Non-Detriment Finding (NDF) of Smooth Hammerhead Sharks *Sphyrna zygaena* in Bangladesh

Bangladesh Forest Department
Ministry of Environment, Forest and Climate Change

Non-Detriment Finding:

This Non-Detriment Finding (NDF) was prepared at two workshops held in Chattogram and Dhaka in February 2022. It is based on the guidance developed by Mundy-Taylor et al. (2014)[1] and was compiled by the Bangladesh Forest Department (BFD), as the designated CITES Management Authority, in consultation with the Department of Fisheries (DoF), the Bangladesh Fisheries Research Institute, and Fisheries experts from national public universities and the Wildlife Conservation Society (WCS).

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Cover Photo

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[1] Mundy-Taylor, V., Crook, V., Foster, S., Fowler, S., Sant, G., and Rice, J. 2014. CITES Non-detriment findings guidance for shark species. 2nd, revised version. A framework to assist Authorities in making Non-detriment Findings (NDFs) for species listed in CITES Appendix II. Report prepared for the Germany Federal Agency for Nature Conservation (Bundesamt fur Naturschutz, BfN).

Available at https://cites.org/eng/prog/shark/Information_resources_from_Parties_and_other_stakeholders.

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Summary of Non-Detriment Finding of Smooth hammerhead sharks in Bangladesh

The smooth hammerhead shark, locally known as *Jowal haturi hangor* is protected under Schedule I of the Bangladesh Wildlife (Conservation and Security) Act, 2012. They are listed under CITES Appendix II and CMS Appendix II. IOTC does not prohibit their retention in the Indian Ocean and the species is assessed as Vulnerable on the Global IUCN Red List.

Smooth hammerhead sharks are largely coastal and semi-oceanic pelagic sharks ranging in temperate and tropical seas. They can live up to 18-21 years and mature at an age of about 15 years. These large sharks can grow up to 362cm in length. Females give birth to a maximum of 30-40 pups per year.

A large shark sanctuary in the Maldives EEZ and around the BIOT/Chagos MPA provides some form of protection for these migratory species and likely mitigate some of the fishing pressures on the Indian Ocean stock. Otherwise, there is a high level of threat in the high seas from tuna purse seiners, many of which use Fish Aggregation Devices (FADs), and from industrial longline fisheries targeting tunas and billfishes. Other countries bordering the Indian Ocean take smooth hammerhead sharks as bycatch in gillnet and longline fisheries.

Available landings data for smooth hammerhead sharks in Bangladesh indicates that low numbers are being captured by Bangladeshi fishing vessels, however all captured individuals are extremely small, immature juveniles. In September 2021, all hammerhead sharks, including this species, were provided full protection under Schedule I of the Bangladesh Wildlife (Conservation and Security) Act, 2012. Additional time is needed to determine levels of compliance.

Considering the potential range of the stock/population, the smooth hammerhead sharks are likely heavily impacted by fishing pressure from multiple Indian Ocean countries and from international fleets fishing in the high seas. Though information on exact trade figures is not available from the region, this species is sold/ marketed/ traded if landed and has multiple uses in both domestic and international markets. Demand for its fins is high. It is likely that smooth hammerhead fins are traded together with the fins of other hammerhead species, thereby affecting species-specific trade data. Meat is utilized as fresh, frozen, or dried and salted for consumption.

A negative NDF is recommended for the smooth hammerhead shark species since specimens cannot be legally obtained as the smooth hammerhead shark is listed under Schedule I of the Bangladesh Wildlife (Conservation and Security) Act, 2012. Therefore, the capture and/or trade of this species would be considered illegal.

Mitigation measures and recommendations to improve the conservation status of this species at a national and regional level include:

- Prioritise smooth hammerhead sharks in national data collection initiatives. This includes improving the skills of fishers, government officers, customs, and individuals in observer and landing survey programmes to identify smooth hammerhead sharks. Motivate fishers through training to safely release this species and record and report data from bycaught specimens
- Strengthening enforcement of existing fishery management regulations, including gear restrictions, marine protected area regulations, and legal operating depths for trawl fisheries, through systematically planned and recorded interagency patrols (e.g. SMART patrols),
- Train fishers on best handling and release practices for protected species,
- Mandate species/product specific HS codes and consider designated ports of entry/exit for shark/ray products,
- Support investigations into key biological/ecological parameters, life-history and behavioural traits, discard survival, and the identification of potential mating, pupping, and nursery grounds.
- Conduct socio-economic studies on shark fisheries, trade, and alternative livelihoods, with a focus on hammerhead sharks. A current priority is to determine spatial distribution of (smooth) hammerhead sharks in Bangladesh waters and identify presence during critical life stages of their life history.
- Address shortcomings in Wildlife Act and align species protection and trade regulations in the Fisheries Rules.

Step 1: Preliminary Considerations

a) CITES Party	**BANGLADESH**
b) Management Authority (name, address, contact details)	Bangladesh Forest Department Ministry of Environment, Forests and Climate Change Telephone +880 (2) 818 17 37; Mobile +880 1712 195946 Fax +880 (2) 818 17 41 Websites http://www.bforest.gov.bd
c) Scientific Authority (name, address, contact details)	Scientific Committee of Wildlife Management in Bangladesh Bangladesh Forest Department, Ban Bhaban, Agargaon, Dhaka-1207 (Conservator of Forests, Wildlife Management and Nature Conservation Circle, Dhaka. Email: cf-wildlife@bforest.gov.bd; cfwildlifefd@gmail.com)

1.1a) Is the specimen subject to CITES controls?

a) Species	Smooth hammerhead shark, also locally known as 'Jowal haturi hangor'. FAO Code: SPZ **Sources:** BFD, 2021
b) Will species be exported?	CITES Appendix I
Comments/ Source(s) of information	
c) In what form is the product?	Whole
Comments/ Source(s) of information	Fins (international trade)- The main product from the species that is traded is the fins (CITES 2013). The meat, liver oil, skin, cartilage, and jaws may also be used. **Sources:** White et al. 2006, Miller 2016, Almerón-Souza et al. 2018; BFD, 2021; CITES, 2013; Rigby et.al., 2018
d) Is the fishery domestic or high seas, or both?	Domestic and artisanal
Is the fishery artisanal, large scale, or both?	Both
Comments/ Source(s) of information	Domestic artisanal, and industrial in Bangladesh. WCS recorded catch in artisanal gillnets and setbag nets. The Smooth Hammerhead is caught globally as target and bycatch in commercial and small-scale pelagic longline, purse seine, and gillnet fisheries. It is also captured in coastal longlines, gillnets, trammel nets, and sometimes trawls, particularly in areas with narrow continental shelves, and in some areas, such as Peru, this includes capture of pregnant females and juveniles . **Sources:** BFD, 2021; Rigby et al., 2018
f) Source of identification	Other
Comments/ Source(s) of information	There is limited identification at the coastal landing sites of Bangladesh. There are no identifcation procedures in place at the point of export, however Customs may request identification support from the Department of Fisheries or WCCU to confirm an export taking place.

	Sources: BFD, 2021
How likely is the product to be correctly identified:	**UNLIKELY**
Question 1.1(a): Is the specimen subject to CITES controls?	**YES**

1.1b) From which stock will the specimen be taken/was the specimen taken?

a) Ocean Basin	Indian Ocean
Comments/ Source(s) of information	The Smooth Hammerhead is a large coastal and semi-oceanic pelagic shark, wide-ranging in temperate and tropical seas to depths of at least 200 m, possibly 500 m. **Sources:** Rigby et al.,2018
b) Is this a shared stock (i.e. occurring in more than one EEZ and/or the high seas)?	Yes
Comments/ Source(s) of information	Based on geographical distribution, this is a shared stock that extends between the Bangladesh EEZ, the high seas, and likely several other Indian Ocean EEZ's. **Sources:** Rigby et al., 2018; Casper et al., 2005; Bester 2008
c) If the stock occurs in more than one EEZ, which other Parties share this stock? (If unknown, type "Unknown")	Based on the geographical distribution of these species, other Indian Ocean littoral states share the stock.
Comments/ Source(s) of information	**Sources:** Rigby et al., 2018 ; BFD, 2021
d) If a high seas stock, which other Parties fish this stock? (If unknown, type "Unknown")	Indian Ocean littoral states.
Comments/ Source(s) of information	
e) Which, if any, RFB(s) cover(s) the range of this stock? (If unknown, type "Unknown")	**With respect to the Indian Ocean region:** * Indian Ocean Tuna Commission (IOTC), *Asia-Pacific Fishery Commission (APFIC), *The Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO), *Commission for the Conservation of Southern Bluefin Tuna (CCSBT), *the Regional Organization for the Conservation of the Environment in the Red Sea and Gulf of Aden (PERSGA), * Regional Commission for Fisheries (RECOFI),

	* South Indian Ocean Fisheries Agreement (SIOFA), and *Southwest Indian Ocean Fisheries Commission (SWIOFC). *The Bay of Bengal Large Marine Ecosystem (BOBLME). *IORA, SAWEN - Both the Indian Ocean Rim Association (IORA) and the South Asian Wildlife Enforcement Network (SAWEN) have relevant mandates but no current marine policies.
Comments/ Source(s) of information	**Sources:** http://iotc.org http://www.apfic.org; http://www.bobpigo.org https://www.ccsbt.org/ http://www.persga.org/ http://www.fao.org/fishery/rfb/ recofi/en http://www.fao.org/fishery/rfb/ siofa/en http://www.fao.org/fishery/rfb/
f) Are all Parties listed above (which fish or share the stock concerned) members of the relevant RFB(s)?	Yes.
Source(s) of information	Most are CITES Parties and/or CMS, and some are also Signatories of the CMS Sharks MoU **Sources:** https://cites.org/eng/disc/parties/chronolo.php http://www.cms.int/sharks/en/signatories-range-states
g) Are there geographical management gaps? If so, list in comments	Yes
Source(s) of information	Regional management: At present there is no regional management in place for the smooth hammerhead shark. The IOTC have adopted prohibitions on finning and encourage the release of live sharks (of all species) where possible. International measures: The FAO IPOA-Sharks (International Plan of Action-Sharks) underscores the responsibilities of fishing to coastal states for sustaining shark populations, ensuring full utilisation of retained shark species and improving shark data collection and monitoring. The formally adopted FAO Port State Measures Agreement is an agreement to prevent, deter and eliminate Illegal, Unreported and Unregulated (IUU) fishing. This agreement requires that any inspections conducted on fishing vessels entering ports includes verification that all species exploited

	have been taken in compliance with international law, international conventions and measures of RFMOs. National measures in Bangladesh: The smooth hammerhead shark is currently listed on Schedule I of the Bangladesh Wildlife (Conservation and Security) Act, 2012. However, while the Act lacks legal definitions for the respective schedules and guidance on penalties resulting from infractions, the listing on Schedule I is interpreted as full protection of the species. **Sources:** CITES listing proposal, CoP 16 Proposal 43: https://cites.org/sites/default/files/eng/cop/16/prop/E-CoP16-Prop-43.pdf; BFD, 2021
h) Stock location/ distribution/ boundaries (attach a map)	Coastal pelagic semi oceanic, 0-200 m depths. In shore and offshore, common in depths below 20 m. Indian Ocean EEZ's including Bangladesh.
i) How reliable is the information on origin?	Very reliable
Comments/ Source(s) of information	
Question 1.1(b): Can origin and stock be *confidently* identified?	**YES**

1.2) Was (will) the specimen (be) legally obtained and is export allowed?

a) Strictly protected under wildlife legislation, a regional biodiversity Agreement, or (for a CMS Party) listed in CMS Appendix I?	Yes
Comments/ Source(s) of information	Strictly protected in the Bangladesh Wildlife (Conservation and Security) Act, 2012; placed in Schedule I which provides complete protection from exploitation, capturing, killing, trading, or displaying. Smooth hammerhead sharks are listed on CMS Appendix II; Bangladesh is a CMS Party since 2005. **Sources:** BFD, 2021; http://www.cms.int/en/page/appendix-i-ii-cms http://www.cms.int/en/parties-range-states
b) Sourced from illegal fishing activities (e.g. in contravention of finning regulations, or where a TAC is zero or exceeded)?	No
Comments/ Source(s) of information	There are no TACs in place for sharks and rays in Bangladesh. While there is no finning prohibition in place, all sharks captured ~~are fu~~lly utilised and therefore landed whole.
c) Taken from a no-take marine protected area or during a closed season?	No
Comments/ Source(s) of information	Bangladesh has two ban periods; 65 days (20 May to 23 July) for all marine fishing, and 22 days (depends on lunar months) for Hilsha management (this management impacts all fisheries). No take zones are recommended within the MPA, but mostly are in shallow areas and likely outside of the common habitat of smooth hammerhead sharks. **Sources:** DoF. 2021. Bangladesh Marine Fisheries Management Plan: Part I- Industrial. Department of Fisheries, Ministry of Fisheries and Livestock.
d) Taken in contravention of RFB recommendations, if any?	No

Comments/ Source(s) of information	There are no measures in place for the smooth hammerhead in the Indian Ocean/IOTC. **Sources:** http://iotc.org
e) Listed as a species whose export is prohibited?	Yes
Comments/ Source(s) of information	This species is listed on Schedule I of the Bangladesh Wildlife (Conservation and Security) Act, 2012 **Sources:** http://www.dpp.gov.bd/upload_file/gazettes/41222_60287.pdf
f) Of concern for any other reason?	No
Comments/ Source(s) of information	
Question 1.2: Were specimens legally obtained?	**NO**

1.3) What does the available management information tell us?

1.3a) Global information

a) Reported global catch	This species is caught in both Indian Ocean FAO Areas (51 and 57). Global capture production from 2008 to 2018 is reported as 2,336.18 mt. These values are considered a significant underestimate, likely due to a lack of species-specific reporting.
Comments/ Source(s) of information	**Sources:** FAO (2021) FishStat
b) Species distribution	Wide distribution, circumglobal in warm temperate oceans
Comments/ Source(s) of information	**Sources:** Rigby et al., 2019
c) Known stocks/populations	No studies from the Indian Ocean region. Possibly single stock.
Comments/ Source(s) of information	**Sources:** www.iucnredlist.org
d) Main catching countries	The main catching countries are India, Oman, Pakistan, Australia, USA, Brazil, Portugal, USA, Ecuador, Spain, Taiwan and Philippines, Liberia, New Zealand, Korea, Japan.
Comments/ Source(s) of information	**Sources:** BFD, 2021; FAO FishStat
e) Main gear types by which the species is taken	Longliners, gillnets, hook and lines, and trawls. In Bangladesh WCS recorded smooth hammerhead bycath in gillnets and setbagnets. Artisanal longlines are also in operation in Bangladesh in the coastal, shallow waters, however no data is available to show that smooth hammerheads are being captured by these coastal longliners.
Comments/ Source(s) of information	**Sources:** BFD, 2021
f) Global conservation status	Current IUCN Status: Globally: Vulnerable (2018)
Comments/ Source(s) of information	**Sources:** Rigby et al., 2018
g) Multilateral environmental agreements	Smooth hammerhead sharks are listed on CITES Appendix II, and Convention on Migratory Species (CMS) Appendix II.
Comments/ Source(s) of information	**Sources:** http://www.cms.int/en/species

1.3b) Stock/context-specific information

a) Stock assessments	Limited information is available and there are no quantitative stock assessments currently available for smooth hammerhead shark in the Indian Ocean and therefore the stock status is largely uncertain. An analysis of Smooth Hammerhead yield- and biomass-per-recruit on the Kerala coast, India in the Northern Indian Ocean for 2008–2009, indicated that the stock was over-exploited.
Comments/ Source(s) of information	**Sources:** Manjusha et al., 2011; https://www.iucnredlist.org/species/39388/2921825
b) Main management bodies	Bangladesh Forest Department, Fisheries Department, Ministry of Environment, Forest and Climate Change; Scientific Committee; Commission. CITES, CMS, BOBLME (Phase 2), CBD, IOTC, and FAO – IPOA.
Comments/ Source(s) of information	
c) Cooperative management arrangements	Unknown
Comments/ Source(s) of information	
d) Non-membership of RFBs	None
Comments/ Source(s) of information	
e) Nature of harvest	Smooth hammerhead sharks are taken in Bangladesh as bycatch in artisanal (gillnet, setbag net, and longline) and industrial (trawl net) fisheries.
Comments/ Source(s) of information	**Sources:** BFD, 2021
f) Fishery types	Traditional, small scale to commercial, caught in variety of gears.
Comments/ Source(s) of information	**Sources:** BFD, 2021
g) Management units	Bangladesh Forest Department, Fisheries Department, Ministry of Environment, Forest and Climate Change (Bangladesh Wildlife (Conservation and Security) Act, 2012)

Comments/ Source(s) of information	
h) Products in trade	Fresh and dried whole fish, fins, meat, skin, cartilage, liver oil, jaws. According to official records, Bangladesh exported between zero and nearly one thousand metric tons of dried shark fins (all species combined) annually between 1990 - 2010, almost none between 2011-2018, and then over 2,000 metric tons in 2018/2019 (DoF 2006, 2010, 2017, 2018 and 2019). The three large species of hammerhead sharks (Scalloped Hammerhead Sphyrna lewini, Great Hammerhead S. mokarran and Smooth Hammerhead S. zygaena) are also traded primarily for their fins and are amongst the preferred species for shark fin soup (Dent and Clarke, 2015). In Bangladesh, the "hammer" of the hammerhead sharks are cut off and included in the dry fish trade where it is used for animal (chicken) fodder.
Comments/ Source(s) of information	BFD, 2021; Rigby et al., 2017

1.3c) Data and data sharing

a) Reported national catch(es)	Bangladesh ranked among the top twenty shark fin exporting countries according to 2000-2011 FAO trade data (Mundy-Taylor and Crook 2013, Dent and Clarke 2015), but the country was not among the top twenty shark catching nations. Official statistics report gradual declines in shark and ray landings from 6,234 metric tons of in 2001-2002 to 3,373 metric tons in 2019-2020. WCS study shows that 0.24 tonnes of smooth hammerhead sharks were recorded in Bangladesh between Dec 2016 to Jan 2019. However, aggregated hammerheads (scalloped, smooth, greater) are the second most commonly landed shark group in Bangladesh (data from BFRI and WCS): BFRI recorded 44.72 tons from 2011-2012 across 9 landing sites while WCS data is 214 tons across 8 landing sites (Dec 2016 to Jan 2019).
Comments/ Source(s) of information	WCS, 2021; DoF, 2018 and 2019; Barua, 2020
b) Are catch and/or trade data available from other States fishing this stock?	Limited data is available for smooth hammerhead sharks in FAO and IOTC datasets. They are either reported as an aggregated species group (hammerheads) or generally included under all "sharks".
Comments/ Source(s) of information	
c) Reported catches by other States	Data from the IOTC shows that only 3 members provided catch/landings data for smooth hammerhead sharks: Oman (3,420 tons), Sri Lanka (33 tons), and Comoros (5 tons) between 2015 and 2019. Data reported to the FAO is provided in the annex.
Comments/ Source(s) of information	
d) Catch trends and values	Despite the lack of sufficient data, there is some anecdotal information suggesting that smooth hammerhead Shark abundance has declined over recent decades in the northern Indian Ocean. There is no quantitative stock assessment or basic fishery indicators currently available for smooth hammerhead shark in the Indian Ocean and therefore the stock status is uncertain.
Comments/ Source(s) of information	https://www.iucnredlist.org/species/39388/2921825
e) Have RFBs and/or other States fishing this stock been consulted during or contributed data during this process?	No, but this NDF will be made public in order to enable other range states to make informed decisions for the management of the stock as a whole for the Indian Ocean.
Comments/ Source(s) of information	

Step 2: Biological and conservation concerns

2.1) What is the level of intrinsic biological vulnerability of the species?

a) Median age at maturity	5-15 years
Comments/Source(s) of information	Median age of maturity is 6-8.8 year, which can vary till 15 years in Atlantic Ocean (Coelho et al. 2011)
b) Median size at maturity	over 200 cm TL
Comments/Source(s) of information	>200 cm TL, males mature at about 250- 260 cm TL and females at about 265 cm TL (Stevens,1984), 220 cm FL Atlantic and Australia (Castro & Mejuto 1995, Last and Stevens 2009) Arabian Seas 210-270 females, 210-250 m (Jabado & Ebert, 2015)
c) Maximum age/longevity in an unfished population	10-25 years
Comments/Source(s) of information	18-21 years (Co P16.43, Coelho et al., 2011)
d) Maximum size	100-300 cm TL
Comments/Source(s) of information	362 TL Cochin (Manjusha et al., 2011), 370- 400 cm TL (Appukuttan and Nair 1988; Last and Stevens 2009; Jabado & Ebert, 2015), 500 cm TL (Froese & Pauly, 2016), 386 (Nair and James,1972). Data from WCS of 32 specimens from 16 landing incidences (4 landing sites) recorded size ranges of 31.75 cm to 68.58 cm. Total survey effort was just under 3,000 surveys from 8 landing sites from 2016 to 2019. Data from BFRI documented a mean length of 43.80 cm for all hammerhead sharks.
e) Natural mortality rate (M)	0.17-0.4
Comments/Source(s) of information	0.1-.06 (Froese & Pauly, 2016), 1.39 (Manjusha et al., 2011)
f) Maximum annual pup production (per mature female)	> 15
Comments/Source(s) of information	30-40 (Muus and Nielsen, 1999) 29-37 (Appukuttan and Nair 1988; Raje et al., 2002)

	20-49 pups (Stevens, 1984)
g) Intrinsic rate of population increase (r)	under 0.15
Comments/Source(s) of information	
h) Geographic distribution of stock	Ocean basin, unrestricted, limited fragmentation
Comments/Source(s) of information	Circumglobal (Ebert et al., 2013). Common in 0-20 m, coastal waters
i) Current stock size relative to historic abundance	Unknown
Comments/Source(s) of information	Possibly declined. **Sources:** IUCN RedList
j) Behavioural factors	Some behavioral factors to increase risk to stock
Comments/Source(s) of information	Sex, age wise segregating behavior, grounds not known, frequent juvenile captures from coastal waters.
k) Trophic level	High
Comments/Source(s) of information	4.5-4.9 **Sources:** (Froese & Pauly, 2016)
Overall biological vulnerability:	**MEDIUM LEVEL OF CONCERN**

2.2) What is the severity and geographic extent of the conservation concern?

Conservation or stock assessment status:

Has a Fisheries stock assessment been conducted?	No
Comments/Source(s) of information	
Has a National Redlist Assessment been conducted?	No
Comments/Source(s) of information	
What is the Regional IUCN Redlist Assessment?	The species, population, or stock has not been assessed (NE or equivalent)
Comments/Source(s) of information	
What is the Global IUCN Redlist Assessment?	The species, population, or stock has been assessed and is moderately threatened (NT, VU)
Comments/Source(s) of information	2018 Assessment— Vulnerable (VU) **Source:** Rigby et al., 2018
What are the population trends?	There are no stock/population trend data, or an attempted stock assessment or it is impossible to estimate population trends
Comments/Source(s) of information	Indian Ocean: There are no stock assessments, however population trends indicate a decline in the northern Indian Ocean. **Sources:** Rigby et a., 2018
What is the geographic extent/scope of conservation concern?	Identified threats affect the entire global population of the species.

Comments/Source(s) of information	There are large Indian Ocean shark sanctuaries in the Maldives EEZ and around the BIOT/Chagos MPA provide some form of protection for these migratory species and likely mitigate some of the fishing pressures on this ocean's stock. Otherwise there is a high level of threat on the high seas from tuna purse seiners setting on FADs and from industrial longline fisheries targeting tunas and billfishes. Other countries bordering the Indian Ocean have gillnet and longline fisheries that take smooth hammerhead sharks as bycatch.
Overall geographic conservation concern:	**HIGH LEVEL OF CONCERN**

Step 3: Pressure on the Species

3.1) What is the severity of trade pressure on the stock of the species concerned?

a (i) Magnitude of legal trade	High
ii) What is the level of confidence in the answer?	Medium
Comments/Source(s) of information	Available landings data for smooth hammerhead sharks in Bangladesh indicates that low numbers are being captured by Bangladesh vessels, however all captured individuals are extremely small, immature juveniles. This species was recently included (in September 2021) under Schedule I of the Wildlife Act and is therefore prohibited from being captured or landed. Additional time is needed to determine level of compliance. Considering the potential range of the stock/population, the smooth hammerhead sharks are likely heavily impacted by fishing pressure from multiple Indian Ocean countries and from international fleets fishing in the high seas. Though information on exact trade figures are not available from the region, this species is sold/ marketed/ traded if it is landed and they have multiple uses in both domestic and international markets. Demand for fins is high. Meat is utilized as fresh, frozen, or dried and salted for consumption. It is likely that smooth hammerhead fins are traded together with the fins of other hammerhead species, thereby affecting species-specific trade data. **Sources:** BOBLME 2013. http://www.iucnredlist.org and national data.
b (i) Magnitude of illegal trade	High
ii) What is the level of confidence in the answer?	Medium
Comments/Source(s) of information	Trade of all shark products is considerably higher than the volume of documented trade based on the import statistics provided by other countries (e.g., Hong Kong). Therefore, illegal trade is

	taking place from Bangladesh. However, no species-specific information is available and the fins and fish maw are combined in trade reporting, so actual volumes of smooth hammerhead sharks cannot be quantified. Fins may also be hidden in shipments of fish maw or dried fish. In India, shark fin exports have been prohibited since 2015 but some shipments to Hong Kong have been reported as originating from India (media reports, letter from WWF India to MoEF & CC, Hong Kong customs data). Fins may be hidden in shipments of dried fish products. Sri Lanka has also seized several shark fins illegally exported from Sri Lanka (Fernando et al., 2021).
Overall trade pressure:	**HIGH**
Overall level of confidence:	**MEDIUM**

3.2) What is the severity of fishing pressure on the stock of the species concerned?

a (i) Fishing mortality (retained catch)	High
ii) What is the level of confidence in the answer?	High
Comments/Source(s) of information	There are no discards of smooth hammerhead shark in Bangladesh waters. Any sharks captured are retained and fully utilised. About 68,000 vessels are operating in the Bangladesh EEZ, however they do not all engage in shark fishing. The situation is similar for most other fisheries in the region where there is virtually no discard of smooth hammerhead sharks and therefore, fisheries mortality is likely ~100% for most of this stock. FADs deployed by other Indian Ocean countries may also increase fishing mortality. There is some information (TRAFFIC report) suggesting that smooth hammerhead shark abundance has declined over recent decades in the Indian Ocean (based on reporting by Sri Lanka). Considering the species is not prohibited in the Indian Ocean and there has been no noticeable reduce in effort (and likely an increase in effort), it can be concluded that the declines are a result of reducing populations. Data from India highlights that this species is vulnerable to multiple gears and the fishing effort shows an increasing trend over the years (Zacharia et al., 2017). Sources: DoF, 2021; Okes, N. and Sant, G., 2019
b (i) Discard mortality	Low
ii) What is the level of confidence in the answer?	Medium
Comments/Source(s) of information	There are no discards of smooth hammerhead sharks from Bangladesh fisheries (complete utilisation). This is similar for many other Indian Ocean fishing nations; all smooth hammerheads that are caught are retained for consumption or trade.
c (i) Size/age/sex selectivity	Medium
ii) What is the level of confidence in the answer?	Medium

Comments/Source(s) of information	There is limited data available from Bangladesh. Data from WCS of 32 specimens from 16 landing incidences (4 landing sites) recorded size ranges of 31.75 cm to 68.58 cm. Total survey effort was just under 3,000 surveys from 8 landing sites from 2016 to 2019. Data from BFRI documented a mean length of 43.80 cm for all hammerhead sharks. Both datasets indicate that extremely small, immature juveniles are being captured by the Bangladesh fishery. There is no targeted or selective fishing for this species in Bangladesh and across most other Indian Ocean countries they are primarily captured incidentally across multiple fishing gears. Data from India suggests that although the species is not targeted, the occurrence of sub adults/juveniles in coastal fishing grounds make them susceptible to various fishing gears, however, the numbers reported in India landings are very low. **Sources:** Zacharia et al., 2017
d (i) Magnitude of illegal, unreported and unregulated (IUU) fishing	High
ii) What is the level of confidence in the answer?	Medium
Comments/Source(s) of information	Information about this factor is limited. In Bangladesh there are some reports of IUU fishing, for example the use of illegal nets, missing licenses by some vessels, and violating the depth ranges of their permits. There is also a poor documentation of catches, particularly at a species level. Additionally, the trade chain is not transparent. Since September 2021, smooth hammerhead sharks are a prohibited species in the Bangladesh EEZ, however it is too early to determine compliance with this measure. Across the Indian Ocean there are other reports of IUU fisheries, such as infringing on fishing grounds of neighbouring countries or potentially by international fleets operating illegally in the high seas. However, data of shark captures from such IUU fisheries are not available.
Overall severity of fishing mortality:	**MEDIUM**
Overall level of confidence:	**MEDIUM**

Step 4: Existing Management Measures

4.1) Are existing management measures apprpriately designed and implemented to mitigate pressures affecting the stock?

Pressure - Magnitude of Legal Trade	
Existing management measure	**CITES**
Is it a Sub-national/National, or Regional/International measure?	Regional/National/International
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Regulates international trade and mandates adoption of national legislation to improve the management of threatened wildlife, including sharks and rays.
Overall assessment of compliance regime	Poor (limited relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Partially

Pressure - Magnitude of Illegal Trade	
Existing management measure	**Bangladesh Wildlife (Conservation and Security) Act, 2012**
Is it a Sub-national/National, orRegional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Both
Relevant monitoring, control, and surveillance(MSC) measure(s)	Eight genera and 23 species of sharks and rays under Schedule I and one genus and 29 species under Schedule II. Species listed in Schedule I and Schedule II of the Wildlife (Conservation and Security) Act, 2012 are protected animals, and require license and/or permit from BFD for commercial farming, capturing, collection, possession, production, rearing, import-export or hunting. Compliance is unknown as the listing of sharks and rays was amended in September 2021.
Overall assessment of compliance regime	Unknown (no information on compliance)
Are relevant data collected and analysed toinform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective ataddressing the pressure?	Insufficient information

Pressure - Fishing mortality (retained catch)	
Existing management measure	**Bangladesh Wildlife (Conservation and Security) Act, 2012**
Is it a Sub-national/National, orRegional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Both
Relevant monitoring, control, and surveillance(MSC) measure(s)	Species listed in Schedule I and Schedule II of the Wildlife (Conservation and Security) Act, 2012 are protected animals, and require license and/or permit from BFD for commercial farming, capturing, collection, possession, production, rearing, import-export or hunting. Control and surveillance are conducted by DoF with support from Navy and Coast Guard. At present compliance is low for sharks and rays; however, the measure is very new (since September 2021).
Overall assessment of compliance regime	Poor (limited relevant compliance measures in place)
Are relevant data collected and analysed toinform management decisions?	No data OR data are of poor quality OR data are not analysed (adequately) to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective ataddressing the pressure?	Insufficient information

Pressure - Fishing mortality (retained catch)	
Existing management measure	**CMS**
Is it a Sub-national/National, orRegional/International measure?	Regional/International
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance(MSC) measure(s)	Not applicable for smooth hammerhead sharks as they are included on Appendix II and not Appendix I. However, CMS Appendix II species have been included in the national Wildlife Act (see above).
Overall assessment of compliance regime	Unknown (no information on compliance)
Are relevant data collected and analysed toinform management decisions?	No data OR data are of poor quality OR data are not analysed (adequately) to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective ataddressing the pressure?	Not Applicable

Pressure - Fishing mortality (retained catch)	
Existing management measure	**IOTC Resolution 1501 on the recording of catch and effort data by fishing vessels in the IOTC area of competence**
Is it a Sub-national/National, orRegional/International measure?	Regional/International
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance(MSC) measure(s)	Standard reporting to the IOTC is being carried out (see IOTC-2020-SC24-NRBangladesh). However, information on control and surveillance is not available. DoF provides a format to collect data for industrial trawling that the trawlers are required to fill out (if they do not provide the data, they are not issued a permit to fish. The data format only requires shark and ray cumulative catch volume and fishing depths). Shark and ray landings data are collected from 2 (Chittagong and Cox's Bazar) coastal landing sites of Bangladesh, 4 days a month (other monitoring occurs across 14 landing sites). Information from artisanal fleets are not available.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed toinform management decisions?	Limited relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Expert advice partially implemented
Is the management measure effective ataddressing the pressure?	Insufficient information

Pressure - Fishing mortality (retained catch)	
Existing management measure	**IOTC Resolution 15/02 mandatory statistical reporting requirements for Contracting Parties and Cooperating NonContracting Parties CPCs**
Is it a Sub-national/National, orRegional/International measure?	Regional/International
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance(MSC) measure(s)	Standard reporting to the IOTC is being carried out (see IOTC-2020-SC24-NRBangladesh). Some statistical reporting is available from industrial fleets and artisanal fleets, however it is lacking at a species level.
Overall assessment of compliance regime	Poor (limited relevant compliance measures in place)
Are relevant data collected and analysed toinform management decisions?	No data OR data are of poor quality OR data are not analysed (adequately) to inform management
Is management consistent with expert advice?	Expert advice partially implemented
Is the management measure effective ataddressing the pressure?	Insufficient information

Pressure - Fishing mortality (retained catch)	
Existing management measure	**IOTC Resolution 1705 on the conservation of sharks caught in association with fisheriesmanaged by IOTC.**
Is it a Sub-national/National, orRegional/International measure?	Regional/International
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance(MSC) measure(s)	Standard reporting to the IOTC is being carried out (see IOTC- 2020-SC24-NRBangladesh). However, information on control and surveillance is not available. The DoF provides a format to collect data for industrial trawling. If trawlers do not provide the data, they are not issued a permit to fish. The data format only requires recording the cumulative catch weight of sharks and rays. Shark and ray landing data from artisanal fisheries are collected by DoF from 2 coastal landing sites in Bangladesh (Chattogram and Cox's Bazar) on 4 days per month, while other fish landing monitoring occurs across 14 landing sites. Information from industrial and artisanal fleets is therefore very limited.
Overall assessment of compliance regime	Poor (limited relevant compliance measures in place)
Are relevant data collected and analysed toinform management decisions?	No data OR data are of poor quality OR data are not analysed (adequately) to inform management
Is management consistent with expert advice?	Expert advice partially implemented
Is the management measure effective ataddressing the pressure?	Partially

Pressure - Discard mortality	
Existing management measure	**Bangladesh Wildlife (Conservation and Security) Act, 2012**
Is it a Sub-national/National, orRegional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Both
Relevant monitoring, control, and surveillance(MSC) measure(s)	No information available. There are no known fisheries discards due to total utilisation of catch.
Overall assessment of compliance regime	Unknown (no information on compliance)
Are relevant data collected and analysed toinform management decisions?	No data OR data are of poor quality OR data are not analysed (adequately) to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective ataddressing the pressure?	Insufficient information

Pressure - Discard mortality	
Existing management measure	**IOTC Resolution 1104 on a regional observer scheme**
Is it a Sub-national/National, orRegional/International measure?	Regional/International
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance(MSC) measure(s)	Standard reporting to the IOTC is being carried out (see IOTC-2020-SC24-NRBangladesh). There is no regional observer scheme in place.
Overall assessment of compliance regime	Unknown (no information on compliance)
Are relevant data collected and analysed toinform management decisions?	No data OR data are of poor quality OR data are not analysed (adequately) to inform management
Is management consistent with expert advice?	Not consistent
Is the management measure effective ataddressing the pressure?	No

Pressure - Magnitude of IUU fishing	
Existing management measure	**Bangladesh Wildlife (Conservation and Security) Act, 2012**
Is it a Sub-national/National, orRegional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Both
Relevant monitoring, control, and surveillance(MSC) measure(s)	Species listed in Schedule I and Schedule II are protected animals, and require license and/or permit from BFD for commercial farming, capturing, collection, possession, production, rearing, import-export or hunting.
Overall assessment of compliance regime	Poor (limited relevant compliance measures in place)
Are relevant data collected and analysed toinform management decisions?	No data OR data are of poor quality OR data are not analysed (adequately) to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective ataddressing the pressure?	Insufficient information

Pressure - Magnitude of IUU fishing	
Existing management measure	**Marine Fisheries Rules, 1983**
Is it a Sub-national/National, orRegional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance(MSC) measure(s)	Gear restriction (minimum mesh size, use of poison and set-bag nets).
Overall assessment of compliance regime	Moderate (some relevant compliance measures in place)
Are relevant data collected and analysed toinform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective ataddressing the pressure?	Partially

Pressure - Magnitude of IUU fishing	
Existing management measure	**Protection and Conservation of Fish Rules, 1985**
Is it a Sub-national/National, orRegional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance(MSC) measure(s)	Prohibits use of monofilament gillnets.
Overall assessment of compliance regime	Poor (limited relevant compliance measures in place)
Are relevant data collected and analysed toinform management decisions?	Limited relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective ataddressing the pressure?	Partially

Pressure - Magnitude of IUU fishing	
Existing management measure	**Territorial Waters and Maritime Zones Act 1974**
Is it a Sub-national/National, orRegional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance(MSC) measure(s)	Aims to prevent indiscriminate exploitation, depletion and destruction of marine resources. Mandate for implementation is under the Navy. Navy and Coastguard carry out patrolling but do not conduct onboard inspections.
Overall assessment of compliance regime	Poor (limited relevant compliance measures in place)
Are relevant data collected and analysed toinform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Expert advice partially implemented
Is the management measure effective ataddressing the pressure?	Partially

Pressure - Magnitude of IUU fishing	
Existing management measure	**The Marine Fisheries Act 2020**
Is it a Sub-national/National, orRegional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance(MSC) measure(s)	Enables gear restriction and monitoring marine protected area. Coastguard and Navy monitors illegal vessels within the MPA, and inform DoF about activities.
Overall assessment of compliance regime	Poor (limited relevant compliance measures in place)
Are relevant data collected and analysed toinform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Expert advice partially implemented
Is the management measure effective ataddressing the pressure?	Partially

Pressure - Magnitude of IUU fishing	
Existing management measure	**IOTC Resolution 1501 on the recording of catch and effort data by fishing vessels in the IOTC area of competence**
Is it a Sub-national/National, orRegional/International measure?	Regional/International
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance(MSC) measure(s)	DoF are working toward improving the catch reporting for sharks and rays from industrial fisheries.
Overall assessment of compliance regime	Unknown (no information on compliance)
Are relevant data collected and analysed toinform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Expert advice partially implemented
Is the management measure effective ataddressing the pressure?	Insufficient information

Pressure - Magnitude of IUU fishing	
Existing management measure	**IOTC Resolution 1104 on a regional observer scheme**
Is it a Sub-national/National, orRegional/International measure?	Regional/International
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance(MSC) measure(s)	Standard reporting to the IOTC is being carried out (see IOTC-2020-SC24-NRBangladesh). There is no regional observer scheme in place.
Overall assessment of compliance regime	Unknown (no information on compliance)
Are relevant data collected and analysed toinform management decisions?	No data OR data are of poor quality OR data are not analysed (adequately) to inform management
Is management consistent with expert advice?	Not consistent
Is the management measure effective ataddressing the pressure?	No

Step 5: Non-Detriment Finding and related advice

5.0	**Non-Detriment Finding and related advice**	
5.1	**Based on the outcomes of the previous sections, is it possible to make a positive NDF (with or without associated conditions)?**	
	STEP 1: Can/should an NDF be made?	
	Section 1.1(a): Is the specimen subject to CITES controls?	Yes
	Section 1.1(b): Can origin and stock be confidently identified?	Yes
	Section 1.2: Were specimens legally obtained?	Yes
	STEP 2: Intrinsic biological vulnerability and conservation concern	
	Section 2.1: Intrinsic biological vulnerability:	Medium level of vulnerability
	Section 2.2: Conservation concern:	High level of concern

	STEP 3: Pressure on species			STEP 4: Existing management measures
	Pressure	**Level of severity (Questions 3.1 and 3.2)**	**Level of confidence (Questions 3.1 and 3.2)**	**Are the management measures effective at addressing the concerns/ pressures/impacts identified?**
	Trade pressures:			
a)	Magnitude of legal trade	High level of risk	Medium level of confidence	Partially
b)	Magnitude of illegal trade	High level of risk	Medium level of confidence	No
	Fishing pressures:			
a)	Fishing mortality (retained catch)	High level of risk	High level of confidence	Partially
b)	Discard mortality	Low level of risk	Medium level of confidence	No
c)	Size/age/ sex selectivity	Medium level of risk	Medium level of confidence	No measures in place
d)	Magnitude of illegal, unreportedand unregulated (IUU) fishing	High level of risk	Medium level of confidence	Partially

	Automated Recommendation: **0 to 2** - Not recommended **2.1 to 5** - Not recommended unless mitigation measures applied **5.1 to 8** - Possible with conditions **8.1 to 10** - Recommended	Negative NDF required since specimen is not subject to CITES controls AND/OR origin cannot be confidently identified AND/OR specimen is not legally obtained	Not recommended
	Based on the above information,can a positive NDF be made?	**No**	Go to Section 6
	Enter any reasoning/comments:		
	The smooth hammerhead shark is listed under Schedule I of the Bangladesh Wildlife (Conservation and Security) Act, 2012. Therefore, the capture and/or trade of this species would be considered illegal and a Negative NDF is recommended.		
	NDF expiry (recommended validity: 1 or 2 years):	This NDF will remain valid until a new one is required (e.g., changes to the listing of this species under the Wildlife Act). In order to prevent further decline of this species and to promote recovery, management and conservation actions are proposed in Step 6 of this NDF.	

Step 6: Recommendations

Recommendation	Population monitoring (fisheries-independent data)
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Provide support to existing regional initiatives (e.g., encouraging and supporting population stock assessments for smooth hammerhead sharks at the IOTC), including providing smooth hammerhead shark tissue samples for Indian Ocean population genetic studies.
Potential lead agencies	DoF, BFRI, universities (national and international), and NGOs
Timeframe	Ongoing
Recommendation	**Fisheries monitoring (fisheries-dependent data)**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	Prioritise smooth hammerhead sharks in national data collection initiatives. This includes: a) improve the skills of fishers, government officers, customs, and individuals in observer and landing survey programmes to identify smooth hammerhead sharks. Motivate fishers through training to safely release this species and record and report data from bycaught specimens (including locaton, gear type, size, sex, and maturity of catches and documenting (any) discards (condition on release)). b) harmonise data (specifically bycatch information) from different sources (e.g., data reported to the IOTC, FAO, and CITES).

	Research: Support investigations into key biological/ecological parameters, life-history and behavioural traits, discard survival, and the identification of potential mating, pupping, and nursery grounds. Conduct socio-economic studies on shark fisheries, trade, and alternative livelihoods, with a focus on smooth hammerhead sharks. A current priority is to determine spatial distribution of smooth hammerhead sharks in Bangladesh waters and identify presence during critical life stages of their life history.
Potential lead agencies	DoF, BFRI, universities (national and international), and NGOs
Deadline	Within 18 months
Recommendation	**Monitoring of domestic and international trade volumes and characteristics**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures,and other notes/comments	FD to request Bangladesh Customs to introduce and mandate HS codes for all shark and ray products (separate codes for fins, meat, cartilage, skin etc.) to improve reporting, surveillence, and data collection on imports and exports. DoF to identify opportunities (with Bangladesh Customs) to designate particular ports of export/import for shark and ray products. This would ensure better monitoring of exports/imports while reducing the need to enhance identification capacity at all exit/entry points across the country. Ensure that the enforcement authorities are mandated to enforce the Wildlife Act and that awareness is generated on species listed on Schedules I and II. Awareness would be improved through providing posters of species on schedules for each of the exit/entry points. Awareness (posters and training events) would be provided to key shipping, courier services, traders (fisheries stakeholders, domestic traders and international exporters and importers, and domestic consumers), and law enforcement agencies on species protection laws (including CITES).

	FIQC (DoF) to prepare a methodology for the random sampling of shark and ray products for export in conjunction with Bangladesh Customs and FD. 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 (this includes improved training in combatting illegal wildlife trade and sharing intelligence). Require all exporters and importers of shark and ray products to be registered with the DoF and to declare their exports/imports at a species level. Additionally, develop a risk index for exporters/importers to support screening upon receival of export/import permit requests, including black-listing and fining of companies/individuals that have multiple violations. Look into establishing an informal communication group (e.g. WhatsApp) consisting of shark identification experts (both local and international), in order to identify sharks and/or shark products with a camera photo at short notice.
Potential lead agencies	DoF, BFRI, universities (national and international), and NGOs
Deadline	Ongoing
Recommendation	**Export quotas**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	A zero export quota will be fixed as trade of this specimen is not permitted under Schedule I of the Wildlife Act. The CITES Secretariat will be formally informed of this zero quota and requested to inform all CITES Parties through a notification of this 0 export quota for smooth hammerhead sharks.

Potential lead agencies	FD
Deadline	Ongoing
Recommendation	**Documentation schemes**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Documentation schemes have been addressed above.
Potential lead agencies	
Deadline	Ongoing
Recommendation	**Limited entry**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	At present there is a limit in place for the number of operating trawlers (current limits: 262 registered and 234 active vessels) based on the realisation that most stocks are overfished. There is no limit in place for artisanal fleets. Strengthen Monitoring, Control and Surveillance (MCS) of existing regulations, including spatial regulations surrounding the minimum operating depths for trawl fisheries.
Potential lead agencies	DoF, with implementation/inspection support provided by Navy and Coastguard
Deadline	Ongoing
Recommendation	**Fishing time restrictions**
Is this recommendation applicable	Yes
Aims, objectives,	There is a seasonal closure of all fishing grounds implemented in Bangladesh (65 days in marine/coastal and

implementation, relevant compliance measures, and other notes/comments	22 days for all water bodies). Additionally, steel trawlers are required to return to port within 30 days of departure, while wooden trawlers are required to return within 13-14 days.
Potential lead agencies	DoF, with implementation/inspection support provided by Navy and Coast Guard.
Deadline	Ongoing
Recommendation	**Fishing gear restrictions**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	At present, there are prohibitions in place for monofilament gillnets, mesh size limits for gillnets and set-bag nets, and there are depth restrictions for trawl and set-bag net fisheries. There is also a prohibition on bottom trawling for steel-body trawlers. Enforcement of these measures must be strengthened through more systematic and interagency patrols particularly in MPAs, with patrols recorded and the information used to plan next patrols (i.e., SMART patrols). Provide training and awareness to fishers on best handling and release practices for ETP (endangered, threatened, and protected) species, particularly undersized and/or gravid specimens. 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. Encourage research aiming to identify other feasible and practicle measures to avoid and reduce smooth hammerhead shark bycatch and post-release mortality in artisanal and industrial fisheries.
Potential lead agencies	DoF, with implementation/inspection support provided by Navy, Coastguard, and FD. Technical support can be provided by NGOs and universities. The bycatch/post-release research would also include NGOs and universities.
Deadline	SMART/training awareness/change in hooks: implement within 12 months and then ongoing.

	Research: initiate within 6 months and complete within 36 months
Recommendation	**Permanent area closures**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	A 698 sq. km are currently closed. Expanding the SONG MPA will cover critical habitats for many sharks and rays (including smooth hammerhead sharks) and facilitate joint monitoring between DoF and FD.
Potential lead agencies	DoF, FD, with implementation/inspection support provided by Navy and Coast Guard.
Deadline	Within 24 months
Recommendation	**No-take MPAs**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	See above
Deadline	Ongoing
Recommendation	**Total allowable catch**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures,	A total allowable catch of 0 is in place for the smooth hammerhead shark in Bangladesh.

andother notes/comments	
Potential lead agencies	
Deadline	Ongoing
Recommendation	**Individual quota**
Is this recommendationapplicable	No
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Not applicable to Bangladesh
Recommendation	**Fishing trip limits**
Is this recommendationapplicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Already in place (steel trawlers 30 days and wooden trawlers 13-14 days).
Potential lead agencies	
Deadline	Ongoing
Recommendation	**Prohibited retention**

Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Smooth hammerhead sharks are fully prohibited (Schedule I species).
Potential lead agencies	DoF
Deadline	Within 6 months
Recommendation	**Fish size limits**
Is this recommendation applicable	No
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	
Potential lead agencies	DoF
Deadline	
Recommendation	**Product form restrictions**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant	All products will be prohibited. To improve surveillence and compliance, opportunities to designate species/product specific HS codes and also designating specific ports of entry/exit will be investigated.

compliance measures, andother notes/comments	
Potential lead agencies	DoF
Deadline	Within 6 months
Recommendation	**Move-on provisions**
Is this recommendationapplicable	No
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Not applicable to Bangladesh
Recommendation	**Bycatch reduction devices (BRDs)**
Is this recommendationapplicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	As mentioned above, research will be encouraged to identify suitable bycatch mitigation options for smooth hammerhead sharks.
Potential lead agencies	NGOs and universities
Deadline	Within 36 months

Recommendation	Protection of breeding females
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	Increase awareness and implement best handling and release practices.
Potential lead agencies	DoF. Technical support by NGOs and universities.
Deadline	Within 12 months

Recommendation	Participatory management
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	Improve participatory management through stakeholder consultations at a national level. Utilize community science (trained citizen scientists from fisher communities) for monitoring the impacts/effectiveness of fisheries management regulations
Potential lead agencies	DoF, BFD, and NGOs
Deadline	
Recommendation	**IOTC engagement**
Is this recommendation applicable	Yes

Aims, objectives, implementation, relevant compliance measures, and other notes/comments	Bangladesh to strengthen engagement at the IOTC in order to advocate for better regulation of shark and ray fisheries by all IOTC members. This includes regulating the deployment of FADs with the aim of prohibiting the deployment of FADs in the Indian Ocean. Request all IOTC members to publish and share their CITES NDFs for pelagic sharks and rays (falling under the IOTC Area of Competence) and encourage the development of regional NDFs through the IOTC.
Potential lead agencies	DoF, in coordination with FD
Deadline	Within 12 months
Recommendation	**Revise Wildlife Act**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	Amend the Wildlife Act to: a) develop clear definitions for the species listed under Schedule I and II of the Wildlife Act. b) provide clarification on the fines and prosecutions for violations (i.e., capturing Schedule I species or trading Schedule II parts without a permit). Ensure that the fines and prosecutions deter illegal wildlife trade (however, determine that the fine targets the appropriate violator). c) provide the mandate to other enforcement authorities to implement the Wildlife Act. d) enabling prosecution.
Potential lead agencies	BFD
Deadline	24 months
Recommendation	**CMS Sharks MoU**
Is this recommendation applicable	Yes
Aims, objectives, implementation,	Bangladesh to establish communications with the CMS Sharks MoU to identify opportunities to

relevant compliance measures, and other notes/comments	become a Signatory and obtain clarifications on potential obligations. The CMS Sharks MoU is a non-binding convention that provides recommendations on improving shark and ray management and could be a valuable source of knowledge and capacity building.
Potential lead agencies	BFD
Deadline	Within 6 months
Recommendation	**Precautionary finning prohibition**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Introduce precautionary regulations to prohibit shark finning.
Potential lead agencies	DoF
Deadline	Within 12 months
Recommendation	**Onboard observer schemes**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother	Evaluate opportunities for crew based observer schemes in artisanal fishing fleets including provision of navigation equipment (e.g., GPS) in exchange for obtaining catch location data, and electronic monitoring systems (EMS) for industrial fleets (reach out to the FAO).

notes/comments	
Potential lead agencies	DoF, with support from IGOs and NGOs.
Deadline	Within 12 months
Recommendation	**Reduce bycatch and post-release mortality**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Encourage research: a) to determine whether the deployment depths of gillnets or longlines positively impact shark and ray bycatch b) identify suitable alternatives to gaffing/spearing sharks and rays
Potential lead agencies	DoF, BFRI, universities (national and international), and NGOs
Deadline	Within 24 months
Recommendation	**10 Principals for Global Transparency**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Encourage the adoption of EJF's 10 principals for global transparency in fisheries.

Potential lead agencies	DoF
Deadline	Within 24 months

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Appendix 1. Global distribution of the smooth hammerhead shark.

https://www.iucnredlist.org/species/39388/2921825

Appendix 2. List of shark and rays protected under Schedule I and Schedule II of the Bangladesh Wildlife (Conservation and Security) Act, 2012.

Schedule I

ক্রমিক নং	বাংলা নাম	ইংরেজি নাম	বৈজ্ঞানিক নাম
১	২	৩	৪
		বর্গ- কার্চারিনিফর্মিজ (হাঙ্গর) **Carcharhiniformes (Sharks)** **পরিবার-স্ফিরনিডি (Sphyrnidae)**	
১.	পাখনাথা হাতুড়ি হাঙ্গর/জুলিয়া মাগর/কাইন্যা/কাউন্যা	Winghead/ Hammerhead shark	*Eusphyra blochii*
২ .	হাতুড়ি হাঙ্গর/ জুলিয়া মাগর/ কাইন্যা/কাউন্যা	Hammerhead sharks	*Sphyrna spp.*
		পরিবার- কার্চারিনিডি (Carcharhinidae)	
৩.	ভোঁতা বলি হাঙ্গর	Pigeye shark	*Carcharhinus amboinensis*
৪.	সাদাগাল হাঙ্গর/ কানোট	Whitecheek shark	*Carcharhinus dussumieri*
৫.	পন্ডিচেরী হাঙ্গর	Pondicherry shark	*Carcharhinus hemiodon*
৬.	ঘ-বলি হাঙ্গর	Bull shark	*Carcharhinus leucas*
৭.	সাদাটুপি হাঙ্গর	Oceanic whitetip shark	*Carcharhinus longimanus*
৮.	গাঙ্গেয় চিনারি হাঙ্গর	Ganges shark	*Glyphis gangeticus*
৯.	বড়পাখ চিনারি হাঙ্গর/সিনারি হাঙ্গর	Broadfin shark	*Lamiopsis temminckii*
১০.	তীক্ষ্ণদাঁত লেমন হাঙ্গর	Sharptooth lemon shark	*Negaprion acutidens*
		বর্গ- ওরেক্টোলোবিফর্মিজ (Orectolobiformes) **পরিবার- স্টেগোস্টোমাটিডি (Stegostomatidae)**	
১১.	বাঘা হাঙ্গর/জেব্রা হাঙ্গর	Leopard shark/Zebra shark	*Stegostoma fasciatum*
		পরিবার- রিংকোডনটিডি (Rhincodontidae)	
১২.	তিমি হাঙ্গর	Whale shark	*Rhincodon typus*
		বর্গ-ল্যামনিফর্মিজ (Lamniformes) **পরিবার – ওডোন্টাসপিডিডি (Odontaspididae)**	
১৩.	ধূসর বাঘা হাঙ্গর	Sand tiger shark	*Carcharias taurus*
		পরিবার - অ্যালোপিডি (Alopiidae)	
১৪.	কাস্তে হাঙ্গর	Thresher sharks	*Alopias spp.*
		পরিবার - ল্যামনিডি (Lamnidae)	
১৫.	মাকো হাঙ্গর	Mako sharks	*Isurus spp.*

ক্রমিক নং	বাংলা নাম	ইংরেজি নাম	বৈজ্ঞানিক নাম
১	২	৩	৪
		বর্গ- রাইনোপ্রিস্টিফর্মিজ (রে মাছ) **Rhinopristiformes (Ray fishes)** **পরিবার - প্রিস্টিডি (Pristidae)**	
১৬.	করাত মাছ/খাপ্পা মাগর/খটক/করাতি হাঙ্গর/আইশা	Sawfishes	*Pristis spp.*
১৭.	ছুরি করাত মাছ/ খাপ্পা মাগর/ খটক/আইশা	Pointed sawfish	*Anoxypristis cuspidata*
		পরিবার- রিনিডি (Rhinidae)	
১৮.	ধনুকমুখী পিতাম্বরি/স্যাঙ হাঙ্গর	Bowmouth guitarfish	*Rhina ancylostoma*
১৯.	পিতাম্বরি/ নাঙলা	Guitarfishes/wedgefishes	*Rhynchobatus spp.*
		পরিবার- রাইনোব্যাটিডি (Rhinobatidae)	
২০.	পিতাম্বরি/ নাঙলা	Guitarfishes/wedgefishes	*Rhinobatos spp.*
		পরিবার- গ্লকোস্টেজিডি (Glaucostegidae)	
২১.	পিতাম্বরি/ নাঙলা	Guitarfishes/wedgefishes	*Glaucostegus spp.*
		বর্গ – মাইলোব্যাটিফর্মিজ (Myliobatiformes) **পরিবার – ইটোব্যাটিডি (Aetobatidae)**	
২২.	বড়মাথা ঠোট্টা/টুইটা ঘাপরি	Longhead eagle ray	*Aetobatus flagellum*
		পরিবার - মোবুলিডি (Mobulidae)	
২৩.	শিংচোয়াইন/দেউ মাছ/লুইমনি	Devil rays	*Mobula spp.*
		পরিবার- মাইলিয়োব্যাটিডি (Myliobatidae)	
২৪.	চিত্রা ঠোট্টা/টুইটা ঘাপরি	Mottled eagle ray	*Aetomylaeus maculatus*
২৫.	ফুল ঠোট্টা/টুইটা ঘাপরি	Ocellate eagle ray	*Aetomylaeus milvus*
		পরিবার- রাইনোপটেরিডি (Rhinopteridae)	
২৬.	ভোঁতা ঘাপরি	Javan cownose ray	*Rhinoptera javanica*
২৭.	ছোটলেজী ভোঁতা ঘাপরি	Shorttail cownose Ray	*Rhinopetra jayakari*
		পরিবার - ডাসিয়াটিডি (Dasyatidae)	
২৮.	ফুল শাপলাপাতা/জাতি শাপলাপাতা	White spotted whipray	*Maculabatis gerrardi*
২৯.	রাম্মি/চুনি শাপলাপাতা	Bleeker's whipray	*Pateobatis bleekeri*
৩০.	থ্যাবড়া নাক থাইন/ হাঙরাইল	Roughnose cowtail ray	*Pastinachus solocirostris*
৩১.	মিঠাপানির শাপলাপাতা/পাইন্যা/বাইল্যা	Giant freshwater whipray	*Urogymnus polylepis*

Schedule II

ক্রমিক নং	বাংলা নাম	ইংরেজি নাম	বৈজ্ঞানিক নাম
১	২	৩	৪
		বর্গ- কার্চারিনিফর্মিজ (হাঙ্গর) **Carcharhiniformes** **(Sharks)** **পরিবার-কার্চারিনিডি** **(Carcharhinidae)**	
২২.	মুইট্যা হাঙ্গর/সাদা লতা বলি/বলি হাঙ্গর	Graceful shark	*Carcharhinus amblyrhynchoides*
২৩.	ঘূর্ণি হাঙ্গর/কালা লতা বলি হাঙ্গর	Spinner shark	*Carcharhinus brevipinna*
২৪.	রেশমি/সিল্কি হাঙ্গর	Silky shark	*Carcharhinus falciformis*
২৫.	ইলিশা বলি/কালা লতা বলি হাঙ্গর	Blacktip shark	*Carcharhinus limbatus*
২৬.	কালাটুপি রিফ হাঙ্গর/কালা লতা বলি হাঙ্গর	Blacktip reef shark	*Carcharhinus melanopterus*
২৭.	ফোঁটালেজী/কালা লতা বলি হাঙ্গর	Spottail shark	*Carcharhinus sorrah*
২৮.	বাঘা হাঙ্গর	Tiger shark	*Galeocerdo cuvier*
২৯.	নীল হাঙ্গর	Blue shark	*Prionace glauca*
৩০.	সাদাটুপি রিফ হাঙ্গর/সাদা পাখনা হাঙ্গর	Whitetip reef shark	*Triaenodon obesus*
		পরিবার- হ্যামিগ্যালিডি **(Hamigaleidae)**	
৩১.	বড়শিদাঁতী হাঙ্গর	Hooktooth shark	*Chaenogaleus macrostoma*
৩২.	শাঁখাদাঁতী/শিয়াল-বলি হাঙ্গর	Snaggletooth shark	*Hemipristis elongata*
		বর্গ-ল্যামনিফর্মিজ (Lamniformes) **পরিবার - ল্যামনিডি (Lamnidae)**	
		পরিবার-জিংলিমসটোমাটিডি **(Ginglymostomatidae)**	
৩৪.	টনি নার্স হাঙ্গর	Tawny nurse shark	*Nebrius ferrugineus*

		বর্গ-টর্পেডিনিফর্মিজ (রে মাছ) (Torpediniformes) (Ray fishes) **পরিবার- নারসিনিডি (Narcinidae)**	
৩৫.	ভোঁতামুখ কারেন্ট মাছ	Shortlip numbfish	*Narcine brevilabiata*
৩৬.	চীনা কারেন্ট মাছ	Chinese numbfish	*Narcine lingula*
৩৭.	বাদামি কারেন্ট মাছ	Brown numbfish	*Narcine timlei*
		বর্গ-মাইলিয়োবেটিফর্মিজ (Myliobatiformes) **পরিবার- জিম্নুরিডি (Gymnuridae)**	
৩৮.	প্রজাপতি/বাদুড়/পদুনি/পদ্মমামনি	Butterfly rays	*Gymnura spp.*
		পরিবার - ডাসিয়াটিডি (Dasyatidae)	
৩৯.	বাঘা/চিতা শাপলাপাতা	Leopard whipray	*Himantura leoparda*
৪০.	জালি/বাঘা/চিতা শাপলাপাতা	Coach (Reticulated) whipray	*Himantura uarnak*
৪১.	বাঘা/হরিণা/চিতা শাপলাপাতা	Honeycomb whipray	*Himantura undulata*
৪২.	ক্ষুদেচোখা শাপলাপাতা	Smalleye stingray	*Megatrygon microps*
৪৩.	সাদানাক শাপলাপাতা/ হাউশ	Whitenose whipray	*Pateobatis uarnacoides*
৪৪.	জাকিনের ঘণ্টি/ ঘুড়ি শাপলাপাতা	Jenkins´ whipray	*Pateobatis jenkinsii*
৪৫.	কালি/কালাফোটা শাপলাপাতা	Blotched stingray	*Taeniurops meyeni*
৪৬.	সজারু শাপলাপাতা	Porcupine ray	*Urogymnus asperrimus*
৪৭.	গোল শাপলাপাতা	Round whipray	*Maculabatis pastinacoides*
৪৮.	বাদা শাপলাপাতা	Mangrove whipray	*Urogymnus granulatus*
৪৯.	চোন্দামুখ/চুনি শাপলাপাতা	Tubemouth whipray	*Urogymnus lobistoma*
		পরিবার – ইটোব্যাটিডি (Ateobatidae)	
৫০.	চিত্রা ঠোট্যা/ফুল টুইটা ঘাপরি	Spotted eagle ray	*Aetobatus ocellatus*
		পরিবার- মাইলিয়োব্যাটিডি (Myliobatidae)	
৫১.	ডোরাকাটা ঠোট্যা/টুইটা ঘাপরি/শঙ্খচিল	Banded eagle ray	*Aetomylaeus nichofii*

Appendix 3. Smooth hammerhead shark global catches reported to the FAO over 10 years.

Global Reported Smooth Hammerhead Catch to the FAO

Country (Name)	[2008]	[2009]	[2010]	[2011]	[2012]	[2013]	[2014]	[2015]	[2016]	[2017]	[2018]	**Total (t)**
Argentina	0	0	0	0	0	0	0	0	0	2	0	**2**
Ecuador	271	0	0	0	0	290	50	45	42	26	17	**741**
Iran (Islamic Rep. of)	0	0	0	0	128	68	49	63	20	22	12	**362**
Morocco	0	0	0	153	155	116	71	122	126	50	0	**793**
New Zealand	11	12	7	14	11	9	11	11	12	10	12	**120**
Peru	0	0	0	0	0	0	0	0	0	4	0.18	**4.18**
Portugal	32	35	54	0	0	0	2	1	0	0	0	**124**
Sao Tome and Principe	0	0	0	0	0	0	0	38	0	0	0	**38**
Spain	66	85	0	0	0	0	0	0	0	0	0	**151**
United States of America	0	0	0	0	0	0	0	0	0	1	0	**1**
Totals - Tonnes	**380**	**132**	**61**	**167**	**294**	**483**	**183**	**280**	**200**	**115**	**41.18**	***2336.18***

FAO. 2020. Fishery and Aquaculture Statistics. Global capture production 1950-2018 (FishstatJ). In: FAO Fisheries Division [online]. Rome. Updated 2020. www.fao.org/fishery/statistics/software/fishstatj/en

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