Non-Detriment Finding (NDF) of Silky Sharks *Carcharhinus falciformis* 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).

Valid for the two years March 2022 to February 2024.

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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.

Table of Contents

Summary of Non-Detriment Finding of Silky Shark in Bangladesh

The silky shark is protected under Schedule II of the Bangladesh Wildlife (Conservation and Security) Act, 2012. Silky sharks are listed under CITES Appendix II and CMS Appendix II. IOTC does not prohibit the retention of silky sharks in the Indian Ocean although retention is prohibited in other regions. The species is assessed as Vulnerable on the Global IUCN Red List.

Silky sharks are highly migratory pelagic species distributed from continental slopes to open ocean across multiple EEZs, and the high seas. Neonates and young juveniles live in coastal waters, before moving further offshore as sub-adults. They mature at the age of about 10 years and a length of around 200 cm. Females give birth to 1-16 pups every one or two years. The few landing records from Bangladesh are all immature specimens (TL 58-152cm).

The silky shark is the second most caught shark species in the world and ranks among the three most important sharks in the global fin trade. It is highly susceptible to longline and purse seine gear. The status of the stock is highly uncertain in the Indian Ocean, but the threat level to sharks is disproportionately high in the tropics and subtropics, including the northern Indian Ocean, where more than three-quarters of all shark and ray species are threatened with extinction from overfishing.

Available landing data for silky sharks in Bangladesh indicates that low numbers are being captured by Bangladeshi fishing vessels. However, considering the stock across the Indian Ocean, fishing pressure is likely to be high. In Bangladesh, sharks are landed whole, with fins attached, and utilised fully. The volume of silky sharks in trade from Bangladesh cannot be quantified due to a lack of species-specifics in official landing and trade statistics.

Considering the extremely low volume of silky shark landings in Bangladesh, a Positive NDF with conditions is recommended. To improve the sustainability of the silky shark fishery, a minimum size limit will be set at 200 cm for this schedule II species and this measure will be re-evaluated upon expiry of this NDF (2 years).

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

- Improve species-specific monitoring and information gathering (e.g., prioritise silky sharks in national data collection initiatives, including through observers at landing sites and on industrial trawl vessels, and harmonizing data sources),
- 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 research aiming to -
  - Identify feasible measures to avoid and reduce bycatch and post-release mortalities,
  - Monitor population through genetic studies in the Indian Ocean,
  - Determine spatial distribution of silky sharks in Bangladesh waters and identify habitats used during critical stages of their life history (e.g., mating, pupping, nursery grounds),
  - Conduct socio-economic studies on shark fisheries, trade, and alternative livelihoods, with a focus on silky sharks,
  - Support investigations into key biological and ecological parameters, life-history, and behavioural traits, discard survival,
- Engage with the IOTC to advocate for better regulations, including the prohibition of FADs and developing regional NDFs to better address conservation concerns of shared stocks,
- 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, Ban Bhaban, Agargaon, Dhaka-1207 (Chief Conservator of Forests, ccf-fd@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	***Carcharhinus falciformis***
b) Will species be exported?	Yes
Comments/ Source(s) of information	Silky shark, also locally known as 'Reshmi hangor'. FAO Code: FAL
c) In what form is the product?	Mixed
Comments/ Source(s) of information	Fins (international trade) Meat (fresh and dried, sometimes salted, for human consumption) – more data is required to confirm international trade of meat. Skin (international trade of sundried skins as leather) – more data is required to confirm international trade of skin. **Sources:** BFD, 2021
d) Is the fishery domestic or high seas, or both?	Domestic
Is the fishery artisanal, large scale, or both?	Both
Comments/ Source(s) of information	In Bangladesh, it is bycaught in domestic artisanal and industrial fisheries. Globally, it is a target or bycatch species in pelagic tuna longline and purse seine fisheries where it is taken in high numbers. **Sources:** BFD, 2021; Rigby et al., 2017 (https://www.iucnredlist.org/species/39370/205782570)
f) Source of identification	Other
Comments/ Source(s) of information	There is limited identification at coastal landing sites in Bangladesh. There are no species-specific identifcation procedures in place at the point of export. However, Customs may request support from the Department of Fisheries or the Wildlife Crime Control Unit (WCCU) of the Bangladesh Forest Department to confirm species identification in exports. **Sources:** DoF, 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 silky shark has a circumglobal distribution in tropical waters including in the Indian Ocean and also the Bay of Bengal. Global distribution maps are provided in Appendix 1. Overall population parameters and indices are not available for the Bangladesh EEZ and no information is available on stock structure in the Indian Ocean. Galvan-Tirado et al. (2013) provided evidence of the existence of distinct Eastern and Western Pacific Ocean populations but it was not possible to definitively reject the hypothesis of panmixia due to the small differences registered as a result of the low levels of mtDNA genetic variation. Preliminary results from ongoing genetic studies suggest that, for management purposes, silky shark in the Eastern Pacific Ocean should be divided into two stocks, approximately along the equator. **Sources:** Rigby et al., 2017; IOTC, 2015 (Silky Shark Executive summary) Galvan-Tirado et al., 2013 Aires-da-Silva et al., 2013
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	Yes, straddling stock ranging between Bangladesh EEZ, the high seas, and likely the EEZ's of other Indian Ocean littoral states. **Sources:** Mejuto J. et al., 2005; Galvan-Tirado et al., 2013; Kohin et al., 2006; Kohler et al., 1998
c) If the stock occurs in more than one EEZ, which other Parties share this stock? (If unknown, type "Unknown")	Yes
Comments/ Source(s) of information	The stock occurs in the EEZ of the other littoral states of the Indian Ocean. Sources: http://www.iotc.org/about-iotc/structure-commission

d) If a high seas stock, which other Parties fish this stock? (If unknown, type "Unknown")	Indian Ocean EEZ's and other countries
Comments/ Source(s) of information	In addition to the above, the following IOTC Contracting Parties: China, Belize, European Union, Guinea, Japan, Republic of Korea, and Cooperating Non-Contracting Party (CNCP): Liberia. Sources: www.iotc.org
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/ swiofc/en
f) Are all Parties listed above (which fish or share the stock concerned) members of the relevant RFB(s)?	Yes
Source(s) of information	Yes. They are Members or Cooperating Non-Contracting Parties of IOTC. Most are CITES and/or CMS Parties, 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
ource(s) of information	**Regional management:** Retention of silky shark is prohibited in ICCAT and WCPFC but is not prohibited in the Indian Ocean/IOTC. All Tuna RFMOs 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: Shark or ray species and genera are legally protected in Bangladesh by the Wildlife (Conservation and Security) Act 2012 (see Appendix 2). However, legal definitions for the respective schedules and guidance on penalties resulting from infractions are lacking. **Sources:** CITES listing proposal, CoP 17 Proposal 42. https://www.iccat.int/en/RecsRegs.asp - Recommendation Silky Sharks 2011-08 http://www.wcpfc.int/sharks BFD, 2021
h) 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?	No
Comments/ Source(s) of information	Not strictly protected in Bangladesh Wildlife (Conservation and Security) Act, 2012; placed in schedule II which requires official permit from Bangladesh Forest Department. This shark is landed in the coastal landing sites of Bangladesh with all fins attached. Silky sharks are listed on CMS Appendix II; Bangladesh is a member of 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	---
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. No take zones are recommended within the MPA, but mostly are in shallow areas. **Sources:** DoF, 2021
d) Taken in contravention of RFB recommendations, if any?	No
Comments/ Source(s) of information	Not in the Indian Ocean/IOTC.

	N.B. WCPFC and ICCAT prohibit silky shark catch. **Sources:** http://www.wcpfc.int/sharks https://www.iccat.int/en/RecsRegs.asp
e) Listed as a species whose export is prohibited?	No
Comments/ Source(s) of information	
f) Of concern for any other reason?	No
Comments/ Source(s) of information	
Question 1.2: Were specimens legally obtained?	**YES**

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). Reported catch in 2014 and 2015: 2,894 t and 3,204 t. Average reported catch 2011–2015: 3,700 t. Nine countries declared silky shark catches to IOTC in 2014 (see Appendix 3 for reported catches tables and charts). These values are considered a significant underestimate. A study shows, silky sharks were landed in 0.72 percent of the total landing in Bangladesh coast in between December 2016 to January 2019.
Comments/ Source(s) of information	**Sources:** http://www.fao.org/fishery/area/search/en; BFD, 2021; http://www.iotc.org/data/datasets
b) Species distribution	Silky sharks are highly migratory and mostly pelagic species distributed from continental slopes to open ocean. They also range to inshore areas, edges of continental shelves, and over deep-water reefs. It demonstrates strong fidelity to seamounts and natural or man-made objects (FADs- Fish Aggregating Devices) floating at the sea surface associated with schools of tuna.
Comments/ Source(s) of information	**Sources:** Bonfil, 2008; Clarke et al., 2011a; Compagno et al., 2005; Compagno, 1984a; Filmalter et al., 2013
c) Known stocks/populations	Population dynamics and structure are poorly known, although life history parameters seem to vary geographically, perhaps reflecting the existence of distinct stocks for different ocean basins. In the Bay of Bengal, 9.66 % of the longline surveys between 2004-2010 recorded silky sharks. In the Arabian Seas it forms 13% by number of sharks caught in longline surveys, and in the Lakshadweep Sea, 90 % of the total shark caught by experimental longline surveys from 2009 to 2011. Three groups, likely constituting distinct populations are identifiable: a distinct group in the Northwest Atlantic, another in the west and central Pacific, and a third in the eastern Pacific (Bonfil, 2008).
Comments/ Source(s) of information	**Sources:** www.iucnredlist.org; Bonfil, 2008; Aires-da-Silva et al., 2014. Varghese et al., 2015a. Kumar et al., 2015. Rigby et al., 2017: http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T39370A117721799.en
d) Main catching countries	The main catching countries (reporting catch) are members of IOTC:

	Eastern IO (Area 57): Bangladesh, Sri Lanka, Taiwan, China, Indonesia. Western IO (Area 51): Iran I.R; Taiwan, China. Other countries may be catching but not reporting data.
Comments/ Source(s) of information	**Sources:** BFD, 2021; IOTC, 2015; Jayathilaka and Maldeniya, 2015; MRAG, 2012; Murua et al.,2013
e) Main gear types by which the species is taken	Gillnet, longline, industrial trawl net, tropical tuna purse seine using fish aggregating devices (FADs), ring-net (very low numbers). In Bangladesh, artisanal gillnets and set-bag nets are responsible for the highest shark catches. Shark and ray catches in industrial trawl fishery are not segregated to species.
Comments/ Source(s) of information	**Sources:** BFD, 2021; Amande et al., 2010; Moazzam and Nawaz, 2014; MRAG, 2012; Murua et al., 2013
f) Global conservation status	Current IUCN Status: Globally: Vulnerable; Arabian Sea and adjacent waters: Near Threatened (2017) Previous IUCN Status: Globally: Vulnerable (2017) Globally: Near Threatened (2016)
Comments/ Source(s) of information	**Sources:** https://www.iucnredlist.org/species/39370/205782570
g) Multilateral environmental agreements	Silky shark is listed on the Convention on Migratory Species (CMS) Appendix II and on Annex 1 of the Memorandum of Understanding on the Conservation of Migratory Sharks (since 20 February 2016).
Comments/ Source(s) of information	**Sources:** Convention on Migratory Species http://www.cms.int/en/species http://www.cms.int/sharks/en/mos2

1.3b) Stock/context-specific information

a) Stock assessments	No quantitative stock assessment or fishery indicators of status are currently available for silky shark in the Indian Ocean, therefore the stock status is highly uncertain. An ecological risk assessment (ERA) was conducted for the Indian Ocean by the IOTC Working Party on Ecosystem and Bycatch (WPEB) and the Scientific Committee (SC) in 2012. Silky shark received a high vulnerability ranking (No. 4) in the ERA rank for longline gear because it was estimated as one of the least productive shark species, and with a high susceptibility to longline gear. Silky shark was estimated as the second most vulnerable shark species in the ERA ranking for purse seine gear, due to its low productivity and high susceptibility for purse seine gear. Stock assessment and stock status indicators conducted elsewhere showed that populations are in decline: The Scientific Committee of the Western Central Pacific Fisheries Commission (WPFC) stock assessment, based on 1995-2009 data, stated that overfishing is occurring and it is highly likely the silky shark stock is overfished. "Current estimates of stock depletion are that the total biomass has been reduced to 30% of theoretical equilibrium virgin biomass". An update to the silky shark standardised Catch-Per-Unit-Effort in the Western Central Pacific Ocean extended the data series to 2014 and reported a decline since 2010; the stock likely maintain their overfished status and an updated stock assessment is warranted. In the eastern Pacific Ocean, a stock assessment has been in process for a couple of years and stock status indicators show the population is in decline, especially in the south.
Comments/ Source(s) of information	**Sources:** (IOTC, 2015; Murua et al., 2012); (IOTC–2012–SC15–INF10 Rev_1) (Murua et al., 2012); (IOTC-2015-SC18-ES21 [E])http://www.iotc.org/documents/status-indian-ocean-silky-shark-fal-carcharhinus-falciformis-0; Silky Shark Supporting Information http://www.iotc.org/science/status-summary-species-tuna-and-tuna-species-under-iotc-mandate-well-other-species-impacted- iotc#sh; (Rice and Harley, 2013); (Rice et al., 2015); (Aires-da-Silva et al., 2013);(Aires-da-Silva et al., 2014); (Lennert-Cody et al., 2016, 2017)
b) Main management bodies	Bangladesh Forest Department under the Ministry of Environment, Forests and Climate Change; Department of Fisheries under the Ministry of Fisheries and Livestock, CITES, CMS, IOTC.
Comments/ Source(s) of information	

c) Cooperative management arrangements	In addition to arrangements and support to scientific bodies and expert groups for the implementation of the Common Fisheries Policy (ICES- International Council for Exploration of the Sea, STECF Scientific Technical and Economic Committee for Fisheries, JRC-Joint Research Centre, etc.), the European Union supports through voluntary contributions scientific research for sharks and mitigation of bycatch in the RFMOs to which it is Party (e.g. IOTC, WCPFC, IATTC, ICCAT). The Areas Beyond National Jurisdiction Program (ABNJ) aims to improve cooperation between tuna RFMOs. The IOTC and WCPFC are trialling a Bycatch Data Exchange Protocol Template (BDEP) that aims to provide a framework for consistent management of bycatch data within RFMOs. A 2016 IOTC report recommends that this BDEP continue in 2017 for the Indian Ocean (IOTC–2016–WPDCS12–28 Rev_1).
Comments/ Source(s) of information	**Sources:** http://www.commonoceans.org/home/en/ UNCLOS Annex 1 Highly Migratory species www.un.org/unlcos/annex1 http://www.commonoceans.org/tuna- biodiversity/en/ IOTC–2016–WPDCS12–28 Rev_1. http://www.iotc.org/documents/bycatch- data-exchange-protocol-indian-ocean
d) Non-membership of RFBs	All of the main catching countries (Bangladesh, Sri Lanka, Taiwan, China, Indonesia, Iran I.R) are Members of IOTC.
Comments/ Source(s) of information	**Sources:** (MRAG, 2012; Murua et al., 2013) http://www.iotc.org
e) Nature of harvest	The silky shark is the second most caught species of shark globally, after the blue shark (Prionace glauca). The silky shark is both targeted or caught as incidental (bycatch) by longline fisheries and purse seine fisheries (especially those using drifting fish aggregating devices [FADs]) as well as by artisanal fisheries. FADs are made of a floating object and nets that lie vertical in the water column to attract schools of fish. The silky shark, as well as other species, is easily entangled in the nets; and there have been large increases in the use of FADs since 1996. Whether they are targeted or an incidental catch, the silky shark is often either retained for its meat and fins where regulations allow, or released with high mortality rates apparent in the tropical purse seine fisheries. Total catches of the silky shark reported to FAO are mainly from Sri Lanka (Western Indian Ocean) with the FAO catch less than 4,000 tonnes (t) from 2005-2009 before doubling in 2010 and 2011. Catches then decreased to ~5,000 t in 2012 and 2013.
Comments/ Source(s) of information	**Sources:** Rigby et al., 2017
f) Fishery types	Silky sharks are taken in Bangladesh as bycatch in artisanal (gillnet), (longline/gillnet) and industrial (trawl net) fisheries. Elsewhere in the Indian Ocean, by other IOTC members, they are taken in industrial fisheries, including

	pelagic longline tuna, swordfish fisheries, and the tropical tuna purse seine fishery using FADs with large bycatch of juveniles. Silky sharks are taken in Indian waters as a secondary (retained) catch in drift gillnet and longline fisheries targeting large pelagics, and to a lesser extent as bycatch by trawlers. Sri Lanka takes large quantities of silky shark as bycatch in artisanal (gillnet) and semi-industrial (longline/gillnet) fisheries.
Comments/ Source(s) of information	**Sources:** BFD, 2021; IOTC, 2015
g) Management units	Department of Fisheries (IOTC); Bangladesh Forest Department (CITES, Bangladesh Wildlife (Conservation and Security) Act, 2012); Ministry of Environment, Forests, and Climate Change (CMS)
Comments/ Source(s) of information	http://www.iotc.org; BFD, 2021
h) Products in trade	Meat (fresh & dried (mostly)) is utilised domestically for human consumption in Bangladesh. Extent of domestic and international meat trade (if any) is currently unknown. Fins enter international trade. Silky shark ranks among the three most important sharks in the global shark fin trade. According to official records, Bangladesh exported between zero and nearly one thousand metric tons of dried shark fins (all species plus fish maws combined) annually between 1990 - 2010, almost none between 2011-2018, and then over 2,000 metric tons in 2018/2019.
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, 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.
Comments/ Source(s) of information	BFD, 2021
b) Are catch and/or trade data available from other States fishing this stock?	Catch and trade data are reported to the FAO and IOTC by some Indian Ocean countries, (including Bangladesh) and States fishing in the Indian Ocean.
Comments/ Source(s) of information	https://www.iotc.org/documents
c) Reported catches by other States	Access to these data managed by IOTC Secretariat are available: Nominal Catches, Catch and Effort, Size frequency data.
Comments/ Source(s) of information	http://www.iotc.org/data/datasets
d) Catch trends and values	Despite the lack of sufficient data, there is some anecdotal information suggesting that silky shark abundance has declined over recent decades in the Indian Ocean, including from Indian longline research surveys. There is no quantitative stock assessment or basic fishery indicators currently available for silky shark in the Indian Ocean and therefore the stock status is uncertain. However, the threat level to sharks is disproportionately high in the tropics and subtrocpics, including the northern Indian Ocean, where more than three-quarters of all shark and ray species are threatened with extinction from overfishing.
Comments/ Source(s) of information	Varghese et al., 2015. Dulvy et al., 2021
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	https://cites.org/eng/prog/shark/resource_Parties_stakeholders#NDFs%20and%20NDF%20guidance

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	Age at maturity in Indian waters is 9.6 for males and 10.7 for females (Varghese et al., 2015). The age of sexual maturity varies between regions. In the Indian Ocean, it hasbeen estimated to be around 13 years for males and 15 years for females (Hall et al., 2012). This is significantly older than reported for silky sharks in the Pacific Ocean (Oshitani et al., 2003; Joung et al., 2008), Gulf of Mexico (Bonfil et al., 1993) and Atlantic Ocean (Branstetter, 1987).
b) Median size at maturity	over 200 cm TL
Comments/Source(s) of information	Silky shark size at maturity also varies between ocean regions, ranging globally from 180 to 225 cm TL for males, and 200–245 cm TL for females. In the Indian Ocean, size at maturity has been estimated at 217 cm TL for males and 226.5 cm TL for females (Varghese et al., 2015), versus 207.6 cm TL for males and 215.6 cm TL for females (Hallet al., 2012). In Aldabra atoll, a 208.4 cm male was immature while individuals of 239 cm and above were fullymature (Stevens, 1984). A 216.1 cm TL mature virgin female has been observed while individuals of 220.3 and 220.7 cm TL were fully mature and no longer virgin (Branstetter, 1987, Bonfil et al., 1993, Galvan-Tirado et al., 2015, Springer, 1960, Oshitani et al., 2003, Joung et al.,2008, Strasburg, 1958.)
c) Maximum age/longevity in an unfished population	10-25 years
Comments/Source(s) of information	In the Indian Ocean, while the maximum ages recorded formales and females by Hall et al. (2012) were 20 and 19 years, Varghese et al. (2015) estimated a maximum age of 27.56 years. In the Gulf of Mexico, the maximum ages were recorded as 20 years for males and 22 years for females (Bonfil et al., 1993), and in the Pacific Ocean, 8years were recorded for males and 13 years for females(Oshitani et al., 2003).
d) Maximum size	100-300 cm TL

Comments/Source(s) of information	L infinity is 277.3 cm TL for males (n=78) in the Indian Ocean (Hall et al., 2012). 309.8 cm TL, pooled for both sexes (Varghese et al., 2015). L infinity is 320.4 cm TL for females (n=90) in the Indian Ocean (Hall et al., 2012). In southern Gulf of Mexico, maximum length is 330 cm (Compagno, 1984). For Bangladesh, to date the maximumrecorded size is 152 cm (immature).
e) Natural mortality rate (M)	0.17-0.4
Comments/Source(s) of information	Pacific: 0.179 (Smith et al., 1998). Atlantic: 017-0.21(Cortes 2002). Gulf of California: 0.26 (Furlong-Estrada et al., 2014).
f) Maximum annual pup production (per mature female)	2-15
Comments/Source(s) of information	Two to sixteen pups were recorded from specimens sampled from landings in Indian waters. No information isavailable on gestation period/periodicity of births. Numbers of pups per litter vary between oceans: from 1 or2, to a maximum of 10–16 (Branstetter, 1987; Oshitani et al., 2003; Joung et al., 2008), or 2-14 in the eastern Indian Ocean (Hall et al., 2012). Gestation period: 12–24 months, with females reported togive birth once every year, every two years, or sometime in between (Clarke et al., 2015). In Bangladesh, no pregnant female silky sharks have been observed.
g) Intrinsic rate of population increase (r)	under 0.15
Comments/Source(s) of information	Intrinsic population increase is 0.205, based on average 9 pups with age of maturity of females being 10.7 years fromIndian waters (ICAR-CMFRI, unpublished data). Rated High (FAO 2016), based on: north Atlantic: 0.078,South Atlantic: 0.042 (Cortés et al., 2015).
h) Geographic distribution of stock	Ocean basin, unrestricted, limited fragmentation
Comments/Source(s) of information	Widespread and highly migratory.

i) Current stock size relative to historic abundance	Unknown
Comments/Source(s) of information	No data available
j) Behavioural factors	Some behavioral factors to increase risk to stock
Comments/Source(s) of information	Neonates and young juveniles up to a few years old live in coastal reef nursery grounds. They are, at this stage, demersal and semi-pelagic and vulnerable to bottom andpelagic longlines. Juveniles then move more offshore, tending to aggregate on floating objects (natural, or man- made FADs); they demonstrate strong fidelity to seamounts and are often associated with schools of tuna (Bonfil, 2008). There is segregation by size: sub-adults arefound in offshore nursery areas, adults even further offshore (Compagno, 1984). Critical habitats for silky sharks are unknown in Bangladesh. To date there is no evidence of FADs inBangladeshs marine waters.
k) Trophic level	High
Comments/Source(s) of information	4.5 Based on diet studies (Froese and Pauly, 2015)
Overall biological vulnerability:	**MEDIUM LEVEL OF CONCERN**

2.1) 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	From the final CMSY model configuration tested, the catches of silky shark in the Indian Ocean exceeded MSY from 1994 onwards. The exploitation rate for 2015 (last year in the model) was predicted to be well above MSY-level (F2015/Fmsy = 2.07). The estimation of current biomass (B2015) was 1.03 of Bmsy, with a considerable margin of uncertainty in the prediction (0.44-1.39), meaning that at present the silky shark stock in the IndianOcean is subject to overfishing but not yet overfished. A fishing reduction to the levels observed in the late 1990s and early 2000s (around 9,000 t) would likely be sustainable. However, given the current level of uncertainty, the estimated lower 95% confidence limit of MSY (6,400 t) could serve as a more conservative guidance for total allowable catches. Sources: Ortiz de Urbina at al., 2018 https://www.iotc.org/documents/preliminary-stock- assessment-silky-shark-indian-ocean-using-data-limited-approach; Josetxu Ortiz de Urbina, 2018
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 andis moderately threatened (NT, VU or equivalent)
Comments/Source(s) of information	2017 Assessment— Vulnerable (VU)Sources:

	https://www.iucnredlist.org/species/39370/205782570
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 assessment trend data available. The IUCN Red List notes that the status of the stock is highly uncertain in the Indian Ocean. TRAFFIC concludes that falling catches of silky shark are likely due to population decline. Sources: Rigby et al., 2017; Okes, N. and Sant, G. (2019)
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, which protects this species and 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 silky 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	Silky Shark ranks among the three most important sharksin the global shark fin trade, with between half a millionand one and a half million Silky Shark traded annually. Available landing data for silky sharks in Bangladeshindicates that low numbers are being captured by Bangladeshi fishing vessels. However, considering thestock across the Indian Ocean, it is clear that fishing pressure is likely to be High. In Bangladesh, sharks arelanded whole, with fins attached, and utilised fully. Sources: Rigby et al., 2017; BFD, 2021
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 thevolume of documented trade in shark fins 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 in official landing or trade statistics, and fins are reported combined with fish maw Actual volumes of silky sharks in trade from Bangladesh can therefore not be quantified. Fins may also be hidden in shipments of fish maw or dried fish. Similar discrepancies have been noted in other Indian Ocean countries. For example in India, shark fin

	exportshave been prohibited since 2015 but some shipments toHong Kong have been reported as originating from India.And in Sri Lanka, customs authorities have made several seizures of fins being attempted to be illegally exported while Hong Kong have also reported illegal imports from Sri Lanka. It is likely that many other unreported incidences from other countries in the region are taking place. **Sources:** BFD, 2021; Hong Kong customs data, 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 silky shark in Bangladesh waters. Any sharks captured are retained and fully utilised. About68,000 artisanal fishing 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 regionwhere there is virtually no discard of silky sharks and therefore, fisheries mortality is likely ~100% for most of this stock. FADs deployed by other countries fishing in the Indian Ocean may also increase fishing mortality. There is some information suggesting that silky 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 reduction in fishing effort (and likely an increase in effort), it can be concluded that the declines area result of reducing populations. 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 silky sharks from Bangladesh fisheries (complete utilisation). This is similar for many other Indian Ocean fishing nations. There are concerns about discard mortality by other fleetsoperating in the Indian Ocean and affecting the same stock(i.e., purse seine fisheries and some long line fisheries). Few studies have established at-vessel mortality rates in longline fisheries. Three studies (published between 2014and 2016) examined the mortality of silky sharks associated with tropical purse seine gear. The high estimates of silky shark's at-vessel mortality (59–69%) andoverall mortality rates (81–95%) reflect the harsh conditions encountered by sharks during purse seine fishing operations in the western and central Pacific Oceanand in the Indian Ocean.

	Shark mortality rates estimated onboard tropical purse seiners appear to be high, but it is worth noting that the contribution of the purse seine fishery to total pelagic sharkmortality in the Indian Ocean is believed to be extremely small compared to gillnet fisheries. The post release mortality rates for silky shark were estimated at 15.8% by Hutchinson et al. (2015), 52% by Poisson et al. (2014) andof 28% by Eddy et al. (2016). Despite these differences, the total mortality rate observed in the equatorial eastern Pacific Ocean (EPO) (92%) was comparable to the value obtained in the Indian Ocean (81%) and in the West and Central Pacific Ocean (84%). There is considerable concern within IOTC about theunknown but potentially severe impacts of gillnets on awide range of bycatch species. **Sources:** Hutchinson et al., 2013; Hutchinson et al., 2015; Poisson etal., 2014
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. The fewlanding records (280 silky sharks encountered over 12 days from a total of almost 3,000 survey days across 8 sites) were of immature specimens (TL 58-152 cm). Data collected by the Bangladesh Fisheries Research Institute (BFRI) in 2014 reported a mean length of 78 cm for landedsilky sharks. There is no targeted or selective fishing for this species in Bangladesh and across most other Indian Ocean countries as they are largely captured incidentallyin multiple fishing gears. Tropical purse seine fisheries in the Indian Ocean are highly selective for certain size-age classes, with juvenilesilky shark comprising the largest component of the incidental elasmobranch catch, particularly when fishingon FADs. **Sources:** Hoq, 2020; WCS, unpublished.
d (i) Magnitude of illegal, unreported and	High

unregulated (IUU) fishing	
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 for theuse of illegal nets, unlicensed vessels, and violations of gear-specific depth ranges detailed in permits. Catches arepoorly documented, particularly at a species level. Additionally, the trade chain is not transparent. Silky sharks are not a prohibited species in the Indian Ocean, however there is likely some level of IUU fisheriesoperating.
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/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, or Regional/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 are included in Schedule I as 'Protected Animal' and one genus and 29 species are included in Schedule II as 'Protected Animal'. 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 list 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, or Regional/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 - Fishing mortality (retained catch)	
Existing management measure	**CMS**
Is it a Sub-national/National, or Regional/International measure?	Regional/International
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Not applicable for silky sharks as they are included on Appendix II and not Appendix I
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, or Regional/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 Department of Fisheries (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	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 1502 mandatory statistical reporting requirements for Contracting Parties and Cooperating NonContracting Parties CPCs**
Is it a Sub-national/National, or Regional/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 and artisanal fleets, however it lacks species-specific details.
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?	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 fisheries managed by IOTC.**
Is it a Sub-national/National, or Regional/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. Thedata format only requires recording the cumulative catch weight of sharksand 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 istherefore 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

ressure - Discard mortality	
Existing management measure	**Bangladesh Wildlife (Conservation and Security) Act, 2012**
Is it a Sub-national/National, or Regional/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, or Regional/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, or Regional/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, or Regional/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, or Regional/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, or Regional/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. Navy is mandated with the implementation. Navy and Coast Guard carry out patrols, but do not conductonboard 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, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Enables declaration, monitoring and enforcement of marine protected areas. Coast Guard and Navy monitor fishing activities and inform DoF about illegal vessels or 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, or Regional/International measure?	Regional/International
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	No information available. DoF recently issued an order for the release of any marine mammal bycatch.
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 - Magnitude of IUU fishing	
Existing management measure	**IOTC Resolution 1104 on a regional observer scheme**
Is it a Sub-national/National, or Regional/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	Partially
	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, unreported and 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	4.3	Not recommended unless mitigation measures applied
	Based on the above information, can a positive NDF be made?	**Yes, with conditions**	List mandatory conditions in Section 6 and list recommendations for measures to improve monitoring/management under reasoning/comments below
	Enter any reasoning/comments:		
	Considering the extremely low volume of silky shark landings in Bangladesh, a Positive NDF (with conditions) is recommended. Mitigation measures and recommendations to improve the conservation status of this species at a national and regional level are outlined in Step 6.		
	NDF expiry (recommended validity: 1 or 2 years):	The NDF validity is set at 2 years with annual reviews suggested to determine progress of actions outlined in Step 6. If significant new data is made available prior to the expiry of this NDF, a new NDF will be developed.	

Step 6: Recommendations

Recommendation	Population monitoring (fisheries-independent data)
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	Provide support to existing regional initiatives (e.g., encouraging and participating in population stock assessments for silky sharks at the IOTC), including providing silky 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 silky sharks in national data collection initiatives. This includes: a) maintaining and expanding observer programs (landing site data collectors, industrial trawl logbooks) and transitioning to species-specific data collection, including catch location and gear type, size, sex, and maturity of catches, and documenting any discards, including the condition at release, for all sharks and rays. b) harmonise data from different sources (e.g., data reported to the IOTC, FAO, and CITES). Research: Support investigations into key biological and 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 silky sharks. A current priority is to determine spatial distribution of silky sharks in Bangladesh waters and identify presence during critical stages of their life history.
Potential lead agencies	DoF, BFRI, universities (national and international), and NGOs
Deadline	
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	BFD to request Bangladesh Customs to introduce and mandate HS codes for all shark and ray products (e.g., separate codes for fins, skins, meat, cartilage, etc.) to improve the traceability and reporting of exports and imports. DoF to identify opportunities in collaboration with Bangladesh Customs to designate particular ports of export/import for shark and ray 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. Ensure that law enforcement agencies are mandated to enforce the Wildlife Act and that awareness is generated on species listed on Schedules I and II. Awareness should be improved through providing posters featuring identifying characteristics of Schedule I and II listed species to each exit/entry point. Awareness on species protection and trade laws (including CITES) should also be improved through the provision of educational outreach events and materials to shipping and courier service providers, domestic traders and consumers, exporters and importers, and fishery stakeholders.

	The Fish Inspection and Quality Control (FIQC) unit of the DoF should prepare a methodology for the random sampling of shark and ray products for export in collaboration with Bangladesh Customs and the BFD. Training support could be requested from NGOs and international bodies (e.g., Interpol, CITES, World Customs Organisation) to identify how and where shark and ray products are being exported, share intelligence, and effectively combat illegal wildlife trade. Require all exporters and importers of shark and ray products to be registered with the DoF and to declare their exports/imports to a species level. Additionally, DoF, BFD, and Customs to jointly 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, imo) consisting of shark identification experts (both local and international), to assist with identifying sharks and/or shark products from a camera photo at short notice.
Potential lead agencies	DoF, BFRI, universities (national and international), and NGOs
Deadline	2023-08-31
Recommendation	**Export quotas**
Is this recommendation applicable	No
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	At present there is insufficient information on the imports and exports of shark and ray products from Bangladesh.This option will be re-evaluated following the implementation of recommendations presented above (see Monitoring of domestic and international trade section).
Recommendation	**Documentation schemes**
Is this recommendatio	Yes

n applicable	
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Documentation schemes have been addressed above.
Recommendation	**Limited entry**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	At present there is a limit in place for the number of operational licensed trawlers based on the realisation that most stocks are overfished. The current limit is 262 registered vessels, of which 234 are active. There is no limit in place for artisanal fleets. Strengthen Monitoring, Control and Surveillance (MCS) of existing regulations, including spatial regulations related to minimum legal operating depths for trawl fisheries.
Potential lead agencies	DoF, with implementation/inspection support provided by Navy and Coast Guard
Deadline	
Recommendation	**Fishing time restrictions**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	There is a seasonal closure of all fishing grounds implemented in Bangladesh (65 days in marine/coastal and 22 days for all water bodies). Additionally, steel trawlers are required to return to port within 30 days of depature, 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	
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 silky shark bycatch and post-release mortality in artisanal and industrial fisheries.
Potential lead agencies	DoF, with implementation/inspection support provided by Navy, Coast Guard, and BFD. Technical support can be provided by NGOs and universities. The bycatch/post-release research would also include NGOs and universities.
Deadline	
Recommendation	**Permanent area closures**
Is this recommendation	Yes

applicable	
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	An area covering 698 sq. km is currently closed as designated Marine Reserve. An expantion of the Swatch-of-No-Ground MPA to incorporate additional critical habitats for many sharks and rays, including silky sharks) should be considered, and joint monitoring of MPAs facilitated between DoF, BFD, Coast Guard, and Navy.
Potential lead agencies	DoF, BFD, with implementation/inspection support provided by Navy and Coast Guard.
Deadline	
Recommendation	**No-take MPAs**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	See above
Recommendation	**Total allowable catch**
Is this recommendation applicable	No
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Not applicable to Bangladesh

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

onapplicable	
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	Not applicable for silky sharks due to low catch rates.
Recommendation	**Fish size limits**
Is this recommendati onapplicable	Yes
Aims, objectives, implementation, relevant compliance measures, andother notes/comments	To improve the sustainability of the silky shark fishery, a minimum size limit will be provided when issuing the permits for this Schedule II species. The minimum size will be set at 200 cm and this measure will be reevaluated upon expiry of this NDF (2 years).
Potential lead agencies	DoF
Deadline	
Recommendation	**Product form restrictions**
Is this recommendati onapplicable	Yes
Aims, objectives, implementation, relevant compliance	As mentioned above, opportunities to designate species/product specific HS codes and also specific ports of entry/exit for shark/ray products will be investigated.

measures, andother notes/comments	
Potential lead agencies	DoF
Deadline	2022-08-31
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 feasible bycatch mitigation options for silky sharks.
Potential lead agencies	NGOs and universities
Deadline	

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	

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 use 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 to better address the conservation concerns of shared stocks.
Potential lead agencies	DoF, in coordination with BFD
Deadline	
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) Define 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). It should be ensured that these suffice to deter illegal wildlife trade and 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	
Recommendation	**CMS Sharks MoU**
Is this recommendation applicable	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	Bangladesh to establish communications with the CMS Sharks MoU to identify opportunities to 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	

References

Aires-da-Silva, A., Lennert-Cody, C., Maunder, M.N., 2013. Stock status of the silky shark in the eastern Pacific Ocean. 4th Meeting of the IATTC Scientific Advisory Meeting, April 29-May 3, 2013. https://www.iattc.org/Meetings/Meetings2013/SAC-04/Presentations/_English/SAC-04-PRES_Silkyshark.pdf.

Aires-da-Silva, A., Lennert-Cody, C., Maunder, M.N., Román-Verdesoto, M., 2014. Stock status indicators for silky sharks in the eastern Pacific Ocean. Document SAC-05-11a. Inter-American Tropical Tuna Commission Scientific Advisory Committee Fifth Meeting La Jolla, California, USA http://www.iattc.org/Meetings/Meetings2014/MAYSAC/PDFs/SAC-05-11a-Indicators-for-silkysharks. pdf.

Amandè, M.J., Ariz, J., Chassot, E., De Molina, A.D., Gaertner, D., Murua, H., Pianet, R., Ruiz, J., Chavance, P., 2010. Bycatch of the European Purse Seine tuna fishery in the Atlantic Ocean for the 2003-2007 period. Aquatic Living Resources, pp 23, 353–362. https://doi.org/10.1051/ALR/2011003.

Bangladesh Forest Department (BFD). 2021. Shark and ray assessment report: Baseline information on the status, threats and governance in Bangladesh. Prepared by the Wildlife Conservation Society (WCS Bangladesh) under the Sustainable Forests and Livelihoods (SUFAL) Project.

Bonfil, R., 2008. The Biology and Ecology of the Silky Shark, *Carcharhinus falciformis*. Sharks Open Ocean 114–127. https://doi.org/10.1002/9781444302516.CH10

Clarke, C., Lea, J.S.E., Ormond, R.F.G., 2011. Reef-use and residency patterns of a baited population of silky sharks, *Carcharhinus falciformis*, in the Red Sea, in: Marine and Freshwater Research, pp 668–675. https://doi.org/10.1071/MF10171.

Compagno, L.J.V., Dando, M., Fowler, S., 2005. Field Guide to the Sharks of the World. London: Harper Collins Publishers Ltd.

Compagno, L.J.V.,1984. FAO Species catalogue. Vol. 4. 1984 Sharks of the world: An annotated and illustrated catalogue of shark species known to date. Part 2 Carcharhiniformes. FAO Fish Synopnis., (125) Vol.4, Part 2: pp 251-655

Department of Forest (DoF), Bangladesh., 2021. Bangladesh Marine Fisheries Management Plan: Part 1 Industrial.

Filmalter, J.D., Capello, M., Deneubourg, J.L., Cowley, P.D., Dagorn, L., 2013. Looking behind the curtain: Quantifying massive shark mortality in fish aggregating devices. Front. Ecol. Environ. 11, 291–296. https://doi.org/10.1890/130045.

Galván-Tirado, C., Díaz-Jaimes, P., García-de León, F.J., Galván-Magaña, F., Uribe-Alcocer, M., 2013. Historical demography and genetic differentiation inferred from the mitochondrial DNA of the silky shark (*Carcharhinus falciformis*) in the Pacific Ocean. Fish. Res. 147, 36–46. https://doi.org/10.1016/J.FISHRES.2013.03.020.

Hoq, M.E., Haroon, M.K.Y. and Karim, E. 2014. Shark fisheries status and management approach in the Bay of Bengal, Bangladesh, pp 233-246.

Hutchinson, M.R., Itano, D.G., Muir, J.A., Leroy, B., Holland, K.N., 2013. Fishery interactions and post-release survival rates of silky sharks caught in purse seine fishing gear. WCPFC-SC9-, pp 26.

Hutchinson, M.R., Itano, D.G., Muir, J.A., Holland, K.N., 2015. Post-release survival of juvenile silky sharks captured in a tropical tuna purse seine fishery. Mar. Ecol. Prog. Ser. 521, 143–154. https://doi.org/10.3354/MEPS11073.

Indian Ocean Tuna Commission, IOTC., 2015. IOTC Draft Executive Summary: Silky Shark. https://www.iotc.org/sites/default/files/documents/2015/11/IOTC-2015-SC18-ES21E_-_Silky_shark_pdf.

Kohin, S., Arauz, R., Holts, D., Vetter, R., 2006. Preliminary results: Behavior and habitat preferences of silky sharks (*Carcharhinus falciformis*) and a bigeye thresher shark (*Alopias superciliosus*) tagged in the Eastern Tropical Pacific. Índice de Contenidos 17-19. https://cremacr.org/wp-content/uploads/2008/07/marcaje-satelital.pdf

Kohler, N.E., Casey, J.G., Turner, P.A., 1998. NMFS Cooperative Shark Tagging Program, 1962-93: An Atlas of Shark Tag and Recapture Data. https://doi.org/10.3/JQUERY-UI.JS.

Lennert-Cody, C., Aires-da-Silva, A., Maunder, M. and Roman, M.H. 2016. Updated stock status indicators for Silky Sharks in the eastern Pacific Ocean. Document SAC-07-06bi. Inter-American Tropical Tuna Commission Scientific Advisory Committee Seventh Meeting, La Jolla, California. https://www.iattc.org/Meetings/Meetings2016/SAC7/7thMeetingScientificAdvisoryCommitteeENG.htm.

Lennert-Cody, C., Clarke, S.C., Aires-da-Silva, A., Maunder, M.N. and Roman, M.H. 2017. Updated stock status indicators for Silky Sharks in the Eastern Pacific Ocean (1994-2017). Inter-American Tropical Tuna Commission Scientific Advisory Committee Ninth Meeting, La Jolla, California. https://www.iattc.org/Meetings/Meetings2018/SAC-09/PDFs/Docs/_English/SAC-09-13-EN_Updated-purse-seine-indicators-for-silky-sharks-in-the-EPO.pdf

Mejuto J., Garcia-Cortes B., A, R.-C., 2005. Tagging-recapture activities of large pelagic sharks carried out by Spain in collaboration with the tagging programs of other countries. SCRS/2004/104 Col. Vol. Sci. Pap. ICCAT 58 (3), 974-1000. https://www.fao.org/3/bi039e/bi039e.pdf

Moazzam, M., Nawaz, R., 2014. By-catch of tuna gillnet fisheries of Pakistan: A serious threat to non-target, endangered and threatened species. J. Mar. Biol. Assoc. India 56, 85–90. https://doi.org/10.6024/JMBAI.2014.56.1.01750S-13.

MRAG, 2012. A review of bycatch in the Indian Ocean gillnet tuna fleet focusing on India and Sri Lanka. ISSF Technical Report 2012-05. International Seafood Sustainability Foundation, Washington, D.C., USA. https://www.bmis-bycatch.org/system/files/zotero_attachments/library_1/DE6M2NVX%20-%20MRAG%20-%202015%20-%20A%20review%20of%20bycatch%20in%20the%20Indian%20Ocean%20gillnet%20tu.pdf

Murua, H., Coelho, R., Santos, M.N., Arrizabalaga, H., Yokawa, K., Romanov, E., Zhu, F., Kim, Z.G., Bach, P., Chavance, P., Delgado de Molina, A., Ruiz, J., 2012. Preliminary Ecological Risk Assessment (ERA) for shark species caught in fisheries managed by the Indian Ocean Tuna Commission (IOTC). IOTC-2012-SC15-INF10 Rev_1. Fifteenth session of the Scientific Committe. 10–15 December 2012. Victoria Mahé, Seychelles. 26 p.

Murua, H., Abascal, F.J., Amande, J., Ariz, J., Bach, P., Chavance, P., Coelho, R., Korta, M., Poisson, F., Santos, M.N., Seret, B., 2013. Provision of scientific advice for the purpose of the implementation of the EUPOA sharks. Final Report. European Commission, Studies for Carrying out the Common Fisheries Policy (MARE/2010/11 - LOT2). http://ec.europa.eu/fisheries/documentation/studies/sharks/index_en.htm.

Okes, N., Sant, G., 2019. An overview of major shark catchers, traders and species. TRAFFIC, Cambridge, UK. https://www.iattc.org/Meetings/Meetings2017/SAC08/8thMeetingScientificAdvisoryCommitteeENG.htm.

Poisson, F., Séret, B., Vernet, A.L., Goujon, M., Dagorn, L., 2014. Collaborative research: Development of a manual on elasmobranch handling and release best practices in tropical tuna purse-seine fisheries. Mar. Policy 44, 312–320. https://doi.org/10.1016/j.marpol.2013.09.025.

Seventeenth meeting of the Conference of the Parties - Proposals for amendment of Appendices I and II | CITES. https://cites.org/eng/cop/17/prop/index.php.

Ram, J., R, M., 2015. Impact of policies on the conservation of sharks in the large pelagic fishery. https://www.iotc.org/documents/impact-policies-conservation-sharks-large-pelagic-fishery

Rice, J., Harley, S., 2013. Updated stock assessment of silky sharks in the western and central Pacific Ocean. Western and Central Pacific Fisheries Commission Scientific Committee WCPFC-SC-2013/SA-WP-03. Available at: https://www.wcpfc.int/node/3685.

Rice, J., Tremblay-Boyer, L., Scott, R., Hare, S., and Tidd, A., 2015. Analysis of stock status and related indicators for key shark species of the Western Central Pacific Fisheries Commission. Scientific Committee Eleventh Regular Session. WCPFC-SC11-2015/EB-WP-04-Rev 1 Analysis of stock status and related indicators for key shark species of the Western Central Pacific Fisheries Commission. Scientific Committee Eleventh Regular Session. WCPFC-SC11-2015/EB-WP-04-Rev 1. https://www.wcpfc.int/node/21719.

Rigby, C.L., Sherman, C.S., Chin, A., Simpfendorfer, C., 2021. *Carcharhinus falciformis* (amended version of 2017 assessment). The IUCN Red List of Threatened Species 2021: e.T39370A205782570. https://dx.doi.org/10.2305/IUCN.UK.20213.RLTS.T39370A205782570.en. Accessed on 10 February 2022.

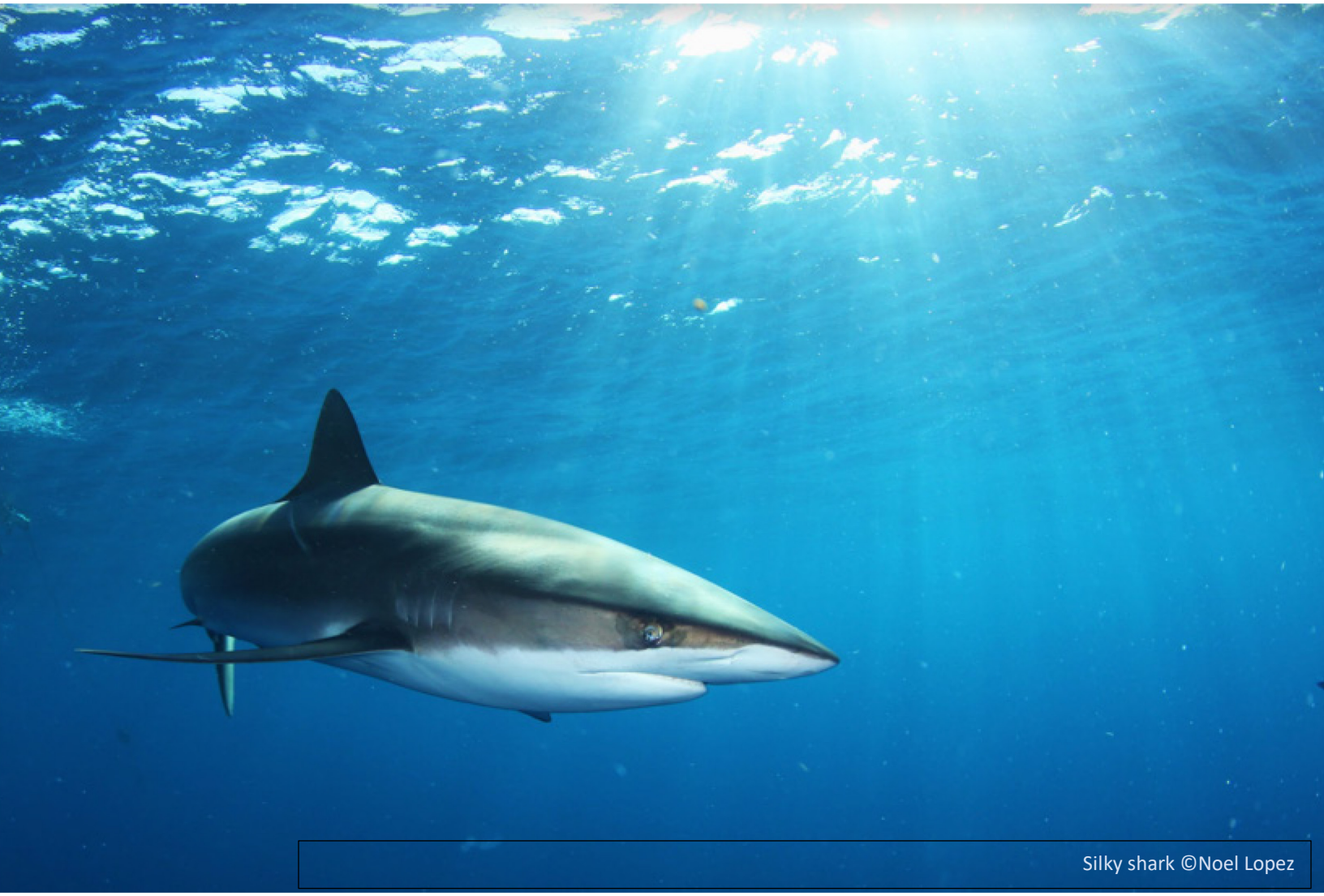
Rigby, C.L., Sherman, C.S., Chin, A., Simpfendorfer, C., 2016. *Carcharhinus falciformis*. https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T39370A205782570.en.

Roy, B.J., Singha, N.K., Ali, S.H., Rahman, M.G., Alam, M.F., 2015. Status of vulnerable leopard whip ray *(Himantura undulata*) at two landing centres of Chittagong and Cox's Bazar, Bangladesh. Bangladesh J. Zool. 42, 11–17. https://doi.org/10.3329/BJZ.V42I1.23332.

Urbina, J.O. De, Brunel, T., Coelho, R., Merino, G., 2018. A Preliminary Stock Assessment for the Silky Shark in the Indian Ocean using a data-limited approach. IOTC-14-2018-033 14. https://www.iotc.org/documents/preliminary-stock-assessment-silky-shark-indian-ocean-using-data-limited-approach

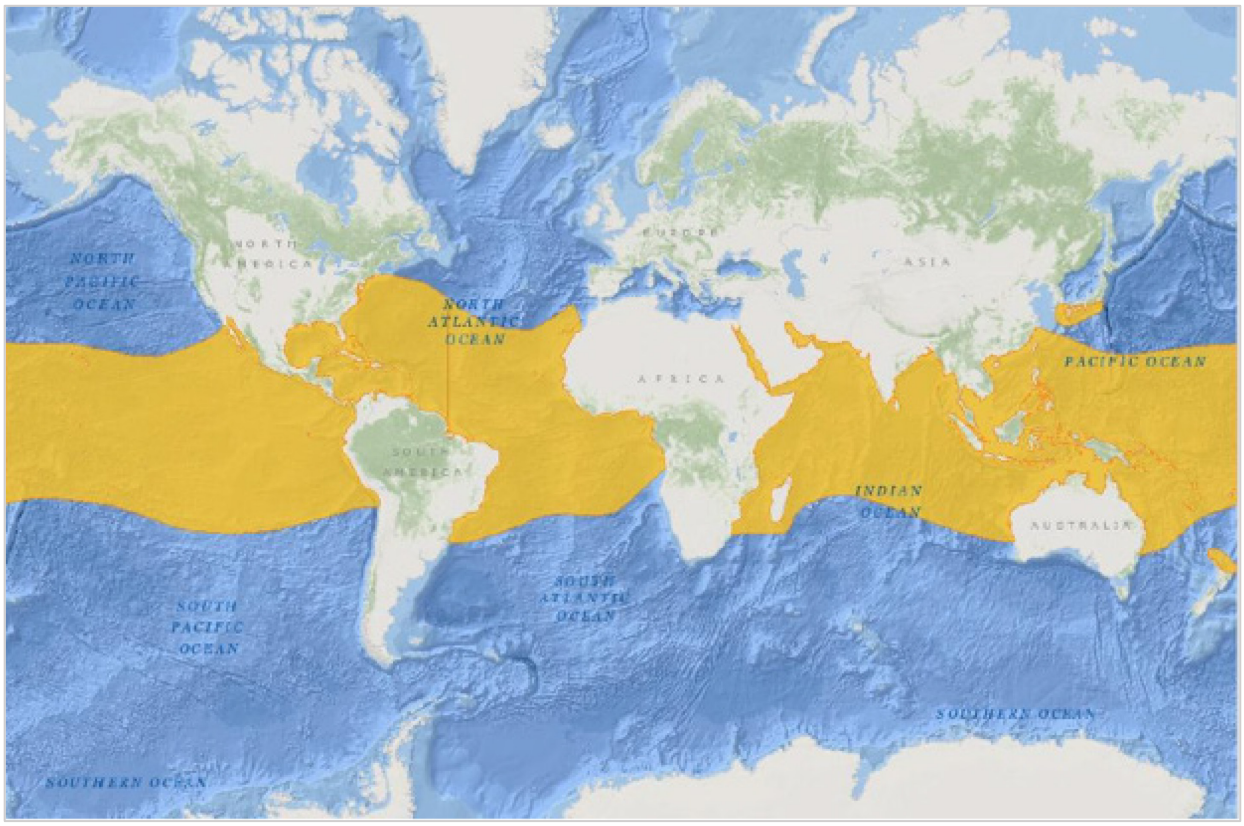
Varghese, S.P., Vijayakumaran, K., Tiburtius, A., Mhatre, V.D., 2015. Diversity, abundance and size structure of pelagic sharks caught in tuna longline survey in the Indian seas. Indian J. Geo-Marine Sci. 44(1), 26–36. https://www.researchgate.net/publication/305022808_Diversity_abundance_and_size_structure_of_pelagic_sharks_caught_in_tuna_longline_survey_in_the_Indian_seas

Varghese, S.P., Gulati, D.K., Unnikrishnan, N., Ayoob, A.E., 2016. Biological aspects of silky shark *Carcharhinus falciformis* in the eastern Arabian Sea. J. Mar. Biol. Assoc. United Kingdom 96, 1437–1447. https://doi.org/10.1017/S0025315415001575.



Silky shark ©Noel Lopez

Appendix 1. Global distribution of the silky shark.



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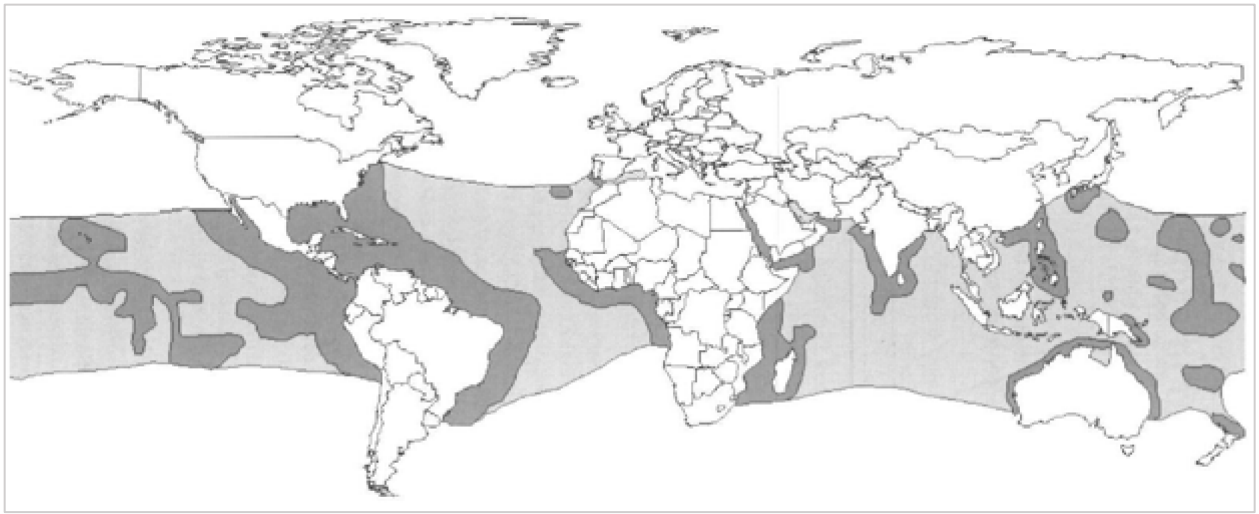

Map showing the global distribution of silky shark. The dark shading shows well-established distribution areas, while the light shading shows uncertain distribution (expected or possible presence or records in need of confirmation) (Bonfil, 2008).

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.	পাখমাথা 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/ কামোট	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.	গাঙ্গের 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.	কৌটালেজী/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. Silky shark catches reported to the IOTC in the Indian Ocean for 2020.

Country	Total Catch (Tonnes)
Taiwan, China	349.000
Pakistan	287.000
Sri Lanka	284.000
Iran Islamic Republic	154.000
Madagascar	112.000
Seychelles	80.700
Comoros	44.700
Indonesia	2.000
Mauritius	0.180

Source: Indian Ocean Tuna Commission 2021, Appendix 27, Executive Summary: Silky Shark (2020). See: www.mol.org

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