CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

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Panama City (Panama), 14 – 25 November 2022

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

This document proposes the inclusion of *Sphyrna tiburo*, commonly referred to as the bonnethead shark, in CITES Appendix II in accordance with Article II paragraph 2(a) of the Convention and satisfying Criterion A and B in Annex 2a of Resolution Conf. 9.24 (Rev. CoP17).

The document also proposes the inclusion of all remaining species in the Family Sphyrnidae (hammerhead sharks) which are not already listed in CITES Appendix II, including: *Sphyrna media*, *Sphyrna tudes, Sphyrna corona, Sphyrna gilberti*, and *Eusphyra blochii*, as well as any other yet to be identified species of the Family Sphyrnidae, in Appendix II in accordance with Article II paragraph 2(b) of the Convention and satisfying Criterion A in Annex 2b of Resolution Conf. 9.24 (Rev. CoP17).

Qualifying criteria that are met

i) Annex 2a, Criterion A. It is known, or can be inferred or projected, that the regulation of trade in the species is necessary to avoid it becoming eligible for inclusion in Appendix I in the near future.

and

ii) Annex 2a, Criterion B. It is known, or can be inferred or projected, that regulation of trade in the species is required to ensure that the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting or other influences.

S. tiburo meets these listing criteria due to the significant population declines documented in much of the species' range, which led to *S. tiburo* being reclassified from 'Least Concern' to 'Endangered' in a recent IUCN Red list assessment (Pollom *et al*. 2020a). *S. tiburo*'s global population is estimated to have declined by between 50-79% within the last 3 generations, which almost reaches the CITES Appendix I guidelines for commercially exploited aquatic species, and it has already been extirpated from portions of its distribution as a result of overexploitation (Péréz-Jiménez, 2014).

The presence of *S. tiburo* fins in international shark fin trade hubs such as Hong Kong Special Administrative Region of China (SAR) (Fields *et al*. 2018; Cardeñosa *et al.* 2019), combined with the increasing prevalence in the international fin trade market of coastal shark species (Van Houtan *et al.* 2020), mean that a CITES Appendix II listing is necessary to ensure that any growth in international trade in *S. tiburo* can be managed sustainably, and in a way that allows the species to recover from the alarming declines already documented.

iii) ***Annex 2b, Criterion A: The specimens of the species in the form in which they are traded resemble specimens of a species included in Appendix II under the provisions of Article II, paragraph 2 (a), or in Appendix I, so that enforcement officers who encounter specimens of CITES-listed species are unlikely to be able to distinguish between them.***

Hammerheads are most commonly traded internationally in the form of dried and unprocessed fins. All hammerhead species have a characteristic fin shape that distinguishes them from all other shark species (Abercrombie and Chapman 2012); however, visually separating between species of hammerhead based on their fins is much more challenging. At the time of the successful proposal to include *S. lewini*, *S. mokarran*, and *S. zygaena* in CITES Appendix II at CoP16, it was believed that only these three Sphyrnidae species were in international trade, due to their superior size. However, since CoP16, improved research of the species composition of fins sold at international trade hubs has demonstrated that smaller-bodied hammerhead species are also being internationally traded (Fields *et al.* 2018; Cardeñosa *et al.* 2019). This exposes the three large-bodied hammerhead species that are already included in the Appendices (*S lewini, S. mokarran*, and *S. zygaena*) to illegal trade, because their fins may be hidden in shipments of lookalike species from the wider family (AC30 Inf. 14). Given the latest conservation status of *S. lewini* and *S. mokarran* (both species are now assessed as Critically Endangered globally), there is an urgent need to ensure that loopholes do not exist that allow for widespread illegal trade in the listed hammerhead species. As small hammerhead species can be lookalikes for each other, as well as for the three species currently listed in the CITES Appendices, in their most commonly traded form (dried, unprocessed fins), the remaining non-CITES hammerhead species satisfy Criterion A in Annex 2b of Resolution Conf. 9.24 (Rev. CoP17).

B. Proponent

Brazil, Colombia, Ecuador, the European Union, and Panama*

C. Supporting statement

1. Taxonomy

1.1 Class: Chondrichthyes, sub class: Elasmobranchii

1.2 Order: Carcharhiniformes

1.3 Family: Sphyrnidae

1.4 Genus, species or subspecies, including author and year: *Sphyrna tiburo* (Linnaeus, 1758)

1.5 Scientific synonyms: *Squalus tiburo (Linnaeus, 1758),*
Sphyrna vespertina (Springer, 1940)

1.6 Common names: English: Bonnethead shark, Shovelhead shark
French: Requin-marteau tiburo
Spanish: Cornuda tiburo

1.7 Code numbers: Not applicable

* *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

Figure 1. Illustration of *Sphyrna tiburo*, taken from the International Game Fishing Association, © Diane Peebles.

Table 1. Species being proposed under Annex 2b, Criterion A as lookalikes for *S. tiburo*, *S. lewini, S. mokarran*, and *S. zygaena*. Note that each species is considered to be a lookalike of at least one other species within the family.

Scientific Name	**Common Name**	**IUCN Red List Status**
Sphyrna media (Springer, 1940)	EN: Scoophead shark FR: Requin-marteau écope ES: Tiburón martillo cuchara	Critically Endangered, with overfishing (Pollom *et al*, 2020c)
Sphyrna tudes (Valenciennes, 1822)	EN: Smalleye hammerhead shark FR: Requin-marteau à petits yeux ES: Tiburón martillo ojichico	Critically Endangered, with overfishing (Pollom *et al*, 2020d)
Sphyrna corona (Springer, 1940)	EN: Scalloped bonnethead shark FR: Requin-Marteau cornu ES: Tiburón martillo coronado	Critically Endangered, with overfishing (Pollom *et al*, 2020b)
Sphyrna gilberti Quattro,Driggers,Grady,Ulrich & M.A.Roberts, 2013	EN: Carolina hammerhead shark	Data Deficient (Van der Wright *et al*, 2020)
Eusphyra blochii (Cuvier, 1816) *(= Zygaena latycephala* van Hasselt, 1823; *Zygaena laticeps* Cantor, 1837; *Sphyrna blochii*)	EN: Winghead shark FR: Requin-marteau planeur ES: Cornuda planeadora	Endangered, with overfishing (Smart & Simpfendorfer, 2016)

2. Overview

Sphyrna tiburo (the bonnethead shark) is a coastal hammerhead shark species that occurs in the Western Atlantic and Eastern Pacific Oceans. The species is proposed for listing in CITES Appendix II because it is currently suffering significant declines in the majority of its populations, is now assessed as globally Endangered, and new information available shows the species' presence in international shark fin trade hubs (Fields *et al.* 2018; Cardeñosa *et al.* 2019).

Severe declines have been recorded in *S. tiburo*'s population in Atlantic Central America and its widespread disappearance has been documented in the Southwest Atlantic and Pacific, with the most recent IUCN Red List Assessment for the species (Pollom *et al*. 2020a) estimating a global population reduction of 50–79% over the past three generation lengths (36 years); the principal driver of these declines has been widespread unmanaged fishing (Section 4). Previously it was thought that trade in *S. tiburo* occurred predominantly in domestic markets; however, recent studies have detected *S. tiburo* fins in retail markets in Hong Kong SAR (Fields *et al.* 2018; Cardeñosa *et al.* 2019), one of the major hubs of international shark fin trade. Studies have additionally noted that the prevalence of coastal shark species in the international fin market is increasing (Van Houtan *et al.* 2020); should this trend continue, given the conservative life histories of sharks (Section 3), the susceptibility of *S. tiburo* to a wide variety of fishing gears (Section 5), and growing pressure on coastal ecosystems and fisheries (Section 4), documented declines in *S. tiburo* are likely to continue or worsen without global action. As a coastal species, management via other international or regional bodies such as the International Commission for the Conservation of Atlantic Tunas (ICCAT) will

largely not apply; a CITES Appendix II listing will therefore be important to ensure that the species is managed in a way that prevents it from being driven to extinction.

While hammerhead fins have a characteristic shape that distinguishes them from all other shark species, visually separating between species of hammerhead in the form in which they first enter trade (principally as dried, unprocessed fins) is challenging (Section 8). At the time of the successful proposal to include *S. lewini*, *S. mokarran*, and *S. zygaena* in CITES Appendix II at CoP16, it was believed that only these three Sphyrnidae species were in international trade, due to their superior size. Improved characterisation of the species composition of the international fin trade since CoP16, however, demonstrates that smaller-bodied hammerhead species are also being internationally traded for their fins (Fields *et al.* 2018; Cardeñosa *et al.* 2019). This exposes the three CITES-listed large-bodied hammerhead species (*S. lewini, S. mokarran*, and *S. zygaena*) to illegal trade, because their fins may be hidden in shipments of lookalike species from the wider family (AC30 Inf. 14). This lookalike issue was acknowledged by the FAO in their analysis of the CoP16 hammerhead listing proposal, which stated, "it is not clear why the other species in the family Sphyrnidae were not proposed to be listed as "look-alikes" (FAO 2013, page 40); lookalike issues within the Sphyrnidae family were additionally the reason why concerns regarding the sustainability of *S. lewini* and *S. zygaena* led ICCAT to adopt retention prohibitions for all hammerhead species (except for *S. tiburo*). Given the latest conservation status of *S. lewini* and *S. mokarran* (both species are now assessed as Critically Endangered globally), there is an urgent need to ensure that loopholes do not exist that allow for widespread illegal trade in the listed hammerhead species. The inclusion of the whole family in the CITES Appendix II is required to ensure this loophole is closed.

In addition, given that fisheries and trade data at national level usually group non-CITES listed hammerhead species with the listed species, there is a considerable lack of species-specific global capture production data for hammerheads (AC30 Inf. 14). This likely means that CITES-listed hammerhead species are not being adequately monitored by countries (AC30 Inf. 14). A CITES Appendix II listing for all remaining hammerhead species would encourage better reporting of species-specific trade, as countries will need to analyse species-specific catch trends to develop non-detriment findings.

3. Species characteristics

3.1 Distribution

S. tiburo is likely to be a species complex (Pollom *et al.* 2020a), occurring in both the Western Atlantic and Eastern Pacific Oceans. In the Western Atlantic, where the species is thought to be comprised of at least two different stocks (NMFS 2014), *S. tiburo* is distributed from Rhode Island, United States of America (hereafter US), to Bahia in southern Brazil and potentially Uruguay (Ebert *et al*. 2013). There are two distinct populations located along the islands of the Bahamas Archipelago and the Caribbean (Compagno, 1984); the species has also been recorded in Bermuda but only rarely (Smith *et al*. 1997). In the Eastern Pacific, its range extends from southern California to Peru (Ebert *et al*. 2013).

Figure 2. Pollom *et al* 2020: The global distribution of *Sphyrna tiburo*. Range States include Aruba (Netherlands); Bahamas; Belize; Bermuda (United Kingdom); Bonaire (Netherlands), Sint Eustatius

and Saba (Netherlands); Brazil; Colombia; Costa Rica; Cuba; Curacao; Ecuador; El Salvador; French Guiana (France); Guatemala; Guyana; Honduras; Mexico; Nicaragua; Panama; Peru; Suriname; Trinidad and Tobago; United States of Americaa; Uruguay; and the Bolivarian Republic of Venezuela (hereafter Venezuela).

3.2 Habitat

The bonnethead shark is an inshore tropical hammerhead of the American continental and insular shelves (Compagno, 1984), with a preference for water temperatures ≥ 21 °C (Froeschke *et al*. 2010). The species inhabits inshore and coastal areas, often in shallow water primarily consisting of mud and sand substrates at depths of between 10 and 25 m (Compagno, 1984). The species also occurs in estuaries, over seagrass, and on coral reefs, and has been observed at depths of 90 m (Ebert *et al*. 2013, Weigmann, 2016).

3.3 Biological characteristics

S. tiburo typically give birth annually, reproducing by placental viviparity (Compagno, 1984). Brood size is significantly correlated with maternal size and ranges from 4–16 pups, with pups 35-40 cm at birth (Castro, 2011; Gonzalez *et al*. 2020). The gestation period of this species is one of the shortest known in sharks, lasting ~4.5–5 months (Parsons 1993, Lombardi-Carlson *et al*. 2003). Males mature between 68–85 cm TL (~2 years old) and females generally mature between 80–95 cm TL (2–3 years old), but this varies spatially (Lombardi-Carlson *et al*. 2003).

The maximum observed ages for *S. tiburo* also vary spatially. For males they range from 5–6 years to 16 years between the Gulf of Mexico (GOM) and Southeast Atlantic respectively. For females maximum ages range from 7–8 years to 17.9 years between the GOM and Southeast Atlantic respectively (Lombardi-Carlson *et al*. 2003; Frazier *et al*. 2014). Overall, the generation length of *S. tiburo* is estimated to be 12 years (Cortés and Parsons, 1996; Márquez-Farias *et al*. 1998).

Elasmobranchs have the most conservative life histories of marine fishes, with slow growth, late maturity and low fecundity making their populations vulnerable to overexploitation. Any harvest and trade of such biologically vulnerable species must be strictly regulated to ensure sustainability. Demographic studies however indicate that *S. tiburo* exhibit a very high rate of population growth (mean = 1.304 per yr; 95% confidence interval = 1.150 – 1.165 per yr) relative to other sharks, making them one of the most productive species (Cortes, 2002). If managed correctly, their relatively high intrinsic rate of increase should allow *S. tiburo* to withstand higher fishing mortality compared with other shark species (Walker, 1998).

3.4 Morphological characteristics

S. tiburo is one of the five small-bodied (<120 cm at maturity) hammerhead species. The species reaches an average size of 100-120 cm total length, with a maximum length of ~150 cm (Ebert *et al*., 2013; Frazier *et al*. 2014). Females tend to be larger than males; the maximum recorded weight for the species is 10.8 kg (Castro 2011).

S. tiburo has the smallest cephalofoil (hammerhead) of all Sphyrnid species (see Figure 2, in Annex 1). Their unique, very narrow, flattened shovel-shaped head, without indentations on its anterior edge, contrasts to the hammer-shaped heads of the other hammerhead species, making it one of the easiest hammerheads to identify if the head remains attached. The head and fins of sharks caught in the US Exclusive Economic Zone or by US vessels in international waters must be retained (CITES MA of the United States of America, 2022). However, in some other commercial fisheries it is common practice to remove the head and fins of certain shark species, including hammerheads, and landing only the carcasses, making species identification challenging (Mazzoleni and Schwingel 1999; Shivji *et al*., 2002; Amorim *et al*., 2011).

The body of *S. tiburo* is moderately compact and lacks an inter-dorsal ridge. The tall first dorsal fin originates just behind the base of the pectoral fins (Compagno ,1984). Bonnetheads are typically grey or grey-brown on their dorsal surface, often with small dark spots on the flanks, and a light color on the ventral side below (Figure 1).

3.5 Role of the species in its ecosystem

S. tiburo are important mesopredators in coastal ecosystems (Kroetz *et al*. 2017). They exhibit diel shifts in activity, spending nighttime hours on shallow grass flats, searching for nocturnally active invertebrate prey, then moving into deeper water during the day (Murdy *et al*. 1997; Kroetz *et al*. 2015). Bonnetheads have been suggested to undergo ontogenetic shifts in diet, but both juvenile and adult bonnetheads exhibit diets comprised primarily of crustaceans, feeding on crabs, shrimp, mantis shrimp, isopods, and even barnacles, but also bivalves, octopi, and small fish (Scharf and Schlight 2000; Bethea *et al*. 2007; Facendola and Scharf 2012).

S. tiburo is abundant in seagrass habitats, with a 2018 study showing they have the capacity to consume large amounts (Leigh *et al*. 2018). Such a discovery makes them the first shark species to demonstrate an omnivorous digestive strategy (Leigh *et al*. 2018). Bonnetheads likely form prey for larger sharks that overlap in distribution, however direct observations of them in the gut contents of larger sharks are absent from the literature.

4. Status and trends

4.1 Habitat trends

S. tiburo inhabits an array of nearshore environments including seagrasses, mangroves, estuaries, mudflats, and coral reefs. Human population growth and development are critical drivers of change in coastal zones and generate a high pressure on these habitats (Neumann *et al*. 2015). Throughout the bonnetheads' range, for example, nearshore mangrove habitat is being removed or degraded by coastal development (Worthington *et al*. 2020). Furthermore, mangrove habitats that serve as nursery areas for bonnetheads are being increasingly lost to shrimp aquaculture in many areas of the Eastern Central Pacific (Lopez-Angarita *et al*. 2016). Seagrass meadows are being degraded by human development, invasive seagrass species, thermal shock, pollution, and in particular areas shrimp trawling (Unsworth *et al*. 2019, McKenzie *et al*. 2020). Coral reefs are increasingly imperiled by the impacts of climate change such as coral bleaching and ocean acidification, coupled with anthropogenic stresses caused by increasing coastal populations (Roberts *et al*. 2017, Suchley & Alvarez-Filip, 2018).

Such pressures will combine with fisheries pressure to contribute to further declines in bonnethead populations, unless the species receives the improved management required.

4.2 Population size

S. tiburo inhabits a variety of depths and levels of turbidity, and does not visit the surface to breathe, making it challenging to quantify its population size. The global *S. tiburo* population size is unknown, therefore trends in relative abundance are used as a proxy (see section 4.4).

4.3 Population structure

Genetics and tagging studies suggest that *S. tiburo* is likely a species complex of at least three geographically discrete species units with fine-scale population structure (Escatel Luna *et al.* 2015; Fields *et al*. 2016). The three species units are:

(1) Eastern Central and Southeast Pacific

(2) Caribbean Sea and Southwest Atlantic (Belize south to Brazil, incl. Panama and Trinidad & Tobago)

(3) Northwest and Western Central Atlantic (US, Bahamas, and Mexico).

The Western Atlantic population may also be comprised of at least two different stocks (NMFS 2014).

4.4 Population trends

The IUCN Red List Assessment for *S. tiburo* found that the species has undergone a global population reduction of 50–79% over the past three generation lengths (36 years), which is at the upper limit for listing commercially exploited aquatic species in Appendix II (almost for Appendix I) under Annex 5 of Res. Conf. 9.24 (Rev. CoP17). This figure represents a compilation of three estimates of the species'

population trends across three populations; the Southwest Atlantic, Eastern and Central Pacific, and the Northwest Atlantic (see Table 1). Further details by region can be found below.

Table 2. Summary of regional and global *Sphyrna tiburo* population trends, from the species' 2019 IUCN Assessment (Pollom *et al*. 2020a).

Region	Pop trend/change over 3 generations	IUCN Assessment
Eastern Central and Southeast Pacific	Decreasing; >80% reduction	Critically Endangered
Southwest Atlantic	Decreasing; >80% reduction	Critically Endangered
Northwest Atlantic*	Stable; 40% increase	Near Threatened
Global trend - Decreasing	**Decreasing; 50-79% reduction**	**Endangered**

**this number is based on studies based on a small portion of this area centered in the SE United States. While this estimate may be the case in a small portion of the region, it is likely not the case elsewhere in the Northwest Atlantic.*

Additionally, the IUCN Green List assessment found *S. tiburo* to be Largely Depleted, with a species recovery score of 44% (Péréz-Jiménez, 2021). *S. tiburo* is classified as a High Dependence species, where the presence or absence of management has a large effect on the health of its populations. With effective management in place, the IUCN Green List estimates that the species recovery score could rise as high as 78%. A CITES Appendix II listing would assist in efforts to allow for such population recovery.

Eastern Central and Southeast Pacific

S. tiburo was classified as **Critically Endangered** in the Eastern Central and Southeast Pacific in the most recent IUCN assessment of the species (Pollom *et al*. 2020a). This assessment was made on the basis that *S. tiburo* is estimated to have **undergone a population reduction of >80% over the past three generation lengths (36 years)** due to heavy and largely unmanaged fishing pressure across the species' range, as well as the recent absence of records of *S. tiburo* from large parts of Mexico and Central America, and a dearth of contemporary records (Pollom *et al*. 2020a).

S. tiburo was formerly abundant in the Gulf of California and the Pacific coast of Mexico (Hernandez-Carvallo 1967). The species was initially caught as bycatch in coastal fisheries, with records becoming increasingly rare from the 1980s onwards (Castro 2011). In the 1990s, after large-bodied sharks in the area were mostly fished out, artisanal fisheries shifted to targeting smaller coastal sharks, including *S. tiburo* (Sala *et al.* 2004). The species is no longer present in the Gulf of California, and despite extensive landings surveys and fishery-independent research, the last *S. tiburo* record in Mexico was in 2006 in Oaxaca (Saldana-Ruiz *et al*. 2017; Péréz-Jiménez 2014). The species also appears to be extinct along Mexico's Pacific coastline (Péréz-Jiménez 2014).

S. tiburo has not been encountered in Central America since the 1980s (Pollom *et al*. 2020a). There were records of the species in the industrial trawl fishery in Colombia in the 1990s, but surveys of this fishery in 2007 did not record any *Sphyrna* species (Péréz-Jiménez 2014). *S. tiburo* is also now rare in gillnet and beach seine catches in Ecuador today despite a historical presence (A. Cevallos unpubl. data 2019 in Pollom *et al*. 2020a).

Southwest Atlantic and Caribbean

Overall, in Southwest Atlantic of Central and South America, *S.* tiburo has been and still is subjected to heavy and largely unmanaged fishing pressure, and there have been very few recent records in Brazil (Pollom *et al.* 2020a). While the species was formerly common or even abundant in Caribbean Sea and Southwest Atlantic the 1970s, the IUCN assessment for the species (Pollom *et al.* 2020a) inferred that the Atlantic South American portion of *S. tiburo*'s population has undergone a **reduction of >80% over the past three generation lengths (36 years), and assessed the species as Critically Endangered in the region**.

In Colombia, *S. tiburo* was commonly encountered in the 1980s off the Caribbean coast but is now very rare (PA Mejia Falla and AF Navia, unpubl. data 2018 in Pollom *et al*. 2020a). In Venezuela, *S. tiburo* remains the fourth most commonly caught shark, but is subjected to heavy and unmanaged exploitation, and populations are suspected to have declined as a result (R Tavares, *pers comm* 2021). This situation is expected to be reflected across The Guianas (Pollom *et al*. 2020a).

In Brazil, *S. tiburo* was regionally assessed as Extinct in the state of Rio de Janeiro (Bizzeril and Costa 2001), collapsed in São Paulo (Bressan *et al.* 2009), and Vulnerable in Espírito Santo State due to overfishing (Passamani and Mendes 2007). There have been very sparse records of this species in Bahia state (Pollom *et al*. 2020a). Although several individuals were recorded there in a 2012–2013 study, the only other record since the 1980s is one from 1995 (Reis-Filho *et al.* 2014), and fishers describe this species as being depleted (Menni & Lesser, 1997).

Northwest Atlantic

For the Northwest Atlantic region, the IUCN Red List assessed the *S. tiburo* population to have increased by an estimated 40% over 3 generation lengths (36 years); however, **expert elicitation concluded that, given uncertainty regarding levels of harvest and its sustainability, the species should be categorized as Near Threatened** (Pollom *et al*. 2020a)**.**

US population trend data for *S. tiburo* are calculated from broad-scale trends in relative abundance for the northwest Atlantic Ocean (Peterson *et al.* 2017), a fishery-independent demersal trawl survey (Pollack 2018), and stock assessments for the US South Atlantic and Gulf of Mexico (SEDAR 2013). Accounts of the status of the species in this area are conflicting. A 2013 stock assessment for the Gulf of Mexico and US south Atlantic found the stock was not overfished and overfishing was not occurring (SEDAR 2013). However, upon peer review, the US found that two assessments should have taken place: one for the Gulf of Mexico and one for the Atlantic, as these were believed to be two separate populations (NMFS 2014). When analyses were run separately for each stock, the Gulf of Mexico stock was found to be not overfished and no overfishing occurring, but the Atlantic population was found to be overfished with overfishing occurring (NMFS 2014). Given that there was no separate assessment for each stock, it was considered that conclusions could not adequately be reached, and the stock status for bonnethead sharks in the region is currently "unknown" (NMFS 2014); scientists have strongly recommended that a benchmark assessment for the two separate stocks is undertaken when possible (CITES MA of the United States of America *in litt.* to the European Commission, 2022).The conclusion of NMFS (2014) that the Atlantic population of *S. tiburo* is overfished is contradicted by data outlined in Peterson *et al*. (2017), which outlines how large increases in abundance in the Atlantic have been recorded since the 1990s after the implementation of management measures.

In Mexico, *S. tiburo* are harvested via a directed fishery in Quintana Roo, where the species is the third most important catch (Pollom *et al*. 2020a). Despite this, no population trend data exist.

Outside the US, Mexico, and the Bahamas the species is captured in artisanal fisheries and as bycatch in shrimp trawl and lobster fisheries, but there appears to be little management (Pollom *et al*. 2020a). The species is present in landings in Cuba (Pollom *et al*. 2020a), though no available trend data currently exist.

4.5 Geographic trends

See section 4.4.

5. Threats

S. tiburo is susceptible to a wide range of fishing gears including gillnets, demersal trawl, and line gears (Pollom *et al*. 2020a). The species is caught throughout its range as a target species and as bycatch in largely unregulated coastal fisheries, and as significant bycatch in commercial shrimp fisheries (Pollom *et al*. 2020a), all of which typically fall outside of the mandate of RFMO management. Despite the species' high productivity, drastic inferred declines have been reported in multiple parts of *S. tiburo*'s range, primarily from over-exploitation but exacerbated by habitat degradation/loss (Pollom *et al*. 2020a). The apparent extinction of *S. tiburo* from the parts of its range that are heavily fished is particularly alarming (Péréz-Jiménez, 2014).

Eastern and Central Pacific

Artisanal fisheries that target coastal sharks including *S. tiburo* have been operating around Mazatlán, Mexico, since at least the 1960s (Kato 1965), though the last known *S. tiburo* recorded in these fisheries was in 2006 (Péréz-Jiménez 2014). Heavy artisanal fishing pressure also exists further south in this portion of the species' range, with little management in place, and there are unmanaged commercial longline and trawl fisheries off parts of western Central and South America (Pollom *et al*. 2020a). *S. tiburo* in this region have additionally suffered documented habitat loss due to coastal development and the conversion of mangrove forest to shrimp aquaculture (Lopez-Angarita *et al*. 2016), although this is likely occurring across the species' range.

Southwest Atlantic and Caribbean

There are intensive artisanal fisheries throughout the Atlantic coast of South America, which are largely unmanaged commercial trawl and longline fisheries (Bizzeril and Costa 2001; Reis-Filho *et al.* 2014; Péréz-Jiménez 2014). *S. tiburo* are present in landings data from Belize (mostly adults) and Trinidad fisheries (Pollom *et al*. 2020a). The species is captured in unknown quantities by artisanal fisheries and as bycatch in shrimp trawl and lobster fisheries throughout the region and it is noted that juvenile bonnetheads are harvested in Costa Rica (Pollom *et al*. 2020a). In Panama, *S. tiburo* is the third most abundant species in the nearshore gillnet fishery that is largely unregulated (Pollom *et al*. 2020a; Guzman *et al*. 2020).

Northwest and Western Central Atlantic

In the Northwest and Western Central Atlantic, *S. tiburo* is primarily captured in gillnets and demersal trawls, and recreationally on hook and line (Pollom *et al*. 2020a). As a result of their seasonal abundance in nearshore waters, *S. tiburo* is regularly captured in fisheries operating in the Southeastern US, particularly in the recreational sector, and as bycatch in the US shrimp trawl fishery (Belcher & Jennings, 2011). Recreational catches in the US are available for the Atlantic Ocean and the Gulf of Mexico. The average number of recreational catches in the Atlantic from 2012-16 was 60,627 individuals harvested and 578,630 released per year, and in the Gulf recreational catches averaged over a million at 21,915 individuals harvested and 1,270,014 released per year (Marine Recreational Information Program Data (MRIP), 2022). Note that the MRIP estimates in the Gulf do not include the state of Texas, and do not include the state of Louisiana as of 2015. Texas harvest averaged 1,310 individuals from 2012-16, while Louisiana's new recreational catch survey did not report any bonnethead sharks harvested during this time period (Cliff Hutt, personal communication, 2022). Commercial landings averaged 3,591 lbs dressed weight annually from 2016 to 2022 in the Atlantic and 442 lbs dressed weight annually from 2016 to 2018 in the Gulf of Mexico (NOAA Fisheries 2021). Bycatch in shrimp trawls averaged 167,981 individuals annually from 2007 to 2011 (Pollom *et al*, 2020a).

6. Utilization and trade

6.1 National utilization

Similar to other hammerheads, the bonnethead shark is harvested primarily for its meat and fins (Kato 1965, Mejia-Falla *et al.* 2017). The majority of meat is likely to be consumed or sold locally, but it may also be exported to Brazil or other markets where demand for shark meat is rising (Dent and Clarke 2015). The low value of shark meat regionally limits the financial incentive of international trade in this commodity, in contrast to the lucrative fin market (Pollom *et al*. 2020a).

In California, US, genetic analysis of 1,720 fins collected from a retail outlet upon its closure detected *S. tiburo* fins in the retail outlet's stock but did not provide a volume of composition (Palumbi *et al*. 2018).

In Colombia, *S. tudes* is consumed by Indigenous communities (Puentes-Canon *et al.*2012); given the similarities in appearance, distribution, and gear susceptibility, it is suspected that *S. tiburo* is also consumed in this manner.

In Guatemala, Panama, and Costa Rica (M. Bond *pers obs*, 2012; Britten *et al*. 2018; Pollom *et al*. 2020a), *S. tiburo* meat was reported to usually be sold for consumption, typically as an ingredient in ceviche.

A survey of shark fisheries in northern and northeastern Brazil, a region known for a high degree of shark bycatch, was conducted by identifying and quantifying landed carcasses (Feitosa *et al*. 2018). *S. tiburo* comprised 2.8% of all samples surveyed, and Sphyrnid species composed 18.7% of sharks landed and traded on Brazil's northern coast (Feitosa *et al*. 2018).

In Guyana, most of the meat products from the shark fishery are salted and consumed locally and the fins and vertebrae are exported. The proportion of the catch which is exported vs. locally- consumed is difficult to evaluate (Maison, 1998; Shing, 1999). A survey quantifying the sharks in trade at six fish markets spanning the populated Guyana coastline found that *S. tiburo* composed 2.3% of the specimens in trade from 144 samples collected (Kolmann *et al*. 2017).

6.2 Legal trade

S. tiburo is the only one of the five small bodied Sphyrnid species with species specific landing data reported to the FAO (FAO 2017a); however, FAO global capture production data indicate that there is limited reporting of hammerheads at species level. The large majority of hammerhead catches are reported as a single aggregated category "Hammerhead sharks, etc. nei."; for example, the quantity of hammerheads reported in the aggregated category was approximately 23 and 15 times the quantity of the combined reported data for the four individual species (*S. lewini, S. mokarran, S. zygaena and S. tiburo)* in 2014 and 2015, respectively. It is also unknown if some catches of hammerheads are included in more general shark catch categories.

6.3 Parts and derivatives in trade

Although the larger, Appendix II-listed hammerheads (*Sphyrna lewini, Sphyrna mokarran* and *Sphyrna zygaena*) are preferred in the fin trade, new research shows that *S. tiburo* has also entered the international market as demand for less-expensive, smaller fins has increased (Cardeñosa *et al.* 2019). Fields *et al.* (2018) found that *S. tiburo* accounted for 0.06% of fin trimmings sampled between 2014-2015 in the major international fin trading hub of Hong Kong SAR, while focused analysis on the emerging small fin trade in Hong Kong SAR revealed that *S. tiburo* composed 0.4% of this trade (Cardeñosa *et al.* 2020). *S. tiburo* was accompanied by another hammerhead species, the winghead shark (*Eusphyra blochii)*, which also represented 0.4% of the trade (Cardeñosa *et al.* 2020). Furthermore, Van Houtan *et al.* (2020) reported an increasing presence of fins from coastal shark species in international trade, suggesting that fishing pressure will continue, if not increase intensity, if left unmanaged.

A recent analysis presented to the Animals Committee as AC30 Inf.14 concluded that due to this newfound trade in non-CITES-listed hammerhead fins, it was highly recommended to list the remainder of the Sphyrnidae Family for compliance, enforcement and reporting purposes.

6.4 Illegal trade

The scarcity of species-specific management and trade-related measures in place for *S. tiburo* throughout its range translates into unregulated fishing and trade, although in some range States illegal harvest and trade have been reported.

In Brazil, for example, *S. tiburo* is listed as Critically Endangered on Ministerial Ordinance 445/2014, which prohibits any harvest and/or trade in the species (Feitosa *et al*. 2018). However illegal harvest and trade exists, as evidenced by a survey of sharks landed and traded on Brazil's North Coast which found that 2.8% of samples were *S. tiburo* (Feitosa *et al*. 2018).

It should be noted that *S. tiburo* fins are similar to the fins of juveniles of the three CITES-listed hammerheads. This may provide a mechanism for the currently unregulated legal trade in *S. tiburo* to be used to mask illegal trade in the CITES-listed hammerheads, given that mislabeling within the elasmobranch trade is well known (Barbuto *et al*. 2010; Griffiths *et al*. 2013).

6.5 Actual or potential trade impacts

There is increasing evidence that small-bodied hammerheads such as *S. tiburo* are found in the international fin trade, and that pressure on coastal shark species continues to grow (Cardeñosa *et al*. 2020; Van Houtan *et al.* 2020). This international market for hammerhead fins, even small ones, will continue to drive population declines unless sustainably managed.

Furthermore, the inclusion of *S. tiburo* in Appendix II alongside the rest of the Sphyrnidae Family as lookalikes will reduce the opportunity for illegal trade in the listed hammerhead species, achieved by labelling them as non-listed species, to occur.

7. Legal instruments

7.1 National

Bonnethead sharks are the subject of a variety of national level conservation and fisheries management approaches across their range. It should be noted that enforcement of and compliance with the existing regulations/management is challenging and often poorly resourced.

S. tiburo management is important from a fishery perspective because it is a commercially valuable species in the US, Mexico, Brazil, Belize and several other Caribbean nations (Bonfil, 1994, 1997; Cortés, 2000; Motta et al., 2005). However, the US and Mexico are the only nations with fisheries management measures in place for the species, in the form of a catch quota and closed season, respectively. The current state of *S. tiburo* populations demonstrates the need for increased management in the remainder of its range. Inclusion of the species in CITES Appendix II would be a catalyst for such management, establishing the regulation and traceability needed to ensure legal trade can continue in a sustainable way.

Northwest Atlantic

In the Northwest Atlantic region, *S. tiburo* has been subject to varying degrees of management. Where fisheries management actions regulating the harvest of the species have been in place for a sufficient length of time, population increases such as those documented throughout the SE United States show that the species can be an ideal candidate for a sustainable fishery (Peterson *et al*. 2017).

The Bahamas: Longline fishing and the use of gillnets was prohibited within Bahamian waters in the 1990s. The establishment of the Bahamas Shark Sanctuary in 2011 additionally made it illegal to fish for, land or possess any sharks or shark parts in the Bahamas' Exclusive Economic Zone (EEZ) (Haas *et al*. 2017).

Mexico: Mexico's shark fishery employs a closed season which runs from 1st May-30th June in the states of Tamaulipas, Veracruz and Quintana Roo, and May 15-July 15, and 1-29th August in the states of Tabasco, Campeche and Yucatan (Pollom *et al.* 2020a). The Official Standard NOM-029-PESC-2007 established marine management measures, including the prohibition of finning, and the prohibition of fishing within 5 km of coral reef areas, river mouths, and coastal lagoons (Pollom *et al.* 2020a). **Fishing** is also prohibited in known nursery areas e.g., gillnets are banned in June in front of Playa Bagdad, Tamaulipas (Pollom *et al.* 2020a). A Management Plan for the "Marine Biosphere Reserve of the Mexican Caribbean" also prohibits any elasmobranch fishery within the biosphere reserve that encompasses the entire Mexican Caribbean (Pollom *et al.* 2020a).

United States of America: In 2006, the National Marine Fisheries Service finalized the Consolidated Atlantic Highly Migratory Species Federal Management Plan. This Federal Management Plan includes a range of management measures including quotas and seasonal closures. Bonnetheads are managed under this plan as part of the small coastal shark complex (NMFS, 2018). Furthermore, coastal gillnet bans in the states of South Carolina, Georgia, Florida, and Texas, which encompass a significant portion of the species' US distribution, will benefit *S. tiburo* by reducing fishing mortality (Pollom *et al.* 2020a).

Southwest Atlantic and Caribbean

Regional Regulation OSP-05-11 prohibited shark finning in all countries that are members of the National Fisheries and **Aquaculture** Institutions of the Central American Integration System (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua , Panama and the Dominican Republic).

Brazil: *S. tiburo* was listed in the Brazilian Ordinance of the Ministry of the Environment N° 445, and categorized as Critically **Endangered** in December 2014; this restricted all harvest and trade of the species (Feitosa *et al*. 2018). However, the Ordinance has faced repeated court challenges from fishing agencies, the Secretaria Nacional de Aquicultura e Pesca (SAP), and industry, that already resulted in its suspension for 18 months in 2015 (Begossi *et al*. 2017; Spautz 2019).

Dutch Caribbean: The Declaration for the establishment of a Marine Mammal and Shark Sanctuary in the Caribbean Netherlands came into effect in 2015. This established the Yarari Marine Mammal and Shark Sanctuary, prohibiting the **catch**, harvest or trade of sharks within the EEZs of Bonaire, St. Eustatius and Saba (Ward-Paige, 2017).

French Caribbean: In La Martinique, La Guadeloupe, Saint-Martin and Saint-Barthelemy, recreational fishing is prohibited for all **Sphyrnidae** species. For professional fishing, there is a prohibition of retention and landing for all Sphyrnidae species (Regional regulations).

Guatemala: In the Guatemalan **Caribbean**, there are fishing bans for one month (usually August) for the capture of sharks (Families: Carcharhinidae, Sphyrnidae) (Pollom *et al.* 2020a).

Honduras: Governmental Degree 107-2011 declared the territorial waters of Honduras a shark sanctuary in 2011, prohibiting **fishing** and exploitation of all shark species in these waters. A revised regulation was adopted in 2016 (Governmental Degree 26-2016), which indicated that sharks that are incidentally caught can be used and sold both domestically and internationally.

Panama: Panama established the Coiba National Park and Bocas del Toro marine protected areas in the middle and west of Panama. A regulation to prohibit shark finning in Panama's EEZ was approved in 2006 (Pollom *et al.* 2020a).

Central and Eastern Pacific:

There are currently no species-specific protections or conservation measures in place for bonnethead shark in the Pacific portion of its **range**.

7.2 International

There are currently no species-specific international protections afforded to the bonnethead shark. *S. tiburo* is distributed in nearshore coastal habitats and captured by artisanal or small-scale fisheries that generally fall outside of the scope of instruments adopted by Regional Fisheries Management Organizations (RFMOs).

ICCAT adopted Recommendation (BYC 10-08) Concerning the Conservation of Sharks caught in Association with Fisheries Managed by ICCAT, which states contracting Parties shall prohibit retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of hammerhead sharks of the family Sphyrnidae taken in the Convention area in association with ICCAT fisheries – however *S. tiburo* is listed as the only exception. Several RFMOs have additionally prohibited the practice of shark finning, including major tuna RFMOs such as ICCAT and the Inter-American Tropical Tuna Commission (IAATC) (Brautigam, 2020). Both ICCAT and IAATC implement shark finning restrictions through a fin-to-carcass ratios (Brautigam, 2020). A ratio-based approach permits the removal of shark fins at sea provided the total weight of fins landed does not exceed a certain percentage of the shark's pre-processed weight, usually 3.5-5% (Ziegler *et al*., 2021). However, this approach has been considered problematic due to potential loopholes and issues with implementation, including that fin-to-carcass ratios vary considerably across species (Ziegler *et al*., 2021).

8. Species management

8.1 Management measures

S. tiburo's relatively high intrinsic productivity makes it an ideal candidate for a sustainable fishery, provided it is managed correctly. However, existing management regulations for *S. tiburo* are patchy and poorly enforced **throughout** the majority of its range. The prohibition of nearshore gillnets and a catch quota approach implemented by the US National Marine Fisheries Service appear to have been sufficient to arrest declines and increase the *S. tiburo* population in the Northwest Atlantic.

To conserve *S. tiburo* populations and facilitate recovery, a suite of measures will be required which may include species protection, spatial management, bycatch mitigation, and harvest and trade management measures, including **international** trade measures such as those ensured by inclusion in CITES Appendix II.

8.2 Population monitoring

Adequate monitoring of *S. tiburo* populations is limited to the Southeast Atlantic units, where their populations are managed as part of the **Small** Coastal Shark Fishery Management complex in the US. These fisheries-dependent data are supported by independent scientific longline survey data from Florida, Georgia, South Carolina, and North Carolina.

A species-centered stock assessment was performed for US East Coast *S. tiburo*, suggesting that these populations were not overfished, and that overfishing was not occurring (SEDAR, 2013). This is the most recent stock assessment for the species, meaning that it is likely out of date at 8 years old. Nonetheless, because of the assessment structure, region-specific assessments were not possible, and stock assessment was therefore conducted using combined catch and life-history data from the northern GOM and Northwest Atlantic coasts despite prior evidence of differences in growth and sexual maturation between the two regions. In particular, **Northwest** Atlantic sharks have been shown to exhibit slower growth, later age-at-maturity and larger size-at-maturity, and greater longevity (Frazier *et al*., 2014). The assessment's results were therefore rejected by US scientists upon peer review because they may not have adequately represented the current stock (Gonzalez *et al*. 2020).

The lack of species level fisheries landing or trade data available from the remainder of *S. tiburo*'s range presents a severe management challenge because species-specific catch/trade monitoring is needed to further understand population trends and inform management. The inclusion of *S. tiburo* in Appendix II of CITES, with the rest of the Sphyrnidae Family as lookalikes, could encourage improved, species-level data collection, as observed for the 3 large bodied hammerhead species since they were listed at CoP16.

8.3 Control measures

8.3.1 International

See section 7.2

8.3.2 Domestic

See section 7.1

8.4 Captive breeding and artificial propagation

N/A

8.5 Habitat conservation

Brennan *et al*. (2020) reported a total of 1509 marine protected areas within the range of *S. tiburo*, which was determined using protected area data from MPAtlas and species occurrence data from GBIF, FishBase, and OBIS. **Enforcement** challenges were reported in marine protected areas which prohibit shark fishing in Mexico and Panama (Pollom *et al*., 2021a).

8.6 Safeguards

N/A

9. Information on similar species

The remaining non-CITES listed species of hammerheads are made up of five species belonging to two genera (*Sphyrna* and *Eusphyra*): *Eusphyrna blochii, Sphyrna corona, Sphyrna tudes, Sphyrna media and Sphyrna gilberti.* While it may be possible to distinguish hammerhead species from each other at the point of landing when landed whole (as is common in most fisheries, where both fins and meat hold value), this is not true for the first point of trade, as most sharks are not *traded* whole (Abercrombie and Chapman 2012, CoP16 Prop. 43). Instead, meat is often used locally, while fins are exported. The non-CITES listed *E. blochii* dorsal fins are very similar in height, fin shape and colour to those of CITES-listed *S. mokarran*, and in height and fin shape to CITES-listed *S. lewini* (Abercrombie and Chapman 2012; Heupel *et al*. 2016; Marshall and Barone 2016). Due to similarities of *S. lewini* and CITES-listed *S. zygaena*, it would also be difficult to visually distinguish *E. blochii* from *S. zygaena*. The fins of the other *Sphyrna* species, *S. tudes, S. media* and

S. corona, are also of the same general tall and thin shape as the CITES-listed hammerhead species (Ebert *et al*. 2013). As *S. gilberti* cannot be visually distinguished from *S. lewini*, except by precaudal vertebral counts, it is assumed the fins are visually similar.

In their analysis of the proposal to include *S. lewini*, *S. mokarran* and *S. zygaena* in CITES Appendix II (CoP16 Prop. 43), FAO (2013) noted that it was not clear why other species in the family Sphyrnidae were not proposed to be listed as 'look-alikes', noting that some panel members considered that visual identification of dried fins by non-experts (such as enforcement officers) would be challenging. A similar conclusion was reached by an evaluation of implementation issues relevant to the 3 CITES-listed hammerhead species in 2018 (AC30 Inf. 14).

Extended profiles of all lookalike species included in this proposal can be found in Annex 1, but a brief overview, extracted from the IUCN Red List Assessment for each species, is provided below.

***Eusphyra blochii* (Cuvier, 1816) (EN: Winghead shark ; FR : Requin-marteau planeur ; ES : Cornuda planeadora) (Information extracted from Smart and Simpfendorfer, 2016).**

- IUCN Red List Status: Endangered, Globally

- Estimated population declines: Over 50% in the last 3 generations

- Additional information: The Winghead Shark (*Eusphyra blochii*) is a highly distinctive Indo-West Pacific continental shelf species that is fished throughout its range. It is a slow growing species which reaches a maximum size of 186 cm total length, a maximum age of 21 years and has a generation length of 14 years. These life history parameters, along with its apparent patchy localised distribution, increases its susceptibility to depletion due to heavy fishing effort. Furthermore, its morphology makes it extremely susceptible to entanglement in a wide variety of nets. Throughout the majority of its range, in particular Asia, fishing effort is concentrated in coastal regions, is intense and is generally unregulated; the Winghead Shark is inferred to have been heavily exploited. This species is now rarely encountered in both India and Indonesia where it has previously been reported, and the absence of the species from fish market and landing surveys in these countries is likely to accurately reflect the situation more broadly across the majority of its range. While there are no species-scientific data on its status, the population is inferred to have declined by at least 50% within the equivalent of three generations (42 years) and hence it is assessed as Endangered globally based on heavy exploitation levels. As fishing practices across most of its range are expected to remain unchanged in terms of intense pressure in nearshore waters, it is inferred that the global population will continue to decline at a similar rate over the next three generations. There is no species-specific management in place for this species.

***Sphyrna corona* Springer, 1940 (EN : Scalloped bonnethead ; FR : Requin-Marteau cornu ; ES: Tiburón martillo coronado) (Information extracted from Pollom *et al*. 2020b).**

- IUCN Red List Status: Critically Endangered, Globally

- Estimated population declines: Over 80% in the last 3 generations

- Additional information: Records of the Scalloped Bonnethead have become increasingly rare over the decades since the 1950s in the northern part of its range. Overall, due to its slow life history, known sensitivity of hammerhead sharks to overfishing, degradation of mangrove habitats, the level of intense and unmanaged fisheries across its range, its lack of refuge at depth, and the lack of recent records in Mexico (a large proportion of its range) despite fisheries- dependent and -independent surveys, it is inferred that this hammerhead has undergone a population reduction of >80% over the past three generations (24 years). There is no species- specific management in place for this species.

***Sphyrna tudes* (Valenciennes, 1822) (EN : Smalleye hammerhead ; FR : Requin-marteau à petits yeux ; ES : Tiburón martillo ojichico) (Information extracted from Pollom *et al*. 2020c).**

- IUCN Red List Status: Critically Endangered, Globally

- Estimated population declines: Over 80% in the past 3 generations

- Additional information: The Smalleye Hammerhead (*Sphyrna tudes*) is a medium-sized (to 150 cm total length) shark that occurs in the Western Central and Southwest Atlantic from Colombia to the Rio de

La Plata, Argentina. It inhabits inshore waters over the continental shelf at depths of 5–80 m. It is captured in intense and largely unmanaged commercial and artisanal beach seines, gillnets, longlines, and trawls throughout its geographic range. This shark is targeted or retained as bycatch for its meat, which is consumed or sold locally. There are few data on population reduction but these intensive unmanaged fisheries are suspected to have caused reductions and possibly local extinctions throughout this species' range. For example, in Brazil, this hammerhead has not been recorded in 35 years from Ceará state and it is considered by local fishers to be depleted in Bahia state. This shark is supposed to be strictly protected in Brazil, but it is clear that it is still landed and traded in various states. Overall, due to intense and largely unmanaged fisheries across its range, lack of refuge at depth, suspected declines in many areas and local extinctions suspected from an absence of records (despite continued sampling and observation), and its relatively unproductive life history, it is suspected that the Smalleye Hammerhead has undergone a population reduction of >80% over the past three generations (37 years), and it is assessed as Critically Endangered A2bd.

***Sphyrna media* Springer, 1940 (EN : Scoophead shark ; FR : Requin-marteau écope ; ES : Tiburón martillo cuchara) (Information extracted from Pollom *et al*. 2020d).**

- IUCN Red List Status: Critically Endangered, Globally

- Estimated Population Declines: Over 80% in 3 generations

- Additional information: The Scoophead Shark (*Sphyrna media*) is a medium-sized (to 150 cm total length) hammerhead that occurs in the Eastern Central and Southeast Pacific from the Gulf of California, Mexico to northern Peru and in the Western Central and Southwest Atlantic from Panama to southern Brazil. It inhabits waters over continental shelves from inshore to 100 m depth. It is captured in commercial and artisanal longlines and gillnets, which are typically unmanaged and operate throughout its range. It may also be caught in trawl fisheries. The declining numbers of records over the past several decades and range contraction in some areas indicates that this shark has undergone population reduction in both the Pacific and the Atlantic. In the Pacific, records have become increasingly rare and this species is no longer present in the Gulf of California. Records are sparse from elsewhere in Pacific Mexico and Central America and occur rarely in Colombia and Ecuador. The Atlantic South American portion of the population has also been reduced in size substantially. Off Caribbean Colombia, this species is considered rare. In Venezuela, it is subjected to intense and unmanaged fishing pressure, and it is suspected to have undergone population reduction there as a result of levels of exploitation. This situation is expected to be similar across the Guianas. Many elasmobranchs are at high risk of extinction in the north of Brazil, and it is suspected that this species has also been overfished there. There have been very sparse records in Bahia state; records of sphyrnid sharks there have been declining in number since the 1990s, and since 2000 have only occurred very rarely. There are no recent records from southern Brazil. Overall, this shark was formerly common or even abundant in the 1970s, has been and still is subjected to intense and largely unmanaged fishing pressure, as well as the degradation of mangrove habitats, and has undergone range retractions in some areas. There have been very few recent records and it is inferred that the Scoophead Shark has undergone a population reduction of >80% based on levels of exploitation, and it is assessed as Critically Endangered A2bcd.

***Sphyrna gilberti* Quattro,Driggers,Grady,Ulrich & M.A.Roberts, 2013 (EN : Carolina hammerhead) (Information extracted from VanderWright *et al*. 2020).**

- IUCN Red List Status: Data Deficient

- Estimated Population Declines: N/A

- Additional information: The Carolina Hammerhead (*Sphyrna gilberti*) is a small (at least to 69 cm total length[1]) poorly-known coastal neritic and possibly semi-oceanic pelagic shark known from the Northwest Atlantic. This is a cryptic species that can only be morphologically distinguished from the Scalloped Hammerhead (*Sphyrna lewini*) by precaudal vertebral counts. There is evidence of a cryptic lineage of hammerhead shark suggesting it may also occur in Panama and Brazil[2], in the Western

[1] *However, a recent working paper confirmed* S. gilberti *specimens from the western North Atlantic of up to 192.5cm in length (*Frazier et al., *2021*)

[2] *Three* S. gilberti *individuals were reported from southern Brazil in Pinhal* et al. *(2012).*

Central and Southwest Atlantic Oceans, respectively. The full distribution range and the depth range of this species is unknown. The species is likely captured in longlines, gillnets, trammel nets and trawls and retained for meat and fins. It may benefit from regulations limiting use of gillnets in inshore waters of South Carolina. Given that the depth is unknown and geographic range is not certain, it is difficult to ascertain the level of overall interactions with regional fisheries. Since it is unknown if fishing is causing a population reduction, there is currently inadequate information available to assess the species beyond Data Deficient[3].

10. Consultations

A consultation was distributed by the European Union to all other range States in March 2022. The Islamic Republic of Iran expressed support for the proposal.

11. Additional remarks

12. References

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details of all hammerhead species included in this proposal. Identification notes are extracted from extract from Compagno, 1984[4]. Information regarding distribution, taxonomy, population, habitat and ecology, threats, use and trade, and conservation actions are extracted from the species' most recent IUCN Red List Assessment.

i) *Eusphyra blochii* (Cuvier, 1816)- EN - Winghead shark (Information extracted from Smart and Simpfendorfer, 2016).

IDENTIFICATION NOTES

An unmistakable shark, with its immense, broad, wing-shaped head, nearly or quite half the shark's length. Head wing- or arrow-shaped in dorsoventral view and very broad, width across head about 40 to 50% of total length; lateral blades of head very narrow and winglike; nostrils greatly enlarged, their widths 0.8 to 0.9 times in internarial width and nearly twice mouth width; bumps present along anterior margin of head opposite nostrils. Upper precaudal pit longitudinal and not crescentic.

DISTRIBUTION

The Winghead Shark occurs on and near continental shelf waters of the Indo-West Pacific from the Arabian/Persian Gulf through south Asia to northern Australia and Papua New Guinea (Last and Stevens 2009).

Range States: Australia; Bangladesh; Brunei Darussalam; Cambodia; PR China; India; Indonesia; Iran, Islamic Republic of; Kuwait; Malaysia; Myanmar; Oman; Pakistan; Papua New Guinea; Philippines; Saudi Arabia; Sri Lanka; Thailand; United Arab Emirates; Viet Nam.

Below copied with permission from the IUCN (Smart & Simpfendorfer, 2016)

IUCN Shark Specialist Group 2016. Eusphyra blochii. The IUCN Red List of Threatened Species. Version 2021-2

[4] With the exception of *S. gilberti*; as a recently described species, identification information was extracted from the species' 2020 IUCN assessment and expert comments

TAXONOMIC NOTES

Synonyms = *Zygaena latycephala* van Hasselt, 1823; *Zygaena laticeps* Cantor, 1837. The name *Sphyrna blochii* has also been used recently for this species.

IUCN ASSESSMENT AND JUSTIFICATION

Globally Endangered

The Winghead Shark (*Eusphyra blochii*) is a highly distinctive Indo-West Pacific continental shelf species that is fished throughout its range. It is a slow growing species which reaches a maximum size of 186 cm total length, a maximum age of 21 years and has a generation length of 14 years. These life history parameters along with its apparent patchy localised distribution increases its susceptibility to depletion due to heavy fishing effort. Furthermore, its morphology makes it extremely susceptible to entanglement in a wide variety of nets.

Throughout the majority of its range, in particular Asia, fishing effort is concentrated in coastal regions, is intense and is generally unregulated; the Winghead Shark is inferred to have been heavily exploited. This species is now rarely encountered in both India and Indonesia where it has previously been reported, and the absence of the species from fish market and landing surveys in these countries is likely to accurately reflect the situation more broadly across the majority of its range. While there are no species-scientific data on its status, the population is inferred to have declined by at least 50% within the equivalent of three generations (42 years) and hence it is assessed as Endangered globally based on heavy exploitation levels. As fishing practices across most of its range are expected to remain unchanged in terms of intense pressure in nearshore waters, it is inferred that the global population will continue to decline at a similar rate over the next three generations. In Australia, the Winghead Shark is only a small component of commercial catches, therefore the population is considered to be relatively healthy and is regionally assessed as Least Concern.

POPULATION

There are no species-specific data available on population numbers, and how they have changed over time, for any part of the range. Globally, however, shark and ray landings have declined by at least 20% since 2003, but the Indo-Pacific is amongst the regions where this decline has been more severe (Dulvy *et al*. 2014). Catches of sharks and rays in Southeast Asia are very high but are declining and fishers are travelling much further from port in order to increase catches (Chen 1996). Net and trawl fisheries in Indonesia (especially the Java Sea) are very extensive and as a result, many shark and ray species are highly exploited and stocks of most species have declined by at least an order of magnitude (Blaber *et al*. 2009).

While species-specific data on long-term declines in elasmobranchs in the Southeast Asian region are lacking, declines in the Winghead Shark in Southeast Asia and elsewhere in the Indo-West Pacific are inferred given the widespread historical and continuing declines of demersal fisheries in this region (Stobutzki *et al*. 2006). Furthermore, the extensive loss and degradation of habitats such as coastal mangroves are another key threat to coastal and inshore species; Southeast Asia has seen an estimated 30% reduction in mangrove area since 1980 (FAO 2007, Polidoro *et al*. 2010). In Australian waters, this species makes up a very small proportion of catches in tropical gillnet fisheries (Harry *et al*. 2011) and its population is not believed to have declined substantially.

HABITAT AND ECOLOGY

The Winghead Shark occurs on the continental shelves and is mainly found in coastal nearshore waters. In eastern Australia, this species is mainly encountered in concentrated areas of less than 50 km² (J. Smart, pers. obs. 2015). This species is familiar to local fishers within these concentrated areas and is seldom encountered by fishers further away, thereby suggesting a patchy localised distribution. This is however, based on local ecological knowledge as there is little additional survey data. One tag recapture has been confirmed from northern Australia with this individual re-caught within 21 km of the original capture location after 12 months (Stevens *et al.* 2000).

Young are born at approximately 45 cm total length (TL), maturity occurs at around 120 cm TL for females and 108 cm TL for males, and they reach a maximum size of 186 cm TL (Stevens and Lyle 1989). Mature females produce litters of 6–25 (mean = 11) every year after a gestation period of 8 to 11 months (Compagno 1984, Stevens and Lyle 1989). This is a slow growing species that reaches maturity at 7.2 years for females and 5.5 years for males. The oldest documented maximum age is 21 years according to vertebral analysis (Stevens and Lyle 1989, Smart *et al*. 2013). Generation length is estimated to be 14 years.

THREATS

The Winghead Shark is heavily exploited in many parts of its range, for example the Gulf of Thailand, India and Indonesia (Simpfendorfer 2003). Only one individual was seen in market surveys in Indonesia during which approximately 20,000 sharks were recorded. It is therefore suspected to be severely overfished in this country as most of Indonesia's fishing effort is focused on coastal nearshore areas where it would be suspected to inhabit (W. White, CSIRO, pers. comm. 2015). Recent catch data from India identifies sharks to species level and has no mention of the Winghead Shark as a bycatch or byproduct species (e.g. Varghese *et al.* 2013). Severe population declines are therefore also suspected as they have previously been recorded there. This pattern is expected throughout the species' Asian range where fishing pressure on nearshore regions is intense and generally unregulated.

Within Australia, the Winghead Shark is lightly exploited in several net fisheries. Its elongated hammer- shaped head makes it susceptible to a wide range of mesh sizes and therefore it is predominantly caught in gillnets and trawls. However, it is only caught in low numbers in the Queensland East Coast Finfish Fishery (0.4% of total catch; Harry *et al.* 2011), Gulf of Carpentaria Inshore Finfish Fishery (<0.3% of total catch; DAFF 2012), Northern Prawn Fishery (0.02% of total catch; Stobutzki *et al.* 2002) and the Pilbara Trawl Fishery (Western Australia Department of Fisheries 2010).

The greatest catches of the Winghead Shark in Australia are taken in the Northern Territory Offshore Net and Line Fishery and has ranged between 10.942 t and 21.356 t between 2007 and 2012. Due to operational changes in the fishery, however, this catch has decreased to 12.786 t in 2012 and this trend is likely to continue (Grant Johnson, NT Fisheries, pers. comm., 2015).

USE AND TRADE

The Winghead Shark has been heavily exploited for fins and meat across the vast majority of its range. Recent studies have found its presence in the international fin trade (Cardenosa *et al*, 2019).

CONSERVATION ACTIONS

There are currently no species-specific management measures in place for the Winghead Shark.

***ii) Sphyrna corona* Springer, 1940- CR – Scalloped bonnethead (Information extracted from Pollom *et al*. 2020b).**

IDENTIFICATION NOTE

A small hammerhead with a moderately broad, anteriorly arched, mallet-shaped head with medial and lateral indentations on its anterior edge and transverse posterior margins, no prenarial grooves, snout rather long and about 2/5 of head width, small, strongly arched mouth, free rear tip of first dorsal fin over pelvic insertions, posterior margin of anal fin nearly straight.

DISTRIBUTION

The Scalloped Bonnethead occurs in the Eastern Central and Southeast Pacific from the Gulf of California, Mexico to Peru (Ebert *et al.* 2013). It now appears to be absent from Mexico (Balart *et al*. 1996, Pérez- Jiménez 2014).

Range States: Extant (resident): Colombia; Costa Rica; Ecuador; El Salvador; Guatemala; Honduras; Nicaragua; Panama; Peru

Possibly Extinct: Mexico

Below copied with permission from the IUCN (Pollom et al, 2020b)

IUCN SSC Shark Specialist Group 2019. Sphyrna corona. The IUCN Red List of Threatened Species. Version 2021-2

IUCN ASSESSMENT AND JUSTIFICATION

Globally Critically Endangered

The Scalloped Bonnethead (*Sphyrna corona*) is a small (to 92 cm total length) hammerhead that occurs in the Eastern Central and Southeast Pacific from the Gulf of California, Mexico to Peru. It inhabits the continental shelf from inshore to 100 m depth. It is captured in commercial and artisanal longlines and gillnets, and may also be caught in trawl fisheries, all of which are intense and largely unmanaged across much of its range. Although it has always been rare, records have become increasingly so over the decades since the 1950s; it is thought to be locally extinct in the Gulf of California and is overfished further south. There were nine records from all of Mexico between 1978 and 1994 and there have been none since. The situation is somewhat different in Colombia, where the species persists and is caught relatively frequently in artisanal catches. Fishing pressure is high there and it is suspected to have undergone a population reduction, although not as severe as that seen in Mexico. Overall, due to the known sensitivity of hammerhead sharks to overfishing, degradation of mangrove habitats, the level of intense and unmanaged fisheries across its range, its lack of refuge at depth, and the lack of recent records in Mexico (a large proportion of its range) despite fisheries-dependent and -independent surveys, it is inferred that the Scalloped Bonnethead has undergone a population reduction of >80% over the past three generations (24 years), and it is assessed as Critically Endangered A2bcd.

POPULATION

Records of the Scalloped Bonnethead have become increasingly rare over the decades since the 1950s in the northern part of its range; it is thought to be locally extinct in the Gulf of California and is likely overfished further south (Pérez-Jiménez 2014, Saldaña-Ruiz *et al*. 2017). There were nine records from all of Mexico between 1978 and 1994 and there have been none since (Balart *et al*. 1996, Pérez-Jiménez 2014). The situation is somewhat different in Colombia, where the species persists and is caught relatively frequently in artisanal catches (Orozco-Guarín 2015, Galindo-Arana 2016). Fishing pressure is high there and it is suspected to have undergone a population reduction, although not as severe as that seen in Mexico. Overall, due to its slow life history, known sensitivity of hammerhead sharks to overfishing, degradation of mangrove habitats, the level of intense and unmanaged fisheries across its range, its lack of refuge at depth, and the lack of recent records in Mexico (a large proportion of its range) despite fisheries-dependent and -independent surveys, it is inferred that this hammerhead has undergone a population reduction of >80% over the past three generations (24 years).

HABITAT AND ECOLOGY

The Scalloped Bonnethead inhabits the continental shelf from inshore to 100 m depth (Weigmann 2016). It reaches a maximum size of 92 cm total length (TL); female maturity is unknown but males mature at 67 cm TL; reproduction is placental viviparous, and it is suspected that females give birth to two pups per litter that are 23 cm TL (Ebert *et al.* 2013). Generation length is suspected to be about 8 years, based on available data for the larger (150 cm TL) congeneric Bonnethead Shark (*Sphyrna tiburo*), which has an age-at-maturity of 7 years and a maximum recorded age of 18 years (Frazier *et al*. 2014).

THREATS

The Scalloped Bonnethead is captured in commercial and artisanal longlines and gillnets, and may also be caught in trawl fisheries. This hammerhead is subjected to intense and largely unmanaged fishing pressure across its range, it has no refuge at depth, and it has been depleted in several areas. Gillnets that often target sharks have been operating since for many decades in the Gulf of California, Mexico, and have led to declines in pelagic sharks and other marine life (Sala *et al*. 2004). Unmanaged artisanal fisheries targeting sharks have been operating around Mazatlán, Mexico since at least the 1960s (Kato 1965). Further south, intense artisanal fishing pressure exists with little management in place, and there are commercial longline and trawl fisheries off many areas of Central and South America. It is caught relatively frequently in artisanal catches in Colombia (Orozco-Guarín 2015, Galindo-Arana 2016). Mangrove habitats, which often serve as nursery areas for coastal sharks such as this, have been degraded with the development of shrimp aquaculture in many areas of the Eastern Central Pacific (López-Angarita *et al*. 2016).

USE AND TRADE

This shark is consumed or sold locally when captured (Mejía-Falla *et al.* 2017) and fins may be traded internationally. Although smaller fins were previously thought not to enter international trade, many smaller species have recently been observed in Hong Kong markets (Cardeñosa *et al*. 2019). This species is not named in that study, but the fins are likely to be similarly valuable to those of other congeners, such as the Bonnethead Shark (*Sphyrna tiburo*), that were present in samples.

CONSERVATION ACTIONS

There are no species-specific protections or conservation measures in place for the Scalloped Bonnethead. In the Mexican Pacific, there is a closed season for targeted elasmobranch fishing from May 1st to July 31st, but enforcement is inadequate (O. Sosa-Nishizaki unpubl. data 2019). A temporal ban of shrimp trawl fisheries is established in Colombia (January to March) but enforcement is also inadequate (Mejía-Falla and Navia 2017). Additionally, targeted industrial fishing of sharks and rays is prohibited in Colombia, with set bycatch limits (up to 35% of bycatch in the national territory; Resolution 1743 of 2017); however, surveillance and compliance requires strengthening. Further research is needed on life history, population size and trends, and threats. To conserve the population and permit recovery, a suite of measures will be required which will need to include species protection, spatial management, bycatch mitigation, and harvest management, all of which will be dependent on effective enforcement.

***iii) Sphyrna tudes* (Valenciennes, 1822) – CR – Smalleye hammerhead (Information extracted from Pollom *et al*. 2020c).**

IDENTIFICATION NOTES

A small hammerhead with a moderately broad, anteriorly arched, mallet-shaped head with medial and lateral indentations on its anterior edge and transverse posterior margins, strong prenarial grooves present on front edge of head, snout rather short and less than 1/3 of head width, moderately large, broadly arched mouth, free rear tip of first dorsal fin over pelvic insertions, posterior margin of anal fin moderately concave and not deeply notched.

DISTRIBUTION

The Smalleye Hammerhead occurs in the Western Central and Southwest Atlantic from Colombia to the Rio de La Plata, Buenos Aires Province, Argentina (Ebert *et al*. 2013, Mejía-Falla and Navia 2019). Historical records from the Mediterranean (Tortonese 1951, McEachran and Séret 1987) are erroneous and refer to specimens of the Scalloped Hammerhead (*Sphyrna lewini*).

Range States : Extant (resident): Argentina; Aruba; Bonaire, Sint Eustatius and Saba; Brazil; Colombia; Curaçao; French Guiana; Grenada; Guyana; Suriname; Trinidad and Tobago; Uruguay; Venezuela, Bolivarian Republic of (CHECK)

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IUCN ASSESSMENT AND JUSTIFICATION

Globally Critically Endangered

The Smalleye Hammerhead (*Sphyrna tudes*) is a medium-sized (to 150 cm total length) shark that occurs in the Western Central and Southwest Atlantic from Colombia to the Rio de La Plata, Argentina. It inhabits inshore waters over the continental shelf at depths of 5–80 m. It is captured in intense and largely unmanaged commercial and artisanal beach seines, gillnets, longlines, and trawls throughout its geographic range. This shark is targeted or retained as bycatch for its meat, which is consumed or sold locally. There are few data on population reduction but these intensive unmanaged fisheries are suspected to have caused reductions and possibly local extinctions throughout this species' range. For example, in Brazil, this hammerhead has not been recorded in 35 years from Ceará state and it is considered by local fishers to be depleted in Bahia state. This shark is supposed to be strictly protected in Brazil, but it is clear that it is still landed and traded in various states. Overall, due to intense and largely unmanaged fisheries across its range, lack of refuge at depth, suspected declines in many areas and local extinctions suspected from an absence of records (despite continued sampling and observation), and its relatively unproductive life history, it is suspected that the Smalleye Hammerhead has undergone a population reduction of >80% over the past three generations (37 years), and it is assessed as Critically Endangered A2bd.

POPULATION

One study found very low haplotype diversity in this species' mitochondrial DNA, possibly indicating that the population is depleted due to fisheries exploitation in Pará and Amapá, Brazil (Tavares *et al*. 2013). There are few data on population reduction but there are intensive unmanaged fisheries that are suspected to have caused reductions and possibly local extinctions throughout this species' range. There are no data from Colombia, Venezuela or the Guianas, but this species is rarely recorded and intense unmanaged artisanal fishing pressure there is suspected to have caused population reduction. In Trinidad and Tobago, this species had already undergone a notable decline in landings in the inshore artisanal fishery there prior to 2006 (Shing 2006). In Brazil,

this hammerhead has not been recorded in 35 years from Ceará state (V. Faria unpubl. data 2018), and this species is considered by local fishers to be depleted in the state of Bahia (Giglio *et al*. 2015, Giglio and Bornatowski 2016). There are intense and unmanaged artisanal fisheries in southern Brazil, which are suspected to have reduced the population substantially. There are no data for this species from Uruguay and Argentina, but there are important artisanal fisheries that are likely to be capturing this species and leading to a population reduction in the absence of management measures. Overall, due to intense and inadequately managed fisheries across its range, its lack of refuge at depth, noted declines in many areas and a lack of records in others, and its relatively unproductive life history, it is suspected that the Smalleye Hammerhead has undergone a population reduction of >80% over the past three generations (37 years).

HABITAT AND ECOLOGY

The Smalleye Hammerhead inhabits inshore waters over the continental shelf at depths of 5–80 m, and nursery grounds are found off shallow muddy beaches (Ebert *et al*. 2013, Weigmann 2016). It reaches a maximum size of 150 cm total length (TL); females reach maturity at 98 cm TL and males at 80 cm TL. Reproduction is placental viviparous, and females give birth after 10 months of gestation to 5–12 pups per litter that are 30 cm TL at birth (Ebert *et al*. 2013). Generation length is estimated to be 12.3 years, based on data available for the Bonnethead Shark (*Sphyrna tiburo*), which has a female age-at-maturity of 6.7 years and a maximum age of 17.9 years (Frazier *et al.* 2014).

THREATS

The Smalleye Hammerhead is captured in commercial and artisanal beach seines, gillnets, longlines, and trawls. Artisanal fisheries are intense across much of coastal Atlantic South America, and there are largely unmanaged commercial trawl and longline fisheries in many areas. In Caribbean Colombia, artisanal fisheries are widespread and lack management, and there is also a shallow-water shrimp trawl fishery for which stocks have been significantly reduced. In the mid-2000s, this fishery had one of the highest ratios of bycatch relative to target species of any in the world (Duarte *et al.* 2010). Since 1995, artisanal fishers have reported decreased mesh sizes, the addition of hooks to gillnets, and spatial expansion of fisheries and subsequent increased fishing pressure on chondrichthyans (Marrugo *et al*. 2015). In Venezuela, commercial and artisanal fisheries are intense, unmanaged, and have exhibited the peaks in catches followed by declines indicative of sequential overfishing (Mendoza 2015). Industrial trawling for shrimp and demersal fish species was introduced in the 1940s and increased rapidly from the 1960s until the 1980s when there were 450 registered vessels (Mendoza 2015). Fishing intensity there increased for several decades and shrimp landings peaked at ~9,000 t in the 1990s (Manickchand-Heileman *et al*. 2004). Efforts to address over-exploitation and conflicts with artisanal fisheries led to a reduction to 260 vessels in 2006, and an industrial trawl ban went into effect in 2009 followed by a large increase in artisanal trawlers (Mendoza 2015). In Trinidad and Tobago, there were over 130 trawl vessels of various sizes operating off the west and south coasts of Trinidad by 2011 (Mohammed *et al*. 2011), and this species is known to have declined in the inshore artisanal fisheries there (Shing 2006). Groundfish fisheries on the Brazil-Guianas shelf were already fully over-exploited by 2000; these fisheries are multi-gear, multi- species, and multinational, with vessels crossing national maritime borders (Booth *et al*. 2001). Despite some areal closures and the implementation of a total allowable catch of target species, there is now a diminished effort and number of vessels in operation there (Diop *et al*. 2015). There are artisanal fisheries that partially target sharks in Guyana with gillnets and demersal longlines. There were ~600 artisanal vessels there in 1998, and these fisheries do capture this shark (Kolmann *et al*. 2017). The situation is suspected to be similar in Suriname and French Guiana.

In north-western Brazil, artisanal fisheries pressure is high and 44% of target stocks were likely to be overfished by the end of the 2000s (Vasconcellos 2011). The combination of intense and unmanaged artisanal and commercial fishing in that area has led to the disappearance of several elasmobranch species in the region, including Largetooth Sawfish (*Pristis pristis*) and Daggernose Shark (*Isogomphodon oxyrhynchus*) (Reis-Filho 2016, Lessa 2016), and this species is known to be caught and traded there despite legal protection (Feitosa *et al.* 2018). In north-eastern and eastern Brazil, artisanal fisheries are intense, gillnetting is the predominant artisanal gear, fishers there report that stocks are over-exploited, and the congener Bonnethead Shark has been depleted (Guebert-Bartholo 2011, Reis-Filho 2014). In southern Brazil, artisanal fisheries are intense and 58% of stocks targeted were over-exploited by 2010, half of those being collapsed (Vasconcellos 2011). In Uruguay, the industrial trawl fleet was developed in the late 1970s, and many target stocks were over-exploited by the 1990s (Defeo 2011). Artisanal vessels fishing in Uruguayan waters increased from 269 vessels in 1975 to 905 vessels in 1996, and after a restructuring in 1997, the number of vessels increased from 393 to 795 in 2010 (Lorenzo 2015). This is thought to be an underestimate as many artisanal vessels are not registered. In Argentina, there are gillnet fisheries that have been known to target sharks in the past (Chiaramonte 1998), and there are still gillnet fisheries that land sharks in the Rio del Plata (although this species was not recorded) (Jaureguizar 2015).

Overall, this shark is caught in a large number of fisheries across its range, many of which are intense and unmanaged, and it has no refuge at depth.

USE AND TRADE

Hammerheads are among the main shark species in the fin trade and are among the preferred species for shark fin soup. Although other larger congeners are preferred in trade, it is likely that this species also enters the international market, as demand for smaller fins is increasing (Cardeñosa *et al.* 2019). The meat is likely consumed or sold locally, but may also be exported to Brazil where demand is rising (Dent and Clarke 2015). In Colombia, it is consumed by Indigenous communities (Puentes-Cañón *et al.* 2012).

CONSERVATION ACTIONS

This shark is listed in the Brazilian Ordinance of the Ministry of the Environment No. 445, which restricts all harvest and trade of species listed as Endangered or Critically Endangered on the Brazilian National Red List (Feitosa *et al.* 2018, Lessa *et al.* 2018). This legislation came into force in December 2014, however, it was suspended for all of 2015 and the first half of 2016 due to pressure from the fishing industry (Begossi *et al.* 2017). The ordinance faces increasing industry pressure, including a current court challenge to suspend the legislation again, by the Secretaria Nacional de Aquicultura e Pesca (SAP), who brought forward their contention that the Brazilian National Red List was designed specifically for terrestrial species (Spautz 2019). In Colombia, targeted industrial fishing of sharks and rays is prohibited, with set bycatch limits (up to 35% of bycatch in the national territory and up to 5% in the Archipelago of San Andres, Providencia, and Santa Catalina; Resolution 1743 of 2017); however, surveillance and compliance requires strengthening. To conserve the population and permit recovery, a suite of measures will be required which will need to include species protection, spatial management, bycatch mitigation, and harvest management, all of which will be dependent on effective enforcement. Further research is needed on life history and population size and trend, and species-specific monitoring should be undertaken in commercial and artisanal fisheries.

***iv) Sphyrna media* Springer, 1940 – CR – Scoophead hammerhead (Information extracted from Pollom *et al*. 2020d).**

IDENTIFICATION NOTES (extract from Compagno, 1984)

A small hammerhead with a moderately broad, anteriorly arched, mallet-shaped head with weak medial and lateral indentations on its anterior edge and transverse posterior margins, no prenarial grooves, snout rather short and about 1/3 of head width, moderately large, broadly arched mouth, free rear tip of first dorsal fin over pelvic insertions, posterior margin of anal fin nearly straight.

DISTRIBUTION

The Scoophead Shark occurred historically in the Eastern Central and Southeast Pacific from the Gulf of California, Mexico to northern Peru and in the Western Central and Southwest Atlantic from Panama to southern Brazil (Ebert *et al*. 2013). It is now absent from the Gulf of California and off Pacific Mexico north of Oaxaca (Pérez-Jiménez 2014).

Extant (resident): Aruba; Bonaire, Sint Eustatius and Saba (Bonaire); Brazil; Colombia; Costa Rica; Curaçao; Ecuador; El Salvador; French Guiana; Guatemala; Guyana; Honduras; Mexico; Nicaragua; Panama; Peru; Suriname; Trinidad and Tobago; Venezuela, Bolivarian Republic of (CHECK)

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IUCN SSC Shark Specialist Group 2019. Sphyrna media. The IUCN Red List of Threatened Species. Version 2021-2

IUCN ASSESSMENT AND JUSTIFICATION

Globally Critically Endangered

The Scoophead Shark (*Sphyrna media*) is a medium-sized (to 150 cm total length) hammerhead that occurs in the Eastern Central and Southeast Pacific from the Gulf of California, Mexico to northern Peru and in the Western Central and Southwest Atlantic from Panama to southern Brazil. It inhabits waters over continental shelves from inshore to 100 m depth. It is captured in commercial and artisanal longlines and gillnets, which are typically unmanaged and operate throughout its range. It may also be caught in trawl fisheries. The declining numbers of records over the past several decades and range contraction in some areas indicates that this shark has undergone population reduction in both the Pacific and the Atlantic. In the Pacific, records have become increasingly rare and this species is no longer present in the Gulf of California. Records are sparse from elsewhere in Pacific Mexico and Central America and occur rarely in Colombia and Ecuador. The Atlantic South American portion of the population has also been reduced in size substantially. Off Caribbean Colombia, this species is considered rare. In Venezuela, it is subjected to intense and unmanaged fishing pressure, and it is suspected to have undergone population reduction there as a result of levels of exploitation. This situation is expected to be similar across the Guianas. Many elasmobranchs are at high risk of extinction in the north of Brazil, and it is suspected that this species has also been overfished there. There have been very sparse records in Bahia state; records of sphyrnid sharks there have been declining in number since the 1990s, and since 2000 have only occurred very rarely. There are no recent records from southern Brazil. Overall, this shark was formerly common or even abundant in the 1970s, has been and still is subjected to intense and largely unmanaged fishing pressure, as well as the degradation of mangrove habitats, and has undergone range retractions in some areas. There have been very few recent records and it is inferred that the Scoophead Shark has undergone a population reduction of >80% based on levels of exploitation, and it is assessed as Critically Endangered A2bcd.

POPULATION

There is evidence of population reduction in both the Pacific and the Atlantic. In the Eastern Central Pacific, this shark was formerly abundant in the Gulf of California and off the Pacific coast of Mexico (Hernández- Carvallo 1967). Records became increasingly rare from the 1980s onwards, and it is no longer present in the Gulf of California; there were only three records from Mexico in the two decades leading up to 2014, all of which were restricted to southern Mexico (Pérez-Jiménez 2014, Saldaña-Ruiz *et al*. 2017). Despite extensive landings surveys, fishery-independent research surveys, and research on museum specimens, the last record in Mexico was in 2006 in Oaxaca (Pérez-Jiménez 2014, J.-C. Pérez-Jiménez unpubl. data 2018). This shark has not been

encountered in Pacific Central America since the 1980s; there are more recent records in Colombia and Ecuador, but they are rare (Pérez-Jiménez 2014). There were records in the industrial trawl fishery in Colombia in the 1990s, but surveys of this fishery in 2007 did not record any Sphyrna species (Navia and Mejía-Falla 2016). To summarize the situation in the Eastern Central and Southeast Pacific, due to intense and largely unmanaged fishing pressure across its range, its recent absence from large parts of Mexico and Central America, and rarity of recent records across this part of its range, it is inferred that this shark has undergone a population reduction of >80% over the past three generations (36 years) in the Eastern Central and Southeast Pacific.

The Atlantic South American portion of the population has been reduced in size substantially. Off Caribbean Colombia, this shark has been very rarely reported (Grijalba *et al*. 2009, García and Armenteras 2015), and is thought to never have been common. In Venezuela, it is subjected to intense and unmanaged fishing pressure, and it is suspected to have undergone population reduction there as a result of levels of exploitation. This situation is expected to be similar across the Guianas. In Brazil, intense fishing pressure is suspected to have led to a population reduction. Many elasmobranchs are at high risk of extinction in the north of Brazil, and it is suspected that this species has also been overfished there. There have been very sparse records of this species in Bahia state; records of sphyrnid sharks there became increasingly rare during the 1990s, and since 2000 have only occurred very rarely (Reis-Filho *et al*. 2014). To summarize the situation in Atlantic South America, this shark was formerly common or even abundant in the 1970s, has been and still is subjected to intense and largely unmanaged fishing pressure, and there have been very few recent records. It is therefore inferred that the Atlantic South American portion of this species' population has undergone a reduction of >80% over the past three generation lengths (36 years).

HABITAT AND ECOLOGY

The Scoophead Shark inhabits waters over continental shelves from inshore to 100 m depth (Weigmann 2016). It reaches a maximum size of 150 cm total length (TL); females mature at 100–133 cm TL and males at 90–100 cm TL; reproduction is placental viviparous and females give birth to young that are 34 cm TL (Ebert *et al*. 2013). Generation length is suspected to be about 12 years, based on available data for the congeneric Bonnethead Shark (*Sphyrna tiburo*), which has an age-at-maturity of 7 years and a maximum recorded age of 18 years (Frazier *et al*. 2014).

THREATS

The Scoophead Shark is captured in commercial and artisanal longlines and gillnets, and may also be caught in trawl fisheries. This hammerhead is subjected to intense and largely unmanaged fishing pressure across its range, it has no refuge at depth, and it has been depleted in several areas.

In the Eastern Central and Southeast Pacific, gillnets that often target sharks have been operating for many decades in the Gulf of California, Mexico, and have led to declines in pelagic sharks and other marine life (Sala *et al*. 2004). Unmanaged artisanal fisheries targeting sharks including this species have been operating around Mazatlan since at least the 1960s (Kato 1965), although there is a three-month seasonal ban on the take of sharks that has been in place since 2012. Further south in this portion of the species' range, intense artisanal fishing pressure exists with little management in place, and there are commercial longline and trawl fisheries off many areas of Pacific Central and South America. Mangrove habitats, which often serve as nursery areas for coastal sharks such as this, have been degraded with the development of shrimp aquaculture in many areas of the Eastern Central Pacific (López-Angarita *et al*. 2016).

In the Atlantic part of its range, artisanal fisheries are intense across much of coastal Atlantic South America, and there are largely unmanaged commercial trawl and longline fisheries in many areas. Caribbean Colombia is dominated by artisanal fisheries and there were an estimated 14,000 artisanal fishers on the Colombian coast in the Caribbean in 2006 (Wielgus *et al*. 2010). Since 1995, fishers there have reported decreased mesh sizes, the addition of hooks to gillnets, and spatial expansion of fisheries and subsequent increased fishing pressure on chondrichthyans (Marrugo *et al*. 2015). Industrial shrimp trawling in shallow coastal waters (operating at ~20–40 m depth) began off the Caribbean coast in the mid-1960s and expanded until the 1980s when overfishing began (Wielgus *et al*. 2010). These fisheries are known to catch the congener Bonnethead Shark (*Sphyrna tiburo*) (Acevedo *et al*. 2007) and are likely to also capture this species. Effort in this fishery peaked in 1990 and declined substantially until the early 2000s (García *et al.* 2007). Furthermore, lack of enforcement capacity has led to illegal fishing by Honduran and Nicaraguan vessels in Colombian waters (Wielgus *et al*. 2010). In Venezuela, commercial and artisanal fisheries are intense, lack management, and have exhibited peaks in catches followed by declines, indicative of sequential overfishing (Mendoza 2015). Groundfish fisheries on the Brazil-Guianas shelf were already fully over-exploited by 2000; these fisheries are multi-gear, multi-species, and multinational, with vessels crossing national maritime borders (Booth *et al*. 2001). Despite some areal closures and the implementation of a total allowable catch of target species, there is now a diminished effort and number of vessels

in operation there (Diop *et al*. 2015). Gillnets and artisanal longlines are prevalent along much of Brazil's coast, other Sphyrnids are captured by them (Reis-Filho *et al*. 2014), and this species is also likely to be caught. In north-western Brazil, artisanal fisheries pressure is high and 44% of target stocks were likely to be overfished by the end of the 2000s (Vasconcellos *et al*. 2011). The combination of intense and unmanaged artisanal and commercial fishing in that area has led to the disappearance of several other elasmobranch species in the region (Reis-Filho *et al*. 2016, Lessa *et al*. 2016). In north-eastern and eastern Brazil, artisanal fisheries are intense, gillnetting is the predominant artisanal gear, fishers there report that stocks are over-exploited, and other sharks have been depleted including congeners (Guebert-Bartholo *et al.* 2011, Reis-Filho *et al.* 2014). In southern Brazil, the trawl fishery began in the 1960s and entered a period of rapid expansion in the 1990s and 2000s, resulting in over 650 vessels fishing at depths of 20–1,000 m (Port *et al.* 2016). Artisanal fisheries there are also intense, and 58% of stocks targeted by artisanal fishers were over-exploited by 2010, half of those being collapsed (Vasconcellos *et al*. 2011). In São Paulo state alone, there are over 300 small-scale trawl vessels (Rodrigues *et al.* 2019). Overall, this shark is subject to intense, largely unmanaged fishing pressure across its range, and it has no refuge at depth.

USE AND TRADE

Like other hammerheads, this shark is utilized for its meat and fins (Kato 1965, Mejía-Falla *et al*. 2017). Hammerheads are among the main shark species in the fin trade and are among the preferred species for shark fin soup. Although other larger congenerics are preferred in trade, it is likely that this species also enters the international market, as demand for smaller fins is increasing (Cardeñosa *et al.* 2019). The meat is likely consumed or sold locally, but may also be exported to Brazil where demand is rising (Dent and Clarke 2015).

CONSERVATION ACTIONS

There are no species-specific protections or conservation measures in place for the Scoophead Shark outside of Brazil. In the Mexican Pacific, there is a closed season for targeted elasmobranch fishing from May 1st to July 31st, but enforcement is inadequate (O. Sosa-Nishizaki unpubl. data 2019). In Brazil, it is listed in the Brazilian Ordinance of Ministry of the Environment Nº 445, which restricts all harvest and trade of species listed as Endangered or Critically Endangered on the Brazilian National Red List (Feitosa *et al.* 2018, Gadig *et al.* 2018). This legislation came into force in December 2014, however, it was suspended for all of 2015 and the first half of 2016 due to pressure from the fishing industry (Begossi *et al.* 2017). The ordinance faces increasing industry pressure, including a current court challenge to suspend the legislation again by the Secretaria Nacional de Aquicultura e Pesca (SAP), who brought forward their contention that the Brazilian National Red List was designed specifically for terrestrial species (Spautz 2019). A temporal ban of shrimp trawl fisheries is established in Colombia (January to March) but enforcement is also inadequate. Additionally, targeted industrial fishing of sharks and rays is prohibited in Colombia, with set bycatch limits (up to 35% of bycatch in the national territory and up to 5% in the Archipelago of San Andres, Providencia and Santa Catalina; Resolution 1743 of 2017); however, surveillance and compliance requires strengthening compliance (Mejía-Falla and Navia 2017).

Further research is needed on life history, population size and trends, and threats. To conserve populations and permit recovery, a suite of measures will be required which will need to include species protection, spatial management, bycatch mitigation, and harvest management, all of which will be dependent on effective enforcement.

***v) Sphyrna gilberti* Quattro, Driggers III, Grady, Ulrich & Roberts, 2013 – DD – Carolina hammerhead (Information extracted from Van der Wright *et al*. 2020).**

IDENTIFICATION NOTES

The species is considered difficult to distinguish from *S. lewini*, however, it was noted to be distinguishable based on precaudal vertebrae counts (Van der Wright, 2020). The United States of America (*in litt*. to: the European Commission, 2022) noted that while the dorsal fins of *S. gilberti* and *S. lewini* are likely similar, the ventral surface of *S. gilberti* pectoral fins had not been described or examined for any distinguishing coloration patterns; it was suggested the pectoral fins of *S. gilberti* may be more similar to *S. zygaena* than *S. lewini*.

DISTRIBUTION

The Carolina Hammerhead (*Sphyrna gilberti*) is found in coastal waters of the Northwest Atlantic Ocean where it is known from South Carolina in the United States of America (Quattro *et al.* 2013). There is evidence of a cryptic lineage of hammerhead shark that may also be this species suggesting it also possibly occurs in Panama in the

Western Central Atlantic and in Brazil in the Southwest Atlantic (Quattro *et al.* 2006, Pinhal *et al*. 2012, Quattro *et al.* 2013).

Extant (resident): United States (South Carolina, Florida, Georgia, North Carolina) Presence Uncertain: Brazil (Santa Catarina, São Paulo); Panama

Distribution data is not mapped for this species

TAXONOMIC NOTES

This cryptic species is most closely related to the Scalloped Hammerhead (*Sphyrna lewini*), and is morphologically distinguishable by the number of precaudal vertebrae (Quattro *et al*. 2013).

IUCN ASSESSMENT AND JUSTIFICATION

Globally data deficient

The Carolina Hammerhead (*Sphyrna gilberti*) is a small (at least to 69 cm total length) poorly-known coastal neritic and possibly semi-oceanic pelagic shark known from the Northwest Atlantic. This is a cryptic species that can only be morphologically distinguished from the Scalloped Hammerhead (*Sphyrna lewini*) by precaudal vertebral counts and there is evidence of a cryptic lineage of hammerhead shark suggesting it may also occur in Panama and Brazil, in the Western Central and Southwest Atlantic Oceans, respectively. The full distribution range and the depth range of this species is unknown. The species is likely captured in longlines, gillnets, trammel nets and trawls and retained for meat and fins. It may benefit from regulations limiting use of gillnets in inshore waters of South Carolina. Given that the depth is unknown and geographic range is not certain, it is difficult to ascertain the level of overall interactions with regional fisheries. Since it is unknown if fishing is causing a population reduction, there is currently inadequate information available to assess the species beyond Data Deficient.

POPULATION

There are no data available for the population size or trend of the Carolina Hammerhead. This species is not able to be easily visually distinguished from the Scalloped Hammerhead (*S. lewini*), hence, it may have been misidentified as the Scalloped Hammerhead. The limited genetic data suggests that the Carolina Hammerhead is less abundant than its sister taxa (Scalloped Hammerhead) in the Northwest Atlantic Ocean (Quattro *et al*. 2006). There is evidence that the Carolina Hammerhead and the Scalloped Hammerhead are able to hybridize in the northern extent of the Carolina Hammerhead's range (Barker *et al.* 2019). The Carolina Hammerhead sympatric distribution with the Scalloped Hammerhead infers that it is exposed to the same threats, and may have also undergone a population decline. Historically, the Scalloped Hammerhead in the Northwest Atlantic and Gulf of Mexico has been overfished from 1983 to 2005 (Jiao *et al.* 2011). The steepest declines occurred prior to 1995, thereafter the abundance index remained stable until the end of the time series in 2005. Second, more recent data (1994–2017) are available from the Northwest Atlantic and Gulf of Mexico comprising two of the time-series underlying the Jiao *et al*. (2011) stock assessment (J. Carlson and W.B. Driggers unpubl. data 2020). Both time-series indicate this stock of Scalloped Hammerhead has begun to increase soon after the implementation of management. Additionally, the commercial shark bottom longline fishery is active in the United States Atlantic Ocean from around North Carolina to Florida and throughout the eastern Gulf of Mexico (BLLOP) that suggest Scalloped Hammerhead is increasing (Rigby *et al*. 2019, J. Carlson unpubl. data 2019). There are no population trend data for Brazil, however the trends in abundance of many coastal sharks is poor, with many exhibiting steep declines. There are intense and unmanaged artisanal fisheries in southern Brazil, which are suspected to have reduced the population of all hammerhead sharks substantially (Barreto *et al*. 2016). Although it is possible that the Carolina Hammerhead as undergone a population reduction, as the depth range and full distribution of the species is unknown, it is not possible to determine the overall interactions with fisheries and it is unknown if fishing is causing a population reduction. Further information is needed on the interactions with fisheries as this species faces similar threats to the Scalloped Hammerhead, and has a much narrower distribution range than the Scalloped Hammerhead which raises concerns for the Carolina Hammerhead's extinction risk.

HABITAT AND ECOLOGY

The Carolina Hammerhead (*S. gilberti*) is a coastal neritic, and possibly semi-oceanic pelagic, shark found over continental shelves (Quattro *et al*. 2013). The depth range for this species is unknown (Wiegmann 2016). The full distribution of its range is also unknown, as it is expected that this species may have migratory behaviour similar to that of other hammerheads (Quattro *et al.* 2013). Most specimens have been juveniles collected in

shallow coastal bays or inlets (Quattro *et al*. 2006, Quattro *et al.* 2013). The maximum size for this species is unknown but it is at least 69 cm total length (TL) (Quattro *et al.* 2013). The size-at-maturity is unknown. Reproduction is presumably placental viviparous based on neonates with an umbilicus (Quattro *et al*. 2013). Size-at-birth is thought to be near 39 cm (TL) based on sampled neonates with an open umbilicus (Quattro *et al.* 2013). Nothing else is known of its biology.

THREATS

The Carolina Hammerhead distribution in the Northwest and Western Central Atlantic Ocean overlaps with that of the Scalloped Hammerhead and thus is likely exposed to similar threats, that is, it may be captured in longlines, gillnets, trammel nets, and trawls (Camhi *et al*. 2008, Martinez-Ortiz *et al*. 2015, Rigby *et al.* 2019). The species is likely retained for meat and fins (Clarke *et al.* 2006a, Clarke *et al.* 2006b, Fields *et al.* 2018), unless regulations prohibit retention. At-vessel mortality for Scalloped Hammerhead in the United States shark bottom-longline fishery is 63% (Gulak *et al.* 2015).

USE AND TRADE

As a cryptic species, the Carolina Hammerhead (*S. gilberti*) could possibly be retained in the Northwest and Western Central Atlantic where the Scalloped Hammerhead (*S. lewini*) is also retained. Sharks of the genus Sphyrna have been known to make up to 4% of the shark fins imported into Hong Kong in 2014 (Fields *et al*. 2018). The meat, liver oil, skin, cartilage and jaws may also be used (Almerón-Souza *et al.* 2018).

CONSERVATION ACTIONS

As a newly described and cryptic species, the Carolina Hammerhead currently has no species-specific conservation actions in place. This species may benefit from a restriction on the use of gillnets in inshore waters (South Carolina Department of Natural Resources 2019). This species may benefit from conservation actions for Scalloped Hammerhead in the Atlantic including retention, trans-shipment, landing, and sale prohibitions put in place by the International Commission for the Conservation of Atlantic Tunas (ICCAT) and the 2013 addition of Scalloped Hammerhead to Appendix II of the Convention on the International Trade in Endangered Species (CITES) which requires CITES Parties to ensure that exports be accompanied by permits based on findings that parts are sourced from legal and sustainable fisheries. Further information is urgently required on its distribution, biology, population size and trends, and interactions with fisheries, with species-specific catch monitoring needed.

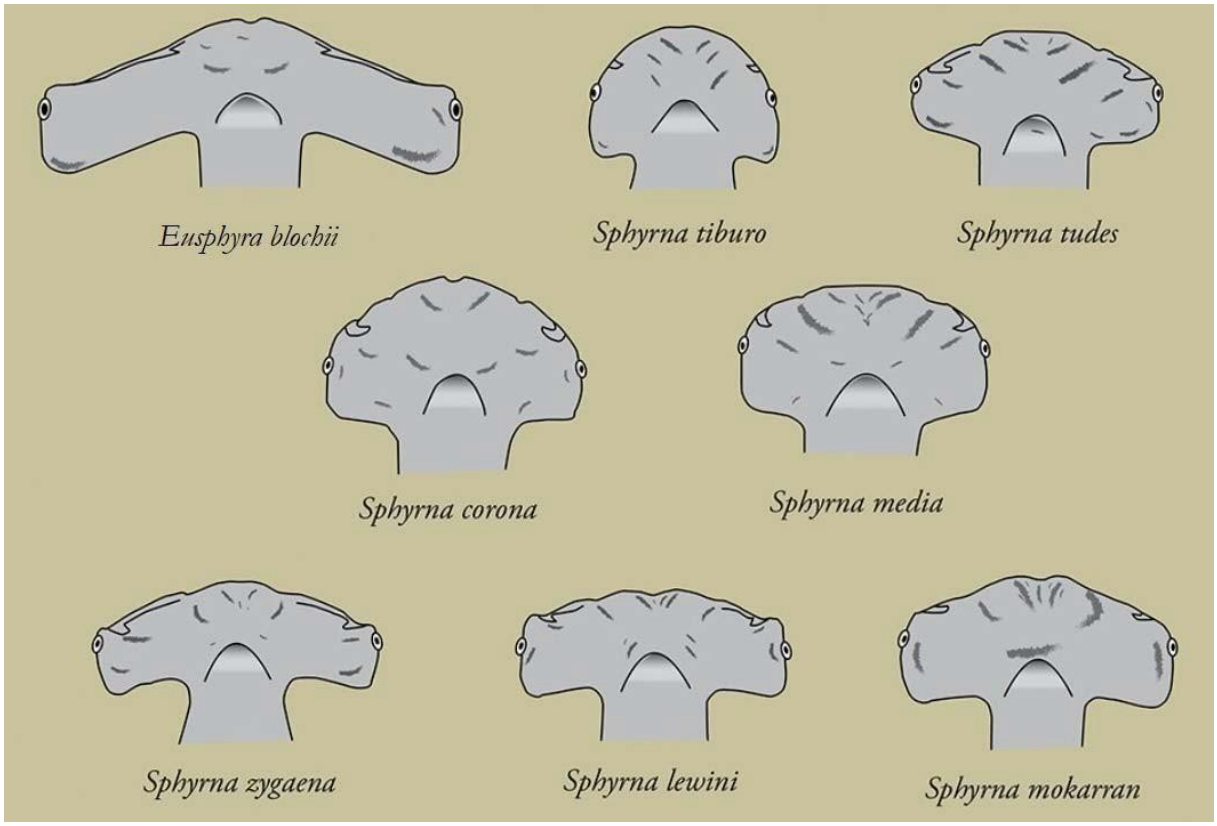

Figure 3. Cephalofoil morphology that can serve as a diagnostic character between hammerhead shark species. The top two rows are the proposed species for Appendix II listing, the bottom row are the currently listed hammerhead species in Appendix II.

Table 3. Summary of supporting biological information for all hammerhead shark species.

Species	Common name	last Red List Status	Assessment	recent Red List Status	date	Int. trade	Distribution	Max. size (cm)
Sphyrna lewini	Scalloped Hammerhead	Endangered	Feb, 2007	Critically Endangered	Nov, 2018	Yes	Worldwide warm temperate and tropical	370-420
Sphyrna mokarran	Great Hammerhead	Endangered	Mar, 2007	Critically Endangered	Nov, 2018	Yes	Worldwide tropical seas	550-610
Sphyrna zygaena	Smooth Hammerhead	Vulnerable	Oct, 2005	Vulnerable	Nov, 2018	Yes	Worldwide tropical and temperate seas	370-400
Eusphyra blochii	Winghead Shark	Near Threatened	Apr, 2003	Endangered	Feb, 2015	Yes	Indo-West Pacific	190
Sphyrna tiburo	Bonnethead Shark	Least Concern	Dec, 2014	Endangered	July, 2019	Yes	West Atlantic, East Pacific	150
Sphyrna tudes	Smalleye Hammerhead	Vulnerable	Jan, 2006	Critically Endangered	July, 2019		West Atlantic	122-150
Sphyrna corona	Scalloped Bonnethead	Near Threatened	Apr, 2004	Critically Endangered	Feb, 2019		East Pacific	92
Sphyrna media	Scoophead Shark	Data Deficient	Jan, 2006	Critically Endangered	Feb, 2019		West Atlantic, East Pacific	150
*Sphyrna gilberti**	Carolina Hammerhead	Not Assessed	N/A	Data Deficient	Apr, 2020		Northwest Atlantic	>69*
NE-DD-LC-NT-VU-EN-CR-EX								
	* this species is recently described and not possible to visually differentiate from S. lewini without precaudal vertebral counts (Quattro et al. 2013)							