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

Eighteenth meeting of the Conference of the Parties
Colombo (Sri Lanka), 23 May – 3 June 2019

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

This proposal refers to the inclusion in Appendix II of the shortfin mako shark, *Isurus oxyrinchus*, (**Figure 1 in Annex I**) in accordance with Article II, paragraph 2 (a) of the Convention and satisfying Criterion B in Annex 2a of Resolution Conf. 9.24 (Rev. CoP17); and of *Isurus paucus*, the longfin mako shark, 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).

B. Proponent

Bangladesh, Benin, Bhutan, Brazil, Burkina Faso, Cabo Verde, Chad, Côte d'Ivoire, Dominican Republic, Egypt, European Union, Gabon, Gambia, Jordan, Lebanon, Liberia, Maldives, Mali, Mexico, Nepal, Niger, Nigeria, Palau, Samoa, Senegal, Sri Lanka, Sudan and Togo[*]:

C. Supporting statement

1. Taxonomy

1.1 Class: Chondrichtyes, subclass Elasmobranchii

1.2 Order: Lamniformes

1.3 Family: Lamnidae

1.4 Genus, species or subspecies, including author and year: *Isurus oxyrinchus* (Rafinesque 1810)

1.5 Scientific synonyms: *Isurus spallanzanii* (Rafinesque, 1810), *Squalus (Lamna) cepedii* (Lesson, 1830), *Lamna oxyrhina* (Cuvier and Valenciennes, in Agassiz, 1838), *Oxyrhina gomphodon* (Müller and Henle, 1839), *Lamna punctata* (Storer, 1839), *Isuropsis dekayi* (Gill, 1862), *Carcharias tigris* (Atwood, 1865), *Lamna guentheri* (Murray, 1884), *Lamna huidobrii* (Philippi, 1887), *Isurus Mako* (Whitley, 1929), *Isurus bideni* (Phillipps, 1932), *Isurus glaucus* (Müller and Henle, 1839), *Isurus tigris africanus* (Smith, 1957)

1.6 Common names:
English: Shortfin mako
French: Taupe bleu
Spanish: Tiburón mako aletas cortas, marrajo común, marrajo dientuso

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.*

2. Overview

Isurus oxyrinchus is a large shark species (~4m) with low biological productivity according to the criteria of Res. Conf. 9.24 (Rev CoP17) and a mortality lower than 0.2. It is highly migratory and is distributed in temperate and tropical oceanic waters (50˚ N to 50˚ S). Its seasonal movements depend on food availability, water temperature and the growth stage of the species, which can sometimes be found on the coast (see **Section 3**).

It is considered as a metapopulation, although genetic exchange in the North Atlantic is considered minimal. There is no global estimate of its population size, but according to the IUCN it has a decreasing population trend worldwide. As regards stocks, the most recent scientific information refers to the Mediterranean, with historical declines above 96%, projected declines (for the next 10 years) of 60% in the North Atlantic and 41.6% in the Indian Ocean; it is probably overfished and overexploited in the South Atlantic and is neither overfished nor overexploited in the North Pacific (see **Section 4**).

Its main threat is fishing – both as a targeted and bycatch species – in multi-species fisheries throughout its range (see **Section 5**). It is used domestically and internationally for its meat and fins (40,000 t/year in international trade). According to FAO global catch production statistics (1981-2016), total landings of *Isurus oxyrinchus* increased by 69% from 2004-2009 to 2010-2016. Spain, Taiwan and Portugal represented 62% of annual catches reported to FAO during the 2006-2016 period (see **Section 6**).

The species is listed as highly migratory in Annex I of the United Nations Convention on the Law of the Sea (UNCLOS), which indicates that it is necessary to take measures for the conservation of the species, and in Appendix II of the Convention on Migratory Species (CMS), which includes species conserved through agreements. In turn, several regional fisheries management organizations (RFMOs) recommend that their Parties improve data collection, ban shark finning and conduct population and risk assessments. The species is present in offshore marine protected areas adopted by FAO members, but their usefulness to avoid fishing of the species has not been assessed (see **sections 7 and 8**).

Isurus paucus, the longfin mako shark, is very similar in appearance to the shortfin mako, *Isurus oxyrinchus*, although it has longer pectoral fins, which are even classified jointly with the fins of thresher sharks (*Alopias* spp.). However, given that both species of the genus *Isurus* are traded for their valuable meat (which amounts to over 90% of the total volume of their body), most international trade is difficult to identify (see **Section 9**).

3. Species characteristics

3.1 Distribution

The shortfin mako is a fast-swimming species reaching 70 km/hour (Sims et al., 2018). It is highly migratory, and 64% of recaptures in the North Atlantic (of 2,459 marks) have been recovered at 500 km, and some up to 4,542 km away from the tagging site (Casey and Kohler, 1992; Compagno, 2001; Mejuto et al*.,* 2005). The species can be found in all temperate and tropical oceanic waters from 50° N (60° N in the North Atlantic) to 50° S (**Figure 2 in Annex I**).

The shortfin mako occurs in the following FAO fishing areas: 21, 27, 31, 34, 37, 41, 47, 51, 57, 61, 67, 71, 77, 81 and 87. Its range States (143 countries according to the IUCN; Cailliet et al*.,* 2009) are illustrated in **Figure 2 in Annex I**.

3.2 Habitat

The shortfin mako is normally found in waters between 15 °C and 31° C (Vaudo et al*.,* 2016) and its horizontal movements are driven by changes in water temperature in the North Pacific, Southeast India and the North West Atlantic (Vaudo et al*.,* 2016; Rogers et al*.,* 2015; Casey and Kohler, 1992). The shortfin mako sometimes exhibits diving behaviour at depths of 500 m (Vaudo et al*.,* 2016) and 1,700 m (Sims 2015) in search of food (Abascal et al*.,* 2011). Marking studies have found that mako sharks dive in deep waters during the day where the temperature is low (~10 °C to 15 °C) (Holts and Kohin 2003; Vaudo et al*.,* 2016).

Occasionally, this species ventures from semi-temperate zones towards the poles in summer, from New Zealand to the Marquesas Islands, Tonga, Fiji and New Caledonia (Ebert et al*.,* 2013). However, it also exhibits periods of relative site fidelity in the Southeast, Central and Northeast Pacific Ocean as well as in the Northeast Atlantic Ocean (Vetter et al., 2008; Abascal et al., 2011; Block et al., 2011; Loefer et al., 2005; Musyl et al., 2011), the Southwest Pacific Ocean in Eastern Australia (Stevens et al., 2010) and the North Atlantic, where the species prefers frontal areas (i.e., areas where two water bodies meet, where the largest target fishery occurs, mainly with longline vessels; Queiroz et al., 2016). The species moves seasonally (Casey and Kohler, 1992), but its movements also vary according to sex (Mucientes et al., 2009) and growth stage of individuals (Sepulveda et al., 2004; Groeneveld et al., 2014). This creates a complex population structure with high spatio-temporal variability. It is mainly an oceanic species but can seasonally occur on the coast where the continental shelf is narrow, as in KwaZulu-Natal, South Africa (Compagno, 2001; Jawad, 2013).

3.3 Biological characteristics

The species has low productivity. The proponents reviewed studies conducted in the regions of the North Pacific, South Pacific, North Atlantic, South Atlantic and Indian Ocean (1983 to 2018). The life history parameters of the shortfin mako vary based on the author of the publication, sex and region, and the range of values is usually broad. Yet, consistently, most of the values reported for each compiled parameter are within the thresholds for species with low productivity defined in the footnote for aquatic species of Annex 5 of Res. Conf. 9.24 (Rev. CoP17) and those recommended by FAO (2001) (see details in **Annex II**). In this regard, the species has a natural mortality lower than 0.2 (0.072 to 0.223), an intrinsic growth rate lower than 0.14 (0.031 to 0.123), a Von Bertalanffy growth constant less than 0.15 (0.05 to 0.266), an average age of maturity greater than 8 years (7 to 21 years), a maximum age greater than 25 years (6 to 45 years), and a generation time above 10 years (25 years). Additionally, this species produces 4 to 25 pups per litter with a gestation period of 12 to 25 months and breeds every two or three years (**Annex II**).

The shortfin mako is ovoviviparous and oophagous, that is, it gives birth to live offspring that feed on infertile eggs during gestation (Compagno, 2001). Like other lamnid sharks, it uses a circulatory heat exchange system to maintain the temperature of its muscles and viscera above that of the surrounding water, which enables it to have a greater activity level (Carey et al., 1981, Bernal et al., 2001).

Based on the analysis of fisheries-dependent data, the existence of mating, spawning and nursery areas has been estimated in the Strait of Gibraltar and the adjacent waters in the Eastern North Atlantic, off the coast of Brazil (between 17 ° S and 35 ° S), in the Western Mediterranean Sea, along the continental margins of the Eastern and Western Pacific (Cailliet et al., 2009; ISC 2015), in Uruguay (Cailliet et al., 2009), in Southern California (Hanan et al., 1993) and on the coast of Chile (Bustamante and Bennet, 2013).

3.4 Morphological characteristics

The shortfin mako has a maximum size of 3.96 m (Compagno, 2001). The coloration is metallic from dark blue to purple on the dorsal surface and white on the ventral surface. The snout is conical, moderately long and pointed, with a U-shaped mouth and large, long and pointed teeth. In the Azores Islands it is called "Creole mako" because the lower part of the snout and the mouth are white in adults, but dark in juveniles. The gill slits are long and extend partially to the upper part of the head.

3.5 Role of the species in its ecosystem

The shortfin mako is a pelagic predator whose diet consists of squid, teleost fish (e.g., swordfish, mackerel, tuna, anchovy), other sharks and, to a lesser extent (in larger adults) sea turtles and marine mammals (Compagno, 2001). Because this species occupies higher trophic levels, it plays an important role in marine ecosystems, including in the structuring of communities and the control of prey populations (Ferretti et al., 2008).

4. Status and trends

4.1 Habitat trends

For fisheries assessment purposes, the exchange across the North Atlantic is considered minimal. In the 1960s and 1970s, adult males were occasionally captured in the Western English Channel, but today they are rarely found (Cailliet et al., 2009). This suggests a possible contraction of the area of distribution of the species in the Northeast Atlantic. Hazen et al. (2013) predicted a decline of up to 25% by 2100 in the central habitat of the shortfin mako in the Eastern North Pacific.

4.2 Population size

The total population size of the shortfin mako is unknown. However, the various stock assessments conducted in the different oceans have assumed the existence of independent stocks (see **Section 4.3**).

4.3 Population structure

From an evolutionary viewpoint, the shortfin mako is a single species that presents differences in its mtDNA allele frequencies between semi-isolated regions (Heist et al., 1996). Using a microsatellite analysis (nDNA), Schrey and Heist (2003) found weak evidence to explain a population structure among oceans. However, females from the eastern and western North Atlantic can be distinguished with mitochondrial DNA, which indicates a philopatry of females, suggesting that the North Atlantic is separated from the rest of the stocks (Heist et al., 1996). In the North Pacific, the stock assessment conducted by the ISC-SWG (2018) considered a single stock in this region based on evidence from genetic studies (Taguchi et al. 2015), marking and catch rates, which are lower near the equator than in temperate zones.

4.4 Population trends

To date, status and population trend assessments are performed per ocean and latitude. Yet, the data and levels of analysis available for each region are heterogeneous. At a global level, the IUCN considers that stocks of shortfin mako shark are declining (Cailliet et al., 2009). However, all regional assessments require updating, except for the one in Europe (the species is classified as Data Deficient by Walls et al., 2015) and the Mediterranean (the species is classified as Critically Endangered by Walls and Soldo, 2016).

North Pacific: Until before 2018, the trends and status of the North Pacific stock had mainly been evaluated regionally, with short time series and different approaches. Chang and Liu (2009) conducted a stock assessment of the Northwest Pacific stock by means of a virtual population analysis based on data from the Taiwanese longline fleet for the 1990-2004 period. They observed a declining trend from the year 2000, and found that the spawning potential ratio (SPR) had reached a level of 20% in 2003 and was lower than the biological reference point (BRP SPR =35%), and that fishing mortality (F) in 2003 had exceeded the current mortality BPR (F2003 = 0.066/year, BRP F35% = 0.045/year). The conclusion of this assessment was that this population might have been overexploited and the authors recommended reducing the fishing effort by 32%. Later, for that same fishery, Tsai et al. (2011) used part of the same information as well as updated data (1995-2005) and included an analysis of uncertainty in their estimations of the BRPs. They concluded that the abundance of the stock of the Northeast Pacific was declining under the fishing conditions during the study period, which was supported by a stage-based matrix demographic analysis (Tsai et al., 2014). Clarke et al. (2013a) used generalized linear models to standardize longline fleet catch rates in the Central and Northeast Pacific; using biological indicators, they identified a significant rate of decline in the catch rate of the shortfin mako of 7% per annum during 1996-2009 (equivalent to approximately 69% during the 15-year study period). Yet, Clarke et al. reported that the performance of the standardization model for the shortfin mako (in the North and South Pacific) was the poorest compared to that of the models applied to other species of sharks studied; therefore, the trends are less reliable. Rice et al. (2015) found relatively stable CPUE trends in the North Pacific during the 2000-2010 period but missing data in some years, so they were not able to infer this stable trend in the last 4 years. Kai et al. (2017) developed a length-disaggregated, spatio-temporal, delta-generalized linear mixed model to analyze the catch rates of shortfin mako in the Japanese fishery of the Central and Northwest Pacific during 2006-2014. They found that catch rates showed an increasing trend from 2008.

Recently, using information from the main fisheries of the North Pacific Ocean, the Shark Working Group (SWG) of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean assessed the status of the stock of the shortfin mako in 2015 and concluded that, as a result of missing information and conflicts in available data, the status of the stock should be considered undetermined in the North Pacific (ISC-SWG, 2015); as a result, a stock assessment was scheduled for 2018.

Finally, the ISC-SWG assessed the stock of the shortfin mako based on the best scientific information available to date, with data from the North Pacific provided by the United States, Japan, Taiwan and Mexico of catches (1975 to 2016) that were standardized (ISC-SWG, 2018). They used Stock Synthesis 3 software to generate a base model and conducted a sensitivity analysis to determine the potential weaknesses of this modelling. Based on this, they also modelled six scenarios considering the weaknesses identified (e.g., increasing the catch data by 50% for the period with the highest uncertainty: 1975-1993). As a result of the base model (which was consistent with the different scenarios modelled), they determined that there are more than 50% chances that the stock is not experiencing overfishing (the current abundance of mature females – 910,000 individuals – is 36% greater than the abundance of females expected at maximum sustainable yield, which is 633,700 individuals), and there is no overexploitation (the impact of current fisheries – 0.16 – is lower than the expected impact at maximum sustainable yield – 0.26). The predictive power of the model into the future is limited and uncertain. However, three scenarios were run projecting the behaviour of the stocks during 10 years, so it is estimated that if the average catches of the 2013-2015 period are maintained or reduced by 20%, the abundance of females can increase (ISC-SWG, 2018).

Based on the number of females generated by the model (Table 7 of the publication by the ISC-SWG, 2018), the authors estimated a historical decline of 16.4% (1,024,000 individuals on average during 1975-1985, compared to 855,700 on average during 2006-2016), a recent increase of 1.8% with an annual rate of increase of 0.18% (844,800 individuals in 2006 and 860,200 individuals in 2016) (see **Annex III**).

South Pacific: In the South Pacific, Clarke et al. (2013a) reported that changes in the abundance of the shortfin mako were not significant during 1996-2009 and that the performance of the standardization model for the species (north and south) was poorer than for the other shark species studied; therefore, its trends were less reliable. Rice et al. (2015) reported that the shortfin mako in the South Pacific may have been declining over the last five years (2009-2013); however, the same authors argued that their studies were based on relatively few data, so the estimated trend may not be very reliable.

North Atlantic: In 2012, the Standing Committee on Research and Statistics of the International Commission for the Conservation of Atlantic Tunas (ICCAT SCRS) conducted an assessment of the North Atlantic stock and determined that the abundance of the species was above the biomass at maximum sustainable yield. As regards fishing mortality, the median was lower than that expected at maximum sustainable yield. However, there were 80% credibility intervals.

Byrne et al. (2017) used satellite telemetry as a tool to document fishing interactions and quantify the fishing mortality of shortfin mako (*Isurus oxyrinchus*) in the North Atlantic Ocean. They tracked a total of 40 sharks from 2013 to 2016 in the Yucatan peninsula, Mexico, and in Maryland, United States. They used the MARK model to estimate the probability of survival of sharks annually, which is formulated as a generalized linear model (GLM) and makes it possible to model survival based on variables at the individual level (e.g., size, age, sex). Estimated fishing mortality ranged from 0.19 to 0.56, 5-18 times higher than the estimated mortality at maximum sustainable yield, which ranges from 0.031 to 0.038.

The ICCAT SCRS (2017) has conducted the most recent assessment of the North Atlantic stock with data from 1950 to 2015 using four models (Bayesian Surplus Production Model, Just Another Bayesian Biomass Assessment model, Catch-only Monte-Carlo and Stock Synthesis 3). The combined probability generated by the four models suggests that there is a 90% probability that the stock is overfished and overexploited.

Based on the number of females generated by the Stock Synthesis 3 model (Table 7 of the publication by the ICCAT SCRS, 2017), the authors of the present proposal estimated a historical decline of 39% (1,126,000 females on average in 1950-1960, compared to 686,600 females on average in 2006-2015) and a recent decline of 32.1% with an annual rate of decline of 4.2% (822,000 females in 2006 and 558,000 females in 2015). Based on a rate of decline of 4.2% and starting with an initial number of 558,000 females, the proponents projected a 10-year decline of 60% from the historic baseline (1,126,000 females on average during 1950-1960 compared to 443,758 females on average during 2016-2025) (see **Annex III**).

South Atlantic: The ICCAT SCRS (2017) has conducted the most recent assessment of the North Atlantic stock with data from 1950 to 2015 using three models (Bayesian Surplus Production Model, Just Another Bayesian Biomass Assessment model and Catch-only Monte-Carlo). The combined results of the model suggest a 19% probability that the stock is overfished and experiencing overfishing. The group in charge of the assessment (ICCAT SCRS, 2017) considered that the results on the status of the South Atlantic stock were highly uncertain. The ICCAT SCRS (2017) concluded that, despite this uncertainty, it was likely that in recent years the number of females in the stock had been below the level expected at maximum sustainable yield and that fishing mortality already exceeded expected mortality at maximum sustainable yield.

Mediterranean: Ferretti et al. (2008) conducted an assessment based on bibliographic information of the Adriatic Sea fishery (76 records of *Isurus oxyrinchus*, *Lamna nasus, Sphyrna tudes* and *S. zygaena* from 1827 to 2000), the Spanish Mediterranean swordfish fleet (1991-1992) and the longline fleet of the Ligurian Sea (1990-1997). They used this information to run generalized linear models and estimated a decline greater than 96% from the baseline. The shortfin mako was classified as Critically Endangered in a regional assessment conducted in 2016, based on (i) inadequate management resulting in continuing (if not increasing) fishing pressure; (ii) the high value of its meat and fins; (iii) characteristics of the life history of the species; (iv) the absence of records from some areas located in the Mediterranean Sea; (v) evidence of large declines in other areas; and (vi) captures of juveniles in a probable nursery area (Walls and Soldo, 2016). The shortfin mako was considered common throughout the Mediterranean Sea at the end of the 19th century but is rarely found today (Walls and Soldo, 2016). The last known sighting of the species in the Mediterranean was in Malta in 2005 (CIESM, 2018) and there have been no records of this species reported in the Adriatic Sea since 1972 (Walls et al*.,* 2015). A decline of the regional stock of at least 80% in the last three generations (75 years) was estimated according to the available data and this trend was expected to continue given the lack of management and current fishing levels (Walls and Soldo, 2016).

Indian Ocean:

Romanov et al. (2008) examined longline bycatch during a research program on longline fisheries of Soviet tuna in the western equatorial Indian Ocean (1964 to 1988). Catches were composed of the following species: *Alepisaurus ferox* (11.3%), *Prionace glauca* (3.5%), *Pteroplatytrygon violacea* (2.81%), and *Isurus oxyrinchus*, *Isurus paucus*, *I.* spp. (2.23%). There were gaps in the data regarding fishing effort and sampled years. The authors noted that CPUE indices of the target species (*Thunnus* spp.) did not show clear trends. Based on information from Table 3 of the article, the authors of this proposal estimated that the shark catches reported represented 12.4% of total catches and that the shortfin mako was the second most frequent species caught, amounting to 1.99% of total catches (behind *Prionace glauca*, representing 3.5% of total catches). The proponents therefore inferred that Romanov et al. referred to these and other species when they reported a major decline in CPUE indices and mean weight.

Jabado et al. (2017) reviewed the species in a regional assessment of elasmobranchs in the Arabian Sea and adjacent waters and classified it as Near Threatened in the area. The authors found that the available standardized CPUE data suggested a variable abundance, but that there was little evidence of a significant population decline (Jabado et al*.,* 2017). However, they noted that there was evidence of decreases in the average size of individuals in countries such as Oman; they estimated that, given the intensive pelagic fishery in the region and the high susceptibility of the species to longline fishing gear, purse seines and driftnets, it was suspected that the shortfin mako had experienced population declines of 20-30% in the last three generations (75 years) (Jabado et al*.,* 2017).

Brunel et al. (2018) conducted a preliminary stock assessment using limited information, mainly catch rates of the longline fleet of European Union countries. They applied two models: a Bayesian Schaefer-type production model and another model analyzing only the trends of catches, and reported that the current exploitation rate exceeds the exploitation levels at which maximum sustainable yield (MSY) has been obtained since 1990; they estimated that the fishing mortality rate, F, has a value much higher than the expected fishing mortality rate at maximum sustainable yield, Fmsy (F2015/Fmsy=2.57). Brunel et al. (2018) preliminarily concluded that in the Indian Ocean the shortfin mako is subject to overfishing (its fishing mortality is 2.57 times greater than the Fmsy value), but is not yet overfished.

The Indian Ocean Tuna Commission has scheduled a stock assessment in 2020 through its Working Party on Ecosystems and Bycatch (Brunel et al. 2018). Catches reported for 2014 amounted to 1,683 t and average catches reported in 2010-2014 were of 1,538 t/year (IOTC 2017).

Based on the Biomass/Bmsy proportions generated by the Scheafer model (Figure 6B of the publication by Brunel et al., 2018), the authors of the present proposal estimated a historical decline of 26% (a mean of 1.6 B/Bmsy in 1970-1980, in contrast with a mean of 1.1 B/Bmsy in 2005-2015), a recent decline of 18.8% with an annual rate of decline of 2.1% (1.31 B/Bmsy in 2005 compared to 1.06 B/Bmsy in 2015). Applying a rate of decline of 2.1% and starting from a value of 1.06 B/Bmsy, the proponents projected a 10-year decline of 41.6% from the historic baseline (a mean of 1.6 B/Bmsy in 1970-1980, compared to a mean of 0.93 B/Bmsy in 2015-2025) (see **Annex III**).

Assessment of all the regions: Considering the most recent information for each region and whenever the information made it possible, the proponents conducted an assessment of historical, recent and projected declines. The results of this assessment are shown on **Table 1.**

Table 1. Assessment of *Isurus oxyrinchus* in the regions where it occurs. Increases are shown in green; inconclusive data and declines between 1 and 40% are shown in yellow; declines greater than 40% are shown in red.

Region	North Atlantic **(1)**	South Atlantic **(2)**	Mediterranean **(3)**	Indian Ocean **(4)**	South Pacific **(5)**	North Pacific **(6)**
% of the total distribution of the species **(7)**	14.50%	12.00%	1.10%	17.90%	22.00%	32.50%
Historical decline first 10 years with data vs. last 10 years	39%	Not available	>96%	26%	Not available	16.4%
Recent decline (0 to 10 years back)	32% (annual rate 4.2%)	Not available	Not available	18.8% (annual rate 2.1%)	2009-2013, no % estimated	Increase of 1.8% (annual rate of increase of 0.18%)
Projected decline (next 10 years)	60%	Not available	Not available	41.6%	Not available	Not applicable
Results of stock assessments **(8)**	Overfished and overexploited (90% prob.)	Overfished and overexploited (19% prob.)	Decline	Overfished but not overexploited	Not available	Neither overfished nor overexploited (>50% prob.)

Notes: 1= Estimated based on Table 7 of the publication by the ICAAT SCRS (2017); 2= Based on information provided by the ICCAT SCRS (2017); 3= Based on Ferretti (et al., 2008); 4= Estimated based on Figure 6B of Brunel et al. (2018); 5= Based on Rice (et al., 2015) and Clarke (et al., 2013a); 6 = Estimated based on Table 7 of the publication by the ISC-SWG (2018); 7= Based on the potential area of distribution of the shortfin mako, estimated by Cailliet et al. (2009), the authors of the present proposal calculated the area represented by each of the regions assessed in order to obtain a parameter to quantify their coverage; 8= Probabilities are only indicated when they are provided by the results of the models (i.e., results of an assessment with Bayesian, Stock Synthesis or similar models).

4.5 Geographic trends

No information.

5. Threats

The main threat to the shortfin mako is fishing, since it is targeted and also taken as bycatch in multispecies fisheries throughout its range, particularly by pelagic longliners in national and international waters (Dulvy et al., 2008; Camhi et al., 2007) targeting tuna, billfish and swordfish (Campana, 2016; Walls and Soldo, 2016, ICES, 2017). The shortfin mako is valued for its high quality meat and its fins, so it is retained more frequently than other pelagic sharks. Its liver oil is considered of average quality (Camhi et al., 2007). The shortfin mako is also a target of sport fisheries in the United States, New Zealand and some European countries (CMS, 2008).

A study conducted with records of catches off the coast of Peru (Adams et al., 2016) and another study carried out in the North Atlantic Ocean (Queiroz et al., 2016) with specimens marked and tracked by satellite revealed that areas of high productivity, including frontal oceanic systems, are important aggregation sites for mako sharks and other pelagic species (e.g., tuna, swordfish, marlin and other sharks); these areas are also targeted by longline fishing fleets.

Globally, the species is classified as Vulnerable in the IUCN Red List (Cailliet et al., 2009). Ecological Risk and Productivity Assessments determined that the shortfin mako was the second most vulnerable shark species to overexploitation in pelagic longline fisheries in the Atlantic Ocean and the most vulnerable one in the Indian Ocean (IOTC, 2017). An ecological risk assessment (ERA) concluded that the shortfin mako was the second most vulnerable shark species to Atlantic pelagic longline fisheries (Cortes et al., 2010). The ERA was reviewed in 2015, showing that the shortfin mako was the most susceptible shark species to pelagic longline fisheries in the Atlantic Ocean and was among the most vulnerable species from a biological point of view (Cortes et al., 2015).

Nursery areas identified so far have been the product of fisheries-dependent data, so it is likely that they are subject to direct fishing pressure (see **Section 3.2**).

As regards fishing gear, the shortfin mako has a post-release survival of up to 70% (depending on handling and time before release), which is higher than other shark species, so it is feasible to implement selective fishing management measures (ICCAT SCRS, 2017; Campana et al., 2016, Coelho et al., 2012). In southeastern Australia, French et al. (2015) estimated that shortfin mako sharks caught by recreational anglers (n = 30) have a survival rate of 90%.

Other threats include bycatch in bather protection nets in the Southwestern Indian Ocean (Groeneveld et al., 2014); there are reports of a small number of individuals caught annually in shark nets off the beaches of KwaZulu-Natal (Dudley and Cliff, 2010).

Finally, given that temperature is an important environmental factor for the spatial and temporal distribution of the shortfin mako, the use and habitat distribution of the species will probably be affected by the warming of oceanic waters as a result of climate change (Vaudo et al., 2016).

6. Utilization and trade

The shortfin mako is mainly taken as bycatch in commercial fisheries (with a retention rate of up to two thirds, James et al., 2016); however, it is also a target species and is an important sport fishing species in the Atlantic and Pacific regions (Francis et al., 2001; Campana et al., 2005; Petersen et al., 2009; Bustamante and Bennett, 2013).

The shortfin mako is used domestically and internationally for its meat and is exploited internationally for its fins, which are traded in large amounts (Clarke *et al*. 2006a).

6.1 National utilization

Shortfin mako meat is of high quality (it is known as "veau de mer" in Europe) and is used fresh, dried, salted, frozen and smoked for human consumption all over the world. Its price is USD 22-44 per kg in American supermarkets and it is a premium product in Japan (Dent and Clarke 2015). In Spain, shortfin mako meat in wholesale markets costs twice as much as blue shark meat (~ USD 14.17/kg fresh, versus USD 7.63/kg for blue shark, and USD 5.21/kg versus USD 4.42 frozen) and in Venezuela it is considered as a high-end product (Clarke et al., 2013b). In some areas, shortfin mako meat is processed into animal feed and fish meal. In Mexico, the highest commercial value of shortfin mako shark products is reflected in the meat, which is more valued than that of other sharks on the market (~ USD 1/kg), followed by the caudal peduncle (for export) and the remaining fins of the species. Jaws and heads are also used for decorative and ornamental purposes (Santana-Morales, 2008); in fact, all the derivatives of the species are used. In Canada, the species is taken as bycatch in fisheries targeting swordfish from April to December (82 to 19 tonnes/year between 2015-2017) (see **Annex IV**).

Rod and line recreational fishing of shortfin mako occurs in places such as New Zealand, South Africa and California. The shortfin mako has recently become a target species for diving ecotourism. There are dive sites to see the species in Southern California, from the Los Angeles Basin to San Diego, in South Africa and in the Maldives (Compagno 2001). In Mexico, the observation of mako sharks is a recreational activity in Los Cabos and María Magdalena (Ecolors, 2018; PelagicSafari, 2018).

6.2 Legal trade

According to FAO global catch production statistics (1981-2016), total landings of shortfin mako increased by 69% from 2004-2009 (a total of 54,155 t during the period) to 2010-2016 (a total of 45,956 t during the period). From 2010 to 2016, the Atlantic contributed to 50% of total catches (a total of 45,956 t during the period), the Pacific amounted to 34% (a total of 31,838 t), the Indian Ocean represented 15% (a total of 14,043 t) and the Mediterranean contributed to less than 1% (a total of 152 t) (**Figure 3 in Annex I**). During these periods, average annual catches were 9,025 t from 2004 to 2009 and 12,141 t/year from 2010 to 2016. Spain, Taiwan and Portugal represent 62% of annual catches reported to FAO during the period from 2006 to 2016 (35%, 15% and 12% respectively).

Atlantic Ocean: There are no targeted fisheries of shortfin mako in the North Atlantic (Campana, 2016) but the species is taken as bycatch, generally in pelagic longline fisheries targeting swordfish, tuna and billfishes (ICES, 2017). It has also been recorded as bycatch in driftnet fisheries in the Mediterranean (CIEM, 2018) and recreational fisheries on both sides of the North Atlantic have also reported relatively large amounts of the species taken by this activity (CIEM, 2017). Reported catches of shortfin mako in the North Atlantic exceeded 3,300 tonnes in 2016 (mainly by longline vessels) (ICCAT SCRS. 2017), which amounts to 130,000 individuals (Sims et al., 2018), and reported catches in the South Atlantic exceeded 2,600 tonnes on the same year (ICCAT, 2017b); however, catches are considered to be underestimated and landing data do not reflect the number of sharks finned and discarded at sea (Cailliet et al., 2009; ICES, 2017). The main countries that reported catches in the North Atlantic in 2016 were Spain, Morocco, the United States and Portugal, which represented 47%, 31%, 9% and 8% of catches, respectively (ICCAT SCRS, 2017). In the Mediterranean Sea, total reported landings have ranged between 0 and 2 tonnes since 2007 (ICES, 2017).

In Mexico, shortfin mako is caught mainly by artisanal and medium-size longline fisheries targeting pelagic sharks or swordfish (Sosa-Nishizaki et al., 2017). Particularly in the Gulf of Mexico, there are no targeted catches of shortfin mako; reports from the northern area of the Gulf (Veracruz and parts of Tamaulipas) are of bycatch in longline vessels targeting red snapper or other shark species. In Canada all the sharks landed are exported to international markets. In Bermuda (United Kingdom of Great Britain), landings of individuals have ranged between 0 and 5 individuals per year (up to 345 kg/year); these catches are not traded internationally (see details in **Annex IV**).

Pacific Ocean: Sharks are caught by purse seiners and longliners in the Eastern Pacific Ocean (EPO) (ICCAT SCRS, 2017). According to the Inter-American Tropical Tuna Commission (IATTC), the main fleets operating in the EPO in 2016 were Ecuador (approximately 35%) and Mexico (approximately 23%) (ICCAT SCRS, 2017). ICCAT has not reported specific catch data for *Isurus oxyrinchus* in the EPO. *Isurus oxyrinchus* is also reported as a prized game fish off the East Coast of the United States (Taylor and Holts, 2001). Catches reported by the USA in the last five years amounted to approximately 5,100 individuals, of which 720 were retained annually on average (see **Annex IV**).

In Mexico, Sosa-Nishizaki et al. (2017) estimated annual catches ranging from 660 to 1,653 tonnes (2012 to 2016) in the north-west of the country (see details in **Annex IV**).

Indian Ocean: According to the IOTC, the main fleets operating in the Indian Ocean during the 2012-2016 period were Spain, South Africa, Portugal, Japan, Iran and China (IOTC, 2017). Catches of *Isurus oxyrinchus* by fishing fleets in the Southwestern Indian Ocean are recorded by the IOTC; however, it is thought that the records probably underestimate actual catches as a result of inaccurate or incomplete reports (IOTC, 2017; Jabado et al., 2017). Reported catches of shortfin mako in the Indian Ocean in 2016 amounted to 1,631 tonnes (with reported average catches of 1,503 t in 2012-2016). It was observed that most artisanal and industrial artisanal fisheries in the Indian Ocean were multi-species and the status of most of the resources was considered poorly documented (Cailliet et al., 2009). However, the species has been reported in catches of longline fisheries targeting tuna and swordfish in Indonesia (White et al., 2006) and in other areas throughout its range in the region (Cailliet et al., 2009) and there are target fisheries in India (Cailliet et al., 2009).

Clark et al. (2006a) estimated that 500,000 to 750,000 fins of shortfin mako are traded annually in the world. According to Clarke (2004), shark fins are obtained worldwide through market channels concentrated in a small number of Asian trading centres.

6.3 Parts and derivatives in trade

Fins: Dent and Clarke (2015) provided estimates of the average declared value of total global imports of shark fins. They were ~ USD 22.5/kg from 2000 to 2011, reaching USD 25.6/kg in 2011. The shortfin mako is the fourth (in 1999-2000) or fifth (in 2014-2015) most abundant species observed in the shark fin trade through Hong Kong's main trading centre (Clarke et al*.,* 2006a, Fields et al*.,* 2017).

Using commercial data on weights and sizes of fins marketed and the trade name of mako sharks, along with statistical DNA and Bayesian analyses to obtain the missing records, Clarke et al. (2006a) estimated that mako fins represented at least 2.7% of the global trade in fins between 1999 and 2001 and perhaps more given their presence in other commercial categories, reaching up to 1 million individuals of mako sharks (*Isurus* spp. = 40,000 t of both species combined) captured annually (Clark et al*.,* 2006b). Fifteen years later (2014-2015), shortfin mako was only recorded in 0.2-1.2% of the samples derived from the genetic analysis of fins processed and imported for the Hong Kong market (Fields et al*.,* 2017). The overall volume of trade of shark fins reported in Hong Kong has proven to be resilient; by 2012 it had decreased by 22% compared to the average recorded between 2008-2010, but the average total volume still amounts to at least 6,000 metric tonnes between 2012-2015 (Eriksson and Clarke, 2015).

Meat: The shortfin mako reaches the highest wholesale price for shark meat in Namibian exports, that is, USD 2-3/kg (Clarke et al*.,* 2013b). Dent and Clarke (2015) have found mako meat and fins in the Singapore market, probably imported. There are reports of Japanese companies producing 240 tonnes/year of frozen mako fillets for export to Italy and Spain for consumption (Dent and Clarke, 2015).

Other products: Shortfin mako oil is extracted to obtain vitamins; the skin is processed as leather and the jaws and teeth are used as ornaments (Compagno, 2001) and sold to tourists in countries such as Sudan (Dent and Clarke, 2015). Most of these by-products are of low value, traded in small quantities and not recorded in trade statistics (Clarke, 2004). Demand seems to fluctuate with changes in fashion, medical knowledge and the availability of substitutes (Rose, 1996).

6.4 Illegal trade

In a study conducted by TRAFFIC, it was reported that the shortfin mako is one of the species that are subject to illegal, unreported and unregulated trade in the Mediterranean (Lack and Sant, 2008). In Mexico there are not enough data to indicate that this species is illegally traded (Working Group, 2018). In Canada, given the management measures implemented to regulate shortfin mako fisheries, there is no concern about illegal trade (see **Annex IV**).

6.5 Actual or potential trade impacts

The international demand for meat and fins is the main cause of the exploitation of the shortfin mako (see **Section 6**). It is expected that the decline of top predator populations will have a negative impact on the dynamics of the marine ecosystem (Vaudo et al*.,* 2016, Adams et al*.,* 2016, Kitchell et al*.,* 2002; Rogers et al*.,* 2012), including alterations of the food chain and habitat degradation (Stevens et al*.,* 2000; Heithaus et al*.,* 2010). However, the consequences of the overexploitation of the shortfin mako and other shark species remain unknown (Queiroz et al*.,* 2016).

7. Legal instruments

7.1 National

Range States of the shortfin mako have adopted a variety of national instruments, some applied through laws and regulations on fisheries and trade, and others through wildlife legislation or other environmental legislation. For example, Canada attempts to keep landings below 100 t/ year as a precautionary approach (FOC, 2018) and in Gibraltar (United Kingdom of Great Britain), the species is listed in Schedule 1 of the Nature Protection Act of 1991, so there is no trade in the species. Mexico has the General Act on Sustainable Fisheries and Aquaculture (LGPSAS, DOF 2007) and its

Regulation. In addition, the Mexican National Fisheries Charter establishes the status of populations and the fishing effort and is also a binding instrument that determines the granting of permits issued by the fisheries management authority (CONAPESCA). According to the Official Mexican Regulation NOM-029-PESC-2006, there are also specific methods or types of gear and measures for the exploitation of sharks in nursery areas as well as temporary closures specified in closure agreements. The rest of the management measures in specific countries can be consulted at http://www.fao.org/ipoa-sharks/database-of-measures/es/ (see details in **Annex IV**).

7.2 International

The shortfin mako is one of the five species of the Lamnidae family; it is listed as a highly migratory species in Annex I of UNCLOS (i.e., adopt measures for the conservation of the species) and in Appendix II of the CMS (i.e., species conserved through agreements). In turn, several RFMOs recommend that their Parties improve data collection, ban shark finning and conduct population and risk assessments (see **annexes V and VI**).

The shortfin mako is included in Annex 3 of the Bern Convention on the conservation of European wildlife and natural habitats (i.e., species that need protection but can be exploited in exceptional cases) and is one of the 20 sharks and rays listed in Annex II of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (under the Barcelona Convention). The General Fisheries Commission for the Mediterranean (GFCM) adopted the list in Recommendation GFCM/36/2012/3 and requested Contracting Parties and Cooperating non-contracting Parties (CPCs) to protect these species from fishing activities and release them alive. They cannot be retained on board, transshipped, landed, stored, displayed or sold. ICCAT Recommendation 17/08 requires (with some exceptions and conditions) that vessels promptly release North Atlantic shortfin mako; dead sharks can be retained, and in some cases also live sharks above a minimum size. Records must be kept and sent to ICCAT, and landings must not exceed the fishing vessel's previous average shortfin mako landings. The current measure will be evaluated and expires on 31 December 2019. The scientific advice for this seriously depleted stock is not to exceed annual catches of 500 t in order to stop overfishing and begin to rebuild the stock (ICCAT SCRS, 2017). The measures adopted will probably result in catches above this minimum amount (see Section 4). The recommendation is aimed to conserve the North Atlantic stock of shortfin mako, considering that it is caught in association with ICCAT fisheries and is in a state of overexploitation and overfishing.

Mexico is part of three RFMOs: the Inter-American Tropical Tuna Commission (IATTC), the International Commission for the Conservation of Atlantic Tunas (ICCAT) and the Latin American Organization for Fisheries Development (OLDEPESCA); it also cooperates with the Western and Central Pacific Fisheries Commission (WCPFC); these RFMOS have issued non-binding recommendations for the management of the species (see details in **Annex IV**).

8. Species management

8.1 Management measures and population monitoring

Apart from the management measures established in each country, there are general measures adopted by the RFMOs and other organizations (http://www.fao.org/figis/geoserver/factsheets/rfbs.html); for example, in ICCAT, according to Resolution C-05-03, sharks cannot be retained on board, transshipped, landed, transferred, sold, displayed or offered for sale. Each Party must implement its IPOA-Sharks, submit annual reports of shark catches, use the total catches and must not retain on board fins that total more than 5% of the total weight of sharks. Fisheries not targeting sharks must release live specimens (as long as they are not used for food or subsistence) and undertake research to identify ways to make fishing gears more selective and to identify shark nursery areas (see **Annex V**).

Additionally, in Mexico the records for the control of the exploitation of shark species are reflected in various tools such as fishing logbooks, temporary closures, reports of the On-Board Observer Programme and prior notifications of port entry as management instruments in the current legal framework that regulates management of the species. In Canada there is no targeted fishery of the species, so its management is included in the Fisheries Management Plan for Canadian Atlantic Swordfish and other tunas; as part of its NPOA-Sharks, DFO is conducting a study using satellite tags that is expected to contribute to national and international stock assessments (see **Annex IV**).

8.3 Control measures

8.3.1 International

RFMOs set measures as recommendations or resolutions that Contracting Parties must implement and report on (Tolotti et al., 2015). Most RFMOs have adopted bans on shark finning (i.e., cutting the fins and discarding the body at sea) and members require that their vessels do not have fins on board that total more than 5% of the weight of sharks on board until the first point of landing (Marshall and Barone, 2016).

In addition to the recommendations of RFMOs (see **Annex V**), the shortfin mako is included in several multilateral environmental agreements (MEAs) for coordinated international management such as UNCLOS, CMS (see **Section 7.2**) and CITES. The latter adopted Resolution 12.6 (Rev. CoP17) on *Conservation and management of sharks*, which, among other things, directs the Animals Committee of the Convention to examine new information on shark management and monitoring and make species-specific recommendations if necessary.

On a regional level, the shortfin mako is protected by Annex II (list of endangered or threatened species) of the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and is included in Appendix III (protected fauna species) of the Bern Convention on the conservation of European wildlife and natural habitats in the Mediterranean (Council of Europe, 2002); yet, it is not included in the EU Habitats Directive (Council Directive 92/43 / EEC of 21 May 1992). Its inclusion in the Barcelona Convention means that the shortfin mako cannot be retained on board, transshipped, landed, transferred, stored, sold, displayed or offered for sale and must be released without harm to the extent possible.

In 2008, the CMS proposal to include the species in Appendix II identified a number of national protection measures, including the following: bycatch and recreational bag limits – South Africa; management under a quota management system – New Zealand; gear regulations for artisanal fisheries – Chile; commercial quotas, limited entry, time-area closures, and recreational bag limits – Atlantic United States; closure of the targeted longline fishery, recreational bag limits in California and harvest guidelines for California, Oregon and Washington – Pacific United States; COSEWIC assessment as an "at risk" species, catch and bycatch limits, license limits, gear restrictions, area and seasonal closures, recreational hook and release – Atlantic Canada; limited entry, time-area closures – Pacific Canada (CMS Proposal II / 9). In addition, Camhi et al. (2008a and 2008b) reported that at least 19 countries (including several range States as well as the European Union) had adopted shark finning bans, although they noted that they were unlikely to reduce the mortality of the species due to its high value for its meat and fins (CMS Proposal II / 9). More recently, a review of the implementation of the FAO International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks), which focused on the 26 main shark fishing countries, areas and territories, reported that 88% of the 26 countries had at least a draft National Plan of Action for sharks and 57% had adopted measures concerning shark finning (Fischer et al., 2012). In addition, there are several Regional Plans of Action for the Conservation and Management of Sharks (RPOA-Sharks) (Fischer et al., 2012).

8.3.2 National

See 8.1.

8.4 Captive breeding and artificial propagation

N/A

8.5 Habitat conservation

There are marine protected areas in the high seas adopted by FAO members with restrictions on some types of fishing gear and types of fishery (http://www.fao.org/fishery/topic/16204/en); however, their success in avoiding shortfin mako fisheries has not been evaluated. In Mexico there are 32 fishing refuges for the recovery of species with commercial value and 37 protected coastal and marine areas that cover 22.3% of the marine surface of the country (exceeding CBD Aichi Target 11 to conserve 10% of the marine surface (https://www.gob.mx/conapesca/articulos/refugios-pesqueros-herramienta-de-manejo-para-lograr-la-sustentabilidad-151175?idiom=es).

8.6 Safeguards

N/A

9. Information on similar species

The longfin mako shark, *Isurus paucus,* is very similar in appearance to the shortfin mako, *Isurus oxyrinchus*, although it has longer pectoral fins. Mako sharks are often grouped in catch, landing and trade data reports (Clarke et al., 2011), although Fields et al. differentiated between shark fin pieces of the two species in 2017. The longfish mako is the rarer of the two species; little is known about its habitat and behaviour, but it is thought to have a more tropical distribution in oceanic waters. The longfin mako is less abundant, but according to the study by Clarke (2006a), most traders reported that they classified its fins in the same category as those of the shortfin mako and thresher sharks (*Alopias* spp., also included in CITES Appendix II), due to their similar appearance and market value (Clarke, 2006a).

The dorsal fins of the shortfin mako and the longfin mako are similar; both are dark greyish-brown, have a short free rear tip and are very erect due to the steep upward angle of their leading edge. The second dorsal and anal fins are extremely small. The pectoral fins are shorter than the length of the head, and their ventral surface is uniform white or light in colour with no obvious dark markings. The caudal peduncle also has strong lateral keels. The caudal fin is crescent shaped, with symmetrical upper and lower lobes. Despite the similarity between both species of the genus *Isurus* spp., the fins of the shortfin mako are easy to distinguish visually from those of the longfin mako, whether they are fresh or dry, since there are differences between the dermal denticles of both species (Abercrombie et al., 2013, Clarke et al., 2006a, Abercrombie and Hernandez 2017) (see **Annex VII**).

Additionally, these two species differ in the lower jaw, which has 11-13 rows of teeth in the longfin mako, whereas the upper and lower jaw of the shortfin mako have 13 rows (Castro, 1996).

Nevertheless, considering that both species are traded for the value of their meat (which amounts to over 90% of the total volume of their body), most of the volume traded is difficult to identify.

10. Consultations

On 6 November, at the request of Mexico, the CITES Secretariat published Notification to Parties No. 2018/086, reporting that Mexico requested range States of mako sharks to provide any information on their conservation status, utilization and international trade. Additionally, on 7 November, the CITES Management Authority of Mexico consulted all the range States; by the time this document was submitted, it had received responses from Argentina, Canada, Jamaica, the Turks and Caicos Islands, the United Kingdom of Great Britain and the United States of America. This information can be consulted in **Annex IV** in the original language in which it was received.

12. References

Abascal, F.J., Quintans M., Ramos-Cartelle A. and Mejuto J. 2011. Movements and environmental preferences of the shortfin Mako, *Isurus oxyrinchus*, in the southeastern Pacific Ocean. *Mar Biol* 158:1175–1184. doi: 10.1007/s00227-011-1639-1.

Abercrombie, D.L. and Hernandez, S. 2017. Identifying shark fins: implementing and enforcing CITES. Abercrombie and Fish, Marine Biological Consulting, Suffolk County, NY. 21 pg.

Abercrombie, D.L., Chapman, D.D., Gulak, S.J.B. and Carlson, J.K. 2013. Visual identification of fins from common elasmobranchs in the Northwest Atlantic Ocean. NMFS-SEFSC-643, 51 p.

Adams, G.D., Flores, D., Flores, O. G., Aarestrup, K. and Svendesen, J.C. 2016. Spatial ecology of blue shark and shortfin Mako in southern Peru: local abundance, habitat preferences and implications for conservation. *Endangered Species Research* 31:19-32. Doi: 10.3354/esr00744.

Bernal, D., Dickson, K.D., Shadwick, R.E. and Graham, J.B. 2001. Analysis of the evolutionary convergence for high performance swimming in lamnid sharks and tunas. *Comparative Biochemical Physiology* 129: 695-726.

Bishop, S.D.H., Francis, M.P., Duffy, C. and Montgomery, J.C. 2006. Age, growth, maturity, longevity and natural mortality of the shortfin Mako shark (*Isurus oxyrinchus*) in New Zealand waters. *Marine and Freshwater Research* 57: 143-154.

Block, B.A., Johnsen, I.D., Jorgensen, S.J., Winship, A.J., Shaffer, S.A., Bogard, S. J., Hazen, E. L., Foley, D. G., Breed, G.A., Harrison, A. L., Ganong, J. E., Swithenbank, A., Castleton, M., Dewar, H., Mate, B.R., Shilinger, G.L., Schaefer, K.M., Benson, S. R., Weise, M.J., Henry R.W. and Costa, D. P. 2011. Tracking apex marine predator movements in a dynamic ocean. *Nature* 475: 86–90.

Brunel, T., Coelho, R., Merino, G., Ortiz de Urbina, J. Rosa, D., Santos, C, Murua, H., Bach, P., Saber, S., and Macias, D. 2018. A preliminary stock assessment for the shortfin Mako shark in the indian ocean using data-limited approaches. IOTC-WPEB14-2018-07. 18 pp.

Bustamante, C. and Bennett, M.B. 2013. Insights into the reproductive biology and fisheries of two commercially exploited species, shortfin Mako (*Isurus oxyrinchus*) and blue shark (*Prionace glauca*), in the south-east Pacific Ocean. Fisheries Research, 143: 174–183.

Byrne, M. E., Cortes, E., Vaudo, J. J., Harvey G. C., Sampson, M., Wetherbee, B.M. and Shivji, M. 2017. Satellite telemetry reveals higher fishing mortality rates than previously estimated, suggesting overfishing of an apex marine predator. *Proc. R. Soc. B* 284 (1860).http://dx.doi.org/10.1098/rspb.2017.0658

Castro J. I., 1996. The sharks of north american waters. Texas A &M University Press. Second edition. United States. 180 P.

Cailliet, G.M. and Bedford, D., 1983. The biology of three pelagic sharks from california waters, and their emerging fisheries: a review. CalCOFI 24:57-69

Cailliet, G.M., Cavanagh, R.D., Kulka, D.W., Stevens, J.D., Soldo, A., Clo, S., Macias, D., Baum, J., Kohin, S., Duarte, A., Holtzhausen, J.A., Acuña, E., Amorim, A. and Domingo, A. 2009. *Isurus oxyrinchus*. The IUCN Red List of Threatened Species 2009: e.T39341A10207466. http://dx.doi.org/10.2305/IUCN.UK.2009-2.RLTS.T39341A10207466.en. Downloaded on 18 May 2018.

Camhi M, Pikitch E.K. and Babcock E.A. 2008a. Sharks of the Open Ocean: Biology, Fisheries and Conservation. Blackwell Publishing: Oxford.

Camhi, M.D., Fordham, S. V. and Fowler, S.L. 2008b. Domestic and international management for Pelagic Sharks. In: Camhi, M.D., Pikitch, Ellen, K. and Babcock, E.A. (Eds.). *Sharks of the Open Ocean: Biology, Fisheries and Conservation*. Blackwell Publishing, Oxford, UK. 418–444.

Camhi, M.D., Valenti, S.V., Fordham, S.V., Fowler, S.L. and Gibson, C. 2007. The Conservation Status of Pelagic Sharks and Rays: Report of the IUCN Shark Specialist Group Pelagic Shark Red List Workshop. IUCN Species Survival Commission Shark Specialist Group. Newbury, UK. 78pp.

Campana, S.E. 2016. Transboundary movements, unmonitored fishing mortality, and ineffective international fisheries management pose risks for pelagic sharks in the Northwest Atlantic. Canadian Journal of Fisheries and Aquatic Sciences, 73: 1599–1607.

Campana, S.E., Joyce, W., Fowler, M. and Showell, M. 2016. Discards, hooking, and post-release mortality of porbeagle (*Lamna nasus*), shortfin Mako (Isurus oxyrinchus), and blue shark (*Prionace glauca*) in the Canadian pelagic longline fishery. ICES Journal of Marine Science, 73(2): 520–528.

Campana, S.E., Marks, L. and Joyce, W. 2005. The biology and fishery of shortfin Mako sharks (Isurus oxyrinchus) in Atlantic Canadian waters. Fisheries Research, 73: 341–352.

Carey, F.G., Teal, J.M. and Kanwisher, J.W. 1981. The visceral temperature of mackerel sharks (Lamnidae). *Physiological Zoology* 54: 334-344.

Cartamil, D., O. Santana-Morales, M. A. Escobedo-Olvera, O. Sosa-Nishizaki, J. Gram., and J. L. Castillo-Géniz. 2008. Caracterización de la pesca artesanal de elasmobranquios desarrollada en la costa Oeste de Baja California, México.

Casey, J.G. and Kohler, N.E. 1992. Tagging studies on the shortfin Mako shark (Isurus oxyrinchus) in the western North Atlantic. Australian Journal of Marine and Freshwater Research 43: 45-60. DOI: 10.1071/MF9920045.

Castillo-Geniz, J. L., Godinez-Padilla, C. J., Ajás-Terriquez, H.A., González-Ania, L.V. 2014. Catch data for shortfin Mako shark reported by fishery observers from Mexican shark longline and driftnet fisheries in the North Pacific in 2006-2014. ISC/14/SHARKWG-3/02

Cerna, F. and Licandeo, R., 2009. Age and growth of the shortfin Mako (*Isurus oxyrinchus*) in the south-eastern Pacific off Chile. Marine and Freshwater Research 60, 394–403.

Chang, J. and Liu, K. 2009. Stock assessment of the shortfin Mako shark (*Isurus oxyrinchus)* in the Northwest Pacific Ocean using per recruit and virtual population analyses. *Fisheries Research* 98: 92-101.

CIESM. 2018. The Mediterránean Science Comission. Historic Records of Marine Fauna. [http://www.ciesm.org/online/archives/medfauna/index.htm].

Clarke S., 2004. Understanding pressures on fishery resources through trade statistics: a pilot study of four products in the Chinese dried seafood market. Fish and Fisheries 5 (1): 53-74.

Clarke, S., Harley, S., Hoyle, S. and Rice, J. 2011. An Indicator-based Analysis of Key Shark Species based on Data Held by SPC-OFP. Western and Central Pacific Fisheries Commission. WCPFC-SC7-2011/EB-WP-01

Clarke, S.C., Francis, M.P. and Griggs, L.H. 2013b. Review of shark meat markets, discard mortality and pelagic shark data availability, and a proposal for a shark indicator analysis. New Zealand Fisheries Assessment Report 2013/65.

Clarke, S.C., Harley, S.J., Hoyle, S.D. and Rice, J.S. 2013a. Population Trends in Pacific Oceanic Sharks and the Utility of Regulations on Shark Finning. *Conservation Biology*,27(1), 197–209.

Clarke, S.C., J.E. Magnussen, D.L. Abercrombie, M.K. McAllister and M.S. Shivji. 2006a. Identification of shark species composition and proportion in the Hong Kong shark fin market based on molecular genetics and trade records. *Conservation Biology* 20(1): 201-211. DOI: 10.1111/j.1523-1739.2006.00247.x

Clarke, S.C., M.K. McAllister, E.J. Milner-Gulland, G.P. Kirkwood, C.G.J. Michielsens, D.J. Agnew, E.K. Pikitch, H. Nakano and M.S. Shivji. 2006b. Global estimates of shark catches using trade records from commercial markets. *Ecology Letters* 9: 1115-1126. doi: 10.1111/j.1461-0248.2006.00968.

Coelho, R., Fernandez-Carvalho, J., Lino, P. G. and Santos, M.N. 2012. An overview of the hooking mortality of elasmobranchs caught in a swordfish pelagic longline fishery in the Atlantic Ocean. *Aquat. Living Resour*. 25, 311–319.

Compagno, L.J.V. 2001. *Sharks of the world*. An annotated and illustrated catalogue of shark species known to date. Vol. 2. Bullhead, mackerel, and carpet sharks (Heterodontiformes, Lamniformes, and Orectolobiformes). *FAO Species Catalogue for Fishery Purposes*. No. 1, vol.2. Rome, FAO: 269 p.

Cliff, G., Dudley, S.F.J., Davis, B., 1990. Sharks caught in the protective gill nets off Natal, South Africa. 3. The shortfin mako shark Isurus oxyrinchus (Rafinesque). South African Journal of Marine Science 9, 115–126. https://doi.org/10.2989/025776190784378808

CMS. 2008. Convention of Migratory Species. Propuesta para la inclusión de especies en los Apéndices de la convención sobre la Conservación de las Especies Migratorias de animales silvestres. Propuesta II/ [https://www.cms.int/sites/default/files/document/cms_cop9_app_II-09_Isurus_Mako_sharks_HRV_orig-e_s.pdf]

Cortes, E., Arocha, F., Beerkircher, L., Carvalho, F., Domingo, A., Heupel, M., Holtzhausen, H., Santos., M. N., Ribera, M. and Simpfendorfer, C. 2010. Ecological risk assessment of pelagic sharks caught in Atlantic pelagic longline fisheries. *Aquat. Living Resour*. 23: 25-34. DOI: 10.1051/alr/2009044

Cortes, E., Domingo, A., Miller, P., Forselledo, R., Mas, F., Arocha, F., Campana, S., Coelho, R., Da Silva, C., Hazin, F.H.V., Holtzhausen, H., Keene, K., Lucena, F., Ramirez, K., Santos, M.N., Semba-Murakami, Y. and Yokawa, K. 2015. Expanding ecological risk assessment of pelagic sharks caught in Atlantic Pelagic longline fisheries. Collect. Vol. Sci. Pap. ICCAT 71 (6): 2637-2688.

Cortés, E., 2017. Estimates of maximum population growth rate and steepness for shortfin makos in the North and South Atlantic Ocean. Collect. Vol. Sci. Pap. ICCAT, 74(4): 1822-1829

Dent, F. and Clarke, S. 2015. State of the global market for shark products. FAO Fisheries and Aquaculture Technical Paper No. 590. Rome, FAO. 187 pp.

DOF, Diario Oficial de la Federación. 2007. Norma Oficial Mexicana NO-029-PESC-2006, Pesca Responsable de tiburones y rayas. Especificaciones para su aprovechamiento. Secretaria de Agricultura, Ganaderia, Desarrollo Rural, Pesca y Alimentación (SAGARPA), Mexico.

Diario Oficial de la Federación (DOF), 2010. Ley General de Vida Silvestre.

Dudley, S.F.J. and Cliff, G. 2010. Influence of the annual sardine run on catches of large sharks in the protective gillnets off KwaZulu-Natal, South Africa, and the occurrence of sardine in shark diet. African Journal of Marine Science, 32(2): 383–397.

Dulvy, N. K., Baum, J. K., Clarke, S., Compagno, L. J. V., Cortes, E., Domingo, A., Fordham, S., Fowler, S., Francis. M. P., Gibson C., Martínez J., Musick J.A., Soldo A., Stevens J.D. and Valenti S. 2008.You can swim but you can't hide: the global status and conservation of oceanic pelagic sharks and rays. Aquatic Conservation: Mar. Freshw. Ecosyst. (2008).DOI:10.1002/aqc.975.

Ebert D.A., S. Fowler and L. Compagno. 2013. Illustrated by M Dando. *Sharks of The World: A Fully Illustrated Guide.* Wild Nature Press, UK. 528 pp.

Ecolors. 2018. Tour científico de buceo con el tiburón Mako. [https://www.ecotravelmexico.com/es/tour-cientifico-de-buceo-con-el-tiburon-Mako.php]. Consulted on 29 October 2018.

Eriksoon, H and Clarke, S. 2015. Chinese market responses to overexplotation of sharks and sea cucumbers. Elsevier. Biological Conservation 184:163-173.

FAO. 2018. Fishery and Aquaculture Statistics. Global capture production 1950-2016 (FishstatJ). En: FAO Fisheries and Aquaculture Department [online]. Roma. Actualizado 2018. www.fao.org/fishery/statistics/software/fishstatj/enFerretti, F., Myers, R. A., Serena, F. and Lotze, H. K. 2008. Loss of Large Predatory Sharks from the Mediterranean Sea. Conservation Biology 22: 952–964. doi: 10.1111/j.1523-1739.2008.00938.

FAO-WECAFC, 2018. Report of the First meeting of the WECAFC/OSPESCA/CRFM/CITES/CFMC working group on shark conservation and management (No. 1192), FAO Fisheries and Aquaculture Report. Bridgetown, Barbados.

Ferretti, F., Myers, R. A., Serena, F. and Lotze, H. K. 2008. Loss of Large Predatory Sharks from the Mediterranean Sea. Conservation Biology 22: 952–964. DOI: 10.1111/j.1523-1739.2008.00938.x

Fields, A. T., Fischer, G. A., Shea, S. K. H., Zhang, H., Abercrombie, D. L., Feldheim, K. A., Babcock, E.A. and Chapman, D. D. 2017. Species composition of the international shark fin trade assessed through a retail-market survey in Hong Kong. *Conservation Biology*. DOI: 10.1111/cobi.13043

Fischer J., Erikstein K., D´Offay B., Barone M. and S. Guggisberg. 2012 : Review of the implementation of the International Plan of Action for the conservation and management of sharks. Rep. No. C1076. FAO.2012; 125.

FOC. 2018. Fisheries and Oceans Canada. http://www.dfo-mpo.gc.ca/species-especes/sharks/info/fisheries-eng.html. Consulted on 31 October 2018.

Francis, M.P. and Duffy, C. 2005. Length at maturity in three pelagic sharks (*Lamna nasus, Isurus oxyrinchus,* and *Prionace glauca*) from New Zealand. Fishery Bulletin 103, 489e00.

Francis, M.P., Griggs, L.H. and Baird, S.J. 2001. Pelagic shark bycatch in the New Zealand tuna longline fishery. Marine and Freshwater Research, 52(2): 165–178.Francis, M. P. & Duffy, C. 2005. Length at maturity in three pelagic sharks (*Lamna nasus, Isurus oxyrinchus,* and *Prionace glauca*) from New Zealand. Fishery Bulletin 103: 489–500.

Francis, M., New Zealand, Ministry for Primary Industries, 2016. Size, maturity and age composition of mako sharks observed in New Zealand tuna longline fisheries.

French, R. P., Lyle, J., Tracey, S., Currie, S. and Semmens, J. M. 2015. High survivorship after catch-and-release fishing suggests physiological resilience in the endothermic shortfin Mako shark (*Isurus oxyrinchus*). Conservation Physiology 3: 1-15 10.1093/conphys/cov044.

Gallagher, A.J., Orbesen, E.S., Hammerschlag, N. and Serafy, J.E. 2014. Vulnerability of oceanic sharks as pelagic longline bycatch. *Global Ecology and Conservation* 1: 50-59. http://dx.doi.org/10.1016/j.gecco.2014.06.003.

GFCM. 2012. Recommendation GFCM/36/2012/3 on fisheries management measures for conservation of sharks and rays in the GFCM area. General Fisheries Commission for the Mediterranean.

Groeneveld, J.C., Cliff, G., Dudley, S.F.J., Foulis, A.J., Santos, J. and Wintner, S.P. 2014. Population structure and biology of shortfin Mako, *Isurus oxyrinchus*, in the south-west Indian Ocean. *Marine and Freshwater Research*. http://dx.doi.org/10.1071/MF13341.

Grupo de Trabajo. 2018. Taller de expertos: Fortalecimiento de la propuesta de enmienda para Tiburón Mako. SEMARNAT-Mexico City (19 October 2018). CONABIO

Hanan, D.A., Holts, D.B. and Coan, A.L., 1993. The California drift gill net fishery for sharks and swordfish, 1981-82 through 1990-91. State of California, Resources Agency, Department of Fish and Game.

Hazen, E.L., Jorgensen S., Rykaczewski R.R., Bograd S.J., Foley, D.G., Jonsen, I.D., Shaffer, S.A., Dunne, J.P., Crowder, L.B. and Block, B.A. 2013. Predicted habitat shifts of Pacific top predators in a changing climate. *Nat Clim Change* 3: 234-238.

Heist, E.J., Musick, J.A. and Graves, J.E. 1996. Genetic population structure of the shortfin Mako (*Isurus oxyrinchus*) inferred from restriction fragment length polymorphism analysis of mitochondrial DNA. *Canadian Journal of Fisheries and Aquatic Science* 53: 583-588.

Heithaus M.R., Frid A., Vaudo J.J., Worm B. and Wirsing A.J. 2010. Unravelling the ecological importance of elasmobranchs. In: Carrier JC, Musick JA, Heithaus MR (eds) *Sharks and their relatives II: biodiversity, adaptive physiology, and conservation*. CRC Press, Boca Raton, FL, p 611−637.

Holts, D.B. and Kohin, S. 2003. Pop-up archival tagging of shortfin Mako sharks, *Isurus oxyrinchus*, in the Southern California Bight. Abstract. American Fisheries Society, Western Division meetings. American Fisheries Society, San Diego, California.

ICCAT 2017, Recommendation 17.08 BYC by ICCAT on the conservation of North Atlantic stock of shortfin Mako caught in association with ICCAT fisheries. International Commission for the Conservation of Atlantic Tunas.

ICCAT SCRS. 2012. Shorfin mako Stock assessment and ecological risk assessment meeting. Portugal 11-18 june 2012. International Commission for the Conservation of Atlantic Tunas. https://www.iccat.int/Documents/Meetings/Docs/2012_SHK_ASS_ENG.pdf

ICCAT SCRS. 2017. Report of the 2017 Shortfin Mako Assessment Meeting. Madrid, Spain, 12-16 June 2017. International Commission for the Conservation of Atlantic Tunas. https://www.iccat.int/Documents/Meetings/Docs/2017_SMA_ASS_REP_ENG.pdf

ICES. 2017. Report of the International Council for the Exploration of the Sea's Working Group on Elasmobranch Fishes, 31 May-7 June 2017, Lisbon, Portugal. ICES CM 2017/ACOM:16. 1018pp.

IOTC 2017. *Report of the 20th Session of the IOTC Scientific Committee. Seychelles, 30 November – 4 December 2017*. 232 pp. Available at: http://www.iotc.org/meetings/search?s=&field_meeting_tid_i18n=68&field_meeting_year_tid=All.

ISC-SWG. 2015. Indicator-based analysis of the status of shortfin Mako shark in the North Pacific Ocean:

Report of the Shark Working Group. 15-20 July 2015, Kona, Hawaii, U.S.A.. International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean.

ISC-SWG. 2018. Stock assessment of shortfin Mako shark in the North Pacific Ocean through 2016. ISC/18Annex/15.120 pp.

Jabado, R.W., Kyne, P. M., Pollom, R. A., Ebert, D. A., Simpfendorfer, C. A., Ralph, G.M. and Dulvy, N.K. (eds.) 2017. The Conservation Status of Sharks, Rays, and Chimaeras in the Arabian Sea and Adjacent Waters. Environment Agency – Abu Dhabi, UAE and IUCN Species Survival Commission Shark Specialist Group, Vancouver, Canada 236 pp.

James, K.C., Lewison, R.L., Dillingham, P.W., Curtis, K.A. and Moore, J.E. 2016. Drivers of retention and discards of Elasmobranch non-target catch. *Environmental Conservation*, 43(1): 3–12.

Jawad, L. 2013. *Dangerous Fishes of the Eastern and Southern Arabian Peninsula.* Auckland: Springer International Publishing.

Joung, S. and Hsu, H. 2005. Reproduction and Embryonic Development of the Shortfin Mako, *Isurus oxyrinchus* Rafinesque, 1810, in the Northwestern Pacific. *Zoological Studies* 44(4): 487-496.

Kai, M. Thorson, J. T., Piner, K. R., and Maunder, M. N. 2017. Spatiotemporal variation in size-structured populations using fishery data: an application to shortfin Mako (*Isurus oxyrinchus*) in the Pacific Ocean. Canadian J. of Fisheries and Aquatic Science, 74: 1765-1780.

Kitchell, J.F., Essington, T.E., Boggs, C.H., Schindler, D.E., Walters, C.J., 2002. The role of sharks and longline fisheries in a pelagic ecosystem of the central Pacific. Ecosystems 5, 202–216.

Lack, M. and Sant, G. 2008.Illegal, unreported and unregulated shark catch: A review of current knowledge and action. Department of the Environment, Water, Heritage and the Arts and TRAFFIC, Canberra.

Loefer, J. K., Sedberry, G. R. and McGovern, J. C. 2005. Vertical movements of a shortfin Mako in the western North Atlantic as determined by pop-up satellite tagging. *South-eastern Naturalist* (Steuben, ME) 4, 237–246. doi:10.1656/1528-7092(2005)004[0237: VMOASM]2.0.CO;2

Marshall, L.J. and Barone, M. 2016. *SharkFin Guide: identifying sharks from their fins*. FAO, Rome, Italy. 144 pp.

Mollet, H. Cliff, G., Pratt, H. and Stevens, J.D. 2000. Reproductive biology of the female shortfin Mako, *Isurus oxyrinchus* Rafinesque, 1810, with comments on the embryonic development of lamnoids. *Fishery Bulletin* 98:299–318.

Mollet, H.F. and Cailliet, G.M. 2002. Comparative population demography of elasmobranchs using life history tables, Leslie matrices and stage-based matrix models. Marine and Freshwater Research 53(8): 503-516

Mucientes, G.R., Queiroz, N., Sousa, L.L., Tarroso, P., Sims, D.W., 2009. Sexual segregation of pelagic sharks and the potential threat from fisheries. Biology Letters rsbl.2008.0761. https://doi.org/10.1098/rsbl.2008.0761

Musyl, M.K., Brill, R.W., Curran, D.S., Fragoso, N.M., McNaughton, L.M., Nielsen A., Kikkawa, B.S. and Moyes, C.D. 2011. Postrelease survival, vertical and horizontal movements, and thermal habitats of five species of pelagic sharks in the central Pacific Ocean. *Fishery Bulletin* 109(4): 341-368.

Natanson, L.J., Kohler, N.E., Ardizzone, D., Cailliet, G.M., Wintner, S.P. and Mollet, H.F. 2006. Validated age and growth estimates for the shortfin Mako, *Isurus oxyrinchus*, in the North Atlantic Ocean. *Environmental Biology of Fishes* 77: 367-383.

Petersen, S.L., Honig, M.B., Ryan, P.G., Underhill, L.G. and Compagno, L.J. V. 2009. Pelagic shark bycatch in the tuna- and swordfish-directed longline fishery off southern Africa. *African Journal of Marine Science*, 31(2): 215–225.

PelagicSafari, 2018. Cabo shark diving. [http://pelagicsafari.com/destination-cabo-shark-diving/]. Consulted on 29 October 2018.

Pratt, H.L., Jr. and J.G. Casey. 1983. Age and growth of the shortfin Mako, Isurus oxyrinchus using four methods. Canadian J. Fish. Aquat. Sci., 40(11): 1944-1957

Rogers, P., Queiroz, N., Humphries, N.E., Mucientes, G., Hammerschlag, N., Lima, F.P., Scales, K.L., Miller, P.I., Sousa, L.L., Seabra, R.I. and Sims, D.W. 2016. Ocean-wide tracking of pelagic sharks reveals extent of overlap with longline fishing hotspots. *PNAS* 113 (6): 1582-1587. www.pnas.org/doi/10.1073/pnas.1510090113.

Ramírez-Amaro, S.R., Cartamil, D., Galván-Magaña, F., González-Barba, G., Graham, J.B., Carrera-Fernández, M., Escobar-Sánchez, O., Sosa-Nishizaki, O., Rochin-Alamillo, A. 2013. The artisanal elasmobranch fishery of the Pacific coast of Baja California Sur, Mexico, management implications. *Sci.* Mar 77(3):473-487.

Ribot-Carballal, M.C., Galván-Magaña, C., and Quiñónez-Velázquez, C. 2005. Age and growth of the shortfin mako shark, Isurus oxyrinchus, from the western coast of Baja California Sur, Mexico. Fisheries Research 76, 14-21.doi:10.1016/J.FISHRES.2005.05.004.

Rice, J., Tremblay-Boyer, L., Scott, R., Hare, S. and Tidd, A. 2015. Analysis of stock status and related indicators for key shark species of the Western Central Pacific Fisheries Commission. Western and Central Pacific Fisheries Commission. WCPFC-SC11-2015/EB-WP-04-Rev 1

Huveneers, C., Page, B., Goldsworthy, S., Coyne, M., Lowther, A., Mitchell, J. and Seuront, L. 2015. Living on the continental shelf edge: Habitat use of juvenile shortfin Makos *Isurus oxyrinchus* in the Great Australian Bight, southern Australia. *Fisheries Oceanography* 24 (3): 205-18.

Rogers, P.J., Huveneers, C., Page, B., Hamer, D.J., Goldsworthy, S.D., Mitchell, J.G., Seuront, L., 2012. A quantitative comparison of the diets of sympatric pelagic sharks in gulf and shelf ecosystems off southern Australia. ICES Journal of Marine Science 69, 1382–1393.

Romanov, E., Bach, P. and Romanova, N. 2008 Preliminary estimates of bycatches in the western equatorial Indian Ocean in the traditional multifilament longline gears (1961-1989). IOTC Working Party on Ecosystems and Bycatch (WPEB) Bangkok, Thailand. 20-22 October 2008. IOTC-2008-WPEB-10.

Rose, D.A. 1996. An overview of world trade in sharks and other cartilaginous fishes. TRAFFIC International Cambridge, UK, 106 pp. (ISBN 1-85850-114-8).

Santana-Morales, O. 2008. Composición específica de elasmobranquios capturados por la pesca artesanal en bahía Vizcaíno, B. C., México: Análisis de un registro histórico. Tesis para obtener el grado de Maestro en Ciencias. Centro de Investigación Científica y de Educación Superior de Ensenada. Programa de Posgrado en Ciencias en Ecología Marina. Ensenada, Baja California, Mexico. 91 p.

Schrey, A. and Heist, E. 2003. Microsatellite analysis of population structure in the shortfin Mako (*Isurus oxyrinchus*). *Canadian Journal of Fisheries and Aquatic Science* 60: 670-675.

Semba, Y., Nakano, H., Aoki, I., 2009. Age and growth analysis of the shortfin Mako, Isurus oxyrinchus, in the western and central North Pacific Ocean. Environmental Biology of Fishes 84, 377–391.

Semba, Y., Aoki, I., Yokawa, K., 2011. Size at maturity and reproductive traits of shortfin mako, Isurus oxyrinchus, in the western and central North Pacific. Marine and Freshwater Research 62, 20–29.

Sepulveda, C.A., Kohin, S., Chan, C., Vetter, R. and Graham, J.B. 2004. Movement patterns, depth preferences, and stomach temperatures of free-swimming juvenile Mako sharks, *Isurus oxyrinchus*, in the Southern California Bight. *Marine Biology* 145(1): 191-199.

SSG ICCAT. 2016. Report of the 2016 intersessional meeting of the shark species group. ICCAT. 27p.

Shark Trust. 2018. Shortfin Mako fisheries advisory. https://www.sharktrust.org/shared/downloads/fisheries_advisories/shortfin_Mako_fisheries_advisory_2018.pdf

Sims, D. 2015. Mako: Atlantic hotspot. Save our Seas Foundation Project news. https://saveourseas.com/update/Mako-atlantic-hotspot/

Sims, D.W., Mucientes, G. and Queiroz, N. 2018. Shortfin Mako sharks threatened by inaction. *Science*, 359(6382): 1342. http://science.sciencemag.org/content/359/6382/1342.1

Sosa- Nishizaki, O. L.E. Saldaña-Ruíz, D. Corro- Espinosa, J. Tovar-ávila, J.L., Castillo-Géniz, H. Santana-Hernández, J.F. Marquéz-Farías. 2017. Estimations of Shortfin Mako Shark (*Isurus oxyrinchus*) catches by Mexican Pacífic fisheries, an update (1976-2016). ISC/2017/SHARKWG-3/19/5P.

Stevens, J.D., Bonfil, R., Dulvy, N.K. and Walker, P.A. 2000. The effects of fishing on sharks, rays, and chimaeras (chondrichthyans), and the implications for marine ecosystems. *ICES J. Mar. Sci.* 57 (3): 476-494.

Stevens, J.D., Bradford, R.W. and West, G.J. 2010. Satellite tagging of blue sharks (*Prionace glauca*) and other pelagic sharks off eastern Australia: depth behavior, temperature experience and movements. *Mar. Biol*. 157 (3): 575–591.

Taguchi, M., Ohshimo, S., Yokawa, K. 2015. Genetic stock structure of shortfin Mako (*Isurus oxyrinchus*) in the Pacific Ocean. ISC/15/SHARKWG-1/05.

Taylor, V.B. and Holts, D.B. 2001. Shortfin Mako Shark. In: Leet, W.S, Dewees, C.M., Klingbeil, R., & Larson, E.J. (eds), *California's Living Marine Resources: A Status Report*, pp. 336-337. The Resources Agency, California Department of Fish and Game.

Tolotti M. T., Filmalter J.D., Bach P., Travassos P., Seret B. and Dagorn L. 2015. Banning is not enough: The complexities of oceanic shark management by tuna regional fisheries management organizations. Glob Ecol Conserv.2015; 4:1-7.doi:10.1016/j.gecco.2015.05.003.

Tsai, W. P., Sun, C. L., Wang, S. P., and Liu, K. M. 2011. Evaluating the impacts of uncertainty on the estimation of biological reference points for the shortfin Mako shark, *Isurus oxyrinchus* in the Northwest Pacific Ocean. Marine and Freshwater Research, 62: 1383 – 1394.

Tsai, W. P., Sun, C. L., Punt, A. E., and Liu, K. M. 2014. Demographic analysis of the shortfin Mako shark, *Isurus oxyrinchus*, in the Northwest Pacific using a two-sex stage-based matrix model. ICES J. Marine Science, 71: 1604-1618.

Vaudo, J.J., Wetherbee, B.M., Wood, A.D., Weng, K., Howey-Jordan, L.A., Harvey, G.M. and Shivji, M.S. 2016. Vertical movements of shortfin Mako sharks *Isurus oxyrinchus* in the western North Atlantic Ocean are strongly influenced by temperature. *Marine Ecology Progress Series* 547:163-175. doi: 10.3354/meps11646.

Vetter, R., Kohin, S., Preti, A., Mcclatchie, S. and Dewar, H. 2008. Predatory interactions and niche overlap between Mako Shark, *Isurus oxyrinchus*, and jumbo squid, *Dosidicus gigas*, in the California current. *CalCOFI Rep*. 49: 142-156.

Walls, R., Soldo, A., Cailliet, G.M., Cavanagh, R.D., Kulka, D.W., Stevens, J.D., Clò, S., Macias, D., Baum, J.K., Kohin, S., Duarte, A., Holtzhausen, J., Acuna, E., Amorim, A.F. and Domingo, A. 2015. *Isurus* *oxyrinchus*. *The IUCN Red List of Threatened Species* 2015: e.T39341A48934371. Downloaded on 17 October 2018 [https://www.iucnredlist.org/species/39341/48934371].

Walls, R.H.L. and Soldo, A. 2016. *Isurus oxyrinchus*. *The IUCN Red List of Threatened Species* 2016: e.T39341A16527941. Downloaded on 17 October 2018. [https://www.iucnredlist.org/species/39341/16527941#assessment-information]

White, W.T., Fahmi, D., Potter, I.C., 2006. Preliminary investigation of artisanal deep-sea chondrichthyan fisheries in eastern Indonesia, in: Deep Sea 2003: Conference on the Governance and Management of Deep-Sea Fisheries. Part 2: Conference Poster Papers and Workshop Papers. FAO Fisheries Proceedings 3. pp. 381–387.

Worm B., Davis, B., Kettemer, L., Ward-Paige, C.A., Chapman, D., Heithaus, M.R., Kessel, S.T. and Gruber, S. H. 2013. Global catches, exploitation rates, and rebuilding options for sharks. *Mar. Policy* 40: 194–204.

Yeung, W. S., C. C. Lam and P. Y. Zhao. 2000. *The complete book of dried seafood and foodstuffs.* Wan Li Book Company Limited, Hong Kong (in Chinese).

ANEXO I. Figuras

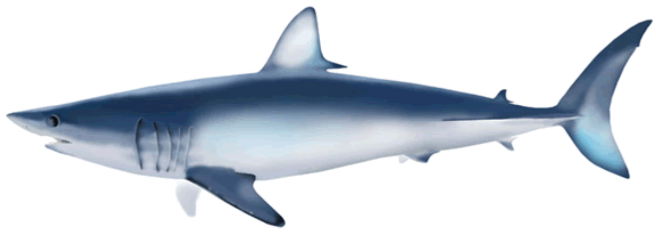

Figura 1. Tiburón Mako de aleta corta (*Isurus oxyrinchus*). Fuente: Comisión Internacional para la Conservación de Atunes del Atlántico por A. López, ('Tokio')

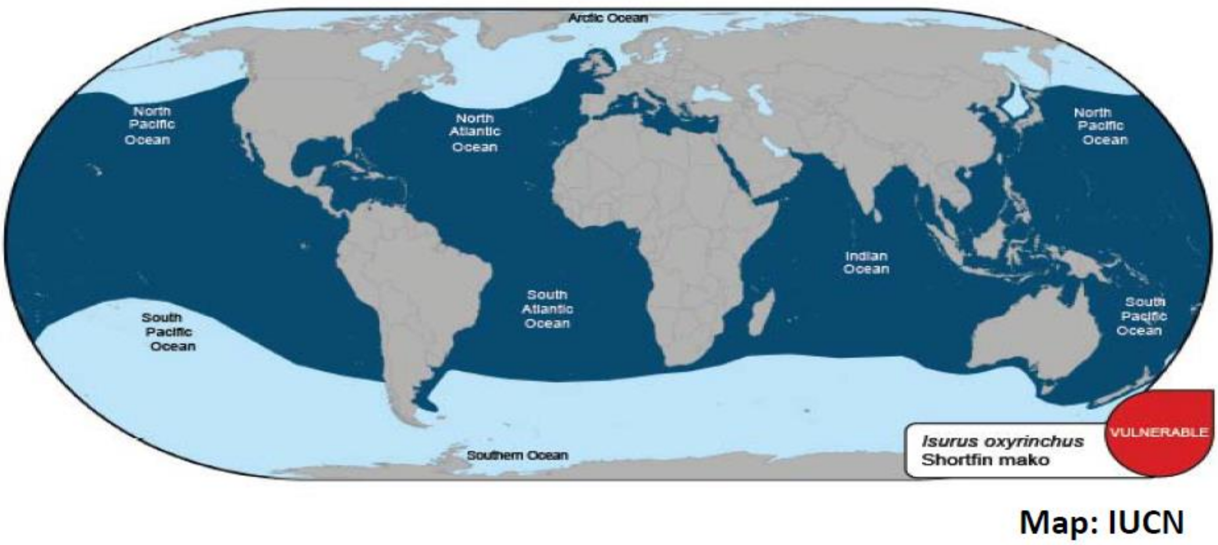

Figura 2: Distribución global del tiburón Mako de aleta corta *Isurus oxyrinchus* (Cailliet *et al.,* 2009)

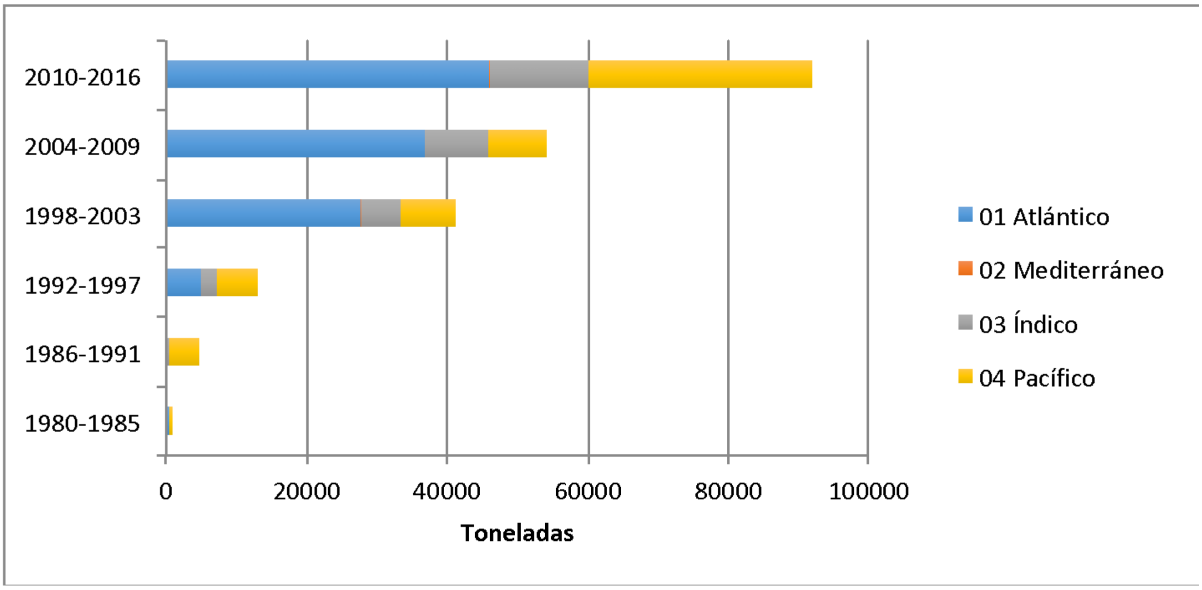

Figura 3. Capturas globales de *Isurus oxyrinchus* 1981-2016 en toneladas. Se grafica el total de capturas de cada periodo por región (FAO, 2018).

Anexo II. Parámetros de historia de vida del tiburón Mako de aleta corta *Isurus oxyrinchus*. AN = Atlántico Norte, AS = Atlántico Sur, I = Océano Indico, PN = Pacífico Norte, PS= Pacífico Sur

	Mortandad		r		K (Von Berlanffy)		Talla media de madurez			Edad máxima (años)			Tiempo generacional		Tamaño de la camada	Gestación	Referencias
Region	**Valor**	**<0.2 (A)**	**Valor**	**<0.14 (A)**	**Valor**	**<0.15 (A)**	**M**	**H**	**>8 (A)**	**M**	**H**	**>25 (A)**		**>10 (A)**			
AN			0.031-0.060	SI													Cortés., 2017
AN					0.2 (M), 0.13 (H)	SI*	3	7	NO	6	19	NO					Barreto *et al*., 2016
AN					0.087 a 0.125	SI	8	18	SI*	21	38	SI*					Natanson *et al*.., 2006
AN										16	19	NO					Cliff *et al*.., 1990;
AN																15-18 meses; cada 3 años	Mollet *et al*,., 2000
AN															min 4, 12, maximo 25		Mollet *et al*,., 2000, 2002
AN					0.266 (M), 0.203 (H)	NO				11.5-17	11.5-17	NO					Pratt y Casey (1983)
AS			0.066-0.123	SI													Cortés 2017
I					0.113	SI	7	15	SI*						9 a 14		Groenvelt *et al*., (2014)
I					0.113	SI	7	15	SI*						9 a 14		Groeneveld

	Mortandad		r		K (Von Berlanffy)		Talla media de madurez			Edad máxima (años)			Tiempo generacional		Tamaño de la camada	Gestación	Referencias
Region	**Valor**	**<0.2 (A)**	**Valor**	**<0.14 (A)**	**Valor**	**<0.15 (A)**	**M**	**H**	**>8 (A)**	**M**	**H**	**>25 (A)**		**>10 (A)**			
																	et al,., 2014
I													25 años	SI			Jabado *et al*,., 2017
PN										180 (cm)							Conde-Moreno y Galván-Magaña 2006
PN										156 (cm)	256 (cm)				8 a 17	9 a 13 meses	Semba, *et al*,., 2011
PN					0.05	SI	242 (cm)	290 (cm)									Ribot-Carballal *et al*.., 2005
PN	0.128	SI			0.128 (H), 0.174 (M)	SI*				31	31	SI				12 meses cada 2 años	ISC -SWG (2018)
PN	0.072	SI			0.215 (M), 0.158 (H)	NO	7 a 8		NO	45	45	SI					Calliet *et al*. (1983)
PN	0.084 (M) a 0.223 (H)	SI*			0.05 (H); 0.056 (M)	SI	12	18	SI								Chang and Liu, 2009
PN					0.09 a 0.16	SI*				240 (cm)	300 (cm)						Semba, *et al*,., 2009
PN							210 (cm)	278 (cm)							11	23-25 meses, cada 3	Joung and Hsu, 2005

	Mortandad		**r**		**K (Von Berlanffy)**		**Talla media de madurez**			**Edad máxima (años)**			**Tiempo generacional**		**Tamaño de la camada**	**Gestación**	**Referencias**
Region	**Valor**	**<0.2 (A)**	**Valor**	**<0.14 (A)**	**Valor**	**<0.15 (A)**	**M**	**H**	**>8 (A)**	**M**	**H**	**>25 (A)**		**>10 (A)**			
																años	
PS					0.09	SI											Bustamante y Bennet (2013); Semba *et al*., (2009)
PS							9 a 10	20 a 21	SI								Francis, 2016
PS					0.076 a 0.087	SI											Cerna y Licandeo (2009)
PS	0.14 (M) y 0.15 (H)	SI			0.0154 a 0.0524	SI	7	19	SI*	29 a 32	29 a 32	SI					Bishop *et al.* (2006)
PS							180 a 185 cm	275-285 cm									Francis and Duffy, 2005;
ND							203-215 cm	275-293 cm									Compagno, 2001

Anexo III. Datos de abundancia de hembras reproductoras estimadas para el Pacífico Norte, Atlántico Norte y biomasa para el Océano Índico.

<u>Pacífico Norte (Tabla 7 ISC SWG, 2018)</u>

Pacífico Norte (Tabla 7 ISC-SWG, 2018)			
Año	Abundancia de hembras reproductoras (1000s)	Año	Abundancia de hembras reproductoras (1000s)
1975	**1031.3**	1996	837.7
1976	**1031.4**	1997	830.6
1977	**1031.3**	1998	827.1
1978	**1030.8**	1999	826.7
1979	**1030.2**	2000	828.3
1980	**1028.8**	2001	831
1981	**1026.3**	2002	833.9
1982	**1022.2**	2003	837.1
1983	**1017.4**	2004	840
1984	**1011**	2005	842.5
1985	**1002.8**	2006	844.8
1986	991.9	2007	847.3
1987	978.9	2008	850.4
1988	963.1	2009	853.7
1989	945.6	2010	856.8
1990	927.7	2011	858.9

1991	910.1	2012	860
1992	893	2013	860.4
1993	876.7	2014	860.3
1994	861.5	2015	859.9
1995	848.2	2016	860.2

Se denota en gris los años considerados como línea base histórica; en negro los años considerados el periodo reciente.

Atlántico Norte (Tabla 7 de ICAAT SCRS, 2017)

Atlántico Norte (Tabla 7 de ICCAT SCRS, 2017)							
Año	Abundancia de hembras reproductoras (1000s)	Año	Abundancia de hembras reproductoras (1000s)	Año	Abundancia de hembras reproductoras (1000s)	Año	Abundancia de hembras reproductoras (1000s)
1950	**1126**	1971	1120	1992	1065	2013	610
1951	**1126**	1972	1120	1993	1058	2014	583
1952	**1126**	1973	1119	1994	1050	2015	558
1953	**1126**	1974	1118	1995	1040		
1954	**1126**	1975	1117	1996	1028		
1955	**1126**	1976	1116	1997	1014		
1956	**1126**	1977	1115	1998	1000		
1957	**1126**	1978	1114	1999	983		
1958	**1125**	1979	1112	2000	966		
1959	**1125**	1980	1111	2001	946		
1960	**1125**	1981	1109	2002	925		
1961	1125	1982	1107	2003	902		
1962	1125	1983	1104	2004	877		
1963	1125	1984	1102	2005	850		
1964	1124	1985	1099	2006	822		
1965	1124	1986	1095	2007	792		

Estimación a 20 años (tasa anual decremento 4.2%)	
Año	Abundancia de hembras reproductoras (1000s)
2015	558
2016	534.4944775
2017	511.9791156
2018	490.4122041
2019	469.7537899
2020	449.965603
2021	431.0109855
2022	412.8548234
2023	395.4634823
2024	378.8047443
2025	362.8477489

1966	1123	1987	1091	2008	762		
1967	1123	1988	1086	2009	731		
1968	1122	1989	1081	2010	700		
1969	1122	1990	1077	2011	669		
1970	1121	1991	1071	2012	639		

Se denota en gris los años considerados como línea base histórica; en negro los años considerados el periodo reciente y en un cuadro separado se observan los años proyectados con base en la tasa de decremento reciente.

Océano Índico (Estimados de la Figura 6b de Brunel, et al., 2018)

Año	B/Bmsy	Año	B/Bmsy	Año	B/Bmsy
1971.089	**1.596**	1985.798	1.601	2011.245	1.158
1974.514	**1.611**	1987.743	1.591	2012.335	1.138
1979.261	**1.606**	1990.000	1.576	2013.346	1.103
1984.241	1.591	1991.479	1.567	2014.125	1.079
1989.066	1.591	1992.335	1.547	2014.591	1.064
1994.747	1.522	1993.658	1.537		
1999.805	1.424	1995.603	1.502		
2004.630	1.320	1996.615	1.483		
2010.389	1.177	1997.471	1.468		
2014.903	1.054	1998.327	1.453		
1954.125	2.094	1999.105	1.438		
1972.412	1.596	2000.817	1.404		
1955.525	2.128	2001.907	1.384		
1955.525	2.118	2002.763	1.365		
1973.580	1.606	2003.619	1.345		
1975.603	1.611	2005.175	1.310		
1977.004	1.601	2006.031	1.281		
1978.249	1.606	2006.887	1.256		

Estimación a 10 años (tasa anual decremento 2.1%)	
Año	B/Bmsy
2014.59144	1.064039409
2015	1.041313423
2016	1.019072825
2017	0.997307245
2018	0.97600654
2019	0.95516078
2020	0.934760248
2021	0.914795435
2022	0.895257035
2023	0.87613594
2024	0.857423238
2025	0.839110206

1980.272	1.606	2007.665	1.236		
1981.206	1.596	2008.755	1.217		
1982.763	1.596	2009.611	1.192		

Se denota en gris los años considerados como línea base histórica; en negro los años considerados el periodo reciente y en un cuadro separado se observan los años proyectados con base en la tasa de decremento reciente.

Anexo IV. Detalle de la información adicional aportada por país respecto al estado de conservación, uso y gestión del tiburón Mako.

1. **México**

Uso nacional

De acuerdo con Santana-Morales (2008), en México el tiburón Mako es la especie que cuenta con el valor comercial más alto en la playa, debido a la calidad de su carne, las aletas grandes son muy apreciadas para la sopa de aleta de tiburón en los mercados asiáticos. Para el caso particular del Tiburón Mako la aleta con mayor valor comercial es el pedúnculo caudal y las pectorales son de un valor más bajo. En México, la carne de Mako tiene un precio promedio de $15 pesos por kilo a nivel de playa, aumentando en la zona de Baja California, en la región de Bahía Tortugas y se sabe que los precios aumentan a nivel internacional (Surizarai, comm. pers.). En la zona del Vizcaíno, la carne de Mako tiene un costo aproximado de $16 pesos el kilo, y las aletas se vende revueltas con las de otros tiburones como aletas de segunda (Santana-Morales, 2008).

Comercio lícito

Océano Atlántico: En el Golfo de México el tiburón Mako tiene una menor importancia en las capturas reportadas ante la FAO y la CICAA, con valores menores a las 10 ton/año (SSG ICCAT, 2016). Ramírez y Amaro *et al*., (2013), con base en datos de pesquería artesanal, reportaron una tasa de captura del 22.7% en palangres con particular incidencia sobre las clases juveniles. Además, los mismos autores mencionan que esta especie es captura incidental en redes de enmalle, de nuevo con mayor frecuencia sobre las clases de edad más temprana.

Para la pesca ribereña del Golfo y Mar Caribe, el INAPESCA determinó durante el 2016-2017, la presencia de 28 especies de tiburones que se capturan con palangres y redes de enmalle. Del grupo de los alecrines se ha reportado la presencia de *Isurus oxyrinchus* que ocupa el lugar número 15 en la lista de tiburones con el 0.13% de los organismos registrados. Con base en información del Subprograma de Observadores a Bordo del Fideicomiso FIDEMAR del Programa Nacional de Aprovechamiento del Atún y de Protección de Delfines (PNAAPD), se ha determinado que la participación de *Isurus oxyrinchus* es muy baja en la captura incidental de la pesca de atún con palangre de deriva en el Golfo de México. La flota se integra por 22 buques de pesca modificados para la pesca con palangre, y para el periodo de 1994 a 2007 con un esfuerzo pesquero de 15,618,900 anzuelos, se reportó la captura incidental de 1,646 alecrines con un promedio de captura anual de 117 organismos. Del cual, *Isurus oxyrinchus* representó el 0.19% de la captura total en número de organismos, con la captura de 1 ejemplar por cada 4 viajes de pesca (temporada 2006, con 85 ejemplares). De acuerdo con la Tabla SMA-Tabla 1. del Capítulo 8.13 SHK-Tiburones del Informe 2014-2015 de CICAA, en el Atlántico norte la captura de México de marrajo dientuso asociada al palangre atunero de 1990 a 2014 fue estimada en 119 toneladas, con un promedio anual de 4.8 t que representarían el 0.2% de la captura total en el Atlántico norte en ese periodo (ICAAT, 2015).

En esta área los volúmenes de captura son insignificantes a comparación de otras especies como (*Rhizopronodon terraenovae* y *Sphyrna lewini*), se reportan capturas de un individuo a dos por mes, esto en temporada alta para la zona (de octubre-febrero), las demás capturas son raras durante el resto del año (Ricoy, comm pers. 2018).

Océano Pacífico: Sosa-Nishizaki y colaboradores (2017) estimaron un promedio por año de 1,041.2 toneladas de Mako, del 2012 al 2016. Señalando que, con el desarrollo de la pesquería de palangre en Mazatlán, Sinaloa, durante la segunda mitad de la década de 1990 hasta 2013, las capturas aumentaron a alrededor de 700 toneladas. Sin embargo, en 2014 se duplicó y alcanzó un nivel de alrededor de 1.400 toneladas, para alcanzar en 2015 un valor de 1.600 toneladas y en 2016, las capturas disminuyeron una vez más en torno a un nivel de alrededor de 700 toneladas, las razones del aumento en 2014 y 2015 podría estar relacionado con las condiciones oceanográficas u otros factores que no se han analizado. Las tallas reportadas son de 75 cm a 210 cm y hasta 310 cm (Santana-Morales 2008; Surizarai comm pers, 2018).

Mediante un estudio realizado en los vertederos de desechos de la Zona del Vizcaíno, con la finalidad de conocer la composición específica de la pesquería e identificar las especies de elasmobranquios y sus abundancias relativas capturadas por la pesca artesanal, se observó que de las 31,861 cabezas de individuos observadas pertenecían a 25 especies de las cuales el 19% correspondían a Tiburón Mako y en comparación con la lista reportada con Cartamil *et al*. 2008 obtenida a partir de la documentación de desembarques, en donde se registraron 4,154 elasmobranquios, correspondientes a 22 especies, en la que se estableció que el tiburón Mako representa un 4.24% de la abundancia relativa (Santana-Morales, 2008).

Castillo-Geniz, y colaboradores (2014) registraron un total de captura de 11,190 Makos de aleta corta durante 2006-2014, el 73% de las lanchas de palangre (8,357) y el 27% se capturó en redes de deriva (3,019). Mako se tomó en el 27,4% del total de los lances de palangre observados y en el 12% de los lances de redes de deriva. Las capturas numéricas más grandes se observaron en las flotas de Ensenada (1.7 a 4.9 capturas por lance) y Mazatlán (1.2 a 2.4 capturas por lance), con ambas artes de pesca. Mako fue capturado durante todo el año por diversas flotas, mostrando un tiempo de residencia prolongado en aguas mexicanas.

Instrumentos jurídicos

Nacionales:

En México la LGPSAS (DOF, 2007) y la LGVS (DOF, 2010) sustentan el manejo y conservación de las especies de tiburones que se pescan en México (Sosa-Nishizaki *et al*. en revisión). De los cuales derivan una serie de instrumentos de regulación y manejo pesquero, que promueven la conservación, el manejo adecuado y el uso responsable de las especies pesqueras, como lo son: el Plan de Acción Nacional para el Manejo y Conservación de los Tiburones, Rayas y Especies Afines en México (PANMCT, 2004), la NOM-029-PESC-2006, Pesca responsable de tiburones y rayas. Especificaciones para su aprovechamiento. Acuerdo SAGARPA 2008 (Pesca Incidental en pesquerías de tiburones y rayas del Océano Pacífico), Acuerdo SAGARPA 2012 (Modificación de zonas y épocas de vedas de tiburones y rayas en aguas nacionales), Acuerdo SAGARPA 2013 (Conclusión de veda de tiburones y rayas en el Océano Pacífico para 2013), Modificación SAGARPA 2013 a la NOM-017-PESC-1994, Para regular las actividades de pesca deportivo-recreativa en las aguas de jurisdicción federal de los Estados Unidos Mexicanos, publicada el 9 de mayo de 1995, NOM-023-SAG/PESC-2014, Que regula el aprovechamiento de las especies de túnidos con embarcaciones palangueras en aguas de jurisdicción federal del Golfo de México y Mar Caribe, en particular esta norma, contiene indicaciones que van en línea con la Recomendación 17-08-BYC de CICAA “sobre la conservación del stock de marrajo dientuso del Atlántico norte capturado en asociación con pesquerías de ICCAT” (solo 20% de captura incidental entre lo que se cuenta a tiburones) y se establece la obligación de que todos los buques deben llevar a bordo un observador científico (comm. pers. Oviedo, 2018). Acuerdo SAGARPA 2014 (Modificación de la veda de tiburones en el Golfo de México y Mar Caribe) y NOM-049-SAG/PESC-2014, Que determina el procedimiento para establecer zonas de refugio para los recursos pesqueros en aguas de jurisdicción federal de los Estados Unidos Mexicanos (Bonfil, 2018- en preparación).Acuerdos de Veda SAGARPA 2013 y 2014 (Modificación de la veda de tiburones en el Golfo de México y Mar Caribe), Carta Nacional Pesquera publicada en el Diario Oficial de la Federación en 2018; Acuerdo mediante el cual se establece el volumen de captura incidental en las operaciones de pesca de tiburón y rayas en el Océano Pacífico 2008.

Por otro lado, a partir de la LEGEEPA surge el establecimiento de áreas naturales protegidas que entre otros objetivos salvaguarden la diversidad genética y permiten proteger las especies amenazadas. Su aplicación se realiza a través de su reglamento en materia de Áreas Naturales Protegidas, mismo que también es considerado como un instrumento importante para la conservación de las especies (Sosa-Nishizaki *et al*. en revisión).

Internacionales:

México es parte de tres OROP: la Comisión Interamericana del Atún Tropical (CIAT), la Comisión Internacional para la Conservación del Atún Atlántico (CICAA) y la Organización Latinoamericana de Desarrollo Pesquero (OLDEPESCA), y coopera con la Comisión de Pesca del Pacífico Occidental y Central (CPPOC). Estas organizaciones han establecido diferentes recomendaciones y resoluciones para el manejo de especies comerciales de tiburones citadas en el **Anexo V.** Así como otras recomendaciones en el marco de la Convención de las Naciones Unidas sobre el Derecho del Mar (Artículo 64 sobre Especies altamente migratorias)

De forma similar, la FAO ha generado recomendaciones como "El Código de Conducta para la pesca responsable-FAO" y el Plan de acción internacional para la conservación y manejo de las poblaciones de tiburones de la FAO (PAI-Tiburones) que indica recomendaciones de manejo para la especie (Sosa-Nishizaki *et al*. en revisión). En el 2004 en México, el INAPESCA con la asistencia y financiamiento de la CONAPESCA elaboraron el Plan de Acción Nacional para el Manejo y Conservación de Tiburones, Rayas y Especies Afines (PANMCT) como parte del PAI-Tiburones. Los objetivos del PANMCT siguen los fundamentos de los objetivos del PAI-Tiburones y estos se enlistan a continuación:

- Asegurar que las capturas sean sostenibles.
- Evaluar las amenazas a las poblaciones.

- Identificar y proteger los hábitats críticos.
- Identificar y proteger a las especies particularmente vulnerables o amenazadas.
- Identificar y desarrollar marcos efectivos para la investigación, ordenación y educación entre todos los interesados.
- Minimizar la captura incidental de tiburones, rayas y especies afines en otras pesquerías.
- Minimizar los desechos y descartes de la captura.
- Fomentar el aprovechamiento integral.
- Contribuir a la protección de la diversidad biológica y la estructura y función del ecosistema.
- Mejorar y sistematizar la información biológica de las especies.
- Mejorar la información de las capturas, esfuerzo, desembarques y comercio por especie.
- Establecer un sistema de información.

2. **Estados Unidos (en su idioma original)**

Conservation status (distribution, population size, structure, and trends)

Stock assessments:

Stock assessments of shortfin mako shark *(Isurus oxyrinchus*) are available for the Atlantic, Pacific, and Indian Oceans. References to these assessments are listed below.

Atlantic Ocean:

- *Report of the 2017 ICCAT Shortfin Mako Assessment Meeting* (Madrid, Spain 12-16 June 2017): https://www.iccat.int/Documents/Meetings/Docs/2017_SMA_ASS_REP_ENG.pdf
- Information on the stock status of shortfin mako shark in the U.S. Atlantic can be found at: https://www.fisheries.noaa.gov/action/amendment-11-2006-consolidated-hms-fishery-management-plan-atlantic-shortfin-mako-sharks

Pacific Ocean:

- *Stock Assessment of Shortfin Mako Shark in the North Pacific Ocean Through 2016* (18th Meeting of the International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean Yeosu, Republic of Korea July 11-16, 2018): http://isc.fra.go.jp/pdf/ISC18/ISC_18_ANNEX_15_Shortfin_Mako_Shark_Stock_Assessment_FINAL.pdf

- Relative to MSY-based reference points, the species is not overfished nor is overfishing occurring [Comment provided by NMFS staff (Pacific Islands Regional Office). They also noted that shortfin mako sharks are generally the only shark utilized by the Hawaii longline fishery. They noted that the ISC assessment referenced above indicated a sustainable stock].
- Chang, J.H., Lui, K.M. 2009. Stock assessment of the shortfin mako shark (*Isurus oxyrinchus*) in the Northwest Pacific Ocean using per recruit and virtual population analyses. Fish. Res. 98, 92-101 (see attached).

Indian Ocean:

- *A Preliminary Stock Assessment for the Shortfin Mako Shark in the Indian Ocean using Data-Limited Approaches* (IOTC-WPEB14-2018-037): http://www.iotc.org/sites/default/files/documents/2018/08/IOTC-2018-WPEB14-37.pdf

Habitat:

Information is available on the Essential Fish Habitat (EFH) in the Atlantic for both shortfin mako shark and longfin mako shark (see below).

- Essential Fish Habitat (EFH) descriptions and maps for both species are available at: https://www.fisheries.noaa.gov/action/amendment-10-2006-consolidated-hms-fishery-management-plan-essential-fish-habitat

U.S. Landings:

Information is available on U.S. landings of mako sharks (see below).

Atlantic Ocean:

- U.S. landings and observed discards of both species in the Atlantic can be found at: https://www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-highly-migratory-species-stock-assessment-and-fisheries-evaluation-reports

Pacific Ocean:

- In the Western and Central Pacific Ocean, the Hawaii and American Samoa longline fleet catch and retain some portion of mako shark catch. The average catch for the past five years is approximately 5,100 individuals, and an average of 720 have been retained annually.

II. Legal domestic and international trade of specimens, parts, and derivatives

The quantity of shortfin mako shark and longfin mako shark in domestic and international trade is unknown. Unlike some other aspects of the international trade in seafood, shark tends to be dealt with as an undifferentiated, or only partially specified category. The U.S. Harmonized Tariff Schedule lists only dogfish by type in its limited selection of codes devoted to shark imports. While some other countries may allow for a more detailed description beyond the six-digit (harmonized) tariff code level, there is an overall lack of species types for trade in sharks (https://www.usitc.gov/tata/hts/bychapter/index.html).

The U.S. National Oceanic and Atmospheric's National Marine Fisheries Service (NMFS) maintains a foreign trade database that can be used to summarize U.S. foreign trade in fishery products, including sharks; this data is not species-specific (see below).

- NMFS' Foreign Fishery Trade Database can be found at: https://www.fisheries.noaa.gov/national/commercial-fishing/foreign-fishery-trade-data

III. Information on illegal trade (seizures and confiscations)

A variety of a of factors make it difficult to assess with precision the total harvest of the product or the extent to which the harvest is reflected in the international market or in arrests, seizures or other violations related to mako shark species. However, mako sharks have a higher market profile than most other shark species.

In the United States, federal, state and local law enforcement ensure that mako shark is caught according to applicable law and regulations.

3. Jamaica

Identification: *Isurus oxyrinchus* (shortfin mako) like *I. paucus*, the longfin mako shark, are members of the family: Lamnidae (mackerel sharks).

Range State Comment: Jamaica like all countries in the tropics & sub-tropics as well as parts of temperate seas, is a Range State for both species. The shortfin mako is more common that the longfin species.

Biological & Distribution information Jamaica: Although there is biological information on populations size, structure or population trends, Jamaican fishers have identified these two species along with many other sharks, from color photographs and identification sheets shown to them by scientists. Northern coast fishers indicate that sharks resembling both species have been seen at and near the surface offshore. They are reported from the surface to 500m depth. The mako species are famous as the fastest swimming of all sharks and are known to be capable of burst of up to 74 km/hr (43 mph) (Dietz *et al*., 2015)

Threats: The main threats to mako sharks but especially the shortfin mako, include but are not limited to (a) sportfishing (due to their propensity to leap when hooked), (b) commercial fishing which has a high proportion of bycatch in driftnet fisheries for other target species and (c) is the Global food market for fins.

Regional Status: The shortfin mako shark, I. oxyrinchus, is under the IUCN Red List Category of "Vulnerable" having been uplisted in 2007 from "Near Threatened". Population trends are reported to be deceasing with a continuing decline of mature individuals. FishBase rates the shortfin mako as Very "Highly Vulnerable" at 83 of 100, and Resilience as "Very Low" with a minimum population doubling size of more than 14 years (https://www.fishbase.de/summary/Isurus-oxyrinchus.html).

Conservation status in Caribbean: Like all other Atlantic sharks the two species can be easily overfished due to their low reproductive capacity (low fecundity) if not carefully managed. Shortfin mako males reach sexual maturity between 7 - 8 years while females achieve maturity only at 18 years of age. Coupled with a three year reproductive cycle with only three or four pups per litter, this makes them particularly prone to overfishing

(Florida Museum 2018). Mako exploitation in nursery areas was reported to be especially worrisome (FAO, 2011).

References Cited

Diez, G., Soto, M. & J.M. Blanco. 2015. J. Fish Biol. 87:123

http://www.fao.org/fishery/species/2011/en

https://www.floridamuseum.ufl.edu/.../isurus-oxyrinchus

3. **Canada (en su idioma original)**

CITES – Canadian Response to Mexico's request to provide any available information on the conservation status and on legal domestic and international trade of Shortfin Mako (North Atlantic) specimens, parts, and derivatives, as well as information on illegal trade

Distribution in Canada

In the northwest Atlantic, Shortfin Mako are found both inshore and offshore. In Canadian waters where they are considered at the edge of their range, they have been recorded on the Canadian continental shelf from Newfoundland, south to the United States border. Tagging studies indicate that Shortfin Mako are highly migratory with a distribution apparently dependent on water temperatures which they prefer to be between 17 and 22ºC. They generally migrate to the Atlantic coast of Canada in the late summer and fall where they are associated with the warm waters of the Gulf Stream.

Management in Canada

Although not formally managed by the International Commission for the Conservation of Atlantic Tunas (ICCAT), conservation and management measures addressing their by-catch have recently been adopted. Canada is a Contracting Party to ICCAT and legally-bound by the measures that the Commission adopts. Since there is no directed fishery for Shortfin Mako in Canadian Waters, management of by-catch for the species is addressed in the Integrated Fisheries Management Plan for Canadian Atlantic Swordfish and other tunas. The general conservation objectives of this plan match those outlined in Fisheries and Oceans Canada's (DFO) framework for an ecosystem approach to management (EAM framework). They require consideration of the impact of the fishery not only on the target species but also on non-target species and habitat. The strategy used to achieve this objective is to keep fishing mortality of sharks moderate by maintaining precautionary management measures that where possible are species-specific. Current management measures in the Swordfish longline fishery that are pertinent to Shortfin Mako by-catch include:

- Integrated Fisheries Management Plans; identifying control of by-catch mortality
- Mandatory Release of all Shortfin Mako sharks that are alive when brought on board
- 100t non-restrictive by-catch limit provision (applied to all fisheries combined)
- Mandatory requirement that fins be naturally attached to all Shortfin Mako sharks retained until the first point of landing.
- Enforcement of these measures is achieved at-sea observers (10% coverage requirement) and 100% Dockside Monitoring of all landings of Shortfin Mako. The latter provides information including weight and catch at size for al landed species.
- Participation in Research and Fisheries Monitoring Programs

In 2007, Canada released its *National Plan of Action for the Conservation and Management of Sharks* (NPOA-Sharks). The plan was developed in accordance with the principles and provisions of the International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks), as developed by United Nations Food and Agriculture Organization (FAO). The national plan identified that blue shark is the most commonly caught large shark in Canadian waters. Although globally, the impact of Canada's fishing activities on shark populations tend to be low, measures have been and continue to be implemented to improve the management of these species. In 2012 a report (*Canada's Progress Report on the Implementation of Key Actions Pursuant to the National Plan of Action on the Conservation and Management of Sharks* (March 2007)) was released indicating that Canada has made progress in a number of areas and is continuing with additional studies to improve knowledge on shark species including Shortfin Mako.

Human Impacts within Canada

Fishing mortality is the only known human impact on Shortfin Mako within Canada. The species is retained as a high-value bycatch of the Canadian pelagic longline fishery that primarily targets Swordfish. This fishery is conducted within Canadian Atlantic waters from April to December, primarily on the edges ofthe the Canadian continental shelf. Recent annual catches and landings for Shortfin Mako have been 85t, 82t and 109t respectively in 2015, 2016 and 2017. Landings for 2018 are estimated to be below 60t. These represent only a small portion of the estimated total landings for this population throughout the North Atlantic. Shortfin Mako is a highly migratory species with the majority of the population residing in waters south of Atlantic Canada.

While a standardized catch rate index from the commercial large pelagic fishery has suggested stable abundance since 1988, the median size of Mako sharks, within the commercial catch, has declined. This would suggest a loss of larger Mako sharks. However, given limitations in available research, the overall abundance and exploitation of this species is difficult to determine. The first report on the stock status of Shortfin Mako in Atlantic Canadian fisheries waters was completed in 2004. Subsequently, a Recovery Potential Assessment for the species in Atlantic Canada was conducted in 2006. Given that Shortfin Mako is not part of the directed fishery and bycatch rates represents only a small portion of the global population, it is expected that current exploitation rates within Canada are not having a significant negative impact on the sustainability of this species.

Research

DFO is currently conducting a two-year study using Satellite Tags to develop estimates of post-release mortality of Shortfin Mako sharks caught in Canada's Atlantic pelagic longline fishery. The results of this study are expected to contribute to national and international stock assessments.

ICCAT is planning to conduct the next stock assessment for Shortfin Mako in 2020 to assess whether or not the new management measures that have been put in place to protect the species have resulted in an improved status for the population.

International Trade

There is no domestic market for Shortfin Mako in Canada; all landed sharks are exported to international markets. There are no records of illegal exports from Canada, and essentially no records of illegal imports from other countries: in 2017 there was an import of three scientific specimens of Shortfin Mako from the United States without an accompanying United States Fish and Wildlife Service document. Given the management measures currently in place to regulate landing of Shortfin Mako by-catch, there are no concerns with illegal trade of species and derivatives into or out of Canada.

4. Islas Turks & Caicos (en su idioma original)

De: Environment [mailto:environment@gov.tc]
Enviado el: lunes, 19 de noviembre de 2018 10:55 a. m.

Para: Miguel Angel Flores Mejia; lormeka M. Williams; Kathy Lockhart; Eric F. Salamanca
Asunto: Re: CITES Consulta Inclusión Ap.II Isurus oxyrinchus,

Isurus paucus Dear Sir,

The Fisheries Unit of the Department of Environment and Coastal Resources (DECR, has reviewed the documents and noted the following:

1. The DECR has no further recommendaUon change.
2. The TCI does not actively seek or fish for these species..
3. The DECR agree with the recommendation to place both species on Appendix II of CITES.

Thank you and all the best.

Sincerely,

Eric F. Salamanca

Department of Environment and Coastal Resources (DECR)

Ministry of Tourism, Environment, Heritage, Maritime and Gaming (MTEHMG) Turks and Caicos Islands Government

Lower Bight Road, Providenciales

Turks and Caicos Islands (TCI) (UK Overseas Territory)
British West Indies (BWI)

email: environment@gov.tc

Department of Environment and Coastal Resources (DECR)
Ministry of Tourism, Environment, Culture and Heritage (MTECH)
Turks and Caicos Islands Government (TCIG)
Providenciales, Turks and Caicos Islands

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5. Reino Unido (en su idioma original)

Feedback & Information from UK Overseas Territories:

- ***Conservation status (distribution, size, structure and population trends):***

Isurus spp. sharks in Bermuda waters fall under the Atlantic migratory populations monitored by ICCAT. We defer to ICCAT assessments of these populations. At the recent ICCAT meeting, it was highlighted that *I. oxyrinchus* is considered overfished in the Atlantic.

In Gibraltar, both species are protected locally under Schedule 1 of the Nature Protection Act 1991. There is no legal or illegal trade in Gibraltar of these species.

- ***legal trade -national and international- of specimens, parts and derivatives (detailing the national use given to the species and products that are exported):***

Bermuda does not have a targeted fishery for *Isurus spp.* sharks. Over the past 20 years, Bermuda's annual landings of *Isurus spp*., primarily *I. oxyrinchus,* have ranged from 0 – 5 individual sharks per year, with a total landed weight of up to 345 kg per year. All locally landed individuals enter the local food market as steaks, with offcuts used for bait. There is no fin market. At present, Bermuda does not export fish and there is no export of *Isurus spp.* products. There is not a large local market for shark products and we are not aware of any legal imports of *Isurus spp.* products.

- ***Illegal trade to which they are subject (illegal trade events identified by year / species and confiscated volumes):***

Bermuda are not aware of any illegal trade in *Isurus spp.* products. There have been no seizures of either attempted imports or attempted exports.

- ***Additional information:***

Bermuda complies with ICCAT reporting requirements for *Isurus spp*., and ICCAT recommendations regarding the release of any *I. oxyrinchus* caught incidentally in association with fisheries targeting ICCAT species are implemented via the terms and conditions of gear-specific licences for these activities. Bermuda does not presently have any further national level management or restrictions regarding the capture of *Isurus spp.* sharks but, given the recent finding by ICCAT, increased protection is being considered.

A certain number of *Isurus spp.* sharks are likely caught annually by sports fishers in Bermuda waters, with most individuals being released. As *Isurus spp.* are obligate ram ventilators, the population level impacts of sublethal stress associated with catch and release are unknown. It is possible, although unlikely, that some individuals might be retained for personal consumption.

Anexo V. Medidas de manejo de las OROP aplicables para *Isurus* spp

General Fisheries Commission for the Mediterranean (GFCM): Recomendación GFCM/36/2012/3 donde los especímenes de tiburones listados en el Anexo II del protocolo SPA/BD (incluyendo a *Isurus oxyrinchus*) no pueden ser retenidos a bordo, transbordado, descargado, transferido, almacenado, vendido, exhibido u ofrecido para la venta.

Indian Ocean Tuna Comission (IOTC): Resolución 13/03, la captura/descarte de todos los tiburones debe ser registrada. Resolución 13/06, las capturas científicas deberán proporcionar información sobre los volúmenes de tiburón capturados.

Inter-American Tropical Tuna Commission (IATTC): Resolución C-16-04, solicita apoyo para la investigación sobre areas de crianza de tiburones. Resolución C-05-03, cada Parte deberá implementar su IPOA-Sharks y presentar informes anuales de capturas de tiburón. Resolución C-16-05, siempre que no se retenga deberá de liberarse vivo cualquier tiburón capturado en las redes de pesca.

International Commission for the Conservation of Atlantic Tuna (ICCAT): Resolución C-04-05 (REV 2) solicita liberar a todo tiburón producto de la pesca incidental. Resolución C-05-03, los tiburones no pueden ser retenidos a bordo, transbordados, descargados, transferidos, almacenados, vendidos, exhibidos u ofrecidos para la venta. Cada Parte deberá implementar su IPOA-Sharks, presentar informes anuales de capturas de tiburón, utilizar el total de las capturas, que no se mantenga abordo mas del 5% de aletas del peso total de los tiburones. Pesquerías no dirigidas a tiburones deberán de liberar a los ejemplares vivos (siempre que no sean utilizados para alimentación o subsistencia), se realizará investigación para contar con artes de pesca mas selectivas y sobre areas de crianza de tiburones.

Recomendaciónes 14-06-BYC, 10-06-BYC, para que las Partes reporten información de acciones emprendidaes a nivel interno para seguimiento a capturas, conservación y ordenación de Mako. Recomendación 04-10-BYC, para que se usen íntegramente las capturas de tiburones retenidas. Liberar a todos los tiburones vivos (siempre que no sean utilizados para alimentación o subsistencia) y no trasportar mas del 5% de aletas del peso del tiburones capturados por la nave. Recomendación 07-06, para que las Partes reporten estimaciones de descartes de ejemplares muertos y frecuencias de tallas de Mako. Recomendación 17-08-BYC, requiere que los ejemplares capturados se liberen rápidamente (a menos de que esté muerto), esto para detener la sobrepesca. Esta medida estará vigente hasta el 31 de diciembre del 2019.

Northwest Atlantic Fisheries Organization (NAFO): Art. 12, todas las Partes deberán reportar las capturas de tiburón con el código de 3 letras (Art. 28), prohibir la remoción de aletas de ejemplares, liberar a todos los tiburones vivos (siempre que no sean utilizados para alimentación o subsistencia) y realizar investigación sobre areas de crianza de tiburones.

South East Atlantic Fisheries Organisation (SEAFO): Medida de conservación 04/06, acuerda que cada Parte debera reportar sus capturas de tiburones, que se utilice el total de las capturas, que no se mantenga abordo mas del 5% de aletas del peso total de los tiburones. Pesquerías no dirigidas a tiburones deberán de liberar a los ejemplares vivos (siempre que no sean utilizados para alimentación o subsistencia) y se realice investigación para contar con artes de pesca mas selectivas.

Western & Central Pacific Fisheries Commission (WCPFC): Medida de conservación y manejo 2010-07, acuerda que cada Parte debera reportar sus capturas de tiburones, que se utilice el total de las capturas, que no se mantenga abordo mas del 5% de aletas del peso total de los tiburones. Pesquerías no dirigidas a tiburones deberán de liberar a los ejemplares vivos (siempre que no sean utilizados para alimentación o subsistencia) y se realice investigación para contar con artes de pesca mas selectivas.

North-East Atlantic Fisheries Commission (NEAFC): Recomendación 10:2015 acuerda que cada Parte debera reportar sus capturas de tiburones, que se utilice el total de las capturas. Pesquerías no dirigidas a tiburones deberán de liberar a los ejemplares vivos (siempre que no sean utilizados para alimentación o subsistencia) y se realice investigación para contar con artes de pesca mas selectivas

Western Central Atlantic Fishery Commission (WECAFC): Se encuentran en desarrollo recomendaciones sobre el manejo y conservación de pesquerías de tiburón así como un Plan Regional para el Manejo y Conservación de Tirburones (FAO-WECAFC, 2018).

Anexo VI. Estados del área de distribución del Mako de aleta corta, Se indica su membresía a OROP, CMS, Memorandum de entendimiento para la conservación de tiburones migratorios (que han adoptado medidas de manejo para el Mako), Partes / Signatarios de los instrumentos de la CMS. General Fisheries Commission for the Mediterranean (GFCM), Indian Ocean Tuna Comission (IOTC), Inter-American Tropical Tuna Commission (IATTC), International Commission for the Conservation of Atlantic Tuna (ICCAT), Northwest Atlantic Fisheries Organization (NAFO), South East Atlantic Fisheries Organisation (SEAFO), Western & Central Pacific Fisheries Commission (WCPFC), North-East Atlantic Fisheries Commission (NEAFC) y Western Central Atlantic Fishery Commission (WECAFC). Obtenido de http://www.fao.org/figis/geoserver/factsheets/rfbs.html, https://www.cms.int/en/parties-range-states, https://www.cms.int/sharks/en, https://www.cites.org/eng/disc/parties/index.php

PAIS	GFCM	IOTC	IATTC	ICCAT	NAFO	SEAFO	WECAFC	WCPFC	NEAFC	CMS	CMS/MoU Sharks	CITES
Albania	X			X						X	X	X
Algeria	X			X						X	X	X
Angola				X		X				X	X	X
Anguilla												
Antigua and Barbuda							X			X	X	X
Argentina										X	X	X
Australia		X						X		X	X	X
Bahamas							X				X	X
Bangladesh										X	X	X
Barbados				X			X				X	X
Belize		X	X	X			X				X	X
Benin										X	X	X
Bermuda												
Bonaire, Sint Eustatius and Saba												
Brazil				X			X			X	X	X

PAIS	GFCM	IOTC	IATTC	ICCAT	NAFO	SEAFO	WECAFC	WCPFC	NEAFC	CMS	CMS/MoU Sharks	CITES
Brunei Darussalam											X	X
Cambodia											X	X
Cameroon										X	X	X
Canada			X	X	X			X			X	X
Cape Verde										X	X	
Cayman Islands												
Chile										X	X	X
China		X	X	X				X			X	X
Colombia			X	X			X				X	X
Comoros		X										
Congo												X
Cook Islands							X			X	X	
Costa Rica			X	X			X			X	X	X
Côte d'Ivoire				X						X	X	X
Croatia	X	X	X	X	X	X	X	X	X	X	X	X
Cuba					X		X			X	X	X
Curaçao				X								
Cyprus	X	X	X	X	X	X	X	X	X	X	X	X
Dominica							X				X	X
Dominican Republic							X			X	X	X

PAIS	GFCM	IOTC	IATTC	ICCAT	NAFO	SEAFO	WECAFC	WCPFC	NEAFC	CMS	CMS/MoU Sharks	CITES
Ecuador			X	X						X	X	X
Egypt	X			X						X	X	X
El Salvador			X	X							X	X
Equatorial Guinea				X						X	X	X
Eritrea		X								X	X	X
Fiji								X		X	X	X
France	X	X	X	X	X	X	X	X	X	X	X	X
French Guiana										X		
French Polynesia												
Gabon				X						X	X	X
Gambia										X	X	X
Ghana				X						X	X	X
Gibraltar												
Greece	X	X	X	X	X	X	X	X	X	X	X	X
Grenada							X				X	X
Guadeloupe												
Guatemala			X	X			X				X	X
Guinea		X		X			X			X	X	X
Guinea-Bissau										X	X	X
Guyana							X				X	X

PAIS	GFCM	IOTC	IATTC	ICCAT	NAFO	SEAFO	WECAFC	WCPFC	NEAFC	CMS	CMS/MoU Sharks	CITES
Haiti							X				X	
Honduras				X			X			X	X	X
India		X								X	X	X
Indonesia		X						X			X	X
Iran		X								X	X	
Ireland		X	X	X	X	X	X	X	X	X	X	X
Israel	X									X	X	X
Italy	X	X	X	X	X	X	X	X	X	X	X	X
Jamaica							X				X	X
Japan	X	X	X	X	X	X	X	X			X	X
Kenya		X								X	X	X
Kiribati				X				X			X	
Korea, Democratic People's Republic of				X			X				X	
Korea, Republic of		X	X	X	X	X		X			X	X
Lebanon	X											
Liberia				X						X	X	X
Libya	X			X						X	X	X
Macao												
Madagascar		X								X	X	X
Malaysia		X									X	X

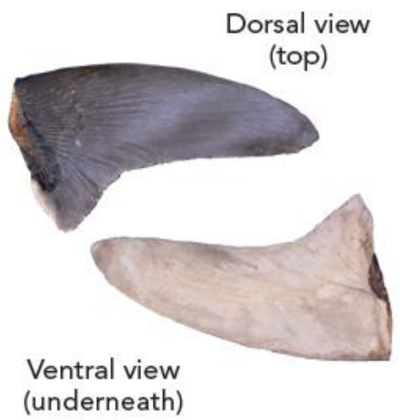
PAIS	GFCM	IOTC	IATTC	ICCAT	NAFO	SEAFO	WECAFC	WCPFC	NEAFC	CMS	CMS/MoU Sharks	CITES
Maldives		X									X	X
Malta	X	X	X	X	X	X	X	X	X	X	X	X
Marshall Islands								X			X	
Martinique												
Mauritania		X		X						X	X	X
Mauritius		X								X	X	X
Mexico			X	X			X				X	X
Micronesia, Federated States of								X				
Monaco	X											
Montenegro	X									X	X	X
Montserrat												
Morocco	X			X						X	X	X
Mozambique		X								X	X	X
Myanmar											X	X
Namibia				X		X					X	X
Nauru								X			X	
New Caledonia												
New Zealand								X		X	X	X
Nicaragua			X	X			X				X	X
Nigeria				X						X	X	X

PAIS	GFCM	IOTC	IATTC	ICCAT	NAFO	SEAFO	WECAFC	WCPFC	NEAFC	CMS	CMS/MoU Sharks	CITES
Northern Mariana Islands												
Norway				X	X	X		X	X	X	X	X
Oman		X									X	X
Pakistan		X								X	X	X
Palau								X		X	X	X
Panama			X	X			X			X	X	X
Papua New Guinea								X			X	X
Peru			X	X						X	X	X
Philippines		X		X				X		X	X	X
Pitcairn												
Portugal		X	X	X	X	X	X	X	X	X	X	X
Puerto Rico												
Russian Federation				X	X			X	X		X	X
Saint Kitts and Nevis							X				X	X
Saint Lucia							X				X	X
Saint Martin												
Saint Vincent and the Grenadines				X			X				X	X
Samoa								X		X	X	X
Saudi Arabia										X	X	X
Senegal				X						X	X	X

PAIS	GFCM	IOTC	IATTC	ICCAT	NAFO	SEAFO	WECAFC	WCPFC	NEAFC	CMS	CMS/MoU Sharks	CITES
Seychelles		X								X	X	X
Sierra Leone		X		X							X	X
Singapore											X	X
Sint Maarten												
Slovenia	X	X	X	X	X	X						
Solomon Islands								X			X	X
Somalia		X								X	X	X
South Africa		X		X		X				X	X	X
Spain	X	X	X	X	X	X	X	X	X	X	X	X
Sri Lanka		X								X	X	X
Sudan		X									X	X
Suriname							X				X	X
Taiwan, Province of China			X					X				
Tanzania, United Republic of		X								X	X	X
Thailand		X									X	X
Timor-Leste											X	
Tonga								X			X	X
Trinidad and Tobago				X			X				X	X
Tunisia	X			X						X	X	X
Turkey	X			X							X	X

PAIS	GFCM	IOTC	IATTC	ICCAT	NAFO	SEAFO	WECAFC	WCPFC	NEAFC	CMS	CMS/MoU Sharks	CITES
Turks and Caicos Islands												
Tuvalu								X			X	
United Kingdom		X	X	X		X	X		X	X	X	X
United States				X	X		X	X			X	X
Uruguay				X						X	X	X
Vanuatu			X	X				X			X	X
Venezuela, Bolivarian Republic of			X	X			X	X			X	X
Viet Nam											X	X
Virgin Islands, British												
Virgin Islands, U.S.											X	X
Western Sahara												
Yemen		X								X	X	X

Anexo VII Identificación de la aleta del tiburón Mako (*Isurus oxyrinchus*) (Adaptado de Abercrombie & Hernandez 2017)

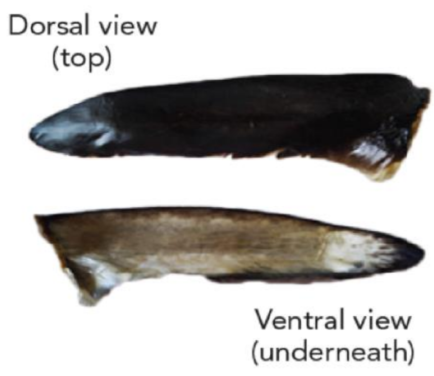


Aletas pectorales del Tiburon mako (*Isurus oxyrhinchus*):

La superficie dorsal es de color marrón grisáceo oscuro o gris pizarra con un margen blanco evidente que corre a lo largo del borde de la punta trasera libre

La superficie ventral es blanca uniforme o de color claro, sin marcas oscuras visibles

Ápice moderadamente redondeado



Aletas pectorales del tiburón mako de aleta larga (*Isurus paucus*):

La superficie dorsal es de color marrón grisáceo oscuro o gris pizarra con un margen blanco obvio que corre a lo largo del borde de la punta trasera libre

La superficie ventral es mayoritariamente blanca o de color claro con manchas oscuras en el ápice y a lo largo de los márgenes de los bordes anterior y posterior

Ápice moderadamente redondeado