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

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SUPPLEMENTARY INFORMATION ON CITES COP 18 PROPOSAL 42: CONFIRMING THAT SHORTFIN AND LONGFIN MAKO SHARKS FULLY MEET THE CRITERIA FOR INCLUSION ON CITES APPENDIX II

This document has been submitted by Senegal in relation with proposal 42.[1]

1. Overview

Prop. 42 concerns the inclusion in Appendix II of the shortfin mako shark, *Isurus oxyrinchus*, 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).

This document presents the 2019 IUCN Red List assessment and summarises two major new scientific studies[2,3] published after Prop. 42 was drafted, submitted and analyzed by the FAO Expert Panel and CITES Secretariat. This research throws new light on the severely threatened status of the shortfin mako, and the urgent need to introduce sustainable fisheries management and regulate international trade.

These studies demonstrate that shortfin mako stocks are in danger of population collapse. The cause is a very high geographic overlap between their oceanic habitat and decades of intensive longline fishing effort that may have removed the majority of juveniles aged 3–10 years. Shortfin mako caught in recent years were the offspring of females born before fisheries expanded. High juvenile mortality since the 1980s means that the adult sharks now dying of old age will not be replaced by similar numbers of maturing sharks. This combination of high juvenile mortality, a 10–20 year lag between exploitation and maturity, and the imminent loss of the large cryptic biomass of aging mature sharks has masked an impending collapse in recruitment and population crash that we are only now beginning to understand.

Current fisheries management measures under ICCAT will not halt the decline. No other RFMOs limit mako catches, although the same intrinsic and extrinsic threats apply elsewhere. A CITES Appendix II listing will supplement and support fisheries management efforts, including for high seas stocks.

We urge Parties to consider this additional information in their CoP decision-making on Proposal 42..

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* *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 https://www.iccat.int/Documents/Meetings/Docs/2019/REPORTS/2019_SMA_SA_ENG.pdf. *Report of the 2019 shortfin mako shark stock assessment update meeting.*

3 https://www.nature.com/articles/s41586-019-1444-4. *Queiroz et al. Global spatial risk assessment of sharks under the footprint of fisheries.*

2. New IUCN Red List assessments[4], released in March 2019

The new IUCN Red List of Threatened Species assessment for the shortfin mako shark, summarized here, finds the species to be Globally **Endangered**. It did not consider the new studies described below.

"The Shortfin Mako is a large pelagic shark, widespread in temperate and tropical oceans. It has low biological productivity with a triennial reproductive cycle and late age at maturity. Steep population declines have occurred in the north and south Atlantic. Declines are also evident in the north Pacific and Indian Oceans. The south Pacific population appears to be increasing but with fluctuating catch rates. The weighted global population trend estimated the highest probability of 50–79% reduction over three generation lengths (72–75 years), and therefore the Shortfin Mako is assessed as Endangered A2bd."

CITES Appendix II listing facilitates management of species that *'although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival'*[5]. The shortfin mako is already threatened with extinction and the case for listing in Appendix II, as stipulated in the Convention text, is clear. Furthermore, in several locations the species meets the Appendix I criteria and requires full protection. Listing in CITES Appendix II will ensure that trade in mako products is legal and sustainable, and facilitate the application of trade controls to complement the domestic and regional biodiversity conservation and fisheries management measures that this species urgently needs.

3. New ICCAT stock assessment and advice[6]

In May 2019, ICCAT Shark Species Group scientists met to update the Atlantic shortfin mako shark stock assessment and refine their 2017 advice to ICCAT Parties for the North and South Atlantic fisheries. All assessment models indicate that the North Atlantic stock will continue to decline until at least 2035, even if fishing ceases immediately. This is due to a combination of depleted age classes following 30 years of overfishing 3–10 year old juveniles (larger sharks are only caught in research surveys), and aging/dying mature females. The species' high age at maturity (50% at 21 years old) and longevity produces a cryptic biomass of mature animals that has enabled recruitment to continue and, until now, masked massively unsustainable juvenile mortality. Earlier, more optimistic, stock assessments had not fully considered the 10–20 year lag between exploitation and reproduction, nor the impact on pup production of 30 years of depleted age classes. Females only produce ~12 pups every 2–3 years, so pup production is closely related to mature female abundance. The low numbers of survivors from 30 years of overfishing will produce significantly fewer pups than the unfished adult generations that they are replacing.

No projections were prepared for the data-poor South Atlantic stock, but its similar biology and fisheries development trends indicate a high risk that this will follow a similar trajectory and require decades to rebuild even after significant catch reductions.

The ICCAT Shark Species Group concluded by reiterating its 2017 advice for a complete prohibition on retention of North Atlantic mako sharks. This represents far stronger action than mandated by a CITES Appendix II listing. However, ICCAT Parties have failed to take action to prevent stock collapse, leaving inclusion in Appendix II necessary to ensure that landings are reduced to sustainable levels, not only in the Atlantic, but worldwide. The management history of the oceanic whitetip shark, rejected for Appendix II until after the tuna RFMOs had prohibited its retention, is a salutary reminder of the result of failing to take timely action to introduce sustainable management measures for threatened pelagic sharks.

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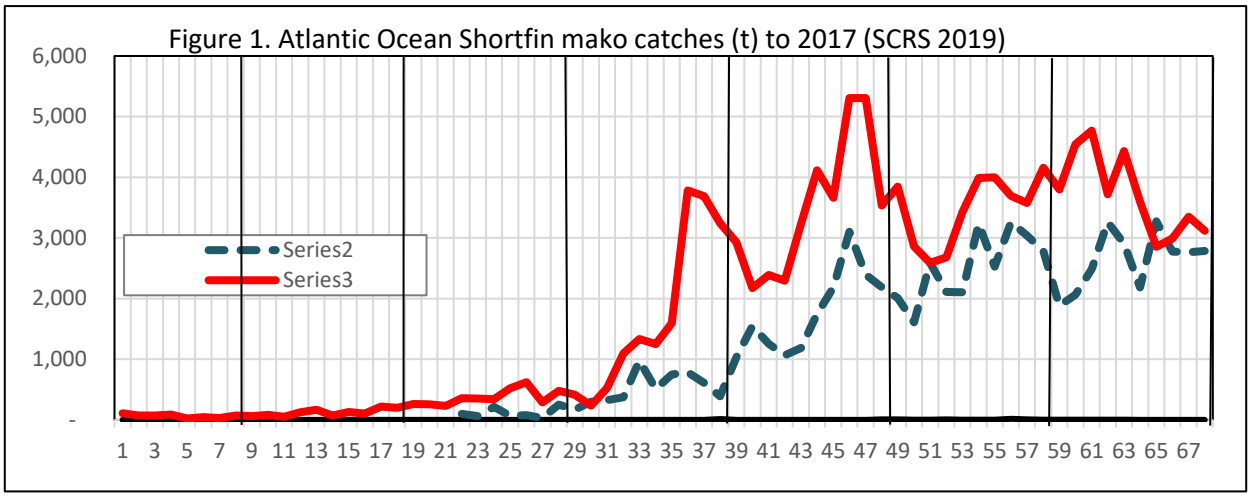
4 https://www.iucnredlist.org/search?taxonomies=117291&searchType=species

5 *CITES Convention Text, Article 2: Fundamental Principles.*

6 https://www.iccat.int/Documents/Meetings/Docs/2019/REPORTS/2019_SMA_SA_ENG.pdf. *Report of the 2019 shortfin mako shark stock assessment update meeting.*



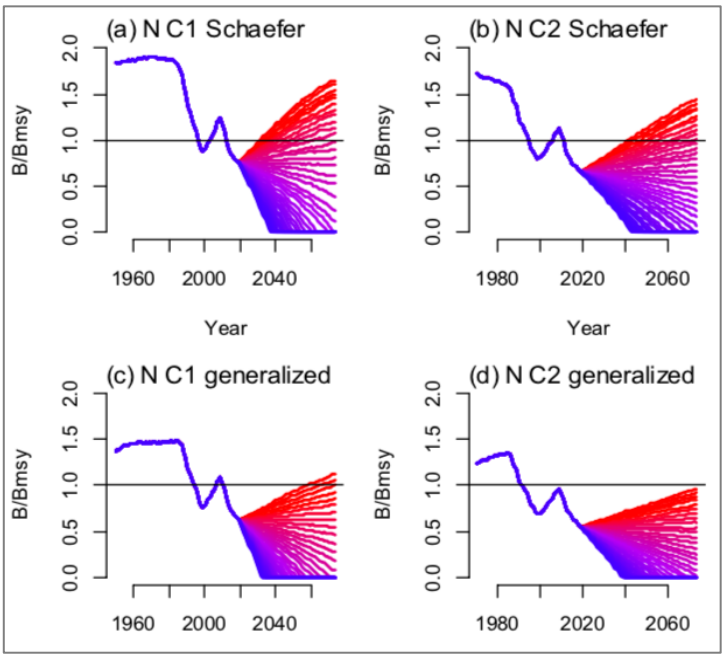


Figure 2. North Atlantic shortfin mako stock projections from 2019 to 2073, updated in 2019 from the 2017 assessment. (SCRS/2019/092)

Lines are TACs from zero catch (red) to 4,000 mt (blue), in 100 mt increments.

This figure presents four modelled scenarios for a range of Total Allowable Catches (TAC), from recent catch levels, which lead to stock collapse, to a zero TAC. All TACs are inclusive of dead discards. The Shark Species Group noted that zero mortality is unachievable because some dead discard of bycatch is inevitable, even with a prohibition on retention of mako.

The key conclusions of the 2019 ICCAT Shark Species Group report are as follows:

a) Despite its binding nature, the ICCAT Recommendation has not stopped overfishing:

ICCAT Rec. [17-08], to reduce shortfin mako fishing mortality, requires CPCs to report catches for the first six months of 2018. The total was 1,530 t, not a significant reduction from recent years (see Figure 1). "*The Group agreed that the exceptions in Rec. [17-08] that allow for the retention of some caught shortfin mako will not permit the recovery of the stock by 2070*."

b) The findings regarding North Atlantic shortfin mako current status and future projections from the 2019 analysis updates those contained in CoP18 Prop. 42, and considered by the Sixth FAO Expert Advisory Panel Assessment of Proposals (CoP18 Doc. 105.3 Annex 1):

"The Group conducted new projections using two Stock Synthesis model scenarios that incorporated important aspects of shortfin mako biology. This was a feature that was not possible with the production model projections developed in the 2017 [ICCAT SCRS] assessment and, therefore, the Group considers the new projections as a better representation of the stock dynamics."

c) The status of North Atlantic shortfin mako population has continued to deteriorate since the 2017 assessment. The stock will continue to decline for at least another fifteen years before rebuilding can begin. The report summarizes:

- *Regardless of the TAC (including a TAC of 0 t), the stock will continue to decline until 2035 before any biomass increases can occur;*
- *The stock synthesis projections indicated that: a zero TAC[*] will allow the stock to be rebuilt and without overfishing (in the green quadrant of the Kobe plot) by 2045 with a 53% probability;*
- *A TAC of 300 tons, including dead discards, has only a 60% probability of rebuilding the stock to levels above SSF_{MSY} and below F_{MSY} in 2070[7].*

d) Far stronger management is needed for this species:

For the North Atlantic, the ICCAT scientists recommended the following: "*Given the vulnerable biological characteristics of this stock and the pessimistic findings of the projections, to accelerate the rate of recovery and to increase the probability of success the Group recommends that the Commission adopt a non-retention policy as it has already done with other shark species."*

For the South Atlantic, the ICCAT scientists recommended the following: "*Given that fishery development in the South predictably follows that in the North and that the biological characteristics of the stock are similar, there is a significant risk that this stock could follow a similar history to that of the North stock. If the stock declines it will, like the North stock, require a long time for rebuilding even after significant catch reductions. To avoid this situation and considering the uncertainty in the stock status, the Group recommends that, at a minimum catch levels should not exceed the minimum catch in the last five years of the assessment (2011-2015; 2,001 t)."*

Furthermore, reporting of dead discards and live release of bycatch is of utmost importance. Additional measures to further reduce incidental mortality, including time/area closures, gear restrictions, and safe handling and best practices for the release of live specimens (since post-release survival can reach 75%).

4. **Nature paper on global spatial risk assessment of sharks under the footprint of fisheries**[8].

This landmark research, published in July 2019, showcases the extreme vulnerability of shortfin mako sharks to high seas longline fisheries. It explains and reinforces the declines described in the IUCN Redlist and the 2019 ICCAT stock assessment, by quantifying the high geographic and temporal degree of overlap between satellite tracked pelagic sharks and commercial fisheries in all oceans. It highlights the particularly high risk faced by the shortfin mako, whose juveniles are captured in large numbers during eight of their first ten years of life before they reach a size refuge from fisheries, due to their limited spatial and temporal refuge from fishing.

The shortfin mako shark was the second (after blue shark) most frequently tagged and tracked of the 22 species analysed, with 261 tags and 56,071 tracking days, mostly in the North Atlantic and East Pacific (Figure 4). In the North Atlantic, shortfin mako was at significantly greater risk compared to all other tracked species except blue sharks, with a mean monthly space use overlap of 62% (median, 71%), co-occurring with a high mean fishing exposure index (FEI). Globally, there was a 37% overlap between shortfin mako tracks and longline vessels, with an 18% overlap in Oceania and 13% in the East Pacific.

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[*] *All TACs are inclusive of dead discards.*

[7] *SSF: spawning (pupping) stock fecundity = biomass of reproductive females. F: fishing pressure. MSY: the level that gives the maximum sustainable yield.*

[8] https://www.nature.com/articles/s41586-019-1444-4. Queiroz et al., July 2019.

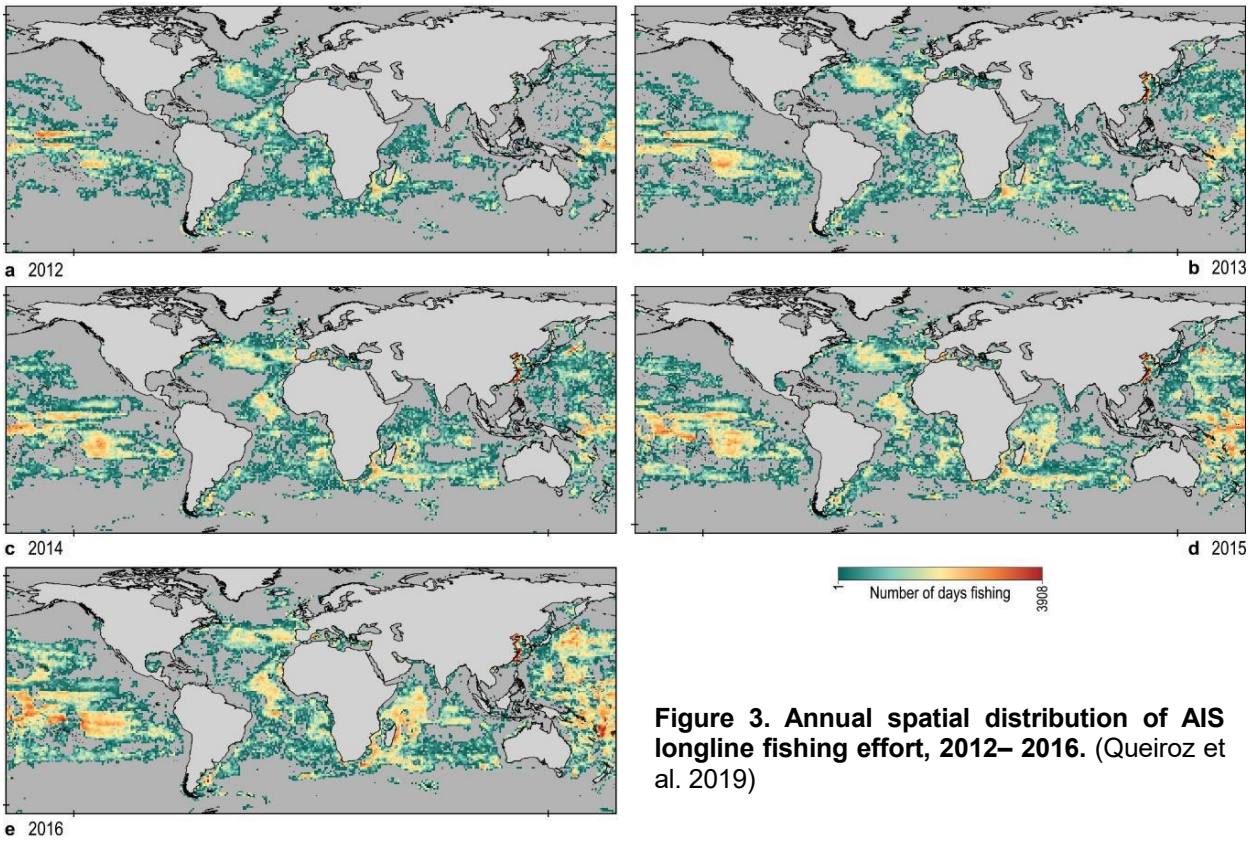

Figure 3. Annual spatial distribution of AIS longline fishing effort, 2012– 2016. (Queiroz et al. 2019)

In other words, habitat hotspots for mako shark coincide with hotspots for industrial fishing vessels and high fishing effort. This species had by far the highest proportion of tag recaptures, at 11.5% globally and 19.3% in the North Atlantic. This is the highest tag recapture rate observed for any oceanic shark species in an ocean-basin scale study. The fishing overlap and effort on shortfin mako habitat appears less extensive in the eastern Pacific, southern Indian Ocean and the Oceania region, but there are fewer tracks to analyse in the South Pacific and southern Indian Ocean, and no data for the South Atlantic, Western and Central Pacific and Indian Oceans, although intensive fishing effort certainly coincides with mako habitat in these regions (Figures 3 and 4). Management within the EEZs of Australia, Canada, Chile, New Zealand and the USA may be sufficient to reduce landings in these areas, but high seas fisheries remain largely unmanaged and likely also unsustainable.

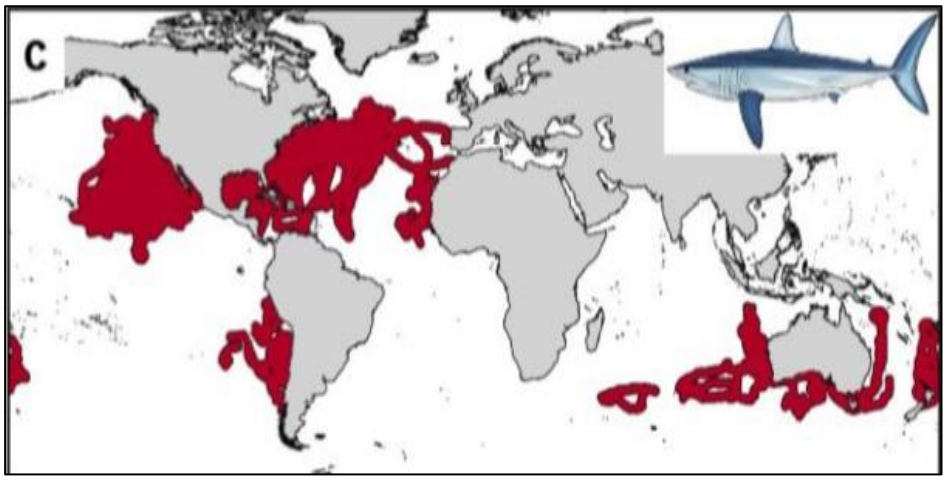

Figure 4. Movements of shortfin mako sharks. Daily state-space model locations estimated from locations obtained via satellite transmitters deployed on 261 tags and 56,071 tracking days between 2002–2017**.** (Queiroz et al. 2019)

These observations complement other recent analyses indicating the previously hidden impact of intensive fisheries on juvenile makos during the first decade of their life, and the very damaging long-term impact on mako stocks once large females cease pup production, die, and no longer mask the

huge juvenile mortality in previous decades. This extreme exposure to high fishing effort, affecting up to 64% of mako space use per month, extends across ocean-wide population ranges and overlaps areas in the high seas where makos are most abundant, and where little to no management is in place.

In addition to reported declines and a vulnerable life-history, These results show that there is an incredibly high probability of mako sharks encountering commercial fisheries in every ocean. Combined with their vulnerable life history, this high level of fishing pressure explains This reinforces the reasons for the declines noted in the IUCN and ICCAT assessments, and reinforces the real risk that those declines are also happening in parts of the Pacific and Indian Ocean, making a global CITES listing essential.

5. Conclusions

Far stronger management action is needed for this species; inclusion on CITES Appendix II can assist in implementing, monitoring and enforcing such action.

This new evidence, unavailable at the time of proposal drafting and assessment, shows clearly that juvenile makos need to survive intensive longline fisheries for ten years (males) or two decades (females) if they are to reach maturity and reproduce. They have not been doing so in sufficient numbers over the past few decades, with the consequences seen clearly in the new ICCAT and IUCN assessments. This staged collapse of mako populations is currently playing out in the North Atlantic, where ICCAT scientists have been recommending the prohibition of catches since 2017, and the South Atlantic stock isn't far behind. Based on the new information on global fishing footprint overlap with mako sharks from Quieroz et al (2019), it seems possible that the Indian Ocean and Pacific populations, where intensive longline fisheries began more recently, will soon follow this trend unless ocean-wide sustainable management is implemented.

Mako sharks fully meet the CITES Appendix II listing criteria. CoP18 may represent the last opportunity to secure the future sustainability of mako shark fisheries, by including all stocks in Appendix II to ensure that sustainable management measures are introduced and implemented as a matter of priority. This measure will allow commercial catch and trade to continue, and prevent the commercial extinction of the species.

The Conference of Parties has seen the effect of being too slow to adopt trade management measures for numerous pelagic shark and ray species that are now prohibited in all or several tuna RFMO fisheries. These include Whale shark, oceanic whitetip, porbeagle, hammerheads, thresher sharks, silky shark, and the mobulid rays. CITES action in 2019 may be too late for the North Atlantic shortfin mako, but will be in time to prevent the commercial extinction of stocks in other oceans.