

# IOTC lagging behind on shark conservation - an analysis of the status quo and comparison with other tuna RFMOs

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## Abstract

This paper analyses the existing management measures of shark species at the four major tuna RFMOs, comparing the IOTC in the Indian Ocean with the ICCAT in the Atlantic and the two RFMOs in the Pacific, IATTC and WCPFC. Beside addressing the absence of much needed active management of sharks that are targeted for commercial reasons in all but one RFMO and the absence of consistent conservation and management measures for threatened shark species throughout the four RRMOs it also compares the historic development of existing measures and evaluates the effectiveness of existing measure for reducing shark mortality. Blue sharks are detailed as an example for the delay respectively absence of adequate stock management and management procedures. The background for the lack of effectiveness and willingness to manage sharks in a similar way as other commercial stocks is assessed and a road forward provided for IOTC by suggesting 12 specific improvements that should be urgently made in Conclusions and 12 Recommendations to improve Shark Conservation at IOTC.

In summary the paper finds that all RFMOs are falling short in properly protecting sharks and rays in their area of competence and have so far clearly failed in managing stocks at a sustainable level. However, IOTC lags farthest behind all other RFMOs in shark conservation and in its attempts to reduce shark mortality, whether in regard to the lack of management of targeted species, or the absence of, respectively the ineffectiveness of the few existing bycatch measures, that are further jeopardized by too many exceptions, poor compliance with reporting requirements and the absence of strong advice from IOTC' Scientific Committee. As an outcome no improvements have been implemented at IOTC over the last decade while other RFMOs have made at least some progress or progress in certain areas. All attempts that were made in the past by some CPCs to strengthen shark conservation measures have failed miserably due to either the lack of clear scientific advice or the unwillingness of some fisheries to accept any improvements for sharks that might impact their catches including shark catches or fishing routine. An analysis of existing measures and their weaknesses is tabulated for stock status, attempts of stock management, existing specific conservation and management measures for stocks including inter alia retention bans but also existing exemptions is discussed in the paper and details provided in Tables at the end of the paper. The paper concludes that shark conservation needs to supersede these obstacles at all RFMOs but specifically and most urgently at IOTC.

## 1. Introduction: The Indian Ocean – a Biodiversity Hotspot for Sharks and the Ocean of biggest Concerns

The Indian Ocean is often referred to as a hotspot of biodiversity and it certainly is an area that is both, of high significance and of high concern regarding the biodiversity of its unique megafauna in general and specifically for chondrichthyans. During a recent ISAR workshop the western Indian Ocean alone was found to exhibit “*125 Important Shark and Ray Areas, 1 candidate ISRA, and 45 Areas of Interest*” by the group of international experts. The identified Important Shark and Ray Areas there include a variety of regions throughout the Western Indian Ocean, including shallow coastal areas but also huge areas of more than 1,400,000 km<sup>2</sup> of the High Seas such as the Western Agulhas Front and areas including water columns from the surface down to the deep sea. Important Shark and Ray Areas are 'discrete, three-

dimensional portions of habitat, important for one or more shark species but not necessarily protected so far.

This highlights the immense richness of biodiversity and the importance of the Indian Ocean for sharks and rays indicating opportunities for effective conservation of chondrichthyans, many of which are by now globally facing the threat of extinction as apparent from the increasing number of sharks and rays having been listed as threatened by the IUCN over the last decade alone and the fact that many previously data deficient species have been reclassified as threatened as IUCN assessments became available accumulating to more than one-third (37.5%) of chondrichthyans now being threatened by extinction and three species already designated as possibly extinct. (N.K. Dulvy et al 2021). Only 7% of all assessed 1186 chondrichthyans were rated not to be threatened by fishing (Fowler et al 2022). Even more of concern to RFMOs should be the fact that three quarters of all pelagic species are threatened by extinction and that half of them are already endangered or even critically endangered (Pacoureau et al. 2021). RFMOs manage fishing in the exclusive economic zones of many member states as well as areas beyond national jurisdiction (ABNJ) that are home to highly migratory pelagic shark and ray species.

B. Worm et al. warned in 2024 that “total fishing mortality increased from at least 76 to 80 million sharks between 2012 and 2019, ~25 million of which were threatened species”, thereby disillusioning any stories about sustainable management and declines in shark mortality at a global level. While he acknowledged that coastal areas are of biggest concern and some reduction in mortality has been observed in pelagic fisheries this does not relate to the Indian Ocean with the northern Indian Ocean having been nominated as one of the “*current hotspots of Mortality*” and two third of the interviewed experts contributing to this paper had identified the Indian Ocean as one of the “*primary areas of shark bycatch concern*”.

It is important to note that shark bycatch in tuna fisheries operations is known to be extremely high due to the high spatial overlap of their distribution and the poor selectivity of most of the gear used in tuna fisheries, i.e. pelagic longlines, purse seine fishing setting on dFADs, and gillnets.

Furthermore, many tuna fisheries directly target sharks although sharks are not managed by the tuna RFMOs to the same level as tuna and tuna like species which they all have committed to manage sustainably, applying best science and a precautionary approach in their area of competence. Sharks, however, are still treated as a “bycatch” and deprived of Management Strategy Evaluation (MSE) and the development of Management Procedures that are increasingly adopted for tuna and tuna like species at all RFMOs

Also M. J. Juan-Jorda et al. in 2022 confirm that “*sharks remain undermanaged and their extinction risk continues to rise*” due to the “*ongoing challenge in the management of oceanic multigear and multispecies fisheries*”. The authors conclude that clear biodiversity goals and targets are needed and science-based conservation and fishery management measures must be implemented supplemented by international trade regulations. Without immediate implementation of an effective mitigation hierarchy of management actions to reduce shark mortality they project that “*their risk of extinction will continue to increase*”.

At IOTC several shark species are actively targeted by several CPCs, ranging from coastal fisheries to industrial fisheries and including mainly near threatened blue sharks, but also endangered shortfin mako sharks and vulnerable silky sharks among other threatened species, all of which are by now listed on CITES App II, subject to trade controls for the international trade and thus requiring a scientific non detriment finding (NDF) confirming that the removals are not jeopardizing the survival and ecosystem role of the species and the specific population (V. Mundy-Taylor et al 2014)) in the wild.

In 2024 H. Patterson, B. D’Alberto and D. Bromhead summarized the conservation status, vulnerability and management advice for the 7 key pelagic shark species at IOTC, blue shark, oceanic whitetip shark, scalloped hammerhead, shortfin mako, silky shark, bigeye thresher shark, and pelagic thresher shark. Those are the only species systematically reviewed by the Scientific Committee while more than 20 other shark species are known to regularly interact with IOTC tuna fisheries. The authors highlight the high uncertainty of catches and stock status, the high vulnerability of all those species by one or more gears in IOTC tuna fisheries and that

management advice recommending a precautionary approach and implementing additional measures exists for several species such as shortfin mako, oceanic whitetips, silky sharks. M. Cronin et. al. in 2023 evaluate conservation efforts and existing CMMs at tuna RFMO in regard to shark bycatch concluding that *“the majority of tRFMO policies concerning threatened pelagic elasmobranchs are focused on research (appearing in 100% of policies) and remediation (appearing in ~68% of policies), while few policies are directed at mitigation by avoiding, minimizing or compensating for bycatch”* while the hierarchy of bycatch measures should according to the authors prioritize avoidance via spatio-temporal management and/or depth prohibitions and minimization via gear and set modifications and catch limits, followed by remediation measures such as handling and release guidelines and the prohibition of retention. Compensation and research while important to pursue should be last in the hierarchy as clearly not able to directly change the situation on the water at this time. The authors also identify *“major data collection and transparency gaps in all five tRFMOs”* and highlight the concern that only few *“pelagic elasmobranch populations (15 of 95 eligible populations)”* have existing stock assessments whereas *“7 of the 15 assessed populations [being] overexploited”*. Here we are combing the intent of these studies and extending the analysis by an in-depth comparison of existing conservation measures for sharks and why many of these have failed to improve the situation on the water but also exploring differences between measures and the approach taken by the four big tuna RFMOs. We analyze and compare existing measures for key pelagic shark species between RFMOs in detail and review the history of how those have been developed to highlight important differences in the attitude pursued by the different tuna RFMOs, the effectiveness of shark conservation and why IOTC is lagging farthest behind with the last shark resolution having been adopted in 2018, six years ago despite the crisis sharks are facing and the derived threat for the future of sustainable tuna fisheries. Especially when reviewing the gaps for the conservation and management of pelagic elasmobranchs in the various tuna RFMOs it is important to review the details of existing measures as otherwise measures e.g. the prohibition of finning or retention bans may appear to be equal but result in quite different outcomes. This is also important to consider when drawing conclusions on the suitability of measures and making recommendations for improvements.

## 2. Analysis and Discussion:

### Sustainable Management of Shark Populations by tuna RFMOs?

V. Schatz and D. Kachelriess argue in 2023 that commercially exploited sharks such as blue sharks are not bycatch from the perspective of the FAO Bycatch Guidelines, UNCLOS or the UNFSA but must be classified as (secondary) target stocks. Therefore, *“these species must in principle be managed in accordance with the obligations laid down in the UNFSA for target stocks and it is not within the discretion of RFMOs to incorrectly designate species as “bycatch” or “non-target” to evade relevant obligations if the species in question are in reality (secondary) target stocks under UNCLOS and the UNFSA.”*

The authors also emphasize that CITES requirements to the sustainable management of App II listed species for non-detriment findings do not differentiate between bycatch and target species but apply to all.

The options of the four tuna RFMOs for the management of sharks as an incidental bycatch or as a – primary or secondary – target species are based on the competence of the RFMO as described in its constitutive instruments.

**WCPFC’s** mandate includes management of “highly migratory fish stocks” including all species listed in Annex 1 of [UNCLOS] occurring in the Convention Area. Therefore, WCPFC has the competence to regulate all sharks listed in Annex I of UNCLOS even as *primary* target species.

The **IATTC** Convention so far had not listed any pelagic sharks and therefore does not have a *primary* target species competence for sharks but IATTC may regulate sharks as incidental catch associated with fisheries for tuna or tuna-like species. Furthermore, IATTC has just agreed in its scientific body to include a list of 18 sharks that interact with IATTC fisheries including blue sharks, shortfin mako, silky sharks and many other pelagic shark species but

also crocodile sharks under the purview of the Commission and will decide upon this during its 2024 Commission Meeting (IATTC SAC 2024 Recommendations)

**ICCAT's** explicit mandate currently covers only the management of tuna and tuna-like fishes but in 2019 ICCAT adopted an amendment of the ICCAT Convention adding "*elasmobranchs that are oceanic, pelagic and highly migratory*" to ICCAT's primary management mandate. Although the amendment is not yet formally in force ICCAT has started managing several oceanic, pelagic and highly migratory elasmobranchs as ICCAT species by monitoring and reporting total mortality, performing directed research and regular stock assessments, and providing scientific advice from its scientific body to the Commission for blue sharks, shortfin mako sharks, and porbeagle as key shark species. It has also agreed in 2023 to include and extend these activities to other ICCAT sharks, such as pelagic stingray, silky shark, oceanic whitetip sharks, hammerhead sharks and thresher sharks. (ICCAT SCRS 2023)

**IOTC's** explicit mandate only covers species listed in Annex B to the IOTC Agreement, which currently does not contain any pelagic shark or ray species resulting in "*incomplete fisheries management and conservation coverage*" regarding sharks as noted in the 2<sup>nd</sup> IOTC performance review. However, even in the absence of a *primary* mandate for the conservation and management of sharks within their geographical competence, the practice of adopted resolutions shows implicit recognition that also IOTC may fully regulate shark fishing.

In summary all tuna RFMO can manage sharks sustainably by adopting effective CMMs, initiating MSE to develop robust Management Procedures and implementing measures to reduce shark bycatch respectively increase chances of bycatch survival.

All tuna RFMOs have the justification and tools to limit total mortality of all shark stocks impacted by RFMO fisheries to levels that will immediately end overfishing and rebuild overfished stocks in the shortest possible time with a high probability by applying scientifically justified target, limit and reference points in line with the substantially lower reproductive rates of chondrichthyans compared with tuna and tuna like species and applying a precautionary approach in case of uncertainty, regardless whether they designate sharks as a target, secondary target, or bycatch species. Available tools include but are not limited to time-spatial closures, quota allocation, prohibitions of retention, mandatory gear modifications, technical measures to reduce bycatch mortality, more species reporting requirements, mandatory best handling and release practices, while calling for further research and more data on their own will not change anything in time to prevent the complete collapse we are heading towards to. And as apparent from adopted CMMs at IOTC and ICCAT, that announced the intent respectively started to manage shark stocks in their area of competence, also these RFMOs that don't have an explicit mandate in their statutes yet to manage sharks, clearly can. However, so far announcements often failed to be followed up with the commitments and delivering effective measures.

Here it is also important to highlight that an NDF is, however, "*concerned with more than ensuring the survival of a listed species, or its relative short-term extinction risk*" as outlined in Article IV.2(a) and that Article IV.3 of (CITES 1983) refers to the assessment need of whether limiting trade is necessary in order to "maintain that species throughout its range at a level consistent with its role in the ecosystems in which it occurs" as well as "above the level at which that species might become eligible for inclusion in Appendix I". (V. Mundy-Taylor et al. 2014). Furthermore, CITES NDF requirements are irrespective whether the species is considered to be a target, secondary target or bycatch species.

When reviewing shark conservation efforts taken by tuna RFMOs so far, the history of failures and halfhearted attempts becomes most apparent from the trajectory of CMMs adopted for blue sharks and shortfin mako sharks at IOTC and ICCAT, which are analyzed in more detail below, while IATTC and WCPFC have not even started considering the development of management procedures, or at least harvest control rules and implement catch limits and quota

even for those clearly commercial shark species that are targeted by both industrial fleets and artisanal fleets in all oceans.

Blue sharks provide the best example for failed attempts of the sustainable management of sharks by tuna RFMOs as it is the only pelagic shark species interacting with tuna fisheries which is not yet globally classified as threatened by the IUCN. At this point it should however be noted that even 'near threatened' blue sharks, which are often referred to as being the shark species most resilient to overfishing, shows by now a downward trend in most oceans and is already classified as 'critically endangered' in the Mediterranean Sea, which is part of ICCAT's area of competence for tuna and tuna like species.

Oceana highlighted in a 2022 report that blue sharks are globally the most heavily caught shark species in tuna RFMOs and that "*there is no doubt that this is also a targeted species at all four tuna RFMOs*". The estimated global catch (landed) of 189,783 tonnes (t) Live Weight Equivalent (LWE) of blue sharks in 2019 translated into more than 7 million blue sharks killed when assuming a weight of 27 kg per animal. A. Climino (2023) estimated total blue shark mortality to be even significantly higher ranging between 6.5 and 11 million animals per year. Blue sharks make up for 60% of all shark catches globally and are the most commonly caught "bycatch" in tuna and swordfish longline fisheries. In the Atlantic Southwest 5 tonnes of blue shark are caught for every 1 tonne of tuna, with tuna thereby being the bycatch rather than the target catch.

Reported blue shark catches in 2019 in the Pacific accounted for 53%, in the Atlantic for 34% and in the Indian Ocean for 13% of the global catch (Oceana 2022) but especially in the Indian Ocean total removals could be much higher with annual catches at IOTC to be almost 50,000 tonnes.

Blue sharks are actively targeted in all four tuna RFMOs, by both industrial and artisanal fleets. Main catch nations in the Atlantic are Spain, Portugal, Japan and Morocco in the North and Spain, South Africa, Namibia, Brazil, Taiwan, Ghana in the South. In the Indian Ocean Indonesia and Spain are the biggest catch nations followed by Taiwan, Portugal and Seychelles. While most blue sharks in the Pacific are caught by Ecuador, Mexico and Peru, as well as by China and Taiwan, further followed by Japan, Portugal and Panama for the EPO. In the WCPFC catches are dominated by Taiwan and Japan, followed by Spain, Vanuatu and Fiji.

Tuna stocks and other species are now subject to comprehensive management procedures at all tuna RFMOs but similar management strategy evaluations to develop robust management procedures for commercially exploited blue sharks have not been started despite the economic importance of this species that achieved an estimated ex vessel value of 411 million US in 2019 (Oceana 2020). IOTC [Resolution 18/02](#) defines that based on the 2021 stock assessment the Scientific Committee (SC) should "*advice on management measures ensuring long-term sustainability of the stock, such as mitigation measures to reduce the mortality of blue shark, improving selectivity of fishing gears, spatial/temporal closures or minimum conservation sizes*" and in its final provision foresaw that based on the Scientific Committee's advice, "the Commission shall consider, at its 2021 meeting, the adoption of conservation and management measures, which could include the catch limit for each CPC to be decided taking into account the most recent reported catch information" and tasked the Scientific Committee on basis of the 2021 stock assessment "to provide advice, if possible, on options for candidate limit, threshold and target reference points for this species".

However, the advice provided by the Scientific Committee after the stock assessment (IOTC-SC Report 2021) recommends only "to closely monitor the stock", despite noting with reference to the stock assessment that "increasing current catches is likely to result in decreasing biomass and the stock becoming overfished and subject to overfishing in the near future" and neither considered the mandate given by Resolution 18/02 nor applying in the absence of sufficient data and scientific reference points a precautionary approach in line with Resolution 12/01 despite the poor data basis the catch estimates are based on (IOTC SC 2021). Neither a catch limit for each CPC, nor other measures to reduce mortality of blue shark were proposed or options for candidate limit, threshold and target reference points provided or initiated.

In 2023 the Maldives had already proposed a shark proposal to strengthen shark conservation and management at IOTC which inter alia repeated the provisions made by Res 18/02. In 2023 this proposal could not reach agreement and therefore the Commission requested specific scientific advice from the Working Party on Bycatch and Ecosystems and the Scientific Committee for its meeting in 2024 on two of the proposed measures, the extension of 'fins naturally attached' to include also fisheries landing sharks frozen and a bycatch mitigation measure to ban the use of wire traces and shark lines as had also already been suggested as an option in Resolution 18/02 to consider. As no clear advice was provided by the Scientific Committee regarding the adoption of 'fins naturally attached' (IOTC SC report 2023) and the effectiveness of a ban of wire traces and shark lines to reduce shark mortality the Commission failed again to agree on a new shark proposal in 2023. IOTC-2024-S28-PropV had been submitted by Maldives and Pakistan including inter alia 'fins naturally attached', a ban for wire traces and shark lines, improved reporting requirements, a retention ban for whale sharks, and specific conservation and management measures for blue sharks, including a total allowable catch, catch limits for each CPC to be decided taking into account the most recent reported catch information and strengthen the conservation and management of sharks within IOTC, including options for candidate limit, threshold and target reference points for the conservation and management of sharks caught for commercial purposes.

Therefore, the Commission REQUESTED the Scientific Committee to initiate management strategy evaluation (MSE) simulations for blue shark with the aim of developing an MP for the species. (IOTC Commission 2024)

**ICCAT** had pioneered blue shark management as early as 2015 by tasking the SCRS back in 2016 to develop "*in the light of the results of the next stock assessment of blue shark [...], if possible, options of HCR with the associated limit, target and threshold reference points for the management of this species in the ICCAT Convention area*". This happened in response to the uncertain outcome of the 2015 stock assessments. However, it took until 2019 before TACs for both blue shark stocks could be adopted as a precautionary measure on basis of catches reported for the previous years and allocating catches in the North Atlantic while postponing allocation of the TAC in the South Atlantic until the next stock assessment.

Although the request for the development of HCRs had been reiterated in Recommendations 2019/07 and 2019/08 and Rec 19-08 had noted with reference to the last stock assessment that "*the estimates obtained with the state-space surplus production model formulation were generally less optimistic, predicting that the stock could be overfished and overfishing could be occurring in some areas*" the development of HCRs was not further pursued at that time.

For the South Atlantic landings exceeded the adopted TAC of Rec 19/08 by more than 4,000 tonnes per year in 2020 and in 2021, or respectively by 17%. In addition, discards of about 200 tonnes were only reported by Japan, Korea and Chinese Taipei, while none of the other CPCs in the South Atlantic has so far complied with the requirement of discard reporting. Thereby, total mortality has been far above the agreed 28,923 tonnes for two years in a row because no catch allocation had been agreed.

The 2023 stock assessments for blue sharks highlighted that both stocks face imminent risks, requiring urgent action.

- With probability of 49.7% the **North Atlantic stock** is in the green quadrant of the Kobe plot (i.e. not overfished and not subject to overfishing), while there is a 49.6% probability that the stock is in the yellow quadrant (i.e. overfished but not subject to overfishing). The SCRS advised that "*the Commission reduces the current TAC to catch levels that will maintain the stock in the green quadrant of the Kobe plot with a high probability*".
- The **South Atlantic stock** has not been overfished in 2021 but has been subject to overfishing, i.e. shows a 46.5% probability of being in the orange quadrant of the Kobe plot, while the probabilities of being in the green quadrant and the red quadrant (i.e. overfished and subject to overfishing) are 44.7% and 8.02%, respectively. The SCRS concluded therefore that "*recent catches (2019-2021; 34,983 t mean catch) are [...] not*



*sustainable in the long term [and indicated] that catches of 27,711t (the estimated 2021 MSY) or less will immediately stop overfishing.”*

In 2023, ICCAT adopted at its 28<sup>th</sup> regular meeting in 2023 new recommendations for the conservation and management of both stocks of blue shark and agreed to tackle important, longtime overdue tasks by tasking the Scientific Committee to “*inform the Commission, by 2025 on the feasibility, cost, options and tentative roadmap for developing an MSE framework (including inter alia HCR with the associated limit, target and threshold reference points, etc.) for the management of this stock in the ICCAT Convention area.*”

[Rec 2023-10](#) for the North Atlantic reduces the previous TAC from 39,102 t to 30,000 t which is allocated between the 3 major catch nations in the North Atlantic but substantially higher than the catches of the two biggest catch nations in the last few years and also substantially higher than the TAC the SCRS had recommended. At a mortality of 30,000 tonnes the probability of the stock to remain in the green quadrant throughout the next 5 years is reduced to less than 60%.

[Rec 2023-11](#) for the South Atlantic reduces the previous TAC slightly from 28,923 t to 27,711 t and allocated the TAC between the 5 major catch nations. The assigned quotas require all of them to reduce catches below catches of the last few years in order to stop overfishing. At the adopted TAC the probability of keeping the stock in the green quadrant is 60% until 2029, by then the probability constantly decreases to only 54% by 2033.

Both Recommendations include an agreed repay scheme in case allocated quotas are exceeded and aim to strengthen reporting requirements for discards. However, neither of the adopted TACs follows a precautionary approach or considers impacts from climate change as such factors have not been included in the stock assessment models.

In summary, the adopted TACs stayed behind expectations and did not follow scientific advice, but reflect the important progress made at ICCAT by starting to manage Atlantic blue shark stocks. This has been possible due to clear recommendations to the Commission which were made by the SCRS when evaluating the outcome of the stock assessments and are in line with the intent of previously adopted Recommendations, to start managing these commercially exploited stocks the same way as tuna stocks.

IOTC has failed to take a similar step for blue sharks so far despite several attempts and thereby falls further behind in its obligation to sustainably manage IOTC species. Although sharks are not official IOTC species yet, healthy shark populations are essential for healthy marine ecosystems on which also tuna stocks rely on. All are at risk in the Indian Ocean and require immediate action.

## 2.1. Stock Status of Pelagic Sharks in the four big Tuna RFMOs

Table 2 provides an overview on existing stock assessments and the adopted management and conservation measures for the seven key pelagic shark species in the IOTC as recently also reviewed by H. Patterson et al (2024) but this overview compares the state at IOTC across all four big tuna RFMOs, including also porbeagle. Porbeagle sharks, blue sharks, and shortfin mako sharks are the three ‘major shark species’ at ICCAT and are also one of the key shark species at WCPFC. Reported and 7 or estimated catches from the most recent years are also compared across RFMOs whenever available. This is however not always possible for all species as each RFMO reports and summarizes shark bycatch data differently and not always according to the same reporting standards established for tuna catches in the annual Commission reports. Public access to aggregated shark bycatch data and the provided details also differ for RFMOs and other than ICCAT no differentiation of catches is made into landed and discarded dead (DD). Only ICCAT requires CPCs to provide also bycatch estimates of

sharks released alive, at least for some shark species such as shortfin mako sharks. All other RFMOs provide the release status, if at all, only for observed bycatch in separate files. At a nominal observer level of only 5% as required for longliners in all four RFMOs however this data is far from comprehensive. Reporting requirements also greatly differ between RFMOs and while ICCAT requires reporting at species level for most sharks, IOTC has varying reporting requirements for different gear types and as such does not require reporting of silky sharks in gillnet fisheries at the species level. IATTC staff also highlight a substantive lack of confidence in the validity of reported bycatch in the IATTC 2023 tuna stocks and ecosystem report, because the “reporting of bycatch data is not compulsory according to the data provision resolution (C-03-05) and the corresponding memorandum of technical guidelines (see SAC-12-09, WSDAT-01-01) which contributes to the variability.”

Therefore, the provided shark bycatch data should always be interpreted as minimum catches rather than a compilation of total catch and by no means as an indication of total mortality. The comparison between the four RFMOs’ databases provides therefore a snapshot to highlight the magnitude of catches for key pelagic sharks and the substantial differences in the four RFMOs as a result of different reporting standards and different management and conservation measures in place. All data used in this paper were obtained from publicly accessible reports or the public databases as provided on the RFMOs websites.

### 2.1.1. Reported catches are mostly incomplete and total mortality remains highly uncertain

Figure 1 compares the shark species of interest at the four tuna RFMOs showing the number of species for which data are reported and assessments carried out. Substantial differences exist between RFMOs and e.g. WCPFC reports most shark species only in aggregated form. However, all tuna fisheries interact more or less with the same sharks and rays when fishing for tuna and tuna like species in the high seas and EEZs or when targeting commercially exploited shark species in the area of competence of the four tuna RFMOs. Only ICCAT and IATTC have recently published lists of these sharks. Also, the number of species considered to be under the purview of the RFMOs differs substantially, while this number is currently under revision in several of the RFMOs.

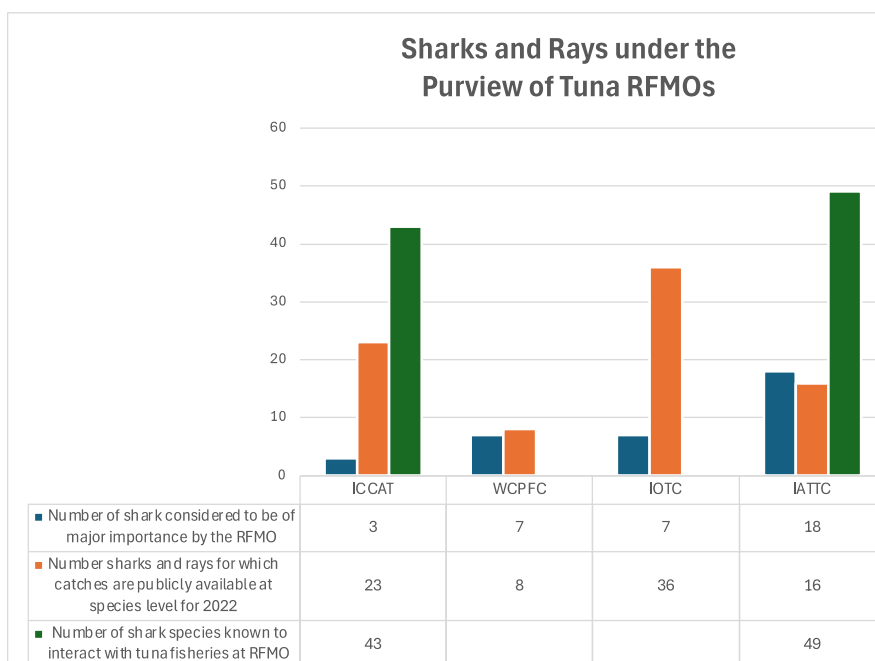


Figure 1: Comparison of sharks and rays reported, assessed and “managed” at the four tuna RFMOs

**ICCAT** reports landings and discards for the 3 major ICCAT shark species, blue shark, shortfin mako and porbeagle. Reported catches are by CPC and gear type and further geographically



differentiated as part of the SCRS report and in the annual report. However, till today only very few CPCs have reported shark discards at all even for those main species. Since 2021 discard reporting has been strengthened at least for shortfin mako in the adopted recommendations 2021/09 and 2022/11 determining that non reporting of discards will exclude CPCs from potential future retention quota. Since then, the reporting of dead discards of shortfin mako has improved in the North Atlantic but information on live discards remains unsatisfactory overall as noted by the SCRS at its 2023 meeting. (ICCAT SCRS 2023) Other shark species that interact with ICCAT fisheries are reported as bycatch either in numbers of animals or in tonnes in the publicly available bycatch datafile for Task 1 data including sharks at [Nominal Catch Information](#). Following the CITES listing of all *Carcharhinidae* and *Sphyrnidae* in 2023 ICCAT has updated its list of bycatch sharks by 27 more species (ICCAT App 5) adding up to a total of 43 shark species of minor commercial importance.

**IOTC** collects information on bigeye thresher shark, blue shark, silky shark, oceanic whitetip shark, pelagic thresher shark, shortfin mako shark and scalloped hammerhead shark as the 7 key IOTC shark species for which the SC provides species summaries. Reported catch data are also available on the IOTC website. [NOMINAL CATCH BY SPECIES, GEAR AND VESSEL FLAG REPORTING COUNTRY](#) However, many shark species at IOTC are not reported at species level or not for all gear. For example, silky sharks do not have to be reported at species level by driftnet fisheries. Total mortality is highly uncertain for all sharks including those of substantial commercial value as more than 30,000 tonnes of sharks are reported as 'nei' (not reported elsewhere) either at a highly aggregated level (*Carcharhinidae*) or even only as 'various sharks'. These 'nei' sharks therefore include significant yet unknown quantities of the 7 key shark species hindering mortality estimates for stock assessments, as these quantities are then either completely unaccounted for or simply split between species for stock assessments affecting the quality of those outcomes with total mortality of most shark species remaining highly uncertain. This even applies for targeted sharks that are caught in substantial quantities for commercial purposes such as blue sharks and shortfin mako. Silky sharks are also targeted by several coastal fisheries in the Indian Ocean by gillnets but mostly not reported or not reported at species level as overall reporting of shark data by coastal fisheries remains extremely poor. Shark discards are only reported in longline and purse seine fisheries as part of the national reports submitted by CPCs to the Commission annually. Systematic non reporting of silky shark discards by several CPCs for their purse seine fleets is known (Ziegler 2022) to exist and reported discards for longline fisheries are limited to observer data and the low level of human observer coverage of only 5% required at IOTC.

**WCPFC** requires reporting for shark species designated as Key Shark Species for Data Provision and Assessment identified as described in [WCPFC Key Document SC-08](#) and collect the scientific data specified by [WCPFC Key Document Data-01](#) for those species to be provided to the Commission. Estimated catches are also modelled for 8 shark species (Blue shark, Bigeye thresher, Shortfin mako, Silky shark, Pelagic stingray, Mobulid rays, Thresher sharks, and Oceanic whitetip sharks) based on observer data separately for longline and purse seine fisheries, the two main fisheries at WCPFC. Most recent data sets including landings and discards from longliners are available as number of animals and as tonnage up to 2021 (Peatman and Nicol 2023) while purse seine data are available only in number of animals up to 2020. (Peatman and Nicol 2021). Although not including all fisheries those estimated catches may be more applicable than reported observer data alone at an observer coverage of only 5% for longliners. Observer coverage for purse seiners is substantially higher but has been almost completely suspended during COVID and applies to a different bycatch species composition.

**IATTC** reports shark catches publicly as bycatch in separate files for [longlines and purse seine by flag state, time and area](#) in either metric tonnes and / or number of animals. A total of 49 shark species have been recorded to interact with industrial (purse-seine and longline) and artisanal (longline and gillnet) pelagic fisheries in the EPO, (Griffiths et al 2022) but only 10 codes are publicly reported for longlines and purse seine, most of them only as aggregated

categories as sharks, mako sharks, hammerhead sharks, or requiem sharks. Blue sharks, oceanic whitetip sharks, blacktip sharks, shortfin mako sharks and silky sharks are the only ones reported at species level in the public database. The reports of the scientific staff also evaluate the three species of thresher sharks, scalloped, great, and smooth hammerhead sharks separately at species level for purse seine and longline fisheries in metric tonnes and for five species of rays for purse seine in numbers of animals (IATTC 2024).

Figure 2 below compares reported catches of blue sharks, the globally most heavily fished shark species in tuna RFMOs with reported catches of more than 60,000 tonnes in the Atlantic and also substantial catches in all other oceans. While Poseidon 2022 had reported the West Pacific to be the origin of most blue shark catches the databases assessed here do not represent this but indeed show ICCAT to be the origin of largest catches of blue sharks, followed by WCPFC, IOTC and IATTC, at least when evaluating the data published on the RFMOs' databases and in their reports. Catches have also remained relatively stable when comparing catches prior to COVID and after COVID at each of the RFMOs. These two years were selected to see whether shark exploitation has changed during respectively after the pandemic. However, catches in all RFMOs decreased only slightly and may also be due to decreased compliance in reporting since the pandemic.

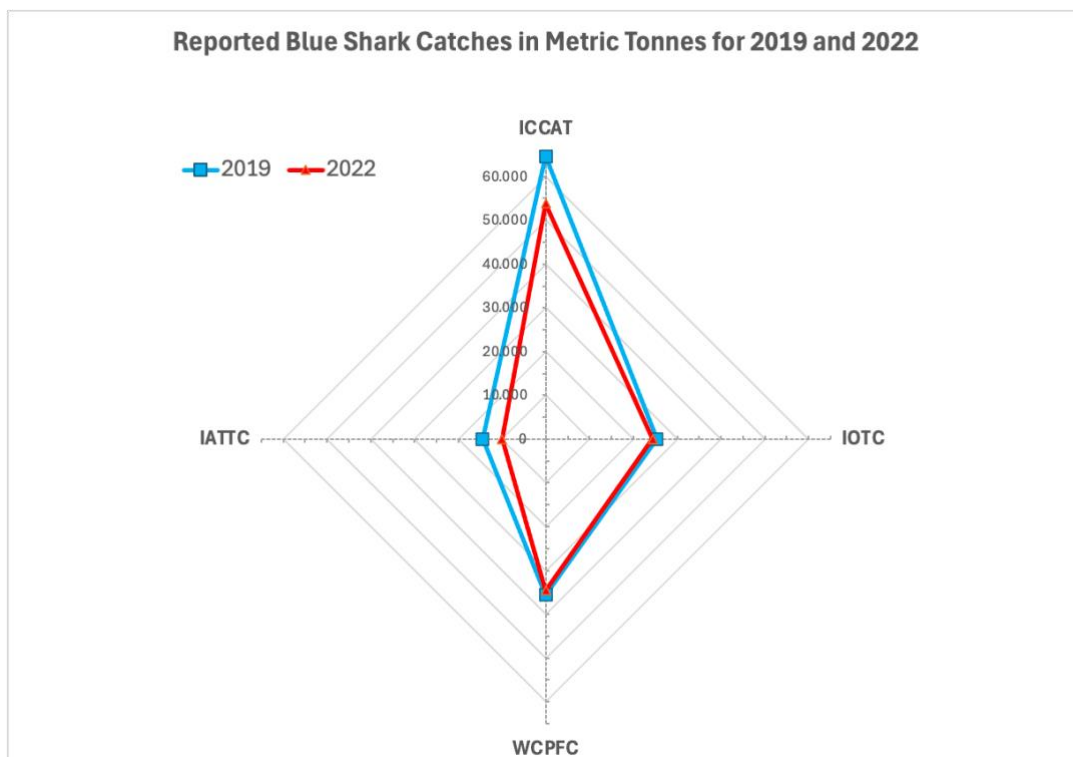


Figure 2: Comparison of reported blue shark catches in the four big tuna RFMOs for 2019 i.e. prior to COVID and in 2022 i.e. after COVID using publicly available catch data. Dead Discards are only reported separately as DD by some CPCs for some species at ICCAT, therefore no differentiation is made between landed and discarded catch here.

Figure 3 and Figure 4 then compare the reported catches of other sharks, several of them aggregated at family level as not all RFMOs provide catches for all of them at species level. And while no attempt is made here to differentiate between landed catches or discards due to existing retention bans for some of these species at various RFMOs, substantial difference in catches of those species, all of them being classified as threatened by IUCN, are apparent. The overall extent of these catches, while different for different species in different RFMOs is extremely concerning and even more keeping in mind that compliance with reporting requirements remains very low in all RFMOs and at IOTC especially.

Therefore, catches of several thousands of tonnes of hammerhead sharks and thresher sharks at IOTC but also substantial mortality of thresher sharks at ICCAT and WCPFC remain a

concern. No hammerhead catches are publicly available at WCPFC other than for purse seiners, which however report rather low numbers only. And at IATTC all catches by longliners have dropped substantially after the pandemic, which may however not reflect the reality, as for some of the species reported catches had been substantially higher even during the pandemic. That catches now have decreased truly after the pandemic needs to be confirmed and may be revised when reporting compliance improves again at least to the pre COVID level, always keeping in mind that at only 5% observer coverage reliability of reported interactions remains low.

For mako sharks and silky sharks, which are without doubt also targeted in several if not all RFMOs where no retention ban applies to the species, the reported catches are also highly concerning for such low reproductive species. And shortfin mako is known to be already overfished in the Atlantic and now also in the Indian Ocean, while silky shark population status is mostly unknown other than at WCPFC where the latest stock assessment confirms the stock to be still overfished but maybe slowly recovering, as a result of the retention ban for the species at WCPFC.

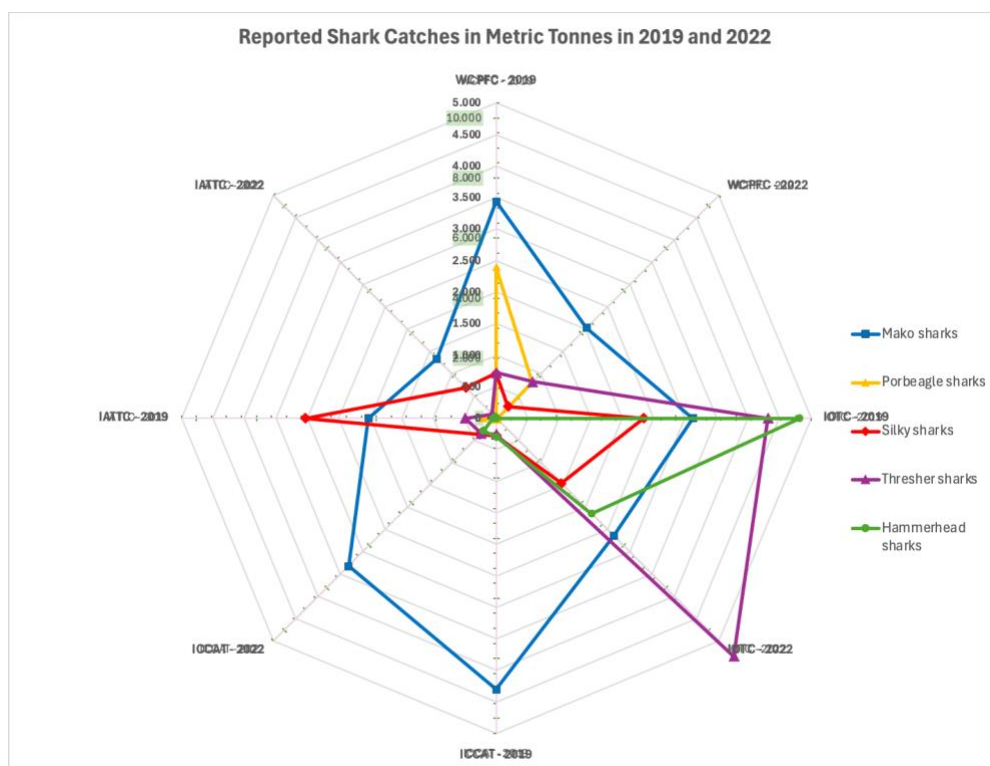


Figure 3: Comparison of reported catches in the four big tuna RFMOs for 2019 i.e. prior to COVID and in 2022 i.e. after COVID using publicly available catch data for mako sharks, silky shark, thresher sharks and hammerhead sharks and porbeagle. Dead Discards are only reported separately as DD by some CPCs and species at ICCAT; Therefore, no differentiation is made between landed and discarded catch here, even for those species for which a retention ban applies at a specific RFMO. Catches for mako sharks, thresher sharks, and hammerhead sharks have been aggregated in order to have a comparable data set for all RFMOs as WCPFC and IATTC do not report all of them at species level. Individual catches at species level are however compiled in [Table 2](#) when available. **Note:** hammerhead sharks are depicted on the secondary axes in green colour as aggregated quantities at IOTC in 2019 exceeded 10,000 tonnes.

Oceanic whitetip shark is still overfished in WCPFC and stock status is unknown in the other RFMOs but all have adopted a retention ban for this species over the last decade, which may however not be effective enough in view of the continued interactions with tuna fisheries and without additional measures in place to reduce bycatch mortality and improve post release survival. So far WCPFC is the only RFMO that has implemented such measures for the longline fisheries.

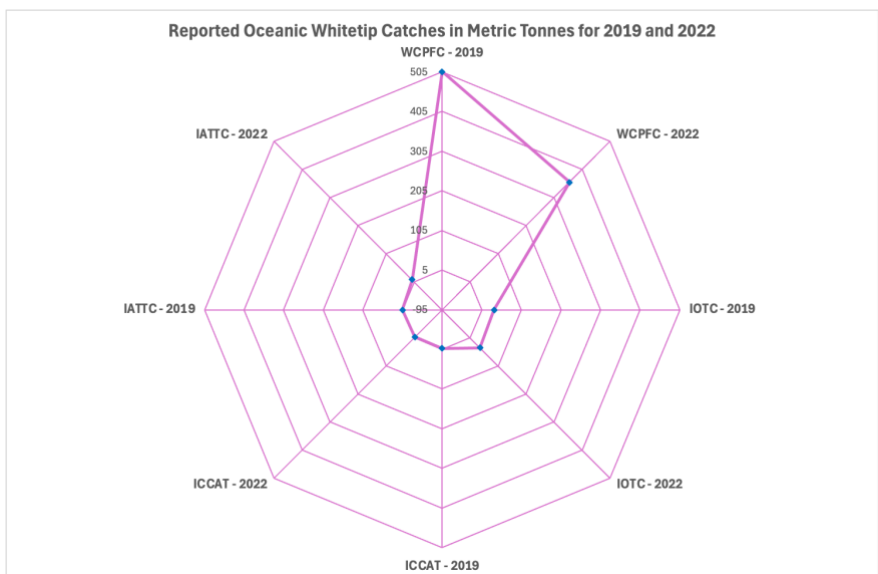


Figure 4: Comparison of reported catches in the four big tuna RFMOs for 2019 i.e. prior to COVID and in 2022 i.e. after COVID using publicly available catch data for oceanic whitetip sharks. Dead Discards are only reported separately as DD by some CPCs and species at ICCAT; therefore, no differentiation is made between landed and discarded catch here, although a retention ban applies at all RFMOs.

Pelagic rays are the really forgotten sharks in most RFMOs although a retention ban has now been adopted for mantas and mobulid rays by all tuna RFMOs, respectively should be confirmed at ICCAT in 2025 in line with the adopted Recommendation in 2023. However, reporting of catches and discards remains very scratchy and is only available in aggregated form for all mobulids together at WCPFC. Therefore, depicted catches in Figure 5 are aggregated for mobulid rays including giant mantas for comparison but for 2022 no data have been available yet in the public domain for WCPFC, whereas IOTC only shows data for pelagic stingray in 2022.

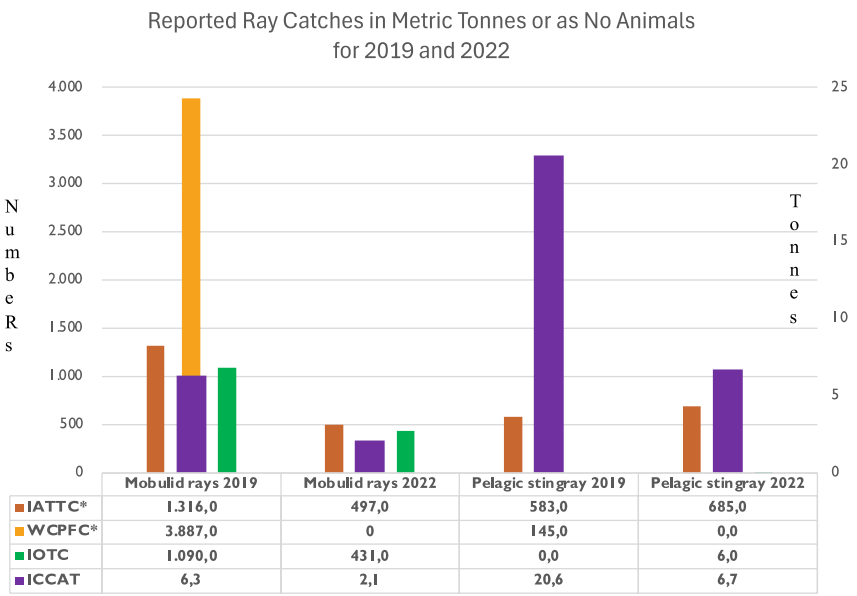


Figure 5: Comparison of reported catches in the four big tuna RFMOs for 2019 i.e. prior to COVID and in 2022 i.e. after COVID using publicly available catch data for mobulid rays and pelagic stingray. Mobulid catches have been aggregated for comparability as WCPFC does not report those at species level. Note: ICCAT and IOTC do report mobulid rays and pelagic stingray in metric tonnes while WCPFC and IATTC report those as number of animals and are depicted on the primary y-axis here while ICCAT and IOTC relate to the secondary y-axis on the left side of the graph.

### 2.1.2. Stock assessment outcomes

We compared stock assessments performed by tuna RFMOs for 8 pelagic sharks and the outcomes are summarized in Table 2 in detail.

Out of the 8 pelagic sharks compared in the table only 5 species do have recent stock assessments (2017 till 2023) that were considered successful while none of the hammerhead species (neither great, scalloped, smooth, nor any other species), none of the three species of thresher sharks have been assessed at any of the RFMO allowing an estimate of the current stock status although ICCAT and IOTC have banned the retention of hammerhead sharks and bigeye thresher sharks, respectively IOTC the retention of thresher sharks. No other oceanic shark species although known to interact with tuna fisheries have been attempted to be assessed at all.

#### 2.1.2.1. On a species level this translates into:

**Blue shark** has current stock assessments at ICCAT, IOTC and WCPFC but outcomes are subject to substantial uncertainty even if concluding that a stock is currently not overfished nor experiencing overfishing. All blue stock assessments highlight substantial uncertainty in model outcomes due to major data gaps, specifically in regard to total mortality.

- IOTC and WCPFC nevertheless concluded that blue shark stocks are not overfished nor experiencing overfishing but warned that increasing catches to either MSY (WCPFC) or by 20% over current catches (IOTC) will substantially decrease the probability of the stocks to remain in the green quadrant in the near future.
- Stock assessment outcomes at ICCAT determine the Southern Atlantic stock to be not overfished but undergoing overfishing and the Northern Atlantic stock to be with an almost 50:50 probability overfished, however still rate it as not overfished based on a marginal 0.1% difference (49.7% probability of not being overfished versus 49.6% probability of being overfished (ICCAT Blue Shark 2023).

**Shortfin mako** has been assessed

- by ICCAT to be overfished and overfishing continuing in the North Atlantic with a model probability of 90% and stock rebuilding to take at least 50 years even at a mortality of zero. For the South Atlantic the stock assessment outcome of the model was less significant but confirmed that the stock is most probably on a similar trajectory as in the North with overfishing occurring and the stock potentially already being overfished. Increasing catches had occurred in the South Atlantic as catch efforts shifted to the South in compensation of decreasing catches in the North Atlantic.
- Main catch nations in the North Atlantic have been Spain, Portugal and Morocco in the North and Spain, Portugal, Namibia and Brazil in the South. Since 2022 there is an ICCAT retention ban for shortfin mako in the North Atlantic while Portugal and Spain had already unilaterally prohibited the introduction of shortfin mako from the High Seas of the North Atlantic in 2021. The Spanish and Portuguese CITES authority have thereby already implemented measures to regulate the trade of this CITES listed species whereas ICCAT had been unable to do so over a period of four years despite the disastrous outcome of the 2017 stock assessment. Yet it should be noted that Portugal still reported landings of SMA from the High Seas and Combined areas to ICCAT for 2021.
- For the South Atlantic catch quotas have been allocated between the main catch nations in 2022 in an attempt to follow scientific advice to lower mortality below 2001 tonnes. The EU Scientific Review Group however has issued and reconfirmed a negative opinion on the introduction from the High Seas and all export of shortfin mako as it considered the agreed measures by ICCAT to still be insufficient to ensure the sustainability of harvests from this stock. (V. Schatz and D. Kachelriess 2023)
- WCPFC concluded the North Atlantic stock to be likely not overfished and overfishing not to occur if removals remain at current levels however considering the high uncertainty



included in the model and historic catches as well as the constant decline in spawning biomass observed over the last 42 year the status may more appropriately be rated as possible not overfished and overfishing not occurring as evaluated by the UK CITES authority when reviewing available stock assessment data, and even more knowing that no limit, reference or threshold data points are available for the WCPFC.

- No stock assessment is available for Southwest Pacific shortfin mako and while not providing management advice the Scientific Committee noted that maintaining the voluntary release of bycaught shortfin mako as currently practiced by several member states should be maintained, however without any measure in place to require this to be complied with total mortality might already have been increasing.
- Main catch nations at WCPFC of shortfin makos and unspecified mako sharks (MAK) are Japan, French Polynesia, Vanuatu, Taiwan, and Spain.
- Neither IATTC nor IOTC have succeeded in the past successful stock assessments for shortfin mako sharks in their area of competence. However substantial amounts of shortfin mako, respectively longfin mako or not further specified mako sharks are caught in both RFMOs.
- At IATTC catches are dominated by Mexico and Ecuador, but also Portugal, Chile and China catch substantial amounts.
- At IOTC the majority of catches is taken by Indonesia and Madagascar but also Spain, Taiwan and Pakistan catch several hundred tonnes per year.
- IOTC has performed a new stock assessment in 2024 with only preliminary outcomes and management advice available at this time. However, Rui et al 2024 confirm as to be expected in view of far too long inactivity of IOTC ignoring scientific advice to implement measures to reduce shortfin mortality. The successful stock assessment summaries that *"in 2022 the shortfin mako shark was overfished (median  $B_{2022}/B_{msy} = 0.96$ ) and is undergoing overfishing (median  $F_{2022}/F_{msy} = 1.65$ ), with an overall 49.7% probability."*

**Silky sharks** have no recent stock assessments at ICCAT, IATTC, or IOTC as attempt to perform e.g. in 2018 for a Pacific wide assessment for silky sharks failed, as did attempts at ICCAT and IOTC. The only RFMO having performed stock assessments has been WCPFC (for evaluation of outcomes see under WCPFC).

- Silky sharks are the main shark bycatch in purse seine fisheries when setting on drifting object but are also actively targeted or caught as bycatch by longline and gillnet fisheries in IATTC and IOTC where no retention ban is in place yet.
- At IOTC most catches are taken by Iran and Pakistan reporting each several hundred tonnes, followed by Taiwan, Sri Lanka and Madagascar.
- At IATTC Mexico and Costa Rica target silky sharks in longline fisheries

**Porbeagle sharks** have only been assessed by ICCAT and WCPFC.

- WCPFC assessed Southern Hemisphere Porbeagle for the last time in 2017 concluding that although the stock status of the species is currently unknown there is a very low risk that the Southern Hemisphere porbeagle shark is subject to overfishing anywhere within its range basing this advice on the low catches reported between 2005 and 2014. Japan catches most of the 800 – 900 tonnes of porbeagle sharks reported to WCPFC while New Zealand catches about 50 tonnes per year.
- ICCAT has conducted stock assessments for the Northeastern and Southwestern stocks in the Atlantic concluding that both stocks are still overfished following the massive overexploitation up to 2000 / 2010 although they consider it likely that no overfishing occurs anymore today. Catches are less than 30 tonnes per year in line with the existing Recommendation that all live sharks must be released as unharmed as possible.
- IOTC reports similarly low catches of about 30 tonnes caught by Indonesia.
- IATTC however reports minimum catches around 200 tonnes per year by Chile.

**Oceanic whitetip sharks** have only been assessed by WCPFC and are considered to be overfished and overfishing continuing. As the only species with a retention ban in all four RFMOs and a retention ban having been in place for more than 10 years in some of them



already this is the pelagic shark for which low or no landings are reported by most RFMOs however in absence of reliable data on discards and the status at discard total removal remain highly unknown.

#### 2.1.2.2. RFMOs and stock assessments for sharks

**IOTC** has only succeeded in performing a current stock assessment 1 shark species, blue sharks, able to provide stock projections for potential harvest strategies. All other shark stocks are considered to have an 'unknown status' but most of them show very concerning trends as also acknowledged by the Scientific Committee but not having resulted in any measures other than a retention ban for oceanic whitetip sharks and all 3 species of thresher sharks.

**ICCAT** actively assesses and manages 3 major shark species, blue shark, shortfin mako shark and porbeagle sharks for which recent stock assessments and scientific advice are available and updated on a regular basis. However, no current stock assessments are available for any of the other 43 shark species.

**IATTC** has at this time not conducted current stock assessments by its own and an attempted pacific wide stock assessment for silky sharks failed in 2018. However, IATTC has performed extensive vulnerability assessments for a range of sharks interacting with IATTC fisheries and rated 20 out of 32 assessed species as most vulnerable, including commercially

**WCPFC** has performed stock assessments for blue sharks, shortfin mako sharks, oceanic whitetip sharks, porbeagle sharks and silky sharks.

- For silky sharks 3 stock assessments were performed over the last decade with earlier assessments concluding the stock to be overfished and experiencing overfishing or at least to still experience overfishing.
- The most recent 2024 assessment now suggests that the stock may show signs of recovering as a result of the implemented measures over the past decade, specifically the retention ban that has been in place since 2014. However, the conclusion that although the stock status is unknown there is confidence that current fishing mortality does not hinder stock recovery should be considered with caution especially since total mortality remains highly uncertain and a major concern. Also, the assumed post release mortality of only 15% in longliners may be overly optimistic considering that additional measures to reduce bycatch mortality have only come into effect at the beginning of 2024.
- As evident from many past stock evaluations for commercially targeted species across a variety of fisheries such stock recoveries have most often proven to be only phantom recoveries (R. Froese and D. Pauly 2024) of “*overfished stocks that were in urgent need of catch reduction and rebuilding [but] were instead displayed by models as increasing in biomass.*” Therefore, these preliminary signs of hope should by no means be considered as proof that this stock is no longer in need of protection but on the contrary seen as a mandate for maintaining stringent measures to further reduce mortality across all fisheries and improve available data validity.
- Specifically, in view of 100,000 - 120,000 juvenile silky sharks caught annually between 2019 and 2021 by the largest purse seine fishery in the WCPFC alone (CFFT PNA 2024), thus exceeding the total estimated purse seine bycatch of 82,875 - 94,847 animals (Peatman and Nicol, 2021) for all WCPFC purse seine fisheries in 2020, the perception of reduced\_silky shark mortality in longline fisheries over the past decade may on its own not be representative for the estimation of total silky shark mortality in WCPFC. While S. Clarke et al. (2018) had estimated more than 700,000 silky sharks dying per year up to 2016, the 2023 modelling by Peatman and Nicol for longlining shows a drop from 149,000 (127,000-177,000) animals in 2016 to 105,000 in 2020 and to 69,700 (58,400-84,400) animals in 2021, when excluding catches by west-tropical domestic fisheries and former shark-targeted fisheries in the EEZs of Papua New Guinea and Solomon Islands. This decrease in longline mortality may however be offset by the major increase in silky shark

bycatch in purse seine fisheries since 2016 driven by the increased use of dFADs (CFFT PNA 2024). In the largest purse seine fishery, the fishery of the Parties of the Narau Agreement (PNA), bycatch of silky sharks has more than doubled since then, from 815 tonnes in 2016 to more than 3,000 tonnes annually between 2019 and 2021. This bycatch therefore no longer accounts for only 8.8% of the total silky shark mortality at WCPFC as claimed by the MSC Conformity Assessment Body (CAB) in its certification determination report (MSC PNA 2024), but now may hinder further stock recovery at a percentage of more than 30% of total silky shark mortality at WCPFC (CFFT PNA 2024). A similar trend has also been reported by Cronin et al (2023) showing almost a switch of catches of silky sharks between long liners and purse seiners in the last few years with purse seiners now catching as many silky sharks as previously caught by long liners while longline catches have dropped substantially.

- This might easily jeopardize the positive signs noticed in the most recent stock assessment, which may still be fragile, especially as purse seine bycatch of silky sharks consists almost exclusively of juvenile animals that have not yet reproduced, when setting on dFADs. As in other oceans this practice of setting on dFADs has also increased substantially in WCPFC over the last few years, whereas unassociated sets had been the majority in the past that resulted in far lower bycatch rates of silky sharks taking the whole size range and not only juvenile animals.
- WCPFC has also assessed oceanic whitetip sharks concluding the stock to be still overfished and subject to overfishing although catches have dropped significantly since the retention ban and there are first signs of a possible recovery, which are however too early to evaluate and therefore recommended further measures to reduce mortality being taken. A new assessment is now planned for 2025.

Figure 6 provides an overview of the performed stock assessments for sharks and outcomes, respectively measures taken at the four tuna RFMOs as a result of the stock assessment. No stock assessments for pelagic rays have been performed at any of the RFMOs in recent years. While several stock assessments had been unsuccessful in the past mostly due to the lack of reliable data on total mortality, IATTC has taken a different approach and evaluated 32 sharks in its area of competence using the EASI Fish vulnerability assessment and concluding that 20 out of the 32 assessed species “exceeded the  $F_{40\%}$  and  $SBR_{40\%}$  BRP threshold values, resulting in the classification of these species as “most vulnerable”. (Griffith et al 2022) The overview highlights how much IOTC has been lagging behind other tuna RFMOs in all shark related measures so far.

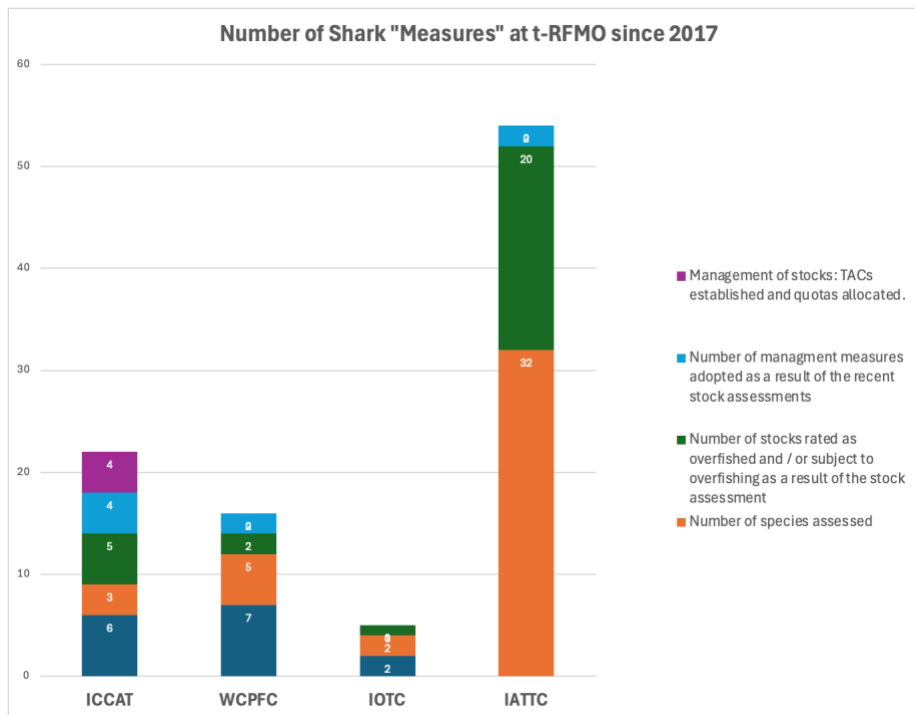


Figure 6: Number of measures taken by t-RFMOs since 2017 to “manage” sharks including stock assessments, management measures implemented to limit mortality or to start actively managing stocks by agreeing and allocating Total Allowable Catches, while no RFMO has so far started a Management Strategy Evaluation for the development of Management Procedures. Note IATTC has not performed stock assessments by a vulnerability assessment (EASI Fish).

### 2.1.3. Evaluation of the existing species-specific conservation and management measures (CMMs)

The table also compares existing CMMs for the respective shark species and whether these CMMs include catch limits or specific management measures to limit total mortality, respectively an attempt to start managing the species sustainably according to the same or similar criteria as commonly adopted for tuna and tuna like species.

In summary only four shark species, blue sharks, shortfin mako sharks, porbeagle and silky shark have CMMs with some degree of management for the stock BUT not in all RFMOs and not at the same level and up to this point without any proof of the effectiveness of the adopted TACs to end overfishing and / or rebuild the overfished stock and notably such management attempts have always only be started after there has already been proof of the stock to be in severe trouble i.e. having an stock assessment outcome showing the stock is experiencing overfishing or already is overfished and even then as demonstrated for blue sharks and shortfin mako at ICCAT in the chapter above it has taken a very long time for the RFMO to take action.

**ICCAT** has so far been the only RFMO to implement at least TACs for some species (porbeagle, shortfin mako and blue shark) albeit with long delays and not necessarily at a level at which the stock will be maintained respectively restored into the green quadrant with a high probability which should according to NOAA be 70% (NOAA 2020) for all pelagic sharks and is even for tuna species by now accepted to be 60%.

**ICCAT** is also the only RFMO that has started developing Management Procedures (at least a partial one) for shortfin mako with a predefined rebuilding objective and timeline for the overfished North Atlantic shortfin mako, while having failed so far to predefine agreed measures that will be taken if the agreed target of limiting the total mortality to less than 250 t has failed to be achieved for e.g. two consecutive years. This retention ban in the North Atlantic is now in place since 2022 but for 2022 several CPCs have still reported landings although at

a low level and not all have submitted the required data for dead discards and estimates for live releases.

For blue sharks ICCAT has committed to start developing MPs in 2025 but based on experience from the past this alone is not yet a guarantee that it will succeed in doing so.

**WCPFC and IATTC** although having the most outspoken mandate to manage sharks have so far not adopted TACs for any species nor started developing management procedures.

**IOTC** also failed to implement any TACs, allocated quota or started to develop management procedures for any shark species despite several previous commitments to start doing so for blue sharks after the next stock assessment. During the last Commission meeting in 2024 IOTC once more failed to adopt an improved shark conservation measures including the establishment of TACs, allocation of quotas and initiating the development of MPs. However, in its report the "*Commission REQUESTED the Scientific Committee to initiate management strategy evaluation (MSE) simulations for blue shark with the aim of developing an MP for the species.*" (IOTC Commission 2024) However the Commission failed to define a timeline or delivery date for this task.

**IATTC** has adopted a measure for silky sharks trying to limit silky shark mortality in targeted fisheries i.e. those fisheries that exceed a percentage of 20% of their catch and also trying to limit catches of juveniles. However as neither the basis for reporting, the applicability of the measure to all fisheries, nor the enforcement of the pre-agreed measure to prohibit in such cases the use of wire traces for a period of 3 months is sufficiently clear. However, at a minimum reported average catch of 10,683 tons annually up to 2021 (IATTC 2023), which may still be substantially underreporting the true impact of fisheries in the Eastern Pacific Ocean on this species, this measure yet must proof effectiveness in reducing mortality and requires further review. Of specific concern are also the poor reporting and low surveillance on enforcement of the 3 month ban of wire leaders for fleets exceeding the percentage of silky shark catch. Biggest catch nations of silky sharks in the past couple of years were Costa Rica and most of all Mexico with 11,742 tonnes reported in 2020.

All other CMMs implemented by RFMOs to reduce shark mortality for some species of specific concern are limited to full or partial retention bans for those species that are considered being most threatened. However, there is no harmonized approach for which shark species are considered to be most threatened by fisheries and therefore subject to a retention ban, except for the critically endangered oceanic whitetip shark for which no valid stock assessment exists at any of the RFMOs and which is not only listed on CITES App II but also internally protected as a CMS Annex I species for which all signatories to the agreement and the MOU for sharks have committed to work together to establish protection across boarder.

**WCPFC and ICCAT** have banned the retention of silky sharks in their area of competence.

**WCPFC** is however, the only RFMO so far that has so far acted in ensuring that the adopted retention ban will be effective in reducing shark mortality of the banned sharks (oceanic whitetip an silky shark) by adopting further conservation measures banning initially the use of shark lines and then extending this ban also to the use of wire traces (at least in the area between 20° N and 20° S) a scientifically widely proven and recommended measure for the reduction of shark mortality in longline fisheries.

**IATTC** has to date banned only the retention of oceanic whitetips sharks and failed in its attempt to introduce a ban of wire traces and shark lines at its 2023 Commission Meeting. The agreed ban of shark lines is expected to be far less effective than a combined ban based in reducing mortality of shark bycatch as also summarized by the IATTC scientific staff referring to evidence from WCPFC. "*Banning wire leaders has been identified as the most effective method for reducing shark mortality in simulation studies of management and mitigation options, with reductions in fishing mortality of 28.2% and 35.8% for silky shark and oceanic*

whitetip shark, respectively (Bigelow and Carvalho 2022). Combined, banning both shark (buoy) lines and wire leaders has the potential to reduce shark fishing mortality by 29.4-30.8% and 40.5% for silky shark and oceanic whitetip shark, respectively (Bigelow and Carvalho 2022; Harley et al. 2015). Similarly, recent simulations of 42 potential CMMs for silky and hammerhead sharks using EASI-Fish by the IATTC staff (SAC-14-12) showed that the use of monofilament leaders was among the most effective measure in reducing vulnerability when applied to industrial and/or artisanal longlines fleets. However, the use of monofilament leaders was only effective when combined with non-retention measures and effectiveness was further increased when combined with best handling practices.” (M. Hutchinson et al 2024)

**IOTC and ICCAT** have banned the retention of thresher sharks (IOTC) or at least banned the retention of bigeye thresher sharks (ICCAT). However, at ICCAT substantial quantities of thresher sharks not further specified continue to be landed by Ghana and may also include bigeye thresher sharks. Such a reduced ban for a species that is not reported at species level by all CPCs is difficult to enforce and surveille.

At IOTC all 3 species of thresher sharks are subject to the retention ban but coastal fleets from Indonesia continue catching more than 4,000 tonnes of unspecified thresher sharks every year and also Madagascar and Oman catch more than 100 tonnes of thresher sharks while 100 – 200 tonnes of pelagic thresher sharks are caught by Pakistan without further specification provided whether those catches are retained or discarded.

**ICCAT** is the only tuna RFMO that has so far banned the retention of most hammerhead sharks excepting only *Sphyrna tiburo*. However, Costa Rica continues landing scalloped hammerheads and St Lucia great hammerhead sharks at approx. 1 tonne each. Trinidad and Tobago continue landing almost 40 tonnes of unspecified hammerhead sharks annually and Senegal of almost 100 tonnes, while Ghana landed between 200 and 400 tonnes every year.

**ICCAT** also recommends releasing all porbeagle sharks unharmed, when still alive at the time when lines are hauled to the vessel. This is not the same as a retention ban and has in the past miserably failed to decrease shortfin mako mortality when a similar measure has been in place for this species. However, for porbeagle the measure may be effective as catches have dropped substantially since then although live releases and status upon release are not well reported.

A further, more detailed analysis of the existing retention bans at all RFMOs and their potential effectiveness is provided in Table 3 analyzing the applicability and expected effectiveness of the existing retention bans across tuna RFMOs and highlighting applicable exemptions. Also whale sharks and mantas and mobulids are included as part of the review in Table 3.

## 2.2. Retention Bans for threatened Shark Species and the existing Exceptions

Although most pelagic sharks tuna fisheries interact with in the four big tuna RFMOs are classified as threatened by the IUCN not all RFMOs have adopted retention bans for all of these sharks and rays in their area of competence. Figure 7 and **Table 1** provide an overview on the existing retention bans in tuna RFMOs.

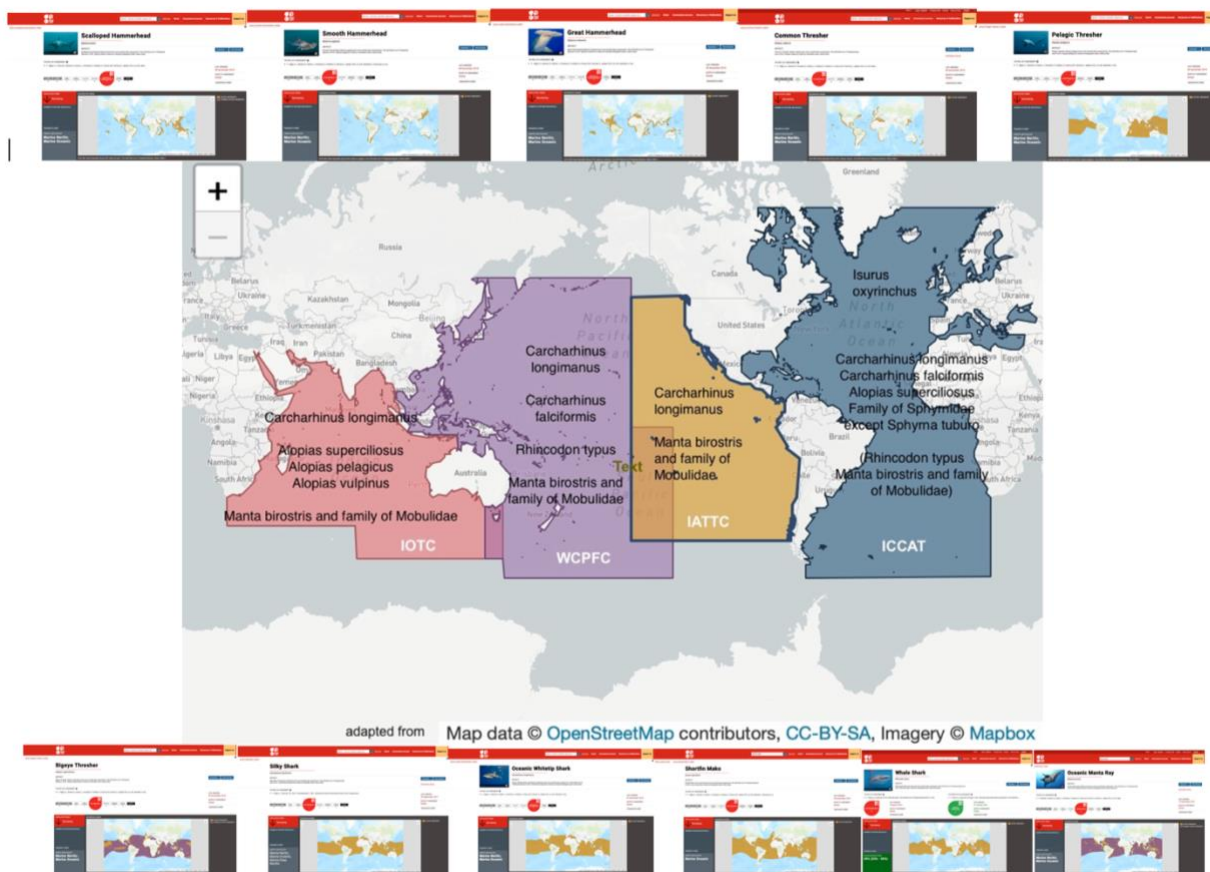


Figure 7: Overview on the four big tuna RFMOs and shark species for which a retention ban exists at the respective RFMO. The figure also includes the latest available global IUCN assessment status for the species as available online 2024-1. All are listed either as “vulnerable”, “endangered”, or even “critically endangered” Note: not all species of the family of Sphyrnidae and Mobulidae are depicted.

Species / RFMO	ICCAT	IOTC	IATTC	WCPFC	Exceptions
<i>Carcharhinus longimanus</i>	x	x	x	x	IOTC: India all fisheries IOTC: Coastal fisheries < 24 m & artisanal fisheries in EEZ WCPFC: Unnoticed bycatch in purse seiners if donated for local consumption
<i>Carcharhinus falciformis</i>	x			x	ICCAT: Developing coastal CPCs for local consumption WCPFC: Unnoticed bycatch in purse seiners if donated for local consumption
<i>Alopias superciliosus</i>	x	x			ICCAT: Mexican fishery for 110 animals
<i>Alopias pelagicus</i>		x			IOTC: Coastal fisheries < 24 m
<i>Alopias vulpinus</i>		x			IOTC: Coastal fisheries < 24 m
<i>Sphyrnidae except Sphyrna tuburo</i>	x				ICCAT: Developing coastal CPCs for local consumption
<i>Rhincodon typus</i>	(x)			x	ICCAT: vessels operating exclusively outside of geographical distribution of species
<i>Manta birostris and Mobulidae</i>	(x)	x	x	x	ICCAT: vessels operating exclusively outside of geographical distribution of species IOTC: Subsistence fisheries WCPFC: Unnoticed bycatch in purse seiners if donated for local consumption
<i>Lamna nasus</i>					ICCAT: Live animals must be released
<i>Isurus oxyrinchus</i>	x				ICCAT: Temporary non retention in North Atlantic only

Table 1: Overview on which species are prohibited from retaining in the four tuna RFMOs



More details for all retention bans, which differ quite substantially between RFMOs are provided also in Table 3, which also analyses to which fisheries those apply or don't apply thereby evaluating their potential conservation impact also in combination with the reported shark catches in [Table 2](#) for several of these sharks despite an existing retention ban at the respective RFMOs.

In this context it is also important to note that a retention ban alone does not reduce mortality neither does the prohibition of targeting a specific shark species by itself lower the catch of this species if not combined with spatial-temporal closures and / or improved gear selectivity such as one by one fisheries in which all unwanted bycatch is released unharmed. The importance of such additional measures has been highlighted by (Cronin et al 2023) and many other scientists over the last decade (Tolotti et al. 2015). However, most tuna fisheries use highly unselective gear catching multiple species. Sharks are thereby highly impacted and a massive bycatch in many tuna fisheries due to the high spatial overlap of distribution with tuna operations. Retention bans alone will not necessarily reduce shark mortality, nor will the chances of survival for the bycatch improved thereby, if not combined with additional measures to either reduce the probability of catching them in the first place or by measures that will substantially reduce the extent to which they get killed or injured when caught as 'unwanted' bycatch. Ideally additional measures optimizing the handling and release of bycaught animals should also be in place on board of all vessels. Specific best handling and release practices vary between gear and for different shark species but have been identified and tested in scientific studies. They have been widely published but have not been adopted in all RFMOs or at all RFMOs in the same way, as discussed in the next chapter.

Retention bans aim to remove economic incentives obtained by fisheries when retaining bycatch with the intent to land and commercialize this catch. This applies to both, sharks that are valued as food by local communities and those sold for their meat internationally. However, most importantly most pelagic sharks are highly appreciated by fishermen for the value of their fins. Despite obtained at lower quantity shark fins do achieve higher revenues and profits in the international fin trade. Market prices increase further as a species becomes more threatened at decreasing abundance. As such especially the fins of oceanic whitetip sharks and hammerhead sharks but also thresher shark fins are most valued by the fin trade, while the fins of blue sharks and silky sharks make up for the highest percentage of fins traded in the markets of Southeast Asia (Cardenosa et al. 2020).

If sharks can't be retained anymore and provide no commercial benefits for fisheries, fishermen loose interest in catching them and may then be more willing to adopt additional measures to avoid or release them, provided that the proposed measures do not reduce the catch of the target species and are not increasing overall costs and efforts for the fishermen.

While technical measures exist and have been proven to be effective, those come at a cost for implementation and operation, and best handling and release practices require full commitment from the fisheries to apply them consistently. Higher efforts and / or a commitment are needed to care for the welfare of the bycatch, especially after having brought the sharks on board of the vessel.

In summary the effectiveness of retention bans relies on three factors, their applicability to all fisheries (i.e. as few exemptions as possible), the combination with additional measures to reduce the probability of catching sharks and to increase their chances of survival. Finally, there is a need to improve the surveillance of fishing operations to ensure compliance with existing measures and enforce prosecution of potential offenses.

The retention bans for oceanic whitetip sharks and silky sharks in the WCPFC as discussed in the previous chapter provides an interesting case study for the successful implementation and increased effectiveness of a retention ban for a shark species.

Substantial differences are apparent between the four tuna RFMOs in regard of existing retention bans for the same species within the four tuna RFMO. As retention bans for different species have been adopted stepwise and over the course of time, the provisions made by them differ between RFMOs. as to applicability, exemptions, and reporting requirements have evolved however not necessarily towards improvement from a conservation point of view and

few RFMOs have reviewed existing retention bans as to the applicability of provided exemptions removing those when no longer justified.

Comparing the retention bans for sharks and rays at the different tuna RFMOs as summarized in **Table 1** and **Table 3** shows significant differences not only in the number of existing retention bans per RFMO but also how those are defined and implemented and thereby their potential effectiveness. Although retention bans generally ban all retention, transshipment and landing of the species whether dead or alive and require all live animals to be released as unharmed as possible, the individual provisions and exemptions differ quite substantially. Therefore, outcomes for 'vulnerable', endangered species differ substantially between RMOs.

**Oceanic whitetip sharks** have been among the first sharks subject to retention bans in tuna RFMOs and they are till today the only shark species for which a retention exists in all four tuna RFMOs albeit at different times and with different consistency.

- ICCAT was first to adopt a retention ban, followed by IATTC, and WCPFC and IOTC was the last one to adopt a ban.
- While ICCAT, IATTC and WCPFC allow no exemptions or have removed those over time IOTC has a retention ban for oceanic whitetip sharks to which India is not bound at all as the CPC had objected against the ban at the time and this has apparently not been readdressed over the last decade.
- Interestingly India does not retain any oceanic whitetip sharks while Comoros and Iran still do retain together about 40 t per year. India may therefore have included its oceanic whitetip catches for reporting as *Carcharhinidae* instead.
- However, WCPFC still reports overall catches between 300 and 500 t from small island nations such as Fiji, the Marshall Islands, and French Polynesia
- IOTC limits the retention ban to vessels that are on the "*IOTC Record of Authorised Vessels, or authorised to fish for tuna or tuna-like species managed by the IOTC on the high seas*" and explicitly exempts "*artisanal fisheries operating exclusively in their respective Exclusive Economic Zone (EEZ) for the purpose of local consumption*".

**Silky sharks** are only subject to a retention ban at WCPFC and at ICCAT.

- While WCPFC has removed exemptions over time ICCAT exempts developing coastal states if they submit Task I and II data to the IOTC and have communicated measures in place to prevent that, silky shark products enter the international trade.
- ICCAT requires that catches by developing coastal states are not increased but has not specified any consequences in case catches are increasing.
- Although including a provision that this exemption will be revoked for those CPCs that do not submit Task I and II data it should be noted that this has not happened to date although several coastal states have not submitted silky shark data or have not submitted all required data. A concern for conservation objectives that have also been highlighted in a recent report from the Shark League for the Atlantic and the Mediterranean. (2023).
- At a reported mortality of over 300 t, which has been increasing it is concerning to see that Costa Rica and Panama are still officially landing between 50 and 120 tonnes of silky sharks, reducing the effectiveness of the retention ban. Furthermore, Suriname and Senegal may also still retain substantial amounts of silky sharks while reporting them only as *Carcharinidae* without providing further information at species level.

All 3 species of **thresher sharks** are prohibited from retention at IOTC, whereas ICCAT only prohibits the retention of bigeye thresher sharks.

- ICCAT explicitly exempts a small Mexican fishery from the retention ban on basis of a number of 110 animals caught per year with no end of this derogation foreseen, no reporting requirements linked to the exemption and no prohibition of bigeye thresher shark products from this fishery entering the international trade included.

- At ICCAT all other species of thresher sharks are exempt from the ban and CPCs are only requested to “*strongly endeavour to ensure that vessels flying their flag do not undertake a directed fishery*”. This opens a huge loophole as the 3 different species of thresher sharks are often difficult to differentiate, resulting in misreporting. Therefore, CITES included all 3 species when listing thresher sharks on App II, but ICCAT so far hasn’t.
- IOTC prohibits the retention of all 3 species but again limits the applicability of the resolution only to those vessels that are in the IOTC vessel register, thereby exempting all coastal fisheries fishing with vessels of less than 24 m. No differentiation is made here between whether these vessels fish in the high seas or exclusively in their own EEZs.
- This exemption is crucial as thereby coastal fisheries from Indonesia and Madagascar are allowed to continue catching and landing substantial quantities of thresher sharks without any limitation that these catches are only to be used for local consumption and must not enter the international trade. This loophole thereby results in annual catches of thresher sharks of 4,000 - 5,000 tons by Indonesia and several hundreds of tons by Oman, Madagascar and Pakistan as outlined also in the catch data provided in [Table 2](#).
- IOTC however explicitly states that this Resolution also applies to sport and recreational fisheries which is as a matter of fact very relevant as thresher sharks are a highly valuable and sought after game fish species.
- At IATTC and WCPFC the catch of thresher sharks is unrestricted and therefore substantial catches are taken both in the East and the Western Central Pacific. At WCPFC Taiwan reports catches between 500 and 650 tonnes of unspecified thresher sharks. IATTC reports thresher shark catches for pacific thresher or bigeye thresher sharks from several catch nations at levels below or around 50 tonnes, but Mexico catches huge amounts of both species close to or above 1,000 tonnes respectively. Peru also reported substantial catches of pelagic thresher close to 1,000 tonnes but only in 2019.

**Hammerhead sharks** can be caught virtually without limits in all RFMOs other than ICCAT where the retention of all species of the family of Sphyrnidae is prohibited exempting only *Sphyrna tiburo*. However, developing coastal CPCs are again exempted from the ban when catching hammerhead sharks for local consumption and having measures in place to ensure products are not entering the international trade. WCPFC, IATTC and IOTC report substantial catches of hammerhead sharks, but most catches are reported at a highly aggregated level as hammerheads only.

- At IATTC mostly Mexico but also Costa Rica appears to be targeting hammerhead sharks with Mexico catching more than 1,000 tonnes of scalloped hammerheads, smooth hammerheads and undifferentiated hammerheads per year.
- At IOTC great hammerhead catches of 10 tonnes per year are only reported by Comoros. Scalloped hammerhead sharks are however taken by a series of fisheries and both Sri Lanka and Kenya reporting several hundred tonnes per year (almost 500 tonnes by Kenya in 2022). Oman reports about 200 tonnes of smooth hammerheads caught per year. Indonesia reports between 1,600 and 2,000 tonnes of unspecified hammerhead catches per year and catches are not limited to coastal fleets only.
- At WCPFC hammerhead catches are reported only for purse seine fisheries in the publicly available databases

**Shortfin mako sharks** at this time are only subject to a retention ban at ICCAT and only for the North Atlantic.

- As the non-retention clause is restricted in the Recommendation to 2022 and 2023 it represents not a retention ban but is rather part of the start of attempts to manage this stock sustainably by limiting total mortality and including additional provision like the requirement to release all live animals unharmed even within the assigned quota or the requirement of full discard reporting and an EMS system on board in order to be eligible for retaining any caught animals in the future is retention of certain amounts allocated between fishing parties may become possible again

- No exemptions made other than for Norway and Iceland as their local legislation requires them to land all dead bycatch but provisions are in place to ensure no economic incentive can be derived from this.
- The retention ban has been prolonged to 2024 and most probably will be prolonged beyond 2025 until the defined total mortality limit of 250 tons continues to be exceeded.

**Whale sharks** are only banned from retention at WCPFC and from 2025 onwards possibly also at ICCAT whereas IOTC and IATTC only prohibit the intentional setting on and encircling of whale sharks by purse seiners and require that animals should be released unharmed but not including any provisions for other fisheries.

- ICCAT exempts vessels operating outside the geographical range of distribution while WCPFC foresees no exemptions and within the PNA explicitly requires the net rolling to be stopped immediately if a whale shark is seen.
- ICCAT has adopted the Recommendation in 2023 but has required endorsement by SC in 2024 before the measure can come into effect in 2025
- Noticeably ICCAT has adopted the same language for the retention ban in its last two new Recommendations for whale sharks and mobulids, as had been used by WCPFC and IOTC already in the past. ICCAT now also does not include a prohibition of “*selling and offering for sale*” in the adopted text whereas it had done so in previous retention bans as has IATTC for all its retention bans.

**Mantas and mobulids** are considered at all RFMOs to include all species of the family of *Mobulidae* and protected now by retention bans in all RFMOs, with IATTC having been the first RFMO to prohibit retention and ICCAT being the last one when the Recommendation adopted in 2023 comes into force in 2025.

- IATTC and WCPFC do not foresee exemptions and have both included detailed release handling guidelines for longline and for purse seine fisheries
- ICCAT has also included best release handling guidelines which are however more differentiated by e.g. requiring different release tools being on board for small and for large animals. ICCAT does not foresee exemptions from implementation of the ban other than for vessels operating exclusively outside the geographical range of distribution of *Mobulidae*.
- IOTC restricts applicability again to vessels in the IOTC vessel register or authorized to fish tuna and tuna like species managed by the IOTC, exempting vessels of < 24 m fishing in the EEZs.
- IOTC also explicitly exempts subsistence fisheries and had provided a derogation for artisanal fisheries until 2022 if caught incidentally and used only for local consumption.
- Again, IOTC explicitly includes sport and recreational fisheries to be bound by the Resolution as well

**Porbeagle and blue sharks** are not subject to retention bans in any of the four RFMOs although it should be noted that blue sharks are critically endangered in the Mediterranean Sea and no longer targeted there due to their low abundance. While live porbeagle sharks should be released unharmed at ICCAT this is not to be mistaken as a retention ban.

In summary the extent and provision of existing retention bans differ quite significantly between RFMOs and for different shark and ray species. Most concerning are inconsistent reporting requirements which differ between “required” and “should encourage” especially for artisanal fisheries which are however defined quite differently between IOTC and ICCAT for example. IATTC and WCPF while having only 2 respectively 4 retention bans in place are most consistent in applying it to all fisheries in their area of competence.

**ICCAT** has to date the biggest number of retention bans (6 in 2025) for sharks and rays in place and aims to provide exemptions only to developing coastal states, restricting the use of catches to local human consumption and requiring reporting in line with ICCATs reporting requirements for sharks and measures in place to prevent sharks or parts of them from entering

international trade. However, the definitions provided are rather weak especially regarding which vessels are allowed to retain sharks despite a ban and enforcement of noncompliance with other conditions is poor to non-existing. Especially the increasingly weaker requirements over time e.g. between oceanic whitetip sharks, silky sharks and hammerheads regarding exemptions and the removal of the prohibition of selling and offering for sale in the most recently adopted recommendations provide loopholes for compliance and enforcement as analyzed in detail in a 2023 Shark League report.

**IATTC** has so far adopted only 2 retention bans but has included the prohibition of selling and offering for sale in both and having been the first RFMO to prohibit the retention of mantas and mobulids but has till today not prohibited the retention of whale sharks.

**WCPFC** has over the years continuously reviewed and improved existing retention bans e.g. for silky sharks and oceanic whitetip sharks, tightening requirements and removing exemptions. It is also the only RFMO that has so far followed up in supporting the protection of species for which a retention ban exists by additional bycatch mitigation measures such as a ban of shark lines and wire traces for longlines. However, WCPFC has not taken any steps to protect critically endangered hammerhead sharks or other endangered sharks that are targeted at WCPFC and has strictly defined its retention bans to operations at sea or on board of vessels, excluding provisions that would ban the selling and offering for sale of prohibited species. Trade provisions are apparently important to stop the international trade in protected species e.g. for shark fins or mobulid gills, while requiring cooperation with other authorities at a national level. Although nominally not foreseeing exemptions from the retention bans for small scale fisheries and/or subsistence fishing the recorded batches of several hundred tons of silky sharks and oceanic whitetip sharks by several Pacific Island nations clearly demonstrate that exemptions exist either as part of other CMMs that are thereby also applicable to the respective CMM for sharks or that the ongoing noncompliance Fiji, the Federated States of Micronesia, the Marshall Islands, and French Polynesia is accepted without consequences. Combined those catches add up to 300 – 500 tonnes every year for each of those species and this more than ten years after implementation of the ban for oceanic whitetips and almost ten years of prohibition of silky sharks respectively. Further mortality of oceanic whitetip sharks results from purse seine fishing when setting on dFADs as juvenile silky sharks and oceanic whitetip sharks are thereby caught adding up to about 1000 animals per year for oceanic whitetips as estimated by Peatman et al (2021) and more than 100,000 juvenile silky sharks (MSC PNA 2024) most of which die even if discarded alive.

**IOTC** has similar to WCPFC started banning only the retaining onboard, transshipping, landing or storing any part or whole carcass of a species subject to a retention ban, whereas when adoption its first retention ban for oceanic whitetip sharks it had still included the prohibition of selling and offering for sale.

However most concerning are the exemptions foreseen in the 3 existing retention bans at IOTC, which literally exempt most fisheries and fishing vessels from those.

India isn't bound at all to the retention ban for oceanic whitetip sharks as it had objected to the Resolution when adopted in 2013. This has still not been revised almost 10 years later allowing India to target and retain this globally critically endangered shark species.

Furthermore, this retention ban but also the retention ban for all 3 species of thresher sharks do exempt a large number of vessels in the IOTC area of competence.

- According to [Resolution 19/04](#) vessels need to be registered in the IOTC record of vessels authorized to operate in the IOTC area of competence, if being

*“a) 24 metres in length overall or above; or  
b) in case of vessels less than 24 meters, those operating in waters outside the Economic Exclusive Zone of the flag State; and that are authorised to fish for tuna and tuna-like species in the IOTC area of competence (hereinafter referred to as ‘authorised fishing vessels’, or AFVs)”*

- Artisanal fisheries at IOTC are defined in the footnote of Res 15/02 as Coastal fisheries and being fisheries other than longline or surface fisheries.
- Longline fisheries are fisheries undertaken by vessels in the IOTC Record of Authorized Vessels that use longline gear.
- Surface fisheries are all fisheries undertaken by vessels in the IOTC Record of Authorized Vessels other than longline fisheries; in particular purse seine, pole-and-line, gillnet fisheries, handline and trolling vessels.

Subsistence fisheries are defined in the footnote of Resolution 19/03 as a fishery where the fish caught are consumed directly by the families of the fishers rather than being bought by middle- (wo)men and sold at the next larger market, using the definition from FAO (1999).

In conclusion the retention ban for mobulids exempts subsistence fisheries explicitly while the ban also doesn't apply to Coastal Fisheries of less than 24 m that are not on the IOTC vessel register or "authorized fishing vessels". The retention ban for oceanic whitetip sharks (Res 13/06) does not apply to Coastal fisheries with vessels of less than 24 m fishing only in the EEZs for local consumption, while local consumption is not further specified. And worst of all, the retention ban for thresher sharks (Res 12/09) applies ONLY to vessels on the IOTC vessel register exempting all Coastal fisheries with vessels of less than 24 m and allowing the catch to enter international trade. The result is continuing catches in large numbers by several coastal states.

### 2.3. Prohibition of "Finning" and the Effectiveness of adopted Measures

'Fins Naturally Attached' (FNA) has been globally recognized to be the most effective if not only measure to prevent shark finning from happening and therefore, an increasing number of fishing nations, RFMOs and RFBs have implemented a strict FNA policy over the last 15 years. 'Fins Naturally Attached' policies are now in place in many jurisdictions including the EU (2013), US (2010), UK (2009), India (2013), Costa Rica (2006), South Africa (1998), Brazil (2012), Cabo Verde (2014), El Salvador (2012), Sierra Leone (2019) and Canada (2019), as well as at NEAFC (2014), NAFO (2016) and GFCM (2018). The United Nations General Assembly's annual resolutions on sustainable fisheries (2007), IUCN Global Policy against shark finning (2008), and the 2010 meeting of the Fish Stocks Agreement also call on nations to take measures to require that all sharks are landed with fins naturally attached. And even the Marine Stewardship Council has updated its Fisheries Standard in 2023 requiring fisheries to have a FNA policy in place as a prerequisite to certification providing a high degree of certainty that shark finning is not taking place in MSC certified fisheries. Although the MSC has most recently derogated the implementation of its updated Fisheries Standard 3.1 until July 2026 (MSC 2024) and thereby allows fisheries to get certified in line with the previous standard that had only required FNA at the SG 100 level, this step clearly shows that FNA is no longer an exclusive policy but really fit for purpose at a global level and in line with the MSC principle of "behind the crest of the wave" quality in fisheries management. (Ziegler WPEB 2023)

However, within tuna RFMOs this global development has been combated vigorously ever since and not a single tuna RFMO has till today adopted this globally acknowledged best practice. Although many attempts to introduce FNA have been made at all RFMOs over the last decade and most of the proposals to do so supported by a majority of member states the adoption of a strict 'fins naturally attached' policy has consistently failed in all of them, still more or less relying on the long outdated principle of a 'fins to carcass ratio', which has been widely proven to be completely inadequate and non-enforceable (Ziegler et al. 2021). And in all RFMOs attempts to introduce FNA failed based on the continued resistance of a few member states, that have refused to accept scientific evidence from around the world demonstrating the benefits of FNA, while calling for more evidence being provided.

However, none of these opponents has ever provided evidence from their end demonstrating that the alternative, i.e. the outdated 5% fins to carcass ratio has succeeded in detection and



prosecution of offences against the prohibition of finning and thereby been effective to prevent finning from happening.

At this point it is important to note that some states have most recently changed their previous attitude towards the introduction of FNA at least in some RFMOs. In May 2024 China stated its support on the floor for the adoption of the shark IOTC-2024-S28-PropV that had been submitted by the Maldives and Pakistan at the 2024 IOTC Commission Meeting included the provision of all sharks having to be landed with fins naturally attached (allowing only partial slicing for purpose of folding over fins for storage on board). However, at the end the proposal was once again not adopted due to the objections raised by other members, against the proposed fins naturally attached and other shark conservation measures included in the proposal, namely a ban of the use of wire traces and shark lines to improve the post release survival of threatened shark species.

The current [IOTC Resolution 17/05 ON THE CONSERVATION OF SHARKS CAUGHT IN ASSOCIATION WITH FISHERIES MANAGED BY IOTC](#) dates from 2017 and while already requiring that sharks landed fresh have to be landed with FNA still allows the by far bigger quantities of frozen fins to be landed in compliance with the 5% rule.

- a) *“Sharks landed fresh: CPCs shall prohibit the removal of shark fins on board vessels. CPCs shall prohibit the landing, retention on-board, transshipment and carrying of shark fins which are not naturally attached to the shark carcass until the first point of landing.*
  - b) *Sharks landed frozen: CPCs that do not apply sub-paragraph 3 a) for all sharks shall require their vessels to not have on board fins that total more than 5% of the weight of sharks on board, up to the first point of landing. CPCs that currently do not require fins and carcasses to be offloaded together at the point of first landing shall take the necessary measures to ensure compliance with the 5 % ratio through certification, monitoring by an observer, or other appropriate measures.*
  - c) *CPCs are encouraged to consider to progressively implement the measures described in sub-paragraph 3 a) to all shark landings. Paragraph 3 will be revisited by the Commission in its 2019 Annual Meeting in light of recommendations from the Scientific Committee, using the best available science and case studies from other CPCs already prohibiting the removal of shark fins on board vessels.*
- 5. Without prejudice to paragraph 3, in order to facilitate on-board storage, shark fins may be partially sliced through and folded against the shark carcass, but shall not be removed from the carcass until the first point of landing.”*

The provisions of c) to progressively extend the FNA provision from a) to all sharks was not achieved at the 2019 review nor in subsequent years, despite the clear request from the Commission in 2023 that the *“relevant Working Parties and IOTC Scientific Committee, at its 26th session, [...] review the latest science and best practices in other oceans and, in collaboration with the Compliance Committee as appropriate, provide advice to the Commission at S28 on technical and mitigation measures to strengthen the conservation of sharks. [...] including the application of fins naturally attached requirements to improve monitoring of elasmobranchs, prevention of the practice of shark finning, full utilization of caught sharks and effective monitoring of compliance with existing conservation and management measures.”* (IOTC Commission report 2023)

However, as the 2023 SC report *“NOTED that while the WPEB had held discussion on the scientific need to improve measures to prevent shark finning, the WPEB has not provided a summary of this evidence to the SC. Subsequently, the SC REQUESTED the WPEB to provide this information to support the SC and Commission’s further consideration of this issue.”*

Without further information neither the Scientific Committee nor the Commission apparently want to move forward, as evident since 2017 from the repeated failures to adopt FNA at IOTC. However, such further information is difficult to impossible to provide with all member states claiming not to engage in finning, hardly any surveillance available at sea and at port at an

observer coverage of 5% or less in most fisheries, no evidence accepted by offenders when provided by NGOs and the high economic incentives derived from finning.

**ICCAT Recommendation 04-10 CONCERNING THE CONSERVATION OF SHARKS CAUGHT IN ASSOCIATION WITH FISHERIES MANAGED BY ICCAT**

is still active and unchanged since 2004 allowing the cutting of fins at sea for all sharks, regardless, whether sharks are landed fresh or frozen and despite the almost annual attempts to introduce fins naturally attached led by the European Union, United Kingdom, the United States of America and many, many other CPCs, but year after year failing due to the opposition of a few CPCs. The ratio of 5% has never been reviewed or changed ever since despite the stated intent.

*3 CPCs shall require their vessels to not have onboard fins that total more than 5% of the weight of sharks onboard, up to the first point of landing. CPCs that currently do not require fins and carcasses to be offloaded together at the point of first landing shall take the necessary measures to ensure compliance with the 5% ratio through certification, monitoring by an observer, or other appropriate measures.*

*4 The ratio of fin-to-body weight of sharks described in paragraph 3 shall be reviewed by the SCRS and reported back to the Commission in 2005 for revision, if necessary.*

*5 Fishing vessels are prohibited from retaining on board, transshipping or landing any fins harvested in contravention of this Recommendation.*

WCPFC has reviewed and updated its CMM for the full utilization of sharks several times over the past decade introducing stepwise alternative measures that can be used besides fins naturally attached but has so far continued to allow parties to use the 5% ratio or other alternatives if endorsed by the TTC.

The most recent **WCPFC CMM 2022-04 CONSERVATION AND MANAGEMENT MEASURE FOR SHARKS** foresees that until 2024 the following alternatives to fins naturally attached are allowed:

*8 In order to implement the obligation in paragraph 7, in 2022, 2023 and 2024, CCMs shall require their vessels to land sharks with fins naturally attached to the carcass.*

*9. Notwithstanding paragraph 8, in 2022, 2023 and 2024, CCMs may take alternative measures as listed below to ensure that individual shark carcasses and their corresponding fins can be easily identified on board the vessel at any time:*

*(1) Each individual shark carcass and its corresponding fins are stored in the same bag, preferably biodegradable one;*

*(2) Each individual shark carcass is bound to the corresponding fins using rope or wire;*

*(3) Identical and uniquely numbered tags are attached to each shark carcass and its corresponding fins in a manner that inspectors can easily identify the matching of the carcass and fins at any time. Both the carcasses and fins shall be stored on board in the same hold. Notwithstanding this requirement, a CCM may allow its fishing vessels to store the carcasses and corresponding fins in different holds if the fishing vessel maintains a record or logbook that shows where the tagged fins and correspondingly tagged carcasses are stored, in a manner that they are easily identified by inspectors.*

*10. In case that a CCM wishes to allow its fishing vessels operating on the high seas to use any measure other than the three alternatives in paragraph 9 (1) – (3), it shall present it to TCC. If TCC endorses it, it shall be submitted to the subsequent annual meeting for endorsement.*

While fins artificially attached by wiring or bagging are tedious and time consuming for fisheries (Ziegler et al 2021) the labeling and storage in separate holds opens up almost similar loopholes as the 5% ratio as simply impossible to verify neither for inspectors on board nor at port. And as the measure expires in 2024 the next Commission Meeting will have to decide whether to prolong or revise this CMM. This then opens all opportunities ranging from FNA

without exceptions, over prolongation of the current measure to reverting back to the old 'fins to carcass ratio'.

**IATTC Resolution C-23-07** on **CONSERVATION MEASURES FOR THE PROTECTION AND SUSTAINABLE MANAGEMENT OF SHARKS** was adopted in 2023 as a compromise after the initially proposed fins naturally attached provision, which was supported by many member states and the IATTC Scientific Staff has once again failed to be acceptable to all member states.

Similar to WCPFC the resolution allows wiring, bagging and tagging as alternatives to FNA but does not provide any details whether the tagging alternative requires storage in the same holds or allows different holds for carcasses and fins to be stored in.

Out of the four RFMOs the IATTC measure is the only RFMO that also requires its member states to also prohibit the trading of fins that have been harvested in contravention of this resolution, whereas all others restrict the prohibition of the retention, storage on board, transshipment and landing of fins.

The measure is therefore only a temporary one expiring in 2026 if not replaced by a new measure and in this case going automatically back to the old fin to carcass ratio, which even allowed vessels to land fins separately from shark carcasses at different ports, a massive loophole the EU realized a long time back can never be enforced adequately. (Ziegler et al. 2021)

*5. CPCs shall prohibit shark finning.*

*6. CPCs shall ensure that all sharks are landed with all fins naturally attached to the body. In order to facilitate on-board storage, shark fins may be partially sliced through and folded against the shark carcass as appropriate but shall remain naturally attached to the carcass until the first point of landing (see Annex 2).*

*7. Until the end of 2026, notwithstanding paragraphs 6, and other provisions in this Resolution, CPCs may take alternative measures to ensure that individual shark carcasses and their corresponding fins can be easily identified on board the vessel at any time, using one of the following methods:*

*(i) each individual shark carcass and its corresponding fins are stored in the same bag, preferably a biodegradable one*

*(ii) each individual shark carcass is bound to the corresponding shark fins using rope or wire;*  
*or,*

*(iii) the shark fins and the corresponding shark are identically, uniquely, and numerically tagged in a manner that an authorized inspector can readily identify the matching of the shark fins to the corresponding shark.*

*8. Fishing vessels are prohibited from retaining on board, transshipping, landing or trading of any fins harvested or that have been removed on board in contravention of this Resolution.*

*9. Paragraphs 4 to 8 shall be reviewed, in consultation with IATTC scientific staff, and amendments shall be adopted by the Commission in 2026, as necessary. If no agreement is reached in 2026 on paragraph 7, paragraph 7 shall be replaced with the following text: Notwithstanding paragraphs 6, and other provisions in this Resolution, CPCs may take alternative measures to require their vessels to have onboard fins that total no more than 5% of the weight of sharks onboard, up to the first point of landing. CPCs that currently do not require fins and carcasses to be offloaded together at the point of first landing shall take the necessary measures to ensure compliance with the 5% ratio through certification, monitoring by an observer, or other appropriate measures.*

In summary so far there has been no progress at tuna RFMOs to implement FNA despite ample evidence and proof which clearly shows the unwillingness of all four RFMOs, respectively some of the member states to vigorously resist against the removal of the currently existing loopholes in the adopted finning bans.

## 2.4. Chances of Survival for unwanted Shark Bycatch & Best Handling and Release Practices

As stated by Cronin et al. (2023) the hierarchy of bycatch management should not be driven by but of course needs to include best practices applied when handling sharks and rays on board to release them alive. Varying between different gear types and for various species scientists have identified a range of best handling measures and also technical tools that can if on board and applied consistently by trained crew members has demonstrated to have huge potential to reduce at vessel mortality and post release mortality of sharks that are caught incidentally by the fishery but not retained as they are truly an “unwanted bycatch”. However not all RFMOs and not all of them for all species have started including such best release handling requirements as mandatory or at least recommended as part of their conservation measures. As such huge differences exist between RFMOs.

Considering such best handling practices requirements **IOTC** is once again at the end of the line as it has so far implemented best release handling requirements – at least for large vessels – only for mantas and mobulids as a short Annex to [Resolution 19/03](#) while as a matter of fact more detailed best practice has been presented to the IOTC by scientists e.g. in IOTC-2022-WGFAD03-09 recommending that large industrial fishing vessels such as e.g., purse seine vessels that set on drifting FADs should be equipped with manta sorting grids and double conveyor belts to allow for the immediate and safe release of mantas and mobulids, and sharks, respectively. This has demonstrated to substantially increase at vessel and post release survival of those animals when caught incidentally as part of fishing operations.

**ICCAT** has included more detailed Do’s and Don’ts in it [Rec 2023/14](#) referring to the recommended practices adopted by WCPFC.

Also [Rec 23/12](#) establishes preliminary requirements for whale sharks in Annex 1 outlining practices that “*should be used when releasing whale sharks incidentally caught in ICCAT fisheries*” and practices that “*should be avoided when releasing whale sharks incidentally caught in ICCAT fisheries*” and inviting CPCs to conduct further research to improve those.

[Rec 21/09](#) requires that “*CPCs shall require vessels flying their flag to implement, while giving due consideration to the safety of the crew, the minimum standards for safe handling and release procedures of North Atlantic shortfin mako shark, as provided under Annex 2 of this Recommendation, in order to promptly release unharmed, to the extent practicable, and to improve survivability of live North Atlantic shortfin mako shark when brought alongside the vessel. Revisions to Annex 2 may be considered by the Commission as new information from the SCRS becomes available.*” Annex 2 describes “*minimum standards for safe handling practices of North Atlantic shortfin mako sharks (nSMA) and provides specific recommendations for both longline and purse seine fisheries*” that are “*appropriate for live shortfin mako sharks when released whether under no- retention policies, or when released voluntarily.*” Annex 2

**IATTC** also lists recommendations for the safe release of mantas and mobulids in Annex 1 of [Resolution C-15-04](#) following recommendations from its scientific staff.

[Resolution C-23-07](#) includes in addition to the utilization of retained sharks also requirements intended to reduce shark bycatch mortality, such as:

10. *CPCs shall prohibit vessels targeting tuna and/or swordfish from using buoy lines.*
11. *All sharks (alive or dead) that are not retained must be promptly released unharmed, to the extent practicable, as soon as they are seen on the line, entangled in the net or brailed on the deck, taking due consideration of the safety of any persons using the following procedures:*

*For purse seine vessels:*

- a. *when seen entangled in the net, disentangle the sharks and release them into the ocean as soon as possible.*
- b. *sharks brailed on deck must be returned to the water as soon as possible, either utilizing a ramp from the deck connecting to an opening on the side of the vessel, or*



*through escape hatches. If ramps or escape hatches are not available, the sharks must be lowered with a sling or cargo net, using a crane or similar equipment, or as indicated in Annex 3 or any future revisions, as identified pursuant to paragraph 12.*

- c. prohibit the use of gaffs, hooks, or similar instruments for the handling of sharks.*
- d. prohibit the lifting of sharks by the head, tail, gill slits, or spiracles, or by using bind wire against or inserted through the body. Prohibit the punching of holes through the bodies of sharks (e.g., to pass a cable through for lifting the shark).*
- e. prohibit the lifting of whale sharks (*Rhincodon typus*) onboard the vessel and prohibit the towing of whale sharks out of a purse-seine net, e.g., using towing ropes.*

*For longline vessels:*

- f. leave the shark in the water, where possible.*
- g. use a line cutter to cut the branchline as close to the hook as possible, and so that less than 1 meter remains on the animal, to the extent practicable.*

Furthermore, the scientific staff was tasked to develop a set of best handling guidelines for the safe release of sharks for inclusion in this measure in 2024 and provided a preliminary list of measures in Annex 3, which can be used by states voluntarily in the meantime.

Therefore, in 2024 the scientific staff developed and published an extensive review of existing measures and practices for tuna fisheries in the Eastern Pacific Ocean [SAC-15-11 Corr. BEST HANDLING AND RELEASE PRACTICE GUIDELINES FOR SHARKS IN IATTC FISHERIES](#) listing proven measures for all fishing gears (longlines, gillnets, purse seine), differentiated for sharks and rays and where appropriate between different species. For each gear avoidance measures are discussed and then gear considerations respectively technical measures on board of vessels to release bycaught sharks differentiating between different vessel types. The paper also prioritizes between existing measures, based on proofed effectiveness and widespread availability, e.g. including where possible release ramps onboard of purse seine vessels to release sharks brought on board by the brailing process can be released as quickly and gently as possible maximizing thereby survival. For longliners the paper recommends inter alia the use of monofilament leaders instead of wire leaders as this has demonstrated to decrease at vessel shark mortality and/or improve post release survival rates. Best handling release practices are also discussed for each gear type and required tools and equipment required on board for release are listed (Hutchinson et. al 2024).

The recommendations have been adopted by the SAC and are now presented to the 2024 Commission for adoption.

**WCPFC [CMM 2022-04](#)** effective since 2024 requires longline fisheries since

*“January 1, 2024, between 20 N and 20 S, to ensure that their longline vessels, targeting tuna and billfish do not use, or if carrying, must stow wire trace as branch lines or leaders and do not use shark lines or branch lines running directly off of the longline floats or drop lines.”*

Thereby the CMM supersedes the older requirement introduced by [CMM 2014-05](#) which required longline fisheries targeting tuna and billfish since 2021 to comply with at least one of the following options:

*“(1) do not use or carry wire trace as branch lines or leaders; or*

*(2) do not use branch lines running directly off the longline floats or drop lines, known as shark lines.”*

Selection between measures was required on a vessel by vessel or CCM basis notifying the Commission of the desired option and whenever changes are made.

This revision was made following the recommendation derived from results of a project that had developed an interaction model for oceanic whitetip sharks and silky sharks with longline gear, evaluating the mortality reduction of the removal of shark lines and the transition from branch-lines with wire leaders to monofilament leaders, (Bigelow et al. 2021). This study has been building up on an earlier study (Harley et al. 2015) on the catchability and survival rates of the two species warning that “Given the high levels of fishing mortality experienced by these two species, it is unlikely that the options under the shark CMM (2014-05) of either banning

shark lines or wire traces will result in sufficient reductions in fishing mortality. Strengthening this measure may be necessary.”

CMM 2022-04 also requires that:

18. *The Commission shall adopt and enhance bycatch mitigation measures and develop new or amend, if necessary, existing Shark Safe Release Guidelines<sup>1</sup> to maximize the survival of sharks that are caught and are not to be retained. Where sharks are unwanted bycatch they should be released alive using techniques that result in minimal harm, taking into account the safety of the crew. CCMs should encourage their fishing vessels to use any Commission adopted guidelines for the safe release and handling of sharks.*

19. *CCMs shall ensure that sharks that are caught and are not to be retained, are hauled alongside the vessel before being cut free in order to facilitate a species identification. This requirement shall only apply when an observer or electronic monitoring camera is present and should only be implemented taking into consideration the safety of the crew and observer.*

20. *Beginning on January 1, 2024, for sharks that are caught by longline vessels and are not retained, CCMs shall require their fishing vessels to release these sharks as soon as possible, taking into consideration the safety of the crew and observer, using the following guidelines:*

*(1) Leave the shark in the water, where possible; and*

*(2) Use a line cutter to cut the branchline as close to the hook as possible.”*

Furthermore, [suppl CMM 2022-04-2 - Best handling practices for the safe release of Sharks \(other than Whale Sharks and Mantas/Mobulids\)](#) describes recommended non-binding guidelines of best handling practices of sharks for both purse seine and longline fisheries and [suppl CMM 2022-04-1 - Guidelines for the safe release of encircled whale sharks](#) provides specific recommendations for the release of encircled whale sharks in purse seine fisheries highlighting that PNA requires “*that when a whale shark is encountered in a purse seine net in PNA waters the net roll must be immediately stopped and the whale shark released.*”

[CMM 2019-05](#) includes best handling practices for the safe release of mantas & mobulids in Annex 1 for purse seine fisheries and longline fisheries with specific Do’s and Don’ts and [suppl CMM 2019-05 - Best Handling Practices for the Safe Release of Mantas & Mobulids](#) provides recommended non-binding guidelines of best handling practices of manta and mobulid rays for both purse seine and longline fisheries

### 3. Summary

- Sustainable management of commercially exploited sharks as a (secondary) target species or as a bycatch species has failed miserably at all tuna RFMOs so far although at least the Pacific RFMOs do have a clear mandate to do so in their statutes while ICCAT and IOTC also can do so should they want to. ICCAT has actually started doing so for 2 of the commercially targeted species, shortfin mako sharks and blue sharks by attempting MSEs and committing to the development of management procedures, while similar attempts for blue sharks at IOTC have so far been ignored by the Scientific Committee.
- Stock assessments are available only for a few stocks and in the absence of limit, threshold and target reference points all stocks are assessed only MSY and SB at MSY based which should not be used for species that have such a low fecundity, long maturing and low reproduction while performing essential ecosystem services that require healthy stock populations. And even when stocks are estimated to be overfished and/or experiencing overfishing projections and proposed measures always only aim to rebuild to SB MSY and accept even lower probability for achieving this than commonly accepted for other commercially targeted species.
- Despite the high uncertainty of total mortality due to low compliance with reporting requirements, close to zero discard reporting and high uncertainty of unexploited stock biomass stock assessment outcomes if at all allowing stock projections are most happily suggesting the stocks are healthy using complex modelling, ignoring the high uncertainty of total mortality in most fisheries and suggesting that higher catches beyond current catches would not jeopardize the survival of specific stocks.



- Conservation and management measures for sharks and rays and for specific shark species are overall low and only ICCAT has started adopting specific measures for porbeagle, shortfin mako, and blue sharks over the last decade, showing a clear intent to start actively managing those major ICCAT shark species, while nothing or only a retention ban without and further supporting measures has been agreed to for other shark species and a lot of shark and ray interactions are not even completely recorded.
- Retention bans differ substantially between the different RFMOs and although IUCN ratings of threatened status and CITES requirements for sustainable removals that do not threaten the survival of the stock and its ecosystem role in the wild apply globally, only oceanic whitetip and mantas and mobulids are now respectively will soon be subject to a retention ban in all RFMOs. Critically endangered hammerhead sharks are only banned from retention and commercialization in the Atlantic while still actively targeted by several nations in the Pacific and thresher sharks although protected by a retention ban at IOTC are still targeted by several nations in the Indian Ocean albeit by coastal fleets that are completely exempt from the retention ban, while catching several thousand tons of thresher sharks every year. Overall, the effectiveness of retention bans strongly depends on whether exemptions exist and how wide the loopholes generated thereby are, allowing products of those sharks still entering international markets and further accelerating overexploitation. Although in the 2 Pacific RFMOs few retention bans have been adopted, those apply to all parties, while IOTC and ICCAT allow wide-ranging exemptions. When assessing the number of adopted retention bans in place, ICCAT is certainly leading while WCPFC has pursued conservation efforts for those sharks that are subject to a retention ban most stringently as demonstrated for oceanic whitetip sharks and silky sharks.
- Finning has been prohibited by all tuna RFMOs, but little progress has been made to introduce fins naturally attached, although globally acknowledged to be the only measure to prevent finning from happening, being able to be enforced and offenses prosecuted. However, resistance of a few states stalled progress globally and recent measures adopted in the Pacific are serving more as an alibi rather than changing the situation on the water.
- Measures aiming to reduce mortality of sharks and rays should always prioritize avoidance, as a first step and technical measures to reduce at vessel mortality and improve post release survival as a second step, while the latter should ideally combine technical measures, gear modifications and best handling practices.
- Best handling and release practices for sharks and rays exist for all tuna gear however so far tuna RFMOs have done little to add mandatory best handling practices as part of their conservation and management measures for sharks. Although retention bans for the most vulnerable species and IUCN threatened species have demonstrated to lower shark mortality by removing commercial incentives, additional technical measures to improve survival of released animals are essential and most effective if combined with best handling practices and retention bans.
- Pacific RFMOs have been leading in combining technical measures and best release handling practices to strengthen the effectiveness of retention bans, while IOTC has to date not implemented a single technical measure to reduce shark mortality of those sharks that are considered to be most sensitive and therefore subject to a retention ban.
- Overall RFMOs' willingness to improve shark conservation and efforts by the Scientific Committees of the RFMOs differs substantially and while some SCs have been very progressive in following up on mandates provided by the Commission and generated strong management advice others have clearly failed to do so in the past, both in regard to start MSE testing and in proposing specific advice for individual stocks deemed to be in need of mortality reduction.

#### 4. Conclusions and 12 Recommendations to improve Shark Conservation at IOTC

IOTC needs clear and strong advice from the Working Party and from the Scientific Committee to start adopting meaningful measures to reduce shark mortality at IOTC. Therefore, we propose that the WPEB formulates respective recommendations for endorsement by SC since evidence in the past and most recently during the 2023 and 2024 Commission Meetings

showed, the Commission is not able to agree on effective measures for sharks without clear advice from SC. As scientists concerned about healthy marine ecosystems and healthy shark populations, we are obliged to take action now and provide clear advice and a roadmap for measures suitable to prevent the collapse of shark stocks in the Indian Ocean. As such the following 12 recommendations are made including both short term and mid term measures, but also a longer-term perspective.

1. Advise adoption of 'fins naturally attached' for all fisheries, without exemptions to be adopted by the Commission in 2024 and in case CPCs want to use alternative methods require evidence from them to be presented to the SC that the alternative measures have proven to be equal or superior to 'fins naturally attached' in preventing finning and enabling the prosecution and conviction of offenses.
2. Adopt the summary conclusion and recommendations from the April 2024 longline gear workshop and recommend to the SC to provide clear SC advice in 2024 for a ban of shark lines and wire traces, respectively the mandatory use of monofilament leaders in all longline fisheries targeting tuna and tuna like species in the IOTC area of competence aiming for adoption by the Commission in 2025.
3. Start testing MSEs for the development of Management Procedures for blue sharks in 2025 with the objective to present a full plan for the development of MPs for adoption by the Commission in 2026.
4. Propose a total mortality limit (including dead discards and estimates for live releases) for blue sharks for adoption by the Commission in 2025 based on the 2021 stock projections to not increase catches beyond 2019 levels. The 2025 TAC should then be reviewed by the SC following a precautionary approach and formulating based on the 2025 stock assessment a clear advice for revised catch limits, that provide a high probability (of 60% or more) to consistently maintain this stock in the green quadrant throughout the next 10 years. In 2026 the Commission should adopt the revised TAC and allocate quota between all catch nations.
5. Advise the Commission to remove existing exemptions from retention bans for Coastal Fisheries or at least limit existing exemptions strictly to subsistence fishing and require measures to be in place and enforced to prevent that carcasses or any part of those sharks enter international trade. The objective should also be to have identical wording for these exemptions for all existing and future retention bans.
6. Provide clear scientific advice from WPEB and from SC for the Commission meeting in 2025, which other mitigation measures should be implemented to reduce mortality and increase survival for those shark species that have already been identified by SC to require a precautionary approach and additional mortality reduction (Patterson et al. 2024). As such, measures for all gear types should be identified and proposed prioritizing measures for oceanic whitetip sharks, silky sharks, and shortfin mako sharks, but also for scalloped hammerheads and thresher sharks and could include retention bans for some or all of those sharks.
7. Provide scientific advice to the Commission for an extension of Resolution 13/05 on whale sharks to include a retention ban for whale sharks for all fishing gear for adoption in 2025.
8. Review existing best practices from other RFMOs for the handling and release (e.g. Hutchinson et al. 2024) for the handling and release of sharks and rays and prepare in 2025 species and gear specific guidance for IOTC including clear prioritization or ranking of mandatory versus suggested measures for endorsement by SC in 2025 and adoption by the Commission in 2026.

9. Initiate the testing of MSEs for the development of management procedures also for other shark species that are targeted for commercial purposes, specifically for shortfin mako sharks and silky sharks. If no target, limit and threshold reference points are available for these stocks apply a precautionary approach and depending on the outcome of the planned stock assessments either propose preliminary, precautionary catch limits allowing only dead animals to be retained or a complete retention ban until more data become available.
10. Start scientific studies to evaluate the ability of additional gear modifications to lower bycatch rates and / or increase survival of threatened sharks prioritizing those sharks that can't be retained but also recognizing the need to lower shark mortality at IOTC overall by improving gear selectivity.
  - Specifically, for longlines evaluate the usefulness of large circle hooks in combination with monofilament leaders to reduce shark mortality (and other bycatch mortality) and investigate biodegradable alternatives for monofilament.
  - Specifically, for purse seine fisheries setting on dFADs require the implementation of technologies to reduce time on board prior to release and to reduce the physical stress on juvenile silky sharks and oceanic whitetip sharks by having separate release ramps in place. As demonstrated by Onandia (2021), Grande (2022) and others this can in combination with best handling practices applied by the crew significantly reduce at vessel and post release mortality
  - Specifically, for gillnets request funding for and start designing a study to validate the benefits of green LED lights in gillnet fisheries in IOTC fishing routine. LED lights have demonstrated the potential to significantly reduce elasmobranch bycatch and bycatch of sea turtles and other ETP species (Senko et al., 2022; Allman et al., 2020 and many others). The potential of this has been presented to the WPEB in 2022 but not been followed up by the SC since then. The use of this bycatch avoidance measure for gillnets should urgently be tested for widespread use in both industrial and artisanal fisheries fishing tuna and tuna like species in the EEZs and the high seas within the IOTC area of competence.
11. Improve reporting requirements for all shark catches at species level for all gear types and fisheries at least for the 7 IOTC key shark species, and sharks from the same family e.g. great hammerhead sharks, smooth hammerhead sharks, longfin mako sharks, and all species of mantas and mobulids. Require also mandatory reporting of all discards for those sharks as part of the national reports for all gear types and all fleets.
12. Allow reporting of shark catches and discards from developing coastal states for coastal fleets and subsistence fisheries to be provided in a simplified method with focus on having more data even if format isn't fully compliant with IOTC recording standards. The Commission and/or CPCs from developed nations should also provide technical and financial support for capacity building for bycatch and discard reporting for developing coastal states.

## 5. Tables

*Table 2: Stock status, species specific Conservation and Management Measures (CMMs), and magnitude of recently reported catches for key pelagic shark species at tuna RFMOs*

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
Blue sharks	ICCAT N	<p><u>Stock Assessment 2015:</u> <i>Based on the scenarios and models explored, the status of the North Atlantic stock is unlikely to be overfished nor subject to overfishing. However, due to the level of uncertainty, the Group could not reach a consensus on a specific management recommendation.</i></p> <p><u>Stock Assessment 2023:</u> <i>A joint Kobe plot indicates that the stock is at MSY level (<math>B_{2021}/B_{MSY} = 1.00</math>, with 95% confidence interval: 0.75-1.31) with no undergoing overfishing (<math>F_{2021}/F_{MSY} = 0.70</math> with a 95% confidence interval: 0.50-0.93). <b>There is a 49.6% probability that the stock currently falls within the yellow quadrant of the Kobe plot, a 49.7% probability that the stock falls within the green, and less than a 1% chance that it is in the red or orange quadrants.</b></i></p>	<p><b>2023:</b> <b>MSY</b> estimate 33,822 t (31,085 – 36,465)  <b>B<sub>MSY</sub></b> is 120,012 t (83,682 -176,399).  The final model estimated median values of <math>B_{2021}/B_{MSY} = 0.96</math> (95%CI: 0.71 - 1.35) and <math>F_{2021}/F_{MSY} = 0.68</math> (95%CI: 0.47-0.91),</p>	<p>Reported landings and dead discards for all gear in metric tons<sup>1</sup></p> <p>2018: 33,978 2019: 27,212 2020: 21,145 2021: 21,886 2022: 22,057</p>	<p><u>Rec 23/10</u> <b>TAC 30,000 t</b></p> <p>SCRS shall inform the Commission, by 2025 on the feasibility, cost, options and tentative roadmap for developing an MSE framework (including inter alia candidate HCR with the associated candidate limit, target and threshold reference points) for the management of this stock in the ICCAT Convention area.</p>	<p><b>Yes,</b> quotas from TAC defined for EU, Japan, Morocco, and UK</p>
	ICCAT S	<p><u>Stock Assessment 2015:</u> <i>Given the uncertainty in South Atlantic stock status results it is not possible to discount that in recent years the stock may have been at a level near BMSY and that fishing mortality has been approaching FMSY. This implies that future increases in fishing mortality could push the stock to be overfished and experience overfishing.</i></p>	<p><b>2023</b> <b>MSY</b> estimate was 29,299 t (23,128 – 47,758) and the median marginal posterior for <b>B<sub>MSY</sub></b> was 135,211 t (91,781- 225,806).</p>	<p>Reported landings and dead discards for all gear in metric tons<sup>2</sup></p> <p>2018: 34,805 2019: 37,407</p>	<p><u>Rec 23/11</u> <b>TAC 27,711 t</b></p> <p>SCRS shall inform the Commission, by 2025 on the feasibility, cost, options and tentative roadmap for developing an MSE framework (including inter</p>	<p><b>Yes,</b> quotas allocated to EU, Japan, Brazil, Namibia, and</p>

<sup>1</sup> [ICCAT Nominal Catch Information up to 2022](#)

<sup>2</sup> [ICCAT Nominal Catch Information up to 2022](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
		<a href="#">Stock Assessment 2023</a> <i>A joint Kobe plot indicates that the stock is not overfished (<math>B_{2021}/B_{MSY} = 1.29</math>, with 95% confidence interval: 0.89 - 1.81) but undergoing overfishing (<math>F_{2021}/F_{MSY} = 1.03</math> with 95% confidence interval: 0.45 - 1.55). <b>There is a 46.5% probability that the stock is currently in the orange quadrant of the Kobe plot, a 44.7% probability that the stock falls within the green, and 8.02% probability of being in the red quadrant, with less than 1% chance that it is in the yellow quadrant.</b></i>	<p>The <math>F_{MSY}</math> median estimate was 0.22 (0.15 - 0.32). The final model estimated median values of <math>B_{2021}/B_{MSY} = 1.41</math> (95%CrI: 0.93 - 1.87) and <math>F_{2021}/F_{MSY} = 0.82</math> (95%CrI: 0.39 - 1.47), respectively.</p>	<p>2020: 33,868 2021: 33,671 2022: 31,727</p>	<p>alia candidate HCR with the associated candidate limit, target and threshold reference points) for the management of this stock in the ICCAT Convention area.</p>	<p>Chinese Taipei</p>
	IOTC	<a href="#">Stock Assessment 2021</a> <i>99.9% not overfished and not subject to overfishing Even though the 2021 assessment indicates that Indian Ocean blue shark are not overfished nor subject to overfishing, increasing current catches is likely to result in decreasing biomass and the stock becoming overfished and subject to overfishing in the near future). If the catches are increased by over 20%, the probability of maintaining spawning biomass above MSY reference levels (<math>SB &gt; SB_{MSY}</math>) over the next 10 years will be decreased.</i> <u>Management advice:</u> <i>Target and limit reference points have not yet been specified for pelagic sharks in the Indian Ocean. The 2021 assessment indicates that Indian Ocean blue shark are not overfished nor subject to overfishing). If the catches are increased by over 20%, the probability of maintaining spawning biomass above MSY reference levels (<math>SB &gt; SB_{MSY}</math>) over the next 10 years will be decreased). The stock should be closely monitored.</i>  Next assessment planned for 2025	<p><b>MSY</b> 36,000 t (33,500 – 38,600)</p> <p><b>Reference points:</b> no adopted reference points or harvest control rules for any shark species.</p>	<p>Reported catches in mt<sup>3</sup></p> <p>2022: 24,424</p> <p>Carcharhinidae nei: 2022: 32,558</p> <p>Estimated annual catch 2015 - 2019 (used for stock assessment): 48,781</p>	<p><b>No</b></p>	<p>N/A</p>

<sup>3</sup> [IOTC NOMINAL CATCH BY SPECIES, GEAR AND VESSEL FLAG REPORTING COUNTRY](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
	WCPFC	<p><a href="#">North Pacific SC18 2022</a> Stock Assessment</p> <ul style="list-style-type: none"> <li>The base case model results show that there is a 61.9% joint probability that NPO BSH stock is not in an overfished condition and that overfishing is not occurring.</li> <li>Stock projections of biomass and catch of NPO BSH from 2020 to 2030 were performed assuming four different harvest policies: <math>F_{current}</math> (2017-2019), <math>F_{MSY}</math>, <math>F_{current+20\%}</math>, and <math>F_{current-20\%}</math> and evaluated relative to MSY-based reference points. Based on these findings, the following conservation information is provided: <ul style="list-style-type: none"> <li>Future projections in three of the four harvest scenarios (<math>F_{current}</math> (2017-2019), <math>F_{current+20\%}</math>, and <math>F_{current-20\%}</math>) showed that median SSB in the North Pacific Ocean will likely (&gt;50 probability) increase; the <math>F_{MSY}</math> harvest scenario led to a decrease in median SSB.</li> <li>Median estimated SSB of BSH in the North Pacific Ocean will likely (&gt;50 probability) remain above <math>SSB_{MSY}</math> in the next ten years for all scenarios except <math>F_{MSY}</math>; harvesting at <math>F_{MSY}</math> decreases SSB below <math>SSB_{MSY}</math> (Figure 5E, SC18-SA-WP-06).</li> <li>There remain some uncertainties in the time series based on the quality (observer vs. logbook) and timespans of catch and relative abundance indices,</li> <li>The SHARKWG notes that uncertainty in stock status in the current assessment is likely still underrepresented as the model ensemble did not consider key uncertainties such as natural mortality or stock-recruitment resilience which are not well-known for many shark species</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Median female SSB in 2020 was estimated to be 1.170 of <math>SSB_{MSY}</math> (80<sup>th</sup> percentile, 0.570 - 1.776)</li> <li>Recent annual F (<math>F_{2017-2019}</math>) is estimated to be below <math>F_{MSY}</math></li> </ul>	<p>Estimated LL catches in metric tonnes<sup>4</sup></p> <p>2021: 28,876 2022: 34,573</p>	No	N/A
		<p><a href="#">South Pacific SC18 2022</a> Stock Assessment Analysis</p> <ul style="list-style-type: none"> <li>stock biomass was low throughout the region through the early 2000s following the expansion of longline fishing effort in the region, but the estimates across the</li> </ul>	MSY =11,413 t		No	N/A

<sup>4</sup> [WCPFC Tuna Fishery Yearbook 2022](#)



Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
		<p>uncertainty grid of 228 models largely indicated that the stock has been recovering since then.</p> <ul style="list-style-type: none"> <li>• median value of relative recent dynamic spawning biomass depletion for Southwest Pacific blue shark (<math>SB_{2017-2020}/SB_{F=0}</math>) was 0.71 (90<sup>th</sup> percentiles 0.37 and 0.82). Alternatively, relative recent equilibrium spawning biomass depletion for South Pacific blue shark (<math>SB_{2017-2020}/SB_0</math>) was = 0.80 (90<sup>th</sup> percentiles 0.43 and 0.90).</li> <li>• median value of <math>SB_{2017-2020}/SB_{MSY}</math> was 1.64 (90<sup>th</sup> percentiles 0.88 and 1.87; Table SBSH-2) with <b>87% likelihood (according to the 228 weighted models) that the biomass is above <math>SB_{MSY}</math>.</b></li> <li>• the fishing mortality has declined over the last decade and is currently relatively low with the median <math>F_{2017-2020}/F_{MSY} = 0.65</math> (90<sup>th</sup> percentiles 0.43 and 0.86; Table SBSH-2).</li> <li>• <b>there was a 1% likelihood (according to the 228 weighted models) that the recent fishing mortality (<math>F_{2017-2020}</math>) was above <math>F_{MSY}</math>.</b></li> </ul>				
	IATTC	No recent stock assessment available for EPO but blue sharks have been included in the <a href="#">EASI vulnerability assessment of 32 shark species in 2022</a> and been identified amongst those as one of the 20 “most vulnerable” shark species due to their commercial value	N/A	Estimated catches in mt <sup>5,6</sup> LL+PS  2018: 12,365 2019: 14,452 2020: 13,269 2021: 8,323 2022: 10,053	<b>No</b>	N/A

<sup>5</sup> [August 2024 Shark EPO purse seine catch and effort aggregated by year, month, flag or set type, 1°x1° and Shark EPO longline catch and effort aggregated by year, month, flag, 5°x5°](#)

<sup>6</sup> [IATTC 102-01 Rev The-tuna-fishery-in-the-Eastern-Pacific-Ocean-in-2023.pdf](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
Shortfin mako	ICCAT N	<a href="#">Stock Assessment 2019:</a> 90% probability that stock is in the red quadrant of the Kobe plot, i.e. overfished <b>and</b> experiencing overfishing; <i>Regardless of the TAC (including a TAC of 0 t), the stock will continue to decline until 2035 before any biomass increases can occur; a TAC of 500 tons, including dead discards has only a 52% probability of rebuilding the stock to levels above SSFMSY and below FMSY in 2070; to be in the green quadrant of the Kobe plot with at least 60% probability by 2070, the realized TAC has to be 300 t or less; lower TACs achieve rebuilding in shorter time frames; 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.</i>	Relative Biomass B2015/BMSY = 0.57-0.953 B2015/B0 = 0.34-0.574  Relative Fishing Mortality FMSY = 0.015-0.0565 F2015/FMSY = 1.93-4.386	Reported landings and dead discards for all gear in metric tons <sup>7</sup>  2018: 2392 2019: 1,885 2020: 1,740 2021: 1,447 2022: 831	<a href="#">Rec 2021/09</a> <b>No retention:</b> 2022 - 2024; Total mortality limit (including dead discards and live discard mortality estimate) = 250 t defining limit for potential retention if mortality stays below the limit; Probability of at least 60-70% defined for stock rebuilding into the green zone of the Kobe plot by 2070;  mandatory discard reporting	<b>Yes, allocation formula</b> defined already for future, potential retention
	ICCAT S	<a href="#">Stock Assessment 2019:</a> Combined probability of the stock being overfished is 32.5% and that of experiencing overfishing is 41.9%. <i>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 with catch scenario C1)</i>	Relative Biomass B2015/BMSY = 0.65-1.753 B2015/B0 = 0.32-1.184  Relative Fishing Mortality: FMSY = 0.030-0.0345 F2015/FMSY = 0.86-3.676	Reported landings and dead discards for all gear in metric tons <sup>8</sup>  2018: 3,158 2019: 2,308 2020: 2,856 2021: 2,279 2022: 2,485	<a href="#">Rec 2022/11</a> <b>TAC = 1,295 t for 2023 &amp; 2024</b> Probability of 60-70% defined for stock being in the green zone of the Kobe plot. from 2025 onwards only dead animals may be retained even within the quotas; mandatory discard reporting	<b>Yes,</b> allocated to all CPCs with previous catches at 60% of historic catches & at 40% of historic catches for CPCs with > 500 t in past years
	IOTC	<a href="#">Stock Status 2020</a> <i>Although an attempt was made to assess the shortfin mako stock in 2020, there is no quantitative stock assessment</i>	<b>MSY:</b> Unknown.	Reported catches in mt <sup>9</sup>	<b>No</b>	N/A

<sup>7</sup> [ICCAT Nominal Catch Information up to 2022](#)

<sup>8</sup> [ICCAT Nominal Catch Information up to 2022](#)

<sup>9</sup> [IOTC NOMINAL CATCH BY SPECIES, GEAR AND VESSEL FLAG REPORTING COUNTRY](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
		<p>currently available for shortfin mako shark in the Indian Ocean. Therefore, the stock status is unknown.</p> <p>Management advice In the absence of a stock assessment and noting conflicting information, the Commission should take a cautious approach by implementing management actions that reduce fishing mortality on shortfin mako sharks.</p> <p><a href="#">Non-detriment Finding by the UK CITES Scientific Authority Isurus oxyrinchus (Shortfin mako), 2022:</a> However, trend analysis of the biomass for 1971–2015 (45 years) revealed annual rates of decline of 0.9%, consistent with a median decline of 47.9% over three generation lengths (72 years), with the highest probability of 30–49% reduction.</p> <p><a href="#">2024 Stock Assessment for Shortfin Mako in Indian Ocean</a> concludes that in 2022 the shortfin mako shark was overfished (median <math>B_{2022}/B_{msy} = 0.96</math>) and is undergoing overfishing (median <math>F_{2022}/F_{msy} = 1.65</math>), with an overall 49.7% probability. and recommends that <b>to maintain the population above MSY-reference levels in the next 10-year period with at least a 50% probability, future catches (TACs) of the shortfin mako shark in IOTC should be no more than 1,217.2 t per year, which represents 40% of the current catches.</b></p>	<p>Reference points: Not applicable.</p> <p>MSY = 1,873.1 t (median) BMSY = 60,999.64 t (median)</p>	<p>2022: SMA 666 All MAK: 1,947</p> <p>SMA, MAK, LMA combined: 2,627</p> <p>Lamnidae nei 2022: 34,248</p> <p>Shortfin mako sharks are commonly taken by a range of fisheries in the Indian Ocean.</p>		
	WCPFC	<p><a href="#">SC14 2018 Stock Assessment for North Pacific Shortfin Mako</a> Concluded that no target and limit reference points have been established for pelagic sharks in the Pacific Ocean and therefore tock status is reported in relation to MSY.</p>	<p>MSY 3127.1 t Spawning Abundance at MSY – 633,700</p>	<p>Estimated LL catches in metric tonnes<sup>10</sup></p>	<b>No</b>	N/A

<sup>10</sup> [WCPFC Tuna Fishery Yearbook 2022](#)

Species	Tuna RFMO	Stock Status? <ul style="list-style-type: none"> <li>Overfished?</li> <li>Overfishing?</li> </ul>	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
		<p>The results from the base case model show that, relative to MSY, the North Pacific shortfin mako stock is likely (&gt;50%) not in an overfished condition and overfishing is likely (&gt;50%) not occurring relative to MSY-based abundance and fishing intensity reference points.</p> <p>Projected North Pacific shortfin mako (<i>Isurus oxyrinchus</i>) spawning abundance under different F harvest policies (Constant F 2013-2015, +20%, -20%) using the base case model. Constant F was based on the average from 2013-2015 showed that spawning abundance will decline within 10 years at +20% F based on F 2013-2015</p> <p>However when issuing their NDF for shortfin mako the UK CITES authority, <a href="#">Non-detriment Finding by the UK CITES Scientific Authority Isurus oxyrinchus (Shortfin mako), 2022</a>: reelevated this outcome to North Pacific stock is 'possibly not overfished and overfishing is possibly not occurring' applying a more precautionary approach in view of the uncertainty in fishery data and key biological processes, especially stock recruitment. Additionally, there is uncertainty in the estimated historical catches of North Pacific shortfin mako shark (WCPFC, 2019).</p> <p>It also notes that the trend analysis of the modelled spawning abundance (SA) for 1975–2016 (42 years) revealed annual rates of decline of 0.6%, consistent with a median decline of 36.5% over three generation lengths (72 years), with the highest probability of 30–49% reduction over three generation lengths.</p> <p><a href="#">2024 Shortfin mako shark in the North Pacific Ocean through 2022 Assessment</a></p> <ul style="list-style-type: none"> <li>No biomass-based or fishing mortality-based limit or target reference points have been established for NPO SMA by the IATTC or WCPFC;</li> <li>The model ensemble results show that there is a 65% joint probability that the North Pacific SMA stock is not in an overfished condition and that overfishing is not occurring relative to MSY based reference points.</li> </ul>	mature females sharks	<p>But only for MAK as not reported at species level</p> <p>2021: 2374 2022: 2030</p>		

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
		<ul style="list-style-type: none"> <li>Several uncertainties may limit the interpretation of the assessment results including uncertainty in catch (historical and modeled period) and the biology and reproductive dynamics of the stock, and the lack of CPUE indices that fully index the stock.</li> <li>Future projections in three of the four harvest scenarios (U2018-2021, U2018-2021+20%, and U2018-2021-20%) showed that median D in the North Pacific Ocean will likely (&gt;50% probability) increase; only the UMSYharvest scenario led to a decrease in median D.</li> </ul> <p><u>2022 stock assessment of southwest pacific shortfin mako</u> Was unsuccessful and SC18 did not regard the South Pacific mako shark assessment to be robust enough to provide management advice but noted that a large number of CCMs currently release (cut sharks free) shortfin mako sharks. SC18 encourages CCMs to continue to maintain this practice as a precautionary measure to reduce mortality of a slow growing, unproductive species with unknown stock status.</p>				
	IATTC	No recent stock assessment available at EPO but shortfin mako sharks were included in the <a href="#">EASI vulnerability assessment of 32 shark species in 2022</a> and were identified amongst those as one of the 20 “most vulnerable” shark species due to their commercial value	N/A	Estimated catches in mt <sup>11,12</sup>  Shortfin mako 2020: 1,764 2021: 1,399 2022: 1,325  Mako nei 2020: 1919	<b>No</b>	N/A

<sup>11</sup> [August 2024 Shark EPO purse seine catch and effort aggregated by year, month, flag or set type, 1°x1° and Shark EPO longline catch and effort aggregated by year, month, flag, 5°x5°](#)

<sup>12</sup> [IATTC 102-01 Rev The-tuna-fishery-in-the-Eastern-Pacific-Ocean-in-2023.pdf](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
				2022: 5		
Silky Shark	ICCAT N ICCAT S	No recent stock assessment	N/A	Reported landings and dead discards for all gear in metric tons <sup>13</sup>  2020: 328 2021: 263 2022: 364	<a href="#">Rec 11/08</a> <b>No retention</b>	
	IOTC	<a href="#">Stock Status (2022)</a> <i>Despite the lack of data, there is some anecdotal information suggesting that silky shark abundance has declined over recent decades, including from Indian longline research surveys, which are described in the IOTC Supporting Information for silky shark sharks. There is no quantitative stock assessment or basic fishery indicators currently available for silky shark in the Indian Ocean therefore the stock status is unknown.</i>  <i>Management advice: Despite the absence of stock assessment information, the Commission should consider taking a cautious approach by implementing some management actions for silky sharks.</i> <i>Mitigation measures should be taken to reduce at-vessel and post release mortality, including consideration of potential gear modifications in longline fleets targeting tuna and swordfish. Noting that a recent study (Bigelow et al. 2021) concluded in WCPFC that banning both shark lines and wire leaders has the potential to reduce fishing mortality by 30.8% for silky shark.</i>	<b>MSY:</b> Unknown.  <b>Reference points:</b> Not applicable.	Reported catches in mt <sup>14</sup>  2020: 1,335 t 2021: 1,423 t 2022: 1,426 t but catches are estimated to be at least 10 times higher  Carcharhinidae nei: 2022: 32,558 t  <i>In addition, silky sharks are commonly taken by a range of fisheries in the Indian Ocean.</i>	<b>No</b>	N/A

<sup>13</sup> [ICCAT Nominal Catch Information up to 2022](#)

<sup>14</sup> [IOTC NOMINAL CATCH BY SPECIES, GEAR AND VESSEL FLAG REPORTING COUNTRY](#)



Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
		New assessment indicatively planned for 2026		Silky sharks are also the main shark bycatch in purse seine fishing, while discards are not consistently reported by CPCs, more than 1,000 t of annual discards have been reported from MSC certified vessels alone (Ziegler 2022) Survival rates of purse seine discards are reported to be low		
	WCPFC	<a href="#">SC14 2018 Stock Assessment</a> <ul style="list-style-type: none"> <li>the stock declined steadily over the model period (1995-2016). The assessment model estimates <b>spawning biomass in 2016 to have been at 47% of the unexploited level</b> (<math>SB_{2016}/SB_0 = 0.469</math>). Current biomass is estimated to be above the MSY reference biomass level; however, there is considerable uncertainty associated with the estimate of stock status (<math>SB_{2016}/SB_{MSY} = 1.178</math> 95% CI 0.590-1.770) (Table FAL-1).</li> <li><b>the stock is not considered to be overfished, i.e. there is a 78% probability</b> that <math>SB_{2016}</math> is greater than <math>SB_{MSY}</math></li> </ul>	<b>MSY</b> = 12,162 (6,711-17,615) t	Estimated Catch LL <sup>15</sup> in number of animals (but not all fisheries included)  2019: 123,000 (107,000-147,000)  2020: 105,000 (87,800-131,000)	<a href="#">CMM 2022-04</a> <b>No retention since 2014</b>	N/A

<sup>15</sup> Peatman et al 2023

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
		<ul style="list-style-type: none"> <li>• <b>Fishing mortality is estimated to be above <math>F_{MSY}</math></b> (<math>F_{2016}/F_{MSY} = 1.607</math>, <math>Pr(F_{2016} &gt; F_{MSY}) = 84\%</math>). The current level of catch is substantially higher than the MSY. <b>If catches remain at the current level there is a high probability that the biomass will decline to below the <math>SB_{MSY}</math> level in the foreseeable future (~ 5 years).</b></li> </ul> <p><a href="#">Stock Assessment of Silky Shark in the Western and Central Pacific Ocean: 2024 - Rev.02</a></p> <ul style="list-style-type: none"> <li>• <i>concludes that fishing mortality has declined substantially in the most recent decade, and that recent stock status is likely improving from previous low levels. A multi-model approach was taken to assess silky shark in the Western and Central Pacific Ocean due to large uncertainties in the underlying data and difficulties with fitting of integrated stock assessments for sharks generally.</i></li> <li>• <i>The multi-model approach to assessing silky shark resulted in an uncertain stock status, but high confidence that recent fishing mortality is below levels that would preclude stock rebuilding.</i></li> <li>• <i>The assessment assumes largest fishing mortality has come from longline fisheries capturing nearly the full size-range of silky sharks, and reductions in interactions as a result of changes in fishing practices over the last decade may have substantially reduced this source of mortality, allowing the stock to rebuild.</i></li> </ul>	<p>This new stock assessment contradicts the 2018 stock assessment, when concluding despite an <b>unknown stock status</b> that the stock has improved since 2010 and that there is high confidence in <b>fishing mortality not to preclude stock rebuilding.</b></p>	<p>2021: 69,700 (58,400-84,400)</p> <p>Purse seine<sup>16</sup> bycatch in mt from PNA</p> <p>2019: 3,549 2020: 3,006 2021: 3,151</p> <p>Equal to approx. 100,000-130,000 animals per year</p>		
	IATTC	<p><a href="#">Stock Status 2023</a></p> <p><i>The terminal point of these indices suggests a relatively stable abundance level for over a decade, with the 2022 values similar to (south), or slightly above (north), the 2021 value, and thus no changes to management measures are recommended (<b>Figure 5</b>). However, the stock status is</i></p>	N/A	<p>Estimated catches in mt<sup>17,18</sup> LL + PS</p> <p>2020: 11,753</p>	<b>No TAC but <a href="#">C 21-06</a></b> requires until 2026 <i>CPCs shall require all longline vessels whose fishing licenses do not include sharks as a fishing</i>	N/A

<sup>16</sup> MSC PNA Assessment report 2024

<sup>17</sup> [August 2024 Shark EPO purse seine catch and effort aggregated by year, month, flag or set type, 1°x1° and Shark EPO longline catch and effort aggregated by year, month, flag, 5°x5°](#)

<sup>18</sup> [IATTC 102-01 Rev The-tuna-fishery-in-the-Eastern-Pacific-Ocean-in-2023.pdf](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
		<i>uncertain, and an assessment has not been possible due to the paucity of data, especially for the longline fleets of the EPO coastal nations, which are believed to have the greatest impact on the stock (SAC-05 INF-F, SAC-14 INF-L). Insufficient data for stock assessment is also a common problem for almost all shark species with which EPO fisheries interact. Therefore, in 2022 the staff used the ecological risk assessment method EASI-Fish to conduct the first comprehensive quantitative vulnerability assessment for 32 shark species caught in industrial and artisanal fisheries in the EPO (SAC-13-11). The assessment showed <b>silky shark to be classified as “most vulnerable”, having the second highest vulnerable rank among the 32 shark species assessed.</b> In 2023, a focused EASI- Fish assessment was undertaken on silky shark and three hammerhead shark species to explore the potential efficacy of hypothetical conservation and management measures (CMM) (SAC-14-12), such as EPO-wide closures, and prohibition of the use of wire leaders.</i>		2022: 681 (LL reported only 37 t!)  Average 2006 - 2021: 10,683	<i>target but catch sharks incidentally, to limit bycatch of silky sharks to a maximum of 20% of the total catch by fishing trip in weight. The 20% limit is set as an interim limit in the absence of data and scientific analysis. CPCs shall require their multi-species fisheries using surface longlines<sup>1</sup> to limit the catch of silky sharks of less than 100 cm total length to 20% of the total number of silky sharks caught during the trip. For those multi-species fisheries using surface longlines that have captured more than 20% of silky sharks in weight on average in a year, CPCs shall prohibit the use of steel leaders during a period of three consecutive months each year.</i>	
<b>Hammer head sharks (Sphyrnidae)</b>	ICCAT N ICCAT S	No recent assessment available	N/A	Reported landings and dead discards for all gear in metric tons <sup>19</sup>  Sphyrna mokarran: 2021: 2 2022: 4  Sphyrna lewini: 2021: 53	<a href="#">Rec 10/08</a> <b>No retention of sharks of the family Sphyrnidae (except for the <i>Sphyrna tiburo</i>) since 2011</b>	

<sup>19</sup> [ICCAT Nominal Catch Information up to 2022](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
				2022: 60  Sphyrnidae nei: 2020: 442 2021: 429 2022: 548		
	IOTC	<u>Scalloped Hammerhead Stock Status</u> <i>There is no quantitative stock assessment or basic fishery indicators currently available for scalloped hammerhead shark in the Indian Ocean therefore the stock status is unknown</i>  <i>Management advice: Despite the absence of stock assessment information, the Commission should consider taking a cautious approach by implementing some management actions for scalloped hammerhead sharks.</i>  Full assessment planned for 2026	<b>MSY:</b> Unknown.  <b>Reference points:</b> Not applicable.	Reported catches in mt <sup>20</sup>  2022: 670  Hammerheads nei 2022: 33,949  <i>Scalloped hammerhead sharks are commonly taken by a range of fisheries in the Indian Ocean.</i>	<b>No</b>	N/A
	WCPFC	No recent Stock Assessment or Stock Status available for any hammerhead shark species	N/A	Catch data only provided for PS fisheries and no significant number reporter there <sup>21</sup>	<b>No</b>	N/A

<sup>20</sup> [IOTC NOMINAL CATCH BY SPECIES, GEAR AND VESSEL FLAG REPORTING COUNTRY](#)

<sup>21</sup> [WCPFC Tuna Fishery Yearbook 2022](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
	IATTC	<p><a href="#">Vulnerability Assessment performed</a></p> <p><i>The CMMs having the greatest positive impact was similar for all four species, imposing EPO-wide closures of 120 or 180 days, especially for the industrial longline fishery, due to its large spatial effort footprint that overlaps significantly with the distribution of the four species.</i></p> <p><i>Amongst other scenarios banning wire traces, imposing a 100 cm total length minimum retention length for all sharks showed positive results on mortality reduction, and a prohibition of landing of all sharks was predicted to greatly reduce at-vessel mortality. However, this positive effect on vulnerability of the latter was mostly negated due to high post-release mortality of these species. These results highlighted that the most effective mitigation measure for these sharks is to avoid interaction with EPO fisheries.</i></p> <p><i>Resolution C-16-05, which called for, among other things, a workplan to complete stock assessments for four species: silky shark (<i>Carcharhinus falciformis</i>), scalloped hammerhead (<i>Sphyrna lewini</i>), great hammerhead (<i>Sphyrna mokarran</i>), and smooth hammerhead (<i>Sphyrna zygaena</i>). However, a lack of reliable long-term time series of abundance has hampered stock assessments for silky shark, which was attempted by the IATTC in 2014 and expanded to a Pacific-wide stock assessment in 2018.</i></p>	N/A	<p>Estimated catches in mt<sup>22, 23</sup></p> <p>Scalloped hammerhead 2020: 14 2022: 47</p> <p>Hammerheads nei 2020: 1918 2022: 9</p> <p>Smooth Hammerhead Average 2006– 2021: 900</p> <p>2021: 37 2022: 18</p>	<b>No</b>	n/a

<sup>22</sup> [August 2024 Shark EPO purse seine catch and effort aggregated by year, month, flag or set type, 1°x1° and Shark EPO longline catch and effort aggregated by year, month, flag, 5°x5°](#)

<sup>23</sup> [IATTC 102-01 Rev The-tuna-fishery-in-the-Eastern-Pacific-Ocean-in-2023.pdf](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
Thresher sharks Genus Alopias	ICCAT N + ICCAT S	No recent stock assessment available	N/A	Reported landings and dead discards for all gear in metric tons <sup>24</sup>  Thresher nei 2021: 539 2022: 310  Bigeye thresher 2021: 5 2022: 29	<a href="#">Rec 09/07</a> <b>No retention allowed since 2010 for <i>Alopias superciliosus</i></b> <i>in any fishery with exception of a Mexican small-scale coastal fishery with a catch of less than 110 fish;</i>  <i>CPCs should strongly endeavor to ensure that vessels flying their flag do not undertake a directed fishery for species of thresher sharks of the genus.</i>	N/A
	IOTC	<a href="#">Pelagic Thresher Stock Status</a> <i>Management advice: The prohibition on the retention of pelagic thresher shark should be maintained.</i>  Assessment indicatively planned for 2026  <a href="#">Bigeye Thresher Stock Status</a> <i>There is no quantitative stock assessment and limited basic fishery indicators are currently available for pelagic and for bigeye thresher shark in the Indian Ocean. Therefore, the stock status is unknown.</i>  <i>Management advice: The prohibition on retention of bigeye thresher shark should be maintained.</i>  Assessment indicatively planned for 2026 for pelagic thresher sharks and bigeye thresher sharks	<b>MSY:</b> Unknown.  <b>Reference points:</b> Not applicable	Reported catches in mt <sup>25</sup>  Pelagic Thresher 2022: 156  Bigeye Thresher 2022: < 1  Thresher sharks nei 2022: 5,209  <i>Bigeye thresher sharks are commonly taken by a range of</i>	<a href="#">IOTC Resolution 12/09</a> <b>No retention of thresher sharks since 2012</b> <i>On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence, prohibits retention onboard, transshipping, landing, storing, selling or offering for sale any part or whole carcass of thresher sharks of all the species of the family Alopiidae.</i>	N/A

<sup>24</sup> [ICCAT Nominal Catch Information up to 2022](#)

<sup>25</sup> [IOTC NOMINAL CATCH BY SPECIES, GEAR AND VESSEL FLAG REPORTING COUNTRY](#)



Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
				<i>fisheries in the Indian Ocean. However, there are few data to estimate CPUE trends and a reluctance of fishing fleets to report information on discards/non-retained catch.</i>		
	WCPFC	<a href="#">Pacific Bigeye Thresher Shark Stock Status 2019</a> No stock assessment existing  <i>SC15 noted that no stock assessments were conducted for Pacific bigeye thresher shark in 2019. Therefore, the stock status descriptions from SC13 are still current for Pacific bigeye thresher shark.</i>	N/A	Bigeye thresher sharks in LL in tons <sup>26</sup> (not including all fisheries)  2019: 3,520 (3,111-4,070)  2020: 2,940 (2,480-3,460)  2021: 2,510 (2,050-3,120)	<b>No</b>	N/A
	IATTC	No recent stock assessment available but bigeye thresher sharks and pelagic thresher sharks were included in the <a href="#">EASI vulnerability assessment of 32 shark species in 2022</a> and were identified amongst those as one of the 20 “most vulnerable” shark species	N/A	Estimated catches in mt <sup>27,28</sup> LL + PS  Bigeye thresher 2020: 1255	<b>No</b>	-

<sup>26</sup> Peatman et al 2023

<sup>27</sup> [August 2024 Shark EPO purse seine catch and effort aggregated by year, month, flag or set type, 1°x1° and Shark EPO longline catch and effort aggregated by year, month, flag, 5°x5°](#)

<sup>28</sup> [IATTC 102-01 Rev The-tuna-fishery-in-the-Eastern-Pacific-Ocean-in-2023.pdf](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
				2022: 85  Pelagic Thresher Average (2007-2021): 1928 2020: 805 2022: 4		
	ICCAT	No stock assessment existing	N/A	Reported landings and dead discards for all gear in metric tons <sup>29</sup>  2021: 2 2022: 2	Retention ban	N/A
<b>Oceanic whitetip sharks</b>	IOTC	<i>There is no quantitative stock assessment and limited basic fishery indicators currently available for oceanic whitetip sharks in the Indian Ocean therefore the stock status is unknown</i>  <i>Management Advice: Mitigation measures should be taken to reduce at-vessel and post release mortality, including consideration of potential gear modifications in longline fleets targeting tuna and swordfish. Noting that a recent study (Bigelow et al. 2021) concluded in WCPFC that banning both shark lines and wire leaders has the potential to reduce fishing mortality by 40.5% for oceanic whitetip shark.</i>  Indicator analysis planned for 2026	N/A	Reported catches in mt <sup>30</sup>  Average 2018-2022: 35 2022: 41  Charharinidae nei 2022: 32,558	Retention ban	N/A

<sup>29</sup> [ICCAT Nominal Catch Information up to 2022](#)

<sup>30</sup> [IOTC NOMINAL CATCH BY SPECIES, GEAR AND VESSEL FLAG REPORTING COUNTRY](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
	IATTC	No recent stock assessment existing but oceanic whitetip sharks were included in the <a href="#">EASI vulnerability assessment of 32 shark species in 2022</a> and were identified amongst those as one of the 20 “most vulnerable” shark species	N/A	Estimated catches in mt <sup>31, 32</sup>  2020 & 2022 no catches reported by LL  2022: 12 t in PS	Retention ban	N/A
	WCPFC	<a href="#">Oceanic Whitetip Stock Status 2019</a> <ul style="list-style-type: none"> <li>• SC15 noted that the median level of spawning biomass depletion from the uncertainty grid was <math>SB_{recent}/SB_0 = 0.04</math> with a probable range of 0.03 to 0.05 (80% probability interval). While no limit reference point has been adopted, the depletion in spawning biomass is very high. The median level of recent spawning biomass relative to that leading to MSY was <math>SB_{recent}/SB_{MSY} = 0.09</math> (range: 0.05–0.17).</li> <li>• SC15 noted that the recent relative fishing mortality was very high and the grid median <math>F_{recent}/F_{MSY}</math> was 3.94, with a range of 2.67 to 5.89 (80% probability interval), and that there were no model runs in the grid where <math>F_{recent}/F_{MSY}</math> was below 1.</li> <li>• The key conclusions are that overfishing is occurring and the stock is in an overfished state relative to MSY and depletion-based reference points (noting that depletion-based reference points have only been adopted for tunas) (Tables OCS-1 and OCS-2). This conclusion is robust to uncertainties in key model assumptions (Figure OCS-5).</li> <li>• SC noted that stock status improved relative to F-based reference points in the period since CMM 2011-04</li> </ul>	MSY = 7055 (1774 – 19122)  SB (MSY) = 4357 (523 – 15593)	Estimated LL catches in metric tonnes <sup>33</sup>  2021: 570 2022: 360  Estimated bycatch in PS In metric tonnes <sup>34</sup>  2019: 1,084 (1,068-1,101)  2020: 989 (885-1,132)	Retention ban	N/A

<sup>31</sup> [August 2024 Shark EPO purse seine catch and effort aggregated by year, month, flag or set type, 1°x1° and Shark EPO longline catch and effort aggregated by year, month, flag, 5°x5°](#)

<sup>32</sup> [IATTC 102-01 Rev The-tuna-fishery-in-the-Eastern-Pacific-Ocean-in-2023.pdf](#)

<sup>33</sup> [WCPFC Tuna Fishery Yearbook 2022](#)

<sup>34</sup> Peatman et al. 2021

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
		<p>became active, which covers the last 4 years of the assessment's time-span (2013–2016). Notably, <i>F/FMSY</i> is predicted to have declined by more than half from 6.12 to 2.67 (<math>n=432</math>, unweighted grid median) (Figure OCS-2), for the last year of the assessment when the impact of CMM 2011-04 on survival is accounted for under 25% and 43.75% discard mortality scenarios</p> <p>New assessment planned for 2025</p>				
Por-beagle	ICCAT	<p><a href="#">2022 PRELIMINARY STOCK ASSESSMENT OF NORTHEASTERN ATLANTIC PORBEAGLE (LAMNA NASUS)</a></p> <p>The probability that the stock is overfished and that overfishing is currently occurring (e.g. red quadrant) is estimated to be 0%. However, the stock is still overfished (~ 0.45 <i>B/BMSY</i>) but fishing mortality is currently well below <i>FMSY</i>, (~ 0.01 <i>F/FMSY</i>) (e.g. yellow quadrant) with a 98% probability. Given that in the last decade commercial catches stopped hence no fishery-dependent indices of abundance are available, [...] there is high uncertainty in the recovery trend of this stock.</p> <p><a href="#">Northwestern Stock Assessment 2020:</a></p> <p>For the northwest stock, all formulations of the ICM model indicate a rebuilding trend since 2001, yet biomass in 2018 was still only 57% of biomass at the SPRmer reference point and the stock is predicted to be overfished with a 98% probability. There are contradictory signals with respect to the overfishing status (with the SAFE approach indicating no overfishing and the exploratory length-based method suggesting overfishing), but with the large reduction in recent removals, the Group does not consider it likely that the stock is undergoing overfishing if total removals</p>	MSY 1,286.4 t with 95%CI (825.6 - 1,849.4 t)	<p>Reported landings and dead discards for all gear in metric tons<sup>35</sup></p> <p>2018: 27 2019: 16 2020: 14 2021: 17 2022: 22</p>	<a href="#">Rec 2015/07</a>	shall require their vessels to promptly release unharmed, to the extent practicable, porbeagle sharks caught in association with ICCAT fisheries when brought alive alongside for taking on board the vessel.

<sup>35</sup> [ICCAT Nominal Catch Information up to 2022](#)

Species	Tuna RFMO	Stock Status? • Overfished? • Overfishing?	MSY and BMSY ...	Reported /estimated Catch by RFMO (landings + discards)	Total Allowable Catch Limits in place?	Quota Allocation existing?
		<i>(unreported landings, dead discards, and post-release mortalities) do not largely exceed what the Group has estimated for removals.</i>				
	IOTC	Assessment had been planned for 2023, but no executive summary is available for the species till today	N/A	Reported catches in mt <sup>36</sup> 2021: 27 2022: 28	No	N/A
	IATTC	Assessed a spart of the Southern Hemisphere Porbeagle Stock Status in 2017 (see WCPFC below)	N/A	Estimated catches in mt <sup>37</sup> 2020: 182	No	N/A
	WCPFC	<a href="#">Southern Hemisphere Porbeagle Stock Status 2017</a> although the stock status of the species is currently unknown there is a very low risk that the Southern Hemisphere porbeagle shark is subject to overfishing anywhere within its range	N/A	Estimated LL catches in metric tonnes <sup>38</sup> 2021: 930 2022: 804	No	N/A

<sup>36</sup> [IOTC NOMINAL CATCH BY SPECIES, GEAR AND VESSEL FLAG REPORTING COUNTRY](#)

<sup>37</sup> [August 2024 Shark EPO purse seine catch and effort aggregated by year, month, flag or set type, 1°x1° and Shark EPO longline catch and effort aggregated by year, month, flag, 5°x5°](#)

<sup>38</sup> [WCPFC Tuna Fishery Yearbook 2022](#)

*Table 3: Existing retention bans for pelagic sharks and rays, their limitations and exemptions at the four tuna RFMOs*

Species	Tuna RFMO	Retention bans adopted for shark species requiring all bycaught sharks to be released alive and dead sharks to be either landed with a prohibition of gaining any commercial benefit from those sharks or being discarded and discards reported	Existing exemptions from the retention bans
Oceanic whitetip sharks	ICCAT	<p><a href="#">Rec 2010-07</a> ON THE CONSERVATION OF OCEANIC WHITETIP SHARK CAUGHT IN ASSOCIATION WITH FISHERIES IN THE ICCAT CONVENTION AREA No retention since 2011</p> <ol style="list-style-type: none"> <li>Contracting Parties, and Cooperating non-Contracting Parties, Entities or Fishing Entities (hereafter referred to as CPCs) shall prohibit retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of oceanic whitetip sharks in any fishery.</li> <li>CPCs shall record through their observer programs the number of discards and releases of oceanic whitetip sharks with indication of status (dead or alive) and report it to ICCAT.</li> </ol>	<p><b>None</b> Reporting of discards required through observer programs</p>
	IOTC	<p><a href="#">Res 13/06</a> on management and conservation of sharks including retention ban for oceanic whitetip sharks as an interim measure. No retention since 2014</p> <ol style="list-style-type: none"> <li>Notwithstanding paragraphs 1 and 2, CPCs shall prohibit, as an interim pilot measure, all fishing vessels flying their flag and on the IOTC Record of Authorised Vessels, or authorised to fish for tuna or tuna-like species managed by the IOTC on the high seas to retain onboard, transship, land or store any part or whole carcass of oceanic whitetip sharks with the exception of paragraph 7. The provisions of this measure do not apply to artisanal fisheries operating exclusively in their respective Exclusive Economic Zone (EEZ) for the purpose of local consumption.</li> <li>CPCs shall require fishing vessels flying their flag and on the IOTC Record of Authorised Vessels or authorised to fish for tuna and tuna-like species managed by the IOTC on the high seas to promptly release unharmed, to the extent practicable, of oceanic whitetip sharks when brought alongside for taking onboard the vessel. However, CPCs should encourage their fishers to release this species if recognised on the line before bringing them onboard the vessels.</li> </ol>	<p><b>India objected against this resolution and is therefore not bound by it!</b> The provisions of this measure apply only to fishing vessels flying their flag and <b>on the IOTC Record of Authorised Vessels or authorised to fish for tuna and tuna-like species managed by the IOTC on the high seas.</b> It explicitly does not apply to artisanal fisheries operating exclusively in their respective Exclusive Economic Zone (EEZ) for the purpose of local consumption</p>
	IATTC	<p><a href="#">C-11-10</a> RESOLUTION ON THE CONSERVATION OF OCEANIC WHITETIP SHARKS CAUGHT IN ASSOCIATION WITH FISHERIES IN THE ANTIGUA CONVENTION AREA; No retention since 2012</p> <ol style="list-style-type: none"> <li>Members and Cooperating non-Members (CPCs) shall prohibit retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of oceanic whitetip sharks in the fisheries covered by the Antigua Convention.</li> </ol>	<p><b>None</b></p>



Species	Tuna RFMO	Retention bans adopted for shark species requiring all bycaught sharks to be released alive and dead sharks to be either landed with a prohibition of gaining any commercial benefit from those sharks or being discarded and discards reported	Existing exemptions from the retention bans
	WCPFC	<p>2. <i>CPCs shall require vessels flying their flag to promptly release unharmed, to the extent practicable, whitetip sharks when brought alongside the vessel.</i></p> <p>3. <i>CPCs shall record inter alia, through the observer programs, the number of discards and releases of oceanic whitetip sharks with indication of status (dead or alive) and report it to IATTC.</i></p> <p><a href="#">CMM 2022-04</a> CONSERVATION AND MANAGEMENT MEASURE FOR SHARKS No retention of oceanic whitetip sharks since 2013 (CMM 2011-04)</p> <p><i>(1) CCMs shall prohibit vessels flying their flag and vessels under charter arrangements to the CCM from retaining on board, transshipping, storing on a fishing vessel or landing any oceanic whitetip shark, or silky shark, in whole or in part, in the fisheries covered by the Convention.</i></p> <p><i>(2) CCMs shall require all vessels flying their flag and vessels under charter arrangements to the CCM to release any oceanic whitetip shark or silky shark that is caught as soon as possible after the shark is brought alongside the vessel, and to do so in a manner that results in as little harm to the shark as possible, following any applicable safe release guidelines for these species</i></p>	<p><b>None</b>, but sharks that are unintentionally caught and frozen as part of a purse seine vessels' operation, the vessel must surrender the whole oceanic whitetip shark and silky shark to the responsible governmental authorities or discard them at the point of landing or transshipment.</p> <p>Oceanic whitetip shark and silky shark surrendered in this manner may not be sold or bartered but may be donated for purpose of domestic human consumption.</p>
Hammer-head sharks	<p>ICCAT</p> <p>IOTC</p> <p>IATTC</p>	<p><a href="#">Rec 10/08</a> No retention of sharks of the family Sphyrnidae (except for the <i>Sphyrna tiburo</i>) since 2011</p> <p><i>1. Contracting Parties, and Cooperating non-Contracting Parties, Entities or Fishing Entities (hereafter referred to as CPCs) shall prohibit retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of hammerhead sharks of the family Sphyrnidae (except for the Sphyrna tiburo), taken in the Convention area in association with ICCAT fisheries.</i></p> <p><i>2. CPCs shall require vessels flying their flag, to promptly release unharmed, to the extent practicable, hammerhead sharks when brought alongside the vessel.</i></p> <p><b>None</b></p> <p><b>None</b></p>	<p>Hammerhead sharks that are caught by <b>developing coastal CPCs for local consumption</b> are exempted from the measures established in paragraphs 1 and 2, <b>provided these CPCs submit Task I and, if possible, Task II data</b> according to the reporting procedures established by the SCRS. If it is not possible to provide catch data by species, they shall be <b>provided at least by genus Sphyrna</b>. Developing coastal CPCs exempted from this prohibition pursuant to this paragraph <b>should endeavor not to increase their catches of hammerhead sharks</b>. Such CPCs shall <b>take necessary measures to ensure that hammerhead sharks of the family Sphyrnidae (except of Sphyrna tiburo) will not enter international trade</b> and shall notify the Commission of such measures.</p>



Species	Tuna RFMO	Retention bans adopted for shark species requiring all bycaught sharks to be released alive and dead sharks to be either landed with a prohibition of gaining any commercial benefit from those sharks or being discarded and discards reported	Existing exemptions from the retention bans
	IATTC	None	n/a
	WCPFC	None	n/a
Whale sharks	ICCAT	<p><b><u>Rec 23-12</u></b> adopted in 2023 <b>but must be endorsed by SCRS in 2024 before coming into effect in 2025</b></p> <ol style="list-style-type: none"> <li><i>CPCs shall prohibit their flagged fishing vessels from retaining on board, transshipping, or landing, in whole or in part, any specimen of whale shark (<i>Rhincodon typus</i>) caught in ICCAT fisheries.</i></li> <li><i>CPCs shall prohibit their flagged fishing vessels from setting a purse seine on a school of tuna associated with a whale shark if the animal is sighted prior to the commencement of the set.</i></li> <li><i>CPCs shall require that when a whale shark is incidentally encircled in the purse seine net, the master of the fishing vessel shall take all reasonable steps to ensure its safe release.</i></li> <li><i>Until safe handling and release guidelines are developed and adopted pursuant to paragraph 9 below, CPCs should require the masters of their flag vessels, in taking steps to ensure the safe handling and release of a whale shark as required under paragraph 3 and while ensuring the safety of the crew, to apply the guidelines outlined in the <b>Annex 1</b></i></li> </ol>	None, except all flagged fishing vessels except when operating exclusively North of 40° N or South of 40° S (i.e., outside the core geographic range of whale shark in the Atlantic Ocean).
	IOTC	<p>None – <u>Res 13/05</u> only prohibits intentionally setting on whale sharks and vessels are encouraged to release the animals as unharmed as possible when whale sharks are caught incidentally in purse seine nets.</p> <p>Shark proposal submitted by Maldives and Pakistan in 2024 proposed to adopt a full retention ban but proposal was withdrawn as no agreement could be achieved between CPCs</p>	n/a but applies only to fishing vessels flying the flag of a CPC and <b>on the IOTC Record of Fishing Vessels or authorized to fish for tuna and tuna-like species managed by the IOTC on the high seas</b> . Artisanal vessels fishing only in their EEZs for local consumption are exempt.
	IATTC	None, only intentional setting is prohibited by <u>C19-06</u> and incidentally encircled whale sharks are released	n/a
	WCPFC	<u>CMM 2022-04</u> CONSERVATION AND MANAGEMENT MEASURE FOR SHARKS Protects whale sharks from deliberate encirclement by purse seiners and calls for unharmed release of incidentally encircled whale sharks since 2014 (CMM 2012-04) but subsequently extended into a full retention ban	None

Species	Tuna RFMO	Retention bans adopted for shark species requiring all bycaught sharks to be released alive and dead sharks to be either landed with a prohibition of gaining any commercial benefit from those sharks or being discarded and discards reported	Existing exemptions from the retention bans
		<p>(1) CCMs shall prohibit their flagged vessels from setting a purse seine on a school of tuna associated with a whale shark if the animal is sighted prior to the commencement of the set.</p> <p>(2) CCMs shall prohibit vessels flying their flag and vessels under charter arrangements to the CCM from retaining on board, transshipping, or landing any whale shark caught in the Convention Area, in whole or in part, in the fisheries covered by the Convention.</p> <p>(3) For fishing activities in Parties to Nauru Agreement (PNA) exclusive economic zones, the prohibition in paragraph (1) shall be implemented in accordance with the Third Arrangement implementing the Nauru Agreement as amended on 11 September 2010.</p> <p>(4) Notwithstanding sub-paragraph (1) above, for fishing activities in exclusive economic zones of CCMs north of 30 N, CCMs shall implement either this measure or compatible measures consistent with the obligations under this measure. When CCMs apply compatible measures, the CCMs shall annually provide to the Commission, in their Part 2 Annual Report, a description of the measure.</p> <p>(5) CCMs shall require that, in the event that a whale shark is incidentally encircled in the purse seine net, the master of the vessel shall:</p> <p>(a) ensure that all reasonable steps are taken to ensure its safe release.; and</p> <p>(b) report the incident to the relevant authority of the flag State, including the number of individuals, details of how and why the encirclement happened, where it occurred, steps taken to ensure safe release, and an assessment of the life status of the whale shark on release.</p> <p>(6) In taking steps to ensure the safe release of the whale shark as required under sub-paragraph (5)(a) above, CCMs shall encourage the master of the vessel to follow the WCPFC Guidelines for the Safe Release of Encircled Whale Sharks (WCPFC Key Document SC-10)2.</p>	

Species	Tuna RFMO	Retention bans adopted for shark species requiring all bycaught sharks to be released alive and dead sharks to be either landed with a prohibition of gaining any commercial benefit from those sharks or being discarded and discards reported	Existing exemptions from the retention bans
Shortfin mako sharks	ICCAT	<p><b>No retention but only in the North Atlantic</b>  <a href="#">Rec 2021/09</a>  Temporary no retention in 2022 and 2023; Total mortality limit (including dead discards and live discard mortality estimate) = 250 t defined as part of rebuilding plan from 2024 onwards and as indicator for potential future retention. Retention ban was carried over into 2024 as mortality limit has been exceeded by far in 2022 not allowing to calculate any potential retention; Recommendation will be reviewed in 2024</p> <p><i>3. CPCs shall implement a prohibition on retaining on board, transshipping and landing, whole or in part, North Atlantic shortfin mako caught in association with ICCAT fisheries in 2022 and 2023 as a first step in rebuilding the stock.</i></p>	<p><b>Iceland and Norway whose domestic law requires that any dead fish be landed, provided that: The fish is dead on haul back</b>, Directed fishing for shortfin mako sharks is prohibited; The amount of landed North Atlantic shortfin mako is reported in the CPC's Shark Implementation Check Sheet, as required by Recommendation 18-06 and any future successor or revision thereto; North Atlantic shortfin mako be landed with their fins naturally attached; and Fishermen are prohibited from drawing any commercial value from such fish.</p>
	IOTC	None	n/a
	IATTC	None	n/a
	WCPFC	None	n/a
Silky sharks	ICCAT	<p><a href="#">Rec 11/08</a>  No retention since 2012</p> <p><i>1. Contracting Parties, and Cooperating non-Contracting Parties, Entities or Fishing Entities (hereafter referred to as CPCs) shall require fishing vessels flying their flag and operating in ICCAT managed fisheries to release all silky sharks whether dead or alive, and prohibit retaining on board, transshipping, or landing any part or whole carcass of silky shark.</i></p> <p><i>2. CPCs shall require vessels flying their flag to promptly release silky sharks unharmed, at the latest before putting the catch into the fish holds, giving due consideration to the safety of crew members. Purse seine vessels engaged in ICCAT fisheries shall endeavor to take additional measures to increase the survival rate of silky sharks incidentally caught.</i></p>	<p><i>4. Silky sharks that are caught by <b>developing coastal CPCs for local consumption</b> are exempted from the measures established in paragraphs 1 and 2, provided these CPCs submit Task I and, if possible, Task II data according to the reporting procedures established by the SCRS. Developing coastal CPCs exempted from the prohibition pursuant to this paragraph <b>shall not increase their catches of silky sharks</b>. Such CPCs shall <b>take necessary measures to ensure that silky sharks will not enter international trade</b> and shall notify the Commission of such measures.</i></p> <p><i>5. Any CPC that does not report Task I data for silky shark, in accordance with SCRS data reporting requirements, shall be subject to the provisions of paragraph 1 until such data have been reported.</i></p> <p><i>6. The prohibition on retention in paragraph 1 does not apply to CPCs whose domestic law requires that all dead fish be landed, that the fishermen cannot draw any commercial profit from such fish and that includes a prohibition against silky shark fisheries.</i></p>

Species	Tuna RFMO	Retention bans adopted for shark species requiring all bycaught sharks to be released alive and dead sharks to be either landed with a prohibition of gaining any commercial benefit from those sharks or being discarded and discards reported	Existing exemptions from the retention bans
	IOTC	None	n/a
	IATTC	None	n/a
	WCPFC	<a href="#">CMM 2022-04</a> CONSERVATION AND MANAGEMENT MEASURE FOR SHARKS No retention since 2014 (CMM 2013-08)  Same as for oceanic whitetip sharks	None, but in the case of oceanic whitetip shark and silky shark that are unintentionally caught and frozen as part of a purse seine vessels' operation, the vessel must surrender the whole oceanic whitetip shark and silky shark to the responsible governmental authorities or discard them at the point of landing or transshipment. Oceanic whitetip shark and silky shark surrendered in this manner may not be sold or bartered but may be donated for purpose of domestic human consumption.
Manta rays & Mobula rays	ICCAT	<a href="#">Rec 2023-14</a> <b>adopted in 2023 but must be endorsed by SCRS in 2024 to come into force in 2025</b>  "1. Contracting Parties, and Cooperating non-Contracting Parties, Entities or Fishing Entities (hereafter referred to as CPCs) shall prohibit retaining onboard, transshipping, landing or storing any part or whole carcass of all species of mobulid rays (family Mobulidae) taken in the Convention area in association with ICCAT fisheries. 2. CPCs shall require vessels flying their flag to promptly release unharmed, to the extent practicable, mobulid rays as soon as they are seen in the net, on the hook or at the vessel, in a manner that will result in the least possible harm to the individual. CPCs should encourage their fishing vessels to implement the handling practices detailed in Annex 1, while taking into consideration the safety of the crew."	<b>None except for</b> for "vessels operating only North of 47 degrees N or South of 47 degrees S latitude" outside of the geographical range of distribution
	IOTC	<a href="#">Res 19/03</a> on the conservation of mobulid rays caught in association with fisheries in the IOTC area of competence No retention since 2020 "1. This Resolution shall apply to all fishing vessels flying the flag of a Contracting Party or Cooperating Non- Contracting Party (hereinafter referred to collectively as CPCs), and on the IOTC record of fishing vessels or authorized to fish for tuna and tuna like species managed by the IOTC.	"Provisions of paragraphs 2 and 3 above do not apply to fishing vessels carrying out subsistence fishery that, anyhow, shall not be selling or offering for sale any part or whole carcass of mobulid rays."  Artisanal fisheries were also explicitly exempt until 2022 if animals were caught unintentionally and landed for local consumption, but derogation has expired



Species	Tuna RFMO	Retention bans adopted for shark species requiring all bycaught sharks to be released alive and dead sharks to be either landed with a prohibition of gaining any commercial benefit from those sharks or being discarded and discards reported	Existing exemptions from the retention bans
	<p data-bbox="331 667 405 687">IATTC</p> <p data-bbox="331 1278 421 1299">WCPFC</p>	<p data-bbox="463 309 1400 608">2. CPCs shall prohibit all vessels from intentionally setting any gear type for targeted fishing of mobulid rays in the IOTC Area of Competence, if the animal is sighted prior to commencement of the set.</p> <p data-bbox="463 392 1400 443">3. CPCs shall prohibit all vessels retaining onboard, transshipping, landing, storing, any part or whole carcass of mobulid rays caught in the IOTC Area of Competence.</p> <p data-bbox="463 451 1400 608">5. CPCs shall require all their fishing vessels, other than those carrying out subsistence fishery, to promptly release alive and unharmed, to the extent practicable, mobulid rays as soon as they are seen in the net, on the hook, or on the deck, and do it in a manner that will result in the least possible harm to the individuals captured. The handling procedures detailed in Annex I, while taking into consideration the safety of the crew shall be implemented and followed.”</p> <p data-bbox="463 651 1400 727"><u>C-15-04 RESOLUTION ON THE CONSERVATION OF MOBULID RAYS CAUGHT IN ASSOCIATION WITH FISHERIES IN THE IATTC CONVENTION AREA;</u> No retention since 2016</p> <p data-bbox="463 762 1400 866">1. Members and Cooperating Non-Members (CPCs) shall prohibit retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of Mobulid rays (which includes Manta rays and Mobula rays) caught in the IATTC Convention Area.</p> <p data-bbox="463 874 1400 1031">2. CPC's shall require their vessels to release all Mobulid rays alive wherever possible. Notwithstanding paragraph 1, in the case of Mobulid rays that are unintentionally caught and frozen as part of a purse- seine vessel's operation, the vessel must surrender the whole Mobulid ray to the responsible governmental authorities at the point of landing. Mobulid rays surrendered in this manner may not be sold or bartered but may be donated for purposes of domestic human consumption</p> <p data-bbox="463 1038 1400 1198">3. CPCs shall require vessels flying their flag to promptly release unharmed, to the extent practicable, Mobulid rays caught in the IATTC Convention Area as soon as they are seen in the net, on the hook, or on the deck, and do it in a manner that will result in the least possible harm to the Mobulid rays captured without compromising the safety of any persons, following the guidance in the 2014 and 2015 recommendations of the IATTC scientific staff at all times, as detailed in Annex 1 to this Resolution.</p> <p data-bbox="463 1257 1400 1366"><u>CMM 2019-05 Conservation and Management Measure on Mobulid Rays caught in association with fisheries in the WCPFC Convention Area</u> No retention of any species of the family Mobulidae, which includes manta rays and mobula rays since 2021.</p>	<p data-bbox="1426 336 1966 357">Recreational and sport fishing is explicitly included</p> <p data-bbox="1426 392 2083 496">Only shark Resolution where direct reference is made to an Annex with required handling procedures for release which are however neither specific to the type of fisheries nor very detailed</p> <p data-bbox="1426 639 1491 660"><b>None</b></p> <p data-bbox="1426 1257 2083 1388"><b>None</b>, “but in the case of mobulid rays that are unintentionally caught and landed as part of a purse seine vessel's operation, the vessel must, at the point of landing or transshipment, surrender the whole mobulid ray to the responsible governmental authorities, or other competent</p>

Species	Tuna RFMO	Retention bans adopted for shark species requiring all bycaught sharks to be released alive and dead sharks to be either landed with a prohibition of gaining any commercial benefit from those sharks or being discarded and discards reported	Existing exemptions from the retention bans
		<p>“3. CCMs shall prohibit their vessels from targeted fishing or intentional setting on mobulid rays in the Convention Area.</p> <p>4. CCMs shall prohibit their vessels from retaining on board, transshipping, or landing any part or whole carcass of mobulid rays caught in the Convention Area.</p> <p>5. CCMs shall require their fishing vessels to promptly release alive and unharmed, to the extent practicable, mobulid rays as soon as possible, and to do so in a manner that will result in the least possible harm to the individuals captured. CCMs should encourage their fishing vessels to implement the handling practices detailed in Annex 1, while taking into consideration the safety of the crew”</p>	<p>authority, or discard them where possible. Mobulid rays surrendered in this manner may not be sold or bartered but may be donated for purposes of domestic human consumption”</p>
<b>Por-beagle</b>	<p>ICCAT</p> <p>IOTC</p> <p>IATTC</p> <p>WCPFC</p>	<p><b>Rec 15-06</b> RECOMMENDATION BY ICCAT ON PORBEAGLE CAUGHT IN ASSOCIATION WITH ICCAT FISHERIES requires since 2016</p> <p>1. Contracting Parties, and Cooperating non-Contracting Parties, Entities or Fishing Entities (hereafter referred to as CPCs) shall require their vessels to promptly release unharmed, to the extent practicable, porbeagle sharks caught in association with ICCAT fisheries when brought alive alongside for taking on board the vessel.</p> <p>3. In the event that catches of porbeagle caught in association with ICCAT fisheries increase beyond 2014 levels, the Commission will consider additional measures.</p> <p><b>None</b></p> <p><b>None</b></p> <p><b>None</b></p>	<p>None, but this is not a retention ban but only request to promptly release live animals unharmed</p> <p>n/a</p> <p>n/a</p> <p>n/a</p>

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