
OUTCOMES OF THE 24TH SESSION OF THE SCIENTIFIC COMMITTEE

PREPARED BY IOTC SECRETARIAT, AUGUST 2022

PURPOSE

To inform participants at the 18th Working Party on Ecosystems and Bycatch (WPEB18) of the recommendations arising from the 24th Session of the IOTC Scientific Committee (SC) held from 6-10 December 2021, specifically relating to the work of the WPEB.

BACKGROUND

At the 24th Session of the SC, the SC noted and considered the recommendations made by the WPEB in 2021 that included requests to address the deficiencies in data collection, monitoring and reporting by CPCs, particularly in relation to sharks and in gillnet fisheries as well as the collection of species-specific data on catch, biology, discards and trade. The SC also noted the recommendation for the holding of a multi-taxa workshop addressing bycatch issues and mitigation solutions in gillnet fisheries.

The recommendations on the deficiencies in data collection, monitoring and reporting by CPCs in relation to bycatch species will be discussed in paper IOTC-2021-WPEB17(AS)-07 and are therefore not presented in this paper.

Based on the recommendations arising from the WPEB17, the SC24 adopted a set of recommendations, provided in **Appendix A** of this paper. The recommendations contained in **Appendix A** were provided to the Commission for consideration at its 25th Session which was held in June 2021.

In addition, the SC24 reviewed and endorsed a Program of Work for the WPEB, including a revised assessment schedule, as detailed in **Appendix B**. A separate paper (IOTC-2022-WPEB18-09) will outline the review and development process for a Program of Work for the WPEB for the next five years (2022–2026).

DISCUSSION

In addition to the recommendations outlined in **Appendix A** and **Appendix B** the following extracts from the SC24 Report (IOTC-2021-SC24-R[E]) are provided here for the consideration and action of the WPEB18:

Status of development and implementation of national plans of action for seabirds and sharks, and implementation of the FAO guidelines to reduce marine turtle mortality in fishing operations

The SC **NOTED** paper [IOTC-2021-SC24-06](#) which provided the SC with the opportunity to update and comment on the current status of development and implementation of national plans of action for seabirds and sharks, and implementation of the FAO guidelines to reduce marine turtle mortality in fishing operations, by each IOTC CPC.

The SC **RECOMMENDED** that the Commission note the current status of development and implementation of National Plans of Action (NPOAs) for sharks and seabirds, and the implementation of the FAO guidelines to reduce marine turtle mortality in fishing operations, by each CPC as provided in [Appendix 5](#), recalling that the IPOA-Seabirds and IPOA-Sharks were adopted by the FAO in 1999 and 2000, respectively, and recommended the development of NPOAs.

The SC **RECALLED** the request from WPEB15 in 2019 for the Secretariat to provide links in the NPOA portal on the IOTC website (<http://iotc.org/science/status-of-national-plans-of-action-and-fao-guidelines>) to the actual plan documents. The SC **NOTED** that work is being done to collect these documents from CPCs and thanked those who had already submitted them.

The SC **REQUESTED** that CPCs submit their NPOA to Secretariat for upload onto the NPOA portal.

The SC **NOTED** that there have been small revisions to the previous update on NPOAs in 2021 including the drafting of revisions of NPOAs by some CPCs and updates on the progress on the development of NPOAs by other CPCs.

Blue shark stock assessment

The SC **NOTED** that in 2021, a stock assessment was completed for blue sharks using an integrated age-structured model (SS3). The SC **NOTED** that uncertainty in data inputs and model configuration were explored through sensitivity analysis. All models produced similar results suggesting the stock is currently not overfished nor subject to overfishing ($SB_{2019}/SB_{MSY} = 1.39$ (1.27 - 1.49) and $F_{2019}/F_{MSY} = 0.64$ (0.53 - 0.75)), but with the trajectories showing consistent trends towards the overfished and subject to overfishing quadrant of the Kobe plot.

The SC **NOTED** that the additional analysis using the JABBA model also suggested a relatively healthy population (B_{2019}/B_{MSY} estimates range 1.4–1.6 and F_{2019}/F_{MSY} estimates range 0.38–0.51 from a range of CPUE grouping scenarios).

The SC **NOTED** that all models (JABBA and SS3) and sensitivity runs produced similar results and that the major sources of uncertainty are the catches and CPUE series.

The SC **NOTED** the need for further research into the Japanese CPUE, particularly the pre-2000 period which exhibited high inter-annual variability which resulted in residual fit deviations at the beginning of the time series in both the SS3 and JABBA models.

The SC **NOTED** that there was a continual increase in catches derived from the miscellaneous states in coastal waters, however the majority of CPUE indices are derived from distant water fleets fishing the open ocean – the exception being South Africa and EU, France (La Réunion).

The SC **NOTED** that the current biological studies on blue shark are encouraging, however there are still gaps in important information sources for this species (i.e., fleet-specific size composition data).

The SC **NOTED** that despite recent catches remaining above MSY estimates, the decline in catches observed in 2019-2020 could potentially underestimate current fishing mortality and may have a disproportionate effect on model projections. This can be overcome by averaging catches over a longer timeframe.

The SC **NOTED** that target and limit reference points have not yet been specified for pelagic sharks in the Indian Ocean and **NOTED** that 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.

The SC **NOTED** that if the catches are increased by over 20%, the probability of maintaining spawning biomass above MSY reference levels ($SB > SB_{MSY}$) over the next 10 years will be decreased and so the stock should be closely monitored.

Other Matters

The SC **NOTED** the ongoing work on developing a series of eco-regions including an expert workshop to be held in January 2022 which will report to the WPEB data preparatory meeting with ideas on how various relevant parameters could contribute to IOTC stock assessments.

The SC **ACKNOWLEDGED** the proposed Letter of Intent between the IWC and IOTC and **NOTED** that this letter is based on the language used in the Letter of Intent between IOTC and ACAP which has been accepted by the Commission. The SC **RECOMMENDED** that the letter is presented at the Commission for further consideration.

The SC **NOTED** the high priority of work establishing stock structure as well as genetics research for sharks including Close Kin Mark Recapture (CKMR) techniques. The SC **AGREED** that funds in the IOTC main budget that were previously allocated to studying tropical tunas should now be allocated to funding CKMR studies in sharks. The SC **NOTED** that a feasibility study for conducting CKMR has already been carried out which provided recommendations on how best to proceed with this work for shark species including how the work should be done and the best species to target, further **NOTING** that shortfin mako was recommended as a key species to target for research.

The SC **AGREED** with the recommendation from the WPEB that a multi-taxa bycatch mitigation workshop focused on drift gillnet fisheries in the Indian Ocean should be held, **NOTING** that bycatch is thought to be significant with this gear. The SC **NOTED** paper IOTC-2021-SC24-INF09 which provides a draft terms of reference for this workshop and **NOTED** that the expected results of such a workshop would be to provide a mitigation toolbox which can help to reduce bycatch in gillnet fisheries ensuring that these are replicable for gillnet fleets across all CPCs and to develop recommendations for consideration by the WPEB.

The SC **NOTED** the use of subsurface gillnetting in the Indian Ocean may be an effective mitigation measure to reduce bycatch of cetaceans, sharks and sea turtles and that Resolution 19/01 already requests the utilization of subsurface gillnets by 2023 to mitigate ecological impacts of this gear. The SC **RECOMMENDED** that it be kept informed by the Commission on the current status of implementation of the relevant clause of Resolution 19/01.

The SC **NOTED** that the WPEB discussed recent developments mitigation of seabird bycatch in relation to the development of new mitigation measures such as hook pods and underwater bait setters. The SC further **REQUESTED** that such mitigation measures be further explored and evaluated by the WPEB, along with seabird experts, as the potential inclusion of additional effective mitigation options in IOTC resolutions in future might provide greater flexibility for CPCs in how they reduce or avoid seabird interactions.

APPENDICES

[Appendix A:](#) Consolidated set of recommendations of the 24th Session of the Scientific Committee to the Commission, relevant to the Working Party on Ecosystems and Bycatch.

[Appendix B:](#) Schedule of stock assessment for the WPEB (2022-2026)

APPENDIX A

CONSOLIDATED SET OF RECOMMENDATIONS OF THE 24th SESSION OF THE SCIENTIFIC COMMITTEE TO THE COMMISSION RELEVANT TO THE WORKING PARTY ON ECOSYSTEMS AND BYCATCH

Extract of the Report of the 24th Session of the Scientific Committee

(IOTC-2021-SC24-R[E]; Appendix 38, Page 223)

Sharks

- SC24.04 (para. 158) The SC **RECOMMENDED** that the Commission note the management advice developed for a subset of shark species commonly caught in IOTC fisheries for tuna and tuna-like species:
- Blue shark (*Prionace glauca*) – [Appendix 23](#)
 - Oceanic whitetip shark (*Carcharhinus longimanus*) – [Appendix 24](#)
 - Scalloped hammerhead shark (*Sphyrna lewini*) – [Appendix 25](#)
 - Shortfin mako shark (*Isurus oxyrinchus*) – [Appendix 26](#)
 - Silky shark (*Carcharhinus falciformis*) – [Appendix 27](#)
 - Bigeye thresher shark (*Alopias superciliosus*) – [Appendix 28](#)
 - Pelagic thresher shark (*Alopias pelagicus*) – [Appendix 29](#)

Marine turtles

- SC24.05 (para. 159) The SC **RECOMMENDED** that the Commission note the management advice developed for marine turtles, as provided in the Executive Summary encompassing all six species found in the Indian Ocean:
- Marine turtles – [Appendix 30](#)

Seabirds

- SC24.06 (para. 160) The SC **RECOMMENDED** that the Commission note the management advice developed for seabirds, as provided in the Executive Summary encompassing all species commonly interacting with IOTC fisheries for tuna and tuna-like species:
- Seabirds – [Appendix 31](#)

Marine Mammals

- SC24.07 (para. 161) The SC **RECOMMENDED** that the Commission note the management advice developed for cetaceans, as provided in the newly developed Executive Summary encompassing all species commonly interacting with IOTC fisheries for tuna and tuna-like species:
- Cetaceans – [Appendix 32](#)

GENERAL RECOMMENDATIONS TO THE COMMISSION, TO SPECIFIC CPC's AND/OR OTHER BODIES

Status of development and implementation of national plans of action for seabirds and sharks, and implementation of the FAO guidelines to reduce marine turtle mortality in fishing operations

- SC24.12 (para. 60) The SC **RECOMMENDED** that the Commission note the current status of development and implementation of National Plans of Action (NPOAs) for sharks and seabirds, and the implementation of the FAO guidelines to reduce marine turtle mortality in fishing operations, by each CPC as provided in Appendix 5, recalling that the IPOA-Seabirds and IPOA-Sharks were adopted by the FAO in 1999 and 2000, respectively, and recommended the development of NPOAs.

Other matters

- SC24.13 (para. 74) The SC **ACKNOWLEDGED** the proposed Letter of Intent between the IWC and IOTC and **NOTED** that this letter is based on the language used in the Letter of Intent between IOTC and ACAP which has been accepted by the Commission. The SC **RECOMMENDED** that the letter is presented at the Commission for further consideration.
- SC24.14 (para. 77) The SC **NOTED** the use of subsurface gillnetting in the Indian Ocean may be an effective mitigation measure to reduce bycatch of cetaceans, sharks and sea turtles and that Resolution 19/01 already requests the utilization of subsurface gillnets by 2023 to mitigate ecological impacts of this gear. The SC **RECOMMENDED** that it be kept informed by the Commission on the current status of implementation of the relevant clause of Resolution 19/01.

SUMMARY DISCUSSION OF MATTERS COMMON TO WORKING PARTIES (CAPACITY BUILDING ACTIVITIES – STOCK ASSESSMENT COURSE; CONNECTING SCIENCE AND MANAGEMENT, ETC.)***Invited Expert(s) at the WP meetings***

- SC24.23 (para. 145) Given the importance of external independent review for working party meetings, the SC **RECOMMENDED** the Commission continues to allocate sufficient budget for invited scientific experts to be regularly invited to scientific working party meetings.

Meeting participation fund

- SC24.24 (para. 147) The SC reiterated its **RECOMMENDATION** that the IOTC Rules of Procedure (2014), for the administration of the Meeting Participation Fund be modified so that applications are due not later than 60 days, and that the full Draft paper be submitted no later than 45 days before the start of the relevant meeting. The aim is to allow the Selection Panel to review the full paper rather than just the abstract, and provide guidance on areas for improvement, as well as the suitability of the application to receive funding using the IOTC MPF. The earlier submission dates would also assist with visa application procedures for candidates.

IOTC species identification guides: Tuna and tuna-like species

- SC24.25 (para. 148) The SC reiterated its **RECOMMENDATION** that the Commission allocates budget towards continuing the translation and printing of the IOTC species ID guides so

that hard copies of the identification cards can continue to be printed as many CPC scientific observers, both on board and at port, need to have hard copies.

Chairpersons and Vice-Chairpersons of the SC and its subsidiary bodies

SC24.26 (para. 150) The SC **RECOMMENDED** that the Commission note and endorse the Chairpersons and Vice-Chairpersons for the SC and its subsidiary bodies for the coming years, as provided in [Appendix 7](#).

PROGRAM OF WORK AND SCHEDULE OF WORKING PARTY AND SCIENTIFIC COMMITTEE MEETINGS

Consultants

SC24.27 (para. 181) Noting the highly beneficial and relevant work done by IOTC stock assessment consultants in previous years, the SC **RECOMMENDED** that the engagement of consultants be continued for each coming year based on the Program of Work. Consultants will be hired to supplement the skill set available within the IOTC Secretariat and CPCs.

REVIEW OF THE DRAFT, AND ADOPTION OF THE REPORT OF THE 24TH SESSION OF THE SCIENTIFIC COMMITTEE

SC24.28 (para. 190) The SC **RECOMMENDED** that the Commission consider the consolidated set of recommendations arising from SC24, provided at [Appendix 38](#).

APPENDIX B**ASSESSMENT SCHEDULE FOR IOTC SPECIES AND SPECIES OF INTEREST FROM 2021-2025***Extract of the Report of the 24th Session of the Scientific Committee**(IOTC-2021-SC24-R; Appendix 36, Page 218)*

The SC **ADOPTED** a revised assessment schedule, ecological risk assessment and other core projects for 2022–26, for the tuna and tuna-like species under the IOTC mandate, as well as the current list of key shark species of interest, as outlined in Appendix 36. (IOTC-2021-SC24-R[E], Para. 161).

Working Party on Ecosystems and Bycatch					
Species	2022	2023	2024	2025	2026
Blue shark	-	-	-	Data preparatory meeting Full assessment	-
Oceanic whitetip shark	Indicator analysis	-	Data preparation	Indicator analysis	-
Scalloped hammerhead	Assessment*	-	-	-	-
Shortfin mako shark	-		Data preparatory meeting	-	-
Silky shark	-	Assessment*	-	-	Assessment*
Bigeye thresher shark	Assessment*	-	-	-	Assessment*
Pelagic thresher shark	Assessment*	-	-	-	Assessment*
Porbeagle shark	-	Assessment*	-	-	-
Mobulid Rays	-	-	Interactions/ Indicators	-	-
Marine turtles	-	Indicators	-	-	-

Seabirds	Review of mitigation measures in Res. 12/06	–	–	–	Review of mitigation measures in Res. 12/06
Marine Mammals	–	–	–	Review of mitigation measures	-
Ecosystem Based Fisheries Management (EBFM) approaches	ongoing	ongoing	ongoing	ongoing	-

* Including data poor stock assessment methods; Note: the assessment schedule may be changed dependent on the annual review of fishery indicators, or SC and Commission requests.

NOTE: (i) the “indicator analysis” is a simple analysis to provide guidance on the stock status based on fishery data such as CPUE, catch, and size frequency data ;(ii) the “full stock assessment” is an assessment to provide the stock status and fishing pressure based on a stock assessment model such as stock synthesis or production model; (iii) the “data preparatory” is a the submission and review by the WP of the fishery data as well as biological parameters for the upcoming stock assessment.