Report of the 27th Session of the IOTC Scientific Committee

South Africa, 2 – 6 December 2024

DISTRIBUTION:
Participants in the Session
Members of the Commission
Other interested Nations and International Organizations
FAO Fisheries Department
FAO Regional Fishery Officers

BIBLIOGRAPHIC ENTRY
IOTC–SC27 2024. Report of the 27th Session of the IOTC Scientific Committee. Online, 2 – 6 December 2024. *IOTC–2024–SC27–R[E]: 221 pp.*

Contact details:

Indian Ocean Tuna Commission
Blend Building
PO Box 1011
Providence, Mahé, Seychelles
Ph: +248 4225 494
Email: IOTC-Secretariat@fao.org
Website: http://www.iotc.org

ACRONYMS

ACAP	Agreement on the Conservation of Albatrosses and Petrels
AFAD	Anchored Fish Aggregation Device
ASPIC	A Stock-Production Model Incorporating Covariates
B	Biomass (total)
B_{MSY}	Biomass which produces MSY
CBD	Convention on Biological Diversity
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CE	Catch and Effort
CI	Confidence interval
CKMR	Close-Kin-Mark-Recapture
CMM	Conservation and Management Measure (of the IOTC; Resolutions and Recommendations)
CoC	Compliance Committee
CPCs	Contracting Parties and Cooperating Non-Contracting Parties
CPUE	Catch Per Unit Effort
current	Current period/time, i.e. $F_{current}$ means fishing mortality for the current assessment year
EEZ	Exclusive Economic Zone
EM/EMS	Electronic Monitoring/Electronic Monitoring System
ERA	Ecological Risk Assessment
EU	European Union
F	Fishing mortality; F_{2010} is the fishing mortality estimated in the year 2010
FAD	Fish Aggregation device
FAO	Food and Agriculture Organization of the United Nations
FL	Fork Length
F_{MSY}	Fishing mortality at MSY
GLM	Generalised Linear Model
HCR	Harvest Control Rule
HBF	Hooks Between Floats
HS	Harvest Strategy
HSF	Harvest Strategy Framework
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
IO	Indian Ocean
IOTC	Indian Ocean Tuna Commission
IOSEA	Indian Ocean - South-East Asian Marine Turtle Memorandum
IPA	International Plan of Action
IPNLF	International Pole and Line Foundation
ISSF	International Seafood Sustainability Foundation
IUCN	International Union for the Conservation of Nature
IUU	Illegal, Unregulated and Unreported (fishing)
LJFL	Lower-jaw fork length
LRP	Limit reference point
LL	Longline
LSTLV	Large-scale Tuna Longline Vessel
M	Natural mortality
MEY	Maximum Economic Yield
MOU	Memorandum of Understanding
MP	Management Procedure
MPA	Marine Protected Area
MSPEA	Maldives Seafood Processors and Exporters Association
MPF	Meeting Participation Fund
MSE	Management Strategy Evaluation
MSY	Maximum Sustainable Yield
n.a.	Not Applicable
NGO	Non-Governmental Organization
NPOA	National Plan of Action
OFCF	Overseas Fishery Cooperation Foundation of Japan
OM	Operating Model
OT	Overseas Territory

PS	Purse seine
PSA	Productivity Susceptibility Analysis
q	Catchability
RBC	Recommended Biological Catch
RFMO	Regional Fisheries Management Organisation
ROS	Regional Observer Scheme
RTTP-IO	Regional Tuna Tagging Project of the Indian Ocean
SB	Spawning stock Biomass (sometimes expressed as SSB)
SB_{MSY}	Spawning stock Biomass which produces MSY
SC	Scientific Committee (of the IOTC)
SCAF	Standing Committee on Administration and Finance (of the IOTC)
SE	Standard Error
SWIOFC	South West Indian Ocean Fisheries Commission
SS3	Stock Synthesis III
SSB	Spawning stock biomass
TAC	Total Allowable Catch
TAE	Total Allowable Effort
Taiwan,China	Taiwan, Province of China
TCAC	Technical Committee on Allocation Criteria
TCMP	Technical Committee on Management Procedures
tRFMO	tuna Regional Fisheries Management Organization
TRP	Target Reference Point
TrRP	Trigger Reference Point
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNGA	United Nations General Assembly
VMS	Vessel Monitoring System
WP	Working Party (of the IOTC)
WPB	Working Party on Billfish
WPEB	Working Party on Ecosystems and Bycatch
WPDCS	Working Party on Data Collection and Statistics
WPFC	Working Party on Fishing Capacity
WPM	Working Party on Methods
WPNT	Working Party on Neritic Tunas
WPTmT	Working Party on Temperate Tunas
WPTT	Working Party on Tropical Tunas
WPSE	Working Party on Socio-Economics

STANDARDISATION OF IOTC WORKING PARTY AND SCIENTIFIC COMMITTEE REPORT TERMINOLOGY

SC16.07 (para. 23) The SC **ADOPTED** the reporting terminology contained in Appendix IV and **RECOMMENDED** that the Commission considers adopting the standardised IOTC Report terminology, to further improve the clarity of information sharing from, and among its subsidiary bodies.

HOW TO INTERPRET TERMINOLOGY CONTAINED IN THIS REPORT

Level 1: From a subsidiary body of the Commission to the next level in the structure of the Commission:
RECOMMENDED, RECOMMENDATION: Any conclusion or request for an action to be undertaken, from a subsidiary body of the Commission (Committee or Working Party), which is to be formally provided to the next level in the structure of the Commission for its consideration/endorsement (e.g. from a Working Party to the Scientific Committee; from a Committee to the Commission). The intention is that the higher body will consider the recommended action for endorsement under its own mandate, if the subsidiary body does not already have the required mandate. Ideally this should be task specific and contain a timeframe for completion.

Level 2: From a subsidiary body of the Commission to a CPC, the IOTC Secretariat, or other body (not the Commission) to carry out a specified task:
REQUESTED: This term should only be used by a subsidiary body of the Commission if it does not wish to have the request formally adopted/endorsed by the next level in the structure of the Commission. For example, if a Committee wishes to seek additional input from a CPC on a particular topic, but does not wish to formalise the request beyond the mandate of the Committee, it may request that a set action be undertaken. Ideally this should be task specific and contain a timeframe for the completion.

Level 3: General terms to be used for consistency:
AGREED: Any point of discussion from a meeting which the IOTC body considers to be an agreed course of action covered by its mandate, which has not already been dealt with under Level 1 or level 2 above; a general point of agreement among delegations/participants of a meeting which does not need to be considered/adopted by the next level in the Commission's structure.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The 27th Session of the Indian Ocean Tuna Commission (IOTC) Scientific Committee (SC) was held in Cape town, South Africa and online, from 2 – 6 December 2024. A total of 141 delegates and other participants attended the Session (106 in 2023), comprised of 120 delegates (92 in 2023) from 24 Contracting Parties with no delegates from Cooperating Non-Contracting Parties (0 in 2023), and 21 participants from 15 observer organisations (including the invited experts). The meeting was opened by the Chairperson, Dr Toshihide Kitakado (Japan), followed by welcoming remarks by Dr Dion George, the Minister of Environment, Forestry and Fisheries, and Ms Sue Middleton, Deputy Director-General for Fisheries Management, Department of Forestry, Fisheries and the Environment of South Africa who warmly greeted the participants. The list of participants is provided at Appendix 1.

The following are the recommendations regarding stock status from the 27th Session of the Scientific Committee. The full list of recommendations is provided in Appendix 39.

Tuna – Highly migratory species

SC27.01 (para. 175) The SC **RECOMMENDED** that the Commission note the management advice developed for each tropical and temperate tuna species as provided in the Executive Summary for each species, and the combined Kobe plot for the four species assigned a stock status in 2024 (Fig. 2):
Albacore (*Thunnus alalunga*) – Appendix 8
Bigeye tuna (*Thunnus obesus*) – Appendix 9
Skipjack tuna (*Katsuwonus pelamis*) – Appendix 10
Yellowfin tuna (*Thunnus albacares*) – Appendix 11

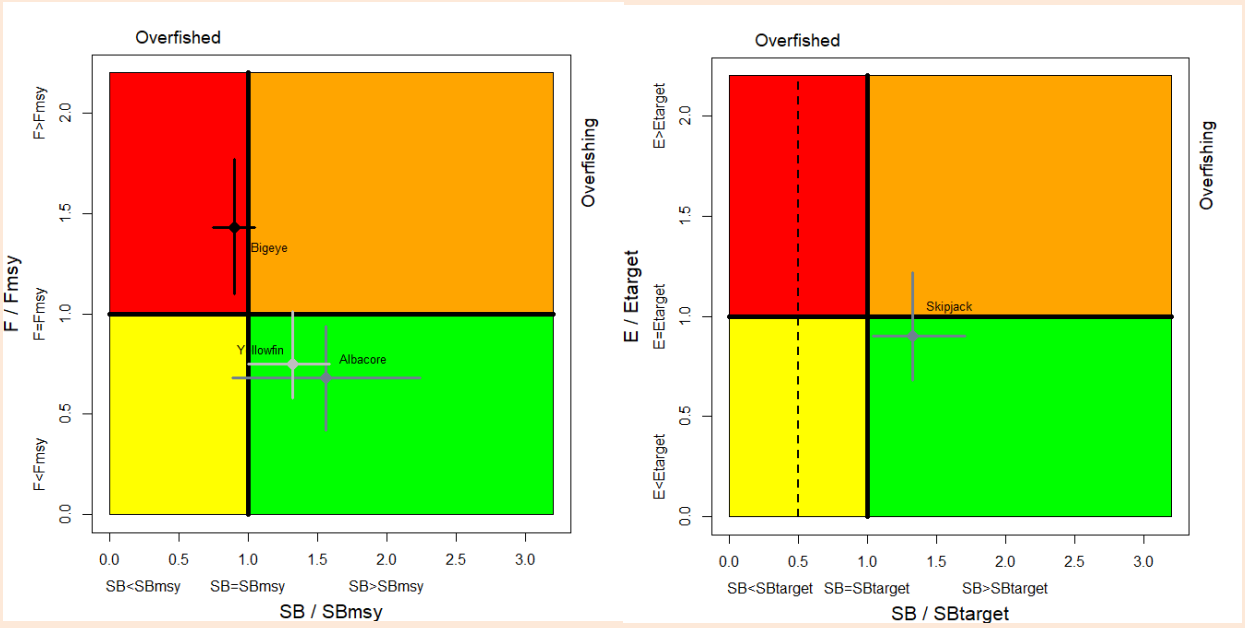


Fig. 2. (Left) Combined Kobe plot for bigeye tuna (black: status in 2021, with assessment conducted in 2022), and yellowfin tuna (light grey: 2023, with assessment conducted in 2024) and albacore (dark grey: 2020 with assessment conducted in 2022) showing the estimates of current spawning biomass (SB) and current fishing mortality (F) in relation to optimal spawning stock size and optimal fishing mortality. (Right) Kobe plot for skipjack tuna (2022 with assessment conducted in 2023) showing the estimates of the current stock status (the dashed line indicates the limit reference point at 20%SB0 while SBtarget=0.4 SB0). Cross bars illustrate the range of uncertainty from the model runs with an 80% CI (95% CI for albacore).

Tuna and seerfish – Neritic species

SC27.02 (para. 177) The SC **RECOMMENDED** that the Commission note the management advice developed for each neritic tuna (and seerfish) species under the IOTC mandate, as provided in the Executive Summary for each species, and the combined Kobe plot for the three species assigned a stock status in 2024 (Fig. 3):
Bullet tuna (*Auxis rochei*) – Appendix 12
Frigate tuna (*Auxis thazard*) – Appendix 13
Kawakawa (*Euthynnus affinis*) – Appendix 14
Longtail tuna (*Thunnus tonggol*) – Appendix 15
Indo-Pacific king mackerel (*Scomberomorus guttatus*) – Appendix 16

Narrow-barred Spanish mackerel (*Scomberomorus commerson*) – Appendix 17

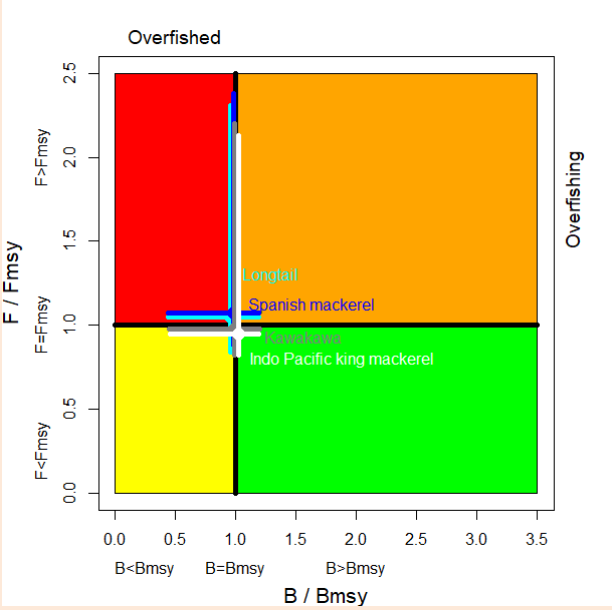


Fig. 3. Combined Kobe plot for longtail tuna (cyan), narrow-barred Spanish mackerel (blue), kawakawa (grey) (all for 2021 with assessment conducted in 2023) and Indo-Pacific king mackerel (2022 with assessment conducted in 2024 (white)), showing the estimates of stock size (B) and current fishing mortality (F) in relation to optimal biomass and optimal fishing mortality. Cross bars illustrate the range of uncertainty from the model runs. Given unresolved uncertainty in the assessment, status for bullet tuna, frigate tuna and Narrow-barred Spanish mackerel should be interpreted with caution**.**

Billfish

SC27.03 (para. 178) The SC **RECOMMENDED** that the Commission note the management advice developed for each billfish species under the IOTC mandate, as provided in the Executive Summary for each species, and the combined Kobe plot for the five species assigned a stock status in 2024 (Fig. 4):
Black marlin (*Istiompax indica*) – Appendix 18
Blue marlin (*Makaira nigricans*) – Appendix 19
Striped marlin (*Kajikia audax*) – Appendix 20
Indo-Pacific sailfish (*Istiophorus platypterus*) – Appendix 21
Swordfish (*Xiphias gladius*) – Appendix 22

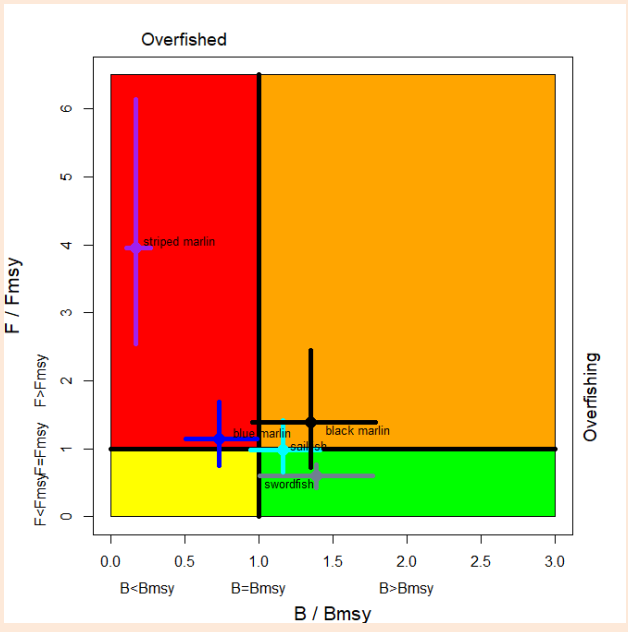


Fig. 4. Combined Kobe plot for swordfish (2021 with assessment conducted in 2023, grey), Indo-Pacific sailfish (2019 with assessment conducted in 2022, cyan), black marlin (2022 with assessment conducted in 2024, black), blue marlin (2020 with assessment conducted in 2022, blue) and striped marlin (2022 with assessment conducted in 2024, purple) showing the estimates of current stock size (SB or B, species assessment dependent) and current fishing mortality (F) in relation to optimal stock size and optimal fishing mortality. Cross bars illustrate the range of uncertainty from the model runs. Given unresolved uncertainty in the assessment, status for black marlin is uncertain.

Sharks

SC27.04 (para. 179) 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
porbeagle shark (*Lamna nasus*) – Appendix 30

Marine turtles

SC27.05 (para. 180) 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 31

Seabirds

SC27.06 (para. 181) 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 32

Marine Mammals

SC27.07 (para. 182) 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 33

Table 1. Status summary for species of tuna and tuna-like species under the IOTC mandate, as well as other species impacted by IOTC fisheries. (NOTE: the year column indicates the year the stock status was determined, not the terminal year of the assessment model)

Temperate and tropical tuna stocks: main stocks being targeted by industrial, and to a lesser extent, artisanal fisheries throughout the Indian Ocean, both on the high seas and in the EEZ of coastal states.

Stock	Indicators		2020	2021	2022	2023	2024	Advice to the Commission
Albacore *Thunnus alalunga*	Catch (2023) (t) Mean annual catch (2019-2023) (t) MSY (1,000 t) (95% CI) F_{MSY} (80% CI) SB_{MSY} (1,000 t) (80% CI) F_{2020} / F_{MSY} (80% CI) SB_{2020} / SB_{MSY} (80% CI) SB_{2020} / SB_0 (80% CI)	41,678 40,747 45 (35-55) 0.18 (0.15-0.21) 27 (21-33) 0.68 (0.42-0.94) 1.56 (0.89-2.24) 0.36 (0.26-0.45)			**85%**			No new stock assessment was carried out for albacore in 2024, thus the stock status is determined on basis of the 2022 assessment. The stock assessment was carried out using Stock Synthesis III (SS3), a fully integrated model that is currently also used to provide scientific advice for the three tropical tunas stocks in the Indian Ocean. The model used in 2022 is based on the model developed in 2019 with a series of revisions that were noted during the WPTmT data preparatory meeting held in April 2022. There are some noticeable changes compared to the previous assessment data set, mainly related to how the fisheries are structured, and how the CPUE indices and length composition data are treated within the assessment model. These changes in stock status since the previous assessment are mainly due to changes in the CPUE. Thus, the stock status in relation to the Commission's interim BMSY and FMSY target reference points indicates that the stock is **not overfished** and is **not subject to overfishing** Click here for full stock status summary: Appendix 8
Bigeye tuna *Thunnus obesus*	Catch in 2023 (t) Average catch 2019-2023 (t) MSY (1,000 t) (80% CI) F_{MSY} (80% CI) SB_{MSY} (1,000 t) (80% CI) F_{2021} / F_{MSY} (80% CI) SB_{2021} / SB_{MSY} (80% CI) SB_{2021} / SB_0 (80% CI)	105,369 294,691 96 (83 –108) 0.26 (0.18–0.34) 513 (332–694) 1.43 (1.10–1.77) 0.90 (0.75–1.05) 0.25 (0.23–0.27)			**79%**			No new stock assessment was carried out for bigeye tuna in 2024 and so the advice is based on the 2022 assessment. In the 2022 assessment, two models were applied to the bigeye stock (Statistical Catch at Size (SCAS) and Stock Synthesis (SS3)), with the SS3 stock assessment selected to provide scientific advice. The reported stock status is based on a grid of 24 model configurations designed to capture the uncertainty on stock recruitment relationship, longline selectivity, growth and natural mortality On the weight-of-evidence available in 2022, the bigeye tuna stock is determined to be overfished and subject to overfishing (Table 2). As IOTC agreed on a bigeye Management Procedure (Res. 22/03) it should be noted that the stock assessment is not used to provide a recommendation on the TAC. Click here for full stock status summary: Appendix 9
Skipjack tuna	Catch in 2023 (t) Average catch 2019-2023 (t) $E_{40\%SB0}$ (80% CI)	688,680 630,120 0.55 (0.48–0.65)				**70%**		No new stock assessment was carried out for skipjack tuna in 2024 and so the advice is based on the 2023 assessment using Stock Synthesis with data up to 2022. The outcome of the 2023 stock assessment model is

Katsuwonus pelamis	SB_0 (1,000t) (80% CI) SB_{2022} (1,000t) (80% CI) SB_{2022} / SB_0 80% CI) SB_{2022} / $SB_{40\%SB0}$ (80% CI) SB_{2022} / $SB_{20\%SB0}$ (80% CI) SB_{2022} / SB_{MSY} (80% CI) F_{2022} / F_{MSY} (80% CI) F_{2022} / $F_{40\%SSB0}$ (80% CI) MSY (1,000 t) (80% CI)	2 177 (1 869–2 465) 1 142 (842–1 461) 0.53 (0.42–0.68) 1.33 (1.04–1.71) 2.67 (2.08–3.42) 2.30 (1.57–3.40) 0.49 (0.32–0.75) 0.90 (0.68–1.22) 584 (512–686)						more optimistic than the previous assessment (2020) despite the high catches recorded in the period 2021-2022, which exceeded the catch limits established in 2020 for this period. The final assessment indicates that: The stock is above the adopted target for this stock ($40\%SB_0$) and the current exploitation rate is below the target exploitation rate with the probability of 70%. Current spawning biomass relative to unexploited levels is estimated at 53%. The spawning biomass remains above SB_{MSY} and the fishing mortality remains below F_{MSY} with a probability of 98.4 % Over the history of the fishery, biomass has been well above the adopted limit reference point ($20\%SB_0$). Subsequently, based on the weight-of-evidence available in 2023, the skipjack tuna stock is determined to be **not overfished** and **not subject to overfishing.** The catch limit calculated applying the HCR specified in Resolution 21/03 is [628, 606 t] for the period 2024-2026. The SC noted that this catch limit is higher than for the previous period. This is attributed to the new stock assessment which estimates a higher productivity of the stock in recent years and a higher stock level relative to the target reference point, possibly due to skipjack life history characteristics and favourable environmental conditions. Noting that the environmental conditions are predicted to enter a less favourable period, it is important that the Commission ensures that catches of skipjack tuna during this period do not exceed the agreed limit, as occurred in recent years. In addition, the SC recognizes the potential impact on other associated stocks (bigeye and yellowfin) of exceeding the catch limits of skipjack tuna. In 2024, the Commission adopted Resolution 24/07 on a management procedure for skipjack. The MP is scheduled to be implemented in 2025 to provide TAC advice for 2027-2029 Click here for full stock status summary: Appendix 10
Yellowfin tuna *Thunnus albacares*	Catch in 2023 (t) Average catch 2019-2023 (t) MSY_{recent} (1,000 t) (80% CI) F_{MSY} (80% CI) SB_{MSY_recent} (1,000 t) (80% CI) F_{2023} / F_{MSY} (80% CI) SB_{2023} / SB_{MSY_recent} (80% CI) SB_{2023} / SB_0 (80% CI)	400,950 423,142 421 (416-430) 0.2 (0.16-0.26) 1,063 (890-1,361) 0.75 (0.58-1.01) 1.32 (1.00-1.59) 0.44 (0.40-0.50)					**89%**	A new stock assessment was carried out for yellowfin tuna in 2024. The 2024 stock assessment was carried out using Stock Synthesis III (SS3), a fully integrated model that is currently used to provide scientific advice for the three tropical tunas stocks in the Indian Ocean**.** The model ensemble (a total of 12 models) encompasses a range of plausible hypotheses about stock and fisheries dynamics The model estimates of current stock status are predominantly informed by the new abundance index derived from the Joint CPUE estimated for

								longline fleets. It was noted that the new index was significantly different to the index used in 2021. Overall stock status estimates differ substantially from the previous assessment. On the weight-of-evidence available in 2024, the yellowfin tuna stock is determined to be **not-overfished** and **not-subject to overfishing**. It is noted that there are still important uncertainties relating to the data used for this stock assessment. There are uncertainties in relation to the CPUE standardisation in 2024 that could not be addressed during the meeting, which are recognised in the SCs catch limit advice (in the stock status summary and SC general recommendations).. Click here for full stock status summary: Appendix 11

Neritic tunas and seerfish: These six species have become as important or more important as the three tropical tuna species (bigeye tuna, skipjack tuna and yellowfin tuna) to most IOTC coastal states. Neritic tunas and mackerels are caught primarily by coastal fisheries, including small-scale industrial and artisanal fisheries, and are almost always caught within the EEZs of coastal states. Historically, catches were often reported as aggregates of various species, making it difficult to obtain appropriate data for stock assessment analyses.

Stock	Indicators		2020	2021	2022	2023	2024	Advice to the Commission
Bullet tuna *Auxis rochei*	Catch 2023 (t) Average catch 2019–2023 (t) MSY (1,000 t) F_{MSY} B_{MSY} (1,000 t) $F_{current}/F_{MSY}$ $B_{current}/B_{MSY}$ $B_{current}/B_0$	28,429 21,996 unknown unknown unknown unknown unknown unknown						A new assessment was carried out in 2024 using data-limited techniques (CMSY,LB-SPR, and FishBlicc). However the catch data for bullet tuna are very uncertain given the high percentage of the catches that had to be estimated due to a range of reporting issues. The size-based assessment methods LB-SPR and FishBlicc using size data from gillnet and purse seine fisheries both estimated the current spawning potential ratio to be below the reference level of SPR40% (a proxy for 40% depletion often considered as the risk averse target in many data-poor fisheries). Due to a lack of fishery data for several fisheries, only preliminary stock status indicators (CPUE and average weight) can be used. Aspects of the fisheries for bullet tuna combined with the lack of data on which to base an assessment of the stock are a cause for concern. Stock status in relation to the Commission's BMSY and FMSY reference points remains **unknown.** For assessed species of neritic tunas and seerfish in the Indian Ocean (longtail tuna, kawakawa and narrow-barred Spanish mackerel), the MSY was estimated during early assessments to have been reached between 2009 and 2011 and both FMSY and BMSY were breached thereafter. It is worth noting that the catch in 2023 was estimated to be 28,429t and there has been significant variability in estimated catches of this species in recent years. This variation is perhaps due to issue of mis-identification of this species among other reasons. In

								the absence of a stock assessment of bullet tuna a limit to the catches should be considered by the Commission, by ensuring that future catches do not continue to exceed the average catches estimated between 2009 and 2011 (8,590 t). This catch advice should be maintained until an assessment of bullet tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice. Click here for a full stock status summary: Appendix 12
Frigate tuna *Auxis thazard*	Catch in 2023 (t) Average catch 2019–2023 (t) MSY (1,000 t) F_{MSY} B_{MSY} (1,000 t) F_{2019}/F_{MSY} B_{2019}/B_{MSY} B_{2019}/B_0	130,815 123,151 unknown unknown unknown unknown unknown unknown						A new assessment was carried out in 2024 using data-limited techniques (CMSY,OCOM, LB-SPR and fishblicc). However the catch data for frigate tuna are very uncertain given the high percentage of the catches that had to be estimated due to a range of reporting issues. Due to a lack of fishery data for several gears, only preliminary stock status indicators can be used. However, the size-based assessment showed results with considerable uncertainty - LB-SPR estimated a SPR greater than the reference level of SPR40%, (a proxy for 40% depletion often considered as risk averse target in many data-poor fisheries) whereas the fishblicc estimated a SPR below the reference level. Aspects of the fisheries for frigate tuna combined with the lack of data on which to base an assessment of the stock are a cause for considerable concern. Stock status in relation to the Commission's BMSY and FMSY reference points remains **unknown.** For assessed species of neritic tunas in Indian Ocean (longtail tuna, kawakawa and narrow-barred Spanish mackerel), the MSY was estimated during early assessments to have been reached between 2009 and 2011 and both FMSY and BMSY were breached thereafter. It is worth noting that the catch in 2023 was estimated to be 130,815t and there has been significant variability in estimated catches of this species in recent years. This variation is perhaps due to issue of mis-identification of this species among other reasons. In the absence of an accepted stock assessment for frigate tuna, a limit to the catches should be considered by the Commission, by ensuring that future catches do not continue to exceed the average catches estimated between 2009 and 2011 (101,260 t). The reference period (2009-2011) was chosen based on the most recent assessments of those neritic species in the Indian Ocean for which an assessment is available under the assumption that MSY for frigate tuna was also reached between 2009 and 2011. This catch advice should be maintained until an assessment

								of frigate tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice. Click here for a full stock status summary: Appendix 13
Kawakawa *Euthynnus affinis*	Catch in 2023 (t) Mean annual catch 2019-2023 (t) MSY (1,000 t) (80% CI) F_{MSY} (80% CI) B_{MSY} (1,000 t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI)	152,828 156,428 154 (122– 193) 0.60 (0.48 – 0.74) 258 (185 – 359) 0.98 (0.82–2.20) 0.99 (0.45 – 1.20)				**27%**		No new stock assessment was conducted in 2024 for kawakawa and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods include C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status. Based on the weight-of-evidence available, the kawakawa stock for the Indian Ocean is classified as **overfished but not subject to overfishing.** The assessment models rely on catch data, which are considered to be highly uncertain. The catch in 2022 was just above the estimated MSY. The available gillnet CPUE of kawakawa showed a somewhat increasing trend although the reliability of the index as abundance indices remains unknown. Despite the substantial uncertainties, the stock is probably very close to being fished at MSY levels and that higher catches may not be sustained in the longer term. A precautionary approach to management is recommended. Click here for a full stock status summary: Appendix 14
Longtail tuna *Thunnus tonggol*	Catch 2023 (t) Mean annual catch (2019-2023) (t) MSY (1,000 t) (80% CI) F_{MSY} (80% CI) B_{MSY} (1,000 t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI)	137,884 130,973 133 (108 –165) 0.31 (0.22 – 0.44) 433 (272– 690) 1.05 (0.84 – 2.31) 0.96 (0.44 – 1.19)				**35%**		No new stock assessment was conducted for longtail in 2024 and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods including C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status. Based on the weight-of-evidence currently available, the stock is considered to be both **overfished** and **subject to overfishing**.

								The catch in 2022 was above the estimated MSY and the exploitation rate has been increasing over the last few years, as a result of the declining abundance. Despite the substantial uncertainties, this suggests that the stock is being fished above MSY levels and that higher catches may not be sustained. A precautionary approach to management is recommended. Click here for a full stock status summary: Appendix 15
Indo-Pacific king mackerel *Scomberomorus guttatus*	Catch in 2023 (t) Average catch 2019-2023 (t) MSY (1,000 t) F_{MSY} B_{MSY} (1,000 t) $F_{current}/F_{MSY}$ $B_{current}/B_{MSY}$ $B_{current}/B_0$	46,255 46,008 47 (39–56) 0.74 (0.56–0.99) 63 (43 –92) 0.95 (0.82–2.13) 1.02 (0.46–1.19) 0.51 (0.23–0.60)					**27%**	A new assessment was conducted in 2024 using the data-limited techniques (CMSY and CMSY++) (using data up to 2022). Analysis using the catch only method CMSY indicates the stock is being exploited at a rate that is below FMSY in recent years and that the stock appears to be above BMSY, although the estimates would be more pessimistic if the stock productivity is assumed to be less resilient. An assessment using CMSY++was also explored in 2024. The stock estimates with CMSY++ are estimated to be very close to the biomass target even though the stock status is more pessimistic than with CMSY. Despite some of the caveats of the underlying assumptions, the catch-only model has provided a more defensible approach in addressing the uncertainty of key parameters and the currently available catch data for the Indo-Pacific king mackerel appear to be of sufficient quality. Based on the weight-of-evidence currently available, the stock is considered to be **not overfished** and **not subject to overfishing.** Reported catches of Indo-Pacific king mackerel in the Indian Ocean has increased considerably since the late 2000s with recent catches fluctuating around estimated MSY, although the catch in 2021 and 20232 was below the estimated MSY. This suggests that the stock is close to being fished at MSY levels and that higher catches may not be sustained despite the substantial uncertainty associated with the assessment, a precautionary approach to management is recommended. Click here for a full stock status summary: Appendix 16
Narrow-barred Spanish mackerel *Scomberomorus commerson*	Catch in 2023 (t) Average catch 2019-2023 (t) MSY (1,000 t) (80% CI) F_{MSY} (80% CI) B_{MSY} (1,000 t)(80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI)	165,295 162,610 161 (132– 197) 0.60 (0.48–0.74) 271 (197– 373) 1.07 (0.88 – 2.38) 0.98 (0.44 – 1.19)				**31%**		No new stock assessment was conducted in 2024 for narrow-barred Spanish mackerel and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods including C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status.

								Based on the C-MSY assessment, the stock appears to be **overfished and subject to overfishing.** The catch in 2022 was above the estimated MSY and the available gillnet CPUE shows a somewhat increasing trend in recent years although the reliability of the index as an abundance index remains unknown. Despite the substantial uncertainties, the stock is being fished above MSY levels and higher catches may not be sustained. Click here for a full stock status summary: Appendix 17

Billfish: The billfish stocks are exploited by industrial and artisanal fisheries throughout the Indian Ocean, both on the high seas and in the EEZ of coastal states. While marlins and sailfish are not usually targeted by most fleets, they are caught and retained as bycatch by the main industrial fisheries, and are also important for localised small-scale and artisanal fisheries or as targets in sports and recreational fisheries.

Stock	Indicators		2020	2021	2022	2023	2024	Advice to the Commission
Black marlin *Istiompax indica*	Catch in 2023 (t) Average catch 2019–2023 (t) MSY (1,000 t) (95% CI) F_{MSY} (95% CI) B_{MSY} (1,000 t) (95% CI) F_{2022}/F_{MSY} (95% CI) B_{2022}/B_{MSY} (95% CI) B_{2022}/B_0 (95% CI)	27,872 20,060 13.90 (8.73 – 28.51) 0.21 (0.15 - 0.30) 65.23 (46.43-101.84) 1.39 (0.72 – 2.45) 1.35 (0.96 – 1.79) 0.49 (0.35 – 0.66)					**62.2%**	A new stock assessment was carried out for black marlin in 2024, based on JABBA, a Bayesian state-space production model (using data up to 2022). Until 2024, fish stock status was characterised as "uncertain" due to significant uncertainties in past assessments (like those from 2018 and 2021). These uncertainties were attributed to both historical catch reporting from key fishing states and poor assessment diagnostics. However, there's been progress recently with black marlin catch data, particularly from coastal countries in the northern Indian Ocean, and the latest JABBA assessment shows it's now more reliable (with improved model fitting to the abundance indices and acceptable level of retrospective patterns). On the weight-of-evidence available in 2024, the stock status of black marlin is determined to be **not overfished** but **subject to overfishing**. The catch limits (9932 t) as stipulated in Resolution 18/05 have been exceeded for three consecutive years since 2020, which as per resolution 18/05, requires a review of the resolution. Furthermore, these limits are not based on estimates of most recent stock assessment. Thus, it is recommended that the Commission urgently revise 18/05 to incorporate limits that reflect the most recent stock assessment and projections and review and where necessary revise the implementation and effectiveness of the measures contained in this Resolution. The stock is now subject to overfishing. If the Commission wishes to recover the stock to the green quadrant of the Kobe plot with a probability ranging from 60% to 90% by 2026 as per Resolution 18/05, it needs to provide mechanisms to ensure the maximum annual catches remain less than 10 626 t.

								Click here for full stock status summary: Appendix 18
Blue marlin *Makaira nigricans*	Catch in 2023 (t) Average catch 2018-2023 (t) MSY (1,000 t) (80% CI) F_{MSY} (80% CI) B_{MSY} (1,000 t) (80% CI) F_{2020}/F_{MSY} (80% CI) B_{2020}/B_{MSY} (80% CI) B_{2020}/B_0 (80% CI)	7,888 7,049 8.74 (7.14 –10.72) 0.24 (0.14 – 0.39) 35.8 (22.9 – 60.3) 1.13 (0.75 – 1.69) 0.73 (0.51 – 0.99) 0.36 (0.26 – 0.50)			**72%**			No new stock assessment was carried out for blue marlin in 2024, thus the stock status is determined on basis of the 2022 assessment which was based on two different models: JABBA, a Bayesian state-space production model (age-aggregated); and SS3, an integrated model (age-structured) (using data up to 2020). Both models were consistent with regards to stock status. On the weight-of-evidence available in 2022, the stock is determined to be **overfished** and **subject to overfishing**. The current catches of blue marlin (average of 7,045 t in the last 5 years, 2018-2022) are lower than MSY (8,740 t). The stock is currently overfished and subject to overfishing. According to K2SM calculated (Table 2), a reduction of 20% of catches (5,700 t) compared to 2020 catches (7,126 t) would recover the stock to the green quadrant by 2030 with a probability of 79% and if the catches are reduced by 10% (6,413 t) the probability would be 67%. The Commission should note that the current catch limit for blue marlin in Resolution 18/05 (11,930 t, which was established as the MSY value estimated in 2016 stock assessment) is 36% higher than the new MSY estimated by the latest stock assessment in 2022 (8,740 t). Thus, it is recommended that the Commission urgently revise Resolution 18/05 to incorporate limits that reflect the most recent stock assessment and projections and review and where necessary revise the implementation and effectiveness of the measures contained in this Resolution. Click here for full stock status summary: Appendix 19
Striped marlin *Kajikia audax*	Catch in 2023 (t) Average catch 2019-2023 (t) MSY (1,000 t) (JABBA) MSY (1,000 t) (SS3) F_{MSY} (JABBA) F_{MSY} (SS3) F_{2022}/F_{MSY} (JABBA) F_{2229}/F_{MSY} (SS3) B_{2022}/B_{MSY} (JABBA) SB_{2022}/SB_{MSY} (SS3) B_{2022}/B_0(JABBA) SB_{2022}/SB_0 (SS3)	3,553 3,024 4.73 (4.22 – 5.24) 4.89 (4.48-5.30) 0.26 (0.20–0.35) 0.22 (0.21–0.24) 3.95 (2.54 - 6.14) 9.26 (5.38-13.14) 0.17 (0.11 - 0.27) 0.27 (0.19-0.35) 0.06 (0.04 – 0.10) 0.036 (0.03-0.04)					**100%**	A new stock assessment was carried out for striped marlin in 2024, based on two different models: JABBA, a Bayesian state-space production model (age-aggregated); and SS3, an integrated model (age-structured) (using data up to 2022). Both models were generally consistent with regards to stock status and confirmed the results from 2012, 2013, 2015, 2017, 2018, and 2021 assessments. On the weight-of-evidence available in 2024, the stock status of striped marlin is determined to be **overfished** and **subject to overfishing.** Current or increasing catches have a very high risk of further decline in the stock status. The 2023 catches (3,553 t) were lower than the estimated MSY (4,730 t) but are above the limit set by Resolution 18/05 (3,260 t) which may be a concern if this trend continues. However, the limit is not based on estimates of the most recent stock assessment. Thus, it is recommended that the Commission urgently revise Resolution 18/05 to incorporate limits that reflect the most recent stock assessment and projections, and review, and where necessary, revise the implementation and effectiveness of the measures contained in this Resolution.

								The stock has been overfished for more than a decade and is now in a highly depleted state. A 70% reduction in the recent average 2020-22 catch of 2,891 t (i.e. catch of 867 t) would recover the stock to the green quadrant by 2032 with a probability of 78% and a 60% reduction in recent average catch (i.e. catch of 1,157 t) would achieve this with a probability of 58%. Click here for full stock status summary: Appendix 20
Indo-Pacific Sailfish *Istiophorus platypterus*	Catch in 2023 (t) Average catch 2019-2023 (t) MSY (1,000 t) (80% CI) F_{MSY} (80% CI) B_{MSY} (1,000 t) (80% CI) F_{2019}/F_{MSY} (80% CI) B_{2019}/B_{MSY} (80% CI) B_{2019}/B_0 (80% CI)	32,154 32,386 25.9 (20.8 – 34.2) 0.19 (0.15 - 0.24) 138 (108–186) 0.98 (0.65 – 1.42) 1.17 (0.94 – 1.42) 0.58 (0.47 – 0.71)			**54%**			No new stock assessment was carried out for Indo-Pacific Sailfish in 2024, thus the stock status is determined on basis of the 2022 stock assessment based on JABBA (using data up to 2019). Data poor methods (C-MSY and SRA) applied to SFA in 2019 relied on catch data only, which is highly uncertain for this species, and resulted in the stock status determined to be uncertain. To overcome the lack of abundance indices for this species, this assessment incorporated length-frequency data to estimate annual Spawning Potential Ratio (SPR). Normalised annual estimates of SPR were assumed to be proportional to biomass and incorporated as an index of relative abundance in the JABBA model (assuming no trends in annual recruitment in the long term). This is a novel technique applied to overcome the paucity of abundance data for SFA. On the weight-of-evidence available in 2022, the stock status of Indo-Pacific sailfish is determined to be **not overfished nor subject to overfishing.** The catch limits as stipulated in Resolution 18/05 have been exceeded since 2020, which as per resolution 18/05, requires a review of the resolution. Furthermore, these limits are not based on estimates of most recent stock assessment. Thus, it is recommended that the Commission urgently revise 18/05 to incorporate limits that reflect the most recent stock assessment and projections and review and where necessary revise the implementation and effectiveness of the measures contained in this Resolution In spite of the Kobe green status of the stock, it is recommended that the Commission review the implementation and effectiveness of the measures contained in this Resolution and consider the adoption of additional conservation and management measures. The Commission should provide mechanisms to ensure that catch limits are not exceeded by all concerned fisheries. Research emphasis on further developing possible CPUE indicators from coastal gillnet and longline fisheries, and further exploration of stock assessment approaches for data poor fisheries are warranted. Given the limited data being reported for coastal fisheries, and the importance of sports fisheries for this species, efforts must be made to rectify these information gaps. Click here for full stock status summary: Appendix 21
Swordfish	Catch in 2022 (t) Average catch 2018-2022 (t)	26,525 28,142				**97%**		No new stock assessment was carried out for swordfish in 2024, thus the stock status is determined on basis of the 2022 assessment. Two models

Xiphias gladius	MSY (1,000 t) (80% CI) F_{MSY} (80% CI) SB_{MSY} (1,000 t) (80% CI) F_{2021}/F_{MSY} (80% CI) SB_{2021}/SB_{MSY} (80% CI) SB_{2021}/SB_{1950} (80% CI)	30 (26–33) 0.16 (0.12–0.20) 55 (40–70) 0.60 (0.43–0.77) 1.39 (1.01–1.77) 0.35 (0.32–0.37)						were applied to the swordfish stock (ASPIC and Stock Synthesis (SS3)), with the SS3 stock assessment selected to provide scientific advice (as done previously). An update of the JABBA model was also conducted during the WPB meeting. Taking into account the characterized uncertainty, and on the weight-of-evidence available in 2023, the swordfish stock is determined to **be not overfished and not subject to overfishing.** A management procedure for Indian Ocean Swordfish was adopted under Resolution 24/08 by the IOTC Commission in May 2024 and was applied to determine a recommended TAC for Swordfish for 2026, 2027 and 2028. A review of evidence for exceptional circumstances was also conducted following the adopted guideline (IOTC-2021-SC24-R, appendix 6A) as per the requirements of Resolution 24/08. The evaluation concluded that there was one exceptional circumstance pertaining to the operation of the MP. Specifically, an error was identified in the original simulation analyses that, when corrected (without retuning), resulted in the MP not reaching the management objective. Correcting the error and retuning the MP (to 60% probability of being in the Kobe green zone) results in an MP that does reach the objective, with similar performance measure outcomes. Therefore, the recommended action is to use the corrected and retuned MP to recommend the TAC for 2026-2028. Should the Commission continue to implement the current MP, without retuning, it has a lower probability (54%) of being in the Kobe green zone and higher TAC variability, but otherwise similar performance statistics. The TAC derived from running SWO MP1 with or without retuning is 30527 t (i.e. the same) because the max TAC change constraint is reached in both MPs. Click here for full stock status summary: Appendix 22

Sharks: Although sharks are not part of the 16 species directly under the IOTC mandate, sharks are frequently caught in association with fisheries targeting IOTC species. Some fleets are known to actively target both sharks and IOTC species simultaneously. As such, IOTC Contracting Parties and Cooperating Non-Contracting Parties are required to report information at the same level of detail as for the 16 IOTC species. The following are the main species caught in IOTC fisheries, although the list is not exhaustive.

Stock	Indicators		2020	2021	2022	2023	2024	Advice to the Commission
Blue shark *Prionace glauca*	Reported catch 2023 (t) Estimated catch 2019 (t) Not elsewhere included (nei) sharks1 2023 (t) Average reported catch 2019-2023 (t) Average estimated catch 2015-19 (t) Avg. not elsewhere included (nei) sharks 2019-2023 (t) MSY (1,000 t) (80% CI) F_{MSY} (80% CI) SB_{MSY} (1,000 t) (80% CI) F_{2019}/F_{MSY} (80% CI) SB_{2019}/SB_{MSY} (80% CI) SB_{2019}/SB_0 (80% CI)	26,342 43,240 28,843 26,013 48,781 29,049 36.0 (33.5 - 38.6) 0.31 (0.306 - 0.31) 42.0 (38.9 - 45.1) 0.64 (0.53 - 0.75) 1.39 (1.27 - 1.49) 0.46 (0.42 - 0.49)		**99.9%**				No new stock assessment was carried out for blue sharks in 2024 and so the results are based on the assessment carried out in 2021 using an integrated age-structured model (SS3) (using data up to 2019). On the weight-of-evidence available in 2021, the stock status is determined to be **not overfished** and **not subject to overfishing**. 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 is not overfished nor subject to overfishing. 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. The stock should be closely monitored. While mechanisms exist for encouraging CPCs to comply with their recording and reporting requirements (Resolution 16/06), these need to be further implemented by the Commission, so as to better inform scientific advice in the future. Click below for a full stock status summary: Appendix 23
Shortfin mako *Isurus oxyrinchus*	Reported catch 2023 (t) Catches reported to MAK in 2023 (t) Average catches reported to MAK 2019-2023 (t) Catches in 2023 (MAK, SMA, LMA) (t) Average catches 2019-2023 (MAK, SMA, LMA) (t) Not elsewhere included (nei) sharks 2023 (t) Average reported catch 2019-2023 (t) Av. Not elsewhere included (nei) sharks 2019-2023 (t)	831 2,021 2,068 2,870 2,928 30,358 846 30,813					49.7%	In 2024 a stock assessment was carried out for the shortfin mako shark in the IOTC area of competence, using data until 2022. The model applied was a population biomass dynamics model using the platform JABBA. The stock status and projections were based on an ensemble grid of 9 models designed to capture the main uncertainties relating to biology (3 options) and the shape of the production curve used in biomass dynamics models (3 options). Considering the characterized uncertainty, and on the weight-of-evidence available in 2024, the shortfin mako shark stock is determined to be **overfished** and **subject to overfishing**. The Commission should take a cautious approach by implementing management actions that reduce fishing mortality on shortfin mako sharks, and the stock should be closely monitored. While mechanisms exist for encouraging CPCs to comply with their recording and reporting requirements (Resolution 18/07), these need to be further implemented by the Commission so as to better inform future scientific advice.

	MSY (1,000 t) (80% CI) FMSY (80% CI) BMSY (1,000 t) (80% CI) F_{2022} /FMSY (80% CI) B_{2022} /BMSY (80% CI) B_{2022} /B0 (80% CI)	1.93 (0.99 – 3.31) 0.03 (0.01 – 0.07) 60.0 (35.7 – 103.8) 1.53 (0.65 – 3.71) 0.96 (0.58 – 1.41) 0.45 (0.27- 0.69)						In order to have a lower than 50% probability of exceeding MSY-reference points in 10 years, i.e., to recover the stock to the green quadrant of the Kobe plot with at least 50% probability in 10 years, future catches should not exceed 40% of the average catches between 2020-2022 (i.e., last 3 year of catches used in the model). This corresponds to an annual TAC of 1,217.2 t (representing all fishing mortality including retention, dead discards and post-release mortality), noting that this TAC level should include and account for the SMA, MAK and MSK species codes as reported to IOTC Click below for a full stock status summary: Appendix 26 There is a paucity of information available for these species and this situation is not expected to improve in the short to medium term. There is no quantitative stock assessment and limited basic fishery indicators currently available. Therefore, the stock status is highly uncertain. The available evidence indicates considerable risk to the stock status at current effort levels. The primary source of data that drive the assessment (total catches) is highly uncertain and should be investigated further as a priority.
Oceanic whitetip shark *Carcharhinus longimanus*	Reported catch 2023 (t) Not elsewhere included (nei) sharks 2023 (t) Average reported catch 2019–2023 (t) Ave. (nei) sharks 2019–2023 (t)	42 28,843 36 29,049						Click below for a full stock status summary: Oceanic whitetip sharks – Appendix 24 Scalloped hammerhead sharks – Appendix 25 Silky sharks– Appendix 27 Bigeye thresher sharks– Appendix 28 Pelagic thresher sharks– Appendix 29 porbeagle sharks– Appendix 30
Scalloped hammerhead shark *Sphyrna lewini*	Reported catch 2023 (t) Not elsewhere included (nei) sharks 2023 (t) Average reported catch 2019–2023 (t) Ave. (nei) sharks 2019–2023 (t)	1,397 30,108 470 31,452						
Silky shark *Carcharhinus falciformis*	Reported catch 2023 (t) Not elsewhere included (nei) sharks 2023 (t) Average reported catch 2019–2023 (t)	1,578 28,843 1,675						

	Ave. (nei) sharks 2019–2023 (t)	29,049						
Bigeye thresher shark *Alopias superciliosus*	Reported catch 2023 (t) Not elsewhere included (nei) sharks2 2023 (t) Thresher sharks nei 2023 (t) Average reported catch 2019-2023 (t) Av. Not elsewhere included (nei) sharks2 2019-2023 (t) Av. Thresher sharks nei 2019-2023 (t)	< 1 33,200 4,863 < 1 33,848 5,108						
Pelagic thresher shark *Alopias pelagicus*	Reported catch 2023 (t) Not elsewhere included (nei) sharks 2023 (t) Thresher sharks nei 2023 (t) Average reported catch 2019-2023 (t) Av. Not elsewhere included (nei) sharks2 2019-2023 (t) Av. Thresher sharks nei 2019-2023 (t)	136 33,200 4,863 162 33,848 5,108						
Porbeagle shark *Lamna nasus*	Reported catch 2023 (t) Not elsewhere included (nei) sharks1 2023 (t) Average reported catch 2019-23 (t) Avg. not elsewhere included (nei) sharks1 2019-23 (t)	28 28,365 28 28,768						

*Estimated probability that the stock is in the respective quadrant of the Kobe plot (shown below), derived from the confidence intervals associated with the current stock status.

Colour key	Stock overfished ($SB_{year}/SB_{MSY}< 1$)	Stock not overfished ($SB_{year}/SB_{MSY}\geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY}> 1$)		
Stock not subject to overfishing ($F_{year}/F_{MSY}\leq 1$)		
Not assessed/Uncertain/Unknown		

1. OPENING OF THE SESSION

1. The 27th Session of the Indian Ocean Tuna Commission (IOTC) Scientific Committee (SC) was held in Cape town, South Africa and online, during 2 – 6 December 2024. A total of 141 delegates and other participants attended the Session (106 in 2023), comprised of 120 delegates (92 in 2023) from 24 Contracting Parties with no delegates from Cooperating Non-Contracting Parties (0 in 2023), and 21 participants from 15 observer organisations (including the invited experts). The meeting was opened by the Chairperson, Dr Toshihide Kitakado (Japan), followed by welcoming remarks by Dr Dion George, the Minister of Environment, Forestry and Fisheries, and Ms Sue Middleton, Deputy Director-General for Fisheries Management, Department of Forestry, Fisheries and the Environment of South Africa who warmly greeted the participants. The list of participants is provided at Appendix 1.

2. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

2. The SC **ADOPTED** the Agenda provided at Appendix 2. The documents presented to the SC are listed in Appendix 3.
3. The SC **NOTED** the statements from Mauritius and France (OT) (Appendix 4).

3. ADMISSION OF OBSERVERS

4. The SC admitted the following observers, in accordance with Rule XIV of the IOTC Rules of Procedure (2014):

3.1 Non-governmental and Inter-governmental Organisations (NGOs)

- Agreement on the Conservation of Albatrosses and Petrels (ACAP)
- Birdlife
- Blue Marine Foundation (BMF)
- Deutsch Stiftung Meeresschutz (DSM)
- Europêche
- Global Tuna Alliance (GTA)
- International Pole-and-line Foundation (IPNLF)
- International Seafood Sustainability Foundation (ISSF)
- Marine Stewardship Council (MSC)
- PEW Charitable Trusts
- Sustainable Fisheries and Communities Trust (SFACT)
- Shark Project
- The Ocean Foundation
- World Wide Fund for Nature (WWF)
- Invited Experts

4. DECISIONS OF THE COMMISSION RELATED TO THE WORK OF THE SCIENTIFIC COMMITTEE

4.1 Outcomes of the 28th Session of the Commission

5. The SC **NOTED** paper IOTC–2024–SC27–03 which outlined the decisions and requests made by the Commission at its 28th Session, held in May 2024, that related to the IOTC science processes. The SC **NOTED** that 11 new CMMs were adopted in 2024 by the Commission (consisting of 10 Resolutions and 1 Recommendation).
6. The SC **NOTED** that the current *Compendium of Active Conservation and Management Measures for the Indian Ocean Tuna Commission* may be downloaded from the IOTC website at the following link:
   English: http://iotc.org/cmms
   French: http://iotc.org/fr/mcgs

7. **Noting** that the 28th Session of the Commission also made general comments and requests regarding the recommendations made by the Scientific Committee in 2023, the SC **AGREED** that any advice to the Commission would be provided in the relevant sections of this report.

4.2 Previous decisions of the Commission

8. The SC **NOTED** paper IOTC–2024–SC27–04 which outlined the decisions by the Commission, in the form of previous Resolutions that require a response from the SC in 2024 and **AGREED** to develop advice to the Commission in response to each request during the current Session.

9. The SC **NOTED** that there was a need to provide capacity building to facilitate better understanding of climate change issues. Tools should be developed to assist scientists in making progress on this topic.

5. SCIENCE RELATED ACTIVITIES OF THE IOTC SECRETARIAT IN 2024

5.1 Report of the Secretariat – Activities in support of the IOTC science process in 2024

10. The SC **NOTED** paper IOTC–2024–SC27–05 which provided an overview of the work undertaken by the IOTC Secretariat in 2024 and **CONGRATULATED** the IOTC Secretariat for its contributions to the science processes this year. These contributions included support to the Working Groups, Working Parties and Scientific Committee meetings; the facilitation of the IOTC Meeting Participation Fund; assisting in improvements made in the quality of the data sets being collected and submitted to the IOTC Secretariat; capacity building activities; recruitment and management of consultants; oversight of scientific projects and facilitation of the attendance of the invited scientific experts that support IOTC technical meetings.

11. The SC **THANKED** the Secretariat for the successful organization and completion of the different Working Party meetings in 2024 using a combination of virtual and hybrid meetings. The SC **NOTED** the technical challenges posed by the hybrid meetings (additional cost of equipment, audio issues, internet connections, time zones and duration).

12. The SC **NOTED** that, in line with its agreement in 2022, virtual meetings were still conducted for certain meetings (such as Data preparatory meetings and Working Groups) to reduce the travel expenses imposed on Contracting Parties (Members) and Cooperating Non-Contracting Parties (collectively termed CPCs) as well as on the IOTC MPF.

13. The SC **NOTED** the completion of the recruitment process for the data coordinator and stock assessment expert positions within the Secretariat, which have been open since early 2024. Emmanuel Chassot from the Data Section was promoted to the data coordinator role. The new stock assessment officer is expected to start in early 2025.

14. The SC **NOTED** that in 2024, Secretariat staff continued to support collaborations and participated in several meetings with other organisations. The SC **ENCOURAGED** these ongoing collaborations.

15. The SC **ACKNOWLEDGED** and **CONGRATULATED** the Data Section of the IOTC Secretariat on their work and for the numerous important activities carried out so far, including capacity building workshops to assist CPCs in formatting and reporting their fisheries data to the Secretariat in accordance with IOTC data reporting requirements.

16. The SC **NOTED** that Indonesia expressed its appreciation to the Secretariat for providing technical assistance in reviewing the approach that Indonesia used to re-estimate its historical catches, with a special focus on coastal fisheries and the period prior to 2010.

17. The SC **NOTED** that the Secretariat conducted four data support missions in 2024 with the EU funding. These missions took place in Tanzania, Bangladesh, Mozambique, and Sri Lanka to review and improve their data collection and reporting systems, aiming to meet IOTC standards.

18. The SC **NOTED** that Pakistan has requested a similar data support mission to enhance their data reporting system. The SC asked Pakistan to work with the Secretariat to plan future missions.

19. In response to the request from the Commission for developing a gillnet CPUE index, the SC **NOTED** that a consultant was hired and joined the data support mission in Sri Lanka in 2024 to assess the feasibility of its gillnet data for developing such an index. Since Pakistan and Iran also have significant gillnet fisheries, Pakistan suggested that an index covering a broader range of fleets would be more beneficial. However, due to different

data systems and logistical challenges (e.g., data access), the SC considered that it would be more feasible to start with country-specific data and gradually work towards combining data from multiple fleets.

20. The SC also emphasized the importance of considering neritic tuna when developing the gillnet index.

6. NATIONAL REPORTS FROM CPCS

6.1 National Reporting to the Scientific Committee: overview

21. The SC **NOTED** that 27 National Reports were submitted to the IOTC Secretariat in 2024 by CPCs (26 by CPs and 1 by a CNCP) (as well as a report by the invited experts, Taiwan,China). The abstracts of CPC reports are provided in Appendix 5.

22. The SC **RECALLED** that the purpose of the National Reports is to provide relevant information to the SC on fishing activities of CPCs operating in the IOTC area of competence. The report should include all fishing activities for species under the IOTC mandate as well as sharks and other byproduct/bycatch species as required by the IOTC Agreement and decisions by the Commission.

23. The SC **RECALLED** that the submission of a National Report is mandatory, irrespective of whether a CPC intends on attending the annual meeting of the SC or not and shall be submitted no later than 15 days prior to the SC meeting. In 2024, of the 27 National Reports submitted, one was submitted shortly after the deadline. Mozambique, Sudan and Yemen did not submit their National Report in 2024. The SC **NOTED** the importance of consistency and standardisation in the format of reporting on fisheries in National Reports and again **REQUESTED** that CPCs follow the reporting template agreed by the Commission.

24. The SC **NOTED** that in 2024, all National Reports were submitted using the latest reporting templates through the E-Maris platform. The Secretariat informed the SC that the latest template will continue to be published on the IOTC webpage (https://iotc.org/science), the SC meeting page and distributed through official Circular as requested by the SC in 2020.

25. In addition, the SC **NOTED** that the availability for download of the revised National Report templates from the IOTC Website was announced through IOTC Circular 2024/33 sent on the 24th of June 2024 as well as through the IOTC Science mailing list.

26. The SC **RECALLED** that the National Reports contain different subsections that specifically cover all important reporting components from the various IOTC Resolutions and confirmed that the format of National Reports is timely updated by the IOTC Secretariat to ensure full accordance with the Resolutions' requirements.

27. The SC **AGREED** that if required, interested CPCs should seek assistance from the IOTC Secretariat in the development of National Reports. Requests should be made as early as possible so that the IOTC Secretariat may be able to better coordinate the resources available.

28. The SC **NOTED** that there was an increase in the Submission of National reports by CPCs in 2024 when compared with the 25 reports provided by CPCs in 2023 (26 in 2022, 21 in 2021, 25 in 2020, and 23 in 2019; see Table 2).

29. The SC **NOTED** that some countries such as Indonesia do not include catches of neritic species in their national reports despite the significant amount of catch of these species by these CPCs. The SC **NOTED** that while Indonesia did not include neritic tuna catch data in the national report, they did submit the data on neritic tunas catch to the Secretariat. The SC **ENCOURAGED** all CPCs to include catches of all IOTC species including the neritic species in their National Reports in future.

30. The SC **NOTED** that mandatory scientific and statistical information such as discard levels, observer coverage, fleet statistics etc., which are of relevance for several IOTC Resolutions, is often only reported by CPCs in their national reports but not made available to the IOTC Secretariat in due time and in accordance with the reporting requirements prescribed in the Resolutions.

31. The SC **RECALLED** that the National Report does not replace the need for submission of data according to the IOTC Mandatory Data Requirements listed in the relevant IOTC Resolutions (and in particular Resolution 15/02).

32. For these reasons, the SC **REQUESTED** all CPCs to ensure that information and data presented in the respective national reports and the official submissions available to the IOTC are in agreement.

Table 2. CPC submission of National Reports to the SC from 2014 to 2024.

CPC	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Contracting Parties (Members)											
Australia											
Bangladesh	n.a.										
China											
Comoros											
European Union											
France (OT)											
India										2 Dec	
Indonesia											
Iran, Islamic Rep. of											
Japan											
Kenya											
Korea, Republic of											
Madagascar											
Malaysia											
Maldives, Rep. of											
Mauritius											
Mozambique											
Oman, Sultanate of											
Pakistan										2 Dec	30 Nov
Philippines											
Seychelles, Rep. of											
Somalia											
Sri Lanka											
South Africa, Rep. of											
Sudan											
Tanzania, United Republic of											
Thailand											
United Kingdom											
Yemen											
Cooperating Non-Contracting Parties											
Liberia	n.a.										

Green = submitted. Red = not submitted. Orange = Submitted using an outdated template or late n.a. = not applicable (not a CPC in that year). For 2024, the date of submission of the report is included in the table if the report was submitted after the deadline (**Note**: the deadline for submission was 17 November 2024).

6.2 Contracting Parties (Members)

33. The SC **NOTED** that in 2024 the Secretariat provided translations of all the submitted National report summaries in both English and French in response to the SC request in 2018.

34. The SC **RECOMMENDED** that the Compliance Committee and Commission note the lack of compliance by 3 Contracting Parties (Members) that did not submit a National Report to the Scientific Committee in 2024, **NOTING** that the Commission agreed that the submission of the annual reports to the Scientific Committee is mandatory.

6.3 Cooperating Non-Contracting Parties (CNCPs)

35. The SC **NOTED** that one National Report was submitted to the IOTC Secretariat in 2024 by the Cooperating Non-Contracting Party (CNCP).

6.4 Invited Experts

36. The SC **NOTED** the report provided by the Invited Experts from Taiwan,China which outlined fishing activities in the IOTC Area of Competence. The report from the Invited Experts is available upon request.

7. REPORTS OF THE 2024 IOTC WORKING PARTY MEETINGS

7.1 Report of the 14th Session of the Working Party on Neritic Tunas (WPNT14)

37. The SC **NOTED** the report of the 14th Session of the Working Party on Neritic Tunas (IOTC–2024–WPNT14–R), including the consolidated list of recommendations provided as an appendix to the report. The meeting was attended by 47 participants (cf. 35 in 2023). Six participants received funding through the MPF.

38. The SC **NOTED** that no scientists from Pakistan have attended the WPNT meeting in recent years despite the fact that they have large catches of these species and therefore **ENCOURAGED** scientists from this and other CPCs with significant neritic catches to attend these meetings in the future and **REQUESTED** these CPCs to provide scientific papers providing information on the neritic tuna fisheries in these CPCs.

39. The SC **NOTED** that assessments were conducted in 2024 for bullet tuna, frigate tuna and Indo-Pacific king mackerel using catch only methods which are used to provide management advice, as well as length-based and spawning potential ratio (SPR) methods which are used to verify the results of the catch-only model.

40. The SC **NOTED** that length frequency data are important for length-based and SPR methods. However, the SC further **NOTED** that the prevalent models are not able to deal with dome shaped selectivities, and it is best to only include size data from representative fisheries, rather than from all fisheries in the region. The SC **NOTED** that size data from purse seine fleets were not included in these assessments due to the small-sized fish caught in this fishery which would have caused a dome shaped selectivity, however the SC **NOTED** that purse seines take a relatively small proportion of the catch of these species.

41. The SC **NOTED** that recent genetic studies have suggested that there is more stock structure found for neritic tuna species (than for tropical tunas) with numerous potential separate stocks within the Indian Ocean. However, the SC **NOTED** that the assessments conducted for these species are still based on the assumption of a single stock across the region. The SC **SUGGESTED** that it would be a good idea to explore the sensitivity of future stock assessments to different stock structures, using information gathered from previous genetic studies, particularly for less data-poor species. The SC **NOTED** that more traditional genetic studies investigating stock structure tend to use an evolutionary time scale which is not particularly suitable for these stock assessments, so therefore **SUGGESTED** that more CKMR type techniques which provide information on connectivity on a generational timescale should be applied. The SC **NOTED** an offer from Australia to present information on CKMR techniques at the next WPNT meeting, and **NOTED** that a study that investigated the stock structure of Spanish mackerel would be particularly relevant.

42. The SC **NOTED** that the WPNT will not be conducting stock assessments in 2025 so there will be time to consider alternative techniques and stock structure considerations for the specification of future assessments.

43. The SC **ENCOURAGED** CPCs to collaborate to carry out stock identification by the application of genetic techniques such as Close Kin Mark Recapture (CKMR) to better understand the structure of all neritic stocks for improved management plans.

44. **NOTING** that there has been considerable recent advancement and emphasis on the length-based approach, which can estimate stock status and serve as a valuable monitoring tool for various fisheries, the SC thus **ENCOURAGED** the continued exploration and utilization of both methods. The SC **RECOMMENDED** that the Commission urge CPCs to collect more representative length composition data for the effective assessment of these species, with a particular focus on frigate and bullet tuna for which the stock status is still unknown. The SC further **RECOMMENDED** that the Commission urge CPCs to summarize the size data from their sampling programs for the next WPNT meeting.

7.2 Report of the 22nd Session of the Working Party on Billfish (WPB22)

45. The SC **NOTED** the report of the 22nd Session of the Working Party on Billfish (IOTC–2024–WPB22–R), including the consolidated list of recommendations provided as an appendix to the report. The meeting was attended by 47 participants (cf. 97 in 2023). Five participants received funding through the MPF.

46. The SC **THANKED** and **CONGRATULATED** the Chair and the WPB for their efforts and accomplishments during the 22nd session of the WPB.

47. The SC **NOTED** that, according to the FAO Global Capture Production Database, the Indian Ocean has accounted for more than 40% of the global billfish catch in recent years.

48. The SC **NOTED** that annual Indian Ocean billfish catches increased from approximately 5,500 tonnes in the 1950s to around 90,000 tonnes in the 2010s, representing less than 5% of the total catch of IOTC species in recent years.

49. The SC further **NOTED** that the contribution of gillnets has increased over the years, accounting for nearly 50% of the total billfish catch in the Indian Ocean in recent years.

7.2.1 Billfish reproductive biology workshop

50. The SC **NOTED** that a portion of the 22nd session of the WPB was dedicated to billfish reproductive biology, **ACKNOWLEDGING** the contribution of an invited expert, Dr. Robert Humphreys, who presented a comprehensive review of past and recent studies utilising gonad histology to define reproductive phases and maturity status in billfish species.

7.2.2 Striped marlin stock assessment

51. The SC **NOTED** with concern the status of the striped marlin stock in the Indian Ocean, despite the agreement to catch limits established in late 2018 through Resolution 18/05. Both a surplus production model using JABBA and an age-structured model using SS3 indicated that the stock was overfished and subject to overfishing in 2022 with a probability of 100%.

52. The SC **NOTED** that the stock status determination in the stock-specific tables of the report refers to the year 2024, despite the input data being available only up to 2022. The SC **AGREED** that the year of assessment could serve as the reference year in the management advice but **ACKNOWLEDGED** the importance of ensuring this approach is consistent across all assessments conducted by the IOTC for harmonisation purposes.

53. **NOTING** that information on stock abundance is derived from the longline fisheries of Japan and Taiwan, China, which have caught relatively small amounts of striped marlin in recent years, the SC **NOTED** the importance of better emphasising the major fishing nations targeting striped marlin.

54. The SC **ACKNOWLEDGED** that the fishing mortality levels (F_{2022}/F_{MSY}) estimated by the models were exceptionally high, with values of 9.26 and 3.95 according to SS3 and JABBA, respectively. The SC **NOTED** that the intensity of the depletion level has be primarily driven by the Japanese longline CPUE in a specific area historically, while the recent increase in catch contributed to the elevated fishing mortality levels.

55. The SC **AGREED** that the abundance indices derived from longline CPUE analyses will be critical for future assessments and **ENCOURAGED** all concerned CPCs to allocate adequate time and resources to support this work.

7.2.3 Black marlin stock assessment

56. The SC **ACKNOWLEDGED** the progress made on the assessment of black marlin, which could not be determined previously due to substantial uncertainties, primarily arising from conflicting information between CPUE and catch data.

57. The SC **NOTED** that the assessment model applied to the stock of black marlin indicated that the stock was not overfished but subject to overfishing in 2022 with a probability of 62.2%.

58. **NOTING** that a joint analysis of fleet specific CPUE based on a consistent statistical framework which accounts for differences in catchability between fleets could be useful for assessing species under the mandate of WPB, the SC **RECOMMENDED** that the Commission urge the CPCs to dedicate effort to harmonising the standardised methods for different fleets and to develop a joint analysis combining catch effort data from key fleets for major billfish species where feasible.

7.2.4 Revision of catch levels of marlins under Resolution 18/05

59. The SC **NOTED** that the catch levels of black marlin and Indo-Pacific sailfish have exceeded the catch limits established under Resolution 18/05, while the catches of blue marlin have remained well below the limit in recent years (**Fig. 1**).

60. For striped marlin, the SC **ACKNOWLEDGED** that the stock has remained subject to overfishing and overfished. While reported catches remained below the Resolution 18/05 limit of 3,260 t during 2018-2022, they have been above levels required to recover the stock to BMSY, as indicated by the most recent assessment based projections.

61. The SC **RECALLED** that the Resolution 18/05 catch limits were based on previous stock assessments and emphasised the need for their revision and update in light of the most recent data and stock status information.

62. The SC **RECOMMENDED** that the Commission reassess the effectiveness of the current measures within this resolution and to revise Resolution 18/05 to update the catch limits based on the latest stock assessments and projections for the billfish species.

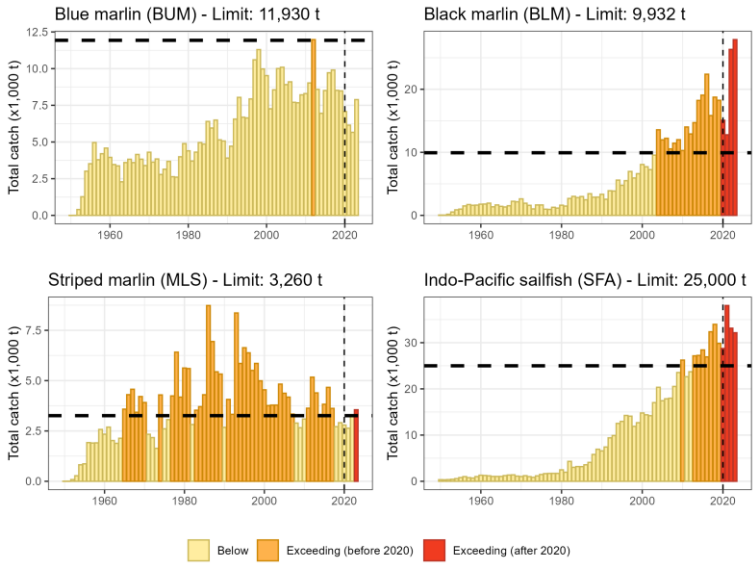


Fig. 1. Annual retained catches of blue marlin (top-left panel), black marlin (top-right panel), striped marlin (bottom-left panel), and Indo-Pacific sailfish (bottom-right panel)

7.3 Report of the 20th Session of the Working Party on Ecosystems and Bycatch (WPEB20)

63. The SC **NOTED** the report of the 20th Session of the Working Party on Ecosystems and Bycatch (IOTC–2024–WPEB20–R), including the consolidated list of recommendations provided as an appendix to the report, which included also recommendations to the SC from the WPEB Data Preparatory meeting in April 2025. The meeting was attended by 92 participants (cf. 100 in 2023). Seven participants received funding through the MPF.

64. **NOTING** the presentation to the WPEB of the recently revised ACAP best practices which included sink rates in the minimum standards for branch line weighting, the SC **NOTED** that there are currently no guidelines for measuring sink rates and further **NOTED** that the WPEB does not have the capacity to develop guidelines on its own for measuring these sinking rates and so will be relying on ACAP to develop these guidelines. The SC **NOTED** that the WPEB committed to examining the suitability and applicability of such guidelines when these have been made available in order to conduct testing on sinking rates of various weighted branchlines used within the fleets of IOTC.

65. The SC **NOTED** the concern by some CPCs that there is very poor data at a species level for marine turtles incidentally caught in IOTC fisheries in general and **SUGGESTED** that CPCs prioritise collecting and providing these data at species level.

66. **NOTING** that the WPEB included holding a workshop on bycatch mitigation in gillnet fisheries in its program of work, the SC **NOTED** an offer from Pakistan to hold this workshop in conjunction with other key gillnet CPCs.

67. The SC **NOTED** that the data presented shows a breakdown of the catches by each gear type since 1950 and **NOTED** that around 35% of catches of sharks are taken in coastal longline fisheries.

68. The SC **NOTED** that the work of the WPEB was more challenging this year due to the requests to provide advice to the Commission in relation to technical measures and mitigation approaches for sharks. This led to the Secretariat and Chair organizing a focused workshop within the WPEB that drew together experts on this issue with relevant papers being presented and considered by the group.

7.3.1 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

69. The SC **NOTED** paper IOTC–2024–SC27–06 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.

70. 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 6, recalling that the IPOA-Seabirds and IPOA-Sharks were adopted by the FAO in 1999 and 2000, respectively, and recommended the development of NPOAs.

71. 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.

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

73. The SC **NOTED** that there have been small revisions to the previous update on NPOAs in 2023 including the drafting of revisions of NPOAs by some CPCs and updates on the progress on the development of NPOAs by other CPCs.

74. The SC **NOTED** that Australia had recently published a third revision of their NPOA for sharks in 2024.

75. The SC **NOTED** that Bangladesh finalised their NPOA for sharks which will apply to 2023-2027.

76. The SC **NOTED** that Kenya finalised their NPOA for sharks and they are also preparing a NPOA for seabirds that will be reviewed by stakeholders soon.

77. The SC **NOTED** that Seychelles have extended their NPOA for sharks to include 2024 and are working on an update which should be completed in 2025.

78. The SC **NOTED** that South Africa have developed an updated NPOA for seabirds which is now awaiting approval.

79. The SC **NOTED** that Tanzania has submitted their NPOA for seabirds through e-MARIS and further NOTED that the NPOA for sharks is just awaiting final approval.

80. The SC **NOTED** that India published their NPOA for sharks in late 2024 and for seabirds in 2021.

81. The SC **NOTED** that Indonesia's National Report notes that their NPOA for sharks and rays which was meant to apply from 2016-2020 is still considered to be valid.

7.3.2 Longline bycatch mitigation measures workshop

82. The SC **NOTED** the Commission request to relevant working parties and the Scientific Committee to provide advice to the Commission on technical and mitigation measures to strengthen the conservation of sharks, in particular vulnerable species, including how to reduce the impact of tuna fisheries. In this regard, the Commission request included a specific request for advice regarding "the use of wire trace as branch lines or leaders and the use of branch lines running directly off the longline floats or drop lines, known as shark lines".

83. The SC **NOTED** that the WPEB conducted a comprehensive research review pertaining to different potential shark mitigation options and produced a summary table listing the strengths and weaknesses of possible mitigation measures focused on longline gear, including limiting the use of wire trace as branch lines or leaders and shark lines (in Appendix VI of WPEB(DP) Report). The SC **ACKNOWLEDGED** that most of the existing

research on this topic comes from the Pacific and Atlantic Oceans and that the information is currently scarce in the Indian Ocean. The SC **REQUESTED** that the WPEB and WPSE evaluate the potential impacts of limiting wire leader and shark lines on fleet operation and the potential social and economic impacts in the Indian Ocean. In addition, the SC **ENCOURAGED** CPCs to conduct region specific analyses on these mitigation methods. The SC **RECOMMENDED** that the Commission consider the research from the summary tables (Appendix VI of WPEB(DP) Report) should they wish to consider additional mitigation measures to strengthen the conservation of vulnerable sharks. The WPEB literature review highlighted that a prohibition on the use of wire leaders and shark lines by longline and other fisheries operating in the IOTC would likely result in a reduction in both the observed catch and the fishing mortality of shark species, particularly in situations where the use of wire leaders and shark lines are common. The SC also considered that further investigation on mitigation measures should be continued.

84. The SC **NOTED** that the summary table was produced during the Bycatch Mitigation Workshop held as a part of the WPEB data preparatory meeting for shortfin mako stock assessment. The SC **NOTED** that the WPEB data preparatory meeting recommended to the SC that additional mitigation measures such as, but not limited to, the non-use of wire leaders and shark lines be considered. The SC also **NOTED** that the WPEB reviewed this recommendation during the main meeting but could not reach an agreement. At present there are no clear guidelines from the SC on whether recommendations from a workshop or WP DP meeting (including a workshop) can go directly to the SC. This is a common issue shared by all WPs, not only to the WPEB, and as such the SC is presently developing its guidelines regarding such procedures.

7.3.3 Shortfin mako shark stock assessment

85. The SC **NOTED** that an assessment for shortfin mako shark was conducted for the first time this year. The SC **NOTED** that it is a data-limited assessment and that it is not possible to assess the stock with a high degree of certainty at present but that despite the difficulties and issues raised, the WPEB had **AGREED** that this is an appropriate stock assessment, suitable to provide management advice on stock status and projections for future catches.

86. Considering the characterized uncertainty, and evidence available in 2024, the shortfin mako shark stock is considered to be **overfished** and **subject to overfishing.**

7.3.4 Other matters

87. The SC **NOTED** the revised handling and release guidelines for mobulids endorsed by the WPEB, and **RECOMMENDED** that the Commission consider revising the live release handling procedures provided in Annex 1 of Resolution 19/03. The SC **NOTED** that further development of the guidelines for gillnets is required and that this will be done intersessionally with the aim of reporting to the WPEB21. The details of the suggested revisions to the handling procedures can be found in IOTC-2024-WPEB20(AS)-R.

88. The SC **NOTED** paper IOTC-2024-SC27-11Rev1 Regarding the operation of Working Party of Ecosystem and Bycatch.

89. The SC **NOTED** the concerns raised about the preparation and operation of data preparatory meetings that contained the longline bycatch mitigation workshop within its agenda and in particular the handling of recommendations arising from a shark mitigation measure workshop that was held during the WPEB's data preparatory meeting in 2024. The SC **AGREED** that official guidelines for these data preparatory meetings would be beneficial to avoid any confusion on this topic in the future.

90. **NOTING** the increased workload of the WPEB in recent years, the SC **NOTED** the need to improve the efficiency and effectiveness in meeting operations allowing adequate time for discussion on the priority topics, including focusing the agenda more specifically on the priority topics for that year, prioritization of topics and documents, sharing a summary of requests from the SC/COM to each WP well in advance of meeting, and improved scheduling of the work and work plan. The SC also **NOTED** however that the scheduled data preparatory meetings can offer an opportunity to address topics that may require more time than is available during the full assessment meeting, while further **NOTING** that in such case, the role and mandate of the data preparatory meeting should be defined and notified before the meeting.

91. As the workings of data preparatory meetings are relevant to all working parties, other discussions relating to this paper can be found in **Section 7.8.6**, other matters for topics common to all working parties.

7.4 Report of the 26th Session of the Working Party on Tropical Tunas (WPTT26)

92. The SC **NOTED** the report of the 26th Session of the Working Party on Tropical Tunas (IOTC–2024–WPTT26–R), including the consolidated list of recommendations provided as an appendix to the report. The meeting was attended by 130 participants (cf. 91 in 2023). Two participants received funding through the MPF.

93. The SC **NOTED** the update of yellowfin catch limits for 2024 and 2025 following resolution 19/01 and 21/01 was provided by the Secretariat (see Section 7.6.2).

7.4.1 Yellowfin tuna stock assessment

94. The SC **NOTED** that WPTT put in a significant effort to discuss and review the yellowfin tuna (YFT) assessment, which was conducted by the modelling team with some help from a consultant who has previously been involved in the expert panel review. The SC **THANKED** the chair of WPTT for the thorough overview of the WPTT report and expressed gratitude to the YFT assessment team for their hard work on this new assessment. The SC **ACKNOWLEDGED** the team's efforts to address many points from the independent review and to make the best assessment possible with the available information and data, with several improvements on the model.

Assessment inputs

95. The SC **NOTED** that the detailed summary provided on data, biology, and model development showed major changes from the previous assessment. The SC further **NOTED** the use of a model grid to characterize uncertainty.

96. The SC **NOTED** that the assessment incorporated a new growth curve based on a validated aging study, which was accepted by WPTT. This new curve suggests a higher Linf, implying a less productive stock than the growth curves used in 2021.

97. The SC **NOTED** that the natural mortality rate, agreed by the WPTT, was based on the Lorenzen curve, assuming a maximum age of 11 (from samples in the Indian Ocean). The mean natural mortality rate is lower than previously assumed, which could also lead to an estimate of lower productivity than the natural mortality vector used in 2021.

98. The SC **NOTED** the significant difference between the 2024 CPUE index and the 2021 CPUE index, especially in tropical areas. The 2024 index shows a flatter trend since the 1990s, with a notable increase in recent years. This has a significant impact on the assessment outcomes and management advice. This issue is described in detail below in the key issues on CPUE index section below.

99. The SC **NOTED** that the use of the 2021 CPUE index in the assessment model results in a significantly more pessimistic biomass up to 2020 (-23%) compared to using the 2024 CPUE indices. However, the SC **NOTED** that the other data used in the assessment (catch and length frequency data) also indicates an increase in biomass in the recent years, albeit a smaller increase (21% and 11% respectively) than the increase due to the inclusion of the 2024 CPUE index (79%).

Key Issues on CPUE index

100. The SC **NOTED** information document IOTC-2024-SC27-INF01, which outlines how analytic methods affect Longline CPUE indices. The author identified several changes in the 2024 analysis compared to 2021 and suggested that these changes might have led to more optimistic index trends up to 2020. For example, combining data from two regions R1a and R1b was advised against due to differing abundance trends and data quality issues. The author also stressed that using cluster analysis for tropical areas had been previously discouraged and could significantly affect the tropical indices.

101. The SC **NOTED** that the WPTT was unable to confirm if the inclusion of the Arabian Sea (R1a) data was the cause of the positive trend in the 2024 index, as an alternative annual index which also included the R1a data showed a more pessimistic trend. The SC further **NOTED** that both the 2021 and 2024 assessments treated both regions (R1a and R1b) as one area, which implicitly assumes that they share the same trend.

102. The SC **NOTED** that a member of the CPUE modelling team indicated that there are no specific reasons for these changes but suggested that they were unlikely to make significant differences in the CPUE. It was argued that using cluster analysis instead of hooks between floats could avoid confounding factors like line material.

103. **NOTING** that concerns were raised about the large difference between the 2024 and 2021 index and the methods used in the standardization process, the SC **REQUESTED** that the joint CPUE working group revise and update the yellowfin tuna CPUE in 2025 in time to be reviewed by WPTT27 assessment meeting, in accordance with the "Recommended action points related to Joint CPUE standardizations" in Appendix IX of the WPTT26 report. The SC **NOTED** that this will enable the WPTT and SC to review the CPUE standardisation and to provide clear advice to the 2026 Commission meeting on the need, if any, to update the yellowfin tuna stock assessment in 2026 to include the revised CPUE.

104. The SC **NOTED** that the Joint CPUE workshop had limited participation and was conducted over a short time period. However, it was noted that the workshop format and standardisation methods have remained the same for a long time. The SC **NOTED** the importance of the Joint Longline CPUE Index as a primary input for the stock assessments of several key IOTC species, including yellowfin, bigeye and albacore tunas, and **AGREED** on the need to ensure a transparent, inclusive, and replicable process in the development of the Joint CPUE Index using operational data. The SC therefore, **RECOMMENDED** that the Commission investigate options to allow independent scientists or Secretariat stock assessment experts to provide inputs and advice through attending meetings of the Joint Longline CPUE standardisation group. The SC **RECALLED** that during the 2015–2019 period analysis was conducted by a consultant by participating in the meetings.

Benchmark Reference points

105. The SC **NOTED** that the assessment model estimated negative recruitment deviates in earlier periods and positive recruitment deviates recently, as such, the WPTT proposed adjusting reference point benchmarks based on average recruitment deviations from a reference period. Using this scaling method for yellowfin would lower the stock status because the adjusted benchmark (SB_{MSY} or spawning biomass at MSY) is higher. **NOTING** the lack of certainty regarding whether recent higher estimated recruitment will be maintained, the WPTT also included reference point estimates based on long-term recruitment.

106. The SC **REQUESTED** other working parties with expertise on stock assessments to discuss and review the new approach for calculating the reference points for their stock assessments or species.

Assessment outputs and advice

107. The SC **NOTED** that regardless of whether the exact reasons are understood or not, the influence of the CPUE index on the assessment is significant, as it affects the MSY reference points, the estimated level of depletion, and future catch limits. Therefore, the SC **AGREED** that it is crucial to consider the additional uncertainty that this issue introduces, which is not reflected in the assessment grid, when forming its final conclusions and advice on the assessment.

108. Given the uncertainty associated with the new CPUE, the SC **RECOMMENDED** that the Commission set a TAC for 2026 only, of no more than the estimated median MSY, which is comparable to the average catch of the last five years, as a precautionary measure to allow time for further investigation (i.e. resolving of uncertainty associated with the new CPUE) and development of advice for 2027 onwards.

Assessment Performance

109. The SC **NOTED** that strong concerns were expressed by some CPCs regarding the results of the 2024 stock assessment for yellowfin tuna, particularly highlighting the structural changes and lack of transparency in the joint CPUE used as the primary index in the assessment, as well as the sudden shift in stock status from a high probability of red to a high probability of green in the Kobe plot. These CPCs indicated that their concerns regarding the assessment will be brought to the Commission's attention.

110. The SC **NOTED** information document IOTC-2024-SC27-INF02, which summarizes a review of the yellowfin tuna stock assessment. This paper suggests that prudent management would keep catches at the previous level which supposedly allowed for the increase in biomass, before the next assessment indeed confirms recovery of biomass.

111. The SC **NOTED** that the paper suggested that using a multi-parameter model like SS3 tends to estimate a lower BMSY/B0 compared to standard surplus models. Additionally, the paper suggested that the current model's recruitment variability is too high to offer useful management advice.

112. The SC **ACKNOWLEDGED** that all tropical tuna species are evaluated using integrated assessment tools such as SS3 and Multifan-CL. These tools show a similar range for B_{MSY}/B_0 and have observed comparable recruitment patterns in tuna stocks across the world's oceans—including the Atlantic, Indian Ocean, and Pacific. These assessments are conducted by various Regional Fisheries Management Organizations (RFMOs).

113. Meanwhile, the SC **NOTED** that most CPCs are of the view that there is a robust scientific process behind the results. This process was thoroughly discussed at the WPTT, including an in-depth examination into the differences between the 2024 and the 2021 assessments. The SC also **NOTED** that all assessment model files have been kept transparent, everyone can access the model, and there is already a plan to further investigate these discrepancies.

114. The SC **NOTED** that there are some observations that some CPCs such as Sri Lanka have had of their own domestic fisheries data, that do not seem to align with the assessments results. The SC **ENCOURAGED** CPCs to develop abundance indices using these observations to improve the assessment model.

7.4.2 Update on the WGFAD06

115. The SC **NOTED** the report of the 6th working group meetings on FADs (IOTC-2024-WGFAD06-R). The meetings were attended by 90 participants (75 and 116 participants in WGFAD04 and WGFAD05 respectively in 2023).

116. The SC **NOTED** that after the recent resolutions on FAD were adopted, CPCs seem less inclined to submit papers to WGFAD. This led to the shortening of WGFAD06 to a single day and the cancellation of WGFAD07 this year due to a shortage of papers. Therefore, the SC **RECOMMENDED** that the Commission schedule only one WGFAD meeting in 2025. The SC also suggests that this meeting should take place before the WPEB, as FAD issues are relevant to WPEB, to allow the findings to be reported to both WPEB and WPTT.

7.4.3 Other Matters

117. The SC **NOTED** that exceptional circumstances of adopted MPs need to be considered at both species WPs and WPM. The SC also **NOTED** that there is benefit in species WPs being held before WPM to allow discussions on issues such as new information on biology before the consideration of potential modelling implications and as such **RECOMMENDED** that in the future the WPM be held after the WPTT.

7.5 Report of the 15th Session of the Working Party on Methods (WPM15)

118. The SC **NOTED** the report of the 15th Session of the Working Party on Methods (IOTC–2024–WPM15–R), including the consolidated list of recommendations provided as an appendix to the report. The meeting was attended by 46 participants (cf. 42 in 2023). Two participants received funding through the MPF funding.

119. The SC **NOTED** that the WPM has reviewed and discussed a wide range of issues including MSE progress for IOTC species, multi-species MSE, exceptional circumstances considerations for bigeye tuna MSE, joint CPUE standardisations, and close kin mark recapture design study for yellowfin tuna.

7.5.1 Update on TCMP08

120. The SC **NOTED** document IOTC-2023-TCMP08-R on the Report of the 8th session of the TCMP held in May 2024. The SC **NOTED** that the WPM had taken into consideration the recommendations and discussions held at that meeting.

7.5.2 Management Strategy Evaluation Progress

121. The SC **NOTED** that the work of albacore is not mature enough that would require a TCMP in February and, therefore, **RECOMMENDED** that an extra TCMP meeting in February 2025 is not organized.

7.5.3 Bigeye tuna MP (Resolution 22/03)

122. The SC **NOTED** that a standardised CPUE index based on the agreed methodology (as per Resolution 22/03) was not yet available to run the Bigeye Tuna MP, but needs to be available in time for the Scientific Committee to review (as required by Resolution 22/03). However, a member of the joint CPUE group responsible for producing the index indicated that logistically (due to the need to have a physical workshop to share the data) it would not be possible to provide the CPUE index in time for SC, but that it might be possible to provide following a meeting of the group in February 2025. The SC **DISCUSSED** options for ensuring that the WPM is able to review and participate in the running of the MP. Following this discussion, the SC **RECOMMENDED** that:

- the joint CPUE working group produce a BET CPUE index, as per the requirements/specifications of Williams et al (2022), at its meeting in early February 2025, and provide this for the WPM(MSE)Taskforce.
- the WPM(MSE) Taskforce meet online on 24-25 February 2025 with one day to review and run the BET MP and one day to consider progress on the Albacore Tuna MSE.

- The Scientific Committee convene a special session, online (for two hours) on 26 February 2025, to review and if appropriate endorse the BET MP run and its associated BET TAC outcomes.

7.5.4 Skipjack tuna MP (Resolution 24/07)

123. The SC **NOTED** that the skipjack tuna MP will be applied during the WPM for endorsement by the SC in 2025. The SC further **NOTED** that the MP requires the Maldivian pole-and-line and EU FAD CPUEs, including 2024 data, using the methodology assumed in the Management Strategy Evaluation.

7.5.5 Swordfish tuna MP (Resolution 24/08)

124. The SC **RECOMMENDED** that the Commission implement a TAC for 2026-2028 for swordfish based on the amended and retuned MP1 if the Commission wishes to ensure that it achieves the current objective in Res 24/08 to be in the Kobe green zone with at least 60% probability during 2034-2038 period. This would require a minor amendment to the Target CPUE value in Annex I of Res 24/08 from 0.7125 to 0.75. The SC **NOTED** that should the Commission continue to implement the current MP1, without retuning, it has a lower probability (54%) of being in the Kobe green zone and higher TAC variability, but otherwise similar performance statistics (Table 1 of IOTC–204–WPM15–R). The TAC derived from running SWO MP1 with or without retuning is 30527 t (i.e. the same and therefore not a severe impact) because the max TAC change constrain is reached in both MPs.

125. Irrespective of the MP chosen by the Commission, the SC **RECOMMENDED** that the Commission endorse the resultant TAC of 30,527 t for swordfish for 2026-2028.

7.5.7 General MSE issues

126. The SC **ENDORSED** the inclusion of the MSE task force meeting in the schedule of meetings for 2025.

127. The SC **ENDORSED** the WPM's **RECOMMENDATION** that the Commission ensure that the IOTC Secretariat is provided with the necessary resources to manage the curation of relevant documents and code to enable users to re-run assessments and other analyses, **NOTING** that the most important information to be curated would be the input file, executables and control files.

7.6 Report of the 20th Session of the Working Party on Data Collection and Statistics (WPDCS20)

128. The SC **THANKED** and **CONGRATULATED** the Chair and the WPDCS for their efforts and accomplishments during the 20th session of the WPDCS.

129. The SC **NOTED** that the report of the 20th Session of the Working Party on Data Collection and Statistics had not yet been finalised as the meeting was held back-to-back with the meeting of the SC. The meeting was attended by 89 participants (cf. 53 in 2023). Nine participants received funding through the MPF, four of whom also attended the SC.

130. The SC **NOTED** the overview of data-related Resolutions, data reporting obligations, and reporting forms developed by the Secretariat, which differ according to species and gear groups.

131. The SC **NOTED** a recommendation from the WPDCS for the following revisions for submission to the Commission:

- Res. 15/01. Annex 2 should be revised to align with the provisions of Resolution 15/02, which mandates data collection and reporting at the species level, regardless of the fishing gear used
- Res. 15/02. The spatial resolution of geo-referenced catch, effort, and size frequency data for coastal fisheries should be clearly defined and aligned, i.e., size-frequency data shall be provided using an alternative geographical area if it better represents the fishery concerned.
- Res. 19/07. The content, format, and timeline for datasets to be collected and reported by the chartering CPC should be clearly specified.
- Res. 24/02. The reporting of buoy purchases to the IOTC and their incorporation into the compliance assessment procedure should be clearly specified.
- Res. 24/04. The spatio-temporal resolution of reported observer data should be aligned with the IOTC observer reporting templates and standards, as originally established in Resolution 22/04.

- Res. 24/04. The timeliness for reporting fisheries observer reports and data collected through the ROS should be harmonised with those for the main IOTC datasets. Specifically, each CPC shall submit observer data collected during a year to the IOTC Secretariat by 30 June of the following year. For longline fisheries, final data shall be submitted no later than 30 December.

132. **NOTING** a lack of clarity and inconsistencies in the aforementioned CMMs, The SC requested CPC to take into considerations these points when proposing potential revisions of these CMMs.

133. The SC **NOTED** the information on the availability and timeliness of the core IOTC datasets for the period 2014–2024 (statistical years 2013-2023), which demonstrated a general improvement in data submissions over the years across all species groups. The SC further **NOTED** that the availability and timeliness of data were highest for retained catches, although there is some variability between years, with late submissions observed for billfish and neritic species in 2020 due to the COVID pandemic, and in 2022. The SC **ACKNOWLEDGED** that data availability and timeliness were lower for geo-referenced catch and effort data compared to retained catch data and were poorest for size-frequency data.

134. The SC **NOTED** the reporting quality scoring system used by the Secretariat to broadly describe CPC compliance with IOTC data reporting obligations. The SC **ACKNOWLEDGED** the improvements made by CPCs over the last decade in reporting core IOTC datasets, while noting that significant issues persist with retained catch data for neritic species. Additionally, geo-referenced catch, effort, and size-frequency data remain insufficiently reported for most coastal fisheries.

135. The SC **CONGRATULATED** the Secretariat for its efforts in 2024 to improve data reporting and management, despite staff shortages.

136. The SC **NOTED** the ongoing review of the data collection system in Oman covering the period 2014-2023, **ACKNOWLEDGING** Oman's efforts to understand the reasons behind the increased yellowfin tuna catches in the handline fishery and to improve the estimates of effort and catch in this fishery.

137. The SC **CONGRATULATED** Indonesia for its efforts to address the requests made at the 26th session of the SC, resulting in a revised catch time series covering the period 1950-2022. The SC **NOTED** that the WPDCS has **ENDORSED** the methodology and results used to re-estimate Indonesia's historical catches for the period 1950–2022 and **AGREED** to endorse them as well.

138. The SC **NOTED** the ongoing EMS pilot projects in Kenya and Seychelles, as well as the development of a crew-based observer programme in Sri Lanka (see document IOTC-2024-SC27-INF05), aimed at enhancing on-board data collection within the framework of the ROS.

139. The SC **ACKNOWLEDGED** the interest of CPCs in developing a collaborative procedure and reporting forms for voluntarily sharing individual biological data (e.g., morphometrics), samples, and fish photographs through the Secretariat.

140. The SC **NOTED** the project initiated by France-OT to develop an online digital ocean atlas covering the IOTC Area of Competence, which was also presented at the 2024 sessions of the WPEB and WPTT. The atlas aims to support the objectives of Resolution 24/01 by serving as a tool to assess the impacts of climate change on IOTC fisheries. The SC **AGREED** on the significant value of this digital atlas in supporting the Commission's work and **ACKNOWLEDGED** that the project will be developed over six months by an expert team. Additionally, the SC **THANKED** Sri Lanka for its commitment to hosting the web portal and ensuring the long-term operation and maintenance of the atlas (see document IOTC-2024-SC27-INF04).

141. The SC **NOTED** that the WPDCS had discussed and reviewed the summary on best practice guidelines for safe handling and release of small cetaceans and the SC **RECOMMENDED** the Commission to consider these guidelines when developing conservation measures for cetaceans.

7.6.1 Update on WGEMS04

142. The SC **NOTED** the report of the 4th ad hoc working group meeting on Electronic Monitoring Standards (IOTC-2024-WGEMS04-R), including the recommendation to convene an in-person meeting to address outstanding issues and finalise changes to the data fields for each gear type. The meeting was attended by 80 participants (cf. 89 in 2023).

143. The SC **ACKNOWLEDGED** that the WPDCS conducted a comprehensive review of all ROS data fields for purse seine, longline, and pole-and-line fisheries but did not address the gillnet-specific fields due to the absence of gillnet fishery experts at the meeting.

144. The SC **NOTED** the recommendation from the WPDCS based on this review:

- That the SC **ENDORSE** the following revised lists of ROS minimum data fields (including their stated collection and reporting requirement) for purse seine, longline and pole and line (include associated "general" fields) provided in IOTC-2024-SC27-DATA01.
- That the SC **ENDORSE** the revised collection and reporting requirement categories as follows:

  - Mandatory – mandatory for collection and reporting

  - Optional – optional for collection and reporting
- That the SC **ENDORSE** the revised ROS data fields (and associated collection and reporting requirements) as a living document, for which CPCs can, if necessary, in future years, bring forward proposals for amendments or improvements, to the WPDCS and SC for review.
- That the SC **advise** the Commission to take actions for all CPCs to ensure that the Record of Authorised Vessels (RAV) details are completely accurate and up to date.

145. The SC **REQUESTED** the WPDCS to undertake an online intersessional review in collaboration with the IOTC Secretariat to check and where necessary amend field definitions and reporting requirements to ensure that they appropriately recognise (where necessary) the potential use of additional ROS data collection tools (e.g., EM and port sampling) and are otherwise also clear and easy to understand for observers.

7.6.2 Other matters

Yellowfin tuna catch limits for 2024 and 2025 (Res. 19/01 and 21/01)

146. The SC **NOTED** that the WPDCS has reviewed and **ENDORSED** the estimates of catch limits of yellowfin tuna for 2024 and 2025 (see document IOTC-2024-WPDCS20-DATA12 for details on computations).

147. The SC **RECALLED** how due to the unavailability of catch data for 2024 (to be provided by the deadline of 30 June 2025) all presented catch limits for 2025 are estimated with the assumption that catches for 2024 will be aligned with the CPC-specific established catch limits for the year.

148. The SC also **RECALLED** that in agreement with the text of Res. 21/01, provided catch limits refer to CPCs, and not distinct fleets, and therefore shall be calculated as such.

149. Considering this, the SC **ENDORSED** the annual catch limits for 2024 (calculated) and 2025 (estimated) as deriving from Res. 19/01 and 21/01 and presented in Appendix 34 as Table 1 and Table 2, respectively.

7.7 Report of the 1st Session of the Working Party on Socio-Economics (WPSE01)

150. The SC **NOTED** the report of the 1st Session of the Working Party on Socio-Economics (IOTC–2024–WPSE01–R) which was held back-to-back with the 13th meeting of the Technical Committee on Allocation Criteria (TCAC13) and attended by 69 participants.

151. The SC **NOTED** that the WPSE was **REQUESTED** by the TCAC to provide guidance on matters related to socio-economic indicators and inputs into the allocation regime.

152. The SC **NOTED** that the WPSE conducted a preliminary review of the information on socio-economic data and indicators for IOTC CPCs and fisheries, building on the scoping study undertaken in 2019 in accordance with Resolution 18/09.

153. The SC **NOTED** that the Programme of Work for the WPSE will be developed over time and that some inter-sessional work will be undertaken in the interim to identify a suite of socio-economic indicators that could be derived from data available in the CPCs and included in a dedicated section of the National Reports, with assistance from the Secretariat.

154. The SC **AGREED** to hold the next WPSE meeting online in 2025 during a two-day session, at least one month prior to the 14th session of the TCAC.

7.8 Summary discussion of matters common to Working Parties (capacity building activities; connecting science and management, etc.)

7.8.1 Data collection and capacity building

155. The SC **NOTED** that the ability to determine the success of any management measure adopted by IOTC will depend on the availability of the necessary monitoring information. This relates not only to the types of data being collected, but also their spatio-temporal resolution and the ability of CPCs to report these data in a timely manner.

156. The SC **NOTED** that this year the Secretariat carried out a number of capacity building missions, mostly focus on data to support CPCs in improving their data collection and reporting systems so they are able to meet the IOTC reporting requirements. The SC **NOTED** that the Secretariat also held a capacity building workshop for MSE with the aim of allowing CPCs to better engage in discussions relating to the selection of MPs and the preparatory work required for running the MSE process.

157. The SC **NOTED** that two training workshops were held in 2024 on the new data reporting forms and further **NOTED** the intention to continue this work in 2025.

158. The SC **NOTED** the intention of the Secretariat to carry out further data support missions with a number of targeted CPCs including Madagascar, Comoros, India and Oman. The SC **NOTED** a request for such assistance from Pakistan and **ENCOURAGED** any other CPCs requiring such assistance to liaise with the Secretariat to make arrangements for this.

7.8.2 Invited Expert(s) at the WP meetings

159. 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.

160. The SC **NOTED** that the Secretariat received nominations for external experts and usually there was only one nomination. The Secretariat then distributed the CVs of the expert to the science mailing list asking if there were any objections. If there were none, the expert was endorsed by the WP chair and finalised. The SC further **NOTED that** there was always a consultation process with participants to ensure transparency.

161. The SC **NOTED** that there are generally funds to support 3 or 4 invited experts to attend IOTC's working parties. IOTC covers the travel costs of these experts but does not pay for their time. For this reason, it is not always possible to secure the targeted expert for the meeting. The SC also **NOTED** that experts may participate remotely.

162. The SC **NOTED** that each working party specifies the areas of expertise required for the following year and further **NOTED** that generally the expertise relate to carrying out stock assessments including applying MSE processes and data-poor assessment approaches. However, the working parties may have more specific needs in a certain year – for example, the WPNT intends to focus on genetic studies in 2025 so it would be suitable to invite scientists with expertise in genetic techniques.

7.8.3 Meeting participation fund

163. The SC **NOTED** that in 2024, the MPF provided funding for 34 participants to attend the various working parties throughout the year.

164. The SC **ENCOURAGED** CPCs to use the MPF in order to attend IOTC's Working Parties so there is a broader representation of countries at these meetings, in particular the WPNT.

7.8.4 IOTC species identification guides: Tuna and tuna-like species

165. 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.

166. The SC **NOTED** that OFCF Japan has facilitated the translation and shipment of ID guides in partnership with the IOTC Secretariat, with short-term funding provided by OFCF Japan. The SC expressed its gratitude to OFCF Japan for conducting these important activities.

167. The SC **NOTED** that the Secretariat has organised a workshop to train 10 CPCs from the Western Indian Ocean on species identification which will be held in the week following the SC. The intention of this workshop is to train participants from these CPCs who will then train enumerators in their own countries. The SC further **NOTED** the intent of the Secretariat to organise an equivalent meeting for the CPCs of the Eastern Indian Ocean in 2025.

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

168. The SC **RECALLED** its recommendation in 2022 that the Commission revise the current Rules of Procedure (if necessary) to allow Chairs to serve an additional year or years beyond two terms if no suitable candidates are available to replace them once their terms are completed. The SC **NOTED** that the Commission endorsed the SC recommendations as its own and that therefore this recommendation was approved. In light of this recommendation, in 2023 the terms of several Working Party Chairs as well the SC Chair was extended beyond their two terms.

169. The SC **NOTED** that the Commission, at its 28 Session, **ENDORSED** those officials elected for the SC and its subsidiary (scientific) bodies for the coming years, as listed in Appendix 7 of the 2023 Scientific Committee Report. However, the Commission **NOTED** that some CPCs expressed a preference for an SC chair from a developing coastal nation. The Commission **AGREED** that the selection of the Scientific Committee chair should remain the decision of the SC itself. The Commission also **AGREED** that an election for the SC chair should take place at the next session of the SC in 2024 (see Section 13.1).

170. 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.

7.8.6 Other matters

171. The SC **NOTED** that the Data Preparatory (DP) meetings were established to facilitate the running of stock assessments. The inaugural DP meeting, held in 2019 for WPTmT, was subsequently followed by meetings for WPTT and WPEB.

172. The SC **NOTED** that since the DP meeting concept is relatively new and lacks specific rules of procedure, there is no clear guidance on their mandate and decision-making processes. In practice, the DP has operated independently and has sometimes provided direct recommendations to the SC, mainly concerning data issues, but in some other instances, concerning topics other than stock assessment inputs.

173. The SC **AGREED** that it would be beneficial to clearly define the role of future Working Party intersessional meetings, including DP meetings, especially how they relate to the main WP meeting.

174. The SC **NOTED** the occasional need of technical workshops, corresponding to a request by the SC or Commission. The SC **RECOMMENDED** that:

- Technical workshops are not to be nested within Working Party meetings
- The terms of reference for such technical workshops should be established ahead of time to clarify their role and decision-making process, including whether they can make direct recommendations to the SC

8. STATUS OF TUNA AND TUNA-LIKE RESOURCES IN THE INDIAN OCEAN

8.1 Tuna – Highly migratory species

175. The SC **RECOMMENDED** that the Commission note the management advice developed for each tropical and temperate tuna species as provided in the Executive Summary for each species, and the combined Kobe plot for the four species assigned a stock status in 2024 (**Fig. 2**):

    Albacore (*Thunnus alalunga*) – Appendix 8

    Bigeye tuna (*Thunnus obesus*) – Appendix 9

    Skipjack tuna (*Katsuwonus pelamis*) – Appendix 10

    Yellowfin tuna (*Thunnus albacares*) – Appendix 11

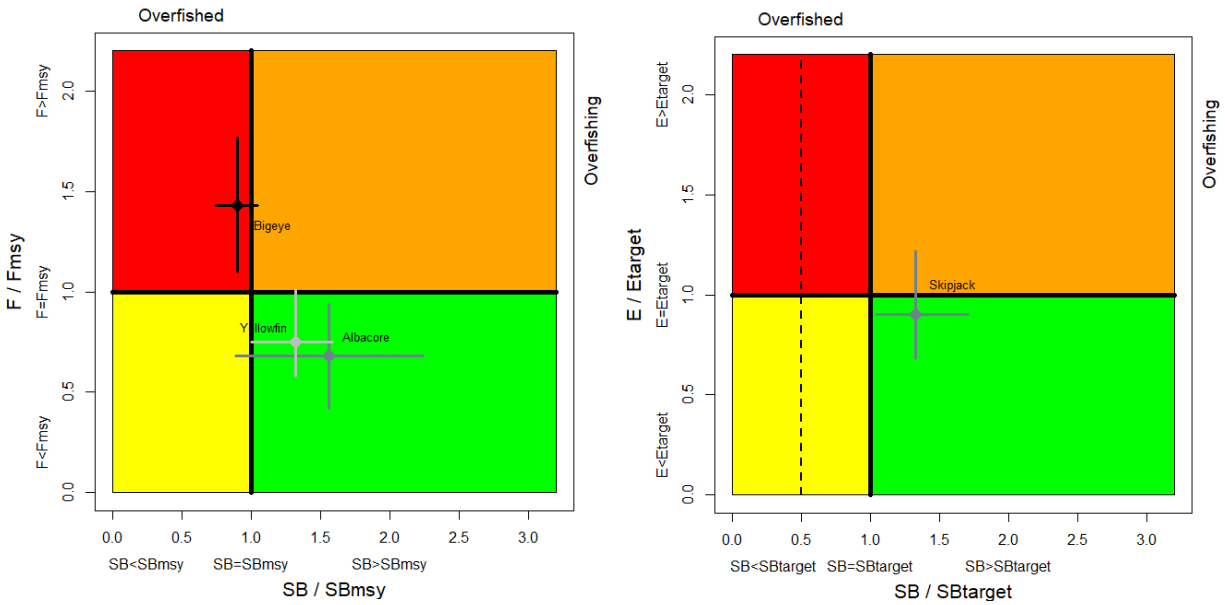


Fig. 2. (Left) Combined Kobe plot for bigeye tuna (black: status in 2021, based on the assessment conducted in 2022), and yellowfin tuna (light grey: 2023, with assessment conducted in 2024) and albacore (dark grey: 2020 with assessment conducted in 2022) showing the estimates of current spawning biomass (SB) and current fishing mortality (F) in relation to optimal spawning stock size and optimal fishing mortality. (Right) Kobe plot for skipjack tuna (2022 with assessment conducted in 2023) showing the estimates of the current stock status (The dashed line indicates the limit reference point at 20%SB0 while SBtarget=0.4 SB0). Cross bars illustrate the range of uncertainty from the model runs with an 80% CI (95% CI for albacore).

176. The SC **NOTED** paper IOTC–2024–SC27–ES05 which provided an overview of the biology, stock status and management of southern bluefin tuna (*Thunnus maccoyii*), and thanked CCSBT for its provision.

8.2 Tuna and seerfish – neritic species

177. The SC **RECOMMENDED** that the Commission note the management advice developed for each neritic tuna (and seerfish) species under the IOTC mandate, as provided in the Executive Summary for each species, and the combined Kobe plot for the three species assigned a stock status in 2024 (**Fig. 3**):

Bullet tuna (*Auxis rochei*) – Appendix 12

Frigate tuna (*Auxis thazard*) – Appendix 13

Kawakawa (*Euthynnus affinis*) – Appendix 14

Longtail tuna (*Thunnus tonggol*) – Appendix 15

Indo-Pacific king mackerel (*Scomberomorus guttatus*) – Appendix 16

Narrow-barred Spanish mackerel (*Scomberomorus commerson*) – Appendix 17

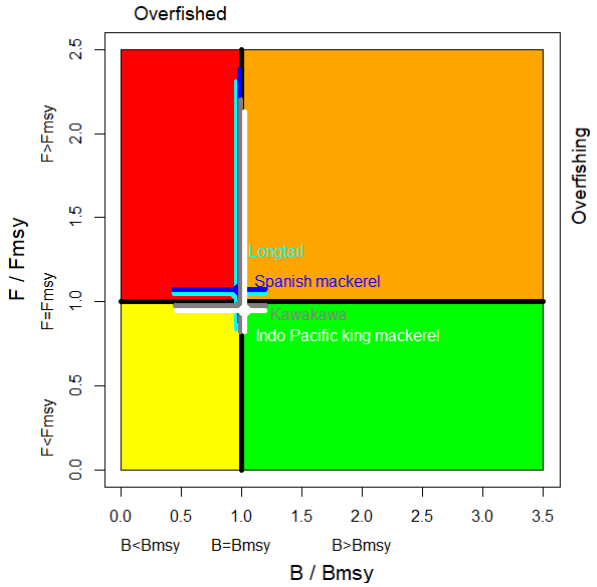


Fig. 3. Combined Kobe plot for longtail tuna (cyan), narrow-barred Spanish mackerel (blue), kawakawa (grey) (all for 2021 with assessment carried out in 2023) and Indo-Pacific king mackerel (2022 with assessment conducted in 2024 (white)), showing the estimates of stock size (B) and current fishing mortality (F) in relation to optimal biomass and optimal fishing mortality. Cross bars illustrate the range of uncertainty from the model runs. Given unresolved uncertainty in the assessment, status for bullet tuna, frigate tuna and narrow-barred Spanish mackerel should be interpreted with caution.

8.3 Billfish

178. The SC **RECOMMENDED** that the Commission note the management advice developed for each billfish species under the IOTC mandate, as provided in the Executive Summary for each species, and the combined Kobe plot for the five species assigned a stock status in 2024 (**Fig. 4**):

    Black marlin (*Istiompax indica*) – Appendix 18

    Blue marlin (*Makaira nigricans*) – Appendix 19

    Striped marlin (*Kajikia audax*) – Appendix 20

    Indo-Pacific sailfish (*Istiophorus platypterus*) – Appendix 21

    Swordfish (*Xiphias gladius*) – Appendix 22

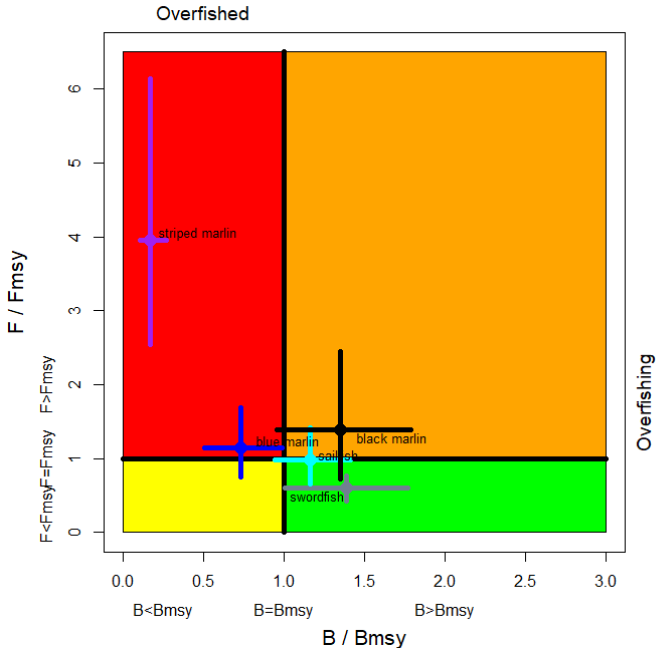


Fig. 4. Combined Kobe plot for swordfish (2021 with assessment conducted in 2023, grey), Indo-Pacific sailfish (2019 with assessment conducted in 2022, cyan), black marlin (2022 with assessment conducted in 2024, black), blue marlin (2020 with assessment conducted in 2022, blue) and striped marlin (2022 with assessment conducted in 2024, purple) showing the estimates of current stock size (SB or B, species assessment dependent) and current fishing mortality (F) in relation to optimal stock size and optimal fishing mortality. Cross bars illustrate the range of uncertainty from the model runs. Given unresolved uncertainty in the assessment, status for black marlin is uncertain.

9. STATUS OF SHARKS, MARINE TURTLES, SEABIRDS AND MARINE MAMMALS IN THE INDIAN OCEAN

9.1 Sharks

179. 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

    porbeagle shark (*Lamna nasus*) – Appendix 30

9.2 Marine turtles

180. The SC **RECOMMENDED** that the Commission note the management advice developed for marine turtles, as provided in the Executive Summary which encompasses all six species found in the Indian Ocean:

    Marine turtles – Appendix 31

9.3 Seabirds

181. The SC **RECOMMENDED** that the Commission note the management advice developed for seabirds, as provided in the Executive Summary which encompasses all species commonly interacting with IOTC fisheries for tuna and tuna-like species:

    Seabirds – Appendix 32

9.4 Marine mammals

182. The SC **RECOMMENDED** that the Commission note the management advice developed for cetaceans, as provided in the newly developed Executive Summary which encompasses all species commonly interacting with IOTC fisheries for tuna and tuna-like species:

    Cetaceans – Appendix 33

10. IMPLEMENTATION OF THE REGIONAL OBSERVER SCHEME

183. The SC **NOTED** paper IOTC–2024–SC27–07Rev2 which provided an update on the status of implementation and reporting to the IOTC Secretariat set out by Resolution 22/04 On a Regional Observer Scheme (ROS) including the coverage estimated for both the longline and purse seine industrial fisheries from concerned CPCs, and how these compare to the expected minimum coverage level.

184. The SC **ACKNOWLEDGED** the Secretariat for the compilation of the data, which provide a comprehensive view of the status of the ROS and the clarifications provided in relation with the reporting formats and the ROS tools development.

185. The SC **ENCOURAGED** CPCs to validate the information provided in appendices A, B, C and D of paper IOTC–2024–SC27–07 and confirm that it correctly reflects the status of implementation of the ROS at the national level, and to liaise with the IOTC Secretariat should any discrepancy be identified.

186. The SC also **RECALLED** that for the sake of clarity and to support the cross-verification of the information provided, the summary tables of *estimated* ROS coverage be broken down to the *fleet* level rather than to the CPC level.

187. The SC **ACKNOWLEDGED** the efforts made by CPCs to deploy observers onboard after the restrictions experienced during the COVID period, as well the submission of ROS data that was previously missing for some fleets.

188. While **NOTING** that there are still many CPCs that have been unable to meet the minimum of 5% coverage, due to the importance of observer data the SC **NOTED** that raising this minimum level of coverage would be beneficial.

189. The SC **NOTED** reports from some CPCs which are looking to further develop their observer schemes as well as roll out EMS across parts of their fleets which will help to increase the coverage for these fleets.

190. The SC **REQUESTED** that the Secretariat updated the ROS forms for data collection and reporting and aligned them accordingly with the final ROS fields agreed by the WPDCS.

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

11.1 Progress on previous recommendations from WPs and the SC

191. The SC **NOTED** paper IOTC–2024–SC27–10 which provided the SC with an update on the progress made on its 2023 recommendations (also available in Appendix 35).

192. The SC **THANKED** the Secretariat for the update on progress and **NOTED** that encouraging progress was being made.

11.2 Program of Work (2025–2029) and assessment schedule

11.2.1 Program of Work

193. The SC **NOTED** IOTC–2023–SC26–08 which provided the SC with a proposed Program of Work for each of its working parties, including prioritisation of the elements requested by each working party.

194. The SC **NOTED** the proposed Program of Work and priorities for the SC and each of the working parties and **AGREED** to a consolidated Program of Work as outlined in Appendix 36a-g. The Chairpersons and Vice-Chairpersons of each working party will ensure that the efforts of their respective working parties are focused on the core areas contained within the appendix, taking into account any new research priorities identified by the Commission at its next Session.

195. The SC **RECALLED** the process for developing the consolidated SC Program of Work (IOTC–2014–SC17–R, para. 179):

    - Step 1: Working Parties to identify research needs (based on the needs of the Commission), rank them by order of priority, provide cost estimates and list potential funding sources;

- Step 2: The SC and Working Party Chair and Vice-Chair, in liaison with the IOTC Secretariat should develop a consolidated document taking into account the different Working Party research needs and priorities, with the objective of ranking the research needs among all Working Parties;
- Step 3: The Chair of the SC shall present these to the SC, to be discussed and endorsed as the consolidated research priorities for the IOTC Science process;
- Step 4: The IOTC Secretariat, in consultation with the Chair and Vice-Chair of the SC and Chair and Vice-Chair or relevant Working Parties, shall identify funding possibilities to undertake the consolidated research priorities;
- Step 5: Once the funding sources have been committed to a particular research priority, the panel mentioned above in Step 2 shall develop terms of reference of the 'Expression of Interest' (including tasks, timelines and deliverables) and the selection procedure/criteria;
- Step 6: IOTC Secretariat to advertise a call for 'Expression of Interest' among the IOTC Commissioner's and Science contact lists, and via the IOTC website;
- Step 7: The Chair of the SC, Chair(s) and Vice-Chair(s) of the WP(s) concerned, in liaison with the IOTC Secretariat shall determine the most appropriate project proposal, based on the criteria defined in Step 5 and in line with the financial rules of the Commission and FAO. Potential contracted candidate will be contacted by the IOTC Secretariat to confirm availability.

196. The SC **AGREED** on the consolidated table of priorities across all working parties (**Table 3**), as developed by each working party Chairperson, and **REQUESTED** that the IOTC Secretariat, in consultation with the Chairpersons and vice-Chairpersons of the SC and relevant working parties, develop ToRs for the specific projects to be carried out.

197. The SC **NOTED** that the consolidated table of priorities does not replace the full programme of work of each working party (Appendix 36a-g) and that adequate attention and focus should still be allocated to those activities where possible. The SC further **NOTED** that Table 3 has been developed by the SC and working party Chairs to provide more specific direction to the IOTC Secretariat and the SC Chair as to the priorities of the SC so that, if and when external funding becomes available intersessionally, it is possible to clearly prioritise across all working parties based on the objectives of the SC (as agreed in IOTC–2014–SC17–R, para. 179).

Table 3. Priority topics for obtaining the information necessary to develop stock status indicators for all Working Parties. Further details can be found in Appendix 36a-g.

Priority	1	2	3
WPTT	**Stock assessment priorities** Address the outstanding issues identified as priorities by the yellowfin tuna peer review panel (February 2023). Address the additional recommendations made by the WPTT in 2024.	**Abundance indices development** Address the additional recommendations made by the WPTT in 2024 regarding the CPUE indices for yellowfin. In view of the coming assessments of yellowfin, bigeye, and skipjack develop abundance time series for each tropical tuna stock for the Indian Ocean Continue to develop CPUE indices from Longline, PS, Pole and line fisheries, and fishery independent indices of abundance such as those derived from echosounder buoys. Explore and support the development of gillnet CPUE indices for fleets (e.g., Iran, Pakistan and Oman) Evaluate effect of changes of spatial coverage on the longline CPUE through the Joint CPUE workshop and estimate spatial temporal abundance distribution through VAST modelling approach	**Fisheries Independent Monitoring** Use of Close Kin Mark Recapture (CKMR) methods which can provide estimates of absolute spawning biomass, mortality, stock structure, and connectivity based on genotyping individuals to a level that can identify close relatives (e.g. parent-offspring or half-siblings). Plan for a staged approach for implementation of a YFT CKMR project **Analysis of tagging and size frequency data** Analyze data from IOTC tagging programs outside stock assessment models and evaluate its utility and impact on stock assessments. Standardization of size frequency data. **Analysis of environmental factors** Evaluate the impact of environmental factors on the dynamics of tropical tuna stocks and the possible role of climate change on changes to selectivity, recruitment deviates and fishing productivity.
WPEB	**Connectivity, movements, habitat use and post release mortality**[1] Electronic tags (PSATs, SPOT, Splash MiniPAT) to assess the efficiency of management resolutions on non-retention species (BSH in LL, marine turtles and rays in GIL and PS, whale sharks) and to determine connectivity, movement rates, mortality estimates and genetic studies	**Shark research and management strategy** 2.1 Prioritising shark research based on previous work and including analysing gaps in knowledge 2.2 Workshop to update and revise shark research plan with a small working group	**Studies and training focused on gillnet bycatch mitigation** 3.1 Focused GN bycatch mitigation workshop – training and monitoring 3.2 Studies trialling gillnet mitigation measures such as: LED lights, sub-surface setting etc.

[1] This item is a top priority for the WPEB; however, completing it will require substantial funding, which the WPEB recognizes is unlikely to be provided through the IOTC Scientific budget.

	Fisheries data collection and development of alternative abundance indices 1.1 Catch composition reconstruction (initial focus Sri Lanka, Pakistan and Indonesia) 1.1.2 Historical data mining for the key species and IOTC fleets (e.g., as artisanal gillnet and longline coastal fisheries) including workshops: 1.1.3 Historical data mining for the key species, including the collection of information about catch, effort and spatial distribution of those species and fleets catching them 1.1.4 CPUE standardisation and review of additional abundance indicators series for each key shark species and fishery in the Indian Ocean 1.2 Exploring different indices of abundance for sharks such as CKMR		
WPNT	**Stock structure (connectivity)** Genetic research to determine the connectivity of neritic tunas throughout their distributions (This should build on the stock structure work conducted in other previous studies): Review of stock structure methodologies with genetic expert during WPNT15 in order to determine the best approach to regional stock structure studies. Based on discussions develop and implement regional genetic sampling collection programme: Sampling of tissue samples DNA extraction and storage for preservation Carry out genetic sequencing on extracted DNA	**Stock assessment / Stock indicators** Explore alternative assessment approaches and develop improvements where necessary based on the data available to determine stock status for longtail tuna, kawakawa and Spanish mackerel 1)The Weight-of-Evidence approach should be used to determine stock status, by building layers of partial evidence, such as CPUE indices combined with catch data, life-history parameters and yield-per recruit metrics, as well as the use of data poor assessment approaches (e.g. CMSY, OCOM, LB-SPR, Risk based methods). 2)Exploration of priors and how these can be quantifiably and transparently developed. 3)Review size data and their suitability for monitoring stock status Improve the presentation of management advice from different assessment approaches to better represent the uncertainty and improve communication between scientists and managers in the IOTC.	**Data mining and collation** Collate and characterize operational level data for the main neritic tuna fisheries in the Indian Ocean to investigate their suitability to be used for developing standardised CPUE indices. The following data should be collated and made available for collaborative analysis: catch and effort by species and gear by landing site; operational data: stratify this by vessel, month, and year for the development as an indicator of CPUE over time; and operational data: collate other information on fishing techniques (i.e. area fished, gear specifics, depth, environmental condition (near shore, open ocean, etc.) and vessel size (length/horsepower)). Reconstruction of historical catch by CPCs using recovered or captured information. Re-estimation of historic catches (with consultation and consent of concerned

			CPCs including India, Pakistan, Bangladesh, Mozambique, Tanzania, Madagascar) for assessment purposes (taking into account updated identification of uncertainties and knowledge of the history of the fisheries)
WPTmT	**Biological information (parameters for stock assessment)** 2.1 Biological research (collaborative research to improve understanding of spatio-temporal patterns in age and growth and reproductive parameters) 2.1.1 Age and growth studies: Uncertainty about the growth curve is a primary source of uncertainty in the stock assessment. A preliminary growth curve was developed in 2019, but there is substantial work to be done to ensure that growth curves include data from smaller size classes, and that spatio-temporal patterns in growth are quantified for use in the stock assessment. Collaborative sampling programs, involving a combination of observer- and port-based sampling, are required to ensure that adequate samples are collected. 2.1.2 Quantitative biological studies are necessary for albacore throughout its range to determine spatio-temporal patterns in key reproductive parameters including sex ratio; female length- and age-at-maturity; spawning location, periodicity and frequency; batch fecundity at length and age; spawning fraction and overall reproductive potential, to inform future stock assessments.	**Size frequency data** 4.1 Further investigate the size information provided by CPCs in order to better understand the stock dynamics and inputs into the assessment models. This is particularly necessary for the purse seine data.	**CPUE standardisation** 3.1 Continue the development of standardized CPUE series for each albacore fishery for the Indian Ocean, with the aim of developing appropriate CPUE series for stock assessment purposes. 3.1.1 Spatio-temporal structure and target changes need to be considered carefully, as fish density and targeting practices can vary in ways that affect CPUE indices. Developments may include changes to fishery spatial structure, new approaches for area weighting, time-area interactions in the model, and/or indices using VAST.
WPB	CPUE standardization Develop and/or revise standardized CPUE series for each billfish species and major fisheries/fleets in the Indian Ocean and develop Joint CPUE series where feasible	Biological and ecological information 2.1 Age and growth research 2.1.1 CPCs to provide further research on billfish biology, namely age and growth studies including through the use of fish otolith or other hard parts, either from data collected through observer programs, port sampling or	**Billfish bycatch mitigation** WPB and CPCs scientists to firstly, review and summarise existing information on billfish bycatch mitigation, including also factors influencing at-haul and post-release mortality of billfish, and secondly to undertake further research to inform gaps in understanding on potential effective mitigation approaches, to

	• Swordfish: Priority LL fleets: Taiwan,China, EU(Spain, Portugal, France), Japan, Indonesia, South African • Striped marlin: Priority fleets: Japan, Taiwan,China • Black marlin: Priority fleets: Longline: Taiwan,China; Gillnet: I.R. Iran, Sri Lanka, Indonesia • Blue marlin: Priority fleets: Japan, Taiwan,China, Indonesia • I.P. Sailfish: Priority fleets: Priority gillnet fleets: I.R. Iran and Sri Lanka; Priority longline fleets: EU(Spain, Portugal, France), Japan, Indonesia;	other research programs. (Priority: all billfishes: swordfish, marlins and sailfish) 2.2 Spawning time and locations 2.2.1 Collect gonad samples from billfish or utilise any other scientific means to confirm the spawning time and location of the spawning areas that are presently hypothesized for each billfish species. This will also provide advice to the Commission on the request for alternative management measures (Res. 18-05, paragraph 6). Partially supported by EU, on-going support and collaboration from CPCs are required. 2.3 Literature review of biological parameters for billfish 2.3.1 Conduct a literature review of biological parameters for billfish through a consultancy and update the supplementary information that companies with species Executive Summaries.	provide options for the Commission to reduce fishing mortality for species where that is required (e.g. Black Marlin, Striped Marlin and Sailfish) focusing on gillnet and longline fisheries but also including recreational and sport fishing activities ..
WPDCS	**Coastal fisheries data collection** • Data support missions to assist the implementation of data collection and sampling activities for fisheries insufficiently sampled. Recommended actions include: designing sampling guidelines for IOTC fisheries. Priority to be given to the following countries / fisheries: • Indonesia • Pakistan • I.R. Irian • Keyna • Tanzania • Comoros • Madagascar	**Data access and dissemination** Ocean-climate information: develop an online digital ocean atlas for the IOTC area of competence, linked by the IOTC website; develop indicators on ocean-climate status to be linked to the atlas portal, along with educational resources	**Compliance with IOTC data reporting requirements[2]** Workshops to clarify data reporting requirements and support preparation of annual submissions
WPM	**MSE** Continuation of Management Strategy Evaluation for albacore, yellowfin tunas as well as blue shark		

[2] Recommended by the CoC; regular annual webinars / workshops to be held from 2025 onwards with each CPCs (or group of CPCs) prior to the approaching of the data reporting deadline.

11.2.2 Assessment schedule

198. The SC **ADOPTED** a revised assessment schedule, ecological risk assessment and other core projects for 2025–29, 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 37.

11.2.3 Consultants

199. **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.

11.3 Schedule of meetings for 2025 and 2026

200. The SC **NOTED** paper IOTC–2024–SC27–09 which outlined the proposed schedule for IOTC Working Parties and SC meetings for 2025 and 2026.

11.3.1 Data preparatory meetings and Hybrid meetings

201. **ACKNOWLEDGING** that holding data preparatory meetings prior to stock assessments is considered to be best practice (as identified by the yellowfin stock assessment external reviewer, the WPTT and the WPDCS) and noting that since 2019 data preparatory meetings were successfully held for the WPTmT, WPTT and WPEB, the SC **AGREED** to continue the practice of having data preparatory meetings in addition to stock assessment meetings for the major IOTC species. The SC **RECOMMENDED** that data preparatory meetings could continue to be held virtually so as not to increase the travel and costs required for the already full IOTC timetable of meetings.

202. The SC **NOTED** that there had been a few teething problems holding meetings in a hybrid format in 2023 and 2024, especially related to the costs associated with the audio-visual equipment required, as well as the issues associated with ensuring the equipment was suitable to ensure full participation of both those in person as well as those connecting virtually. However, the SC **AGREED** on the utility of facilitating both in-person and virtual participation at future meetings to ensure increased participation and reduce the logistical costs for many CPCs and observers. As such, the SC **RECOMMENDED** that future Scientific Committee meetings continue to be held in a hybrid format, as well as working parties if possible. The SC further **RECOMMENDED** that all presentations at these meetings be made in person to ensure the aforementioned issues did not adversely affect the quality of the advice being provided.

203. The SC **NOTED** all IOTC working party meetings this year (except the WPDCS and WPSE) were held in Seychelles, as there were no offers to host them. The SC meeting was originally planned in Seychelles but this was not possible due to unavailability of the venue. There has been an increasing reluctance for CPCs to offer to host IOTC scientific working party and SC meetings. This reluctance may be due to budget constraints, as well as the logistical burdens of Hybrid meetings. The SC **NOTED** that there has been a number of issues when hosting meetings in Seychelles (e.g., high cost). The SC **RECOMMENDED** this issue be discussed at the Commission in order to find a way forward.

11.3.2 Final Meeting schedule

204. The SC **REQUESTED** that the schedule of Working Party and Scientific Committee meetings for 2025 and 2026 provided in Appendix 38 be communicated by the IOTC SC Chairperson to the Commission for its endorsement.

12. IOTC Scientific Strategic Research Plan

205. The SC **NOTED** paper IOTC–2024–SC27–18 which provided the draft updated IOTC Strategic Science Plan for 2025–2029 for SC review.

206. The SC **THANKED** the Secretariat and Chairperson for updating the Plan and noted the importance of this work in communicating targets, objectives and indicators for monitoring progress on scientific work of the IOTC to the Commission.

207. The SC noted that a number of minor changes requested by CPCs could be communicated intersessionally.

208. The SC **AGREED** that the draft updated IOTC Strategic Science Plan 2025–2029 will be distributed to Heads of Delegation from each CPC for comment during early 2025. Thereafter comments will be collated and consolidated and another version sent to CPCs for final review. Pending agreement of CPCs, and noting that the IOTC Strategic Science Plan would be a dynamic document that would change over time, the SC **RECOMMENDED** that the revised draft of the IOTC Strategic Science Plan 2025–2029 be tabled at the Commission meeting in 2025.

13. Other Business

13.1 Election of a Chair and a Vice-Chair for the next biennium (Chair and Secretariat)

209. The SC **NOTED** that the second term of the current Chairperson, Dr Toshihide Kitakado, expired at the end of the SC meeting in 2023 and as per the IOTC Rules of Procedure (2014), participants were required to elect a new Chairperson. However, no nominations were received at the SC26. The SC **RECALLED** that taking into account the recommendation outlined in paragraph 157 of IOTC-2023-SC26-R, CPCs proposed and agreed that Dr Kitakado continue as SC chair as an interim measure.

210. The SC **NOTED** that at the 28th Session of the Commission, some CPCs expressed a preference for an SC chair from a developing coastal nation. The Commission **AGREED** that the selection of the Scientific Committee chair should remain the decision of the SC itself. The Commission also **AGREED** that an election for the SC chair should take place at the next session of the SC in 2024.

211. Noting the Rules of Procedure (2014), the SC **CALLED** for nominations for the position of the Chairperson of the IOTC SC. Dr Toshihide Kitakado (Japan) was nominated, seconded and elected as Chairperson of the SC for one more year.

212. The SC **NOTED** that Dr Gorka Merino (Spain) was elected as the Vice-Chairperson of the SC at the close of the SC meeting in 2023. However, due to personal reasons, Dr. Merino could no longer serve in this role. As per the IOTC Rules of Procedure, participants are required to elect a new Vice-Chairperson of the SC for the next biennium.

213. Noting the Rules of Procedure (2014), the SC called for nominations for the position of the Vice Chairperson of the IOTC SC. Dr Fayakun Satria (Indonesia) was nominated, seconded and elected as Vice-Chairperson of the SC for the next biennium.

14. Adoption of the Report of the 26th Session of the Scientific Committee

214. The SC **RECOMMENDED** that the Commission consider the consolidated set of recommendations arising from SC26, provided at Appendix 39.

215. The report of the 27th Session of the Scientific Committee (IOTC–2024–SC27–R) was **ADOPTED** by correspondence.

APPENDIX 1
LIST OF PARTICIPANTS

CHAIRPERSON
Mr Toshihide Kitakado
Tokyo University of Marine Science and Technology
kitakado@kaiyodai.ac.jp

AUSTRALIA
Head of Delegation
Mr Don Bromhead
Australian Bureau of Agricultural and Resource Economics and Sciences
Don.Bromhead@aff.gov.au

Alternate
Mr Ashley Williams
Commonwealth Scientific and Industrial Research Organisation
Ashley.Williams@csiro.au

Advisor(s)
Ms Ann Preece
Commonwealth Scientific and Industrial Research Organisation
Ann.Preece@csiro.au

Ms Heather Patterson
Australian Bureau of Agricultural and Resource Economics and Sciences
Heather.Patterson@aff.gov.au

Ms Brooke D'Alberto
Australian Bureau of Agricultural and Resource Economics and Sciences
Brooke.D'Alberto@aff.gov.au

Mr Daniel Wright
Australian Bureau of Agricultural and Resource Economics and Sciences
Daniel.Wright@aff.gov.au

Ms Lakshmi Gudipati
Department of Agriculture, Fisheries and Forestry
Lakshmi.Gudipati@aff.gov.au

Ms Selina Stoute
Australian Fisheries Management Authority
Selina.Stoute@afma.gov.au

Ms Jessica Farley
Commonwealth Scientific and Industrial Research Organisation
Jessica.Farley@csiro.au

Mr Patrick Sachs
Department of Agriculture, Fisheries and Forestry
patrick.sachs@aff.gov.au

Mr Neil Hughes
Department of Agriculture, Fisheries and Forestry
neil.hughes@aff.gov.au

BANGLADESH
Head Of Delegation
Mr Khaled Kanak
Ministry of Fisheries and Livestock
mkkanak2003@yahoo.com

CHINA
Head Of Delegation
Ms Yanan Li
Shanghai Ocean University
liyananxiada@yeah.net

Alternate
Mr Xuefang Wang
Shanghai Ocean University
xfwang@shou.edu.cn
Advisor(s)

Ms Huihui Shen
Shanghai Ocean University
hhshen@shou.edu.cn

Mr Jie Cao
Shanghai Ocean University
jcao22@ncsu.edu

Ms Yang Wang
Shanghai Ocean University
yan-wang@shou.edu.cn

COMOROS
Absent

EUROPEAN UNION
Head of Delegation
Mr Gorka Merino
AZTI
gmerino@azti.es

Alternate
Ms Mariana Tolotti
IRD
mariana.travassos@ird.fr

Advisor(s)
Mr Sylvain Bonhommeau
IFREMER
sylvain.bonhommeau@ifremer.fr

Mr David Kaplan
IRD
david.kaplan@ird.fr

Ms Alexandra Maufroy
ORTHONGEL
amaufroy@orthongel.fr

Mr Michel Goujon
ORTHONGEL
mgoujon@orthongel.fr
Mr Giancarlo Moron Correa
AZTI
gmoron@azti.es

Mr Agurtzane Urtizberea
AZTI
aurtizberea@azti.es

Mr Rui Coelho
IPMA
rpcoelho@ipma.pt

Ms Eider Andonegi
AZTI
eandonegi@azti.es

Ms Patricia Lastra
AZTI
plastra@azti.es

Ms Nekane Alzorriz
ANABAC
nekane@anabac.org

Ms Ane Iriondo
ANABAC
a.iriondo@echebastar.com-

Ms Estíbaliz Aintzina
FIP BLUES
departamentotecnico@fipblues.com

Ms María JoséJuan Jorda
IEO
mjuan.jorda@ieo.csic.es-

Mr Marco Valletta
DG MARE
marco.valletta@ec.europa.eu

Mr Benoit Marcoux
DG MARE
benoit.marcoux@ec.europa.eu
Mr Evgeny Romanov
IRD
evgeny.romanov@ird.fr

Mr Haritz Arrizabalaga
AZTI
harri@azti.es

FRANCE(OT)
Head Of Delegation
Mr Francis Marsac
Institut de recherche pour le développement
francis.marsac@ird.fr

INDIA
Alternate
Mr Sijo P. Varghese
Department of Fisheries
varghesefsi@hotmail.com

Advisor(s)
Mr Sanjay Pandey
Department of Fisheries
sanjay.rpandey@gov.in

Mr Shoba Joe Kizhakudan
Central Marine Fisheries Research Institute
shoba.joe@icar.gov.in

Mr Abdul Azeez
Central Marine Fisheries Research Institute
azeez.cr7@gmail.com

Mr Muktha M
Indian Council of Agricultural Research
muktham@gmail.com

Mr A. Siva
Forest Survey of India
anandhan.siva@fsi.gov.in

INDONESIA
Head Of Delegation
Ms Riana Handayani
Ministry of Marine Affairs and Fisheries
daya139@yahoo.co.id

Alternate
Mr Muhammad Anas
Ministry of Marine Affairs and Fisheries
mykalambe@yahoo.com

Advisor(s)
Mr Irwan Jatmitko
Center for Fisheries Research, National Research and Innovation Agency
irwan.jatmiko@gmail.com

Mr Fayakun Satria
National Research and Innovation Agency
fsatria70@gmail.com

IRAN (ISLAMIC REP OF)
Alternate
Mr Fariborz Rajaei
Iran Fisheries Organization
rajaeif@gmail.com

JAPAN
Head Of Delegation
Mr Takayuki Matsumoto
Fisheries Resources Institute
matsumoto_takayuki77@fra.go.jp

Alternate
Ms Sachiko Tsuji
Fisheries Resources Institute
tsuji_sachiko30@fra.go.jp

Advisor(s)
Mr Kimiyoshi Hiwatari
Fisheries Agency
kimiyosi_hiwatari190@maff.go.jp

Ms Yuka Matsuzawa
Fisheries Agency
yuka_matsuzawa450@maff.go.jp

Mr Yuji Uozumi
Japan Tuna Fisheries Co-operative Association
uozumi@japantuna.or.jp

Mr Tadanori Fujino
Oversea Fishery Cooperation Foundation
ofcf.fujino@gmail.com

Mr Naomasa Kugimoto
Oversea Fishery Cooperation Foundation
kugimoto@ofcf.or.jp

KENYA
Alternate
Mr Stephen Ndegwa
State Department for the Blue Economy and Fisheries
ndegwafish@yahoo.com

KOREA
Head Of Delegation
Mr Jung-hyun Lim
Ministry of Oceans and Fisheries
jhlim1@korea.kr

Alternate
Mr Heewon Park
Ministry of Oceans and Fisheries
heewon81@korea.kr

MADAGASCAR
Head Of Delegation
Ms Vola Rakotonjanahary
Ministère de la pêche et de l'économie bleue
rvolanjanahary@gmail.com

Advisor(s)
Mr Lalaina Rakotonaivo
Ministère de la pêche et de l'économie bleue
lrakotonaivo@wwf.mg

Mr John Burton
Ministère de la pêche et de l'économie bleue
John.burton@sustainablefisheriesandcommunitiestrust org

MALAYSIA
Head of Delegation
Mr Arthur Sujang
Department of Fisheries
arthur@dof.gov.my

Ms Effarina binti Mohd Faizal Abdullah
Department of Fisheries
ffarina@dof.gov.my

MALDIVES
Head Of Delegation
Mr Mohamed Shimal
Maldives Marine Research Institute
mohamed.shimal@mmri.gov.mv

Alternate
Ms Mariyam Shama
Maldives Marine Research Institute
mariyam.shama@mmri.gov.mv

Advisor(s)
Ms Hawwa Raufath
Ministry of Fisheries and Ocean Resources
raufath.nizar@fisheries.gov.mv

Ms Khadeeja Ali
Maldives Marine Research Institute
khadeeja.ali@mmri.gov.mv

Ms Sarah Hashim
Maldives Marine Research Institute
sarah.hashim@mmri.gov.mv

MAURITIUS
Head of Delegation
Ms Clivy Lim Shung
Ministry ofAgro-Industry, Food Security, Blue Economy and Fisheries
clivilim@yahoo.com

Ms Hanista Jhumun-Foolheea
Ministry ofAgro-Industry, Food Security, Blue Economy and Fisheries
hfoolheea@govmu.org

Ms Veronique Garrioch
IBL Seafood
vgarrioch@iblseafood.com

Mr David Mc Diarmid
Princes Ltd
david.mcdiarmid@princes.co.uk

MOZAMBIQUE
Advisor(s)
Mr Pedro Pires
Ministry of the Sea, Inland Waters and Fisheries
ppires1969@gmail.com

Mr Antonio Cuambe
Ministry of the Sea, Inland Waters and Fisheries
kechane@gmail.com

OMAN
Absent

PAKISTAN
Head of Delegation
Mr Mian Aftab Ali Shah
Ministry of Maritime Affairs
aftab_ec@hotmail.com

Alternate
Mr Farhan Khan
Ministry of Maritime Affairs
farhankhan704@gmail.com

Advisor(s)
Mr Javed Iqbal
Ministry of Maritime Affairs
javediqbal40@gmail.com

PHILIPPINES
Head of Delegation
Ms Jennifer Viron
Bureau of Fisheries and Aquatic Resources
jennyviron@bfar.da.gov.ph

Advisor(s)
Ms Maria Joy Mabanglo
Bureau of Fisheries and Aquatic Resources
mj.mabanglo@gmail.com

Mr Benjamin Tabios
Bureau of Fisheries and Aquatic Resources
benjotabios@gmail.com

SEYCHELLES
Head Of Delegation
Ms Juliette Lucas
Seychelles Fisheries Authority
jlucas@sfa.sc

Alternate
Ms Cindy Assan
Seychelles Fisheries Authority
cassan@sfa.sc

Advisor(s)
Ms Sabrena Lawrence
Seychelles Fisheries Authority
slawrence@sfa.sc

Mr Miguel Armas Herrera
OPAGAC
miguel.herrera@opagac.org

Mr. Roy Clarisse
Ministry of Fisheries and The Blue Economy
rclarisse@gov.sc

Mr Vincent Lucas
Seychelles Fisheries Authority
vlucas@sfa.sc

Ms Annie Vidot
Seychelles Fisheries Authority
avidot@sfa.sc

Mr Rodney Govinden
Seychelles Fisheries Authority
rgovinden@sfa.sc

Mr Borja Soroa
PEVASA
borjasoroa@pevasa.es

Mr Howard Tan
DFMG Group
dfm@dfmgroup.co

Mr Tony Lazazzara
Thai Union
Tony.Lazazzara@thaiunion.com

SOMALIA
Absent

SOUTH AFRICA
Head Of Delegation
Mr Qayiso Mketsu
Department of Forestry, Fisheries and Environment
QMketsu@dffe.gov.za

Alternate
Ms Charlene Da Silva
Department of Forestry, Fisheries and Environment
CDaSilva@dffe.gov.za

Advisor(s)
Ms Kim Prochazka
Department of Forestry, Fisheries and Environment
KProchazka@dffe.gov.za

Mr Sven Kerwath
Department of Forestry, Fisheries and Environment
SKerwath@dffe.gov.za

Ms Wendy West
Department of Forestry, Fisheries and Environment
WMWest@dffe.gov.za

Ms Melissa Meyer
Department of Forestry, Fisheries and Environment
MEMeyer@dffe.gov.za

SRI LANKA
Head Of Delegation
Mr N.D.P Gunawadhana
Department Of Fisheries And Aquatic Resources
nuwan.dfar@gmail.com

Alternate
Ms Kalyani Hewapathirana
Department Of Fisheries And Aquatic Resources
hewakal2012@gmail.com

SUDAN
Absent

TANZANIA (UNITED REP. OF)
Head Of Delegation
Mr Emmanuel A. Sweke
Deep Sea Fishing Authority
emmanuel.sweke@dsfa.go.tz

Alternate
Mr Mathew S. Ogalo
Deep Sea Fishing Authority
mathew.silas@dsfa.go.tz

Advisor(s)
Ms Tumu A. Mussa
Deep Sea Fishing Authority
tumu.mussa@dsfa.go.tz

THAILAND
Head Of Delegation
Mr Pavarot Noranarttragoon
Department of Fisheries
pavarotn@gmail.com

Advisor(s)
Ms Chidchanok Sangnitidaj
Department of Fisheries
sangnitidaj@gmail.com

Ms Chonticha Kumyoo
Department of Fisheries
chonticha.dof@gmail.com

Ms Prompan Hiranmongkolrat
Department of Fisheries
prompan.hiranmongkolrat@gmail.com

UNITED KINGDOM
Head Of Delegation
Mr Stuart Reeves
The Centre for Environment, Fisheries and Aquaculture Science
stuart.reeves@cefas.co.uk

Alternate
Mr James Clark
Mrag
J.Clark@mrag.co.uk

Advisor(s)
Mr Marc Owen
Department for Environment Food and Rural Affairs
Marc.Owen@defra.gov.uk

Mr Carlo Bella
Department for Environment Food and Rural Affairs
Carlo.Bella@defra.gov.uk

Ms Ella Smith
Department for Environment Food and Rural Affairs
Ella.Smith@defra.gov.uk

YEMEN
Absent

INVITED EXPERTS

Mr Ren-Fen Wu
fan@ofdc.org.tw

Dr Sheng-Ping Wang
wsp@mail.ntou.edu.tw

Dr Wen-Pei Tsai
wptsai@nkust.edu.tw

OBSERVERS

AGREEMENT ON THE CONSERVATION OF ALBATROSSES AND PETRELS (ACAP)
Mr Sebastián Jiménez
jimenezpsebastian@gmail.com

BLUE MARINE FOUNDATION (BMF)
Ms Jess Rattle
ess@bluemarinefoundation.com

DEUTSCH STIFTUNG MEERESSCHUTZ (DSM)
Ms Iris Meeresschutz
iris.ziegler@stiftung-meeresschutz.org

EUROPECHE
Mr Shelton Harley
shelton_harley@hotmail.com

GLOBAL TUNA ALLIANCE (GTA)
Mr Daniel Suddaby
daniel@globaltunaalliance.com

INTERNATIONAL POLE AND LIFE FOUNDATION (IPNLF)
Mr Martin Purves
martin.purves@ipnlf.org

Mr Shiham Adam
shiham.adam@ipnlf.org

Mr Gert le Roux
GertleRoux@woolworths.co.za

INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION (ISSF)
Dr Hilario Murua
hmurua@iss-foundation.org

MARINE STEWARDSHIP COUNCIL (MSC)
Dr Andrew Gordon
Andrew.Gordon@msc.org

PEW CHARITABLE TRUSTS (PEW)
Mr Ashley Wilson
awilson@pewtrusts.org

SUSTAINABLE FISHERIES AND COMMUNITIES TRUST (SFACT)
Ms Beatrice Kinyua
Beatrice.kinyua@sfact.org

Mr Simon Hoyle
simon.hoyle@gmail.com

SHARK TRUST
Ms Ali Hood
ali@sharktrust.org

THE OCEAN FOUNDATION
Ms Chloe Evans
cevans@oceanfdn.org

WORLD WIDE FUND FOR NATURE (WWF)
Mr Craig Smith
WWF-South Africa
csmith@wwf.org.za

Mr Umair Shahid
WWF-Mozambique
ushahid@wwf.org.pk

Ms Naghmana Zafar Bhatti
WWF-Mozambique
nzbhatti@wwf.org.pk

CHAIRPERSON

CHAIRPERSON WPDCS
Mr Julien Barde
julien.barde@ird.fr

CHAIRPERSON WPNT
Mr Farhad Kaymaram
farhadkaymaram@gmail.com

IOTC SECRETARIAT

Mr Dan Fu
Dan.Fu@fao.org

Ms Lauren Nelson
Lauren.Nelson@fao.org

Ms Melanie Williamson
melanie@capfish.co.za

Mr Emmanuel Chassot
Emmanuel.Chassot@fao.org

Mr Howard Whalley
Howard.Whalley@fao.org

Ms Mirose Govinden
Mirose.Govinden@fao.org

INTERPRETERS

Mr Nicholas Crowther
nicholascrowther1972@gmail.com

Ms Nathalie Heyndericx-De Klerk
nathalie@language-solutions.co.za

Mr Brandon Moult
b.moult002@gmail.com

Ms Elisabeth Arnaud
era@iafrica.com

APPENDIX 2
AGENDA FOR THE 27TH SESSION OF THE SCIENTIFIC COMMITTEE

Date: 2 - 6 December 2024

Location: Cape Town Lodge Hotel and Conference Centre, Cape town, South Africa/Hybrid

Time: 09:00 – 17:00 daily

Chair: Dr Toshihide Kitakado (Japan)

Vice-Chair: Gorka Merino (Spain)

1. **OPENING OF THE SESSION** (Chairperson)

2. **ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION** (Chairperson)

3. **ADMISSION OF OBSERVERS** (Chairperson)

4. **DECISIONS OF THE COMMISSION RELATED TO THE WORK OF THE SCIENTIFIC COMMITTEE** (IOTC Secretariat)
   - 4.1 Outcomes of the 28th Session of the Commission.
   - 4.2 Previous decisions of the Commission

5. **SCIENCE RELATED ACTIVITES OF THE IOTC SECRETARIAT IN 2024** (IOTC Secretariat)
   - 5.1 Report of the Secretariat – Activities in support of the IOTC science process in 2024

6. **NATIONAL REPORTS FROM CPCs** (CPCs)

7. **REPORTS OF THE 2024 IOTC WORKING PARTY MEETINGS**
   - 1.1 IOTC–2024–WPNT14–R Report of the 14th Session of the Working Party on Neritic Tunas
   - 1.2 IOTC–2024–WPB22–R Report of the 22nd Session of the Working Party on Billfish
     - 1.2.1 Billfish reproductive biology workshop
     - 1.2.2 Stripe marlin stock assessment
     - 1.2.3 Black marlin stock assessment
     - 1.2.4 Revision of catch levels of Marlins under Resolution 18/05
   - 1.3 IOTC–2024–WPEB20–R Report of the 20th Session of the Working Party on Ecosystems and Bycatch
     - 1.3.1 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
     - 1.3.2 Longline bycatch mitigation measures workshop
     - 1.3.3 Shortfin mako shark stock assessment
     - 1.3.4 Other matters
   - 1.4 IOTC–2024–WPTT26–R Report of the 26th Session of the Working Party on Tropical Tunas
     - 1.4.1 Yellowfin tuna stock assessment
     - 1.4.2 Update on the WGFAD06
     - 1.4.3 Other matters
   - 1.5 IOTC–2024–WPM15–R Report of the 15th Session of the Working Party on Methods
     - 1.5.1 Update on TCMP08
     - 1.5.2 Management Strategy Evaluation Progress
     - 1.5.3 Bigeye tuna MP (Resolution 22/03)
     - 1.5.4 Skipjack tuna MP (Resolution 24/07)

1.5.5 Swordfish tuna MP (Resolution 24/08)

1.6 IOTC–2024–WPDCS20–R Report of the 20th Session of the Working Party on Data Collection and Statistics

1.6.1 Update on WGEMS04

1.6.2 Other matters

1.7 IOTC–2024–WPSE01–R Report of the 1st Session of the Working Party on Socio-Economics

1.8 Summary discussion of matters common to Working Parties (capacity building activities; connecting science and management, etc.)

1.8.1 Data collection and capacity building

1.8.2 Invited Expert(s) at the WP meetings

1.8.3 Meeting participation fund

1.8.4 IOTC species identification guides: Tuna and tuna-like species

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

8. STATUS OF TUNA AND TUNA-LIKE RESOURCES IN THE INDIAN OCEAN (Chairperson)

8.1 Tuna – Highly migratory species

8.2 Tuna and mackerel – Neritic species

8.3 Billfish

9. STATUS OF SHARKS, MARINE TURTLES, SEABIRDS AND MARINE MAMMALS IN THE INDIAN OCEAN (Chairperson)

9.1 Sharks

9.2 Marine turtles

9.3 Seabirds

9.4 Marine mammals

10. IMPLEMENTATION OF THE REGIONAL OBSERVER SCHEME (IOTC Secretariat)

10.1 Consideration of Resolution 24/04 On a regional observer scheme

11. PROGRAM OF WORK AND SCHEDULE OF WORKING PARTY AND SCIENTIFIC COMMITTEE MEETINGS (IOTC Secretariat and Chairperson**)**

11.1 Progress on previous Recommendations from WPs and SC

11.2 Program of Work (2025–2029) and assessment schedule

11.2.1 Program of Work

11.2.2 Assessment schedule

11.2.3 Consultants

11.3 Schedule of meetings for 2025 and 2026

11.3.1 Data preparatory meetings

11.3.2 Final meeting schedule

12 IOTC SCIENTIFIC STRATEGIC RESEARCH PLAN (Chairperson)

13 OTHER BUSINESS (Chairperson)

13.1 Election of a Chair for the next biennium (Chair and Secretariat)

14 REVIEW OF THE DRAFT, AND ADOPTION OF THE REPORT OF THE 27th SESSION OF THE SCIENTIFIC COMMITTEE (Chairperson)

APPENDIX 3
LIST OF DOCUMENTS

Document	Title
IOTC-2024-SC27-01a	Draft: Agenda of the 27th Session of the Scientific Committee
IOTC-2024-SC27-01b	Draft: Annotated agenda of the 27th Session of the Scientific Committee
IOTC-2024-SC27-02	Draft: List of documents of the 27th Session of the Scientific Committee
IOTC-2024-SC27-03	Outcomes of the 28th Session of the Commission (IOTC Secretariat)
IOTC-2024-SC27-04	Previous decisions of the Commission (IOTC Secretariat)
IOTC-2024-SC27-05	Report of the Secretariat - Activities in support of the IOTC science process in 2024 (IOTC Secretariat)
IOTC-2024-SC27-06	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 (IOTC Secretariat)
IOTC-2024-SC27-07	Update on the implementation of the regional observer scheme (IOTC Secretariat)
IOTC-2024-SC27-08	Revision of the program of work (2024-2028) for the IOTC science process (IOTC Secretariat)
IOTC-2024-SC27-09	Proposed schedule of Working Party and Scientific Committee meetings for 2025 and 2026 (IOTC Secretariat)
IOTC-2024-SC27-10	Progress on SC26 recommendations (IOTC Secretariat)
IOTC-2024-SC27-11	Regarding the operation of Working Party of Ecosystem and Bycatch
IOTC-2024-SC27-18	Draft IOTC Strategic Science Plan 2025-2029 (Secretariat and Chair of Scientific Committee)
Executive Summaries	
IOTC-2024-SC27-ES01	Status of the Indian Ocean Albacore (ALB: *Thunnus alalunga*) resource
IOTC-2024-SC27-ES02	Status of the Indian Ocean bigeye tuna (BET: *Thunnus obesus*) resource
IOTC-2024-SC27-ES03	Status of the Indian Ocean skipjack tuna (SKJ: *Katsuwonus pelamis*) resource
IOTC-2024-SC27-ES04	Status of the Indian Ocean yellowfin tuna (YFT: *Thunnus albacares*) resource
IOTC-2024-SC27-ES05	Report on Biology, Stock Status and Management of Southern Bluefin Tuna: 2023 (from CCSBT)
IOTC-2024-SC27-ES06	Status of the Indian Ocean bullet tuna (BLT: *Auxis rochei*) resource
IOTC-2024-SC27-ES07	Status of the Indian Ocean frigate tuna (FRI: *Auxis thazard*) resource
IOTC-2024-SC27-ES08	Status of the Indian Ocean kawakawa (KAW: *Euthynnus affinis*) resource
IOTC-2024-SC27-ES09	Status of the Indian Ocean longtail tuna (LOT: *Thunnus tonggol*) resource
IOTC-2024-SC27-ES10	Status of the Indian Ocean Indo-Pacific king mackerel (GUT: *Scomberomorus guttatus*) resource
IOTC-2024-SC27-ES11	Status of the Indian Ocean narrow-barred Spanish mackerel (COM: *Scomberomorus commerson*) resource

Document	Title
IOTC-2024-SC27-ES12	Status of the Indian Ocean black marlin (BLM: *Makaira indica*) resource
IOTC-2024-SC27-ES13	Status of the Indian Ocean blue marlin (BUM: *Makaira nigricans*) resource
IOTC-2024-SC27-ES14	Status of the Indian Ocean striped marlin (MLS: *Tetrapturus audax*) resource
IOTC-2024-SC27-ES15	Status of the Indian Ocean Indo-Pacific sailfish (SFA: *Istiophorus platypterus*) resource
IOTC-2024-SC27-ES16	Status of the Indian Ocean swordfish (SWO: *Xiphias gladius*) resource
IOTC-2024-SC27-ES17	Status of the Indian Ocean blue shark (BSH: *Prionace glauca*)
IOTC-2024-SC27-ES18	Status of the Indian Ocean oceanic whitetip shark (OCS: *Carcharhinus longimanus*)
IOTC-2024-SC27-ES19	Status of the Indian Ocean scalloped hammerhead shark (SPL: *Sphyrna lewini*)
IOTC-2024-SC27-ES20	Status of the Indian Ocean shortfin mako shark (SMA: *Isurus oxyrinchus*)
IOTC-2024-SC27-ES21	Status of the Indian Ocean silky shark (FAL: *Carcharhinus falciformis*)
IOTC-2024-SC27-ES22	Status of the Indian Ocean bigeye thresher shark (BTH: *Alopias superciliosus*)
IOTC-2024-SC27-ES23	Status of the Indian Ocean pelagic thresher shark (PTH: *Alopias pelagicus*)
IOTC-2024-SC27-ES24	Status of marine turtles in the Indian Ocean
IOTC-2024-SC27-ES25	Status of seabirds in the Indian Ocean
IOTC-2024-SC27-ES26	Status of cetaceans in the Indian Ocean
Other meeting reports	
IOTC-2024-WPNT15-R	Report of the 15th Session of the Working Party on Neritic Tunas
IOTC-2024-WPB22-R	Report of the 20th Session of the Working Party on Billfish
IOTC-2024-WPEB20-R	Report of the 20th Session of the Working Party on Ecosystems and Bycatch
IOTC-2024-WPM15-R	Report of the 15th Session of the Working Party on Methods
IOTC-2024-WPDCS20-R	Report of the 20th Session of the Working Party on Data collection and Statistics
IOTC-2024-WPTT26-R	Report of the 26th Session of the Working Party on Tropical Tunas
IOTC-2024-TCMP08-R	Report of the 8th Session of the Technical Committee on Management Procedures
IOTC-2024-WGFAD06-R	Report of the 6th meeting of the Working Group on FADs
IOTC-2024-WGEMS04-R	Report of the 4th meeting of the Working Group on Electronic Monitoring Standards
IOTC-2024-WPSE01-R	Report of the 1st meeting of the Working Party on Social-Economics
National Reports	
IOTC-2024-SC27-NR01	Australia
IOTC-2024-SC27-NR02	Bangladesh, People's Republic of
IOTC-2024-SC27-NR03	China
IOTC-2024-SC27-NR04	Comoros

Document	Title
IOTC-2024-SC27-NR06	European Union (Including Annexes)
IOTC-2024-SC27-NR07	France (OT)
IOTC-2024-SC27-NR08	India
IOTC-2024-SC27-NR09	Indonesia
IOTC-2024-SC27-NR10	Iran, Islamic Republic of
IOTC-2024-SC27-NR11	Japan
IOTC-2024-SC27-NR12Rev1	Kenya
IOTC-2024-SC27-NR13	Korea, Republic of
IOTC-2024-SC27-NR14	Madagascar
IOTC-2024-SC27-NR15	Malaysia
IOTC-2024-SC27-NR16	Maldives, Republic of
IOTC-2024-SC27-NR17	Mauritius
IOTC-2024-SC27-NR19	Oman
IOTC-2024-SC27-NR20	Pakistan
IOTC-2024-SC27-NR21	Philippines
IOTC-2024-SC27-NR22	Seychelles
IOTC-2024-SC27-NR23	Somali
IOTC-2024-SC27-NR24	South Africa
IOTC-2024-SC27-NR25	Sri Lanka (Including Annexes)
IOTC-2024-SC27-NR27	Tanzania
IOTC-2024-SC27-NR28	Thailand
IOTC-2024-SC27-NR29	United Kingdom of Great Britain and Northern Ireland
IOTC-2024-SC27-NR31	Liberia
Information Papers	
IOTC-2024-SC27-INF01	Longline CPUE indices for Indian Ocean yellowfin tuna: analysis methods and their implications for the indice
IOTC-2024-SC27-INF02	Summary analysis of the 2024 IOTC yellowfin tuna stock assessment
IOTC-2024-SC27-INF03	Taiwan,China Report 2024 (Available on Request)
IOTC-2024-SC27-INF04	An online digital ocean atlas for the Indian Ocean to study the impacts of climate change and variability on tuna fisheries
IOTC-2024-SC27-INF05	A Crew-based Observer protocol alternate for on-board data collection in compliance with Resolution 24/04 On A regional observer scheme effectively deployed on artisanal and semi-industrial multiday fisheries boats in the Indian Ocean by Sri Lanka
IOTC-2024-SC27-INF06_Rev1	Regional Observer Scheme Data Fields Revised Version

APPENDIX 4
NATIONAL STATEMENTS

The SC noted the following statements made by Mauritius

REPUBLIC OF MAURITIUS

MINISTRY OF FOREIGN AFFAIRS, REGIONAL INTEGRATION AND INTERNATIONAL TRADE

No. 06 /2024 (18570/46/142 V27)

The Ministry of Foreign Affairs, Regional Integration and International Trade of the Republic of Mauritius presents its compliments to the Secretariat of the Indian Ocean Tuna Commission (IOTC) and has the honour to refer to 27th Session of the Scientific Committee of the IOTC which is being held from 02 to 06 December 2024 at the Cape Town Lodge Hotel and Conference Centre, Cape Town, South Africa.

The Ministry would appreciate it if the two attached statements by the Republic of Mauritius on agenda item 6 could be annexed to the report of the meeting and posted on the IOTC website. The original statements are being despatched to the IOTC Secretariat by courier.

The Ministry of Foreign Affairs, Regional Integration and International Trade of the Republic of Mauritius avails itself of this opportunity to renew to the Secretariat of the Indian Ocean Tuna Commission the assurance of its highest considerations.

Port Louis, 02 December 2024

MINISTRY OF FOREIGN AFFAIRS, REGIONAL INTEGRATION & INT. TRADE * REG.

The Executive Secretary
Indian Ocean Tuna Commission
Blend Seychelles Building (2nd floor)
Providence
PO Box 1011
Victoria Mahé
SEYCHELLES

Newton Tower, Sir William Newton Street, Port Louis
Tel: (230) 405 2500 Fax: (230) 208 8087, (230) 212 6764, Email: mfa@govmu.org

27th Session of IOTC Scientific Committee
2-6 December 2024, Cape Town, South Africa

Agenda Item 6: National Reports from CPCs

Statement by the Republic of Mauritius

National Report submitted by the United Kingdom

The Republic of Mauritius will not repeat its position on the issues raised in the National Report submitted by the United Kingdom since that position is well known to this Committee.

The Republic of Mauritius wishes to point out that its position with regard to the purported membership of the United Kingdom in the Indian Ocean Tuna Commission as a coastal State and on the issues raised in the National Report of the United Kingdom remains unchanged.

The Republic of Mauritius requests that this statement be annexed to the report of this meeting.

27th Session of IOTC Scientific Committee
2-6 December 2024, Cape Town, South Africa

Agenda Item 6: National Reports from CPCs

Statement by the Republic of Mauritius

National Report submitted by France

The Republic of Mauritius wishes to point out that the Island of Tromelin is not a French territory, as claimed by France in its National Report.

The Republic of Mauritius reiterates that the Island of Tromelin forms an integral part of its territory and rejects France's sovereignty claim over that island as well as France's claim to any sovereign right or jurisdiction over the Exclusive Economic Zone adjacent to that island.

Moreover, the Republic of Mauritius does not recognize the validity of the inclusion of the Island of Tromelin in the French Southern and Antarctic Lands (TAAF) or the Scattered Islands/Iles Eparses.

The Republic of Mauritius reaffirms that it has full and complete sovereignty over the Island of Tromelin, including its maritime zones.

The Republic of Mauritius requests that this statement be annexed to the report of this meeting.

The SC noted the following Statement by France-OT

27th Session of IOTC Scientific Committee

2-6 December 2024

Statement by the FRANCE Overseas Territories

France declares that it does not recognize the Mauritian declaration as having any legal value, because it ignores the fact that the island of Tromelin is a French territory over which France constantly exercises full and complete sovereignty.

Thus, France enjoys the sovereign rights or jurisdiction conferred on it by international law in the Exclusive Economic Zone adjacent to the island of Tromelin. Meetings of Indian Ocean RFMOs are not the place to discuss issues of territorial sovereignty, but France stresses that it will continue to maintain a constructive dialogue with the Republic of Mauritius on this subject.

APPENDIX 5
NATIONAL REPORT EXECUTIVE SUMMARIES (2024)

Australia (IOTC-2024-SC27-NR01)

Pelagic longline and purse seine are the two main fishing methods used by Australian vessels to target tuna and billfish in the Indian Ocean Tuna Commission (IOTC) Area of Competence. The number of active longliners and levels of fishing effort are very low relative to the scale of the regional IOTC fishery. In 2023 in the IOTC Area of Competence, 1 Australian longliner operated exclusively in the Western Tuna and Billfish Fishery, 4 operated exclusively in the Eastern Tuna and Billfish Fishery, and 1 operated in both fisheries. They caught 7.6 t of albacore (Thunnus alalunga), 34.7 t of bigeye tuna (Thunnus obesus), 44.4 t of yellowfin tuna (Thunnus albacares), 98.3 t of swordfish (Xiphius gladius) and 1 t of striped marlin (Kajikia audax). In addition, in 2023 the review rate for electronic monitoring (e-monitoring) footage of longline hook deployed in the IOTC Area of Competence was 9%. The actual catch of southern bluefin tuna (Thunnus maccoyii) in the purse-seine fishery targeting this species was 4,501 t in 2023. There was no skipjack tuna (Katsuwonus pelamis) caught by purse-seine fishing.

Bangladesh (IOTC-2024-SC27-NR02)

Tuna and tuna-like other highly migratory species have become high pace in the priority list to the Government of Bangladesh (GoB) for a couple of years especially being after demarcation of sea boundary with the neighbours that lead to open up the access of Bangladeshi fishers to the ABNJ. But it is not possible yet to take this opportunity by harnessing tuna and tuna-like fishes from expanded EEZ and high seas because of initiation stage of such fishing industry. Simultaneously, the study of tuna and tuna-like fishes of Bangladesh marine waters are one of the most poorly studied areas of the world although it possesses high potentiality. Proper attention is needed in every aspect of exploitation, handling and processing, export and marketing, as well as in biological and institutional management strategies. Therefore, a pilot project has been launched to find out the opportunity of tuna and tuna-like fishes from Bangladesh marine waters and ABNJ on a pilot basis. Basically, there is no specific tuna fishery in Bangladesh. Tuna and tuna-like fishes are by catch from industrial fishing vessels (trawler), as well as by artisanal mechanized fishing vessels. Statistically, it shows that tuna and tuna-like fishes (mackerels) comprise about 3.83% (5597 MT) in industrial sector and 1.77% (9454 MT) in artisanal mechanized sector in the year 2022-23. Still bill fishes are reported as “other marine fish” in the fish logbooks. Nowadays, the catch and effort data system for marine sector is being developed by Sustainable Coastal and Marine Fisheries Project (SCMFP) through FAO and it seems that after few years’ species wise data for tuna and tuna-like fishes will be available. This report, thereby tried to articulate in a frame as per format of commission incorporating a salient feature of the marine fisheries of Bangladesh. Besides, there was no reporting of sea bird interactions with the both industrial and artisanal fishery during the reporting period. Similarly, there was no reporting of mortality of sea turtles, marine mammals and whale sharks, which are protected under existing rules and regulations of Bangladesh.

China (IOTC-2024-SC27-NR03)

The Longline (LL) is the only fishing gear used by Chinese fleets to catch tuna and tuna-like species in the Indian Ocean Tuna Commission (IOTC) Area of Competence. In 2023, there were 74 Chinese LL fleets operating in this area, a reduction of four LLs compared to 2022. The tropical tuna catch (Bigeye and Yellowfin tuna) of Chinese LL fleets in 2023 was at 10,499MT, which was 3,008 MT higher than that in 2022 (7,491MT). The temperate tuna catch (Albacore) of Chinese LL fleets in 2023 was 3,859 MT, which was 2,071MT lower than that in 2022 (5,930MT). Both the logbook and observer programs are being implemented for the Chinese LL fleets. In 2023, five scientific observers were deployed on board LL fleets to collect data for both target and bycatch species as required.

Comoros (IOTC-2024-SC27-NR04)

La pêche en Union des Comores est exclusivement artisanale, pratiquée sur des embarcations non pontées en bois et en fibre de verre, motorisées et non motorisées d'une longueur de 2 m à 9 m. Elle exploite essentiellement les espèces pélagiques (Thunnus albacares, Katsuwonus pelamis, Thunnus alalunga Istiophorus platypterus, Thunnus obesus, Euthynnus affinis) et aussi des espèces benthiques. Elle contribue, non seulement à la socio-économie du pays (55% de l'emploi total du secteur agricole, soit environ 7000 pêcheurs), et source de sécurité alimentaire et nutritionnelle, mais aussi elle constitue une importante source des moyens de subsistance, de bien-être et de diversité culturelle pour les personnes exerçantes directement ou indirectement cette activité. Les techniques de pêche utilisées sont essentiellement la ligne de traine, la palangrotte, la ligne à main légère et peu de filet pour les petits pélagiques. La durée de la marée est d'une journée à 7 jours. Le circuit commercial des captures en général est très simple (PêcheursVendeur-Consommateur) et les produits de la pêche sont uniquement destinés au marché national (consommateurs locaux et autoconsommations). Depuis février 2011, les Comores ont mis en place un système de collecte des données sur les lieux de débarquement en collaboration avec la CTOI. Suite à une analyse approfondie réalisée de la FAO sur les données collectées (2011-2014), une réorientation du plan d'échantillonnage s'est effectuée et appliquée en 2015. Et, depuis 2017, la collecte de données est réalisée intégralement sur smartphone. La production annuelle issue de l'enquête de 2023 est estimée à 18 100 tonnes sur un ensemble de 5 035 embarcations.

European Union (IOTC-2024-SC27-NR06)

The EU fleet fishing in the waters of the Indian Ocean is composed of two main segments. The first is an offshore segment including:

- Purse seiners targeting the three species of tropical tunas:
    - 25 active vessels
    - 206,112 t of catch of tropical tunas
        - YFT 32 %
        - SKJ 60 %
        - BET 9 %
- Longliners swordfish with significant associated catches of some pelagic shark species
    - 16 active vessels
    - 3,865* 10^6 Hooks
    - 8,690 t of catch
        - SWO 42 %
        - BSH 49 %
        - SMA 6 %
- Longliners swordfish with significant associated catches of tunas (La Réunion)
    - 20 active vessels (≥12m)
    - 3,67 * 10^6 Hooks
    - 2,032 t of catch
        - SWO 46 %
        - YFT & BET 29 %
        - ALB 18 %

The second is a coastal segment, understanding vessels of less than 12 m fishing for and testing broad pelagic species and associated species, some of which use anchored fish aggregating devices (AFADs) over Mayotte and La Réunion Islands, the two outermost regions of the European Union of the Indian Ocean. This coastal segment corresponds to the following:

- Longliners
    - 23 vessels at Reunion Island (<12m)
        - 0,42 *10^6 hooks
        - 539,8 t of catch
            - SWO 30 %
            - YFT & BET 32 %
            - ALB 18 %
    - 2 vessels at Mayotte Island
        - 67.5 t of catch
            - YFT 56 %
            - SWO 35 %
- Trolling line and hand-lines
    - La Réunion: 118 vessels
        - 403.2 t of catch
    - Mayotte: 142 vessels
        - 578 t of catch

The fishing capacity of the EU fleet authorised to deploy a fishing activity for large pelagic species in the IOTC Convention Area is managed by provisions on capacity limits set out in the IOTC Resolution and by European Union legislation.
Furthermore, the conditions of access to certain fishing areas in waters under the jurisdiction of coastal states of the South West Indian Ocean are subject to specific provisions defined in public agreements engaging the European Union and named Sustainable Fisheries Partnership Agreements (SFPA).
In accordance with IOTC Resolution 15/02, flag EU Member States (Spain, France, Italy and Portugal) have undertaken scientific data characterising the activity of the EU fleet fishing in 2023 in the IOTC area of competence and enabling the IOTC Scientific Committee to conduct its work.

France-territories (IOTC-20234-SC27-NR07)
Depuis le passage de Mayotte comme territoire sous régime communautaire depuis le 1er janvier 2014, l'outre-mer français tropical de l'océan Indien ne concerne plus que les îles Éparses qui sont rattachées à l'administration supérieure des Terres Australes et Antarctiques françaises (TAAF). Un parc naturel marin a été créé le 22 février 2012 (décret n°2012-245), il s'agit du PNM des Glorieuses, qui dépend des îles Éparses et s'étend sur l'ensemble de la ZEE des Glorieuses. Les Iles Éparses (France Territoires) ne disposent pas de flottilles thonières immatriculées pour ce territoire. Néanmoins, l'administration des TAAF délivre des licences de pêche à des palangriers et senneurs français et étrangers souhaitant pêcher dans les eaux administrées par France Territoires, et un programme observateur embarqué accompagne l'octroi de ces licences. En 2023, il n'y a pas eu de formation OBSPEC organisée par l'administration des TAAF et aucun observateur n'a embarqué au cours de l'année 2023 sur les thoniers senneurs ou navires auxiliaires sous pavillon français ou étranger opérant dans la zone. Des observations en mer sur les palangriers français basés à La Réunion sont faites par des observateurs embarqués ou via l'auto-échantillonnage (collecte de données par les capitaines). Ces observations sont pilotées par l'IRD sur des fonds européens dans le cadre du projet 'Data Collection Framework' (DCF). En 2023, 114 opérations de pêche ont été observées sur 2 navires réunionnais dans les ZEE des Iles Éparses, dont 64 par observation embarquée et 50 via l'auto-échantillonnage. Les données des palangriers sous pavillon UE-France ont été présentées dans le rapport UE-FR. Le dispositif de recherche actuel de la France (IRD et Ifremer principalement) sur les grands pélagiques couvre le suivi des activités de pêche, des débarquements et de la biométrie des espèces cibles et des rejets, l'étude des comportements migratoires des grands pélagiques, des études sur les dispositifs de concentration de poissons, la collecte de données observateurs à partir d'un suivi

électronique, des études génétiques et microchimiques pour la délimitation des stocks, la mise au point de mesures d'atténuations des prises accessoires et de la déprédation, la mortalité après rejet des pêcheries européennes à la senne et palangrière des requins, ainsi que le développement d'une innovation pour faciliter une libération rapide de la mégafaune marine capturé à la palangre et améliorer la survie des individus. La plupart des projets sont financés sur appels d'offre internationaux, européens ou nationaux. On trouvera dans ce rapport la liste des différents projets qui se sont poursuivis ou ont débuté en 2023. On trouvera de plus des projets impliquant directement la CTOI même si ces projets sont en cours de lancement. La France a participé activement à tous les groupes de travail organisés par la CTOI, et a présenté 28 contributions scientifiques en 2023.

India (IOTC-2024-SC27-NR08)

The total landings of tuna and tuna-like species along the Indian coast for 2023 is estimated at 2,05,189 tonnes, against 1,92,988.11 tonnes during 2022 showing an increase of 6.3 % against last year's landings. Gillnets remained the major gear contributing to the tuna and tuna-like fish catch during 2023 also (34.76 %). Small purse seine and hooks and line (15.82 % and 12.37 % respectively), followed by trawl net and ring seine were the principal gears contributing to the catch. Pole and line fishing, practised exclusively in the waters of the Lakshadweep archipelago, contributed 4.31 % to the total landings. Other gears like small longlines, and troll lines, also contributed to the tuna landings in small quantities during the year.

Considerable spatial variation was observed in the tuna and tuna-like species landings during 2023. The west coast of India (FAO area 51) contributed the larger share to the landings (62.46%) and the balance 37.54 % of landings came from the east coast (FAO area 57). Tuna landings in 2023 comprised eight species, out of which five species representing the neritic (68.25 %) and three from the oceanic group (31.74 %). Kawakawa (Euthynnus affinis, 24.63 %) and Skipjack (Katsuwonus pelamis; 15.45 %) contributed the maximum catch, followed by Yellowfin tuna (Thunnus albacares) (10.36 %).

Seabird interactions with the tuna fishery were not reported during the reporting period. Similarly, there was no reporting of the mortality of sea turtles, marine mammals and whale sharks, protected under Schedule 1 of the Wildlife (Protection) Act of 1972 of India. The Fishery Survey of India (FSI) of the Department of Fisheries, Ministry of Fisheries, Animal Husbandry & Dairying, Government of India, Central Marine Fisheries Research Institute of the Indian Council of Agricultural Research (ICAR-CMFRI) and the Department of Fisheries of the coastal States and Union Territories (UTs) are the main agencies responsible for data collection and collation on tuna fishery.

Indonesia (IOTC-2024-SC27-NR09)

For fisheries management, Indonesian waters are divided into eleven Fisheries Management Areas (FMAs). Three of these located within the IOTC area of competence: FMA 572 (Western Sumatra and the Sunda Strait), FMA 573 (south of Java to East Nusa Tenggara, the Sawu Sea, and the western part of the Timor Sea), and FMA 571 (the Malacca Strait and the Andaman Sea). Indonesian fishers use various fishing gear, including longlines, purse seines, handlines, and gillnets, to catch large pelagic fish like tuna, skipjack, and billfish. Longlines are the primary fishing gear targeting tuna in these FMAs. The total catch of key tuna species in 2023 was estimated at around 274,601 tons, consisting of yellowfin tuna (62,861 tons), bigeye tuna (22,512 tons), skipjack tuna (182,819 tons), and albacore (6,410 tons). Both artisanal and industrial landing ports are regularly monitored through port-based monitoring and observer programs managed by the Directorate General of Capture Fisheries (DGCF).

Iran (Islamic Republic of) (IOTC-2024-SC27-NR10)

Tuna and tuna-like species constitute a significant portion of Iran's large pelagic fisheries. This sector is pivotal to the nation's marine economy, operating primarily in the Persian Gulf, Oman Sea, and the high seas. In 2023, Iran's total fish production amounted to 1.4 million tonnes. Of this, 741 thousand tonnes (representing 52% of the total) were derived from the Persian Gulf, Oman Sea, and the high seas.

The Caspian Sea contributed 37 thousand tonnes (3%), while aquaculture produced 640 thousand tonnes (45%).
The catch quantity of large pelagic species (including by-catch) amounted to around 332 thousand metric tonnes, representing approximately 43% of the country's total catch in 2023, and around 275 thousand metric tonnes belongs to tuna and tuna-like fishes in the Indian Ocean areas. This catch primarily comprised tropical tuna 112 thousand metric tonnes (37.6%), neritic tuna 132 thousand metric tonnes (44.5%), billfish species 31 thousand metric tonnes (10.6%), 1,528 metric tonnes (0.5%) of various shark species, and 20 thousand metric tonnes (6.8%) of other non-target species.

Japan (IOTC-2024-SC27-NR11)
This Japanese national report describes following eight relevant topics stipulated in the 2024 national report guideline mainly in recent five years (2019-2023) (2023 is provisional) , i.e. (1) Fishery information (longline and purse seine fishery), (2) fleet information, (3) catch and effort by species and fishery, (4) ecosystem and bycatch (sharks, seabirds, marine turtles), (5) national data collection and processing systems including “logbook data collection and verification”, “observer scheme”, “port sampling programs”, “monitoring billfish catch”, and “sampling plans for mobulid rays”, (6) national research programs, (7) Implementation of Scientific Committee recommendations and resolutions of the IOTC relevant to the Scientific Committee”, and (8) “Literature cited”. Highlights from the eight topics are described as follows: Japan is currently operating longline and purse seine fisheries in the Indian Ocean. Catch and effort data are collected mainly through logbooks. Bigeye, yellowfin, albacore, southern bluefin tuna are main components of the catch by longliners, while three species (skipjack, yellowfin and bigeye tuna) are exploited by purse seiners. In recent years, catch and effort by longliners are in a low level mainly because of piracy activities off Somalia. Purse seiners have not operated in the Indian Ocean since 2021. Japan has been dispatching scientific observers in accordance with the Resolution 11/04 (superseded by 22/04), whose coverage for longline fishery has been more than the 5% compliance level in recent years except for 2020-2022 due to COVID-19 pandemic. Observer coverage for purse seine fishery is highly variable. A number of information including bycatch and biological data, has been collected through the observer program. Japan has been conducting several research activities.

Kenya (IOTC-2024-SC27-NR12)
The Kenyan tuna and tuna-like fishing fleets comprise of the artisanal, semi-industrial, industrial and recreational fisheries which have an impact on IOTC’s priority species. The commercial artisanal fishing fleet is composed of a multigear and multi-species fleet operating in the territorial waters. The artisanal boats are broadly categorized as outrigger boats or dhows which come with variants depending on the construction designs. It is estimated that 606 artisanal vessels are engaged in the fishing for tuna and tuna like species in 2022 within the coastal waters. The main gears used are artisanal long line hooks, gillnets, monofilament nets and artisanal trolling lines. In 2023, five (5) Kenya pelagic longline vessels operated in the IOTC area of competence. The IOTC species landed during the year included swordfish (217.3 tons), yellowfin tuna (129.1 tons) Bigeye tuna (35.3 tons), Sharks (52.3 tons), Marli while other species combined (18.6 tons). Artisanal fishers landed 388 tons of marlins, 4,959 tons of tuna and tuna like species and 1652 tons of sharks and rays. Catches of scombrids decreased from 6,160 tons to 4,959 tons but still above the landing of previous years of 1,953 tons and 1,613 tons in 2020 and 2021. The main target species from the recreational fisheries are marlins and sailfish (Istiophiridae), swordfish (Xiiphidae) and tuna (Scombridae). Other species caught include small pelagic species such as barracuda, Spanish mackerel, Wahoo and sharks. The artisanal fisheries and recreational fishing fleets have interactions with sharks where sharks are caught and the carcass is retained and fully utilised in artisanal fisheries and recreational trolling line fisheries have a voluntary shark release policy.

Republic of Korea (IOTC-2024-SC27-NR13)
The number of active vessels in 2023 was 4four for longline fishery and two for purse seine fishery. With this fishing capacity, Korean tuna longline fishery caught 731 tonnes in 2023, which was 10% lower than that of 2022. The fishing efforts in 2023 were 1,422 thousand hooks. The fishing efforts averaged for recent five years (2019-2023) were 3,220 thousand hooks and distributed in the western tropical areas around 0-20°S as well as in the western and eastern areas around 20°S-40°S. Since 2015, some vessels have moved to the western tropical area between 5°N-10°S to fish for bigeye tuna and yellowfin tuna. In 2020, Korean longline vessels moved again to the eastern Indian Ocean to operate southern bluefin tuna. Korean tuna purse seine fishery in the Indian Ocean recorded 13,877 tonnes in 2020. In 2020, two vessels of Korean tuna purse seine fishery operated mainly in the western and central tropical areas around 10°N10°S. The fishing efforts in 2020 were 610 sets, which mainly distributed in the western and central tropical areas around 40°E-70°E. During 2020-2021, national scientific observers for longline fishery were not dispatched onboard for implementing observer program due to the worldwide spread of the COVID-19. National observer for longline fishery was dispatched again since 2022. Regarding purse seine fishery, regional scientific observers were dispatched onboard.

Madagascar (IOTC-2024-SC27-NR14)
A Madagascar, la pêche thonière industrielle est assurée par des palangriers de moins de 24 mètres (entre 14 et 17 mètres) qui opèrent sur la côte Est. Aucun palangrier national n'a obtenu de licence de pêche durant l'année 2022, et ils ne l'ont obtenu qu'au dernier trimestre de l'année 2023. Depuis 2010, les techniques et les méthodes demeurent les mêmes. En général, les navires déploient entre 800 à 1300 hameçons par filage et ils effectuent une sortie relativement courte d'une durée de 4 à 7 jours afin de maintenir les captures fraiches en arrivant aux ports de débarquement qui est celui de Toamasina. Le programme de collecte de fiches de pêche et d'échantillonnage au port de débarquement, mis en œuvre depuis 2014, nous permet d'avoir des données sur la distribution de taille des espèces capturées. Les prises annuelles des palangriers de 2019 à 2023 varient entre 66 tonnes et 193 tonnes, excepté celles de 2022 qui sont nulles. Cette variation est légèrement proportionnelle à celle de l'effort de pêche (exprimé en nombre d'hameçons déployés). Suite à la diminution du nombre de navire en activité depuis 2018, la capture moyenne annuelle des palangriers est de 140 tonnes. Elle est constituée à 60,98% de thons, 17,35% de poissons porte-épées, 12,13% de requins et 9,54% d'autres espèces. La capture en thons est majoritairement composée des thons obèses, des germons et des albacores. Les engins utilisés par la pêche côtière sont principalement le filet maillant, la ligne et la palangre.

Malaysia (IOTC-2024-SC27-NR15)
Total catch of marine fish from Malaysian waters in 2023 were 1.270 million mt, a slight decreased 2.9% compared to 1.308 million in 2022. The total landing in 2023 were attributed to the catch from 49,173 registered vessels with trawlers, purse seines, drift nets contributed large percentage of the catches. In 2023, marine fish production from the west coast of Peninsular Malaysia (Malacca Straits) contributed 670,137 mt (52.8%) out of the total catch.
Tuna fisheries contributes 69,924 mt (5.5%) of Malaysia's marine fish landings in 2023. Purse seiners are the main fishing gears in neritic tuna fisheries, especially the 40-69.9 GRT (Zone C) and >70 GRT (Zone C2) vessel size, with longtail tuna dominated the landings followed by kawakawa and frigate tuna. In 2023, neritic tuna landings in west coast Peninsular Malaysia amounted to 12,513 mt; increasing by 37% compared to 12,336 mt in 2022. Meanwhile landings of neritic tuna in the whole Malaysia ranged from 56,736 mt to 74,489 mt (2016-2023) where 55,233 mt neritic tuna catch recorded in 2023.
The highest catch was recorded in 2017 with 74,489 mt. Landings of neritic tuna in Malaysia appear to have stabilized from 2016 to 2023. The catch of oceanic tuna from the Indian Ocean increased 39.5% from 1,701.20 mt in 2022 to 2,816.02 mt in 2023. Albacore landings increased from 1,258.50

mt in 2022 to 1,970.65 mt in 2023. Albacore tuna formed nearly 70% of the total catches in the form of whole frozen tuna meanwhile, Yellowfin contributed 25% and Bigeye 5% of total catches in frozen and gutted forms.
Malaysia have updated the national logbook to include all the species as requested in Resolution 19/04. Monitoring of tuna landing and inspection by Port Inspector is ongoing. DOFM monitored and tracked the deep-sea and tuna vessels using National VMS. DOFM have installed CCTV on tuna vessels as a tool for EMS.

Maldives (IOTC-2024-SC27-NR16)
Tuna fishery is a significant source of employment and income for a substantial proportion of the whole population of Maldives. The two primary gears used in the fishery are pole-and-line and handline, with the main target species being skipjack (Katsuwonas pelamis) and yellowfin (Thunnus albacares), respectively. The total tuna landings (skipjack, yellowfin, bigeye, frigate and kawakawa) in 2023 were 160,485 t while skipjack and yellowfin tuna contributed to 81% and 19% to this total catch, respectively. Pole-and-line gear has been the most common gear for catching skipjack tuna (99% of the catch), a pattern that has persisted over the last five years (2019-2023). Yellowfin tuna are mainly caught from Handline gear, contributing about 64% of catch in 2023. The tuna fleet consists of 650 vessels, the most of which are in the 12.5 to 32.5 m length range. Since 1970, Maldives has been collecting species-level data with vessel-specific catch and effort data has become available from 1995. Logbooks were introduced to the Maldivian fishery in 2010 by the Ministry of Fishery and a web-enabled fishery information system, “Keyolhu” is now fully functional. Fishery and catch data are also collected through other tools such as Vessel Monitoring System (VMS) and Electronic Monitoring Systems (EMS).

Mauritius (IOTC-2024-SC27-NR17)
In 2023, Mauritius had 5 purse seiners, 1 supply vessel and 16 industrial longliners operating in the tuna fishery. One of the purse seiners started to operate in December 2023 for only 15 days The five purse seiners are large freezer vessels with three having an overall length of 89.4 m each, one at 82.06 m and the last at 71.95 m. The longliners are all industrial boats of more than 24 meters in length.
All the longliners carried out fishing activities inside and outside the EEZ of Mauritius undertaking a total of 56 fishing trips that spanned 3413 fishing days. A total of 4454205 hooks was deployed. The majority of the catch consisted of yellowfin (43.9%) followed by bigeye (33.7%), albacore (9.6%), and swordfish (3.4%). Their total catch amounted to 5866.25 tons and the CPUE was 1.3kg/hook. These longliners transhipped most of their main catch which included yellowfin, albacore, bigeye and swordfish at sea while the remaining catch were unloaded at Port Louis for the local market.
The Mauritian purse seiners operated between latitude 19oN to 23oS and longitude 28o to 68oE. The total catch of the five purse seiners amounted to 24920.0 tons comprising 29.1% yellowfin, 62.2% skipjack and 6.3% bigeye tuna for 822 positive sets out of a total of 856 sets.
Sampling exercises were carried out on the catches that were unloaded in port by the industrial longliners and purse seiners. The total amount of fish sampled amounted to 13097 (5779 from the longliners and 7318 from the purse seiners). In the artisanal fishery, 459 fishes were sampled for length frequency.

Mozambique (No National Report Submitted)

Oman (IOTC-2024-SC27-NR19)
The total production of the Omani fishery sector amounted to around 794 thousand tons in 2023, with a slight increase of approximately 6% compared to 2022, with a total value amounting to about 531 million Omani riyals in 2023. Artisanal fishing contributed a percentage 89% of this production amounted to approximately 706 thousand tons with a value of 439 million Omani riyals, while The quantities of commercial fishing production amounted to 76,480 tons, forming a contribution rate of

9.6% of the total production, and the coastal fishing contributed by 0.7%, with catch quantities estimated at approximately 5,600 tons. Tuna species considered as highly valuable products for Omani consumers, have experienced significant increases in the total annual production until 2022, with a decrease in its production in 2023 by 7.4% compared with 2022.

Pakistan (IOTC-2024-SC27-NR20)

Tuna and tuna like fishes are one of the components of pelagic resources. In Pakistan, mainly neritic and oceanic species are caught in the tuna fishery. Tuna fishing fleet comprises of about 709 gillnet boats. The total production of tunas and tuna-like fishes, including neritic and oceanic tunas, billfishes and seerfishes during the year 2023 was 47,715 m. tonnes. There are no reported instances of sea bird interaction in any of the tuna fishing boat. sea turtles, marine mammals and whale sharks are protected in Pakistan under various national and provincial fisheries and wildlife legislations. Data on tuna production is collected by provincial fisheries departments of maritime provinces of Sindh and Balochistan and compiled by Marine Fisheries Department, Government of Pakistan, Ministry Maritime Affairs. Tuna and allied resources called as large pelagic resources. The large pelagic resources contributed 44,360 ton. Major share of the landing was by tunas (61.35%) followed by seerfishes (0.08%), dolphinfish (9.17%) and billfish (25.77%). Among the tunas, yellowfin was dominating with 20.19%, followed by frigate (33.37%), Tuna Nei (18.38%), longtail (18.25 %), kawakawa (0.06%) and skipjack (0.03%). There were some landings of bullet tuna and striped bonito as well. In addition, there was extremely high sea surface temperature during August to October (possibly oceanic heat wave) in major part of the Arabian sea resulted in poor catches of tuna, therefore, only a few tuna boats remained operated during this period. Unprecedented jellyfish bloom of Crambionella orsini during September and December (and even onward in 2021) forced fishermen to stop fishing operations during this period because of excessive entanglement and choking of fishing net. Significant progress has been made during the years from 2016-2018, for the conservation of bycatch species which include promulgation of fisheries legislations by both provinces of Sindh and Balochistan. These legislations prohibited the catching of turtle, cetacean (whales & dolphins), whale shark, silky shark, oceanic whitetip shark, thresher shark, hammerhead sharks, all species of sawfishes of Family Pristidae, all species of guitarfishes and wedgefishes of family Rhinidae, Rhinobatidae or Rhynchobatodae. To monitor the activities of local tuna boat, it is made mandatory to have VMS on all fishing vessel larger than 15 meters (in length overall). The contravention of these regulation is punishable with fine and imprisonment

Philippines (IOTC-2024-SC27-NR21)

Between October 7 and December 19, 2017, the Philippines operated a single active vessel in the Indian Ocean Tuna Commission (IOTC) Convention Area (10°S to 5°N, 75°E to 90°E). The FV Marilou 888, a purse seiner with a gross tonnage (GT) of 349, conducted fishing operations during this period. The vessel's total catch included:

- 25,551 kg of bigeye tuna (Thunnus obesus),
- 72,680 kg of yellowfin tuna (Thunnus albacares), and
- 144,566 kg of skipjack tuna (Katsuwonus pelamis).

All catches were landed at the General Santos City Fish Port in the Philippines. Bycatch records included 34 silky sharks (Carcharhinus falciformis), of which 12 were released alive and 22 were

released dead. Additionally, an olive ridley turtle (Lepidochelys olivacea) was released alive, while one smooth mobula ray (Mobula thurstoni) was released dead. No sharks or other bycatch species were retained on board.

The FV Marilou 888 had 100% observer coverage for the duration of its trip and was equipped with a Vessel Monitoring System (VMS). As with previous Philippine fishing operations, all conservation and management measures mandated for sharks and other species were strictly observed during the vessel's activities.

While the Philippines has been inactive in the IOTC Convention Area since 2018, the country remains a committed Contracting Member of the IOTC. It upholds its dedication to the effective management, conservation, and sustainable use of highly migratory fish stocks within the IOTC Area of Competence.

Seychelles (IOTC-2024-SC27-NR22)

In 2023, the Seychelles' fishing fleet experienced notable changes, particularly the industrial longline fleet, which was significantly reduced, with registered vessels dropping from 58 in 2022 to 34 in 2023. Despite this reduction, the total catch decreased by only 3% to 9,627 metric tons (MT), with a higher catch rate of 0.48 MT per 1,000 hooks, up from 0.36 MT in 2022. Meanwhile, the semi-industrial longline fleet expanded to 66 licensed vessels, the largest since the fishery began. This fleet achieved a 22% increase in total catch, reaching 2,536 MT, driven by a 29% rise in fishing effort.

The purse seine fleet reported an estimated total catch of 121,200 MT in 2023, maintaining stability compared to 120,642 MT in 2022. However, there was a marked increase in fishing effort, with 3,727 fishing days recorded, a 27% rise from the previous year. Skipjack tuna continued to dominate the catch composition, representing 66%, followed by yellowfin tuna (23%) and bigeye tuna (9%). A 9% reduction in yellowfin tuna catches was recorded for this fleet in 2023.

The Seychelles Fishing Authority has undergone significant legislative reforms, with the Seychelles Fisheries Authority Act 2024 coming into effect. The Act renamed the Authority to the Seychelles Fisheries Authority, in line with its expanded mandate, which includes fishing-related activities, particularly aquaculture and port management. Additionally, the Fisheries and Aquaculture Bill 2023, designed to address gaps in previous legislation and align with international standards such as UNCLOS and the IOTC, is in its final stages of revision for anticipated enactment in 2025.

Efforts to enhance data collection and monitoring also advanced. Observer coverage resumed to near-normal levels following covid-19 pandemic disruptions. Projects on Electronic Monitoring and Electronic Reporting are progressing well. These developments, coupled with Seychelles' commitment to implementing IOTC recommendations and Conservation and Management Measures (CMMs), underscore the nation's commitment for sustainable fisheries management and adaptation to emerging challenges.

Somalia (IOTC-2024-SC27-NR23)

The Somali National Report to the Indian Ocean Tuna Commission (IOTC) Scientific Committee provides an in-depth analysis of Somalia's fisheries, focusing on data collection, fleet structure, and conservation initiatives. The report highlights Somalia's vast marine potential, underpinned by its long coastline and productive Exclusive Economic Zone (EEZ), which hosts abundant migratory pelagic species, especially tuna. Following civil unrest, Somalia's fisheries data was primarily inaccurate, misreported, and highly underestimated by the FAO/IOTC until recent national data collection efforts clarified the nation's actual catch levels.

Recent initiatives, led by the Fisheries Data Collection Working Group (FDCWG), have implemented a robust system to monitor artisanal fisheries. This includes the use of logbooks, an observer scheme, and port sampling across key landing sites to gather reliable data on catch composition and fishing effort. Enhanced training for data collectors and digital tools for recording has improved data accuracy and compliance with IOTC requirements.

Conservation of vulnerable species, such as sharks, marine turtles, and seabirds, is a priority under Somalia's new Fisheries Law, which prohibits harmful fishing practices and mandates safe handling

and release protocols. The report also outlines future research programs on species such as mobulid rays and oceanic whitetip sharks, aiming to identify nursery areas and improve post-release survival rates. These efforts underscore Somalia's commitment to sustainable fisheries management and alignment with international conservation standards, enhancing its regional role in the IOTC area of competence

South Africa (IOTC-2024-SC27-NR24)

South Africa has two commercial fishing sectors that target tuna – the Large Pelagic Longline and the Tuna Pole-line (baitboat) sectors. The latter sector mainly targets albacore (*Thunnus alalunga*) and to a lesser degree yellowfin tuna (Thunnus albacares) and rarely operates in the IOTC Area of Competence. The Large Pelagic Longline sector comprises two fleets with different histories: The South African-flagged Large Pelagic Longline vessels that traditionally used swordfish (Xiphias gladius) targeting methods, and the Japanese-flagged vessels that operate under joint-ventures and fish for South African right holders. In more recent years, the South African-flagged longline fleet catch a combination of tropical and temperate tunas, alongside swordfish. In 2022 and 2023, 19 longline vessels were active in the IOTC Area of Competence. Effort (hooks set) increased by 2% from 2022 (1 295 129) to 2023 (1 326 564) but was still less than that of 2019 (1 355 677). Only one Japaneseflagged vessel operated under joint-venture in South African waters in 2021, with an increase in fishing effort by South African flagged vessels over the last few years. Since a large portion of the fleet operates on the west coast, the effort in the IOTC Area of Competence is influenced by the vessels' desire to fish further south crossing the 20°E boundary that separates the IOTC and ICCAT. Catches for some species showed a significant increase. There was no tuna pole-line effort in the Indian Ocean area of competence in 2023. A total of 139 652 hooks were observed in the IOTC area of competence during 2022 which equates to 21.6% observer coverage.

Sri Lanka (IOTC-2023-SC27-NR25)

The total production of tuna and tuna like species of Sri Lanka in year 2023 was 101,848t. 73% of the catch was from the EEZ. 29%of the total catch was Yellow fin tuna, 37%Skipjack tuna and 6.3%was bigeye tuna.13.2% of the total catch was bill fish while Sword fish dominate in the catch. The total shark catch was 1392t. The YFT catch reductions adhered as per 21/01. Large scale Gill net are surveyed and being reduced in number and length to comply with resolution 17/07.

Over 5400 boats engaged in large pelagic fishing in both high seas and within EEZ. 1796 vessels were authorized to fish in high seas. Majority of vessels are less than 15m in length and only 5 vessels are more than 24m in length. Vessel marking and gear marking is legally mandatory. VMS is mandatory for high seas operating vessels. Major fishing gears were long line and gill net. The gill nets are being discouraged and directed to selective gears. 32.6%, 21.6% and 21% of vessels were exclusively operated for longline, gill net and ring net respectively. 24.8% of the vessels used multigear of more or less combinations of the above gears in seasonal or incidental manner.

By-catch data reporting and mitigatory measures are being followed as per the resolutions concerned. On board observers were deployed in all vessels >24m and pilot project on EMS is ongoing. Ten number of trained, IOTC registered human observers are in the pool and are being on service. Field sampling on landing is increased to achieve 5% observer coverage in ports.

Port State Measures are being implemented through e-PSM application. Coastal data collection is being improved by introducing better sampling techniques and to achieve the length frequency data as per the required proportions.

Sudan (No National Report Submitted)

Tanzania (IOTC-2024-SC27-NR27)

As a developing coastal state, Tanzania is actively advancing the sustainable utilisation and management of its marine fisheries resources. Industrial tuna fisheries operate within the Tanzanian

Exclusive Economic Zone (EEZ), whereas semi-industrial and artisanal fisheries operate within territorial waters. Industrial fishers employ mostly longlines and purse seines. In 2023, two Tanzania-flagged longlines and one purse seiner operated within the EEZ and on the high seas. These vessels reported a combined catch of Yellowfin tuna (2643.29 tons), Bigeye tuna (964.21 tons), Skipjack tuna (8913.1 tons), Swordfish (22.66 tons), Blue marlin (7.27 tons), Albacore (59.8 tons), Black marlin (1.14 tons), Sailfish (3.38 tons), Frigate tuna (238.1 tons) and Striped marlin (0.68 tons). Longline fishing accounted for 267.23 tons, while purse seine yielded 12,743 tons.

Artisanal fisheries used ring nets, gill nets, handlines, and small coastal longlines contributed largely to the tuna catch in 2023. Over 7,528.72 tons of IOTC species were landed comprising Kanadi kingfish (490.28 tons), Bigeye tuna (774.37 tons), Swordfish (702.91 tons), Yellowfin tuna (775.91 tons), Kawakawa (1176.03 tons), Bullet tuna (3.09 tons), Longtail tuna (2277.09 tons), Frigate tuna (401.26 tons), Wahoo (46.59 tons), Narrow barred Spanish mackerel (507.67 tons), and Shark nei (23.68 tons).

Tanzania has been bolstering its fisheries data collection and reporting systems through capacity-building initiatives, including FAO and the IOTC Secretariat technical support. For instance, training conducted in 2020, 2022, and 2023 enhanced the skills of fisheries officers in data collection and handling and facilitated the upgrade of the Fisheries Information System (FIS) to capture data from industrial and artisanal fisheries better. Efforts to improve species identification, biometric data collection, and data integration across fisheries management authorities are ongoing, reflecting the complexity of managing marine fisheries in the country.

Thailand (IOTC-2024-SC27-NR28)

In 2023, Thailand's fisheries sector continued to demonstrate commitment to sustainable resource management, focusing on key species such as neritic tunas, skipjack, and yellowfin tuna in the Andaman Sea. The Thai fishing fleet includes 218 purse seine vessels operating exclusively within the Thai Exclusive Economic Zone (EEZ). There were no Drifting Fish Aggregating Devices (DFADs) used by Thai purse seine fisheries while Anchored Fish Aggregating Devices (AFADs) are used to target small pelagic fishes. The catch of IOTC-managed species was 24,806 tons, with longtail tuna, kawakawa, and bullet tuna making up the largest composition of 24.56%, 22.72%, and 22.39% of the total catch, respectively.

Thailand has implemented robust conservation measures to protect vulnerable marine species, including turtles, seabirds, and sharks, following international guidelines and national regulations. The National Plan of Action for Sharks (NPOA Sharks) and other protective actions for seabirds and marine turtles outline systematic conservation approaches and are supported by data collected through logbooks, port sampling, and satellite transmission from offshore fishing activities. Furthermore, Thailand adheres to mandatory reporting requirements, ensuring transparency and accountability within the IOTC framework.

Despite facing challenges such as increased fuel costs and labour shortages, Thailand remains committed to reducing fishing pressure through fishing day scheme, seasonal closures, and gear restrictions. The report highlights ongoing research initiatives on bycatch species and shark biology, aiming to enhance data - driven management and conservation policies in Thai fisheries.

United Kingdom of Great Britain and Northern Ireland (IOTC-2024-SC27-NR29)

This report is from the UK and primarily concerns the recreational fisheries in the British Indian Ocean Territory (BIOT). The UK had no commercial fleet operating during 2023.

BIOT waters are a no-take Marine Protected Area (MPA) to commercial fishing. Diego Garcia and its territorial waters are excluded from the MPA and include a recreational fishery. UK (BIOT) does not operate a flag registry and has no commercial tuna fleet or fishing port. The UK National Report summarises fishing in the BIOT recreational fishery in 2023 and provides details of research activities undertaken to date within the MPA.

The recreational fishery landed eight tonnes of tuna and tuna like species on Diego Garcia in 2023. Principle target tuna species of the industrial fisheries (yellowfin and skipjack tunas) contributed to

15.1% of the total catch of tuna and tuna like species of the recreational fishery. Recognising that yellowfin tuna are currently overfished and subject to overfishing in the Indian Ocean and that Resolution 21/01 seeks to address this, UK(BIOT) have been taking action to reduce the number of yellowfin tuna caught in the BIOT recreational fishery and encouraging their live release. Length frequency data were recorded for all tuna and tuna-like species in the recreational fishery. A total of213 yellowfin tuna from this fishery and the mean length was 70.4cm. Sharks caught in the recreational fishery are released alive.
IUU fishing remains one of the greatest threats to the BIOT ecosystem but a range of other threats exist including invasive and pest species, climate change, coastal change, disease and pollution, including discarded fishing gear such as Fish Aggregating Devices. During 2023 the BIOT Environment Officer continued to take forward the current conservation priorities. Recommendations of the Scientific Committee and those translated into Resolutions of the Commission have been implemented as appropriate by the BIOT Authorities.

Yemen (No National Report Submitted)

Liberia (IOTC-2024-SC27-NR31)
Liberia's status as a cooperating non-contracting party (CNCP) of the India Ocean Tuna commission was renewed by the IOTC Commission last year. In accordance with its CNCP status, there are currently 13 Liberian flagged carrier and support vessels authorized to conduct transshipment operations in the IOTC Convention Area. Liberia remains fully committed to working with IOTC in promoting cooperation among the Contracting Parties and Cooperating Non Contracting Parties of the IOTC with a view to ensuring, through appropriate management, the conservation and optimum utilization of stocks covered by the organization. This is done through commitment to implement and comply with conservation and management measures (CMMs) of the IOTC Commission. Liberia will continue to implement measures such as vessel monitoring system (VMS), authorization to transship and establishment of fisheries monitoring center (FMC) to ensure compliance by its vessels.
In addition to its status as a flag state, Liberia is also a fishing nation with different and vast fisheries including tuna and tuna-like species such as Bigeye, Yellowfin, Skipjack, Albacore billfishes and small tunas. In addition to giving Liberia the experience and competence in fisheries management, fishery sector remains a major source of revenue, employment and food security for the country.
A lot of gains have been made in ensuring the proper management of the fisheries sector of Liberia. There were two purse seine tuna vessels flagged to Liberia and conducted fishing activities for the reporting period, although these vessels did not operate within the IOTC Area. There were access agreements signed during the 2022 and the vessels operated within the ICCAT Area, therefore, the agreements were transmitted to ICCAT Secretariat. Under access agreement, there were 33 vessels that obtained licenses to fish for tuna and tuna like species in the EEZ of Liberia. For the industrial fisheries, the catches for the two flag vessels is estimated at 8721.87 tons of which 77.61% (6769.37 tons) was SKJ, 19.84% tons was YFT and 2.55% (222.04) tons was BET. There are approximately 650 canoes targeting tuna and tuna like species throughout the 114 fish landing sites along the nine coastal counties of Liberia.

APPENDIX 6

STATUS OF DEVELOPMENT AND IMPLEMENTATION OF NATIONAL PLANS OF ACTION (NPOA) FOR SEABIRDS AND SHARKS AND IMPLEMENTATION OF THE FAO GUIDELINES TO REDUCE MARINE TURTLE MORTALITY IN FISHING OPERATIONS (2024)

CPC	Sharks	Date of Implementation	Seabirds	Date of implementation	Marine turtles	Date of implementation	Comments
MEMBERS							
Australia		1st: April 2004 2nd: July 2012 3rd: 2021 4th: August 2024		1st: 1998 2nd: 2006 3rd: 2014 NPOA in 2018.		2003	**Sharks:** 3rd NPOA-Sharks (Shark-plan 3) was released in 2021 replacing the previous Shark-plan 2.. Australia produced a revised NPOA for the conservation and management of sharks (Revised Shark-plan 2) in 2024. **Seabirds:** Has implemented a Threat Abatement Plan [TAP] for the Incidental Catch (or Bycatch) of Seabirds During Oceanic Longline Fishing Operations since 1998. The present TAP took effect from 2014 and largely fulfilled the role of an NPOA in terms of longline fisheries. http://www.antarctica.gov.au/__data/assets/pdf_file/0017/21509/Threat-Abatement-Plan-2014.pdf. In 2018 Australia finalised, an NPOA to address the potential risk posed to seabirds by other fishing methods, including longline fishing in state and territory waters, which are not covered by the current threat abatement plan. **Marine turtles:** Australia's current marine turtle bycatch management and mitigation measures fulfil Australia's obligations under the FAO-Sea turtles Guidelines.
Bangladesh			n.a.				**Sharks:** Bangladesh has finalised a NPOA for shark and rays which will be in place for 2023-2027. The Wildlife Conservation and Security Act introduced in 2012 lays out rules on requirements for hunting wild animals. It includes provisions for the protection of sharks and rays including the species for which there are active IOTC CMMs (hammerhead, blue, mako, silky, oceanic whitetip, thresher and whale sharks, and mobulid rays). **Seabirds:** Bangladesh currently do not have a NPOA for seabirds. The Wildlife Conservation and Security Act introduced in 2012 lays out rules on permits required to hunt wild animals and includes provisions for the protection of seabirds. Bangladesh does not have any flagged purse seine or longline vessels so do not consider there to be any problems with seabird interactions in their fisheries. **Marine turtles:** Bangladesh currently have no information on their implementation of FAO guidelines on sea turtles. The Wildlife Conservation and Security Act introduced in 2012 lays out rules on requirements for hunting wild animals and includes provisions for the protection of marine turtles. A Marine Fisheries Rules act was finalised in 2023 which requires the use of turtle excluder devices onboard shrimp trawlers. The act also requires live release of marine turtles for all gear and the mandatory use of circle hooks for hook and line fishing.

China		–		–			**Sharks:** China is currently considering developing an NPOA for sharks. Regulations relating to the conservation of sharks managed by RFMOs have been updated. Targeted distant water fisheries for sharks and rays are prohibited and vessels must avoid or reduce catching of sharks. Sharks (species not under a retention ban) caught as bycatch shall be fully utilised and finning is prohibited. Longliners are prohibited from using shark lines and wire tracers. **Seabirds:** China is currently considering developing an NPOA for seabirds. Regulations relating to the conservation of seabirds managed by RFMOs have been updated. Vessels operating in the area south of 25ºS shall use two mitigation measures from: tori lines, night setting and weighted branch lines. They may also use hook-shielding devices to replace the above three measures. **Marine turtles:** Regulations relating to the conservation of turtles managed by RFMOs has been updated. All longlines shall use circle hooks whenever possible. Longline vessels are encouraged to use finfish as bait, not squid.
–Taiwan,China		1st: May 2006 2nd: May 2012		1st: May 2006 2nd: Jul 2014			**Sharks:** No revision currently planned. **Seabirds:** No revision currently planned. **Marine turtles:** Wildlife Protection Act introduced in 2013, Protected Wildlife shall not be disturbed, abused, hunted, killed, traded, exhibited, displayed, owned, imported, exported, raised or bred, unless under special circumstances recognized in this or related legislation. *Cheloniidae spp*., *Caretta Caretta*, *Chelonia mydas*, *Eretmochelys imbricata, Lepidochelys olivacea* and *Dermochelys coriacea* are listed into List of Protected Species. Domestic Fisheries Management Regulation on Far Sea Fisheries request all fishing vessels must carry line cutters, de-hookers and hauling nets in order to facilitate the appropriate handling and prompt release of marine turtles caught or entangled.
Comoros		–		–			**Sharks:** No NPOA has been developed. Shark fishing is prohibited but measures are difficult to enforce due to the artisanal nature of the fisheries. A campaign to raise awareness of measures is being implemented to improve compliance. Shark catches and size frequency data are submitted to IOTC **Seabirds:** No NPOA has been developed. There is no fleet in operation south of 25 degrees south and no long-line fleet. The main fishery is artisanal operating within 24 miles of the coast where there is low risk of interactions with seabirds. **Marine turtles:** According to the Comoros Fisheries Code Article 78, fishing, capture, possession and marketing of turtle and marine mammals or of protected aquatic organisms is strictly forbidden in accordance with national legislation in force and International Conventions applicable to the Comoros.

European Union		5 Feb 2009		16-Nov-2012		2007	Regulation n°2021-47 of 9th of July 2021 legislating tuna and tuna-like species fisheries includes marine species protection measures, especially in its Annex 2, aiming to reduce the impact on marine turtles, sea birds and sharks. **Sharks:** Approved on 05-Feb-2009 and it is currently being implemented. **Seabirds:** The EU adopted on Friday 16 November 2012 an Action Plan to address the problem of incidental catches of seabirds in fishing gears. A specific national plan of action has been published for Albatrosses which runs from 2018-2027. **Marine turtles**: European Union Council Regulation (EC) No 520/2007 of 7 May 2007 lay down technical measures for the conservation of marine turtles including articles and provisions to reduce marine turtle bycatch. The regulation urges Member States to do their utmost to reduce the impact of fishing on sea turtles, in particular by applying the measures provided for in paragraphs 2, 3 and 4 of the resolution.
France (territories)		2009		2009, 2011		2015	**Sharks:** approved on 05-Feb-2009. **Seabirds:** Implemented in 2009 and 2011. 2009 for Barrau's petrel and 2019 for Amsterdam albatross which will be in force from 2018-2027. **Marine turtles:** Implemented in 2015 for the five species of marine turtles that are present in the southwest Indian Ocean for the period 2015-2020. This is still being applied and currently being revised and will be published in 2025.
India							**Sharks:** In preparation. In June 2015, India published a document entitled "Guidance on National Plan of Action for Sharks in India" which is intended as a guidance to the NPOA-Sharks, and seeks to (1) present an overview of the currents status of India's shark fishery, (2) assess the current management measures and their effectiveness, (3) identify the knowledge gaps that need to be addressed in NPOA-Sharks and (4) suggest a theme-based action plan for NPOA-Sharks. **Seabirds:** India has determined that seabird interactions are not a problem for their fleets. However, a formal evaluation has not yet taken place which the WPEB and SC require. **Marine turtles:** No information received by the Secretariat.

Indonesia		–		–			**Sharks:** Indonesia first drafted a NPOA in 2010 then later developed a revised NPOA for sharks and rays for the period 2016-2020. Indonesia has also established a national plan of action for whale sharks from 2021-2025 through Ministerial Decree No. 16 of 2021. Indonesia plans to review the NPOA for sharks in 2025 **Seabirds:** An NPOA was finalized in 2016 **Marine turtles:** Indonesia has established an NPOA for Marine Turtles in 2022 and this will be reviewed in 2025. Indonesia has also been implementing Ministerial Regulations 12/2012 and 30/2012 regarding capture fishing business on high seas to reduce turtle bycatch. Indonesia is also cooperating with Coral Triangle countries including Malaysia, the Philippines, the Solomon Islands, Papua New Guinea, and Timor Leste through Coral Triangle Initiatives on Coral Reefs, Fish, and Food Security (CTI CFF) platform to protect threatened migratory species, including marine turtles. The CTI CFF is now developing a regional plan of action (RPOA) 2020-2030 and areas of critical habitats, such as migratory corridors, nesting beaches, and Inter-nesting and feeding areas, have been identified.
Iran, Islamic Republic of		–		–		–	**Sharks:** Have communicated to all fishing cooperatives the IOTC resolutions on sharks. Have in place a ban on the retention of live sharks. **Seabirds:** I.R. Iran determined that seabird interactions are not a problem for their fleet as they consist of gillnet vessels only. i.e. no longline vessels. **Marine turtles:** No information received by the Secretariat.
Japan		03-Dec-2009, 2016		03-Dec-2009, 2016			**Sharks:** NPOA–Shark assessment implementation report submitted to COFI in July 2012 has since been revised in 2016 and again in 2023. **Seabirds:** NPOA–Seabird implementation report submitted to COFI in July 2012 (Revised in 2016). **Marine turtles:** All Japanese fleets fully implement Resolution 12/04.
Kenya			n.a.	–			**Sharks:** A National Plan of Action for sharks has been finalised and is awaiting cabinet approval. This document shall put in place a framework to ensure the conservation and management of sharks and their long-term sustainable use in Kenya. **Seabirds:** Kenya does not have any flagged longline vessels on its registry. There is no evidence of any gear seabird interaction with the current fishing fleet. Kenya has prepared a NPOA for seabirds which is in the process of being reviewed by relevant stakeholders. **Marine turtles:** The Kenyan fisheries law prohibits retention and landing of turtles caught incidentally in fishing operations. Public awareness efforts are conducted for artisanal gillnet and artisanal longline fishing fleets on the mitigations measures that enhance marine turtle conservation. Kenya has prepared a NPOA for marine turtles which is in the process of being reviewed by relevant stakeholders.
Korea, Republic of		08-Aug-11		2019		–	**Sharks:** Currently being implemented. **Seabirds:** NPOA seabirds was submitted to FAO in 2019. **Marine turtles:** All Rep. of Korea vessels fully implement Res 12/04.

Madagascar		–		–			**Sharks:** Madagascar has developed a NPOA for sharks which is awaiting final ministerial approval. **Seabirds:** Development has not begun. Note: A fisheries monitoring system is in place in order to ensure compliance by vessels with the IOTC's shark and seabird conservation and management measures. **Marine turtles:** There is zero capture of marine turtle recorded in logbooks. All longliners use circle hooks. This has been confirmed by onboard observers and port samplers.
Malaysia		2008 2014		–		2008	**Sharks:** A revised NPOA-sharks was published in 2014. **Seabirds:** To be developed **Marine turtles:** A NPOA For Conservation and Management of Sea Turtles had been published in 2008. A revision will be published in 2017.
Maldives, Republic of		Apr 2015	n.a.	–			**Sharks:** NPOA Sharks was finalised in 2015 with the assistance of Bay of Bengal Large Marine Ecosystem (BoBLME) Project. On 14th July 2019 the Government of Maldives officially announced the cessation of the Maldives long line fishery in Maldives EEZ and High Seas so consider the NPOA for sharks to now be unnecessary. **Seabirds** Maldives is in the final stages of developing an action plan on seabird nesting sites. Article 12 of IPOA states that if a 'problem exists' CPCs adopt an NPOA. IOTC Resolution 05/09 suggests CPCs to report on seabirds to the IOTC Scientific Committee if the issue is appropriate'. Maldives considers that seabird entanglement and bycatch is not an issue in Maldives fisheries especially with the cessation of the Maldives long line fishery in 2019. **Marine turtles:** Standards of code and conduct for managing sea turtles have been developed by the Environmental Protection Agency in the drafted national sea turtle management plan under the protected species regulation. Longline regulation has provisions to reduce marine turtle bycatch. The regulation urges longline vessels to have dehookers for removal of hook and a line cutter on board, to release the caught marine turtles as prescribed in Resolution 12/04.
Mauritius		2016					**Sharks:** The NPOA-sharks has been finalised; it focuses on actions needed to exercise influence on foreign fishing through the IOTC process and licence conditions, as well as improving the national legislation and the skills and data handling systems available for managing sharks. **Seabirds:** Mauritius does not have national vessels operating beyond 25^0S. However, fishing companies have been requested to implement all mitigation measures as provided in the IOTC Resolutions. There are currently no plans to develop a NPOA for seabirds. **Marine turtles:** Marine turtles are protected by the national law. Fishing companies have been **requested** to carry line cutters and de-hookers in order to facilitate the appropriate handling and prompt release of marine turtles caught or entangled. There are currently no plans to develop a NPOA for marine turtles.

Mozambique		–		–			**Sharks**: Drafting of the NPOA-Shark started in 2016. At this stage, a baseline assessment was performed and the relevant information of coastal, pelagic and demersal shark species along the Mozambican coast was gathered. **Seabirds**: Mozambique is regularly briefing the Masters of their fishing vessels on the mandatory requirement to report any seabird interaction with longliner fleet. **Marine turtles**: see above.
Oman, Sultanate of							**Sharks:** The drafting of an NPOA-sharks started in 2017 but has not yet been finalised. **Seabirds:** Not yet initiated. **Marine turtles:** The law does not allow the catch of sea turtles, and the fishermen are requested to release any hooked or entangled turtle. The longline fleet are required to carry out the line cutters and de-hookers.
Pakistan							**Sharks:** A stakeholder consultation workshop was conducted in 2016 to review the actions of the draft NPOA - Sharks. The final version of the NPOA - Sharks has been submitted to the provincial fisheries departments for endorsement but has not yet been finalised. Meanwhile, the provincial fisheries departments have passed notification on catch, trade and/or retention of sharks including Thresher sharks, hammerheads, oceanic whitetip, whale sharks, guitarfishes, sawfishes, wedgefishes and mobulids. Sharks are landed with the fins attached and each and every part of the body of sharks are utilised. **Seabirds:** Pakistan considers that seabird interactions are not a problem for the Pakistani fishing fleet as the tuna fishing operations do not include longline vessels. **Marine turtles:** Pakistan has already framed Regulations regarding the prohibition of catching and retaining marine turtles. As regards to the reduction of marine turtle bycatch by gillnetters; presently Marine Fisheries Department (MFD) in collaboration with International Union for Conservation of Nature (IUCN) Pakistan, is undertaking an assessment. Stakeholder Coordination Committee Meeting was conducted on 10th September 2014. The "Turtle Assessment Report (TAR)" will be finalized by February 2015 and necessary guidelines / action plan will be finalized by June 2015. As per clause-5 (c) of Pakistan Fish Inspection & Quality Control Act, 1997, "Aquatic turtles, tortoises, snakes, mammals including dugongs, dolphins, porpoises and whales etc" are totally forbidden for export and domestic consumption. Pakistan is also in the process of drafting a NPOA for cetaceans.
Philippines		Sept. 2009		–			**Sharks:** A NPOA sharks was published in 2009 and this document is under periodic review. **Seabirds:** Development has not begun. **Marine turtles:** No information received by the Secretariat.

Seychelles, Republic of		Apr-2007 2016		–			**Sharks:** Seychelles developed and is implementing a NPOA for Sharks for years 2016-2020 which has been extended for 2024. Seychelles are working to develop a new NPOA for sharks which should be complete by mid-2025. **Seabirds:** SFA is collaborating with Birdlife South Africa to develop an NPOA for seabirds. **Marine turtles:** The development of a NPOA for turtles is planned to start in 2025.
Somalia							**Sharks:** Somalia is currently revising its fisheries legislation (current one being from 1985) and has completed the necessary steps for required for the consultative process to begin in order to develop these NPOA. **Seabirds:** See above. **Marine turtles:** The Somali national fisheries law and legislation was reviewed and approved in 2014. This includes Articles on the protection of marine turtles. Further review of the National Law is underway to harmonize this with IOTC Resolutions and is expected to be presented to the new parliament for endorsement in 2017.

South Africa, Republic of		2013 2022		2008			**Sharks**: The NPOA-sharks was first approved and published in 2013. A revised version of the document was finalised in 2022 following extensive review including input from the research community and affected stakeholders. **Seabirds**: The NPOA seabirds was published in August 2008 and fully implemented. An updated NPOA has been drafted and is now awaiting approval. **Marine turtles**: All FAO guidelines to reduce marine turtle mortality have been inserted into permit conditions. A report from 2019 on the implementation of FAO guidelines to reduce marine turtle mortality has been provided to the IOTC. Bycatch in South African fisheries is considered to be very low. The South African permit conditions for the large pelagic longline fishery prohibits landing of turtles. All interactions with turtles are recorded, by species, within logbooks and in observer reports, including data on release condition. Vessels are required to carry a de-hooker on board and instructions on turtle handling and release in line with the FAO guidelines are included in the South African Large Pelagic permit conditions. All turtle interactions in respective areas of competence are reported to the respective RFMOs. Recent South African led studies on impact of marine debris on turtles have been published in the scientific literature (Ryan et al. 2016). Marine turtle nesting sites in South Africa are protected by coastal MPAs since 1963.
Sri Lanka		2013 2018					**Sharks:** The first NPOA-sharks was finalized in 2013 then revised in 2018 which was valid until 2022. This version is in the process of being reviewed with assistance from CEFAS. Shark data collection is done through logbooks and a large pelagic data collection programme. NARA has started to collect fisheries and biological data on blue, silky and scalloped hammerhead sharks. **Seabirds:** Sri Lanka has determined that seabird interactions are not a problem for their fleets. However, a formal review has not yet been provided to the WPEB and SC for approval. **Marine turtles:** Implementation of the FAO Guideline to Reduce Sea Turtle Mortality in Fishing Operation in 2015 was submitted to IOTC in January 2016. Marine turtles are legally protected in Sri Lanka. Longliner vessels are required to have dehookers for removal of hooks and a line cutter on board, to release the caught marine turtles. Gillnets longer than 2.5 km are now prohibited in domestic legislation. Reporting of bycatch has made legally mandatory and facilitated via logbooks.
Sudan							**Sharks:** No information received by the Secretariat. **Seabirds:** No information received by the Secretariat. **Marine turtles:** No information received by the Secretariat.
Tanzania, United Republic of		–		–			**Sharks:** A NPOA has been drafted but not finalised. **Seabirds:** Initial discussions have commenced. Note: Terms and conditions related to protected sharks and seabirds contained within fishing licenses. **Marine turtles:** Sea turtles are protected by law. However, as there is a national turtle and Dugong conservation committee that oversee all issues related to sea turtles and dugongs. There is no information so far with regards to interaction between sea turtles and long line fishery.

Thailand		2020		–			**Sharks:** An updated NPOA Sharks has been developed for the years 2020-2024 and has been submitted to the Secretariat and FAO. **Seabirds:** Currently the draft NPOA – Seabirds for Thailand is being reviewed. Thailand has the Notification of the Department of Fisheries on Requirement and Regulations of Fishing Vessels Operating Outside Thai Water in IOTC Area of Competence (IOTC) B.E. 2565 (2022), Clause 18 and 21 include requirements for line-cutters and dehookers to be carried for releasing marine animals and for any fishing vessel operating south of 25°S to follow the measures for mitigating capture of seabirds. **Marine turtles:** Thailand reports on progress of the implementation of FAO guidelines on turtles in their National Report to IOTC. Regulations on Fishing Vessels operating outside Thai waters in the IOTC area of competence contains clauses relating to the conservation of marine turtles including: Clause 14 prohibiting purse seines from setting around cetaceans, marine turtles or whale sharks; Clause 18 requiring the release and recording of incidental bycatch of sensitive species including marine turtles; Clause 19 requiring that any bycaught marine turtles that are not healthy should be cared for until it is ready to be released.
United Kingdom	n.a.	–	n.a.	–		–	British Indian Ocean Territory (Chagos Archipelago) waters are a Marine Protected Area closed to fishing except recreational fishing in the 3nm territorial waters around Diego Garcia. Separate NPOAs have not been developed within this context. **Sharks/Seabirds:** For sharks, UK is the 24th signatory to the Convention on Migratory Species 'Memorandum of Understanding on the Conservation of Migratory Sharks' which extends the agreement to UK Overseas Territories including the British Indian Ocean Territory; Section 7 (10) (e) of the *Fisheries (Conservation and Management) Ordinance* refers to recreational fishing and requires sharks to be released alive. No seabirds are caught in the recreational fishery. **Marine turtles:** No marine turtles are captured in the recreational fishery. A monitoring programme is taking place to assess the marine turtle population in UK (OT). In August 2022 the UK Government published the Bycatch Mitigation Initiative which applies to metropolitan UK waters but includes commitments to work with the international community to contribute to the understanding, reduction and elimination of bycatch globally, including by advocating for effective measures through RFMOs.
Yemen							**Sharks:** No information received by the Secretariat. **Seabirds:** No information received by the Secretariat. **Marine turtles:** No information received by the Secretariat.

COOPERATING NON-CONTRACTING PARTIES							
Liberia							**Sharks:** Liberia does not currently have a NPOA for sharks **Seabirds:** No information received by the Secretariat. **Marine turtles:** No information received by the Secretariat.

Colour key	
Completed	
Drafting being finalised	
Drafting commenced	
Not begun	

APPENDIX 7

LIST OF CHAIRS, VICE-CHAIRS AND THEIR RESPECTIVE TERMS FOR THE IOTC SCIENTIFIC COMMITTEE AND ITS SUBSIDIARY BODIES

Group	Chair/Vice-Chair	Chair	CPC/Affiliation	1st Term commencement date	Term expiration date (End date is until replacement is elected)	Comments
SC	Chair	Dr Toshihide Kitakado	Japan	10–Dec–19	End of SC in 2025	Ext 2nd term
	Vice-Chair	Dr Fayakun Satria	Indonesia	8–Dec–24	End of SC in 2026	1st term
WPB	Chair	Dr Jie Cao	China	08–Sep–23	End of WPB in 2025	1st term
	Vice-Chair	Dr Sylvain Bonhommeau	EU,France	08–Sep–23	End of WPB in 2025	1st term
WPTmT	Chair	Dr Toshihide Kitakado	Japan	29–July–22	End of WPTmT in 2028	1st term
	Vice-Chair	Dr Jiangfeng Zhu	China	29–July–22	End of WPTmT in 2028	1st term
WPTT	Chair	Dr Gorka Merino	EU,Spain	03–Nov–23	End of WPTT in 2025	Ext 2nd term
	Vice-Chair	Dr Shiham Adam	IPNLF	03–Nov–23	End of WPTT in 2025	Ext 2nd term
WPEB	Chair	Dr Mariana Tolotti	EU,France	15–Sept–21	End of WPEB in 2025	2nd term
	1st Vice-Chair	Dr Mohamed Koya	India	15–Sept–21	End of WPEB in 2025	2nd term
	2nd Vice-Chair	Dr Charlene da Silva	South Africa	15–Sept–21	End of WPEB in 2025	2nd term
WPNT	Chair	Dr Farhad Kaymaram	I.R. Iran	7–July–23	End of WPNT in 2025	1st term
	Vice-Chair	Mr Bram Setyadji	Indonesia	7–July–23	End of WPNT in 2025	1st term
WPDCS	Chair	Dr Julien Barde	EU,France	3–Dec–21	End of WPDCS in 2025	2nd term
	Vice-Chair	Mr Nuwan Gunawardane	Sri Lanka	3–Dec–21	End of WPDCS in 2025	2nd term
WPM	Chair	Dr Hilario Murua	ISSF	28–Oct–23	End of WPM in 2025	Ext term
	Vice-Chair	Dr Ann Preece	Australia	28-Oct-23	End of WPM in 2025	1st term
WPSE	Chair	Dr Umi Muawanah	Indonesian	25–Oct–24	End of WPSE in 2026	1st term
	Vice-Chair	Ms Sheriffa Morel	Seychelles	25-Oct-24	End of WPSE in 2026	1st term
WGFAD	Co-Chair	Dr Gorka Merino	EU,Spain	06-Oct-21	End of WGFAD in 2025	2nd term
	Co-Chair	Mr Avelino Munwane	Mozambique	03-Oct-22	End of WGFAD in 2026	2nd term
WGEMS	Chair	Dr Hilario Murua	ISSF	17-Nov-21	End of WGEMS in 2025	2nd term
	Vice-Chair	Dr Don Bromhead	Australia	17-Nov-21	End of WGEMS in 2025	2nd term

APPENDIX 8
EXECUTIVE SUMMARY: ALBACORE (2024)

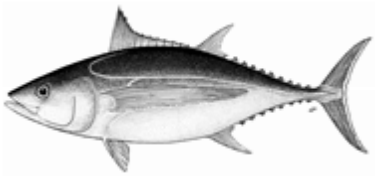


Table 1. Status of albacore (*Thunnus alalunga*) in the Indian Ocean

Area	Indicators – 2022 assessment		2022 stock status determination[3]
Indian Ocean[1]	Catch (2023) (t)[2]	41,678	85%
	Mean annual catch (2019-2023) (t)	40,747	
	MSY (x1,000 t) (95% CI)	45 (35-55)	
	F_{MSY} (80% CI)	0.18 (0.15-0.21)	
	SB_{MSY} (x1,000 t) (80% CI)	27 (21-33)	
	F_{2020} / F_{MSY} (80% CI)	0.68 (0.42-0.94)	
	SB_{2020} / SB_{MSY} (80% CI)	1.56 (0.89-2.24)	
	SB_{2020} / SB_0 (80% CI)	0.36 (0.26-0.45)	

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2023: 16.3%;
[3]2020 is the final year that data were available for this assessment

Table 2: Probability of stock status with respect to each of four quadrants of the Kobe plot. Percentages are calculated as the proportion of model terminal values that fall within each quadrant with model weights taken into account

	Stock overfished (SB_{2020} / SB_{MSY}<1)	Stock not overfished (SB_{2020} / SB_{MSY}≥ 1)
Stock subject to overfishing (F_{2020} / F_{MSY}≥ 1)	1%	9%
Stock not subject to overfishing (F_{2020} / F_{MSY}≤ 1)	5%	85%
Not assessed/Uncertain / Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was carried out for albacore in 2024, thus the stock status is determined on basis of the 2022 assessment. The stock assessment was carried out using Stock Synthesis III (SS3), a fully integrated model that is currently also used to provide scientific advice for the three tropical tunas stocks in the Indian Ocean. The model used in 2022 is based on the model developed in 2019 with a series of revisions that were noted during the WPTmT data preparatory meeting held in April 2022. There are some noticeable changes compared to the previous assessment data set, mainly related to how the fisheries are structured, and how the CPUE indices and length composition data are treated within the assessment model.

The current assessment has utilised the new joint CPUE series that shows some differences compared with the last assessment. This is mainly related to changes in standardisation methodology, which were partly caused by limited operational data access for joint CPUE analysis. Compared to the last assessment, the CPUE index in the southwestern fishery (LL3) shows a somewhat flatter overall trend, the CPUE index in the northwestern fishery (LL1) also exhibited considerably larger variability. Further, the size composition data are significantly down-weighted within the assessment model, and length samples from fisheries other than longline fisheries are effectively given a zero weight. This is to reduce the bias that can be introduced by potentially unrepresentative or problematic length samples.

The final set of model options included alternative models using the northwest and southwest CPUE indices. Both sets of indices suggested a considerable difference in biomass trend between 1990 and now which highlights the uncertainty with respect to the model estimates of recent biomass trends. The two sets of indices effectively monitor different components of the albacore stock. The CPUE in the western area (LL1+3) may best represent the abundance of albacore at this time. The western area also represents a significant proportion of the albacore biomass in the Indian Ocean. The eastern indices are affected by changes in targeting.

Trends in the northwest CPUE series suggest that the biomass vulnerable to longline has declined to around 45-50% of the levels observed in 1980-82, whereas a much smaller decline was observed in the southwest CPUE series for the same period. Prior to 1980 there were 20 years of moderate fishing, after which total catches of albacore tuna in the Indian Ocean have more than doubled (**Fig. 1**). Catches have also increased substantially since 2007 for some fleets (i.e., Indonesian and Taiwan,China longline fisheries), although there is substantial uncertainty regarding the reliability of the catch estimates. Catches in 2020 were marginally below the MSY level estimated by the SS3 model. Fishing mortality represented as F_{2020}/F_{MSY} is 0.68 (0.42–0.94). Biomass is estimated to be above the SB_{MSY} level (1.56 (0.89–2.24)) from the SS3 models (**Table 1**, **Fig. 3**). These changes in stock status since the previous assessment are mainly due to changes in the CPUE. Thus, the stock status in relation to the Commission's interim B_{MSY} and F_{MSY} target reference points indicates that the stock is **not overfished** and is not **subject to overfishing** (**Table 1**).

Outlook. The impacts of piracy in the western Indian Ocean resulted in the displacement of a substantial portion of longline fishing effort into the traditional albacore fishing areas in the southern and eastern Indian Ocean. However, in recent years the effort distribution in the Indian Ocean has been rather dynamic. Projections indicate that current catch appears to be sustainable in the short term although the projections are based on model assumptions that may be associated with high levels of uncertainty (see management advice below for more detail). It should be noted with caution that the short-term projections are more influenced by the recent low recruitment levels, whereas the long-term projections are more determined by the assumptions of average recruitment levels over the longer-term period.

Management advice. Considerable uncertainty remains in the SS3 assessment conducted in 2022, particularly due to the conflicts in key data inputs, caution is therefore advised for the interpretation of the K2SM. The K2SM indicates that there is little risk of violating the target and limit reference points with current and moderate increases in catch in the short term. Current catches (41,678t for the statistical year 2023; **Table 1**) are just above the estimated level of MSY.
There remains considerable uncertainty resulting from changes in the CPUE series which are not well understood, model instability in response to updated data, growth variability and poor fits to the size data. It should be noted that neither CPUE series or other model assumptions account for any change in catchability/effort creep over the time series.

The following should be noted:

- The primary sources of data that drive the assessment, total catches, CPUE and length data, are highly uncertain and should be developed further as a priority;
- The catch estimates for 2022 (46,625 t) are above the current estimated MSY levels (**Table 1**);
- A Kobe 2 Strategy matrix was calculated to quantify the risk of different future catch scenarios, using the projections from the SS3 models (**Table 3**);
- Provisional reference points: noting that the Commission in 2015 adopted Resolution 15/10 *On interim target and limit reference points and a decision framework*, the following should be noted:
  - **Fishing mortality**: the fishing mortality at the time of the assessment was considered to be below the interim target reference point of F_{MSY}, and therefore below the interim limit reference point of $1.4*F_{MSY}$ (**Fig. 3**)
  - **Biomass**: the spawning biomass at the time of the assessment was considered to be above the target reference point of SB_{MSY}, and therefore above the limit reference point of $0.4*SB_{MSY}$ (**Fig. 3**)
- **Main fisheries (mean annual catch 2019-2023)**: albacore are caught using longline (81.3%), followed by line (14.9%) and purse seine (1.8%). The remaining catches taken with other gears contributed to 2% of the total catches in recent years (**Fig. 1**).
- **Main fleets (mean annual catch 2019-2023)**: the majority of albacore catches are attributed to vessels flagged to Taiwan,China (53.8%) followed by Indonesia (23.3%) and China (9%). The 26 other fleets catching albacore contributed to 13.7% of the total catch in recent years (**Fig. 2**).

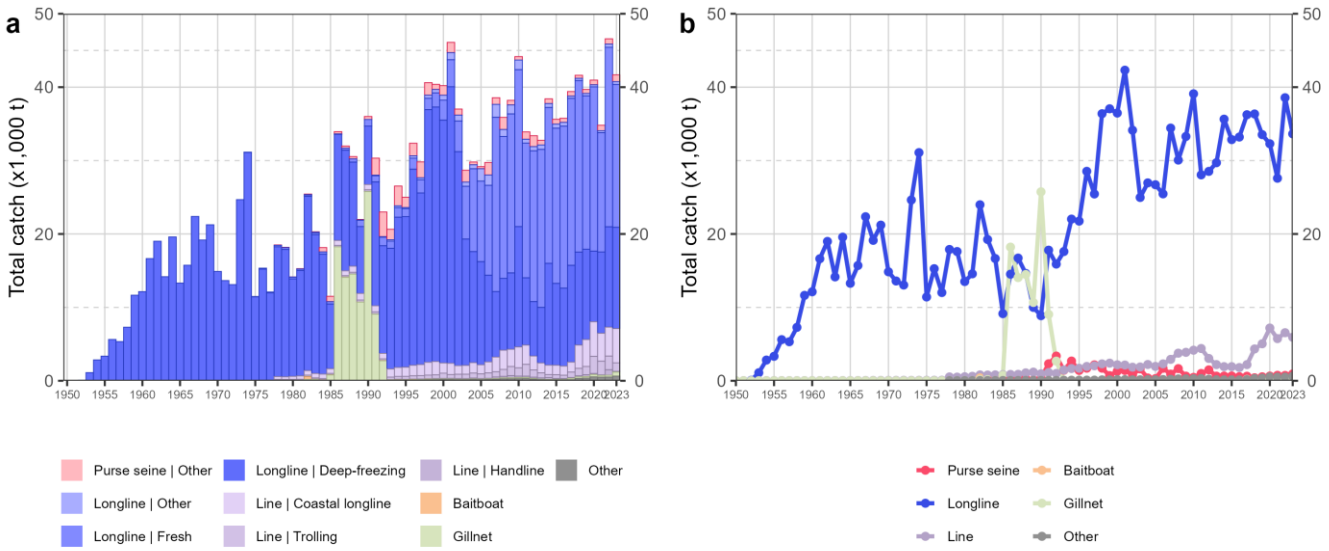


Fig. 1. Annual time series of (a) cumulative nominal catches (metric tonnes; t) by fishery and (b) individual nominal catches (metric tonnes; t) by fishery group for albacore during 1950-2023. Purse seine | Other: coastal purse seine, purse seine of unknown association type, ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

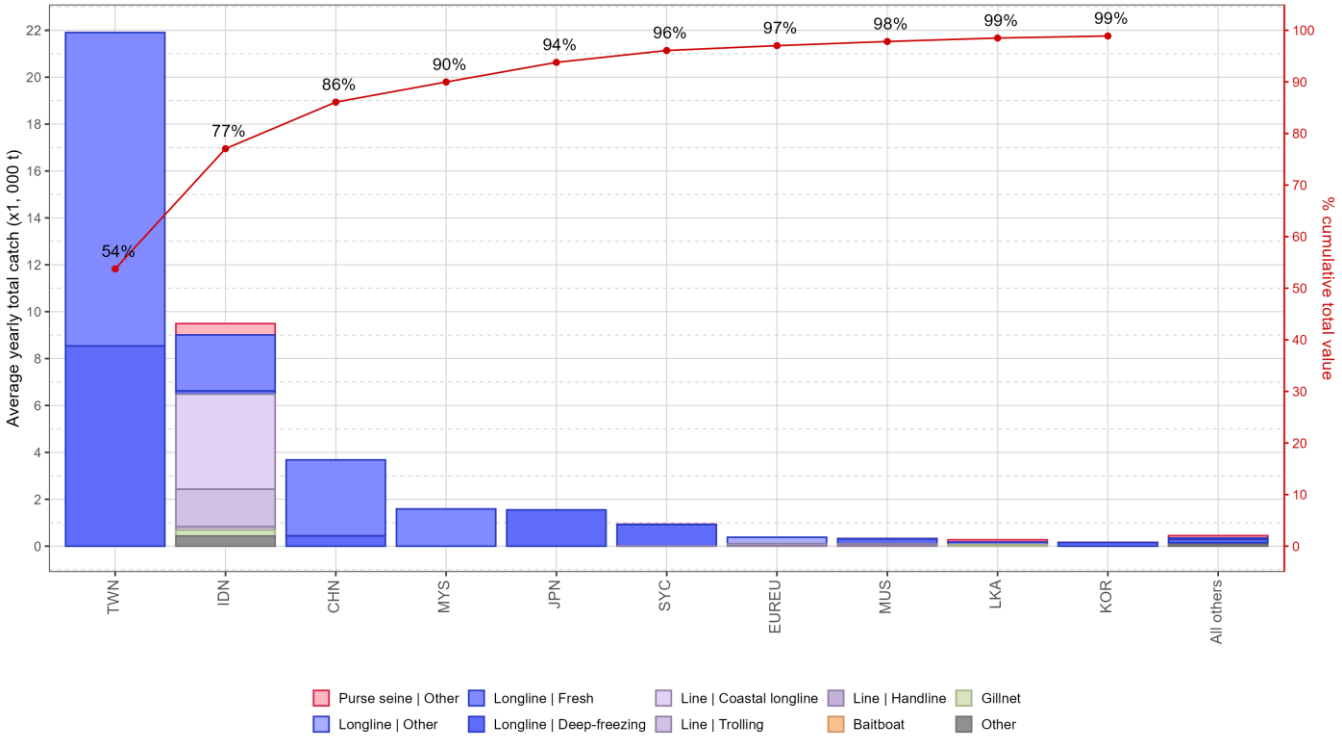


Fig. 2. Mean annual catches (metric tonnes; t) of albacore by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, purse seine of unknown association type, ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

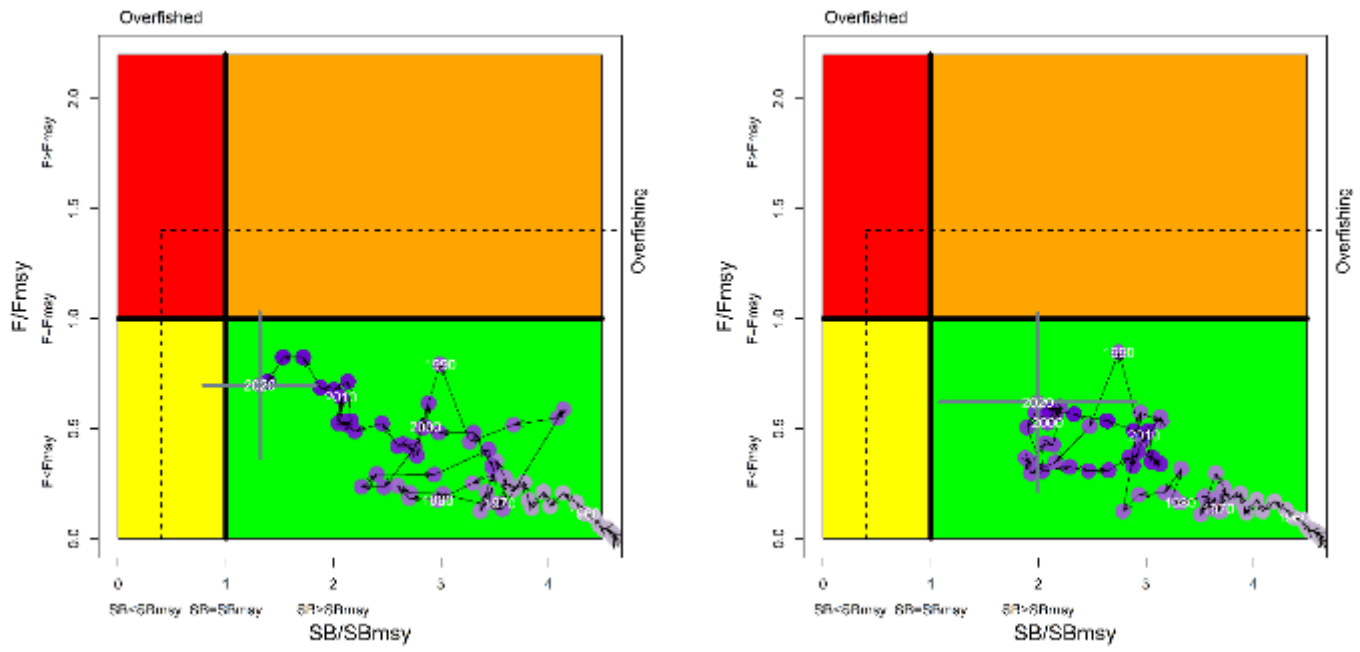


Fig. 3. Albacore: SS3 Indian Ocean assessment Kobe plot for the two model options considered: (i) Model fitted to the North-western CPUE; (ii) Model fitted to the South-western CPUE. Purple circles indicate the trajectory of the point estimates for the spawning biomass (SB) ratio and fishing mortality (F) ratio for each year 1950–2020 (the grey lines represent the 95 percentiles of the 2020 estimate). Target (F_{target} and SB_{target}) and limit (F_{lim} and SB_{lim}) reference points are shown

Table 3. Albacore: SS3 aggregated Indian Ocean assessment Kobe II Strategy Matrix based on the model options (i) Model 1 and (ii) Model 2. Probability (percentage) of violating the MSY-based target (top) and limit (bottom) reference points for constant catch projections (2020 catch level, ± 10%, ± 20%, ± 30% ± 40%) projected for 3 and 10 years

Reference point and projection timeframe	**Alternative catch projections (relative to the catch level for 2020) and probability (%) of violating MSY-based target reference points (SB_{targ} = SB_{MSY}; F_{targ} = F_{MSY})**								
	60% (24,644)	70% (28,751)	80% (32,858)	90% (36,966)	100% (41,073)	110% (45,180)	120% (49,288)	130% (53,395)	140% (57,502)
$SB_{2023} < SB_{MSY}$	0.006	0.016	0.022	0.036	0.045	0.069	0.097	0.123	0.154
$F_{2023} > F_{MSY}$	0	0	0.003	0.029	0.1	0.204	0.326	0.434	0.529
$SB_{2030} < SB_{MSY}$	0.03	0.047	0.087	0.135	0.19	0.28	0.395	0.505	0.603
$F_{2030} > F_{MSY}$	0	0	0.001	0.037	0.141	0.3	0.453	0.565	0.618
Reference point and projection timeframe	**Alternative catch projections (relative to the catch level for 2020) and probability (%) of violating MSY-based target reference points (SB_{Lim} = 0.4*SB_{MSY}; F_{Lim} = 1.4*F_{MSY})**								
	60% (24,644)	70% (28,751)	80% (32,858)	90% (36,966)	100% (41,073)	110% (45,180)	120% (49,288)	130% (53,395)	140% (57,502)
$SB_{2023} < SB_{Lim}$	0	0	0	0	0.001	0.002	0.005	0.006	0.012
$F_{2023} > F_{Lim}$	0	0	0	0	0.001	0.011	0.056	0.117	0.213
$SB_{2030} < SB_{Lim}$	0.004	0.009	0.022	0.042	0.074	0.118	0.169	0.243	0.344
$F_{2030} > F_{Lim}$	0	0	0	0	0.008	0.073	0.21	0.374	0.496

APPENDIX 9
EXECUTIVE SUMMARY: BIGEYE TUNA (2024)

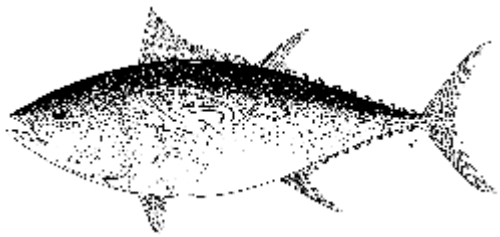


Table 1. Status of bigeye tuna (*Thunnus obesus*) in the Indian Ocean

Area[1]	Indicators		2022 stock status determination[4]
Indian Ocean	Catch 2023[2] (t) Mean annual catch 2019-2023 (t)[3]	105,369 94,691	79%
	MSY (1,000 t) (80% CI) F_{MSY} (80% CI) SB_{MSY} (1,000 t) (80% CI) F_{2021}/F_{MSY} (80% CI) SB_{2021}/SB_{MSY} (80% CI)	96 (83 – 108) 0.26 (0.18 – 0.34) 513 (332 – 694) 1.43 (1.10–1.77) 0.9 (0.75 – 1.05)	

[1]Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence
[2]Proportion of 2023 catch fully or partially estimated by IOTC Secretariat: 18.9%
[3]Including re-estimations of EU PS species composition for 2018 (only requested for stock assessment purposes)
[4]2021 is the final year that data were available for this assessment
*Estimated probability that the stock is in the respective quadrant of the Kobe Plot (**Table 2**), derived from the confidence intervals associated with the current stock status.

Table 2. Probability of stock status with respect to each of four quadrants of the Kobe plot. Percentages are calculated as the proportion of model terminal values that fall within each quadrant with model weights taken into account

	Stock overfished (SB_{2021} / SB_{MSY}<1)	Stock not overfished (SB_{2021} / SB_{MSY}≥ 1)
Stock subject to overfishing (F_{2021} / F_{MSY}≥ 1)	79%	17%
Stock not subject to overfishing (F_{2021} / F_{MSY}≤ 1)	2%	2%
Not assessed / Uncertain / Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was carried out for bigeye tuna in 2024 and so the advice is based on the 2022 assessment. In the 2022 assessment, two models were applied to the bigeye stock (Statistical Catch at Size (SCAS) and Stock Synthesis (SS3)), with the SS3 stock assessment selected to provide scientific advice. The reported stock status is based on a grid of 24 model configurations designed to capture the uncertainty on stock recruitment relationship, longline selectivity, growth and natural mortality. Spawning biomass in 2021 was estimated to be 25% (80% CI: 23-27%) of the unfished levels (**Table 1**) and 90% (75-105%) of the level that can support MSY. Fishing mortality was estimated at 1.43 (1.1-1.77) times the F_{MSY} level. Considering the characterized uncertainty, the assessment indicates that SB2021 is below SBMSY and that F_{2021} is above FMSY (79%). On the weight-of-evidence available in 2022, the bigeye tuna stock is determined to be **overfished** and **subject to overfishing** (**Table 2**).
As IOTC agreed on a bigeye Management Procedure (Res. 22/03) it should be noted that the stock assessment is not used to provide a recommendation on the TAC.

Management Procedure. A management procedure for Indian Ocean Bigeye tuna was adopted under Resolution 22/03 by the IOTC Commission in May 2022 and was applied to determine a recommended TAC for Bigeye tuna for 2024 and 2025. A review

of evidence for exceptional circumstances, was also conducted following the adopted guideline (ref SC 2021 report appendix 6A) as per the requirements of Resolution 22/03. The review covered information pertaining to i) new knowledge about the stock, population dynamics or biology, ii) changes in fisheries or fisheries operations, iii) changes to input data or missing data, and iv) inconsistent implementation of the MP advice. The evaluation concluded that there were no exceptional circumstances requiring either further research or management action on the TAC calculated by the MP. Application of the MP in 2022 results in a recommended TAC of 80,583t per year for the period 2024-2025. The recommended TAC is 15% below the 2021 catch The MP was scheduled to be run in time for the 2024 SC, however, exceptional circumstances in relation to the CPUE series has delayed the TAC advice. The revised plan is to run the MP in early 2025 following new standardisation of the CPUE as specified for the adopted MP (see section 5.2). A special session of the SC is proposed for late February 2025 to update the TAC advice for 2026-2028 prior to the TCMP.

Outlook. Catch in 2021 (94,803 t) and 2022 (102,266 t), and 2023 (105,369 t) of bigeye tuna were above the recommended TAC for 2024 and 2025 from the application of the bigeye tuna MP. Achieving the objectives of the Commission for this stock will require effective implementation of the MP TAC advice by the Commission going forward, a requirement further emphasised by the current status of the stock estimated from the stock assessment to be overfished and subject to overfishing.

Management advice. The TAC recommended from the application of the MP specified in Resolution 22/03 and Resolution 23/04 is 80,583t / year for the period 2024-2025. The recommended TAC is 15% below the 2021 catch (this is constrained by the maximum TAC change). The TAC advice will be updated at the Special Session of the SC in February 2025.

The following key points should also be noted:

- **Main fisheries (mean annual catch 2019-2023)**: bigeye tuna are caught using purse seine (44.9%), followed by longline (35.1%) and line (13.3%). The remaining catches taken with other gears contributed to 6.8% of the total catches in recent years (**Fig. 1**).

- **Main fleets (mean annual catch 2019-2023)**: the majority of bigeye tuna catches are attributed to vessels flagged to Indonesia (26.7%) followed by EU (Spain) (15.1%) and Seychelles (15%). The 29 other fleets catching bigeye tuna contributed to 43.4% of the total catch in recent years (Fig. 2).

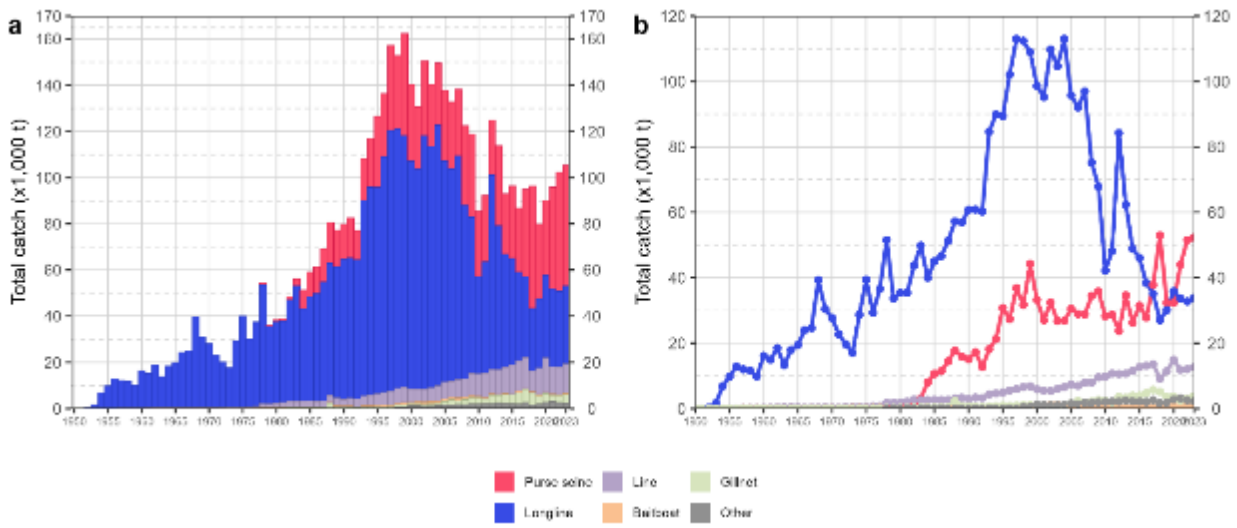


Fig. 1. Annual time series of (a) cumulative nominal catches (metric tonnes; t) by fishery group and (b) individual nominal catches (metric tonnes; t) by fishery group for bigeye tuna during 1950-2023.

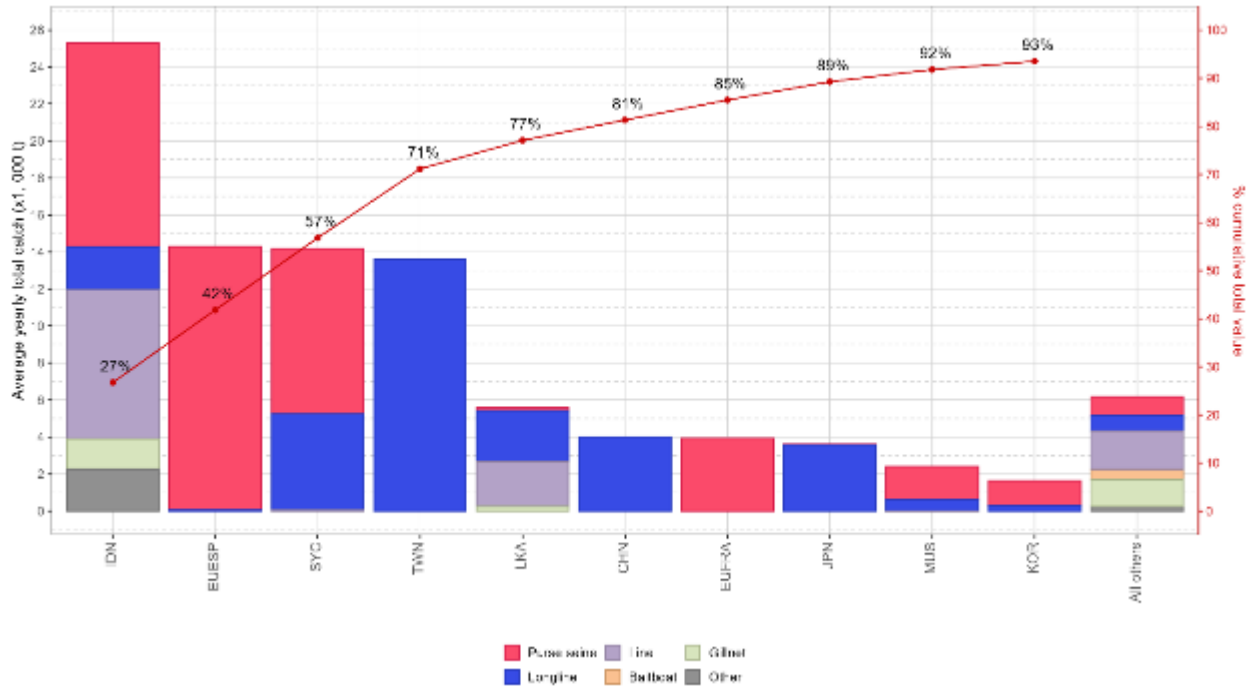


Fig. 2. Mean annual catches (metric tonnes; t) of bigeye tuna by fleet and fishery group between 2019 and 2023, with indication of cumulative catches by fleet.

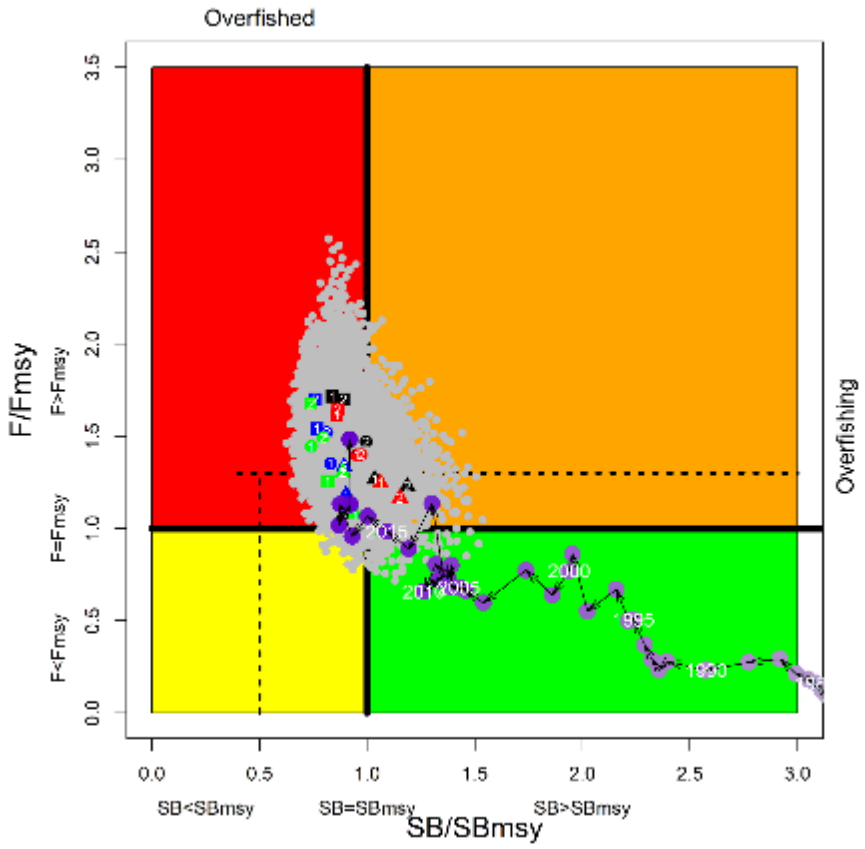


Fig. 3. Bigeye tuna: SS3 Aggregated Indian Ocean assessment Kobe plot. The coloured points represent stock status estimates from the 24 model options. Coloured symbols represent Maximum posterior density (MPD) estimates from individual models: square, circle, and Triangles represents alternative steepness options; black, red, blue, and green represents alternative growth and natural mortality option combination; 1,2, represents alternative selectivity options. The purple dot and arrowed line represent estimates of the reference model (the last purple dot represents the terminal year of 2021). Grey dots represent uncertainty from individual models. The dashed lines represent limit reference points for IO bigeye tuna (SBlim = 0.5 SBMSY and Flim = 1.4 FMSY).

APPENDIX 10
EXECUTIVE SUMMARY: SKIPJACK TUNA (2024)

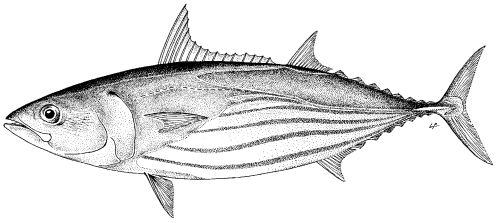


Table 1. Status of skipjack tuna (*Katsuwonus pelamis*) in the Indian Ocean

Area[1]	Indicators		2023 stock status determination[3]
Indian Ocean	Catch 2023[2] (t)	688,680	**70%***
	Mean annual catch 2019-2023 (t)	630,120	
	$E_{40\%SB0}$ [4] (80% CI)	0.55 (0.48–0.65)	
	SB_0 (t) (80% CI)	2 177 144 (1 869 035–2 465 671)	
	SB_{2022} (t) (80% CI)	1 142 919 (842 723–1 461 772)	
	SB_{2022} / SB_0 80% CI)	0.53 (0.42–0.68)	
	SB_{2022} / $SB_{40\%SB0}$ (80% CI)	1.33 (1.04–1.71)	
	SB_{2022} / $SB_{20\%SB0}$ (80% CI)	2.67 (2.08–3.42)	
	SB_{2022} / SB_{MSY} (80% CI)	2.30 (1.57–3.40)	
	F_{2022} / F_{MSY} (80% CI)	0.49 (0.32–0.75)	
	F_{2022} / $F_{40\%SSB0}$ (80% CI)	0.90 (0.68–1.22)	
	MSY (t) (80% CI)	584 774 (512 228–686 071)	

[1]Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence
[2] Proportion of 2023 catch fully or partially estimated by IOTC Secretariat: 17.5%
[3]2022 is the final year that data were available for this assessment.
[4] $E_{40\%SB0}$ is the equilibrium annual exploitation rate (Etarg) associated with the stock at Btarg, and is a key control parameter in the skipjack harvest control rule as stipulated in Resolution 21/03. Note that Resolution 23/03 did not specify the exploitation rate associated with the stock at Blim
*Estimated probability that the stock is in the respective quadrant of the Kobe plot (defined in resolution 21/03 and shown below), derived from the confidence intervals associated with the current stock status

Table 2. Probability of stock status with respect to each of four quadrants of the Kobe plot. Percentages are calculated as the proportion of model terminal values that fall within each quadrant with model weights taken into account, as defined in resolution 21/03

	Stock overfished (SB_{2022} / $SB_{40\%SB0}$<1)	Stock not overfished (SB_{2022} / $SB_{40\%SB0}$≥ 1)
Stock subject to overfishing (F_{2022} / $F_{40\%SB0}$≥ 1)	8%	21%
Stock not subject to overfishing (F_{2022} / $F_{40\%SB0}$≤ 1)	1%	70%
Not assessed / Uncertain / Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was carried out for skipjack tuna in 2024 and so the advice is based on the 2023 assessment using Stock Synthesis with data up to 2022. The outcome of the 2023 stock assessment model is more optimistic than the previous assessment (2020) despite the high catches recorded in the period 2021-2022, which exceeded the catch limits established in 2020 for this period.

The final assessment indicates that:

i) The stock is above the adopted target for this stock (40%SB_0) and the current exploitation rate is below the target exploitation rate with the probability of 70%. Current spawning biomass relative to unexploited levels is estimated at 53%.
ii) The spawning biomass remains above SB_{MSY} and the fishing mortality remains below F_{MSY} with a probability of 98.4 %
iii) Over the history of the fishery, biomass has been well above the adopted limit reference point (20%SB_0).

Subsequently, based on the weight-of-evidence available in 2023, the skipjack tuna stock is determined to be **not overfished** and **not subject to overfishing**.

Outlook.

There has been a substantial increase of fishery dependent abundance index in recent years: the CPUE from the Pole and line fishery increased by 75% from 2019 to 2022, and the PSLS also increased by over 30% between 2019 and 2021. Total catches in 2022 were 30% larger than the resulting catch limit from the skipjack HCR for the period 2021-2023 (513,572 t). The increase in abundance despite catches exceeding the recommended limits was primarily driven by an increase in recent recruitment which was estimated to be well above the long-term average. Environmental conditions (such as sea surface productivity (chlorophyll)) are believed to significantly influence recruitment of skipjack tuna and can produce high variability in recruitment levels between years. The high recruitment anomaly estimated in 2022 appears to be supported by the strong increasingly positive phase of sea surface productivity which began from a below average level in 2015. Climate model predictions suggest that the positive productivity phase will end by the start of 2024 resulting in a period of lower productivity. There is also considerable uncertainty in the stock assessment models due to the potential caveats of using PL and PSLS CPUE as index of basin-level abundance and uncertainty in stock productivity parameters of skipjack tuna (e.g., steepness and growth, natural mortality). The model runs analyzed illustrate a wide range of stock status (SB_{2022} / SB_0) to be between 35% and 78%.

Management advice. The catch limit calculated by applying the HCR specified in Resolution 21/03 is [628, 606t] for the period 2024-2026. The SC noted that this catch limit is higher than for the previous period. This is attributed to the new stock assessment which estimates a higher productivity of the stock in recent years and a higher stock level relative to the target reference point, possibly due to skipjack life history characteristics and favorable environmental conditions. Noting that the environmental conditions are predicted to enter a less favorable period, it is important that the Commission ensures that catches of skipjack tuna during this period do not exceed the agreed limit, as occurred in recent years. In addition, the SC recognizes the potential impact on other associated stocks (bigeye and yellowfin) of exceeding the catch limits of skipjack. In 2024, the Commission adopted Resolution 24/07 on a management procedure for skipjack. The MP is scheduled to be implemented in 2025 to provide TAC advice for 2027-2029.

The following key points should also be noted:

- **Reference points**: Commission in 2016 agreed to Resolution 16/02 on *harvest control rules for skipjack tuna in the IOTC area of competence (superseded by Resolution 21/03)*.
- **Biomass**: Current spawning biomass was considered to be above the target reference point of 40% of SB_0, and above the limit reference point of 0.2*SB_0 as per Resolution 16/02 (**Fig. 2**).
- **Main fisheries (mean annual catch 2019-2023):** skipjack tuna are caught using purse seine (53.9%), followed by baitboat (19.5%) and gillnet (17.5%). The remaining catches taken with other gears contributed to 9.2% of the total catches in recent years (Fig. 1).
- **Main fleets (mean annual catch 2019-2023):** the majority of skipjack tuna catches are attributed to vessels flagged to Indonesia (21.8%) followed by Maldives (18%) and EU (Spain) (14.8%). The 32 other fleets catching skipjack tuna contributed to 45.3% of the total catch in recent years (Fig. 2).

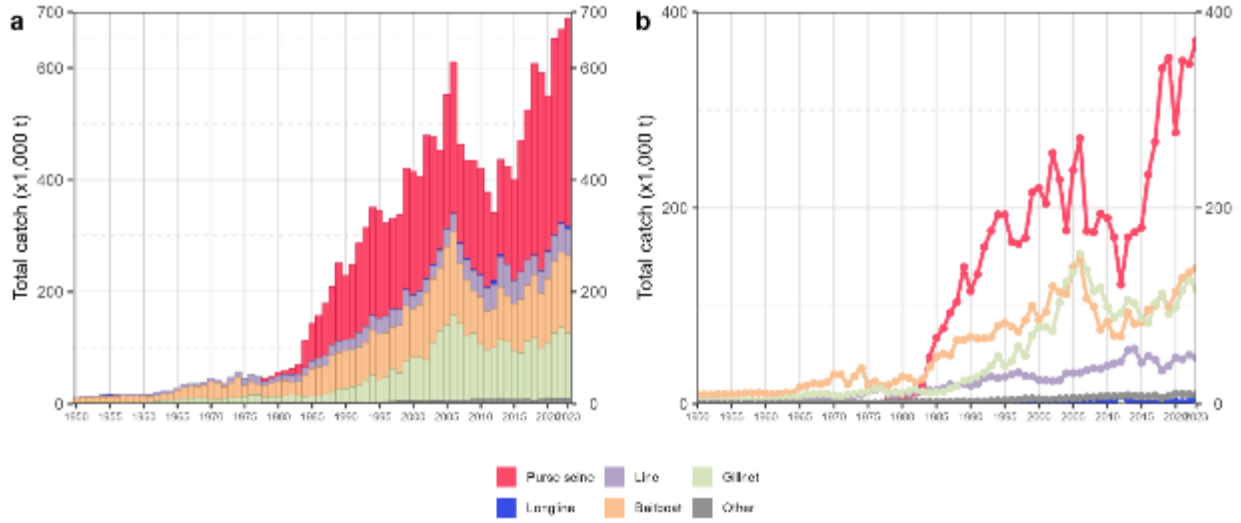


Fig. 1. Annual time series of (a) cumulative nominal catches (metric tonnes; t) by fishery group and (b) individual nominal catches (metric tonnes; t) by fishery group for skipjack tuna during 1950-2023.

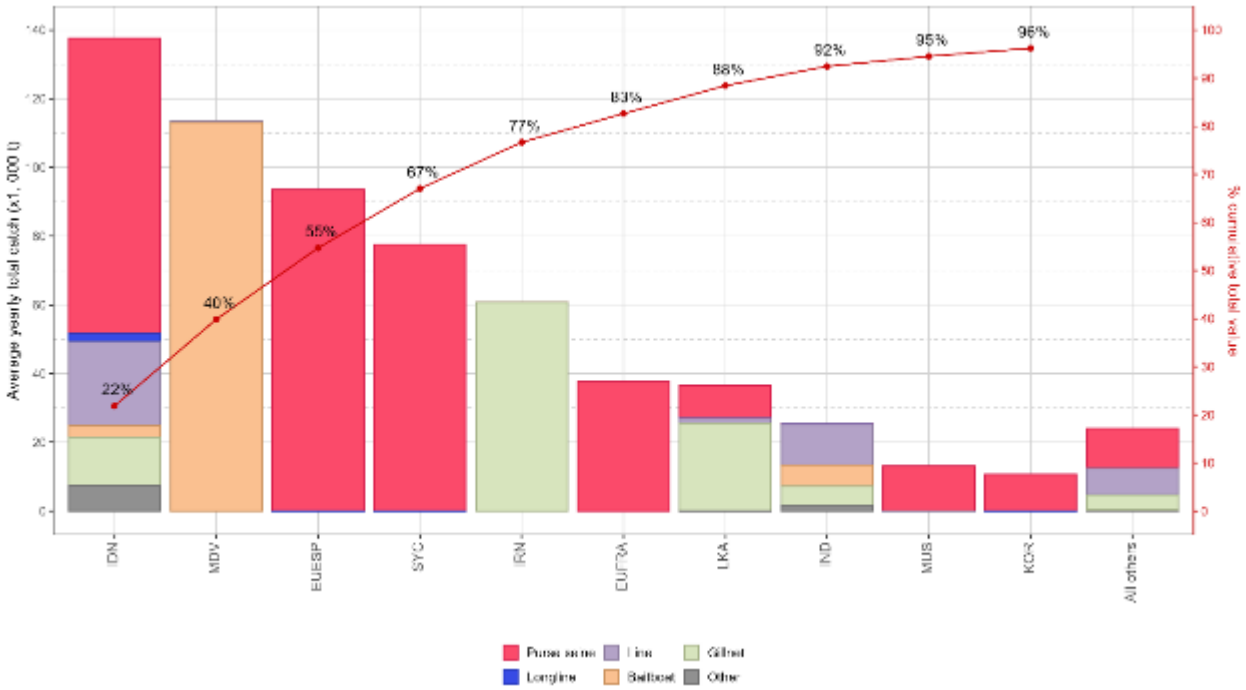


Fig. 2. Mean annual catches (metric tonnes; t) of skipjack tuna by fleet and fishery group between 2019 and 2023, with indication of cumulative catches by fleet.

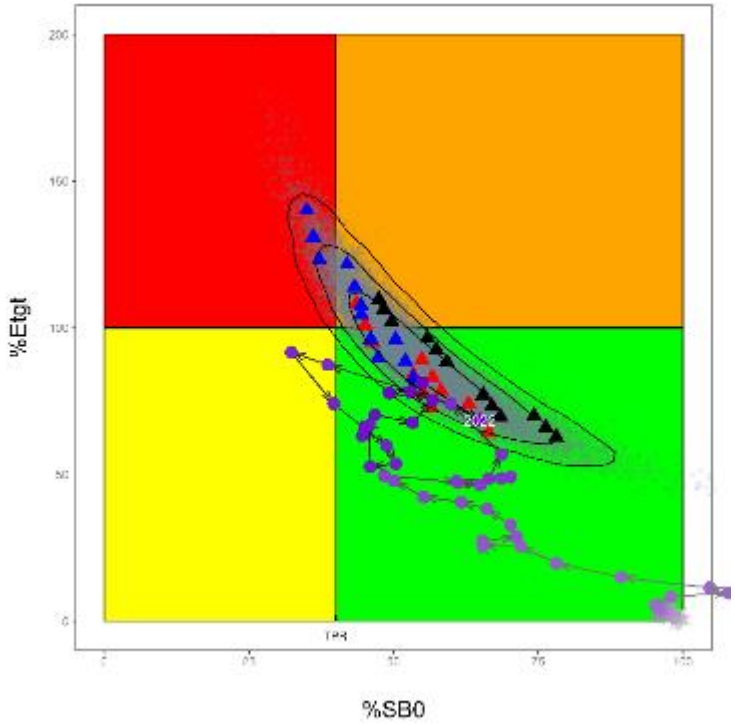


Fig. 3. Skipjack tuna: SS3 Aggregated Indian Ocean assessment Kobe plot of the 2023 uncertainty grid. Left - current stock status, relative to SB0 and F (x-axis) and $F_{40\%B0}$ (y-axis) reference points for the final model grid.. TPR indicates 40% B0; Triangles represent MPD estimates from individual models (black, models based on PL index; red, models based on PSLS index; blue, models based on and both PSLS and ABBI index). Grey dots represent uncertainty from individual models. The arrowed line represents time series of historical stock trajectory for model PSLS. Contours represents 50, 80, and 90% confidence region.

APPENDIX 11
EXECUTIVE SUMMARY: YELLOWFIN TUNA (2024)

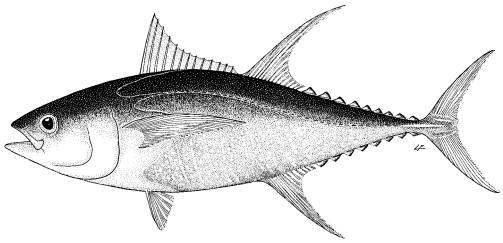


Table 1. Status of yellowfin tuna (*Thunnus albacares*) in the Indian Ocean

Area[1]	Indicators		2024 stock status determination[3]
Indian Ocean	Catch 2023[2] (t)	400,950	**89%***
	Mean annual catch 2019-2023 (t)	423,142	
	MSY_{recent}[4] (1,000 t) (80% CI)	421 (416-430)	
	F_{MSY} (80% CI)	0.2 (0.16-0.26)	
	SB_{MSY_recent}[4] (1,000 t) (80% CI)	1,063 (890-1,361)	
	F_{2023} / F_{MSY} (80% CI)	0.75 (0.58-1.01)	
	SB_{2023} / SB_{MSY_recent} (80% CI)	1.32 (1.00-1.59)	
	SB_{2023} / SB_0 (80% CI)	0.44 (0.40-0.50)	

[1]Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence
[2]Proportion of 2023 catch fully or partially estimated by IOTC Secretariat: 33.4%
[3]2023 is the final year that data were available for this assessment
[4] Recent refers to the most recent 20 years (2003-2022)

Colour key	Stock overfished ($SB_{2023}/SB_{MSY}<1$)	Stock not overfished ($SB_{2023}/SB_{MSY}\geq 1$)
Stock subject to overfishing (F_{2023} / $F_{MSY}\geq 1$)	7.9%	3.3%
Stock not subject to overfishing (F_{2023} / $F_{MSY}\leq 1$)	0%	88.8%
Not assessed / Uncertain / Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new stock assessment was carried out for yellowfin tuna in 2024. The 2024 stock assessment was carried out using Stock Synthesis III (SS3), a fully integrated model that is currently used to provide scientific advice for the three tropical tunas stocks in the Indian Ocean. The model used in 2024 is based on the model developed in 2021 with a series of revisions that were discussed during the WPTT in 2024. The new model represents a marked improvement over the previous model available in 2021, as demonstrated using a number of statistical diagnostic analyses. These revisions addressed many of the recommendations of the independent review of the yellowfin stock assessment carried out in 2023. The model uses four types of data: catch, size frequency, tagging and CPUE indices. The proposed final assessment model options correspond to a combination of model configurations, including alternative assumptions about the selectivity of longline fisheries (2 options on size frequency data prior and post 2000), longline catchability (effort creep (0% and 0.5% per year)) and steepness values (0.7, 0.8, and 0.9). The model ensemble (a total of 12 models) encompasses a range of plausible hypotheses about stock and fisheries dynamics.

A number of sensitivity runs were conducted to understand additional uncertainties not captured in the model grid, including two alternative natural mortalities (based on maximum age of 18 years and the natural mortality used in 2021), the CPUE used in 2021, a model that started in 1975, the influence of the tagging data and the revised catch information for Indonesia. In general, the sensitivity runs did not suggest that other parameters should be included in the reference grid and the group decided not to include any additional axes of uncertainty.

The model estimates of current stock status are predominantly informed by the new abundance index derived from the Joint CPUE estimated for longline fleets. It was noted that the new index was significantly different to the index used in 2021 (**Fig. 6**), especially for the Northwestern region of the Indian Ocean for the periods 2005-2015 and 2019-2020 (this is further discussed, below). In addition, the new index suggests a marked increase of abundance for yellowfin in the last three years (2021-2023).

With regards to the differences in the modelling choices, the new SS3 model includes a new growth model, natural mortality and maturity. All these have been updated from recent biological studies, as agreed by the WPTT in the 2024 data preparatory meeting.

For the 2024 model, a new approach was applied to the derivation of the MSY and associated biomass-based reference point (SBMSY) based on the magnitude of recruitment estimated for the recent 20-year period (see Para 89–100 of IOTC-2024-WPTT26-R for details). The derivation of MSY is in line with the recommendations of the 2023 review. MSY was estimated to be 421,000 t. Recent annual catches of 401,000 t are below the estimated MSY. Differences in the estimates of MSY and BMSY using recent and long-term recruitment levels introduce additional uncertainty in the estimates of stock status relative to BMSY. This is highlighted in Tables 2 and 3 which indicate, for example, that while SB/SBMSY is estimated to be higher (1.47) under long-term recruitment assumption, MSY is estimated to be lower (374,000 t). However, fishing mortality-based estimates of stock status are insensitive to those assumptions.

Table 2. Reference points for yellowfin tuna (*Thunnus albacares*) in the Indian Ocean based on long term and 20 year conditions

Long term MSY (t)	Recent 20 yr MSY (t)	Long term SSBmsy (t)	Recent 20 yr SSBMSY (t)
374,421	420,623	986,599	1094,844

Table 3. Status of yellowfin tuna (*Thunnus albacares*) in the Indian Ocean using equivalent (i.e. long-term) recruitment trends

Indicators	
Catch 2023[2] (t)	400,950
Mean annual catch 2019-2023 (t)	423,142
MSY_{eq} (1,000 t) (80% CI)	374 (350-411)
SB_{MSY_eq} (1,000 t) (80% CI)	987 (791-1,247)
SB_{2023} / SB_{MSY_eq} (80% CI)	1.47 (1.21-1.65)

The recent 20 year period was selected for the estimation of recent benchmarks (SB_{MSY} and MSY) on the basis that the period encompassed the most reliable series of catch and size composition data and, as such, provided the best available information regarding the prevailing productivity of the stock.

According to the information available to the 2024 assessment, the total catch has remained within the estimated recent (20 year average) MSY since 2007 (i.e., between 402,000 t and 427,000 t), with the exception of 2018 (443,252 t) and 2019 catch (450,586 t), the latter being the largest since 2006 and above the estimated recent MSY (for details see WPTT23 report).

Overall stock biomass declined substantially during the 1980s and 1990s. The stock is estimated to have been in an overfished state from 2007 to 2019 (**Fig. 4**). Spawning biomass increased considerably after 2021 following recent strong recruitment (informed by the recent increase in LL CPUE). Correspondingly, overfishing was occurring from 2003 until 2020. Fishing mortality was estimated to be below the FMSY level in 2021-2023. The recent strong recruitments also contribute to a continued increase in projected biomass in the forthcoming years. The magnitude of the recent annual recruitments (2020-2022) is unprecedented in the time series.

Overall stock status estimates differ substantially from the previous assessment. Spawning biomass in 2023 was estimated to be on average 44% of the initial (1950) levels (**Table 1**). Spawning biomass in 2023 was estimated to be 32% higher than the level that supports the maximum sustainable yield (SB_{2023}/SB_{MSY} = 1.32). Current fishing mortality is estimated to be 25% lower than F_{MSY} (F_{2023}/F_{MSY} = 0.75). The probability of the stock being in the green Kobe quadrant in 2023 is estimated to be 89%. On the weight-of-evidence available in 2024, the yellowfin tuna stock is determined to be **not-overfished** and **not-subject to overfishing** (**Table 1** and **Fig. 4**).

It is noted that there are still important uncertainties relating to the data used for this stock assessment. There are uncertainties in relation to the CPUE standardisation in 2024 that could not be addressed which are recognised in the SCs catch limit advice (in the stock status summary and SC general recommendations). The use of the 2021 CPUE index in the current model results in a significantly more pessimistic biomass up to 2020 compared to the 2024 CPUE indices (-23% SB_{2021}/SB_{MSY}), but there is no clear understanding or agreement for why the two indices are significantly different (especially in Region 1). However, it is noted that the exploratory runs discussed during the SC meeting indicate that the other data used in the stock assessment (catch and

length frequency data) also indicate an increase in biomass in recent years, albeit a smaller increase (21% and 11% respectively) than the increase driven by the 2024 CPUE index (+79%).

It is noted that there is also considerable uncertainty in the reported catches by some fisheries. In particular, catch estimates for several artisanal fisheries have increased substantially in recent years, the implication of which should be further investigated.

Outlook.

Assumptions on recent productivity were used to make 10 year projections and evaluate the impact of alternative catch levels. The results of these projections are shown in **Fig. 7** and summarized in the K2SM (**Table 3**). For each catch scenario, the probability of the biomass being below the SB_{MSY} level and the probability of fishing mortality being above F_{MSY} were determined over the projection horizon using the delta-MVLN estimator (Walter & Winker 2020), based on the variance-covariance derived from estimates of SB/SB_{MSY} and F/F_{MSY} across the model grid.

Management advice

Noting the pending advice to be provided by the SC to the 2026 Commission meeting on the need, if any, to update the yellowfin tuna stock assessment in 2026, results of the K2SM should not be considered as catch advice until the uncertainties in the CPUE index are resolved. As such, the following advice was recommended:

- If catches are maintained within the estimated MSY range (416,000-430,000 tons) there is more than a 50% probability that the stock will remain above SB_{MSY} in 2033.
- Higher levels of catch are predicted to lead the stock to an overfished state in the long term.
- The probability of breaching the biological limit reference point ($0.4SB_{MSY}$) with recent catches is 0% by 2033. The probability of breaching the F limit reference point ($1.4\ F_{MSY}$) with recent catch is 0% by 2033.
- However, in order to account for the uncertainty of the projections (e.g., relating to whether estimated high recruitment will be maintained) and uncertainty not captured in the assessment grid (e.g. relating to the new CPUE indices), the Commission should set an initial one year (2026) TAC that does not exceed the median recent MSY estimate, task the SC to investigate and resolve CPUE uncertainty in 2025, and advise the 2026 Commission on future catch levels.

The Commission has an interim plan for the rebuilding the yellowfin stock, with catch limitations based on 2014 and other reference levels (Resolution 21/01 which superseded 19/01, 18/01 and 17/01). Some of the fisheries subject to catch reductions have achieved a decrease in catches in 2023 in accordance with the levels of reductions specified in the Resolution; however, these reductions were offset by increases in the catches from CPCs exempt from and some CPCs subject to limitations on their catches of yellowfin tuna.

The following key points should also be noted:

- Maximum Sustainable Yield (MSY): estimate for the Indian Ocean stock is 421,000 t with a range between 416,000 and 430,000 t (**Table 1**). The 2021-2023 average catches (413,000 t) were within the estimated recent MSY level.
- **Interim reference points**: Noting that the Commission in 2015 adopted Resolution 15/10 on target and limit reference points and a decision framework, the following should be noted:
- **Fishing mortality**: 2023 fishing mortality is considered to be 25% below the interim target reference point of F_{MSY}, and below the interim limit reference point of $1.4*F_{MSY}$ (**Fig. 4**).
- **Biomass**: 2023 spawning biomass is considered to be 32% above the interim target reference point of SB_{MSY} and above the interim limit reference point of $0.4*SB_{MSY}$ (**Fig. 4**).
- **Catch data uncertainty:** the overall quality of the nominal catches of yellowfin tuna shows some large variability between 1950 and 2023. In some years, a large portion of the nominal catches of yellowfin tuna had to be estimated, and catches reported using species or gear aggregates had to be further broken down. The data quality was particularly poor between 1994 and 2002 when less than 70% of the nominal catches were fully or partially reported, with most reporting issues coming from coastal fisheries. The reporting rate has generally improved over the last decade however detailed information on data collection procedures, which determines the quality of fishery statistics, is still lacking.
- **Main fisheries (mean annual catch 2019-2023)**: yellowfin tuna are caught using line and coastal longline (40%), followed by purse seine (33%) and gillnet (15%). The remaining catches taken with other gears contributed to 12% of the total catches in recent years (**Fig. 1**). The fishery impact plot is shown in **Fig. 8**.
- **Main fleets (mean annual catch 2019-2023)**: the majority of yellowfin tuna catches are attributed to vessels flagged to Sultanate of Oman (15%) followed by I. R. Iran (11%) and EU (Spain) (10%). The 32 other fleets catching yellowfin tuna contributed to 64% of the total catch in recent years (**Fig. 2**).

References

Walter, J., Winker, H., 2020. Projections to create Kobe 2 Strategy Matrices using the multivariate log-normal approximation for Atlantic yellowfin tuna. Collect. Vol. Sci. Pap. ICCAT, 76(6): 725-739

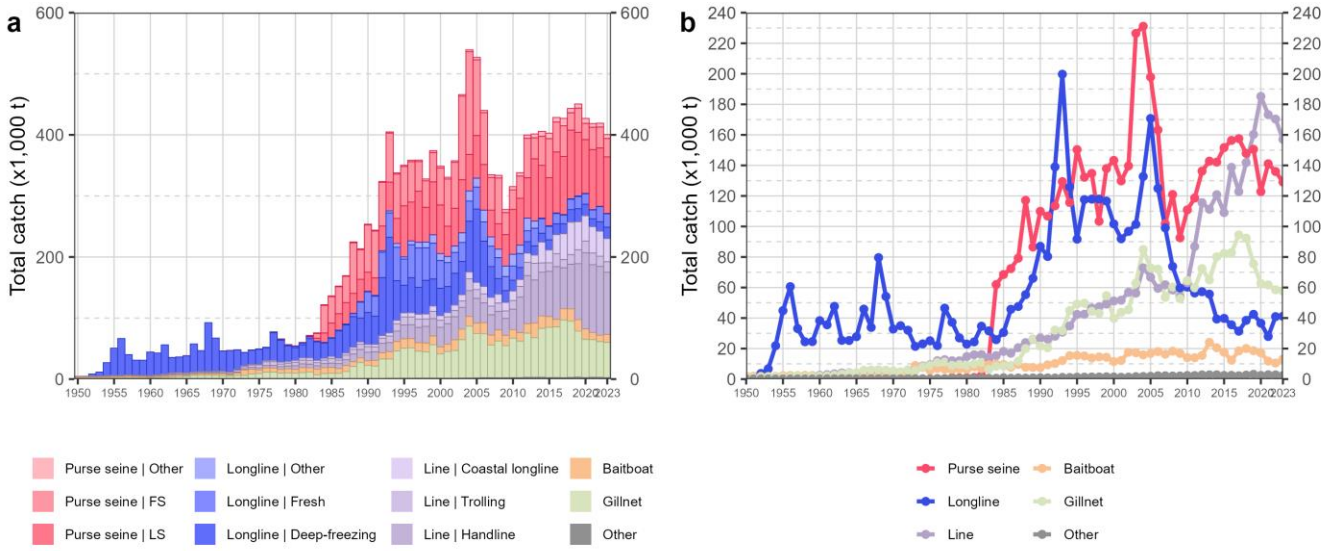


Fig. 1. Annual time series of (a) cumulative nominal catches (metric tonnes; t) by fishery and (b) individual nominal catches (metric tonnes; t) by fishery group for yellowfin tuna during 1950-2023. FS = free-swimming school; LS = school associated with drifting floating objects. Purse seine | Other: coastal purse seine, purse seine of unknown association type, ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

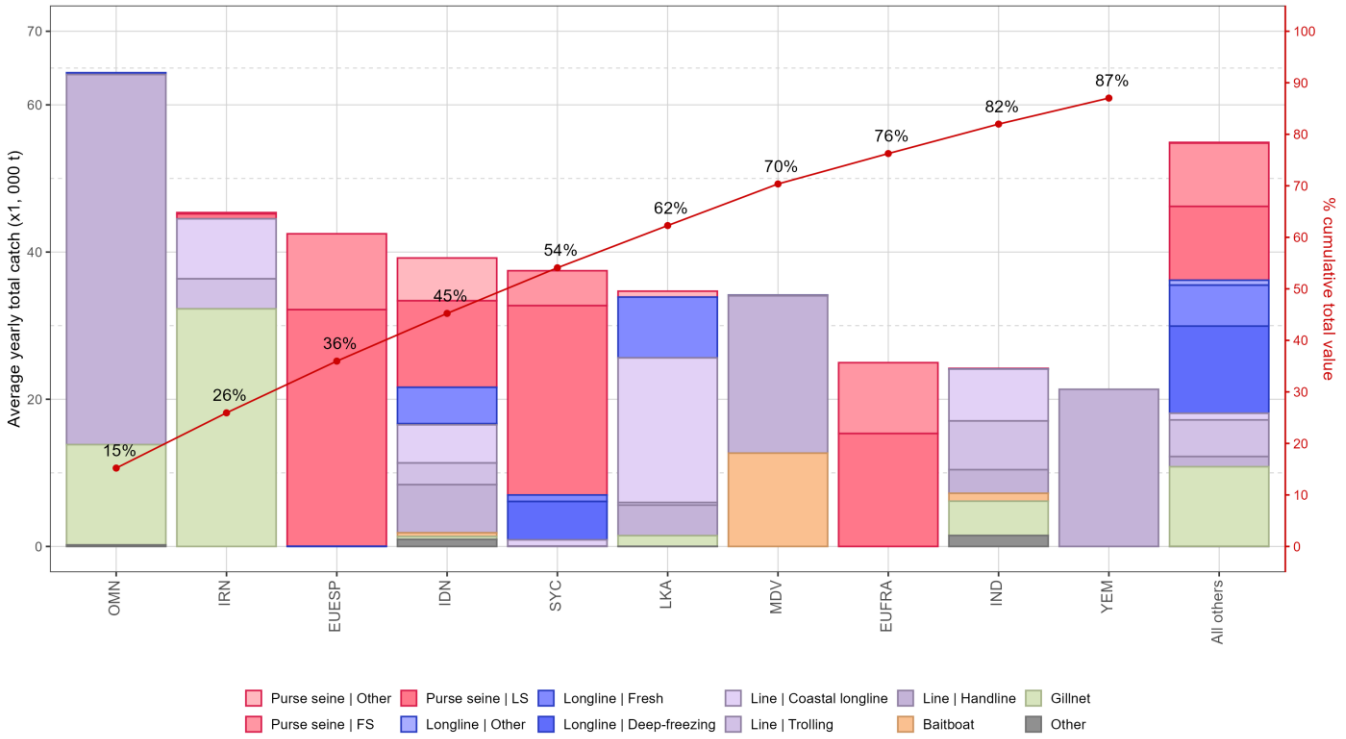


Fig. 2. Mean annual catches (metric tonnes; t) of yellowfin tuna by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet. FS = free-swimming school; LS = school associated with drifting floating objects. Purse seine | Other: coastal purse seine, purse seine of unknown association type, ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

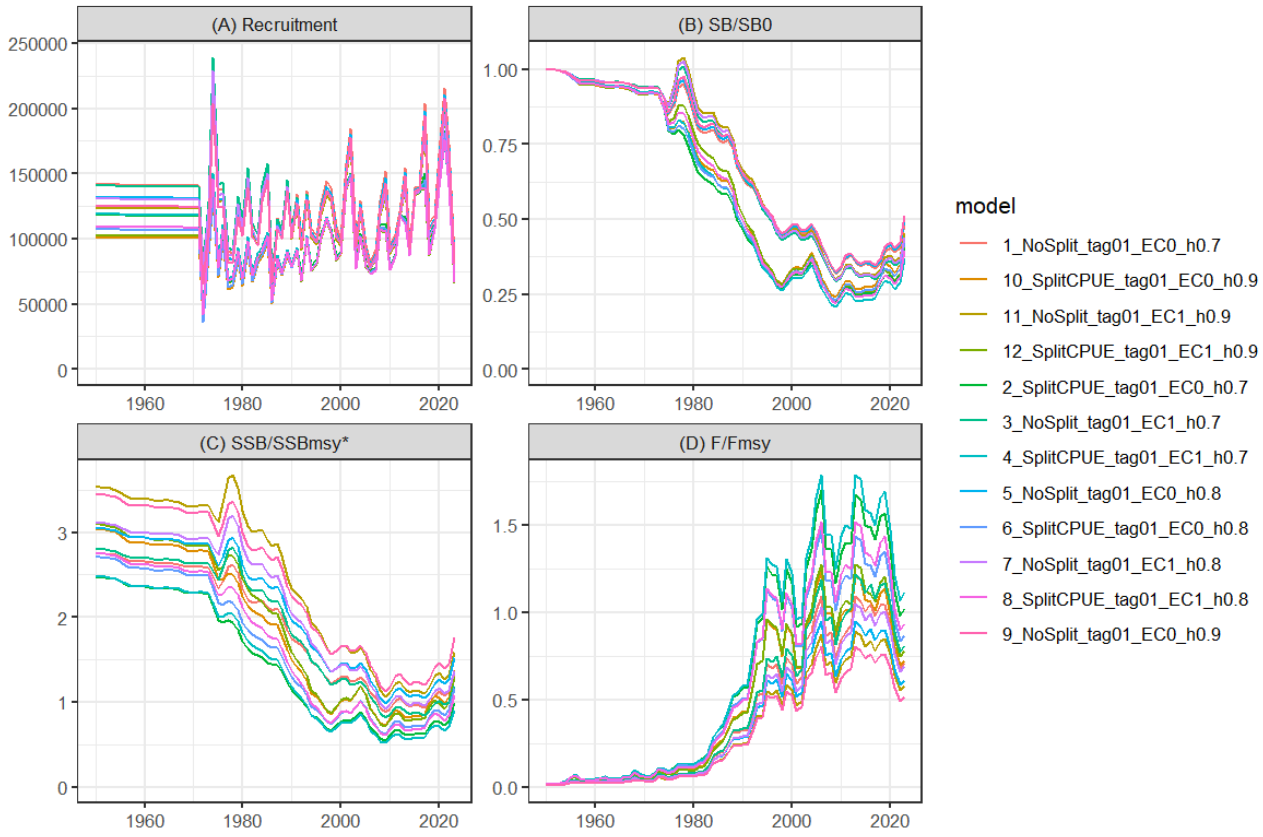


Fig 3. Estimated time series (1950-2023) of recruitment, spawning stock biomass relative to virgin biomass and to spawning stock biomass at MSY and fishing mortality relative to fishing mortality at MSY of yellowfin tuna from the reference models of the 2024 assessment.

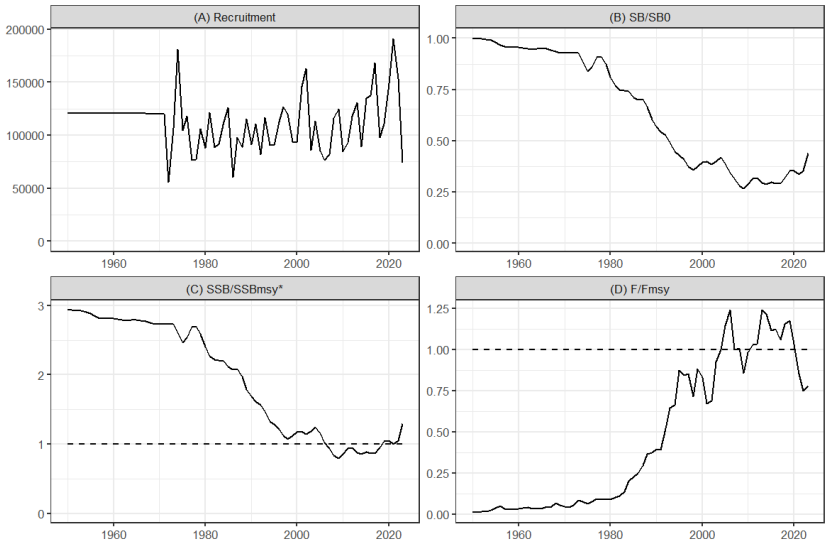


Fig 4. Estimated time series (1950-2023) of recruitment, spawning stock biomass and fishing mortality of yellowfin tuna from the reference model of the 2024 assessment.

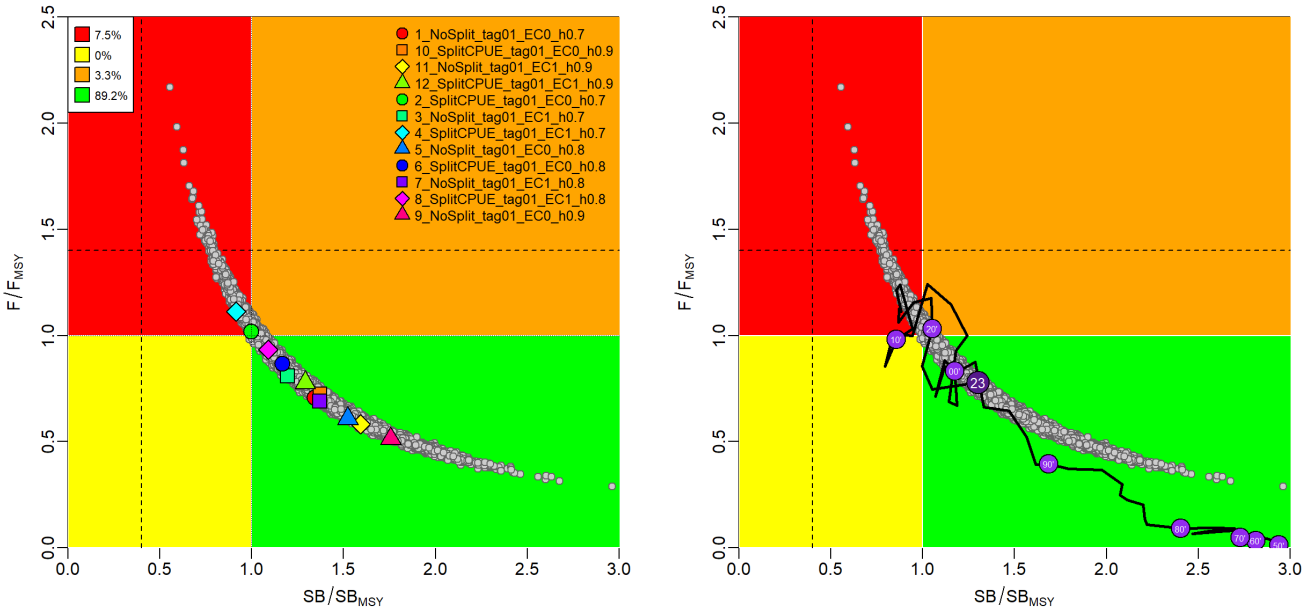


Fig. 5. Yellowfin tuna: SS3 Indian Ocean assessment Kobe plot: (left): current (2023) stock status, relative to SB_{MSY} (x-axis) and F_{MSY} (y-axis) reference points for the final model options. Coloured symbols represent Maximum posterior density (MPD) estimates from individual models Grey dots represent the statistical uncertainty from individual models (20,000 replicates from each). The dashed lines represent limit reference points for IO yellowfin tuna (SBlim = 0.4 SB_{MSY} and Flim = 1.4 F_{MSY}); (right) mean stock trajectory from the model grid.

Fig 6. Standardised CPUE indices used in the final assessment models: Joint longline CPUE indices by region 1975-2023 (The red lines are indices used in 2021 assessment 1975 – 2020).

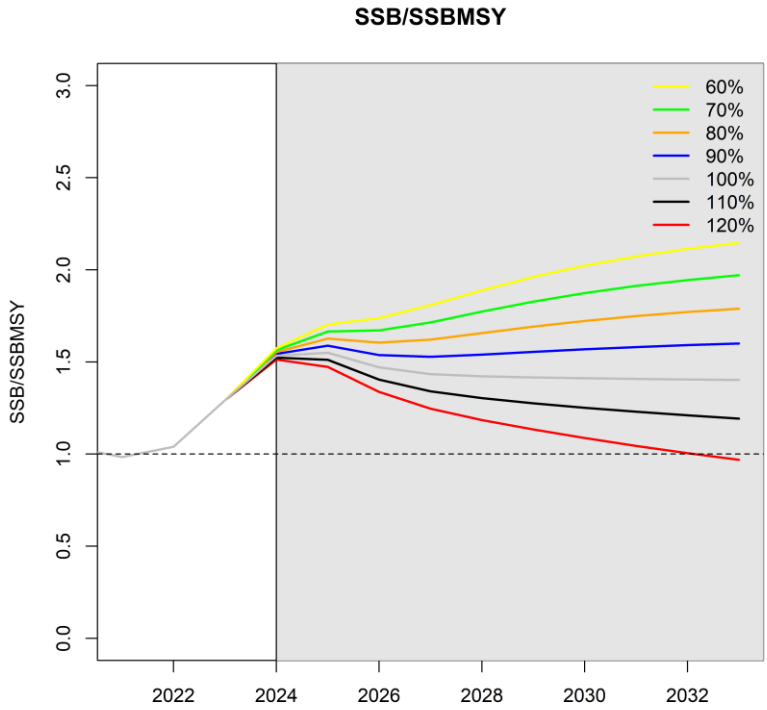


Fig 7. Trajectory showing the impact of alternative catch levels on spawning stock biomass relative to spawning stock biomass at MSY relative to the catch level from 2023

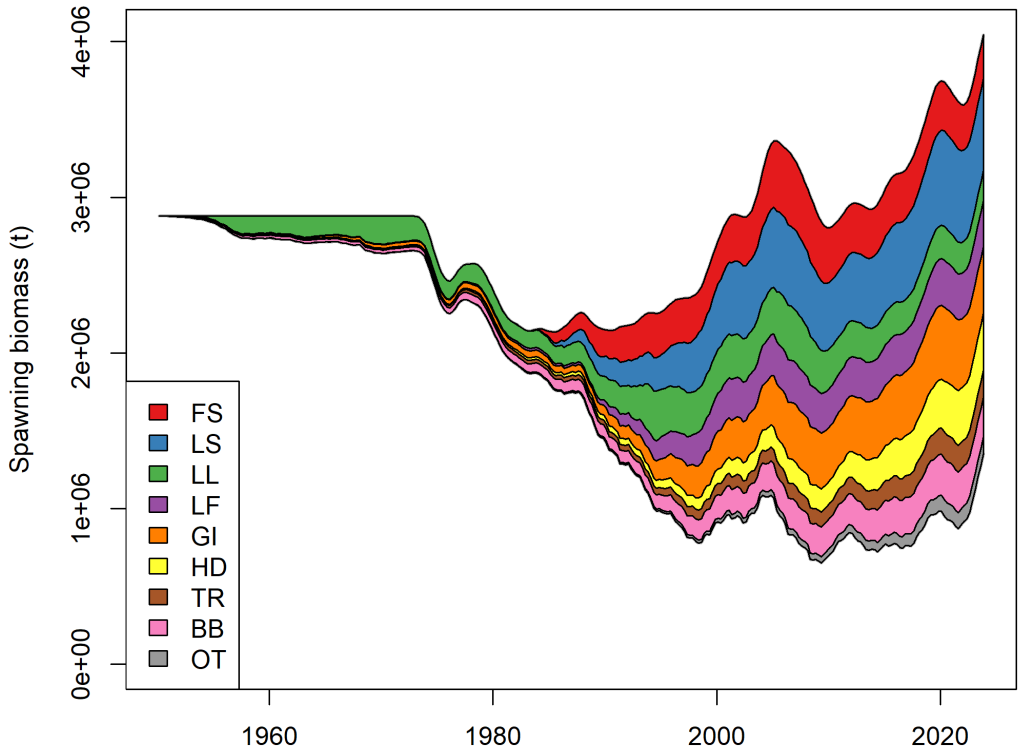


Fig 8. Fishery Impact Plot: Estimates of reduction in spawning biomass due to fishing over all regions attributed to various fishery groups for the assessment model.

TABLE 3. Yellowfin tuna: Stock synthesis assessment Kobe II Strategy Matrix. Probability of violating the MSY-based target (top) and limit (bottom) reference points for constant catch projections (relative to the catch level from 2023 -40%, - 30%, -20%, -10%, 0%, +10%, +20%) projected for 3 and 10 years

Alternative catch projections (relative to the catch level from 2023) and probability of violating MSY-based target reference points ($SB_{targ} = SB_{MSY}$; $F_{targ} = F_{MSY}$)							
Reference point and projection timeframe	60%	70%	80%	90%	100%	110%	120%
$SB_{2026} < SB_{MSY}$	0	0	0.1	0.1	0.6	1.3	4
$F_{2026} > F_{MSY}$	0	0	0	0	2.5	11.2	30.9
$SB_{2033} < SB_{MSY}$	0	0	0	0	0.1	13.1	66.7
$F_{2033} > F_{MSY}$	0	0	0	0	1.3	31.6	84.9
Alternative catch projections (relative to the catch level from 2023) and probability of violating MSY-based limit reference points ($SB_{lim} = 0.4\ SB_{MSY}$; $F_{Lim} = 1.4\ F_{MSY}$)							
Reference point and projection timeframe	60%	70%	80%	90%	100%	110%	120%
$SB_{2026} < SB_{Lim}$	0	0	0	0	0	0	0
$F_{2026} > F_{Lim}$	0	0	0	0	0	0.1	0.9
$SB_{2033} < SB_{Lim}$	0	0	0	0	0	0	0
$F_{2033} > F_{Lim}$	0	0	0	0	0	0.3	24.1

APPENDIX 12
EXECUTIVE SUMMARY: BULLET TUNA (2024)

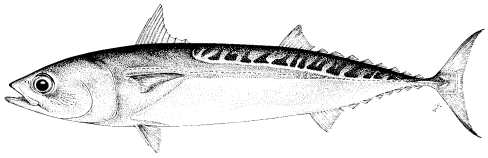


TABLE 1. Status of bullet tuna (*Auxis rochei*) in the Indian Ocean

Area[1]	Indicators		2024 stock status determination[3]
Indian Ocean	Catch 2023[2] (t) Mean annual catch (2019-2023) (t)	28,429 21,996	**Unknown**
	MSY (1,000 t) (80% CI) F_{MSY} (80% CI) B_{MSY} (1,000 t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI) $B_{current}/B_0$ (80% CI)	Unknown	

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2023: 57.2%;
[3]2022 is the final year that data were available for this assessment

Colour key	Stock overfished (SB_{year}/SB_{MSY}< 1)	Stock not overfished (SB_{year}/SB_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)		
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)		
Not assessed/Uncertain / Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new assessment was carried out in 2024 using data-limited techniques (CMSY,LB-SPR, and FishBlicc). However the catch data for bullet tuna are very uncertain given the high percentage of the catches that had to be estimated due to a range of reporting issues. The size-based assessment methods LB-SPR and FishBlicc using size data from gillnet and purse seine fisheries both estimated the current spawning potential ratio to be below the reference level of SPR40% (a proxy for 40% depletion often considered as the risk averse target in many data-poor fisheries). Due to a lack of fishery data for several fisheries, only preliminary stock status indicators (CPUE and average weight) can be used. Aspects of the fisheries for bullet tuna combined with the lack of data on which to base an assessment of the stock are a cause for concern. Stock status in relation to the Commission's B_{MSY} and F_{MSY} reference points remains unknown (**Table 1**).

Outlook. Annual catches of bullet tuna have steadily increased from around 2,000 t in the early 1990s to around 13,000 t in 2015-2017. In 2018, catches sharply increased to 33,000 t – mostly due to an increase in catches reported by Indonesian industrial purse seine fisheries (**Fig. 1**). In 2019, the catches of bullet tuna decreased to less than 24,000 t despite a major increase in the number of Indonesian industrial purse seiners in operation. There is considerable uncertainty around bullet tuna catches and insufficient information to evaluate the effect that these catch levels may have on the resource. Research emphasis should be focused on improving the data collection and reporting systems in place and collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.).

Management advice. For assessed species of neritic tunas and seerfish in the Indian Ocean (longtail tuna, kawakawa and narrow-barred Spanish mackerel), the MSY was estimated during early assessments to have been reached between 2009 and 2011 and both F_{MSY} and B_{MSY} were breached thereafter. It is worth noting that the catch in 2023 was estimated to be 28,429t and there has been significant variability in estimated catches of this species in recent years. This variation is perhaps due to issue of mis-identification of this species among other reasons. In the absence of a stock assessment of bullet tuna a limit to the catches should be considered by the Commission, by ensuring that future catches do not continue to exceed the average catches estimated between 2009 and 2011 (8,590 t). This catch advice should be maintained until an assessment of bullet tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely

monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice.

The following should be also noted:

- The Maximum Sustainable Yield estimate for the Indian Ocean stock is unknown;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Further work is needed to improve the reliability of the catch series. Reported catches should be verified or estimated, based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g. estimates of growth, natural mortality, maturity, etc.).
- Species identification, data collection and reporting urgently need to be improved;
- There is limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status. In the case of 2022 catches (reference year 2021), 50.3% of the total catches was either fully or partially estimated by the IOTC Secretariat, which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution 15/01 and 15/02.

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: bullet tuna are caught using purse seine (52.6%), followed by line (19%) and gillnet (17.1%). The remaining catches taken with other gears contributed to 11.3% of the total catches in recent years (**Fig. 1**);
- **Main fleets (mean annual catch 2018-2022)**: the majority of bullet tuna catches are attributed to vessels flagged to India (34%) followed by Indonesia (31%) and Thailand (23%). The 17 other fleets catching bullet tuna contributed to 12% of the total catch in recent years (**Fig. 2**).

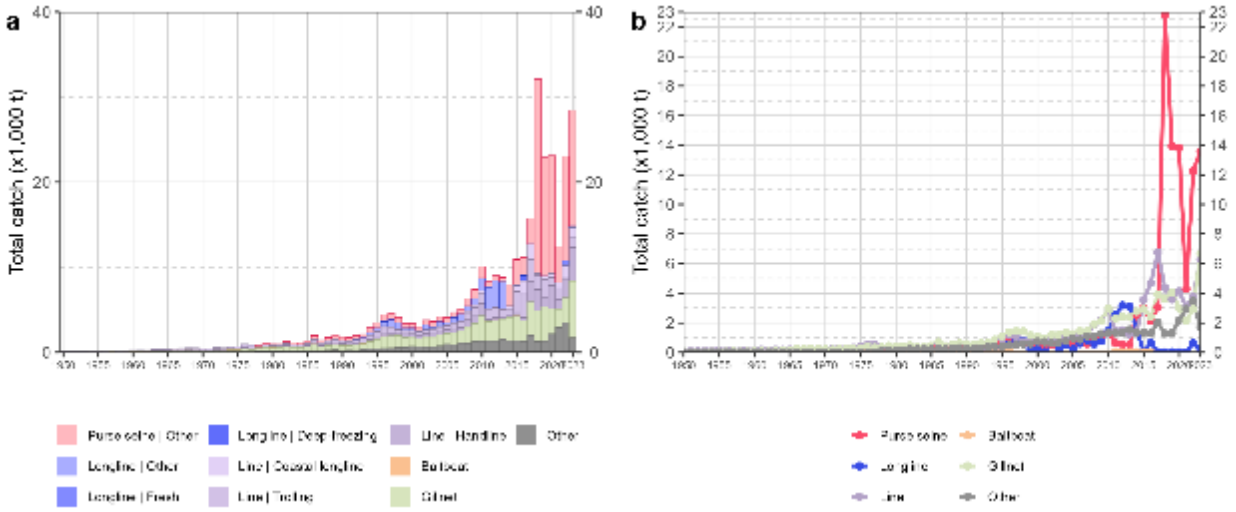


Fig. 1. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for bullet tuna during 1950-2023

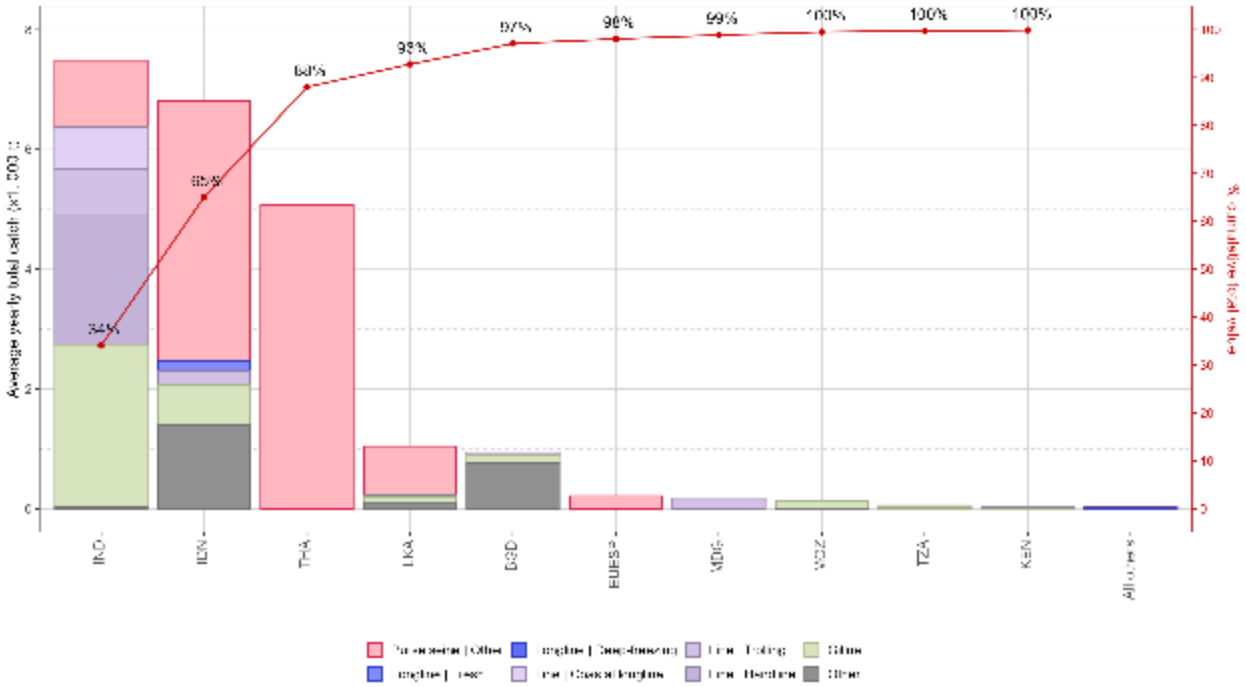


Fig. 2. Mean annual catches (t) of bullet tuna by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet.

.

APPENDIX 13
EXECUTIVE SUMMARY: FRIGATE TUNA (2024)

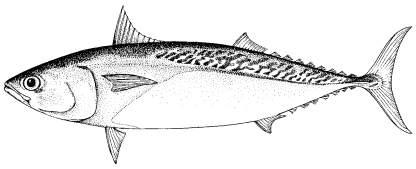


TABLE 1. Status of frigate tuna (*Auxis thazard*) in the Indian Ocean

Area[1]	Indicators		2024 stock status determination[3]
Indian Ocean	Catch (2023) (t)[2]	130,815	Unknown
	Mean annual catch (2019-2023) (t)	123,151	
	MSY (1,000 t) (80% CI)	Unknown	
	F_{MSY} (80% CI)		
	B_{MSY} (1,000 t) (80% CI)		
	$F_{current}/F_{MSY}$ (80% CI)		
	$B_{current}/B_{MSY}$ (80% CI)		
	$B_{current}/B_0$ (80% CI)		

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2023: 70.1%; [3]2022 is the final year that data were available for this assessment

Colour key	Stock overfished (SB_{year}/SB_{MSY}< 1)	Stock not overfished (SB_{year}/SB_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)		
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)		
Not assessed/Uncertain / Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new assessment was carried out in 2024 using data-limited techniques (CMSY,OCOM, LB-SPR and fishblicc). However the catch data for frigate tuna are very uncertain given the high percentage of the catches that had to be estimated due to a range of reporting issues. Due to a lack of fishery data for several gears, only preliminary stock status indicators can be used. However, the size-based assessment showed results with considerable uncertainty - LB-SPR estimated a SPR greater than the reference level of SPR40%, (a proxy for 40% depletion often considered as risk averse target in many data-poor fisheries) whereas the fishblicc estimated a SPR below the reference level. Aspects of the fisheries for frigate tuna combined with the lack of data on which to base an assessment of the stock are a cause for considerable concern. Stock status in relation to the Commission's B_{MSY} and F_{MSY} reference points remains **unknown** (**Table 1**).

Outlook. Estimated catches have increased steadily since the late-1970s, reaching around 30,000 t in the late-1980s, to between 51,000 and 58,000 t by the mid-1990s, and steadily increasing to over 90,000 t in the following ten years. Between 2010 and 2014 catches have increased to over 105,000 t, rising to the highest levels recorded, although catches have since decline marginally to between 90,000 – 141,000 t since 2014. There is insufficient information to evaluate the effect that this level of catch or a further increase in catches may have on the resource. Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.).

Management advice. For assessed species of neritic tunas in Indian Ocean (longtail tuna, kawakawa and narrow-barred Spanish mackerel), the MSY was estimated during early assessments to have been reached between 2009 and 2011 and both F_{MSY} and B_{MSY} were breached thereafter. It is worth noting that the catch in 2023 was estimated to be 130,815t and there has been significant variability in estimated catches of this species in recent years. This variation is perhaps due to issue of mis-identification of this species among other reasons. In the absence of an accepted stock assessment for frigate tuna, a limit to the catches should be considered by the Commission, by ensuring that future catches do not continue to exceed the average catches estimated between 2009 and 2011 (101,260 t). The reference period (2009-2011) was chosen based on the most recent assessments of those neritic species in the Indian Ocean for which an assessment is available under the assumption that MSY for frigate tuna was also reached between 2009 and 2011. This catch advice should be maintained until an assessment of frigate

tuna is available. Considering that MSY-based reference points for assessed species can change over time, the stock should be closely monitored. Mechanisms need to be developed by the Commission to improve current statistics by encouraging CPCs to comply with their recording and reporting requirements, so as to better inform scientific advice.

The following should be also noted:

- The Maximum Sustainable Yield estimate for the Indian Ocean stock is unknown;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Further work is needed to improve the reliability of the catch series, such as verification or estimation based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.)
- Species identification, data collection and reporting urgently need to be improved;
- There is limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status. In the case of 2022 catches (reference year 2021), 80% of the total catches were either fully or partially estimated by the IOTC Secretariat, which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution 15/01 and 15/02.

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: frigate tuna are caught using gillnet (35.2%), followed by line (31.8%) and purse seine (19.2%). The remaining catches taken with other gears contributed to 13.8% of the total catches in recent years (**Fig. 1**);
- **Main fleets (mean annual catch 2019-2023)**: the majority of frigate tuna catches are attributed to vessels flagged to Indonesia (57.3%) followed by India (9%) and Pakistan (8.2%). The 23 other fleets catching frigate tuna contributed to 25.6% of the total catch in recent years (**Fig. 2**).

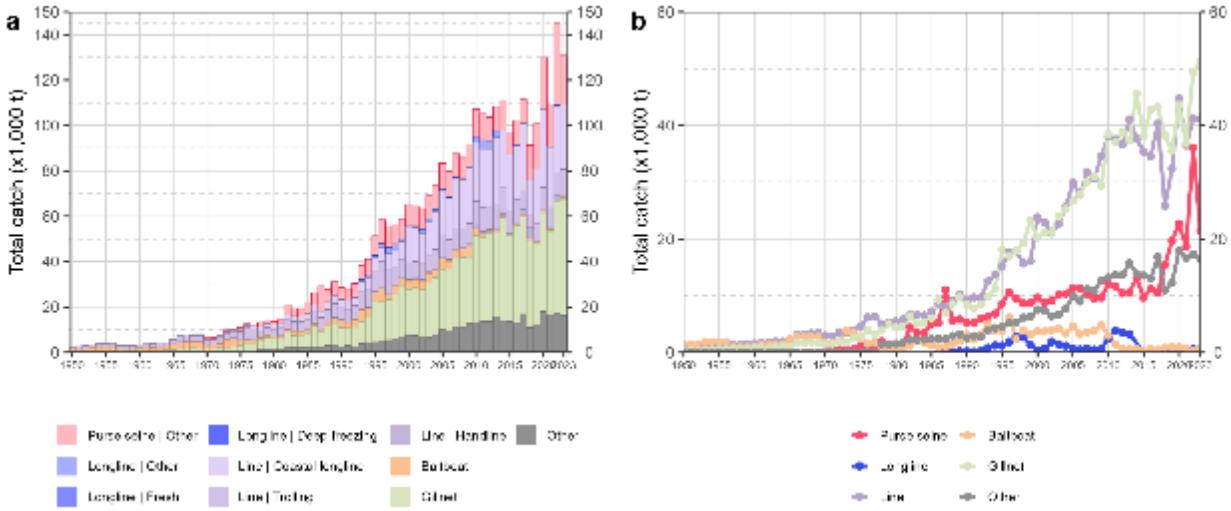


Fig. 1. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for frigate tuna during 1950-2023

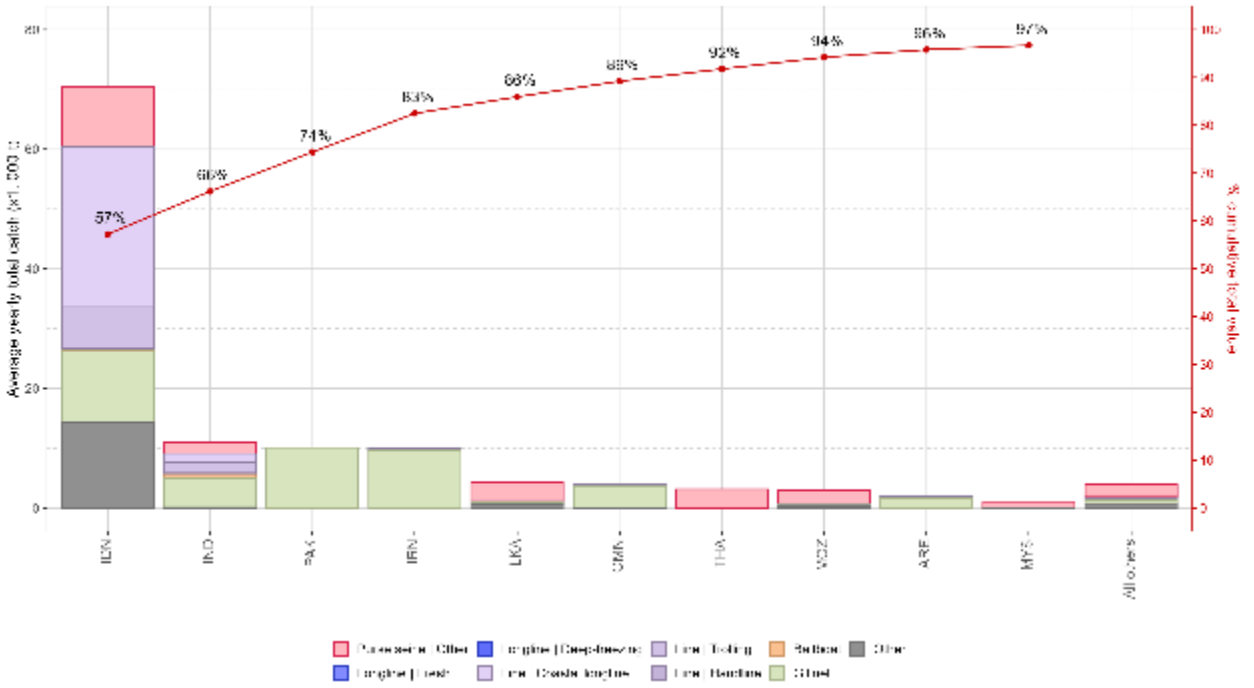


Fig. 2. Mean annual catches (t) of frigate tuna by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet

APPENDIX 14
EXECUTIVE SUMMARY: KAWAKAWA (2024)

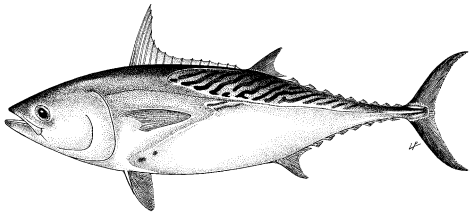


TABLE 1. Status of kawakawa (*Euthynnus affinis*) in the Indian Ocean

Area[1]	Indicators		2023 stock status determination[3]
Indian Ocean	Catch 2023[2] (t) Mean annual catch 2019-2023 (t)	152,828 156,428	**27%**
	MSY (t) (80% CI) F_{MSY} (80% CI) B_{MSY} (t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI)	154,000 (122,000 – 193,000) 0.60 (0.48 – 0.74) 258,000 (185 – 359) 0.98 (0.82–2.20) 0.99 (0.45 – 1.20)	

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2023: 67.6%;
[3]2021 is the final year that data were available for this assessment.

Colour key	Stock overfished (SB_{year}/SB_{MSY}< 1)	Stock not overfished (SB_{year}/SB_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)	25%	23%
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)	27%	25%
Not assessed/Uncertain / Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted in 2024 for kawakawa and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods include C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status. The C-MSY model indicated that the fishing mortality F was very close to F_{MSY} (F/F_{MSY}=0.98) and the current biomass B was also very close to B_{MSY} (B/B_{MSY}=0.99). The estimated probability of the stock currently being in yellow quadrant of the Kobe plot is about 27%. The analysis using OCOM model is more pessimistic and using JABBA incorporating gillnet CPUE indices is more optimistic. Due to the quality of the data being used, the simple modelling approach employed in 2020 and 2023, and the large increase in kawakawa catches over the last decade (**Fig. 1**), measures need to be taken in order to reduce the level of catches which have surpassed the estimated MSY levels for most years since 2011. While the precise stock structure of kawakawa remains unclear, recent research (IOTC-2020-SC23-11_Rev1) provides strong evidence of population structure of kawakawa within the IOTC area of competence, with at least 4 genetic populations identified. This increases the uncertainty in the assessment, which currently assumes a single stock of kawakawa. Based on the weight-of-evidence available, the kawakawa stock for the Indian Ocean is classified as **overfished** but **not subject to overfishing** (**Table 1**, **Fig. 1**). However, the assessment using catch-only method is subjected to high uncertainty and is highly influenced by several prior assumptions.

Outlook. There is considerable uncertainty about stock structure and the estimate of total catches. Due to the uncertainty associated with catch data (e.g., 67.6% of catches partially or fully estimated by the IOTC Secretariat for 2023) and the limited number of CPUE series available for fleets representing a small proportion of total catches, only data poor assessment approaches can currently be used. Aspects of the fisheries for this species, combined with the lack of data on which to base a more complex assessment (e.g., integrated models) are a cause for considerable concern. In the interim, until more traditional approaches are developed, data-poor approaches will be used to assess stock status. Continued increase in the annual catches for kawakawa is also likely to further increase the pressure on the Indian Ocean stock. Research emphasis should be focused

on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.).

Management Advice. The assessment models rely on catch data, which are considered to be highly uncertain. The catch in 2022 was just above the estimated MSY. The available gillnet CPUE of kawakawa showed a somewhat increasing trend although the reliability of the index as abundance indices remains unknown. Despite the substantial uncertainties, the stock is probably very close to being fished at MSY levels and that higher catches may not be sustained in the longer term. A precautionary approach to management is recommended.

The following should be also noted:

- The Maximum Sustainable Yield for the Indian Ocean is estimated to be 154,000 t with a range between 122,000 t and 193,000 t and so catch levels should be reduced in future to bring the stock back into the green quadrant;
- Further work is needed to improve the reliability of the catch series. Reported catches should be verified or estimated, based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Improvement in data collection and reporting is required if the stock is to be assessed using integrated stock assessment models;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.);
- Given the limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status, the IOTC Secretariat was required to estimate 60.1% of the catches of kawakawa (in 2022), which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution 15/01 and 15/02.

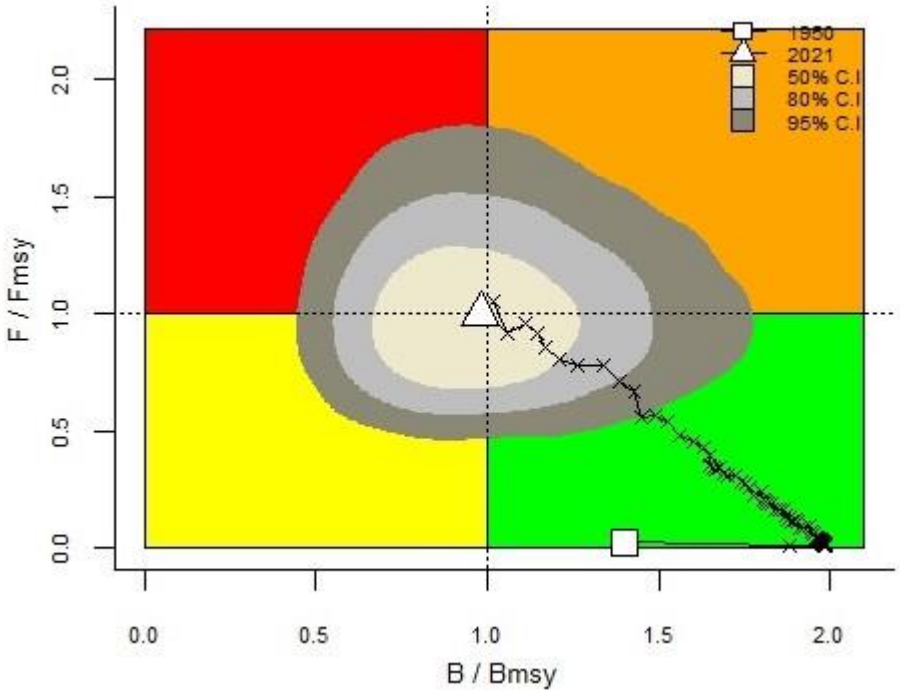


Fig. 1. C-MSY Indian Ocean assessment Kobe plot for kawakawa. The Kobe plot presents the trajectories (median) for the range of plausible model trajectories included in the formulation of the final management advice. The shaded contour lines represent 50%, 80%, and 95% confidence intervals of estimated stock status in 2021

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: kawakawa are caught using gillnet (48.5%), followed by purse seine (29.3%) and line (17%). The remaining catches taken with other gears contributed to 5.1% of the total catches in recent years (**Fig. 2**).

- **Main fleets (mean annual catch 2019-2023)**: the majority of kawakawa catches are attributed to vessels flagged to Indonesia (30.6%) followed by India (23.4%) and I. R. Iran (22.2%). The 32 other fleets catching kawakawa contributed to 23.7% of the total catch in recent years (**Fig. 3**).

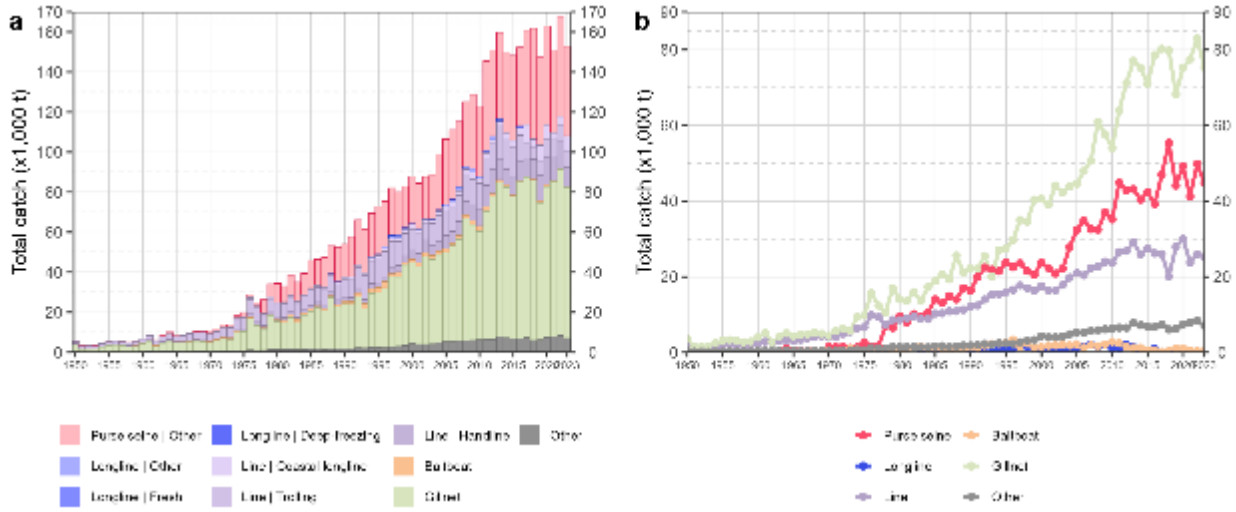


Fig. 2. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for kawakawa during 1950-2023

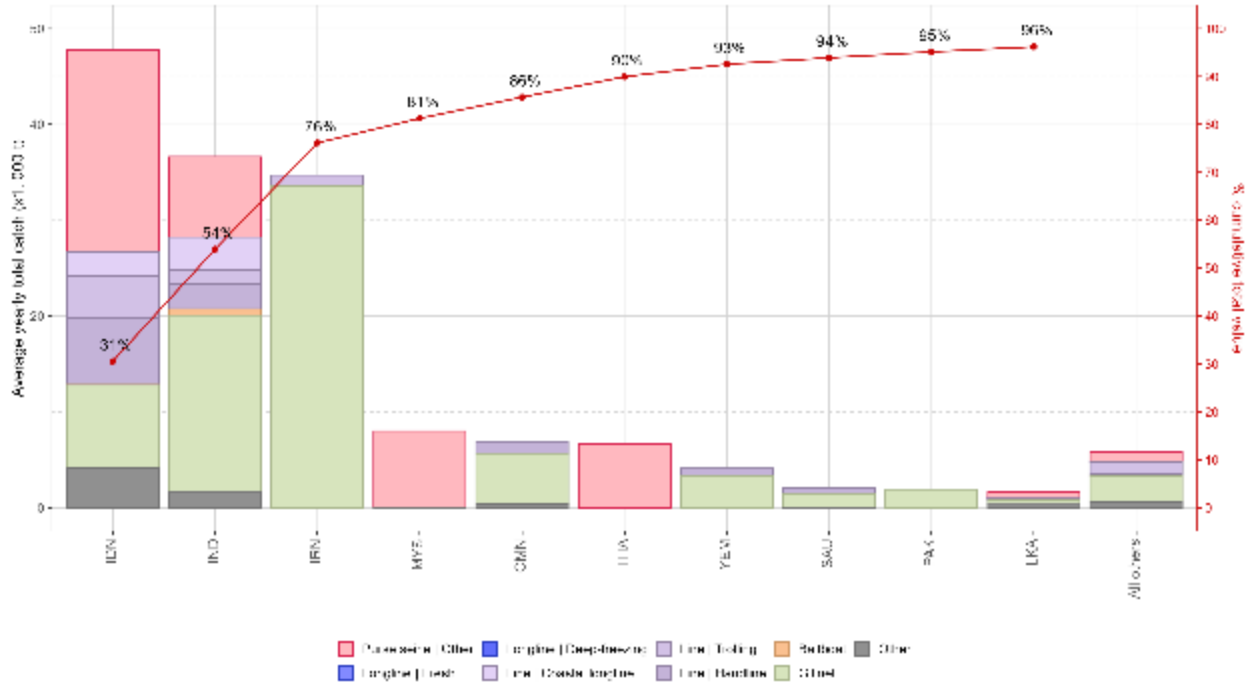


Fig 3. Mean annual catches (t) of kawakawa by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet

APPENDIX 15
EXECUTIVE SUMMARY: LONGTAIL TUNA (2024)

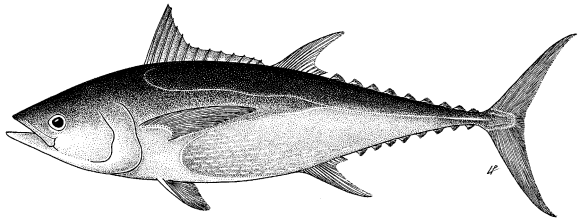


TABLE 1. Status of longtail tuna (*Thunnus tonggol*) in the Indian Ocean

Area[1]	Indicators		2023 stock status determination[3]
Indian Ocean	Catch 2023[2] (t)	137,884	35%
	Mean annual catch (2019-2023) (t)	130,973	
	MSY (t) (80% CI)	133,000 (108000 –165000)	
	F_{MSY} (80% CI)	0.31 (0.22 – 0.44)	
	B_{MSY} (t) (80% CI)	433,000 (272,000 – 690,000)	
	$F_{current}/F_{MSY}$ (80% CI)	1.05 (0.84 – 2.31)	
	$B_{current}/B_{MSY}$ (80% CI)	0.96 (0.44 – 1.19)	

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2023: 46%;
[3]2021 is the final year that data were available for this assessment

Colour key	Stock overfished ($SB_{year}/SB_{MSY}< 1$)	Stock not overfished ($SB_{year}/SB_{MSY}\geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY}> 1$)	35%	25%
Stock not subject to overfishing ($F_{year}/F_{MSY}\leq 1$)	23%	17%
Not assessed/Uncertain/Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted for longtail in 2024 and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods including C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status. The C-MSY analysis indicates that the stock is being exploited at a rate that exceeded F_{MSY} in recent years and that the stock appears to be below B_{MSY} and above F_{MSY} (35% of plausible models runs) (**Fig. 2**). Catches between 2017 and 2021 were slightly above MSY but steadily declined from 2012 to less than 113,000 t in 2019, (**Fig. 1**). The F_{2021}/F_{MSY} ratio is lower than previous estimates and the B_{2021}/B_{MSY} ratio was higher than in previous years. The analysis using the OCOM model is more pessimistic and using JABBA incorporating gillnet CPUE indices is more optimistic. The JABBA model, however, is unable to estimate carrying capacity with a fair degree of certainty without additional prior constraints, indicating the fact that the CPUE is either not informative or is conflicting with catch data. While the precise stock structure of longtail tuna remains unclear, recent research (IOTC-2020-SC23-11_Rev1) provides strong evidence of population structure of longtail tuna within the IOTC area of competence, with at least 3 genetic populations identified. This increases the uncertainty in the assessment, which currently assumes a single stock of longtail tuna. Based on the C-MSY assessment, the stock is considered to be both **overfished** and **subject to overfishing** (**Table 1**; **Fig. 1**). However, the assessment using catch-only method is subjected to high uncertainty and is highly influenced by several prior assumptions.

Outlook. There remains considerable uncertainty about the total catches of longtail tuna in the Indian Ocean. The increase in annual catches to a peak in 2012 increased the pressure on the longtail tuna Indian Ocean stock, although the catch trend has reversed since then. As noted in 2015, the apparent fidelity of longtail tuna to particular areas/regions is a matter for concern

as overfishing in these areas can lead to localised depletion. Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions, exploring alternative approaches for estimating abundance (e.g., close-kin mark-recapture), and gaining a better understanding of stock structure and life trait history parameters (e.g. estimates of growth, natural mortality, maturity, etc.).

Management advice. The catch in 2022 was above the estimated MSY and the exploitation rate has been increasing over the last few years, as a result of the declining abundance. Despite the substantial uncertainties, this suggests that the stock is being fished above MSY levels and that higher catches may not be sustained. A precautionary approach to management is recommended.

The following should be also noted:

- The Maximum Sustainable Yield for the Indian Ocean is estimated to be 133,000t with a range of 108,000 – 165,000t and so catch levels should be reduced in future to bring the stock back into the green quadrant;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Further work is needed to improve the reliability of the catch series. Reported catches should be verified or estimated, based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Improvements in data collection and reporting are required if the stock is to be assessed using integrated stock assessment models;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets (I.R. Iran, Indonesia, Pakistan, Sultanate of Oman and India), size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.);
- There is limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status. In the case of 2022 catches 27.2% of the total catches of longtail were either fully or partially estimated by the IOTC Secretariat, which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution 15/01 and 15/02.

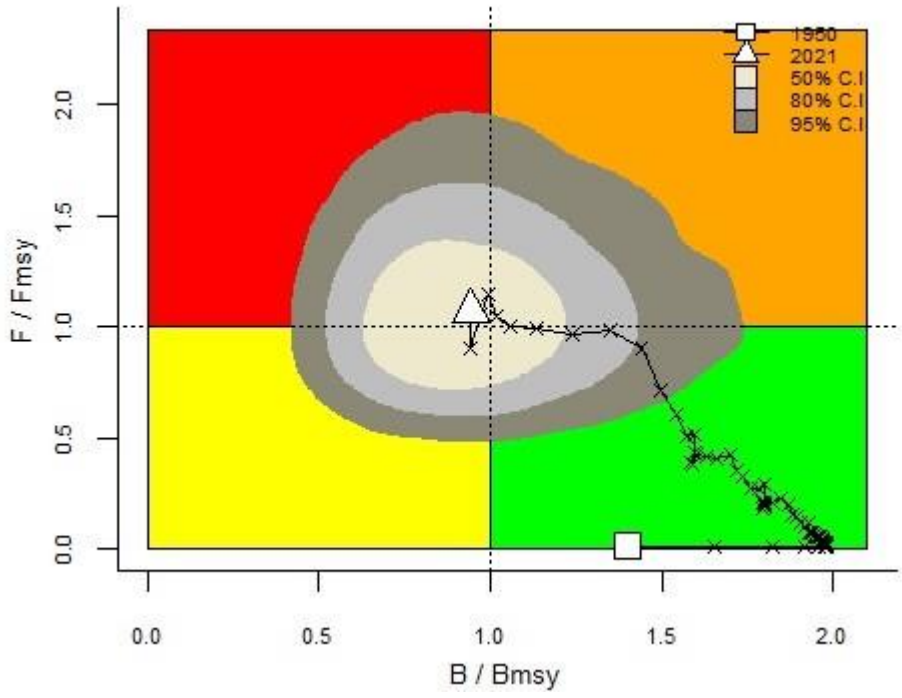


Fig. 1. Longtail tuna C-MSY Indian Ocean assessment Kobe plot. The Kobe plot presents the trajectories (median) for the range of plausible model trajectories included in the formulation of the final management advice. The shaded contour lines represent 50%, 80%, and 95% confidence intervals of estimated stock status in 2021 (

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: longtail tuna are caught using gillnet (65.4%), followed by line (17.4%) and other (8.6%). The remaining catches taken with other gears contributed to 8.7% of the total catches in recent years (**Fig. 2**).

- **Main fleets (mean annual catch 2019-2023)**: the majority of longtail tuna catches are attributed to vessels flagged to I. R. Iran (39.5%) followed by Indonesia (23.2%) and Sultanate of Oman (19.7%). The 21 other fleets catching longtail tuna contributed to 17.7% of the total catch in recent years (**Fig. 3**).

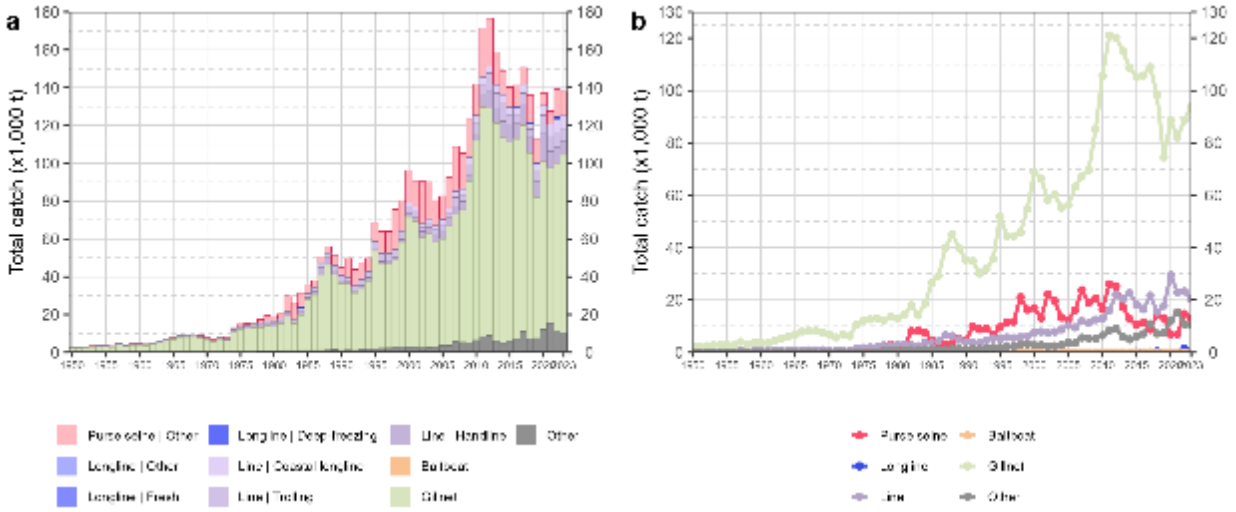


Fig. 2. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for longtail tuna during 1950-2023

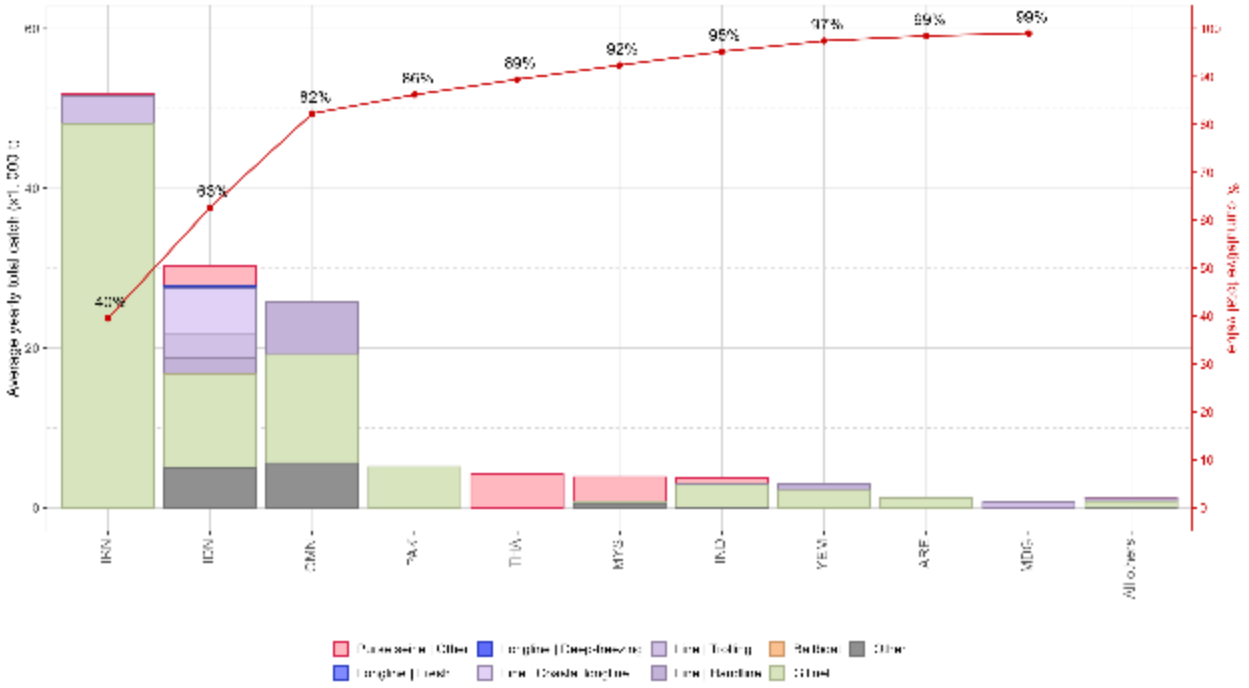


Fig. 3. Mean annual catches (t) of longtail tuna by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet.

APPENDIX 16
EXECUTIVE SUMMARY: INDO-PACIFIC KING MACKEREL (2024)

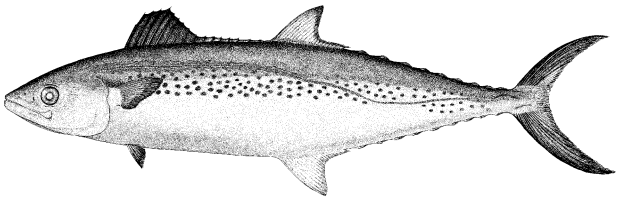


TABLE 1. Status of Indo-Pacific king mackerel (*Scomberomorus guttatus*) in the Indian Ocean

Area[1]	Indicators		2024 stock status determination[3]
Indian Ocean	Catch (2023) (t)[2]	46,255	**27%**
	Mean annual catch (2019-2023) (t)	46,008	
	MSY (1,000 t)	47 (39–56)	
	F_{MSY}	0.74 (0.56–0.99)	
	B_{MSY} (1,000 t)	63.1 (43.1–92.4)	
	$F_{current}/F_{MSY}$	0.95 (0.82–2.13)	
	$B_{current}/B_{MSY}$	1.02 (0.46–1.19)	
	$B_{current}/B_0$	0.51 (0.23–0.60)	

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2023: 69.5%;
[3]2022 is the final year that data were available for this assessment

Colour key	Stock overfished ($SB_{year}/SB_{MSY}< 1$)	Stock not overfished ($SB_{year}/SB_{MSY}\geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY}> 1$)	24%	24%
Stock not subject to overfishing ($F_{year}/F_{MSY}\leq 1$)	25%	27%
Not assessed/Uncertain/Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new assessment was conducted in 2024 using the data-limited techniques (CMSY and CMSY++) (using data up to 2022). Analysis using the catch only method CMSY indicates the stock is being exploited at a rate that is below F_{MSY} in recent years and that the stock appears to be above B_{MSY}, although the estimates would be more pessimistic if the stock productivity is assumed to be less resilient. An assessment using CMSY++was also explored in 2024. The stock estimates with CMSY++ are estimated to be very close to the biomass target even though the stock status is more pessimistic than with CMSY. Despite some of the caveats of the underlying assumptions, the catch-only model has provided a more defensible approach in addressing the uncertainty of key parameters and the currently available catch data for the Indo-Pacific king mackerel appear to be of sufficient quality. Based on the weight-of-evidence currently available, the stock is considered to be **not overfished and not subject to overfishing** (**Table 1; Fig. 1**).

Outlook. Total annual catches for Indo-Pacific king mackerel have increased steadily over time, reaching a peak of 51,600 t in 2009 and have since fluctuated between around 40,000 t and 51,300 t. There is considerable uncertainty about stock structure and total catches. Aspects of the fisheries for this species, combined with the limited data on which to base a more complex assessment (e.g., integrated models), are a cause for concern. Although data-poor methods are used to provide stock status advice, further refinements to the catch-only methods and application of additional data-poor approaches may improve confidence in the results. Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g., estimates of growth, natural mortality, maturity, etc.).

Management advice. Reported catches of Indo-Pacific king mackerel in the Indian Ocean has increased considerably since the late 2000s with recent catches fluctuating around estimated MSY, although the catch in 2021 and 2023 was below the estimated

MSY. This suggests that the stock is close to being fished at MSY levels and that higher catches may not be sustained despite the substantial uncertainty associated with the assessment, a precautionary approach to management is recommended.

The following should be also noted:

- The Maximum Sustainable Yield for the Indian Ocean is estimated to be 47,000 t with a range between 39,000–56,000 t
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic tunas under its mandate;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions and life trait history parameters (e.g. estimates of growth, natural mortality, maturity, etc.).
- Further work is needed to improve the reliability of the catch series. Reported catches should be verified or estimated, based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Data collection and reporting urgently needed to be improved, given the limited information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status. In the case of 2022 74.8% of the total catches of Indo-Pacific king mackerel was either fully or partially estimated by the IOTC Secretariat, which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution 15/01 and 15/02.

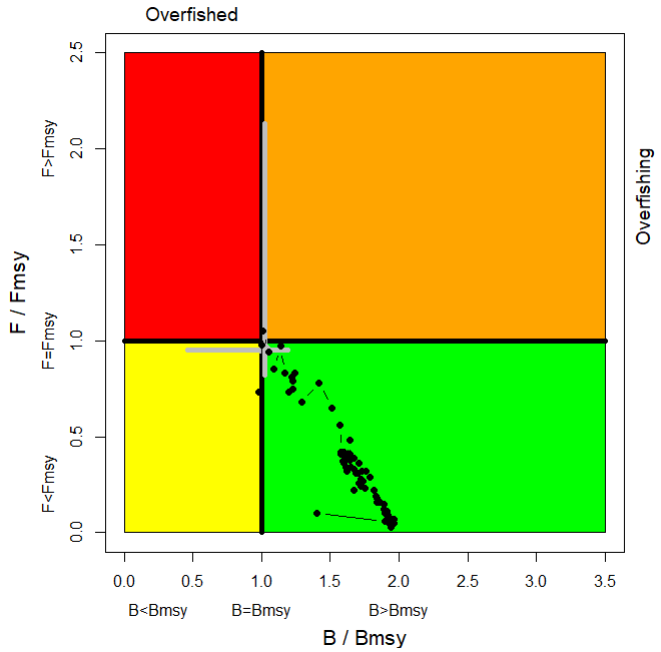


Fig. 1 Kobe plot of the CMSY assessment for the Indo-Pacific king mackerel. The Kobe plot shows the trajectories (geometric mean) of the range of plausible model options included in the formulation of the final management advice. The grey cross represents the estimated stock status in 2021 (median and 80% confidence interval).

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: Indo-Pacific king mackerel are caught using gillnet (63.7%), followed by other (23.3%) and line (9.7%). The remaining catches taken with other gears contributed to 3.3% of the total catches in recent years (**Fig. 2**).

- **Main fleets (mean annual catch 2019-2023:** the majority of Indo-Pacific king mackerel catches are attributed to vessels flagged to Indonesia (32.3%) followed by India (26.8%) and I. R. Iran (22.2%). The 15 other fleets catching Indo-Pacific king mackerel contributed to 18.7% of the total catch in recent years (Fig. 3).

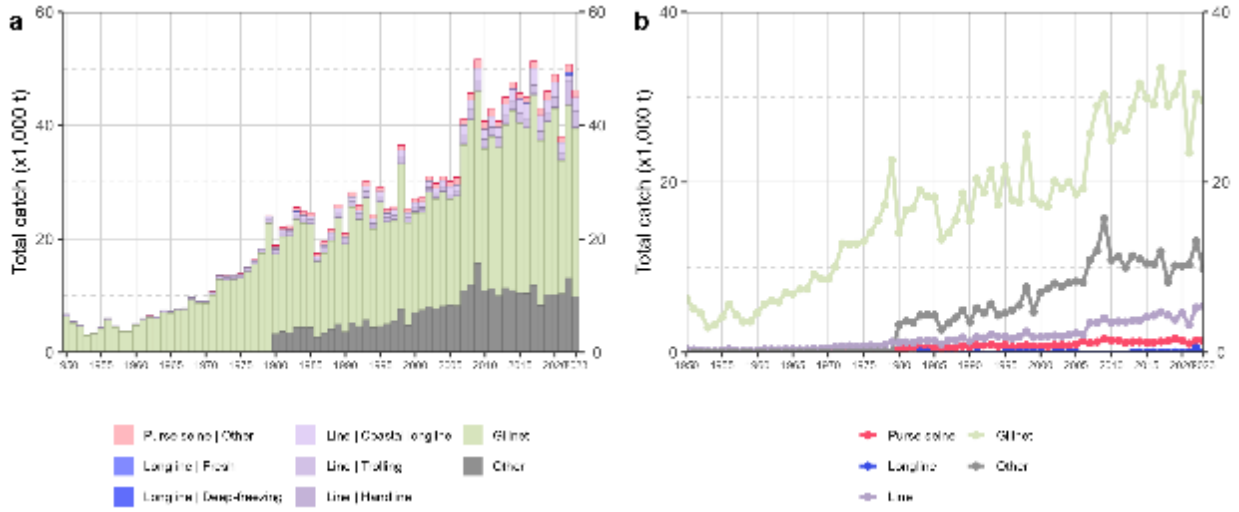


Fig. 2. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for Indo-Pacific king mackerel during 1950-2023

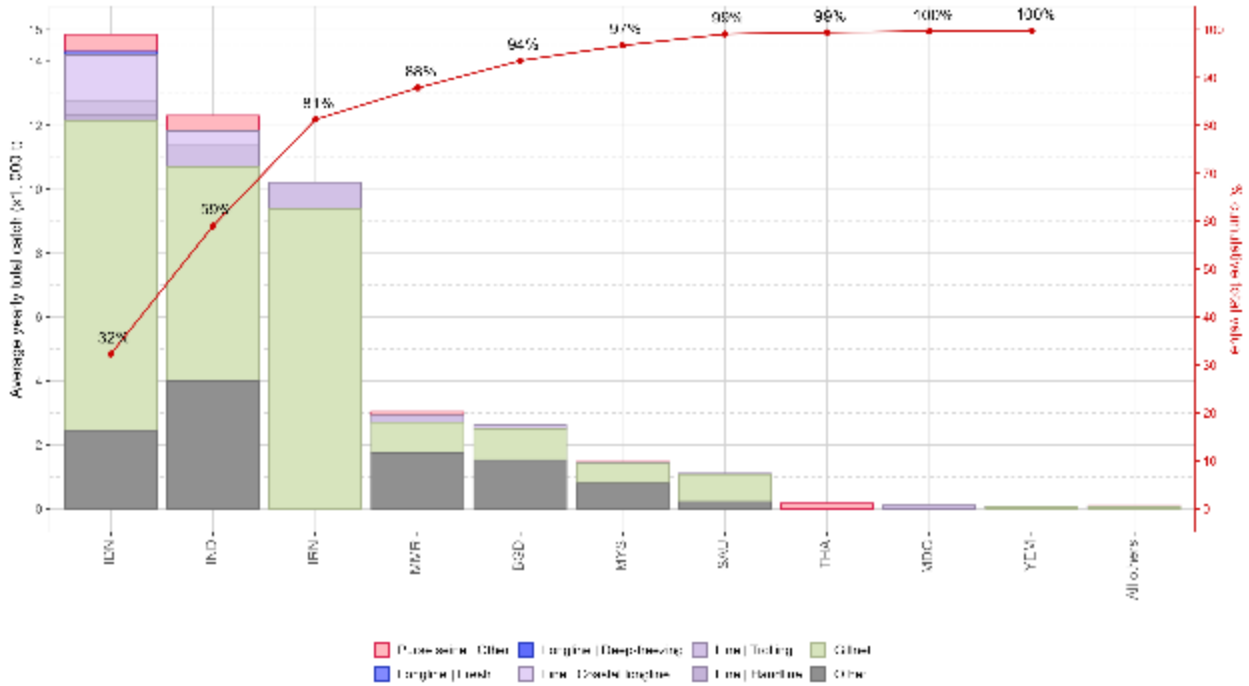


Fig. 3. Mean annual catches (t) of Indo-Pacific king mackerel by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet.

APPENDIX 17
EXECUTIVE SUMMARY: NARROW-BARRED SPANISH MACKEREL (2024)

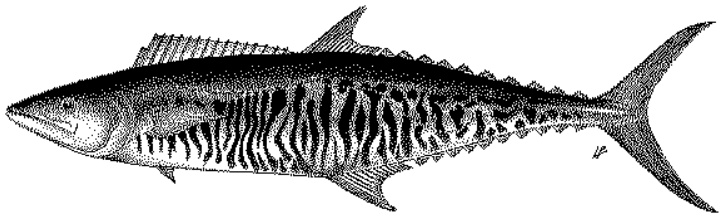


TABLE 1. Status of narrow-barred Spanish mackerel (*Scomberomorus commerson*) in the Indian Ocean

Area[1]	Indicators		2023 stock status determination[3]
Indian Ocean	Catch (2023)[2] (t) Mean annual catch (2019-2023) (t)	165,295 162,610	31%
	MSY (t) (80% CI) F_{MSY} (80% CI) B_{MSY} (t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $B_{current}/B_{MSY}$ (80% CI)	161,000 (132,000 – 197,000) 0.60 (0.48–0.74) 271,000 (197,000 – 373,000) 1.07 (0.88 – 2.38) 0.98 (0.44 – 1.19)	

[1]Stock boundaries defined as the IOTC area of competence;
[2]Proportion of catch fully or partially estimated for 2023: 62.8%;
[3]2021 is the final year that data were available for this assessment

Colour key	Stock overfished (SB_{year}/SB_{MSY}< 1)	Stock not overfished (SB_{year}/SB_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)	31%	28%
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)	21%	19%
Not assessed/Uncertain/Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was conducted in 2024 for narrow-barred Spanish mackerel and so the results are based on the results of the assessment carried out in 2023 which examined a number of data-limited methods including C-MSY, OCOM, and JABBA models (based on data up to 2021). These models produced stock estimates that are not drastically divergent because they shared similar dynamics and assumptions. The C-MSY model has been explored more fully and therefore is used to obtain estimates of stock status. The C-MSY analysis indicates that the stock is being exploited at a rate that exceeded F_{MSY} in recent years and that the stock appears to be below B_{MSY} and above F_{MSY} (31% of plausible models runs). The analysis using OCOM model is more pessimistic and using JABBA incorporating gillnet CPUE indices is more optimistic. The JABBA model, however, is unable to estimate carrying capacity with a fair degree of certainty without additional prior constraints, indicating that the CPUE is either not informative or is conflicting with catch data. An analysis undertaken in 2013 in the Northwest Indian Ocean (Gulf of Oman) indicated that overfishing is occurring in this area and that localised depletion may also be occurring[3]. While the precise stock structure of Spanish mackerel remains unclear, recent research (IOTC-2020-SC23-11_Rev1) provides strong evidence of population structure of Spanish mackerel within the IOTC area of competence, with at least 4 genetic populations identified. This increases the uncertainty in the assessment, which currently assumes a single stock of Spanish mackerel. Based on the C-MSY assessment, the stock appears to be **overfished** and **subject to overfishing** (**Table 1**, **Fig. 1**). However, the assessment using catch-only method is subjected to high uncertainty and is highly influenced by several prior assumptions.

Outlook. There is considerable uncertainty about the estimate of total catches. The continued increase in annual catches in recent years has further increased the pressure on the Indian Ocean narrow-barred Spanish mackerel stock. The apparent fidelity of narrow-barred Spanish mackerel to particular areas/regions is a matter for concern as overfishing in these areas can lead to localised depletion.

[3] IOTC-2013-WPNT03-27

Management advice. The catch in 2023 was above the estimated MSY and the available gillnet CPUE shows a somewhat increasing trend in recent years although the reliability of the index as an abundance index remains unknown. Despite the substantial uncertainties, the stock is being fished above MSY levels and higher catches may not be sustained.

The following should also be noted:

- Maximum Sustainable Yield for the Indian Ocean stock was estimated at 161,000 t (ranging between 132,000 t and 197,000 t, with catches for 2022 (178,403 t) exceeding this level;
- Limit reference points: the Commission has not adopted limit reference points for any of the neritic species under its mandate;
- Further work is needed to improve the reliability of the catch series. Reported catches should be verified or estimated, based on expert knowledge of the history of the various fisheries or through statistical extrapolation methods;
- Improvement in data collection and reporting is required if the stock is to be assessed using integrated stock assessment models;
- Given the increase in narrow-barred Spanish mackerel catch in the last decade, measures need to be taken to reduce catches in the Indian Ocean;
- Research emphasis should be focused on collating catch per unit effort (CPUE) time series for the main fleets, size compositions, exploring alternative approaches for estimating abundance (e.g., close-kin mark-recapture), and gaining a better understanding of stock structure and life trait history parameters (e.g. estimates of growth, natural mortality, maturity, etc.);
- There is a lack of information submitted by CPCs on total catches, catch and effort and size data for neritic tunas, despite their mandatory reporting status. In the case of 2023 catches, 62.8% of the total catches of narrow-barred Spanish mackerel were either fully or partially estimated by the IOTC Secretariat, which increases the uncertainty of the stock assessments using these data. Therefore, the management advice to the Commission includes the need for CPCs to comply with IOTC data requirements per Resolution 15/01 and 15/02.

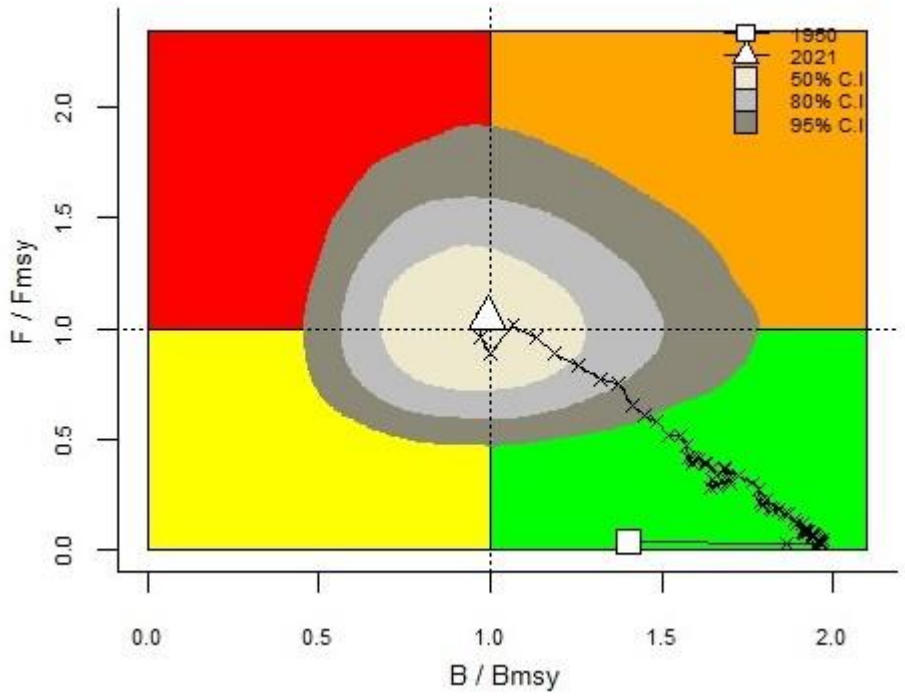


Fig. 1. Narrow-barred Spanish Mackerel OCOM Indian Ocean assessment Kobe plot. The Kobe plot presents the trajectories (median) for the range of plausible model trajectories included in the formulation of the final management advice. The shaded contour lines represent 50%, 80%, and 95% confidence intervals of estimated stock status in 2021

Fisheries overview.

- **Main fisheries (mean annual catch 2019-2023)**: narrow-barred Spanish mackerel are caught using gillnet (57.7%), followed by line (19.9%) and other (16.5%). The remaining catches taken with other gears contributed to 5.9% of the total catches in recent years (**Fig. 2**).

- **Main fleets (mean annual catch 2019-2023)**: the majority of narrow-barred Spanish mackerel catches are attributed to vessels flagged to Indonesia (30%) followed by India (17.5%) and I. R. Iran (16.1%). The 29 other fleets catching narrow-barred Spanish mackerel contributed to 36.3% of the total catch in recent years (**Fig. 3**).

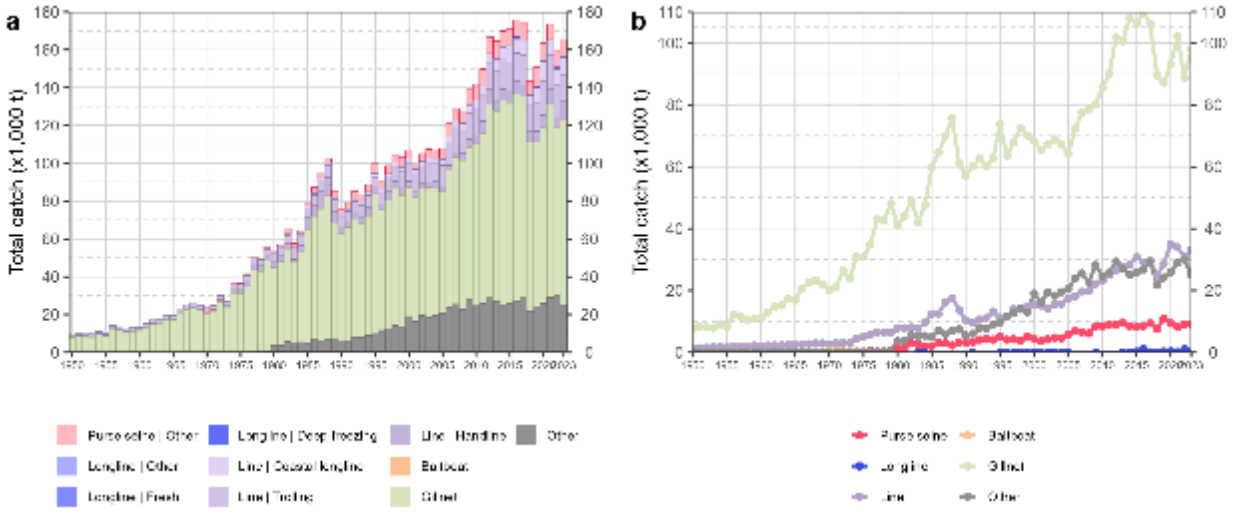


Fig. 2. Annual time series of (a) cumulative nominal catches (t) by fishery and (b) individual nominal catches (t) by fishery group for narrow-barred Spanish mackerel during 1950-2023

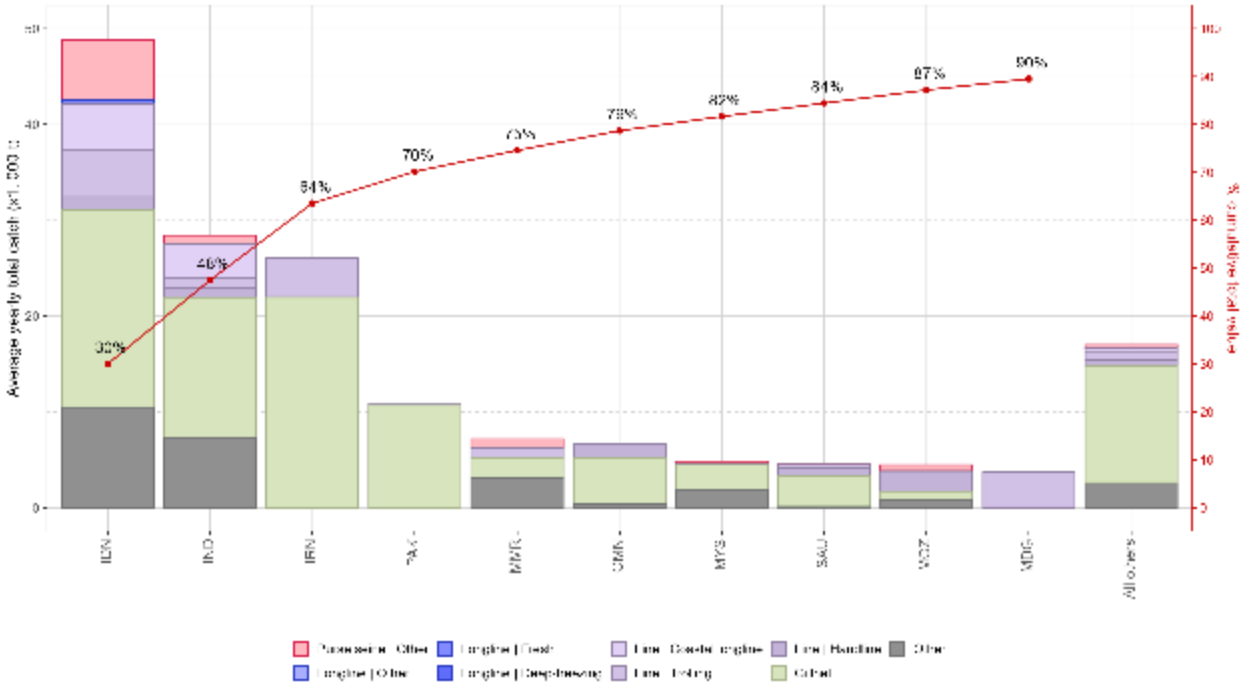


Fig. 3. Mean annual catches (t) of narrow-barred Spanish mackerel by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet

APPENDIX 18
EXECUTIVE SUMMARY: BLACK MARLIN (2024)

TABLE 1. Status of black marlin (*Istiompax indica*) in the Indian Ocean.

Area[1]	Indicators		2024 stock status determination[3]
Indian Ocean	Catch 2023 (t)[2]	27,872	62.2%
	Average catch 2019–2023 (t)	20,060	
	MSY (1,000 t) (80% CI)	13.90 (8.73 – 28.51)	
	F_{MSY} (80% CI)	0.21 (0.15 - 0.30)	
	B_{MSY} (1,000 t) (80% CI)	65.23 (46.43-101.84)	
	F_{2022}/F_{MSY} (80% CI)	1.39 (0.72 – 2.45)	
	B_{2022}/B_{MSY} (80% CI)	1.35 (0.96 – 1.79)	
	B_{2022}/B_0 (80% CI)	0.49 (0.35 – 0.66)	

[1] Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence
[2] Proportion of 2023 catch fully or partially estimated by the IOTC Secretariat: 34.9%
[3] 2022 is the final year that data were available for this assessment

Colour key	Stock overfished (B_{2022}/B_{MSY}< 1)	Stock not overfished (B_{2022}/B_{MSY}≥ 1)
Stock subject to overfishing (F_{2022}/F_{MSY}> 1)	12.5%	62.2%
Stock not subject to overfishing (F_{2022}/F_{MSY}≤ 1)	0	25.3%
Not assessed/Uncertain/Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new stock assessment was carried out for black marlin in 2024, based on JABBA, a Bayesian state-space production model (using data up to 2022). The relative point estimates for this assessment are F/FMSY=1.39 (0.72-2.45) and B/BMSY=1.35 (0.96 -1.79). The Kobe plot indicated that the stock is currently not overfished but is subject overfishing (Table 1; Fig. 3). In 2022, the catch of black marlin surged to 26,320 tons. Until 2024, fish stock status was characterised as "uncertain" due to significant uncertainties in past assessments (like those from 2018 and 2021). These uncertainties were attributed to both historical catch reporting from key fishing state and poor assessment diagnostics. However, there's been progress recently with black marlin catch data, particularly from coastal countries in the northern Indian Ocean, and the latest JABBA assessment shows it's now more reliable (with improved model fitting to the abundance indices and acceptable level of retrospective patterns). The assessment relied on CPUE indices from longline fisheries in which the black marlin is a bycatch species. On the weight-of-evidence available in 2024, the stock status of black marlin is determined to be not overfished but subject to overfishing (Table 1; Fig. 3).

Outlook. While the recent high catches seem to be mainly due to developing coastal fisheries operating in the core habitat of the species (mainly IR. Iran, India and Sri Lanka), the CPUE indicators are from industrial fleets with lower catches of black marlin operating mostly offshore. There has been a substantial increase of catches of black marlin from coastal countries. The outlook is likely to remain uncertain in the absence of CPUE indices from gillnet and coastal longline fleets to inform stock assessment models. Moreover, catches remain substantially higher than the limits stipulated in Res 18/05 and are a cause for concern as this will likely continue to drive the population towards overfished status.

Management advice. The catch limits (9932 t) as stipulated in Resolution 18/05 have been exceeded for three consecutive years since 2020, which as per resolution 18/05, requires a review of the resolution. Furthermore, these limits are not based on estimates of most recent stock assessment. Thus, it is recommended that the Commission urgently revise 18/05 to incorporate limits that reflect the most recent stock assessment and projections and review and where necessary revise the implementation and effectiveness of the measures contained in this Resolution. The stock is now subject to overfishing. If the Commission wishes to recover the stock to the green quadrant of the Kobe plot with a probability ranging from 60% to 90% by 2026 as per Resolution 18/05, it needs to provide mechanisms to ensure the maximum annual catches remain less than 10 626 t (**Table 3**).

The following key points should be noted:

- **Maximum Sustainable Yield (MSY)**: estimate for the whole Indian Ocean is 13,900 t.
- **Provisional reference points**: Although the Commission adopted reference points for swordfish in Resolution 15/10 *on target and limit reference points and a decision framework*, no such interim reference points nor harvest control rules have been established for black marlin.
- **Main fisheries** (mean annual catch 2019-2023): black marlin are caught using gillnet (65.6%), followed by line (23.3%) and longline (5.9%). The remaining catches taken with other gears contributed to 5.1% of the total catches in recent years (**Fig. 1**).
- **Main fleets** (mean annual catch 2019-2023): the majority of black marlin catches are attributed to vessels flagged to I. R. Iran (45.7%) followed by India (19.5%) and Indonesia (11.6%). The 28 other fleets catching black marlin contributed to 23.1% of the total catch in recent years (**Fig. 2**).

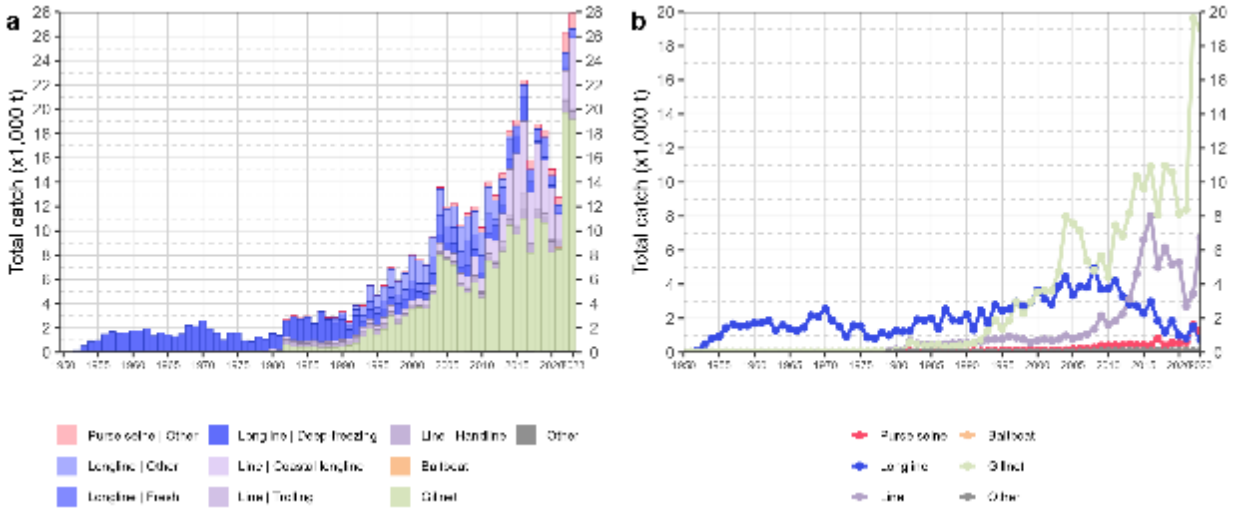


Fig. 1. Annual time series of (a) cumulative nominal catches (metric tons; t) by fishery and (b) individual nominal catches (metric tons; t) by fishery group for black marlin during 1950-2023. Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

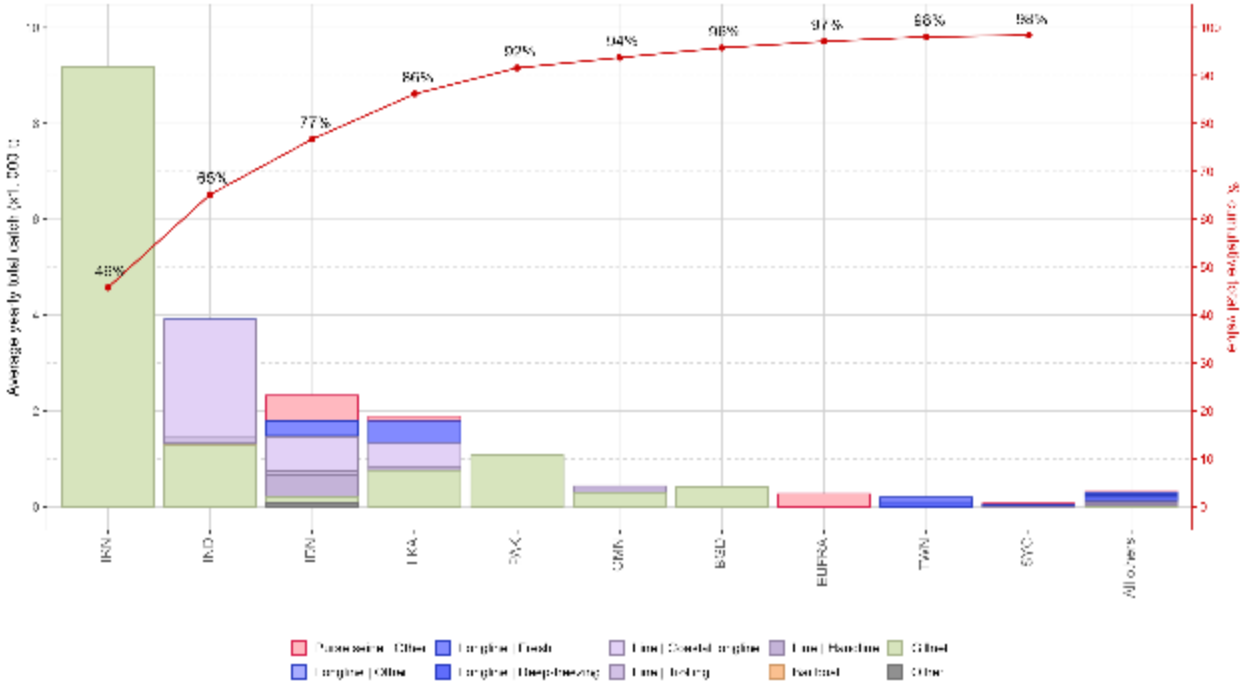


Fig. 2. Mean annual catches (metric tons; t) of black marlin by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet. Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

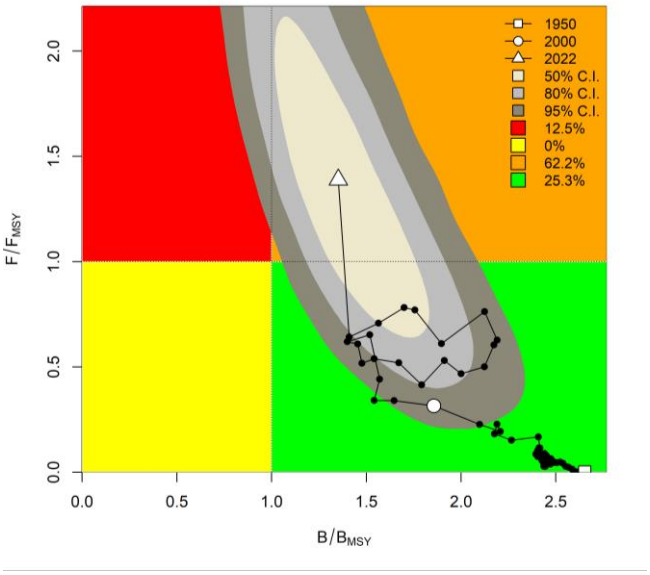


Fig. 3. JABBA Indian Ocean assessment Kobe plots for black marlin (contours are the 50, 80 and 95 percentiles of the 2022 estimate). Black line indicates the trajectory of the point estimates for the total biomass ratio (B/B_{MSY}) and fishing mortality ratio (F/F_{MSY}) for each year 1950–2022.

Table 2. Black marlin: JABBA Indian Ocean assessment Kobe II Strategy Matrix. Probability (percentage) of violating the MSY-based target reference points for nine constant catch projections relative to the average catch level of 2020 – 2022 (17710 t) * ± 20%, ± 40%,± 60%) projected for 3 and 10 years.

Reference point and projection timeframe	**Alternative catch projections (relative to the average catch level of 2020–2022 of 17710 t) and probability (%) of violating MSY-based target reference points (Btarg = B_{MSY}; Ftarg = F_{MSY})**						
	40% (7084 t)	**60%** (10626 t)	**80%** (14168 t)	**100%** (17710 t)	**120%** (21252 t)	**140%** (24794 t)	**160%** (28336 t)
$B_{2025} < B_{MSY}$	23	31	40	49	57	64	70
$F_{2025} > F_{MSY}$	6	23	45	63	76	84	89
$B_{2032} < B_{MSY}$	8	25	48	67	80	88	92
$F_{2032} > F_{MSY}$	4	21	49	71	84	91	95

Table 3. Black marlin: Probability (percentage) of achieving the KOBE green quadrat from 2023-2032 for a range of constant catch projections (JABBA).

Catch (t)| Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
7084 (40%)	65	72	77	81	85	87	89	90	91	92
10626 (60%)	63	66	68	70	71	72	73	74	74	75
14168 (80%)	55	54	53	53	52	52	51	50	50	50
17710(100%)	42	39	37	35	33	32	31	30	29	29
21252 (120%)	30	27	24	22	21	19	18	17	17	16
24794 (140%)	22	19	16	14	13	12	11	10	9	9
28336 (160%)	16	13	11	9	8	7	7	6	6	5

APPENDIX 19
EXECUTIVE SUMMARY: BLUE MARLIN (2024)

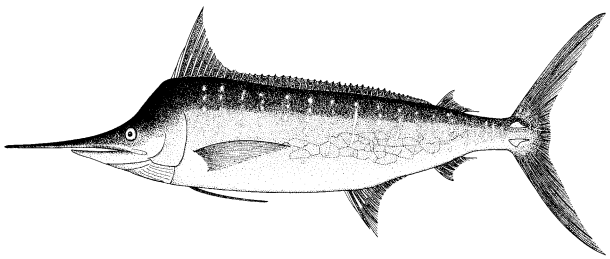


Table 1. Status of blue marlin (*Makaira nigricans*) in the Indian Ocean

Area[1]	Indicators		2022 stock status determination[3]
Indian Ocean	Catch 2023[2] (t)	7,888	72%*
	Average catch 2019-2023 (t)	7,049	
	MSY (1,000 t) (80% CI)	8.74 (7.14 –10.72)	
	F_{MSY} (80% CI)	0.24 (0.14 – 0.39)	
	B_{MSY} (1,000 t) (80% CI)	35.8 (22.9 – 60.3)	
	F_{2020}/F_{MSY} (80% CI)	1.13 (0.75 – 1.69)	
	B_{2020}/B_{MSY} (80% CI)	0.73 (0.51 – 0.99)	
	B_{2020}/B_0 (80% CI)	0.36 (0.26 – 0.50)	

[1] Boundaries for the Indian Ocean are defined as the IOTC area of competence
[2] Proportion of 2023 catch estimated or partially estimated by IOTC Secretariat: 45.7%
[3] 2020 is the final year that data were available for this assessment
* Estimated probability that the stock is in the respective quadrant of the Kobe plot (shown below), derived from the confidence intervals associated with the current stock status

Colour key	Stock overfished ($B_{year}/B_{MSY}< 1$)	Stock not overfished ($B_{year}/B_{MSY}\geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY}> 1$)	72%	0%
Stock not subject to overfishing ($F_{year}/F_{MSY}\leq 1$)	26%	2%
Not assessed/Uncertain/Unknown		

The percentages are calculated as the proportion of model terminal values that fall within each quadrant with model weights taken into account

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was carried out for blue marlin in 2024, thus the stock status is determined on basis of the 2022 assessment which was based on two different models: JABBA, a Bayesian state-space production model (age-aggregated); and SS3, an integrated model (age-structured) (using data up to 2020). Uncertainty in the biological parameters is still evident and as such the JABBA model (B2020/BMSY = 0.73, F2020/FMSY =1.13) was selected as the base case. Both models were consistent with regards to stock status. On the weight-of-evidence available in 2022, the stock is determined to be ***overfished*** and ***subject to overfishing*** (**Table 1** and **Fig. 3**).

Outlook. The B/B_{MSY} trajectory declined from the mid-1980s to 2007. A short-term increase in B/B_{MSY} occurred from 2007 to 2012, which is thought to be linked to the NW Indian Ocean Piracy period. Thereafter, the B/B_{MSY} trajectory again declines to the current estimate **of 0.73**. F/F_{MSY} increased since the mid-1980s and despite a recent decline, F/F_{MSY} remains above 1. The majority of CPUE indices have shown a declining trend since 2015.

Management advice. The current catches of blue marlin (average of 7,045 t in the last 5 years, 2018-2022) are lower than MSY (8,740 t). The stock is currently overfished and subject to overfishing. According to K2SM calculated (Table 2), a reduction of 20% of catches (5,700 t.) compared to 2020 catches (7,126t.) would recover the stock to the green quadrant by 2030 with a probability of 79% and if the catches are reduced by 10% (6,413 t.) the probability would be 67%. The Commission should note that the current catch limit for blue marlin in Resolution 18/05 (11,930 t, which was established as the MSY value estimated in 2016 stock assessment) is 36% higher than the new MSY estimated by the latest stock assessment in 2022 (8,740 t). Thus, it is recommended that the Commission urgently revise Resolution 18/05 to incorporate limits that reflect the most recent stock

assessment and projections and review and where necessary revise the implementation and effectiveness of the measures contained in this Resolution.

The following key points should also be noted:

- **Maximum Sustainable Yield (MSY)**: estimate for the Indian Ocean blue marlin stock is 8,740 t (estimated range 7,140–10,720 t).
- **Provisional reference points**: although the Commission adopted reference points for swordfish in Resolution 15/10 *on target and limit reference points and a decision framework*, no such interim reference points, nor harvest control rules have been established for blue marlin.
- **Main fisheries (mean annual catch 2019-2023)**: blue marlin are caught using longline (43.8%), followed by line (27.4%) and gillnet (23%). The remaining catches taken with other gears contributed to 5.8% of the total catches in recent years (**Fig. 1**).
- **Main fleets (mean annual catch 2019-2023)**: the majority of blue marlin catches are attributed to vessels flagged to Sri Lanka (22.3%) followed by Taiwan,China (22%) and India (21%). The 26 other fleets catching blue marlin contributed to 34.8% of the total catch in recent years (Fig. 2).

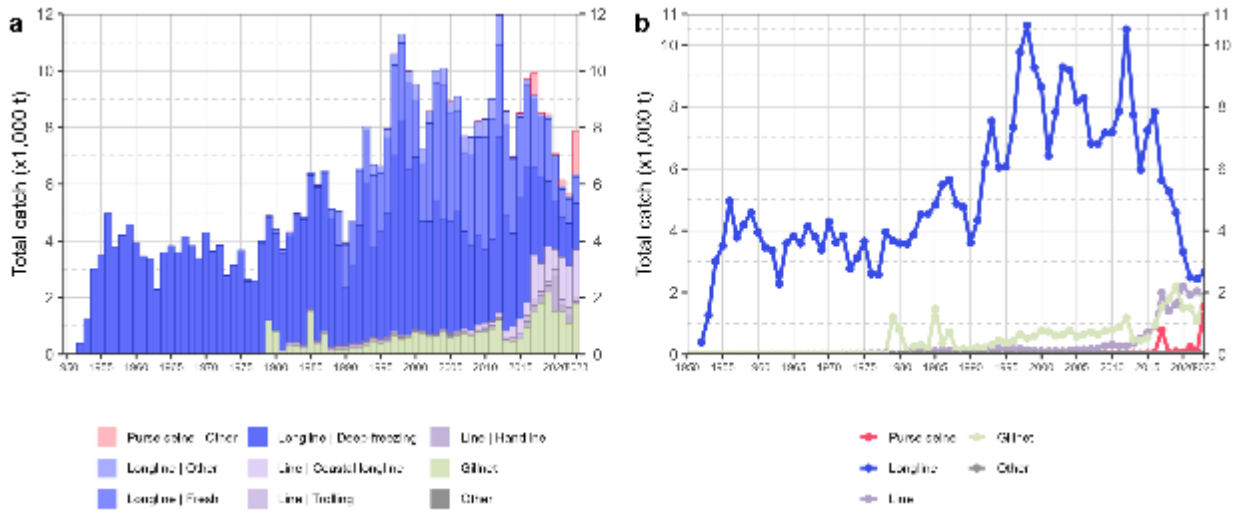


Fig. 1. Annual time series of (a) cumulative nominal catches (metric tons; t) by fishery and (b) individual nominal catches (metric tons; t) by fishery group for blue marlin during 1950-2023. Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

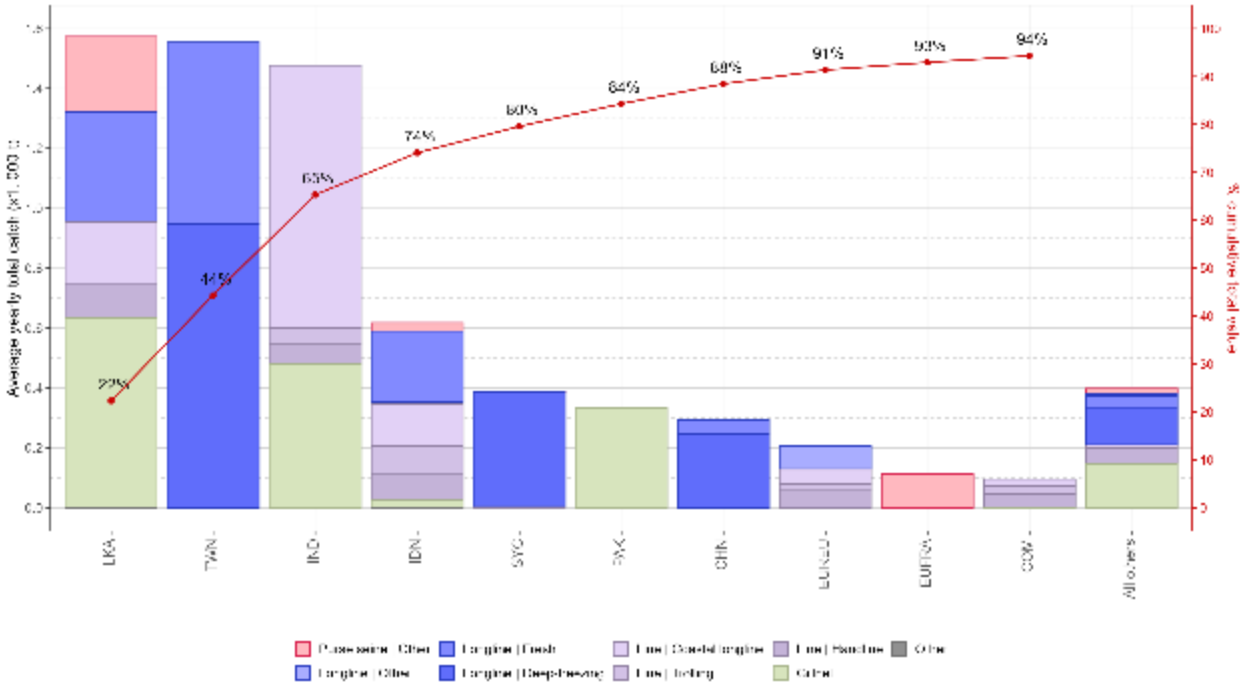


Fig. 2. Mean annual catches (metric tons; t) of blue marlin by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet. Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

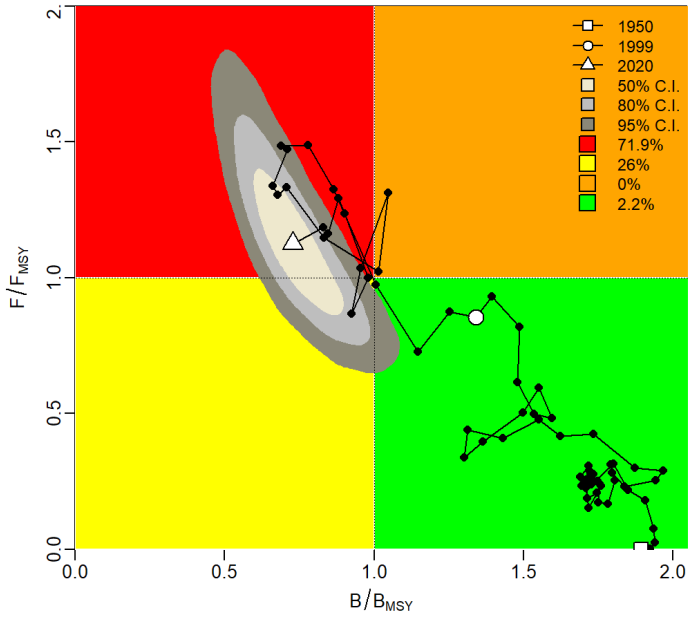


Fig. 3. Kobe stock status plot for the Indian Ocean stock of blue marlin, from the final JABBA base case (the black line traces the trajectory of the stock over time). Contours represent the smoothed probability distribution for 2020 (isopleths are probability relative to the maximum).

Table 2. Blue Marlin: Indian Ocean JABBA Kobe II Strategy Matrix. Probability (percentage) of achieving the green quadrant of the KOBE plot nine constant catch projections, with future catch assuming to be 30–110% (in increments of 10%) of the 2020 catch level (7,126 t)

TAC (t) | Year	2023	2024	2025	2026	2027	2028	2029	2030
2137	65	81	90	94	96	98	99	99
2850	59	76	85	91	94	96	97	98
3563	54	70	80	87	90	93	95	96
4275	48	63	73	80	86	89	91	93
4998	42	55	65	72	78	82	85	88
5700	36	47	56	63	69	73	77	79
6413	30	40	46	53	57	61	65	67
7126	25	32	37	41	45	48	51	53
7838	21	24	28	31	33	35	37	38

APPENDIX 20
EXECUTIVE SUMMARY: STRIPED MARLIN (2024)

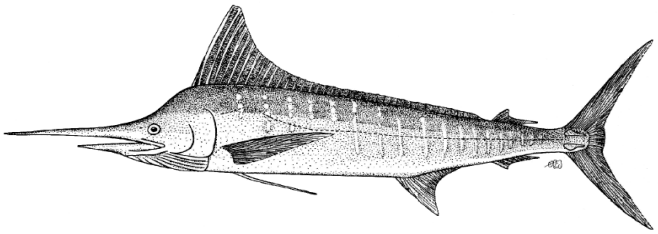


Table 1. Status of striped marlin (*Kajikia audax*) in the Indian Ocean

Area[1]	Indicators		2024 stock status determination[5]
Indian Ocean	Catch 2023[2] (t)	3,553	100%*
	Average catch 2019-2023 (t)	3,024	
	MSY (1,000 t) (JABBA)	4.73 (4.22 – 5.24)[3]	
	MSY (1,000 t) (SS3)	4.89 (4.48-5.30)	
	F_{MSY} (JABBA)	0.26 (0.20–0.35)	
	F_{MSY} (SS3)	0.22 (0.21–0.24)	
	F_{2022}/F_{MSY} (JABBA)	3.95 (2.54 - 6.14)	
	F_{2022}/F_{MSY} (SS3)	9.26 (5.38-13.14)	
	B_{2022}/B_{msy} (JABBA)	0.17 (0.11 - 0.27)	
	SB_{2022}/SB_{MSY} (SS3)[4]	0.27 (0.19-0.35)	
	B_{2022}/B_0(JABBA)	0.06 (0.04 – 0.10)	
	SB_{2022}/SB_0 (SS3)	0.036 (0.03-0.04)	

[1] Boundaries for the Indian Ocean are defined as IOTC area of competence
[2] Proportion of 2023 catch estimated or partially estimated by IOTC Secretariat: 30%
[3] Range estimates in the table are 80% confidence interval
[4] SS3 is the only model that used SB/SB_{MSY}, all others used B/B_{MSY}
[5] 2022 is the final year that data were available for this assessment
* Estimated probability that the stock is in the respective quadrant of the Kobe plot (shown below), derived from the confidence intervals associated with the current stock status

Colour key	Stock overfished (B_{2022}/B_{MSY}< 1)	Stock not overfished (B_{2022}/B_{MSY}≥ 1)
Stock subject to overfishing (F_{2022}/F_{MSY}> 1)	**100%**	**0.0%**
Stock not subject to overfishing (F_{2022}/F_{MSY}≤ 1)	**0.0%**	**0.0%**
Not assessed/Uncertain/Unknown		

The percentages are calculated as the proportion of model terminal values that fall within each quadrant with model weights taken into account

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new stock assessment was carried out for striped marlin in 2024, based on two different models: JABBA, a Bayesian state-space production model (age-aggregated); and SS3, an integrated model (age-structured) (using data up to 2022). Both models were generally consistent with regards to stock status and confirmed the results from 2012, 2013, 2015, 2017, 2018, and 2021 assessments, indicating that the stock is subject to overfishing ($F>F_{MSY}$) and is overfished, with the biomass being below the level which would produce MSY ($B<B_{MSY}$) for over a decade. Both SS3 and JABBA assessments rely on CPUE indices from the longline fisheries in which the striped marlin are not the main target species. On the weight-of-evidence available in 2024, the stock status of striped marlin is determined to be ***overfished*** and ***subject to overfishing*** (**Table 1**; **Fig. 3**).

Outlook. Biomass estimates of the Indian Ocean striped marlin stock have likely been below BMSY since the late 90's – the stock has been severely depleted (B/B_0 = 0.06; JABBA model). The level of depletion has increased since the previous assessment and is currently the worst among IOTC species. There has been a substantial increase of catches of stripe marlin from coastal fleets in recent years. The outlook is very pessimistic, and a substantial decrease in fishing mortality is required to ensure a

reasonable chance of stock recovery in the foreseeable future (**Table 2**). It should be noted that point estimates from SS3 indicate that F_{curr}/F_{MSY} are much higher than those estimated by JABBA.

Management advice. Current or increasing catches have a very high risk of further decline in the stock status. The 2023 catches (3,553 t) were lower than the estimated MSY (4,730 t) but are above the limit set by Resolution 18/05 (3,260 t) which may be a concern if this trend continues. However, the limit is not based on estimates of the most recent stock assessment. Thus, it is recommended that the Commission urgently revise Resolution 18/05 to incorporate limits that reflect the most recent stock assessment and projections, and review, and where necessary, revise the implementation and effectiveness of the measures contained in this Resolution.
The stock has been overfished for more than a decade and is now in a highly depleted state. A 70% reduction in the recent average 2020-22 catch of 2,891 t (i.e. catch of 867 t) would recover the stock to the green quadrant by 2032 with a probability of 78% and a 60% reduction in recent average catch (i.e. catch of 1,157 t) would achieve this with a probability of 58%.

The following key points should also be noted:

- **Maximum Sustainable Yield (MSY)**: estimates for the Indian Ocean stock are uncertain and estimates range between 4,220 - 5,240 t. However, the current biomass is well below the B_{MSY} reference point and fishing mortality is in excess of F_{MSY} at recent catch levels.
- **Provisional reference points**: although the Commission adopted reference points for swordfish in Resolution 15/10 *on target and limit reference points and a decision framework*, no such interim reference points have been established for striped marlin.
- **Main fisheries (mean annual catch 2019-2023)**: striped marlin are caught using gillnet (66.7%), followed by longline (15.9%) and line (11.8%). The remaining catches taken with other gears contributed to 5.6% of the total catches in recent years (**Fig. 1**).
- **Main fleets (mean annual catch 2019-2023)**: the majority of striped marlin catches are attributed to vessels flagged to I. R. Iran (35.1%) followed by Pakistan (26.8%) and Indonesia (16.7%). The 24 other fleets catching striped marlin contributed to 21.5% of the total catch in recent years (**Fig. 2**).

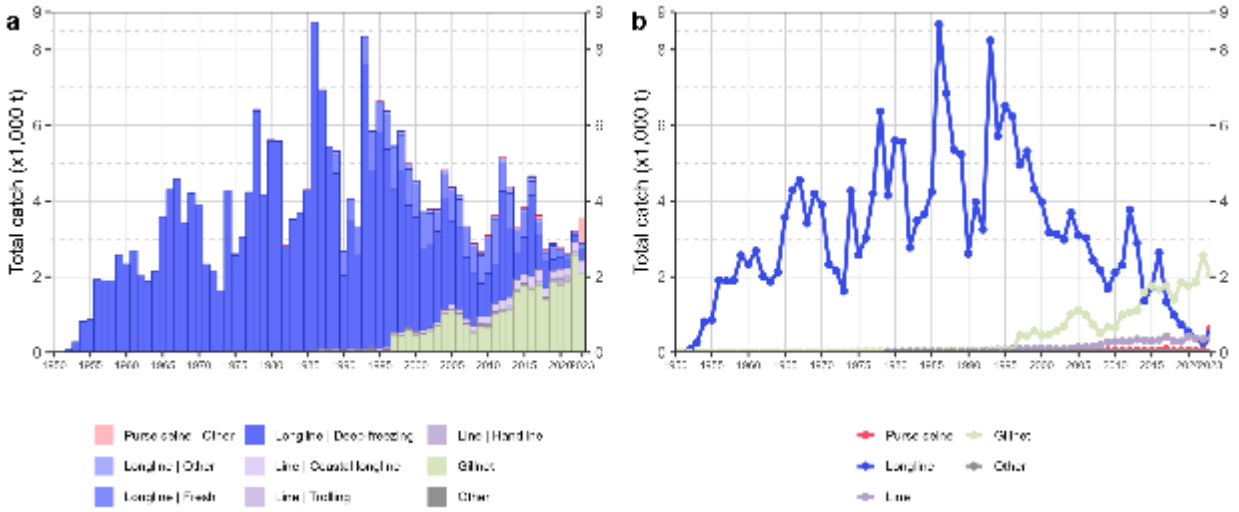


Fig. 1. Annual time series of (a) cumulative nominal catches (metric tons; t) by fishery and (b) individual nominal catches (metric tons; t) by fishery group for striped marlin during 1950-2023. Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

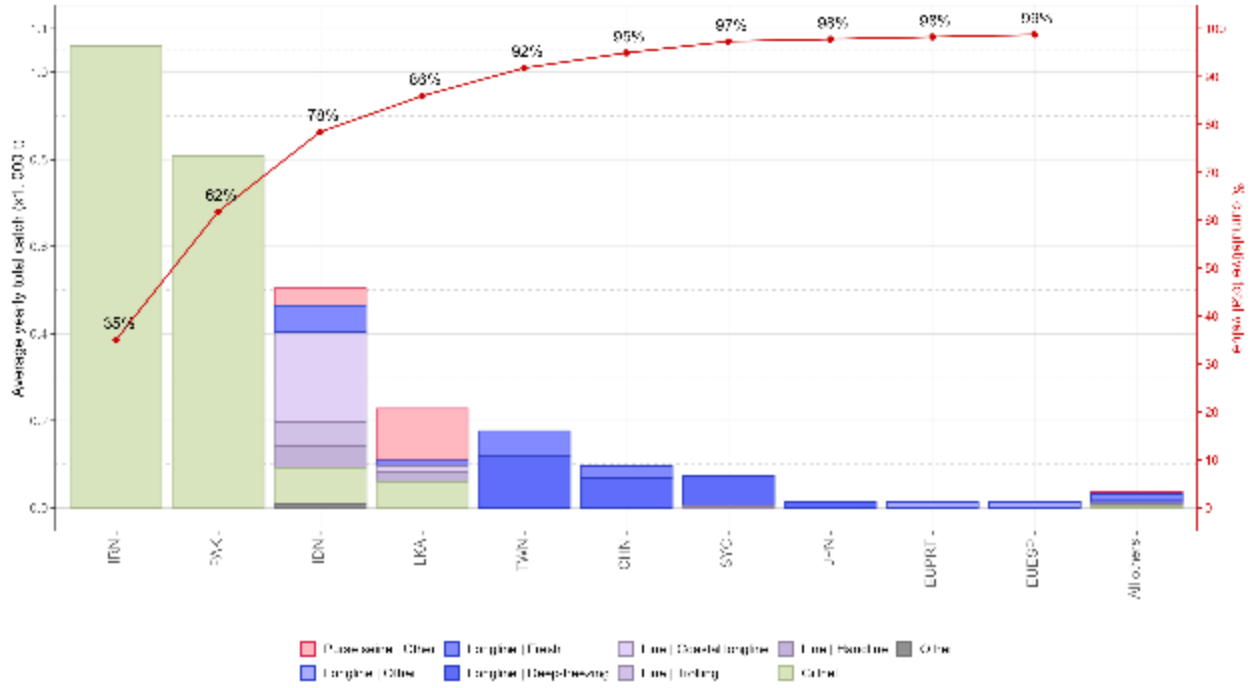
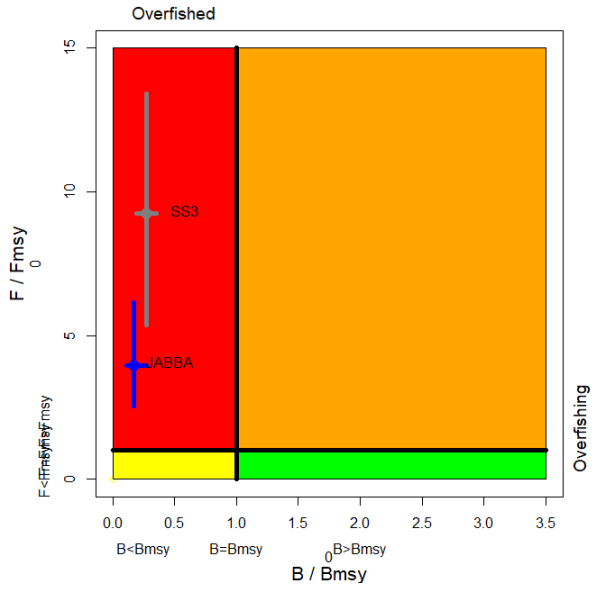


Fig. 2. Mean annual catches (metric tons; t) of striped marlin by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet. Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

(a) Stock status (JABBA and SS3 models)



(b) JABBA B/B_{MSY} and F/F_{MSY} trajectories

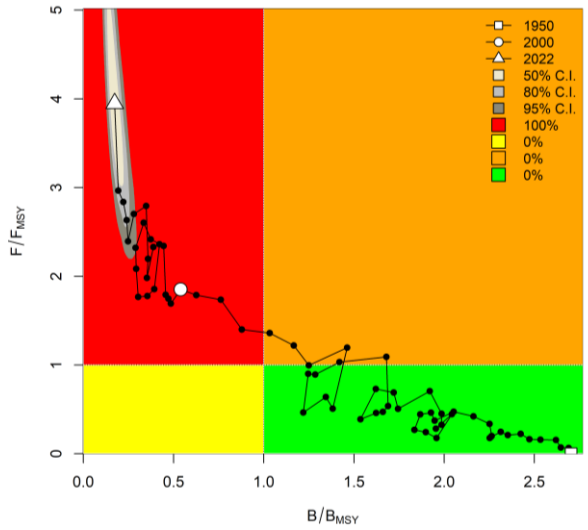


Fig. 3. (a) Striped marlin: Stock status from the Indian Ocean assessment JABBA (Bayesian State Space Surplus Production Model) and SS3 models with the confidence intervals (left); (b) Trajectories (1950-2022) of *B/B$_{MSY}$ and F/F$_{MSY}$* from the JABBA model. NB: SS3 refers to SB/SB$_{MSY}$ while the JABBA model's output refers to B/B$_{MSY}$

Table 2. Striped marlin: JABBA Indian Ocean assessment Kobe II Strategy Matrix. Probability (percentage) of violating the MSY-based target reference points for nine constant catch projections relative to the average catch level of 2020–2022 (2891 t) (100%, 80%, then 70%–10% in decrement of 10%) projected for 3 and 10 years.

Reference point and projection timeframe	**Alternative catch projections (relative to the 2020-2022 catch of 3,001 t) and probability (%) of violating MSY-based target reference points (Btarg = B$_{MSY}$; Ftarg = F$_{MSY}$)**								
	10% (289 t)	**20%** (578 t)	**30%** (867 t)	**40%** (1157 t)	**50%** (1446 t)	**60%** (1735 t)	**70%** (2024 t)	**80%** (2313 t)	**100%** (2891 t)
$B_{2025} < B_{MSY}$	100	100	100	100	100	100	100	100	100
$F_{2025} > F_{MSY}$	3	12	35	66	88	97	99	100	100
$B_{2032} < B_{MSY}$	3	9	22	42	64	83	93	98	100
$F_{2032} > F_{MSY}$	0	4	8	18	35	57	78	91	99

Table 3. Striped marlin: Probability (percentage) of achieving the KOBE green quadrant from 2023-2032 for a range of constant catch projections (JABBA).

Catch (t)| Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
289 (10%)	0	0	0	0	7	31	63	84	94	97
578 (20%)	0	0	0	0	3	17	44	68	84	91
867 (30%)	0	0	0	0	1	8	26	48	66	78
1157 (40%)	0	0	0	0	0	4	13	28	45	58
1446 (50%)	0	0	0	0	0	1	5	13	25	36
1735 (60%)	0	0	0	0	0	0	2	5	11	17
2024 (70%)	0	0	0	0	0	0	1	2	4	7
2313 (80%)	0	0	0	0	0	0	0	0	1	2
2891 (100%)	0	0	0	0	0	0	0	0	0	0

APPENDIX 21
EXECUTIVE SUMMARY: INDO-PACIFIC SAILFISH (2024)

Table 1. Status of Indo-Pacific sailfish (*Istiophorus platypterus*) in the Indian Ocean

Area[1]	Indicators		2022 stock status determination[3]
Indian Ocean	Catch 2023[2] (t)	32,154	54%
	Average catch 2019-2023 (t)	32,386	
	MSY (1,000 t) (80% CI)	25.9 (20.8 – 34.2)	
	F_{MSY} (80% CI)	0.19 (0.15 - 0.24)	
	B_{MSY} (1,000 t) (80% CI)	138 (108–186)	
	F_{2019}/F_{MSY} (80% CI)	0.98 (0.65 – 1.42)	
	B_{2019}/B_{MSY} (80% CI)	1.17 (0.94 – 1.42)	
	B_{2019}/B_0 (80% CI)	0.58 (0.47 – 0.71)	

[1] Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence
[2] Proportion of 2023 catch estimated or partially estimated by IOTC Secretariat: 31.5%
[3] 2019 is the final year that data were available for this assessment

Colour key	Stock overfished ($B_{year}/B_{MSY}< 1$)	Stock not overfished ($B_{year}/B_{MSY}\geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY}> 1$)	7%	39%
Stock not subject to overfishing ($F_{year}/F_{MSY}\leq 1$)	0%	54%
Not assessed/Uncertain/Unknown		

The percentages are calculated as the proportion of model terminal values that fall within each quadrant with model weights taken into account

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was carried out for Indo-Pacific Sailfish in 2024, thus the stock status is determined on basis of the 2022 stock assessment based on JABBA (using data up to 2019). Data poor methods (C-MSY and SFA) applied to Indo-Pacific Sailfish in 2019 rely on catch data only, which is highly uncertain for this species, and resulted in the stock status determined to be uncertain. To overcome the lack of abundance indices for this species, this assessment incorporated length-frequency data to estimate annual Spawning Potential Ratio (SPR). Normalised annual estimates of SPR were assumed to be proportional to biomass and incorporated as an index of relative abundance in the JABBA model (assuming no trends in annual recruitment in the long term). This is a novel technique applied to overcome the paucity of abundance data for SFA. The results indicate that there has been a 41% decline in SPR since 1970. B/B_{MSY} declined consistently from the early-1980s, while F/F_{MSY} gradually increased from 1980, peaking in 2018 at 1.1. The latest (2019) estimate of B/B_{MSY} was 1.17, while the F/F_{MSY} estimate was 0.98.
On the weight-of-evidence available in 2022, the stock status of Indo-Pacific sailfish is determined to be ***not overfished nor subject to overfishing*** (**Table 1**; **Fig. 3**).

Outlook. Catches have exceeded the estimated MSY since 2013 and the current catches (average of 32,386 t in the last 5 years, 2019-2023) are substantially higher than the current MSY estimate of 25,905 t. This increase in coastal gillnet longline catches and fishing effort in recent years is a substantial cause for concern for the Indian Ocean stock, however there is not sufficient information to evaluate the effect this will have on the resource. It is also noted that the 2020, 2021 and 2022 catches exceed the catch limit prescribed in Resolution 18/05 (25,000 t).

Management advice. The catch limits as stipulated in Resolution 18/05 have been exceeded since 2020, which as per resolution 18/05, requires a review of the resolution. Furthermore, these limits are not based on estimates of most recent stock assessment. Thus, it is recommended that the Commission urgently revise 18/05 to incorporate limits that reflect the most recent stock assessment and projections and review and where necessary revise the implementation and effectiveness of the measures contained in this Resolution In spite of the Kobe green status of the stock, it is recommended that the Commission review the implementation and effectiveness of the measures contained in this Resolution and consider the adoption of additional conservation and management measures. The Commission should provide mechanisms to ensure that catch limits are not exceeded by all concerned fisheries. Research emphasis on further developing possible CPUE indicators from coastal gillnet and longline fisheries, and further exploration of stock assessment approaches for data poor fisheries are warranted. Given the limited data being reported for coastal fisheries, and the importance of sports fisheries for this species, efforts must be made to rectify these information gaps.

The following key points should also be noted:

- **Maximum Sustainable Yield (MSY):** estimate for the Indian Ocean stock is 25,905 t.
- **Provisional reference points:** although the Commission adopted reference points for swordfish in Resolution 15/10 on target and limit reference points and a decision framework, no such interim reference points have been established for Indo-Pacific sailfish.
- **Main fisheries (mean annual catch 2019-2023):** Indo-Pacific sailfish are caught using gillnet (70.2%), followed by line (25.7%) and longline (2.9%). The remaining catches taken with other gears contributed to 1.1% of the total catches in recent years (**Fig. 1**).
- **Main fleets (mean annual catch 2019-2023)**:): the majority of Indo-Pacific sailfish catches are attributed to vessels flagged to I. R. Iran (43.6%) followed by India (21.2%) and Sri Lanka (6.2%). The 33 other fleets catching Indo-Pacific sailfish contributed to 28.9% of the total catch in recent years(**Fig. 2**).

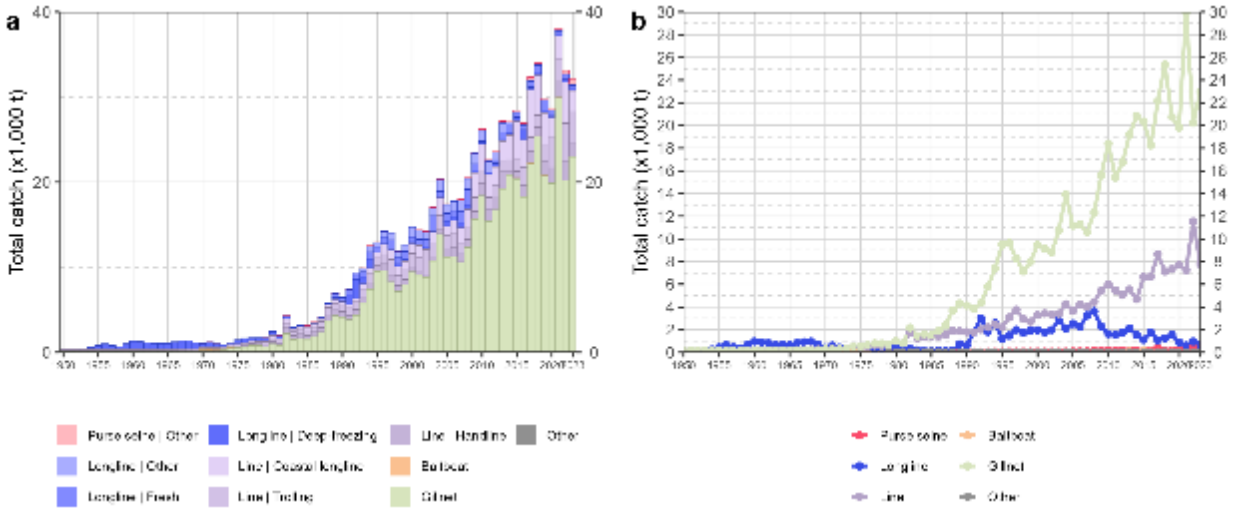


Fig. 1. Annual time series of (a) cumulative nominal catches (metric tons; t) by fishery and (b) individual nominal catches (metric tons; t) by fishery group for Indo-Pacific sailfish during 1950-2023. Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

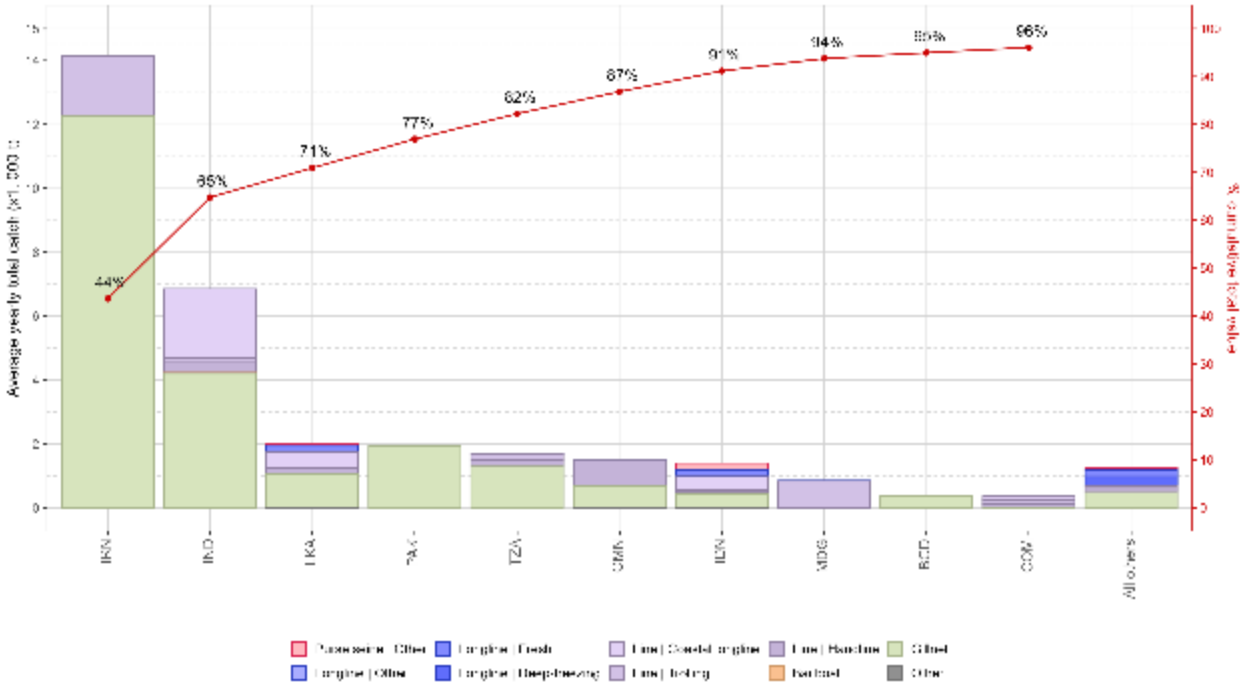


Fig. 2. Mean annual catches (metric tons; t) of Indo-Pacific sailfish by fleet and fishery between 2019 and 2023, with indication of cumulative catches by fleet. Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

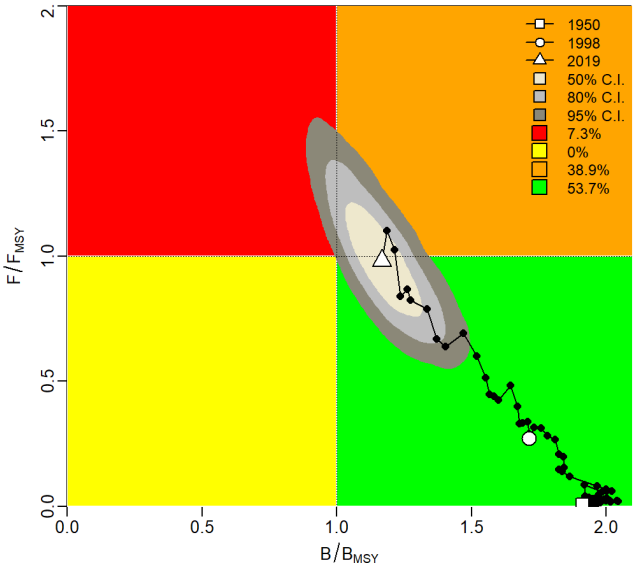


Fig. 3. Indo-Pacific sailfish: Kobe plot showing estimated trajectories (1950-2019) of B/B_{MSY} and F/F_{MSY}. Different grey shaded areas denote the 50%, 80%, and 95% credibility interval for the terminal assessment year. The probability of terminal year points falling within each quadrant is indicated in the figure legend.

APPENDIX 22
EXECUTIVE SUMMARY: SWORDFISH (2024)

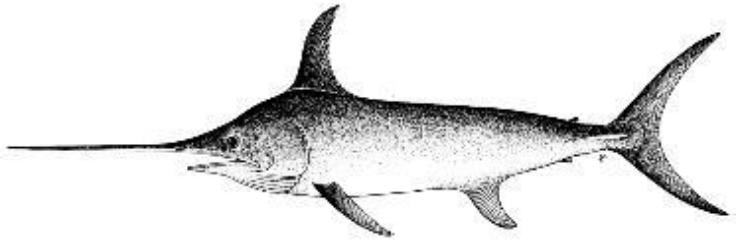


TABLE 1. Status of swordfish (*Xiphias gladius*) in the Indian Ocean.

Area[1]	Indicators		2023 stock status determination
Indian Ocean	Catch 2023[2] (t) Average catch 2019-2023 (t)	26,525 28,142	**97%**
	MSY (1,000 t) (80% CI) F_{MSY} (80% CI) SB_{MSY} (1,000 t) (80% CI) F_{2021}/F_{MSY} (80% CI) SB_{2021}/SB_{MSY} (80% CI) SB_{2021}/SB_{1950} (80% CI)	30 (26–33) 0.16 (0.12–0.20) 55 (40–70) 0.60 (0.43–0.77) 1.39 (1.01–1.77) 0.35 (0.32–0.37)	

[1] Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence
[2] Proportion of 2023 catch estimated or partially estimated by IOTC Secretariat: 19.8%
[3]2021 is the final year that data were available for this assessment

Colour key	Stock overfished ($SB_{year}/SB_{MSY}< 1$)	Stock not overfished ($SB_{year}/SB_{MSY}\geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY}> 1$)	0.2%	0
Stock not subject to overfishing ($F_{year}/F_{MSY}\leq 1$)	3%	97%
Not assessed/Uncertain/Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was carried out for swordfish in 2024, thus the stock status is determined on basis of the 2022 assessment. Two models were applied to the swordfish stock (ASPIC and Stock Synthesis (SS3)), with the SS3 stock assessment selected to provide scientific advice (as done previously). An update of the JABBA model was also conducted during the WPB meeting. The reported SS3 stock status is based on a grid of 48 model configurations designed to capture the uncertainty relating to steepness of the stock recruitment relationship (0.7, 0.8, and 0.9), recruitment variability (two levels), CPUE series (2 options), growth (2 options) and weighting of length composition data (two options). A number of the options included in the final grid were selected from a range of additional sensitivity runs that were conducted to explore uncertainties. In considering the assessment results, the WPB has expressed concern over whether the Japanese longline CPUE index accurately represents the change in abundance in the north-western region, which may require further investigation. Further, the south-western region, which is one of the sub-regions used in the model, exhibits a declining biomass trend which indicates higher depletion in this region, compared to other regions. Overall, median spawning biomass in 2021 was estimated to be 35% (80% CI: 32-37%) of the unfished levels (**Table 1**) and 1.39 times (80% CI: 1.01-1.77) the level required to support MSY. Median fishing mortality in 2021 was estimated to be 60% (80% CI 43%-77%) of the FMSY level, and catch in 2021 (23,237 t) was well below the estimated MSY level of 29,856 t (80% CI: 26,319-33,393t). Taking into account the characterized uncertainty, and on the weight-of-evidence available in 2023, the swordfish stock is determined to be ***not overfished*** and ***not subject to overfishing*** (**Table 1**, **Fig. 3**). Noting that the IOTC has now agreed on a swordfish Management Procedure (Res. 24/08) to provide TAC recommendations, the stock assessment is no longer to be used to inform TACs.

Management Procedure. A management procedure for Indian Ocean Swordfish was adopted under Resolution 24/08 by the IOTC Commission in May 2024 and was applied to determine a recommended TAC for Swordfish for 2026, 2027 and 2028. A review of evidence for exceptional circumstances was also conducted following the adopted guideline (IOTC-2021-SC24-R,

appendix 6A) as per the requirements of Resolution 24/08. The review covered information pertaining to i) new knowledge about the stock, population dynamics or biology, ii) changes in fisheries or fisheries operations, iii) changes to input data or missing data, and iv) the operation of the MP. The evaluation concluded that there was one exceptional circumstance pertaining to the operation of the MP. Specifically, an error was identified in the original simulation analyses that, when corrected (without retuning), resulted in the MP not reaching the management objective. Correcting the error and retuning the MP (to 60% probability of being in the Kobe green zone) results in an MP that does reach the objective, with similar performance measure outcomes. Therefore, the recommended action is to use the corrected and retuned MP to recommend the TAC for 2026-2028. Should the Commission continue to implement the current MP, without retuning, it has a lower probability (54%) of being in the Kobe green zone and higher TAC variability, but otherwise similar performance statistics. The TAC derived from running SWO MP1 with or without retuning is 30527 t (i.e. the same) because the max TAC change constraint is reached in both MPs.

Outlook. The significant decrease in recent longline catch and effort from 2019 to 2022 (a 33% reduction from 35,256t to 23,597t) substantially lowered the fishing pressure on the Indian Ocean stock as a whole, prior to an increase in 2023 to 26,525t. The recent average catch of swordfish of 28,142t (for 2019-2023) is below the MP recommended TAC of 30,527 t for 2026-2028. Achieving the objectives of the Commission for this stock will require effective implementation of the MP TAC advice by the Commission going forward.

***Management advice*.**
The TAC recommended from the application of the MP specified in Resolution 24/08 for the period 2026-2028 is 30,527t, which is around 15% higher than the catch in 2023 (26,525t).

The following key points should also be noted:

- **Maximum Sustainable Yield (MSY)**: estimate for the Indian Ocean is 29,856 t.
- **Provisional reference points**: noting that the Commission in 2015 agreed to Resolution 15/10 *on target and limit reference points and a decision framework*, the following should be noted:
    a. **Fishing mortality**: current fishing mortality is considered to be below the provisional target reference point of F_{MSY} and below the provisional limit reference point of $1.4*F_{MSY}$ (**Fig. 2**).
    b. **Biomass**: current spawning biomass is considered to be above the target reference point of SB_{MSY}, and therefore above the limit reference point of $0.4*SB_{MSY}$ (**Fig. 2**).
- **Main fisheries (mean annual catch 2019-2023)**: swordfish are caught using longline (52.3%), followed by line (31.5%) and gillnet (15.7%). The remaining catches taken with other gears contributed to 0.4% of the total catches in recent years(**Fig. 1**).
- **Main fleets (mean annual catch 2019-2023)**: the majority of swordfish catches are attributed to vessels flagged to Sri Lanka (26.5%) followed by Taiwan,China (15.4%) and Yemen (7.5%). The 29 other fleets catching swordfish contributed to 50.6% of the total catch in recent years (**Fig. 2**).

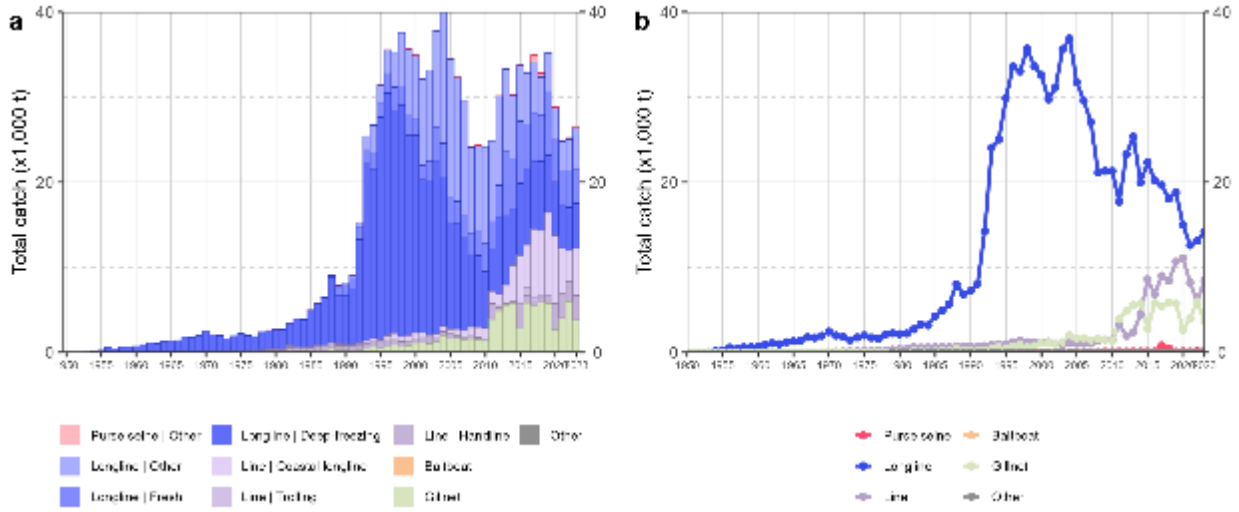


Fig. 1. Annual time series of (a) cumulative nominal catches (metric tons; t) by fishery and (b) individual nominal catches (metric tons; t) by fishery group for swordfish during 1950–2023. Longline|Other: swordfish and sharks-targeting longlines; Other: all remaining fishing gears

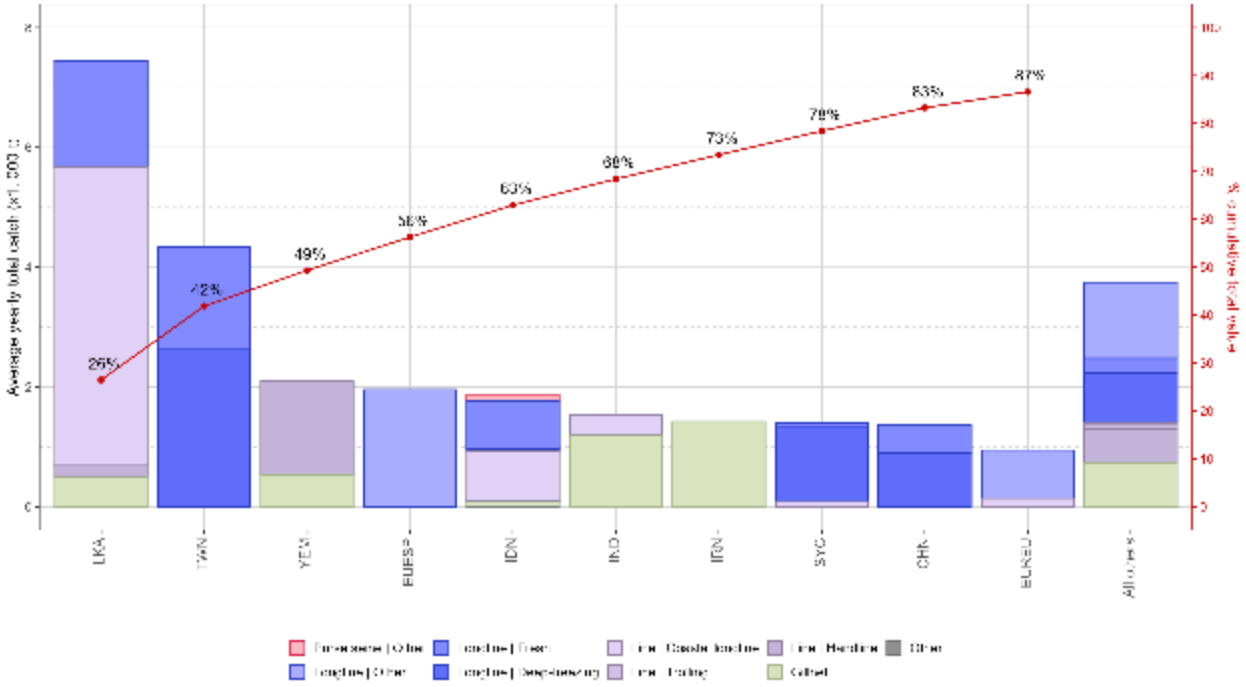


Fig. 2. Mean annual catches (metric tons; t) of swordfish by fleet and fishery between 2019 and 2032, with indication of cumulative catches by fleet. Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

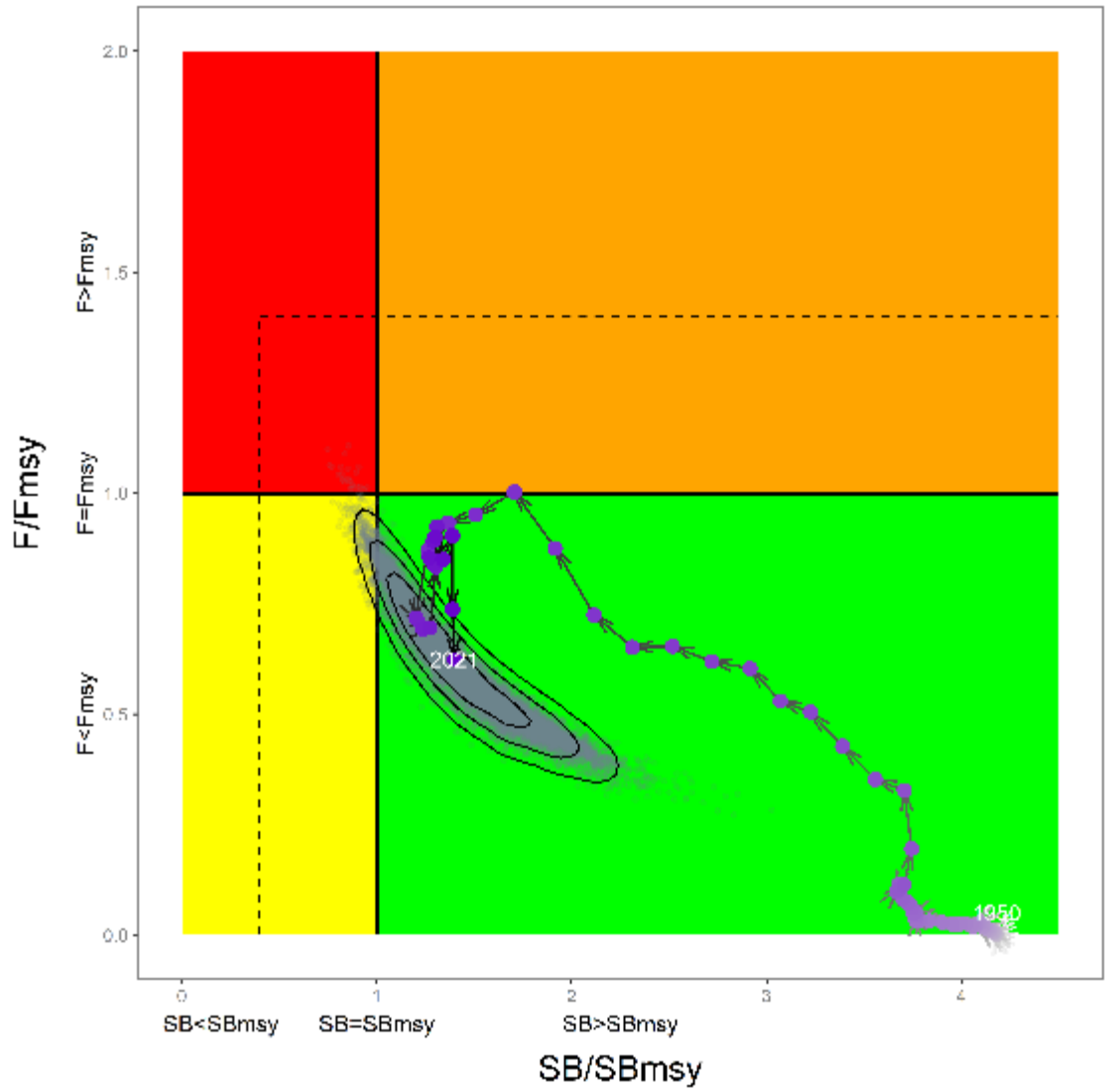


Fig. 3. Swordfish: 2021 stock status, relative to SB_{MSY} (x-axis) and F_{MSY} (y-axis) reference points for the final model grid. Grey dots represent uncertainty from individual models with 50%, 80% and 95% contours lines. The arrowed line represents the time series of stock trajectory from the reference model. The dashed lines represent limit reference points for Indian Ocean swordfish (SB_{lim} = 0.4 SB_{MSY} and F_{lim} = 1.4*FMSY).

APPENDIX 23
EXECUTIVE SUMMARY: BLUE SHARK (2024)

Table 1. Status of blue shark (*Prionace glauca*) in the Indian Ocean

Area	Indicators		2021 stock status determination
Indian Ocean	Reported catch 2023 (t)	26,342	99.9%
	Estimated catch 2019 (t)[1]	43,240	
	Not elsewhere included (nei) sharks[1] 2023 (t)	28,843	
	Average reported catch 2019-23 (t)	26,013	
	Average estimated catch 2015-19 (t)[4]	48,781	
	Avg. not elsewhere included (nei) sharks[1] 2019-23 (t)	29,049	
	MSY (1,000 t) (80% CI)[2]	36.0 (33.5 - 38.6)	
	F_{MSY} (80% CI) [2]	0.31 (0.306 - 0.31)	
	SB_{MSY} (1,000 t) (80% CI) [2,3]	42.0 (38.9 - 45.1)	
	F_{2019}/F_{MSY} (80% CI) [2]	0.64 (0.53 - 0.75)	
	SB_{2019}/SB_{MSY} (80% CI) [2,3]	1.39 (1.27 - 1.49)	
	SB_{2019}/SB_0 (80% CI) [2,3]	0.46 (0.42 - 0.49)	

[1]Includes all other shark catches reported to the IOTC Secretariat, which may contain this species (i.e., SKH: Various sharks nei; RSK: Requiem sharks nei; AG38: Blue shark, shortfin mako, oceanic whitetip shark)
[2]Estimates refer to the base case model using estimated catches
[3]Refers to fecund stock biomass
[4]Catch estimated for stock assessment purposes only (doc IOTC-2021-WPEB17(AS)-14_Rev1). Proportion of 2023 catch estimated or partially estimated by IOTC Secretariat: 64.8%
[5]2019 is the final year that data were available for this assessment

Colour key	Stock overfished ($SB_{2019}/SB_{MSY}< 1$)	Stock not overfished ($SB_{2019}/SB_{MSY}\geq 1$)
Stock subject to overfishing($F_{2019}/F_{MSY}> 1$)	0%	0.1%
Stock not subject to overfishing ($F_{2019}/F_{MSY}\leq 1$)	0%	99.9%
Not assessed/Uncertain		

Table 2. Blue shark: IUCN threat status of blue shark (*Prionace glauca*) in the Indian Ocean.

Common name	Scientific name	IUCN threat status[3]		
		Global status	WIO	EIO
Blue shark	*Prionace glauca*	Near Threatened	–	–

IUCN = International Union for Conservation of Nature; WIO = Western Indian Ocean; EIO = Eastern Indian Ocean

[3]The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

Sources: IUCN Red List 2020, Rigby et al 2019

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was carried out for blue sharks in 2024 and so the results are based on the assessment carried out in 2021 using an integrated age-structured model (SS3) (**Fig. A** 3) (using data up to 2019). 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, but with the trajectories showing consistent trends towards the overfished and subject to overfishing quadrant of the Kobe plot (**Fig. A** 3). A base case model was selected based on the best Indian Ocean

biological data, consistency of CPUE standardized relative abundance series, model fits and spatial extent of the data (**Fig. A** 1, **Table 1**). In particular, the base case model used the GAM-based catch history estimates and CPUE series from South Africa, EU-Portugal, EU-France (Reunion), EU-Spain, Taiwan and Japan. The major sources of uncertainty identified in the current model are catches and CPUE indices of abundance. Model results were explored with respect to their sensitivity to the major axes of uncertainty identified, however the ratio-based and nominal catches were considered unrealistic. If the alternative CPUE groupings were used, then the stock status was somewhat less positive. The ecological risk assessment (ERA) conducted for the Indian Ocean by the WPEB and SC in 2018 consisted of a semi-quantitative risk assessment analysis to evaluate the resilience of shark species to the impact of a given fishery by combining the biological productivity of the species and its susceptibility to each fishing gear type. Blue sharks received a medium vulnerability ranking (No. 10) in the ERA rank for longline gear because it was estimated as the most productive shark species but was also characterised by the second highest susceptibility to longline gear. Blue shark was estimated as not being susceptible thus not vulnerable to purse seine gear. The current IUCN threat status of 'Near Threatened' applies to blue sharks globally (**Table 1**). Information available on this species has been improving in recent years. Blue sharks are commonly taken by a range of fisheries in the Indian Ocean and in some areas they are fished in their nursery grounds. Because of their life history characteristics – they live until at least 25 years, mature at 4–6 years, and have 25–50 pups every year – they are considered to be the most productive of the pelagic sharks. On the weight-of-evidence available in 2021, the stock status is determined to be **not overfished** and **not subject to overfishing** (**Table 1**).

Outlook. Kobe II Strategy Matrix (**Table 3**) provides the probability of exceeding reference levels in the short (3 years) and long term (10 years) given a range of percentage changes in catch.

Management advice. 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 (**Table 3**). 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 (**Table 3).** The stock should be closely monitored. While mechanisms exist for encouraging CPCs to comply with their recording and reporting requirements (Resolution 16/06), these need to be further implemented by the Commission, so as to better inform scientific advice in the future.

The following key points should also be noted:

- **Maximum Sustainable Yield (MSY)**: estimate for the Indian Ocean stock is approximately 36,000 t.
- **Reference points**: The Commission has not adopted reference points or harvest control rules for any shark species.
- **Main fishing gear** (2019–23): coastal longline; longline (deep-freezing); longline targeting swordfish; gillnet (**Fig. A1**).
- **Main fleets** (2019–23): Indonesia[4]; Taiwan,China; EU-Spain; EU-Portugal, Seychelles (**Fig. A2**)

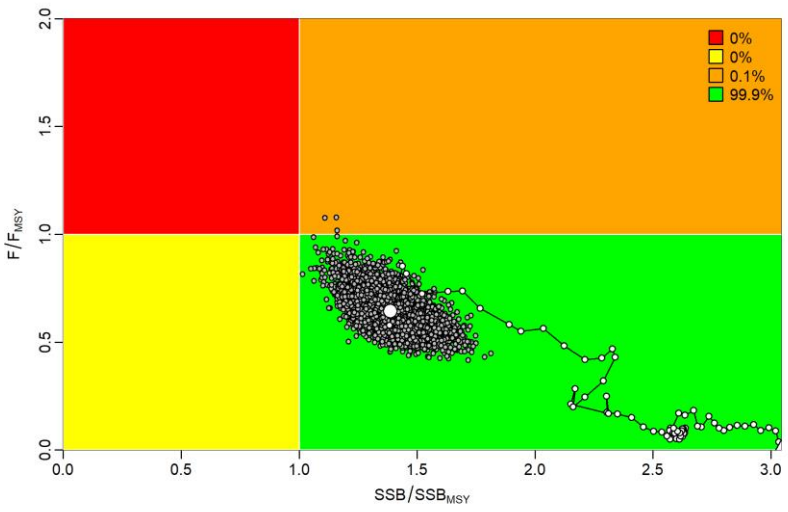


Fig. 1. Blue shark: Aggregated Indian Ocean stock assessment Kobe plot for the 2021 assessment (base case model with trajectory and uncertainty in the terminal year).

[4] There are large uncertainties associated with the estimates of blue shark catches from artisanal Indonesian fisheries which accounted for about 64% of all catches of blue shark from the Indian Ocean in recent years.

Table 3. Blue shark: Aggregated Indian Ocean assessment Kobe II Strategy Matrix. Probability (percentage) of violating the MSY-based reference points for nine constant catch projections using the base case model (catch level from 2019* (43,240 MT), ± 10%, ± 20%, ± 30% and ± 40%) projected for 3 and 10 years

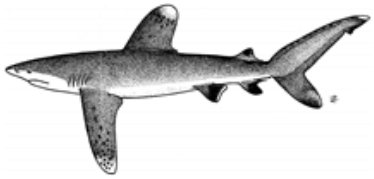
Reference point and projection time frame	Alternative catch projections (relative to the catch level* from 2019) and probability (%) of exceeding MSY-based reference points								
Catch Relative to 2019	60%	70%	80%	90%	100%	110%	120%	130%	140%
Catch (t)	(25,944)	(30,267)	(34,592)	(38,916)	(43,240)	(47,564)	(51,888)	(56,212)	(60,535)
$SB_{2022} < SB_{MSY}$	0%	0%	0%	0%	0%	0%	0%	0%	0%
$F_{2022} > F_{MSY}$	0%	0%	0%	0%	0%	1%	5%	16%	36%
$SB_{2029} < SB_{MSY}$	0%	0%	0%	0%	0%	2%	9%	25%	48%
$F_{2022} > F_{MSY}$	0%	0%	0%	0%	1%	13%	44%	75%	90%

*: average catch level and respective % changes refer to the estimated catch series used in the final base case model (IOTC-2021-WPEB17(AS)-15)

LITERATURE CITED

Rigby, C.L., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Herman, K., Jabado, R.W., Liu, K.M., Marshall, A., Pacoureau, N., Romanov, E., Sherley, R.B. & Winker, H. 2019. Prionace glauca. The IUCN Red List of Threatened Species 2019: e.T39381A2915850. https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T39381A2915850.en. Accessed on 06 December 2023.

APPENDIX 24
EXECUTIVE SUMMARY: OCEANIC WHITETIP SHARK (2024)



CITES APPENDIX II species

Table 1. Status of oceanic whitetip shark (*Carcharhinus longimanus*) in the Indian Ocean.

Area[1]	Indicators		2018 stock status determination
Indian Ocean	Reported catch 2023 (t)[3]	42 t	
	Not elsewhere included (nei) sharks[2] 2023	28,843 t	
	Average reported catch 2019-23	36 t	
	Av. not elsewhere included 2019-2023 (nei) sharks[2]	29,049 t	
	MSY (1,000 t) (80% CI)	unknown	
	F_{MSY} (80% CI)		
	SB_{MSY} (1,000 t) (80% CI)		
	$F_{current}/F_{MSY}$ (80% CI)		
	$SB_{current}/SB_{MSY}$ (80% CI)		
	$SB_{current}/SB_0$ (80% CI)		

[1]Boundaries for the Indian Ocean = IOTC area of competence

[2]Includes all other shark catches reported to the IOTC Secretariat, which may contain this species (i.e., SHK: sharks various nei; RSK: requiem sharks nei)

Colour key	Stock overfished (SB_{year}/SB_{MSY}< 1)	Stock not overfished (SB_{year}/SB_{MSY}≥ 1)
Stock subject to overfishing (F_{year}/F_{MSY}> 1)		
Stock not subject to overfishing (F_{year}/F_{MSY}≤ 1)		
Not assessed/Uncertain		

Table 2. Oceanic whitetip shark: IUCN threat status of oceanic whitetip shark (*Carcharhinus longimanus*) in the Indian Ocean.

Common name	**Scientific name**	**IUCN threat status[3]**		
		Global status	**WIO**	**EIO**
Oceanic whitetip shark	*Carcharhinus longimanus*	Critically Endangered	–	–

IUCN = International Union for Conservation of Nature; WIO = Western Indian Ocean; EIO = Eastern Indian Ocean

[3]The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

Sources: IUCN Red List 2020, Rigby et al 2019

CITES - In March 2013, CITES agreed to include oceanic whitetip shark to Appendix II to provide further protections prohibiting the international trade; which will become effective on September 14, 2014.

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. There remains considerable uncertainty about the relationship between abundance, standardised CPUE series and total catches over the past decade (**Table 1**). The ecological risk assessment (ERA) conducted for the Indian Ocean by the WPEB and SC in 2018 consisted of a semi-quantitative risk assessment analysis to evaluate the resilience of shark species to the impact of a given fishery, by combining the biological productivity of the species and its susceptibility to each fishing gear type (Murua *et al.* 2018). Oceanic whitetip shark received a medium vulnerability ranking (No. 9) in the ERA rank for longline gear because it was estimated as one of the least productive shark species but was only characterised by a medium susceptibility to

longline gear. Oceanic whitetip shark was estimated as being the 11th most vulnerable shark species to purse seine gear, as it was characterised as having a relatively low productive rate, and medium susceptibility to the gear. The current IUCN threat status of 'Critically Endangered' applies to oceanic whitetip sharks globally (**Table 2**). There is a paucity of information available on this species in the Indian Ocean and this situation is not expected to improve in the short to medium term. Oceanic whitetip sharks are commonly taken by a range of fisheries in the Indian Ocean. Because of their life history characteristics – they are relatively long lived, mature at 4–5 years, and have relatively few offspring (<20 pups every two years), the oceanic whitetip shark is likely vulnerable to overfishing. Despite the limited amount of data, recent studies (Tolotti et al., 2016) suggest that oceanic whitetip shark abundance has declined in recent years (2000-2015) compared with historic years (1986-1999). Available pelagic longline standardised CPUE indices from Japan and EU,Spain indicate conflicting trends as discussed in the IOTC Supporting Information for oceanic whitetip sharks. 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** (**Table**).

Outlook. Maintaining or increasing effort with associated fishing mortality can result in declines in biomass, productivity and CPUE. Piracy in the western Indian Ocean resulted in the displacement and subsequent concentration of a substantial portion of longline fishing effort into certain areas in the southern and eastern Indian Ocean. Some longline vessels have returned to their traditional fishing areas in the northwest Indian Ocean, due to the increased security onboard vessels, with the exception of the Japanese fleet which has still not returned to the levels seen before the start of the piracy threat. It is therefore unlikely that catch and effort on oceanic whitetip sharks declined in the southern and eastern areas and may have resulted in localised depletion there.

Management advice. A cautious approach to the management of oceanic whitetip shark should be considered by the Commission, noting that recent studies suggest that longline mortality at haulback is high (50%) in the Indian Ocean (IOTC-2016-WPEB12-26), while mortality rates for interactions with other gear types such as purse seines and gillnets may be higher.

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.

While mechanisms exist for encouraging CPCs to comply with their recording and reporting requirements (Resolution 18/07), these need to be further implemented by the Commission, so as to better inform scientific advice. IOTC Resolution 13/06 *on a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries*, prohibits retention onboard, transhipping, landing or storing any part or whole carcass of oceanic whitetip sharks. Given that some CPCs are still reporting oceanic whitetip shark as landed catch, there is a need to strengthen mechanisms to ensure CPCs comply with Resolution 13/06.

The following key points should be also noted:

- **Maximum Sustainable Yield (MSY)**: Not applicable. Retention prohibited.
- **Reference points**: Not applicable.
- **Main fishing gear** (2019-2023): gillnet, line; Longline, purse seine (other).
- **Main fleets** (2019-23): I.R. Iran; Comoros; Mozambique, China, Indonesia, Seychelles, (Reported as discarded/released alive by China, EU-France, Mauritius, Tanzania, Sri Lanka, EU-Spain).

LITERATURE CITED

Bigelow, K. and Carvalho, F. 2021. Review of potential mitigation measures to reduce fishing-related mortality on silky and oceanic whitetip sharks (Project 101). WCPFC Scientific Committee 17th Regular Session. WCPFC-SC17-2021/EB-WP-01. Available: https://meetings.wcpfc.int/node/12598

Coelho, R. 2016. Hooking mortality of oceanic whitetip sharks caught in pelagic longline targeting swordfish in the SW Indian Ocean: comments on the efficiency of no-retention measures. IOTC-2016-WPEB12-26

Murua H, Santiago, J, Coelho, R, Zudaire I, Neves C, Rosa D, Semba Y, Geng Z, Bach P, Arrizabalaga, H., Baez JC, Ramos ML, Zhu JF and Ruiz J. (2018). Updated Ecological Risk Assessment (ERA) for shark species caught in fisheries managed by the Indian Ocean Tuna Commission (IOTC). IOTC–2018–SC21–14_Rev_1.

Rigby, C.L., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Herman, K., Jabado, R.W., Liu, K.M., Marshall, A., Pacoureau, N., Romanov, E., Sherley, R.B. & Winker, H. 2019. Carcharhinus longimanus. The IUCN Red List of Threatened Species 2019: e.T39374A2911619. https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T39374A2911619.en. Accessed on 06 December 2023.

Tolotti M.T., Capello M., Bach P., Romanov E., Murua H., Dagorn L. 2016. Using FADs to estimate a population trend for the oceanic whitetip shark in the Indian Ocean. IOTC-2016-WPEB12-25.

APPENDIX 25
EXECUTIVE SUMMARY: SCALLOPED HAMMERHEAD SHARK (2024)

CITES APPENDIX II species

Table 1. Status of scalloped hammerhead shark (*Sphyrna lewini*) in the Indian Ocean.

Area[1]	Indicators		2018 stock status determination
Indian Ocean	Reported catch 2023 (t)[3]	1,397	
	Not elsewhere included (nei) sharks[2] 2023 (t)	30,108	
	Average reported catch 2019-23 (t)	470	
	Av. not elsewhere included 2019-2023 (nei) sharks[2] (t)	31,452	
	MSY (1,000 t) (80% CI) F_{MSY} (80% CI) SB_{MSY} (1,000 t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $SB_{current}/SB_{MSY}$ (80% CI) $SB_{current}/SB_0$ (80% CI)	unknown	

[1]Boundaries for the Indian Ocean = IOTC area of competence

[2]Includes all other shark catches reported to the IOTC Secretariat, which may contain this species (i.e., SKH: Various sharks nei; SPN: Hammerhead sharks nei).

[3]Proportion of catch fully or partially estimated for 2023: 0% All catches within the database were reported by CPCs.

Colour key	Stock overfished ($SB_{year}/SB_{MSY} < 1$)	Stock not overfished ($SB_{year}/SB_{MSY} \geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY} > 1$)		
Stock not subject to overfishing ($F_{year}/F_{MSY} \leq 1$)		
Not assessed/Uncertain		

Table 2. IUCN threat status of scalloped hammerhead shark (*Sphyrna lewini*) in the Indian Ocean.

Common name	Scientific name	IUCN threat status[3]		
		Global status	WIO	EIO
Scalloped hammerhead shark	*Sphyrna lewini*	Critically Endangered	Critically Endangered	–

IUCN = International Union for Conservation of Nature; WIO = Western Indian Ocean; EIO = Eastern Indian Ocean

[3]The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

Sources: IUCN Red List 2020, Rigby et al 2019

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. The current IUCN threat status of 'Critically Endangered' applies to scalloped hammerhead sharks globally but specifically for the western Indian Ocean the status is 'Critically Endangered' (**Table**). The ecological risk assessment (ERA) conducted for the Indian Ocean by the WPEB and SC in 2018 consisted of a semi-quantitative risk assessment analysis to evaluate the resilience of shark species to the impact of a given fishery, by combining the biological productivity of the species and its susceptibility to each fishing gear type (Murua *et al.* 2018). Scalloped hammerhead shark received a low vulnerability ranking (No. 17) in the ERA rank for longline gear because it was estimated to be one of the least productive shark species but was also characterised by a lower susceptibility to longline gear. Scalloped hammerhead shark was estimated as the twelfth most vulnerable shark species in the ERA ranking for purse seine gear, but with lower levels of vulnerability compared to longline gear, because the susceptibility was lower for purse seine gear. There is a paucity of information available on this species and

this situation is not expected to improve in the short to medium term. Scalloped hammerhead sharks are commonly taken by a range of fisheries in the Indian Ocean. They are extremely vulnerable to gillnet and prawn trawl fisheries, especially when these occur in and around nursery areas. Scalloped hammerheads are commonly landed in coastal fisheries in the Western Indian Ocean, and have often been recorded among the species with the highest catches numerically. While species-level catch data are limited for the region, there are several sources of published and unpublished data on catches of this species. Furthermore, pups occupy shallow coastal nursery grounds, often heavily exploited by inshore fisheries. Because of their life history characteristics – they are relatively long lived (over 30 years) and have relativity few offspring (<31 pups each year), the scalloped hammerhead shark is vulnerable to overfishing. The stock status is **unknown** due to a lack of data available for quantitative stock assessment or basic fishery indicators (**Table**).

Outlook. The marked increase in catches over the previous year (200 t) is due to the breakdown by species reporting this year by Kenya and Tanzania, which previously reported sharks aggregated. Piracy in the western Indian Ocean has resulted in the displacement and subsequent concentration of a substantial portion of longline fishing effort into certain areas in the southern and eastern Indian Ocean. Some longline vessels have returned to their traditional fishing areas in the northwest Indian Ocean, due to the increased security onboard vessels, with the exception of the Japanese fleet which has still not returned to the levels seen before the start of the piracy threat. It is therefore unlikely that catch and effort from longline fleets on scalloped hammerhead shark declined in the southern and eastern areas during this time period and may have resulted in localised depletion there. Mortality from coastal fisheries remain high and unmonitored.

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. While mechanisms exist for encouraging CPCs to comply with their recording and reporting requirements (Resolution 18/07), these need to be further implemented by the Commission so as to better inform scientific advice.

The following key points should be noted:

- **Maximum Sustainable Yield (MSY)**: Unknown.
- **Reference points**: Not applicable.
- **Main fishing gear** (2019-2023): Gillnet; Handline, longline-coastal; Ringnet; and offshore gillnet, Prawn trawl fisheries
- **Main fleets** (2019-23): Mozambique, Madagascar, Kenya; Tanzania; Sri Lanka; Malaysia, I. R Iran; (report as released alive/discarded by United Kingdom, EU-France, South Africa,) (artisanal fisheries)

LITERATURE CITED

De Bruyn, P., Dudley, S.F.J., Cliff, G. and Smale, M.J., 2005. Sharks caught in the protective gill nets off KwaZulu-Natal, South Africa. 11. The scalloped hammerhead shark Sphyrna lewini (Griffith and Smith). African Journal of Marine Science, 27(3), pp.517-528.

Doukakis, P., Hanner, R., Shivji, M., Bartholomew, C., Chapman, D., Wong, E. and Amato, G., 2011. Applying genetic techniques to study remote shark fisheries in northeastern Madagascar. Mitochondrial DNA, 22(sup1), pp.15-20.

Kiilu, B.K., Kaunda-Arara, B., Oddenyo, R.M., Thoya, P. and Njiru, J.M., 2019. Spatial distribution, seasonal abundance and exploitation status of shark species in Kenyan coastal waters. African Journal of Marine Science, 41(2), pp.191-201.

Humber, F., Andriamahaino, E.T., Beriziny, T., Botosoamananto, R., Godley, B.J., Gough, C., Pedron, S., Ramahery, V. and Broderick, A.C., 2017. Assessing the small-scale shark fishery of Madagascar through community-based monitoring and knowledge. Fisheries Research, 186, pp.131-143.

Marshall, N.T., and Barnett, R. 1997. The trade in sharks and shark products in the Western Indian and Southeast Atlantic Oceans. Nairobi, Kenya.

Murua H, Santiago, J, Coelho, R, Zudaire I, Neves C, Rosa D, Semba Y, Geng Z, Bach P, Arrizabalaga, H., Baez JC, Ramos ML, Zhu JF and Ruiz J. (2018). Updated Ecological Risk Assessment (ERA) for shark species caught in fisheries managed by the Indian Ocean Tuna Commission (IOTC). IOTC–2018–SC21–14_Rev_1.

Osuka, K.E., Samoilys, M.A., Musembi, P., Thouless, C.J., Obota, C. and Rambahiniarison, J., 2025. Status and characteristics of sharks and rays impacted by artisanal fisheries: potential implications for management and conservation. Marine and Fishery Sciences (MAFIS), 38(1).

Rigby, C.L., Dulvy, N.K., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Herman, K., Jabado, R.W., Liu, K.M., Marshall, A., Pacoureau, N., Romanov, E., Sherley, R.B. & Winker, H. 2019. Sphyrna lewini. The IUCN Red List of Threatened Species 2019: e.T39385A2918526. Accessed on 06 December 2023.

Robinson, L., and Sauer, W.H.H. 2013. A first description of the artisanal shark fishery in northern Madagascar: implications for management. African Journal of Marine Science, 35:1, pp. 9-15, DOI: 10.2989/1814232X.2013.769906

APPENDIX 26
EXECUTIVE SUMMARY: SHORTFIN MAKO SHARK (2024)

CITES APPENDIX II species

Table 1. Status of shortfin mako shark (*Isurus oxyrinchus*) in the Indian Ocean.

Area[1]	Indicators		2024 stock status determination
Indian Ocean	Catches (SMA) 2023 (t)[2]	831	49.7%
	Average catches (SMA) 2019-23 (t)	846	
	Catches (SMA, MAK, MSK) in 2023 [3]	2021	
	Average catches (SMA, MAK, MSK) 2019-2023	2074	
	Not elsewhere included (nei) sharks[2] 2023 (t)[4]	30358	
	Av. Not elsewhere included (nei) sharks[2] 2019-23(t)	30714	
	MSY (1,000 t) (80% CI)	1.93 (0.99 – 3.31)	
	F_{MSY} (80% CI)	0.03 (0.01 – 0.07)	
	B_{MSY} (1,000 t) (80% CI)	60.0 (35.7 – 103.8)	
	$F_{current}/F_{MSY}$ (80% CI)	1.53 (0.65 – 3.71)	
	$B_{current}/B_{MSY}$ (80% CI)	0.96 (0.58 – 1.41)	
	$B_{current}/B_0$ (80% CI)	0.45 (0.27- 0.69)	

[1] Boundaries for the Indian Ocean = IOTC area of competence
[2] Proportion of 2023 catch estimated or partially estimated by IOTC Secretariat: 0%
[3] Catches of MAK include for all Isurus spp, reported as aggregated MAK. Catches of MSK include Mackerel sharks,porbeagles nei. Those 3 codes were the ones used for the total catch in the stock assessment.
[4] Includes all other shark catches reported to the IOTC Secretariat, which may contain this species (i.e., SKH: Various sharks nei; MSK: Mackerel sharks,porbeagles nei; MAK: Mako sharks; AG38: Blue shark, shortfin mako, oceanic whitetip shark).

Colour key	Stock overfished ($SB_{year}/SB_{MSY}< 1$)	Stock not overfished ($SB_{year}/SB_{MSY}\geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY}> 1$)	49.7	24.0
Stock not subject to overfishing ($F_{year}/F_{MSY}\leq 1$)	4.1	22.2
Not assessed/Uncertain		

Table 2. Shortfin mako shark: IUCN threat status of shortfin mako shark (*Isurus oxyrinchus*) in the Indian Ocean.

Common name	**Scientific name**	**IUCN threat status[5]**		
		Global status	**WIO**	**EIO**
Shortfin mako shark	*Isurus oxyrinchus*	Endangered	–	–

IUCN = International Union for Conservation of Nature; WIO = Western Indian Ocean; EIO = Eastern Indian Ocean

[5]The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

Sources: IUCN Red List 2020, Rigby et al 2019

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. In 2024 a stock assessment was carried out for the shortfin mako shark in the IOTC area of competence, using data until 2022. The WPEB carried out a data-preparatory meeting earlier in the year followed by the stock assessment meeting. The model applied was a population biomass dynamics model using the platform JABBA. The stock status and projections were based on an ensemble grid of 9 models designed to capture the main uncertainties relating to biology (3 options) and the shape of the production curve used in biomass dynamics models (3 options). A number of additional options and model configurations were explored as sensitivity runs. The MSY for the stock is estimated at 1,930 t (80% CI: 985 – 3,313 t). The median biomass in 2022 was estimated to be at 45% (80% CI: 27-69%) of the unfished levels and below the levels that support MSY (B/BMSY in 2022 = 0.96, 80% CI: 0.58-1.48) (**Table 1**). The median fishing mortality in 2022 was estimated to be higher than the level that supports MSY (F/FMSY in 2022 = 1.53, 80% CI: 0.65-3.71) (**Table 1**). While in recent years there were a number of CPUE indices to compare, the assessment relied on the Japanese CPUE index which showed a large depletion through the late 1990s and there is no alternative abundance index to compare the extent of this decline during that period. Additionally, although the reported catches of shortfin mako are generally considered to be reliable because this species used to be retained by several fleets, there is still significant uncertainty about the accuracy of reports from earlier years. This uncertainty also applies to more recent years (post-2018) due to discarding or non-retention.

A semi-quantitative ecological risk assessment (ERA) was conducted for the Indian Ocean by the WPEB and SC in 2018 to evaluate the resilience of shark species to the impact of pelagic fisheries (Murua *et al.* 2018). Shortfin mako sharks received the highest vulnerability ranking in the ERA for longline gear (No. 1) because of their low productivity and high susceptibility to longline gear, and were ranked the fourth most vulnerable shark species for purse seine gear. Considering the characterized uncertainty, and on the weight-of-evidence available in 2024, the shortfin mako shark stock is determined to be **overfished** and subject to **overfishing** (**Table 1, Fig 3**).

Outlook. Catches increased mostly from the mid-1980s up to 2016 followed by a decrease until 2022 as it has been under domestic landing restrictions by a number of fleets, and as a result of it having been listed in CITES Appendix II. The CPUE series for several key fleets which have been available since the early 2000s are generally stable or are increasing.

Management advice The Commission should take a cautious approach by implementing management actions that reduce fishing mortality on shortfin mako sharks, and the stock should be closely monitored. While mechanisms exist for encouraging CPCs to comply with their recording and reporting requirements (Resolution 18/07), these need to be further implemented by the Commission so as to better inform future scientific advice. The Kobe II Strategy Matrix (Table 3) provides the probability of exceeding reference levels over 3-, 10-, 20- and 30-year periods, over a range of TAC options established as a percentage of current catches. Catches at the terminal year of the model (2022) were higher than MSY, and the shortfin mako is currently overfished (B/Bmsy < 1) and undergoing overfishing (F/Fmsy > 1). Under those levels of catches, the biomass will continue to decline, and fishing mortality will continue to increase over time. In order to have a lower than 50% probability of exceeding MSY-reference points in 10 years, i.e., to recover the stock to the green quadrant of the Kobe plot with at least 50% probability in 10 years, future catches should not exceed 40% of the average catches between 2020-2022 (i.e., last 3 year of catches used in the model). This corresponds to an annual TAC of 1,217.2 t (representing all fishing mortality including retention, dead discards and post-release mortality), noting that this TAC level should include and account for the SMA, MAK and MSK species codes as reported to IOTC.

The following key points should also be noted:

- **Maximum Sustainable Yield (MSY)**: estimate for the Indian Ocean is approximately 1,930 t
- **Reference points**: The Commission has not adopted reference points or harvest control rules for any shark species.
- **Main fishing gear** (2019-23): Longline targeting swordfish; gillnet, longline (deep-freezing); longline (fresh); gillnet offshore (**Fig 1).**
- **Main fleets** (2019-23): EU,Spain (43.6%) , Pakistan (25.2%) and EU,Portugal (12.4%). The 12 other fleets catching shortfin mako contributed to 18.8% of the total catch in recent years (Reported as discarded/released alive: EU,Spain, Australia, EU,France, Indonesia, Korea, South Africa) **(Fig 2)**.

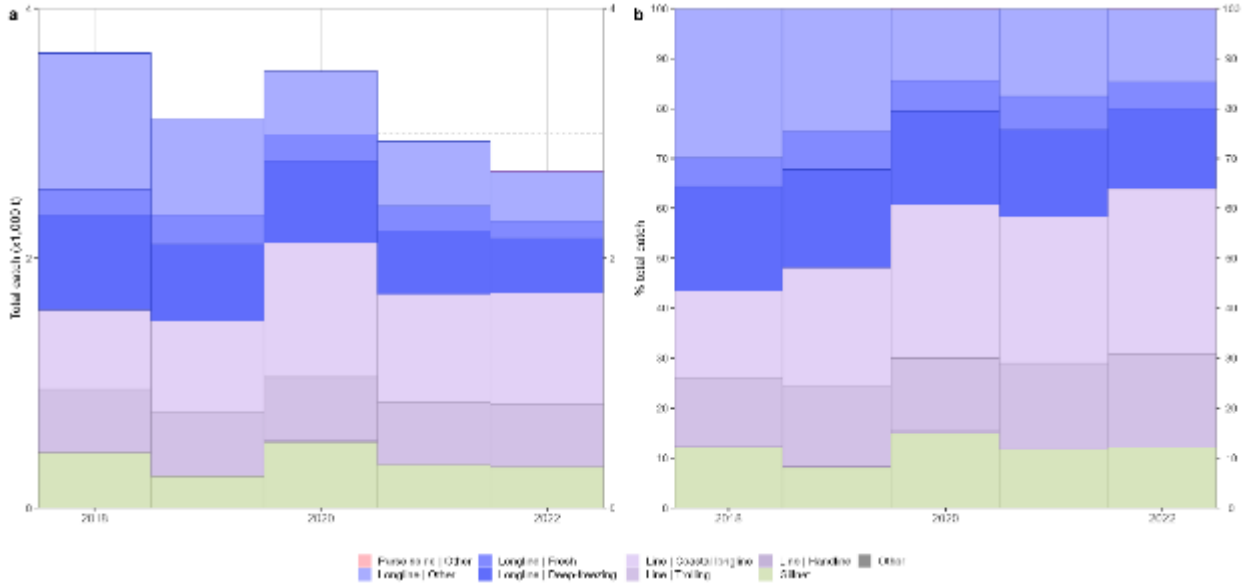


Fig 1: Annual absolute (a) and relative (b) time series of retained catches (metric tonnes; t) of shortfin mako reported at species level or aggregated (SMA, MAK and MSK) by fishery for the period 2018-2022

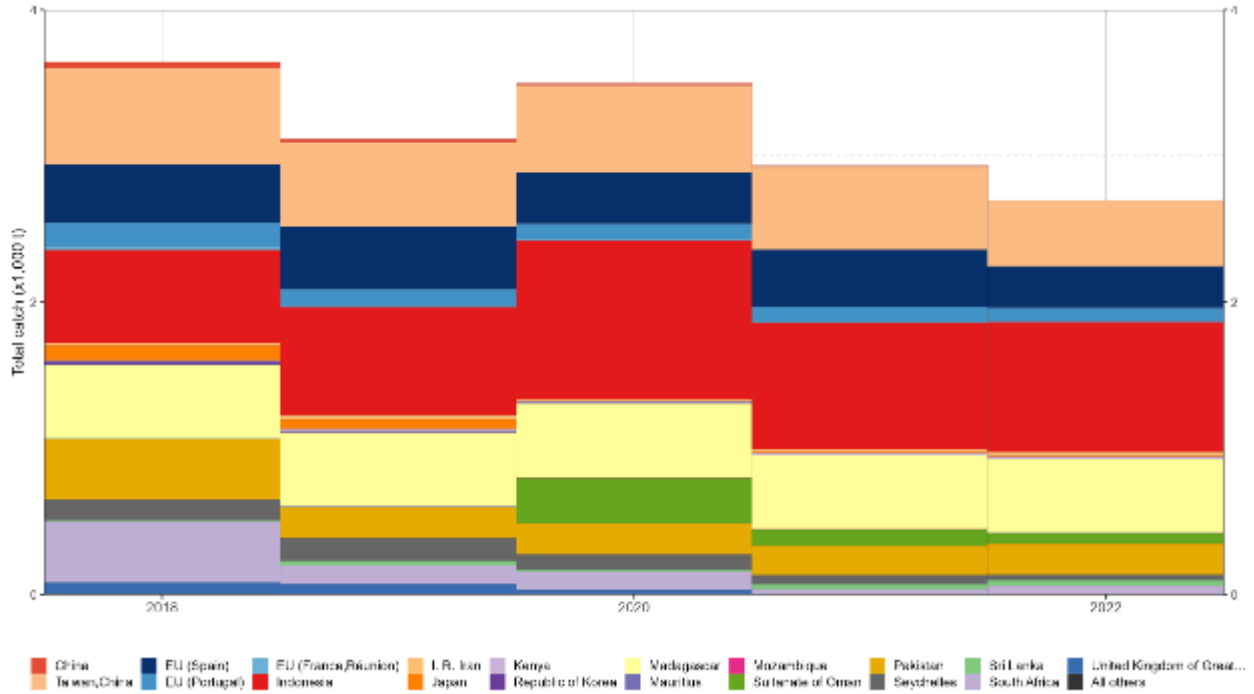


Fig 2: Annual time series of retained catches (metric tonnes; t) of shortfin mako reported at species level or aggregated (SMA, MAK and MSK) by fleet during 1918-2022

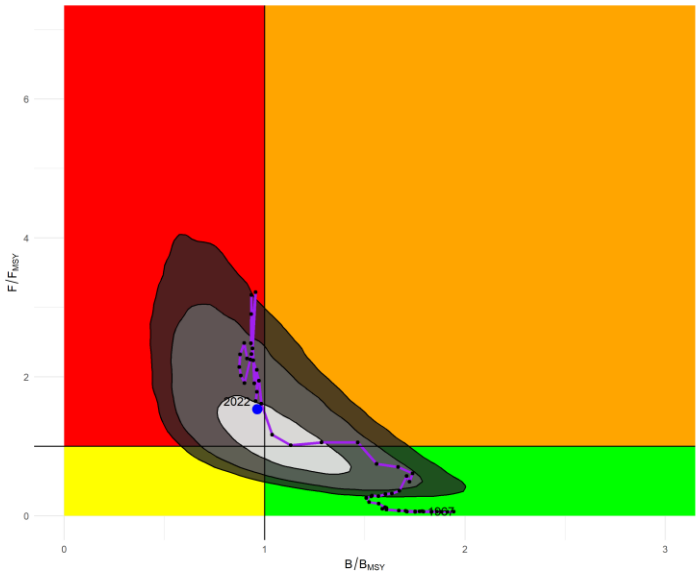


Fig 3: **Shortfin mako**: 2024 stock status, relative to BMSY (x-axis) and FMSY (y-axis) for the final model (terminal year of the model is 2022). The point represents the median of the 9 final models used in the ensemble grid and the shaded areas are the 50%, 80% and 90% contours of the uncertainties in the terminal year. The line represents the time series of the median stock trajectory from the ensemble grid of models.

Table 3. **Shortfin mako**: Final model ensemble aggregated Indian Ocean Kobe II Strategy Matrix. The values represent the probabilities (percentage) of exceeding the MSY-based target reference points, for constant catch projections between 0%-100% (10% intervals) relative to last years of catches used in the model (i.e., average of last 3 years, 2020-2022), and projected for periods of 3, 10, 20 and 30 years.

Reference point and projection time	**Catch projections (relative to the 2020-2022 catches) and probability (%) of exceeding MSY-based reference points**										
Catch relative to 2020-2022 (%)	**0%**	**10%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**	**100%**
TAC (t)	**0.0**	**304.3**	**608.6**	**912.9**	**1217.2**	**1521.5**	**1825.7**	**2130.0**	**2434.3**	**2738.6**	**3042.9**
3 year projection											
B2025 < BMSY	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7
F2025 > FMSY	0.0	1.5	9.6	21.7	34.1	45.3	55.1	63.2	70.0	75.7	80.2
10 year projection											
B2032 < BMSY	39.2	41.8	44.5	47.1	49.8	52.5	55.2	57.9	60.6	63.2	65.8
F2032 > FMSY	0.0	2.0	10.0	21.2	32.8	43.8	53.6	62.2	69.5	75.6	80.6
20 year projection											
B2042 < BMSY	26.1	30.0	34.4	39.1	44.0	49.0	54.1	59.1	64.0	68.6	72.9
F2042 > FMSY	0.0	2.4	10.2	20.6	31.9	42.8	52.9	62.0	69.9	76.5	81.8
30 year projection											
B2052 < BMSY	19.3	23.9	29.0	34.9	41.2	47.7	54.3	60.7	66.7	72.3	77.3
F2052 > FMSY	0.0	2.6	10.2	20.4	31.6	42.6	53.1	62.4	70.6	77.5	83.0

LITERATURE CITED

Murua H, Santiago, J, Coelho, R, Zudaire I, Neves C, Rosa D, Semba Y, Geng Z, Bach P, Arrizabalaga, H., Baez JC, Ramos ML, Zhu JF and Ruiz J. (2018). Updated Ecological Risk Assessment (ERA) for shark species caught in fisheries managed by the Indian Ocean Tuna Commission (IOTC). IOTC–2018–SC21–14_Rev_1.

Rigby, C.L., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Jabado, R.W., Liu, K.M., Marshall, A., Pacoureau, N., Romanov, E., Sherley, R.B. & Winker, H. 2019. Isurus oxyrinchus. The IUCN Red List of Threatened Species 2019: e.T39341A2903170. https://dx.doi.org/10.2305/IUCN.UK.2019-1.RLTS.T39341A2903170.en. Accessed on 06 December 2023.

APPENDIX 27
EXECUTIVE SUMMARY: SILKY SHARK (2024)

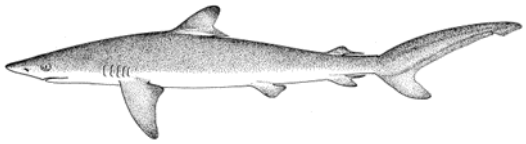


Table 1. Status of silky shark (*Carcharhinus falciformis*) in the Indian Ocean.

Area[1]	Indicators		2018 stock status determination
Indian Ocean	Reported catch 2023 (t)[3] Not elsewhere included (nei) sharks[2] 2023 (t) Average reported catch 2019-23 (t) Av. Not elsewhere included (nei) sharks[2] 2019-23 (t)	1,578 28,843 1,675 29,049	
	MSY (1,000 t) (80% CI) F_{MSY} (80% CI) SB_{MSY} (1,000 t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $SB_{current}/SB_{MSY}$ (80% CI) $SB_{current}/SB_0$ (80% CI)	unknown	

[1]Boundaries for the Indian Ocean = IOTC area of competence
[2]Includes all other shark catches reported to the IOTC Secretariat, which may contain this species (i.e., SKH: Various sharks nei; RSK: requiem sharks nei).
[3]Proportion of 2023 catch estimated or partially estimated by IOTC Secretariat: 7.1%

Colour key	Stock overfished ($SB_{year}/SB_{MSY} < 1$)	Stock not overfished ($SB_{year}/SB_{MSY} \geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY} > 1$)		
Stock not subject to overfishing ($F_{year}/F_{MSY} \leq 1$)		
Not assessed/Uncertain		

Table 2. Silky shark: IUCN threat status of silky shark (*Carcharhinus falciformis*) in the Indian Ocean.

Common name	**Scientific name**	**IUCN threat status[3]**		
		Global status	**WIO**	**EIO**
Silky shark	*Carcharhinus falciformis*	Vulnerable	-	-

IUCN = International Union for Conservation of Nature; WIO = Western Indian Ocean; EIO = Eastern Indian Ocean

[3]The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

Sources IUCN Red List 2020, Rigby 2021

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. There remains considerable uncertainty about the relationship between abundance and the nominal CPUE series from the main longline fleets, and about the total catches over the past decade (**Table 1**). The ecological risk assessment (ERA) conducted for the Indian Ocean by the WPEB and SC in 2018 consisted of a semi-quantitative risk assessment analysis to evaluate the resilience of shark species to the impact of a given fishery, by combining the biological productivity of the species and its susceptibility to each fishing gear type (Murua *et al.* 2018). Silky shark received a high vulnerability ranking (No. 2) in the ERA rank for longline gear because it was estimated to be one of the least productive shark species, and with a high susceptibility to longline gear. Silky shark was estimated to be the fifth most vulnerable shark species in the ERA ranking for purse seine gear,

due to its low productivity and high susceptibility to purse seine gear. The current IUCN threat status of this species globally is 'Vulnerable' (**Table 2**). There is a paucity of information available on this species, but several studies have been carried out for this species in the recent years. CPUE derived from longline fishery observations indicated a decrease from 2009 to 2011 with a stable pattern onward. A preliminary stock assessment was run in 2018 but could not be updated in 2019. This assessment is extremely uncertain, however, and so the population status of silky sharks in the Indian Ocean is considered uncertain. Silky sharks are commonly taken by a range of fisheries in the Indian Ocean. Because of their life history characteristics – they are relatively long lived (over 20 years), mature relatively late (at 6–12 years), and have relativity few offspring (<20 pups every two years), the silky shark can be vulnerable to overfishing. 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**.

Outlook. The impact of piracy in the western Indian Ocean has resulted in the displacement and subsequent concentration of a substantial portion of longline fishing effort into certain areas in the southern and eastern Indian Ocean. Some longline vessels have returned to their traditional fishing areas in the northwest Indian Ocean, due to the increased security onboard vessels, with the exception of the Japanese fleet which has still not returned to the levels seen before the start of the piracy threat. It is therefore unlikely that catch and effort on silky shark has declined in the southern and eastern areas and may have resulted in localised depletion there.

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. While mechanisms exist for encouraging CPCs to comply with their recording and reporting requirements (Resolution 18/07), these need to be further implemented by the Commission so as to better inform scientific 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 30.8% for silky shark.

The following key points should also be noted:

- **Maximum Sustainable Yield (MSY)**: Unknown.
- **Reference points**: Not applicable.
- **Main fishing gear** (2019-23): Gillnet; offshore gillnet; longline; longline (fresh), trolling (reported as discard by PS)
- **Main fleets** (2019-23): I.R. Iran; Pakistan, Sri Lanka; Taiwan,China; Kenya (reported as discarded/released alive by: EU-France, Mauritius, EU-Spain, Korea, Seychelles and Tanzania).

LITERATURE CITED

Bigelow, K. and Carvalho, F. 2021. Review of potential mitigation measures to reduce fishing-related mortality on silky and oceanic whitetip sharks (Project 101). WCPFC Scientific Committee 17th Regular Session. WCPFC-SC17-2021/EB-WP-01. Available: https://meetings.wcpfc.int/node/12598

Murua H, Santiago, J, Coelho, R, Zudaire I, Neves C, Rosa D, Semba Y, Geng Z, Bach P, Arrizabalaga, H., Baez JC, Ramos ML, Zhu JF and Ruiz J. (2018). Updated Ecological Risk Assessment (ERA) for shark species caught in fisheries managed by the Indian Ocean Tuna Commission (IOTC). IOTC–2018–SC21–14_Rev_1.

Rigby, C.L., Sherman, C.S., Chin, A. & Simpfendorfer, C. 2021. Carcharhinus falciformis (amended version of 2017 assessment). The IUCN Red List of Threatened Species 2021: e.T39370A205782570. https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T39370A205782570.en. Accessed on 06 December 2023.

APPENDIX 28
EXECUTIVE SUMMARY: BIGEYE THRESHER SHARK (2024)

Table 1. Status bigeye thresher shark (*Alopias superciliosus*) in the Indian Ocean.

Area[1]	Indicators		2018 stock status determination
Indian Ocean	Reported catch 2023 (t) Not elsewhere included (nei) sharks[2] 2023 (t) Thresher sharks nei 2023 (t) Average reported catch 2019-23 (t) Av. Not elsewhere included (nei) sharks[2] 2019-23 (t) Av. Thresher sharks nei 2019-23 (t)	< 1 33,200 4,863 < 1 33,848 5,108	
	MSY (1,000 t) (80% CI) F_{MSY} (80% CI) SB_{MSY} (1,000 t) (80% CI) $F_{current}/F_{MSY}$ (80% CI) $SB_{current}/SB_{MSY}$ (80% CI) $SB_{current}/SB_0$ (80% CI)	unknown	

[1]Boundaries for the Indian Ocean = IOTC area of competence

[2]Includes all other shark catches reported to the IOTC Secretariat, which may contain this species (i.e., SKH: Various sharks nei;THR: Thresher sharks nei; MSK: Mackerel sharks,porbeagles nei).

Colour key	Stock overfished ($SB_{year}/SB_{MSY}< 1$)	Stock not overfished ($SB_{year}/SB_{MSY}\geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY}> 1$)		
Stock not subject to overfishing ($F_{year}/F_{MSY}\leq 1$)		
Not assessed/Uncertain		

Table 2. Bigeye thresher shark: IUCN threat status of bigeye thresher shark (*Alopias superciliosus*) in the Indian Ocean.

Common name	**Scientific name**	**IUCN threat status[3]**		
		Global status	**WIO**	**EIO**
Bigeye thresher shark	*Alopias superciliosus*	Vulnerable	–	–

IUCN = International Union for Conservation of Nature; WIO = Western Indian Ocean; EIO = Eastern Indian Ocean

[3]The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

Sources: IUCN Red List 2020, Rigby et al 2019

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. There remains considerable uncertainty in the stock status due to lack of information necessary for assessment or for the development of other indicators of the stock (**Table 1**). The ecological risk assessment (ERA) conducted for the Indian Ocean by the WPEB and SC in 2018 consisted of a semi-quantitative risk assessment analysis to evaluate the resilience of shark species to the impact of a given fishery, by combining the biological productivity of the species and its susceptibility to each fishing gear type (Murua *et al.* 2018). Bigeye thresher shark received a high vulnerability ranking (No. 4) in the ERA rank for

longline gear because it was characterised as one of the least productive shark species, and highly susceptible to longline gear. Despite its low productivity, bigeye thresher shark has a low vulnerability ranking to purse seine gear due to its low susceptibility to this particular gear. The current IUCN threat status of 'Vulnerable' applies to bigeye thresher shark globally (**Table 2**). There is a paucity of information available on this species and this situation is not expected to improve in the short to medium term. Bigeye thresher sharks are commonly taken by a range of fisheries in the Indian Ocean. Because of their life history characteristics – they are relatively long lived (+20 years), mature at 3–9 years, and have few offspring (2–4 pups every year), the bigeye thresher shark is vulnerable to overfishing. There has been no quantitative stock assessment and limited basic fishery indicators are available for bigeye thresher shark in the Indian Ocean. Therefore, the stock status is **unknown**.

Outlook. Current longline fishing effort is directed at other species, however, bigeye thresher sharks are commonly taken as bycatch in these fisheries. Hooking mortality is apparently very high, therefore IOTC Resolution 12/09 prohibiting retaining of any part of thresher sharks onboard and promoting live release of thresher shark may be largely ineffective for species conservation. Maintaining or increasing effort can result in declines in biomass, productivity and CPUE. However, there are few data to estimate CPUE trends and a reluctance of fishing fleets to report information on discards/non-retained catch. Piracy in the western Indian Ocean resulted in the displacement and subsequent concentration of a substantial portion of longline fishing effort into other areas in the southern and eastern Indian Ocean. Some longline vessels have returned to their traditional fishing areas in the northwest Indian Ocean, due to the increased security onboard vessels, with the exception of the Japanese fleet which has still not returned to the levels seen before the start of the piracy threat. It is therefore unlikely that catch and effort on bigeye thresher shark declined in the southern and eastern areas over that time period, potentially resulting in localised depletion.

Management advice. The prohibition on retention of bigeye thresher shark should be maintained. While mechanisms exist for encouraging CPCs to comply with their recording and reporting requirements (Resolution 18/07), these need to be further implemented by the Commission, so as to better inform scientific advice. IOTC Resolution 12/09 *On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence*, prohibits retention onboard, transhipping, landing, storing, selling or offering for sale any part or whole carcass of thresher sharks of all the species of the family *Alopiidae*[5].The following key points should also be noted:

- **Maximum Sustainable Yield (MSY)**: Not applicable. Retention prohibited.
- **Reference points**: Not applicable.
- **Main fishing gear** (2018–22): No report after 2012. (reported as discard from longline - records from submissions by CHN, IDN, ZAF, Eu FRA, KEN and KOR).
- **Main reporting fleets** (2018–22): India; (reported as discarded/released alive by United Kingdom, South Africa, Indonesia, Korea, EU,France).

LITERATURE CITED

Murua H, Santiago J, Coelho R, Zudaire I, Neves C, Rosa D, Semba Y, Geng Z, Bach P, Arrizabalaga, H, Baez JC, Ramos ML, Zhu JF and Ruiz J (2018). Updated Ecological Risk Assessment (ERA) for shark species caught in fisheries managed by the Indian Ocean Tuna Commission (IOTC). IOTC–2018–SC21–14_Rev_1

Rigby CL, Barreto R, Carlson J, Fernando D, Fordham S, Francis MP, Herman K, Jabado RW, Liu KM, Marshall, A., Pacoureau, N., Romanov, E., Sherley, R.B. & Winker, H. 2019. Alopias superciliosus. The IUCN Red List of Threatened Species 2019: e.T161696A894216. https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T161696A894216.en. Accessed on 06 December 2023.

[5] Scientific observers shall be allowed to collect biological samples from thresher sharks that are dead at haulback, provided that the samples are part of the research project approved by the Scientific Committee (or the Working Party on Ecosystems and Bycatch).

APPENDIX 29
EXECUTIVE SUMMARY: PELAGIC THRESHER SHARK (2024)

Table 1. Status pelagic thresher shark (*Alopias pelagicus*) in the Indian Ocean.

Area[1]	Indicators		2018 stock status determination
Indian Ocean	Reported catch 2023 (t) [3]	136	
	Not elsewhere included (nei) sharks[2] 2023 (t)	33,200	
	Thresher sharks nei 2023 (t)	4,863	
	Average reported catch 2019-23 (t)	162	
	Av. Not elsewhere included (nei) sharks[2] 2019-23 (t)	33,848	
	Av. Thresher sharks nei 2019-23 (t)	5,108	
	MSY (1,000 t) (80% CI)	unknown	
	F_{MSY} (80% CI)		
	SB_{MSY} (1,000 t) (80% CI)		
	$F_{current}/F_{MSY}$ (80% CI)		
	$SB_{current}/SB_{MSY}$ (80% CI)		
	$SB_{current}/SB_0$ (80% CI)		

[1]Boundaries for the Indian Ocean = IOTC area of competence

[2]Includes all other shark catches reported to the IOTC Secretariat, which may contain this species (i.e., SKH: Various sharks nei;THR: Thresher sharks nei; MSK: Mackerel sharks,porbeagles nei).

[3]Proportion of 2023 catch estimated or partially estimated by IOTC Secretariat: 0%

Colour key	Stock overfished ($SB_{year}/SB_{MSY}< 1$)	Stock not overfished ($SB_{year}/SB_{MSY}\geq 1$)
Stock subject to overfishing ($F_{year}/F_{MSY}> 1$)		
Stock not subject to overfishing ($F_{year}/F_{MSY}\leq 1$)		
Not assessed/Uncertain		

Table 2. Pelagic thresher shark: IUCN threat status of pelagic thresher shark (*Alopias pelagicus*) in the Indian Ocean.

Common name	**Scientific name**	**IUCN threat status[3]**		
		Global status	**WIO**	**EIO**
Pelagic thresher shark	*Alopias pelagicus*	Endangered	–	–

IUCN = International Union for Conservation of Nature; WIO = Western Indian Ocean; EIO = Eastern Indian Ocean

[3]The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

Sources: IUCN Red List 2020, Rigby et al 2019

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. There remains considerable uncertainty in the stock status due to lack of information necessary for assessment or for the development of other indicators (**Table 11**). The ecological risk assessment (ERA) conducted for the Indian Ocean by the WPEB and SC in 2018 consisted of a semi-quantitative analysis to evaluate the resilience of shark species to the impact of a given fishery, by combining the biological productivity of the species and susceptibility to each fishing gear type (Murua *et al.* 2018). Pelagic thresher shark received a medium vulnerability ranking (No. 12) in the ERA for longline gear because it was characterised as one of the least productive shark species, and with a medium susceptibility to longline gear. Due to its low productivity, pelagic thresher shark has a high vulnerability ranking (No. 2) to purse seine gear due to its high availability for this particular gear. The current IUCN threat status of 'Endangered' applies to pelagic thresher shark globally (**Table 2**). There is a paucity of information available on this species and this situation is not expected to improve in the short to medium term. Pelagic thresher sharks are commonly taken by a range of fisheries in the Indian Ocean. Because of their life history characteristics – they are relatively long lived (+ 20 years), mature at 8–9 years, and have few offspring (2 pups every year–) -

the pelagic thresher shark is vulnerable to overfishing. There is no quantitative stock assessment and limited basic fishery indicators are currently available for pelagic thresher shark in the Indian Ocean. Therefore, the stock status is **unknown.**

Outlook. Current longline fishing effort is directed at other species, however, pelagic thresher sharks are commonly taken as bycatch in these fisheries. Hooking mortality is apparently very high, therefore IOTC Resolution 12/09 prohibiting retaining of any part of thresher sharks onboard and promoting life release of thresher shark may be largely ineffective for species conservation. Maintaining or increasing effort can result in declines in biomass, productivity and CPUE. However, there are few data to estimate CPUE trends, and a reluctance of fishing fleets to report information on discards/non-retained catch. Piracy in the western Indian Ocean resulted in the displacement and subsequent concentration of a substantial portion of longline fishing effort into other areas in the southern and eastern Indian Ocean. Some longline vessels have returned to their traditional fishing areas in the northwest Indian Ocean, due to the increased security onboard vessels, with the exception of the Japanese fleet which has still not returned to the levels seen before the start of the piracy threat. It is therefore unlikely that catch and effort on pelagic thresher shark declined in the southern and eastern areas over that time period, potentially resulting in localised depletion there.

Management advice. The prohibition on the retention of pelagic thresher shark should be maintained. While mechanisms exist for encouraging CPCs to comply with their recording and reporting requirements (Resolution 18/07), these need to be further implemented by the Commission, so as to better inform scientific advice. IOTC Resolution 12/09 *On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence*, prohibits retention onboard, transhipping, landing, storing, selling or offering for sale any part or whole carcass of thresher sharks of all the species of the family *Alopiidae*[6].The following key points should also be noted:

- **Maximum Sustainable Yield (MSY):** Not applicable. Retention prohibited.
- **Reference points**: Not applicable.
- **Main fishing gear** (2019-23): Gillnet, coastal longline, exploratory longline (reported as discard/ released from gillnet and longline).
- **Main fleets** (2019-23): Pakistan; reported as discarded/released alive by Korea, South Africa, Indonesia.

LITERATURE CITED

Murua H, Santiago J, Coelho R, Zudaire I, Neves C, Rosa D, Semba Y, Geng Z, Bach P, Arrizabalaga, H, Baez JC, Ramos ML, Zhu JF and Ruiz J. (2018). Updated Ecological Risk Assessment (ERA) for shark species caught in fisheries managed by the Indian Ocean Tuna Commission (IOTC). IOTC–2018–SC21–14_Rev_1. Available from: https://www.iotc.org/documents/SC/21/14

Reardon M, Márquez F, Trejo T, Clarke SC (2009) *Alopias pelagicus*. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. <www.iucnredlist.org>. Downloaded on 15 September 2013.

Rigby CL, Barreto R, Carlson J, Fernando D, Fordham S, Francis MP, Herman K, Jabado RW, Liu KM, Marshall A, Pacoureau N, Romanov E, Sherley RB & Winker H (2019). Alopias pelagicus. The IUCN Red List of Threatened Species 2019: e.T161597A68607857. https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T161597A68607857.en. Accessed on 06 December 2023.

[6]Scientific observers shall be allowed to collect biological samples from thresher sharks that are dead at haulback, provided that the samples are part of the research project approved by the Scientific Committee (or the Working Party on Ecosystems and Bycatch).

APPENDIX 30
EXECUTIVE SUMMARY: PORBEAGLE SHARK (2024)

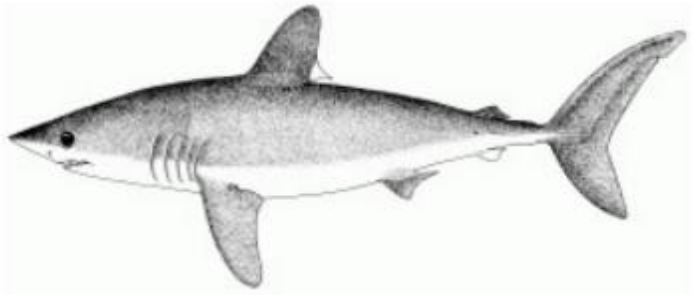


Table 1. Status of porbeagle shark (*Lamna nasus*) in the Indian Ocean

Area	Indicators		2024 stock status determination
Indian Ocean	Reported catch 2023 (t)[4]	28t	Unknown
	Not elsewhere included (nei) sharks[1] 2023 (t)	28,365t	
	Average reported catch 2019-23 (t)	28t	
	Avg. not elsewhere included (nei) sharks[1] 2019-23 (t)	28,768t	
	MSY (1,000 t) (80% CI)[2]		
	F_{MSY} (80% CI) [2]		
	SB_{MSY} (1,000 t) (80% CI) [2,3]		
	F_{2019}/F_{MSY} (80% CI) [2]		
	SB_{2019}/SB_{MSY} (80% CI) [2,3]		
	SB_{2019}/SB_0 (80% CI) [2,3]		

Boundaries for the Indian Ocean are defined as the IOTC area of competence

[1]Includes all other shark catches reported to the IOTC Secretariat, which may contain this species (i.e., SKH: Various sharks nei; MSK: Mackerel sharks, porbeagles nei, AG21: Sharks nei other than oceanic whitetip shark and blue shark)

Colour key	Stock overfished (SB_{2019}/SB_{MSY}< 1)	Stock not overfished (SB_{2019}/SB_{MSY}≥ 1)
Stock subject to overfishing(F/F_{MSY}> 1)		
Stock not subject to overfishing (F/F_{MSY}≤ 1)		
Not assessed/Uncertain		

Table 4. Porbeagle shark: IUCN threat status of porbeagle shark (*Lamna nasus*) in the Indian Ocean.

Common name	Scientific name	IUCN threat status[3]
		Global status
Porbeagle shark	*Lamna nasus*	Vulnerable

IUCN = International Union for Conservation of Nature; WIO = Western Indian Ocean; EIO = Eastern Indian Ocean

[3]The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

Sources: IUCN Red List 2024

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No stock assessment was carried out for porbeagle sharks in 2024. There remains considerable uncertainty in the stock status due to lack of information necessary for assessment or for the development of other indicators of the stock (**Table**). The ecological risk assessment (ERA) conducted for the Indian Ocean by the WPEB and SC in 2018 consisted of a semi-quantitative risk assessment analysis to evaluate the resilience of shark species to the impact of a given fishery, by combining the biological productivity of the species and its susceptibility to each fishing gear type (Murua *et al.* 2018). Porbeagle shark received a high vulnerability ranking (No. 3) in the ERA rank for longline gear because it was characterised as one of the least

productive shark species, and highly susceptible to longline gear. Despite its low productivity, porbeagle shark has a low vulnerability ranking to purse seine gear due to its low susceptibility to this particular gear. The current IUCN threat status of 'Vulnerable' applies to porbeagle shark globally (**Table 2**). There is a paucity of information available on this species and this situation is not expected to improve in the short to medium term. Porbeagle sharks are commonly taken by a range of fisheries in the Indian Ocean. Because of their life history characteristics – they are relatively long lived (+30 years), mature at around 15 years, and have few offspring (around 4 pups every one or two years), the porbeagle shark is vulnerable to overfishing. There has been no quantitative stock assessment and limited basic fishery indicators are available for porbeagle shark in the Indian Ocean. Therefore, the stock status is **unknown**.

Outlook. Current longline fishing effort is directed at other species, however, porbeagle sharks are taken as bycatch in these fisheries but it may be released by some fleets. Maintaining or increasing effort can result in declines in biomass, productivity and CPUE. However, there are few data to estimate CPUE trends and a reluctance of fishing fleets to report information on discards/non-retained catch. Preliminary analysis of IOTC catch and effort data from the Japanese and Korean fleets found catchability to have declined from 2009 through 2018 (IOTC-2023-WPEB19-20). The Japanese fleet releases porbeagle sharks caught by longline vessels which may be a reason for the decline in catches of this species.

Management advice.

While mechanisms exist for encouraging CPCs to comply with their recording and reporting requirements (Resolution 18/07), these need to be further implemented by the Commission so as to better inform scientific advice. This is considered to be a vulnerable species

The following key points should also be noted:

- **Maximum Sustainable Yield (MSY)**: Unknown
- **Reference points**: The Commission has not adopted reference points or harvest control rules for any shark species.
- **Main fishing gear** (2019–23): coastal longline; Longline (deep-freezing),
- **Main fleets** (2019–23): IDN (96%), JPN, Catches by JPN are discarded.

LITERATURE CITED

Rigby, C.L., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Herman, K., Jabado, R.W., Liu, K.M., Marshall, A., Pacoureau, N., Romanov, E., Sherley, R.B. & Winker, H. 2019. *Lamna nasus*. *The IUCN Red List of Threatened Species* 2019: e.T11200A500969. https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T11200A500969.en. Accessed on 20 June 2024.

APPENDIX 31
EXECUTIVE SUMMARY: MARINE TURTLES

Table 1. Marine turtles: IUCN threat status for all marine turtle species reported as caught in fisheries within the IOTC area of competence.

Common name	Scientific name	IUCN threat status[7]
Flatback turtle	*Natator depressus*	Data deficient
Green turtle	*Chelonia mydas*	Endangered
Hawksbill turtle	*Eretmochelys imbricata*	Critically Endangered
Leatherback turtle	*Dermochelys coriacea*	Vulnerable (Globally)
	(N. East Indian Ocean subpopulation)	Data deficient
	(S. West Indian Ocean subpopulation)	Critically Endangered
Loggerhead turtle	*Caretta caretta*	Vulnerable (Globally)
	(N. West Indian Ocean subpopulation)	Critically Endangered
	(S. East Indian Ocean subpopulation)	Near Threatened
Olive Ridley turtle	*Lepidochelys olivacea*	Vulnerable

Sources: Marine Turtle Specialist Group 1996, Red List Standards & Petitions Subcommittee 1996, Sarti Martinez (Marine Turtle Specialist Group) 2000, Seminoff 2004, Abreu-Grobois & Plotkin 2008, Mortimer et al. 2008, IUCN 2020, The IUCN Red List of Threatened species. <www.iucnredlist.org>. Downloaded on 16 September 2020

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No assessment has been undertaken by the IOTC WPEB for marine turtles due to the lack of data being submitted by CPCs. However, the current International Union for Conservation of Nature (IUCN) threat status for each of the marine turtle species reported as caught in IOTC fisheries to date is provided in **Table 1**. It is important to note that a number of international global environmental accords (e.g., Convention on Migratory Species (CMS), Convention on Biological Diversity (CBD), as well as numerous fisheries agreements obligate States to provide protection for these species. In particular, there are now 35 Signatories to the Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia (IOSEA MoU). Of the 35 Signatories to the IOSEA MoU, 25 are also members of the IOTC. While the status of marine turtles is affected by a range of factors such as degradation of marine turtle natural habitats and targeted harvesting of eggs and turtles, the level of mortality of marine turtles due to capture by gillnets is likely to be substantial as shown by the Ecological Risk Assessment (ERA) presented in 2018 (Williams et al., 2018). Stock assessments of all species of marine turtles in the Indian Ocean are limited due to data insufficiencies as well as limited data quality (Wallace et al., 2011). Bycatch and mortality from gillnet fisheries have greater population-level impacts on marine turtles relative to other gear types, such as longline, purse seine and trawl fisheries in the Indian Ocean (Wallace et al., 2013). Population levels of impacts of leatherback turtles caught in longline gear in the Southwest Indian Ocean were also identified as a conservation priority.

Outlook. Resolution 12/04 *On the conservation of marine turtles* includes an annual evaluation requirement (para. 17) by the Scientific Committee (SC). However, given the lack of reporting of marine turtle interactions by CPCs to date, such an evaluation cannot be undertaken. Unless IOTC CPCs become compliant with the data collection and reporting requirements for marine turtles, the WPEB and the SC will continue to be unable to address this issue. So far, reporting of sea turtle interactions are not described at the species level. It is recommended that CPCs now declare interactions indicating the sea turtle species. Guides for species identification are available at http://iotc.org/science/species-identification-cards. Notwithstanding this, it is acknowledged that the impact on marine turtle populations from fishing for tuna and tuna-like species will increase as fishing pressure increases, and that the status of the marine turtle populations will continue to worsen due to other factors such as an increase in fishing pressure from other fisheries or anthropological or climatic impacts.

[7] IUCN, 2020. The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

The following should also be noted:

1. The available evidence indicates considerable risk to marine turtles in the Indian Ocean.
2. Given the high mortality rates associated with marine turtle interactions with gillnet fisheries and the increasing use of gillnets in the Indian Ocean (Aranda, 2017) there is a need to both assess and mitigate impacts on threatened and endangered marine turtle populations.
3. The primary sources of data that drive the ability of the WPEB to determine a status for the Indian Ocean, total interactions by fishing vessels or in net fisheries, are highly uncertain and should be addressed as a matter of priority.
4. Current reported interactions are known to be a severe underestimate.
5. The Ecological Risk Assessment (Nel et al., 2013) estimated that ~3,500 and ~250 marine turtles are caught by longline and purse seine vessels, respectively, per annum, with an estimated 75% of turtles released alive[7]. The ERA set out two separate approaches to estimate gillnet impacts on marine turtles, based on very limited data. The first calculated that 52,425 marine turtles p.a. and the second that 11,400–47,500 turtles p.a. are caught in gillnets (with a mean of the two methods being 29,488 marine turtles p.a.). Anecdotal/published studies reported values of >5000–16,000 marine turtles p.a. for each of India, Sri Lanka and Madagascar. Of these reports, green turtles are under the greatest pressure from gillnet fishing, constituting 50–88% of catches for Madagascar. Loggerhead, hawksbill, leatherback and olive Ridley turtles are caught in varying proportions depending on the region, season and type of fishing gear.
6. Maintaining or increasing fishing effort in the Indian Ocean without appropriate mitigation measures in place, will likely result in further declines in marine turtle populations.
7. Efforts should be undertaken to encourage CPCs to investigate means to reduce marine turtle bycatch and at-vessel and post-release mortality in IOTC fisheries and improve data collection and reporting for marine turtles. This may include alternative data collection mechanisms such as skipper-based reporting, port sampling and cost-effective electronic monitoring systems.

LITERATURE CITED

Abreu-Grobois A, Plotkin P (IUCN SSC Marine Turtle Specialist Group) (2008) *Lepidochelys olivacea*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Downloaded on 09 November 2012.

Aranda, M. 2017. Description of tuna gillnet capacity and bycatch in the IOTC Convention Area. IOTC-2017-WPEB13-18.

Mortimer JA, Donnelly M (IUCN SSC Marine Turtle Specialist Group) (2008) *Eretmochelys imbricata*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Downloaded on 09 November 2012

Nel, R., Wanless, R. M., Angel, A., Mellet, B. and Harris, L. 2013. Ecological Risk Assessment and Productivity -Susceptibility Analysis of sea turtles overlapping with fisheries in the IOTC region IOTC–2013–WPEB09–23

Seminoff JA (Southwest Fisheries Science Center, U.S.) (2004) *Chelonia mydas*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Downloaded on 09 November 2012.

Wallace BP, DiMatteo AD, Bolten AB, Chaloupka MY, Hutchinson BJ, et al. (2011) Global Conservation Priorities for Marine Turtles. PLoS ONE 6(9): e24510. doi:10.1371/journal.pone.0024510

Wallace, B. P., C. Y. Kot, A. D. DiMatteo, T. Lee, L. B. Crowder, and R. L. Lewison. 2013. Impacts of fisheries bycatch on marine turtle populations worldwide: toward conservation and research priorities. Ecosphere 4(3):40. http://dx.doi.org/10.1890/ES12-00388.1 (Fig. 13)

Williams, A. J., Georgeson, L., Summerson, R., Hobday, A., Hartog, J., Fuller, M., Swimmer, Y., Wallace, B. and Nicol, S. J. 2018. Assessment of the vulnerability of sea turtles to IOTC tuna fisheries. IOTC-2018-WPEB14-40

APPENDIX 32
EXECUTIVE SUMMARY: SEABIRDS

Table 1. IUCN threat status for all seabird species reported as caught in fisheries within the IOTC area of competence.

Common name	Scientific name	IUCN threat status[8]
Albatross		
Atlantic Yellow-nosed Albatross	*Thalassarche chlororhynchos*	Endangered
Black-browed albatross	*Thalassarche melanophris*	Least Concern
Indian yellow-nosed albatross	*Thalassarche carteri*	Endangered
Shy albatross	*Thalassarche cauta*	Near Threatened
Sooty albatross	*Phoebetria fusca*	Endangered
Light-mantled albatross	*Phoebetria palpebrata*	Near Threatened
Amsterdam albatross	*Diomedea amsterdamensis*	Endangered
Tristan albatross	*Diomedea dabbenena*	Critically Endangered
Wandering albatross	*Diomedea exulans*	Vulnerable
White-capped albatross	*Thalassarche steadi*	Near Threatened
Grey-headed albatross	*Thalassarche chrysostoma*	Endangered
Petrels		
Cape/Pintado petrel	*Daption capense*	Least Concern
Great-winged petrel	*Pterodroma macroptera*	Least Concern
Grey petrel	*Procellaria cinerea*	Near Threatened
Southern giant petrel	*Macronectes giganteus*	Least Concern
Northern giant-petrel	*Macronectes halli*	Least Concern
White-chinned petrel	*Procellaria aequinoctialis*	Vulnerable
Others		
Cape gannet	*Morus capensis*	Endangered
Flesh-footed shearwater	*Puffinus carneipes*	Near Threatened

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. Following a data call in 2016, the IOTC Secretariat received seabird bycatch data from 6 CPCs, out of the 15 with reported or expected longline effort South of 25ºS (IOTC-2016-SC19-INF02). Due to the lack of data submissions from other CPCs, and the limited information provided on the use of seabird bycatch mitigations, it has not yet been possible to undertake an assessment for seabirds. The current International Union for Conservation of Nature (IUCN) threat status for each of the seabird species reported as caught in IOTC fisheries to date is provided in **Table 1**. A number of international global environmental accords (e.g., Convention on Migratory Species (CMS), the Agreement on the Conservation of Albatrosses and Petrels (ACAP), Convention on Biological Diversity (CBD)), as well as numerous fisheries agreements obligate States to provide protection for these species. While the status of seabirds is affected by a range of factors such as degradation of nesting habitats and targeted harvesting of eggs, for albatrosses and large petrels, fisheries bycatch is generally considered to be the primary threat. The level of mortality of seabirds due to fishing gear in the Indian Ocean is poorly known, although where there has been rigorous assessment of impacts in areas south of 25 degrees (e.g., in South Africa), very high seabird incidental catches rates have been recorded in the absence of a suite of proven incidental catches mitigation measures.

Outlook. The level of compliance with Resolution 23/07 (*On Reducing the Incidental Bycatch of Seabirds in Longline Fisheries)* and the frequency of use of each of the 4 measures (because vessels can choose two out of three possible options) are still

[8] The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

poorly known. Observer reports and logbook data should be analysed to support assessments of the effectiveness of mitigation measures used and relative impacts on seabird mortality rates. Information regarding seabird interactions reported in National Reports should be stratified by season, broad area, and in the form of catch per unit effort. Following the data call in 2016 it was possible to carry out a preliminary and qualitative analysis. The information provided suggests higher sea bird catch rates at higher latitudes, even within the area south of 25°S, and higher catch rates in the coastal areas in the eastern and western parts of the southern Indian Ocean. In terms of mitigation measures, the preliminary information available suggests that those currently in use (Resolution 12/06) may be proving effective in some cases, but there are also some conflicting aspects that need to be explored further. Unless IOTC CPCs become compliant with the data collection, Regional Observer Scheme and reporting requirements for seabirds, the WPEB will continue to be unable to fully address this issue.

The following should also be noted:

- The available evidence indicates considerable risk from longline fishing to the status of seabirds in the Indian Ocean, where the best practice seabird incidental catches mitigation measures outlined in Resolution 23/07 are not implemented.
- CPCs that have not fully implemented the provisions of the IOTC Regional Observer Scheme outlined in paragraph 3 of Resolution 22/04 shall report seabird incidental catches through logbooks, including details of species, if possible.
- Appropriate mechanisms should be developed by the Compliance Committee to assess levels of compliance by CPCs with the Regional Observer Scheme requirements and the mandatory measures described in Res 23/07.

APPENDIX 33
EXECUTIVE SUMMARY: CETACEANS

Table 1. Cetaceans: IUCN Red List status and records of interaction (including entanglements and, for purse seines, encirclements) with tuna fishery gear types for all cetacean species that occur within the IOTC area of competence.

Family	Common name	Species	IUCN Red List status*	Interactions by Gear Type**
Balaenidae	Southern right whale	*Eubalaena australis*	LC	GN
Neobalaenidae	Pygmy right whale	*Caperea marginata*	LC	-
Balaenopteridae	Common minke whale	*Balaenoptera acutorostrata*	LC	-
	Antarctic minke whale	*Balaenoptera bonaerensis*	NT	-
	Sei whale	*Balaenoptera borealis*	EN	PS
	Bryde's whale	*Balaenoptera edeni*	LC	-
	Blue whale	*Balaenoptera musculus*	EN	-
	Fin whale	*Balaenoptera physalus*	VU	-
	Omura's whale	*Balaenoptera omurai*	DD	-
	Humpback whale	*Megaptera novaeangliae*	LC***	GN, LL
Physeteridae	Sperm whale	*Physeter macrocephalus*	VU	GN
Kogiidae	Pygmy sperm whale	*Kogia breviceps*	LC	GN
	Dwarf sperm whale	*Kogia sima*	LC	GN
Ziphiidae	Arnoux's beaked whale	*Berardius arnuxii*	LC	-
	Southern bottlenose whale	*Hyperoodon planifrons*	LC	-
	Longman's beaked whale	*Indopacetus pacificus*	LC	GN
	Andrew's beaked whale	*Mesoplodon bowdoini*	DD	-
	Blainville's beaked whale	*Mesoplodon densirostris*	LC	-
	Ramari’s beaked whale	*Mesoplodon eueu*	DD	-
	Gray's beaked whale	*Mesoplodon grayi*	LC	-
	Hector's beaked whale	*Mesoplodon hectori*	DD	-
	Deraniyagala's beaked whale	*Mesoplodon hotaula*	DD	-
	Strap-toothed whale	*Mesoplodon layardii*	LC	-
	Spade-toothed whale	*Mesoplodon traversii*	DD	-
	Shepherd's beaked Whale	*Tasmacetus shepherdi*	DD	-
	Cuvier's beaked whale	*Ziphius cavirostris*	LC	GN
Delphinidae	Common dolphin	*Delphinus delphis*	LC	GN
	Pygmy killer whale	*Feresa attenuata*	LC	GN
	Short-finned pilot whale	*Globicephala macrorhynchus*	LC	LL, GN
	Long-finned pilot whale	*Globicephala melas*	LC	-
	Risso's dolphin	*Grampus griseus*	LC	LL, GN

	Fraser's dolphin	*Lagenodelphis hosei*	LC	-
	Irrawaddy dolphin	*Orcaella brevirostris*	EN	GN
	Australian snubfin dolphin	*Orcaella heinsohni*	VU	GN
	Killer whale	*Orcinus orca*	DD	LL, GN
	Melon-headed whale	*Peponocephala electra*	LC	LL, GN
	False killer whale	*Pseudorca crassidens*	NT	LL, GN
Delphinidae	Indo-Pacific humpback dolphin	*Sousa chinensis*	VU	GN
	Indian Ocean humpback dolphin	*Sousa plumbea*	EN	GN
	Australian humpback dolphin	*Sousa sahulensis*	VU	GN
	Pantropical spotted dolphin	*Stenella attenuata*	LC	PS, GN, LL
	Striped dolphin	*Stenella coeruleoalba*	LC	-
	Spinner dolphin	*Stenella longirostris*	LC	GN
	Rough-toothed dolphin	*Steno bredanensis*	LC	GN
	Indo-Pacific bottlenose dolphin	*Tursiops aduncus*	NT	GN
	Bottlenose dolphin	*Tursiops truncatus*	LC	LL, GN
Phocoenidae	Indo-Pacific finless porpoise	*Neophocaena phocaenoides*	VU	GN

* The assessment of the status level in IUCN is independent of IOTC processes
** Published bycatch records only (reference at the end of the document)
*** Arabian Sea population: EN
The IUCN Red List of Threatened species. <www.iucnredlist.org>.
Downloaded on 16 September 2020.

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. . The current[9] International Union for Conservation of Nature (IUCN) Red List status for each of the cetacean species reported in the IOTC Area of Competence is provided in **Table 1**. Information on their interactions with IOTC fisheries is also provided. It is important to note that a number of international global environmental accords (e.g., Convention on Migratory Species (CMS), Convention on Biological Diversity (CBD), International Whaling Commission (IWC)), as well as numerous fisheries agreements obligate States to provide protection for these species. The status of cetaceans is affected by a range of factors such as direct harvesting and habitat degradation, but the level of cetacean mortality due to capture in tuna drift gillnets is likely to be substantial and is also a major cause for concern (Anderson *et al.* 2020, Kiszka *et al.* 2021). Several reports (e.g., Sabarros et al., 2013) also suggest some level of cetacean mortality for species involved in depredation of pelagic longlines, and these interactions need to be further documented throughout the IOTC Area of Competence. Recently published information suggests that the incidental capture of cetaceans in purse seines is low (e.g., Escalle et al., 2015), but should be further monitored.

Outlook. . Resolution 23/06 *On the conservation of cetaceans* highlights the concerns of the IOTC regarding the lack of accurate and complete data collection and reporting to the IOTC Secretariat of interactions and mortalities of cetaceans in association with tuna fisheries in the IOTC Area of Competence. In this resolution, the IOTC have agreed that CPCs shall prohibit their flagged vessels from intentionally setting a purse seine net around a cetacean if the animal is sighted prior to the commencement of the set. The IOTC also agreed that CPCs using other gear types targeting tuna and tuna-like species found in association with cetaceans shall report all interactions with cetaceans to the relevant authority of the flag State and that these will be reported to the IOTC Secretariat by 30 June of the following year. It is acknowledged that the impact on cetacean populations from fishing for tuna and tuna-like species may increase if fishing pressure increases (which is already clear for tuna gillnet fisheries from IOTC data) or if the status of cetacean populations worsens due to other factors such as an increase in external fishing pressure or other anthropogenic or climatic impacts.

The following should be noted:

[9] September 2023

- The number of fisheries interactions involving cetaceans is highly uncertain and should be addressed as a matter of priority as it is a prerequisite for the WPEB to determine a status for any Indian Ocean cetacean species.
- Available evidence indicates considerable risk to cetaceans in the Indian Ocean, particularly from tuna drift gillnets.
- Current reported interactions and mortalities are scattered but are most likely severely underestimated (Anderson *et al*., 2020, Kiszka *et al*., 2021).
- Maintaining or increasing fishing effort in the Indian Ocean without appropriate mitigation measures in place will likely result in further declines in a number of cetacean species. An increasing effort by tuna drift gillnet fisheries has been reported to the IOTC, which is a major cause of concern for a number of species, particularly in the northern Indian Ocean.
- Efforts should be undertaken to encourage CPCs to investigate means to reduce cetacean bycatch and at-vessel and post-release mortality in IOTC fisheries and improve data collection and reporting for cetaceans. This may include alternative data collection mechanisms such as skipper-based reporting, port sampling and cost-effective electronic monitoring systems.

RELEVANT LITERATURE

Allen, S.J., Cagnazzi, D.D., Hodgson, A.J., Loneragan, N.R. and Bejder, L., 2012. Tropical inshore dolphins of north-western Australia: Unknown populations in a rapidly changing region. Pacific Conservation Biology, 18: 56-63.

Amir, O.A., 2010. Biology, ecology and anthropogenic threats of Indo-Pacific bottlenose dolphins in East Africa (Doctoral Dissertation, Department of Zoology, Stockholm University).

Anderson C.R. 2014. Cetaceans and tuna fisheries in the western and central Indian Ocean. IOTC-2014-WPEB10-31.

Anderson, R.C., Herrera, M., Ilangakoon, A.D., Koya, K.M., Moazzam, M., Mustika, P.L. and Sutaria, D.N., 2020. Cetacean bycatch in Indian Ocean tuna gillnet fisheries. Endangered Species Research 41: 39-53.

Atkins, S., Cliff, G. and Pillay, N., 2013. Humpback dolphin bycatch in the shark nets in KwaZulu-Natal, South Africa. Biological Conservation, 159: 442-449.

Beasley, I., Jedensjö, M., Wijaya, G.M., Anamiato, J., Kahn, B. and Kreb, D., 2016. Chapter Nine-Observations on Australian Humpback Dolphins (*Sousa sahulensis*) in Waters of the Pacific Islands and New Guinea. Advances in Marine Biology, 73: 219-271.

Braulik, G.T., Findlay, K., Cerchio, S. and Baldwin, R., 2015. Assessment of the Conservation Status of the Indian Ocean Humpback Dolphin (*Sousa plumbea*) Using the IUCN Red List Criteria. Advances in Marine Biology 72: 119-141.

Braulik, G.T., Ranjbar, S., Owfi, F., Aminrad, T., Dakhteh, S.M.H., Kamrani, E. and Mohsenizadeh, F. 2010. Marine mammal records from Iran. Journal of Cetacean Research and Management, 11:49-63.

Collins, T., Minton, G., Baldwin, R., Van Waerebeek, K., Hywel-Davies, A. and Cockcroft, V., 2002. A preliminary assessment of the frequency, distribution and causes of mortality of beach cast cetaceans in the Sultanate of Oman, January 1999 to February 2002. IWC Scientific Committee document SC/54/O4.

Collins, T., Preen, A., Willson, A., Braulik, G. and Baldwin, R. M. 2005. Finless porpoise (*Neophocaena phocaenoides*) in waters of Arabia, Iran and Pakistan. IWC Scientific Committee document SC/57/SM6.

Escalle, L., Capietto, A., Chavance, P., Dubroca, L., De Molina, A.D., Murua, H., Gaertner, D., Romanov, E., Spitz, J., Kiszka, J.J., Floch, L., Damiano, D. and Merigot, B., 2015. Cetaceans and tuna purse seine fisheries in the Atlantic and Indian Oceans: interactions but few mortalities. Marine Ecology Progress Series, 522: 255-268.

Hamer, D.J., Childerhouse, S.J. and Gales, N.J., 2012. Odontocete bycatch and depredation in longline fisheries: a review of available literature and of potential solutions. Marine Mammal Science, 28: 345-374.

Kiszka, J., Pelourdeau, D. and Ridoux, V., 2008. Body Scars and Dorsal Fin Disfigurements as Indicators Interaction Between Small Cetaceans and Fisheries Around the Mozambique Channel Island of Mayotte. Western Indian Ocean Journal of Marine Science, 7: 185-193.

Kiszka, J., Bein, A., Bach, P., Jamon, A., Layssac, K., Labart, S. and Wickel, J., 2010. Catch and bycatch in the pelagic longline fishery around Mayotte (NE Mozambique Channel), July 2009-September 2010. IOTC WPEB-19.

Kiszka, J., Muir, C., Poonian, C., Cox, T.M., Amir, O.A., Bourjea, J., Razafindrakoto, Y., Wambitji, N. and Bristol, N., 2009. Marine mammal bycatch in the southwest Indian Ocean: review and need for a comprehensive status assessment. Western Indian Ocean Journal Marine Science, 7: 119-136.

Kiszka, J., Moazzam, M., Boussarie, G., Shahid, U., Khan, B. and Nawaz, R., 2021. Setting the net lower: A potential low-cost mitigation method to reduce cetacean bycatch in drift gillnet fisheries. Aquatic Conservation: Marine and Freshwater Ecosystems, 31: 3111-3119.

Kruse, S., Leatherwood, S., Prematunga, W.P., Mendes, C. and Gamage, A., 1991. Records of Risso's dolphins, Grampus griseus, in the Indian Ocean, 1891–1986. Cetaceans and Cetacean Research in the Indian Ocean Sanctuary. UNEP Marine Mammal Technical Report, 3: 67-78.

Leatherwood, S., McDonald, D., Prematunga, W.P., Girton, P., Ilangakoon, A. and McBrearty, D., 1991. Recorded of ”he" Blackf”sh" (Killer, False Killer, Pilot, Pygmy Killer and Melon-headed whales) in the Indian Ocean, 1772-1986. Cetaceans and Cetacean Research in the Indian Ocean. UNEP Marine Mammal Technical Report, 3: 33-65.

Meÿer, M.A., Best, P.B., Anderson-Reade, M.D., Cliff, G., Dudley, S.F.J. and Kirkman, S.P., 2011. Trends and interventions in large whale entanglement along the South African coast. African Journal of Marine Science, 33: 429-439.

Razafindrakoto, Y., Andrianarivelo, N., Cerchio, S., Rasoamananto, I. and Rosenbaum, H., 2008. Preliminary assessment of cetacean incidental mortality in artisanal fisheries in Anakao, southwestern region of Madagascar. Western Indian Ocean Journal of Marine Science, 7: 175-184.

Reeves, R.R., McClellan, K. and Werner, T.B., 2013. Marine mammal bycatch in gillnet and other entangling net fisheries, 1990 to 2011. Endangered Species Research, 20: 71-97.

Romanov, E.V., 2002. Bycatch in the tuna purse-seine fisheries of the western Indian Ocean. Fishery Bulletin, 100: 90-105.

Sabarros, P.S., Romanov, E., Le Foulgoc, L., Richard, E., Lamoureux, J.P. and Bach, P., 2013. Commercial catch and discards of pelagic longline fishery of Reunion Island based on the self-reporting data collection program. 9th IOTC Working Party on Ecosystems and Bycatch, La Réunion, France. IOTC-2013-WPEB09-37 Rev_1

Slooten, E., Wang, J.Y., Dungan, S.Z., Forney, K.A., Hung, S.K., Jefferson, T.A., Riehl, K.N., Rojas-Bracho, L., Ross, P.S., Wee, A. and Winkler, R., 2013. Impacts of fisheries on the Critically Endangered humpback dolphin Sousa chinensis population in the eastern Taiwan Strait. Endangered Species Research, 22: 99-114

APPENDIX 34
STATUS OF YELLOWFIN TUNA CATCH LIMITS FOR 2024 AND 2025 PURSUANT TO RESOLUTIONS 19/01 AND 21/01

Table 1: Annual catch limits (metric tonnes) of yellowfin tuna calculated for 2020–2024 and estimated for 2025 for longline and surface fisheries of the CPCs bound by Resolution 19/01, excluding Somalia, which only has coastal fisheries. PS = purse seines; LL = longlines; GN = gillnets

CPC	Fishery	Base annual limit	Catch limits					
			2020	2021	2022	2023	2024	2025
IDN - Indonesia	PS	12,395	12,395	12,395	11,173	9,557	7,231	4,394
	LL	-	-	-	-	-	-	-
IND - India	LL	-	-	-	-	-	-	-
IRN - I.R. Iran	GN	16,948	16,948	- 12,490	- 398	- 16,978	- 20,495	- 12,515
	PS	-	-	-	-	-	-	-
MDG - Madagascar	LL	-	-	-	-	-	-	-
OMN - Oman	PS	-	-	-	-	-	-	-
	LL	-	-	-	-	-	-	-

Table 2: Annual catch limits (metric tonnes) of yellowfin tuna calculated for 2024 and estimated for 2025 for all CPCs bound by Resolution 21/01

CPC	Base annual limit	Catch limits	
		2024	2025
AUS - Australia	2,000	2,000	2,000
BGD - Bangladesh	2,000	2,000	2,000
CHN - China	10,557	1,419	6,341
COM - Comoros	5,279	5,279	5,279
EU - European Union	73,078	73,078	73,078
FRA - France OT	500	500	500
GBR - United Kingdom	500	500	500
JPN - Japan	4,003	4,003	4,003
KEN - Kenya	3,654	3,654	3,654
KOR - Korea	9,056	9,056	9,056
LKA - Sri Lanka	33,245	33,245	33,245
MDV - Maldives	47,195	47,195	47,195
MOZ - Mozambique	2,000	2,000	2,000
MUS - Mauritius	10,490	10,140	10,490
MYS - Malaysia	2,000	2,000	2,000
PAK - Pakistan	14,468	14,468	14,468
PHL - Philippines	700	700	700
SDN - Sudan	2,000	2,000	2,000
SYC - Seychelles	39,577	39,577	39,577
THA - Thailand	2,000	2,000	2,000
TZA - Tanzania	3,905	3,905	3,905
YEM - Yemen	26,262	26,262	26,262
ZAF - South Africa	2,000	2,000	2,000

APPENDIX 35
PROGRESS MADE ON THE RECOMMENDATIONS OF SC26

SC26 Report	SC recommendations	Update/Progress
SC26.08 Para. 38	***National Reports from CPCs*** SC26.08 (para. 38) The SC **RECOMMENDED** that the Compliance Committee and Commission note the lack of compliance by 5 Contracting Parties (Members) that did not submit a National Report to the Scientific Committee in 2023, **NOTING** that the Commission agreed that the submission of the annual reports to the Scientific Committee is mandatory**.**	**Update:** Ongoing. (IOTC-2024-S28-R, Para 16) The Commission NOTED that 25 National Reports were submitted to the IOTC Secretariat in 2023 by CPCs and that this was a slight decrease when compared with the 26 reports provided by CPCs in 2022.
SC26.09 Para. 49	***Report of the 20th Session of the Working Party on Billfish (WPB20)*** The SC **NOTED** that the WPB had reviewed evidence that shortbill spearfish (*Tetrapturus angustirostris*) is being caught in IOTC fisheries and that the species population size may be declining. The SC **ACKNOWLEDGED** that the addition of shortbill spearfish in the official list of IOTC species may require a review of the IOTC Agreement, which would be a complex administrative process and unlikely to occur in the near future. The SC **AGREED** that a way to move forward may be for the Commission to adopt the same approach as for the main pelagic sharks caught in tuna and tuna-like fisheries (e.g., blue shark) and mandate the SC with collating information on this species and providing scientific advice for its management. As such the SC **RECOMMENDED** that the Commission endorse the SCs approach to address the captures of shortbill spearfish in IOTC fisheries.	**Update:** Ongoing. The Commission has endorsed the recommendation. This species is already covered under the reporting requirements for various fishing gear types in Resolutions 15/01 and 15/02. The IOTC database records annual catches of shortbill spearfish amounting to a few hundred tonnes. However, these figures likely significantly fall short of the actual catches due to data collection and reporting challenges
SC26.10 Para. 57	***Revision of catch levels of marlins under Resolution 18/05*** Subsequently, the SC **RECOMMENDED** that Resolution 18/05 be urgently revised and updated so as to reflect MSY based catch limits for each species based on the most recent stock assessment and projections information available, and to contain provisions to ensure that catches do not exceed such limits. The SC **REQUESTED** that for Indo-Pacific sailfish, K2SM projections be provided based on the most recent assessment so as to inform revised limits for that stock, and that further work is undertaken to improve the black marlin assessment to generate status and catch limit information	**Update:** Ongoing. No Revision to Resolution 18/05 has taken place and no new management measures for billfish species have been adopted.
SC26.11 Para. 64	***Report of the 18th Session of the Working Party on Ecosystems and Bycatch (WPEB18)*** The SC **NOTED** that several longline fleets targeting swordfish in the IOTC area of competence are using submerged artificial lights (chemical light sticks or electrically	

SC26.12 Para. 66	powered lights) attached to the terminal gear for the purpose of attracting the target species and further NOTED that Resolution 16/07 prohibits all vessels from using artificial lights to attract fish, without specifying the type of fleet or gear subjected to the Resolution. The SC therefore **RECOMMENDED** that the Commission provides clarity on whether Resolution 16/07 applies to longline fisheries as the current wording is somewhat ambiguous. The SC also **SUGGESTED** that Resolution 16/07 could be amended to clearly state which fleets and/or gears are bound by the Resolution to avoid future doubts. The SC **RECOMMENDED** that the Commission consider extending measures to prevent finning of sharks such as fins naturally attached including partially attached and tethered for all fisheries or similar, alternative measures (for example, fins artificially attached), providing they had been assessed and endorsed by the SC and Compliance Committee as being equally or more likely to meet the conservation benefit (of a fins naturally attached measure) and are logistically feasible from a compliance monitoring perspective. The SC **NOTED** that while such other measures may be logistically more difficult to implement and monitor for governments, they may be more practical (and beneficial to crew safety) for the fishing industry when conducting their fishing operations and storing shark catches on board.	**Update:** Ongoing. The issue was not raised at the latest Commission meeting. (IOTC-2024-S28-R, para 31) The Commission NOTED that Resolution 16/07 *On the use of artificial lights to attract fish* (which prohibits using artificial lights for the purpose of aggregating tuna and tuna-like species) requires further clarifications as to which fishery/gear this measure should apply. The Commission REQUESTED the CPCs to provide proposals to revise the Resolution next year. . **Update:** Ongoing. The Commission did not adopt a new Conservation and Management Measure regarding sharks.
SC26.13 Para. 71	***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 **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 6, recalling that the IPOA-Seabirds and IPOA-Sharks were adopted by the FAO in 1999 and 2000, respectively, and recommended the development of NPOAs.	**Update:** Completed. (IOTC-2024-S28-R, Para 28) The Commission ENDORSED the Scientific Committee's 2023 list of recommendations as its own.
SC26.14 Para. 96	***Report of the 24th Session of the Working Party on Tropical Tunas (WPTT24)*** ***Skipjack tuna stock assessment*** The SC **RECALLED** that IOTC Resolution 21/03, which superseded Resolution 16/02 requires the skipjack tuna stock assessment estimates to be used as inputs for the Harvest Control Rule (HCR) to calculate the TAC. The SC therefore **ENDORSED** the stock assessment and that the median estimates from the model ensemble are used to	**Update**: Completed. (IOTC-2024-S28-R, Para 28) The Commission ENDORSED the Scientific Committee's 2023 list of recommendations as its own. (IOTC-2024-S28-R, Para 17) The Commission NOTED a question regarding the necessity of a catch limit for SKJ, given that the species has been assessed as neither overfished nor subject to overfishing and that the stock is very productive. The Commission NOTED that the current productivity might result from favorable environmental conditions, which may not persist. The catch limit was set by the HCR specified in

	calculate the TAC for skipjack tuna. The SC **RECOMMENDED** that the Commission endorse the calculated annual TAC of 628 606 t for 2024-2026.	Resolution 21/03, which simulations have shown to perform effectively over a longer term, on average, under a range of uncertainty.
SC26.15 Para. 100	***Update on the WGFAD05*** The SC **NOTED** the quantitative analyses presented during the meeting (IOTC-2023-WGFAD05-13 and IOTC-2023-WPTT25-INF08). The analyses which were all conducted with a 10 year time frame indicated that the most positive impact on the stocks for the three tuna species, in order of the largest to smallest benefits, would be (i) a three-month complete closure for all gears, (ii) a two-month complete closure for all gears, and (iii) a three-month oceanwide PS log school closure. In addition, several scenarios with closures applied to other gears also achieve the objective of recovering bigeye and yellowfin to the green quadrant of the Kobe plot in 10 years. However, the SC **NOTED** that these benefits were estimated under the assumption that there would not be an increase in catches from other gears during this time and further **NOTED** that the full benefits of these closures would only been seen if there is no reallocation of catches to other gears or time periods. The analyses further indicated that the period that would result in the best outcomes from the closure would be during Q1, Q3 and Q4 for BET and YFT and Q3 and Q4 for SKJ. In addition, the SC **RECALLED** that Resolution 23/03 (para. 3) states that "The IOTC Scientific Committee shall provide advice and recommendations no later than 31st December 2023 on appropriate fishing closures applicable to all fishing gears." As such the SC **RECOMMENDED** the Commission take these analyses into account, with results shown in Annex IX of the WPTT report (IOTC-2023-WPTT25-R) and Figures a-c (below), and **REQUESTED** the WPTT to consider conducting further analysis intersessionally to assess the impacts of all gears on stock status so that this issue can be comprehensively addressed. The SC **NOTED** that some artisanal fleets may struggle to implement closures due to socio-economic dependence on the resources and so REQUESTED that the WGFAD look into excluding artisanal fleets from future analyses.	**Update**: Ongoing. The S28 discussed the proposal IOTC-2024-S28-PropM *On establishing a fishing closure in the Indian ocean for the conservation of tropical tunas*. The proposal was based on this quantitative analysis (IOTC-2023-WGFAD05-13) and the conclusion of the Scientific Committee. (IOTC-2024-S28-R, Para 59, 60) Several CPCs noted their dependency on fisheries for both their economy as well as food security and noted that a complete closure for all gears would place a disproportionate burden on them. Other CPCs noted that they already enforced seasonal fishing bans in their coastal waters and requested that the timings of these bans be incorporated into the proposal. The proponents stopped pursuing the adoption of their proposal when it became clear to them that the Commission would not be able to adopt it by consensus. The proponents requested that the SC be tasked with evaluating an effective common period for a fishing ban. The WPTT26 has conducted am updated analysis of the responses of tuna stocks to temporal closures in the Indian Ocean.
SC26.16 Para. 101	The SC **NOTED** that the Jelly-FAD is an example of how the implementation of biodegradable DFADs can be achieved, further **NOTING** that other actions have been also carried out in the Indian Ocean for BIOFAD testing using alternative designs and materials and this work has been presented to the WGFAD and WPEB for many years. The SC further **NOTED** that the IATTC has recently adopted a step-wise approach to the full adoption of biodegradable DFADs (IATTC C-23-04). The SC therefore **RECOMMENDED** that	**Update**: Ongoing. The Commission adopted Resolution 24/02 On management of drifting fish aggregating devices (FADs) in the IOTC area of competence. The Resolution has provided provisions of the timeline for CPCs to implement biodegradable DFADs (Res 24/02 para 31 and 32)

SC26.17 Para. 106	the Commission initiate an ambitious step-wise approach for the implementation of biodegradable DFADs as soon as possible. ***Bigeye Tuna MP*** The SC agreed with the review findings that there was no evidence for exceptional circumstances and **RECOMMENDED** that the agreed TAC for 2024 and 2025 should remain unchanged.	**Update**: Completed. (IOTC-2024-S28-R, Para 28) The Commission ENDORSED the Scientific Committee's 2023 list of recommendations as its own.
SC26.18 Para. 114	***Other Matters*** Following the presentation of document IOTC-2023-SC26-11 the SC **RECOMMENDED** that pursuing the development of the Close-Kin Mark Recapture project for yellowfin tuna should be a high priority for the Commission	**Update:** Ongoing.
SC26.19 Para. 129	***Report of the 13th Session of the Working Party on Methods (WPM13)*** ***General MSE issues*** The SC **NOTED** that there is a need to ensure that any code and input files used for developing MPs is housed internally on an accessible platform, so it is available to other users and not lost when developers move on to other tasks. The SC **NOTED** that ICES uses a Transparency and Assessment Framework (TAF) which is a useful frontend to direct users to the locations of relevant documents and code (e.g. Github repositories) that enable users to re-run assessments and other analyses, but that a much smaller system would be needed for the IOTC. The SC **NOTED** that most important information to be curated would be the input files, executables, and control files (not the large volume of output files), and **RECOMMENDED** that the Commission ensure that the IOTC Secretariat is provided with the necessary resources to manage the curation of this information.	**Update**: Ongoing. The Commission has not yet provided the resources to the issue.
SC26.20 Para. 138	***Report of the 18th Session of the Working Party on Data Collection and Statistics (WPDCS18)*** The SC **ACKNOWLEDGED** the request to clarify the issues with data reporting requirements identified with Res. 12/02 and 19/07, as well as the request to change the status of reporting of fishing craft statistics from voluntary to mandatory in Res. 15/02 and **RECOMMENDED** that the Commission takes these requests in due consideration at the next revision of all concerned resolutions.	**Update**: Ongoing. Although two proposals were presented to the Commission to revise Resolutions 15/01 and 15/02, they were ultimately not adopted. No new Resolutions were adopted regarding data collection or reporting.

SC26.21 Para. 153	***Invited Expert(s) at the WP meetings*** Given the importance of external independent review for working party meetings, the SC **RECOMMENDED** the Commission continue to allocate sufficient budget for invited scientific experts to be regularly invited to scientific working party meetings.	**Update**: Ongoing. The Commission has provided budget for invited experts for 2025.
SC26.22 Para. 155	***IOTC species identification guides: Tuna and tuna-like species*** SC26.22 (para. 155) 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.	**Update**: Ongoing. Budget has been made available through the IOTC main budget and the OFCF project to continue the translation of ID cards and this has continued in 2024 and will do again in 2025.
SC26.23 Para. 157	***General - Chairpersons and Vice-Chairpersons of the SC and its subsidiary bodies*** The SC **RECALLED** its recommendation in 2022 that the Commission revise the current Rules of Procedure (if necessary) to allow Chairs to serve an additional year or years beyond two terms if no suitable candidates are available to replace them once their terms are completed. The SC **NOTED** that the Commission endorsed the SC recommendations as its own and that therefore this recommendation was approved. In light of this recommendation the terms of several Working Party Chairs as well the SC Chair was extended beyond their two terms and the SC **RECOMMENDED** that this be noted and endorsed by the Commission.	**Update:** Completed. The Commission endorsed the SCs Recommendations as their own. No change to the Rules of Procedure was made, but there was no disagreement with the recommendation to allow chairs to extend their terms if necessary to ensure sufficient capacity.
SC26.24 Para. 158	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	Update: Completed. (IOTC-2024-S28-R, Para 29, 30) The Commission ENDORSED those officials elected for the SC and its subsidiary (scientific) bodies for the coming years, as listed in Appendix 7 of the 2023 Scientific Committee Report. The Commission NOTED that some CPCs expressed a preference for an SC chair from a developing coastal nation. However, the Commission AGREED that the selection of the Scientific Committee chair should remain the decision of the SC itself. The Commission also AGREED that an election for the SC chair should take place at the next session of the SC in 2024

SC26.25 Para. 175	***Implementation of the Regional Observer Scheme*** The SC **ACKNOWLEDGED** that the estimated levels of coverage provided in Appendix B.1 of IOTC-2023-SC26-07_rev1 are based on the number of hooks (observed and total), as this effort unit is the only one generally available to the IOTC Secretariat. The SC further NOTED that the issue had been previously raised during SC25 and therefore **REITERATED** its **RECOMMENDATION** (SC25.34 (Para. 172)) that at the next revision of Res. 15/02 this is amended to include the mandatory reporting of sets/operations as an additional unit of effort for longline fisheries.	**Update:** Ongoing. No new Resolutions were adopted regarding data collection or reporting.
SC26.26 Para. 187	***General - Consultants*** 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.	**Update:** Ongoing. Several consultants were contracted in 2024.
SC26.27 Para. 189 SC26.28 Para. 190	***Data preparatory meetings and Hybrid meetings*** SC26.27 (para. 189) **ACKNOWLEDGING** that holding data preparatory meetings prior to stock assessments is considered to be best practice (as identified by the yellowfin stock assessment external reviewer, the WPTT and the WPDCS) and noting that since 2019 data preparatory meetings were successfully held for the WPTmT, WPTT and WPEB, the SC **AGREED** to continue the practice of having data preparatory meetings in addition to stock assessment meetings for the major IOTC species. The SC **RECOMMENDED** that data preparatory meetings could continue to be held virtually so as not to increase the travel and costs required for the already full IOTC timetable of meetings.. The SC **NOTED** that there had been a few teething problems holding meetings in a hybrid format in 2023, especially related to the costs associated with the audio-visual equipment required, as well as the issues associated with ensuring the equipment was suitable to ensure full participation of both those in person as well as those connecting virtually. However, the SC **AGREED** on the utility of facilitating both in-person and virtual participation at future meetings to ensure increased participation and reduce the logistical costs for many CPCs and observers. As such, the SC **RECOMMENDED** that future Scientific Committee meetings continue to be held in a hybrid format, as well as working parties if possible. The SC further **RECOMMENDED** that all presentations at these meetings be made in person to ensure the aforementioned issues did not adversely affect the quality of the advice being provided.	**Update:** Completed. All data preparatory meetings as well as working group meetings were held virtually in 2024. **Update:** Completed. All working party meetings as well as the Scientific Committee meeting were held in a hybrid format in 2024.

SC25 Report	SC recommendations	Update/Progress
SC25.08 Para. 30	***National Reports from CPCs*** The SC **RECOMMENDED** that the Compliance Committee and Commission note the lack of compliance by 5 Contracting Parties (Members) that did not submit a National Report to the Scientific Committee in 2022, **NOTING** that the Commission agreed that the submission of the annual reports to the Scientific Committee is mandatory.).	**Update:** Ongoing. (IOTC-2023-S27-R, Para 17) The Commission NOTED that 26 National Reports were submitted to the IOTC Secretariat in 2022 by CPCs and that this was an increase when compared with the 21 reports provided by CPCs in 2021.

SC25.09 Para.41	***Report Of The 12th Session of the Working Party 0n Neritic Tunas (WPNT12)*** The SC **NOTED** with concern the stock status of Longtail tuna and Narrow-barred Spanish Mackerel. The SC further **NOTED** that the stock statuses for these species have been in the red for at least the past 5 years with a high probability and are showing no sign of recovery. As such, the SC **RECOMMENDED** that the Commission take measures to reduce the catches (to at least MSY levels) of these species and develop management measures that will facilitate the recovery of these stocks.	**Update:** Ongoing. No new management measures have been adopted for neritic tuna species.
SC25.10 Para. 52	***Report of the 20th Session of the Working Party on Billfish (WPB20)*** The SC **NOTED** that reported catches of black marlin and Indo-Pacific sailfish have exceeded the limits set out in Resolution 18/05 for both 2020 and 2021. The SC further noted that catches of both species are predominantly taken by gillnet and as such, **RECOMMENDED** that any revision of Resolution 18/05 should focus mainly on gillnet fisheries, to be effective.	**Update:** Ongoing. No Revision to Resolution 18/05 has taken place.
SC25.11 Para. 53	The SC **NOTED** that striped marlin and blue marlin assessments indicate these species to be overfished and subject to overfishing, with 100% and 72% probability, respectively. The SC advised that projections and associated Kobe 2 Strategy Matrices (K2SM) are available for both species and **RECOMMENDED** that any revision of Resolution 18/05 catch limits with respect to these species should be based on projections as opposed to MSY estimates, given the need to rebuild these stocks.	**Update:** Ongoing. No Revision to Resolution 18/05 has taken place.
SC25.12 Para. 54	The SC **NOTED** that the current minimum size limit in Res 18/05 (60 cm LJFL) is unlikely to be effective for these species, with the possible exception of blue marlin, due to the high at-haul mortality and low post release survival of these species particularly when taken by gillnet. For blue marlin, it is **RECOMMENDED** that further management options relating to limiting retention, including the option of increasing the current minimum size limit, be considered.	**Update:** Ongoing. No new management measures for billfish species have been adopted.
SC25.13 Para. 62	***Report of the 18th Session of the Working Party on Ecosystems and Bycatch (WPEB18)*** The SC **NOTED** the evidence indicating the increased operation of squid fisheries in the high seas of the Indian Ocean, and particularly in fishing grounds which overlap with areas where tuna purse seine fleets operate, NOTING that this overlap results in bycatch of tuna and tuna-like species in the squid fishery. However, as these fisheries are not managed by IOTC, data on these catches of tuna and tuna-like species are not provided to the IOTC. Therefore, the SC **RECOMMENDED** that the Commission request that the CPCs report all catches of tuna to the IOTC regardless of the target species of the fishery. The SC further **REQUESTED** that the Commission seek more information on this fishery from the CPCs.	**Update:** Ongoing. The issue was not raised at the latest Commission meeting. Data submitted to the Compliance department at the Secretariat indicated that in most cases, only small pelagics and other non-IOTC species were being encountered by these vessels.
SC25.14 Para. 63	The SC **NOTED** the evidence provided to the WPEB on the effectiveness of hook-shielding devices in reducing seabird bycatch mortality in pelagic longlines and further **NOTED** that the WCPFC included the hook-shielding devices in 2018 as an option to mitigate longline seabird bycatch. The SC **ACKNOWLEDGED** the potential operational difficulties and costs of utilising these devices as well as the potential limited number of manufacturers. However, based on the scientific evidence (supported by the ACAP guidelines) the SC **RECOMMENDED** that the	**Update:** Completed. The Commission adopted Resolution 23/07 *On Reducing the Incidental Bycatch of Seabirds in Longline Fisheries* which allows for the use of hook-shielding devices as a mitigation measure.

	Commission consider including hook-shielding devices as an additional option for seabird bycatch mitigation measures in Resolution 12/06. The SC **NOTED** that this had previously been recommended as a stand-alone measure in 2016 for the proposed revision of 12/06 (IOTC-2016-SC19-R para. 69).	
SC25.15 Para. 64	The SC **NOTED** the potential for using artificial lights (a visual deterrent) in gillnet fisheries as a potential bycatch mitigation device and the need to test this further via LED trials, which could also determine if such lights might attract unwanted bycatch. However, the SC **NOTED** that Resolution 16/07 prohibits Fishing vessels and other vessels including support, supply and auxiliary vessels to use, install or operate surface or submerged artificial lights for the purpose of aggregating tuna and tuna-like species. However, the SC **NOTED** that it is not clear if this also applies to gillnets. Therefore, the SC **RECOMMENDED** that the Commission provide clarification on whether Resolution 16/07 also applies to gillnet fisheries and/or to scientific studies as the current wording is somewhat ambiguous.	**Update:** Completed. (IOTC-2023-S27-R, para 32) The Commission **NOTED** in particular, SC Recommendation 15 that Resolution 16/07 On the use of artificial lights to attract fish (which prohibits using artificial lights for the purpose of aggregating tuna and tuna-like species) does not apply to scientific studies. NOTE: The Commission did not address the issue with regards to gillnet fisheries.
	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	
SC25.16 Para. 68	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.	**Update:** Ongoing. The SC chair presented 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 to the Commission in 2023.
	Other matters	
SC25.17 Para. 73	The SC **ACKNOWLEDGED** the proposed Cooperation Agreement between the IOSEA Marine Turtle MOU and IOTC and **NOTED** that this Agreement is based on the language used in the Agreement between IOTC and ACAP which has been accepted by the Commission. The SC **NOTED** this will facilitate better exchange of scientific information and data on sea turtles and their fishery interactions relevant to future commission discussions and decisions on this issue. The SC **RECOMMENDED** that the proposed Agreement is presented at the Commission for further consideration.	**Update:** Completed. The Commission approved the signature of a Collaboration Agreement with the IOSEA Marine Turtle MOU.
	Report of the 24th Session of the Working Party on Tropical Tunas (WPTT24)	
	Bigeye tuna MP	
SC25.18 Para. 98	The SC **NOTED** that the application of the bigeye management procedure resulted in a recommended TAC of 80,583 t per year for 2024 and 2025, which requires a 15% catch reduction from the 2021 catch level. The SC **RECOMMEND** that the Commission endorse the calculated TAC for 2024 and 2025.	**Update**: Completed. The Commission adopted **Resolution 23/04** *On Establishing Catch Limits for Bigeye Tuna in the IOTC Area of Competence*. This Resolution contains the endorsed TAC for bigeye, which is unchanged from the SC advice.
SC25.19 Para. 99	Given average catch of BET in the past 5 years being above the calculated TAC for 2024 and 2025 and the lack of effective implementation of catch limits for other stocks in the IOTC, the SC **RECOMMENDED** that the Commission ensure effective implementation of the bigeye management procedure recommended TAC, especially taking into consideration the current overfished and subject to overfishing status of the stock. The SC **NOTED** that respecting the BET TAC is especially important when taking into consideration the multi-species nature of the	**Update**: Ongoing. The implementation of the BET TAC is included in Res 23/04.

	Tropical tuna fisheries and especially taking into account the existing catch limit for YFT and TAC for SKJ.	
	Report of the 13th Session of the Working Party on Methods (WPM13)	
SC25.20 Para. 118	The SC **NOTED** that the 1-year time gap between the running of an MP by the SC and its actual implementation is less than ideal. The SC **NOTED**, however, that such a delay in the implementation has been MSE tested for the adopted BET MP and thus its effect on the performances has been already taken into account. The SC **RECOMMENDED** that the Commission identify and adopt a decision-making process to shorten the delay in the implementation of the MP output.	**Update**: Ongoing. The Commission has not yet found a solution to the delay issue.
	Update on TCMP05	
SC25.21 Para. 122	The SC **QUERIED** whether it would be necessary to hold a virtual TCMP meeting early in the year if no MPs are considered ready for presentation to the TCMP that particular year. The SC **RECOMMENDED** that there is no need to organize a virtual TCMP as no candidate MPs will be ready for consideration for adoption in 2023.	**Update**: Completed. The Commission agreed to defer the February 2023 TCMP meeting until 2024.
SC25.22 Para. 123	The SC however **CONSIDERED** that it is advisable to have focused dialogue with managers on those MSE which are more advanced such as that for SKJ. The SC **RECOMMENDED** that a virtual TCMP is tentatively convened early in 2024 with a special focus on MSE for SKJ.	
	Report of the 18th Session of the Working Party on Data Collection and Statistics (WPDCS18)	
	Updates to the workflow for the management and submission of statistical data to the IOTC	
	SC25.23 (para. 130) The SC **RECOMMENDED** that the Commission **ENDORSE** the proposed improvements in the data submission process of fisheries statistics, including a) the new approach for the classification of IOTC fisheries, and b) the adoption of the new data submission forms**.**	**Update**: Completed. The Commission endorsed the SC recommendations as its own.
	SC25.24 (para. 131) The SC **RECOMMENDED** that the Commission **ENDORSE** the mandatory reporting of fishing craft statistics and that this change is included in the next revision of Res. 15/02**.**	**Update**: Ongoing. Although a proposal was presented to the Commission to revise Res. 15/02, it was ultimately not adopted.
	SC25.25 (para. 132) The SC **RECOMMENDED** that, once the Commission adopts data requirements for IOTC fisheries, the Commission **DELEGATES** the adoption of data standards and submission forms to the SC to facilitate reporting by the CPCs.	**Update**: Completed. The Commission endorsed the SC recommendations as its own.
	SC25.26 (para. 133) The SC **NOTED** that some of the paragraphs in some of the Resolutions are either unclear or inconsistent and therefore the SC **RECOMMENDED** the Commission to	**Update**: Ongoing. Although two proposals were presented to the Commission to revise Resolutions 15/01 and 15/02, they were ultimately not adopted. No change was made to Res. 19/02.

	ENDORSE the following changes for inclusion in the next revision of the relevant IOTC Resolutions: a. that silky shark (*Carcharhinus falciformis*) be included in the list of "*other*" species appearing in the gillnet table in Section 2.3 of Annex II of Res. 15/01; b. that the terms "*shall be submitted frequently*" appearing in para. 4.c of Res. 15/02 be further clarified and complemented by a clearer indication of the spatial-temporal stratification of the dataset concerned; c. that para. 4.c of Res. 15/02 be amended with the inclusion of the request that "*Documents describing the extrapolation procedures (including raising factors corresponding to the logbook coverage) shall also be submitted routinely*" that already appears in both para. 4.a and 4.b of Res. 15/02; d. that para. 5 of Res. 15/02 be amended with the inclusion of "*and all other relevant gears*" in addition to purse seiners already mentioned in this paragraph; e. that para. 26 of Res. 19/02 be amended to also allow the use of buoy position data for scientific purposes, and to further clarify how to protect business confidentiality aspects as per para. 24 of Res. 19/02. SC25.27 (para. 134) The SC **RECOMMENDED** the Commission to **STRENGTHEN** the requirements for the monitoring of artisanal and semi-industrial fisheries to improve the collection, reporting and the quality of Neritic tunas and Billfish fisheries statistics. ***Update on WGEMS02*** SC25.28 (para. 148) The SC reviewed and **ENDORSED** a) the EM terms and definitions b) the EM Program standards, and c) the EM Data standards described in Appendices 6A, 6B and 6C (except Annex 1 and 2 to be adopted in March 15-16), respectively, and **RECOMMENDED** their adoption by the Commission.	**Update**: Ongoing. No new Resolutions were adopted regarding data collection or reporting. **Update**: Completed. The Commission adopted **Resolution 23/08** *On Electronic Monitoring Standards for IOTC Fisheries.* This Resolution takes into account the recommendations from the SC.
SC25.29 Para. 151	***Invited Expert(s) at the WP meetings*** 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.	**Update**: Ongoing. The Commission has provided budget for invited experts for 2024.
SC25.30 Para. 153	***Meeting participation fund*** 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.	**Update**: No progress. The Rules of Procedure have not been modified to reflect this requested change.
SC25.31 Para. 154	***IOTC species identification guides: Tuna and tuna-like species*** 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	**Update**: Ongoing. Budget has been made available through the IOTC main budget and the OFCF project to continue the printing of ID cards and this has continued in 2023 and will do again in 2024.

	identification cards can continue to be printed as many CPC scientific observers, both on board and at port, need to have hard copies.	
SC25.32 Para. 156	***General - Chairpersons and Vice-Chairpersons of the SC and its subsidiary bodies*** **ACKNOWEDGING** the need to have officers with sufficient experience and capability to serve as Chairs and Vice-chairs of the SC Working Parties and Working Groups, the SC **RECOMMENDED** that the Commission revise the current Rules of Procedure (if necessary) to allow Chairs to serve an additional year or years beyond two terms if no suitable candidates are available to replace them once their terms are completed.	**Update:** Completed. The Commission endorsed the SCs Recommendations as their own. No change to the Rules of Procedure were made, but there was no disagreement with the recommendation to allow chairs to extend their terms if necessary to ensure sufficient capacity.
SC25.33 Para. 157	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.	**Update:** Completed.
SC25.34 Para. 172	***Implementation of the Regional Observer Scheme*** The SC **RECOMMENDED** that the Commission **ENDORSE** the mandatory reporting of geo-referenced effort data as number of sets/operations for longline and surface fisheries (according to the definitions in Res 15/02) to complement the current requirements of Res. 15/02, in order for the Secretariat to accurately and independently calculate the ROS coverage in agreement with the provisions of Res. 22/04**.**	**Update:** Ongoing. No new Resolutions were adopted regarding data collection or reporting.
SC25.35 Para. 186	***General - Consultants*** 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.	**Update:** Ongoing. Several consultants were contracted in 2023.
SC25.36 Para. 188	***Data preparatory meetings and Hybrid meetings*** **ACKNOWLEDGING** that holding data preparatory meetings prior to stock assessments is considered to be best practice and noting that since 2019 data preparatory meetings were successfully held for the WPTmT, WPTT and WPEB, the SC **AGREED** to continue the practice of having data preparatory meetings prior to stock assessment meetings for the major IOTC species. The SC **RECOMMENDED** that data preparatory meetings continue to be held virtually so as not to increase the travel and costs required for the already full IOTC timetable of meetings.	**Update:** Completed. All data preparatory meetings as well as working group meetings were held virtually in 2023.
SC25.37 Para. 189	The SC **NOTED** the utility of facilitating both in-person and virtual participation at future meetings to ensure increased participation and reduce the logistical costs for many CPCs. As such, the SC **RECOMMENDED** that future working party and Scientific Committee meetings are held in a hybrid format.	**Update:** Completed. All working party meetings as well as the Scientific Committee meeting were held in a hybrid format in 2023.

APPENDIX 36A
WORKING PARTY ON NERITIC TUNAS PROGRAM OF WORK (2025 – 2029)

Table 1. Priority topics for obtaining the information necessary to develop stock status indicators for neritic tunas in the Indian Ocean

Topic in order of priority	Sub-topic and project	Timing				
		2025	2026	2027	2028	2029
1. Stock structure (connectivity)	Genetic research to determine the connectivity of neritic tunas throughout their distributions (This should build on the stock structure work conducted in other previous studies): 1. Review of stock structure methodologies with genetic expert during WPNT15 in order to determine the best approach to regional stock structure studies. Based on discussions develop and implement regional genetic sampling collection programme: • Sampling of tissue samples • DNA extraction and storage for preservation • Carry out genetic sequencing on extracted DNA					
2. Stock assessment / Stock indicators	Explore alternative assessment approaches and develop improvements where necessary based on the data available to determine stock status for longtail tuna, kawakawa and Spanish mackerel					
	1) The Weight-of-Evidence approach should be used to determine stock status, by building layers of partial evidence, such as CPUE indices combined with catch data, life-history parameters and yield-per recruit metrics, as well as the use of data poor assessment approaches (e.g. CMSY, OCOM, LB-SPR, Risk based methods). 2) Exploration of priors and how these can be quantifiably and transparently developed. 3) Review size data and their suitability for monitoring stock status. Improve the presentation of management advice from different assessment approaches to better represent the uncertainty and improve communication between scientists and managers in the IOTC.					

3. Data mining and collation	Collate and characterize operational level data for the main neritic tuna fisheries in the Indian Ocean to investigate their suitability to be used for developing standardised CPUE indices. The following data should be collated and made available for collaborative analysis: ➢ catch and effort by species and gear by landing site; ➢ operational data: stratify this by vessel, month, and year for the development as an indicator of CPUE over time; and ➢ operational data: collate other information on fishing techniques (i.e. area fished, gear specifics, depth, environmental condition (near shore, open ocean, etc.) and vessel size (length/horsepower)). ➢ Reconstruction of historical catch by CPCs using recovered or captured information. ➢ Re-estimation of historic catches (with consultation and consent of concerned CPCs including India, Pakistan, Bangladesh, Mozambique, Tanzania, Madagascar) for assessment purposes (taking into account updated identification of uncertainties and knowledge of the history of the fisheries)					

APPENDIX 36B
WORKING PARTY ON TEMPERATE TUNAS PROGRAM OF WORK (2023 – 2027)

Table 1. Priority topics for obtaining the information necessary to develop stock status indicators for albacore in the Indian Ocean (2023-2027). No WPTmT meeting was held in 2023 to update this plan.

Topic		Sub-topic and project	Priority	Timing				
				2023	2024	2025	2026	2027
1	Stock structure (connectivity and diversity)	1.1 Genetic research to determine the connectivity of albacore throughout its distribution and the effective population size.	Low (5)					
2	Biological information (parameters for stock assessment)	2.1 Biological research (collaborative research to improve understanding of spatio-temporal patterns in age and growth and reproductive parameters)	High (1)					
		2.1.1 Age and growth studies: Uncertainty about the growth curve is a primary source of uncertainty in the stock assessment. A preliminary growth curve was developed in 2019, but there is substantial work to be done to ensure that growth curves include data from smaller size classes, and that spatio-temporal patterns in growth are quantified for use in the stock assessment. Collaborative sampling programs, involving a combination of observer- and port-based sampling, are required to ensure that adequate samples are collected.						
		2..1.2 Quantitative biological studies are necessary for albacore throughout its range to determine spatio-temporal patterns in key reproductive parameters including sex ratio; female length- and age-at-maturity; spawning location, periodicity and frequency; batch fecundity at length and age; spawning fraction and overall reproductive potential, to inform future stock assessments.						

3	CPUE standardisation	3.1 Continue the development of standardized CPUE series for each albacore fishery for the Indian Ocean, with the aim of developing appropriate CPUE series for stock assessment purposes.	High (3)					
		3.1.1 Spatio-temporal structure and target changes need to be considered carefully, as fish density and targeting practices can vary in ways that affect CPUE indices. Developments may include changes to fishery spatial structure, new approaches for area weighting, time-area interactions in the model, and/or indices using VAST.						
4	Size frequency data	4.1 Further investigate the size information provided by CPCs in order to better understand the stock dynamics and inputs into the assessment models. This is particularly necessary for the purse seine data.	High (2)					
5	Management strategy evaluation	5.1 Continue to collaborate with the WPM on input to the Management Strategy Evaluation (MSE) process.	High (4)					

APPENDIX 36C
WORKING PARTY ON BILLFISH PROGRAM OF WORK (2025 – 2029)

Table 1. Priority topics for obtaining the information necessary to develop stock status indicators for billfish in the Indian Ocean

Topic in order of priority	Sub-topic and project	Timing				
		2025	2026	2027	2028	2029
1. CPUE standardization	1.1 Develop and/or revise standardized CPUE series for each billfish species and major fisheries/fleets in the Indian Ocean and develop Joint CPUE series where feasible 1.1.1 Swordfish: Priority LL fleets: Taiwan,China, EU(Spain, Portugal, France), Japan, Indonesia, South African 1.1.2 Striped marlin: Priority fleets: Japan, Taiwan,China 1.1.3 Black marlin: Priority fleets: Longline: Taiwan,China; Gillnet: I.R. Iran, Sri Lanka, Indonesia 1.1.4 Blue marlin: Priority fleets: Japan, Taiwan,China, Indonesia 1.1.5 I.P. Sailfish: Priority fleets: Priority gillnet fleets: I.R. Iran and Sri Lanka; Priority longline fleets: EU(Spain, Portugal, France), Japan, Indonesia;					
2. Biological and ecological information	2.1 Age and growth research 2.1.1 CPCs to provide further research on billfish biology, namely age and growth studies including through the use of fish otolith or other hard parts, either from data collected through observer programs, port sampling or other research programs. (Priority: all billfishes: swordfish, marlins and sailfish)					
	2.2 Spawning time and locations 2.2.1 Collect gonad samples from billfish or utilise any other scientific means to confirm the spawning time and location of the spawning areas that are presently hypothesized for each billfish species. This will also provide advice to the Commission on the request for alternative management measures (Res. 18-05, paragraph 6). Partially supported by EU, on-going support and collaboration from CPCs are required.					
	2.3 Literature review of biological parameters for billfish					

		2.3.1. Conduct a literature review of biological parameters for billfish through a consultancy and update the supplementary information that companies with species Executive Summaries.					
		2.3 Stock structure (connectivity and diversity) 2.3.1 Continue work on determining stock structure of Billfish species, using complimentary data sources, including genetic and microchemistry information as well as other relevant sources/studies.					
	3. Billfish bycatch mitigation	WPB and CPCs scientists to firstly, review and summarise existing information on billfish bycatch mitigation, including also factors influencing at-haul and post-release mortality of billfish, and secondly to undertake further research to inform gaps in understanding on potential effective mitigation approaches, to provide options for the Commission to reduce fishing mortality for species where that is required (e.g. Black Marlin, Striped Marlin and Sailfish) focusing on gillnet and longline fisheries but also including recreational and sport fishing activities .					
		Other Future Research Requirements (not in order of priority)					
1.	Data mining and processing – (Development of subsequent CPUE indices)	Data on gillnet fisheries are available in Pakistan (and potentially other CPCs) and the recovery of this information and the development of gillnet CPUE indices would improve species assessments, particularly for: • Black marlin • Sailfish					
2.	Historical data review	2.1 Changes in fleet dynamics					
		2.1.1 Continue the work with coastal countries to address recent changes and/or increases of marlins catches especially in some coastal fleets. The historical review should include as much explanatory information as possible regarding changes in fishing areas, species targeting, gear changes and other fleet characteristics to assist the WPB understand the current fluctuations observed in the data and very high increases in some species (e.g., black marlin mainly due to very high catches reported by India in recent years). The possibility of producing alternative catch histories should also be explored. Priority countries: India, Pakistan, Iran, I.R., Indonesia.					
		2.2 Species identification					
		2.2.1 The quality of the data available at the IOTC Secretariat on marlins (by species) is likely to be compromised by species miss-identification. Thus, CPCs should review					

	their historical data in order to identify, report and correct (if possible) potential identification problems that are detrimental to any analysis of the status of the stocks. Consider the application of DNA-Barcoding technology for billfish species identification.					
	2.3 Tagging data recovery from alternate sources (e.g. Billfish foundation) to supplement IOTC tagging database information.					
3. Stock structure (connectivity and diversity)	Tagging research (PSAT tags) to determine connectivity, movement rates and mortality estimates of billfish (Priority species: swordfish). Similar projects have been partially funded by EU, with a focus on epipelagic species. More tags are needed for swordfish.					
4. Billfish as bycatch	How to provide scientific advice to management on billfish caught as bycatch					

APPENDIX 36D
WORKING PARTY ON ECOSYSTEMS AND BYCATCH PROGRAM OF WORK (2025 – 2029)

Table 1. Priority topics for obtaining the information necessary to develop stock status indicators for bycatch species in the Indian Ocean

Topic in order of priority	Sub-topic and project	Timing				
		2025	2026	2027	2028	2029
Connectivity, movements, habitat use and post release mortality[10]	Electronic tags (PSATs, SPOT, Splash MiniPAT) to assess the efficiency of management resolutions on non-retention species (BSH in LL, marine turtles and rays in GIL and PS, whale sharks) and to determine connectivity, movement rates, mortality estimates and genetic studies					
1. Fisheries data collection and development of alternative abundance indices	1.1 Catch composition reconstruction (initial focus Sri Lanka, Pakistan and Indonesia)					
	1.1.2 Historical data mining for the key species and IOTC fleets (e.g., as artisanal gillnet and longline coastal fisheries) including workshops:					
	1.1.3 Historical data mining for the key species, including the collection of information about catch, effort and spatial distribution of those species and fleets catching them					
	1.1.4 CPUE standardisation and review of additional abundance indicators series for each key shark species and fishery in the Indian Ocean 1.2 Exploring different indices of abundance for sharks such as CKMR					
2. Shark research and management strategy	2.1 Prioritising shark research based on previous work and including analysing gaps in knowledge					

[10] This item is a top priority for the WPEB; however, completing it will require substantial funding, which the WPEB recognizes is unlikely to be provided through the IOTC Scientific budget.

	2.2 Workshop to update and revise shark research plan with a small working group					
3. Studies and training focused on gillnet bycatch mitigation	3.1 Focused GN bycatch mitigation workshop – training and monitoring 3.2 Studies trialling gillnet mitigation measures such as: LED lights, sub-surface setting etc.					

Other Future Research Requirements (not in order of priority)

Topic	Sub-topic and project	2025	2026	2027	2028	2029
1. Review and improve data collection for mobulid rays	1.1 Mobulid ID guide revision and translation. ID guides to be updated with help of CPC scientists					
2. Bycatch mitigation measures	2.1 Gears 2.1.1 Undertake a series of gear specific workshops focusing on multi-taxa bycatch issues					
	2.1.2 Develop studies on bycatch mitigation measures for the main gears using in the IOTC area (operational, technological aspects and best practices)					
	2.2 Sharks a) Harmonise and finalise guidelines and protocols for safe handling and release of sharks and rays caught in IOTC fisheries					
	2.3 Sea turtles 2.3.1 Res. 12/04 (para. 11) Part I. The IOTC Scientific Committee shall request the IOTC Working Party on Ecosystems and Bycatch to:					
	a) Develop recommendations on appropriate mitigation measures for gillnet, longline and purse seine fisheries in the IOTC area; [mostly completed for LL and PS]					
	b) Develop regional standards covering data collection, data exchange and training					

	2.3.2 Res. 12/04 (para. 17) The IOTC Scientific Committee shall annually review the information reported by CPCs pursuant to this measure and, as necessary, provide recommendations to the Commission on ways to strengthen efforts to reduce marine turtle interactions with IOTC fisheries.					
	2.3.3 Regional workshop to review the effectiveness of marine turtle mitigation measures					
	2.3.4 Harmonise and finalise guidelines and protocols for safe handling and release of sea turtles caught in IOTC fisheries					
	2.3 Seabirds 2.3.1 Bycatch assessment for seabirds taking into account the information from the various ongoing initiatives in the IO and adjacent oceans					
	2.3.2 Study on cryptic mortality of seabirds in tuna LL fisheries.					
	2.3.3 Study post release survival rates for seabirds and harmonise and finalise guidelines and protocols for safe handling and release of seabirds caught in IOTC fisheries					
	2.4 Cetaceans 2.4.1 Testing mitigation methods for cetacean bycatch in tuna drift gillnet fisheries					
	2.4.2 Harmonise and finalise guidelines and protocols for safe handling and release of cetaceans caught in IOTC fisheries					

	2.4.3. Intersessional meeting to discuss cetacean guidelines, ERA, Data gaps.					
3. CPUE standardisation / Stock Assessment / Other indicators	3.1 Develop standardised CPUE series for each key shark species and fishery in the Indian Ocean:					
	3.1.1 Development of CPUE guidelines for standardisation of CPC data.					
	3.1.2 Blue shark: Priority fleets: TWN,CHN LL, EU,Spain LL, Japan LL; Indonesia LL; EU,Portugal LL					
	3.1.3 Shortfin mako shark: Priority fleets: Longline and Gillnet fleets					
	3.1.4 Oceanic whitetip shark: Priority fleets: Longline fleets; purse seine fleets					
	3.1.5 Silky shark: Priority fleets: Purse seine fleets					
	3.2 Joint CPUE standardization across the main LL fleets for silky shark, using detailed operational data					
	3.3 Stock assessment and other indicators					
4. Ecosystems	4.1 Develop a plan for Ecosystem Approach to Fisheries (EAF) approaches in the IOTC, in conjunction with the Common Oceans Tuna Project.					
	4.1.2 Workshop for CPCs on continuing efforts to the development of an EAF including delineation of candidate eco regions within IOTC.					
	4.1.3 Practical Implementation of EBFM with the development and testing of ecosystem report cards.					
	4.1.4 Evaluation of EBFM plan in IOTC area of competence by the WPEB to review its elements components and make any corrective measures.					

	4.2 Assessing the impacts of climate change and socio- economic factors on IOTC fisheries					
	4.3 Evaluate alternative approaches to ERAs to assess ecological risk					
	4.4 Progress on Climate webpage on IOTC website and liaise with WPDCS for technical implementation					
Ecoregions development	Support for the development and refinement of ecoregions in the Indian Ocean: Development of a pilot study (focused on two ecoregions: one coastal, the Somali Current ecoregion and one oceanic, the Indian Ocean Gyre ecoregion)					
Development of Indian Ocean Digital Atlas	Facilitate the discussions with WPDCS to consolidate the Indian Ocean Digital Atlas project with stakeholders					

APPENDIX 36E
WORKING PARTY ON TROPICAL TUNAS PROGRAM OF WORK (2025 – 2029)

Table 1. Priority topics for obtaining the information necessary to develop stock status indicators for bycatch species in the Indian Ocean.

Topic in order of priority	Sub-topic and project	TIMING				
		2025	2026	2027	2028	2029
Stock assessment priorities	Address the outstanding issues identified as priorities by the yellowfin tuna peer review panel (February 2023). Address the additional recommendations made by the WPTT in 2024.					
Abundance indices development	Address the additional recommendations made by the WPTT in 2024 regarding the CPUE indices for yellowfin. In view of the coming assessments of yellowfin, bigeye, and skipjack develop abundance time series for each tropical tuna stock for the Indian Ocean • Continue to develop CPUE indices from Longline, purse seine, Pole and line fisheries, and fishery independent indices of abundance such as those derived from echosounder buoys. • Explore and support the development of gillnet CPUE indices for fleets (e.g., Iran, Pakistan and Oman) • Evaluate effect of changes of spatial coverage on the longline CPUE through the Joint CPUE workshop and estimate spatial temporal abundance distribution through VAST modelling approach					
Fisheries Independent Monitoring	Use of Close Kin Mark Recapture (CKMR) methods which can provide estimates of absolute spawning biomass, mortality, stock structure, and connectivity based on genotyping individuals to a level that can identify close relatives (e.g. parent-offspring or half-siblings). Plan for a staged approach for implementation of a YFT CKMR project					
Analysis of tagging and size frequency data	Analyze data from IOTC tagging programs outside stock assessment models and evaluate its utility and impact on stock assessments. Standardisation of size frequency data.					
Analysis of environmental factors	Evaluate the impact of environmental factors on the dynamics of tropical tuna stocks and the possible role of climate change on changes to selectivity, recruitment deviates and fishing productivity.					

Other Future Research Requirements (not in order of priority)						
		2025	**2026**	**2027**	**2028**	**2029**
1 Stock structure (connectivity and diversity)	1.1 Genetic research to determine the connectivity of tropical tuna species throughout their distribution (including in adjacent Pacific Ocean waters as appropriate) and the effective population size.					
	1.2 Population genetic analyses to decipher intraspecific connectivity, levels of gene flow, genetic divergence and effective population sizes based on genome-wide distributed Single Nucleotide Polymorphisms (SNPs).					
	1.3 Connectivity, movements, and habitat use, including identification of hotspots and investigate associated environmental conditions affecting the tropical tuna species distribution, making use of conventional and electronic tagging (P-SAT).					
	1.4 Investigation into the degree of local or open population in main fishing areas (e.g,, the Maldives and Indonesia – archipelagic and open ocean) by using techniques such flux in FAD arrays or used of morphological features such as shape of otoliths.					
2 Biological and ecological information (incl. parameters for stock assessment)	2.1 Biological sampling					
	2.1.1 Design and develop a plan for a biological sampling program to support research on tropical tuna biology. The plan would consider the need for the sampling program to provide representative coverage of the distribution of the different tropical tuna species within the Indian Ocean and make use of samples and data collected through observer programs, port sampling and/or other research programs. The plan would also consider the types of biological samples that could be collected (e.g. otoliths, spines, gonads, stomachs, muscle and liver tissue, fin clips, etc.), the sample sizes required for estimating biological parameters, and the logistics involved in collecting, transporting and processing biological samples. The specific biological parameters that could be estimated include, but are not limited to, estimates of growth, age at maturity, fecundity, sex ratio, spawning season, spawning fraction and stock structure.					
	2.1.2 Collect gonad samples from tropical tunas to confirm the spawning periods and location of the spawning area that are presently hypothesized for each tropical tuna species.					
3 Historical data review	3.1 Changes in fleet dynamics need to be documented by fleet					
	3.1.1 Provide an evaluation of fleet-specific fishery impacts on the stock of bigeye tuna, skipjack tuna and yellowfin tuna. Project potential impact of realizing fleet					

		development plans on the status of tropical tunas based upon most recent stock assessments.					
4	Alternative indices	4.1 That methods be developed for standardising purse seine catch species composition using operational data, so as to provide alternative indices of relative abundance (see Terms of Reference, Appendix IXb IOTC-2017-WPTT19-R).					
		4.2 Investigate the potential to use the Indian longline survey as a fishery-independent index of abundance for tropical tunas.					
5	Stock assessment stock indicators	5.1 Develop and compare multiple assessment approaches to determine stock status for tropical tunas 5.2 Scoping of ongoing age composition data collection for stock assessment 5.3 Develop a high resolution age structured operating model that can be used to test the spatial assumptions including potential effects of limited tags mixing on stock assessment outcomes (see Terms of Reference, Appendix IXa IOTC-2017-WPTT19-R).					
6	Fishery monitoring	6.1 Develop fishery independent estimates of stock abundance to validate the abundance estimates of CPUE series. All of the tropical tuna stock assessments are highly dependent on relative abundance estimates derived from commercial fishery catch rates, and these could be substantially biased despite efforts to standardise for operational variability (e.g. spatio-temporal variability in operations, improved efficiency from new technology, changes in species targeting). Accordingly, the IOTC should continue to explore fisheries independent monitoring options which may be viable through new technologies. There are various options, among which some are already under test. Not all of these options are rated with the same priority, and those being currently under development need to be promoted, as proposed below: Acoustic FAD monitoring, with the objective of deriving abundance indices based on the biomass estimates provided by echo-sounder buoys attached to FADs 6.2 Longline-based surveys (expanding on the Indian model) or “sentinel surveys” in which a small number of commercial sets follow a standardised scientific protocol 6.3 Aerial surveys, potentially using remotely operated or autonomous drones 6.4 Studies (research) on flux of tuna around anchored FAD arrays to understand standing stock and independent estimates of the stock abundance. 6.5 Investigate the possibility of conducting ongoing ad hoc, low level tagging in the region					

7	Target and Limit reference points	7.1	To advise the Commission, on Target Reference Points (TRPs) and Limit Reference Points (LRPs). Used when assessing tropical tuna stock status and when establishing the Kobe plot and Kobe matrices				
8	Fisheries Indicators	8.1	Examination of additional fisheries indicators and their discussion at WP meetings. Perhaps a section in report to accommodate these. See how this is being addressed in other RFMOs.				

Appendix 36f
Working Party on Data Collection and Statistics Program of Work (2025–2029)

Table 1. Priority topics for obtaining the information necessary to deliver the necessary advice to the Commission. * indicates activities with high priority for funding

	Topic		Sub-topic and project	2025	2026	2027	2028	2029
1	Coastal fisheries data collection	1.1*	Data support missions to assist the implementation of data collection and sampling activities for fisheries insufficiently sampled. Recommended actions include: designing sampling guidelines for IOTC fisheries. Priority to be given to the following countries / fisheries: • Indonesia • Pakistan • I.R. Iran • Kenya • Tanzania • Comoros • Madagascar					
		1.2	Biological sampling workshop, including species identification and genetics sampling					
2	Data access and dissemination	2.1*	Ocean-climate information: develop an online digital ocean atlas for the IOTC area of competence, linked by the IOTC website; develop indicators on ocean-climate status to be linked to the atlas portal, along with educational resources					
		2.2	Biological information: collaborate with CPCs to Review, analyse, and manage of biological data and information					
		2.3	Improve accessibility of IOTC scientific products and digital assets through standard metadata and DOI (e.g., remote workshops)					

		2.4	Establish a photo and imagery tool library and archive and develop associated reporting guidelines					
3	Compliance with IOTC data reporting requirements	3.1	Drafting of indicators to assess performance of IOTC CPCs against IOTC Data Requirements; evaluation of performance of IOTC CPCs with those Requirements; development of plans of action to address the issues identified, including timeframe of implementation and follow-up activities required. Priority to be given to the following CPCs / fisheries • Indonesia • India • Pakistan • Oman • Tanzania • Other (as required / determined)					
		3.2 *	Workshops to clarify data reporting requirements[11] and support preparation of annual submissions					
		3.3	Support the documentation of sampling protocols and processing[12]					
5	Support for the implementation of the IOTC Regional Observer Scheme (ROS)	5.1	ROS e-tools					
			5.1.1 Review and update ROS e-tools according to the new ROS data standards	funding available for 2025				
			5.1.2 Support the adoption of the ROS e-Reporting and ROS national database tools by countries not having any existing observer data collection and management system in place					

[11] Recommended by the CoC; **regular annual webinars / workshops to be held from 2025 onwards with each CPCs (or group of CPCs) prior to the approaching of the data reporting deadline**

[12] Secretariat to finalize the template, CPC to provide information

5.2	ROS Regional Database					
5.2.1	Review and update the ROS database structure					
5.2.2	Incorporate all historical observer data currently available in other proprietary data formats (e.g., ObServe, ICCAT ST09 and other custom observer forms)					
5.3	ROS Electronic Monitoring Systems					
5.3.1	Implement pilot EMS system on gillnet / coastal longline vessels for fleets insufficiently covered by on-board observers, possibly by providing support through remote / in-person meetings[13]					
5.4	Evaluate the combination of alternative data collection systems and protocols for the collection of scientific observer data for artisanal and coastal fisheries, with an initial expert to develop protocols and guidelines for minimum data collection requirements in coastal fisheries, including through EMS systems through a regional workshop					
5.5	Review and update ROS training materials to the CPCs					
		2025	2026	2027	2028	2029

[13] Sri Lanka EMS, training and setup of data exchange

APPENDIX 36G
WORKING PARTY ON METHODS PROGRAM OF WORK (2025 – 2029)

Table 1. Priority topics for obtaining the information necessary to deliver the necessary advice to the Commission. Resolution 15/10 elements have been incorporated as required by the Commission.

Topic	Sub-topic and project	Timing				
		2025	2026	2027	2028	2029
1. Management Strategy Evaluation	Continuation of Management Strategy Evaluation for Albacore and Yellowfin tunas as well as Blue shark					
MP Implementation	Monitoring the implementation of SKJ, BET and SWO Management Procedures					
	Peer review of SKJ/SWO MSE/MPs as required by MP resolutions					
Future Research Requirements (not in order of priority)						
	1.1 Albacore					
Management Strategy Evaluation	1.1.1 Revision of Operating Models based on WPALB, WPM and SC feedback, including possible robustness tests					
	1.1.2 Implementation of simulation runs and presentation of results at the TCMP					
	1.1.3 Revision and evaluation of new set of Management Procedures after presentation of MP runs to TCMP and Commission (as needed)					
1.2 Skipjack tuna						
	1.2.1 Run MP using the catch and CPUE standardisation input data, consider exceptional circumstances*, and provide the TAC advice					

1.2.2 Presentation of MP application and exceptional circumstances* and resulting TAC to the TCMP and Commission meeting for adoption of the TAC					
1.2.3 Stock assessment to provide information on stock status					
1.2.4 External peer review (2026-2028)					
1.3 Bigeye tuna					
1.3.1 Run MP using the catch and CPUE standardisation input data, consider exceptional circumstances*, and provide the TAC advice					
1.3.2 External peer review					
1.3.3 Presentation of MP application and exceptional circumstances* and resulting TAC to the TCMP and Commission meeting for adoption of the TAC					
1.3.4 Stock assessment to provide information on stock status					
1.4 Yellowfin tuna					
1.4.1 Update OM & present preliminary MP results to TCMP, WPTT/WPM review of new OM					
1.4.2 Present revised MP results to TCMP; iteratively update development if required)					
1.4.3 additional iterations if required					
1.5 Swordfish					
1.5.1 Run MP using the catch and CPUE standardisation input data, consider exceptional circumstances*, and provide the TAC advice					

1.5.2 Presentation of MP application and exceptional circumstances* and resulting TAC to the TCMP and Commission meeting for adoption of the TAC						
1.5.3 Stock assessment to provide information on stock status Stock assessment to provide information on stock status						
1.5.4 External peer review						
Stock status guidance and reference points.	Review IOTC stock status characterization against reference points and the framework for the provision of management advice (Resolution 15/10) to address the TORs of ad hoc reference point WG.					
CKMR pilot project	Implementation of a CKMR pilot project for Indian Ocean yellowfin tuna to evaluate the logistics and feasibility of sampling, and levels of cross contamination of DNA.					
Capacity Building	Ongoing development of tools, materials and courses to continue Capacity Building for increasing participation in the MSE process and develop improved MSE communication to fishery managers.					

APPENDIX 37
SCHEDULE OF STOCK ASSESSMENTS FOR IOTC SPECIES AND SPECIES OF INTEREST FROM 2025–2029, AND FOR OTHER WORKING PARTY PRIORITIES

Working Party on Neritic Tunas					
Species	**2025****	**2026***	**2027***	**2028**	**2029***
Bullet tuna	Data preparation	Data preparation	**Assessment**	Data preparation	Data preparation
Frigate tuna	Data preparation	Data preparation	**Assessment**	Data preparation	Data preparation
Indo-Pacific king mackerel	Data preparation	Data preparation	**Assessment**	Data preparation	Data preparation
Kawakawa	Data preparation	**Assessment**	Data preparation	Data preparation	**Assessment**
Longtail tuna	Data preparation	**Assessment**	Data preparation	Data preparation	**Assessment**
Narrow-barred Spanish mackerel	Data preparation	**Assessment**	Data preparation	Data preparation	**Assessment**

* Including data-limited stock assessment methods.
** Including species-specific catches, CPUE, biological information and size distribution as well as identification of data gaps and discussion of improvements to the assessments (stock structure); one day may be reserved for capacity building activities.

Working Party on Billfish					
Species	**2025**	**2026**	**2027**	**2028**	**2029**
Black marlin			**Full assessment**		
Blue marlin	**Full assessment**			**Full assessment**	
Striped marlin			**Full assessment**		
Swordfish		**Full assessment**	**Data Prep for MP**		**Full assessment**
Indo-Pacific sailfish	**Full assessment**			**Full assessment**	

Working Party on Tropical Tunas					
Species	**2025**	**2026**	**2027**	**2028**	**2029**
Bigeye tuna	**Data preparatory meeting** **Full assessment**	Indicators	**Data Prep and MP to be run**	**Data preparatory meeting** **Full assessment**	Indicators **MP to be run**
Skipjack tuna	Indicators **Data Prep for SKJ MP**	**Data preparatory meeting** **Full assessment**	Indicators	**Data Prep for MP and MP to be run**	**Data preparatory meeting** **Full assessment**
Yellowfin tuna	Indicators	Indicators	**Data preparatory meeting** **Full assessment**	Indicators	Indicators

Working Party on Ecosystems and Bycatch					
Species	**2025**	**2026**	**2027**	**2028**	**2029**
Blue shark	Data preparatory meeting Full assessment	-	–	–	–
Oceanic whitetip shark	Indicator analysis	-	Data preparation	–	Data preparation
Scalloped hammerhead shark	–	Data preparatory meeting Assessment*	–	–	–
Shortfin mako shark	–	-	Data preparatory meeting Full assessment		-
Silky shark	–	Assessment*	-	Assessment*	-
Bigeye thresher shark	–	Assessment*	–	-	–
Pelagic thresher shark	–	Assessment*	–	-	–
Porbeagle shark	–	-	– Assessment*		–
Mobulid Rays	–	-	Interactions/ Indicators	-	Interactions/ Indicators
Marine turtles	Indicators	-	–	Indicators	–
Seabirds	Development of draft workplan	Review of mitigation measures in Res. 23/07	–	–	Development of draft workplan
Marine Mammals		-	–	–	
Ecosystem Approach to Fisheries Management (EAFM) approaches	Ecoregions pilot study ongoing				
Series of multi-taxa bycatch mitigation workshops	Focus: tbd	Focus: tbd	Focus: tbd	Focus: tbd	Focus: tbd
Shark research plan update		Shark research plan update workshop			

*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.

Working Party on Temperate Tunas					
Species	**2025**	**2026**	**2027**	**2028**	**2029**
Albacore	Data preparatory Meeting (4 days) Stock assessment meeting (5 days) (July/August)	–	–	**TBC**	–

APPENDIX 38
SCHEDULE OF IOTC WORKING PARTY AND SCIENTIFIC COMMITTEE MEETINGS
(2025 and 2026)

	2025			2026		
Meeting	**No.**	**Date**	***Location**	**No.**	**Date**	***Location**
Management Strategy Evaluation Task Force of the Working Party on Methods (WPM)	16th	24 –25 February (2d)	Virtual	17th	April	Virtual
Special session Scientific Committee (SSC)	1st	26 February (2h)	Virtual			
Working Party on Temperate Tunas (data preparation) (WPTmT-DP)	9th	27 February – 1 March	Virtual			
Working Party on Social-Economics (WPSE)	2nd	24-25 April (2d)	Virtual	3rd	April/May	Virtual
Working Party on Ecosystems and Bycatch (Data Preparatory meeting) (WPEB)	21st	28 – 30 April (3d)	Virtual			
Ad hoc Working Group on Electronic Monitoring Systems (WGEMS)	5th	5-6 May (2d)	Virtual	6th	TBC	Virtual
Working Group on FADs (WGFAD)	7th	9 -10 June (2d)	Virtual	8th	May/June	Virtual
Working Party on Tropical Tunas (Data Preparatory meeting) (WPTT)	27th	11-13 June (3d)	Virtual	28th	May/June	Virtual
Working Party on Neritic Tunas (WPNT)	15th	7-11 July (5d)	TBC	16th	July	TBC
Working Party on Temperate Tunas (Assessment meeting) (WPTmT-AS)	9th	21-25 July (5d)	TBC			
Working Party on Ecosystems and Bycatch (WPEB)	21st	9-13 September (5d) (with WPB)	France	22nd	September (5d) (with WPB)	TBC
Working Party on Billfish (WPB)	23rd	15-18 September (4d) (with WPEB)	France	24th	September (4d) (with WPEB)	TBC
Working Party on Tropical Tunas (Assessment meeting) (WPTT-AS)	27th	21 October – 25 October (5d) (with WPM)	TBC	28th	October (6d) (with WPM)	TBC
Working Party on Methods (WPM)	16th	27-28 October (2d) (with WPTT)	TBC	17th	October (3d) (with WPTT)	TBC
Working Party on Data Collection and Statistics (WPDCS)	21st	25 – 29 November (5d)	China	22nd	November (5d)	TBC
Scientific Committee (SC)	28th	1 - 5 December (5d)	China	29th	December (5d)	TBC

* In accordance with the SC Recommendations, Data Preparatory and Working Group meetings will remain virtual. The Secretariat will endeavour to ensure all remaining meetings are held in a hybrid format.

APPENDIX 39
CONSOLIDATED SET OF RECOMMENDATIONS OF THE 27TH SESSION OF THE SCIENTIFIC COMMITTEE (2 – 6 DECEMBER 2024) TO THE COMMISSION

Tuna – Highly migratory species

SC27.01 (para. 175) The SC **RECOMMENDED** that the Commission note the management advice developed for each tropical and temperate tuna species as provided in the Executive Summary for each species, and the combined Kobe plot for the four species assigned a stock status in 2024 (Fig. 2):
Albacore (*Thunnus alalunga*) – Appendix 8
Bigeye tuna (*Thunnus obesus*) – Appendix 9
Skipjack tuna (*Katsuwonus pelamis*) – Appendix 10
Yellowfin tuna (*Thunnus albacares*) – Appendix 11

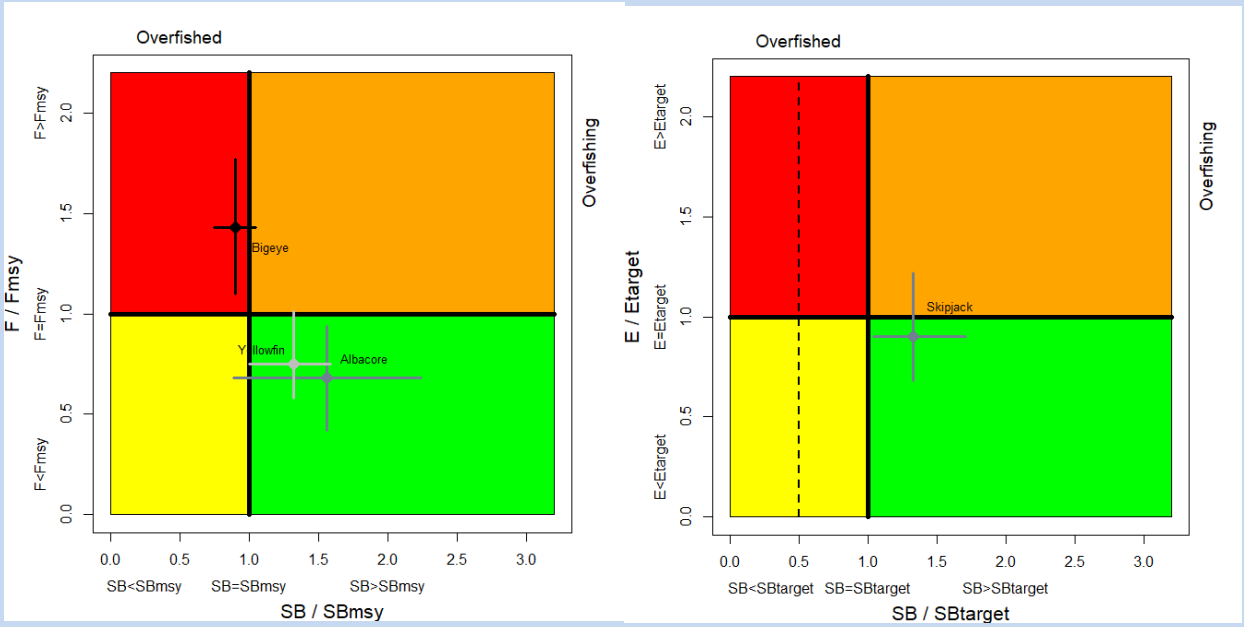


Fig. 2. (Left) Combined Kobe plot for bigeye tuna (black: status in 2021, with assessment conducted in 2022), and yellowfin tuna (light grey: 2023, with assessment conducted in 2024) and albacore (dark grey: 2020 with assessment conducted in 2022) showing the estimates of current spawning biomass (SB) and current fishing mortality (F) in relation to optimal spawning stock size and optimal fishing mortality. (Right) Kobe plot for skipjack tuna (2022 with assessment conducted in 2023) showing the estimates of the current stock status (the dashed line indicates the limit reference point at 20%SB0 while SBtarget=0.4 SB0). Cross bars illustrate the range of uncertainty from the model runs with an 80% CI (95% CI for albacore).

Tuna and seerfish – Neritic species

SC27.02 (para. 177) The SC **RECOMMENDED** that the Commission note the management advice developed for each neritic tuna (and seerfish) species under the IOTC mandate, as provided in the Executive Summary for each species, and the combined Kobe plot for the three species assigned a stock status in 2024 (Fig. 3):
Bullet tuna (*Auxis rochei*) – Appendix 12
Frigate tuna (*Auxis thazard*) – Appendix 13
Kawakawa (*Euthynnus affinis*) – Appendix 14
Longtail tuna (*Thunnus tonggol*) – Appendix 15
Indo-Pacific king mackerel (*Scomberomorus guttatus*) – Appendix 16
Narrow-barred Spanish mackerel (*Scomberomorus commerson*) – Appendix 17

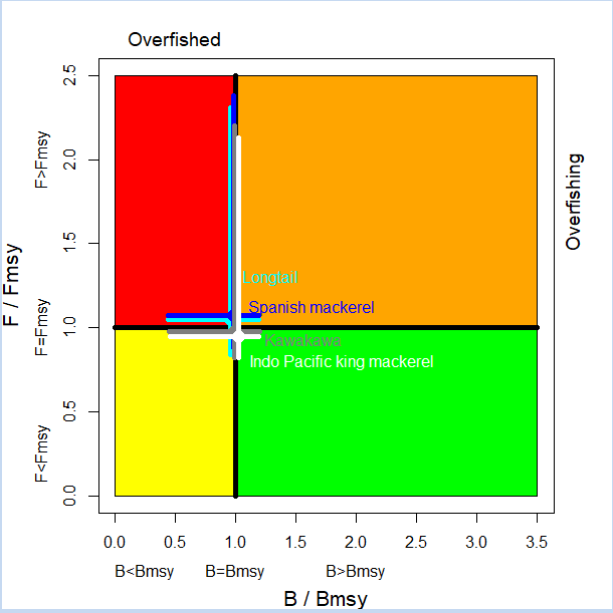


Fig. 3. Combined Kobe plot for longtail tuna (cyan), narrow-barred Spanish mackerel (blue), kawakawa (grey) (all for 2021 with assessment conducted in 2023) and Indo-Pacific king mackerel (2022 with assessment conducted in 2024 (white)), showing the estimates of stock size (B) and current fishing mortality (F) in relation to optimal biomass and optimal fishing mortality. Cross bars illustrate the range of uncertainty from the model runs. Given unresolved uncertainty in the assessment, status for bullet tuna, frigate tuna and Narrow-barred Spanish mackerel should be interpreted with caution.

Billfish

SC27.03 (para. 178) The SC **RECOMMENDED** that the Commission note the management advice developed for each billfish species under the IOTC mandate, as provided in the Executive Summary for each species, and the combined Kobe plot for the five species assigned a stock status in 2024 (Fig. 4):
Black marlin (*Istiompax indica*) – Appendix 18
Blue marlin (*Makaira nigricans*) – Appendix 19
Striped marlin (*Kajikia audax*) – Appendix 20
Indo-Pacific sailfish (*Istiophorus platypterus*) – Appendix 21
Swordfish (*Xiphias gladius*) – Appendix 22

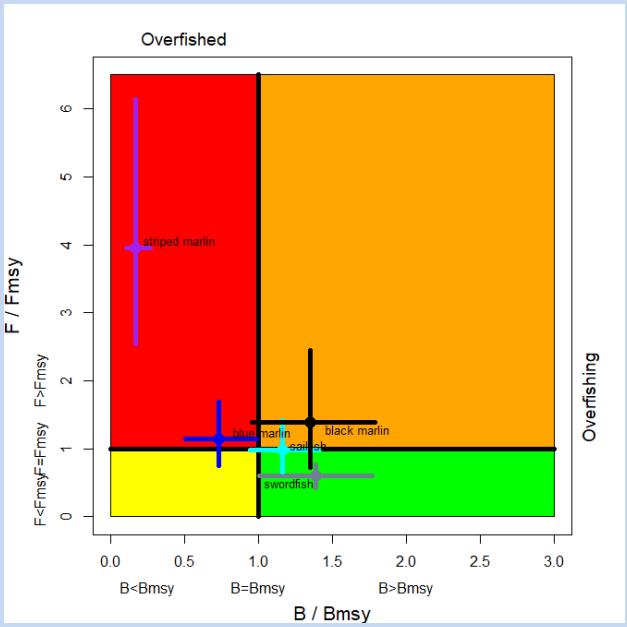


Fig. 4. Combined Kobe plot for swordfish (2021 with assessment conducted in 2023, grey), Indo-Pacific sailfish (2019 with assessment conducted in 2022, cyan), black marlin (2022 with assessment conducted in 2024, black), blue marlin (2020 with assessment conducted in 2022, blue) and striped marlin (2022 with assessment conducted in 2024, purple) showing the estimates of current stock size (SB or B, species assessment dependent) and current fishing mortality (F) in relation to optimal stock size and optimal fishing mortality. Cross bars illustrate the range of uncertainty from the model runs. Given unresolved uncertainty in the assessment, status for black marlin is uncertain.

Sharks

SC27.04 (para. 179) 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
porbeagle shark (*Lamna nasus*) – Appendix 30

Marine turtles

SC27.05 (para. 180) 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 31

Seabirds

SC27.06 (para. 181) 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 32

Marine Mammals

SC27.07 (para. 182) 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 33

GENERAL RECOMMENDATIONS TO THE COMMISSION

NATIONAL REPORTS FROM CPCS

SC27.08 (para. 34) The SC **RECOMMENDED** that the Compliance Committee and Commission note the lack of compliance by 3 Contracting Parties (Members) that did not submit a National Report to the Scientific Committee in 2024, **NOTING** that the Commission agreed that the submission of the annual reports to the Scientific Committee is mandatory**.**

Report of the 14th Session of the Working Party on Neritic Tunas (WPNT14)

SC27.09 (para. 44) **NOTING** that there has been considerable recent advancement and emphasis on the length-based approach, which can estimate stock status and serve as a valuable monitoring tool for various fisheries, the SC thus **ENCOURAGED** the continued exploration and utilization of both methods. The SC **RECOMMENDED** that the Commission urge CPCs to collect more representative length composition data for the effective assessment of these species, with a particular focus on frigate and bullet tuna for which the stock status is still unknown. The SC further **RECOMMENDED** that the Commission urge CPCs to summarize the size data from their sampling programs for the next WPNT meeting.

REPORT OF THE 22ST SESSION OF THE WORKING PARTY ON BILLFISH (WPB22)

SC27.10 (para. 58) **NOTING** that a joint analysis of fleet specific CPUE based on a consistent statistical framework which accounts for differences in catchability between fleets could be useful for assessing species under the mandate of WPB, the SC **RECOMMENDED** that the Commission urge the CPCs to dedicate effort to

harmonising the standardised methods for different fleets and to develop a joint analysis combining catch effort data from key fleets for major billfish species where feasible.

Revision of catch levels of marlins under Resolution 18/05

SC27.11 (para. 62) The SC **RECOMMENDED** that the Commission reassess the effectiveness of the current measures within this resolution and to revise Resolution 18/05 to update the catch limits based on the latest stock assessments and projections for the billfish species.

REPORT OF THE 20TH SESSION OF THE WORKING PARTY ON ECOSYSTEMS AND BYCATCH (WPEB20)

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

SC27.12 (para. 70) 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 6, recalling that the IPOA-Seabirds and IPOA-Sharks were adopted by the FAO in 1999 and 2000, respectively, and recommended the development of NPOAs.

LONGLINE BYCATCH MITIGATION MEASURES WORKSHOP

SC27.13 (para. 83) The SC **NOTED** that the WPEB conducted a comprehensive research review pertaining to different potential shark mitigation options and produced a summary table listing the strengths and weaknesses of possible mitigation measures focused on longline gear, including limiting the use of wire trace as branch lines or leaders and shark lines (in Appendix VI of WPEB(DP) Report). The SC **ACKNOWLEDGED** that most of the existing research on this topic comes from the Pacific and Atlantic Oceans and that the information is currently scarce in the Indian Ocean. The SC **REQUESTED** that the WPEB and WPSE evaluate the potential impacts of limiting wire leader and shark lines on fleet operation and the potential social and economic impacts in the Indian Ocean. In addition, the SC **ENCOURAGED** CPCs to conduct region specific analyses on these mitigation methods. The SC **RECOMMENDED** that the Commission consider the research from the summary tables (Appendix VI of WPEB(DP) Report) should they wish to consider additional mitigation measures to strengthen the conservation of vulnerable sharks. The WPEB literature review highlighted that a prohibition on the use of wire leaders and shark lines by longline and other fisheries operating in the IOTC would likely result in a reduction in both the observed catch and the fishing mortality of shark species, particularly in situations where the use of wire leaders and shark lines are common. The SC also considered that further investigation on mitigation measures should be continued.

OTHER MATTERS

SC27.14 (para. 87) The SC **NOTED** the revised handling and release guidelines for mobulids endorsed by the WPEB, and **RECOMMENDED** that the Commission consider revising the live release handling procedures provided in Annex 1 of Resolution 19/03. The SC **NOTED** that further development of the guidelines for gillnets is required and that this will be done intersessionally with the aim of reporting to the WPEB21. The details of the suggested revisions to the handling procedures can be found in IOTC-2024-WPEB20(AS)-R.

REPORT OF THE 26TH SESSION OF THE WORKING PARTY ON TROPICAL TUNAS (WPTT26)

Yellowfin tuna stock assessment

SC27.15 (para. 104) The SC **NOTED** that the Joint CPUE workshop had limited participation and was conducted over a short time period. However, it was noted that the workshop format and standardisation methods have remained the same for a long time. The SC **NOTED** the importance of the Joint Longline CPUE Index as a primary input for the stock assessments of several key IOTC species, including yellowfin, bigeye and albacore tunas, and AGREED on the need to ensure a transparent, inclusive, and replicable process in the development of the Joint CPUE Index using operational data. The SC therefore, **RECOMMENDED** that the Commission investigate options to allow independent scientists or Secretariat stock assessment experts to provide inputs and advice through attending meetings of the Joint Longline CPUE standardisation group. The SC **RECALLED** that during the 2015–2019 period analysis was conducted by a consultant by participating in the meetings.

SC27.16 (para. 108) Given the uncertainty associated with the new CPUE, the SC **RECOMMENDED** that the Commission set a TAC for 2026 only, of no more than the estimated median MSY, which is comparable to the average catch of the last five years, as a precautionary measure to allow time for further investigation (i.e. resolving of uncertainty associated with the new CPUE) and development of advice for 2027 onwards.

Update on the WGFAD05

SC27.17 (para. 116) The SC **NOTED** that after the recent resolutions on FAD were adopted, CPCs seem less inclined to submit papers to WGFAD. This led to the shortening of WGFAD06 to a single day and the cancellation of WGFAD07 this year due to a shortage of papers. Therefore, the SC **RECOMMENDED** that the Commission schedule only one WGFAD meeting in 2025. The SC also suggests that this meeting should take place before the WPEB, as FAD **issues** are relevant to WPEB, to allow the findings to be reported to both WPEB and WPTT.

Other Matters

SC27.18 (para. 117) The SC **NOTED** that exceptional circumstances of adopted MPs need to be considered at both species WPs and WPM. The SC also **NOTED** that there is benefit in species WPs being held before WPM to allow discussions on issues such as new information on biology before the consideration of potential modelling implications and as such **RECOMMENDED** that in the future the WPM be held after the WPTT.

REPORT OF THE 15TH SESSION OF THE WORKING PARTY ON METHODS (WPM15)

Management Strategy Evaluation Progress

SC27.19 (para. 121) The SC NOTED that the work of albacore is not mature enough that would require a TCMP in February and, therefore, **RECOMMENDED** that an extra TCMP meeting in February 2025 is not organized.

Bigeye tuna MP (Resolution 22/03)

SC27.20 (para. 122) The SC **NOTED** that a standardised CPUE index based on the agreed methodology (as per Resolution 22/03) was not yet available to run the Bigeye Tuna MP, but needs to be available in time for the Scientific Committee to review (as required by Resolution 22/03). However, a member of the joint CPUE group responsible for producing the index indicated that logistically (due to the need to have a physical workshop to share the data) it would not be possible to provide the CPUE index in time for SC, but that it might be possible to provide following a meeting of the group in February 2025. The SC **DISCUSSED** options for ensuring that the WPM is able to review and participate in the running of the MP. Following this discussion, the SC **RECOMMENDED** that:

- the joint CPUE working group produce a BET CPUE index, as per the requirements/specifications of Williams et al (2022), at its meeting in early February 2025, and provide this for the WPM(MSE)Taskforce.
- the WPM(MSE) Taskforce meet online on 24-25 February 2025 with one day to review and run the BET MP and one day to consider progress on the Albacore Tuna MSE.
- the Scientific Committee convene a special session, online (for two hours) on 26 February 2025, to review and if appropriate endorse the BET MP run and its associated BET TAC outcomes.

Swordfish tuna MP (Resolution 24/08)

SC27.21 (para. 124) The SC **RECOMMENDED** that the Commission implement a TAC for 2026-2028 for swordfish based on the amended and retuned MP1 if the Commission wishes to ensure that it achieves the current objective in Res 24/08 to be in the Kobe green zone with at least 60% probability during 2034-2038 period. This would require a minor amendment to the Target CPUE value in Annex I of Res 24/08 from 0.7125 to 0.75. The SC **NOTED** that should the Commission continue to implement the current MP1, without retuning, it has a lower probability (54%) of being in the Kobe green zone and higher TAC variability, but otherwise similar performance statistics (Table 1 of IOTC–204–WPM15–R). The TAC derived from running SWO MP1 with or without retuning is 30527 t (i.e. the same and therefore not a severe impact) because the max TAC change constrain is reached in both MPs.

SC27.22 (para. 125) Irrespective of the MP chosen by the Commission, the SC **RECOMMENDED** that the Commission endorse the resultant TAC of 30,527 t for swordfish for 2026-2028.

General MSE issues

SC27.23 (para. 127) The SC **ENDORSED** the WPM's **RECOMMENDATION** that the Commission ensure that the IOTC Secretariat is provided with the necessary resources to manage the curation of relevant documents and code to enable users to re-run assessments and other analyses, NOTING that the most important information to be curated would be the input file, executables and control files.

REPORT OF THE 19TH SESSION OF THE WORKING PARTY ON DATA COLLECTION AND STATISTICS (WPDCS19)

SC27.24 (para. 141) The SC **NOTED** that the WPDCS had discussed and reviewed the summary on best practice guidelines for safe handling and release of small cetaceans and the SC **RECOMMENDED** the Commission to consider these guidelines when developing conservation measures for cetaceans.

SUMMARY DISCUSSION OF MATTERS COMMON TO WORKING PARTIES

Invited Expert(s) at the WP meetings

SC27.25 (para. 159) 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.

IOTC species identification guides: Tuna and tuna-like species

SC27.26 (para. 165) 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

SC27.27 (para. 170) 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.

Other matters

SC27.28 (para. 174) The SC **NOTED** the occasional need of technical workshops, corresponding to a request by the SC or Commission. The SC **RECOMMENDED** that:

- Technical workshops are not to be nested within Working Party meetings
- The terms of reference for such technical workshops should be established ahead of time to clarify their role and decision-making process, including whether they can make direct recommendations to the SC.

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

Consultants

SC27.29 (para. 199) **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.

Data preparatory meetings and Hybrid meetings

SC27.30 (para. 201) **ACKNOWLEDGING** that holding data preparatory meetings prior to stock assessments is considered to be best practice (as identified by the yellowfin stock assessment external reviewer, the WPTT and the WPDCS) and noting that since 2019 data preparatory meetings were successfully held for the WPTmT, WPTT and WPEB, the SC **AGREED** to continue the practice of having data preparatory meetings in addition to stock assessment meetings for the major IOTC species. The SC **RECOMMENDED** that data preparatory meetings could continue to be held virtually so as not to increase the travel and costs required for the already full IOTC timetable of meetings.

SC27.31 (para. 202) The SC **NOTED** that there had been a few teething problems holding meetings in a hybrid format in 2023 and 2024, especially related to the costs associated with the audio-visual equipment required, as well as the issues associated with ensuring the equipment was suitable to ensure full participation of both those

in person as well as those connecting virtually. However, the SC **AGREED** on the utility of facilitating both in-person and virtual participation at future meetings to ensure increased participation and reduce the logistical costs for many CPCs and observers. As such, the SC **RECOMMENDED** that future Scientific Committee meetings continue to be held in a hybrid format, as well as working parties if possible. The SC further **RECOMMENDED** that all presentations at these meetings be made in person to ensure the aforementioned issues did not adversely affect the quality of the advice being provided.

SC27.32 (para. 203) The SC **NOTED** all IOTC working party meetings this year (except the WPDCS and WPSE) were held in Seychelles, as there were no offers to host them. The SC meeting was originally planned in Seychelles but this was not possible due to unavailability of the venue. There has been an increasing reluctance for CPCs to offer to host IOTC scientific working party and SC meetings. This reluctance may be due to budget constraints, as well as the logistical burdens of Hybrid meetings. The SC **NOTED** that there has been a number of issues when hosting meetings in Seychelles (e.g., high cost). The SC **RECOMMENDED** this issue be discussed at the Commission in order to find a way forward.

IOTC Scientific Strategic Research Plan

SC27.33 (para. 208) The SC **AGREED** that the draft updated IOTC Strategic Science Plan 2025–2029 will be distributed to Heads of Delegation from each CPC for comment during early 2025. Thereafter comments will be collated and consolidated and another version sent to CPCs for final review. Pending agreement of CPCs, and noting that the IOTC Strategic Science Plan would be a dynamic document that would change over time, the SC **RECOMMENDED** that the revised draft of the IOTC Strategic Science Plan 2025–2029 be tabled at the Commission meeting in 2025.

REVIEW OF THE DRAFT, AND ADOPTION OF THE REPORT OF THE 25TH SESSION OF THE SCIENTIFIC COMMITTEE

SC27.34 (para. 214) The SC **RECOMMENDED** that the Commission consider the consolidated set of recommendations arising from SC25, provided at Appendix 39.