



Report of the 24th Session of the IOTC Working Party on Billfish

Réunion, France, 09–12 September 2026

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Acronyms

ABF	African Billfish Foundation
ASPIC	A Stock-Production Model Incorporating Covariates
B	Biomass (total)
B_{MSY}	Biomass which produces MSY
BLM	Black marlin (FAO code)
BSP-SS	Bayesian Surplus Production Model – State-Space
BUM	Blue marlin (FAO code)
CE	Catch and effort
CI	Confidence Interval
CMM	Conservation and Management Measure (of the IOTC; Resolutions and Recommendations)
CPCs	Contracting parties and cooperating non-contracting parties
CPUE	Catch per unit of effort
current	Current period/time, i.e. $F_{current}$ means fishing mortality for the current assessment year.
EU	European Union
EEZ	Exclusive Economic Zone
F	Fishing mortality; F_{2010} is the fishing mortality estimated in the year 2010
FAO	Food and Agriculture Organization of the United Nations
F_{MSY}	Fishing mortality at MSY
GLM	Generalized linear model
HBF	Hooks between floats
IO	Indian Ocean
IOTC	Indian Ocean Tuna Commission
JABBA	Just Another Bayesian Biomass Assessment (a generalized Bayesian State-Space Surplus Production Model)
LL	Longline
M	Natural Mortality
MLS	Striped marlin (FAO code)
MSY	Maximum sustainable yield
n.a.	Not applicable
NGO	Non-governmental organization
OFCF Japan	Overseas Fishery Cooperation Foundation of Japan
PS	Purse-seine
q	Catchability
r	Intrinsic rate of population increase
ROS	Regional Observer Scheme
SC	Scientific Committee of the IOTC
SB	Spawning biomass (sometimes expressed as SSB)
SB_{MSY}	Spawning stock biomass which produces MSY
SFA	Indo-Pacific sailfish (FAO code)
SS3	Stock Synthesis III
SWO	Swordfish (FAO code)
Taiwan,China	Taiwan, Province of China
WPB	Working Party on Billfish of the IOTC
WPEB	Working Party on Ecosystems and Bycatch of the IOTC

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 formalize 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.

NOTED/NOTING: Any point of discussion from a meeting which the IOTC body considers to be important enough to record in a meeting report for future reference.

Any other term: Any other term may be used in addition to the Level 3 terms to highlight to the reader of and IOTC report, the importance of the relevant paragraph. However, other terms used are considered for explanatory/informational purposes only and shall have no higher rating within the reporting terminology hierarchy than Level 3, described above (e.g. **CONSIDERED**; **URGED**; **ACKNOWLEDGED**).

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EXECUTIVE SUMMARY

The 24th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Billfish (WPB) was held in Reunion, using a hybrid format from the 9 to 12 September 2026. A total of 36 participants (36 in 2025, 47 in 2024, 97 in 2023, 51 in 2022) attended the Session (of which 25 attended in person). The list of participants is provided at [Appendix I](#). The meeting was opened by the Chairperson, Dr Jie Cao (China), who welcomed participants.

The following are the complete recommendations from the WPB24 to the Scientific Committee, which are also provided at [Appendix XI](#):

Review of exceptional circumstances of swordfish management procedure (Resolution 24/08)

WPB24.01 (para 165): The WPB **RECOGNIZED** that the absence of fishery observations in the Northwest Indian Ocean raises serious concerns regarding the long-term suitability of the Japanese CPUE series as a monitoring index for the Management Procedure. The WPB **AGREED** that this situation represents an Exceptional Circumstance with respect to the continued future use of the MP. The WPB **RECOMMENDED** that the SC also consider this an Exceptional Circumstance with a potential impact on the future application of the MP. The WPB **NOTED** that the current implementation of the Management Procedure, through the adopted TAC for 2027 and 2028, as per Resolution 26/02, is not affected, as it is based on the agreed CPUE index

WPB24.01 (para 166): The WPB **RECOMMENDED** that the Scientific Committee prioritize the development of a workplan to investigate alternative CPUE indices, including indices derived from alternative fleets, areas, or combinations of fleets and areas, for potential incorporation into revised candidate harvest control rules and the MSE testing of these within revised candidate Management Procedures, for consideration by the Commission. The WPB **NOTED** that this work may take a number of years to complete and as such, **FURTHER RECOMMENDED** that this work commence as a matter of urgency. This is required to mitigate against the scenario whereby the Japanese Northwest Indian Ocean CPUE series no longer provides an adequate monitoring index in future.

Revision of the WPB Program of work (2027–2031)

WPB24.07 (para 189): The WPB **RECOMMENDED** that the SC consider and endorse the WPB Program of Work (2027–2031), as provided in [Appendix IX](#).

Date and place of the 25th and 26th Sessions of the Working Party on Billfish

WPB24.08 (para 196): The WPB **RECOMMENDED** the SC consider early September as a preferred time period to hold the WPB25 in 2027. As usual it was also **AGREED** that this meeting should continue to be held back-to-back with the WPEB and that in 2027 WPB will be held in the week after the WPEB.

Review of the draft, and adoption of the Report of the 24th Session of the Working Party on Billfish

WPB24.09 (para 198): The WPB **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPB24, provided at [Appendix X](#), as well as the management advice provided in the draft resource stock status summary for each of the five billfish species under the IOTC mandate, and the combined Kobe plot for the five species assigned a stock status in 2026 (**Figure 5**):

- Swordfish (*Xiphias gladius*) – [Appendix IV](#)
- Black marlin (*Istiompax indica*) – [Appendix V](#)
- Blue marlin (*Makaira nigricans*) – [Appendix VI](#)
- Striped marlin (*Kajikia audax*) – [Appendix VII](#)
- Indo-Pacific sailfish (*Istiophorus platypterus*) – [Appendix VIII](#)

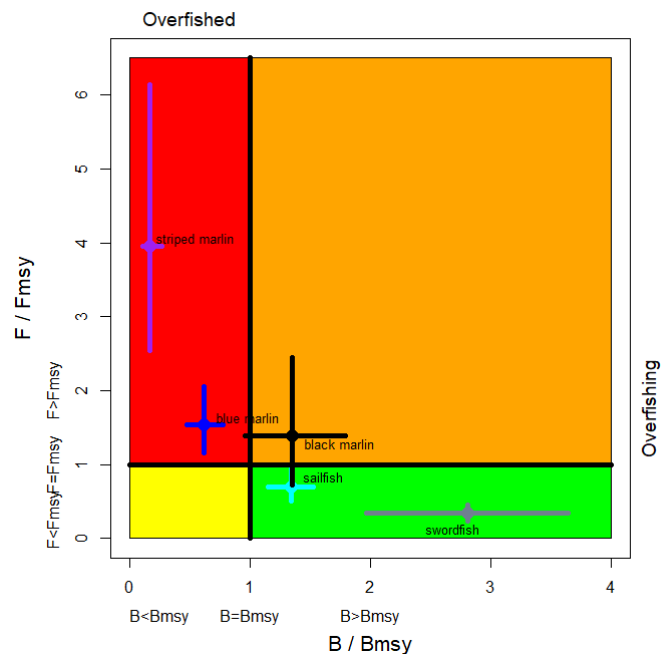


Figure. 5. Combined Kobe plot for swordfish (grey), Indo-Pacific sailfish (cyan), black marlin (black), blue marlin (blue) and striped marlin (purple) showing the 2024 (black marlin and striped marlin), 2025 (blue marlin and Indo-Pacific sailfish), and 2026 (swordfish) estimates of current stock size (S_B or B , species assessment dependent) and current fishing mortality (F) in relation to optimal spawning stock size and optimal fishing mortality. Cross bars illustrate the range of uncertainty from the model runs.

Table 1. Status summary for billfish species under the IOTC mandate.

Stock	Indicators	2022	2023	2024	2025	2026	Advice to the Scientific Committee
Swordfish <i>Xiphias gladius</i>	Catch 2024 (t): 28,144 Average catch 2020-2024 (t): 26,877 MSY (1,000 t) (80% CI): 39 (32-46) F_{MSY} (80% CI): 0.18 (0.13-0.23) SB_{MSY} (1,000 t) (80% CI): 58 (38-77) F_{2024}/F_{MSY} (80% CI): 0.34 (0.23-0.45) SB_{2024}/SB_{MSY} (80% CI): 2.81 (1.97-3.64) SB_{2024}/SB_{1950} (80% CI): 0.58 (0.55-0.61)		97%			100%	Stock status. A new stock assessment was carried out for swordfish in 2026, thus the stock status is determined on basis of the 2026 assessment. Three models were applied to the swordfish stock (JABBA, SPiCT, and Stock Synthesis (SS3)), with the SS3 stock assessment selected to provide scientific advice (as was done previously). 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 natural mortality (two options).. In considering the assessment results, the WPB has expressed concern over the use of the outputs from the Japanese longline CPUE index in 2011, and 2024, as these values were estimated by the CPUE model as there was no effort by the Japanese fleet in this area in these years. A sensitivity run was conducted during WPB to test for the impact of excluding these values and the impact to the model was determined to be satisfactorily small. Overall, mean spawning stock biomass in 2024 was estimated to be 58 % (80% CI: 55-61 %) of the unfished levels and 2.81 times (80% CI: 1.97-3.64) the level required to support MSY. Median fishing mortality in 2024 was estimated to be 34 % (80% CI 23 %-45 %) of the FMSY level, and catch in 2024 (28,144 t) was well below the estimated MSY level of 39,000 t (80% CI: 32 000 – 46,000t). Taking into account the characterized uncertainty, and on the weight-of-evidence available in 2026, the Indian Ocean swordfish stock is determined to be not overfished and not subject to overfishing. 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 advice. A revised management procedure for Indian Ocean Swordfish was adopted under Resolution 25/07 by the IOTC Commission in May 2025 following revision to correct a small error, and was applied to determine a recommended TAC for Swordfish for 2026, 2027 and 2028 of 30,527 t. A review of evidence for exceptional circumstances was conducted in 2026 following the adopted guideline (IOTC-2021-SC24-R, appendix 6A) as per the requirements of Resolution 25/07. The review identified that the reduction in effort in the NW region by the Japanese longline fleet, that resulted in zero effort in 2024, and therefore no observation for the CPUE index used in the MP potentially represents an Exceptional Circumstance. Additionally, the SSB estimates fall outside of those estimated by the Management Strategy Evaluation, in particular the point estimate for the final year is more positive than those estimated by the MSE. Click here for full stock status summary: Appendix IV
Black marlin <i>Istiompax indica</i>	Catch 2024: 26,599 t Average catch 2020-2024: 21,894t MSY (1000 t) (80% CI): 13.90 (8.73-28.51)			62%			No new stock assessment was carried out for black marlin in 2025, thus, the stock status estimates are based on the stock assessment in 2024 using 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

	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)						were attributed to both historical catch reporting from key fishing states and poor assessment diagnostics. However, there has 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 (9,932 t) as stipulated in Resolution 18/05 have been exceeded for four consecutive years since 2020, which as per resolution 18/05, requires a review of the resolution. Furthermore, these limits are not based on estimates from the 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 V
Blue marlin <i>Makaira nigricans</i>	Catch 2024: 9,637 t Average catch 2020–2024: 8,851 t MSY (1000 t) (80% CI): 8.35 (7.52 –9.23) F_{MSY} (80% CI): 0.30 (0.21 – 0.38) B_{MSY} (1,000 t) (80% CI): 27.9 (22.3 – 39.9) F_{2023}/F_{MSY} (80% CI): 1.54 (1.16 – 2.06) B_{2023}/B_{MSY} (80% CI) : 0.62 (0.48 – 0.78) B_{2023}/B_0 (80% CI): 0.23 (0.18 – 0.29)	100%			97.4%		Stock status. No new stock assessment was carried out for blue marlin 2026, thus, the stock status estimates are based on the two different assessment models carried out in 2025: JABBA, a Bayesian state-space production model (age-aggregated); and SS3, an integrated model (age-structured) (using data up to 2023). Uncertainty in the biological parameters and the parameterisation of the SS3 model is still evident and as such the JABBA model ($B_{2023}/B_{MSY} = 0.62$, $F_{2023}/F_{MSY} = 1.54$) was selected as the base case. Both models were consistent with regards to stock status, although the SS3 model was less pessimistic. On the weight-of-evidence available in 2025, the stock is determined to be overfished and subject to overfishing. Management advice. The catches of blue marlin (average of 7,262 t in the final 3 years examined in the assessment, 2021–2023) were lower than MSY (8,351 t), however the catch in 2024 was higher than MSY. The stock is currently overfished and subject to overfishing, and according to the KOBE plot (Fig. 3), has been in this state since 2001 (with ~ 80 % CI). According to K2SM calculated at the time of the assessment, a reduction of 20% of catches (5,809 t) compared to the mean of catches from 2021–2023 (7,262 t) would recover the stock to the green quadrant by 2035 with a probability of 64 % and if the catches are reduced by 40 % (4,357 t) the probability would be 86 %. 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 30 % more (3,579 t) than the new MSY estimated by the latest stock assessment in 2025 (8,351 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 strengthen the implementation and effectiveness of the measures contained in this Resolution. Click here for full stock status summary: Appendix VI
Striped marlin <i>Kajikia audax</i>	Catch 2024: 5,827 Average catch 2020–2024: 3,689 t			100%			Stock status: No new stock assessment was carried out for striped marlin 2026, thus, the stock status estimates are based on two different assessment models carried out in 2024: JABBA, a

	MSY (1,000 t) (JABBA): 4.73 (4.22–5.24) 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): 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)						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. Management advice. Current or increasing catches have a very high risk of further decline in the stock status. The 2024 catches (4,334 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 The stock has been overfished for more than a decade and is now in a highly depleted state. Based on the Kobe II strategy matrix run in 2024, a 70% reduction in the average 2020–22 catch of 2,891 t (i.e. to a 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%. 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 VII
Indo-Pacific Sailfish <i>Istiophorus platypterus</i>	Catch 2024: 40,849t Average catch 2020–2024: 36,488t MSY (1,000 t) (80% CI): 34.3 (28.7–42.2)⁴ F_{MSY} (80% CI) : 0.20 (0.17–0.23)⁴ SB_{MSY} (1,000 t) (80% CI) : 174 (145–212)⁴ F_{2023}/F_{MSY} (80% CI) : 0.69 (0.51 – 0.94)⁴ SB_{2023}/SB_{MSY} (80% CI) : 1.34 (1.15 – 1.53)⁴ SB_{2023}/SB_0 (80% CI) : 0.67 (0.58 – 0.76)⁴ ⁴These figures are outputs from the 2025 stock assessment and are not endorsed for management advice. Please see the section on management advice for further explanations on these estimates.				92%		Stock status: No new stock assessment was carried out for Indo-Pacific Sailfish in 2026, thus, the stock status estimates are based on the JABBA assessment carried out in 2025, using data up to 2023. Prior to this, in 2015 and 2019, data poor methods (Catch-MSY) were utilised to provide stock status for Indo-Pacific sailfish. To overcome the lack of standardised CPUE indices or alternative abundance indices for this species, this assessment followed the methods of the previous assessment in 2022 where length-frequency data were used to estimate the annual Spawning Potential Ratio (SPR) using the length-based spawning potential ratio (LBSPR) method. Annual estimates of SPR were then normalised in the JARA (Just Another Red List Assessment) model to provide an index that was assumed to be proportional to spawning biomass. This index was then incorporated as an index of relative abundance in a JABBA model On the weight-of-evidence available in 2025, the stock status of Indo-Pacific sailfish is determined to be not overfished nor subject to overfishing Management advice: Considerable uncertainty remains in the JABBA assessment conducted in 2025, however the trends in key model outputs align relatively well with the 2022 assessment. For this year, due to the uncertainty in the model outputs, the management advice from 2022 would be carried over for one year (1 year) to allow time to complete the simulation studies and provide updated management advice in 2026. It is anticipated that, once the underlying uncertainty in the JABBA assessment is understood and presented at the proposed WPB meeting next year, management advice can be updated.

							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. 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 VIII
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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		

1. OPENING OF THE SESSION

1. The 24th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Billfish (WPB) was held in Reunion, using a hybrid format from the 9 to 12 September 2026. A total of 50 participants (36 in 2025, 47 in 2024, 97 in 2023, 51 in 2022) attended the Session (of which 25 attended in person). The list of participants is provided at [Appendix I](#). The meeting was opened by the Chairperson, Dr Jie Cao (China), who welcomed participants.

2. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

2. The WPB **ADOPTED** the Agenda provided in [Appendix II](#). The documents presented to the WPB24 are listed in [Appendix III](#).

3. THE IOTC PROCESS: OUTCOMES, UPDATES AND PROGRESS

3.1 Outcomes of the 28th Session of the Scientific Committee

3. The WPB **NOTED** paper [IOTC–2026–WPB24–03](#) which describes the main outcomes of the 28th Session of the Scientific Committee (SC28), specifically related to the work of the WPB:

Report of the 23rd Session of the Working Party on Billfish (WPB23)

85. The SC **NOTED** the report of the 23rd Session of the Working Party on Billfish ([IOTC–2025–WPB23–R](#)), including the consolidated list of recommendations provided as an appendix to the report. The meeting was attended by 36 participants (cf. 47 in 2024). Five participants received funding through the MPF.
86. The SC **THANKED** and **CONGRATULATED** the Chair and the WPB for their efforts and accomplishments during the 23rd Session of the WPB.
87. The SC **NOTED** the presentation from the Chair of the WPB and **THANKED** the WPB for completing a significant amount of work, including two stock assessments – for blue marlin (BUM) and Indo-Pacific sailfish (SFA).

Blue marlin stock assessment

88. The SC **NOTED** that the blue marlin (BUM) stock assessment was run using both JABBA and SS3, with the models providing similar outputs with regards to stock status. The SC **NOTED** that the SS3 model was used as model from which the stock status was taken, although it was **AGREED** by the WPB that the model required further development in the future. The SS3 model was a spatial model, with two areas (east and west), based on fleet dynamics, with both fixed M (instantaneous rate of natural mortality) and h (0.87).
89. The SC **NOTED** some concerns with assessment, including: 1) fixing both M and h essentially fixes the population dynamics of the stock; and 2) there were generally poor fits to abundance indices.
90. The SC **NOTED** the requested sensitivity runs during the WPB, that included several values of M, additional Francis-weighting of the length data, and retrospective analyses using the base case model.
91. The SC **NOTED** the results of the JABBA model where 10 + model runs were presented to the WPB with several data weighting scenarios, including inclusion / exclusion of specific CPUE indices, and the use of different production functions.
92. The SC **NOTED** the development of a sdmTMB model for a CPUE index, although there were concerns around the process error as this is trending upwards.
93. The SC **ACKNOWLEDGED** the KOBE II strategy matrix, including results of projections that suggest that a reduction in catch by 20% would return the stock to the green quadrant in 2035 with a probability of 64%, this percentage increases to 86% if the catch is reduced by 40%.

94. The SC **ACKNOWLEDGED** issues surrounding the CPUE indices in the BUM stock assessment, including changes to fisheries and the overall reduction in spatial coverage of individual fleets. The SC **AGREED** that joint work can produce more robust indices, while **NOTING** that data confidentiality between CPCs is an issue.
95. The SC **DISCUSSED** the possibility of developing BUM CPUE indices that do not include confidential data, **NOTING** that the WPB hopes to develop data inference approaches that can perhaps explore more ways to produce abundance indices.
96. The SC **ACKNOWLEDGED** that although developing a joint CPUE index is common for the WPTT, it is not common among other WPs in the IOTC, and **NOTED** that this process could be lengthy, and requires careful consideration, **NOTING** the greater number of CPCs involved in major billfish fisheries, unlike the fisheries that target tropical tunas. Notwithstanding these issues, the SC **NOTED** that the first steps towards joint CPUE indices would be the harmonisation of CPUE standardisation methods between CPCs involved in billfish fisheries.
97. The SC **AGREED** that the WPB should draft guidelines for longline CPUE standardisation with consistent methods, **NOTING** that the intent is not to prescribe a single model, but to improve reproducibility and transparency among the production of CPUE indices. The SC **SUGGESTED** that the IOTC Secretariat could coordinate this approach, with the work being presented at the WPM next year.
98. The SC **NOTED** that, for several years, joint analyses combining catch and effort data from major longline fleets have been proposed to improve the CPUE index for billfish species, and that the WPEB had previously recommended investigating methods to compare CPUE indices across fleets and to develop joint CPUE indices for bycatch species. The SC also **NOTED** that these joint analyses could harmonize standardization methods, reconcile conflicts between indices developed from different fleets, and potentially produce more robust indices with broader spatial and temporal coverage. The SC further **NOTED** that it is at the discretion of CPCs to determine the feasibility of such collaboration, considering data confidentiality agreements and other logistical arrangements. The SC **AGREED** on the importance of establishing a process to discuss how to move forward. **NOTING** that joint CPUE analysis arrangements already exist for the standardization of tropical and temperate tuna, the SC **RECOMMENDED** that the Commission urge CPCs to explore ways to extend joint analyses to non-targeted species, such as marlins.
99. The SC **DISCUSSED** the BUM stock status, and that the stock has been classified as overfished, and subject to overfishing, for over 20 years despite relatively stable catches over this time frame. This conflict between the stock status and catch data might suggest that the assessment may be overly pessimistic, or that the stock is extremely resilient. The SC **DISCUSSED** the implications of this conflict between catch data and the stock status, including the significant uncertainties associated with billfish catch data, including the increases in reported catches from gillnet fisheries, while **NOTING** that these catches only represent 22% of the reported BUM catches.
100. The SC also **DISCUSSED** the potential of cryptic biomass in BUM that could be supporting the stock but **AGREED** that it is extremely difficult to collect evidence for the existence of refuges or cryptic biomass.
101. The SC **AGREED** that BUM CPUE indices may not effectively or appropriately reflect changing fishing practices (e.g. changes to gear type or depth of fishing). Noting these issues, the SC **URGED** the development of standardised CPUE indices that account for these changes.
102. The SC **NOTED** that there have been unusually high catches of striped and blue marlin by purse seines in vert recent years. The SC **REQUESTED** the WPB and WPDCS to investigate these data to check if those estimates are realistic.

Indo-Pacific Sailfish stock assessment

103. The SC **NOTED** the stock assessment for Indo-Pacific sailfish, implemented in JABBA using the same methods as in 2022. The method uses length frequency data to estimate annual spawning potential ratios (SPR) which are then normalised in the Just Another Red List Assessment (JARA) model to develop an index of spawning stock biomass. This index of biomass is then used within the JABBA modelling framework as an abundance index alongside catch data.
104. The SC **DISCUSSED** the novel abundance index and **NOTED** that the method has not been fully evaluated, even though it was **AGREED** after the SC in 2022 that the method should be evaluated by the WPM prior to being implemented in 2025. Indeed, during the WPB, the assumptions of the method were questioned, particularly with respect to the fact that the trend in biomass could be the opposite of that estimated by the SPR.
105. The SC **NOTED** that model developers have outlined a simulation approach to test the robustness of the stock assessment methods used in 2022 and 2025. The SC **CONGRATULATED** the developers on making significant progress on this topic since the end of the 23rd WPB and **NOTED** that the results are likely to be ready prior to the 24th WPB.
106. The SC **NOTED** the weight-of-evidence approach used in 2025 to provide the stock status, using the results of the JABBA assessment and **ACKNOWLEDGING** that the status of the stock is consistent with the previous assessment. However, the SC **NOTED** the WPB's concerns regarding the reliability of the method, and that there were concerns regarding consistently high catches that are above the estimated MSY for several years.
107. Considering all this, the SC **AGREED** that the results of the current stock assessment should be revisited at the 24th WPB in 2026, alongside results of the simulation study.

Revision of catch levels of marlins under Resolution 18/05

108. The SC **NOTED** that the WPB received a presentation from Australia scientists on potential management options for billfish, summarising available scientific information, reviewing data and research gaps, and outlining potential management tools, including catch limits, non-retention measures, gear modifications, and improved data collection. The WPB **AGREED** not to recommend specific management tools at this stage, but instead to advise the SC that the Commission should urge CPCs to address critical data gaps and conducted required research.
109. The SC **DISCUSSED** the purpose and cost-effectiveness of the proposed gillnet experimental fishing trials, **ACKNOWLEDGING** that the approach could also generate very important information on target species and TEPS interactions and potential mitigation approaches associated with that gear type.
110. The SC **NOTED** that the broader issues of gillnet catch and effort data, and their implications for multiple WPs.
111. **NOTING** the necessity to gather information to enable the development of advice relating to a range of potential management measures to complement the commonly used CPC based catch advice, the SC **REQUESTED**:
 - That the IOTC Secretariat (or alternately CPCs, where the Secretariat does not hold a CPCs relevant data or information) provide summaries of observer data (or logbook data or other relevant information) to WPB pertaining to the following data types for the following fishery types:
 - **All gear/fishery types** – discarding/retention rates and at-haul mortality (%) for each marlin and sailfish species, by fishery/gear type
 - **Longline** – proportion of each fleet using different hook types and sizes (Japanese tuna, J hook, Circle hook, other)

- **Gillnet** – estimate of the proportion of the gillnet fleet using subsurface setting, and if possible, preferred depths used in fishery, and whether the fishery predominantly sets/soaks the gear overnight or through the day (or other).
 - CPCs to consider undertaking analyses (e.g., model-based) of at-haul mortality, at a longline fleet level (and if possible for troll/handline), to help identify key factors driving at-haul mortality and subsequently, possibly help identify additional options to reduce at haul mortality
 - CPCs individually or collaboratively conduct gillnet experimental fishing trials that:
 - Aim to test different setting depths and times of setting/soaking (e.g. day/night), on catch rates and mortality of interacting species
 - Collect data on all interacting species including billfish bycatch, target tuna and vulnerable species (e.g. cetaceans, turtles), in order to provide the Commission a quantified understanding of likely effects and possible trade-offs of various subsurface setting options, on each species.
 - Prioritise accurate species identification.
112. The SC **RECOMMENDED** that the Commission to give consideration to how best to financially and logistically support an experimental fishing trial with gillnets to be conducted by CPCs which would:
- Aim to test different setting depths and times of setting/soaking (e.g. day/night), on catch rates and mortality of interacting species
 - Collect data on all interacting species including billfish bycatch, target tuna and vulnerable species (e.g. cetaceans, turtles), in order to provide the Commission a quantified understanding of likely effects and possible trade-offs of various subsurface setting options, on each species
 - Prioritise accurate species identification

3.2 Outcomes of the 30th Session of the Commission

4. The WPB **NOTED** paper [IOTC–2026–WPB24–04](#) which provided the main outcomes of the 30th Session of the Commission specifically related to the work of the WPB.
5. The WPB **NOTED** that the new requirement by the Commission to obtain permission to attend IOTC Working Party meetings is not intended to restrict meeting participation, but rather to streamline and formalise the process and align with general practice in other RFMOs. Nevertheless, some participants expressed concerns that the new rule may limit participation due to the added administrative burden
6. Participants to WPB24 were **ENCOURAGED** to familiarise themselves with the previously adopted Resolutions, especially those most relevant to the WPB and **AGREED** to consider how best to provide the Scientific Committee with the information it needs, in order to satisfy the Commission's requests, throughout the course of the current WPB meeting.
7. The WPB **NOTED** that there was very little discussion related to the WPB and that the main items were the endorsement by the Commission of the SC information on stock status and Work Plan.
8. The WPB **AGREED** that any advice to the Commission would be provided in the Management Advice section of each stock status summary.

3.3 Review of Conservation and Management Measures relevant to billfish

9. The WPB **NOTED** paper [IOTC–2026–WPB24–05](#) which aimed to encourage participants at the WPB24 to review some of the existing CMMs relevant to billfish, noting the CMMs referred to in document IOTC–2026–WPB24–05, and - as necessary - to 1) provide recommendations to the SC on whether modifications may be required and 2) recommend whether other CMMs may be required.

3.4 Progress on the recommendations of WPB23

10. The WPB **NOTED** paper [IOTC-2026-WPB24-06](#) which provided an update on the progress made in implementing the recommendations from the previous WPB meeting which were endorsed by the Scientific Committee and **AGREED** to provide alternative recommendations for the consideration and potential endorsement by participants as appropriate given any progress.
11. The WPB **NOTED** that good progress had been made on these Recommendations, and that several of these, would be directly addressed by the scientists when presenting the results for 2025.
12. The WPB **NOTED** its recommendation to the SC in 2025 to dedicate efforts toward harmonizing standardized methods for different fleets and to develop a joint analysis that combines catch and effort data from key fleets for major billfish species. It was also **NOTED** that other working parties have made similar recommendations, as they are facing very similar issues. The WPB was informed that a joint trFMO longline CPUE workshop is planned for 2026, focusing on standardization methods for longline data.
13. The WPB participants were **ENCOURAGED** to review IOTC-2026-WPB24-06 during the meeting and report back on any progress in relation to requests or actions by CPCs that have not been captured by the report, and to note any pending actions for attention before the next meeting (WPB25).
14. The WPB **REQUESTED** that the IOTC Secretariat continue to annually prepare a paper on the progress of the recommendations arising from the previous WPB, incorporating the final recommendations adopted by the Scientific Committee and endorsed by the Commission.

4. NEW INFORMATION ON FISHERIES AND ASSOCIATED ENVIRONMENTAL DATA FOR BILLFISH

4.1 Review of the statistical data available for billfish at the Secretariat

15. The WPB **NOTED** paper [IOTC-2026-WPB24-07](#) on a review of the statistical data available for Indian Ocean billfish (1951-2023), with the following abstract provided by the authors:

“This paper reviews the fisheries, catch, and size data available for the five billfish species under the IOTC mandate, together with available information for shortbill spearfish, for the period 1950-2025. Total reported billfish catches have increased substantially over time, reaching a record level in 2025, largely due to recent reporting of catches from Somalia. The composition of billfish fisheries has changed markedly, with declining contributions from high-seas longline fisheries and increasing contributions from gillnet and coastal line fisheries, which now account for the majority of reported catches. Recent data submissions and revisions since WPB23 have improved the completeness of catch statistics and updated the catch series used for stock assessment, particularly for swordfish. The review also evaluates catches of species subject to Resolution 18/05 and indicates that reported catches of black marlin, striped marlin, and Indo-Pacific sailfish have exceeded their established catch limits for more than two consecutive years, while blue marlin catches exceeded the adopted catch limit in 2025. Particular emphasis is placed on recent submissions and revisions received since WPB23, current fishery characteristics, and the availability of fishery-dependent and biological data for billfish species in the Indian Ocean.”

16. The WPB **THANKED** the authors for the comprehensive study and **NOTED** that the review of catch levels against the limits established in Resolution [18/05](#) is now incorporated into this paper rather than presented separately as an INFO paper to the WPB.
17. The WPB **NOTED** that the paper is based on data available to the IOTC Secretariat as of September 2026 and covers the period 1950–2025. The catch data presented in the review are consistent with those used in the Indian Ocean swordfish stock assessment covering the period 1950–2024 and presented in paper [IOTC-2026-WPB24-27](#).
18. The WPB **ACKNOWLEDGED** that data for 2025 should be considered preliminary and may be subject to revision.

19. The WPB **NOTED** the substantial increase in reported billfish catches in recent years, including more than 20,000 t reported by Somalia in 2025 for the first time. Billfish catches reported for Somali coastal fisheries covered all five IOTC billfish species and included 7,370 t of striped marlin, a catch level considered unusual for coastal gillnet and line fisheries.
20. The WPB **NOTED** that mean annual catches reported for shortbill spearfish were approximately 4,000 t during the period 2021–2025, including catches of approximately 10 t reported by Reunion-based longliners.
21. The WPB **NOTED** the ongoing development by the IOTC Secretariat of a consolidated discard dataset based on data submitted through IOTC Form [1DI](#), which will complement the retained catch dataset and support more comprehensive analyses of total catches of billfish species.
22. The WPB **NOTED** that a review of the size-frequency data available for billfish species could be considered as part of the future Programme of Work, following an approach similar to that applied to tropical tunas by [Hoyle et al. \(2021\)](#), to assess the availability, coverage and quality of the data and identify potential issues affecting their use in scientific analyses.
23. The WPB **NOTED** the planned review of morphometric relationships for billfish species and the collection of additional morphometric data under the EU-funded EC1350 and SWIOP projects. The WPB further **NOTED** the importance of CPCs sharing available individual-level morphometric data through IOTC Form [5MB](#) to support the development and improvement of species-specific conversion relationships.
24. The WPB **NOTED** that some fisheries targeting oilfish (*Ruvettus pretiosus*) and escolar (*Lepidocybium flavobrunneum*) in the southwestern Indian Ocean may catch substantial amounts of tuna and tuna-like species, including billfish species, and **REQUESTED** the Secretariat to liaise with SIOFA to determine whether data on these catches are reported to the IOTC.
25. The WPB **NOTED** that coastal line fisheries from Sri Lanka catch substantial amounts of swordfish and have been monitored through logbooks since 2015. The WPB further **NOTED** that no CPUE analysis has been conducted for these fisheries, in which swordfish is caught as bycatch and specimens are highly processed.
26. The WPB **NOTED** that ICCAT recently recognised Atlantic sailfish (*Istiophorus albicans*; SAI) and Indo-Pacific sailfish (*Istiophorus platypterus*; SFA) as a single species, and that this taxonomic change has been incorporated into the latest version of the FAO [ASFIS](#) List of Species for Fishery Statistics Purposes, released in 2026.
27. The WPB **NOTED** that the Secretariat follows the standards established by the FAO Coordinating Working Party on Fishery Statistics ([CWP](#)) and has started adopting the English common name “Sailfish” in its documents. The WPB **AGREED** to adopt this nomenclature.
28. The WPB **QUERIED** whether the increase in reported billfish catches in recent years reflected an actual increase in catches or improvements in reporting. The WPB **ACKNOWLEDGED** that the observed increase likely reflects a combination of both factors, including improvements in species identification and reporting, but **NOTED** that the trends observed over the last 15-20 years were considered sufficiently reliable to indicate an underlying increase in catches.
29. The WPB **NOTED** paper [IOTC–2026–WPB24–10](#) on billfish fisheries in India with insights into the habitat preference and biology of swordfish from the western Indian EEZ, with the following abstract provided by the authors:

*“Billfishes support economically important artisanal, commercial, and recreational fisheries along the Indian coast, yet long-term assessments of their landings remain limited. This study analysed ten years (2016–2025) of landing statistics to evaluate temporal trends and species composition of Indian billfish fisheries. Sailfish (*Istiophorus platypterus*) dominated the landings, averaging $7,932 \pm 794$ t year⁻¹, followed by swordfish (*Xiphias gladius*) with $2,079 \pm 239$ t year⁻¹, and sailfish landings were significantly higher than swordfish throughout the study period (paired t-test, $p < 0.0001$). No significant long-term temporal trend was detected for either species despite marked interannual variability. Generalized Additive Model analysis*

showed that sea surface salinity (SSS), sea surface temperature (SST), sea surface height anomaly (SSHa), and current speed significantly influenced swordfish catch rates ($p < 0.05$), whereas chlorophyll-a was not significant, and the model explained 45.5% of the variation in catch rates. Swordfish exhibited higher habitat suitability in waters with SST of 25–29 °C, salinity of 32–37 ppt, positive SSHa (>4 m), and current speeds below 0.2 m s^{-1} , providing valuable information for habitat prediction, fisheries management, and sustainable exploitation of billfish resources in Indian waters. The lower jaw fork length (LJFL) of swordfish analysed between 2022–2025 ranged from 57.7 to 294.8 cm, with a mean of 135.8 cm, while body weight varied from 3.5 to 132.7 kg (mean: 22.6 kg). The length–weight relationship of swordfish was highly significant ($R^2 = 0.876$, $P < 0.001$) and was described by the equation $W = 2.27 \times 10^{-6} L^{3.131}$, with the allometric coefficient ($b = 3.131$) not differing significantly from the theoretical isometric value of 3 ($P = 0.15$), indicating isometric growth.”

30. The WPB **THANKED** the authors for the presentation and **CONGRATULATED** them on their work to estimate billfish catches at the species level, **NOTING** that approximately 40–50% of billfish catches had previously been reported under aggregated species codes.
31. The WPB **NOTED** that the compulsory 61-day fishing ban has been voluntarily extended in some Indian States and applies to all species.
32. The WPB **NOTED** that no time lag was considered in the GAMs between chlorophyll-a and swordfish catches, although a delayed response might be expected due to the transfer of energy from lower to higher trophic levels, and **ENCOURAGED** the authors to explore the potential effects of incorporating such a lag in the analyses.
33. The WPB **NOTED** the substantial variability in catches among billfish species and **ACKNOWLEDGED** that this may partly reflect the fact that billfish are predominantly caught as bycatch in these fisheries. The WPB further **NOTED** that catch trends are being monitored and that corrective measures have been taken to minimise variations in catch levels reported to the IOTC.
34. The WPB **QUERIED** whether the historical billfish catches reported under the aggregated species codes BXQ (Marlins nei) and AG02 (Indo-Pacific sailfish and shortbill spearfish) could be disaggregated by species. The authors clarified that such a reconstruction was not possible in the absence of historical information on species composition.
35. The WPB **DISCUSSED** whether the species composition estimated from the 2025 data could be used to disaggregate catches reported under aggregated species codes in previous years. The WPB **NOTED** that such an approach should be treated with caution, as the available species composition data cover only a subset of landing sites on the western coast of India and may not be representative of historical catches.
36. The WPB **NOTED** the substantial variability in the length–weight relationship presented for swordfish, including two apparent trends, and **QUERIED** whether this could reflect differences between sexes. The authors clarified that information on sex was not collected. The WPB **ENCOURAGED** the authors to further investigate the observed patterns in the length–weight data.
37. The WPB **NOTED** that individual length and weight measurements were collected from different fisheries and landing sites along the western coast of India and **ENCOURAGED** the authors to share these individual-level morphometric data with the IOTC Secretariat through Form [5MB](#).
38. The WPB **NOTED** that the maturity ogive for female swordfish was based on a relatively limited number of samples collected along the western coast of India, with sampling potentially not covering all months or spawning periods. The authors clarified that maturity was determined through microscopic examination of oocytes.
39. The WPB **NOTED** paper [IOTC–2026–WPB24–11](#) on the length frequency distributions of billfishes from Indonesian longline tuna fishery, with the following abstract provided by the authors:

“Billfish are high-value marine predators of significant ecological and socio-economic importance in the Indian Ocean, where Indonesia accounts for approximately 13% of total production. This study evaluates the maturity composition and length-frequency distribution of billfish species caught by the Indonesian tuna longline fishery between 2005 and 2021. Using data from 1,969 individuals collected by scientific observers, the research compares lower-jaw fork lengths (LJFL) with established length-at-first-maturity (Lm) values for six species: black marlin, blue marlin, striped marlin, Indo-Pacific sailfish, shortbill spearfish, and swordfish. The results indicate that while mature individuals were dominant in blue marlin and swordfish catches, a high proportion of immature individuals were harvested among Indo-Pacific sailfish, male black marlin, and female striped marlin. These findings reveal that fishing pressure varies significantly across species and life stages, with some species being caught before they have a chance to reproduce.”

40. The WPB **THANKED** the author for the presentation and **CONGRATULATED** them for the use of length-frequency data from observer records and estimates of billfish length at first maturity.
41. The WPB **NOTED** that swordfish were the dominant species in the dataset and that females were generally larger than males for most billfish species, except sailfish. **NOTING** that no data were available for female black marlin or shortbill spearfish; consequently, maturity estimates could not be derived for females of these species.
42. The WPB **NOTED** that blue marlin and swordfish were predominantly composed of mature individuals compared with other billfish species.
43. The WPB **QUERIED** whether monthly data were available to monitor spawning activity; however, the data were only available at an annual resolution.
44. The WPB **NOTED** that, although Indonesian billfish catch data are available through 2025, the study relied on observer data collected in Bali between 2016 and 2021. **NOTING** that as the research institute closed in 2022 and observer activities ceased following the transfer of the research division to the Ministry, no more recent observer data were available.
45. The WPB **NOTED** paper [IOTC–2026–WPB24–13](#) on the development of morphometric conversion equations for blue marlin and striped marlin using observer-collected photographs from Sri Lankan multiday fisheries, with the following abstract provided by the authors:

*“Blue Marlin (*Makaira mazara*) and Striped Marlin (*Kajikia audax*) are important billfish species in Sri Lankan offshore fisheries. However, these species are frequently processed at sea before landing, resulting in the loss of morphological features required for standard length measurements, particularly lower jaw–fork length (LJFL), and creating gaps in biological data available for fisheries monitoring, stock assessment, and reporting to the Indian Ocean Tuna Commission (IOTC). This study developed species-specific morphometric conversion equations to estimate LJFL from alternative body measurements using whole-fish photographs collected through the National Observer Programme on Sri Lankan multiday fishing vessels operated during 2025/2026. A total of 66 Blue Marlin and 32 Striped Marlin specimens were analyzed. We measured lower jaw–fork length (LJFL), pectoral–second dorsal length (PDL), and pectoral–anus length (PAL) from standardized photographs and developed linear regression models to establish relationships among the three measurements. Strong linear relationships were observed for both species. For Striped Marlin, the strongest relationship was between LJFL and PDL ($R^2 = 0.94$), while the corresponding relationship for Blue Marlin was also strong ($R^2 = 0.92$). Relationships involving PAL produced R^2 values of 0.81 for Striped Marlin and 0.80 for Blue Marlin. The developed equations provide a practical means of reconstructing standard-length measurements when direct LJFL measurements are unavailable, thereby improving the consistency and compatibility of biological data collected under different sampling protocols. These results address an important gap in standardized billfish biological data and provide a useful tool for improving biological data reporting to the IOTC, fisheries monitoring, and stock assessment of Blue Marlin and Striped Marlin in the Indian Ocean.”*

46. The WPB **THANKED** the author for the innovative work undertaken to develop morphometric conversion relationships for blue marlin and striped marlin using measurements derived from photographs collected by observers aboard Sri Lankan multiday fishing vessels. The WPB **NOTED** the relatively small sample sizes available for the analyses and **ACKNOWLEDGED** that data collection would continue to increase the number of observations available.
47. The WPB **QUERIED** whether the approach could be extended to black marlin and **NOTED** that this would depend on the availability of sufficient observations for this species.
48. The WPB **NOTED** that a similar approach had previously been applied to sailfish, although direct measurements could also be collected at landing sites for this species, as sailfish may be landed whole, contrary to marlins which are generally processed at sea.
49. The WPB **NOTED** that reference markers of known dimensions were included in the photographs to calibrate measurements obtained using the image analysis software. The WPB further **NOTED** that measurement uncertainty may increase for larger and thicker specimens due to their positioning and body shape, and that observations associated with excessive uncertainty were excluded from the analyses.
50. The WPB **ENCOURAGED** the authors to compare the morphometric relationships developed for blue marlin and striped marlin with those available from other CPCs and **NOTED** the importance of making the underlying individual-level morphometric data available to facilitate comparisons among fisheries and regions and support the development of more robust conversion relationships.
51. The WPB **NOTED** paper [IOTC-2026-WPB24-14](#) on the preliminary length frequency characterization of Indo-Pacific sailfish from purse seine fishery in the Andaman Sea of Thailand, with the following abstract provided by the authors:

“This study presents a preliminary length-frequency analysis of landed Indo-Pacific sailfish sampled from purse seine fishery in the Andaman Sea of Thailand. The length data was monthly collected in year 2025. The result showed that 85 sailfishes were sampled across eleven months of the year (no individuals recorded in July). Monthly sample sizes were highly uneven (range 0–19 individuals). The samples ranged from 45.5 to 209.5 cm LJFL (average length is 108.6 ± 37.9 cm; median = 99.5 cm). The statistical analysis showed no significant difference in length and individual encounter among monsoon seasons. The majority of sampled individuals (77.6%) were smaller than the reference length at maturity for the species reported in FishBase (150 cm). Comparison with longline-based studies from the adjacent areas, which report larger individuals suggesting that the Andaman Sea potentially are nursery or aggregation habitat of this species. Given the sparse in length data, this study provides a preliminary size structure for this data limited species in the eastern Indian Ocean supporting future researches.”

52. The WPB **NOTED** the preliminary analysis of length-frequency data for Indo-Pacific sailfish caught by the purse seine fishery in the Andaman Sea of Thailand, based on measurements from 85 specimens sampled from approximately 70 t of catches in 2025, and **NOTED** that additional data will be collected to further develop the analysis.

5. SWORDFISH (PRIORITY SPECIES FOR 2026: SWORDFISH)

5.1 Review new information on marlin biology, stock structure, fisheries and associated environmental data (all)

53. The WPB **NOTED** paper [IOTC-2026-WPB24-15](#), which provided an update of the sex-specific growth parameters for swordfish in the tropical Indian Ocean for the 2026 IOTC stock assessment, with the following abstract provided by the authors:

“Updated sex-specific growth parameters are provided for Indian Ocean swordfish for consideration in the 2026 IOTC stock assessment. The analysis is based on 834 anal-fin ray specimens and 181 otolith specimens collected by Taiwanese scientific observers from major tropical Indian Ocean longline fishing grounds between May 2007 and April 2008. Four back-calculation formulations were evaluated in the full analysis,

but this working paper focuses on the simplified modified Fry-type formulation (MF) as the reference scenario for assessment use. Otolith daily increment information was used as a complementary population-level constraint on early growth, and uncertainty was quantified through 1000 fish-level bootstrap iterations. Reference MF estimates were $L_{\infty} = 274.31$ cm, $K = 0.136$ yr⁻¹, and $t_0 = -1.904$ yr for females and $L_{\infty} = 243.01$ cm, $K = 0.156$ yr⁻¹, and $t_0 = -1.992$ yr for males. MF produced the lowest median RMSE for both sexes, although its fit did not differ significantly from the biological-intercept formulation. These historical data represent a regional tropical Indian Ocean growth scenario rather than a contemporary basin-wide growth curve, but they provide a documented sex-specific growth option with explicit uncertainty for stock assessment sensitivity analyses”.

54. The WPB **THANKED** the authors for the study, which provided updated sex-specific growth parameters for swordfish that were used in sensitivity runs of the 2026 stock assessment.
55. The WPB **NOTED** that the estimated growth curve did not fit well the growth estimates derived from otoliths for fish less than one year old and **ENCOURAGED** the authors to explore the use of a two-stage growth model, as applied to other tuna and billfish species. The authors **ACKNOWLEDGED** the relevance of this approach while noting that the primary objective of the study was to update the existing growth curve for use in the 2026 stock assessment.
56. The WPB **QUERIED** the potential effect of fishery selectivity on the estimated growth parameters. The authors clarified that selectivity was not explicitly accounted for in the growth model and **NOTED** that, although selectivity can strongly affect growth estimates derived from length-frequency data, its effect was expected to be less pronounced for estimates based on annual and daily growth increments from biological samples. The WPB **NOTED** that approaches accounting for selectivity, including the use of conditional length-at-age data within the stock assessment model, could be explored in future analyses.
57. The WPB **QUERIED** whether variability in the vascularisation of fin rays could affect the identification or interpretation of growth increments and potentially result in an underestimation of growth. The authors **NOTED** that the back-calculation approach used in the study was intended, among other considerations, to mitigate potential biases associated with this issue.
58. The WPB **NOTED** that the biological samples used in the study were collected up to 2008 and comprised 834 fin-ray samples and 181 otolith samples, limiting the ability to investigate temporal or spatial differences in growth. The WPB **EMPHASISED** the importance of continuing biological sampling and expanding the collection of samples across fisheries and areas of the Indian Ocean to support future analyses of swordfish growth.
59. The WPB **NOTED** that no differences in growth between northern and southern areas were considered in the analysis and **ENCOURAGED** further investigation of spatial differences in growth, taking into account current knowledge of the potential population structure of swordfish in the Indian Ocean. The WPB further **NOTED** that the limited number and spatial coverage of existing samples currently constrain such analyses.
60. The WPB **NOTED** that otolith weights had not been recorded for the samples used in the study and that no associated genetic samples were available. The WPB **NOTED** that otolith weight could provide useful complementary information for ageing, given the relationships between otolith weight and age demonstrated for some fish species.
61. The WPB **EMPHASISED** the need for a coordinated sampling programme to collect new biological samples of swordfish across the Indian Ocean, including through ongoing and planned research projects and in collaboration with CPCs such as India and Sri Lanka. The WPB **NOTED** that sampling should, where possible, include structures suitable for conventional ageing as well as associated tissue samples for epigenetic ageing and genetic analyses to complement the recent analysis of the population structure of the stock by [Chevrier et al. \(2025\)](#).
62. The WPB **NOTED** that the EC1350 and SWIOP projects were approved in late December 2025 and therefore could not be presented to the Scientific Committee at its previous session. The WPB **ACKNOWLEDGED** the interest expressed by several participants in receiving further information on the projects and opportunities for scientific collaboration. The Secretariat clarified that implementation of SWIOP started in January 2026,

with the project coordinator, based in Maputo, Mozambique, taking up duties in June 2026, followed by the recruitment of the project team and the IOTC/SIOFA coordinator in September 2026. The WPB **NOTED** that further information on both projects will be presented to the Scientific Committee in December 2026 and made available through the IOTC website.

63. The WPB **NOTED** that EC1350 includes a pilot biological sampling component targeting three main landing sites in Victoria (Seychelles), Negombo (Sri Lanka) and Benoa (Indonesia), while SWIOP includes a component on the establishment, through a direct grant to Ifremer, of a biological sample bank hosted in Reunion Island. The sample bank will store soft and hard tissues, but not whole fish specimens, and associated information on available samples will be made accessible to CPCs. The WPB **ACKNOWLEDGED** the strong interest of participants in the development of the sample bank and **NOTED** that the pilot initiative could provide a basis for planning larger-scale collaborative sampling programmes with balanced sampling designs covering the Indian Ocean and the habitats of the stocks concerned.

5.2 Review Nominal and standardised CPUE indices of swordfish

64. The WPB **NOTED** paper [IOTC-2026-WPB24-16](#) which provided information on standardized catch rates of swordfish based on observer data from the French Réunion-based pelagic longline fishery in the South-West Indian Ocean, including the following abstract provided by the authors:

*“For the upcoming stock assessment of swordfish (*Xiphias gladius*), we developed a standardized catch-per-unit-effort (CPUE) series for this species, based on the French Reunion-based pelagic longline fishery operating in the southwestern Indian Ocean. We used observer and self-reported data collected between 2007 and 2025. This observer-based series is intended to be compared with a second standardized CPUE derived from logbook data. Observer data provide more detailed information for standardization, whereas logbook data provide broader fishery coverage. Comparing the trends derived from these two data sources will provide an opportunity to assess the consistency of the resulting indices of relative abundance. Temporal, spatial, operational and environmental covariates were considered during model selection. Three modelling approaches were evaluated: conventional Generalized Linear Mixed Models (GLMMs), GLMMs incorporating a spatial random field, and a GLMM incorporating a spatiotemporal random field, with the latter two fitted using the sdmTMB R package. Poisson and Negative Binomial distributions were also compared. The retained index was estimated using a GLMM with a spatiotemporal random effect and a Negative Binomial distribution, which provided the best fit to the overdispersed catch data. For the upcoming swordfish stock assessment, we recommend using the standardized CPUE series for the period between 2011 and 2025, during which monitoring coverage is substantially higher than in the earlier years. Over this period, the standardized swordfish CPUE shows a slight but statistically significant increasing trend”*

65. The WPB **NOTED** the presentation of the standardized swordfish CPUE index developed for the Réunion Island-based pelagic longline fishery operating in the southwestern Indian Ocean. The index was developed using a combination of observer and self-reported data, which provide more detailed operational information than logbooks, and is intended to be compared with a separate logbook-based index. Observer coverage was approximately 14%. A range of temporal, spatial, operational and environmental covariates were examined, and the preferred model was a spatio-temporal GLMM with a negative binomial distribution.
66. The WPB **NOTED** that the standardized CPUE trend was generally similar to but smoother than the nominal CPUE series. However, data coverage was relatively low before 2011, increasing substantially thereafter. On this basis, the authors recommended that only the 2011-2025 portion of the series be considered in future stock assessments. Over this period, the standardized index showed a slight but statistically significant increasing trend. The trend was also consistent with the logbook-based index presented at the WPB ([IOTC-2026-WPB24-17](#)), providing additional confidence in the index.
67. The WPB **THANKED** the authors for the valuable contribution and raised several questions regarding model assumptions and interpretation.
68. The WPB **NOTED** the CPUE index resulting from this standardization process is believed to reflect a genuine increase in swordfish abundance rather than changes in fishing dynamics or efficiency over time, since these should be corrected for in the standardization process. The WPB **SUGGESTED** that future analyses include

information on the temporal distribution of key explanatory variables to assess whether their influence remains stable through the series.

69. The WPB **NOTED** Diagnostic analyses indicated a good model fit. Although statistically significant deviations were observed between the observed and expected residuals, these deviations were small and were not considered to affect confidence in the model.
70. The WPB **NOTED** below results from the standardisation analysis:
- Swordfish catches increased with soaking time up to a certain point, after which catches decreased. This decline may be related to depredation of caught swordfish.
 - Swordfish catch rates were higher in shallow sets and lower in deeper sets.
 - Seasonal patterns were also evident, with higher catch rates between November and January and lower rates during April and August
 - Bait type was considered during the model selection process but was not retained in the final model. On average, fishers from Reunion used both squid and fish bait in approximately equal proportions.
 - The final model included a spatiotemporal random effect and the effect of month may vary according to location.
 - The moon illumination showed a non-linear relationship with CPUE, with higher catch rates at intermediate levels of moonlight and lower rates during full and new moon periods, likely reflecting changes in prey availability and vertical migration, and theoretical moon illumination was preferred over moon phase as a covariate.
71. Based on these discussions, the WPB **SUGGESTED**:
- The authors investigate temporal changes in the covariates, notably the use of circle hooks, to assess whether changes in fishing practices may be driving the resulting standardized CPUE trend.
 - The authors consider including a spatial-month interaction effect in the model.
 - The authors consider cloud coverage/weather conditions when analyzing the effect of moon illumination, as cloud cover may reduce the amount of available light and consequently influence the depth distribution of micronekton and swordfish prey (**NOTING** that moon illumination is calculated based on date and location)
 - The use of conditional Akaike Information Criterion (cAIC) for model construction (because random effects are included). Using cAIC instead of the conventional AIC could potentially lead to different covariate selection.
72. The WPB **NOTED** paper [IOTC-2026-WPB24-17](#) which provided information on standardized catch rates of swordfish based on logbook data from the French Réunion-based pelagic longline fishery in the South-West Indian Ocean, including the following abstract provided by the authors

“The Réunion pelagic longline fleet has operated in the southwest Indian Ocean since the late 1990s and constitutes one of the longest continuously monitored swordfish fisheries in the region. This paper presents the first standardized swordfish CPUE index for this fleet, based on 155,959 fishing sets recorded in the SACROIS logbook database between 2005 and 2025, representing approximately 220.6 million hooks and 14,700 t of swordfish. Because raw effort records contained implausible values, the number of hooks per set was reconstructed from an auxiliary vessel-year hook database. Three standardization frameworks were evaluated and compared: a DeltaLognormal generalized additive model separating encounter probability from positive catch rates, a single-stage Tweedie GAM, and a spatiotemporal generalized linear mixed model fitted with sdmTMB. All models accounted for year, quarter, fishing métier, vessel identity and spatial location. The three approaches produced closely convergent abundance trajectories (pairwise correlations of 0.956–0.991) describing three phases: an initial decline to 2008, a decade of relative stability to 2018, and a sustained increase thereafter. Relative to the 2005 baseline, standardized CPUE approximately doubled by 2025. The persistence of this trend after accounting for changes in fishing strategy, fleet composition and spatial distribution indicates that it cannot be attributed solely to changes in fishing practices, and is

consistent with increased swordfish availability to the Réunion fleet. Standardized CPUE nevertheless remains an index of availability to the gear rather than a direct measure of stock biomass, and operational variables known to influence catchability – hook depth, bait and hook type, soak duration and light-stick use – were unavailable in the logbook records. The convergence of results across three conceptually distinct frameworks supports the robustness of the index and its suitability as a regional abundance indicator for Indian Ocean swordfish stock assessment but only for sensitivity analyses with respect to the strong limitations of the standardization process identified in the document”

73. The WPB **NOTED** the presentation of the standardized swordfish CPUE index developed for the Réunion pelagic longline fleet, based on logbook records from 2005-2025 covering approximately 156,000 fishing sets. Three alternative standardization approaches were evaluated (Delta-Lognormal GAM, Tweedie GAM and a spatio-temporal GLMM), all of which produced highly similar abundance trends. The authors proposed the Tweedie-GAM index as the operational abundance index for the Réunion fishery and recommended its use as a sensitivity analysis in future Indian Ocean swordfish stock assessments, given limitations in the available logbook information. The standardized indices showed an initial decline to 2008, relative stability until around 2018, and a sustained increase thereafter, with CPUE approximately doubling by 2025 relative to the 2005 baseline.
74. The WPB **THANKED** the authors for the presentation and focused discussion on the strong increase (2-fold) in CPUE observed in recent years. The WPB **ASKED** whether the trend reflected increasing swordfish abundance or changes in fishing practices and technology. The authors explained that swordfish size composition has remained relatively stable, as well as fishing practices, targeting and gear configuration. Authors argued that increased use of improved satellite tools in the last 10-12 years (especially these last 3 years with the development of AI), and favourable environmental conditions may have contributed to the observed increase, although the causes require further investigation. The WPB believe that environmental conditions are currently favourable and **SUGGESTED** that environmental production indices be investigated.
75. The WPB **NOTED** that similarly strong increases have been observed in catch rates of other pelagic predators in the region, including bigeye and yellowfin tuna, suggesting that broader changes in ocean productivity may be contributing to the observed increase. The WPB also **NOTED** that satellite-derived information has been used by the fleet for many years and is therefore unlikely to fully explain the recent increase, although improvements in environmental information available to fishers may have contributed. The authors further emphasized that the increasing trend persisted after accounting for changes in fishing strategy, vessel composition and spatial distribution, suggesting that the trend cannot be explained solely by changes in fishing practices.
76. **NOTING** that French longliners in the Mediterranean have started using traplines these last years, the WPB **NOTED** this was not the case in the Réunion fishery where traplines are not currently used, supposedly because fishers not only target swordfish but also tuna and are therefore not keen on using traplines.
77. The WPB **NOTED** that the Secretariat raised a concern regarding the consistency of trends between data submitted to the Secretariat and the standardized CPUE presented in the paper. This would need to be investigated.
78. The WPB **NOTED** that although the convergence of results across multiple modelling approaches provides confidence in the robustness of the index, important operational variables known to influence catchability, including hook depth, bait type, hook type, soak time and light-stick use, were unavailable in the logbook records. Consequently, the WPB **AGREED** that the index is a useful indicator of swordfish availability to the fishery but should be considered primarily as a sensitivity index within future stock assessments.
79. The WPB **NOTED** paper [IOTC-2026-WPB24-18](#) on an update of the swordfish catch, effort and standardized CPUEs by the Portuguese pelagic longline fleet operating in the Indian Ocean, between 1998 and 2024, including the following abstract provided by the authors:

“The Portuguese pelagic longline fishery in the Indian Ocean started in the late 1990’s, targeting mainly swordfish in the southwest. This document updates that analysis with regards to catch, effort and standardized CPUE trends for the Portuguese fleet operating in the Indian Ocean. Nominal annual CPUEs were calculated as kg/1000 hooks and were standardized with Tweedie Generalized Linear Mixed Models (GLMMs) using year, quarter, area and targeting ratios as fixed factors, and the vessel effect as a random

variable. Model goodness-of-fit and validation was carried out with AIC, deviance explained and residual analysis. Overall, the standardized CPUE series showed an initial high level in 2000–2003, a decline through the mid-2000s with a partial recovery in 2007–2008, a lower and relatively stable period between 2009 and 2021, and an increase in the most recent years (2022–2024), though potential gear-related effects may contribute to this recent pattern and warrant further investigation. The results present an updated annual index of abundance for the swordfish captured by the Portuguese pelagic longline fleet in the Indian Ocean that can be integrated in stock assessment models for that species in the region”

80. The WPB **NOTED** that the standardized CPUE of swordfish caught by the Portuguese pelagic longline fleet was relatively stable between 2009 and 2021, followed by an increase in recent years.
81. The WPB **NOTED** that the fishing effort of the Portuguese fleet is mainly concentrated in the southwestern area, while relatively few sets are conducted in the eastern part of the Indian Ocean. The WPB **NOTED** that CPUE estimates in areas with low fishing effort may be strongly influenced by a limited number of observations and potential outliers, like larger swordfish increasing artificially the CPUE.
82. **ACKNOWLEDGING** that the overall standardized index is primarily driven by the southwest region, the WPB **ENCOURAGED** the authors to investigate the temporal trends in CPUE separately by area. The WPB **SUGGESTED** that examining regional trends could help assess whether similar trends are observed across areas and to compare these CPUE to the one of other fleets.
83. The WPB **NOTED** that the available data could potentially allow for a more detailed spatial stratification than the five spatial areas used in this standardization. The WPB **SUGGESTED** investigating alternative approaches based on the 5°x5° spatial squares, either as a fixed effect or as a random effect, and comparing the resulting CPUE indices with those obtained using the five areas.
84. The WPB **NOTED** that Portuguese longliners have recently been using 30-40% of traplines in combination with hooks in their fishing operations. The WPB further **NOTED** that catch rates achieved with traplines are significantly higher for swordfish. The WPB therefore **SUGGESTED** that the increase in swordfish CPUE observed in the last years be related to the recent use of traplines by the Portuguese fleet.
85. The WPB **ENCOURAGED** the authors to investigate the potential effect of trapline use on swordfish catch rates and, if possible, to include information on trapline use as an additional covariate in future CPUE standardizations. The WPB also **DISCUSSED** the possibility of conducting separate analyses for sets using and not using traplines, or alternatively excluding sets conducted with traplines from the standardization, depending on the availability and quality of the information.
86. The WPB **NOTED** that information on the use of traplines is available from observer data for some fishing trips, as observers record whether fish were caught using traplines or conventional hooks, but observer coverage is currently limited and varies among years. The WPB **NOTED** that some information is also available from forms that vessels are required to complete when using traplines. However, this information is not currently available systematically for all fishing sets, and the number of swordfish caught using traplines versus conventional hooks cannot be determined at the moment. The WPB further **NOTED** that new logbook forms have been developed to collect more detailed information on trapline use, and that observer data could potentially be used to assess the consistency of the information reported in logbooks.
87. The WPB **NOTED** that the ratio of swordfish to swordfish-blue shark was used as an explanatory variable and that swordfish represented approximately 90–95% of the catches in most cases. The WPB **NOTED** that the fleet may modify gear configuration depending on whether swordfish or blue shark is targeted, and that traplines are used preferentially when targeting swordfish
88. The WPB **NOTED** paper [IOTC-2026-WPB24-19](#) which provided information on updated standardized catch rates of swordfish Caught by the Spanish surface longline fleet in the Indian Ocean During the 2001-2024 period, including the following abstract provided by the authors:

“This paper provides an updated of the standardized catch rates per unit of effort (CPUE) in number and in biomass for the swordfish Indian Ocean stock using Generalized Linear Models. A total of 3,504 trips, representing 91% of coverage of the Spanish surface longline fleet targeting swordfish, are analyzed for the

period 2001-2024. The main factors considered in the analysis were year, quarter, area, gear, targeting criteria of skippers and the interaction quarter-area. The results indicate that the skipper's target criteria was the most important factor explaining CPUE variability, followed by year and, to a lesser extent, the other factors considered. The model explained 53% and 56% of CPUE variability in number and weight, respectively. The standardized CPUE show a stable trend until 2021 followed by a slight increase afterward"

89. The WPB **NOTED** that the standardized catch rates of swordfish caught by the Spanish surface longline fleet were globally stable between 2001 and 2024.
90. The WPB **NOTED** that the mean weight of swordfish remained quite stable during the time series (approximately 50 kg). The WPB **DISCUSSED** the relatively high and stable mean weight of individuals caught by the Spanish fleet and whether this could be related to the spatial distribution of the fleet or to potential selectivity in the retention of individuals. The WPB **NOTED** that similar patterns of stable swordfish length distributions over time have been observed in other fisheries in the Indian Ocean, such as the French longline fishery.
91. The WPB **ASKED** how the spatial areas used in the standardization were defined. The authors explained that the spatial stratification followed previous analyses and that the spatial areas were defined based on the sea temperature at a depth of 50 meters. The WPB **NOTED** that a single standardized CPUE index was derived for the entire Indian Ocean, while the swordfish stock assessment considers four spatial areas. The WPB **NOTED** that the Spanish fleet's fishing activity and the resulting CPUE index are mainly representative of the southwestern Indian Ocean, where fishing effort is most concentrated.
92. The WPB **NOTED** paper [IOTC-2026-WPB24-20](#) which provided information on updated standardized catch rates of swordfish caught by the South African surface longline fleet in the Indian Ocean, including the following abstract provided by the authors:

"A standardised CPUE index for swordfish (Xiphias gladius) is presented, derived from 10 826 sets recorded by the South African pelagic longline fleet operating along the east coast of South Africa between 2004 and 2025. A tweedie generalised additive mixed model (GAMM) was used to account for zero inflation in the catch data. Covariates included year, month, fishing tactic, and a two-dimensional spatial smoother representing the spatial distribution of fishing effort, with vessel included as a random effect to account for vessel-specific differences in catchability. Model selection via the corrected Akaike Information Criterion (AICc), with all covariates contributing meaningfully to explaining variation in catch rates. Marginal means with spatial averaging were used to derive the standardised year index, isolating the year effect and spatial effect from the influence of seasonal and operational covariates. Residual diagnostics confirmed adequate model fit. The standardised CPUE index showed a stable trend up to 2017 and indicates an increase in abundance since. Swordfish CPUE had a definitive seasonal trend, with catch rates higher in winter (July - October) than in the rest of the year"

93. The WPB **NOTED** the updated standardised CPUE series for swordfish from the South African pelagic longline fishery for the period 2004–2025, which showed a general increase in relative abundance in recent years, particularly since 2021. The WPB further **NOTED** that this recent increasing trend was broadly consistent with trends observed in other swordfish CPUE series, including those from Japan, La Réunion (EU, France) and Taiwanese. The consistency among several independent indices may indicate a broader increase in swordfish abundance and/or changes in stock productivity, although other factors affecting catchability and availability should also be considered.
94. The WPB **ENCOURAGED** further comparative analyses of the available CPUE indices to investigate the coherence of recent trends among fleets and regions and their implications for the interpretation of swordfish stock productivity.
95. The WPB **NOTED** that the South African national dataset used for the CPUE standardisation was restricted to catches east of 29°E to minimise potential mixing between Atlantic and Indian Ocean swordfish stocks. Consequently, nominal catches derived from this dataset may differ from those reported in the IOTC database, which are based on the IOTC area of competence (>20°E).

96. The WPB **NOTED** paper [IOTC-2026-WPB24-22](#) which included the CPUE standardization for swordfish (*Xiphias gladius*) by Japanese longline fishery in the Indian Ocean using zero-inflated Bayesian hierarchical spatial model, including the following abstract provided by the authors:
- “CPUE standardization of swordfish (1994-2024) in the Indian Ocean was conducted using data from four areas (NW, NE, SW, and SE) collected by Japanese longliners. We applied Bayesian hierarchical spatial models to standardize the CPUE. Since the catch data contained many zero observations, we used zero-inflated Poisson generalized linear mixed model (ZIP-GLMM). To ensure consistency with the previous stock assessment, the model structures adopted in Matsumoto et al. (2023) were retained and applied to the updated dataset without modification. The standardized CPUE trends were generally similar among areas, although some differences were evident. The standardized CPUE declined from the mid-1990s to the early 2000s in all areas, whereas subsequent trends differed among areas. Comparison with previous studies indicated that the temporal trends in standardized CPUE were generally consistent among studies for each area”*
97. The WPB **NOTED** the standardisation of Japanese longline swordfish CPUE data (1994-2024) were updated for the four assessment regions (NW, NE, SW and SE). The analysis used the same Bayesian hierarchical spatial zero-inflated Poisson GLMM (ZIP-GLMM) applied in the previous assessment to maintain consistency. Standardised CPUE trends were generally similar to previous studies, showing declines from the mid-1990s to early 2000s across all regions before diverging regionally. The updated indices were largely consistent with nominal CPUE, except in the NE region where some unexplained divergence remained.
98. The WPB **DISCUSSED** extensively on the Northwest (NW) region, where Japanese fishing effort has declined substantially in recent years and no observations were available in 2024. Several members questioned the use of a standardised CPUE value for 2024 when it was derived entirely from model predictions rather than observations. The authors explained that the Bayesian framework allows prediction in years without data but acknowledged that declining effort in the NW has become a significant issue for the Japanese index.
99. The WPB **NOTED** the concern that both the Japanese and Taiwanese indices have experienced reduced spatial coverage in the NW region over the past decade, raising questions about their representativeness. It was **NOTED** that this issue had already been identified in 2024 and would be revisited during discussions on the Exceptional Circumstances consideration of the swordfish MP, as it could have important implications for the implementation processes of the MP.
100. The WPB **NOTED** the argument that years with no observations, such as 2011 and 2024 in the NW region, should not be included as relative abundance estimates in stock assessments, even if model predictions are available. The WPB **SUGGESTED** conducting sensitivity analyses that remove the 2024 (and potentially 2011) NW values from the assessment to evaluate their influence. It was also **SUGGESTED** that the model's predictive ability could be evaluated through hindcast testing by using data up to 2023 to predict subsequent observations.
101. The WPB **NOTED** that the Japanese series remains one of only two abundance indices available for the NW region, meaning its removal would leave very limited information for assessment purposes. This highlighted the need to develop additional abundance indices for the area.
102. The WPB further **DISCUSSED** the representativeness of the current spatial stratification, given that larger swordfish appear to be concentrated in temperate waters that also support high catches, fishing effort and CPUE. It was **SUGGESTED** that the current regional structure used in the standardisation may warrant further review. Questions were also raised regarding the large difference between nominal and standardised CPUE in the SE region, although no clear explanation was identified. The authors further pointed out that the large number of zero catches in the NW region is linked to low fishing effort and seasonal changes in fishing activity, supporting the use of a zero-inflated modelling approach.
103. The WPB **AGREED** that the updated Japanese CPUE series remains broadly consistent with previous analyses but that the use of predicted values in years without observations requires further consideration. The issue will be revisited under the Exceptional Circumstances discussions, with sensitivity analyses requested to evaluate the impact of excluding prediction-only years from the stock assessment.

104. The WPB **NOTED** paper [IOTC-2026-WPB24-23](#) which provided the CPUE standardization of swordfish (*Xiphias gladius*) caught by Taiwanese large-scale longline fishery in the Indian Ocean, including the following abstract provided by the authors:

*“This study standardized catch-per-unit-effort (CPUE) for swordfish (*Xiphias gladius*) caught by the Taiwanese large-scale longline fishery in the Indian Ocean using a spatiotemporal model implemented in sdmTMB. Operational logbook records from 2005 to 2023 (602,219 fishing sets) were analyzed. Fishing strategy was represented by five clusters derived from hierarchical clustering of catch composition in the same 2005–2023 whole-Indian-Ocean operational dataset, thereby retaining fleet-wide operational heterogeneity without pre-stratifying the data by fixed fishing areas. Candidate sdmTMB models included delta-lognormal, delta-gamma, and Tweedie formulations and several mesh cutoffs. The 200-km delta-lognormal model was retained as the reference model and showed excellent numerical convergence, with 734 mesh vertices, a maximum final gradient of 2.82×10^{-9} , and all sdmTMB sanity checks passing. The standardized wholeIndian-Ocean index was relatively stable over 2005–2023 compared with nominal CPUE. In particular, the pronounced nominal increase in 2012 was substantially reduced after standardization. The standardized index reached its lowest value in 2017 (0.883) and its highest value in 2019 (1.185), and remained above the longterm mean in 2023 (1.107). Regional indices nevertheless showed substantial spatial heterogeneity, emphasizing the value of explicitly accounting for spatial and spatiotemporal processes when deriving abundance indices for stock assessment”*

105. The WPB **NOTED** that the Taiwanese fleet has undergone structural modifications in recent years, and vessel reclassification became increasingly important in 2024–2025. Since the impact of this change in fleet composition on swordfish catchability has not yet been fully evaluated, the CPUE standardisation was restricted to data through 2023 to avoid introducing uncertainty.
106. The WPB **NOTED** that the standardisation is based on the sdmTMB delta-lognormal model structure. A clustering approach based on species composition was used to define targeting strategies, which was included as one of the explanatory variables.
107. The WPB **NOTED** that the model was fitted to the full catch effort dataset, while the index for each assessment region was extracted using a prediction grid based on the area of each region (i.e., NW, NE, SW and SE). The WPB also **NOTED** that although the overall IO-wide index appears relatively flat, there are significant spatial differences in the regional indices.
108. The WPB further **NOTED** that within each region there is considerable variability in the nominal index, whereas the standardised index is much smoother, and asked which variables were most influential in the standardisation process. The author pointed out that the cluster variable (representing the targeting effect) appears to have the largest impact on the CPUE.
109. The WPB further **NOTED** that the model imposes an autocorrelation structure (i.e., AR(1)) on the spatiotemporal random effect, which may also contribute to the smoothing of the index. It was further **NOTED** that stock assessment models generally cannot handle temporal correlation structures well, and that common practice is to assume an independent (IID) error structure instead.
110. The WPB **NOTED** that the standardised indices are essentially spatial (and spatiotemporal) effects assumed to represent population density estimates. As such, the index for each region, accounting for its respective area, can inform the relative abundance distribution in a spatially structured assessment model (e.g., by assuming equal catchability of the index across regions). The WPB further **NOTED** that swordfish CPUE was previously standardised using a different approach, in which data for each region were fitted with independent models, meaning the resulting indices were not comparable. Therefore, in the swordfish assessment model, the relative regional biomass distribution (regional scaling factor) has instead been derived from an alternative source of information.
111. The WPB **NOTED** that the regional structure used for CPUE (as well as for the SWO stock assessment) is based on historical analysis of catch distribution and fleet structure and may need to be revised in light of new information on biology, size structure, and other available data. The WPB **NOTED** that the sdmTMB model is very flexible and can produce a regional index for any specific region as needed.

112. The WPB **NOTED** paper [IOTC-2026-WPB24-24](#) which described a preliminary exploration of CPUE standardization of swordfish using IOTC catch effort dataset, including the following abstract provided by the authors:

“This paper explores the utility of IOTC’s geo-referenced catch and effort dataset for CPUE standardisation, using swordfish as a case study. Standardised indices were produced for several major longline fleets using both a generalised linear model (GLM) and a spatiotemporal model (sdmTMB). The resulting indices for the Japanese, Taiwanese, Portuguese and Spanish fleets are fairly comparable to those standardised by national scientists using finescale, operational-level logbook data, but the indices for South Africa and Réunion are markedly different. These results suggest that the IOTC geo-referenced catch and effort data can reproduce trends seen in fine-scale, operational-level data using relatively simple analyses, and could therefore serve as a useful interim monitoring tool”

113. The WPB **NOTED** the preliminary exploration of the use of the IOTC geo-referenced catch-and-effort dataset to derive standardised CPUE indices for swordfish. The WPB **NOTED** that, despite the aggregated nature of these data and the limited availability of covariates, the resulting indices were broadly comparable with those derived from operational-level national logbook data for several fleets, particularly Japan, Taiwanese, Portugal and Spain.
114. The WPB **NOTED** this work is a very good example on how IOTC effort data can be used as so far, these data have not been exploited a lot while it requires a substantial effort for CPC to declare them.
115. The WPB **NOTED** that catch-and-effort data submitted to the IOTC Secretariat may be revised or corrected by CPCs over time and that differences may therefore occur between national datasets and the versions currently held in the IOTC database. The WPB further **NOTED** that national scientists are generally best placed to identify changes in data collection, reporting practices and fleet characteristics that may affect the interpretation of CPUE series.
116. The WPB **NOTED** that the comparison between indices derived from the IOTC dataset and those developed by national scientists provides a useful means of identifying similarities or discrepancies in trends but does not by itself establish which index provides a better measure of relative abundance. This is particularly relevant given the reduced spatial resolution and absence of operational covariates such as vessel identifiers and fishing configuration in the IOTC dataset.
117. The WPB **NOTED** the generally increasing recent trends in the Japanese CPUE indices and similar indications in some of the Taiwanese indices, and **DISCUSSED** whether these patterns could reflect changes in swordfish abundance or productivity. The WPB **AGREED** that these trends should be interpreted in conjunction with information from national scientists and other fleets before drawing conclusions regarding changes in stock productivity.
118. The WPB **NOTED** that the Japanese South-East regional index derived from the IOTC data differed from the operational-level index, whereas the indices for the other Japanese regions showed substantially greater agreement. The WPB further **NOTED** that CPUE standardisation can substantially modify nominal CPUE trends and that improvements in model structure and the treatment of spatial effects may therefore have an important influence on the resulting abundance indices.
119. The WPB **DISCUSSED** the potential use of CPUE indices derived from IOTC catch-and-effort data in stock assessments, particularly for fisheries or regions where robust standardised indices based on operational-level national data are not available. The WPB **NOTED** that such analyses could potentially provide supplementary or interim abundance information for some coastal fisheries, including fisheries in the northern Indian Ocean, provided that the quality and representativeness of the underlying catch-and-effort data are adequately evaluated.
120. The WPB **NOTED** that, even where the available data may not be sufficient to derive reliable abundance indices, the effort component of the IOTC catch-and-effort dataset could provide useful information on changes in fishing pressure and the spatial distribution of fishing activity. Improvements in logbook and e-logbook programmes may further increase the utility of these data in the future.

121. The WPB **NOTED** that changes in the composition of the Taiwanese longline fleet, including the distinction between fresh and frozen longline components and changes around 2014, should be considered when interpreting the CPUE series. The WPB further **NOTED** that the geo-referenced data were derived from logbook information and that no particular data-quality issue had been identified for the Taiwanese series.
122. The WPB **ENCOURAGED** the IOTC Secretariat and national scientists to further explore the use of geo-referenced catch-and-effort data, particularly for fisheries and regions for which operational-level standardised CPUE indices are currently unavailable.

5.3 Stock assessments of swordfish

Bayesian Surplus Production Model (JABBA)

123. The WPB **NOTED** paper [IOTC-2026-WPB24-25](#) the Bayesian Surplus Production Model (JABBA), including the following abstract provided by the authors:

“This paper provides a stock assessment for Indian Ocean (IOTC) swordfish using Bayesian state-space surplus production models (JABBA). The base case is developed as a single ocean-wide model fitted to the total swordfish catch and using all standardized CPUE series available (13 series), each with its own catchability. An extensive sensitivity analysis was carried out, covering the production function, the productivity priors, the CPUE error assumptions, the process error formulation and the influence of each individual CPUE index, including runs using one CPUE at a time, removing one CPUE at a time, and removing CPUEs for particular areas at a time. A continuity run reproducing the configuration of the last JABBA assessment (5 CPUE series), using updated catches and CPUEs and maintaining consistent with the previous remaining configurations, was also carried out and compared to the new base case. Finally, four area-specific models were fitted and used as a further diagnostic to the base model, assuming that each index used is proportional to and can track total stock biomass. The final base case model estimated that in the final year (2024) the stock is not overfished ($B/B_{msy} = 1.528$) and not subject to overfishing ($F/F_{msy} = 0.511$). Current MSY is estimated at 33,816 t. The final stock status perception tended to be robust across multiple sensitivity analyses carried out and when using the continuity run”

124. The WPB **NOTED** that the base case was a single ocean-wide model fitted to total swordfish catch, using all 13 standardized CPUE series available, each with its own catchability. The authors conducted an extensive sensitivity analysis covering the production function, productivity priors, CPUE error assumptions, process error formulation, and the influence of individual CPUE indices — including runs using one CPUE at a time, removing one CPUE at a time, and removing CPUEs by area. A continuity run reproducing the previous JABBA assessment configuration (5 CPUE series, updated catches and CPUEs) was also carried out for comparison. Four area-specific models were additionally fitted as a diagnostic to the base model, on the assumption that each index used is proportional to and can track total stock biomass, though the WPB **NOTED** these area-based models should be used for information only, not as biomass estimates, given the migratory nature of swordfish.
125. The WPB **NOTED** that the final base case estimated that in 2024 the stock is not overfished ($B/B_{msy} = 1.528$) and not subject to overfishing ($F/F_{msy} = 0.511$), with current MSY estimated at 33,816 t (**Figure 1**). This stock status perception was robust across the sensitivity analyses and the continuity run, and the WPB congratulated the authors on the breadth of sensitivities explored.
126. The WPB **NOTED** that only 6 of the 13 indices passed the runs tests, which could indicate conflict between indices, though the WPB noted that failures are also common when so many indices are used. The WPB **DISCUSSED** the impact of the "leave-one-out" strategy given the large number of CPUE indices, comparing dropping one-at-a-time versus using one-at-a-time, **NOTING** this can still help identify whether a particular index is disproportionately driving the assessment.
127. The WPB **SUGGESTED** it may be preferable to use a single ocean-wide CPUE index from Japan rather than area-based indices, and **NOTED** that the Spanish index used was incorrect, the logCPUE had been used rather than the non-log index; this should be recorded in the notes. The WPB further discussed the impact of

including or excluding the logEU ESP CPUE index, and the use of the TWN LL indices, which showed an overall higher biomass when used one-at-a-time.

128. The WPB **ASKED** whether the model's time period had been tested in JABBA, particularly whether it covered only the target fishery or the bycatch portion too. The catch increase around 1990 could stem from mandatory reporting or a shift in fishery type. Initial depletion was assumed near zero around 1950, with a suggestion to test this in future assessments. The WPB **AGREED** that any change to the model's start point must be applied consistently across all models — starting later than 1950 requires assuming a starting depletion (difficult to estimate), while starting in 1950 requires different catch scenarios up to the present

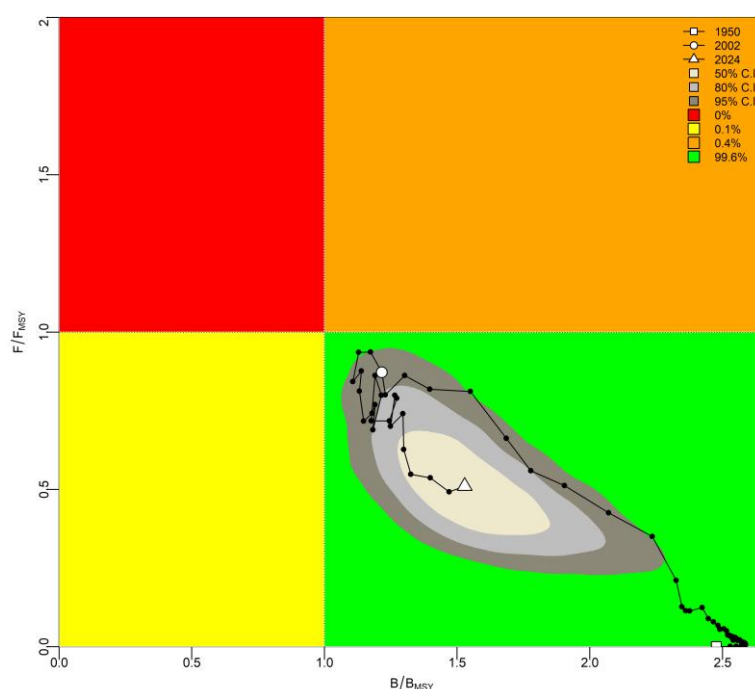


Figure 1. JABBA model: Kobe phase plot with the estimated trajectory of B/B_{MSY} and F/F_{MSY} for the IOTC swordfish JABBA stock assessment. The different grey shaded areas denote the 50%, 80% and 95% credibility intervals for the terminal year of the assessment data (2024). The probability of the terminal year stock status falling within each quadrant is indicated in the figure legend.

Stochastic production model in continuous time (SPiCT)

129. The WPB **NOTED** paper [IOTC-2026-WPB24-26](#) which described a stock assessment of swordfish in the Indian Ocean using Stochastic production model in continuous time (SPiCT), including the following abstract provided by the authors:

“This working paper presents the first application of the stochastic surplus production model in continuous time (SPiCT) to the stock assessment of Indian Ocean swordfish. Annual catch in weight from 1950 to 2024 and 13 standardized CPUE indices were analyzed. Alternative Fox, Schaefer, and generalized Pella Tomlinson production formulations were evaluated. The Pella Tomlinson shape parameter was poorly identified, particularly when its prior was removed, and the Fox formulation was selected as the base production model. Residual diagnostics identified persistent autocorrelation in CPUE indices I2, I6, I10, and I11. A final Fox model excluding these four indices (Scenario j) removed the major residual-autocorrelation signals while retaining stable retrospective behavior. Terminal biomass was estimated at 1.850 times the MSY-based biomass reference point (80% CI: 1.667 to 2.053), and fishing mortality at 0.333 times the MSYbased fishing mortality reference point (80% CI: 0.247 to 0.449), indicating that the stock was neither overfished nor subject to overfishing in 2024. Constant-catch projections from 60% to 140% of the recent catch baseline indicated low risk through 2036, although risk increased with catch level and projection horizon. The results support the use of SPiCT as a complementary assessment framework for Indian Ocean swordfish”

130. The WPB **CONGRATULATED** the author on the work, **NOTING** that this is the first time that SPiCT has been run for Indian Ocean swordfish. The WPB **NOTED** that the results of the assessment were very similar to the JABBA model, where the final base case estimated that in 2024 the stock is not overfished and not subject to overfishing, with a 100% probability in the Kobe green quadrant (**Figure 2**).
131. The WPB **DISCUSSED** the size data presented in the paper – showing that larger swordfish are more likely to be caught in the higher latitudes, however the size seems to be quite consistent for the Taiwanese fleet. There was a suggestion to not separate the TWLL fleet into more than one area. The WPB **NOTED** that there was a very low sample size from the eastern Indian Ocean, and so it is likely that at least for the longitude data, there is not much difference in average size.
132. The WPB **NOTED** the difficulty in estimating the production function and that the different production functions result in very different outcomes for the stock. The WPB **NOTED** and **DISCUSSED** the modeller's decision to use the Fox model, noting that in next iterations of the model, the production function could be explored further.
133. The WPB **DISCUSSED** the way that the catch data are treated in the SPiCT model (e.g. is the annual data cut into 1/16th and spread evening across the year), **NOTING** that the more positive outlook for the stock could be due to differences in the catch treatment between JABBA and SPiCT. The WPB **SUGGESTED** that this could be investigated in a future model.
134. The WPB **DISCUSSED** the stochastic process error that is an additional parameter in the SPiCT model compared to traditional discrete-time SPM, and whether this changed through time. The WPB **NOTED** that this is a key parameter to present to the group in future iterations of the model.
135. The WPB **DISCUSSED** whether AIC / BIC (information criterion) could be used to identify the best model – the author confirmed that the same diagnostic “cook-book” for JABBA was used for SPiCT to identify the best model. The WPB **NOTED** the difficulty of using the Pella-Tomlinson production function within the model, as even with a broad prior, it was too similar to Fox. Additionally, Schaefer models are problematic for surplus production models.
136. The WPB **NOTED** that comparisons have been done between SPiCT vs JABBA in the past, and that there are differences in the ways that parameters are specified within the model, so perhaps r can be different in each model, but the definition may be the same. SPiCT appears to be easier to set up compared to JABBA, with fewer options – e.g. JABBA can provide different prior distributions, but for SPiCT you can only provide a lognormal distribution for all priors.
137. The WPB again **CONGRATULATED** the author for this assessment and encouraged the author to continue development of this model for the next iteration of the Indian Ocean swordfish stock assessment, currently scheduled for 2029.

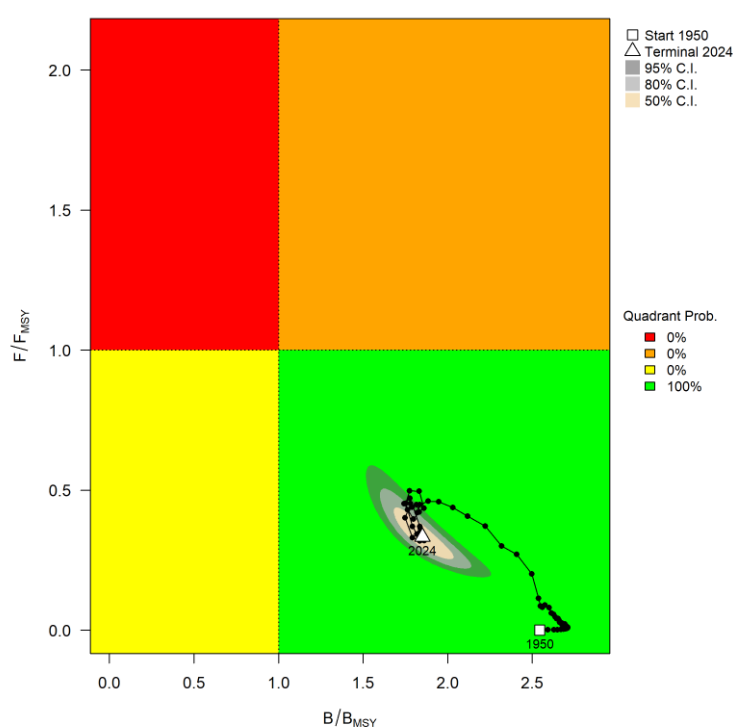


Figure 2. SPiCT Model: Kobe plot for the selected Scenario j showing the estimated stock-status trajectory from 1950 to 2024 and the terminal 2024 estimate. Confidence regions of 50%, 80%, and 95% are shown for the terminal stock status.

Stock Synthesis (SS3)

138. The WPB **NOTED** document [IOTC-2026-WPB24-27](#) which described the stock assessment of swordfish in the Indian Ocean using Stock Synthesis, including the following abstract as provided by the author:

*“This report presents an integrated stock assessment for *X. gladius* in the Indian Ocean in 2026, using data up to the end of 2024 (31st December 2024). The stock assessment is based on an update of the 2023 model and is a spatially structured, sex-based, age-structured integrated model that uses catch rate indices, length-compositions and catch data to inform estimates of spawning stock biomass (SSB) and fishing mortality (F), relative to estimated maximum sustainable yield (MSY)” – see paper for full abstract.*

Reference Model

139. The WPB **RECALLED** that the integrated SS3 model for swordfish was originally developed in 2009 as an age-based, sex-specific, spatially structured model. The WPB **NOTED** that following the adoption of the swordfish MP in 2025 (Res. 25/07), the current assessment is used only to evaluate stock status.
140. The WPB further **NOTED** that the data and model structure of the 2026 assessment are broadly consistent with the previous assessment, with the exception that catches from the fresh tuna longline fishery in the North-East (NE) region were revised following catch revisions submitted by Indonesia.
141. The WPB **NOTED** that the assessment model covers 1950-2024 and treats Indian Ocean swordfish as a single genetic stock, modelled across four spatially disaggregated regions with 15 fishing fleets. Standardised CPUE indices were available from the main longline fleets of Japan, Taiwan(China), the European Union (Portugal, Spain, Réunion), South Africa, and Indonesia. The reference model included only the Japanese longline CPUE. Size data are available for all fleets except for the gillnet fleet in the north west (AIGI NW).
142. The WPB also **NOTED** that the reference model used growth parameters estimated from otolith samples collected in the south-west Pacific ([Farley et al., 2016](#)), and assumed a constant natural mortality of 0.25.

143. The WPB **NOTED** that the large number of CPUE indices poses a challenge, as there is no clear guidance on how to reconcile differences between them or weight them appropriately within the model. The WPB **NOTED** that the author had conducted a correlation analysis to assess the consistency of trends among the CPUE indices, as a basis for deciding how to include them. The author **NOTED** the importance of avoiding the inclusion of clearly conflicting indices within the same area. On the other hand, the availability of multiple indices provides useful coverage across different gears and areas, particularly important given that the Japanese fleet, which provides the main abundance indices, has seen steadily declining effort and spatial coverage.
144. The WPB **NOTED** that the model assumed logistic selectivity for the Japanese longline fleet, whereas a double-normal selectivity was used for the Taiwanese fleet, reflecting length data showing that average fish size in the Taiwanese longline fishery is smaller — a pattern consistent across all areas. The WPB **AGREED** that it is good practice to assume asymptotic selectivity for at least one fishery, to avoid the model estimating cryptic biomass.
145. The WPB **NOTED** that the assessment estimated a very large increase in abundance from around 2010 to the present, driven mainly by persistent above-average recruitment during this period (following an earlier period of below-average recruitment). This high recruitment appears to be driven largely by the recent increase in CPUE across the main fishery areas (NW, NE, and SW). A diagnostic analysis using an age-structured production model (ASPM) — which turns off estimation of recruitment deviations — suggested that if recruitment had instead remained at the long-term average during these years, recent catches would have led to a decline in abundance.
146. The WPB **NOTED** that the recent high recruitment was concentrated mainly in the NE area, and **DISCUSSED** whether this reflects a genuine trend or is simply an artefact of the model attempting to explain the very high catches and CPUE observed in that region. The WPB **ASKED** whether any external information could help corroborate the recruitment signal; it was **SUGGESTED** that operational-level data on juvenile swordfish catches could be used to develop a potential recruitment index.
147. The WPB **NOTED** clarification on the process used to scale the regional Japanese CPUE index for input to the assessment. It was **NOTED** that CPUE, as a relative index of abundance, typically carries no information on the relative scale of abundance across regions — yet this information is essential for a spatially explicit model to correctly allocate biomass among regions and avoid unrealistic estimates. This is addressed by linking regional CPUE through a common catchability parameter and rescaling regional CPUE to reflect regional biomass distribution. The scaling factors are generally derived from catch-and-effort data through a process similar to CPUE standardisation. Earlier assessments used an area-based regional scaling factor, which was shown to be problematic ([IOTC-2017-WPB15-20 Rev1](#)). Since the 2017 assessment, scaling factors have instead been derived from biomass estimates produced by region-specific models (i.e., models including data from only one region), and used to rescale the Japanese CPUE index.

Sensitivity Runs and Model Grid

148. The WPB **NOTED** that a large number of sensitivity runs were conducted to test alternative assumptions and identify the major sources of uncertainty in the model estimates. These included alternative growth parameters (based on otolith and fin-ray samples from the Indian Ocean; [IOTC-2026-WPB24-15](#)), alternative natural mortality (a Lorenzen M with reference ages 4–12 and a median M of 0.25), alternative CPUE indices, and alternative recruitment parameter assumptions.
149. The WPB **NOTED** that excluding the Japanese index values for 2011 and 2024 in the NW region (values predicted by the standardisation model rather than estimated directly from data) had no major impact on the assessment results.

150. The WPB **NOTED** that the sensitivity run using the Taiwanese indices produced extremely high, clearly unreasonable biomass estimates. It was **NOTED** that the Taiwanese index has an overall flat trend, providing little information on B_0 , since it implies that abundance is largely unresponsive to catch removals.
151. The WPB **NOTED** that based on the sensitivity analyses, further model options were configured into a grid of 48 models to capture the main sources of uncertainty, varying steepness of the stock-recruitment relationship (0.7, 0.8, 0.9), recruitment variability (two levels), CPUE series (two options), growth (two options), and natural mortality (two options), as summarised in **Table 1**.
152. The WPB **NOTED** that the final model grid estimated that in 2024 the stock is not overfished ($B/B_{msy} = 2.81$) and not subject to overfishing ($F/F_{msy} = 0.34$), with current MSY estimated at 39,000 t (**Table 2, Figure 3**).

General Conclusions and Discussion for Future Assessments

153. The WPB **AGREED** that, overall, the assessment model performs satisfactorily: there are no gross mis-fits to the observed data, and no evidence of major conflicts between data sources or model mis-specification. The impact of alternative assumptions and model configurations on the results was evaluated and is well understood. In particular, results do not differ substantially depending on which indices are included or how they are weighted, with the exception of the Taiwanese index. That said, the WPB also **NOTED** that spatial heterogeneity in catch, CPUE, and productivity assumptions across the four regions is difficult to reconcile, meaning that some model outputs (e.g., recruitment deviations and the regional distribution of recruits) more likely reflect model artefacts than true population dynamics.
154. The WPB **RAISED** concern that Japanese longline effort has declined substantially in recent years (with no effort recorded in the north-west region in 2024), making it increasingly difficult to derive a representative and reliable abundance index from this fleet. It was suggested that future assessments place greater emphasis on the Taiwanese index and explore its potential as the primary abundance index: the Taiwanese fleet has high swordfish catches, broad spatial coverage, and a notably stable size structure in its catches, making it well suited to standardisation. On the other hand, the large depletion evident in the early part of the Japanese index, combined with the sharp rise in catches, provides key information on B_0 — information that would be very difficult to recover without it. The pre-mid-2000s Japanese index is therefore expected to remain essential to the assessment, even if future standardisation of the index is discontinued due to insufficient fishing effort.
155. The WPB **RECOMMENDED** exploring alternative spatial structures for future assessments, to better reflect current understanding of the population and fishery structure. The WPB **RECALLED** that the current spatially explicit model was originally adopted to account for differing regional CPUE trends (e.g., concerns over potential local depletion in the SW). Recent work suggests that CPUE trends are, in fact, broadly similar across most regions — the NW, NE, and SW indices all show an initial decline from the mid-1990s to the mid-2000s, followed by a more recent increase, while the SE index shows an opposite trend, albeit with considerable uncertainty in its standardisation (see IOTC-2026-WPB24-22). It was therefore **REQUESTED** that a single-area (fleet-as-area) approach could serve as a useful intermediate step ahead of establishing a more appropriate regional structure. The WPB further **RECOMMENDED** that a conceptual modelling approach — incorporating available biological information, size structure, population dynamics, and migration — should be used to define future regional and fleet structures. The WPB **AGREED** that maintaining continuity with the current approach is important before transitioning to a new spatial structure.

Table 1. Model options for the 2026 assessment grid. The final grid comprises the full combination of options below (48 models in total). Options adopted in the reference (base) model are highlighted.

Model options	Description
Steepness (h) in SRR	• h_{70} : $h = 0.70$
	• h_{80}: $h = 0.80$
	• h_{90} : $h = 0.90$
Growth	• Gnew: VB growth parameters estimated by Wang et al. (2026)
	• Gold : VB growth parameters estimated by Farley et al., (2016)
Natural Mortality	• Lorenzen: – Lorenzen functional form M with reference ages 5-12 yrs, and fixed M of 0.25
	• Fixed M of 0.25 for all ages
Recruitment variability	• $\sigma_r = 0.20$
	• $\sigma_r = 0.40$
CPUE	• Only Japanese longline indices (NW, NE, SW, SE)
	• altCPUE: Inclusion of Japanese (NW, NE, SW, SE; weight = 1.0); Indonesian (NE; weight 0.5); South African (SW; weight = 0.1); EU (Réunion; SW; weight = 0.5) indices. Based on CPUE comparison analyses.

Table 2. Stock status summary table for the assessment final model grid (CI = confidence interval).

Catch in 2024:	28112
Average catch 2019–2024:	27076
MSY (1000 t) (plausible range):	39 (32-46)
F_{MSY}	0.06 (0.05-0.06)
SSB_0 (1000 t) (80% CI):	264 (226-302)
SSB_{2024} (1000 t) (80% CI):	152 (119-185)
SSB_{MSY}	58 (38-77)
SSB_{2024}/SSB_0 (80% CI):	0.58 (0.55-0.61)
SSB_{2024} / SSB_{MSY}	2.81 (1.97-3.64)
F_{2024} / F_{MSY}	0.34 (0.23-0.45)

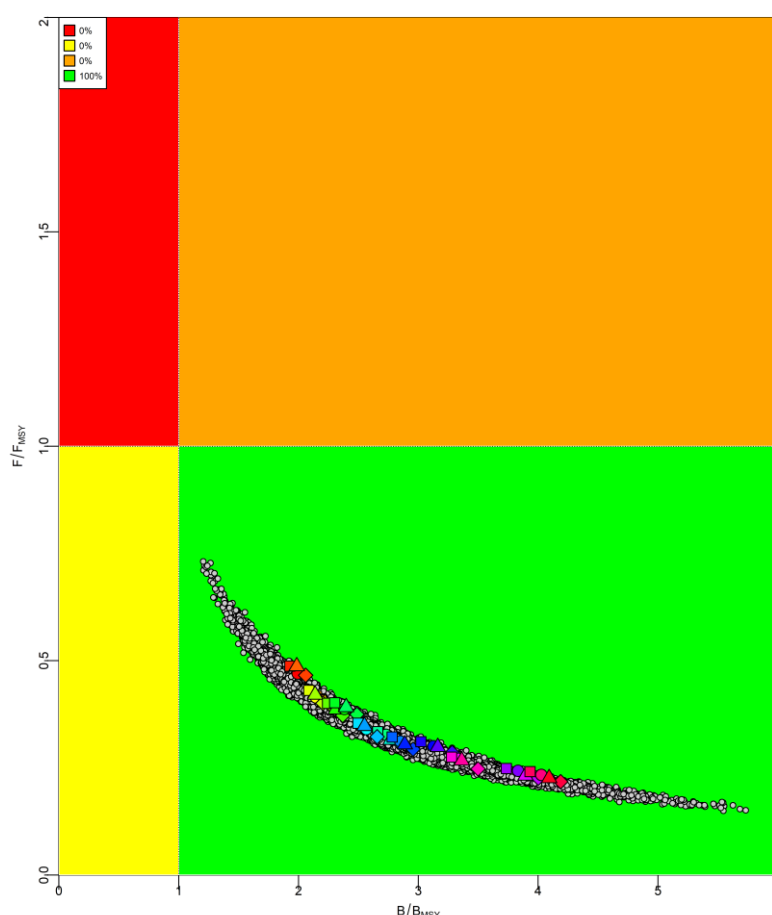


Figure 3. Stock synthesis grid-IO. Kobe stock status plot for the Indian Ocean for swordfish. Coloured symbols represent Maximum Posterior Distribution estimates from individual models. Grey dots represent uncertainty from individual models. The dashed lines represent limit reference points for Indian Ocean swordfish ($SB_{lim} = 0.4 SB_{MSY}$ and $F_{lim} = 1.4 F_{MSY}$).

5.4 Review of exceptional circumstances of swordfish management procedure (Resolution 24/08)

156. The WPB **NOTED** document [IOTC-2026-WPB24-28](#), which synthesises the consideration of exceptional circumstances for the Swordfish Management Procedure 2026, **NOTED** the following points from the paper abstract:

“This paper summarises the outcomes from a review of a wide range of information to determine whether there is evidence of exceptional circumstances. It is important to note that this review paper may not yet take account of all new information presented to the WPB24 (9-12 September 2026). However, any new and relevant information can be included in a revised paper for consideration by the Working Party on Methods (October 2026)” – see paper for full abstract

157. The WPB **NOTED** the presentation of the Exceptional Circumstances (EC) review for the Indian Ocean swordfish Management Procedure (MP), undertaken in accordance with the IOTC EC Guidelines. The review examined whether new biological information, fishery developments, catch data, CPUE indices, or stock assessment results provided potential evidence that the assumptions underpinning the operating models (OMs) used in the Management Strategy Evaluation (MSE) were no longer valid.
158. The WPB **NOTED** that the shift in relative importance (in terms of proportion of total catch) from distant-water to coastal fisheries occurred prior to development of the Management Procedure and was therefore captured in the operating models. Consequently, the WPB **AGREED** that this change does not constitute an Exceptional Circumstance.
159. The WPB **NOTED** that catch data quality remains high and that no evidence was identified of a deterioration in the completeness, representativeness, or reliability of catch statistics. The WPB **FURTHER NOTED** that recent

catch composition remains broadly consistent with that considered during development and testing of the Management Procedure.

160. The WPB **DISCUSSED** the potential implications of the increasing use of meka-ring (also called loop or trapline) terminal branchline gear in some longline fisheries. The WPB **ACKNOWLEDGED** that this gear may affect swordfish catchability and could influence the interpretation of CPUE indices in the future. However, the WPB **NOTED** that there is currently insufficient information on the extent of recent adoption and impact of meka-rings within the Indian Ocean to determine whether this issue should trigger an Exceptional Circumstance. The WPB **ENCOURAGED** the continued collection of information on the use of this gear and its potential influence on catchability and CPUE trends.
161. The WPB **ACKNOWLEDGED** that no new biological information has been identified that falls outside the ranges considered during development of the operating models. The WPB **NOTED** that previously identified evidence suggesting possible north-south stock structure remains unresolved and requires additional sampling and analysis. The WPB **AGREED** that there remains insufficient certainty to consider stock structure an Exceptional Circumstance at present.
162. However, the WPB **NOTED** that the 2026 stock assessment did produce stock status estimates or parameter estimates outside the range of expectations represented within the operating models in recent years. The implications of this with respect to exceptional circumstances should be considered further by the WPM.
163. The WPB **NOTED** that the current Management Procedure was developed and tested using a Japanese CPUE index (as the key harvest control rule indicator) that was based solely on fishing activity in the Northwest Indian Ocean. The WPB **RECALLED** that there has been general agreement that continued reductions in effort, or periods without observations in that region, could ultimately mean that a revision of the monitoring index used by the Management Procedure may be required and potentially necessitate re-evaluation of the Management Strategy Evaluation framework.
164. The WPB **NOTED** that the standardized Japanese longline CPUE series remains an important component of the Management Procedure and that the 2023 and 2024 standardized indices were generally consistent. However, the WPB **DISCUSSED** the continuing decline in Japanese fishing effort in the Northwest Indian Ocean and the complete absence of observations from that area in 2024. The WPB **NOTED** that the 2024 CPUE value for the Northwest region (included in Takahashi et al (2026)), was derived from model predictions rather than direct observations.
165. The WPB **RECOGNIZED** that the absence of fishery observations in the Northwest Indian Ocean raises serious concerns regarding the long-term suitability of the Japanese CPUE series as a monitoring index for the Management Procedure. The WPB **AGREED** that this situation represents an Exceptional Circumstance with respect to the continued future use of the MP. The WPB **RECOMMENDED** that the SC also consider this an Exceptional Circumstance with a potential impact on the future application of the MP. The WPB **NOTED** that the current implementation of the Management Procedure, through the adopted TAC for 2027 and 2028, as per Resolution 26/02, is not affected, as it is based on the agreed CPUE index.
166. The WPB **RECOMMENDED** that the Scientific Committee prioritize the development of a workplan to investigate alternative CPUE indices, including indices derived from alternative fleets, areas, or combinations of fleets and areas, for potential incorporation into revised candidate harvest control rules and the MSE testing of these within revised candidate Management Procedures, for consideration by the Commission. The WPB **NOTED** that this work may take a number of years to complete and as such, **FURTHER RECOMMENDED** that this work commence as a matter of urgency. This is required to mitigate against the scenario whereby the Japanese Northwest Indian Ocean CPUE series no longer provides an adequate monitoring index in future.

5.5 *Development of management advice for swordfish and update of species Executive Summaries for the consideration of the Scientific Committee, including discussion on current catch limits as per standing IOTC Resolutions*

167. The WPB **AGREED** that the final advice for the executive summary should be based on the Stock Synthesis (SS3) model, based on the availability of length data and biological data specific for the Indian Ocean as well as the availability of CPUE series for several fisheries and better description of population dynamic for Swordfish. Therefore, the WPB **SUPPORTED** the use of Stock Synthesis (SS3) for swordfish as data and information are available to run this type of complex model. Other models provide useful complementary information to support SS3 results and were in general in agreement in terms of stock status.
168. The WPB **NOTED** the selection of SS3 model assemble as the base case as that it captures most of the uncertainty identified in the assessment. This model grid estimated MSY at 39,000 t which is above the current catch level (28,112 t).
169. The WPB also **NOTED** that following the 2023 assessment, an MP was adopted in 2025 (Res. 25/07) and used to set a TAC of 30,527 t for 2027–2028. The MP is scheduled to be run in 2027.
170. The WPB **ADOPTED** the management advice developed for swordfish, as provided in the draft status summary, and **REQUESTED** that the IOTC Secretariat update the draft stock status summary with the latest interaction data to be provided to the SC as part of the draft Executive Summary, for its consideration:

- Swordfish (*Xiphias gladius*)– [Appendix IV](#)

6. OTHER BILLFISHES

6.1 *Review of new information on other billfishes (marlins, I.P. sailfish) biology, stock structure, fisheries and associated environmental data*

171. The WPB **NOTED** document [IOTC-2026-WPB24-29](#), which introduced the Development of billfish & swordfish species identification App, with the following abstract provided by the author:
- “OFCF Japan has launched a new project from JFY2024 called “WEB based tool development for identification of IOTC species” under the IOTC-OFCF project in JFY2024. In JFY2026, OFCF Japan started developing a web application “ID tool for IOTC Billfish species” which is designed to facilitate species identification of Billfish and Swordfish species for field samplers/observers.”*
172. The WPB **NOTED** the presentation of a web-based species identification tool being developed under the IOTC-OFCF project to assist field samplers and observers with the identification of billfish and swordfish species. The tool is intended to improve species identification in situations where specimens are either fully intact or partially processed, as commonly occurs in coastal fisheries. The application includes separate identification pathways for processed specimens with fins removed and unprocessed specimens, which can be accessed through dedicated QR codes.
173. The WPB **ACKNOWLEDGED** the importance of accurate species identification for IOTC data collection and stock assessment processes and **NOTED** that species identification errors continue to occur, even among experienced field samplers. The WPB **WELCOMED** the development of a practical field-based identification tool and **NOTED** that the QR codes associated with the application could be distributed widely to field samplers and observers once the tool is finalized.
174. The WPB **DISCUSSED** the diagnostic characteristics used within the application and **NOTED** that some morphological features may vary among individuals or regions. Examples were provided where blue marlin and striped marlin may exhibit overlapping external characteristics, particularly when specimens have been processed. The WPB **ADVISED** the authors to evaluate whether the proposed identification features are consistently applicable across regions and fisheries.

175. The WPB **NOTED** that verification of species identifications through genetic analyses would provide an important means of validating the accuracy of the tool. The WPB **ENCOURAGED** the authors to collaborate with ongoing genetic identification programmes and to use molecular methods, where available, to corroborate species assignments and assess the performance of the application.
176. The WPB **FURTHER NOTED** that the application may be particularly useful in fisheries where billfish are landed frozen or processed with fins and tails removed. The WPB **SUGGESTED** that future development of the tool consider additional identification pathways for frozen and heavily processed specimens where external characteristics may be less apparent.
177. The WPB **WELCOMED** plans to undertake field testing of the application in collaboration with scientists and samplers from CPCs, including Sri Lanka. The WPB **ALSO NOTED** that the application could potentially be translated into multiple languages to facilitate broader uptake and use throughout the Indian Ocean region.
178. The WPB **NOTED** the authors' request for additional photographs of billfish species, particularly blue marlin and striped marlin, to support further development and validation of the application. The WPB **ENCOURAGED** CPCs to collaborate with the authors by providing photographs and other relevant materials that may assist with improving the accuracy and coverage of the identification tool.
179. The WPB **NOTED** this work directly addresses the concerns raised during the previous WPB regarding the complexities of identifying billfish landed in processed forms (with fins and tails removed) by some CPCs.
180. The WPB **NOTED** the request by I.R. Iran to include Persian language support into the application and further **NOTED** that Iran is fully prepared to collaborate on field-testing this application in their landing sites.
181. The WPB **AGREED** that the application represents a valuable contribution to improving billfish and swordfish species identification in the Indian Ocean and **ENCOURAGED** the authors to continue its development, testing and validation, including through appropriate genetic verification where feasible.

6.2 Resolution 18/05 Catch Limits

182. The WPB **NOTED** that catches of blue marlin, black marlin, striped marlin, and sailfish have exceeded the catch limits established under Resolution 18/05 (**Figure 4**), **ACKNOWLEDGING** that catch data for 2025 should be considered preliminary and may be subject to revision.

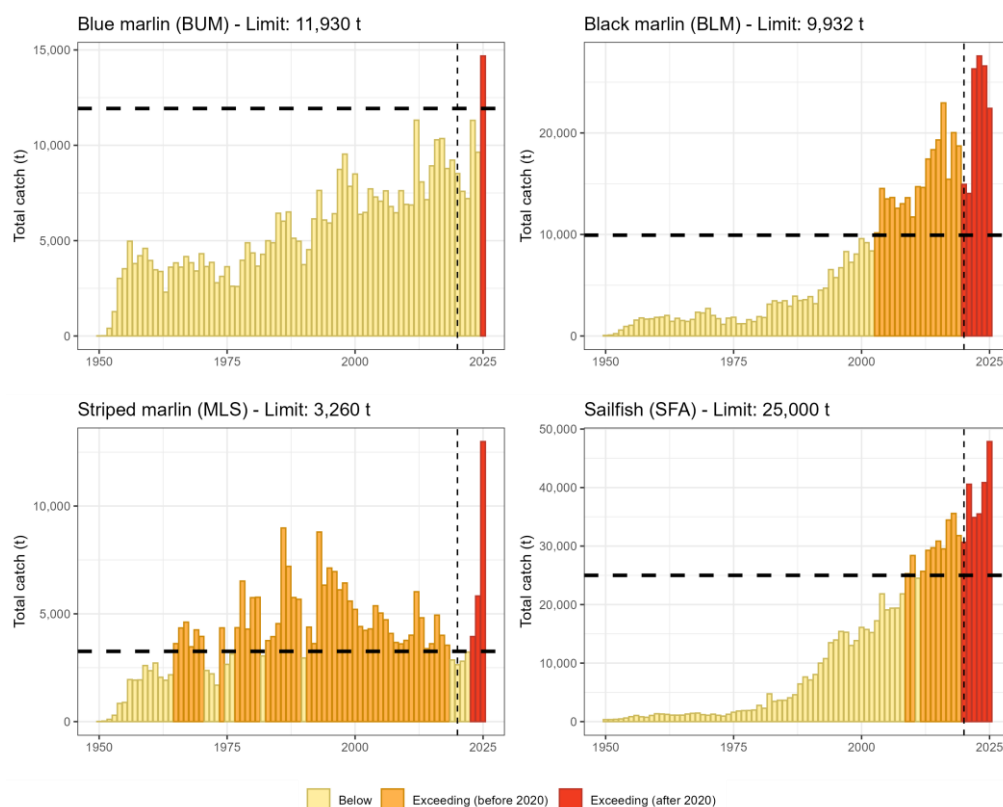


Figure 4. Best scientific estimates of retained catches (metric tonnes; t) of the four billfish species subject to catch limits under Resolution 18/05 for the period 1950-2025

183. The WPB **NOTED** with concern that catches of striped marlin increased substantially in 2025, reaching almost 13,000 t and far exceeding the catch limit of 3,260 t established under Resolution 18/05, and **ACKNOWLEDGED** that the most recent stock assessment indicated that the stock is overfished and subject to overfishing.
184. The WPB **NOTED** that historical data reconstructions and improved reporting compliance may also have contributed to the recent apparent catch increases.
185. The WPB **REITERATED** that the catch limits established under Resolution 18/05 were based on previous stock assessments and **NOTED** the limitations of using fixed catch limits as a management measure. The WPB emphasised the need to move towards the development of Management Procedures for billfish species, with pre-agreed rules specifying the management actions to be taken in response to changes in catch levels and other relevant indicators.

7. WPB PROGRAMME OF WORK

7.1 Revision of the WPB Programme of Work (2027–2031) (Chairperson and IOTC Secretariat)

186. The WPB **NOTED** document [IOTC-2026-WPB24-08](#), which provides a revision of the WPB Programme of Work for 2027–2031.
187. The WPB **NOTED** the paper provided an opportunity to consider and revise the WPB Programme of Work (2027–2031), by taking into account the specific requests of the Commission, SC, and the resources available to the IOTC Secretariat and CPCs.
188. The WPB **RECALLED** that the SC, at its 18th Session, made the following request to its Working Parties:

*“The SC **REQUESTED** that during the 2016 Working Party meetings, each group not only develop a Draft Program of Work for the next five years containing low, medium and high priority projects, but that all High Priority projects are ranked. The intention is that the SC would then be able to review the rankings and develop a consolidated list of the highest priority projects to meet the needs of the Commission. Where possible, budget estimates should be determined, as well as the identification of potential funding sources.” (SC18. Para 154).*

189. The WPB **RECOMMENDED** that the SC consider and endorse the WPB Programme of Work (2027–2031), as provided in [Appendix X](#).
190. The WPB **NOTED** that I.R. Iran has been designated as a priority country for the development of gillnet CPUE indices for black marlin and Indo-Pacific sailfin in the Program of Work. The WPB **NOTED** that billfish are exclusively bycatch in their drifting gillnet tuna fisheries. There are on-going logistical constraints of placing human observers onboard for 45-day trips. Therefore, any CPUE standardization for Iran's gillnet fleet must rely on alternative data collection methodologies, such as enhanced port sampling and participatory fisher-dependent reporting mechanisms, supported by IOTC capacity-building frameworks.
191. The WPB **NOTED** the the SC's recommendation for CPCs to conduct gillnet experimental fishing trials focusing on setting depths and soak times to mitigate bycatch. It was pointed out that given the vast size and traditional nature of some coastal gillnet fleets, implementing such scientific trials requires substantial logistical and financial resources. The WPB **NOTED** that specific funding mechanisms (e.g., through FAO or IOTC project funds) are required to support developing coastal states in designing and executing these vital experimental trials.

7.2 Development of priorities for an Invited Expert at the next WPB meeting (Chairperson)

192. The WPB **NOTED** that an Invited Expert may be required to support the next WPB meeting and **AGREED** that the decision for the selection of the candidate for the WPB25 be considered inter-sessionally. Once decided, the selection will be performed by advertising the position through the IOTC science list (as a priority channel) and finalized after receipt and assessment of supporting information for potential candidates, according to the deadlines set forth by the rules and procedures of the Commission.
193. The WPB **AGREED** to the following core areas of expertise and priority areas for contribution that need to be enhanced for the next meeting of the WPB in 2027 by an Invited Expert:
- **Expertise:** Stock assessment, CPUE standardisation.
 - **Priority areas for contribution:** Providing expert input into billfish stock assessment work.

8. OTHER BUSINESS

8.1 Date and place of the 25th and 26th Sessions of the Working Party on Billfish

194. The WPB **REQUESTED** that CPCs that may be interested in hosting the 25th and 26th Working Party on Billfish meetings contact the Secretariat.
195. The WPB **NOTED** that the SC emphasized the importance of holding working party meetings in a hybrid format whenever feasible. However, the WPB further **NOTED** that this should not discourage CPCs from offering to host the meetings, even if they are unable to accommodate a hybrid format.
196. The WPB **RECOMMENDED** the SC consider early September as a preferred time period to hold the WPB25 in 2027. As usual it was also **AGREED** that this meeting should continue to be held back-to-back with the WPEB and that in 2027 WPB will be held in the week after the WPEB.
197. The WPB **NOTED** that China tentatively offered to host the next WPB and WPEB meetings in Shanghai, with confirmation to be provided at the SC meeting in December. The WPB **THANKED** China for this offer.

8.2 Review of the draft, and adoption of the Report of the 24th Session of the Working Party on Billfish

198. The WPB **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPB24, provided at [Appendix XI](#), as well as the management advice provided in the draft resource stock status summary for each of the five billfish species under the IOTC mandate, and the combined Kobe plot for the five species assigned a stock status in 2026 (**Figure 5**):
- Swordfish (*Xiphias gladius*) – [Appendix IV](#)
 - Black marlin (*Istiompax indica*) – [Appendix V](#)
 - Blue marlin (*Makaira nigricans*) – [Appendix VI](#)

- Striped marlin (*Kajikia audax*) – [Appendix VII](#)
- Indo-Pacific sailfish (*Istiophorus platypterus*) – [Appendix VIII](#)

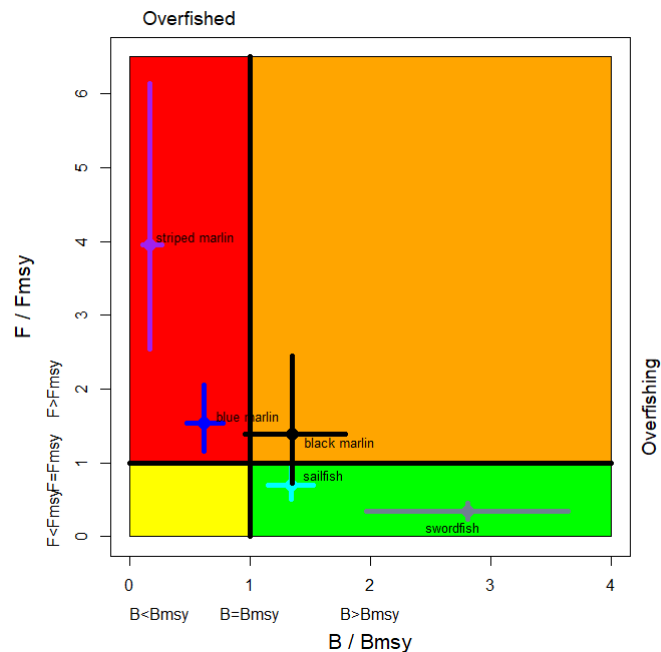


Figure 5. Combined Kobe plot for swordfish (grey), Indo-Pacific sailfish (cyan), black marlin (black), blue marlin (blue) and striped marlin (purple) showing the 2024 (black marlin and striped marlin), 2025 (blue marlin and Indo-Pacific sailfish), and 2026 (swordfish) estimates of current stock size (B or B_{msy} , species assessment dependent) and current fishing mortality (F) in relation to optimal spawning stock size and optimal fishing mortality. Cross bars illustrate the range of uncertainty from the model runs.

199. The report of the 24th Session of the Working Party on Billfish (IOTC-2026-WPB24-R) was **ADOPTED** by correspondence.

APPENDIX I - LIST OF PARTICIPANTS

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Mr.	Don	Bromhead	ABARES	Don.Bromhead@aff.gov.au	Australia.

APPENDIX II - AGENDA FOR THE 24 WORKING PARTY ON BILLFISH

Date: 9–12 September 2026

Location: Reunion

Time: 09:00 – 17:00 daily (French time)

Chair: Dr Jie Cao (China); **Vice-Chair** Dr Sylvain Bonhommeau (France):

- 1. OPENING OF THE MEETING** (Chairperson)
- 2. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION** (Chairperson)
- 3. THE IOTC PROCESS: OUTCOMES, UPDATES AND PROGRESS**
 - 3.1. Outcomes of the 28th Session of the Scientific Committee (IOTC Secretariat)
 - 3.2. Outcomes of the 30th Session of the Commission (IOTC Secretariat)
 - 3.3. Review of Conservation and Management Measures relevant to billfish (IOTC Secretariat)
 - 3.4. Progress on the recommendations of WPB23 (IOTC Secretariat)
- 4. NEW INFORMATION ON FISHERIES AND ASSOCIATED ENVIRONMENTAL DATA FOR BILLFISH**
 - 4.1. Review of the statistical data available for billfish at the Secretariat (IOTC Secretariat)
 - 4.2. Climate change (all)
- 5. MARLINS (Priority species for 2026: Swordfish)**
 - 5.1. Review new information on marlin biology, stock structure, fisheries and associated environmental data (all)
 - 5.2. Nominal and standardised CPUE indices
 - 5.3. Stock assessments
 - 5.4. Review of exceptional circumstances of swordfish management procedure (Resolution 24/08)
 - 5.5. Development of management advice for swordfish and update of species Executive Summaries for the consideration of the Scientific Committee, including discussion on current catch limits as per standing IOTC Resolutions (all)
- 6. OTHER BILLFISHES (new information for informing future assessments)**
 - 6.1. Review of new information on other billfishes (biology, stock structure, fisheries and associated environmental data (all)
 - 6.2. Resolution 18/05 Catch Limits
- 7. WPB PROGRAM OF WORK**
 - 7.1. Revision of the WPB Program of Work (2027–2031) (Chairperson and IOTC Secretariat)
 - 7.2. Development of priorities for an Invited Expert at the next WPB meeting (Chairperson)
- 8. OTHER BUSINESS**
 - 8.1. Date and place of the 25th and 26th Sessions of the Working Party on Billfish (Chairperson and IOTC Secretariat)
 - 8.2. Review of the draft, and adoption of the Report of the 24th Session of the Working Party on Billfish (Chairperson)

APPENDIX III - LIST OF DOCUMENTS FOR THE 24TH WORKING PARTY ON BILLFISH

Document	Title
IOTC-2026-WPB24-01a	Agenda of the 24 th Working Party on Billfish
IOTC-2026-WPB24-01b	Annotated agenda of the 24 th Working Party on Billfish
IOTC-2026-WPB24-02	List of documents of the 24 th Working Party on Billfish
IOTC-2026-WPB24-03	Outcomes of the 28 th Session of the Scientific Committee (IOTC Secretariat)
IOTC-2026-WPB24-04	Outcomes of the 30 th Session of the Commission (IOTC Secretariat)
IOTC-2026-WPB24-05	Review of Conservation and Management Measures relevant to billfish (IOTC Secretariat)
IOTC-2026-WPB24-06	Progress made on the recommendations and requests of WPB23 and SC28 (IOTC Secretariat)
IOTC-2026-WPB24-07	Review of the statistical data and fishery trends for billfish species (IOTC Secretariat)
IOTC-2026-WPB24-08	Revision of the WPB Program of Work (2027-2031) (IOTC Secretariat)
IOTC-2026-WPB24-10	Billfish fisheries in India with insights into the habitat preference and biology of Swordfish (<i>Xiphias gladius</i>) from the Western Indian EEZ (Pradeep H)
IOTC-2026-WPB24-11	Length frequency distributions of billfishes from Indonesian longline tuna fishery (Jatmiko I)
IOTC-2026-WPB24-13	Development of morphometric conversion equations for blue marlin (<i>Makaira nigricans</i>) and striped marlin (<i>Kajikia audax</i>) using observer-collected photographs from Sri Lankan multiday fisheries (Haputhanthri S)
IOTC-2026-WPB24-14	Preliminary length frequency characterization of Indo-Pacific sailfish (<i>Istiophorus platypterus</i>) from purse seine fishery in the Andaman Sea of Thailand (Thitipongtrakul W)
IOTC-2026-WPB24-15	Updated sex-specific growth parameters for swordfish (<i>Xiphias gladius</i>) in the tropical Indian Ocean for the 2026 IOTC stock assessment (Wang S, Lin C, Hugang K, Chiang W)
IOTC-2026-WPB24-16	Standardized swordfish CPUE based on observer data from the French Réunion-based pelagic longline fishery in the South-West Indian Ocean (2007-2025) (Tellier C, Sabarros P)
IOTC-2026-WPB24-17	Standardization of swordfish CPUE from the Réunion longline fishery logbook data (Bonhommeau S)
IOTC-2026-WPB24-18	Updated standardized CPUE indices for swordfish caught by the Portuguese pelagic longline fleet in the Indian ocean, 2000–2024 (Coelho R, Rosa D, Lino P)
IOTC-2026-WPB24-19	Updated standardized catch rates of swordfish (<i>Xiphias gladius</i>) caught by the Spanish surface longline fleet in the Indian Ocean during the 2001-2024 period (Fernández-Costa J, Ramos-Cartelle A)
IOTC-2026-WPB24-20	CPUE standardisation of swordfish caught by longline in South African waters (West W, da Silva C)
IOTC-2026-WPB24-22	Updated CPUE standardization for swordfish (<i>Xiphias gladius</i>) in the Indian Ocean using a zero-inflated Bayesian hierarchical spatial model with Japanese longline fishery data (1994-2024) (Takahashi S, Kai M)
IOTC-2026-WPB24-23	CPUE standardization of swordfish (<i>Xiphias gladius</i>) caught by Taiwanese large-scale longline fishery in the Indian Ocean (Lin C, Wang S, Xu W)
IOTC-2026-WPB24-24	Preliminary exploration of CPUE standardization of swordfish using IOTC catch effort dataset (Fu D)
IOTC-2026-WPB24-25	Stock assessment of Indian Ocean swordfish (<i>Xiphias gladius</i>) using Bayesian Surplus Production Models (JABBA): model development, validation, sensitivity and stock status (Coelho R)
IOTC-2026-WPB24-26	Stock assessment of swordfish (<i>Xiphias gladius</i>) in the Indian Ocean using the stochastic production model in continuous time (SPiCT) (Wang S)
IOTC-2026-WPB24-27	Indian Ocean Swordfish Stock Assessment 1950-2024 (Stock Synthesis) (Phillips G)

Document	Title
IOTC-2026-WPB24-28	Consideration of exceptional circumstances for the swordfish management procedure 2026 (Bromhead D, Preece A)
IOTC-2026-WPB24-29	Development of billfish & swordfish species identification App (Fujino)

APPENDIX IV - [DRAFT] RESOURCE STOCK STATUS SUMMARY – SWORDFISH

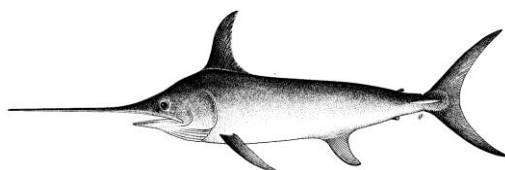


TABLE 1. Status of swordfish (*Xiphias gladius*) in the Indian Ocean

Area ¹	Indicators		2026 stock status determination ³
Indian Ocean	Catch 2024 (t)	28,144 ²	100 %
	Average catch 2020-2024 (t)	26,877	
	MSY (1,000 t) (80% CI)	39 (32-46)	
	F _{MSY} (80% CI)	0.18 (0.13-0.23)	
	SB _{MSY} (1,000 t) (80% CI)	58 (38-77)	
	F ₂₀₂₄ /F _{MSY} (80% CI)	0.34 (0.23–0.45)	
	SB ₂₀₂₄ /SB _{MSY} (80% CI)	2.81 (1.97–3.64)	
	SB ₂₀₂₄ /SB ₁₉₅₀ (80% CI)	0.58 (0.55–0.61)	

¹ Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence

² Proportion of 2024 catch estimated or partially estimated by IOTC Secretariat: 0.1%

³ 2024 is the final year that data were available for this assessment

Colour key	Stock overfished (SB ₂₀₂₄ /SB _{MSY} < 1)	Stock not overfished (SB ₂₀₂₄ /SB _{MSY} ≥ 1)
Stock subject to overfishing (F _{year} /F _{MSY} > 1)	0 %	0 %
Stock not subject to overfishing (F _{year} /F _{MSY} ≤ 1)	0 %	100 %
Not assessed/Uncertain/Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. A new stock assessment was carried out for swordfish in 2026, thus the stock status is determined on basis of the 2026 assessment. Three models were applied to the swordfish stock (JABBA, SPiCT, and Stock Synthesis (SS3)), with the SS3 stock assessment selected to provide scientific advice (as was done previously). 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 natural mortality (two options). In considering the assessment results, the WPB has expressed concern over the use of the outputs from the Japanese longline CPUE index in 2011, and 2024, as these values were estimated by the CPUE model as there was no effort by the Japanese fleet in this area in these years. A sensitivity run was conducted during WPB to test for the impact of excluding these values and the impact to the model was determined to be satisfactorily small. Overall, mean spawning stock biomass in 2024 was estimated to be 58 % (80% CI: 55-61 %) of the unfished levels (Table 1) and 2.81 times (80% CI: 1.97-3.64) the level required to support MSY. Median fishing mortality in 2024 was estimated to be 34 % (80% CI 23 %-45 %) of the F_{MSY} level, and catch in 2024 (28,112 t) was well below the estimated MSY level of 39,000 t (80% CI: 32,000 – 46,000t). Taking into account the characterized uncertainty, and on the weight-of-evidence available in 2026, the Indian Ocean 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 revised management procedure for Indian Ocean Swordfish was adopted under Resolution 25/07 by the IOTC Commission in May 2025 following revision to correct a small error, and was applied to determine a recommended TAC for Swordfish for 2026, 2027 and 2028 of 30,527 t. A review of evidence for exceptional circumstances was conducted in 2026 following the adopted guideline (IOTC-2021-SC24-R, appendix 6A) as per the requirements of Resolution 25/07. The review identified that the reduction in effort in the NW region by the Japanese longline fleet, that resulted in zero effort in 2024, and therefore no observation for the CPUE index used in the MP potentially represents an Exceptional Circumstance. Additionally, the SSB estimates fall outside of those estimated by the Management Strategy Evaluation, in particular the point estimate for the final year is more positive than those estimated by the MSE.

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 and 2024. The recent average catch of swordfish of 27,651t (for 2020-2024) 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 25/07 for the period 2026-2028 is 30,527t, which is around 12% higher than the catch in 2023 (26,836t). Noting that the Commission did not adopt an implementing measure for the TAC in 2025, the SC urgently recommended that the Commission adopt an implementing measure for the TAC in 2026.

The following key points should also be noted:

- **Maximum Sustainable Yield (MSY):** estimate for the Indian Ocean is 39,000 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 2020-2024):** swordfish are caught using longline (54%), followed by line (29.4%) and gillnet (16.1%). The remaining catches taken with other gears contributed to 0.6% of the total catches in recent years (**Fig. 1**).
- **Main fleets (mean annual catch 2020-2024):** the majority of swordfish catches are attributed to vessels flagged to Sri Lanka (24.4%) followed by Taiwan, China (14%) and Indonesia (9.7%). The 28 other fleets catching swordfish contributed to 51.9% of the total catch in recent years (**Fig. 2**).

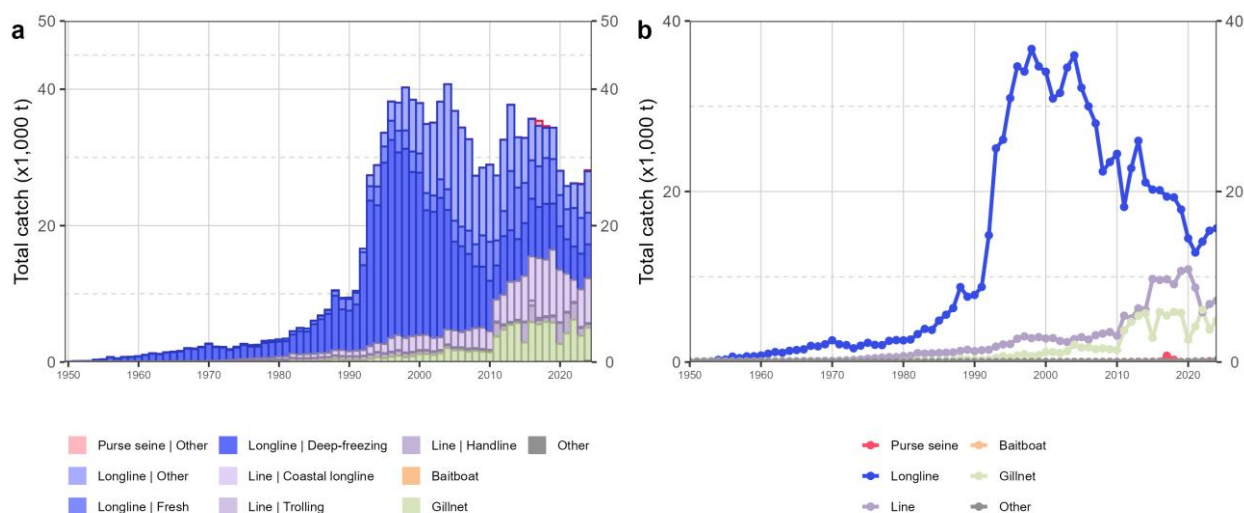


Fig. 1. Annual time series of (a) cumulative retained catches (metric tonnes; t) by fishery and (b) individual retained catches (metric tonnes; t) by fishery group for swordfish during 1950–2024. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeting longlines; Other: all remaining fishing gears

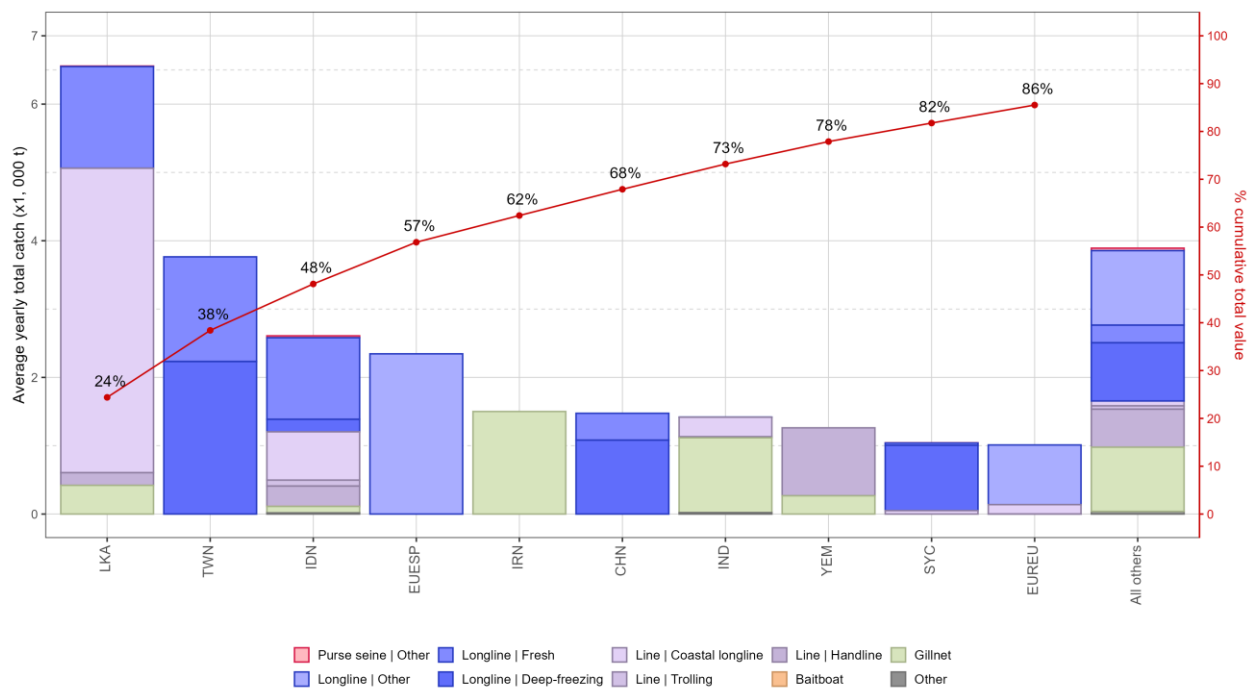


Fig. 2. Mean annual retained catches (metric tonnes; t) of swordfish by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

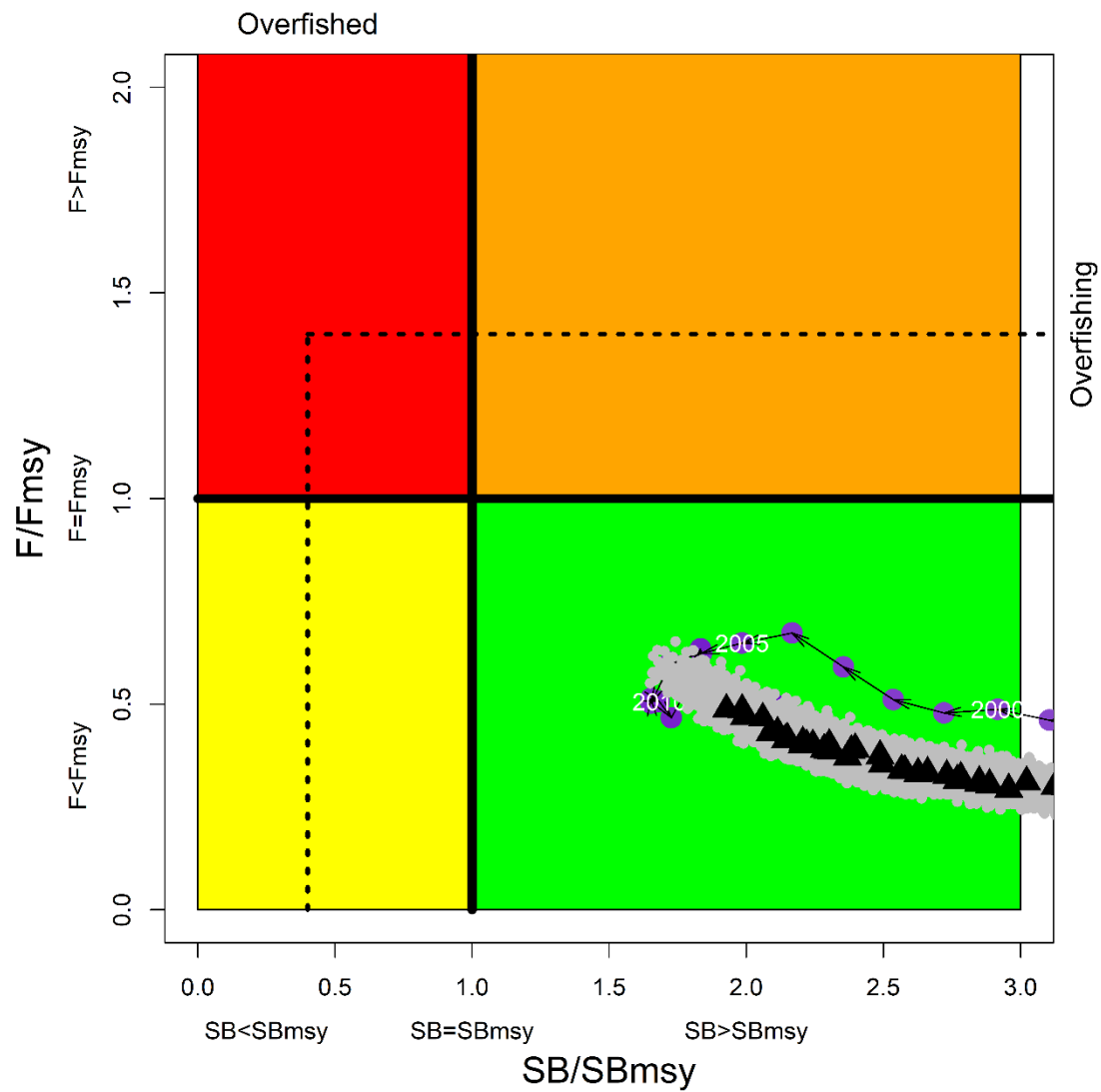


Fig. 3. Swordfish: 2024 stock status, relative to SB_{MSY} (x-axis) and F_{MSY} (y-axis) reference points for the final model grid. Grey dots represent uncertainty from individual models with 50%, 80% and 95% contours lines. The arrowed line represents the time series of stock trajectory from the reference model. The dashed lines represent limit reference points for Indian Ocean swordfish ($SB_{lim} = 0.4 SB_{MSY}$ and $F_{lim} = 1.4 F_{MSY}$)

APPENDIX V - [DRAFT] RESOURCE STOCK STATUS SUMMARIES – BLACK MARLIN



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

Area ¹	Indicators		2024 stock status determination ³
Indian Ocean	Catch 2024 (t)	26,599 ²	62.2%
	Average catch 2020–2024 (t)	21,894	
	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 2024 catch fully or partially estimated by the IOTC Secretariat: 33.9%

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. No new stock assessment was carried out for black marlin in 2025, thus, the stock status estimates are based on the stock assessment in 2024 using JABBA, a Bayesian state-space production model (using data up to 2022). The relative point estimates for this assessment are $F/F_{MSY}=1.39$ (0.72-2.45) and $B/B_{MSY}=1.35$ (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 t. 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 (9,932 t) as stipulated in Resolution 18/05 have been exceeded for four 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 2020-2024): black marlin are caught using gillnet (65.5%), followed by line (27%) and longline (4.9%). The remaining catches taken with other gears contributed to 2.6% of the total catches in recent years (**Fig. 1**).
- **Main fleets** (mean annual catch 2020-2024): the majority of black marlin catches are attributed to vessels flagged to I. R. Iran (44.1%) followed by India (19.5%) and Indonesia (15.3%). The 28 other fleets catching black marlin contributed to 21.1% of the total catch in recent years (**Fig. 2**).

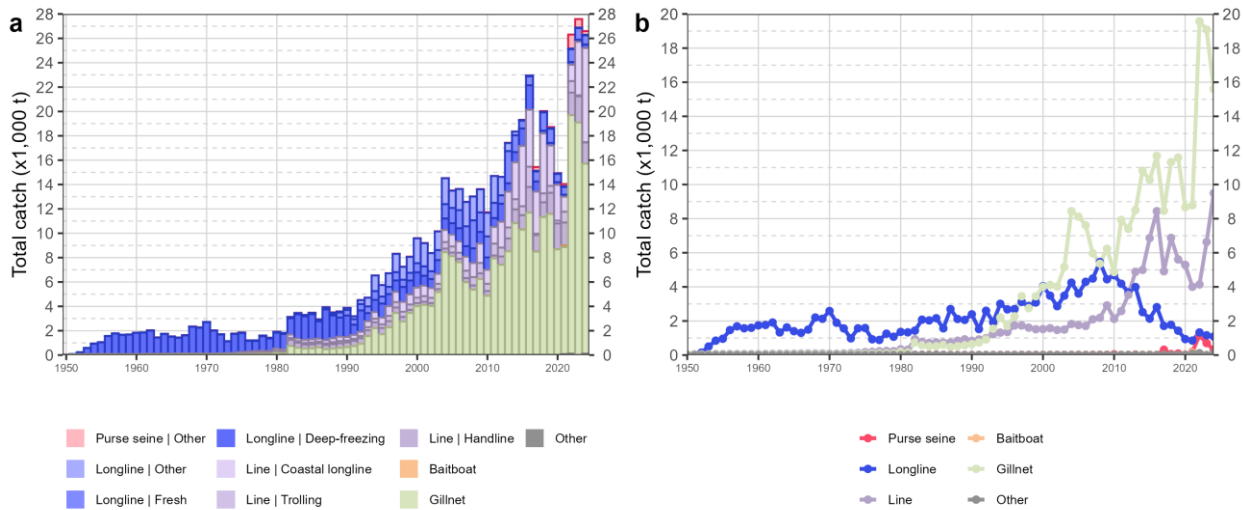


Fig. 1. Annual time series of (a) cumulative retained catches (metric tonnes; t) by fishery and (b) individual retained catches (metric tonnes; t) by fishery group for black marlin during 1950–2024. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

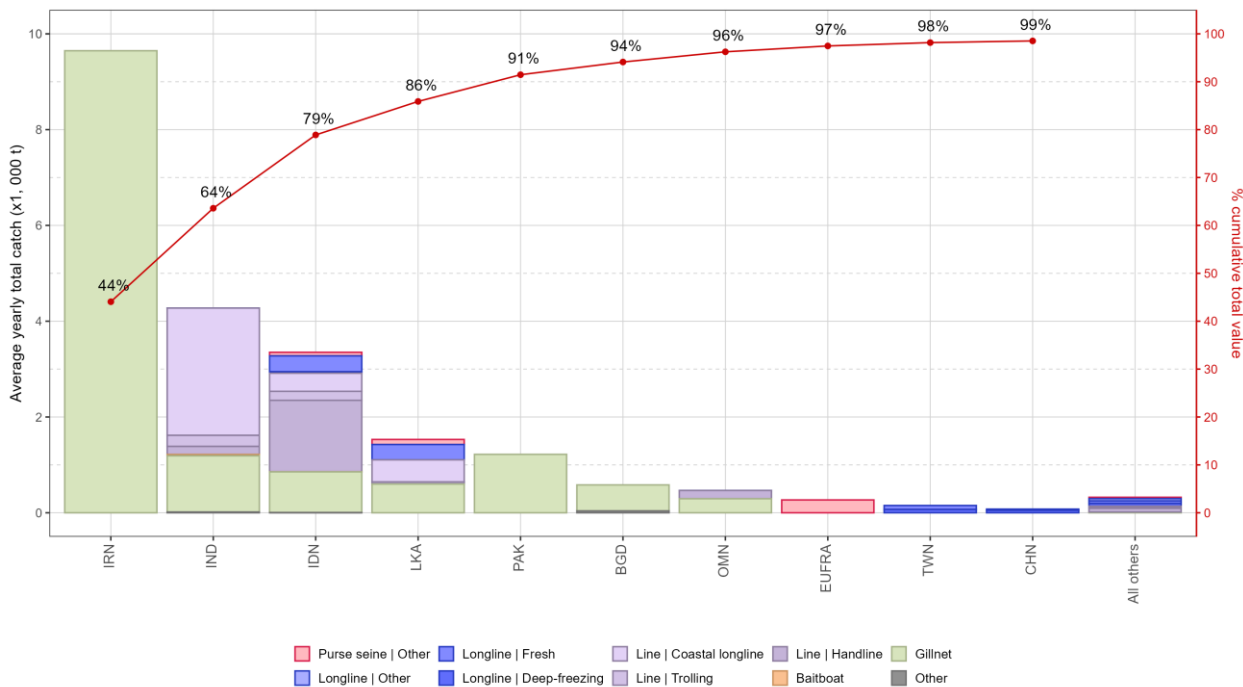


Fig. 2. Mean annual retained catches (metric tonnes; t) of black marlin by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

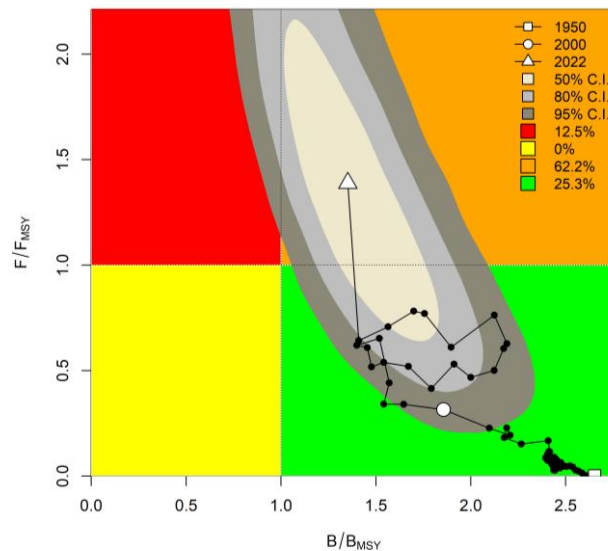


Fig. 3. JABBA Indian Ocean assessment Kobe plots for black marlin (contours are the 50, 80 and 95 percentiles of the 2022 estimate). Black line indicates the trajectory of the point estimates for the total biomass ratio (B/B_{MSY}) and fishing mortality ratio (F/F_{MSY}) for each year 1950–2022.

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 (17,710 t) * $\pm 20\%$, $\pm 40\%$, $\pm 60\%$) projected for 3 and 10 years

Reference point and projection timeframe	Alternative catch projections (relative to the average catch level of 2020–2022 of 17,710 t) and probability (%) of violating MSY-based target reference points ($B_{targ} = B_{MSY}$; $F_{targ} = F_{MSY}$)						
	40% (7,084 t)	60% (10,626 t)	80% (14,168 t)	100% (17,710 t)	120% (21,252 t)	140% (24,794 t)	160% (28,336 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
7,084 (40%)	65	72	77	81	85	87	89	90	91	92
10,626 (60%)	63	66	68	70	71	72	73	74	74	75
14,168 (80%)	55	54	53	53	52	52	51	50	50	50
17,710 (100%)	42	39	37	35	33	32	31	30	29	29
21,252 (120%)	30	27	24	22	21	19	18	17	17	16
24,794 (140%)	22	19	16	14	13	12	11	10	9	9
28,336 (160%)	16	13	11	9	8	7	7	6	6	5

APPENDIX VI - [DRAFT] RESOURCE STOCK STATUS SUMMARIES – BLUE MARLIN

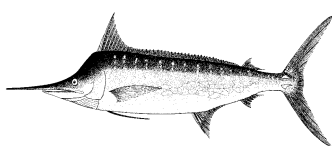


Table 1. Status of blue marlin (*Makaira nigricans*) in the Indian Ocean

Area ¹	Indicators		2025 stock status determination ³
Indian Ocean	Catch 2024 (t)	9,637 ²	97.4%
	Average catch 2020-2024 (t)	8,851	
	Average catch 2021-2023 (t)	8,134	
	MSY (1,000 t) (80% CI)	8.35 (7.52 – 9.23)	
	F _{MSY} (80% CI)	0.30 (0.21 – 0.38)	
	B _{MSY} (1,000 t) (80% CI)	27.92 (22.3 – 39.9)	
	F ₂₀₂₃ /F _{MSY} (80% CI)	1.54 (1.16 – 2.06)	
	B ₂₀₂₃ /B _{MSY} (80% CI)	0.62 (0.48 – 0.78)	
	B ₂₀₂₃ /B ₀ (80% CI)	0.23 (0.18 – 0.29)	

¹ Boundaries for the Indian Ocean are defined as the IOTC area of competence

² Proportion of 2024 catch estimated or partially estimated by IOTC Secretariat: 31.3 %

³ 2023 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 ₂₀₂₃ /B _{MSY} < 1)	Stock not overfished (B ₂₀₂₃ /B _{MSY} ≥ 1)
Stock subject to overfishing (F ₂₀₂₃ /F _{MSY} > 1)	97.4%	0.2%
Stock not subject to overfishing (F ₂₀₂₃ /F _{MSY} ≤ 1)	2.1%	0.3%
Not assessed/Uncertain/Unknown		

The percentages are calculated as the proportion of model terminal values that fall within each quadrant with model weights accounted for

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. No new stock assessment was carried out for blue marlin 2026, thus, the stock status estimates are based on the two different assessment models carried out in 2025: JABBA, a Bayesian state-space production model (age-aggregated); and SS3, an integrated model (age-structured) (using data up to 2023). Uncertainty in the biological parameters and the parameterisation of the SS3 model is still evident and as such the JABBA model (B₂₀₂₃/B_{MSY} = 0.62, F₂₀₂₃/F_{MSY} = 1.54) was selected as the base case. Both models were consistent with regards to stock status, although the SS3 model was less pessimistic. On the weight-of-evidence available in 2025, 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 Northwestern Indian Ocean piracy period. Thereafter, the B/B_{MSY} trajectory again declines to the current estimate of **0.62**. 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, noting a recent increasing trend in CPUE indices in 2023.

Management advice. The catches of blue marlin (average of 7,262 t in the final 3 years examined in the assessment, 2021-2023) were lower than MSY (8,351 t), however the catch in 2024 was higher than MSY. The stock is currently **overfished** and **subject to overfishing**, and according to the KOBE plot (Fig. 3), has been in this state since 2001 (with ~ 80 % CI). According to K2SM calculated at the time of the assessment (Table 2), a reduction of 20% of catches (5,809 t) compared to the mean of catches from 2021-2023 (7,262 t) would recover the stock to the green quadrant by 2035

with a probability of 64 % and if the catches are reduced by 40 % (4,357 t) the probability would be 86 %. 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 30 % more (3,579 t) than the new MSY estimated by the latest stock assessment in 2025 (8,351 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 strengthen 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 in 2025 is 8,351 t (estimated range (80% C.I.) 7,516–9,232 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 2020-2024):** blue marlin are caught using line (42.3%), followed by longline (30%) and gillnet (22.2%). The remaining catches taken with other gears contributed to 5.5% of the total catches in recent years (**Fig. 1**). The last 2 years in the data series are significantly higher than previous years which could be due to the revision of catches from Indonesia and increased catches from India, and these may be subject to examination. The recent increase in catch by lines also requires further examination.
- **Main fleets (mean annual catch 2020-2024):** the majority of blue marlin catches are attributed to vessels flagged to India (25.1%) followed by Indonesia (24.5%) and Sri Lanka (15.2%). The 28 other fleets catching blue marlin contributed to 35.2% of the total catch in recent years (**Fig. 2**).

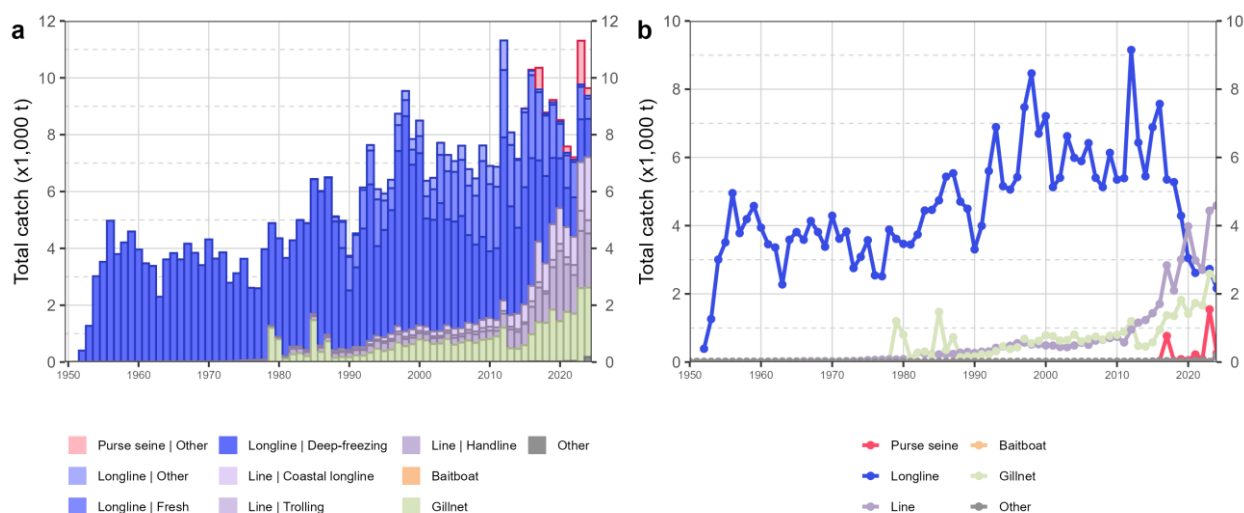


Fig. 1. Annual time series of (a) cumulative retained catches (metric tonnes; t) by fishery and (b) individual retained catches (metric tonnes; t) by fishery group for blue marlin during 1950-2024. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

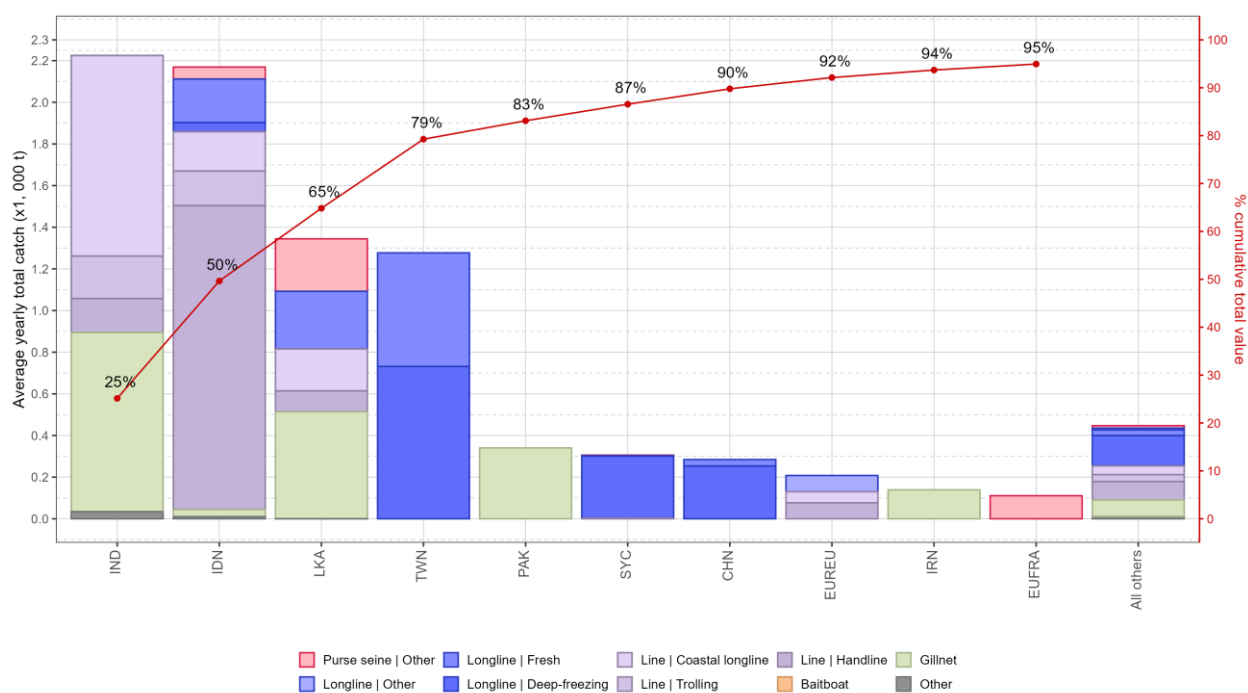


Fig. 2. Mean annual retained catches (metric tonnes; t) of blue marlin by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

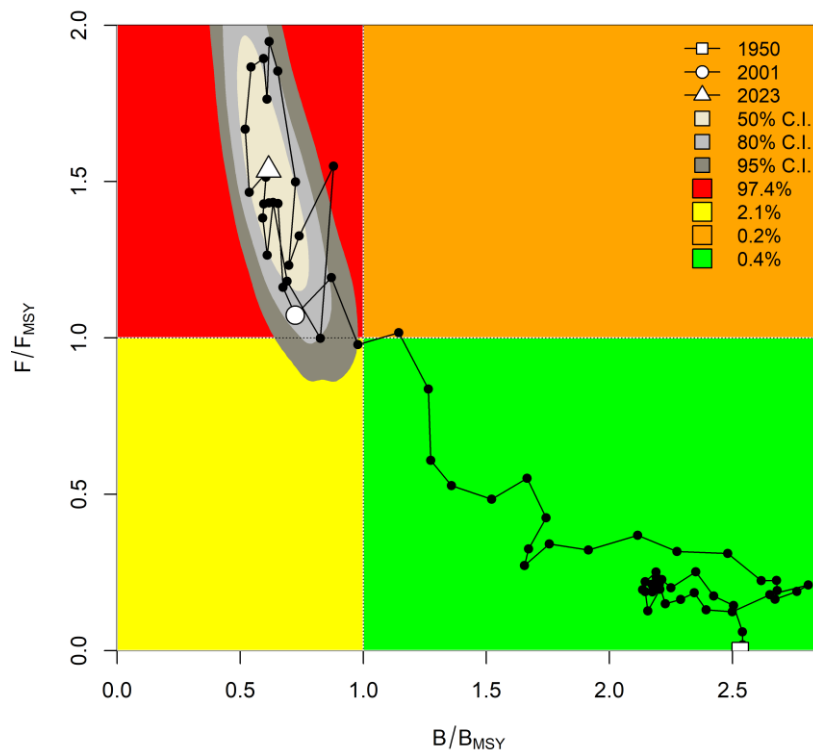


Fig. 3. JABBA Indian Ocean assessment Kobe plots for blue marlin (contours are the 50, 80 and 95 percentiles of the 2023 estimate). Black line indicates the trajectory of the point estimates for the total biomass ratio (B/B_{MSY}) and fishing mortality ratio (F/F_{MSY}) for each year 1950–2023

Table 2. Blue Marlin: Indian Ocean JABBA Kobe II Strategy Matrix. Probability (percentage) of achieving the green quadrant of the KOBE plot, for a range of constant catch projections (JABBA). Catch in 2024 and 2025 are fixed at 7,262 t

Catch (t)\Year	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
4,357 (60%)	10	22	35	48	59	67	74	80	83	86
5,083 (70%)	10	20	31	41	50	58	64	69	73	77
5,809 (80%)	10	18	26	34	41	47	53	57	61	64
6,536 (90%)	10	16	22	27	33	37	41	44	47	50
7,262 (100%)	10	14	18	22	25	27	30	32	34	35
7,988 (110%)	10	12	15	16	18	19	20	21	22	22
8,714 (120%)	8	9	11	11	12	12	12	13	12	12
9,440 (130%)	6	6	6	7	6	6	6	6	6	6
10,167 (140%)	4	4	4	4	3	3	3	3	3	2

Table 3. Blue 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 from 2021 to 2023 (7,262 t)*, $\pm 10\%$, $\pm 20\%$, $\pm 30\%$ $\pm 40\%$ projected for 3 and 10 years

Reference point and projection timeframe	Alternative catch projections (relative to the average catch level from 2021 to 2023 of 7,262 t) and probability (%) of violating MSY-based target reference points (B _{targ} = B _{MSY} ; F _{targ} = F _{MSY})								
	60% (4,357)	70% (5,083)	80% (5,809)	90% (6,536)	100% (7,262)	110% (7,988)	120% (8,714)	130% (9,440)	140% (10,167)
B ₂₀₂₈ < B _{MSY}	65	69	74	78	82	85	88	90	92
F ₂₀₂₈ > F _{MSY}	19	31	45	60	72	81	88	93	96
B ₂₀₃₅ < B _{MSY}	14	23	36	50	64	77	87	93	97
F ₂₀₃₅ > F _{MSY}	5	12	23	40	58	75	87	94	98

APPENDIX VII - [DRAFT] RESOURCE STOCK STATUS SUMMARIES – STRIPED MARLIN

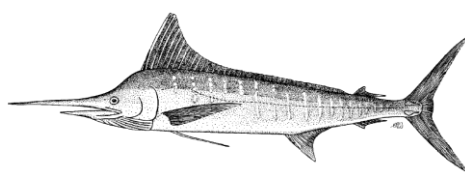


Table 1. Status of striped marlin (*Kajikia audax*) in the Indian Ocean

Area ¹	Indicators		2024 stock status determination ³
Indian Ocean	Catch 2024 (t)	5,827 ²	100%
	Average catch 2020-2024 (t)	3,689	
	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 2024 catch estimated or partially estimated by IOTC Secretariat: 28%

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. No new stock assessment was carried out for striped marlin 2026, thus, the stock status estimates are based on two different assessment models carried out in 2024: 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 $F_{\text{curr}}/F_{\text{MSY}}$ 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 2024 catches (4,334 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.

The stock has been overfished for more than a decade and is now in a highly depleted state. Based on the Kobe II strategy matrix run in 2024, a 70% reduction in the average 2020-22 catch of 2,891 t (i.e. to a 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%. 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):** 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 2020-2024):** striped marlin are caught using gillnet (72.6%), followed by longline (11.3%) and purse seine (10.5%). 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 2020-2024):** the majority of striped marlin catches are attributed to vessels flagged to I. R. Iran (29.7%) followed by Indonesia (22.9%) and Pakistan (22.1%). The 24 other fleets catching striped marlin contributed to 25.2% of the total catch in recent years (**Fig. 2**).

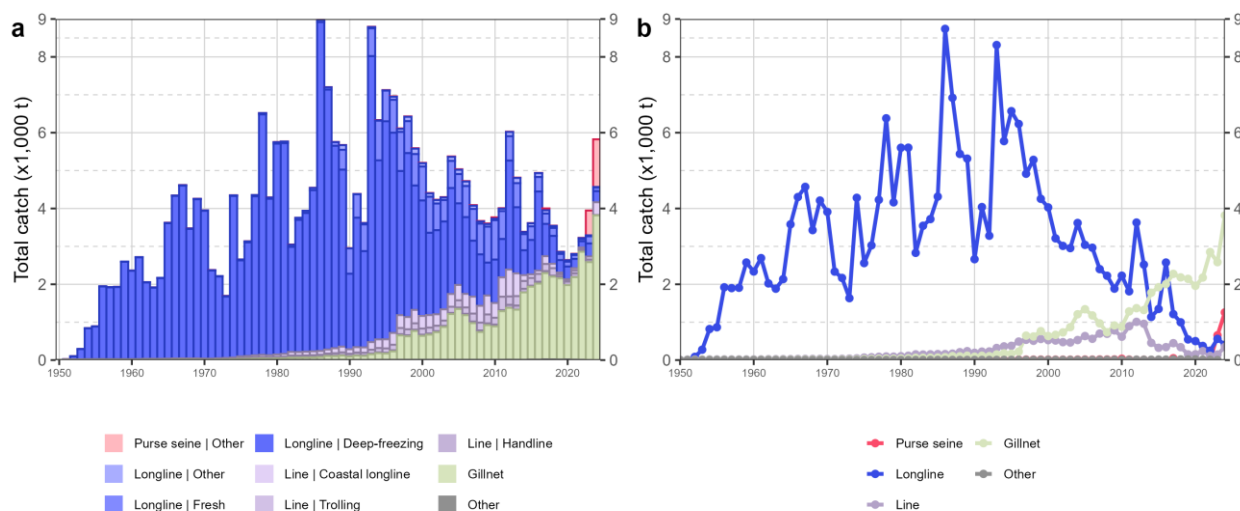


Fig. 1. Annual time series of (a) cumulative retained catches (metric tonnes; t) by fishery and (b) individual retained catches (metric tonnes; t) by fishery group for striped marlin during 1950-2024. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

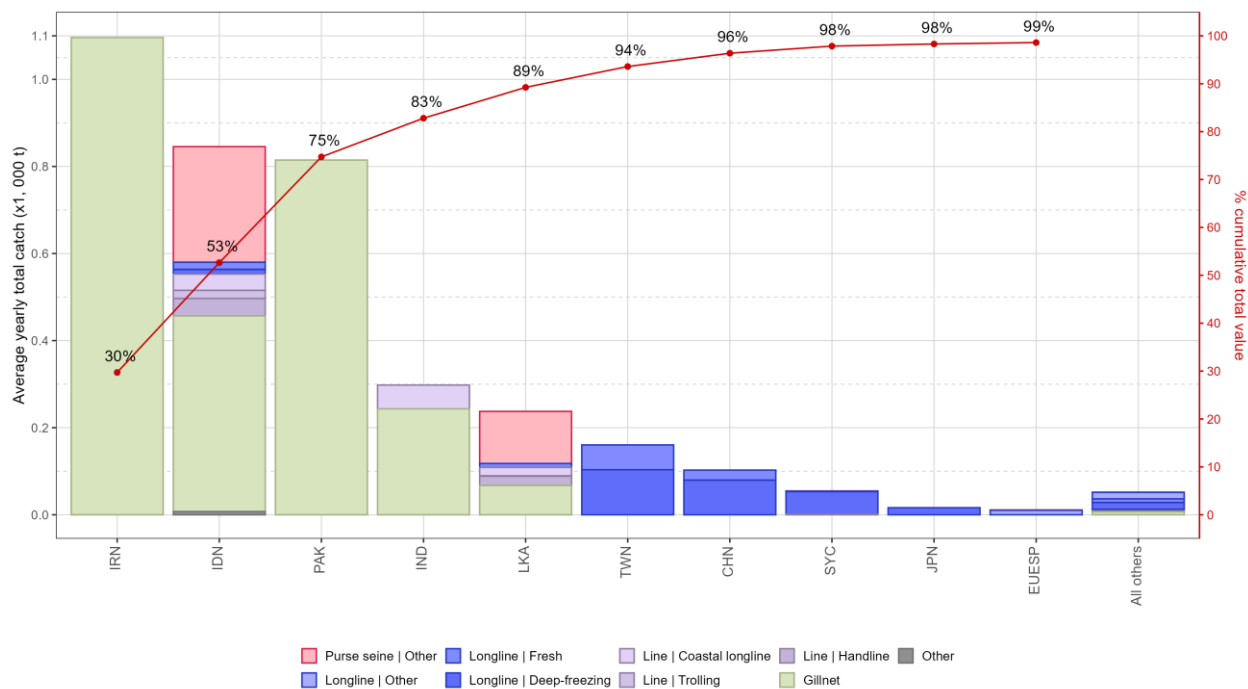


Fig. 2. Mean annual retained catches (metric tonnes; t) of striped marlin by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

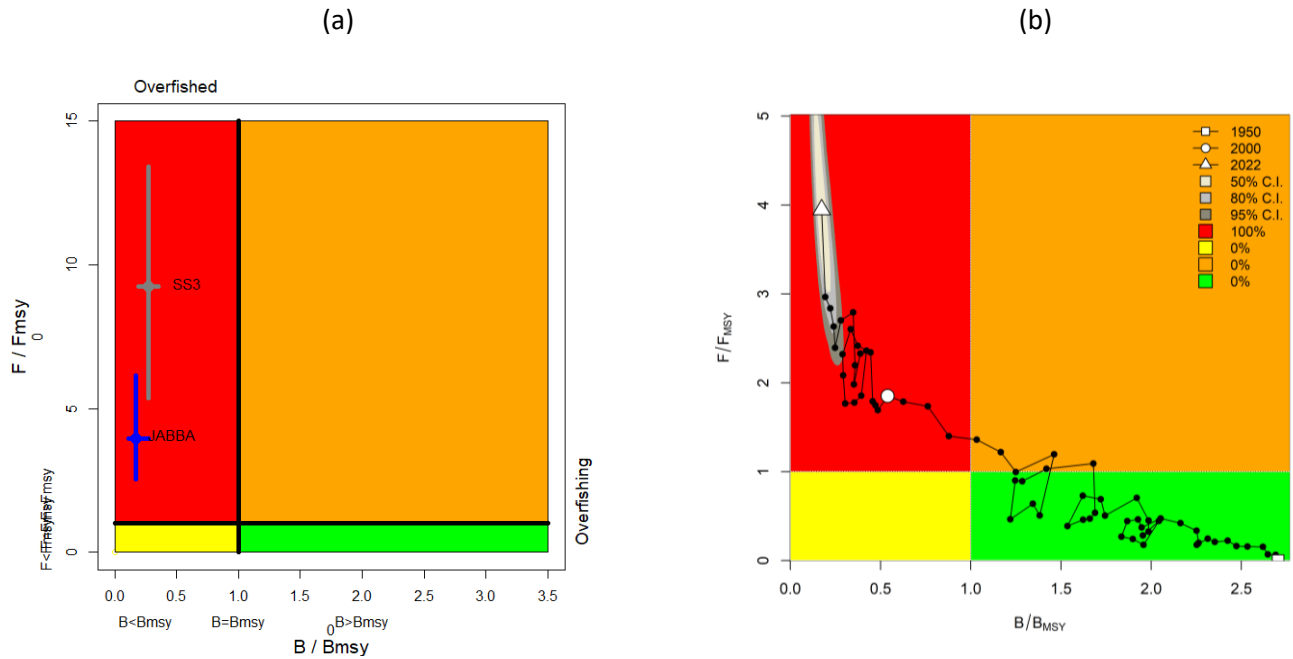


Fig. 3. (a) Striped marlin: Stock status from the Indian Ocean assessment JABBA (Bayesian State Space Surplus Production Model) and SS3 models with the confidence intervals (left); (b) Trajectories (1950-2022) of B/B_{MSY} and F/F_{MSY} from the JABBA model. NB: SS3 refers to SB/SB_{MSY} while the JABBA 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 (2,891 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 ($B_{\text{targ}} = B_{MSY}$; $F_{\text{targ}} = F_{MSY}$)								
	10% (289 t)	20% (578 t)	30% (867 t)	40% (1,157 t)	50% (1,446 t)	60% (1,735 t)	70% (2,024 t)	80% (2,313 t)	100% (2,891 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
1,157 (40%)	0	0	0	0	0	4	13	28	45	58
1,446 (50%)	0	0	0	0	0	1	5	13	25	36
1,735 (60%)	0	0	0	0	0	0	2	5	11	17
2,024 (70%)	0	0	0	0	0	0	1	2	4	7
2,313 (80%)	0	0	0	0	0	0	0	0	1	2
2,891 (100%)	0	0	0	0	0	0	0	0	0	0

APPENDIX VIII - [DRAFT] RESOURCE STOCK STATUS SUMMARY – INDO-PACIFIC SAILFISH



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

Area ¹	Indicators		2025 stock status determination ^{3,4}
Indian Ocean	Catch 2024 (t)	40,849 ²	92%
	Average catch 2020-2024 (t)	36,488	
	MSY (1,000 t) (80% CI) ⁴	34.3 (28.7 - 42.2)	
	F _{MSY} (80% CI) ⁴	0.20 (0.17 - 0.23)	
	SB _{MSY} (1,000 t) (80% CI) ⁴	174 (145 - 212)	
	F ₂₀₂₃ /F _{MSY} (80% CI) ⁴	0.69 (0.51 - 0.94)	
	SB ₂₀₂₃ /SB _{MSY} (80% CI) ⁴	1.34 (1.15 - 1.53)	
	SB ₂₀₂₃ /SB ₀ (80% CI) ⁴	0.67 (0.58 - 0.76)	

¹ Boundaries for the Indian Ocean stock assessment are defined as the IOTC area of competence

² Proportion of 2024 catch estimated or partially estimated by IOTC Secretariat: 2 %

³ 2023 is the final year that data were available for this assessment

⁴ These figures are outputs from the 2025 stock assessment and are not endorsed for management advice. Please see the section on management advice for further explanations on these estimates.

Colour key	Stock overfished ($B_{\text{year}}/B_{\text{MSY}} < 1$)	Stock not overfished ($B_{\text{year}}/B_{\text{MSY}} \geq 1$)
Stock subject to overfishing ($F_{2023}/F_{\text{MSY}} > 1$)	2 %	6 %
Stock not subject to overfishing ($F_{2023}/F_{\text{MSY}} \leq 1$)	0 %	92 %
Not assessed/Uncertain/Unknown		

The percentages are calculated as the proportion of model terminal values that fall within each quadrant with model weights accounted for

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Stock status. No new stock assessment was carried out for Indo-Pacific Sailfish in 2026, thus, the stock status estimates are based on the JABBA assessment carried out in 2025. Prior to this, in 2015 and 2019, data poor methods (Catch-MSY) were utilised to provide stock status for Indo-Pacific sailfish. These methods rely on catch data only, which is highly uncertain for this species, and resulted in an undefined stock status.

To overcome the lack of standardised CPUE indices or alternative abundance indices for this species, this assessment followed the methods of the previous assessment in 2022 where length-frequency data were used to estimate the annual Spawning Potential Ratio (SPR) using the length-based spawning potential ratio (LBSPR) method. Annual estimates of SPR were then normalised in the JARA (Just Another Red List Assessment) model to provide an index that was assumed to be proportional to spawning biomass. This index was then incorporated as an index of relative abundance in a JABBA model.

This is a novel technique applied to overcome the paucity of abundance data for Indo-Pacific sailfish and it had not been thoroughly tested with rigorous simulation-evaluation. This method has key assumptions that raised concerns within members of the WPB23. These three equilibrium assumptions that are likely to be violated are: 1) annual

recruitment is assumed to be constant over time without directional trends; 2) length-frequency data used to derive the SPR trends is representative of the population; 3) selectivity is non-varying, and follows a logistic form.

The previous iteration of the Indo-Pacific sailfish assessment also noted the same concerns, and it was agreed by the SC in 2022 that the methodology of converting the length data into an index of relative abundance required further review. At the time of the assessment in 2025, there was uncertainty regarding how much the current assessment results are impacted by the violation of the assumptions listed above. It was discussed that it was possible that if assumptions are violated, the index of abundance could be showing trends that are diametrically opposed to the true population trend. It was recommended by the WPB23 that the extent of the potential bias must be evaluated with a simulation study which will inform whether this index is acceptable for use in the Indo-Pacific sailfish stock assessment.

The results of the LBSPR portion of the assessment indicate that there has been a 45.5 % decline in SPR since 1970. The latest (2023) estimate of B/B_{MSY} was 1.34, while the F/F_{MSY} estimate was 0.69. Additionally, concern was raised regarding the high levels of current catches (31,898 t in 2023), that are above the previous MSY estimate of 25,905 t, and close to the current, higher estimate of MSY of 34,300 t.

On the weight-of-evidence available in 2025, 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 36,390 t in the last 5 years, 2020-2024) are substantially higher than the previous MSY estimate of 25,905 t, and close to the current MSY estimate of 34,300 t. This increase in coastal gillnet and 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 2020-2024 catches exceed the catch limit prescribed in [Resolution 18/05](#) (25,000 t).

Management advice. Considerable uncertainty remains in the JABBA assessment conducted in 2025, however the trends in key model outputs align relatively well with the 2022 assessment. For this year, due to the uncertainty in the model outputs, the management advice from 2022 would be carried over for one year (1 year) to allow time to complete the simulation studies and provide updated management advice in 2026. It is anticipated that, once the underlying uncertainty in the JABBA assessment is understood and presented at the proposed WPB meeting next year, management advice can be updated.

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. 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 34,300 t. As mentioned in the paragraph above and in the table at the start of the document (**Table 1**), MSY and associated stock assessment outputs are not to be used for management advice. This includes the KOBE plot, and these values (including the KOBE plot) may be updated in 2026 after the simulation study has been completed.
- **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 2020-2024):** indo-pacific sailfish are caught using gillnet (67.1%), followed by line (27.7%) and longline (2%). The remaining catches taken with other gears contributed to 3.3% of the total catches in recent years (**Fig. 1**).
- **Main fleets (mean annual catch 2020-2024):** the majority of indo-pacific sailfish catches are attributed to vessels flagged to I. R. Iran (42.8%) followed by India (19.2%) and Indonesia (12.3%). The 33 other fleets catching indo-pacific sailfish contributed to 25.6% of the total catch in recent years (**Fig. 2**).

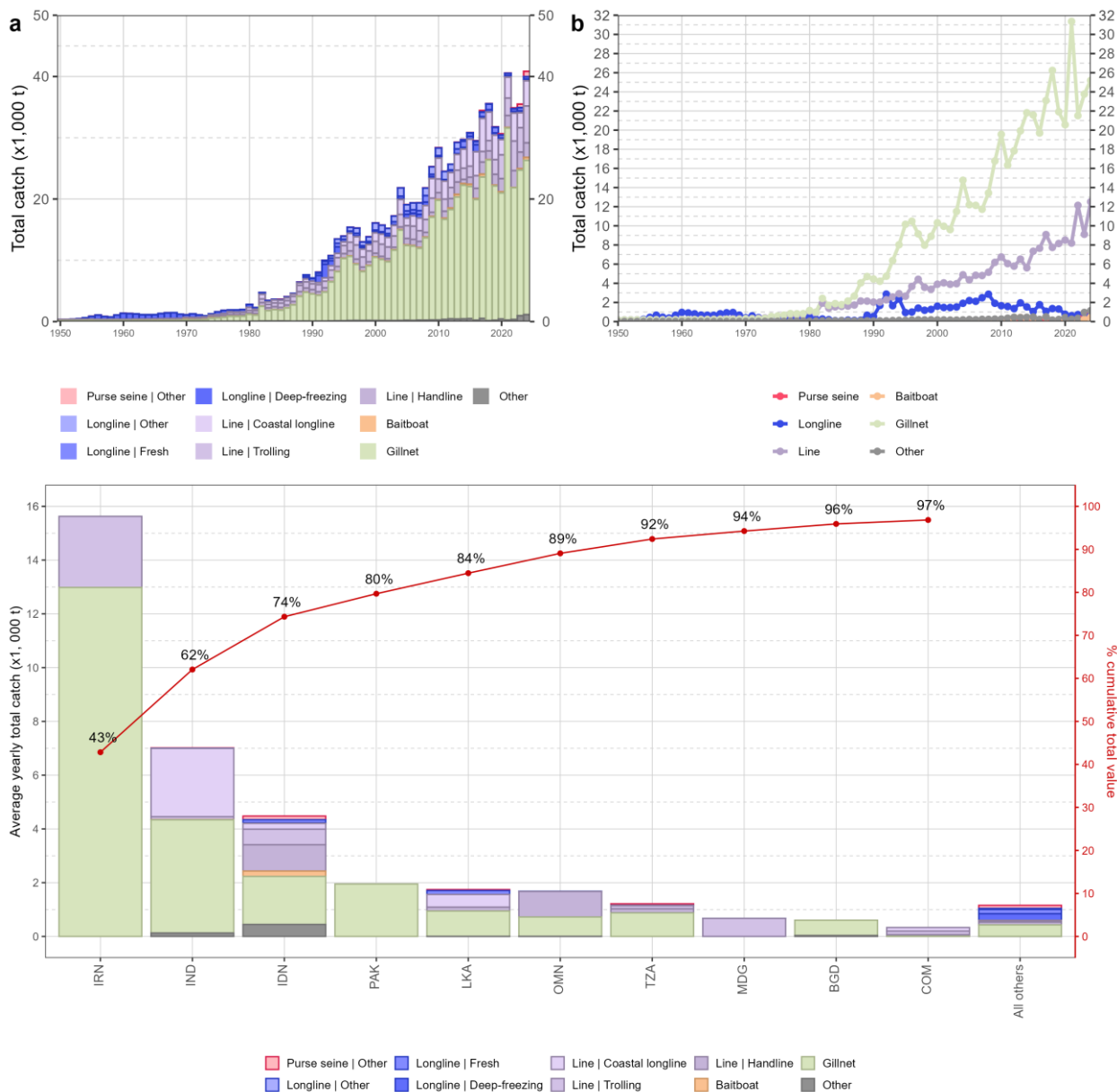


Fig. 1. Annual time series of (a) cumulative retained catches (metric tonnes; t) by fishery and (b) individual retained catches (metric tonnes; t) by fishery group for Indo-Pacific sailfish during 1950-2024. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

Fig. 2. Mean annual retained catches (metric tonnes; t) of Indo-Pacific sailfish by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, large-scale purse seine, and ring net; Longline | Other: swordfish and sharks-targeted longlines; Other: all remaining fishing gears

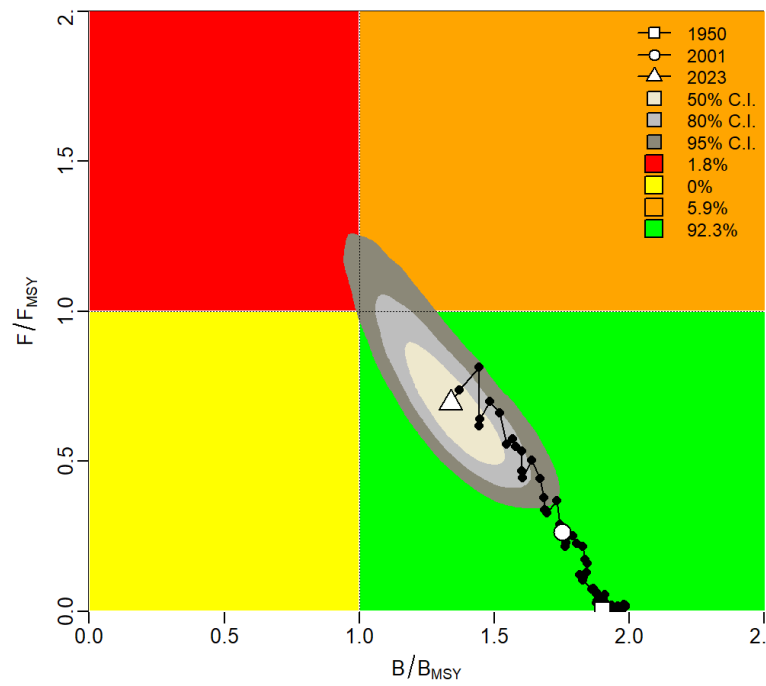


Fig.3: Kobe plot showing estimated trajectories (1950-2023) of B/B_{MSY} and F/F_{MSY} for JABBA model of Indian Ocean Indo-Pacific sailfish. Different grey shaded areas denote the 50%, 80%, and 95% credibility interval for the terminal assessment year. The probability of terminal year points falling within each quadrant is indicated in the figure legend

APPENDIX IX WORKING PARTY ON BILLFISH PROGRAM OF WORK (2027–2031)

The Program of Work consists of the following, noting that a timeline for implementation would be developed by the SC once it has agreed to the priority projects across all of its Working Parties:

- **Table 1:** High priority topics for obtaining the information necessary to develop stock status indicators for billfish in the Indian Ocean; and
- **Table 2:** Stock assessment schedule.

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				
		2027	2028	2029	2030	2031
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, Japan, Indonesia; 1.2 Data on gillnet fisheries are available in several CPCs (Pakistan, I.R. Iran) and the recovery of this information and the development of gillnet CPUE indices will improve species assessments, particularly for: • Black marlin • Sailfish (Noting that the work outlined in shark research plan could contribute to this objective)					

	1.3 Investigate environmental variables and habitat covariates in CPUE standardisation, and improve the understanding of how they could potential influence fish distribution and changes in abundance					
2. Biological and ecological information	2.1 Biological 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) 2.1.2 Tissues samples to support genetic studies such as epigenetic and CKMR 2.1.3 Spawning time and locations: 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 2.2 Stock structure (connectivity and diversity) 2.2.1 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. 2.2.2 Tagging research (e.g., PSAT tags & genetic 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.					
Other Future Research Requirements (not in order of priority)						
3. Historical data review	3.1 Changes in fleet dynamics 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, Somalia, Oman					
	3.2 Species identification					
	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.					
	3.3 Tagging data recovery from alternate sources (e.g. Billfish foundation) to supplement IOTC tagging database information and potentially develop Shiny APP for data dissemination.					
4. Billfish as bycatch	How to provide scientific advice to management on billfish caught as bycatch 4.1 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 .					

Table 2. Assessment schedule for the IOTC Working Party on Billfish

<i>Working Party on Billfish</i>					
Species	2027	2028	2029	2030	2031
Black marlin	Full assessment			Full assessment	
Blue marlin		Full assessment			Full assessment
Striped marlin	Full assessment			Full assessment	
Swordfish	Run MP		Full assessment	Run MP	
Indo-Pacific sailfish		Full assessment			Full assessment

APPENDIX X

CONSOLIDATED RECOMMENDATIONS OF THE 24TH SESSION OF THE WORKING PARTY ON BILLFISH***Review of exceptional circumstances of swordfish management procedure (Resolution 24/08)***

WPB24.01 (para 165): The WPB **NOTED** that WPB **RECOGNIZED** that the absence of fishery observations in the Northwest Indian Ocean raises serious concerns regarding the long-term suitability of the Japanese CPUE series as a monitoring index for the Management Procedure. The WPB **AGREED** that this situation represents an Exceptional Circumstance with respect to the continued future use of the MP. The WPB **RECOMMENDED** that the SC also consider this an Exceptional Circumstance with a potential impact on the future application of the MP. The WPB **NOTED** that the current implementation of the Management Procedure, through the adopted TAC for 2027 and 2028, as per Resolution 26/02, is not affected, as it is based on the agreed CPUE index

WPB24.01 (para 166): The WPB **RECOMMENDED** that the Scientific Committee prioritize the development of a workplan to investigate alternative CPUE indices, including indices derived from alternative fleets, areas, or combinations of fleets and areas, for potential incorporation into revised candidate harvest control rules and the MSE testing of these within revised candidate Management Procedures, for consideration by the Commission. The WPB **NOTED** that this work may take a number of years to complete and as such, **FURTHER RECOMMENDED** that this work commence as a matter of urgency. This is required to mitigate against the scenario whereby the Japanese Northwest Indian Ocean CPUE series no longer provides an adequate monitoring index in future.

Revision of the WPB Program of work (2027–2031)

WPB24.07 (para 189): The WPB **RECOMMENDED** that the SC consider and endorse the WPB Program of Work (2027–2031), as provided in [Appendix X](#).

Date and place of the 25th and 26th Sessions of the Working Party on Billfish

WPB24.08 (para 196): The WPB **RECOMMENDED** the SC consider early September as a preferred time period to hold the WPB25 in 2027. As usual it was also **AGREED** that this meeting should continue to be held back-to-back with the WPEB and that in 2027 WPB will be held in the week after the WPEB.

Review of the draft, and adoption of the Report of the 24th Session of the Working Party on Billfish

WPB24.09 (para 198): The WPB **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPB24, provided at [Appendix XI](#), as well as the management advice provided in the draft resource stock status summary for each of the five billfish species under the IOTC mandate, and the combined Kobe plot for the five species assigned a stock status in 2026 (**Figure 5**):

- Swordfish (*Xiphias gladius*)– [Appendix IV](#)
- Black marlin (*Istiompax indica*) – [Appendix V](#)
- Blue marlin (*Makaira nigricans*) – [Appendix VI](#)
- Striped marlin (*Kajikia audax*) – [Appendix VII](#)
- Indo-Pacific sailfish (*Istiophorus platypterus*) – [Appendix VIII](#)

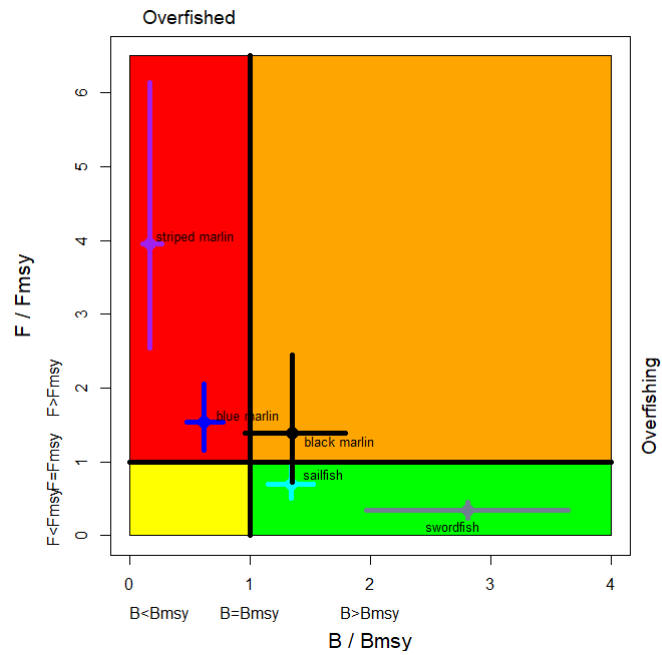


Figure. 5. Combined Kobe plot for swordfish (grey), Indo-Pacific sailfish (cyan), black marlin (black), blue marlin (blue) and striped marlin (purple) showing the 2024 (black marlin and striped marlin), 2025 (blue marlin and Indo-Pacific sailfish), and 2026 (swordfish) estimates of current stock size (B or SB , species assessment dependent) and current fishing mortality (F) in relation to optimal spawning stock size and optimal fishing mortality. Cross bars illustrate the range of uncertainty from the model runs.