

OUTCOMES OF THE 25th SESSION OF THE SCIENTIFIC COMMITTEE

PREPARED BY: IOTC SECRETARIAT, 17 MAY 2023

PURPOSE

To inform participants at the 25th Working Party on Tropical Tunas Data Preparatory meeting (WPTT25(DP)) of the recommendations arising from the 25th Session of the IOTC Scientific Committee (SC) held from 5 -9 December 2022, specifically relating to the work of the WPTT.

BACKGROUND

At the 25th Session of the SC, the SC noted and considered the recommendations made by the WPTT in 2022 that included requests to address the deficiencies in data collection, monitoring and reporting by CPCs, as well as to carry out targeted research and analysis on tropical tuna species.

Tropical tunas caught in the IOTC area of competence and under the WPTT mandate

Common name	Species	Code
Bigeye tuna	<i>Thunnus obesus</i>	BET
Skipjack tuna	<i>Katsuwonus pelamis</i>	SKJ
Yellowfin tuna	<i>Thunnus albacares</i>	YFT

The recommendations on the deficiencies in data collection, monitoring and reporting by CPCs in relation to tropical tunas will be discussed in paper IOTC–2023–WPTT25(DP)–07 and are therefore not presented in this paper.

Based on the recommendations arising from the WPTT24, the SC25 adopted a set of recommendations, provide at [Appendix A](#) of this paper.

The recommendations contained in [Appendix A](#) were provided to the Commission for consideration at its 27th Session held in May 2023.

In addition, the SC25 reviewed and endorsed a Program of Work (2023–2027) for the WPTT, including a revised assessment schedule. A separate paper will be reviewed during the WPTT24(AS) and will outline the review and development process for a *Program of Work* for the WPTT for the next five years.

DISCUSSION

In addition to the recommendations outlined in [Appendix A](#), the following extracts from the SC25 Report (2022) are provided here for the consideration and action of the WPTT25(DP):

Report of the 24th Session of the Working Party on Tropical Tunas (WPTT24)

75. The SC **NOTED** the report of the 24th Session of the Working Party on Tropical Tunas ([IOTC–2022–WPTT24–R](#)), including the consolidated list of recommendations provided as an appendix to the report. The meeting was attended by 113 participants (cf. 108 in 2021). No MPF funding was provided as the meeting was held online.

7.4.1 Bigeye tuna stock assessment

76. The SC **NOTED** that the 2022 bigeye tuna assessment (using Stock Synthesis III, SS3) concluded that the stock is overfished and is subject to overfishing. The SC further **NOTED** that two models were applied to the bigeye stock (Statistical Catch at Size (SCAS) and SS3), with the SS3 stock assessment selected to provide scientific advice.
77. The SC **NOTED** that the new bigeye tuna stock assessment captured structural uncertainty through a grid of 24 models covering stock recruitment, growth, natural mortality and selectivity assumptions, and statistical uncertainty of individual models was also incorporated into the estimates of stock status. The SC further **NOTED** that all models in the grid are equally weighted.

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78. The SC **NOTED** that although the assessment looked at using diagnostics for model selection and weighting, no agreement on how different diagnostic information can be converted to model weights was reached. Model weighing is an active topic on the WPM meeting agenda and is an ongoing study in the field of stock assessment, particularly at the Center for the Advancement of Population Assessment Methodology (CAPAM) [stock assessment good practice workshops](#), which have covered model weighting and diagnostics in detail.
79. The SC **DISCUSSED** whether models with lower steepness should be removed from the model grid noting that several diagnostic tests on such models had failed. The SC **NOTED** that an early ISSF workshop recommended steepness levels between 0.7 and 0.9 for tropical tuna species. The workshop suggested that higher values may be less suited for bigeye tuna but are more likely to be better for yellowfin and skipjack. The SC further **NOTED** that the cut-off ranges for certain diagnostic criteria for model selection may be arbitrary.
80. The SC **NOTED** that the new CPUE index in region 3 (South) shows a greater decline than the previous index, which may be due to changes in data access arrangement which resulted in the CPUE standardization being based on catch effort data at a coarser geographical resolution (i.e., 1x1 degree) than the prior standardization. This may have resulted in a more negative stock trajectory but regardless, did not fundamentally change the conclusion of the assessment. The SC also **NOTED** that the new CPUE in other regions are more consistent with the earlier estimates.
81. The SC **NOTED** the substantial increase of catch for Seychelles in 2021 is due to changes in data processing rather than increase of harvest.
82. The SC **RECALLED** that WPTT21 used a spatial-temporal re-estimation approach to revise the bigeye tuna catch reported by EU, Spain in 2018 (limited to their log-associated school component). The official reported catches were, however, kept in the IOTC database, and the revised catch was incorporated in the assessment as scientific estimates. The WPDCS15 further improved the re-estimation technique, and the WPTT24(DP) has agreed to utilize it in the current assessment.
83. The SC **NOTED** that preliminary fishery impact analysis (to help understand the contribution of different gears/fisheries to stock depletion), which the commission had requested, had been initiated; however, the methodology needs to be reviewed by the WPM before the analysis is finished and presented to the commission.

7.4.2 Update on the WGFAD03

84. The SC **NOTED** the report of the 3rd ad hoc working group meeting on FADs ([IOTC-2022-WGFAD03-R](#)). The meeting was attended by 111 participants (cf. 93 in 2021).
85. The SC **THANKED** the WGFAD for their work and the chair for the presentation which included a summary of the progress made on the terminology and definitions related to FAD-fishing as proposed by a Small Working Group on FAD definitions who worked intersessionally between the WGFAD and the WPDCS.
86. The SC **NOTED** the presentation of the three updated forms for reporting FAD-related data to the Secretariat, **NOTING** that the resolution of the data is higher than in the previous form 3FA (i.e., at vessel and operational levels) to better reflect the data requirements set in Resolutions 15/02 and 19/02.
87. The SC **NOTED** that the new 3FA forms would become available for download on the IOTC website in the forthcoming weeks and that they could be used for the 2023 data cycle, i.e., for reporting data for the statistical year 2022.
88. The SC **NOTED** that several FAD-related definitions were agreed on by the Small Working Group that was held after the WGFAD, but that no consensus was reached on the general definition of a FAD, **NOTING** further that two alternate definitions were proposed by the Small Working Group.
89. The SC **AGREED** that both definitions have some merit and that each one could be used if all FAD-related data are included as part of the submissions to the Secretariat, **NOTING** however that the definition derived from the EU-funded CECOFAD project (i.e., a FAD is a floating object constructed and deployed by fishers with the purpose to aggregate fish) makes a clear distinction between man-made rafts and natural floating objects, which is essential for some scientific analyses, e.g., to assess the contribution of FAD-fishing to marine pollution.
90. The SC **REQUESTED** the WGFAD to discuss further the FAD definition and report to the WPEB and WPDCS in 2023.

91. The SC **NOTED** that the implementation of time-area closures for FAD fishing has been discussed for several years at the IOTC while found to be an effective management tool in other oceans, e.g., to reduce fishing mortality on juveniles of tuna. The SC **ACKNOWLEDGED** the need to provide clear guidance to the Commission on this matter and **REQUESTED** the WGFAD to prioritise this undertaking.
92. The SC **NOTED** that no agreement was reached by the WGFAD regarding the potential efficacy of time-area closure for FAD fishing in absence of scientific assessment on their location and duration, further **NOTING** that FAD purse seine fishing grounds are widely spread in the Indian Ocean as compared to other oceans (e.g., Atlantic Ocean).
93. The WGFAD **NOTED** that some research is currently conducted by some CPCs to assess the feasibility and effects of seasonal closing of FAD fishing.
94. **NOTING** that the WGFAD endorsed the need to move towards biodegradable FADs and **RECALLING** that the transitioning to biodegradable FADs is explicitly included in Resolution 19/02, the SC **NOTED** that more guidance might be required by the Commission so support the concrete implementation of biodegradable FADs.

7.4.3 Bigeye Tuna MP

95. The SC **RECALLED** that Resolution 22/03 adopted the bigeye management procedure and that due to the adoption of the MP for bigeye tuna, the role of the BET stock assessment has now changed to only providing information on stock status rather than also being a tool for providing management advice.
96. The SC **NOTED** the MP schedule requires the MP to be run by the IOTC Scientific Committee in 2022, through the Working Party on Methods and Working Party on Tropical Tunas, including a review of exceptional circumstances, to recommend a TAC for 2024 and 2025 for IOTC Commission consideration. The SC **NOTED** that the key data inputs to the MP and the calculation of the TAC has been presented to both the WPM13 and WPTT24.
97. The SC **NOTED** that to run the BET MP, a Pella-Tomlinson biomass dynamic model was firstly fitted to the catch and the longline CPUE index to estimate (within the MP model) stock depletion, and then the harvest control rule ($TAC_{new} = B_y(1 - \exp(-F_{mult} \times HCR_{mult} \times F_{MSY\ ratio}))$) was used to calculate the TAC (Figure a), and finally the 15% maximum TAC change is applied. The SC **NOTED** that the data input to the MP is consistent with the stock assessment (the longline CPUE index was combined across the four regional indices used in the assessment), and the internal estimation model of the MP fits well to these data.

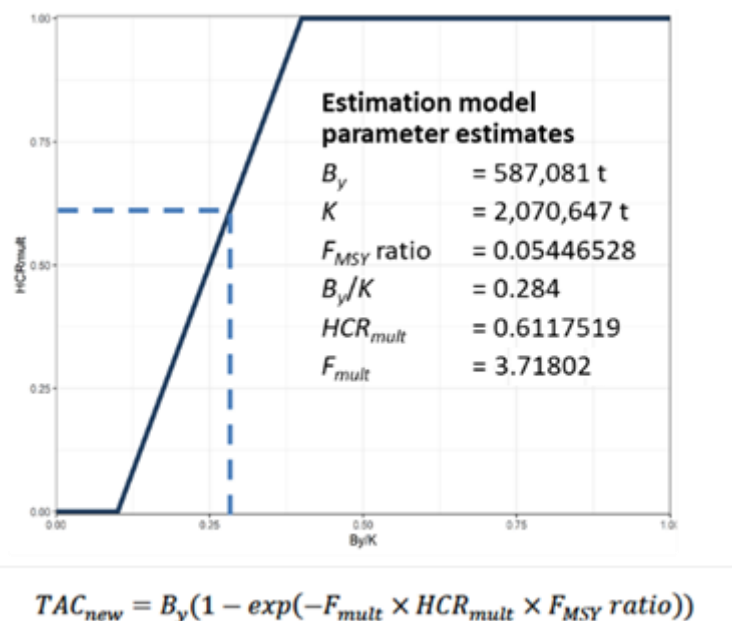


Figure a: the BET tuna Harvest Control Rule and control parameters estimated from the Pella-Tomlinson model used to calculate the TAC

98. The SC **NOTED** that the application of the bigeye management procedure resulted in a recommended TAC of 80,583 t per year for 2024 and 2025, which requires a 15% catch reduction from the 2021 catch level. The SC **RECOMMENDED** that the Commission endorse the calculated TAC for 2024 and 2025.
99. Given average catch of BET in the past 5 years being above the calculated TAC for 2024 and 2025 and the lack of effective implementation of catch limits for other stocks in the IOTC, the SC **RECOMMENDED** that the Commission ensure effective implementation of the bigeye management procedure recommended TAC, especially taking into consideration the current overfished and subject to overfishing status of the stock. The SC **NOTED** that respecting the BET TAC is especially important when taking into consideration the multi-species nature of the tropical tuna fisheries and especially taking into account the existing catch limit for YFT and TAC for SKJ.
100. The SC **NOTED** the consideration of exceptional circumstances for the Bigeye Tuna MP in 2022 were discussed extensively at WPM8 and WPTT24 and evidence reviewed included new biological parameters and fishery operations, input data, and a comparison of the estimated population trend in the assessment with operating models. The SC **AGREED** that the review of evidence for exceptional circumstances did not identify any reasons to change the advice on the TAC.
101. The SC **NOTED** that there is a one-year gap between the TAC's calculation and intended implementation. The SC also **NOTED** that the TCMP had discussed and agreed this timeline for running the MP. It is noted that the MP is robust to the implementation lag, which has been thoroughly tested in the MSE.

7.4.4 Other Matters

102. The SC thanked the Australian scientists for taking the lead of running the bigeye MP for the first year. The SC **AGREED** that the secretariat would from now take responsibility for managing it going forward, with assistance from the CPC's scientists..

RECOMMENDATION

That the WPTT:

- 1) **NOTE** paper IOTC–2023–WPTT25(DP)–03 which outlined the main outcomes of the 25th Session of the Scientific Committee, specifically related to the work of the WPTT.
- 2) **CONSIDER** how best to progress these issues at the present meeting.

APPENDICES

Appendix A: Consolidated set of recommendations of the 25th Session of the Scientific Committee to the Commission, relevant to the Working Party on Tropical Tunas.

APPENDIX A

CONSOLIDATED SET OF RECOMMENDATIONS OF THE 25TH SESSION OF THE SCIENTIFIC COMMITTEE (5–9 DECEMBER 2023) TO THE COMMISSION

STATUS OF TUNA AND TUNA-LIKE RESOURCES IN THE INDIAN OCEAN AND ASSOCIATED SPECIES

Tuna – Highly migratory species

SC25.01 (para. 159) The SC **RECOMMENDED** that the Commission note the management advice developed for each tropical and temperate tuna species as provided in the Executive Summary for each species, and the combined Kobe plot for the four species assigned a stock status in 2022 (Fig. 1):

Albacore (*Thunnus alalunga*) – [Appendix 8](#)

Bigeye tuna (*Thunnus obesus*) – [Appendix 9](#)

Skipjack tuna (*Katsuwonus pelamis*) – [Appendix 10](#)

Yellowfin tuna (*Thunnus albacares*) – [Appendix 11](#)

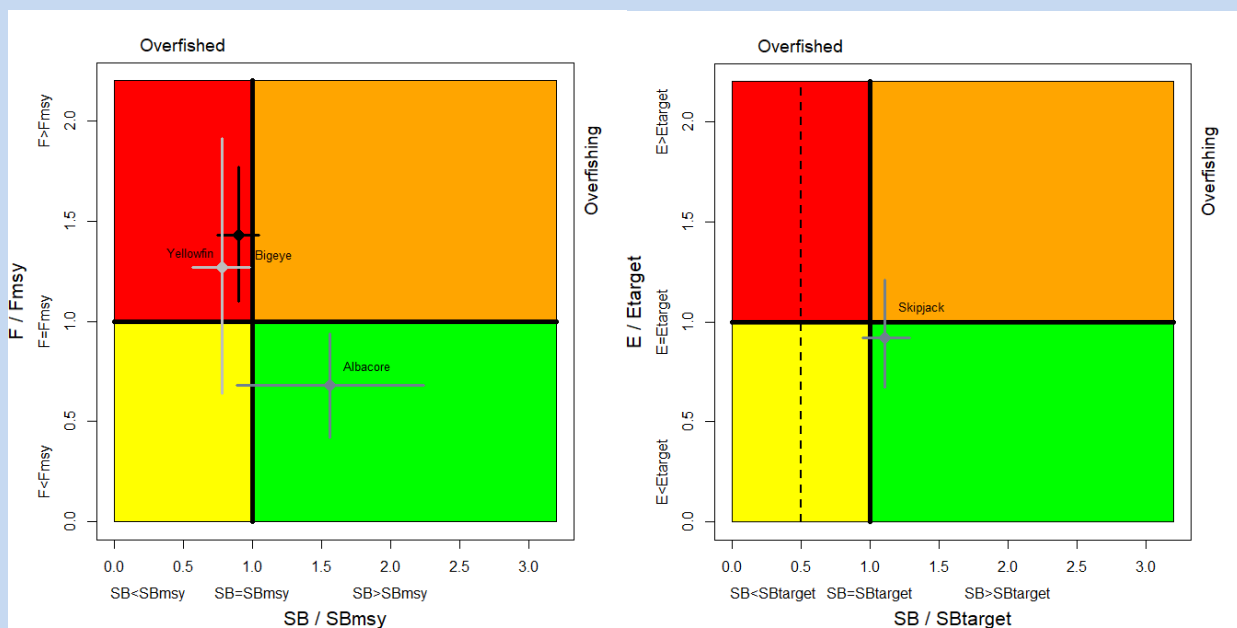


Fig. 1. (Left) Combined Kobe plot for bigeye tuna (black: status in 2021, based on the assessment conducted in 2022), and yellowfin tuna (light grey: 2020, with assessment conducted in 2021) and albacore (dark grey: 2020 with assessment conducted in 2022) showing the estimates of current spawning biomass (SB) and current fishing mortality (F) in relation to optimal spawning stock size and optimal fishing mortality. (Right) Kobe plot for skipjack tuna (2019 with assessment conducted in 2020) showing the estimates of the current stock status (The dashed line indicates the limit reference point at 20%SB0 while SBtarget=0.4 SB0). Cross bars illustrate the range of uncertainty from the model runs with an 80% CI (95% CI for albacore).

GENERAL RECOMMENDATIONS TO THE COMMISSION

Bigeye tuna MP

SC25.18 (para. 98) The SC **NOTED** that the application of the bigeye management procedure resulted in a recommended TAC of 80,583 t per year for 2024 and 2025, which requires a 15% catch reduction from

the 2021 catch level. The SC **RECOMMEND** that the Commission endorse the calculated TAC for 2024 and 2025.

SC25.19 (para. 99) Given average catch of BET in the past 5 years being above the calculated TAC for 2024 and 2025 and the lack of effective implementation of catch limits for other stocks in the IOTC, the SC **RECOMMENDED** that the Commission ensure effective implementation of the bigeye management procedure recommended TAC, especially taking into consideration the current overfished and subject to overfishing status of the stock. The SC **NOTED** that respecting the BET TAC is especially important when taking into consideration the multi-species nature of the Tropical tuna fisheries and especially taking into account the existing catch limit for YFT and TAC for SKJ.

SUMMARY DISCUSSION OF MATTERS COMMON TO WORKING PARTIES (CAPACITY BUILDING ACTIVITIES – STOCK ASSESSMENT COURSE; CONNECTING SCIENCE AND MANAGEMENT, ETC.)

Invited Expert(s) at the WP meetings

SC25.29 (para. 151) Given the importance of external independent review for working party meetings, the SC **RECOMMENDED** the Commission continue to allocate sufficient budget for invited scientific experts to be regularly invited to scientific working party meetings.

Meeting participation fund

SC25.30 (para. 153) The SC reiterated its **RECOMMENDATION** that the IOTC Rules of Procedure (2014), for the administration of the Meeting Participation Fund be modified so that applications are due not later than 60 days, and that the full Draft paper be submitted no later than 45 days before the start of the relevant meeting. The aim is to allow the Selection Panel to review the full paper rather than just the abstract, and provide guidance on areas for improvement, as well as the suitability of the application to receive funding using the IOTC MPF. The earlier submission dates would also assist with visa application procedures for candidates.

IOTC species identification guides: Tuna and tuna-like species

SC25.31 (para. 154) The SC reiterated its **RECOMMENDATION** that the Commission allocates budget towards continuing the translation and printing of the IOTC species ID guides so that hard copies of the identification cards can continue to be printed as many CPC scientific observers, both on board and at port, need to have hard copies.

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

SC25.32 (para. 156) **ACKNOWLEDGING** the need to have officers with sufficient experience and capability to serve as Chairs and Vice-chairs of the SC Working Parties and Working Groups, the SC **RECOMMENDED** that the Commission revise the current Rules of Procedure (if necessary) to allow Chairs to serve an additional year or years beyond two terms if no suitable candidates are available to replace them once their terms are completed

SC25.33 (para. 157) The SC **RECOMMENDED** that the Commission note and endorse the Chairpersons and Vice-Chairpersons for the SC and its subsidiary bodies for the coming years, as provided in [Appendix 7](#).

IMPLEMENTATION OF THE REGIONAL OBSERVER SCHEME

SC25.34 (para. 172) The SC **RECOMMENDED** that the Commission **ENDORSE** the mandatory reporting of geo-referenced effort data as number of sets/operations for longline and surface fisheries (according to the definitions in Res 15/02) to complement the current requirements of Res. 15/02, in order for the Secretariat to accurately and independently calculate the ROS coverage in agreement with the provisions of Res. 22/04.

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

Consultants

SC25.35 (para. 186) Noting the highly beneficial and relevant work done by IOTC stock assessment consultants in previous years, the SC **RECOMMENDED** that the engagement of consultants be continued for each

coming year based on the Program of Work. Consultants will be hired to supplement the skill set available within the IOTC Secretariat and CPCs.

Data preparatory meetings and Hybrid meetings

SC25.36 (para. 188) **ACKNOWLEDGING** that holding data preparatory meetings prior to stock assessments is considered to be best practice and noting that since 2019 data preparatory meetings were successfully held for the WPTmT, WPTT and WPEB, the SC **AGREED** to continue the practice of having data preparatory meetings prior to stock assessment meetings for the major IOTC species. The SC **RECOMMENDED** that data preparatory meetings continue to be held virtually so as not to increase the travel and costs required for the already full IOTC timetable of meetings.

SC25.37 (para. 189) The SC **NOTED** the utility of facilitating both in-person and virtual participation at future meetings to ensure increased participation and reduce the logistical costs for many CPCs. As such, the SC **RECOMMENDED** that future working party and Scientific Committee meetings are held in a hybrid format.

REVIEW OF THE DRAFT, AND ADOPTION OF THE REPORT OF THE 25TH SESSION OF THE SCIENTIFIC COMMITTEE

SC25.38 (para. 192) The SC **RECOMMENDED** that the Commission consider the consolidated set of recommendations arising from SC25, provided at [Appendix 38](#).