

Report of the Tenth Session of the IOTC Working Party on Temperate Tunas: Assessment Meeting

Seychelles, 20–21 July 2026

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ACRONYMS

ALB	Albacore
ASAP	Age structured assessment program
ASPIC	A Stock-Production Model Incorporating Covariates
ASPM	Age-structured production model
B	Biomass (total)
BBDM	Bayesian biomass dynamics model
B_{MSY}	Biomass which produces MSY
BSPM	Bayesian State-Space Production Model
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.
EEZ	Exclusive Economic Zone
F	Fishing mortality; F_{2011} is the fishing mortality estimated in the year 2011
F_{MSY}	Fishing mortality at MSY
HBF	Hooks between floats
HCR	Harvest control rule
IO	Indian Ocean
IOTC	Indian Ocean Tuna Commission
LL	Longline
LRP	Limit reference point
M	Natural mortality
MPF	Meeting participation fund
MSE	Management strategy evaluation
MSY	Maximum sustainable yield
n.a.	Not applicable
PS	Purse-seine
SC	Scientific Committee of the IOTC
SB	Spawning biomass (sometimes expressed as SSB)
SB_{MSY}	Spawning stock biomass which produces MSY
SS3	Stock Synthesis III
SST	Sea surface temperature
TAC	Total allowable catch
TRP	Target reference point
VB	Von Bertalanffy (growth)
WPTmT	Working Party on Temperate Tunas 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 formalise the request beyond the mandate of the Committee, it may request that a set action be undertaken. Ideally this should be task specific and contain a timeframe for the completion.

Level 3: *General terms to be used for consistency:*

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

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 10th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Temperate Tunas Meeting (WPTmT10) was held online, from 20 to 21 July 2026. A total of 25 participants (22 in 2025, 42 in 2022, 23 in 2019) attended the Session.

The WPTmT10 meeting reviewed the 2026 albacore stock assessment (SS3) and the main objective of the assessment is to resolve the issues identified in 2025 and explore the recommended options. The WPTmT **NOTED** a thorough and in-depth analysis of SS3 was presented by the authors with a complete set of diagnostics. The issues identified in the 2025 assessment were resolved to the extent possible. The WPTmT **AGREED** that albacore stock status should be determined and management advice be updated by the results of the updated stock assessments undertaken in 2026.

The following are recommendations from the WPTmT10(AS) to the Scientific Committee:

STOCK ASSESSMENTS

WPTmT10.01 (Para 21) The WPTmT **AGREED** that while there is some support for time-varying selectivity (particularly for the NW model), more careful consideration is required. Statistical models generally favour more parameters due to increased flexibility, and the observed variability may stem from changes in vulnerability, availability, sampling errors, or unmodelled migration effects, all of which are difficult to disentangle. A range of technical options for implementing time-varying selectivity also requires detailed evaluation. The WPTmT therefore **RECOMMENDED** establishing an explicit framework or protocol to guide the treatment of temporal changes in selectivity and catchability in a defensible, robust manner informed by expert knowledge of the fishery and consistent with biological plausibility.

Date and place of the 11th and 12th Sessions of the WPTmT

WPTmT10.02 (Para 30) The WPTmT **RECOMMENDED** that the 11th Session of the WPTmT be held in 2028, as originally planned.

WPTmT10.03 (Para 31) The WPTmT **NOTED** that there has been a lower response to WPTmT meetings (both data preparation and assessment meetings), and consequently, the assessment meeting has been reduced from five days to three days. The WPTmT **NOTED** that with low participation, the meeting is unlikely to be productive or cost-efficient. The WPTmT encourages CPCs' scientists to actively engage and participate in future WPTmT meetings to contribute to albacore research. The WPTmT **RECOMMENDED** that only one combined meeting (in person, five days) be held in July 2028.

Review of the draft, and adoption of the Report of the 10th Session of the WPTmT

WPTmT10.04 (Para 32) The WPTmT **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPTmT10(AS), provided at [Appendix IV](#), as well as the management advice provided in the draft resource stock status summary for albacore ([Appendix III](#)).

1. OPENING OF THE MEETING

1. The 10th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Temperate Tunas Meeting (WPTmT10) was held online, from 20 to 21 July 2026. A total of 25 participants (22 in 2025, 42 in 2022, 23 in 2019) attended the Session. The list of participants is provided at [Appendix I](#). The meeting was opened by the Chairperson, Dr Toshi Kitakado (Japan).

2. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

2. The WPTmT **ADOPTED** the Agenda provided at [Appendix II](#).
3. The WPTmT **NOTED** that the Chair provided a summary of the WPTmT meeting in 2025 and highlighted its recommendation:

“WPTMT09.01 (para 79) The WPTmT **DISCUSSED** in detail the outstanding issues in the updated NW and SW models. In particular, the SW model produced very high biomass estimates with large uncertainty when the selectivity for LL3 and LL4 was unconstrained (allowed to be domed-shaped), while the NW model showed bias in the predicted length composition for the LL1 fishery. Despite several investigative model runs during the meeting, the exact causes of these issues and potential solutions remain unclear. Given the changes in input data and the late availability of the CPUE indices, the WPTmT **AGREED** that, while the updated assessment model in its current configuration is sufficient for estimating stock status, further scrutiny is needed to improve its reliability and ensure robust management advice. As such, the WPTmT **RECOMMENDED** that assessment work continue next year and that the SC convene another WPTmT assessment meeting in 2026 to review progress”

3. ALBACORE STOCK ASSESSMENT

3.1 STOCK ASSESSMENTS

4. The WPTmT **NOTED** paper [IOTC-2022-WPTmT08\(AS\)-10](#) which provided a stock assessment for albacore in the Indian Ocean by Stock Synthesis III (SS3) model, including the following abstract provided by the author:

“This paper presents a stock assessment of albacore tuna in the Indian Ocean using Stock Synthesis (version 3.30.24.2 <https://nmfs-ost.github.io/ss3-website/>). The albacore tuna assessment model is an age structured (14 years), spatially aggregated (1 region) and two sex model. The catch, effort, and size composition of catch, are grouped into 23 fisheries covering the time period from 1950 through 2023. Fifteen indices of abundance, fourteen of which are from longline fisheries were considered for this analysis” – see the paper for the full abstract

5. The WPTmT **RECALLED** that WPTmT meeting in 2025 updated the albacore tuna stock assessment (the SW and NW diagnostic models) with revised catch, length composition, and CPUE data to estimate management quantities, but the delayed provision of the CPUE index prevented full investigation of model issues during the meeting. Two outstanding problems were identified: the SW model producing very high biomass estimates with large uncertainty when LL3/LL4 fishery selectivity was unconstrained, and the NW model showing bias in predicted length composition for the LL1 fishery. Despite investigative runs, the causes and solutions remained unclear. The WPTmT **CONCLUDED** that while the 2025 model configuration is sufficient for estimating stock status, further work is needed to improve reliability, and as such the assessment work should continue with another WPTmT meeting in 2026 to review progress.
6. The WPTmT **THANKED** the authors for their significant effort and highlighted the important findings from the preliminary SS3 models. Based on the results presented in the paper, the WPTmT **NOTED** the following regarding the modeling approach discussed at the meeting.
7. The WPTmT **AGREED** to use the same dataset as the 2025 assessment: catch and length-composition data through 2023 (the final model year), with CPUE indices covering 1975–2023. The same model configuration and biological parameters were retained, including spatial and fleet structure (Fig. 1). Longline fisheries in each region are separated by season, with independent selectivity and catchability estimated per quarter. This allows the model to account for seasonal variation in length compositions and catch rates.

8. The WPTmT **AGREED** that key management quantities from the updated assessment are based on the median of combined outputs from two model options:
 - **NW model:** based on NW CPUE regional indices (R1 region / LL1 fishery) only
 - **SW model:** based on SW CPUE regional indices (R3 region / LL3 fishery) only
9. The WPTmT **NOTED** that these model options were selected based on the consistency and representativeness of the regional indices. The NW and SW indices are considered more representative of relative albacore abundance, as these regions account for most catches and have more consistent targeting practices. Using independent models avoids potential conflicts between the two index sets. The WPTmT in 2025 agreed to retain these model options; the objectives of the current assessment are to resolve issues identified in 2025 and explore recommended alternatives.

NW Diagnostic Model

10. The WPTmT **NOTED** extensive exploratory runs aimed at improving fits to length-composition data (particularly LL1) and CPUE indices. The final recommended model fixes selectivity for the LL1 and LL2 fisheries at values estimated from the SW model. Additionally, a number of poor-quality length-frequency observations from LL1 (several quarters during 1999–2023), composed primarily of very small fish, were removed. This configuration eliminates the large bias in LL1 length-distribution fits identified previously.
11. The WPTmT **NOTED** that sequentially estimating some selectivity parameters for LL1 and LL2 may improve length-composition fits to varying degrees; however, estimating all selectivity parameters produced very poor fits. The terminal selectivity parameter (p_6) for both fisheries appears poorly informed by available data and can vary substantially without affecting model results.
12. The WPTmT **NOTED** conflicting trends in the quarterly CPUE indices for Region 1: the Q1 index is noticeably different from other quarters, particularly in recent years. This conflict produces poor fits, evidenced by positive residuals followed by negative residuals around 2005 for the Q1 and Q4 indices.
13. The WPTmT **NOTED** that the reversal of residuals coincides with the mid-2000s, when Taiwanese CPUE data were first included in the joint CPUE standardisation (pre-2005 data were excluded due to quality concerns). This may indicate a catchability change requiring further investigation.
14. The WPTmT also **NOTED** that the model still predicts mean lengths consistently below observed values in recent years for LL1, which may indicate a selectivity change in the fishery that warrants investigation.

SW Diagnostic Model

15. The WPTmT **NOTED** that after careful reanalysis and reconfiguration, the issue of very high biomass estimates for the SW model appears resolved. The model now estimates biomass at a scale comparable to the NW model, further highlighting the importance of providing input data in time to allow sufficient modelling effort. The SW model assumes a freely estimated double-normal selectivity for LL3 and LL4 (i.e., the right-hand limb is not constrained to be asymptotic). A profile analysis demonstrated the sensitivity of the population scalar to the terminal double-normal selectivity parameter.

Diagnostics and Sensitivity Analyses

16. The WPTmT **NOTED** that a suite of diagnostics was conducted for both models, including likelihood profiles, runs tests, jitter analyses, retrospective analyses, leave-one-out, and let-one-in CPUE influence diagnostics. Overall, the models are generally stable and internally consistent despite some unresolved fitting patterns.
17. The WPTmT **NOTED** a number of sensitivity analysis designed to separate three sources of uncertainty, namely biological structure (e.g., steepness and natural mortality), data weighting, relative influence of CPUE indices and size-composition data, and fishery process including terminal selectivity, time-varying selectivity, and time-varying catchability.
18. The WPTmT **NOTED** some of the general findings of these sensitivity analysis:
 - Structural biological sensitivities changed population scale more than broad temporal patterns.
 - Length-composition weighting and terminal selectivity had larger effects on stock-status quantities.

- NW diagnostics support time-varying selectivity more strongly than SW diagnostics.
 - NW time-varying catchability improves CPUE fit but produces little change in terminal stock-status quantities.
19. The WPTmT **AGREED** that final model selection should balance statistical fit, biological plausibility, parsimony, and robustness of management advice.
20. The WPTmT **NOTED** that length-composition samples show very large inter-annual and inter-seasonal variability, possibly reflecting sampling variability or changes in fishery targeting (small juveniles vs. large mature fish). Variability is greater in Region 3, where juveniles are more prevalent. The authors thoroughly investigated time-varying selectivity via time blocks, implemented for LL1–4 (NW) and LL5–8 (SW).
21. The WPTmT **AGREED** that while there is some support for time-varying selectivity (particularly for the NW model), more careful consideration is required. Statistical models generally favour more parameters due to increased flexibility, and the observed variability may stem from changes in vulnerability, availability, sampling errors, or unmodelled migration effects, all of which are difficult to disentangle. A range of technical options for implementing time-varying selectivity also requires detailed evaluation. The WPTmT therefore **RECOMMENDED** establishing an explicit framework or protocol to guide the treatment of temporal changes in selectivity and catchability in a defensible, robust manner informed by expert knowledge of the fishery and consistent with biological plausibility.
22. The WPTmT **NOTED** that the authors proposed a candidate grid structure capturing identified uncertainty across: area/index structure, biological parameters, data weighting, and selectivity/catchability configuration. The WPTmT **AGREED** that this grid should be considered for the 2028 assessment following a more thorough evaluation of model performance across the proposed options.
23. The WPTmT **NOTED** the key assessment results for the Stock Synthesis III model (SS3) as shown below (**Tables 1; Figs. 2– 4**).

Table 1. Key management quantities from the 2025 SS3 assessment for Indian Ocean albacore. Values for the Indian Ocean results are based on the median of the combined outputs of 2 model options: Models NW and SW

Management Quantity	Indian Ocean	NW model run	SW model run
2023 catch estimate (t)	41 806		
Mean catch from 2019–2023 (t)	39 943		
MSY (1000 t) (95% CI)		41	47
Data period used in assessment	1950–2023	1950–2023	1950–2023
F_{MSY} (95% CI)	0.15 (0.15-0.16)	0.16 (0.14-0.17)	0.15 (0.14-0.16)
SB_{MSY} (1000 t) (95% CI)	27 (22-31)	25 (19-33)	28 (22-36)
F_{2023}/F_{MSY} (95% CI)	0.91 (0.46-1.35)	1.26 (0.43-2.10)	0.56 (0.25-0.86)
SB_{2023}/SB_{MSY} (95% CI)	1.3 (0.86-1.72)	1.02 (0.56-1.47)	1.57 (0.84-2.31)
SB_{2023}/SB_{1950} (95% CI)	0.26 (0.08-0.58)	0.22 (0.07-0.36)	0.34 (0.09-0.59)

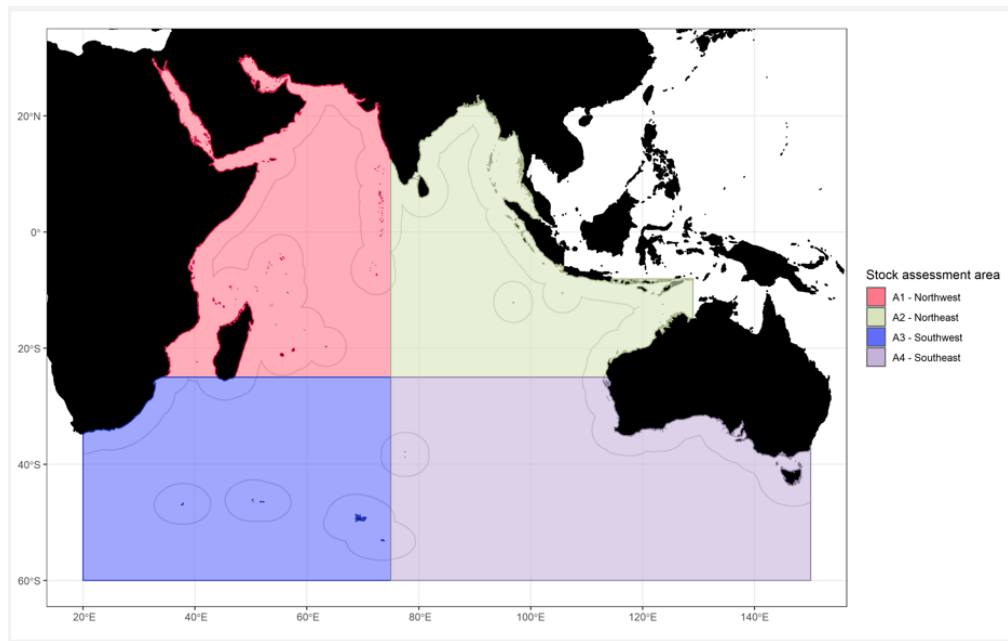


Fig. 1: Spatial stratification of the Indian Ocean for the definition of the fisheries.

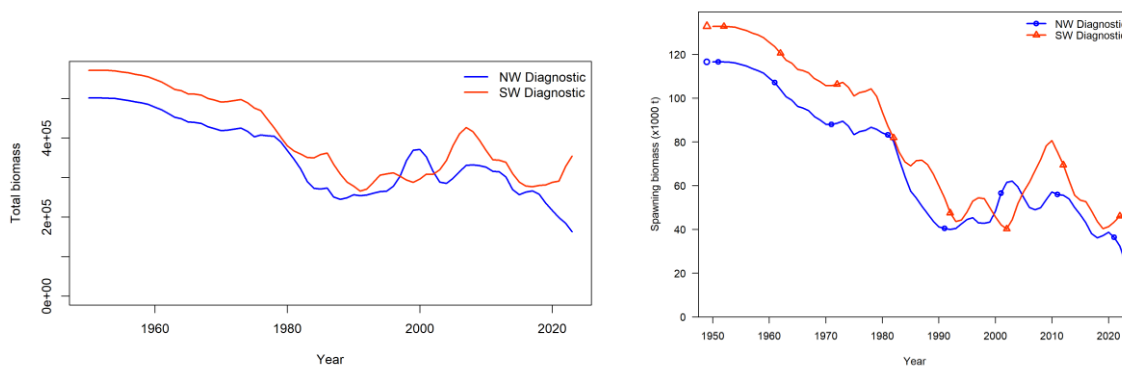


Fig. 2: Estimates of total biomass (left) and spawning biomass (right) from the 2026 NW and SW models.

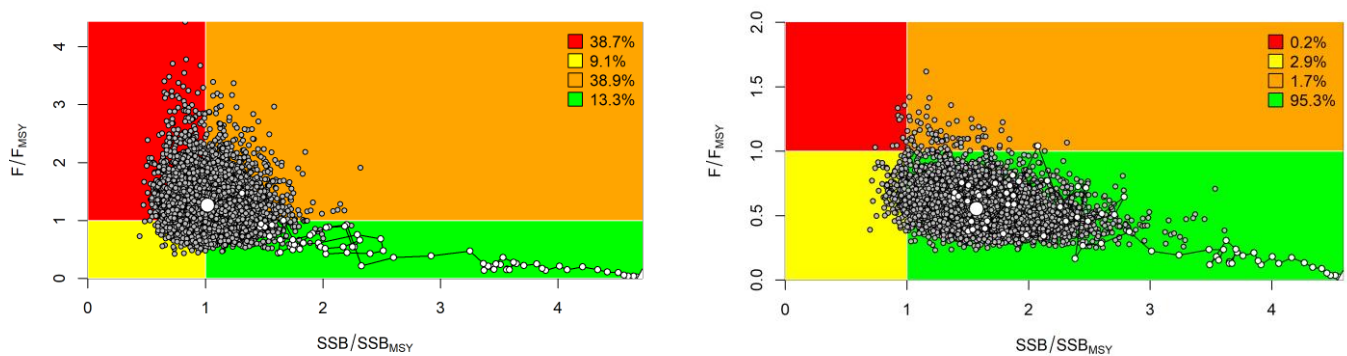


Fig. 3. Albacore: SS3 Indian Ocean assessment Kobe plot for the two model options: (left) Model NW diagnostic (right) Model SW diagnostic. Purple circles indicate the trajectory of the point estimates for the spawning biomass (SB) ratio and fishing mortality (F) ratio for each year 1950–2023 (the grey lines represent the 95 percentiles of the 2023 estimate).

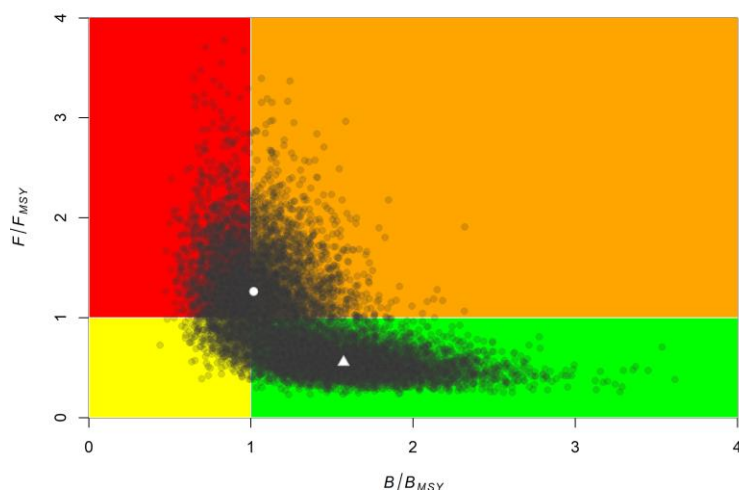


Fig. 4. Albacore: SS3 Indian Ocean assessment Kobe plot for the final two model options combined: current stock status relative to SB_{MSY} (x-axis) and F_{MSY} (y-axis) reference points. Black symbols represent Maximum posterior density (MPD) estimates from individual models: square represents NW_CPUE model and triangle represents SW_CPUE model. Grey dots represent uncertainty from individual models.

3.2 SELECTION OF STOCK STATUS INDICATORS

24. The WPTmT **NOTED** a thorough and in-depth analysis of SS3 was presented with a complete set of diagnostics. Further, the issues identified in the 2025 assessment were resolved to the extent possible. Therefore, the WPTmT **AGREED** that albacore stock status should be determined and management advice be updated by the results of the SS3 stock assessments undertaken in 2026.

3.3 UPDATE ON MANAGEMENT STRATEGY EVALUATION PROGRESS (OM FORMULATION)

25. The WPTmT **NOTED** that the albacore MSE is ongoing, with the current work being undertaken by Adrian Hordyk from Blue Matter, a consultancy firm, supported by the Ocean Foundation and stakeholders from the industry. The objective is to complete a draft final MSE by running the MSE using the existing OMs and CMPs.
26. The WPTmT **NOTED** that the workplan is to present the candidate MP to the WPM later this year, revise the framework based on feedback from that meeting, and present final results at the December SC meeting, with the aim of recommending the MP to the TCMP next year.
27. The WPTmT **NOTED** that the existing OM, which was built using an Approximate Bayesian Computation approach, has been incorporated into the [openMSE](#) framework through a dedicated R package, [iotcALB](#) ([GitHubBlue-Matter/iotcALB](#)). The MSE material, including detailed technical specifications and progress report, is maintained and managed at the project webpage [iotcalb.bluematterscience.com](#).
28. The WPTmT **NOTED** that the current OM was conditioned on data up to 2020 and that reconditioning OMs is not within the scope of the current project. However, recent data can be incorporated into the MSE to bring the model up to date in order to evaluate the MPs that generates future TAC recommendations. The developers will liaise with the Secretariat to discuss the need for more recent data.

3.4 Development of technical advice on the status of the albacore tuna stock

29. The WPTmT **ADOPTED** the management advice developed for albacore as provided in the draft Executive Summary and **REQUESTED** that the IOTC Secretariat update the draft stock status summary for albacore with the latest catch data:
- Albacore (*Thunnus alalunga*) – [Appendix III](#)

4. OTHER BUSINESS

4.1 DATE AND PLACE OF THE 11TH AND 12TH SESSIONS OF THE WPTmT

30. The WPTmT **RECOMMENDED** that the 11th Session of the WPTmT be held in 2028, as originally planned.
31. The WPTmT **NOTED** that there has been a lower response to WPTmT meetings (both data preparation and assessment meetings), and consequently, the assessment meeting has been reduced from five days to three days. The WPTmT **NOTED** that with low participation, the meeting is unlikely to be productive or cost-efficient. The WPTmT encourages CPCs' scientists to actively engage and participate in future WPTmT meetings to contribute to albacore research. The WPTmT **RECOMMENDED** that only one combined meeting (in person, five days) be held in July 2028.

5. REVIEW OF THE DRAFT, AND ADOPTION OF THE REPORT OF THE 10TH SESSION OF THE WPTmT(AS)

32. The WPTmT **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPTmT10(AS), provided at [Appendix IV](#), as well as the management advice provided in the draft resource stock status summary for albacore ([Appendix III](#)).
33. The report of the 10th Session of the Working Party on Temperate Tunas (IOTC-2026-WPTmT10-R) was **ADOPTED** intersessionally.

APPENDIX I
LIST OF PARTICIPANTS

CHAIRPERSON					
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Mr.	Shang Ping	Wang	National Taiwan Ocean University		wsp@mail.ntou.edu.tw

APPENDIX II
AGENDA FOR THE 10TH WORKING PARTY ON TEMPERATE TUNAS (AS)

Date: 20 - 22 July 2026

Location: Eden Bleu Hotel, Seychelles

Time: 9:00 – 17:00 daily (Seychelles time)

Chair: Dr Toshihide Kitakado (Japan); **Vice-Chair** Dr Jiangfeng Zhu (People's Republic of China)

- 1. OPENING OF THE MEETING** (Chair)
- 2. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION** (Chair)
- 3. ALBACORE STOCK ASSESSMENT** (Chair)
 - 4.1 Stock assessments
 - Stock Synthesis (SS3)
 - 4.2 Selection of Stock Status indicators for albacore
 - 4.3 Development of management advice for albacore tuna (all)
 - 4.4 Update of albacore tuna Executive Summary for the consideration of the Scientific Committee (all)
- 4. OTHER BUSINESS**
 - 5.1 Date and place of the 11th and 12th Sessions of the WPTmT (Chair and IOTC Secretariat)
- 5. Review of the draft, and adoption of the Report of the 10th Session of the WPTmT(AS)** (Chair)

APPENDIX III

DRAFT RESOURCE STOCK STATUS SUMMARY – ALBACORE

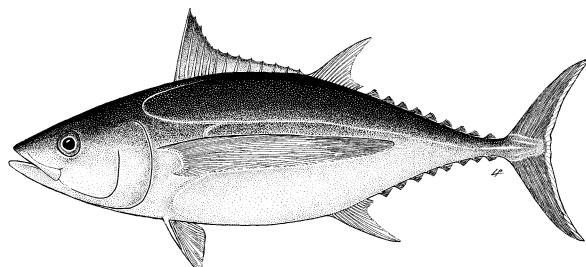


Table 1. Status of albacore (*Thunnus alalunga*) in the Indian Ocean

Area	Indicators – 2026 assessment		2026 stock status determination ³
Indian Ocean ¹	Catch (2024) (t)	36,458 ²	54 %
	Mean annual catch (2020-2024) (t)	40,715	
	MSY (x1,000 t) (95% CI)	44.52 (37.03-52.06)	
	F _{MSY} (95% CI)	0.15 (0.15-0.16)	
	SB _{MSY} (x1,000 t) (95% CI)	26.83 (22.00-31.33)	
	F ₂₀₂₃ / F _{MSY} (95% CI)	0.91(0.46-1.35)	
	SB ₂₀₂₃ / SB _{MSY} (95% CI)	1.30 (0.86-1.72)	
	SB ₂₀₂₃ / SB ₀ (95% CI)	0.263 (0.083-0.584)	

¹Stock boundaries defined as the IOTC area of competence; ²Proportion of catch fully or partially estimated for 2024: 0%

³2023 is the final year that data were available for this assessment

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

	Stock overfished (SB ₂₀₂₃ / SB _{MSY} < 1)	Stock not overfished (SB ₂₀₂₃ / SB _{MSY} ≥ 1)
Stock subject to overfishing (F ₂₀₂₃ / F _{MSY} ≥ 1)	19.4%	20.3 %
Stock not subject to overfishing (F ₂₀₂₃ / F _{MSY} ≤ 1)	6.0 %	54.3 %
Not assessed/Uncertain / Unknown		

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

Stock status. The stock status for albacore tuna has been assessed in 2026 using data up to the end of 2023, to complete the stock assessment started in 2025. The stock assessment was carried out using Stock Synthesis III (SS3), a fully integrated model that is currently also used to provide scientific advice for the three tropical tunas stocks in the Indian Ocean. The models used in 2026 are based on the models developed in 2019 and 2022 with a series of revisions that were noted during the 10th WPTmT data preparatory and assessment meetings held in July 2026. There were some significant changes compared to the previous data sets used as inputs into the assessment models: for example, the CPUE indices were estimated using updated methods (described during the 9th WPTmT assessment meeting); and the length-frequency data were updated and include additional data not available for the 2022 assessment.

A series of new joint CPUE indices from JPN, TWN, China, and KOR were only made available at the start of the 9th WPTmT assessment meeting. These indices are used as the main abundance indices within the assessment models. The methodology for the standardisation of the CPUE is again different from that used in the 2019, and 2022 assessments. In this iteration of the CPUE standardisation, similar methods were followed (as in 2022), to identify suitable sets from which to standardise the CPUE indices. The main difference between the 2022 and 2025 CPUE indices is the omission of positive spatio-temporal interactions and use of operational data instead of aggregated data in the 2025 analyses. This was tested, but results suggested omitting this aspect was a better update for the indices.

The 2025 CPUE series follow similar trends to the indices in 2019 and 2022, noting that there is a significant increase in CPUE in the final years in all quarters in the southwest (R3), compared to the last iteration.

The two sets of indices from the northwest and southwest Indian Ocean monitor different components of the albacore stock. The CPUE in the western area (LL1+3) may best represent the abundance of albacore at this time. The western area also represents a significant proportion of the albacore biomass in the Indian Ocean. The eastern indices are affected by changes in targeting and are not used in the assessment of the stock.

Trends in the northwest CPUE (R1) series suggest that the biomass vulnerable to longline fishing has declined significantly compared to levels observed in 1980-82, whereas a much smaller decline was observed in the southwest CPUE series for the same period (R3). Prior to 1980 there were 20 years of moderate fishing, after which total catches of albacore tuna in the Indian Ocean have more than doubled (**Fig. 1**). Catches have also increased substantially since 2007 for some fleets (e.g., Taiwan, China longline fisheries), although there is substantial uncertainty regarding the reliability of the catch estimates.

The final set of assessment model options included alternative models using the northwest and southwest CPUE indices. Both northwestern (NW) and southwestern (SW) models show similar trends in biomass estimates as the 2022 assessment models. There were issues with fitting the data within the models in 2025, however these issues have now been resolved.

Based on outputs from the combined stock assessment models, catches in 2024 (36,458 t) were marginally below the MSY level estimated by the SS3 model in 2026 (44,520 t). Fishing mortality represented as F_{2023}/F_{MSY} is 0.91 (0.46-1.35). Biomass is estimated to be above the SB_{MSY} level (1.303 (0.86-1.72), **Table 1, Fig. 3**). The stock status in relation to the Commission's interim B_{MSY} and F_{MSY} target reference points indicates that the stock is **not overfished** and is **not subject to overfishing** (**Table 1**).

Outlook. The impacts of piracy in the western Indian Ocean resulted in the displacement of a substantial portion of longline fishing effort into the traditional albacore fishing areas in the southern and eastern Indian Ocean. However, in recent years the effort distribution in the Indian Ocean has been dynamic. Based on the previous advice current catch appears to be sustainable in the short term although the advice is based on model assumptions that may be associated with high levels of uncertainty (see management advice below for more detail).

Management advice. The issues in the stock assessment conducted in 2025 have been resolved, and the trends in key model outputs from this model iteration align relatively well with the 2022 assessment.

The K2SM indicates that there is low risk of violating the target and limit reference points with current and moderate increases in catch in the short term. Current catches (36,458 t for the statistical year 2024; **Table 1**) are below the estimated level of MSY.

For the NW model, SS3 delta-method forecast variances became numerically unstable under some TAC scenarios as projected spawning biomass declined. For each affected projection, the first unstable forecast year was identified from abrupt or extreme increases in the coefficients of variation for projected biomass, biomass ratio, or fishing mortality. Interim probabilities for that year and subsequent years were calculated using multivariate lognormal draws centered on the deterministic projections, with marginal CVs fixed at their values from the immediately preceding stable forecast year. Unaffected TAC scenarios and all SW-model projections retained the standard SS3 delta-method uncertainty estimates.

The following should be noted:

- The primary sources of data that drive the assessment, total catches, CPUE and length data, are uncertain and should be developed further as a priority;
- The catch estimates for 2024 (36,458 t) are below the current estimated MSY levels (**Table 1**);
- Provisional reference points: noting that the Commission in 2015 adopted Resolution 15/10 *On interim target and limit reference points and a decision framework*, the following should be noted:
 - **Fishing mortality:** the fishing mortality at the time of the assessment was considered to be below the interim target reference point of F_{MSY} , and therefore below the interim limit reference point of $1.4 \times F_{MSY}$ (**Fig. 3**)

- **Biomass:** the spawning biomass at the time of the assessment was considered to be above the target reference point of SB_{MSY} , and therefore above the limit reference point of $0.4 \cdot SB_{MSY}$ (**Fig. 3**)
- **Main fisheries (mean annual retained catch 2020-2024):** albacore are caught using longline (82.3%), followed by line (15%) and gillnet (1.1%). The remaining catches taken with other gears contributed to 1.6% of the total catches in recent years (**Fig. 1**).
- **Main fleets (mean annual retained catch 2020-2024):** the majority of albacore catches are attributed to vessels flagged to Taiwan, China (50.9%) followed by Indonesia (24.1%) and China (11%). The 24 other fleets catching albacore contributed to 13.8% of the total catch in recent years (**Fig. 2**).

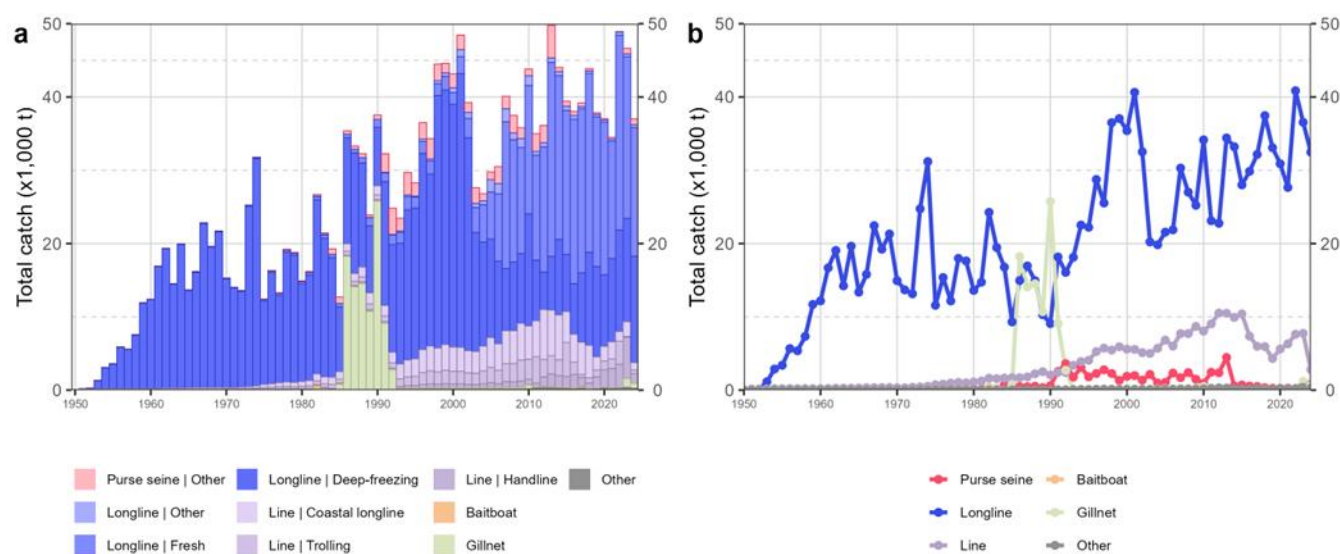


Fig. 1. Annual time series of (a) cumulative retained catches (metric tonnes; t) by fishery and (b) individual retained catches (metric tonnes; t) by fishery group for albacore during 1950-2024. Purse seine | Other: coastal purse seine, purse seine of unknown association type, ring net; Longline | Other: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

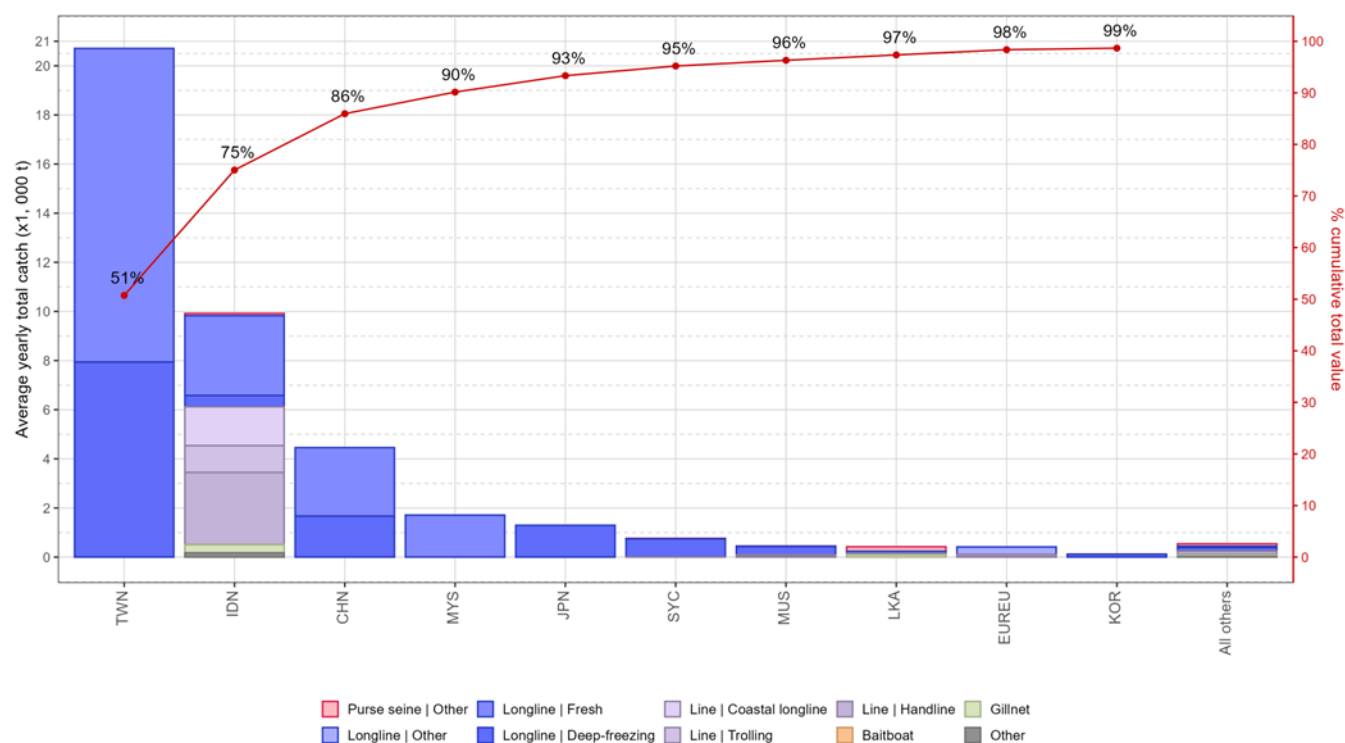


Fig. 2. Mean annual catches (metric tonnes; t) of albacore by fleet and fishery between 2020 and 2024, with indication of cumulative catches by fleet. Purse seine | Other: coastal purse seine, purse seine of unknown association type, ring net; Longline | Other: swordfish and sharks-targeted longlines;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

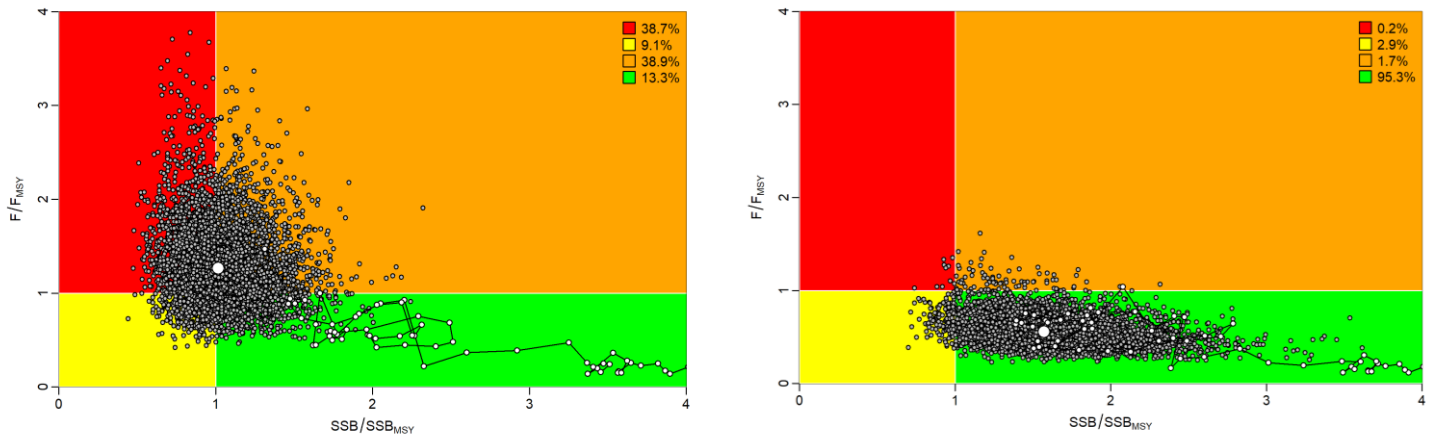


Fig. 3. Albacore: SS3 Indian Ocean assessment Kobe plot for the two model options considered: (i) Model fitted to the North-western CPUE; (ii) Model fitted to the South-western CPUE. White circles indicate the trajectory of the point estimates for the spawning biomass (SB) ratio and fishing mortality (F) ratio for each year 1950–2023 (the grey lines represent the 95 percentiles of the 2023 estimate). Target (F_{target} and SB_{target}) and limit (F_{lim} and SB_{lim}) reference points are shown

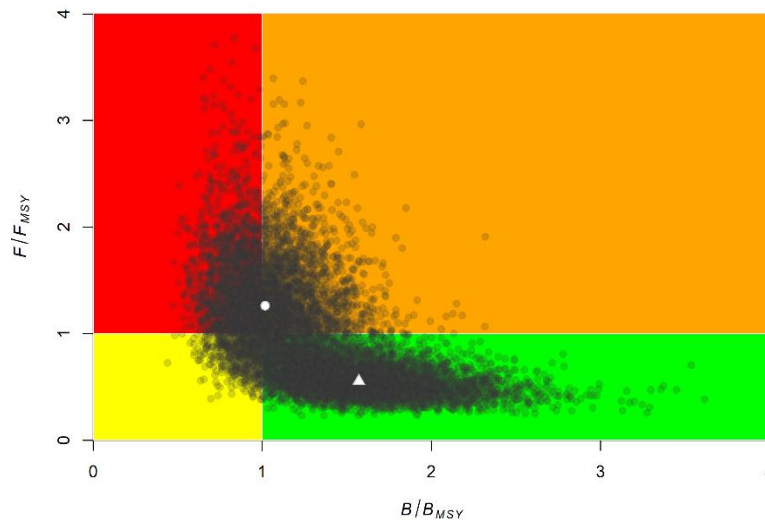


Fig. 4. Albacore: SS3 Indian Ocean assessment Kobe plot for the two model options considered plotted on the same figure. Black circles indicate the trajectory of the point estimates for the spawning biomass (SB) ratio and fishing mortality (F) ratio for each year 1950–2023. Target (F_{target} and SB_{target}) and limit (F_{lim} and SB_{lim}) reference points are shown (white triangle is southwest; white circle is northwest).

Table 3. Albacore: SS3 aggregated Indian Ocean assessment Kobe II Strategy Matrix based on the 2022 Assessment model options (i) Model 1 and (ii) Model 2. Probability (percentage) of violating the MSY-based target (top) and limit (bottom) reference points for constant catch projections (2020 catch level, $\pm 10\%$, $\pm 20\%$, $\pm 30\%$ $\pm 40\%$) projected for 3 and 10 years

Reference point and projection timeframe	Alternative catch projections (relative to the catch level for 2023) and probability (%) of violating MSY-based target reference points ($SB_{\text{targ}} = SB_{\text{MSY}}$; $F_{\text{targ}} = F_{\text{MSY}}$)								
	60% (25,083)	70% (29,264)	80% (33,444)	90% (37,625)	100% (41,806 t)	110% (45,986 t)	120% (50,167 t)	130% (54,347 t)	140% (58,528 t)
$SB_{2026} < SB_{\text{MSY}}$					42.38				
$F_{2026} > F_{\text{MSY}}$					37.14				
$SB_{2033} < SB_{\text{MSY}}$	17.63	23.42	28.48	31.81	41.36	43.43	56.56	61.30	65.52
$F_{2033} > F_{\text{MSY}}$	4.78	13.04	21.43	27.96	38.30	42.71	61.53	70.64	77.52
Reference point and projection timeframe	Alternative catch projections (relative to the catch level for 2023) and probability (%) of violating MSY-based target reference points ($SB_{\text{Lim}} = 0.4 \cdot SB_{\text{MSY}}$; $F_{\text{Lim}} = 1.4 \cdot F_{\text{MSY}}$)								
	60% (24,644)	70% (28,751)	80% (32,858)	90% (36,966)	100% (41,806 t)	110% (45,986 t)	120% (50,167 t)	130% (54,347 t)	140% (58,528 t)
$SB_{2026} < SB_{\text{Lim}}$					15.0				
$F_{2026} > F_{\text{Lim}}$					21.7				
$SB_{2033} < SB_{\text{Lim}}$	2.4	5.6	11.1	18.3	22.4	29.0	41.6	49.7	50.7
$F_{2033} > F_{\text{Lim}}$	1.4	6.1	14.2	21.8	27.0	31.4	46.8	58.2	63.1

APPENDIX IV

CONSOLIDATED RECOMMENDATIONS OF THE 10TH SESSION OF THE WORKING PARTY ON TEMPERATE TUNAS: ASSESSMENT MEETING

The following are the complete recommendations from the WPTmT10(AS) to the Scientific Committee.

STOCK ASSESSMENTS

WPTmT10.01 (Para 21) The WPTmT **AGREED** that while there is some support for time-varying selectivity (particularly for the NW model), more careful consideration is required. Statistical models generally favour more parameters due to increased flexibility, and the observed variability may stem from changes in vulnerability, availability, sampling errors, or unmodelled migration effects, all of which are difficult to disentangle. A range of technical options for implementing time-varying selectivity also requires detailed evaluation. The WPTmT therefore **RECOMMENDED** establishing an explicit framework or protocol to guide the treatment of temporal changes in selectivity and catchability in a defensible, robust manner informed by expert knowledge of the fishery and consistent with biological plausibility.

Date and place of the 11th and 12th Sessions of the WPTmT

WPTmT10.02 (Para 30) The WPTmT **RECOMMENDED** that the 11th Session of the WPTmT be held in 2028, as originally planned.

WPTmT10.03 (Para 31) The WPTmT **NOTED** that there has been a lower response to WPTmT meetings (both data preparation and assessment meetings), and consequently, the assessment meeting has been reduced from five days to three days. The WPTmT **NOTED** that with low participation, the meeting is unlikely to be productive or cost-efficient. The WPTmT encourages CPCs' scientists to actively engage and participate in future WPTmT meetings to contribute to albacore research. The WPTmT **RECOMMENDED** that only one combined meeting (in person, five days) be held in July 2028.

Review of the draft, and adoption of the Report of the 10th Session of the WPTmT

WPTmT10.04 (Para 32) The WPTmT **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPTmT10(AS), provided at [Appendix IV](#), as well as the management advice provided in the draft resource stock status summary for albacore ([Appendix III](#)).