
Report of the 16th Session of the IOTC Working Party on Methods

Seychelles, 27 - 28 October 2025

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ACRONYMS

ABNJ	Areas Beyond National Jurisdiction
ALB	Albacore
B	Biomass (total)
B_0	Unfished biomass
BET	Bigeye tuna
B_{MSY}	Biomass which produces MSY
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.
ETP	Endangered, threatened and protected
F	Fishing mortality
FAD	Fish aggregating device
FOB	Floating Object
F_{MSY}	Fishing mortality at MSY
IOTC	Indian Ocean Tuna Commission
MP	Management Procedure
MPD	Management Procedures Dialogue
MSE	Management Strategy Evaluation
MSY	Maximum Sustainable Yield
OM	Operating Model
P	Probability
SC	Scientific Committee, of the IOTC
SB	Spawning biomass (sometimes expressed as SSB)
SB_{MSY}	Spawning stock biomass which produces MSY (sometimes expressed as SSB_{MSY})
SKJ	Skipjack tuna
SWO	Swordfish
TCMP	Technical Committee on Management Procedures
WPM	Working Party on Methods
WPNT	Working Party on Neritic Tunas
WPTT	Working Party on Tropical Tunas of the IOTC
YFT	Yellowfin tuna

GLOSSARY OF TERMS

The WPM decided to utilise the MSE Glossary developed by the Joint Tuna RFMO MSE Working Group in 2018.

Average Annual Variation - (in catch/TAC) The absolute value of the proportional TAC change each year, averaged over the projection period.

Biomass - Stock biomass, which may refer to various components of the stock. Often spawning stock biomass (SSB) of females is used, as the greatest conservation concern is to maintain the reproductive component of the resource.

Candidate Management Procedure - An MP (defined below) that has been proposed, but not yet adopted.

Conditioning - The process of fitting an Operating Model (OM) of the resource dynamics to the available data on the basis of some statistical criterion, such as a Maximum Likelihood. The aim of conditioning is to select those OM's consistent with the data and reject OM's that do not fit these data satisfactorily and, as such, are considered implausible.

Error - Differences, primarily reflecting uncertainties in the relationship between the actual dynamics of the resource (described by the OM's) and observations. Four types of error may be distinguished, and simulation trials may take account of one or more of these:

- Estimation error: differences between the actual values of the parameters of the OM and those provided by the estimator when fitting a model to the available data;
- Implementation error: differences between intended management actions (as output by an MP) and those actually achieved (e.g. reflecting over-catch);
- Observation error (or measurement error): differences between the measured value of some resource index and the corresponding value calculated by the OM;
- Process error: natural variations in resource dynamics (e.g., fluctuations about a stock-recruitment curve or variation in fishery or survey selectivity /catchability).

Estimator - The statistical estimation process within a population model (assessment or OM); in a Management Strategy Evaluation (MSE) context, the component that provides information on resource status and productivity from past and generated future resource-monitoring data for input to the Harvest Control Rule (HCR) component of an MP in projections.

Exceptional circumstances - Specifications of circumstances (primarily related to future monitoring data falling outside the range covered by simulation testing) where overriding of the output from a Management Procedure should be considered, together with broad principles to govern the action to take in such an event.

Feedback Control - Rules or algorithms based, directly or indirectly, on trends in observations of resource indices, which adjust the management actions (such as a TAC change) in directions that will change resource abundance towards a level consistent with decision makers' objectives.

Harvest Control Rule - (also Decision Rule) A pre-agreed and well-defined rule or action(s) that describes how management should adjust management measures in response to the state of specified indicator(s) of stock status. This is described by a mathematical formula.

Harvest Strategy - Some combination of monitoring, assessment, harvest control rule and management action designed to meet the stated objectives of a fishery. Sometimes referred to as a Management Strategy (see below). A fully specified harvest strategy that has been simulation tested for performance and adequate robustness to uncertainties is often referred to as a Management Procedure.

Implementation - The practical application of a Harvest Strategy to provide a resource management recommendation.

Kobe Plot - A plot that shows the current stock status, or a trajectory over time for a fished population, with abundance on the horizontal axis and fishing mortality on the vertical axis. These are often shown relative to BMSY and to FMSY, respectively. A Kobe plot is often divided into four quadrants by a vertical line at $B=B_{MSY}$ and a horizontal line at $F=F_{MSY}$.

Limit Reference Point - A level of biomass below, or fishing mortality above, which an actual value would be considered undesirable, and which management action should seek to avoid.

Management Objectives - The social, economic, biological, ecosystem, and political (or other) goals for a given management unit (i.e. stock). These typically conflict, and include concepts such as maximising catches over time, minimising the chance of unintended stock depletion, and enhancing industry stability through low inter-annual variability in catches. For the purposes of Management Strategy Evaluation (MSE) these objective need to be quantified in the form of Performance statistics (see below).

Management Plan - In a broad fisheries governance context, a Management Plan is the combination of policies, regulations and management approaches adopted by the management authority to reach established societal

objectives. The management plan generally includes the combination of policy principles and forms of management measures, monitoring and compliance that will be used to regulate the fishery, such as the nature of access rights, allocation of resources to stakeholders, controls on inputs (e.g. fishing capacity, gear regulations), outputs (e.g. quotas, minimum size at landing), and fishing operations restrictions (e.g. closed areas and seasons). Ideally, the Management Plan will also include the Harvest Strategy for the fishery or a set of principles and guidelines for the specification, implementation and review of a formal Management Procedure for target and non-target species.

Management Procedure - A management procedure has the same components as a harvest strategy. The distinction is that each component of a Management Procedure is formally specified, and the combination of monitoring data, analysis method, harvest control rule and management measure has been simulation tested to demonstrate adequately robust performance in the face of plausible uncertainties about stock and fishery dynamics.

Management Strategy - Synonymous with harvest strategy. (But note that this is also used with a broader meaning in a range of other contexts.)

Management Strategy Evaluation - A process whereby the performances of alternative harvest strategies are tested and compared using stochastic simulations of stock and fishery dynamics against a set of performance statistics developed to quantify the attainment of management objectives.

Maximum Economic Yield - The (typically annual) yield that can be taken continuously from a stock sustainably (i.e. without reducing its size) that maximizes the economic yield of a fishery in equilibrium. This yield occurs at the effort level that creates the largest positive difference between total revenues and total costs of fishing (including the cost of labor, capital, management and research etc.), thus maximizing profits.

Maximum Sustainable Yield - The largest (typically annual) yield that can be taken continuously from a stock sustainably (i.e. without reducing its size). In real, and consequently stochastic situations, this is usually estimated as the largest average long-term yield that can be obtained by applying a constant fishing mortality F , where that F is denoted as FMSY.

Observation Model - The component of the OM that generates fishery-dependent and/or fishery-independent resource monitoring data from the underlying true status of the resource provided by the OM, for input to an MP.

Operating Model(s) - A mathematical–statistical model (usually models) used to describe the fishery dynamics in simulation trials, including the specifications for generating simulated resource monitoring data when projecting forward in time. Multiple models will usually be considered to reflect the uncertainties about the dynamics of the resource and fishery.

Performance statistics/measures - A set of statistics used to evaluate the performance of Candidate MPs (CMPs) against specified management objectives, and the robustness of these MPs to important uncertainties in resource and fishery dynamics.

Plausibility (weights) - The likelihood of a scenario considered in simulation trials representing reality, relative to other scenarios also under consideration. Plausibility may be estimated formally based on some statistical approach, or specified based on expert judgement, and can be used to weight performance statistics when integrating over results for different scenarios (OMs).

Precautionary Approach - An approach to resource management in which, where there are threats of serious irreversible environmental damage, lack of full scientific certainty is not used as a reason for postponing cost-effective measures to prevent environmental degradation.

Reference case - (also termed reference scenario or base case) A single, typically central, conditioned OM for evaluating Candidate MPs (CMPs) that provides a pragmatic basis for comparison of performance statistics of the CMPs.

Reference set - (also termed base-case or evaluation scenarios) A limited set of scenarios, with their associated conditioned OMs, which include the most important uncertainties in the model structure, parameters, and data (i.e. alternative scenarios which have both high plausibility and major impacts on performance statistics of Candidate MPs).

Research-conditional option - Temporary application of an MP that does not satisfy conservation performance criteria, accompanied by both a research programme to check the plausibility of the scenarios that gave rise to this poor performance and an agreed subsequent reduction in catches should the research prove unable to demonstrate implausibility.

Robustness tests - Tests to examine the performance of an MP across a full range (i.e. beyond the range of the Reference Set of models alone) of plausible scenarios. While plausible, robustness test OMs are typically considered to be less likely than the reference set OMs, and often focus on particularly challenging circumstances with potentially negative consequences to be avoided.

- Scenario-** A hypothesis concerning resource status and dynamics or fishery operations, represented mathematically as an OM.
- Simulation trial/test** - A computer simulation to project stock and fishery dynamics for a particular scenario forward for a specified period, under controls specified by a HS or MP, to ascertain the performance of that HS or MP. Such projections will typically be repeated a large number of times to capture stochasticity.
- Spawning Biomass, initial** - Initial spawning biomass prior to fishing as estimated from a stock assessment.
- Spawning Biomass, current** - Spawning biomass (SSB) in the last year(s) of the stock assessment.
- Spawning Biomass at MSY** - The equilibrium spawning biomass that results from fishing at FMSY. In the presence of recruitment variability, fishing a stock at FMSY will result in a biomass that fluctuates above and below SSBMSY.
- Stationarity** - The assumption that population parameter values are fixed (at least in expectation), and not varying systematically, over time. This is a standard assumption for many aspects of stock assessments, OMs and management plans.
- Stock assessment** - The process of estimating stock abundance and the impact of fishing on the stock, similar in many respects to the process of conditioning OMs.
- Target Reference Point** - The point which corresponds to a state of a fishery and/or resource which is considered desirable and which management aims to achieve.
- Trade-offs** - A balance, or compromise, achieved between desirable but conflicting objectives when evaluating alternative MPs. Trade-offs arise because of the multiple objectives in fisheries management and the fact that some objectives conflict (e.g. maximizing catch vs minimizing risk of unintended depletion).
- Tuning** - The process of adjusting values of control parameters of the Harvest Control Rule in a Management Procedure to achieve a single, precisely-defined performance statistic in a specified simulation test. This reduces confounding effects to allow the performance of different candidate MPs to be compared more readily with respect to other management objectives. For example, in the case of evaluating rebuilding plans, all candidate MPs might be tuned to meet the rebuilding objective for a specified simulation trial; then the focus of comparisons among MPs is performance and behaviour with respect to catch and CPUE dimensions.
- Weight(s)** - Either qualitative (e.g. high, medium, low) or quantitative measures of relative plausibility accorded across a set of scenarios.
- Worm plot** - Time series plots showing a number of possible realizations of simulated projections of, for example, catch or spawning biomass under the application of an MP for a specific OM or weighted set of OMs.

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 an 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 16th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Methods (WPM) was held in Laila Hotel, Seychelles 27-28 October 2025. A total of 47 participants (42 in 2024, 46 in 2023, 60 in 2022, and 55 in 2021) attended the Session either in person or online. The list of participants is provided in [Appendix I](#). The meeting was opened by the Chairperson, Dr Hilario Murua (ISSF) who welcomed participants.

The following are the recommendations from the WPM16 to the Scientific Committee, and key outcomes of the WPM, which are provided in [Appendix V](#).

Review of intersessional meetings related to the IOTC MSE process

WPM16.01 (Para 11): The WPM **THANKED** the participants of the Working Party on Methods Management Strategy Evaluation Task Force meeting for their informative discussions and input on the technical aspects of MSE and related topics. The WPM **NOTED** that the output of this meeting remains very important to the WPM as it provides an informal forum for the highly technical discussions necessary to advance the MSE process in IOTC for which there is insufficient time during the WPM meeting. The WPM further **RECOMMENDED** that the SC endorse the inclusion of this meeting in the schedule of meetings for 2026.

Skipjack tuna MP (Resolution 24/07)

WPM16.02 (Para 40): The WPM **NOTED** The application of the skipjack management procedure generated an unconstrained estimated TAC of 528,130 t which is more than 10% lower than the TAC set for 2024–2026. The SC **NOTED** that by applying the maximum 10% decrease in the TAC as per Resolution 24/07, the MP recommended a TAC of 565,745 t. per year for 2027–2029. Therefore, the WPM **RECOMMENDED** that the SC adopt the TAC advice for skipjack tuna of 565,745 t as determined by the MP.

WPM16.03 (Para 44): Based on the available evidence reviewed, the WPM **RECOMMEND** that there are no exceptional circumstances regarding the application of the skipjack tuna Management Procedure.

Bigeye tuna MP (Resolution 22/03)

WPM16.04 (Para 49): The WPM **NOTED** that the paper highlighted that 2024 catch has exceeded the 2024 TAC, which is an exceptional circumstance. The WPM **RECOMMENDED** that the Commission should ensure that the appropriate provisions (e.g., in paragraphs 4, 5 and 8) of 23/04 are implemented to ensure catches remain inside the TAC, conditional on the allowances and requirements of those provisions.

Swordfish MP (Resolution 24/08)

WPM16.05 (Para 64): The WPM **RECOMMENDED** that the SC **STRESS** to the Commission that the TAC resulted from the MP (Resolution 24/08) should be urgently proposed and adopted by the Commission in 2026.

Stock assessment and stock status guidance

WPM16.07 (Para 153): The WPM **RECOMMENDED** that the SC consider not using the target 40% SSB₀ to determine stock status, using instead other reference points. The WPM **SUGGESTED** that a CPC could bring a proposal to the SC to facilitate further discussion, including through a possible intersessional process.

Revision of the WPM Program of work (2026–2030)

WPM16.08 (Para 159): The WPM **RECOMMENDED** that the Scientific Committee consider and endorse the WPM Programme of Work (2026–2030), as provided in [Appendix IV](#).

Date and place of the 17th and 18th sessions of the WPM

WPM16.09 (Para 165): The WPM **RECOMMENDED** the SC consider mid-late October 2026 as a preferred time period to hold the WPM17. As usual it was also AGREED that this meeting should continue to be held back-to-back with the WPTT.

WPM16.10 (Para 168): In view of the status of the albacore and blue shark MSE, and the potential progress that may be achieved in the coming months, the WPM **RECOMMENDED** that an extra TCMP meeting in January 2026 is not organized.

Review of the draft, and adoption of the Report of the 16th Session of the WPM

WPM16.11 (Para 169): The WPM **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPM16, provided in [Appendix V](#)

1. OPENING OF THE MEETING

1. The 16th Session of the Indian Ocean Tuna Commission's (IOTC) Working Party on Methods (WPM) was held in Laila Hotel, Seychelles 27-28 October 2025. A total of 47 participants (42 in 2024, 46 in 2023, 60 in 2022, and 55 in 2021) attended the Session either in person or online. The list of participants is provided in [Appendix I](#). The meeting was opened by the Chairperson, Dr Hilario Murua (ISSF) who welcomed participants.

2. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

2. The WPM **ADOPTED** the Agenda provided at [Appendix II](#). The documents presented to the WPM16 are listed in [Appendix III](#).

3. THE IOTC PROCESS: OUTCOMES, UPDATES AND PROGRESS

3.1 Outcomes of the 27th Session of the Scientific Committee

3. The WPM **NOTED** paper [IOTC–2025–WPM16–03](#) which outlined the main outcomes of the 27th Session of the Scientific Committee (SC27), specifically related to the work of the WPM.
4. The WPM **NOTED** that in 2024, the SC made a number of endorsements and recommendations in relation to the WPM15 report. These are provided below for reference:

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

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

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

7.5.1 Update on TCMP08

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

7.5.2 Management Strategy Evaluation Progress

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

7.5.3 Bigeye tuna MP (Resolution 22/03)

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

- *the joint CPUE working group produce a BET CPUE index, as per the requirements/specifications of Williams et al (2022), at its meeting in early February 2025, and provide this for the WPM(MSE)Taskforce.*
- *the WPM(MSE) Taskforce meet online on 24-25 February 2025 with one day to review and run the BET MP and one day to consider progress on the Albacore Tuna MSE.*
- *The Scientific Committee convene a special session, online (for two hours) on 26 February 2025, to review and if appropriate endorse the BET MP run and its associated BET TAC outcomes.*

7.5.4 Skipjack tuna MP (Resolution 24/07)

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

7.5.5 Swordfish tuna MP (Resolution 24/08)

(para. 124) The SC **RECOMMENDED** that the Commission implement a TAC for 2026-2028 for swordfish based on the amended and retuned MP1 if the Commission wishes to ensure that it achieves the current objective in Res 24/08 to be in the Kobe green zone with at least 60% probability during 2034-2038 period. This would require a minor amendment to the Target CPUE value in Annex I of Res 24/08 from 0.7125 to 0.75. The SC **NOTED** that should the Commission continue to implement the current MP1, without retuning, it has a lower probability (54%) of being in the Kobe green zone and higher TAC variability, but otherwise similar performance statistics (Table 1 of IOTC-2024-WPM15-R). The TAC derived from running SWO MP1 with or without retuning is 30527 t (i.e. the same and therefore not a severe impact) because the max TAC change constrain is reached in both MPs.

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

7.5.7 General MSE issues

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

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

3.2 Outcomes of the 29th Session of the Commission

5. The WPM **NOTED** paper [IOTC-2025-WPM16-04](#) which provided the main outcomes of the 29th Session of the Commission specifically related to the work of the WPM.
6. The WPM **NOTED** (IOTC-2025-S29-R):

[Para 85] The Commission **NOTED** the report of the 8th meeting of the Technical Committee on Management Procedures (TCMP) (IOTC-2025-TCMP09-R) and **ENDORSED** the following TCMP recommendations:

 - The TCMP **NOTED** that the application of the bigeye management procedure generated an unconstrained estimated TAC of 175,005 t which is more than 15% higher than the TAC set for 2024 and 2025. The TCMP **NOTED** that by applying the maximum 15% increase in the TAC as per Resolution 22/03, the MP recommended an annual TAC of 92,670 t for 2026-2028. Therefore, the TCMP **RECOMMENDED** that the Commission adopt the TAC advice for bigeye tuna of 92,670 t resulting from the MP.
 - The TCMP **RECOMMENDED** adopting Australia's proposal (IOTC-2025-S29-PropU) to amend the swordfish MP (as specified in Resolution 24/08), to ensure the current objective of at least 60% probability of being in Kobe green zone is met during 2034-2038. This involves a minor amendment to the Target CPUE in Annex I of Res 24/08, changing it from 0.7125 to 0.75. Further, the TCMP **RECOMMENDED** that the Commission establish a TAC (30,527 t) for swordfish for 2026-2028 based on the revised MP **NOTING** that this TAC is the same as that from the original MP.

3.3 Review of Conservation and Management Measures relevant to the WPM

7. The WPM **NOTED** paper [IOTC-2025-WPM16-05](#) which aimed to encourage participants at the WPM16 to review some of the existing Conservation and Management Measures (CMM) relevant to the WPM and as necessary to 1) provide recommendations to the Scientific Committee on whether modifications may be required; and 2) recommend whether other CMMs may be required.
8. Participants to WPM16 were **ENCOURAGED** to familiarise themselves with the previously adopted Resolutions, especially those most relevant to the WPM 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 WPM meeting.

3.4 Progress on the recommendations of WPM15

9. The WPM **NOTED** paper [IOTC-2025-WPM16-06](#) which provided an update on the progress made in implementing the recommendations from the previous WPM meeting which were endorsed by the Scientific Committee and **AGREED** to provide alternative recommendations during the WPM16 as appropriate given any progress.
10. The WPM **NOTED** report [IOTC-2025-WPM16\(MSE\)-R](#) which provided the report of Report of the 15th Session of the IOTC Working Party on Methods Management Strategy Evaluation Task Force that took place from 10-13 April 2024.
11. The WPM **THANKED** the participants of the Working Party on Methods Management Strategy Evaluation Task Force meeting for their informative discussions and input on the technical aspects of MSE and related topics. The WPM **NOTED** that the output of this meeting remains very important to the WPM as it provides an informal forum for the highly technical discussions necessary to advance the MSE process in IOTC for which there is insufficient time during the WPM meeting. The WPM further **RECOMMENDED** that the SC endorse the inclusion of this meeting in the schedule of meetings for 2026.
12. The WPM **NOTED** the recommendation from the WPM15 for the IOTC Secretariat to have the necessary resources to manage code and input files on accessible platforms. This ensures that staff or modeller changes shall not disrupt the application of management procedures. Additionally, the WPM **NOTED** that the IOTC Secretariat is currently reviewing its IT platforms to meet future needs. This includes considering mechanisms for running interactive applications through its future website.

4. ALBACORE MSE: UPDATE

4.1 Review of OM and candidate MP development

13. The WPM **NOTED** paper [IOTC-2025-WPM16-11](#) which presented an update of the Indian Ocean albacore MSE, with the following summary provided by the author:

"The operating models selected by WPM (IOTC 2024) are being employed to develop and test management procedures (MPs) for the stock. Initial runs of a model-free MP are described here, and the next steps for the finalization of this analysis are listed for WPM discussion".

14. The WPM **NOTED** that the document presented an update of the work done for the Indian Ocean albacore tuna MSE. The WPM **NOTED** that a full evaluation of Candidate Management Procedures (CMPs) could not be completed ahead of this meeting.
15. The WPM **NOTED** the latest iteration of the Approximate Bayesian Computation (ABC) OMs for albacore. The WPM **NOTED** that, when compared with the assessment model, the OMs have a reduced number of fisheries, down to six, and these have been aggregated in time. The WPM **NOTED** that size frequency data for the longline and purse seine fleets is also aggregated in time and that the model assumes a single longline CPUE as the main index of abundance.
16. The WPM **NOTED** that there are some advantages of the ABC methodology, including using priors on stock status and a more consistent development of the axes of uncertainty. So far, this includes options for: covariant of steepness and natural mortality; fixed or estimated variability in recruitment; the influence of size frequency data and options for the abundance indices (with and without effort creep (1% per year); and using fleet 1 and fleet 3 alternatively).

17. The WPM **NOTED** that the OM have been updated to provide more recent stock abundances as a starting point for the simulation by projecting the conditioned population to follow the annual catch. Given the recent revisions to the catch data, this projection has been carried out from 2010 to 2023.
18. The WPM **NOTED** that revisions to catch data by several CPCs, including recent updates from Indonesia could affect the albacore estimates, particularly where ratio methods using swordfish catches are applied.
19. The WPM **NOTED** that the OM currently uses the northwest longline CPUE indices, which may not represent the core fishing area for albacore-targeting fleets and **NOTED** that this was chosen because it aligned better with the estimates of spawning biomass from the stock assessment and so had a better prediction skill. The WPM **NOTED** that the SW area is the main fishing area for albacore in the Indian Ocean and so the SW series was also included in this year's base case assessment. The WPM **NOTED** that the WPTmT used both indices in several combinations for the assessments of the recent years, and that this could be also the case in the model-based MP using JABBA.
20. The WPM **NOTED** that the new stock assessment suggests a more pessimistic stock status than previous evaluations after being updated to include the new data. However, the WPM **NOTED** that the CPUE has not changed significantly from previous assessments. Overall, the population is at a lower level than in the previous assessment, but the overall stock scale, the estimates of SB_0 , remains similar. The WPM **NOTED** that the uncertainty in the updated OM still includes the new stock assessment estimates, so the WPM **AGREED** that it still provides a robust basis for advice on MPs.
21. The WPM **NOTED** that while the latest assessment had been accepted at the WPTmT meeting, several issues were identified that require further scrutiny. A follow-up assessment meeting is planned for 2026 to revisit and resolve these issues. Consequently, the current assessment model was considered unsuitable for updating the OM and so just the updated catch data have been included in the OM at this stage.
22. The WPM **NOTED** that the current OM was considered sufficient and that updating it with the latest assessment results was not deemed necessary, as the OM should be closed at a defined point. It was understood that this closure had already occurred, and that an update would therefore not be required.
23. The WPM **NOTED** that assessing the performance of Management Procedures was viewed as a higher priority than updating the OM, and that efforts should now focus on this next step. An evaluation of the constant catch scenario indicated that current catches are approximately at the levels required to meet management targets, consistent with the present CPUE levels, which remain historically low. The WPM **SUGGESTED** that economic considerations related to these targets be incorporated into future analyses.
24. The WPM **NOTED** the initial exploration of constant catch MP, tuned to the main management objective of 60% probability of being in the Kobe green, which was used to calculate the levels of change in catch and abundance that a successful MP is likely to require. The WPM **NOTED** that it appears likely that catches need to be decreased from current levels.
25. The WPM **NOTED** that the work is now at the stage of evaluating an empirical catch-based MP, which could either work on multipliers of the previous catch level as a function of the abundance series, or directly set total catch as is done in other MPs in IOTC. The WPM **ENCOURAGED** the developers to compare both options.
26. The WPM **NOTED** that the CMPs under evaluation are slightly different from the CMPs shown in previous years. The WPM **NOTED** that the main difference is that the HCR prescribes a multiplier for the catch instead of the total catch as it was in earlier attempts. The WPM **NOTED** that this shift aimed to improve clarity in communication with managers and avoid issues with “hockey stick”-type catch rules at low biomass levels. However, the WPM **RECOGNISED** that this multiplier approach could lead to faster increases in catch, and that its performance should be tested to ensure it remains consistent with management objectives and that a total catch HCR will still be run so behaviour can be compared.

27. The WPM **NOTED** that the slope parameter within the control rule determines the rate of change in catch and fishing mortality relative to biomass. The WPM **SUGGESTED** simulating different control rules with varying parameters to assess their implications for F trajectories and management outcomes.
28. The WPM **NOTED** that it would be beneficial to illustrate how the CMPs would work in terms of catch and fishing mortality beyond the multiplier.

4.2 Discussion and feedback on MSE development

29. The WPM **NOTED** the issues related to the time lag between the data used in adopted Management Procedures (MPs) and the implementation of the corresponding management advice or Total Allowable Catch (TAC), and **CONSIDER** possible approaches to reduce this lag. The WPM **NOTED** that this issue is particularly relevant for albacore tuna, as the Working Party on Temperate Tunas meets before CPCs submit their catch data at the end of June, resulting in an overall four-year delay. The WPM **SUGGESTED** that, for albacore in particular, the CPUE series and associated data used in the MP could be reviewed and endorsed by the WPM or the SC meetings that take place later in the year, allowing the reduction of the MP implementation time lag

4.3 Future workplan

30. The WPM **NOTED** with regards to finalizing the MSE process and to help the Commission adopt an MP for Indian Ocean albacore, the evaluation of the CMPs along with associated robustness tests will be finalized by the end of 2025. The WPM **NOTED** that these will include:
 - Finalize tuning of the proposed model-free MPs;
 - Run and tune a model-based MP, using depletion level from the JABBA surplus production model as status indicator;
 - Finalize the set of climate-change and robustness scenarios; and
 - Test the tuned MPs on the robustness OMs.

5. SKIPJACK TUNA MP (RESOLUTION 24/07)

5.1 Running the Skipjack MP as per Resolution 24/07

31. The WPM **NOTED** paper [IOTC–2025–WPM16–25](#), which provided an update on the long time series CPUE standardization for skipjack tuna of the EU purse-seine fishery on floating objects (FOB) in the Indian Ocean, with the following summary provided by the authors:

“In 2023, a 1-component GAMM model to standardize SKJ catch per FOB set of the Indian Ocean EU purse-seine fleet for the period 1991-2021 was presented (Kaplan et al. 2023a). This paper updates that model to include data for the period 2022-2024 for the SKJ management strategy evaluation (MSE) process. Results indicate a roughly stable trend 2018-2024 with non-negligible interannual variability”.

32. The WPM **NOTED** that the paper provides a revision of the EU purse seine CPUE, which was presented at the WPTT27 meeting and used in the running of the skipjack MP during that meeting. The CPUE was calculated using the same method, in accordance with the requirements specified by the MP. The WPM further **NOTED** that the only change in the analysis was an updated filtering process for the input data.
33. The WPM **NOTED** that the significant dip in 2024, as presented to the WPTT, was due to an error in the T3 process that may have affected the estimates of species composition (i.e., yellowfin vs. skipjack tuna). This issue occurred in only one quarter and, although the exact cause remains unclear, it may be related to low sample sizes in 2024 for calculating species composition. The correction using the new T3R procedure produced estimates that are now consistent with port sampling data. The WPM **NOTED** that transitioning to the new T3R system will make it easier to resolve such issues in the future.
34. The WPM also **NOTED** that preliminary analyses of historical species composition data using the new T3R procedure yielded results similar to those obtained with the T3 procedure. The transition to the new T3R procedure is planned for 2025, and over time, it will be applied retrospectively to historical data (with the

intention to cover the past 5–10 years). The WPM **REQUESTED** that a comparison of the two approaches for estimating species composition from historical data be conducted and presented at the WPDCS meetings.

35. Regarding further plans for standardizing purse seine CPUE, the WPM **NOTED** that there is an intention to adopt more advanced spatiotemporal modelling approaches, using the sdmTMB R package.
36. The WPM **NOTED** that the skipjack assessment is scheduled for 2026 and will require a standardized CPUE index. While it would be ideal to have the CPUE index updated through 2025, the data may not be available before the data preparatory meeting. The WPM **SUGGESTED** that one option would be to present the methods during the DP meeting, with the standardization to be performed after the meeting, once the data is ready.
37. The WPM **NOTED** paper [IOTC-2025-WPM16-12rev1](#), which presented a summary of running the IOTC skipjack tuna management procedure for 2025, with the following summary provided by the authors:

“The Indian Ocean Tuna Commission (IOTC) adopted a Management Procedure (MP) for skipjack tuna in 2024 to recommend the total allowable catch (TAC) for consideration by the Commission (Resolution 24/07). Resolution 24/07 requires the MP to be implemented for the first time in 2025 to estimate the TAC for the period 2027–2029. The IOTC Scientific Committee, through the Working Party on Methods and the Working Party on Tropical Tunas, was tasked with running the MP and deriving a recommended TAC. The skipjack MP replaces the previously adopted harvest control rule (HCR) for skipjack tuna (Resolutions 16/02 and 21/03, now superseded by 24/07)”.

38. The WPM **NOTED** that Resolution 24/07 on a skipjack management procedure includes an adopted MP schedule that requires the MP to be run by the IOTC Scientific Committee in 2025, through the Working Party on Methods and Working Party on Tropical Tunas, including a review of exceptional circumstances, to derive a recommended TAC for 2027, 2028, and 2029 for IOTC Commission consideration.
39. The WPM **NOTED** the two data inputs to run the skipjack MP the EU purse seine CPUE index for 1990–2024 ([IOTC-2025-WPM-25](#)) and the Maldivian Pole and Line CPUE index for 1995 – 2024 ([IOTC-2025-WPTT27 \(DP\)-11](#)). The WPM **NOTED** the formula used in the MP to determine the recommended TAC. The WPM **NOTED** that four parameters in the MP are fixed parameters (Cmin, Cmax, Uthreshold, and Usafey), and the fifth parameter (U2024) is calculated from the two CPUE indices. The TAC is generated via a harvest control rule determined by these parameters (the full MP specifications are provided in Resolution 24/07).
40. The WPM **NOTED** that the application of the skipjack management procedure generated an unconstrained estimated TAC of 528,130 t which is more than 10% lower than the TAC set for 2024–2026. The WPM **NOTED** that by applying the maximum 10% decrease in the TAC as per Resolution 24/07, the MP recommended a TAC of 565,745 t. per year for 2027–2029. Therefore, the WPM **RECOMMENDED** that the SC adopt the TAC advice for skipjack tuna of 565,745 t, as determined by the MP.

5.2 Review of exceptional circumstances

41. The WPM **NOTED** paper [IOTC-2025-WPM16-21](#), which discusses the consideration of exceptional circumstances for the skipjack tuna MP in 2025, with the following summary provided by the authors:

“The IOTC adopted a Management Procedure for skipjack tuna during its Annual Meeting in 2024. This MP is used for the first time in 2025 to set catch limits for this important stock for the period 2027–2029. The application of the MP in 2025 is described in document IOTC-2025-WPM16-12, and this document reviews recent data to help the IOTC’s Scientific Committee evaluate if the implementation of the TAC for the period 2027–2029 may pose the sustainability of skipjack at risk”.

42. The WPM **NOTED** that the catch of skipjack tuna in 2024, while among the highest in recent years, did not exceed the current TAC. The WPM further **NOTED** that catches in each of the previous five years have exceeded the TAC.
43. The WPM also **NOTED** that both CPUE indices used for running the MP remain within the 95th percentile simulation range of the skipjack MSE operating model.

44. Based on the available evidence reviewed, the WPM **RECOMMEND** that there are no exceptional circumstances regarding the application of the skipjack tuna Management Procedure.
45. The WPM **NOTED** paper [IOTC-2025-WPM16-09](#), which presented a preliminary study of length frequency analysis of skipjack tuna in Indonesia, with the following summary provided by the authors

*“This preliminary study investigates the length frequency distribution of skipjack tuna (*Katsuwonus pelamis*) in Indonesia. A total of 127,000 samples were collected between 2018 and 2021 at various fishing ports along the West of Sumatra and South of Jawa. These ports are Lampulo, Sibolga, Padang, Bengkulu, Binuangeun, Palabuhanratu, Cilacap, Pacitan, Prigi, and Labuhan Lombok. Around three-quarters of the samples were collected from ports along the southern coast of Jawa. Binuangeun contributed the largest share, accounting for over 35% of the total samples. Handlines accounted for about 53% of the sampled fish and purse seines were the second contributing about 27% of the samples. The highest average fork length was recorded in Cilacap using gillnets, at 51.3 cm, indicating that this gear captured larger fish. In Prigi, purse seines yielded an average fork length of 47.3 cm, while trolling lines recorded an average of 46.0 cm. This study highlights the importance of length frequency analysis for understanding stock characteristics and informs sustainable fishery management”.*

46. The WPM **THANKED** the author for the study and **REQUESTED** the paper to be presented to the upcoming WPDCS meeting, as the paper is more relevant to their work.

6. BIGEYE TUNA MP (RESOLUTION 22/03)

6.1 Review of exceptional circumstance

47. The WPM **NOTED** document [IOTC-2025-WPM16-13](#), which discusses the consideration of exceptional circumstances for the Bigeye Tuna MP in 2025, with the following abstract provided by the author:

“The consideration of exceptional circumstances in 2025 applies to the adopted TAC for 2026-2028 from running the MP in early 2025 (slightly delayed from the scheduled MP run in 2024” (see the paper for the full summary)

48. Following the presentation, the WPM thanked the authors and **AGREED** with the conclusions of the paper, including that there is no basis for any change to the current TAC advice (based on the bigeye tuna MP).
49. The WPM **NOTED** that the paper highlighted that 2024 catch has exceeded the 2024 TAC, which is an exceptional circumstance. The WPM **RECOMMENDED** that the Commission should ensure that the appropriate provisions (e.g., in paragraphs 4, 5 and 8) of 23/04 are implemented to ensure catches remain inside the TAC, conditional on the allowances and requirements of those provisions.

6.2 External peer-review

50. The WPM **NOTED** document [IOTC-2025-WPM16-14](#), which provides a review of the Indian Ocean Tuna Commission bigeye tuna management procedure and its underlying management strategy evaluation, with the following abstract provided by the author:

*“The present report provides an evaluation of the Indian Ocean Tuna Commission’s (IOTC) Management Procedure (MP; MP1 Harvest) for bigeye tuna (*Thunnus obesus*), adopted through IOTC Resolution 22/03. MP1 Harvest is a model-based MP designed to set total allowable catches (TACs) for bigeye tuna (BET) in the Indian Ocean, utilizing a Pella-Tomlinson biomass dynamic model fitted to historical catch and standardized longline CPUE data. The MP was underpinned by a management strategy evaluation (MSE) process that tested its performance across a range of plausible operating models and robustness scenarios. The present review focuses on the procedure’s design, its underpinning management strategy evaluation (MSE), and its alignment with established best practices for management procedure development, MSE, and process for running MPs” (see the paper for the full summary)*

51. The WPM **THANKED** the author for the thorough review of the bigeye tuna MSE and the suite of very useful recommendations, many of which are relevant to the development and testing of MPs in general, not just for bigeye tuna.
52. The WPM **NOTED** that the review highlighted an inconsistency in the wording of Resolution 23/03 which indicates that the MP is designed to achieve a 60% that SSB is above SSB_{MSY} when the MP, in fact, was tuned to 60% probability of being in the Kobe green zone. This needs to be corrected in the resolution, however, the WPM **NOTED** that it was not necessarily urgent to do this, providing that the issue is clearly noted and documented by the SC and Commission to be changed in future, perhaps in association with the next MP review.
53. With respect to on the use of trade off plots and coloured decision trees, the WPM **NOTED** that these tools can help in communicating trade-offs. Coloured decision tables were initially developed to show the performance trade-offs for different bigeye tuna MPs, but the consensus was that different colours had specific interpretations for some people in other contexts, so it was agreed that shaded grey tables would be a better alternative.
54. The WPM **AGREED** with the recommendation that a more thorough exploration of catch stability implications of tuning objectives in conjunction with alternative tuning settings (e.g., including targets for average variability in yield) should be undertaken as part of the 2030 MP review, **NOTING** this may yield MPs that have more desirable behaviour in terms of catch stability, while maintaining desired over-all catch and risk levels.
55. With respect to recommendation related to the projection-based MPs the WPM **AGREED** that a more thorough exploration of projection-based MPs might be desirable in future given their ability to use recent process error (productivity deviations) to set TACs, which may provide better performance given the current 3-year lag between data availability and TAC setting. However, the WPM **NOTED** that despite this being recommended by developers, the MP choice is ultimately the Commissions choice, which chose to not adopt this type of MP.
56. The WPM **NOTED** that the 5-year tuning window from 2024-2038 chosen for the projections was also a Commission decision based on tuning to a medium timeframe period for consistency across the different stocks. However, in the standard output document from the MSEs there are short, medium, and longer term performance statistics provided. However, there may need to revisit whether the long term is long enough and the need to include even longer term statistics in the discussion of the performance of MPs. This would allow consideration of the performance of the MPs in timeframes beyond those that are influenced by just the recent/current dynamics (e.g., recruitments) of the stock, to ensure that they are performing appropriately. The WPM **SUGGESTED** it might be useful to add a performance measure related to how it takes to get the stock to stay at equilibrium and it may be useful to also look at longer term decadal scale performance scenarios with respect to the potential impacts of climate change.

7. SWORDFISH MP (RESOLUTION 24/08)

7.1 Review of exceptional circumstances

57. The WPM **NOTED** paper [IOTC-2025-WPM16-INF02](#) on population structure of the swordfish (*Xiphias gladius*) across the Indian Ocean using next-generation sequencing:
“While the Indian Ocean Tuna Commission (IOTC) considers swordfish to be a single panmictic population in the Indian Ocean, several studies have examined the potential for spatial variations within this highly migratory species with conflicting results, including emerging evidence that population structuring does indeed exist within swordfish. These findings therefore raise questions about the current guidelines for management adopted by the IOTC.”
58. The WPM **NOTED** the gaps in the data and spatial extent of sampling, and the need for collection of additional samples from other subregions not yet sampled, including from gillnet fisheries in the north and from fisheries in the Eastern Indian Ocean (e.g., including off West Australia). There may be some samples collected in EIO not yet analysed.

59. The WPM **NOTED** that additional sampling could be prioritised by the SC as part of the scoping work to develop a new IOTC biological sample collection program.
60. The WPM **NOTED** that additional simulation analyses could be conducted for design of sample collection that will lead to better understanding of movement and mixing between regions and implications for the assessment, OMs and MP. The simulation analyses could also examine levels at which stock structure would matter.
61. The WPM **NOTED** that undertaking Close-Kin Mark-Recapture (CKMR, genetic analysis of kin-pairs) could help in reducing uncertainty in stock structure due to the CKMR approach operating on timescales more relevant to informing current structure/mixing assumptions.
62. The WPM **NOTED** document [IOTC-2025-WPM16-15](#), which discusses the consideration of exceptional circumstances for the Swordfish Tuna MP in 2025, with the following abstract provided by the author:
“This paper summarises the outcomes from a review of a wide range of information, in considering if there is evidence of exceptional circumstances. It represents an update of the preliminary review paper (IOTC-2025-WPB23-21) presented in September 2025 to WPB23. It takes account of new information presented to WPB23 and associated discussions and recommendations of the WPB” (see the paper for the full summary)
63. The WPM **NOTED** the issues considered in the review of exceptional circumstances, and in the paper on stock structure, and **THANKED** the authors for the thorough review.
64. The WPM **RECOMMENDED** that the SC **STRESS** to the Commission that the TAC resulted from the MP (Resolution 24/08) should be urgently proposed and adopted by the Commission in 2026.
65. The WPM **NOTED** that currently there is not sufficient certainty around the implications of the new research on stock structure to conclude that there is an exceptional circumstance in relation to the swordfish MP TAC advice. The WPM **AGREED** that additional sampling and analyses should be prioritised by the SC and Commission to help reduce uncertainty around stock structure.
66. The WPM **NOTED** that new longline fishing gear (meka-rings) for targeting swordfish has emerged in the Atlantic and Pacific but its use in the IOTC is as yet uncertain, with more information needed to be provided by CPCs on use and impact on catchability.
67. The WPM **NOTED** that the shifts identified in the relative proportion of swordfish catch by fishery type over time have been incorporated into the MSE operating models, and the subsequent MP have been performance tested and demonstrated to be acceptable. Fishery catch levels and proportions from the 2 most recent years of data are not substantially different to the most recent levels considered.
68. The WPM **NOTED** that the standardised CPUE time series estimates from the 2023 standardisation process (for period to 2022) and the 2024 standardisation process (for period to 2023) are very similar. Prediction skill of the NWIO Japanese longline CPUE remains acceptable but Japanese longline effort trends should continue to be monitored and considered in the annual review of exceptional circumstances and as part of the larger review of MP performance scheduled for 2031.
69. The WPM **NOTED** the need to improve knowledge and accounting of uncertainty in the catch estimates.
70. The WPM **AGREED** that there were no exceptional circumstances in relation to the swordfish MP recommended TAC for 2026-2028.

8. YELLOWFIN TUNA MSE: UPDATE

8.1 Discussion and feedback on MSE development

71. The WPM **NOTED** presentation [IOTC-2025-WPM16-16](#), which described conditioning of OMs and preliminary evaluation of MPs for Indian Ocean yellowfin , with the following abstract provided by the authors:

“A preliminary conditioning of the Operating Model (OM) and an initial evaluation of Management Procedures (MPs) for yellowfin tuna (YFT) in the Indian Ocean were presented in this study. The objective was to reinstate a process and discussion that had been stuck for several years. FLBEIA, an open source library, was used for the development of the MSE. The OM was conditioned using the 12 models developed for the uncertainty grid of the 2024 YFT stock assessment. And based on that OM, the performance of a model-based MP, incorporating a hockey-stick Harvest Control Rule (HCR) was tested. The assessment model used within the MP framework was SPiCT, a surplus production model adequate to use within an MSE framework. For input data, only the joint longline CPUE from the northwestern region was considered and simulated, given the higher biomass of YFT observed in that area. The preliminary results indicate that with a fishing mortality target set at $0.8 \times F_{MSY}$ and a biomass threshold at $0.8 \times B_{MSY}$, the MP is capable of maintaining the stock within the green zone with a probability greater than 0.5.”

72. The WPM **ACKNOWLEDGED** the work and the project, funded by ISSF, to develop a preliminary Yellowfin MSE, designed to initiate and advance discussions on the development of a comprehensive MSE for this important species within the IOTC.
73. The WPM **NOTED** that a shiny app has been created for the yellowfin MP evaluation that is currently only available for the developers but will be made more widely available as a communication tool later in the MP development process.
74. The WPM **NOTED** that a specification document for the yellowfin MP has been drafted which documents all aspects of the MP development. The WPM **REQUESTED** that a similar specification document be created when developing MPs for all other IOTC species. The WPM further **NOTED** that the framework for this specification document has been used for multi-species MPs in ICCAT and could also be applied in future multi-species MSE work in the IOTC.
75. The WPM **NOTED** that the F-based hockey stick HCR used in the preliminary evaluations does not reduce F until the stock is below B_{msy} which may not be desirable. However, the form of the HCR is still very preliminary and is currently only used to understand how the MP is behaving.
76. The WPM **NOTED** the importance of constructing a realistic OM grid and the issues that previous MSEs have encountered when constructing the OM grid (e.g. problems when using different combinations of natural mortality and steepness). The WPM **AGREED** that it is important take a principled approach when constructing the OM grid by separating the process from the stock assessment model and using priors for key parameters and appropriate weightings when drawing from priors to develop the OM grid. The WPM **NOTED** that a recent publication (<https://iotc.org/documents/addressing-uncertainty-wcpfc-stock-assessments-review-and-recommendations-wcpfc-project>) provides some useful guidance in applying this approach.
77. The WPM **NOTED** the importance of considering climate change scenarios in the MP projections and that several approaches have been used in other RFMOs (e.g. Merino et al. 2019, Carruthers 2024) that consider the potential impacts of climate change through evaluating different scenarios for recruitment, mortality and growth.
78. The WPM **NOTED** that historic catches remain a large source of uncertainty in the MSE process and that ideally this uncertainty would be evaluated through using plausible alternative catch histories (i.e. observation error) in the OMs rather than through testing the robustness of MPs to overcatch as this complicates MPs and may send the wrong message to the Commission that the MP is robust to larger catches.

8.2 Future Plan

79. The WPM **AGREED** that presentation of the progress of the yellowfin tuna MSE should follow the usual iterative process for MSE in IOTC with an update on progress presented to the WPM(MSE) in 2026 and a high level overview presented to the TCMP in 2026 to inform them that the process is underway and seek guidance on potential reference points for tuning MPs and the general types of MPs that the TCMP would like to see evaluated.

9. BLUE SHARK MSE: UPDATE

9.1 Discussion and feedback on MSE development

80. The WPM **NOTED** document [IOTC-2025-WPM16-17-rev1](#), which provides a summary of the scoping study of MSE work for the Indian Ocean blue shark, with the following extract from the introduction provided by the author:

“The IOTC, during its 28th session, requested that the SC initiate a MSE for blue shark (IOTC, 2024c). As a consequence, this objective has been incorporated into the SC’s program of work, with oversight by the Working Party on Methods (WPM). However, although the recent SS assessment models of Rice (2017, 2025a,c) offer a good foundation for constructing the OM, they have also highlighted significant uncertainties, concerning both the input data and the model performance, and raised questions about the model’s suitability for direct application as an OM within the MSE framework. The objective of the current report is to provide a preliminary scoping study, aiming to identify suitable methodologies and options for the application of MSE to Indian Ocean blue shark. This includes options for a robust OM, informed by recent assessments, and preparing the groundwork for a comprehensive MSE process.” (see the paper for the full introduction, and project summary).

81. The WPM **NOTED** that the key uncertainty for blue shark (BSH) in the Indian Ocean is the catch time series with major difference between the high and low scenarios used in the current SS3 stock assessment.
82. The WPM **NOTED** that the length frequency data for BSH are most likely the most informative dataset available to inform a Management Procedure, **NOTING** that CPUE data are not informative. The WPM **NOTED** that information on stock status could be obtained therefore from simple models (not SS3) that utilise catch curves.
83. The WPM **NOTED** that BSH is taken in both targeted and non-targeted fisheries, and therefore should be considered a mixed-target fishery rather than purely bycatch.
84. The WPM **NOTED** that survivability of discarded BSH is generally high (85–100%) but is size-dependent, and that current estimates may overstate true survival as they are based on short-duration sets and best-practice handling studies.
85. The WPM **NOTED** that survivability is likely to vary among fleets due to differences in soak time and operational practices.
86. The WPM **NOTED** that size-based management measures could be effective for gears such as nets, but may be less applicable for longline fisheries where size selectivity is limited.
87. The WPM **NOTED** that smaller BSH are often more valuable due to fin size and lower toxicity of the meat, and therefore an upper and lower size limit may be appropriate to balance economic and biological objectives.
88. The WPM **NOTED** support for exploring both TAC-based and size-based management procedures within the MSE framework, including testing their relative performance under uncertainty.
89. The WPM **NOTED** that length-frequency data can be informative for MSE testing if properly standardised, but that variability in data due to fleet movement and changes in gear composition presents challenges for use as an indicator of fishing mortality.
90. The WPM **NOTED** that CPUE data may not be reliable for use in the MP, and that TAC-based rules linked to recent catch levels may provide a more stable basis for management.
91. The WPM **NOTED** that the BSH stock assessment model is able to reproduce available data and that uncertainty can be incorporated through the range of operating models.
92. The WPM **NOTED** that ecosystem-based management should avoid creating conflicts between fisheries and that management of one fishery impacting another is not unusual within the IOTC framework.

93. The WPM **NOTED** that, although BSH is not currently listed under the IOTC Convention Annex, Article 61.4 of UNCLOS provides an obligation to maintain associated species above levels at which their reproduction would be seriously threatened.
94. The WPM **NOTED** that the development of a TAC-based MP should take into account uncertainty in BSH catch data, with potential application of catch/effort multipliers in the control rule.
95. The WPM **AGREED** that both TAC- and length-based management procedures should be tested, with results to be presented first to the MSE Taskforce, followed by the TCMP prior to Commission consideration.
96. The WPM **AGREED** that MP inputs should include standardised length-frequency data and focus on target fisheries data. The WPM **AGREED** that MP outputs should be based on taking the following into account:
- A TAC control is desirable and feasible;
 - Conflict with other fisheries could be mitigated (e.g. shift to nylon traces), given the correct incentive;
 - Fixed size limits (upper and lower) should be considered in conjunction with a TAC setting algorithm; and
 - Given uncertainties in catch estimates, a relative-change, catch-based MP might be the best approach.
97. The WPM **AGREED** that MP evaluation should include and take into account the following:
- Discard survivorship should be reviewed to ensure it is realistic for the main target fisheries, and allows evaluation of size limit measures; and
 - Number of sharks caught may be more relevant than biomass, but catches may be reported in weight in some fisheries, and TAC would also need to be in weight.

9.2 Future Plan

98. The WPM **AGREED** that both TAC- and length-based management procedures should be tested and **REQUESTED** the results to be presented first to the MSE Taskforce, followed by the TCMP prior to Commission consideration.

10. GENERAL MSE ISSUES

10.1 General MSE issues

99. The WPM **NOTED** that the FAO Common Oceans project will be holding a MSE workshop for tRFMOs led by ICCAT in Rome in January 2026. The WPM **NOTED** that while abstract submission has already closed, interested scientists are welcome to join the meeting. The WPM **NOTED** that members of the Secretariat as well as other members of the WPM will be attending.

10.2 Climate change scenarios in MSE

100. The WPM **NOTED** a recent literature review conducted by PEW which synthesised information on existing efforts to incorporate climate elements into the MSE process.¹

10.3 MSE capacity building

101. The WPM **NOTED** that the Commission always requests that the TCMP meeting include a capacity building component to help Commissioners to better understand the process.

¹ The paper can be accessed here: https://harveststrategies.org/wp-content/uploads/2025/06/2024.11.13_HarvestStrategies_ClimateChange_Pew_TOF.pdf

102. The WPM **NOTED** that the FAO Common Ocean Project recently launched an e-learning course on MSE and Management Procedures which can be completed by any interested scientists. The WPM **NOTED** that this is an FAO certified learning course and can be accessed here: [Course: Management procedures for sustainable tuna fisheries - Introduction | FAO elearning Academy](#)
103. The WPM **NOTED** that in addition to developing the e-learning course, the project also includes support for 10 capacity building workshops. The WPM **ENCOURAGED** anyone interested in such a workshop to get in touch with Rebecca Scott at the Ocean Foundation (see participant list).

11.CPUE STANDARDISATION (CHAIRPERSON)

11.1 Update on the development of the joint CPUE indices for 2026/2027

104. The WPM **NOTED** plans for the joint CPUE group for 2026 and 2027.
105. The WPM **NOTED** that depending on the decision of the SC on when it is appropriate to run the next yellowfin tuna assessment, the joint CPUE may need to be updated to include data going up to 2025 for inclusion in a 2026 assessment.
106. The WPM **NOTED** that work will be done on spatio-temporal modelling to account for interannual changes in the distribution over time as this may be linked with climate change. The WPM **NOTED** that this has been done for some other species by members of the joint CPUE group in the past and attempts will be made to apply this to IOTC species.
107. The WPM **NOTED** that for the albacore assessment, further work will be required for the assessment but the CPUE will not require an update as the same dataset will be used for the diagnostics and for determining the robustness of the assessment.
108. The WPM **RECALLED** the recommendation for developing a fixed set of code for the joint CPUE group and **NOTED** that this has almost been finalised. The WPM **NOTED** that the code was changed for extracting data components to make it more stable and to allow a safer extraction process for data components as there were some issues with this previously. The WPM **NOTED** that the code will be shared when this process has been completed.

12.STOCK ASSESSMENT AND STOCK STATUS GUIDANCE (CHAIRPERSON)

12.1 Review the approach used to provide stock status and management advice relative to reference points

109. The WPM **NOTED** document [IOTC-2025-WPM16-08](#), which provides a summary of stock assessment for Kawakawa in the Andaman Sea Thailand, with the following abstract provided by the author:

“The study of the stock assessment of Kawakawa (Euthynnus affinis) in the Andaman Sea, Thailand, was conducted using the Bayesian surplus production model JABBA (Just Another Bayesian Biomass Assessment), which used data from commercial fishing vessel catch and CPUE data from purse seines collected by the Fisheries Department from 2001 to 2024. The assessment results showed that the maximum sustainable yield (MSY) of Kawakawa tuna estimate was 10,161 tons, while the catch in 2024 was 5,714 tons, and the biomass at MSY (BMSY) estimate was 25,197 tons. The JABBA study indicated that the stock of Kawakawa tuna in the Andaman Sea is underfished”

110. The WPM **THANKED** the author for the introduction of the assessment methods for the pelagic species within Thailand’s waters, which may be useful for other CPCs wishing to apply such methods to the assess their domestic fisheries.
111. The WPM **NOTED** that the data used for the assessment were obtained from survey vessels employing purse seine and gillnet gears for the period 2001–2024, **NOTING** that these vessels operate as commercial coastal fisheries.

112. The WPM **NOTED** that the optimum fishing catch level of Kawakawa in 2024 was below MSY, which indicated that the stock of Kawakawa in the Thailand area is in a healthy (green) status.
113. The WPM **NOTED** that these fisheries target multiple species, and that neritic tuna species are not the principal targets. The WPM further **NOTED** that controlling individual species is difficult, and that no single-species management measures are currently in place.
114. The WPM **NOTED** that the Total Allowable Catch is in place for this group of species, **NOTING** that additional measures, such as seasonal closures and mesh size regulations, are implemented.
115. The WPM **NOTED** that the use of JABBA for assessments, even when the coefficient of variation remains unchanged, can alter the assessment results when size data are incorporated. The WPM **NOTED** that including size composition information in the model may influence stock status estimates and reference point calculations, even if the overall variability of the input data does not change.
116. The WPM **NOTED** that CPUE was used as an abundance index for the purse seine fisheries, **NOTING** that the CPUE data were not standardized. The WPM **SUGGESTED** that Thailand liaise with the IOTC Secretariat for assistance in standardizing their CPUE data.
117. The WPM **NOTED** that purse seine vessels in Thailand operate on Anchored Fish Aggregating Devices (AFADs) and, in some instances, on free schools. The WPM further **NOTED** the importance of standardizing the data and separating the fisheries by fishing mode for analysis.
118. The WPM **NOTED** document [IOTC-2025-WPM16-10](#), which describes photo-based method for collecting fish length data of coastal tuna in Sri Lanka, with the following abstract provided by the author:
- “Sri Lanka, as an island nation, possesses tuna fishery resources with high species diversity. Among them, coastal tuna species such as Kawakawa (*Euthynnus affinis*), bullet tuna (*Auxis rochei*), and frigate tuna (*Auxis thazard*) play a vital role in the fisheries industry while also serving as an essential source of daily protein for local communities. Therefore, obtaining accurate fish length data for these species is crucial to monitor the resources and manage them in a sustainable manner. However, collecting reliable data has been a challenge in the ongoing data collection programs. To address this, a practical method was developed using a photo-based application to collect fish length data. A field-friendly measuring board was designed, allowing fish to be placed on it and photographed.”* (see the paper for the full summary)
119. The WPM **THANKED** the authors for presenting a new methodology for collecting fish size samples using photographs.
120. The WPM **NOTED** that with many landing sites in Sri Lanka, it is difficult for the NARA sampling plan to cover all sites. The WPM **NOTED** that the current system of collecting size data faces challenges, including limited cooperation from fishers.
121. The WPM **NOTED** that the new methodology involves placing the fish on a calibrated board, taking photographs, and then estimating the size using Fish-Mesh software.
122. The WPM **NOTED** that the software is a web-based application designed for use by enumerators. The WPM **NOTED** that the system can detect duplicate entries and includes a measurement window pointer to select fish measurement points.
123. The WPM **NOTED** the limitations of the method, which include the fact that only small-sized fish can be measured, the requirement to have a flat surface, and the need to avoid shadows.
124. The WPM **NOTED** that different species are measured using various types of length, which are not always fork length (FL). The WPM **NOTED** that the specifications of the board could limit measurements to certain measurement types.
125. The WPM **NOTED** document [IOTC-2025-WPM16-18](#), which discusses how to strength artisanal tuna and tuna-like species data collection in Tanzania, with the following abstract provided by the author:

“Tanzania has faced underreporting of data on tuna and tuna-like species harvested in its artisanal fisheries for several years. Historically, data collection has been limited to a few fishing grounds, resulting in an incomplete representation of national catches. The country has approximately 500 landing sites dedicated to coastal fisheries, yet only six out of 500 are actively involved in collecting tuna landings. The distribution of these dedicated tuna and tuna-like species sites is uneven and does not align with the intensity of fishing activities. For example, the southern regions of Lindi and Mtwara, where significant artisanal tuna fishing occurs due to their geography, are represented by only a single monitoring site in the south Mtwara site. Similarly, the Zanzibar Channel remains poorly represented despite active fishing in this area. Furthermore, Ferry, the largest landing site in Tanzania and a major hub where much of the tuna catch supplies local hotels in urban centres, has been left out of this monitoring framework.” (see the paper for the full summary)

126. The WPM **EXPRESSED** its appreciation to the authors for presenting the development of the data processing system project in Tanzania, designed to improve the quality and efficiency of data collection.
127. The WPM **NOTED** that artisanal fisheries, which represent the main livelihood for local communities at landing sites, face significant challenges in data collection. The WPM **NOTED** the limitation of the coverage of landing sites, with few sites landing tuna and tuna-like species being adequately monitored. The WPM further **NOTED** that data collectors face limitations in properly identifying species.
128. The WPM **NOTED** that the Deep Sea Fishing Authority (DSFA) serves as the central body for reporting data to the IOTC, but that its data processing capacity and information coverage remain limited, which could introduce bias into the data.
129. The WPM **NOTED** that Tanzania intends to conduct a nationwide survey to cover most landing sites and update information on vessels and fisheries currently in operation.
130. The WPM **NOTED** that Tanzania plans to harmonize its three existing data processing systems into a single integrated management system, **NOTING** that this effort faces challenges due to differences among the current systems used by various departments.
131. The WPM **NOTED** document [IOTC-2025-WPM16-23](#), which discusses a stratified baseline-anchored simulator for precision and reliability for the longline observer program of Kenya, with the following abstract provided by the authors

“Effective fisheries management relies on accurate, unbiased, and spatially resolved information on catch, effort, and bycatch composition. This study integrates longline observer datasets collected along the Kenyan coastline with advanced analytical frameworks to standardize Catch Per Unit Effort (CPUE), quantify uncertainty through the Coefficient of Variation (CV), and evaluate sampling biases that influence bycatch estimates. The study employed modern statistical, spatial, and computational tools to improve the precision, transparency, and interpretability of observer-based indices of abundance and mortality. “ (see the paper for the full summary)

132. The WPM **NOTED** that observer data are collected following the guidelines of the observer manual obtained during training. The WPM **NOTED** that Kenya continues to face challenges in properly interpreting the guidelines and performing estimations for bycatch, target species, and species of special interest based on sampling procedures.
133. The WPM **NOTED** the limited observer data submitted by Kenya in previous years and **NOTED** that enhancing observer data collection from Kenyan vessels will improve the quality of data reported by the country.
134. The WPM **NOTED** that past observer data were not collected directly onboard vessels, but rather through observations conducted at landing sites.
135. The WPM **NOTED** that the code developed for analysis could be shared on GitHub to allow for reproducibility of population estimates.

136. The WPM **NOTED** the low level of observer coverage, currently around 5%, which could affect the precision of estimates in the simulations.
137. The WPM **NOTED** that the Secretariat is developing a Shiny application to assist with data verification and checking. The WPM further **NOTED** the existence of various digital tools used by large purse seine vessels to collect observer data. The WPM **SUGGESTED** that CPCs operating new purse seine vessels liaise with these institutions for technical assistance.
138. The WPM **NOTED** document [IOTC-2025-WPM16-24](#), which discusses the mapping process entailed using geo-referenced data, with the following abstract provided by the authors:
- “India has one of the most extensive and diverse marine fisheries sectors in the world, contributing significantly to national food security, employment, and coastal livelihoods. With an Exclusive Economic Zone (EEZ) of 2.02 million square kilometers and India's marine fisheries have great ecological and commercial potential. India's marine capture fisheries are composed of a rich diversity of species—over 2,000 species, and is supported by a multi-gear, multi-species fishery system using mechanized, motorized, and traditional non-motorized crafts. India's marine fish production in recent years has averaged over 4 million tonnes annually, making it one of the top marine fish-producing countries globally. A large portion of the catch is exported, generating substantial foreign exchange revenue. Fishers use different fishing grounds in different seasons depending on fishing opportunities, fish prices, fishing costs, fishing traditions, and/or regulations in force and, therefore, exploit different species and age classes of the population. Spatial mapping of fish landings is vital for visualizing the spatial distribution of fish catches thereby identifying resource use patterns.” (see the paper for the full summary)*
139. The WPM **EXPRESSED** its appreciation to the authors for the paper mapping tuna landings to their corresponding fishing grounds, **NOTING** the benefits of understanding the spatial distribution of fishing effort and catches to support sustainable fisheries management by region.
140. The WPM **NOTED** the development of an online data collection system, Fish Catch Survey and Analysis (FCSA), a mobile application for field samplers that enables the collection of basic fishing location information without the use of GPS or VMS.
141. The WPM **NOTED** that the new system will employ passive geo-referencing technology to determine fishing locations based on information entered into the application.
142. The WPM **NOTED** that India has implemented several management measures, such as mesh-size and minimum fish-size regulations, which have been in place for over a decade. The WPM also **NOTED** the increasing catches from gillnet fisheries.
143. The WPM **NOTED** document [IOTC-2025-WPM16-INFO1](#) titled *Is my red the same as your red? Improving the communication of stock status and support for management in the Indian Ocean Tuna Commission with specific recommendations for Indian Ocean skipjack*, with the following abstract, provided by the authors:

“Fisheries management is based on the status of fish stocks and the scientific advice developed from stock assessments. Scientific advice is communicated using tables and figures and is often summarized using colours, which are a powerful tool to communicate information and trigger decision-making. However, a common understanding of what colours and stock status categories represent is necessary to ensure the adoption of scientifically sound management measures. We show that the characterization of the status of Indian Ocean skipjack tuna stock is flawed due to the inconsistent combination of overarching fishery principles (maximum use of stocks' productivity and reduction of risk) and the inaccurate representation of the scientific evidence available from recent stock assessments. Furthermore, we discuss how the general principles of fisheries management are applied in tuna RFMOs and propose a way forward for improving the communication of the status of tuna stocks in general. This discussion paper is specifically focused on Indian Ocean skipjack and aims at improving the management framework of the Indian Ocean Tuna Commission. However, our conclusions are applicable to fisheries management worldwide.”

144. The WPM **NOTED** that Resolution 15/10 is binding while Recommendation 14/07 is not compulsory.
145. The WPM **NOTED** broad agreement that the current reporting framework for SKJ stock status—particularly the use of the 40%B₀ target—is inconsistent with the IOTC reference point framework and creates communication challenges.
146. The WPM **NOTED** consensus that the Target Reference Points (TRP) should be set above B_{MSY} to remain precautionary, with depletion-based reference points such as 0.2 B₀ used as Limit Reference Points (LRPs) to indicate when the stock is overfished. The WPM **NOTED** that the robustness of such reference points and their implications on providing management advice should be assessed.
147. The WPM **NOTED** differing views on whether 0.2 B₀ is a suitable proxy for B_{MSY}, or for ½ BMSY with some participants noting inconsistency with the current IOTC framework, while others referenced its scientific basis in other RFMOs or CPC jurisdictional fisheries.
148. The WPM **NOTED** that the TRP is a management decision, and that any proposal to adjust the SKJ TRP should be informed by SC advice on potential biological and ecosystem impacts (for example the implications of changes in purse seine effort on vulnerable bycatch species and on fishing mortality for juvenile bigeye and yellowfin).
149. The WPM **NOTED** that while SKJ remains healthy under current management, stock status reporting can misrepresent its condition due to the use of a precautionary 40% B₀ target. The WPM **EMPHASISED** that under the new MP, the stock assessment functions primarily as a monitoring tool rather than a decision-making mechanism.
150. The WPM **NOTED** prior concerns regarding the reliability of MSY estimates from SS3 for this species, and **AGREED** that uncertainty in reference points should be reflected within MSE testing and MP evaluation.
151. The WPM **NOTED** a discussion on the potential to define the range between 20–40% B₀ as an “orange zone”, where management intervention may be triggered, noting this function is now largely embedded in the MP’s harvest control rule.
152. The WPM **NOTED** the need for harmonisation between reference point guidance, stock status reporting, and the new MP, and that such guidance should apply consistently across all IOTC stocks.
153. The WPM **RECOMMENDED** that the SC consider not using the target 40% SSB₀ to determine stock status, using instead other reference points. The WPM **SUGGESTED** that a CPC could bring a proposal to the SC to facilitate further discussion, including through a possible intersessional process.

13. WPM PROGRAM OF WORK

13.1 Revision of the timeline of the MSE development

154. The WPM **NOTED** that the most recent timeline for MSE development was provided in the draft WPM Programme of Work (IOTC–2025–WPM16–07) that will need to be updated. The WPM discussed and reviewed the timeline for MSE development and the updated schedule of MSE work is provided in [Appendix IV](#) (as part of the WPM Program of Work)
155. The WPM **NOTED** that the updated schedule of MSE work needs to be reviewed and endorsed by the SC in 2025 and the Commission in 2026.

13.2 Revision of the WPM Program of work (2026–2030)

156. The WPM **NOTED** paper [IOTC–2025–WPM16–07](#) presenting the draft WPM Programme of Work (2025–2029).
157. The WPM **RECALLED** that the SC, at its 18th Session, made the following request to its working parties:

“The SC REQUESTED that during the 2015 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.” (SC17, Para. 178)

158. The WPM **REQUESTED** that the Chairperson and Vice-Chairperson of the WPM, in consultation with the IOTC Secretariat, develop Terms of Reference (ToR) for each of the projects detailed on the WPM Programme of Work (2026–2030) that are yet to be funded, for circulation to potential funding bodies.
159. The WPM **RECOMMENDED** that the Scientific Committee consider and endorse the WPM Programme of Work (2026–2030), as provided in [Appendix IV](#).

14. OTHER BUSINESS

14.1 Election of a Chairperson and a Vice-Chairperson of the WPM for the next biennium

Chairperson

160. The WPM **NOTED** that the second term of the current Chairperson, Dr Hilario Murua, is due to expire at the end of the current WPM meeting and, as per the IOTC Rules of Procedure (2014), participants are required to elect a new Chairperson for the next biennium.
161. The WPM **THANKED** Dr Hilario Murua for his Chairmanship over the past seven years and looked forward to his continued engagement in the activities of the WPM in the future.
162. **NOTING** the Rules of Procedure (2014), the WPM **CALLED** for nominations for the newly vacated position of Chairperson of the IOTC WPM. Dr Ann Preece (AUS) was recommended, nominated, and seconded to continue to be the Chairperson of the WPM for the next biennium.

Vice-Chairperson

163. The WPM **NOTED** that the first term of the current Vice-Chair Dr Ann Preece is due to expire. As per the IOTC Rules of Procedure (2014), participants are required to elect a Vice-Chairperson for the next biennium.
164. **NOTING** the Rules of Procedure (2014), the WPM **CALLED** for nominations for the position of the Vice Chairperson of the IOTC WPM. Dr Giancarlo Correa (EU, Spain) was nominated, seconded and elected as Vice-Chairperson of the WPM for the next biennium.

14.2 Date and place of the 17th and 18th sessions of the WPM

165. The WPM **RECOMMENDED** the SC consider mid-late October 2026 as a preferred time period to hold the WPM17. As usual it was also **AGREED** that this meeting should continue to be held back-to-back with the WPTT.
166. The WPM also **NOTED** the MSE task force meeting to be held in 2026 should continue to take place. Considering the contents and related MSE work, the WPM **AGREED** to hold it online for 2 days (23-24 February 2026). The WPM **AGREED** that this task force meeting is crucial for providing technical feedback to the TCMP.
167. The WPM **RECALLED** that Resolution 25/10 states that “...the Scientific Committee at its annual meeting may recommend a change to the date and/or format of the next TCMP...” (paragraph 4 of Resolution 25/10). The WPM **NOTED** that the Commission has tentatively scheduled two TCMP meetings in 2026: one online meeting in late January and one in-person meeting in May (to be held back-to-back with the Commission meeting).
168. In view of the status of the albacore and blue shark MSE, and the potential progress that may be achieved in the coming months, the WPM **RECOMMENDED** that that an extra TCMP meeting in January 2026 is not organized.

14.3 Review of the draft, and adoption of the Report of the 16th Session of the WPM

169. The WPM **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPM16, provided in [Appendix V](#).

170. The WPM **THANKED** the Chair for his excellent running of the meeting as well as his contributions to the intersessional work conducted to expedite the MSE of the Indian Ocean stocks.
171. The Chair **THANKED** all the participants for their dedicated discussion during the session. The Chair also expressed his appreciation to the rapporteurs and Secretariat for their hard work.
172. The report of the 16th Session of the Working Party on Methods (IOTC–2025–WPM16–R) was **ADOPTED** via correspondence.

APPENDIX I
LIST OF PARTICIPANTS

Chairpersons					
Title	First name	Last name	Organisation	CPC	E-mail
Dr.	Hilario	Murua	ISSF		hmurua@iss-foundation.org
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Title	First name	Last name	Organisation	CPC	E-mail
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APPENDIX II

AGENDA FOR THE 15TH WORKING PARTY ON METHODS

Date: 27-28 October 2025

Location: Anse Royale, Mahe, Seychelles

Venue: Laïla Resort, Seychelles

Time: 09:00 – 17:00 daily

Chairperson: Dr. Hilario Murua; **Vice-Chairperson:** Ann Preece

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 27th Session of the Scientific Committee (IOTC Secretariat)

3.2 Outcomes of the 9th Session of the Technical Committee on Management Procedures (IOTC Secretariat)

3.3 Outcomes of the 29th Session of the Commission (IOTC Secretariat)

3.4 Review of Conservation and Management Measures relevant to the WPM (IOTC Secretariat)

3.5 Progress on the recommendations of WPM15 (IOTC Secretariat and Chairperson)

4. ALBACORE MSE: UPDATE (Developers)

4.1 Review of OM and candidate MP development

4.2 Discussion and feedback on MSE development

4.3 Future workplan

5. SKIPJACK TUNA MP (Resolution 24/07)

5.1 Running the Skipjack MP as per Resolution 24/07

5.2 Review of exceptional circumstances

6. BIGEYE TUNA MP (Resolution 22/03)

6.1 Review of exceptional circumstances

6.2 External peer-review

7. SWORDFISH MP (Resolution 24/08)

7.1 Review of Exceptional Circumstances

8. YELLOWFIN TUNA MSE: UPDATE (Developers)

8.1 Discussion and feedback on MSE development

8.2 Future workplan

9. BLUE SHARK TUNA MSE: UPDATE (Developers)

9.1 Discussion and feedback on MSE development

9.2 Future workplan

10. GENERAL MSE ISSUES (Chairperson and Vice-chairperson)

10.1 Climate change scenarios in MSE

10.2 MSE capacity building

10.3 Feedback on MSE and MP communication to TCMP

11. CPUE STANDARDISATION (Chairperson)

11.1 Update on the development of the joint CPUE indices for 2026/2027.

11.2 Advice on CPUE standardisation

11.3 Future workplan

12. STOCK ASSESSMENT and STOCK STATUS GUIDANCE (Chairperson)

12.1 Review the approach used to provide stock status and management advice relative to reference points

13. WPM PROGRAM OF WORK (Chairperson and IOTC Secretariat)

13.1 Revision of the timeline of the MSE development

13.2 Revision of the WPM Program of Work (2026–2030) and research priorities

14. OTHER BUSINESS

14.1 Election of a Chairperson and a Vice-Chairperson of the WPM for the next biennium (Secretariat)

14.2 Date and place of the 17th and 18th Sessions of the WPM (Chairperson and IOTC Secretariat)

14.3 Development of priorities for Invited Expert(s) at the next WPM meeting (Chairperson)

14.4 Review of the draft, and adoption of the Report of the 16th Session of the WPM (Chairperson)

APPENDIX III
LIST OF DOCUMENTS FOR THE 16TH WORKING PARTY ON METHODS

Document	Title
IOTC-2025-WPM16-01a	Agenda of the 16th Working Party on Methods
IOTC-2025-WPM16-01b	Annotated agenda of the 16th Working Party on Methods
IOTC-2025-WPM16-02	List of documents of the 16th Working Party on Methods
IOTC-2025-WPM16-03	Outcomes of the 27 th Session of the Scientific Committee (IOTC Secretariat)
IOTC-2025-WPM16-04	Outcomes of the 29 th Session of the Commission (IOTC Secretariat)
IOTC-2025-WPM16-05	Review of Conservation and Management Measures relating to methods (IOTC Secretariat)
IOTC-2025-WPM16-06	Progress made on the recommendations and requests of WPM15 and SC27 (IOTC Secretariat)
IOTC-2025-WPM16-07	Revision of the WPM program of work (2026-2030) (IOTC Secretariat & Chairpersons)
IOTC-2025-WPM16-08	Stock assessment for Kawakawa (<i>Euthynnus affinis</i>) in the Andaman Sea Thailand (Prasertsook O)
IOTC-2025-WPM16-09	Preliminary study of length frequency analysis of skipjack tuna (<i>Katsuwonus pelamis</i>) in Indonesia (Jatmiko I et al.)
IOTC-2025-WPM16-10	Photo-Based Method for Collecting Fish Length Data of Coastal Tuna in Sri Lanka (Ayeshya H, Johannessen T, Jayasinghe R, Bandaranaike K, Rushinika S, Thilakarathne K, Wijewardhana W)
IOTC-2025-WPM16-11	Simulation testing of management procedures for Indian ocean albacore tuna based on ABC operating models (Mosqueira I, Hilary R)
IOTC-2025-WPM16-12	Running the IOTC skipjack tuna management procedure for 2025 (IOTC Secretariat)
IOTC-2025-WPM16-13	Consideration of exceptional circumstances for the IOTC bigeye tuna management procedure for 2025 (Preece A, Williams A)
IOTC-2025-WPM16-14	Review of the Indian Ocean Tuna Commission bigeye tuna management procedure and its underlying management strategy evaluation (Neubauer P)
IOTC-2025-WPM16-15	Consideration of exceptional circumstances for the IOTC swordfish tuna management procedure for 2025 (Bromhead D, Preece A, Williams A, Brunel T, Mosqueira I)
IOTC-2025-WPM16-16	Conditioning of OMs and preliminary evaluation of MPs for Indian Ocean yellowfin. (Urtizberea A, Correa M, Merino G, Murua H)
IOTC-2025-WPM16-17	Potential for a blue shark management procedure in the Indian Ocean (Edward C)
IOTC-2025-WPM16-18	Strengthening Artisanal Tuna and Tuna-like Species Data Collection in Tanzania: Bridging Geographical Gaps (Tumu M)
IOTC-2025-WPM16-20	Catch level projections and management benchmarks in the face of non-stationarity - an application to Indian Ocean yellowfin tuna (Merino et al 2025)
IOTC-2025-WPM16-21	Consideration of Exceptional Circumstances for the skipjack tuna Management Procedure adopted by the IOTC in 2023 (Merino G)
IOTC-2025-WPM16-22	Preliminary evaluation of Seychelles longline length, catch and effort data (Medley P)
IOTC-2025-WPM16-23	A Stratified Baseline-Anchored Simulator for Precision and Reliability Metric for Longline Fisheries Observer Programs' Coverage Design and Validation by Integrating the Coefficient of Variation: A Case Study of Kenya (Wachira K)
IOTC-2025-WPM16-24	Spatial Distribution of Marine Fish Landings through a Modified Grid Framework (Kuriakose S et al.)

Document	Title
IOTC-2025-WPM16-25	Update on the long time series CPUE standardization for skipjack tuna (<i>Katsuwonus pelamis</i>) of the EU purse-seine fishery on floating objects (FOB) in the Indian Ocean (Kaplan et al.)
IOTC-2025-WPM16-INF01	Is my red the same as your red? Improving the communication of stock status and support for management in the Indian Ocean Tuna Commission with specific recommendations for Indian Ocean skipjack (Merino et al., 2025)
IOTC-2025-WPM16-INF02	Population structure of the swordfish (<i>Xiphias gladius</i>) across the Indian Ocean using next-generation sequencing (Chevrier T et al.)

APPENDIX IV
WORKING PARTY ON METHODS PROGRAM OF WORK (2060–2030)

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. Priority topics for obtaining the information necessary to deliver the necessary advice to the Commission. Resolution 15/10 elements have been incorporated as required by the Commission.

Topic	Sub-topic and project	Timing				
		2026	2027	2028	2029	2030
1. Management Strategy Evaluation	Continuation of Management Strategy Evaluation for Albacore, Yellowfin, and Blue shark					
MP Implementation	Monitoring the implementation of SKJ, BET and SWO Management Procedures					
	Peer review of SKJ/SWO MSE/MPs as required by MP resolutions					
Future Research Requirements (not in order of priority)						
Management Strategy Evaluation	1.1 Albacore					
	1.1.2 Implementation of candidate MP simulation runs and presentation of results at the TCMP					
	1.1.3 Revision and evaluation of new set of Management Procedures after presentation of MP runs to TCMP and Commission (as needed)					

1.2 Skipjack tuna	
1.2.1 Run MP using the catch and CPUE standardisation input data, consider exceptional circumstances*, and provide the TAC advice	
1.2.2 Presentation of MP application and exceptional circumstances* and resulting TAC to the TCMP and Commission meeting for adoption of the TAC	
1.2.3 Stock assessment to provide information on stock status	
1.2.4 External peer review (2026-2028)	
1.3 Bigeye tuna	
1.3.1 Run MP using the catch and CPUE standardisation input data, consider exceptional circumstances*, and provide the TAC advice	
1.3.2 MP performance review (preceded by the development of TORs),	
1.3.3 Presentation of MP application and exceptional circumstances* and resulting TAC to the TCMP and Commission meeting for adoption of the TAC	
1.3.4 Stock assessment to provide information on stock status	
1.4 Yellowfin tuna	
1.4.1 Update OM & present preliminary MP results to TCMP, WPTT/WPM review of new OM	
1.4.2 Present revised MP results to TCMP; iteratively update development if required)	

1.4.3 additional iterations if required						
1.5 Swordfish						
1.5.1	Run MP using the catch and CPUE standardisation input data, consider exceptional circumstances*, and provide the TAC advice					
1.5.2	Presentation of MP application and exceptional circumstances* and resulting TAC to the TCMP and Commission meeting for adoption of the TAC					
1.5.3	Stock assessment to provide information on stock status Stock assessment to provide information on stock status					
1.5.4	External peer review of the MSE/MP					
Stock status guidance and reference points.	Review IOTC stock status characterization against reference points and the framework for the provision of management advice (Resolution 15/10) to address the TORs of ad hoc reference point WG.					
CPUE Standardisation	Continue the development of CPUE series for IOTC Species to be used in stock assessment and MSE/MP. Develop mechanism to ensure that CPUE standardization for the MP follows the MP specifications. Consider alternative CPUE (and catch data) to explore alternative plausible time series to address potential uncertainties associated with productivity to be included in OM conditioning					

Stock assessment	Exploration and development of next-generation integrated fisheries stock assessment models (e.g., age-structured state-space assessment models) and their application to tuna stocks.				
CKMR pilot project	Implementation of a CKMR pilot project for Indian Ocean yellowfin tuna to evaluate the logistics and feasibility of sampling, and levels of cross contamination of DNA.				
Capacity Building	Ongoing development of tools, materials and courses to continue Capacity Building for increasing participation in the MSE process and develop improved MSE communication to fishery managers.				

* Exceptional Circumstances should be reviewed every year at each WP and WPM.

SCHEDULE OF WORK FOR THE DEVELOPMENT OF MANAGEMENT PROCEDURES FOR KEY SPECIES IN THE IOTC AREA

A more detailed explanation of the roles of the Working Parties (WPs), Scientific Committee (SC), Technical Committee on Management Procedures (TCMP) and the Commission are provided below

Year	Albacore	Skipjack	Yellowfin	Bigeye	Swordfish	Blueshark
2026	TCMP: Provide advice to Commission on elements of OMs and, if possible, candidate MPs, that require a decision by the Commission, including the performance of candidate MPs against Commission objectives.	TCMP: Provide advice to the Commission on SKJ TAC for 2027-2029	TCMP: Provide advice to Commission on elements of OMs and, if possible, candidate MPs, that require a decision by the Commission, including the performance of candidate MPs against Commission objectives.	TCMP: Consider outcomes of BET MSE review and provide advice Commission.	TCMP:	TCMP: Provide advice to Commission on elements of OMs and, if possible, candidate MPs, that require a decision by the Commission, including the performance of candidate MPs against Commission objectives.
	Commission: Consider work and advice from subsidiary bodies and provide direction to the WPs/SC on the need to undertake further MSE of candidate or alternative MPs.	Commission: Adopt the TAC for 2027-2029	Commission: Consider work and advice from subsidiary bodies and provide direction to the WPs/SC on the need to undertake further MSE.	Commission: Consider outcomes of BET MSE review	Commission:	Commission: Consider work and advice from subsidiary bodies and provide direction to the WPs/SC on the need to undertake further MSE.

	WPs/SC: Consider recommendations from the Commission and undertake MSE to provide advice on the performance of candidate MPs.	WPs/SC: Stock Assessment to monitor MP implementation Review Exceptional Circumstances	WPs/SC: Consider recommendations from the Commission and undertake MSE to provide advice on the performance of candidate MPs.	WPs/SC: Review Exceptional Circumstances	WPs/SC: Stock Assessment to monitor MP implementation Review Exceptional Circumstances	WPs/SC: Consider recommendations from the Commission and undertake MSE to provide advice on the performance of candidate MPs.
2027	TCMP: Provide advice to Commission on elements of candidate MPs, and any proposed Resolutions for an MP, that require a decision by the Commission, including the performance of candidate MPs against Commission objectives. Commission: Consider work and advice from subsidiary bodies. Decision and adoption of an MP.	Commission:	TCMP: Provide advice to Commission on elements of candidate MPs, and any proposed Resolutions for an MP, that require a decision by the Commission, including the performance of candidate MPs against Commission objectives. Commission: Consider work and advice from subsidiary bodies and provide direction to the WPs/SC on the need to undertake further MSE of candidate or alternative MPs.		TCMP: Commission:	TCMP: Provide advice to Commission on elements of candidate MPs, and any proposed Resolutions for an MP, that require a decision by the Commission, including the performance of candidate MPs against Commission objectives. Commission: Consider work and advice from subsidiary bodies and provide direction to the WPs/SC on the need to undertake further MSE of candidate or alternative MPs.
	WPs/SC: Consider recommendations	WPs/SC: Review Exceptional Circumstances	WPs/SC: Consider recommendations	WPs/SC:	WPs/SC:	WPs/SC: Consider recommendations

	from the Commission		from the Commission and undertake MSE to provide advice on the performance of candidate MPs.	Run BET MP and Review Exceptional Circumstances and agree in any corrective action, if needed. Provide TAC advice to the TCMP and Commission for 2029-2032.	Run SWO MP and Review Exceptional Circumstances and agree in any corrective action, if needed. Provide TAC advice to the TCMP and Commission for 2029-2032.	from the Commission and undertake MSE to provide advice on the performance of candidate MPs.
2028	TCMP:	TCMP:	TCMP: Provide advice to Commission on elements of candidate MPs, and any proposed Resolutions for an MP, that require a decision by the Commission, including the performance of candidate MPs against Commission objectives.	TCMP: Provide advice to the Commission on BET TAC for 2029-2032.	TCMP: Provide advice to the Commission on SWO TAC for 2029-2032.	TCMP: Provide advice to Commission on elements of candidate MPs, and any proposed Resolutions for an MP, that require a decision by the Commission, including the performance of candidate MPs against Commission objectives.
	Commission:	Commission:	Commission: Consider work and advice from subsidiary bodies. Decision and adoption of an MP.	Commission: Adopt the TAC for 2029-2032.	Commission: Adopt the TAC for 2029-2032.	Commission: Consider work and advice from subsidiary bodies. Decision and adoption of an MP.
	WPs/SC: Review Exceptional Circumstances	WPs/SC: Review Exceptional Circumstances	WPs/SC: Consider recommendations from the Commission	WPs/SC: Stock Assessment to monitor MP implementation.	WPs/SC: Review Exceptional Circumstances	WPs/SC: Consider recommendations from the Commission

				Review Exceptional Circumstances.		
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APPENDIX V

CONSOLIDATED RECOMMENDATIONS OF THE 16TH SESSION OF THE WORKING PARTY ON METHODS

Note: Appendix references refer to the Report of the 16th Session of the Working Party on Methods (IOTC–2024–WPM15–R)

Review of intersessional meetings related to the IOTC MSE process

WPM16.01 (Para 11): The WPM **THANKED** the participants of the Working Party on Methods Management Strategy Evaluation Task Force meeting for their informative discussions and input on the technical aspects of MSE and related topics. The WPM **NOTED** that the output of this meeting remains very important to the WPM as it provides an informal forum for the highly technical discussions necessary to advance the MSE process in IOTC for which there is insufficient time during the WPM meeting. The WPM further **RECOMMENDED** that the SC endorse the inclusion of this meeting in the schedule of meetings for 2026.

Skipjack tuna MP (Resolution 24/07)

WPM16.02 (Para 40): The WPM **NOTED** The application of the skipjack management procedure generated an unconstrained estimated TAC of 528,130 t which is more than 10% lower than the TAC set for 2024–2026. The SC **NOTED** that by applying the maximum 10% decrease in the TAC as per Resolution 24/07, the MP recommended a TAC of 565,745 t. per year for 2027–2029. Therefore, the WPM **RECOMMENDED** that the SC adopt the TAC advice for skipjack tuna of 565,745 t as determined by the MP.

WPM16.03 (Para 44): Based on the available evidence reviewed, the WPM **RECOMMEND** that there are no exceptional circumstances regarding the application of the skipjack tuna Management Procedure.

Bigeye tuna MP (Resolution 22/03)

WPM16.04 (Para 49): The WPM **NOTED** that the paper highlighted that 2024 catch has exceeded the 2024 TAC. The WPM **RECOMMENDED** that the Commission should ensure that the appropriate provisions (e.g., in paragraphs 4, 5 and 8) of 23/04 are implemented to ensure catches remain inside the TAC, conditional on the allowances and requirements of those provisions.

Swordfish MP (Resolution 24/08)

WPM16.05 (Para 64): The WPM **RECOMMENDED** that the SC **STRESS** to the Commission that the TAC resulted from the MP (Resolution 24/08) should be urgently proposed and adopted by the Commission in 2026.

Stock assessment and stock status guidance

WPM16.07 (Para 153): The WPM **RECOMMENDED** that the SC consider not using the target 40% SSB₀ to determine stock status, using instead other reference points. The WPM **SUGGESTED** that a CPC could bring a proposal to the SC to facilitate further discussion, including through a possible intersessional process.

Revision of the WPM Program of work (2026–2030)

WPM16.08 (Para 159): The WPM **RECOMMENDED** that the Scientific Committee consider and endorse the WPM Programme of Work (2026–2030), as provided in [Appendix IV](#).

Date and place of the 17th and 18th sessions of the WPM

WPM16.09 (Para 165): The WPM **RECOMMENDED** the SC consider mid-late October 2026 as a preferred time period to hold the WPM17. As usual it was also **AGREED** that this meeting should continue to be held back-to-back with the WPTT.

WPM16.10 (Para 168): In view of the status of the albacore and blue shark MSE, and the potential progress that may be achieved in the coming months, the WPM **RECOMMENDED** that an extra TCMP meeting in January 2026 is not organized.

Review of the draft, and adoption of the Report of the 16th Session of the WPM

WPM16.11 (Para 169): The WPM **RECOMMENDED** that the Scientific Committee consider the consolidated set of recommendations arising from WPM16, provided in [Appendix V](#)