

IOTC–2021-SC24–INF06 Rev2

**Draft terms of reference for an independent peer review of the IOTC bigeye tuna  
Management Strategy Evaluation (Bigeye)**

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***Introduction***

IOTC Resolution 15/10 requested the IOTC Scientific Committee to develop and assess, through the management strategy evaluation (MSE) process, the performance of Management Procedures (MP) and Harvest Control Rules (HCRs), to achieve Target Reference Points (TRPs) on average and avoid the Limit Reference Points (LRPs) with a high probability taking into account the levels of uncertainty in the stock assessments for the priority species listed as Skipjack, Bigeye tuna (BET), Yellowfin tuna, Albacore tuna, and swordfish.

The Working Party on Methods (WPM), in conjunction with other Working Parties, has been developing the MSE for different IOTC species and has identified the need for external peer-review of the MSE process. As such, the 2021 MSE task force of the WPM meeting discussed the merits of external peer-review and agreed that external review at both the technical (e.g. code inspection) and process can greatly benefit the MSE. The MSE task force of the WPM suggested that the external review could be conducted independently and in parallel to the TCMP process, preferably to species for which the MP evaluation is close to completion (such as BET), and when resources and expertise are available.

Moreover, the 2021 WP on Methods identified as a **priority** in its workplan the need of an external peer review based on Terms of Reference agreed to by the WPM and the Scientific Committee and following the schedule recommended in its workplan (Appendix VI of the [IOTC–2021–WPM12–R\[E\]](#)). The WPM also identified as a research priority in its workplan the external peer-review for Bigeye MSE to be completed by 2023. The WPM also noted that clear instructions and terms of references should be provided for the external review given the complexity of the MSE process. Moreover, the WPM highlighted that arranging an external peer review will not be trivial due to the complexity of the process, the limited number of experts able to conduct the work as well as the cost and, thus, the WPM suggested that the scope should be agreed and terms of references developed. The absence of an independent review should not preclude the Commission from the initial adoption of a Resolution for an MP. As part of the MP resolution, the review of the performance of the MP (e.g. after 6-9 years of implementation) by the SC and TCMP should also be specified.

The SC24 will review and finalize these ToRs for the external Bigeye MSE peer review. The starting dates of the peer review will be agreed with the experts but ideally will be mid-2022 after IOTC Commission approves Scientific Committee workplan.

### ***Objectives***

The objective of the Terms of References is to contract a qualified individual, and/or group of individuals, to conduct the review of the bigeye MSE operating model (OM) and the MPs evaluated through MSE.

Based on the review work provide recommendations for improving the bigeye MSE, including the operating model, harvest control rules and management procedures.

### ***Terms of Reference***

The key areas for consideration by the peer review of the Indian Ocean Bigeye Tuna Management Strategy Evaluation ([IOTC-2021-WPM12\(MSE\)-04](#)) and follow-up considerations of the WPM and WPTT are listed below:

- Review the operating model conditioning and the range of uncertainties included in reference and robustness sets
- Review the evaluation of the candidate Management Procedures and Harvest Control Rules
- Review the robustness scenarios tested through the MSE
- Review the exceptional circumstances guidelines included in the adopted MP
- Review the performance of candidate MPs against the Performance Metrics of the MPS
- Advise on adequacy of communication of MSE results, the trade-offs between various management procedures, and the ranking of management procedures.
- Advise and future recommendations for bigeye MSE next iteration.

### ***Workplan***

It is envisaged that the external expert will review the bigeye MSE documentation and code where appropriate and will have access to the full documentation of bigeye MSE. The external expert will have access to the BET MSE code. To carry out the peer-review the external expert will:

- work with the developer of the bigeye MSE, the WPTT, the SC Chair, IOTC Secretariat and IOTC Stock Assessment expert, to review the OM and performance of candidate MPs. The contractor will also suggest ways to improve the current MSE framework.
- review the process followed to adopt a MP, by reviewing relevant documents, including SC documents, reports from SC or Commission meetings, IOTC Recommendations, etc. and to provide comments on the appropriateness of the selection (or omission) of OMs and MPs considered, as well as on the involvement of scientists and/or stakeholders in the process.

- document the quality control procedures followed to test the code, the outcomes of the review process, and the comments on the MSE process, with suggestions for the future work of the SC.
- participate in the WPTT meeting as well as other relevant IOTC WPM and MSE meetings and discussions.

### ***Deliverables***

- An inception draft report documenting the initial review process, preliminary outcomes, initial recommendations and next steps to be discussed with bigeye MSE developers, IOTC WPM Chair, IOTC WPTT Chair and Vicechair, and SC Chair and Vicechair (October 2022).
- A comprehensive report documenting all the review process conducted, the outcomes of the review and responses to initial recommendations as well recommendations to improve future next MSE iteration, that will be presented as an IOTC document during the 2023 IOTC WPM, WPTT and SC as well as the TCMP in 2024 (if needed).

### ***Duration of the work and potential funding***

- The consultant is expected to take no more than 40 working days to execute the assignment with a potential cost of 20,000 \$.

### ***Contractor minimum qualifications***

- At least a PhD or equivalent experience in the relevant sciences, e.g. Mathematics, Statistics, Engineering, Fisheries Science, Marine Biology, Natural Sciences, Biological Sciences, Environmental Sciences or a closely related field.
- A minimum of 10 years of experience in advanced fishery modelling, including experience in Management Strategy Evaluation and the provision of stock assessment and management advice, preferably for highly migratory species.
- Experience in participating in interdisciplinary and international working group and/or projects.
- Demonstrated experience in quantitative methods, system modelling and software design.
- Demonstrated experience in design and implementation of management strategy evaluation and stock assessment models, preferably for highly migratory species.
- Strong working knowledge of and ability to program in major software used in fisheries stock assessment and MSE, in particular, R, ADMB and C++. Experience with FLR library is desired.
- Strong working knowledge and ability to develop and maintain contemporary program documentation systems.
- Good communication skills with scientists, managers, and stakeholders with an ability to explain the essences of the complex technical objectives, results and

implications of OMs and Management Procedures (MP) to a non-technical audience is desirable.

- Excellent working knowledge of one of the two official languages of IOTC (English and French). A high level of knowledge of English is highly desirable.
- Strong teamwork and project management skills.

## **References**

Kolody, D, Jumppanen, P. 2021. Indian Ocean Bigeye Tuna Management Procedure Evaluation Update March 2021. Working Paper prepared for the Management Strategy Evaluation Task Force of the Indian Ocean Tuna Commission Working Party on Methods Meeting, March 2021. IOTC-2021-WPM12(MSE)-04.