Consultancy

WESTERN AND CENTRAL PACIFIC FISHERIES COMMISSION
SCIENTIFIC COMMITTEE

Further development of ensemble model approaches for presenting stock assessment uncertainty

INTRODUCTION

The Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (Convention) entered into force in June 2004 creating one of the first regional fisheries management organizations to be established since the 1995 adoption of the United Nations Fish Stocks Agreement.

The objective of the Convention is to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific Ocean (WCPO) in accordance with the 1982 United Nations Convention on the Law of the Sea (UNCLOS) and the 1995 Fish Stocks Agreement. For this purpose, the Convention establishes a Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC). The Commission Secretariat is based at Kolonia, Pohnpei, Federated States of Micronesia.

The Convention applies to all species of highly migratory fish stocks (defined as all fish stocks of the species listed in Annex I of UNCLOS occurring in the Convention Area and such other species of fish as the Commission may determine) within the Convention Area, except sauries. Conservation and management measures under the Convention are to be applied throughout the range of the stocks, or to specific areas within the Convention Area, as determined by the Commission. The Commission currently has 26 Members, eight Cooperating Non-Members, and seven Participating Territories. Additional information concerning the Commission, including meeting documents, is available from www.wcpfc.int.

Recognising the importance of stock assessment uncertainty as the basis for assessing management risk, including evaluating management procedures for harvest strategies, plus the ongoing and evolving research in this area, the Commission in December 2022 endorsed funding support of USD 30,000 for WCPFC Scientific Committee Project 113 (*Further development of ensemble model approaches for presenting stock assessment uncertainty*). A review of the approaches used to characterise uncertainty in WCPFC tuna, billfish and shark stock assessments was initially noted at SC17 which recommended the development of Terms of Reference (TOR) for *Further development of ensemble model approaches for presenting SA uncertainty* (P17X4; Table WP-02, SC17 Outcomes Document). This TOR was subsequently provided to SC18 as SC18-SA-IP-09.

EXPRESSIONS OF INTEREST

The Term of Reference (TORs) for this Consultancy can be found at https://www.wcpfc.int/vacancies-opportunities

Bids should be no more than 8 single spaced pages. Requests for additional information relating to this consultancy can be obtained from the Finance and Administration Manager (Aaron Nighswander) at Aaron.Nighswander@wcpfc.int.

Applications for the consultancy should include the following:

- Cover letter including proposed methodology, including timeframes, for the evaluation and a capacity statement against the knowledge, skills and experience required in the TOR (under "Consultant/Team Requirements");
- Financial proposal; and
- CV for the nominated consultant/s.

Submission of EOI should be directed to Aaron.Nighswander@wcpfc.int by 28 February 2023.

Terms of Reference for Further Development of Ensemble Model Approaches for Presenting Stock Assessment Uncertainty

OBJECTIVES

Review of the approaches used to characterise uncertainty in WCPFC tuna, billfish and shark stock assessments.

SCOPE OF WORK

The scope of work is expected to:

General review

1. Review and summarize the various approaches used for characterising uncertainty in WCPFC stock assessments for tuna, billfish and sharks over the last 5 years. Describe how uncertainty was communicated in the context of management risks and its influence on decision-making processes used by the WCPFC. Comment on the suitability of the recent approaches to characterising uncertainty for the management systems, including the harvest strategy approach.

Technical review

2. Critically review the ensemble approach that was applied for the 2021 southwest Pacific Ocean swordfish assessment (SC17-SA-WP-04, Ducharme-Barth et al. 2021) to capture both 'structural' and 'estimation' uncertainty. Comment on the approaches used within that assessment to select models to include in the uncertainty ensemble used for management advice.
3. Conduct a similar review of the approaches used in SC18-SA-WP-03 (*Report on WCPFC Project 107b: Improved stock assessment and structural uncertainty grid for Southwest Pacific blue shark*).
4. Considering the above reviews, provide recommendations for model ensemble construction, model retention, and weighting of models included within ensembles in the context of the WCPFC tuna, billfish and shark assessments.

The outcomes of this review work are expected to:

1. Provide a basis for stock assessment teams to better consider and apply alternative approaches for characterising stock assessment uncertainty (including model selection and weighting) across the WCPFC tuna, billfish and shark assessments

2. Provide guidance to the SC on the approaches for capturing assessment uncertainty in the provision of management advice; and

3. Ultimately provide managers and stakeholders with a better understanding of the implications of alternative approaches to characterising uncertainty for their perceptions of risk.

TIMEFRAME

Key activities and outputs includes:

Activity	Output
1. Consultant to conduct initial discussions with the various teams involved in stock assessments for the WCPFC.	Meetings conducted
2. Review and summarize the various approaches used for characterising uncertainty in WCPFC stock assessments for tuna, billfish and sharks over the last 5 years. Describe how uncertainty was communicated in the context of management risks and its influence on decision-making processes used by the WCPFC. Comment on the suitability of the recent approaches to characterising uncertainty for the management systems, including the harvest strategy approach.	Report chapter
3. Critically review the ensemble approach that was applied for the 2021 southwest Pacific Ocean swordfish assessment (SC17-SA-WP-04, Ducharme-Barth et al. 2021) to capture both 'structural' and 'estimation' uncertainty. Comment on the approaches used within that assessment to select models to include in the uncertainty ensemble used for management advice. 4. Conduct a similar review of the approaches used in SC18-SA-WP-03 (Report on WCPFC Project 107b: Improved stock assessment and structural uncertainty grid for Southwest Pacific blue shark).	Report chapter
5. Considering the above reviews, provide recommendations for model ensemble construction, model retention, and weighting of models included within ensembles in the context of the WCPFC tuna, billfish and shark assessments.	Report chapter
6. Final report compiled and submitted to SC19 by July 28th, and plenary presentation to SC19, August 16-24th 2023. (Travel costs are included in the total project budget.)	Final report