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MIXED FISHERY MONITORING STRATEGY

WCPFC-SC22-2026-MI-IP02

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Executive Summary

Monitoring strategies have been implemented or drafted for the adopted skipjack and South Pacific albacore management procedures (MPs). This paper considers both the required WCPFC monitoring strategy for bigeye and the likely components necessary for yellowfin tuna within the mixed fishery framework. Both monitoring strategies are scheduled for adoption by the Commission in 2027 and more complete versions will be presented to SC23.

The proposed structures for the monitoring strategies of bigeye and yellowfin follow those adopted for skipjack, focussing on the performance of the adopted management procedure, including:

- are conditions in the stock/fishery as they are expected to be under the control of the MP?
- are the required data available to run the MP?
- is the Management Procedure design still appropriate, i.e. are management objectives and the scope of the MP still appropriate; is there any evidence for exceptional circumstances?
- is the Management Strategy Evaluation still robust, i.e. are there more or fewer uncertainties to be considered; are the assumptions made for fisheries outside MP control still valid?

While yellowfin does not have a specific MP under the mixed fishery framework, many elements of the monitoring strategy remain relevant given outcomes for this stock under that framework will be MSE tested. The monitoring strategy and the consideration of exceptional circumstances for yellowfin tuna will be particularly important.

As MPs are adopted and monitoring strategies developed for 'key' tuna stocks, there is the opportunity to increase efficiency in the implementation of monitoring strategy processes. The Commission may consider specifying the review of monitoring strategies as a standing meeting agenda item for the Commission and its subsidiary bodies. To aid this process, the consolidation of stock-specific monitoring strategy reports into an omnibus report could be considered. This has the potential to transition to a more easily updateable and accessible online structure to prevent the process becoming unwieldy. Finally, the utility of the range of existing papers that can inform the monitoring process might be reviewed, with a view to consolidating and refocussing papers to supply the specific information needed.

SC22 is invited to:

- Note the proposed outline content of the monitoring strategies for WCPO bigeye and yellowfin and suggest any specific additional elements to be captured.
- Consider recommending to the Commission that the monitoring strategy process be a standing agenda item on Commission and subsidiary body meeting agendas.
- Consider the proposal to consolidate the regular papers provided to meetings into a format designed to specifically inform monitoring strategies.
- Suggest improved approaches to presenting the four stock-specific monitoring strategies for implementation following adoption of the bigeye MP.

Introduction

Monitoring strategies have been implemented or drafted for the adopted WCPO skipjack and South Pacific albacore management procedures (MPs), respectively (SPC-OFP, 2026, Scott et al., 2026a).

With development of the Commission's bigeye MP (Scott et al., 2026b), scheduled for adoption this year within the Harvest Strategy Workplan (WCPFC22 summary report, Attachment 24), this paper considers the required monitoring strategy for that stock as well as the likely components necessary for yellowfin tuna within the mixed fishery framework. Both monitoring strategies are scheduled for adoption by the Commission in 2027 and a more complete strategy for each stock will be presented to SC23 for consideration. At this stage, SC22 may wish to provide observations and inputs into the general structures presented herein.

If the schedule for adoption of bigeye and yellowfin monitoring strategies in 2027 is maintained, single-stock monitoring plans will then be in place for all 'key' WCPFC tuna stocks. This paper therefore also considers whether enhancements to the monitoring strategy approach can be gained within the mixed fishery framework.

Bigeye monitoring strategy

As for South Pacific albacore (Scott et al., 2026a), the monitoring strategy for bigeye cannot be finalised until the implementing arrangement is progressed. However, the general structure is anticipated to be the same as that for skipjack and South Pacific albacore, capturing the following components:

1. Performance of the adopted management procedure
 - a. Relating actual conditions experienced in the stock and fishery (e.g. catch/effort/CPUE in managed fishery components, stock status relative to the adopted TRP as identified through stock assessments) to the range of values anticipated from the MSE results for the corresponding period. This monitors whether actual outcomes are within the range expected from the adopted MP's testing. With regards stock status, if a bigeye MP is adopted this year and implemented through the tropical tuna CMM in 2027, the first year under MP influence would be 2028. This would only be monitored as part of the assessment scheduled for 2032, under the 3 year assessment cycle.
 - b. Whether the data needed to run the MP (e.g. estimation method inputs) are available and of sufficient quality. These data include the catch data for the thirty six extraction fisheries, operational CPUE data for the 'whole fishery' longline index, and the associated environmental data (depth of the 15°C isotherm and difference between depths of the 12° and 18°C isotherms²; see Wickens et al., 2026a).
 - c. Any additional data to inform MP performance. Given the influence of ENSO on purse seine fishing and FAD usage, ENSO phase might be considered as part of the monitoring

² EN.4.2.2 data have been obtained from <https://www.metoffice.gov.uk/hadobs/en4/> and are © British Crown Copyright, Met Office, provided under a Non-Commercial Government Licence <http://www.nationalarchives.gov.uk/doc/non-commercial-government-licence/version/2/>.

strategy. Economic analyses would provide insight into the outcomes under the adopted MP, consistent with the wider management objectives noted by WCPFC13 (Summary report, Attachment M). As for South Pacific albacore (Scott et al., 2026a) while a summary of economic conditions for fisheries in the WCPFC-CA is provided in the SC overview of WCPO fisheries paper (e.g. Vidal et al., 2026), SC22 may wish to discuss whether collection of more specific economic data is important for the monitoring strategy.

- d. That the diagnostics for the estimation method (run to inform the MP every 3 years) are appropriate.
2. Management procedure design
 - a. That the management objectives and associated performance indicators that led to the choice of the adopted MP remain appropriate.
 - b. That the scope of the management procedure, such as the spatial scope and fisheries under MP control, remain appropriate.
 - c. An evaluation of whether exceptional circumstances have occurred.
3. Management Strategy Evaluation
 - a. That the operating model (OM) grid used to test the adopted MP remains appropriate, or whether new studies have either reduced the range of OM uncertainties that need to be considered or have identified new areas that should be included.
 - b. That the calculation of the performance indicators remains appropriate.
 - c. That the assumptions made for e.g. the levels of catch or effort in fisheries outside the MP's control are within the ranges considered in testing of the adopted MP.
 - d. Whether new data need to be collected.

Yellowfin tuna monitoring strategy

As noted by Scott et al. (2025), under the mixed fishery framework there is no MP that explicitly considers the stock status of WCPO yellowfin and controls the associated fisheries. Instead, the fisheries that catch yellowfin are primarily managed through the MPs of bigeye, skipjack and South Pacific albacore. Therefore, the monitoring strategy and consideration of exceptional circumstances for yellowfin tuna will be particularly important.

While there is no specific yellowfin tuna MP, the consequences of the mixed fishery framework for this stock will be evaluated once the bigeye MP has been adopted. Wickens et al. (2026b) provide a preliminary evaluation of potential outcomes under the MPs as they stand. These evaluations will provide elements of expected stock and fishery outcomes that will inform the yellowfin monitoring strategy, while the scheduled adoption of a yellowfin TRP under the WCPFC's agreed sequenced approach with bigeye will also contribute. WCPFC22 noted that a consistent set of performance indicators across the bigeye and yellowfin tuna stocks and fisheries should be used and supported the sensitivity scenarios outlined in SPC-OFP (2025), both of which further inform elements to be monitored.

The yellowfin monitoring strategy may therefore include:

1. Performance of the mixed fishery framework

- a. Evaluating actual conditions experienced in the stock and fishery (e.g. catch/effort/CPUE in key fishery components, stock status relative to the adopted TRP) to the range of values anticipated from the MSE results for the corresponding period. This monitors whether actual outcomes are within the range expected from testing of the mixed fishery framework.
 - b. Any additional data to inform performance. For example, outcomes of WCPFC SC Project 128 (Understanding the connectivity of the yellowfin and skipjack stocks in the WPEA region and the WCPFC-CA), should this project continue in future, may contribute, along with data improvements through the work of the WPEA project. The observations on economic data raised above for bigeye are also worth consideration for yellowfin.
2. Management procedure design
 - a. That the management objectives and associated performance indicators remain appropriate.
 - b. That the scope of the management procedure, such as the spatial scope and fisheries under control of the mixed fishery framework, remain appropriate.
 - c. An evaluation of whether exceptional circumstances have occurred.
3. Management Strategy Evaluation
 - a. That the OM grid used to test the mixed fishery framework remains appropriate, or whether new studies have reduced the range of OM uncertainties that need to be considered or have identified new areas that should be included.
 - b. That the calculation of the performance indicators remains appropriate.
 - c. That the assumptions made for e.g. the levels of catch or effort in fisheries outside the mixed fishery framework's control are within the ranges considered in the testing of the adopted MP. Monitoring and improved data on yellowfin catch levels within the WPEA region will be a key consideration.
 - d. Whether new data need to be collected.

Enhancements within the mixed fishery framework

As MPs are adopted and monitoring strategies developed for 'key' tuna stocks, there is the opportunity to increase efficiency in the implementation of the monitoring strategy process across those stocks.

On a procedural note, once the bigeye MP has been adopted and implemented, the Commission may consider specifying the review of monitoring strategies as a standing agenda item for the Commission and its subsidiary body meetings.

To increase efficiency, the consolidation of stock-specific monitoring strategy reports into an omnibus report could be considered. This has the potential to transition to a more easily updateable and accessible online structure to prevent the process becoming unwieldy.

A range of papers exist that can inform the monitoring of stocks and fisheries. These include the 'Gen-1' (Vidal et al., 2026), 'indicators' (Hare et al., 2026), 'albacore trends' (McKechnie et al., 2026a) 'tropical tuna CMM tables' (SPC-OFP and WCPFC Secretariat, 2026), and the temporary 'bigeye trends' (McKechnie

et al., 2026b) papers. Most of these regular papers have expanded considerably as additional information has been requested by CCMs over the years. Following implementation of the mixed fishery framework, a review of the utility of these products is recommended, with a view to consolidating and refocussing papers to supply the specific information needed under the mixed fishery framework's monitoring strategy.

Conclusion

SC22 is invited to:

- Note the proposed outline content of the monitoring strategies for WCPO bigeye and yellowfin and suggest any specific additional elements to be captured.
- Consider recommending to the Commission that the monitoring strategy process be a standing agenda item on Commission and subsidiary body meeting agenda.
- Consider the proposal to consolidate the regular papers provided to meetings into a format designed to specifically inform monitoring strategies.
- Suggest improved approaches to presenting the four stock-specific monitoring strategies for implementation following adoption of the bigeye MP.

Declaration of generative AI and AI-assisted technologies in the SC paper preparation process

No AI technologies were used in the preparation of this paper.

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