



**Western and
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WCPFC Skipjack tuna monitoring strategy report

1. EXECUTIVE SUMMARY

The monitoring strategy routinely evaluates the performance of the management procedure (MP) to check that it is working as expected. The monitoring strategy should consider all aspects of the harvest strategy including procedures for evaluating and testing MPs; the identification of any scenarios that should be added to the OM grid; the preparation and application of the EM and the performance of the management procedure as a whole. In addition, it may identify changes in the dynamics of the fishery resulting from environmental, economic or social factors that may require a reconsideration for the management objectives and the testing of alternative MPs.

This paper updates the skipjack MP monitoring strategy to reflect Commission discussions and observations at WCPFC20 and subsequent considerations of WCPFC-SC20, WCPFC-SMD02 and WCPFC-TCC20.

SC20 noted the following outcomes with respect to the skipjack monitoring strategy:

- SC20 requested that the SSP conduct the following analyses related to the monitoring strategy for skipjack:
 - Evaluate whether changes in the FAD closure duration (as adopted in CMM 2023-01) will affect the performance of the interim MP;
 - Representativeness and appropriateness of candidate CPUEs for the use in MP.
- SC20 recommended that in years when an assessment is not conducted, the monitoring strategy could be reviewed by SC and feedback provided through the Online Discussion Forum.
- SC20 was invited to review the information provided in the Monitoring Strategy included in Table 1 of SC20-MI-WP-02, and to update the text in column 1 (SC) as appropriate. SC20 recommended the following modifications to Table 1: Monitoring strategy for the skipjack Management Procedure:
 - Amend sub-paragraph a) of Element 1.a) (comparison of predicted MP performance against the latest stock assessment outcomes) to read “The performance of the MP in managing skipjack tuna to achieve defined objectives, including the TRP”.
 - Amend element 1.b) (Data availability to run the MP) to include a new comment for SC20: “The effect of changes made to the historical data is not known”.

- SC20 recommended the monitoring strategy be forwarded to the SMD, TCC and the Commission for their consideration.

SMD02 noted the following outcomes from its discussion of the skipjack monitoring strategy:

- SMD02 thanked the SSP for the updated skipjack monitoring strategy (**WCPFC-SMD02-2024-BP-06**), which, amongst other things, provided clear guidance on what technical advice TCC can provide to the Commission. SMD02 supported the approach of not making adjustments to the key elements of the management procedure on an annual basis, but that modelling be undertaken as part of the next review of the management procedures in 2026, including for scenarios related to climate change.
- SMD02 recommended that as part of the next regular review of the skipjack management procedure, the Commission directly incorporate SEAPODYM and/or other model projections into the skipjack management strategy evaluation operating model grid projections.

TCC20 noted the following outcomes from its discussion of the development of a monitoring strategy for Skipjack tuna.

- TCC20 recommended to the Commission that it adopt the skipjack MP monitoring strategy (TCC20-2024-17 rev1) noting the updates and input provided by TCC20.
- TCC20 noted that, as the Commission adopts more management procedures, there could be a need for a standing item on the TCC agenda to consider management procedures.

2. INTRODUCTION

The interim management procedure (MP) for WCPO skipjack was formally adopted at WCPFC19 (CMM2022-01) and was implemented for the first time at WCPFC20 (through CMM2023-01). The overall objectives of the MP are to maintain the stock around the target reference point (TRP) and to minimise the extent of changes in catch and effort between management periods. Now that the skipjack MP has been adopted and implemented, it should be routinely monitored to check that it is performing as expected and is achieving the desired outcomes. This is a key role of the monitoring strategy.

In addition to monitoring the performance of the adopted MP, the monitoring strategy should consider all aspects of the harvest strategy, including the underlying management objectives (TRP); procedures for designing and evaluating candidate MPs; and the scenarios against which they are tested (the OM grid). The purpose of the monitoring strategy is not to conduct these analyses but, rather, to identify instances where conditions may have changed from those assumed when testing and evaluating the MP, and to highlight areas where modifications to the existing MP may be necessary or where further work may be required. The monitoring report is intended to be routinely considered and updated by the relevant bodies of the Commission (specifically SC and TCC), allowing incremental development as new information becomes available.

An outline of the elements of a monitoring strategy for the WCPO skipjack tuna interim MP was provided in Table 2 of Annex III of CMM 2022-01. The content, structure and development of a monitoring report has been further discussed in recent papers to both the SC (WCPFC-SC19/MI-WP-02) and to the Commission (WCPFC20-2023-WP14-Rev1). WCPFC20 noted that there was a need for intersessional work, led by the SC and TCC Chairs, to facilitate the development by the SSP of a monitoring strategy for adoption at WCPFC21 (WCPFC20 summary report, paragraph 313). Under the harvest strategy workplan (WCPFC20 Summary report, attachment 4) the Commission is scheduled to adopt the monitoring strategy for WCPO skipjack in 2024.

This paper builds on the information provided in attachment B of WCPFC20-2023-WP14 to provide additional detail to support discussions and advice on the respective roles of SC, TCC and the Commission in developing and implementing a monitoring strategy for skipjack tuna.

3. ISSUES ARISING

The experience of implementing the skipjack MP for the first time has highlighted a number of issues that were not foreseen during its development and testing. These relate specifically to the monitoring of catch and effort in the fishery to both ensure and demonstrate compliance with the MP, as well as some practical issues encountered when running the MP and implementing the catch and effort limits output from it.

Catch and effort reporting

An omission from the initial proposal for information to be reported under the monitoring strategy (CMM 2022-01, annex III) is the provision of catch and effort data to monitor compliance with the MP. This represents an important component of the monitoring strategy not only because it provides the confirmation and reassurance that the MP has been implemented as intended, but also so that, in instances where the measures of the MP have not been followed, the reasons for non-compliance can be investigated and appropriate action taken.

To this end, a tasking for TCC has been added to item 1.a. of Table 1, requesting that, as and when such data become available, TCC provides advice on the levels of catch and effort of fisheries subject to the MP in relation to the limits set by the MP. Note that the MP applies to the catch and effort of purse seine and pole and line fisheries, and other commercial fisheries referred to in paragraph 47 of CMM 2023-01 taking more than 2,000 tonnes of tropical tunas (bigeye, yellowfin and skipjack) in the Exclusive Economic Zones and high seas.

TCC20 noted that the regularly provided summaries of tropical tuna fisheries catch and effort only partially covers the information required to monitor implementation of the skipjack MP. Future data submissions will need to provide TCC with sufficient information to monitor annual fishing levels of fisheries subject to the MP relative to the MP output. Specifically, effort data for pole and line fisheries and skipjack catch data for the relevant fisheries within Region 5 of the 2022 assessment model will be required. This information will need to be provided both for the time-period under consideration of the monitoring strategy and for the baseline year ranges (2016-18 ID-PH fisheries; 2001-04 JP pole and line fisheries).

Update of the estimation method

The skipjack MP was implemented in 2024, with the resulting catch and effort limits being applied for the period 2024 to 2026. Although the MP ran successfully, it was noted that the contraction of

pole and line fishing in key regions of the skipjack fishery had impaired the ability to index relative abundance of WCPO skipjack across the equatorial region. Diagnostic analyses indicated that sustained low levels of effort of these fisheries is likely to affect the future performance of the MP. SC19 recommended that further work be undertaken to develop and test an alternative estimation model for future use in the WCPO skipjack tuna MP. WCPFC20 noted that ‘a re-evaluation of the skipjack estimation method needs to be undertaken prior to the next implementation of the Management Procedure’ (WCPFC20 summary report, paragraph 302).

Work to revise the estimation method and re-test the skipjack MP has been delayed and results were not available for presentation to SC20. Options for the revision of the skipjack estimation method are under consideration (WCPFC-SC20/MI-WP-01). The development and testing of these alternative approaches will be a priority work area to allow a re-evaluation of the skipjack estimation method prior to the next implementation of the MP in 2026.

Alignment with TT-CMM

At the first implementation of the WCPO skipjack MP it became apparent that there was a disconnect between the assumptions of the MP and the underlying basis of the TT-CMM (CMM 2023-01), through which the MP is implemented. Resolving this mis-match could entail either , revising the MP so that it more closely aligns with the TT-CMM, which would entail changes to the MP design additional to those described above for the revision of the estimation method, or alternatively revising the limits of the TT-CMM to align more closely with a the skipjack MP. Further discussion by managers is required to provide guidance on which approach should be taken prior to work being undertaken on this issue.

In addition, recent changes to the timing and extent of the FAD closure means that future conditions of the fishery differ from those initially assumed. This may also require additional testing of the MP. Changes or additions to the grid of operating models used to test the MP may be required to account for changes in the FAD closure period.

4. MONITORING PERFORMANCE OF THE MANAGEMENT PROCEDURE

The monitoring strategy (as outlined in Table 1, below) addresses three main aspects of the design, testing and implementation of the MP as well as monitoring its outcomes in relation to defined objectives, with consideration of these aspects divided amongst the various bodies of the Commission as appropriate. Table 1 outlines the issues to be considered and what advice is required. Where these issues have previously been considered the resulting recommendations are also provided.

Table 1: Monitoring strategy for the skipjack Management Procedure (CMM 2022-01).

1. Review of MP performance		
a. Comparison of predicted MP performance against latest stock assessment outcomes		
SC	TCC	Commission
Regularly review/check the performance and outputs of the MP, including the indicators set out in Annex III of CMM 2022-01 and provide advice to the Commission on:	Regularly review/check the performance and outputs of the MP, including the indicators set out in Table 3, Annex III of CMM 2022-01 and provide advice to the Commission on:	

<p>a) The performance of the MP in managing skipjack tuna to achieve defined objectives including the TRP. This includes the robustness of the MP to changes in the fishery and any exceptional circumstances consistent with Annex IV of CMM 2022-01.</p> <p>b) The application of the MP outputs to CMM 2023-01.</p> <p>SC19: With the first implementation of the MP in 2024, the stock assessment in 2025 will be the first in which the impact of the MP on stock status will be experienced. Only one year of MP implementation will be included in that assessment and it will therefore provide only a preliminary measure of performance.</p> <p>The MSE predicted outcomes of the adopted MP and the 2022 stock assessment show good correspondence with assessed status for the most recent years but some departure for the historical period.</p> <p>SC20: No new information</p>	<p>a. Catch and effort levels for all fisheries subject to the MP relative to maximum levels specified under the most recent output of the MP.</p> <p>b. Identify quality of information and gaps in available data that would affect ability to monitor the implementation of the MP relative to the MP outputs.</p> <p>TCC20: Additional information on relevant catch and effort for the fisheries subject to the MPs will be needed by TCC.</p>	<p>WCPFC20: Noted the successful running of the MP as outlined in SC19-MI-WP-01</p>
<p>b. Data availability to run the MP</p>		
<p>SC</p>	<p>TCC</p>	<p>Commission</p>
<p>Check availability, quantity and quality of data necessary to run the MP (e.g. the estimation method)</p> <p>SC19: Sufficient data were available to run the MP. However, declining effort in the pole and line fishery in some regions (e.g. tropical region) and consequent reduction of informative CPUE data represents a risk to the future performance of the MP. A re-evaluation of the estimation method may need to</p>	<p>Check availability, quantity and quality of data necessary to run the MP (e.g. the estimation method)</p> <p>TCC20: No new information</p>	<p>WCPFC20: Noted that a re-evaluation of the estimation method may need to be undertaken prior to the next implementation of the MP.</p>

<p>be undertaken prior to the next implementation of the MP. High priority</p> <p>SC20: The effect of changes made to the historical data is not known.</p>		
<p>c. Other sources of data to monitor performance</p>		
<p>SC</p>	<p>TCC</p>	<p>Commission</p>
<p>Identify any other data, as available, that might not be included in the MSE framework, that can inform on performance indicators (economic, social, ecosystem, etc.)</p> <p>SC19: No new information noted at SC19. SC20: No other sources of data have been identified.</p>	<p>Identify any other data, as available, that might not be included in the MSE framework, that can inform on performance indicators (economic, social, ecosystem, etc.)</p> <p>TCC20: No new information</p>	
<p>d. Performance of the estimation method (EM)</p>		
<p>SC</p>	<p>TCC</p>	<p>Commission</p>
<p>Confirm the EM is performing well and not subject to estimation failure.</p> <p>SC19: Overall the EM performed well and provided estimates of stock status within the prediction range of the MSE.</p>	<p>No input anticipated.</p>	
<p>2. Review of the MP design</p>		
<p>a. Management objectives</p>		
<p>SC</p>	<p>TCC</p>	<p>Commission</p>
<p>No input anticipated.</p>	<p>No input anticipated.</p>	<p>Review the TT-CMM, taking account of the outputs of the SKJ MP. Check that overall objectives of the MP remain appropriate. Revise catch and effort limits for 2024-06 as necessary.</p> <p>WCPFC20: CCM requests for further work to better align the skipjack MP with the TT-CMM.</p>

b. Scope of the management procedure		
SC	TCC	Commission
<p>Confirm the fisheries controlled by the MP, and the method of control, remains appropriate</p> <p>SC19: No new information at the time of SC19. SC20: No change.</p>	<p>Confirm the fisheries controlled by the MP, and the method of control, remains appropriate</p> <p>TCC20 No new information</p>	<p>Confirm the fisheries controlled by the MP, and the method of control, remains appropriate</p>
c. Exceptional circumstances		
SC	TCC	Commission
<p>Provide technical advice to identify the occurrence of exceptional circumstances (see CMM 2022-01 Annex IV) and review, modify or replace the MP as appropriate.</p> <p>SC19: None identified. SC20: None identified.</p>	<p>Provide technical advice to identify exceptional circumstances (see CMM 2022-01 Annex IV) and recommend remedial action where necessary.</p> <p>TCC20: No new information</p>	<p>Identify the occurrence of exceptional circumstances (see CMM 2022-01 Annex IV) and review, modify or replace the MP as appropriate.</p>
3. Review of MSE		
a. Operating model grid		
SC	TCC	Commission
<p>Ensure the most important sources of uncertainty are included in the OM grid.</p> <p>SC19: OM grid to be extended to include climate change scenarios (robustness set). In particular the effects of warm pool expansion in the WCPO. This requires further analysis of SEAPODYM outputs and may occur over an extended time frame. Medium priority</p> <p>Further investigation of the OM grid is suggested to investigate the lack of overlap in estimates of stock status for the historical period. These issues will be considered for inclusion when the current MP is reviewed. Low priority</p>	<p>No input anticipated.</p>	

SC20: Impacts of changes to FAD closure period from 2024 should be investigated and where necessary the OM grid modified to better represent fishery dynamics.		
b. Calculation of performance indicators		
SC	TCC	Commission
Check that performance indicators adequately represent management objectives SC19: No new information at the time of SC19.	No input anticipated.	
c. Modelling assumptions		
SC	TCC	Commission
Consider the technical details of the simulation and testing framework SC19: While no major issues are identified, any re-evaluation of the skipjack EM (identified under 1.2) may require a re-evaluation of the modelling framework	No input anticipated.	
d. Data availability to support the MSE framework		
SC	TCC	Commission
Identify any improvements in data collection to either enhance the OM framework or reduce uncertainty included in the OM grid.	No input anticipated.	

5. MONITORING SCHEDULE

Many elements of the monitoring report depend either on the outputs of an updated stock assessment or on the running and implementation of the MP itself. To date, the MP has been implemented just once (in 2024) and the subsequent considerations of SC19 and WCPFC20 are provided above. The next assessment of WCPO skipjack is scheduled for 2025.

Some aspects of the monitoring report can be updated on a more frequent basis, such as annual estimates of catch and effort and corresponding inter-annual variations in catch and effort. In some cases these data may be available in-year, however, due to time lags in the reporting and processing of data, some delay in the reporting of these figures is likely. CMM 2022-01 outlines a repeating 3-year schedule for the implementation and review of the skipjack MP (Table 2).

Table 2: Schedule for the implementation and review of the skipjack MP (CMM 2022-01)

Year	Science Services Provider	Scientific Committee	Commission
2023	Run the MP (using data to 2022). Support the SC and Commission consideration of the MP	Provide advice to the Commission on the MP outputs for the period 2024-2026	Review the Tropical Tuna CMM, taking into account the output of the MP. Revise catch and effort related limits for 2024-2026
2024		Data to monitor performance of the MP not available in first year of implementation.	Apply Tropical Tuna CMM
2025	Perform full stock assessment (with data up to and including 2024).	Review performance of the MP including potential exceptional circumstances and advise Commission.	Apply Tropical Tuna CMM. Review the performance and use of the MP.
2026	Run the MP (using data to 2025). Support SC and Commission consideration of the MP.	Monitor the performance of the MP using available data to 2025. Provide advice to Commission on the MP outputs for the next management period (2027-2029).	Review the Tropical Tuna CMM, taking into account the output of the MP. Revise catch and effort related provisions for 2027-2029
2027		Monitor the performance of the MP using available data to 2026.	Apply Tropical Tuna CMM.
2028	Perform full stock assessment (with data up to and including 2027).	Review performance of the MP including potential exceptional circumstances and advise Commission.	Apply Tropical Tuna CMM. Review the performance and use of the MP.
2029	Run the MP (using data to 2028). Support SC and Commission consideration of the MP.	Monitor the performance of the MP using available data to 2028. Provide advice to Commission on the MP outputs for the next management period (2030-2032).	Review the Tropical Tuna CMM, taking into account the output of the MP. Revise catch and effort related provisions for 2030-2032

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