TECHNICAL AND COMPLIANCE COMMITTEE
Twenty-First Regular Session
24 September to 30 September 2025
Pohnpei, Federated States of Micronesia (Hybrid)

REFERENCE PAPER RELATED TO HARVEST STRATEGY DEVELOPMENT FOR TCC21

WCPFC-TCC21-2025-14
15 September 2025

Submitted by the Secretariat

Purpose

1. The purpose of this paper is to support TCC's consideration of matters related to harvest strategy development, where input from TCC21 is expected or anticipated. Where relevant, SC21 and the First South Pacific Albacore Management Workshop (SPAMWS01) recommendations relating to harvest strategies have been presented.

2. In particular, TCC21 is invited to:

- Review and provide input into the Skipjack Monitoring Strategy using the template in **ANNEX 2**.
- Provide technical and compliance-related advice to support the development of harvest strategies, including harvest control rules, as appropriate.
- Note SC21 and SPAMWS01 harvest strategy related outcomes.

TCC21 Agenda 7.2 | Skipjack tuna

2. The TCC Workplan 2025-2027 indicates that TCC21 will review and provide input into the Skipjack Monitoring Strategy on an annual basis.

3. A template that can be used to record TCC21 inputs into the Skipjack Monitoring Strategy is provided in **ANNEX 2**.

4. SC21 has prepared inputs into the Skipjack Monitoring Strategy, which are provided in **ANNEX 1**. Key SC21 recommendations are summarized below:

SC21	**Skipjack tuna** Monitoring strategy for skipjack tuna Based on the discussion and information available, including the 2025 SKJ stock assessment, SC21 made updates to the skipjack monitoring strategy table as shown in Attachment 5. (See **ANNEX 1**). Skipjack tuna management procedure SC20 requested that the SSP conduct analyses to: (a) evaluate whether changes in the FAD closure duration (as adopted in CMM 2023-01) will affect the performance of the interim MP; and (b) determine the representativeness and appropriateness of candidate CPUEs for use in the MP. • On (a), SC21 noted that, based on the analysis by SSP (SC21-MI-WP-02), changes in the FAD closure duration (as adopted in CMM 2023-01) have a negligible impact on the performance of the interim skipjack MP. The effects of the FAD closure period on other tropical tunas were not considered in this evaluation. SC21 also noted that the results are based on the assumption that the relative levels of FAD and free-school fishing change proportionally with changes in the FAD closure period. These assumptions may not always hold, as witnessed in 2024 when the proportion of free-school sets increased, notwithstanding a reduction in the FAD closure period. • On (b) above, based on the analysis presented by SSP(SC21-MI-WP-01), SC21 noted the following: (i) the index used within the 2022 dry run analysis contained inconsistencies in the penalty application within MFCL and did not implement the sea surface temperature (SST) spatial filter. Reapplying the SST filter and correcting the penalty calculations restored consistency with the tested MP, (ii) the transition to sdmTMB for standardization has had minimal impact on MP outputs and is acceptable under current MP settings, (iii) the settings used to develop standardized CPUE indices should be included within MP documentation for all relevant WCPFC management procedures, and (iv) the MP appears reliable in the short term under JPPL data degradation in the tropical region, but presents increased risks in the longer-term. Pending agreement by the Commission on proposed changes to the WCPFC harvest strategy workplan and MP implementation timetable (see agenda item 5.1.5), the skipjack MP may next be run in either 2026 or 2027, and the review of the skipjack MP may occur in either 2028 or 2029.

	SC21 supported the continued application of the interim skipjack MP for the next implementation cycle, while also emphasizing the importance of further development of alternative indices in advance of the third implementation of the MP. This work should be conducted as part of the scheduled MSE review in 2028 (or potentially, 2029). SC21 further noted that changes to the tuning indices used by the MP may require reconditioning of the OMs and retesting of the MP, which is a considerable undertaking. *(ref: SC21 Outcomes, paragraph 128-131)*

5. The TCC Workplan indicates that the TCC will provide technical and compliance-related advice to support the development of harvest strategies, including harvest control rules.
6. Adoption of a South Pacific albacore (SPA) Management Procedure (MP) and implementing CMM is anticipated at WCPFC22.
7. Relevant SC21 and SPAMWS01 recommendations are provided below:

SC21 and SPAMWS01	South Pacific albacore tuna South Pacific albacore management procedure (SC21) SC21 reviewed the revised candidate South Pacific albacore management procedures provided in SC21-MI-WP-04. SC21 noted the management area to which the MPs presented in SC21-MI-WP-04 applies has changed to the WCPFC Convention Area south of 10S, which is in accordance with the proposed mixed fishery framework (notified in WCPFC Circular 2025/17, SC21-MI-IP-04). SC21 also noted that, in comparison to the results presented to WCPFC21, a reduced set of MPs was provided with different HCRs and assumed catch levels in the EPO and in the area north of 10 degrees S (together with sensitivity analyses of higher catches in these areas). **SC21 encouraged the SSP to provide sufficient explanation and additional information as necessary (such as historical catch trajectory in the EPO and the area bounded by 0-10 degrees S) to the SPAMWS01 (Sept 2025) and to WCPFC22 to assist decision makers.** While SC21 acknowledged the need to focus discussion on a reduced set of MPs, SC21 also recommended that in the future, revisions to the set of candidate MPs preferably be guided by the Commission, its subsidiary bodies, or by dedicated WCPFC science-management dialogue, including species-specific workshops, while suggestions from SSP may be helpful in certain instances. **SC21 requested WCPFC22 to consider developing a mechanism to provide timely feedback for MSE development to achieve the timelines detailed in the harvest strategy workplan.** SC21 recognized that, in developing the candidate MPs in MI-WP-04, it was necessary to make some assumptions with respect to future catches of SPA in the Eastern Pacific Ocean (excluding the overlap area) and in WCPFC-CA from the Equator to 10S, which are outside the control of SPA MP. SC21 noted that for the evaluations presented in SC21-MI-WP-04, these annual catches were set at a baseline level of 18,000 mt for the EPO (excluding the overlap area) and 9,000 mt for the WCPFC-CA equator to 10°S region, being the approximate averages for the period 2014-2023. It was further noted that, following the adoption and implementation of the MP, the occurrence of conditions outside the range of scenarios used for testing may invoke consideration of exceptional circumstances. SC21 noted the need for candidate MPs to be tested against a range of plausible scenarios that may be beyond historical observations, to minimize this possibility. In developing the monitoring strategy, SC21 also noted the importance of closely monitoring catches if MP implementation differs from conditions assumed when testing MP (e.g., if implementation is in terms of effort for a catch-based MP). This is to ensure that catch levels do not deviate from the tested range during MP evaluations and that the selected MP still meets

	management objectives. **SC21 recommended the continued application of the Estimation Method, which does not include a troll index, as presented to WCPFC21 in WCPFC21-2024-30_Rev01.** **For the four candidate MPs provided, SC21 draws the attention of the Commission to the following:** • **All the MPs perform well in terms of biological risk to the stock, with the risk of breaching the limit reference point below the specified 20% threshold, and only HCR 10 shows a greater than 5% risk of breaching this threshold.** • **The candidate MPs have different outcomes in terms of the trade-off between catches and catch rates.** • **Sensitivity tests were conducted, which evaluated the performance of the MPs when catches in the two areas outside of the MP were set to higher levels (EPO excluding the overlap area at 22,500 mt, and the WCPFC-CA between 0° and 10°S at 12,000 mt), which appears below. These tests showed that the performance of the candidate MPs was not strongly affected by the alternative catch assumptions examined.** **SC21 noted that it is desirable to constrain the number of candidate MPs evaluated to a manageable level. SC21 recommended that, in addition to the results presented in SC21-MI-WP-04, three additional MPs be developed for the Commission's consideration that more fully explore EPO (excluding overlap area) catch consequences as well as the use of a fixed effort assumption in the WCPFC-CA area equator to 10°S.** • **EPO (excluding the overlap area) set to 22,500 mt (being the approximate average of catches in the years 2021-22), WCPFC-CA 0-10S set to 9,000t (being the approximate average in the period 2014-2023), using a catch control HCR "tuned" to achieve the adopted iTRP.** • **EPO (excluding the overlap area) set to 13,500 mt (being the approximate catch in the year 2020), WCPFC-CA 0-10°S set to 9,000 t (being the approximate average in the period 2014–2023), using a catch control HCR "tuned" to achieve the adopted iTRP.** • **EPO (excluding the overlap area) set to 18,000 mt (being the approximate average for the period 2014-2023), WCPFC-CA 0-10°S set to average effort levels in the period 2014-2023, using a catch control HCR "tuned" to achieve the adopted iTRP.** **SC21 recommended that, to the extent possible, the results of this expanded set of seven candidate MP evaluations and all candidate MP evaluations in WCPFC21-2024-30 (those applied to longline and troll fisheries operating in the WCPFC-CA, south of the equator) be provided to the SPAMWS01 in September 2025 and to the Commission for their consideration and decision.** **SC21 also requested that the SSP report the median time series of vulnerable biomass from the Oms for the historical period and to develop a table with the average nominal CPUE (kg/100 hooks) for the reference period (2020–2022) by CCMs with SPA catches.** SC21 Outcomes Document (*ref: SC21 Outcomes, paragraph 132-140)*

First South Pacific Albacore Management Workshop (SPAMWS01)

South Pacific Albacore management procedure (MP)

The Co-Chair reviewed the discussion and recommendations from SC21 relating to the SPA management procedure, including on candidate MPs, contained in the SC21 Summary Report. The SPAMWS reviewed the latest results available for candidate management procedures for SPA which were presented by the SSP (refer to SPAMWS01-WP-01 Evaluation of the candidate MPs for SP albacore). The candidate MPs are designed to ensure the SPA stock remains above the limit reference point (20% SBF=0) with at least 80% probability, while achieving either the interim target reference point (0.96 SB2017 2019/SBF=0) or one of the two other TRPs identified by the Commission for evaluation.

The key points from the discussion:

- Some participants expressed concern over the design of the SPA MP, particularly the exclusion of the area between the equator and 10° South.
- The SSP explained that the change had been driven by the mixed fishery framework and the Commission's request to develop in parallel MPs for SPA and bigeye tuna. The mixed fishery sought to consider activities in the tropical longline fishery between 20° N and 10° S and to avoid a clash of MPs in the same geographical area.
- Notwithstanding this explanation, some participants were not convinced of the desirability of limiting the scope of application of the SPA MP.
- Other participants strongly supported the revised MP design, especially the geographic area, as a logical and necessary step to implement the mixed fishery framework.
- Another participant noted their interest in managing the stock under the SPA MP up to the equator, however, given the importance of developing a SPA MP, they supported discussing this further with CCMs.
- The Co-Chair noted that there were clearly diverging views, with some participants preferring that the MP cover the area from the equator south, while others wished to exclude the area from the equator to 10° South.

Australia presented its delegation paper (SPAMWS-WP02 DRAFT – Conservation and Management Measure on a Management Procedure for South Pacific Albacore).

- Most of the text of the draft CMM was unchanged from the South Pacific Group and Australia proposal submitted to WCPFC21. It was based on HCR 7, with the EEZs of Tokelau and Tuvalu excluded (the albacore catch in these EEZs taken south of 10°S representing an annual average catch of approximately 600 mt) to reduce complexities for small administrations and avoid disproportionate burden in accordance with CMM 2013-06.
- Some participants noted that they had not had sufficient time to consider the revised proposal in detail, and various questions were posed.
- The draft CMM would be considered further at TCC21.

Various views were expressed regarding the results of the various analyses of candidate management procedures.

- A participant expressed concern over the process used to narrow the options for candidate MPs.
- Participants expressed different views on: the number of candidate MPs to be forwarded to the Commission; the use of 2017-2019 as the baseline reference period, (instead of 2000-2004 or 2005 as in CMM 2015-02); and the maximum change constraints (e.g. +- 5% or +-10%).
- Some participants supported forwarding four HCRs (HCR 7, HCR 10, HCR 13, HCR 9) to the Commission, some supported HCR 7 and HCR 13, while others supported also forwarding HCR 14, HCR 15 and HCR 16 to the Commission.
- The participants generally agreed that the MP would be based on a three-year management period with a two-year data lag.

The Workshop participants requested the SSP to undertake additional analyses prior to WCPFC22. These requests were identified and circulated to SPAMWS participants at the end of Day 1. Given the available SSP resources, the participants narrowed down the requests through a ranking process. The six requests with the highest rankings were referred to the SSP for further work.

The Annex (See **ANNEX3**) contains four tables:

- The list of six requests that were ranked and forwarded to SSP.
- The list of requests which were ranked, but were not forwarded to the SSP.
- Essential SSP activities prior to WCPFC22.
- Additional Requests to SSP that were removed from ranking and will be requested following decisions at WCFPC22.

The SSP noted for the benefit of participants that there was a potential for confusion arising from the overlap of the naming of HCR last year and this year. The SSP would therefore need to adjust the naming of the HCRs.

Following the SC21 recommendation encouraging the continued application of Open Science principles to produce transparent and reproducible science accessible to all, the SPAMWS recommends that WCPFC22 agree for all outputs from the SSP MP evaluations be made publicly available on a website or GitHub repository.

Management arrangements for implementing the SPA MP

The South Pacific Group (SPG) explained that the draft Outline for a South Pacific Albacore CMM that Implements the Management Procedure (WCPFC21-2024-DP12_Rev01) which was discussed at WCPFC21 which outlines principles for a draft CMM. A proposal was expected to be presented to WCPFC22.

Participants welcomed the progress made in the development of the management procedure for SPA and the accompanying implementing arrangements.

- Some participants noted the importance of adopting zone-based management arrangements and ensuring compatible management measures for the high seas. The importance of the recognition of the rights and interests of coastal States, the particular

	importance of albacore to many SIDS and territories and the special requirements of SIDS was emphasised. • FFA members noted that they had recently agreed at the annual FFC Ministerial meeting a binding agreement on a proportional in-zone allocation for the 15 Members catching South Pacific albacore south of the equator. They propose a two-step approach to allocation: agreement on an overall proportional split between EEZ and high seas areas; then a proportional allocation of the high seas component. • Some participants noted that an implementing arrangement for SPA should encompass zone-based limits and accompanying high seas limits; provide for both catch and effort-based management; strengthened coastal State rights; provide flexibility to account for variability in the SPA fishery; and strengthened monitoring in regional longline fisheries including through electronic monitoring. • Some participants noted the importance of progressing allocation and referred to the key allocation criteria in Article 10.3.d, 10.3.g and 10.3.j in the WCPF Convention as well as Article 30 which gives full recognition of requirements to the special requirements of SIDS. • Participants expressed the desire to engage with others in the lead up to WPCFC22 to progress the implementation of the SPA MP, and emphasised the importance of progress on this issue. Review of outstanding issues and workplan It was noted that there was a fair amount of work that had been requested of the SSP and more consultations between interested CCMs and Participating territories would be needed prior to WCPFC22. Participants therefore agreed: • To hold a one day four-hour virtual SPAM workshop on 5th November. • To focus the discussion at the workshop on HCRs and any proposals for a CMM which would implement the SPA MP. SPAMWS01 Outcomes Document (*ref: SPAMWS01 Outcomes, Section 3,4 and 6)*

8. The TCC Workplan indicates that the TCC will provide technical and compliance-related advice to support the development of harvest strategies, including harvest control rules.
9. Adoption of a BET MP is expected once the MSE framework and mixed fishery interactions are finalized. WCPFC22 will review BET MP settings and assumptions.
10. Relevant SC21 recommendations are summarized below:

SC21	Bigeye tuna Bigeye Target Reference Points and Performance Evaluation of Candidate Management Procedures **SC21 welcomed the development of a full feedback simulation modelling framework for BET and the initial testing of candidate MPs designed to achieve the three TRP options identified by WCPFC21. SC21 noted that the MP controls only a fraction of the BET catch (27% over the period 2020-2022) and stressed the importance of considering the dynamics of other fisheries that catch BET that are either managed under an MP (same or separate) or require assumptions about their management. SC21 also noted that specific settings within the BET MSE remained to be defined by the Commission.** A variety of alternatives for MP design settings were suggested by CCMs. Those need to be carefully considered by the Commission so that plausible assumptions are properly covered in the MSE testing. **SC21 also draws the Commission's attention to the fact that the order of MP and MSE application under the mixed fishery harvest strategy framework (i.e., which species' MP goes first) could affect the performance across the individual MPs, and that this order of MP application has not yet been formally agreed upon.** **SC21 recommended that WCPFC22 review the current proposed BET MSE framework and provide guidance on BET MP settings and assumptions.** **SC21 considered that the six proposed performance indicators should be included in future presentations and encouraged the SSP to consider further options to help inform management decision-making, including through feedback from WCPFC22.** SC21 Outcomes Document (*ref: SC21 Outcomes, paragraph 146-149)*

11. The TCC Workplan also indicates that the TCC will provide technical and compliance-related advice to support the development of harvest strategies.

12. Relevant SC21 and SPAMWS01 recommendations related to the Mixed Fishery Framework are summarized below:

SC21 and SPAMWS01	Mixed fishery framework Mixed fishery MSE framework (SC21) **SC21 reviewed the current status of YFT MSE development (SC21-MI-WP-08) and recommended that the initial yellowfin tuna operating model reference set be constructed around the 2023 yellowfin stock assessment grid, consistent with the approach used for the other key tuna species. Additionally, it was recommended that the proposed OM grid be expanded to also take into account similar additional uncertainties as suggested for the BET OM grid, as well as recommendations from the past tuna assessment peer reviews.** **SC21 further noted a consistent set of performance indicators across yellowfin and bigeye tunas be used.** **SC21 noted that under the current proposed framework of the mixed fishery MSE framework, YFT is intended to be managed through the catch and effort constraints that are applied by the three other MPs without a dedicated MP for YFT. SC21 noted that testing of the mixed fishery harvest strategy framework would be needed to evaluate how effectively such a management framework can achieve YFT objectives.** SC21 Outcomes Document (*ref: SC21 Outcomes, paragraph 150-152)* Mixed fishery framework (SPAMWS01) Consideration of mixed fishery issues and compatibility between BET and SPA MPs The SSP provided a presentation on mixed fishery issues, where the same fleets target bigeye, yellowfin, and albacore. The presentation considered the overlap of the tropical longline fishery and the South Pacific albacore longline fishery, the spatial separation between which indicates that SPA and bigeye objectives can be achieved independently, and the implications for yellowfin. • Some participants supported the separation of the tropical longline from the SPA longline fishery. As the great majority of albacore catch is taken south of 10 degrees South and the southern longline fishery has a limited impact on the bigeye stock, the management of SPA can be achieved through the MP. • There was also concern that the mixed fishery framework was a new concept and the Commission had not taken a decision on it. As this a workshop for SPA MP, it was not appropriate to discuss bigeye and yellowfin.

	• In response to a question, the SSP noted that recently 5% of the bigeye longline catch had been taken in the region south of 10° South. Under the SPA MP, the bigeye catch in that area would be defined through that SPA MP within the mixed fishery framework. SPAMWS01 Outcomes Document (*ref: SPAMWS01 Outcomes, Section 5)*

13. The TCC Workplan also indicates that the TCC will provide technical and compliance-related advice to support the development of harvest strategies.
14. The Secretariat highlights a paper considered by SC21 on Wider Issues for Consideration within the Harvest Strategy Workplan Review.
15. Relevant SC21 recommendations are summarized below:

SC21	**Progress of the WCPFC Harvest Strategy Work Plan** SC21 noted the planning and scheduling considerations for the development, adoption, and implementation of harvest strategies for the key tuna stocks provided in MI-WP-10. SC21 noted that this is primarily a matter for the Commission's consideration, but that the proposal to extend the skipjack current MP application from 3 to 4 years was a matter that required SC advice. SC21 considered the risks of extending the skipjack current MP application period from 3 to 4 years to the performance of the MP and achievement of its objectives. SC21 refers to the Commission to the results of the skipjack monitoring strategy report from SC21 and also notes the following relevant considerations: • The 2025 stock assessment indicates spawning potential depletion, and average fishing mortality rates have remained relatively stable since 2010 (SA-WP-02). • The 2025 stock assessment indicates the recent stock depletion is close to the recalibrated TRP and is within the range expected through the MSE testing of the adopted interim skipjack MP. • Stochastic projections indicate relative stability of stock depletion in the future when recent (2024) conditions are assumed (SA-WP-02). • The FAD closure period has been determined to have very little impact on the performance of the skipjack MP (MI-WP-02). Based on these considerations, **SC21 recommended that the Commission support a one-time extension of the current skipjack MP application period from 3 to 4 years.** SC21 noted that such a change would need to be reflected in an amendment to CMM-2022-01. **SC21 recommended that SC21-MI-WP-10 be provided to WCPFC22.** **SC also reconfirmed the importance of capacity building for the implementation of the harvest strategy.** **MSE analyses for three stocks (SKJ, SPA, BET) were presented to SC21 this year and represented a significant body of work for the SC's consideration. SC21 noted that, as the development and implementation of the harvest strategy approach progresses under the milestones within the WCPFC harvest strategy work plan, it is critical to receive timely guidance and instruction from the Commission on key aspects of this work. The workplan anticipates the adoption of multiple MPs in the near future, and it is important that the Commission provide guidance in relation to the implementation of the mixed fishery approach.** **SC21 noted that for complex fisheries management, such as that required for WCPFC key tuna stocks, the development and simultaneous application of species-specific MPs, as in WCPFC, is a reasonable approach due to the difficulty in developing fully integrated multi-stocks approaches. When developing species-specific MPs in this approach, settings must be agreed**

	not just for individual MPs but also for how those individual MPs should interact. These would include, but are not limited to: • **How each fishery is to be managed (catch or effort).** • **What catch or effort levels in fisheries not managed by the MP should be considered.** • **The scope of candidate MPs in terms of their spatial extent and the fisheries to be managed .** • **Management objectives for fisheries and, in particular, TRP options to consider.** • **How stock status of individual species may trigger Exceptional Circumstances in other species MPs.** • **Order of MP application** SC21 Outcomes Document (*ref: SC21 Outcomes, paragraph 153-157)*

Recommendations

- TCC21 is invited to review and provide input into the Skipjack Monitoring Strategy using the template in **ANNEX 2**.

- TCC21 is invited to provide technical and compliance-related advice to support the development of harvest strategies, including harvest control rules.

- Note SC21 and SPAMWS01 harvest strategy related outcomes.

ANNEX1

SC21 Outcomes, Attachment 5

The Commission for the Conservation and Management of
Highly Migratory Fish Stocks in the Western and Central Pacific Ocean

SCIENTIFIC COMMITTEE

TWENTY-FIRST REGULAR SESSION

Nuku'alofa, Tonga

13 – 21 August 2025

Skipjack Monitoring Strategy – Updates by SC21

1. Review of MP performance
a. Comparison of predicted MP performance against latest stock assessment outcomes
SC
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: 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. b) The application of the MP outputs to CMM 2023-01. SC21: The 2025 stock assessment (SC21 SA-WP-02) includes only one year of data (2024) under MP implementation and therefore provides a preliminary measure of the MP's performance. The 2025 stock assessment indicates the recent stock depletion is close to the recalibrated TRP and is within the range expected through the MSE testing of the adopted interim skipjack MP. Projections indicate relative stability of stock depletion in the future when recent (2024) conditions are assumed.
b. Data availability to run the MP
SC
Check availability, quantity, and quality of data necessary to run the MP (e.g. the estimation method) SC19: Sufficient data were available to run the MP. However, declining effort in the pole and line fishery in some regions (e.g., tropical regions) and consequent reduction of informative CPUE data represent a risk to the future performance of the MP. SC20: The effect of changes made to the historical data is not known. SC21: Analyses (SC21 MI-WP-01) indicate that the current MP remains valid in the short-term, for at

least the second implementation of the MP. In the longer term, degradation of data used in the MP estimator remains a risk that should be addressed before the third implementation of the MP.
c. Other sources of data to monitor performance
SC
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.). SC21: No other sources of data have been identified.
d. Performance of the estimation method (EM)
SC
Confirm the EM is performing well and not subject to estimation failure. SC19: Overall, the EM performed well and provided estimates of stock status within the prediction range of the MSE.
2. Review of the MP design
a. Management objectives
SC
No input anticipated.
b. Scope of the management procedure
SC
Confirm that the fisheries controlled by the MP, and the method of control, remain appropriate SC21: No new information
c. Exceptional circumstances
SC
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. SC21: None identified.
3. Review of MSE
a. Operating model grid
SC
Ensure the most important sources of uncertainty are included in the OM grid. 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

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

SC21: The impact of changes to the FAD closure period on the expected performance of the WCPO skipjack tuna MP was evaluated (SC21 MI-WP-02). It was determined that the FAD closure period had very little impact on the performance of the skipjack MP.

SC21: The ongoing need to consider climate change impacts within the Skipjack MP operating model set was noted.

b. Calculation of performance indicators
SC
Check that performance indicators adequately represent management objectives SC21: No new information at the time of SC21.
c. Modelling assumptions
SC
Consider the technical details of the simulation and testing framework. SC21: No issues identified at the time of SC21.
d. Data availability to support the MSE framework
SC
Identify any improvements in data collection to either enhance the OM framework or reduce uncertainty included in the OM grid.

Skipjack Monitoring Strategy – Template for updates by TCC21.

1. Review of MP performance
a. Comparison of predicted MP performance against latest stock assessment outcomes
TCC
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: 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. 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. TCC20: Additional information on relevant catch and effort for the fisheries subject to the MPs will be needed by TCC. TCC21: {placeholder}
b. Data availability to run the MP
TCC
Check availability, quantity and quality of data necessary to run the MP (e.g. the estimation method) TCC20: No new information TCC21: {placeholder}
c. Other sources of data to monitor performance
TCC
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.) TCC20: No new information TCC21: {placeholder}
d. Performance of the estimation method (EM)
TCC
No input anticipated.

2. Review of the MP design
a. Management objectives
TCC
No input anticipated.
b. Scope of the management procedure
TCC
Confirm the fisheries controlled by the MP, and the method of control, remains appropriate TCC20 No new information TCC21: {placeholder}
c. Exceptional circumstances
TCC
Provide technical advice to identify exceptional circumstances (see CMM 2022-01 Annex IV) and recommend remedial action where necessary. TCC20: No new information TCC21: {placeholder}
3. Review of MSE
a. Operating model grid
TCC
No input anticipated.
b. Calculation of performance indicators
TCC
No input anticipated.
c. Modelling assumptions
TCC
No input anticipated.
d. Data availability to support the MSE framework
TCC
No input anticipated.

The tables below include a list of requests for the SSP to undertake additional analyses prior to WCPFC22. Given the available SSP resources, SPAMWS participants prioritized these requests through a ranking process.

Table 1 below includes those requests which were ranked the highest, as well as those which did not require ranking, which will be undertaken by the SSP in advance of WCPFC22. Also included is an estimate of the SSP time (points) required to deliver each of the work items, based upon the assumptions provided in the 'Notes' section of the table. It was determined that work up to a maximum total of 14 points can be feasibly undertaken by the SSP between SPAMWS and WCPFC22. A point score of '0' means that request will be done and does not need prioritisation.

There is an assumption that the estimation method (EM) will need to be run before WCPFC22 in line with the WCPFC harvest strategy work plan. That activity is included as Table2.

Table 3 includes those requests which were discussed and ranked participants during SPAMWS, but will not be undertaken by the SSP in advance of WCPFC22.

Table 4 includes additional requests to SSP that were removed from ranking and will be requested following decisions at WCFPC22.

Table 1: The list of six requests that were ranked highest, and requests which did not require ranking, which will be undertaken by to the SSP prior to WCPFC22.

Request to SSP	CCM/Observer	Points	Notes
Additional MPs			
Include MPs that reflect implementation of the MP from the equator southward	Japan	0	Results presented to WCPFC21 in WCPFC21-2024-30 meet this request, noting EPO assumption was 22,500mt not 18,000mt in runs performed for SC21 Points represent work level to re-tune 10 MPs with specific constraints using the current EPO baseline.
Re-tune all 7 candidate MPs operating south of 10S with exclusion of TK and TV catches that are south of 10S.	FFA	5	
Perform sensitivity analyses on re-tuned MPs in #2		3	
Develop additional MPs based on the current modified HCR 7 proposal (AU proposal) and HCR 13, which treat troll catch as an assumed and constant "external catch" in the MP. These MPs would be tuned to achieve the appropriate associated TRP. In developing these MPs the "external troll	US	2	Equates to 4 new MPs Assume ONLY HCR7 is excluding TK/TV catch south of 10S here; #2 will need to be done first

catch" could be set at 2000-2004 average troll levels (in line with the baseline referenced in CMM 2015-02)			
Develop MP equivalent to HCR 14 (EPO at 22,500) but with 0-10S on fixed effort (2014-2023) instead of catch, and that achieves the iTRP in the long-term.	CN	1	
Additional sensitivity analyses			
Run HCR7 with no constraint	US	1	If new baseline excludes TK and TV, #2 will need to be done first
Update SPAMPLE to include full suite of considered MPs	US	2	
Other work			
SPC paper be revised for WCPFC22 include catches in the modelled area of the application of the SPA MP, south of 10 S in the same figure presenting the SPA catches from the equator to 10 S and in the EPO	Japan	0	
The reference in the paper to "all" fisheries for SPA be clarified	Japan	0	SSP will tighten the text up.
		14	

Maximum 'points' available for the selection from the options listed in the above = 14.

Table 2: Essential SSP activities prior to WCPFC22

Request to SSP	CCM/Observer	Points	Notes
Run the estimation method using data up to 2023 and calculate the output from all candidate MPs		(4)	This needs to be done to meet the harvest strategy workplan timetable.

Table 3: The list of requests which were ranked, but were not forwarded to the SSP.

Request to SSP	CCM/Observer	Points	Notes
Additional MPs			
Develop additional MPs based on the current modified HCR 7 proposal (AU proposal) and HCR 13, which treat longline fisheries targeting southern bluefin tuna with an annual average bycatch of south Pacific albacore less than 2500mt as an assumed and constant "external catch" in the MP. These MPs would be tuned to achieve the appropriate associated TRP	JP	3	
Other work			
Catch composition of LL catches in Tokelau and Tuvalu EEZ between equator and 10 degrees south and south of 10S	New Caledonia	1	Assume as an average over 2020-2023. Note plots are available in TK Part 1 report.
Proportion of domestic and foreign catches in Tokelau and Tuvalu EEZ between equator and 10 degrees south and south of 10S	New Caledonia	-	To be advised by TV (TK responded during SPAM1). Some details are available in Part 1 reports.

Table 4: Additional Requests to SSP that were removed from ranking and will be requested following decisions at WCFPC22

Request to SSP	CCM/Observer	Points	Notes
Use a baseline of 2000-2004 or 2005 within MPs, as in CMM 2015-02	Japan		SPC noted that this has no material impact on the performance or outputs of the MPs. Changing the baseline of the MP does have implications when developing the CMM for an MP, and would require sufficient notification to for example update the HCR parameter table and plot.
In considering proposed robustness testing of the MP7 to EPO catch levels outside of historical observations, test a	US		In the absence of guidance, catch in 0-10S assumed to be 12,000 mt.

level of 27,000 mt which is approximately 10% higher than the largest observed catch level in 2021 of 24,700 mt			If new baseline excludes TK and TV, #2 will need to be done first. Robustness testing is usually performed only on those MPs most likely to be adopted.
Perform additional robustness testing on sub-set of candidate MPs			Effort creep and TLL levels Needs to be on a defined sub-set of MPs, with agreed geographic scope. Suggesting this is unlikely to be feasible until after decisions are made at WCPFC22