SCIENCE-MANAGEMENT DIALOGUE
FIRST SESSION
Online
19, 22 August 2022

SC18 Management Issues Theme – Adopted Recommendations for the Commission

WCPFC-SMD01-2022/IP-10

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SC18 - MANAGEMENT ISSUES THEME

ADOPTED RECOMMENDATIONS FOR THE COMMISSION

17 August 2022

4.1 DEVELOPM-ENT OF THE HARVEST STRATEGY FRAMEWORK FOR KEY TUNA SPECIES

AGENDA 4.1.1 – SKIPJACK TUNA

4.1.1.1 Skipjack tuna target reference point (TRP) analyses

1. Noting the Commission is scheduled to adopt a target reference point (TRP) for skipjack tuna in 2022, and the request from WCPFC18 for SC18 to review any additional information on TRPs for skipjack tuna, SC18 reviewed SC18-MI-WP-09 (*Further updates to WCPO skipjack tuna projected stock status to inform consideration of an updated target reference point).*

2. SC18 noted that the updated stock assessment for skipjack tuna (accepted by SC18) indicates that the median value of $SB_{recent}/SB_{F=0}$ relative to a recalibrated TRP based upon the stock depletion in 2012 was 0.85, relative to a recalibrated TRP based upon the level of projected equilibrium depletion reached under 2012 fishing conditions was 1.00, and relative to the average of these two values was 0.93. Alternatively, the value relative to $50\%SB_{F=0}$ is 1.02 for this assessment.

3. Several CCMs noted that one of the challenges with the specification of absolute depletion-based TRPs is their possible susceptibility to change our perception of stock status when successive stock assessments predict different stock trajectories. To counter this, it was recommended the Commission adopt TRPs specified in terms of a reference year, or a set of years.

4. SC18 was informed that the interim TRP for skipjack tuna is 50% of the spawning biomass in the absence of fishing as set out in CMM 2015-06, and while the TRP is still under review, no agreement had been reached at WCPFC18.

5. SC18 requested the Scientific Service Provider update MI-WP-09 (Table 2) to include evaluations based on the 2022 skipjack assessment (the Scientific Services Provider noted that this will need to wait until updates to the current software are completed). This update should be performed using the same settings as MI-WP-09 and include the projected outcomes from a set of candidate TRP options ranging between 40 to 60% depletion ratios and should continue to assess the change in purse-seine effort from 2012 levels for the different candidate TRPs, the change in depletion relative to 2018-2021 average levels, as well as the projected impacts on equilibrium yields and the risk of breaching the LRP.

6. SC18 recommended that this update be provided to WFCPF19, and that the Commission take appropriate management action to ensure that the biomass depletion level fluctuates around the TRP (e.g., through the adoption of a harvest control rule).

4.1.1.2 Skipjack tuna operating models (OMs)

7. Noting the Commission is scheduled to adopt a management procedure (MP) for skipjack tuna in 2022, and the request from WCPFC18 for SC18 to review and recommend an agreed grid of operating models (OMs) that reflect important sources of uncertainty and plausible states of nature for WCPO skipjack, SC18 reviewed SC18-MI-WP-01 (*Operating models for skipjack tuna in the WCPO*).

8. SC18 noted the settings and configurations of the models that comprise the reference set of OMs for skipjack tuna are working well. While there were some differences, the range of uncertainty in the trajectories of spawning potential depletion estimated by the reference set spanned the results of the 2022 stock assessment, especially in recent years. Noting that stock assessments focus on historical uncertainty while OMs focus on future uncertainty, updating the reference set of OMs to be based on the 2022 assessment was unlikely to result in any changes in the relative performance of candidate MPs.

9. SC18 also noted that the OM grid should not require updating each time a new assessment is accepted unless new evidence is provided that indicates that population dynamics or key uncertainties are substantially outside of the bounds of that encompassed by the OM sets. Such an instance would be covered under exceptional circumstances.

10. SC18 also noted that further expansion of the axes of uncertainty at this time, as suggested by some CCMs, would unlikely change the relative performance of candidate MPs.

11. SC18 agreed to accept the reference set of 96 OMs as currently specified in SC18-MI-WP-01, noting the broad range of uncertainty encompassed by the grid axes, and recommended this reference set be adopted by WCPFC19.

12. SC18 agreed, and recommended to WCPFC19, to provisionally adopt the robustness set of OMs as listed in Table 1 of SC18-MI-WP-01, noting that SC18 also discussed expanding this set of models to include additional uncertainties. These included models that could account for effort-creep in the Japanese pole-and-line fisheries, likely changes on SKJ productivity due to the impacts of climate change, and a lower productivity (lower recruitment) 'stress test'. This further work is an integral part of the MSE and will be presented to SC19 and where possible key elements will be presented to WCPFC19.

13. Noting that the Commission is scheduled to adopt a monitoring strategy for skipjack tuna in 2023, SC18 noted that further discussion will be undertaken at SC19.

4.1.1.3 Skipjack management procedure (MP) and evaluations

14. Noting the Commission is scheduled to adopt a MP for skipjack tuna in 2022, and the request from WCPFC18 for SC18 to review further progress on developing and testing the performance of candidate MPs for WCPO skipjack, SC18 reviewed the analyses included in SC18-MI-WP-02 (*Evaluations of candidate management procedures for skipjack tuna in the WCPO).*

15. SC18 thanked the Scientific Service Provider for the latest information on the testing of candidate MPs for skipjack tuna and noted that the continued development of the PIMPLE software package had been particularly useful in evaluating candidate harvest control rules (HCRs). However, noting the similar performance of many candidate HCRs, and the limited ability of the current suite of performance indicators to distinguish between them, SC18 expressed support for the development of an overall performance measure that allows for alternative weighting of indicators. Inclusion in PIMPLE of information on the values of the threshold points in each HCR was also supported. It was also suggested that the "compare performance" button should go to the box plots by default (rather than the bar charts) to prioritize the display of uncertainty (a key aspect of comparing performance).

16. One CCM also suggested that the results of robustness testing be included within PIMPLE and welcomed discussion and potential inclusion of additional models within the robustness set.

17. Several CCMs supported running the MP every three years, as it replicates, more or less, the timescale of the current assessment cycle for WCPFC tuna stocks. However, the additional burden this would place on the Scientific Services Provider, and also on WCPFC members providing supporting analyses, was noted.

18. One CCM recommended that WCPFC19 note that the current candidate MPs are evaluated against the 2012 depletion ratio calculated from the current OM grid that is based on 2019 assessment, which is about 42%$SSB_{F=0}$, and cannot be automatically modified to a different target level when future assessments show a different level of depletion for 2012. (SC18 noted the earlier explanation of the Scientific Services Provider on how performance relative to the TRP can be used when evaluating performance.) This CCM also expressed their concern about having effort control for purse-seine fisheries while other fisheries are controlled by catch.

19. SC18 noted that additional agreed performance indicators will need to be reported on through the monitoring strategy after an MP is adopted. In this regard one CCM also supported the future development of a performance indictor for measuring the impact on small-scale fisheries.

20. SC18 noted that all candidate HCRs should allow for minimal fishing mortality below the LRP as part of their initial design as completely closing the fishery would result in information loss, preventing ongoing assessment of the status of the stock. SC18 further noted that, from the results of the evaluations, the likelihood of the stock falling below the LRP was extremely small.

21. SC18 agreed that the framework necessary for evaluating candidate MPs for skipjack tuna is now fully established and ready for consideration by the Science-Management-Dialogue and WCPFC19 for the adoption of a MP on schedule in 2022. However, SC18 did not see that its role was to recommend any particular MP but to furnish the Commission with the tools to do so, and noted the use of the PIMPLE tool for this purpose. Nevertheless, SC18 noted that on biological grounds none of the candidate MPs should be recommended for rejection on the basis of LRP risk. SC18 also noted that there will be further discussion concerning MPs for skipjack at the upcoming Science-Management-Dialogue.

4.1.1.4 Skipjack Management Procedure Implementation

22. Noting the Commission is scheduled to adopt a MP for skipjack tuna in 2022, SC18 reviewed an example of how a skipjack MP could be implemented to illustrate the function, performance, and implications of a hypothetical MP as outlined in SC18-MI-WP-03 (*WCPO skipjack management procedure: dry run*).

23. SC18 thanked the Scientific Service Provider for the 'dry run' analysis and agreed that it was very helpful in illustrating the function, performance, and implications of a hypothetical MP.

24. SC18 noted that based on the analyses presented, there was sufficient data in the monitoring strategy to generate the inputs to run the estimation model and to provide a reliable estimate of stock status. As the estimation model is part of the MP, this was seen as a step forward in the development of a MP for skipjack tuna which should make it easier to adopt a MP by the end of 2022.

25. SC18 also noted that the estimation model is based on fixed parameter settings and that only the stock status in the terminal year of the estimation model is used in the MP. It is the combined output of the estimation model and the harvest control rule that determines the performance of a MP.

26. Several CCMs supported undertaking the full stock assessment and running the MP in different years in order to separate the processes of running the MP to set new management levels, and running the full stock assessment to monitor the performance of the MP.

27. Noting that a monitoring strategy for skipjack tuna is scheduled to be adopted by the Commission in 2023, SC18 supported further discussion on this issue at SC19, including mechanisms for the collection of data for the range of agreed performance indicators not generated by the MSE framework (such as economic PIs). Several CCMs also noted that exceptional circumstances should be defined in relatively simple and broad terms and avoid being overly prescriptive as flexibility is needed to adapt to future unpredictable situations. It was noted that draft exceptional circumstances text submitted to the ODF under Topic 17 (MI-IP-03) generally conformed with this approach.

AGENDA 4.1.2 – SOUTH PACIFIC ALBACORE TUNA

4.1.2.1 South Pacific Albacore target reference point (TRP)

28. Noting the concerns expressed at WCPFC18 regarding the delayed process to implement an interim TRP adopted in 2018 and the need to achieve a long-term TRP, and the request from WCPFC18 for SC18 to review any additional information on TRPs for South Pacific albacore tuna, SC18 reviewed the information in SC18-MI-WP-04 (*Further analyses to inform discussions on South Pacific albacore objectives and the TRP).*

29. SC18 noted the implications of a potential MP to be developed across the South Pacific, particularly with the areas outside of the WCPFC jurisdiction, and sought advice on how a MP that only applied to the WCPO could be developed. The Scientific Service Provider explained that this could be undertaken in a similar manner as done for skipjack tuna, where fishing in WCPO archipelagic waters is not controlled by the MP. The MP would be designed so it only applied to the WCPO, and not to the EPO.

30. Noting the request for additional catch scenarios to inform management options to clarify management objectives, several CCMs suggested a 10% and 20% reduction in catch from the 2017-2019 baseline for consideration.

31. SC18 recommended forwarding this updated working paper to WCPFC19 for its deliberations on alternative target reference points for south-Pacific albacore tuna.

4.1.2.2 South Pacific Albacore Operating Models (OMs)

32. Noting the Commission is scheduled to adopt a MP for South Pacific albacore tuna in 2022, SC18 reviewed the current grid of OMs that has been developed to reflect all important sources of uncertainty and plausible states of nature for South Pacific albacore as outlined in SC18-MI-WP-05 (*Progress update and technical challenges for the South Pacific albacore MSE framework).*

33. SC18 noted the two alternative sets of OMs listed in Table 1 of SC18-MI-WP-05 – one based on the 2018 assessment (WCPO area only) and one based on the 2021 assessment (including EPO) – but also noted that it was not able to definitively agree on the reference set of OMs for South Pacific albacore tuna because it was necessary for the Commission to decide whether or not to consider the impacts of fishing within the EPO in their decision making. Nevertheless, SC18 agreed to specify an OM grid for both options so there is a clear way forward for this work pending the Commission's decision.

34. SC18 noted the axes of uncertainty currently outlined in each set of OMs and recommended that additional axes be considered for inclusion in each (if practical). For the 2018 grid a movement axis should be considered, while for the 2021 grid the addition of an axis exploring CPUE uncertainty should be considered. For both grids, axes examining effort creep and hyperstability should be explored.

35. One CCM also noted that both options exhibit some retrospective bias and suggested that adjustment of terminal estimates to account for retrospective bias in projections might be included as another axis of uncertainty (i.e., with or without bias adjustment).

36. SC18 seeks advice from WCPFC19 on whether the impacts of fishing within the EPO need to be included in a set of OMs for south Pacific albacore tuna, and recommends that both the Science-Management-Dialogue and the Commission note the further additions recommended to the alternative sets of OMs.

4.1.2.3 South Pacific Albacore Management Procedures (MPs)

37. Noting the Commission is scheduled to adopt a MP for South Pacific albacore tuna in 2022, SC18 reviewed the progress on developing and testing MPs for South Pacific albacore tuna as outlined in SC18-MI-WP-05 (*Progress update and technical challenges for the South Pacific albacore MSE framework).*

38. SC18 noted the progress on the development of MPs using model-based approaches (SPICT) for South Pacific albacore tuna and recommended that candidate HCRs for this species be adapted from those already considered for skipjack tuna.

39. SC18 recommended that both the Science-Management-Dialogue and WCPFC19 take note of the progress to date on the development of an MSE framework for South Pacific albacore tuna and that further work is required prior to adoption of a MP.

AGENDA 4.1.3 – MIXED FISHERIES MSE FRAMEWORK

4.1.3.1 Bigeye and Yellowfin Tuna target reference points (TRPs)

40. Noting the Commission is scheduled to adopt a TRP for both bigeye tuna and yellowfin tuna in 2022, that the results of the analyses on candidate TRPs for bigeye and yellowfin had been reviewed by SC17 and presented to WCPFC18, and noting that no further analyses had been undertaken since, SC18 was unable to provide any further advice or recommendations to the Commission on this issue and reiterates the advice provided by SC17 (see paras. 41-45 below).

41. SC17 noted that these analyses (see SC17-MI-WP-01) reflected the original request made by SC16, and the additional request by the Commission for additional information. SC17 also noted the usefulness of these updates as they facilitate an improved understanding of multi-species implications of alternative harvest levels.

42. SC17 noted that impacts on skipjack tuna depletion associated with relative changes to fishing levels to achieve a candidate bigeye tuna TRP are contingent on the proportion of fishing scalars related to purse seine fishing that target skipjack tuna. The relative change in fishing scalars to achieve candidate TRPs assume equal proportionality in purse seine and longline fishing scalars, provided for comparative purposes from the SC16 request.

43. SC17 noted that the analyses will greatly aid in considering candidate TRPs for bigeye and yellowfin tuna.

44. SC17 also noted that the risks of breaching the LRPs outlined in the paper are dependent on the treatment of uncertainty in any assessment and may underestimate uncertainty.

45. SC17 recommended forwarding this working paper to the Commission for its deliberations on target reference points for bigeye and yellowfin tuna and that the results be taken into account at the next Tropical Tuna Workshop.

4.1.3.2 Mixed Fishery Update and Performance Indicators

46. Noting the work reviewed by SC17 in developing a multi-species modelling framework for including mixed fishery interactions when developing and testing harvest strategies for the four main WCPO tuna stocks, SC18 reviewed an update on the development of this framework outlined in SC18-MI-WP-06 (*Mixed fishery harvest strategy update*) and SC18-MI-WP-07 (*Mixed-fishery harvest strategy performance indicators*).

47. SC18 thanked the Scientific Service Provider for the progress in developing the mixed fishery harvest strategies and noted the encouraging results in including South Pacific albacore in the multi-species modelling framework. However, SC18 also noted that considerable work remains to be completed, such as building a full suite of OMs for bigeye and yellowfin tuna and considering candidate MPs for the tropical longline fisheries.

48. SC18 noted that most of the performance indictors used in the working paper were useful and easy to understand, but also noted that the indicators may need to be separated for fisheries, and the set of performance indicators could be further developed (such as an indicator related to stability and impacts on SIDS). SC18 also noted that the question about what indicators are necessary is generally a management or policy decision.

49. Several CCMs, in noting that the analysis outlined in SC18-MI-WP-07 indicated a larger impact by the purse-seine fleet on bigeye tuna than the impact of the tropical longline fleet, explained that they had not yet agreed on the mixed fisheries MSE framework outlined in this paper (e.g., the order in which the individual MPs are implemented). They suggested, for instance, that a stock status-based approach could be considered while another CCM suggested a stock productivity-based approach may also be considered. However, the difficulty in implementing such approaches was acknowledged.

50. Several CCMs noted they would not be able to support any proposed MP outcomes unless those outcomes are designed to ensure that there is no disproportionate burden transfer. They also noted that it will not usually be possible to achieve all the TRPs at the same time and that there will need to be trade-offs.

51. SC18 supported continuing the work on the development of the mixed fishery MSE framework and recommended that both the Science-Management-Dialogue and WCPFC19 take note of the progress to date and provide feedback.

AGENDA 4.1.4 – REVIEW OF WCPFC HARVEST STRATEGY WORKPLAN

52. SC18 noted the adoption by WCPFC18 of the updated *Indicative Workplan for the Adoption of Harvest* Strategies *under CMM 2014-06* (Attachment I, WCPFC18 Summary Report) and that further discussion on this workplan would more appropriately take place during the upcoming Science-Management Dialogue.

53. Several CCMs noted that the adoption of the skipjack MP remains on track for 2022 but that adoption of TRPs for bigeye and yellowfin tuna and a MP for South Pacific albacore may need to be delayed pending further work. Some concern was also expressed in relation to how such delays may impact on MSC certification.

54. SC18 also noted the views expressed by several CCMs that a better understanding on how the Harvest Strategy Work Plan is progressing had been achieved during SC18, and this should help inform discussions at the Science-Management Dialogue.

4.2 DRAFT SOUTH-WEST PACIFIC SWORDFISH CMM

55. SC18 welcomed the opportunity to review and provide scientific and technical feedback on the draft CMM for southwest Pacific Ocean (SWPO) swordfish that had been submitted by Australia and outlined in SC18-MI-WP-08 (*A revised draft conservation and management measure for South Pacific Swordfish in the WCPFC Area*).

56. SC18 noted that this draft CMM had taken into consideration the updated stock assessment for south-west Pacific broadbill swordfish reviewed by SC17 (SC17-SA-WP-04), Australia's updated paper on bycatch management options submitted to SC17 (SC17-MI-IP-10), the projections of this stock as outlined in WCPFC18-2021-20-rev1 **(***Southwest Pacific Swordfish projections)* and WCPFC18-2021-21 (*Reference Document for the Review of CMM 2009-03 (Southwest Pacific swordfish)*).

57. Most CCMs supported this draft CMM, stressing the importance of developing a strengthened measure for this stock, noting that SC17 highlighted that the current measure (CMM 2009-03) for SWPO swordfish does not contain provisions to limit total fishing mortality on the stock and subsequently puts at risk the future sustainability of the stock, future fishery development opportunities for SIDS, and ongoing economic viability of current fisheries targeting this stock. They also noted the Commission now has a comprehensive suite of data and technical information with which to inform and base a revised and strengthened measure for this stock. They noted and supported provisions in the measure that seek to prevent any transfer of disproportionate burden to SIDS while at the same time, recognising coastal state sovereign rights, a commitment to zone-based management, and protecting and explicitly allowing for future fishery development opportunity for SIDS. Of the two alternate management options proposed for fisheries taking swordfish as bycatch, bycatch limits were seen as the most easily implemented and monitored, noting that swordfish bycatch contributes a very significant component of the overall fishing mortality.

58. Two CCMs stated that further consideration needed to be given to the effectiveness and consequences of implementing some gear-based measures, such as changing bait, as this may not reduce the fishing mortality or CPUE of the bycatch and could result in changes to the catch rates of other species. Two CCMs raised concerns that the uncertainties in the latest stock assessment had not been adequately captured in the projections, and that these uncertainties could impact the proposed catch limit. One CCM stated that they support actions to mitigate fishing mortality on bycatch fisheries, but do not consider a full review of the measure should be undertaken on the basis of the stock assessment and projections. This CCM noted that, even when catch-based projections might include very unrealistic scenarios, all of them resulted on average in levels well above the MSY in 10-y time. Furthermore, projections indicated increases in recent effort of up to 20% resulted in almost the same depletion levels as in 2019. One CCM, while supporting the need for strengthening management, also noted that the current CMM does not contain all the elements of a harvest strategy, including a harvest control rule.

59. SC18, noting that it is important to ensure CMMs are effective and are updated in the light of new information available, encouraged all CCMs with an interest in this measure to work collaboratively with Australia prior to Australia's submission of a revised draft CMM to WCPFC19.

4.3 LIMIT REFERNCE POINTS FOR SPECIES OTHER THAN TUNA

4.3.1 Limit reference points for WCPO elasmobranchs

60. SC18 noted that no further progress in developing appropriate limit reference points (LRPs) for non-target WCPO elasmobranchs has been made since SC17, and that the recommendations and need for further research made by SC17 had been adopted by WCPFC18.

61. Noting the need to appraise a broader range of reference points to assess their applicability to WCPO elasmobranchs, and to avoid undesirable consequences on allowable catch levels of target species, SC18 recommended that SC19 consider reviewing and including the further research identified at SC17 in the Scientific Committee's Shark Research Plan 2021-2025 (Project 97).

4.3.2 Review of appropriate LRPs for SWPO striped marlin and other billfish

62. SC18 noted that no further progress in developing appropriate LRPs for WCPO billfish species has been made since SC17, and that the recommendations and need for further research made by SC17 had been adopted by WCPFC18.

63. SC18 recommended that SC19 consider reviewing and including the further research identified at SC17 in the Scientific Committee's Billfish Research Plan 2023-2027 (Project 18X1 listed in the SC18-GN-IP-07).