

**REPORT OF THE FOURTH INTERSESSIONAL MEETING  
OF PANEL 2 ON BLUEFIN TUNA MSE**  
*(Madrid, Spain, hybrid, 14 October 2022)*

**1. Opening of the meeting and meeting arrangements**

The meeting was opened by the Chair of Panel 2, Mr. Shingo Ota (Japan).

**2. Nomination of Rapporteur**

Mr. Mathieu Pellerin (Canada) was appointed as rapporteur.

**3. Adoption of agenda**

The agenda (**Appendix 1**) was adopted without changes. The List of Participants is included in **Appendix 2**.

**4. Update on BFT MSE framework and Candidate Management Procedure (CMPs) by SCRS**

**5. Candidate management procedure performance, refinement and selection**

These agenda items were discussed together.

Dr John Walters (on behalf of the SCRS) presented an update on the BFT-MSE framework, including CMPs development, performance, refinement and selection. The SCRS has made substantial progress in testing CMPs and considers the MSE to be complete, except for exceptional circumstances provisions to be drafted in 2023. With the withdrawal of two CMPs (PW and AI) since the last July meeting, there were 4 CMPs remaining (BR, FO, LW, and TC) at the time of this meeting. All of the CMPs meet the status and safety management objectives, thereby providing viable and robust options for setting total allowable catches (TACs) for Atlantic bluefin tuna in 2023 and beyond.

Each CMP is a package-deal in that one single CMP calculates separate TACs for the West and East management areas. All CMPs include a phase-in period that would limit any upward or downward TAC changes to +20%/-10% for the first two management cycles if a 2-year cycle is adopted, or only for the first management cycle if a 3-year cycle is adopted. All results assume that the operational management objectives and other CMP specifications (e.g., management cycle length) are the same for both stocks/management areas. One CPC asked if the MSE framework would allow for adopting one CMP for one area and none for the other. The SCRS noted that this would not reflect what was tested for each CMP: the management of each area takes into account the impacts that CMP-specific removals from either stock have in the other area. It was noted that the East area biomass of Western origin or the Western stock biomass in the East area are negligible fractions whilst Eastern stock origin specimens may account for a quite relevant fraction of the West area biomass.

Key performance statistics includes: the probability of being in the green quadrant of a Kobe plot after year 30 (PGK) to measure performance with respect to the stock status objective, lowest depletion (LD) to measure performance with respect to the safety objective, average catch for years 1-10 (AvC10) and 1-30 (AvC30) to measure performance with respect to the yield objective and average percentage variation in TAC (VarC) to measure performance with respect to the yield stability objective. Overall, an equal weighting scheme was used for status, yield, stability and safety objectives, as per PA2 guidance on default weighting. In answering a CPC question, the SCRS noted that PGK can be viewed differently in the context of an MSE, compared to a best assessment model, as the MSE put CMPs through more challenging and a wider range of scenarios (e.g., even under a zero catch scenario biomass declines are observed). In that sense, it was noted that a given percentage value of PGK for a management procedure is actually a more conservative objective than the same percentage reflected in a Kobe strategy matrix developed from a stock assessment. To meet the same value of PGK in an MSE compared to a best assessment model, a more conservative TAC would be needed for the latter (or the lower PGK would be required for the former). However, the extensive status space explored through the MSE includes both challenging and optimistic scenarios simulated over a much longer time period.

An additional consideration for Panel 2 is the possibility of establishing a minimum threshold for implementing a TAC change. Such an approach would minimize the administrative burden related to adopting new TAC advice if it represented only a small change from the previous TAC. If such a minimum threshold were incorporated in a management procedure (MP), no change in TAC would be implemented in those instances where application of the MP indicated a TAC level that was less than the agreed minimum threshold. Simulations for the BR CMP were conducted to test applying a minimum TAC change threshold of up to 100 t for the West and up to 1000 t for the East. Results showed that these thresholds would not cause significant difference to BR's performance, however no indication of how often the rule was invoked was given. Panel 2 requested the developers of FO to conduct analysis using the same thresholds to see the impact on the performance of that CMP.

## 6. Key decisions

Several remaining key decisions are required for adoption of a final MP at the Annual meeting, which pertain to LD, PGK, stability both in terms of management cycle duration and TAC change, choice of a CMP type, whether to implement a minimum TAC change threshold and MSE review timeframe. Panel 2 discussed these various decision points and in some cases, narrowed down the remaining available options. Agreements of Panel 2 are described below for each decision point and are also captured in the Chair's summary on the way forward in **Appendix 3**. The SCRS also noted that it could produce an updated decision guide document prior to the Annual Meeting.

### **Decision Point #1: Operational management objective for Safety (LD10% or LD15%)**

LD is the performance statistic used to track how successful a CMP is at not breaching the limit reference point ( $B_{LIM}$  or LRP). This reference point is used solely in the context of the MSE to evaluate CMP performance and does not function as a hard trigger that would require a management response, such as closing the fishery.

The SCRS noted that in order for CMPs to meet a safety requirement of LD10%, a significant reduction in yield would be required. The SCRS highlighted the significance of the decision on the PGK percentage when considering the appropriate level of precaution, noting that a higher level was more precautionary. Panel 2 agreed to remove LD10% from the options and to move forward with LD15%.

### **Decision Point #2: Operational management objective for Stock Status (PGK 60% or PGK 70%)**

PGK60% allows for heavier fishing pressure and entails a higher probability of overfishing and/or being overfished, relative to PGK 70%, which has lower fishing pressure. There was discussion of PGK65% being considered. The SCRS representative noted that the relationship between PGK and key performance statistics is essentially linear, with PGK65% nearly halfway between PGK60% and PGK70%. This will be the most significant decision in terms of the tradeoff between the objectives of maximizing yields versus maintaining the stock's status.

There was no consensus among CPCs for a preferred PGK value. Preferences were expressed for both PGK60% and PGK70%, while others showed flexibility between the two options, noting that the decision was linked to other decision points. Some CPCs supporting PGK 60 stated that PGK60 is the standard in ICCAT and there is no reason to set PGK larger than 60% considering that PGK60 in the context of MSE is more conservative compared to that of a best assessment model. Panel 2 agreed to keep these two options, noting that the decision was linked to other decision points. One CPC requested analysis of PGK65% as a potential compromise value. While PGK65% had already been tested for BR, it had not been for FO., Panel 2 agreed to request the FO CMP developers to conduct analysis with that value. The developer of FO informed Panel 2 that they would make utmost efforts to provide these results, but that they might not be able to complete this work on this timeline.

### **Decision Point #3: Management cycle length**

The 3-year management cycle CMPs were slightly slower to react to signals from the indices to change the TAC than the 2-year management cycles. As a result of this poorer performance, the changes in TAC need to be larger with a 3-year cycle as observed with the VarC statistic results. Yields are often slightly lower with a 3-year management cycle, with more pronounced reductions in near-term TACs (AvC10) compared to long-term TACs (AvC30). Panel 2 needs to consider if the administrative burden reduction of a 3-year management cycle would outweigh the reduction in yield.

There was no consensus among CPCs for a preferred management cycle length. Preferences were expressed for both a 2-year management cycle and a 3-year management cycle, while others showed flexibility between the two options. Panel 2 agreed to keep both options on the table.

### **Decision Point #4: Operational management objective for Stability**

This decision point is highly dependent on management cycle length and PGK. With the option of a 3-year management cycle, greater reductions in TAC may be needed. If a 3-year cycle is chosen with PGK60, no CMPs meet LD15 with the default TAC change limits of +20%/-30%. As such, stability must then be adjusted to +20%/-35% in order to meet safety requirements. All CMPs with a 2-year management cycle meet LD15% with the default stability option of +20%/-30%.

As this decision point is linked to management cycle length preferences, no decision was reached on the objective for stability. Panel 2 agrees that the default option is +20%/-30% but recognizes that allowing a greater asymmetry of +20%/-35% in some scenarios is needed to meet LD safety requirements.

### **Decision Point #5: Management procedure type**

All four CMPs remaining (BR, FO, LW, and TC) at the time of the meeting provide viable options for setting TACs for Atlantic bluefin tuna in 2023 and beyond.

While many CPCs expressed a preference for BR, others supported continuing to consider both BR and FO. Panel 2 agreed to narrow down the options for this decision point by dropping the LW and TC CMPs. At the Annual Meeting, Panel 2 will need to choose between the two remaining CMPs: BR and FO.

### **Decision Point #6: Timeframe for review of Management Procedure**

A key element of a management procedure is the timing for its review. The SCRS recommended that regular reviews of the MP be conducted to consider new data and methods, and to potentially recondition the MSE. The SCRS recommended a review every 6 years, which means the first review would be completed in 2028. This review period is compatible with both a 2-year and 3-year management cycles as well as with scientific considerations.

One CPC suggested that carrying out the first MSE review in 4 years could be preferable as it would allow more recent and important data, including on stock mixing via close-kin mark-recapture, to be taken into consideration. The SCRS noted that a review after 4 years would add to the SCRS workload and could impact its work on other issues, which is part of the reason a 6-year review period was suggested. The SCRS also noted that, in any case, a review could be triggered sooner than every 6 years under an exceptional circumstances protocol. Moreover, some CPCs noted that a 4-year review will not allow taking into account the effects of the whole implementation of the MP after the phasing-in period and will not be consistent with the claim that a MP allows for an inter-session review period longer than a traditional fish stock assessment. Panel 2 agreed to move forward with a 6-year review cycle.

One CPC asked if the 30-year projection period for bluefin tuna under the MSE would be adjusted at the first MSE review. The SCRS noted that generally this is not deemed necessary in a first review, but that it would eventually be the case that the projection period would be adjusted to recondition the MSE operating model using the most up to date data.

**7. Other matters**

No other matters were discussed.

**8. Adoption of report and closure**

The Chair mentioned that considering the short timeframe between the 4th intersessional meeting of Panel 2 and the annual meeting, the report will be short, with focus on the decision points discussed at the meeting.

It was agreed that the meeting report would be adopted by correspondence.

The Chair thanked all participants for their work and adjourned the meeting.

**Agenda [PA2\_BFT\_MSE\_OCT\_01]****Objectives**

The objective of this meeting will be for Panel 2 to recommend a single management procedure for consideration for adoption by the Commission at the ICCAT annual meeting. Key information on the BFT MSE process to provide the basis for making such a selection is available on the following pages:

Splash page: <https://iccat.github.io/nswo-mse/>

CMP plotting: <https://apps.bluematterscience.com/ABTMSE/>

Quilt plot: [https://apps.bluematterscience.com/ABTMSE\\_Performance2/](https://apps.bluematterscience.com/ABTMSE_Performance2/)

1. Opening of the meeting and meeting arrangements
2. Nomination of Rapporteur
3. Adoption of Agenda
4. Update on BFT MSE framework and CMPs by SCRS
  - a. SCRS responses to feedback provided at July PA2 meeting
    - i. Evaluation of 2 and 3 year TAC setting for selected CMPs
    - ii. "Phase-in" +20%/-30% for 2-year cycle *and* +20%/-30% and +20%/-35% for 3-year cycles
    - iii. Additional stability or trajectory provisions implemented by several CMPs
    - iv. Revised quilt plots and summary table for CMPs
  - b. Finalized operational management objective options
5. Candidate management procedure performance, refinement and selection
  - a. Finalized performance tuning
  - b. PA2 will see complete set of remaining CMPs (note that several presented earlier are no longer supported by their developers, so will not be presented)
6. Key decisions
  - a. 2 year vs 3 year management cycle
  - b. Basis for performance tuning selection including consideration of LD\*(for which values in the range of 10-15% have been suggested) and PGK (for which the values in the 60-70% range have been suggested)
  - c. Selection of recommended MP
7. Other matters
8. Adoption of report and closure

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**Summary of the Chair of Panel 2 on the way forward**

1. Regarding six decision points, Panel 2 agreed as follows:
  - 1) LD  
LD15% should be used.
  - 2) PGK  
There are three options: 60%, 65% or 70%.
  - 3) Management cycle  
There are two options: 2 years or 3 years.
  - 4) Stability  
The default is +20%/-30%. If a CMP with certain parameters cannot satisfy LD15%, it should be +20%/-35%.
  - 5) CMP  
There are two remaining options: BR or FO.
  - 6) Review cycle  
Tentatively agreed at 6 years.
2. In addition, Panel 2 will consider whether or not the minimum threshold of TAC change (up to 100 t for the West and up to 1,000 t for the East) should be incorporated in the management procedure (MP).
3. Panel 2 requested the SCRS to produce new quilt plots, taking into account paragraph 1 above. It was noted that the developer of FO will have to test within that CMP the effects of incorporating the minimum TAC change threshold discussed in paragraph 2 above. In addition, the developers of the BR and FO CMPs will need to test tuning to PGK65% specifically and present the output to the Panel 2. It was confirmed that this analysis should first test stability figures of +20/-30% and if the result does not satisfy LD15%, it should test figures of +20/-35%. The quilt plots from the previous and expected analyses will be as follows: 2 CMPs (BR and FO), 2- vs 3-year management cycle setting and PGK 60%, 65%, and 70% (with applicable stability figures) resulting in a quilt plot containing  $2 \times 2 \times 3 = 12$  options.
4. Panel 2 requested the SCRS to provide the results of the analysis requested in paragraph 3 above one week prior to the Annual Meeting. The developer of FO informed Panel 2 that they would make utmost efforts but could not guarantee that the work could be completed on this timeline.
5. The SCRS will also provide trajectory plots of the CMPs under 4 different assumptions about the trajectory of future indices: (1) all indices stable, (2) 10% increase per year, (3) 10% decrease per year, and (4) 20% decrease per year.