



**North Pacific Fisheries Commission**

NPFC-2020-TWG CMSAint01-Summary

**North Pacific Fisheries Commission  
1<sup>st</sup> Intersessional Meeting of the Technical Working Group on Chub Mackerel  
Stock Assessment**

**27 May 2020**

**WebEx**

**Summary**

**Agenda Item 1. Opening of the Meeting and Adoption of Agenda**

1. The 1<sup>st</sup> virtual intersessional meeting of the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA) commenced at 12pm (noon) on 27 May 2020, Tokyo time (UTC +9 hours), in the format of video conferencing via WebEx. The meeting was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation and the United States of America. Two invited experts, Dr. Larry Jacobson and Dr. Tom Carruthers, participated in the meeting. The European Union and the Pew Charitable Trusts attended as observers. The meeting was opened by Dr. Oleg Katugin (Russia) who served as the TWG CMSA Chair.
2. The agenda was adopted without revision (Annex A). The Participants List is attached (Annex B).

**Agenda Item 2. Summary of catch and effort statistics of Members' chub mackerel fisheries**

3. The Science Manager presented catch and effort statistics for chub mackerel in 1995-2019 compiled from the annual reports of Members. The compiled catch and effort are available on the [NPFC website](#).
4. Japan presented a summary of its recent fisheries and stock estimates of chub mackerel in Japan. Japan noted that 2019 catch was similar to that in 2018. Recruitment index decreased in 2019 in comparison with that in 2018 but remained above average. Spawning stock biomass index was high in 2017-2019 and exploitation rate was maintained at low levels below 25% in 2010-2019.
5. In response to the question about scientific survey area and fishing grounds, Japan clarified that the scientific survey was conducted in both Japanese EEZ and high seas, but fishing vessels

operated in the Japanese EEZ only.

Agenda Item 3. Development of the operating model for the stock assessment of chub mackerel

*4.1 Review of key considerations and specifications from the TWG CMSA02 meeting*

6. Participants reviewed the key considerations and specifications from the TWG CMSA02 meeting. No amendments of the specifications agreed at TWG CMSA02 have been suggested.

*3.2 Review of availability and quality of data shared by the Members*

7. China presented the description of its data shared for chub mackerel stock assessment. China has two types of fishing vessels, light purse seiners and trawlers. The number of purse seiners increased from 2014 to 2016 and then decreased in 2017-2019. The number of trawlers was small, usually 2-3 vessels, and did not fluctuate much. Catch at age estimation has been conducted using otolith analyses. In 2018-2019, ages 1-3 fish dominated the catch. Mean fork length and maturity at age fluctuated significantly in 2017-2019. Fishery-dependent CPUE index demonstrated increasing trend from 2016 to 2019.

8. Japan suggested Members to share their age determination methods in the future.

9. Japan updated participants about progress of data sharing for the development of operating model. At TWG CMSA02, China, Japan and Russia agreed to share the data for age-structured models including total catch, catch-at-age, weight-at-age, maturity-at-age and abundance indices. Japan noted the following issues with the shared data. Russian catch-at-age and weight-at-age data are inconsistent. Chinese catch-at-age data are available only for 2018, and assumption is needed for 2015-2017 data. Chinese and Japanese catch at age compositions and weight at age compositions differ greatly, and maturity at age compositions are similar. Japan raised the issues of the data quality, assumptions when merging data, the use of Chinese and Russian CPUE, natural mortality coefficient and timelines for completion of data sharing and preliminary analysis.

10. Russia explained that some mistakes were found in Russian data shared with Members. Russia will correct them and submit a revised data set to the Secretariat.

11. China suggested not to merge data sets shared by Members and treat them as different indices. China clarified the values of natural mortality as agreed upon at TWG CMSA02.

12. Members noted the options to either merge the shared data or treat them separately as different indices.

13. Members agreed to update the shared data sets including 2019 and complete data sharing and compilation by 1 September 2020. Participants agreed to provide data description by the same deadline.
14. Japan presented a document describing the method to estimate catch-at-age. Japan proposed to use this document as a template for data description for other Members.
15. Members agreed to provide data description and, if possible, follow the requirements specified in Annex C.

### *3.3 Brief overview on preliminary stock assessment (VPA, ASAP, KAFKA, SAM)*

16. Russia gave a presentation on KAFKA stock assessment of chub mackerel conducted based on some data shared by Members and data and information submitted by Members to previous TWG CMSA meetings. Russia reviewed the data and decided to use only Japanese data because indices from China and Russia were uninformative. Fifteen case scenarios were analyzed. Russia concluded that maximum recruitment would stay within 800-1,700 mln individuals with 95% confidence interval.
17. China informed participants of its trial on ASAP stock assessment of chub mackerel. China pointed out that data shared by China, Japan and Russia are inconsistent. ASAP model has not converged with the data shared by Members. China will continue ASAP stock assessment after Members update data up to 2019 and Russia submits revised data.

### *3.4 Preliminary example of using PopSim as the operating model*

18. Dr. Larry Jacobson, invited expert, presented a draft report on PopSim-A operating models for chub mackerel. Dr. Jacobson gave a brief overview of PopSim, demonstrated its use and gave an example for chub mackerel. Dr. Jacobson explained technical issues including data and parameters for PopSim and described input data. He ran the PopSim with data from Japan for demonstration purposes and explained output data. He demonstrated an example of testing stock assessment models.
19. Dr. Jacobson suggested a small group to generate pseudo-data in PopSim which then will be used by individual scientists to run their models. He suggested to initially use only two scenarios: one simple and one having a more realistic probable outcome. He noted that the TWG CMSA also needs to agree on common database format for model estimates.
20. In response to the question from Russia about the KAFKA model, Dr. Jacobson clarified that any model can be tested by PopSim but it may require additional work to generate data files

for the stock assessment model if the model is not included in the NOAA toolbox.

### *3.5 Discussion on further development of operating model*

- *Assumptions and parameters from the stock assessment models*
- *Major sources of uncertainty to be included in the operating model*
- *Determination of scenarios for the operating model*

21. The TWG CMSA will continue the development of operating model intersessionally and at the next meeting in accordance with the workplan.

### *3.6 Priority issues and timelines for future work*

22. Members agreed on data sharing and description as described in paragraphs 13 and 15.
23. Members agreed to discuss and revise, if needed, the flowchart for the development of operating model intersessionally and adopt it at the formal meeting in November 2020.
24. Members recognized the contribution by the invited expert in the work of the TWG CMSA and suggested that the SC allocate funds for further support from an external expert for the development of the operating model for chub mackerel.
25. Dr. Jacobson suggested members work on a tool that takes pseudo data and feed it into stock assessment models to be tested. Members agreed to try output data generated by PopSim for their stock assessment models by November 2020, if possible.

## Agenda Item 4. Toward development of Management Strategy Evaluation (MSE)

### *4.1 Update on intersessional work towards MSE*

26. Dr. Tom Carruthers, invited expert, gave a presentation on management strategy evaluation (MSE) and demonstrated MSE for chub mackerel using an open-source framework. Dr. Carruthers described closed-loop simulation testing as an alternative to open-loop simulation testing. He clarified the distinction between the MSE process versus MSE technical work. He presented MSE tool as a framework for doing MSE technical work. He demonstrated an example of application of MSE tool to chub mackerel data from bootstrap VPA.
27. Dr. Carruthers suggested the following possible steps forward: Perfect VPA2OM operating model conversion code and release in MSE tool; Update all code on the shared GitHub repository; Establish a small collaborative group to investigate demonstration scenarios for chub mackerel; Draft a technical working paper on the approach.
28. The Chair updated the group that MSE process for chub mackerel came from the

recommendation of the BRP/HCR/MSE workshop to conduct MSE for chub mackerel, and this recommendation was adopted by the Commission in 2019.

#### *4.2 Priority issues and timelines for future work*

29. Japan stated that the first priority should be given to the development of operating model and stock assessment of chub mackerel. Japan commented that defining the objective of MSE is an important first step to begin the MSE process for chub mackerel.
30. China suggested to finalize MSE-related priority issues and timelines for future work at the next formal TWG CMSA meeting in November.
31. Members agreed to exchange views on the MSE for chub mackerel intersessionally and finalize priority issues and timelines for future work at the next formal TWG CMSA meeting.
32. Dr Carruthers suggested an updated presentation to be given to a broader audience of SC members to inform them about the concept and initiate the MSE process.
33. Members thanked Dr. Carruthers for his voluntary work on MSE with the TWG CMSA.
34. Members agreed with the suggestion from the Chair to continue discussions on MSE for chub mackerel with support from Dr. Carruthers, as an invited expert.

#### Agenda Item 5. Review of the Work Plan of the TWG CMSA

35. The Science Manager informed the participants about the request from SC to develop five-year rolling research and work plans from 2020 onwards.
36. Japan expressed concerns about the delay in the implementation of the TWG CMSA workplan to conduct stock assessment and provide recommendations to Commission due to the coronavirus outbreak.
37. Members agreed to draft the workplan intersessionally and present it at the TWG CMSA meeting in November 2020.

#### Agenda Item 6. Close of the Meeting

38. The meeting closed at 18:15 on 27 May 2020, Tokyo time.

Annex A – Agenda

Annex B – List of participants

Annex C – Content of the document for catch-at-age description

## **Agenda**

Agenda Item 1. Opening of the Meeting and Adoption of Agenda

Agenda Item 2. Summary of catch and effort statistics of Members' chub mackerel fisheries

Agenda Item 3. Development of the operating model for the stock assessment of chub mackerel

3.1 Review of key considerations and specifications from the TWG CMSA02 meeting

3.2 Review of availability and quality of data shared by the Members

3.3 Brief overview on preliminary stock assessment (VPA, ASAP, KAFKA, SAM)

3.4 Preliminary example of using PopSim as the operating model

3.5 Discussion on further development of operating model

- Assumptions and parameters from the stock assessment models

- Major sources of uncertainty to be included in the operating model

- Determination of scenarios for the operating model

3.6 Priority issues and timelines for future work

Agenda Item 4. Toward development of Management Strategy Evaluation (MSE)

4.1 Update on intersessional work towards MSE

4.2 Priority issues and timelines for future work

Agenda Item 5. Review of the Work Plan of the TWG CMSA

Agenda Item 6. Close of the Meeting

## List of participants

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## **Content of the document for catch-at-age description**

### Methodology

- Sampling methodology, frequency, and size
- Methodology of ALK-development
- Criteria if multiple ALKs are used in different regions
- Methodology of estimating catch-at-age from ALK

### Results to be shown

- Sample sizes of length measurements and age determination
- Length and age distribution
- ALK (if used)
- Length-Weight relationship