North Pacific Fisheries Commission

NPFC-2024-TWG CMSA09-RP01

1st Intersessional Meeting of the Technical Working Group on Chub Mackerel Stock Assessment
March 12, 2024 (9am – 1pm Tokyo time)
WebEx

Summary

Agenda Item 1. Opening of the Meeting

The 1st intersessional meeting of the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA) in the 2024 operational year commenced at 9 AM on 12 March 2024, Tokyo time in the format of video conferencing via WebEx. The meeting was attended by Members from China (Qiuyun Ma, Heng Zhang), European Union (Karolina Molla Gazi), Japan (Kazuhiro Oshima, Shuya Nakatsuka, Shota Nishijima, Momoko Ichinokawa, Akihiro Manabe, Ryuji Yukami, Ken Ishida, Kazunari Higashiguchi), Russia (Vladimir Kulik, Igor Chernienko) and USA (Erin Bohaboy) as well as the Secretariat (Robert Day, Alex Zavolokin, Sungkuk Kang, Jihwan Kim). Dr. Joel Rice attended the meeting as invited expert. The meeting was opened by Dr. Kazuhiro Oshima (Japan), Chair of the TWG CMSA.

The Chair outlined the goals of this meeting which are (1) to finalize data for stock assessment of chub mackerel, and (2) to review progress on stock assessment model, biological reference points, and future projections. Chair's presentation is available on the Collaboration website under TWG CMSA intersessional meetings.

Agenda Item 2. Adoption of Agenda

There were no amendments to the agenda.

Agenda Item 3. Review of timeline with short summary of TWG CMSA08 meeting

The Chair informed participants about the outcomes of TWG CMSA08 and presented the timeline and activities for intersessional work toward TWG CMSA09 meeting.

Agenda Item 4. Finalization of age-specific data

4.1. Catch-at-age (CAA)

Japan (Dr. Akihiro Manabe) presented an update on CAA data submitted by Members. Japan reminded participants that TWG CMSA08 had agreed to use the Eastern Japanese ALK from the equivalent quarter/year for the missing Chinese data in 2015–2017, and the mean catch-at-length from 2016 to 2018 for the missing Chinese data in 2015 and the missing Russian data

in 2014 and 2015. Also, TWG CMSA08 had agreed to use Japanese catch-at-length and the Eastern Japanese ALK to substitute the missing Russian data in 2022 Q1/Q2 and 2023 Q1/Q2.

Following these agreements, Japan made calculations for the missing CAA data, prepared the final set of CAA data and presented it for review. The presentation that includes CAA, WAA and MAA is available on the Collaboration website under Input Data and Codes for 2024 Chub Mackerel Stock Assessment.

Participants **agreed** to use the presented CAA data as an input for the stock assessment.

4.2. Weight-at-age (WAA)

Japan (Dr. Akihiro Manabe) presented an update on WAA data submitted by Members. Japan reminded participants that TWG CMSA08 had agreed to use the average, weighted by age-specific catch number with the same ratio across all years (FY2014–FY2022) by Member, of the Chinese, Eastern Japanese, Western Japanese and Russian WAA data.

Japan prepared the final set of WAA data and presented it for review. The presentation that includes CAA, WAA and MAA is available on the Collaboration website under Input Data and Codes for 2024 Chub Mackerel Stock Assessment.

Participants **agreed** to use the presented WAA data as an input for the stock assessment.

4.3. Maturity-at-age (MAA)

Chair reminded participants that TWG CMSA08 had agreed to use Japanese maturity-at-age from 1970 to 2022 as an input for the base case stock assessment and also to consider other options when China resubmits its updated MAA data.

China (Dr. Qiuyun Ma) gave a brief update on its MAA data revised in accordance with suggestions made at TWG CMSA08. China applied the maturity determination method used by Japan, re-calculated MAA data and uploaded them on the Collaboration website (Input Data and Codes for 2024 Chub Mackerel Stock Assessment).

Japan (Dr. Akihiro Manabe) presented a review of the updated MAA data. It was noted that the gap between Chinese and Japanese MAA data has narrowed. The presentation that includes CAA, WAA and MAA is available on the Collaboration website under Input Data and Codes for 2024 Chub Mackerel Stock Assessment.

Participants **re-affirmed** that Japanese MAA data for 1970-2022 will be used for the base case stock assessment and **agreed** to check a robustness of the base case using both Chinese and

Japanese MAA data for 2018-2022 as a sensitivity case.

Participants noted that Japanese data were collected from CM spawning grounds in the Japanese EEZ while Chinese MAA data were collected from fishing grounds in the Convention Area. This results in different approaches (annual versus quarterly) with respect to calculation of Chinese and Japanese MAA data.

Agenda Item 5. Abundance Indices

5.1. Revision of standardized CPUE

Russia (Dr. Igor Chernienko) presented a revised document on CPUE standardization for Russian chub mackerel fisheries which addresses suggestions made at TWG CMSA07 and 08. The document is available on the Collaboration site under Input Data and Codes for 2024 Chub Mackerel Stock Assessment.

Chair reminded participants that TWG CMSA08 had agreed to review the revised CPUE standardization when it is submitted by Russia and to consider including it in a sensitivity analysis for the forthcoming chub mackerel assessment if the necessary improvements have been made and if the CPUE Standardization Protocol has been followed.

Referring to discussions at TWG CMSA08 about Chinese CPUE standardization, Japan pointed out that proportion of chub mackerel and the proportion of Japanese flying squid in the catch should not be used as covariates because these variables have the information of abundance, and standardizing them could possibly obscure a fluctuating pattern of chub mackerel abundance.

Participants **noted** that CPUE standardization presented by Russia requires further improvement and cannot be used as a sensitivity analysis at this time. In particular, the proportions of chub mackerel and Japanese flying squid should be excluded from the covariates used in Russia's analysis.

Chair **requested** Russia to revise its CPUE standardization and submit a revised paper for review intersessionally before the next intersessional meeting.

China (Dr. Qiuyun Ma) presented a revised standardization of CPUE data for chub mackerel based on the comments and suggestions made at TWG CMSA08. The major change from the previous document was the removal of the proportion of chub mackerel in the catch as a covariate. Also, some relatively minor modifications were made. In addition, China presented responses to the questions about CPUE standardization provided by Japan intersessionally. The revised CPUE standardization document is available on the Collaboration site under Input

Data and Codes for 2024 Chub Mackerel Stock Assessment.

Participants **agreed** to use the revised China's standardized CPUE as an input for the stock assessment.

Japan (Dr. Shota Nishijima) presented a revised document on standardized abundance indices for ages 0 and 1 fish of chub mackerel from Northwest Pacific autumn surveys up to 2023 (presentation is available on the Collaboration website under Input Data and Codes for 2024 Chub Mackerel Stock Assessment). As requested by TWG CMSA08, Japan (1) compared previous results with the autoregressive process and those revised with the IID process for age-1 fish and (2) investigated the impact of the narrower coverage of 2023 survey data. Japan concluded that in both cases changes in standardized abundance indices were minor.

Participants **agreed** to use the revised Japan's standardized abundance indices for age-0 fish and age-1 fish as inputs for the stock assessment.

Japan (Dr. Ken Ishida) presented an update on a standardization of egg abundances from monthly egg density data obtained by research surveys for the Pacific stock of chub mackerel up to 2023 (presentation is available on the Collaboration website under Input Data and Codes for 2024 Chub Mackerel Stock Assessment).

Participants **agreed** to use the updated standardization of egg abundances as an input for the stock assessment.

5.2. Finalization of abundance indices

Chair summarized the abundance indices to be used in the stock assessment as follows:

- China's lighting purse seine CPUE standardization agreed at this meeting
- Japan's summer survey CPUE standardization agreed at TWG CMSA08
- Japan's autumn survey of age-0 and age-1 fish CPUE standardization agreed at this meeting
- Japan's egg survey standardization agreed at this meeting
- Japan's dip net CPUE standardization agreed at TWG CMSA08
- Russia's trawl CPUE standardization as a sensitivity case, subject to approval by TWG CMSA after review

Agenda Item 6. Confirmation of finalized input data for stock assessment of chub mackerel

Chair presented the compiled data set that includes the agreed data and abundance indices from TWG CMSA08 and this meeting. The data set will be uploaded on the Collaboration site under Input Data and Codes for 2024 Chub Mackerel Stock Assessment.

Agenda Item 7. Progress on stock assessment model, biological reference points, and future projections

Japan (Dr. Shota Nishijima) presented a paper on SAM configurations in fitting to catch-at-age and abundance indices (document is available on the Collaboration website under Input Data and Codes for 2024 Chub Mackerel Stock Assessment). Japan highlighted the issues of selectivity and values for age-specific weights for China's abundance index and made suggestions how to overcome those issues.

In particular, Japan suggested that since the fleet-specific catch-at-age data is available, the fleet-specific F can be approximated as follows:

$$F_{a,y,f} \fallingdotseq \frac{C_{a,y,f}}{\sum_f C_{a,y,f}} F_{a,y} \text{ ,}$$

where $C_{a,y,k}$ are the observed catch number in age a and year y for fleet k.

As for values for age-specific weights, Japan suggested that the simplest way is to use the mean weight-at-age for biomass calculation, as in the SSB indices.

Participants **agreed** to use the approaches proposed by Japan.

Japan (Dr. Momoko Ichinokawa) gave a presentation on future projection script for SAM (presentation is available on the Collaboration website under Input Data and Codes for 2024 Chub Mackerel Stock Assessment). Japan uploaded the R script for future projection on the NPFC GitHub repository established by the Secretariat. It explained the content of the uploaded files and how to install packages required for stock assessment. Japan suggested to use "frasyr" package for calculating reference points instead of "OMutility" package.

Participants **agreed** to use "frasyr" package for calculating reference points instead of "OMutility" package. Japan will remove the latter package from the NPFC GitHub repository.

Agenda Item 8. Other matters

8.1. Reconfirmation of timeline towards TWG CMSA09 meeting

Chair updated the timeline towards TWG CMSA09 based on the outcomes of this meeting (Annex A).

Russia will submit a revised paper on CPUE standardization, and TWG CMSA Members will communicate by email to review the paper before the next intersessional meeting in April.

8.2. Dates of the 2nd intersessional meeting

Participants **agreed** to hold the next intersessional TWG CMSA meeting on 22-23 April 2024, 9 AM – 1 PM Tokyo time.

8.3. Others

8.3.1. Sharing of codes of SAM and future projection

Data Coordinator presented a progress report on the GIT repository plan for TWG CMSA (available on the Collaboration website under Input Data and Codes for 2024 Chub Mackerel Stock Assessment). The Secretariat established a private CMSA repository (https://github.com/The-North-Pacific-Fisheries-Commission/CMSA) accessible exclusively to registered TWG CMSA Members. It plans to transition from the current GitHub Free Plan to the nonprofit organization plan (GitHub Free Team Plan) upon approval of its application to GitHub. Members are advised to contact the Data Coordinator if they wish to get access to the NPFC GitHub repository.

Secretariat was **tasked** to develop a GitHub user manual and share it with Members for review by the next intersessional meeting in April.

8.3.2. Others

No other matters were raised.

Agenda Item 9. Close of the meeting

The meeting closed at 1:04 PM on 12 March 2024, Tokyo time.

Annex A

Timeline and activities for intersessional work from the conclusion of TWG CMSA08 to the next TWG CMSA meeting in mid-July

<table>
<tr><th colspan="2">Month</th><th>Catch@Age</th><th>Weight@Age</th><th>Maturity@Age</th><th>Abundance Indices</th><th>SAM/Future projection</th><th>BRP</th></tr>
<tr><td rowspan="4">Feb</td><td>Early</td><td>CHN submit CAL and CAA up to 2nd quarter 2023 by 10 Feb</td><td>RUS submit WAA up to 2nd quarter 2023 by 10 Feb</td><td>CHN submit revised and updated MAA up to 2nd quarter 2023 by 10 Feb</td><td>CHN submit revised abundance indices by 10 Feb</td><td rowspan="4">After GIT repository becomes available, SAM codes are posted</td><td></td></tr>
<tr><td>Mid</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>25-Feb</td><td colspan="4">Finalization of input data</td><td></td></tr>
<tr><td>Late</td><td colspan="4" rowspan="2">One-day intersessional meeting to check finalized input data on 12 March</td><td></td></tr>
<tr><td rowspan="3">Mar</td><td>Early</td><td></td></tr>
<tr><td>Mid</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Late</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="4">Apr</td><td>Early</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Mid</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>22-23 Apr</td><td colspan="6">Two-day intersessional meeting to check progress of stock assessment works on 22-23 April</td></tr>
<tr><td>Late</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">May</td><td>Early</td><td></td><td></td><td></td><td></td><td rowspan="2">Future projection codes are posted in</td><td></td></tr>
<tr><td>Mid</td><td></td><td></td><td></td><td></td><td></td></tr>
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	Late					GIT repository no later than end of May	Share updated frasyr with Members
Jun	Early						
	Mid	Working papers due					
	Late						
Jul	Early						
	Mid						
	17-20	TWG CMSA09					