North Pacific Fisheries Commission

Yearbook 2021-2022

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Yearbook

2021-2022

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FOREWORD

It is an honour for me, as the Chair of the North Pacific Fisheries Commission (NPFC), to present this Yearbook for the years 2021 to 2022. This Yearbook comprises the events and activities from June 2021 to March 2023 (i.e., meetings after COM06 and up to and including COM07).

Due to the Covid-19 pandemic, we were forced to hold online meetings over the two years. However, in the year 2023, we could finally hold an in-person meeting in a hybrid format for the first time since 2019.

During the period, the NPFC adopted and revised several Conservation and Management Measures, and agreed to proposals to strengthen relationships with other organizations. Regarding the membership, the European Union deposited its instrument of accession to the Convention, and became an official Member of the NPFC in 2022. Therefore, nine Members are now actively cooperating with each other, discussing the science and compliance matters, sharing the best scientific information available, and formulating Conservation and Management Measures for conserving fish stocks and protecting the marine environment, and dealing with IUU fishing.

Finally, I wish to express my sincere gratitude to all Members, invited experts, and observers for their invaluable contribution to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur.

Mr. Shingo OTA
Chair
North Pacific Fisheries Commission

ACKNOWLEDGEMENT

Like the Chairman, I also would like to congratulate our Members on this publication of the 2021 - 2022 NPFC Yearbook which incorporates the meetings held after COM06 and up to and including COM07. This record commemorates the Commission's performance, drawing from the commitment and contribution from Members and spans more than one calendar year due to a delay in Commission meetings.

COM07 in 2023 was the first in-person Commission meeting since COM05 in July 2019. The Commission was able to advance its work through the dedication and commitment of Members to meet virtually.

There are many people who I wish to appreciate for their hard work in preparation for the meetings held predominately virtually due to the COVID-19 pandemic. They are the Chair of the Commission, and Chairs of the Scientific Committee, Technical and Compliance Committee, Finance and Administration Committee, Management Strategy Evaluation Small Working Group for Pacific Saury, Small Scientific Committees, Technical Working Group, and intersessional working groups.

My thanks also go to our Rapporteur and Secretariat staff who were enthusiastic, dedicated, and wonderful to work with during the course of Commission meetings and in assisting the Members in carrying out the Convention's objectives.

This Yearbook was edited by Mr. Shinnosuke KATO (NPFC intern) and I very much appreciate his focus on getting this delayed project finished. We welcome comments or suggestions from readers on this Yearbook to improve the quality of this publication in the future.

Dr. Robert Day
Executive Secretary
North Pacific Fisheries Commission

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INTRODUCTION

The North Pacific Fisheries Commission (NPFC) is an inter-governmental organization established by the Convention on the Conservation and Management of High Seas Fisheries Resources in the North Pacific Ocean. The objective of the Convention is to ensure the long-term conservation and sustainable use of the fisheries resources in the Convention Area while protecting the marine ecosystems of the North Pacific Ocean in which these resources occur. The Convention was adopted on 24th February 2012 and came into force 180 days after receipt of the 4th ratification on 19th July 2015.

The task of the Commission is to achieve the objective by establishing management regimes to ensure the conservation and sustainable use of the fisheries resources of the North Pacific Ocean and its sensitive marine ecosystems. At present, there are nine (9) Members of the NPFC, namely: Canada, China, the European Union (EU), Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America, and the Republic of Vanuatu. Panama is a Cooperating Non-contracting Party (CNCP). The NPFC Secretariat is located in Tokyo, Japan. Dr. Robert Day is the Executive Secretary and has been leading the Secretariat since November 2022.

Fisheries resources covered by the Convention include all the fish, mollusks, crustaceans and other marine species caught by fishing vessels within the Convention Area, excluding:

(i) Sedentary species insofar as they are subject to the sovereign rights of coastal States and indicator species of vulnerable marine ecosystems as listed in, or adopted pursuant to the NPFC Convention, including at the moment four families of cold-water corals;
(ii) Catadromous species;
(iii) Marine mammals, marine reptiles and seabirds; and
(iv) Other marine species already covered by pre-existing international fisheries management instruments within the area of competence of such instruments.

Currently the fish species targeted by the NPFC Members include bottom fish stocks and pelagic fish stocks as follows:

- **<u>FISHERY FOR BOTTOM FISH STOCKS:</u>**

In the Northwestern Pacific Ocean, bottom trawl fisheries, bottom gillnet fisheries and bottom longline fisheries have been conducted over the Emperor seamounts by Japan, Korea and Russia. The primary target species of the bottom trawl fisheries have been North Pacific Armorhead (*Pentaceros wheeleri*), and splendid alfonsino (*Beryx splendens*), and the primary target species of the bottom gillnet fisheries have been splendid alfonsino, oreo (*Allocyttus verrucosus*) and mirror dory (*Zenopsis nebulosa*).

In the Northeastern Pacific Ocean, the seamount long-line fishery began in the 1970's. Four seamount aggregations (Eickelberg Seamounts, Warwick Seamount, Cobb Seamounts, and Brown

Bear Seamounts) have been fished by Canada, via longline hook and longline trap gear. The primary target species of both the above fishing gears has been sablefish (*Anoplopoma fimbria*).

- **FISHERY FOR PELAGIC FISH STOCKS:**

Pacific saury (*Cololabis saira*) is one of the major target species in the Convention Area and has been harvested by China, Japan, Korea, Russia, Chinese Taipei and Vanuatu. Most fleets mainly use stick-held dip nets or lift nets (a similar fishing method which uses fishing lamps) to catch Pacific saury. While Japanese and Russian vessels operate mainly within their EEZs, Chinese, Korean, Chinese Taipei and Vanuatu vessels operate mainly in the high seas of the North Pacific. Stock assessment of this species provides the basis for establishing conservation and management measures for the sustainability of the fishery.

A Chub mackerel (*Scomber japonicus*) fishery is also active in the NPFC Convention Area in the Northwestern Pacific Ocean. Similar with the Pacific saury, stock assessment for chub mackerel also determines if current conservation and management measures are enough to continue the sustainable use of these marine resources.

Neon flying squid (*Ommastrephes bartramii*) and Japanese flying squid (*Todarodes pacificus*) are traditionally harvested by squid jigging vessels within the Convention Area.

The Japanese sardine (*Sardinops melanostictus*) fishery has been the largest fishery by volume over the last five years, with increasing catch both in Member's waters (Japan and Russia) and in the Convention Area (China).

- **NPFC PERSONNEL:**

The personnel of the Secretariat and the Chairman are representatives of the multinational and multicultural nature of the Commission. At the time of publication, the Commission is led by the Chair, Mr. Shingo OTA. The Secretariat is headed by the Executive Secretary, Dr. Robert Day; with the Science Manager, Dr. Aleksandr Zavolokin; the Compliance Manager, Ms. Judy Dwyer; and supported by the Executive Assistant, Yuko Yoshimura-Takamiya; and the Data Coordinator, Mr. Sungkuk Kang. The Secretariat has also engaged temporary consultants for a limited period of time to assist the Commission in finance, compliance and science-related activities, and has benefited from secondees and interns over the course of the years.

- **PERIOD OF COVERAGE:**

This publication picks up immediately after the last reported activity of the previous Yearbook (after COM06) and covers key activities and Commission meetings held from the 4th Technical Working Group on Chub Mackerel Stock Assessment Meeting in June 2021 up to and including the 7th Commission Meeting in March 2023.

In its efforts to achieve the objective of the Convention, the Commission:

a. held formal scientific committee meetings on Pacific saury, bottom fish and vulnerable marine ecosystems, and stock assessments on chub mackerel as well as intersessional meetings of SC and its subsidiary bodies;
b. held 15 small working group meetings on compliance matters;
c. adopted two new CMMs (Sharks, and Prevention, Reduction and Elimination of Marine Pollution);
d. revised several CMMs (Transshipment, Vessel Registration, Bottom Fisheries and Protection of Vulnerable Marine Ecosystem in the Northwestern Pacific Ocean and in the Northeastern Pacific Ocean, Chub Mackerel, Pacific Saury, High Seas Boarding and Inspection Procedures, Japanese Sardine, Neon Flying Squid, Japanese Flying Squid, and Vessel Monitoring System);
e. adopted the Resolution on Climate Change.

In addition, the Secretariat, as an observer, participated in a number of international fisheries meetings, including NPAFC annual meeting, PICES annual meetings, WCPFC annual meeting, FAO COFI and RSN meetings, ICEC-PICES-FAO SPF symposium, IMCS sessions, Webinar BBNJ workshops, UN BBNJ meetings, PEW RFMO Compliance Workshop, FAO ABNJ Deep Sea Fisheries Project Validation workshop, FAO meeting *Use of still and video cameras to record deepwater shark and VME indicator catches by scientific observers*, NPAFC meeting regarding the research program of the 2022 pan-Pacific expedition, and NPAFC International Year of the Salmon North Pacific Steering Committee meeting. The Secretariat also increased public awareness of the NPFC activities, contributed to a newsletter, magazine and report of RSN and UN DOALOS, provided information and responded to the questionnaire of the International Whaling Commission and FAO.

The following pages provide the final approved reports of meetings of the North Pacific Fisheries Commission and its subsidiary bodies, provided in chronological order for meetings after COM06 up to and including COM07.

4th Meeting of the Technical Working Group on Chub Mackerel Stock Assessment

22-25 June 2021
Virtual
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MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 4th Meeting of the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA) of the North Pacific Fisheries Commission (NPFC) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Russian Federation, and the United States of America. An invited expert, Dr. Joel Rice, participated in the meeting. The European Union (EU) and the Pew Charitable Trusts (Pew) attended as observers.

2. The meeting was opened by the TWG CMSA Chair, Dr. Vladimir Kulik (Russia). Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

3. The Agenda was adopted without revision (Annex A). The List of Documents and Participants List are attached (Annexes B, C).

Agenda Item 3. Overview of the recommendations and outcomes of previous NPFC meetings relevant to chub mackerel

3.1 3rd TWG CMSA and 5th SC meetings

4. The Chair provided an overview of the recommendations made by the 3rd TWG CMSA meeting, which the 5th Scientific Committee (SC) meeting endorsed with slight modifications and recommended to the Commission meeting.

3.2 6th Commission meeting

5. The Science Manager, Dr. Alex Zavolokin, reported that the 6th Commission meeting adopted the majority of the TWG CMSA-related recommendations made by the SC. However, regarding the recommendation that the Commission give guidance on how to move forward,

including the setting of management objectives for the development of the management strategy evaluation (MSE), the Commission decided to change the primary target for MSE development from chub mackerel to Pacific saury. As for the recommendation that reporting requirements be changed such that Convention Area chub mackerel fisheries be required to report bycatch of pelagic species, the Commission agreed to defer discussions to its next meeting, due to time limitations.

3.3 Intersessional meetings of SWG OM

6. The SWG OM Lead, Dr. Shota Nishijima (Japan), provided an overview of the discussions and outcomes of the intersessional meeting of the SWG OM. The Lead outlined the issues related to developing an operating model and input data which require further discussions at the TWG CMSA meeting.

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

4.1 Update on intersessional work towards MSE

7. The Science Manager reported that no further progress on an MSE process for chub mackerel has been made since the last TWG CMSA meeting.

4.2 Recommendations and timelines for future work

8. The TWG CMSA discussed recommendations and timelines for future work under Agenda Item 9.

Agenda Item 5. Review of Terms of Reference and Protocols of the TWG CMSA

5.1 Terms of Reference

9. The TWG CMSA reviewed the Terms of Reference and determined that no revisions are currently required.

5.2 CPUE Standardization Protocol

10. The TWG CMSA reviewed the CPUE Standardization Protocol and determined that no revisions are currently required.

5.3 Stock Assessment Protocol

11. The TWG CMSA reviewed the Stock Assessment Protocol and determined that no revisions are currently required.

5.4 Protocol for the Operating Model Development

12. The TWG CMSA reviewed the Protocol for the Operating Model Development and determined

that no revisions are currently required.

Agenda Item 6. Review of Member's fisheries and research activities

6.1 Description of fisheries, inter alia, fishing seasons and fishing grounds

6.2 Research activities

13. Japan presented an updated description of its chub mackerel fisheries (NPFC-2021-TWG CMSA04-WP02). Japan's chub mackerel fisheries consist of large-scale (≥ 40 GRT) and small-scale (<40 GRT) purse seiners, set nets, and dip nets. Annual catch data showed a decadal variation. The largest catch is by large-scale purse-seiners. The monthly catch showed a periodic change annually over the recent decade. Catch starts to increase after the July-to-October period, when it is at its lowest annually, before peaking from the 4th quarter to the 1st quarter of the following year. The spawning season, from January to June, corresponds to the second half of the fishing year, such that the recruitment of age-0 fish occurs in the first half of the fishing year. Japan applied a fishing year reflecting this seasonal catch variation and biological background in its domestic stock assessment and recommended that the NPFC consider incorporating such a fishing year when developing the benchmark chub mackerel stock assessment.

14. The TWG CMSA discussed Japan's suggestion and noted that China, Russia, and Japan each have different fishing seasons. China and Russia explained that they manage chub mackerel based on a calendar year, rather than a fishing year, and pointed out that there could be problems developing calendar-year-based management measures from a stock assessment based on a fishing year. Japan pointed out that other regional fisheries management organizations (RFMOs) have been able to apply a fishing year for the stock assessment but the calendar year for developing management measures, for example in the case of Pacific bluefin tuna. A calendar illustrating the spawning season of chub mackerel and China, Japan and Russia's fishing seasons is attached as Annex D.

15. The TWG CMSA considered four possible options for addressing the issue of fishing year, as described below, and agreed to discuss them further at the next meeting:
    (a) Apply a fishing year beginning in July
    (b) Apply a fishing year beginning in April
    (c) Apply the calendar year
    (d) Apply a fishing year beginning in July for Japan and Russia, and the calendar year for China

16. Japan was requested to review and update its annual footprint data for chub mackerel by the

next TWG CMSA meeting as there seemed to be inconsistency between catch and effort data reported by Japan to the Secretariat. Japan clarified that mackerels are caught as bycatch by Japanese bottom trawlers operating in the Convention Area, which is why the catch but not the effort of those vessels is shown in the annual footprint data.

17. Russia presented an update of its chub mackerel fisheries with results for 2020 (NPFC-2021-TWG CMSA04-WP10). The 2020 Russian mackerel fishery situation was similar to that in 2019, with catch peaking during autumn and early winter. Over the past three years, annual catch has declined slightly. Russia conducted a trawl survey in the upper epipelagic zone off the Kuril Islands in August and early September 2020, and found a similar distribution of chub mackerel to 2019.

18. China presented a review of its chub mackerel fishery and research activities (NPFC-2021-TWG CMSA04-WP18) and the distribution of its catch of chub mackerel in 2020 (NPFC-2021-TWG CMSA04-WP15). In 2020, China operated a light-purse seine fishery and a small pelagic trawl fishery in the Convention Area. 51 purse seine vessels operated for a total of 8,459 fishing days and 2 trawl vessels operated for a total of 296 fishing days. In 2020, total catch was 94,256 tons and the majority of the catch occurred at around 40-43° north latitude and 150-154° east longitude. China collects and analyzes fishing logbooks every year and sends research specialist staff to fishing vessels or ports to collect sample data. It is also providing annual training for fishermen and enterprises via the Technical Group of Mackerel Fish. In future, China intends to strengthen its collection of fishery-dependent biological data for assessment of mackerel resources.

Agenda Item 7. Development of the operating model for the stock assessment of chub mackerel

7.1 Review of key considerations and specifications from the TWG CMSA03 meeting

19. The TWG CMSA reviewed the key considerations and specifications from the 3rd TWG CMSA meeting.

20. Japan presented updated age-common and age-specific natural mortality (M) estimators obtained from life-history parameters for chub mackerel in the northwestern Pacific Ocean (NPFC-2021-TWG CMSA04-WP05). Based on newly added data, which showed smaller fork lengths for five years of age and older, the growth coefficient (K) and asymptotic fork length (L∞) were estimated to be higher and lower, respectively, than the estimates Japan presented at TWG CMSA02 (NPFC-2019-TWG CMSA02-WP01 (Rev. 2)). The updated M values obtained from equations such as Pauly and Jensen were higher than previous ones because of the higher growth coefficient; accordingly, the median value of M among various estimators

was also higher. Japan also estimated age-specific M including age 0 using Gislason estimators. Japan suggested applying the median of updated estimators as the age-common M (0.53) and the updated Gislason estimates as the age-specific M (0.80 for age 0, 0.60 for age1, 0.51 for age 2, 0.46 for age 3, 0.43 for age 4, 0.41 for age 5, and 0.40 for age 6+), for rerunning candidate stock assessment models under the scenarios of operating models for the chub mackerel stock assessment.

21. China suggested that the TWG CMSA also consider time-varying M. Japan suggested that considering time-varying M is an issue toward the benchmark stock assessment rather than the development of the operating model.

22. China expressed its concern on the lack of goodness of fit for the von Bertalanffy growth function (VBGF) using updated data, which may affect the calculation of natural mortality with empirical estimators and consequentially bias the stock assessment results. China also suggested that Japan apply other growth functions to fit the growth of chub mackerel. On the lack of goodness of fit for VBGF, Japan responded that the goodness of fit by year class is not so bad according to Figure A2 in NPFC-2021-TWG CMSA04-WP05. Japan also explained that applying other growth function is possible but cannot be used to estimate M since M estimator uses parameters specific to VBGF.

7.2 Review of stock assessment results (VPA, ASAP, KAFKA, SAM)

23. China presented an updated stock assessment based on age-structured assessment program (ASAP) for the operating model for chub mackerel in the North Pacific Ocean (NPFC-2021-TWG CMSA04-WP01). The biomass of chub mackerel stayed at a high level before 1980, then declined to a low value, before recovering from 2010, with a similar trend for abundance and spawning stock biomass (SSB). Fishing mortality during 1985-2005 was high for chub mackerel and stock abundance was very low.

24. Japan suggested that the very low estimates of SSB_{MSY} may be due to the high steepness value used for the stock-recruitment relationship and that the results of the Kobe plots may be misleading. Furthermore, Japan pointed out that an issue with ASAP is that it assumes that the recruitment age is 1, but the actual recruitment age of chub mackerel is 0 and suggested appropriately applying a post-hoc analysis of stock-recruitment relationship after the running of ASAP.

25. The invited expert suggested that China conduct a likelihood profile on a global scaling parameter or choice of steepness to investigate their influence on the results.

26. The TWG CMSA suggested presenting preliminary results of the BSSPM at the next SWG OM meeting.

27. Japan presented the updated results of tuned virtual population analysis (VPA) and state-space assessment model (SAM) under the determined scenarios to include biological uncertainties on natural mortality, weight, and maturity (NPFC-2021-TWG CMSA04-WP08). The recent abundance estimates in VPA were much higher than those in the SAM and the recent fishing pressure was lower in the VPA. The scenarios under the highest maturity and weight estimated higher SSB in recent years and larger retrospective biases of SSB than the other scenarios in both SAM and VPA. The application of a continuous hockey-stick stock-recruit model enabled estimation of feasible biological reference points. A few potential problems were found in both SAM and VPA: (1) the abundance indices from China and Russia were extremely hyper-stable against vulnerable stock size, (2) depletion statistics such as SSB/SSB0 and SSB/SSB_{MSY} were highly sensitive to the choices of stock-recruit function, and (3) the MSY-based reference points were moderately sensitive to the biological parameters of maturity- and weight-at-age.

28. China noted the retrospective patterns and large Mohn's rho values for the SAM and VPA results. China suggested that these could be due to misspecifications of survey catchability and natural mortality and that Japan try different specifications of those parameters to see if they reduce the retrospective patterns. Japan agreed to do so, while expressing the view that the retrospective patterns are likely due to different assumptions of weight-at-age and maturity-at-age.

29. Russia presented an updated preliminary chub mackerel stock assessment using a KAFKA model (NPFC-2021-TWG CMSA04-WP09). The preliminary chub mackerel SSB estimation is 3,035,000 t for 2019 and 2,246,000 t for 2020. Japan pointed out that Russia used the two SSB indices and analyzed a single base-case scenario, and requested that Russia use all six abundance indices and analyze all six scenarios at the next meeting of the SWG OM. Russia was requested to continue to develop the KAFKA model and run it for all determined scenarios and all agreed abundance indices, as well as to share the technical details of the model.

7.3 Review of assumptions and parameters from the stock assessment models

7.4 Review of major sources of uncertainty to be included in the operating model

30. The TWG CMSA reviewed the stock assessment model assumptions and parameters, and major sources of uncertainty to be included in the operating model.

31. Regarding the natural mortality scenario, the TWG CMSA agreed to use the previous estimates of M (NPFC-2019-TWG CMSA02-WP01 (Rev. 2)). For age-0 M in Gislason1, an extrapolated value was calculated (0.57; using a second order polynomial from the values of age-1 – 0.47; age-2 – 0.38; age-3 – 0.32; age-4 – 0.28; age-5 – 0.26; age-6+ – 0.24).

32. Regarding the maturity-at-age and weight-at-age scenarios, the TWG CMSA agreed to keep the three existing scenario settings (average, highest, lowest).

33. The TWG CMSA formulated an updated table of stock assessment model settings (Annex E).

7.5 Review of scenarios for the operating model

34. The TWG CMSA reviewed and revised the table of scenarios for the operating model (Annex F). The TWG CMSA added a column of "Weight" to Annex F, which is indicative of a future weighting scheme that may be developed if multiple scenarios are adopted for the evaluation of the fit of stock assessment models to the operating model.

7.6 Review of the rules for prioritization of the performance measures

35. The invited expert proposed guiding questions for the interpretation of the performance measures, suggested possible initial performance measures, and highlighted the importance of model diagnostics (NPFC-2021-TWG CMSA04-WP14).

36. The TWG CMSA reviewed the table of performance measures for evaluating the stock assessment models agreed to at TWG CMSA03 while considering the invited expert's suggestions and formulated a table of priority performance measures for evaluating the stock assessment models (Annex G).

7.7 Technical aspects of using POPSIM-A as an operating model for testing chub mackerel stock assessment models

37. The TWG CMSA discussed the technical aspects of using POPSIM-A as an operating model for testing chub mackerel stock assessment models.

7.8 Finalization of specification of the operating model for testing chub mackerel stock assessment models

38. The TWG CMSA finalized the specification of the operating model for testing chub mackerel stock assessment models and agreed that the timeframe of the pseudo-data would be from 1970-2019 and that the number of generated pseudo-data for each scenario would be 100. The TWG CMSA agreed that the scenarios presented in Annex F would be considered.

7.9 Recommendations and timelines for future work

39. The TWG CMSA reviewed the timeline for future work as agreed by the SWG OM during the intersessional period and agreed on the need to hold an additional SWG OM meeting in late August 2021 to update and rerun the candidate stock assessment models before the generation of pseudo-data by the invited expert. The TWG CMSA discussed the tasks to be completed before the SWG OM meeting and drafted a revised timeline for inclusion in the Work Plan of the TWG CMSA (Annex H).

40. The TWG CMSA tasked the SWG OM to review the results of the updated stock assessment models. The TWG CMSA agreed that if the updated stock assessment results for all agreed scenarios (except BSSPM) are not provided to the SWG OM meeting, the model will be excluded from the list of candidate stock assessment models. For BSSPM, description of model configuration and stock assessment results with the base case scenario is to be provided.

Agenda Item 8. Development of data for the stock assessment of chub mackerel

8.1 Data inventory (catch, size, abundance indices, etc.) and updates

41. Russia presented its methodology for calculating catch- and weight-at-age data for chub mackerel (NPFC-2021-TWG CMSA04-WP11). Size data were collected from research surveys in 2016-2020 as well as from fishery observers. Fish fork length was measured, and some fish were weighed. Weight-length relationships by 3-month periods and years were compiled. Age composition of catch was calculated using weight-length relationships and Japanese age-length keys (ALKs) for the northeastern region.

42. Russia was requested to present an abundance index from its research survey at the next TWG CMSA meeting.

43. China presented a description of its available data (NPFC-2021-TWG CMSA04-WP16). China explained its methodologies for sampling, ALK development, and estimating catch-at-age from the ALK, and presented its data for length and age distribution, length-weight relationship, catch-at-age, and number-at-age.

44. The TWG CMSA suggested that China clarify the methodology of ALK development and use year-specific ALK.

45. The TWG CMSA reviewed and updated the table of potentially available data for stock assessment of chub mackerel (Data availability for CMSA).

8.2 Standardized fishery-dependent/independent indices

46. Japan presented the standardized CPUE of its commercial dip-net fishery targeting spawners of chub mackerel in the northwestern Pacific Ocean using delta GLM (NPFC-2021-TWG CMSA04-WP03).

47. Japan presented its standardized monthly egg survey data using the vector autoregressive spatio-temporal (VAST) model for use as an abundance index for SSB of chub mackerel in the northwestern Pacific Ocean (NPFC-2021-TWG CMSA04-WP04).

48. Japan presented a standardized abundance index for recruitment of chub mackerel in the northwestern Pacific Ocean derived by applying delta-GLM-tree models to data from summer (June and July) and autumn (September and October) surface trawl surveys (NPFC-2021-TWG CMSA04-WP06).

49. China presented the standardized CPUE for chub mackerel caught by its lighting purse seine fishery up to 2019 using GAM (NPFC-2021-TWG CMSA04-WP17).

50. The TWG CMSA encouraged China to improve its CPUE standardization and the documentation of the standardization methodology by the next TWG CMSA meeting. A list of potential improvements was communicated and it was agreed that progress would be made to resolve these intersessionally.

51. Russia was encouraged to submit a CPUE standardization document to the next TWG CMSA meeting.

8.3 Biological information

52. Japan presented an analysis of the maturity-at-age of chub mackerel under different stock levels in the northwestern Pacific Ocean (NPFC-2021-TWG CMSA04-WP07). The timing of maturity was variable depending on the stock levels. The maturation length was consistent throughout the different stock levels. Since the growth rate is affected by the density-dependent effect, the variation of the timing to reach the length at maturity is also density-dependent. Since maturity-at-age is variable based on the density, Japan recommended that density-dependent maturity-at-age be incorporated in the chub mackerel stock assessment.

8.4 Observer Program

53. The Science Manager presented a summary of Members' views on the potential establishment

of an observer program for chub mackerel (NPFC-2021-TWG CMSA04-WP13 (Rev. 1)).

54. The TWG CMSA considered the summary and held further discussions. Most Members noted the necessity of an observer program for chub mackerel and its value in filling data gaps and aiding the stock assessment process. However, some Members expressed the view that it would be premature to establish an observer program at this time. The TWG CMSA agreed on the need for further discussions, including the possible objectives of an observer program and the types of data that could be collected.

55. Pew expressed its strong support for the development of a regional NPFC observer program, highlighting its scientific benefits. Pew encouraged the TWG CMSA to identify types of data that could be collected by such a program, as requested by the SC.

56. The TWG CMSA revisited the recommendation made at TWG CMSA03 that reporting requirements be changed such that Convention Area chub mackerel fisheries be required to report bycatch of pelagic species. The TWG CMSA recognized the scientific value of reporting bycatch of pelagic species but could not reach consensus on revising the CMM.

8.5 Recommendations for future work

57. The TWG CMSA agreed to continue discussions towards potentially developing an observer program for chub mackerel.

58. The TWG CMSA agreed to continue discussions on the reporting of bycatch of pelagic species by Convention Area chub mackerel fisheries.

Agenda Item 9. Review of the Work Plan of the TWG CMSA

59. The TWG CMSA reviewed and updated the Work Plan of the TWG CMSA (NPFC-2021-TWG CMSA04-WP12 (Rev. 2)).

60. The TWG CMSA recommended hiring an external expert to continue the work to develop an operating model (PopSim) and test chub mackerel stock assessment models, if needed, in the next year.

Agenda Item 10. Other matters

10.1 Next TWG CMSA meeting

61. The TWG CMSA suggested that two meetings be held in 2022, possibly in spring and fall, with the specific dates and meeting format to be determined intersessionally via correspondence.

10.2 Other matters

62. No other matters were discussed.

Agenda Item 11. Recommendations to the Scientific Committee

63. The TWG CMSA agreed:
    (a) To hold further discussions on aggregating data by fishing year and/or calendar year.
    (b) To rerun the models using the latest determined scenarios for the operating model by the next SWG OM meeting (Annex F).
    (c) To use the revised performance measures for evaluating the stock assessment models in the development of the operating model (Annex G).
    (d) To update the standardized abundance indices and other data for use in the stock assessment and provide a standardized abundance index of Russian fishery.

64. The TWG CMSA recommended the following to the SC:
    (a) The TWG CMSA recommended the Work Plan of the TWG CMSA (NPFC-2021-TWG CMSA04-WP12 (Rev. 2)).
    (b) The TWG CMSA recommended hiring an external expert to continue the work to develop an operating model (PopSim) and test chub mackerel stock assessment models, if needed, in the next year.
    (c) The TWG CMSA recommended holding two meetings in 2022, possibly in spring and fall, with the specific dates and meeting format to be determined intersessionally via correspondence.

Agenda Item 12. Adoption of the Report

65. The report was adopted by consensus.

Agenda Item 13. Close of the Meeting

66. The meeting closed at 15:24 on 25 June 2021, Tokyo time.

Annexes:

Annex A – Agenda
Annex B – List of documents
Annex C – Participants list
Annex D – Calendar of the spawning season of chub mackerel and fishing seasons of China, Japan and Russia
Annex E – Settings of the stock assessment models used for the conditioning of operating models
Annex F – Scenarios for operating models
Annex G – Priority performance measures for evaluating the stock assessment models
Annex H – Flowchart for the development of operating models and testing stock assessment models

Please refer to the NPFC website for the complete annexes

7th Meeting of the Small Scientific Committee on Pacific Saury

8-11 October 2021
Virtual
Meeting Report

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- 11.1 Specification of models and development of software
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- 12.1 Initial discussions on RPs and MSE
- 12.2 Recommendations for future work

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- 13.1 Draft agenda and priority issues for next meeting
- 13.2 Other

Agenda Item 14. Adoption of Report

Agenda Item 15. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 7th Meeting of the Small Scientific Committee on Pacific Saury (SSC PS07) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, and Vanuatu. Dr. Larry Jacobson participated as an invited expert.

2. The meeting was opened by Dr. Toshihide Kitakado (Japan), the SSC PS Chair, who welcomed the SSC PS. The Science Manager, Dr. Aleksandr Zavolokin, outlined the procedures for the meeting. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

3. The agenda was adopted without revision (Annex A). The List of Documents and Participants List are attached (Annexes B, C).

Agenda Item 3. Overview of the outcomes of previous NPFC meetings

3.1 SSC PS06, SC05 and SCsm01 meetings

4. The Chair presented the outcomes and recommendations from the SSC PS06, SC05 and SCsm01 meetings.

3.2 COM06 meeting

5. The Science Manager presented the outcomes from the sixth Commission meeting and an overview of Conservation and Management Measure (CMM) 2021-08 For Pacific Saury.

3.3 Joint SC-TCC-COM Small Working Group on MSE for Pacific saury (SWG MSE PS)

6. The Science Manager reported on the intersessional activities towards the establishment of a joint SC-TCC-COM Small Working Group on Pacific saury (SWG MSE PS).

Agenda Item 4. Review of the Terms of References of the SSC PS and existing protocols

4.1 Terms of References of the SSC PS

7. The SSC PS reviewed the Terms of References of the SSC PS and determined that no revisions are currently necessary.

4.2 CPUE Standardization Protocol

8. The SSC PS reviewed the CPUE Standardization Protocol and determined that no revisions are currently necessary.

4.3 Stock Assessment Protocol

9. The SSC PS reviewed the Stock Assessment Protocol and determined that no revisions are currently necessary.

Agenda Item 5. Review of Member's fishery status including 2021 fishery

10. Canada presented information about Pacific saury catch by its commercial and research vessels. There is only a single record of Pacific saury bycatch in commercial fishing gear. This record was from the hook and line halibut fishery in 2006. From research vessels, the CPUE of Pacific saury in survey catches (bottom trawl, midwater and surface trawls) is zero in most years. In 2006, 2009 and 2012 there were a total of 5 bottom trawl survey tows capturing Pacific saury (1, 7, 1, 1 and 3 individuals, respectively). The Pacific saury were mostly captured on the outer coast surveys and inside Queen Charlotte Sound in the eastern North Pacific. However, this mostly reflects the areas where the surveys are conducted (on the shelf and continental slope exclusively), rather than representing the distribution of Pacific saury in the northeast Pacific Ocean. There are also reports of juvenile and adult Pacific saury being captured on oceanographic cruises to Ocean Station P using bongo nets. However, this data was not available.

11. China presented its fisheries activities. Annual catch and nominal CPUE of Chinese fishery in 2020 were 44,006 tons and 9.51 tons/vessel/day, respectively, which were both the lowest values after 2014. The number of vessels in 2020 was 57. In 2021, Chinese accumulated catch from May to September was about 21,000 metric tons.

12. Japan presented its fisheries activities. Annual catch was 29,562 tons in 2020, which is the lowest after 1950. In 2021, Japanese accumulated catch from August to September was 5,317 metric tons, which was the third lowest after 2000. Nominal CPUE from August to September in 2021 was 0.50 tons/haul, which was the second lowest value after 2000. The fishing conditions in 2021 also continue to be low. The fishing grounds in August and September 2021

were mainly distributed in the high seas area between 150°E and 163°E longitude.

13. Korea presented its fisheries activities. Annual catch was 5,993 tons in 2020 which was the historical low. In 2021, Korean accumulated catch from June to September was 2,818 metric tons, which was the second lowest after 2001. Nominal CPUE from June to September in 2021 was 3.6 tons/vessel/day, which was the lowest value after 2001. The start of fishing was delayed around a month in 2020 and 2021. The Korean fleet started its fishing around 168°E longitude and gradually moved to the west.

14. Russia presented its fisheries activities. Annual catch was 753 tons in 2020, which is the lowest since 1959. Three Russian fishing vessels operated in the Convention Area in June-August 2021. The fishing grounds were mainly distributed in the high seas area between 156°E and 173°E longitude. The total catch by the end of August 2021 was 320 tons.

15. Chinese Taipei presented its fisheries activities. The catch recovered to around 180,000 tons in 2018 and showed a declining trend since then. In 2021, fishing vessels began operations in fishing grounds earlier than previous years. The saury distribution in 2021 was noted to be more northerly in comparison with the same period of 2020, and the nominal CPUE from June to September was 5.2 tons/vessel/day in 2021.

16. Vanuatu presented its fisheries activities. The Pacific saury fishery was first developed in 2004, and the total number of authorized fishing vessel at its historical level is 16. Annual catch in 2020 was the lowest recorded since 2015. Nominal CPUE in 2020 was historically low at 9.64 tons/vessel/day. The current estimated catch amount for 2021 by September is 542 tons. Fishing grounds shifted to the west earlier in 2021. Vanuatu also presented its development aspiration to rebuild its number of fishing vessels to 16 in the future and increase catches accordingly, and requested the SSC PS to consider its aspiration when making recommendations to the SC and the Commission.

17. The SSC PS agreed that each Member will submit its fisheries status information to SSC PS08 in accordance with the agreed template. The information will include:
    (a) Time series of annual catch
    (b) Time series of number of vessels and, if available, other relevant information such as size of vessel
    (c) Accumulated catch by 10-day period for current and past years
    (d) Catch by 10-day period for current and past years
    (e) Time series of nominal CPUE with the most recently available data

(f) Spatial pattern of fishing grounds over current and past years and a summary of the spatial pattern based on the catch-weighted average latitude and longitude by month
(g) Size and age compositions, if possible

18. The SSC PS encouraged Members to present their nominal CPUE data up to the end of November 2021 to SSC PS08.

Agenda Item 6. Biological and environmental information relevant to Pacific saury

6.1 Review of new biological information

19. Japan presented an estimation of the proportion of Pacific saury spawned during their first spawning season (PSFS) based on histological observations of ovary tissues (NPFC-2021-SSC PS07-WP03). Ovaries were sampled by surveys covering the distribution area of Pacific saury widely during the end of the spawning season (June and July) in 2013-2019. Combining these histological results with the biomass estimates derived from a swept area method, Japan estimated the annual PSFS, which varied from 13.0% to 63.1%, with a mean of 31.1% and a median of 28.3%. Japan found no evidence of spawning-related mortality and considered its estimates of PSFS to be plausible. Japan suggested that PSFS could be regarded as the maturity ratio of age-0 in the age-structured model.

20. China pointed out the wide range of results (13-63%) with low precision in the PSFS estimation. The results also indicated the significant spatial and temporal variations of PSFS. China suggested that Japan conduct further analysis to evaluate the potential reasons and influencing factors. Additionally, the strong assumptions of the radius of the otolith annual ring and sex ratio cannot support the hypothesis of spawning-related mortality. China suggested that future studies focus more on improving the estimation of PSFS based on further analysis of the influencing factors.

21. Japan explained that the wide variation of PSFS might be explained by interannual variation of prey environment and/or dominant seasonal cohorts of Pacific saury.

22. Japan provided a short summary of NPFC-2021-SSC PS07-WP10, which describes the length-weight relationship and weights at age information for Pacific saury for summer, autumn, and winter.

6.2 Review of environmental information relevant to Pacific saury distribution and migration

23. Japan presented a review of the effects of environmental factors on distribution, migration and recruitment of Pacific saury (NPFC-2021-SSC PS07-WP04). The distribution and migration

route of Pacific saury in autumn fluctuated from west to east depending on the period. In general, a suitable environment for the distribution of Pacific saury is formed along the Oyashio in autumn, thus they migrate through the Oyashio. The mechanism of the eastward shift of the distribution and migration route in autumn has recently been explained by two factors: 1) the change of the pathway of Oyashio making it difficult to form a suitable habitat of Pacific saury in the waters around east of Hokkaido, and 2) eastward shift of the distribution of Pacific saury in early summer. There might also be other unknown factors affecting distribution and migration. The environment in the spawning/nursery ground would be important for the recruitment variation. It should be noted that the relationship between environmental factors and the ecology of Pacific saury may not be consistent in the long term, given the complex life history of Pacific saury.

24. Japan presented a study of the effects of the environment on Pacific saury recruitment (NPFC-2021-SSC PS07-WP05). The study was conducted using a state space population dynamics model with robust estimation of environmental effects by selecting random effect variance via retrospective forecasting. Japan found that, among several candidate environmental indices (Pacific decadal oscillation (PDO) index, North Pacific gyre oscillation (NPGO), Southern oscillation index (SOI), Kuroshio position index (KPI), and local sea surface temperature (SST)), KPI, which explains the position of the Kuroshio axis, improved the prediction performance of the Pacific saury recruitment. The other environmental indices did not improve the prediction which suggests that recruitment is a relatively local event, rather than an oceanic-level event.

25. The SSC PS noted that the KPI in particular may be useful and could be examined in environmental recruitment studies.

26. China suggested that the SSC PS conduct further analyses of which environmental factors would be useful to include in future stock assessment models.

6.3 Distribution and migration patterns of juvenile Pacific saury

27. The Chair reminded participants about a request from the Commission to submit relevant scientific information on the geographical distribution of juvenile fish in the Convention Area, and its migration patterns in order to develop management measures to protect juvenile fish (CMM 2021-08, paragraph 14). The request was first addressed by SSC PS04. The SSC PS encouraged Members to present further scientific information relevant to the distribution and migration of juvenile Pacific saury to subsequent meetings.

6.4 Recommendations for future work

28. The SSC PS encouraged Members to continue analyses on Pacific saury that spawned during their first spawning season and the effects of environmental factors on distribution, migration and recruitment of Pacific saury.

Agenda Item 7. Review of the statistical data available

7.1 Annual catch

29. The SSC PS reviewed the compiled data on Pacific saury catches in the Northwestern Pacific Ocean up to 2020 (NPFC-2021-SSC PS07-WP01 (Rev. 1)) and agreed to use the data for the stock assessment (Annex D).

30. The SSC PS noted NPFC-2021-SSC PS07-WP12 (Rev. 1), which summarizes Vanuatu's Pacific saury catch and CPUE data from its stick-held dip net fishery in the North Pacific Ocean during 2013-2020. The SSC PS noted the usefulness of the information in the paper and encouraged Vanuatu to continue to provide such information at future meetings.

7.2 Size and age composition

31. Dr. Wen-Bin Huang, the SWG co-lead, reported on the progress of the SWG for estimating each Member's catch-at-size (CAS) data on behalf of Dr. Satoshi Suyama, the SWG co-lead. Most Members have submitted their CAS data updated to 2020 by SSC PS07, but two Members have not submitted 2019 and 2020 CAS data. Members employed two methods for CAS estimation: random sampling from fishing vessel catch (China, Japan, and Russia) and estimation from the total number of each size box (Korea, Chinese Taipei, and Vanuatu). The CAS data can be converted to catch-at-age data using age-length keys. These data will contribute to the development of the age structured models.

32. The SWG co-lead outlined the protocols for calculating CAS data used by Japan (NPFC-2021-SSC PS07-IP01), China (NPFC-2021-SSC PS07-WP19), Russia (NPFC-2021-SSC PS07-WP20), and Chinese Taipei (NPFC-2021-SSC PS07-15 & 18), and the methods used by Korea and Vanuatu.

33. Japan provided a supplementary explanation of NPFC-2021-SSC PS07-IP01 and reminded the SSC PS that this was previously submitted as a working paper to SSC PS05.

34. Chinese Taipei provided a short summary of NPFC-2021-SSC PS07-IP02, which describes body length distributions and age compositions of the Pacific saury caught by the Chinese Taipei saury fishery in 2007-2018 and was submitted as a working paper to SSC PS06.

35. Preliminary information on size and age composition data of Pacific saury from Members were provided to the SSC PS07 meeting for the purpose of developing the age-structured model. Chinese Taipei visualized the size and age composition data from Japan (2000-2018), Chinese Taipei (2007-2018), Russia (2000-2018), and Korea (2001-2019). Seasonal changes of size and age compositions of the Members were also developed. Since the updated size and age composition data in 2020 have been made available at this meeting, the preliminary results could be improved by including the latest dataset.

7.3 Others

36. The SSC PS agreed to continue the intersessional work of the SWG for further development of a standardized approach to determining, collecting and sharing age and size data.

Agenda Item 8. Review of fishery-independent abundance indices

8.1 Review of outcomes of Japanese biomass survey including 2021 estimate

37. Japan presented the historical biomass/number estimates and weight/number-based indices of Pacific saury from the Japanese fishery independent survey up to 2021 (NPFC-2021-SSC PS07-WP08 (Rev. 1)). The total biomass estimated by swept area method was 845 thousand metric tons, which consisted of 537 thousand and 458 thousand metric tons of age-0 and age-1 fish, respectively. Japan noted that the sum of age-0 and age-1 fish weight does not equal the total weight because Japan used a tentative length-weight relationship in 2021.

38. The estimated total biomass in 2021 was the lowest level recorded but was probably underestimated because the easternmost and a part of the second easternmost lines were not surveyed due to the unavoidable return of the vessel. For an equitable comparison, Japan also estimated the time series of biomass for only the area surveyed in 2021 and the trend was generally the same. The Vector Autoregressive Spatio-temporal (VAST) modeling procedure described below was used to account for the incomplete sampling.

39. Japan presented the Japanese survey biomass index of Pacific saury up to 2021 (NPFC-2021-SSC PS07-WP06). Japan applied a VAST model to Japanese fishery-independent survey data to predict the Pacific saury distribution and estimate the biomass index from 2003 to 2021 including the unsampled area. The estimated biomass index from the selected VAST model with minimum AIC indicated similar year trends with the index from a design-based approach after 2010. The estimated biomass index dropped to a low level in 2020 but was highly uncertain. It remained low in 2021 and had typical precision. Japan recommended using the biomass index estimated by the VAST model as the input for the stock assessment, pointing

out that the VAST model has the advantage of being able to estimate the abundance of missing survey areas and the non-zero risk of surveys being suspended or disrupted in the future due to unpredictable circumstances like the COVID-19 pandemic or an injury to a crew member.

40. The SSC PS thanked Japan for continuing to conduct its biomass survey, which has contributed greatly to understanding the Pacific saury stock, and for continuing to conduct the technical work to improve the abundance estimates.

8.2 Conclusion as inputs for stock assessments

41. The SSC PS agreed to use the biomass index estimated by the VAST model as the input for the stock assessment (Annex D) and to include the 2020 estimate but reflect the higher level of uncertainty compared to other years using the CV as shown in Annex F.

8.3 Plans for future surveys by Members

42. Japan indicated that it plans to conduct its biomass survey in 2022 and the following years.

8.4 Recommendations for future work

43. The SSC PS noted the high percentage of missing biomass in the biomass survey in recent years, which suggests that age-0 fish may have shifted to eastern areas further offshore. The SSC PS suggested that it would be worthwhile considering extending the Japanese biomass survey further east, while recognizing that there may be logistical constraints that make this difficult. The SSC PS encouraged Japan to present next year's survey plan at the December meeting for further discussion.

44. The SSC PS encouraged Members to conduct research surveys or share data from existing research surveys that could complement the Japanese large-scale biomass survey and provide useful information for understanding the Pacific saury abundance, spatio-temporal distribution, and any other relevant biological or ecological information.

45. The SSC PS suggested that Japan use a species distribution model to try to identify any distribution patterns in the early, middle and late biomass survey years, and investigate if there is a suitable habitat for Pacific saury beyond the current survey area.

46. The SSC PS noted the continual improvements that have been made to the VAST-based method for estimating biomass indices and agreed to continue to estimate the biomass indices using the VAST model.

Agenda Item 9. Review of fishery-dependent abundance indices

9.1 Member's CPUE standardization up to 2020 fishery

47. Russia presented a standardization of CPUE data for Pacific saury from 1994 to 2020 using generalized linear model (GLM) (NPFC-2021-SSC PS07-WP02). Russia recommended using the standardized CPUE derived from GLM as input for the stock assessment.

48. The SSC PS agreed to use Russia's standardized CPUE derived from GLM as the input for the stock assessment.

49. Japan presented a standardization of CPUE data for Pacific saury from 1994 to 2020 using GLM (NPFC-2021-SSC PS07-WP07). Japan recommended using the standardized CPUE derived from GLM as input for the stock assessment. Japan also pointed out that the standardized CPUE in 2020 had decreased to the lowest level since 1994.

50. The SSC PS agreed to use Japan's standardized CPUE derived from GLM as input for the stock assessment.

51. China presented a standardization of CPUE data for Pacific saury from 2013 to 2020 using a GLM and a generalized additive model (GAM) on the assumption of lognormal distribution of errors (NPFC-2021-SSC PS07-WP13 (Rev. 1)). China recommended using the standardized CPUE derived from GAM as the input for the stock assessment.

52. The SSC PS agreed to use China's standardized CPUE derived from GAM as the input for the stock assessment.

53. Chinese Taipei presented a standardization of CPUE data for Pacific saury from 2001 to 2020 using GLM and GAM on the assumption of lognormal distribution of errors (NPFC-2021-SSC PS07-WP14). Chinese Taipei recommended using the standardized CPUE derived from GAM as input for the stock assessment.

54. The SSC PS agreed to use Chinese Taipei's standardized CPUE derived from GAM as the input for the stock assessment.

55. Korea presented a standardization of CPUE data for Pacific saury from 2001 to 2020 using GLM (NPFC- 2021-SSC PS07-WP18). Korea recommended using the standardized CPUE derived from GLM as input for the stock assessment.

56. The SSC PS agreed to use Korea's standardized CPUE derived from GLM as the input for the stock assessment.

57. The SSC PS noted that China and Korea did not extract the CPUE using a method that can account for spatial heterogeneity of effort, as required by the CPUE Standardization Protocol, but recognized that this would not affect the stock assessment. The SSC PS encouraged China and Korea to follow the CPUE Standardization Protocol fully in future.

58. In future, Members should fully adhere to the CPUE Standardization Protocol barring any special reason not to.

59. The finalized table of abundance indices is attached to the report as Annex D. A plot of Members' standardized CPUEs is attached to the report as Annex E.

9.2 Joint CPUE standardization up to 2020 fishery

60. Chinese Taipei presented a joint CPUE standardization of Pacific saury in the Northwest Pacific Ocean from 2001 to 2020 using a VAST model (NPFC-2021-SSC PS07-WP16). The spatio-temporal effect had the largest influence on the time series of estimated CPUE among all variables. The results indicated that the annual standardized CPUE trend had a fluctuating pattern over the studied periods, and the annual standardized CPUE value was at the lowest level below average (2001-2020) in 2020. Correlation analysis indicated that the joint index could resolve the issue of inconsistency among individual indices (p=0.5-0.8).

61. The SSC PS agreed to use the standardized joint CPUE as an input for the stock assessment.

9.3 Recommendations for future work

62. The SSC PS agreed that each Member will continue to submit their standardized CPUEs as inputs for the stock assessment.

63. The SSC PS agreed to continue to discuss issues related to the method of extracting the CPUE in the CPUE standardization intersessionally.

64. The SSC PS agreed to continue the joint CPUE standardization work, while further investigating how to account for issues such as size/age-selectivity and fleet type effects.

Agenda Item 10. Stock assessment using "provisional base models" (BSSPM)

10.1 Review of the key considerations and recommendations from the SCsm01 meeting

65. The SSC PS reviewed the outcomes of the SCsm01 meeting, including the agreed upon updated BSSPM specification.

10.2 Specification of models

66. The SSC PS further updated the BSSPM specification (Annex F). The two sensitivity cases with q_{bio}~$U(0,2)$ were eliminated because it seems clear that q_{bio} values larger than 1 are unlikely for the Japanese survey.

67. The SSC PS agreed to use the existing template for stock status information and future projection developed by SSC PS05 (NPFC-2019-SSC PS05-Final Report, Annex H), with a two year adjustment to use the most recent available information.

10.3 Workplan and timeline until the SSC PS08

68. The SSC PS agreed on a workplan and timeline as follows:
    (a) Conduct updated stock assessments based on the updated BSSPM specifications and submit the results by November 10.
    (b) If possible, test the incorporation of environmental effects in the BSSPM model and submit the results by November 30.
    (c) If possible, conduct trial analyses with consideration of different uses of indices in the BSSPM model and submit the results by November 30.

Agenda Item 11. New stock assessment models

11.1 Specification of models and development of software

69. Japan proposed an example state-space age-structured stock assessment model for Pacific saury (NPFC-2021-SSC PS07-WP21). Japan tested several treatments of the natural mortalities and age-0 spawning. Based on the obtained results, Japan did not recommend free-estimation of the age-specific natural mortalities without validation of the biological plausibility of the obtained results. Japan suggested that introducing some assumptions on the natural mortalities would be a potential option. It also suggested carefully considering the assumptions on the spawning ability of age-0 fish.

70. The SSC PS welcomed the work done by Japan and suggested some issues for further investigation, including the assumption of natural mortality, measurement error in observed catch, and estimation of age-based selectivity.

71. A report was provided on the joint study conducted by scientists of China, Japan and Chinese Taipei to propose the use of Stock Synthesis 3 (SS3) as a candidate age-structured model for

the Pacific saury stock assessment (NPFC-2021-SSC PS07-WP22). The work is still in the early stages so the specification has been kept simple in order to set up a framework for using the available data sets. The structure of the model will continue to be improved by diagnosing convergence, goodness of fit, consistency of model via retrospective analysis and model predictability, which will take into account uncertainties in parameters and other assumptions to produce a set of plausible scenarios and robustness scenarios. Better spatial and temporal resolutions will also be considered to account for the effects of environmental changes and temporal patterns of migration and fishing activities. The advantages of using the existing SS3 software include the ease with which results can be shared without having to check the code and features such as the availability of diagnostic tools, simulation platforms and links to activities for Management Strategy Evaluation (MSE). Further results will be presented at SSC PS08.

72. The SSC PS welcomed the joint work and suggested some issues for further investigation, including the estimation of fecundity and the maturity ratio.

11.2 Workplan and timeline until the SSC PS08

73. The SSC PS encouraged Members to provide further updates on the development of potential age-structured models by November 30.

Agenda Item 12. Toward setting of biological reference points (RPs) and development of Management Strategy Evaluation (MSE)

12.1 Initial discussions on RPs and MSE

74. The Chair presented the draft Terms of Reference (TOR) of the SWG MSE PS, which was circulated to Commission Members on 13 September 2021, and the tentative timeline for the MSE development work.

75. Full MSE analyses for Pacific saury will require years of work but there is a need to reconsider the harvest control rule (HCR) more quickly given declines in the Pacific saury stock over the last two decades. Therefore, the SSC PS supports development of an interim HCR in the near term based on currently available information as outlined in the draft TOR. There are a number of general approaches that can be considered outside of a full and elaborate MSE analysis.

12.2 Recommendations for future work

76. The SSC PS suggested that it could assist the SWG MSE PS in developing draft interim management objectives and a draft interim HCR by developing the current BSSPM further by incorporating environmental effects or developing a preliminary age-structured model and

using said model to test potential simple HCRs based on the model functions.

Agenda Item 13. Other matters

13.1 Draft agenda and priority issues for next meeting

77. The Chair informed participants that the agenda of the SSC PS08 had been approved by the Commission Members. The agenda is available on the meeting webpage. The priorities for the next meeting are to finalize the BSSPM results, review the updated stock assessments, investigate environmental effects on the stock that might be useful in providing management advice, and provide routine scientific advice on the management of the Pacific saury stock.

13.2 Other

78. Japan expressed its intention to continue the research described in NPFC-2021-SSC PS07-WP05 and publish it as a paper in a scientific journal. The research uses CAA calculated based on CAS data submitted by each Member for the purpose of developing age-structured models and Japan stated that it would submit formal requests to use such data to the relevant data providers, in accordance with the Regulations for Management of Scientific Data and Information.

79. Canada informed participants of two upcoming opportunities for collaboration and engagement related to small pelagic fishes. In November 2022, there will be an ICES-PICES-FAO Small Pelagic Fish Symposium covering a broad range of relevant topics (in particular the impacts of the environment on small pelagic fishes) held in Lisbon, Portugal. Topic and workshop sessions can be found at the symposium webpage. Secondly, some participants had submitted a proposal for a topic session at the 2022 PICES meeting in Busan, Korea titled "Environmental variability and small pelagic fishes in the North Pacific: exploring mechanistic and pragmatic methods for integrating ecosystem considerations into assessment and management." Last year the NPFC had agreed to jointly sponsor the session if accepted. This will follow on the PICES-NPFC workshop held in 2019 and would be expected to be very useful and hopefully informative for SSC PS members. Finally, Canada requested participation in completing a questionnaire of information about small pelagic fish surveys that was circulated by the NPFC Secretariat.

Agenda Item 14. Adoption of the Report

80. The SSC PS07 Report was adopted by consensus.

Agenda Item 15. Close of the Meeting

81. The meeting closed at 10:38 on 11 October 2021, Tokyo time.

Annexes:

Annex A – Agenda
Annex B – List of Documents
Annex C – List of Participants
Annex D – Updated total catch, CPUE standardizations and biomass estimates for the stock assessment of Pacific saury
Annex E – Time series of Members' standardized CPUE from 1980-2020
Annex F – Specifications of the BSSPM for the updated stock assessment

Please refer to the NPFC website for the complete annexes.

2nd Meeting of the Small Scientific Committee on Bottom Fish and Marine Ecosystems

7-9 December 2021
Virtual
Meeting Report

Agenda

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MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 2nd Meeting of the Small Scientific Committee on Bottom Fish and Marine Ecosystems (SSC BF-ME02) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, and the United States. The Deep Sea Conservation Coalition (DSCC) and the Pew Charitable Trusts (Pew) attended as observers.

2. The meeting was opened by the SSC BF-ME Chair, Dr. Chris Rooper (Canada), who welcomed the participants. The Science Manager, Dr. Aleksandr Zavolokin, outlined the procedures for the meeting. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

3. The Chair explained that a number of proposed amendments to the agenda had been received:
   (a) A new agenda item on the summary of the SSC BF-ME01 meeting should be added between Agenda items 2 and 3.
   (b) Japan's acoustic survey was conducted in 2020, and there was no acoustic survey in 2021. Consequently Agenda Item 3.3 should be updated to reflect the correct year ofthe survey.
   (c) Agenda Item 3.4.3 Update on Japan's maturity data should be moved to Agenda Item 4.2 as the maturity data concern splendid alfonsino (SA), not North Pacific armorhead (NPA).
   (d) Regarding Agenda Item 4.2.1 Yield per recruit analysis update of SA, the Small Working Group on NPA and SA (SWG NPA-SA) has agreed to conduct collaborative analyses on yield per recruit and spawner per recruit analyses and this topic will be discussed as part of Agenda Item 6.1.3. Therefore, Agenda Item 4.2.1 can be removed.
   (e) A new agenda item on the overview of sablefish management should be added between 5.2 and 5.2.1.
   (f) Agenda item 7.2.2 Review and recommendation of data used to identify VME (the flow

chart from SWG VME) should be discussed prior to Agenda Item 7.1.1 Update on developing a quantitative definition of VMEs.

(g) A new agenda item for the description of the eastern NPFC VME identification guide should be added between Agenda Items 7.2.1 and 7.2.2.

(h) It would make more sense to swap the order in which Agenda Items 7.3.2 and 7.3.3 are discussed.

4. The SSC BF-ME agreed to the proposed revisions.

5. The revised agenda was adopted (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

Agenda Item 3. Summary of SSC BF-ME01 meeting

6. The Chair summarized the discussions and outcomes of the SSC BF-ME01 meeting.

Agenda Item 4. Stock assessment and scientific advice on the management of North Pacific armorhead (NPA)

4.1 Review of Members fishing statistics for NPA in 2021

7. The Science Manager presented the fishing catch and effort statistics for NPA including the latest available data for 2020. Total catch in 2020 was 81 tons. One Japanese trawl vessel and one Japanese gillnet vessel were in operation targeting NPA and SA in the Convention Area.

4.2 NPA monitoring survey and Adaptive Management Procedure (AMP)

4.2.1 Review of the results from 2021 monitoring survey

8. The Science Manager presented the results of the monitoring survey for NPA in the Emperor Seamounts in 2021 (NPFC-2021-SSC BFME02-IP03). The fishing vessel Kaiyo Maru No.51 conducted four trawl hauls for at least one hour each in the Koko Seamount from March to June. The criteria for high recruitment were not met.

9. Korea informed the SSC BF-ME that a Korean vessel may be able to participate in the monitoring survey next year.

4.3 Update on analyses or progress on biomass estimates from the NPA 2020 acoustic survey

10. Japan explained that it conducted an acoustic survey for SA on the C-H and Colahan Seamounts in 2020 and that it will continue such work and related analyses and submit a working paper on the results at a future meeting.

4.4 Review of Members' research and joint research activities on NPA

11. Korea presented the catch size composition of NPA caught in the Emperor Seamounts by the Korean trawl fishery up to 2019 (NPFC-2021-SSC BFME02-WP14). Korea compared the catch-length composition of 2019, the year in which the NPFC's updated mesh size regulations entered into effect, and the catch-length composition in prior years. The catch composition in 2019 was larger in size than the other years. The weight over total length of the NPA was also higher in 2019 than in 2018.

4.4.1 Analysis of recruitment relationships to oceanography

12. The Chair presented a summary of research into the effects of oceanography on NPA recruitment in the Emperor Seamounts (NPFC-2021-SSC BFME02-WP02). Significant seasonal correlations were found between the recruitment index and the Arctic Oscillation, Pacific Decadal Oscillation and North Pacific Gyre Oscillation, suggesting that NPA recruitment mechanisms appear to respond to interannual ocean-atmospheric climate oscillations. Better knowledge of the connections between recruitment and the environment would be valuable for stock management.

4.4.2 Species summary document for NPA

13. Japan presented a species summary of NPA in the Emperor Seamounts drafted in cooperation with Members (NPFC-2021-SSC BFME02-WP06).

14. The SSC BF-ME reviewed the species summary (Annex D). The SSC BF-ME recommends that the SC adopt the species summary.

Agenda Item 5. Stock assessment and scientific advice on the management of splendid alfonsino (SA)

5.1 Review of Members fishing statistics for SA in 2021

15. The Science Manager presented the fishing catch and effort statistics for SA including the latest available data for 2020. Total catch in 2020 was 1,066 tons. One Japanese trawl vessel and one Japanese gillnet vessel were in operation targeting NPA and SA in the Convention Area.

5.2 Review of Members' research and joint research activities on SA

5.2.1 Update on Japan's maturity data

16. Japan presented a preliminary analysis for estimating size at sexual maturity of SA in the Emperor Seamounts (NPFC-2021-SSC BFME02-WP08). Japan analyzed 5,264 female gonads collected by Japanese fishing and research vessels in 2013-2021 and identified the reproductive season by calculating GSI (Gonadsomatic Index). Japan then estimated the size at maturity by

calculating FL_{50} (fork length at which 50% of the population reaches sexual maturity). Japan analyzed the monthly change in GSI and gonad development, and estimated the reproductive season for SA in the Emperor Seamounts as being during April to October. The size at maturity (FL_{50}) was estimated as 339.7 mm. However, results are still preliminary due to the indistinct reproductive season and the small sample size for maturity analysis. The next step will be to increase the sample size by including data from other Members and seeking an alternative approach to estimating maturity stages.

5.2 Species summary document for SA

17. The SSC BF-ME reviewed and revised the species summary of SA in the Emperor Seamounts (NPFC-2021-SSC BFME02-WP07). The SSC BF-ME recommends that the SC adopt the species summary (Annex E).

5.3 Adaptive management strategy for SA

5.3.1 Intersessional work to develop TOR for SA adaptive management plan

18. The SSC BF-ME discussed the intersessional work to develop a TOR for the SA adaptive management plan (AMP). The SSC BF-ME agreed that before advancing the AMP work further, there needs to be an agreed upon goal set based on the stock status. The SSC BF-ME therefore agreed that the first priority should be to conduct a stock assessment, determine the status of the SA stock, determine a management objective for the stock based on the stock status, and discuss potential management measures to achieve said objective, including AMP or other measures.

Agenda Item 6. Stock assessment and scientific advice on the management of sablefish

6.1 Review of Members fishing statistics for sablefish in 2021

19. Canada presented 1996-2021 data for landings, days fished, and CPUE from its sablefish fishery. No vessels fished for sablefish in the Convention Area in 2021. Some potential reasons for this may be the reduced price of sablefish, increased fuel costs, the relatively high total allowable catch set for the Canadian domestic fishery, reduced fishing activity in general due to COVID-19, and some concerns about vessel monitoring system requirements.

6.2 Review of Members' research and joint research activities on sablefish

6.2.1 Overview of sablefish management (Canada and USA)

6.2.2 Tagging studies – Joint USA-Canada research

6.2.3 Sablefish Management Strategy Evaluation (MSE)

20. Canada presented a summary it prepared together with the United States on current sablefish science, management and data collection/validation in the eastern North Pacific including the

NPFC Convention Area (NPFC-2021-SSC BFME02-WP04).

21. The SSC BF-ME encouraged Canada to make its catch and effort data on sablefish publicly available through the NPFC website.

6.2.4 Species summary document for sablefish

22. The SSC BF-ME reviewed the species summary of sablefish (NPFC-2021-SSC BFME02-WP12). The SSC BF-ME recommends that the SC adopt the species summary pending minor revisions (Annex F).

23. The SSC BF-ME reviewed the species summary of blackspotted and rougheye rockfishes (NPFC-2021-SSC BFME02-WP13). The SSC BF-ME recommends that the SC adopt the species summary pending minor revisions (Annex G).

6.2.5 Evaluation of historical harvest relative to trip limits

24. Canada provided a summary of its historical sablefish catch. Most of the catch is from the domestic fishery. In 2017, Canada closed most of its domestic seamounts to fishing. In Canada's view, the NPFC quota outside its exclusive economic zone (EEZ) probably does not reflect the obtainable harvest given the domestic seamount closures, nor sustainable harvest for open seamounts. Canada is evaluating the quota in the NPFC Convention Area to consider how it can be made to reflect Canada's domestic conservation measures. Canada believes that the coast-wide stock is in the healthy zone.

Agenda Item 7. Data-limited management tools and approach to assessment of NPA and SA

7.1 Discussion of next steps in identification of data limited approaches to stock assessment for NPA and SA

25. The Chair presented a summary of the SWG NPA-SA's work in 2021 (NPFC-2021-SSC BFME02-WP01).

7.1.1 Review of data available and data quality for stock assessment of NPA and SA (compiled by SWG)

26. The SSC BF-ME reviewed the available data for stock assessment of NPA and SA (Annex H).

7.1.2 Discussion of data availability and sharing

27. The SSC BF-ME discussed data availability and sharing and the work to develop a data sharing template. The SSC BF-ME agreed that it would be useful to share information that would help determine the spatial variation in life history of NPA and SA, while recognizing that there may

be confidentiality issues that prevent the sharing of fine-scale data. The SSC BF-ME requested the SWG NPA-SA to discuss the resolution at which spatial data could be shared and share the data intersessionally for further analyses using data limited approaches.

7.1.3 Review and recommendation of data limited tools available to use with existing data for NPA and/or SA

28. The SSC BF-ME reviewed the data limited tools available to use with existing data for NPA and/or SA (NPFC-2021-SSC BFME02-WP01).

7.1.4 Recommendations for plans to determine stock status and potentially rebuilding stocks

29. The SSC BF-ME reviewed the recommendations from the SWG NPA-SA on determining stock status and potentially rebuilding stocks of NPA and SA (NPFC-2021-SSC BFME02-WP01).

30. Japan reminded the SSC BF-ME of the SWG NPA-SA's discussions regarding taking a life history based approach to determining the stock status of NPA. NPA has a complicated life history that may make such an approach difficult. However, such an approach would nevertheless be an effective first step. Furthermore, since a life history based approach will also be taken for SA, doing the same for NPA could make the work more efficient.

31. Japan informed the SSC BF-ME that it will conduct yield-per-recruit analysis as collaborative work using data shared by Members.

7.1.5 Formulate TOR for stock assessment for NPA and SA

32. The SSC BF-ME reviewed the TOR for stock assessment for NPA and SA developed by the SWG NPA-SA (NPFC-2021-SSC BFME02-WP01). The SSC BF-ME recommends that the SC adopt the TOR for stock assessment for NPA and SA (Annex I).

7.1.6 Update on plans to hold workshop on managing NPA, SA and other species with other RFMOs

33. The Chair reminded the SSC BF-ME that the SWG NPA-SA agreed that holding a workshop on managing NPA, SA and other species with other RFMOs could be worthwhile, but that it should be given a lower priority given the SWG's current heavy workload. The SWG NPA-SA suggested that this matter could be revisited in future and perhaps such a workshop could be held as part of the Food and Agriculture Organization's (FAO's) ABNJ Deep Sea Fisheries Project.

7.1.7 Review CPUE time series for NPA and SA commercial fisheries

34. The SSC BF-ME discussed the development of CPUE time series for NPA and SA commercial

fisheries. Japan and Korea informed the SSC BF-ME that they have catch and effort data but have yet to begin work to calculate and standardize CPUE. Russia informed the SSC BF-ME that it only has historical catch and effort data for NPA and SA and that these data have many gaps that would make them less useful to include as inputs in a stock assessment.

Agenda Item 8. Assessment and scientific advice on the management of Vulnerable Marine Ecosystems (VME)

8.1 Review of Members' research and joint research activities on VME

35. Japan presented a report on its sea-floor visual survey in the southern Emperor Seamounts in 2021 (NPFC-2021-SSC BFME02-WP09 (Rev. 1)). The survey was conducted to collect further information on the dense distribution of cold-water corals and other communities in Koko and Yuryaku Seamounts reported by the US research paper NPFC-2020-SSC BFME01-WP08. At Koko Seamount, uniaxial antipatharian coral *Stichopathes* sp. was observed in a wide range of the study area, consistent with the US study. Gorgonian and scleractinian corals were distributed sparsely in the northern part of the study area. In the southeastern part of study area, low to medium densities of several corals including Isididae gorgonian coral was distributed. In Yuryaku Seamount a mixed distribution of several coral species was observed at many study sites. Coral assemblages consisting of gorgonian species were densely distributed in the northwestern part and on the slope of the southeastern part. In some areas, results were consistent with the observation of the US research. An unreported coral community was identified in the northwestern part of Yuryaku Seamount. As the next step, Japan intends to compare its survey results with the US research in detail, examine the potential of these communities as a tool for SAI assessment, and conduct a more detailed survey for the communities that were identified in this study.

36. Russia presented the preliminary results of its marine expeditions in the Emperor Seamounts (NPFC-2021-SSC BFME02-WP16). The expeditions involved a comprehensive study of the ecosystems using both standard methods and deep sea equipment, including study of planktonic communities, biological sampling of bottom fauna, studies of the conditions for the formation of ferromanganese and cobalt manganese crusts, biogeochemical studies of hydrocarbons in the water mass and bottom sediments, hydrological (hydrochemical) studies of water masses, and geology/landscape studies of bottom sediments of the study area.

8.1.1 Review and recommendation of data used to identify VME (the flow chart from SWG VME)

37. The Lead of the SWG VME, Dr. Janelle Curtis, presented a summary of the SWG VME's intersessional activities in 2021 (NPFC-2021-SSC BFME02-WP10), including development a flow chart to identify data that can be used to identify VMEs in the northwestern and

northeastern parts of the NPFC Convention Area.

38. The SSC BF-ME reviewed and revised the flow chart and agreed to include the revised flow chart in the CMMs For Bottom Fisheries and Protection of VMEs in the NW Pacific Ocean and the NE Pacific Ocean.

39. The SSC BF-ME agreed that model predictions that suggest the presence of VMEs are a high priority for groundtruthing using visual surveys.

40. DSCC expressed concern that no management measures would be taken regarding areas identified as likely to be VMEs using predictive modelling until a survey has been done to groundtruth or ascertain that the area is in fact a VME. DSCC believed that the groundtruthing should rather be used to improve the robustness of the predictive modeling and in the meantime areas identified as likely to be VMEs should be protected unless a survey is conducted in the area and concludes that a VME is not present.

8.1.2 Update on developing a quantitative definition of VMEs

41. Canada presented a study on the use of predictive habitat models and visual surveys to identify VMEs on seamounts in the Convention Area (NPFC-2021-BFME02-WP05). Canada proposed a quantitative method of VME identification that integrates visual data and model predictions in a manner that aligns with the SWG VME's flow chart, the precautionary approach, the Convention, and the research plan of NPFC's Scientific Committee. The methodology involves five steps: identify a visual threshold for VME occurrence, develop predictive models of VME indicator taxa, identify areas likely to be VMEs, use visual data in areas likely to be VMEs, and identify VMEs according to FAO criteria with visual data. Canada used data from Cobb Seamount to illustrate the proposed methodology and explained that the analyses have no management implications. Canada recommended that the SSC BF-ME endorse the proposed method as one method for identifying VMEs in the Convention Area, and that Canada moves forward with revising the method based on feedback and use it to identify VMEs and areas likely to be VMEs in the eastern part of the Convention Area.

42. The SSC BF-ME discussed the current NPFC VME indicator taxa list and agreed to task the SWG VME with discussing potential additions to the list, including reviewing the VME indicator taxa of other RFMOs.

8.1.3 Review of Members available VME related data

43. The SSC BF-ME reviewed the table of Members' available VME related data, which was last

modified at the SSC VME04 meeting (Annex J).

8.2 VME identification

8.2.1 Update on VME indicator taxa identification course

44. The Science Manager reminded the SSC BF-ME that the SC agreed to hold a VME indicator taxa identification course in 2020 but decided to postpone it until 2021 due to travel restrictions resulting from the COVID-19 pandemic.

45. The SSC BF-ME agreed to further postpone the course and to revisit the matter.

8.2.2 Description of eastern NPFC VME ID guide

46. Canada informed the SSC BF-ME that it has developed a VME identification guide for the eastern part of the Convention Area, available at: https://publications.gc.ca/site/eng/9.900778/publication.html.

8.3 Encounter protocol

8.3.1 Review and recommendation of post-encounter measures

47. The SWG VME Lead presented the recommendations of the SWG VME for post-encounter measures (NPFC-2021-SSC BFME02-WP10).

48. The Science Manager presented the revised post-encounter measure proposed by the SWG VME. The SSC BF-ME agreed to hold further discussions on the proposed revisions under Agenda Item 10.

49. Japan presented an overview of SIMRAD's ITI fishing net monitoring system and Marport's Trawl Fish System used by Kaiyo Maru No.51 in the Emperor Seamount (NPFC-2021-SSC BFME02-IP01). Based on the capabilities of the abovementioned systems, Japan recommended that the fact that trawl nets are not contacting the seabed be confirmed electronically by a third party when a vessel enters a temporary closure area. Japan also recommended that the area to be temporarily closed by the move-on rule should be limited to 1 nm either side of the trawl track based on the plausible distance between the track line of the net and the vessel.

8.3.2 Reports from Members on analyses of the impacts of different fishing gears on VME from their own data or literature

50. Canada presented a synopsis of literature assessing the impacts of longline hooks and traps on the seafloor (NPFC-2021-SSC BFME02-WP15). Longlined hooks and longlined traps (pots) can interact with VME in several ways. Traps can be dropped directly on top of colonies, or

dragged on the bottom during deployment and recovery. Longlines can snag on rocks, and become entangled during recovery, or when hooked fish struggle. Derelict fishing gear has also been observed caught on VME indicator taxa.

8.3.3 Consider gear-specific thresholds and gear-specific closures for encounter protocol

51. The SSC BF-ME discussed gear-specific thresholds and gear-specific closures and agreed to task the SWG VME with reviewing the practices of other RFMOs and recent literature on the subject.

52. The SSC BF-ME discussed how to define a temporary closure in the case of a VME encounter in the northwestern Pacific Ocean.
    (a) The SSC BF-ME discussed the setting of move-on rules and the size of the area for closure. Some Members suggested that a 1 nm move-on distance would be appropriate in light of observations indicating that VME patch sizes do not exceed 1 nm. Other Members suggested that there is sufficient uncertainty to warrant maintaining the move-on distance at 2 nm. The SSC BF-ME agreed to maintain the move-on distance at 2 nm and conduct further scientific analyses towards potentially amending the move-on distance.
    (b) The SSC BF-ME discussed which vessels the temporary closure should apply to. The SSC BF-ME suggested that each Member should prohibit its bottom fishing vessels from contacting the sea floor with their trawl nets. The SSC BF-ME noted that there is some uncertainty about how this stipulation would be enforced and that further analyses should be conducted to demonstrate whether trawl nets can be operated in a way that ensures that they do not contact the sea floor.

8.4 Significant and adverse impacts (SAI) assessment

8.4.1 Update on small working group progress on standardizing an approach to defining SAI

53. The SWG VME Lead gave an update on the SWG VME's progress on standardizing an approach to defining SAI (NPFC-2021-SSC BFME02-WP10).

54. The SSC BF-ME agreed to task the SWG VME with continuing this work.

8.4.2 Update on analysis of the potential impact of current fishing activities on known and potential VME sites in the Emperor Seamount area

55. The SWG VME Lead explained that the SWG VME agreed that analysis of the potential impact of current fishing activities on known and potential VME sites in the Emperor Seamount area is related to standardizing an approach to defining SAI of bottom fisheries on VMEs and did not explicitly discuss this task.

Agenda Item 9. Data collection and reporting

9.1 Review of the template for collection of scientific observer data

56. The SSC BF-ME reviewed the template for collection of scientific observer data and determined that no revisions are currently required.

9.2 Update on Japan's fish ID guide, translation into English and translation costs

57. The Science Manager provided an outline of the provisional design and content of Japan's fish identification guide, which is being translated into English by Japan and also being reviewed by a contracted expert (NPFC-2021-SSC BFME02-WP11).

58. The SSC BF-ME agreed with the proposed design and content of the fish identification guide.

9.3 Review and discussion of other RFMOs' practices regarding developing maps of combined fishing footprint

59. The Science Manager presented a review of other RFMOs' practices regarding developing maps of combined fishing footprint (NPFC-2021-SSC BFME02-IP04). The review included the practices of the South Pacific Regional Fisheries Management Organisation (SPRFMO), the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the Southern Indian Ocean Fisheries Agreement (SIOFA), and the North East Atlantic Fisheries Commission (NEAFC).

60. The Data Coordinator, Mr. Sungkuk Kang, presented a summary of bottom fishing footprint data and provisional maps of bottom fishing footprints (NPFC-2021-SSC BFME02-IP02 (Rev. 1)).

61. The SSC BF-ME agreed to post the maps in the Members' Area of the NPFC website.

62. The SSC BF-ME suggested adding a bathymetry base layer and also developing a heat map aggregated by gear type regardless of Member. The SSC BF-ME agreed to task the SWG VME with improving and updating the maps.

Agenda Item 10. 5-Year Rolling Work Plan

10.1 North Pacific armorhead

10.2 Splendid alfonsino

10.3 Sablefish

10.4 Vulnerable marine ecosystems

10.5 Other ecosystem components

63. The SSC BF-ME reviewed the 2021-2025 SSC BF-ME 5-Year Rolling Work Plan and updated it as detailed in NPFC-2021-SSC BFME02-WP03 (Rev. 1).

64. The SSC BF-ME took stock of the activities of its various SWGs. The SSC BF-ME agreed to disband the SWG on Data collection Template for Bottom Fish and the SWG on VME ID field guide as their work is complete, and to disband the SWG on Spatial Management as it has been inactive for some time. The SSC BF-ME noted that the work of the SWG on Combined Bycatch Taxa List and Fish ID Guide is almost complete and agreed to combine this SWG into the SWG NPA-SA. Both the SWG NPA-SA and the SWG VME remain active.

Agenda Item 11. Review of CMMs 2021-05 and 2019-06 for bottom fisheries and protection of vulnerable marine ecosystems and CMM 2019-10 for sablefish

65. The SSC BF-ME reviewed and revised CMM 2021-05 (Annex K).

66. The SSC BF-ME reviewed and revised CMM 2019-06 (Annex L).

67. The SSC BF-ME reviewed CMM 2019-10 and determined that no changes are currently necessary.

Agenda Item 12. Other matters

12.1 Inter-sessional work and priority issues for next meeting

68. The SSC BF-ME discussed intersessional work and agreed priority issues for the next meeting as described under Agenda Item 12.

12.2 Election of SSC BF-ME Chair and vice-Chair

69. The SSC BF-ME re-elected Dr. Chris Rooper (Canada) to serve as its Chair and elected Dr. Felipe Carvalho (USA) to serve as its vice-Chair. The SSC BF-ME selected Dr. Kota Sawada (Japan) to serve as the new SWG NPA-SA Lead.

12.3 Update on PICES WG47 Seamount Ecology

70. The SC Chair presented a summary of the 2021 activities by PICES Working Group 47 (WG-47) on the ecology of seamounts (NPFC-2021-SSC BFME02-OP01). WG-47 convened two business meetings that focused on introductions of members and observers, discussions of WG-47's terms of reference and exchanging information and ideas about participants' seamount research activities. The participants shared common interests in areas such as identification of VME on seamounts, studying spatial ecology of seamount fishes and invertebrates, and

developing species distribution models for seamount taxa. WG-47 is convening a two-day workshop on "Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions" at 2022 PICES meeting in Busan, Korea. WG-47 is requesting that the NPFC co-sponsor this workshop by contributing the equivalent of $5,000 USD.

71. The SSC BF-ME endorsed the request for the NPFC to co-sponsor the abovementioned PICES workshop.

12.4 Other issues

72. No other issues were discussed.

Agenda Item 13. Recommendations to the Scientific Committee

73. The SSC BF-ME agreed to:
    (a) Task the SWG NPA-SA to:
        i. Continue joint work on life history based approach to stock assessment (higher priority)
        ii. Define spatial resolution of shared data for data template (higher priority)
        iii. Continue work on the fish ID guide (higher priority)
        iv. Update species summaries (higher priority)
        v. CPUE standardization (lower priority)
    (b) Task the SWG VME to:
        i. Determine scientific basis for gear-specific encounter thresholds if possible (higher priority)
        ii. Determine scientific basis for move-on rules and size of the area for temporary closure (higher priority)
        iii. Bring together observation data on VME from visual survey sources (higher priority)
        iv. Refine quantitative definition of VME (higher priority)
        v. Consider VME indicator taxa list for additions/changes (higher priority)
        vi. Determine data requirements and spatial/temporal resolution for SAI assessment (lower priority)
        vii. Review literature on fisheries impacts on VME indicator taxa (lower priority)
        viii. Develop management objectives for recovering VME sites (lower priority)
    (c) Postpone the VME indicator taxa identification course and revisit the matter.
    (d) Endorse the proposed design and content of the fish identification guide (NPFC-2021-SSC BFME02-WP11).
    (e) Post the maps of bottom fishing footprints in the Members' Area of the NPFC website.

(f) Disband the SWG on Data collection Template for Bottom Fish, the SWG on VME ID field guide, and the SWG on Spatial Management, and to combine the SWG on Combined Bycatch Taxa List and Fish ID Guide into the SWG NPA-SA.

74. The SSC BF-ME recommends the following to the SC:
    (a) Adopt the species summaries of North Pacific armorhead (Annex D), splendid alfonsino (Annex E), sablefish (Annex F), and blackspotted and rougheye rockfishes (Annex G).
    (b) Adopt the Terms of Reference for stock assessment for NPA and SA (Annex I).
    (c) Endorse the updated 2021-2025 SSC BF-ME 5-Year Rolling Work Plan (NPFC-2021-SSC BFME02-WP03 (Rev. 1))
    (d) Endorse the revised CMM 2021-05 (Annex K).
    (e) Endorse the revised CMM 2019-06 (Annex L).
    (f) Select Dr. Chris Rooper (Canada) to serve as Chair and Dr. Felipe Carvalho (USA) to serve as vice-Chair of the SSC BF-ME.
    (g) Select Dr. Kota Sawada (Japan) to serve as the new SWG NPA-SA Lead.
    (h) Recommend that the Commission co-sponsor the PICES WG-47 Workshop on "Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions" by contributing the equivalent of $5,000 USD.

Agenda Item 14. Next meeting

75. The SSC BF-ME recommends holding a 3-day virtual meeting or a 2.5-day in-person meeting of the SSC BF-ME in 2022 and requests the guidance of the SC and Commission for determining the date, format and location of the meeting.

76. The SSC BF-ME recommends holding intersessional meetings of the SWG NPA-SA and SWG VME.

Agenda Item 15. Adoption of the Report

77. The report was adopted by consensus.

Agenda Item 16. Close of the Meeting

78. The meeting closed at 13:00 on 9 December 2021, Tokyo time.

Annexes:

Annex A – Agenda
Annex B – List of documents
Annex C –List of participants
Annex D – Species summary for North Pacific armorhead
Annex E – Species summary for splendid alfonsino
Annex F – Species summary for sablefish
Annex G – Species summary for blackspotted and rougheye rockfishes
Annex H – Data availability for North Pacific armorhead and splendid alfonsino
Annex I – Terms of Reference for a data limited approach to stock assessment for North Pacific armorhead and splendid alfonsino
Annex J – Members' available VME related data
Annex K – Revised CMM 2021-05 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean
Annex L – Revised CMM 2019-06 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northeastern Pacific Ocean

Please refer to the NPFC website for the complete annexes.

8th Meeting of the Small Scientific Committee on Pacific Saury

10-14 December 2021
Virtual
Meeting Report

Agenda

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Agenda Item 3. Overview of the outcomes of previous NPFC meetings
- 3.1 SSC PS07 meeting
- 3.2 COM06 meeting and CMM 2021-08

Agenda Item 4. Review of the Terms of References of the SSC PS and existing protocols
- 4.1 Terms of References of the SSC PS
- 4.2 CPUE Standardization Protocol
- 4.3 Stock Assessment Protocol

Agenda Item 5. Member's fishery status including 2021 fishery

Agenda Item 6. Fishery-independent abundance indices
- 6.1 Review of any updates and progress
- 6.2 Review of plans of future biomass surveys
- 6.3 Recommendations for future work

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- 7.1 Review of any updates and progress
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Agenda Item 8. Biological information on Pacific saury
- 8.1 Review of any updates and progress
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Agenda Item 9. Stock assessment using "provisional base models" (BSSPM)
- 9.1 Review of results and implications to management
- 9.2 Development of recommendations to the Commission to improve conservation and management
- 9.3 Recommendations for future work

Agenda Item 10. New stock assessment models
- 10.1 Review of any updates and progress
- 10.2 Data sharing protocol for new models
- 10.3 Recommendations for future work

Agenda Item 11. Toward setting of biological reference points (RPs) and development of Management Strategy Evaluation (MSE)
- 11.1 Joint SC-TCC-COM Small Working Group on MSE for Pacific saury
- 11.2 Recommendations for future work

Agenda Item 12. Review of the Work Plan of the SSC PS

Agenda Item 13. Other matters
- 13.1 Draft agenda, priority issues and timeline for next meeting
- 13.2 Invited expert
- 13.3 Election of SSC PS Chair
- 13.4 Other

Agenda Item 14. Recommendations to the Scientific Committee

Agenda Item 15. Adoption of Report

Agenda Item 16. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 8th Meeting of the Small Scientific Committee on Pacific Saury (SSC PS08) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America, and Vanuatu. Dr. Larry Jacobson participated as an invited expert.

2. The meeting was opened by Dr. Toshihide Kitakado (Japan), the SSC PS Chair, who welcomed the participants. The Science Manager, Dr. Aleksandr Zavolokin, outlined the procedures for the meeting. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

3. The agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

Agenda Item 3. Overview of the outcomes of previous NPFC meetings

3.1 SSC PS07 meeting

4. The Chair presented the outcomes and recommendations from the SSC PS07 meeting.

3.2 COM06 meeting and CMM 2021-08

5. The Science Manager presented the outcomes from the sixth Commission meeting and an overview of Conservation and Management Measure (CMM) 2021-08 For Pacific Saury.

Agenda Item 4. Review of the Terms of References of the SSC PS and existing protocols

4.1 Terms of References of the SSC PS

6. The SSC PS reviewed the Terms of References of the SSC PS and determined that no revisions are currently necessary.

4.2 CPUE Standardization Protocol

7. The SSC PS reviewed the CPUE Standardization Protocol and determined that no revisions are currently necessary.

4.3 Stock Assessment Protocol

8. The SSC PS reviewed the Stock Assessment Protocol and determined that no revisions are currently necessary.

Agenda Item 5. Member's fishery status including 2021 fishery

9. The Science Manager presented the cumulative catch of Pacific saury as of 27 November in 2020 and 2021. In 2021, the total catch in the Convention Area was 89,494 tons. Preliminary catches in the exclusive economic zones (EEZs) of Russia and Japan were 36 tons and 902 tons respectively. In 2020, Members' total catch in the Convention Area over the same period was 122, 595 tons.

10. China presented its fisheries activities until 13 November in 2021 (NPFC-2021-SSC PS08-IP05). The preliminary reported catch was 31,859 tons, a decrease of 64.7% from the total reported catch in 2018. The nominal CPUE of the Chinese fishery was 7.22 tons/vessel/day. The number of vessels was 66.

11. Japan presented its fisheries status in 2021 (NPFC-2021-SSC PS08-IP04). 124 fishing vessels have been registered, 4 fewer than the previous year. The Japanese total catch by November 30 was 17,899 tons (37,715 and 27,197 in 2019 and 2020, respectively). Nominal CPUE by November 30 showed a continuous decrease since 2018. It has decreased 16.5% from the previous year, and was the lowest since 2000. Because Pacific saury have hardly been found in the EEZ in 2021, 95.0% of the catch occurred in the high seas. This proportion is extraordinarily high compared with recent years (49.0% and 59.0% in 2019 and 2020, respectively). Japanese annual catch in 2021 will be the lowest historically since 1950.

12. Korea presented its fisheries activities (NPFC-2021-SSC PS08-IP06). The Korean fishing vessels caught 4,346 tons of Pacific saury as of November 2021, which was a historical low. There has been a gradual decrease in the number of Korean vessels operating in the Convention Area, and just 10 vessels operated in 2020 and 2021 respectively. Typically, the Pacific saury catch of Korean fisheries has shown two modes, in spring and autumn, but in 2021, there appeared to be a faint mode in autumn. The nominal CPUE from June to November 2021 was 2.67 tons/haul, which was the lowest level since 2001. The main fishing ground of the Korean vessels was at 43ºN, 159ºE, indicating that the vessels have shifted further to the northeast in

2021 compared to 2020.

13. Russia presented its fisheries activities (NPFC-2021-SSC PS08-IP01). Russian annual catch for Pacific saury was 753 tons in 2020, and 608 tons in 2021, the lowest since 1991. Two fishing vessels participated in fishery for Pacific saury in 2020 and three vessels in 2021, and those were the lowest numbers of active vessels in the last 30 years. Commercial concentrations of Pacific saury were of lower density in summer and early autumn 2020 compared to 2021. In 2020, catches increased substantially in autumn, and in 2021, the seasonal increase in catches was lower. Fishing grounds were located further east in 2020 compared to previous years, and were distributed even further to the east in 2021. Average CPUE values (catch per day per vessel) were 9.9 tons in 2020 and (preliminarily) 4.2 tons in 2021, which is the lowest in the last 30 years.

14. Chinese Taipei presented its fisheries activities (NPFC-2021-SSC PS08-IP02). The catch was 104,405 tons in 2017 and increased to around 180,000 tons in 2018 then declined to 56,662 tons in 2020. In 2021, fishing vessels began operations in fishing grounds earlier than previous years. The preliminary catch in 2021 was 33,258 tons and fishing occurred more northerly than in 2020, and the nominal CPUE from June to November was about 1 tons/haul in 2021.

15. Vanuatu presented its fisheries activities (NPFC-2021-SSC PS08-IP03). The Pacific saury fishery was first developed in 2004 with 16 authorized fishing vessels during 2004 through 2021. The active fishing vessel has remained the same at 4 since 2015. The estimated catch and nominal CPUE in 2021 were 1,270 tons and 5.3 tons/vessel/day, which were the lowest records in recent years. The fishing grounds in 2021 were mainly to the west of 165^{o}E longitude.

16. The SSC PS noted common results in the 2021 fisheries among the six members as follows: i) there has been a sharp decline in catch and nominal CPUE from 2020 to 2021, continuing the declining trend in recent years; ii) the spatial distribution of the fishing grounds has also shifted, with fishing grounds shifting to the east and a higher proportion of catch occurring in the Convention Area compared to previous years; iii) there was a reduced proportion of catch in autumn, which has been the main fishing season, compared to past years; and iv) an increased proportion of catch in early summer was observed.

17. The SSC PS noted unusual fishing activity by some Members east of 170^{o}E in June and July 2021. According to CMM 2021-08 for Pacific Saury, Members of the Commission are encouraged to take measures for fishing vessels flying their flags to refrain from fishing for Pacific saury in the areas east of 170°E from June to July. The SSC PS requested those

Members to provide information on the catch and size of Pacific saury from that area.

18. The SSC PS noted that some Members' fisheries might have been affected by COVID-19 in 2021.

19. The SSC PS agreed to update the template for the submission of each Member's fisheries status information by adding new charts showing relative accumulated catch and relative seasonal catch (available on the website).

Agenda Item 6. Fishery-independent abundance indices

6.1 Review of any updates and progress

20. No updates were provided.

6.2 Review of plans of future biomass surveys

21. Japan presented the plans for its 2022 biomass survey (NPFC-2021-SSC PS08-IP07). Japan plans to conduct its biomass survey with the usual area coverage in 2022. There has been an eastward shift of the center of the distribution of age-0 fish in the survey area in recent years. However, restrictions on the mobility of Japan's research vessels and the need to continue to survey the western part of the survey area make it difficult for Japan to survey the area east of 165ºW. In light of this, additional surveys by other Members for the eastern area would be fruitful.

22. Japan presented information about a biomass survey it conducted in 2012 covering the area from 165°W to 145°W. The survey was conducted with the *Hokuho-maru*, the research vessel used to conduct the annual Japanese biomass survey, in the area west of 165°W and the *Kaiyo-maru*, a special research vessel which conducted a survey in the area from 165°W to 145°W. The *Kaiyo-maru* is approximately four times the size of the *Hokuho-maru* and uses nets that are about twice as large. The biomass of Pacific saury in the area east of 165°W was estimated to be 2.4% of the area west of 165°W during 2012 and the proportion of age-0 fish was very high. Japan therefore had considered the importance of surveys east of 165°W to be low in 2012.

23. The SSC PS noted that observed fishing effort east of 170ºE during 2021 indicates that the distribution patterns may have shifted. Japan noted that it is difficult to conduct the same survey in the area east of 165ºW in the future due to logistical issues.

6.3 Recommendations for future work

24. The SSC PS suggested that Japan consider increasing the distance between transects so as to expand the area covered by its biomass survey eastward, while recognizing that fuel and other mobility restrictions may make this unfeasible.

25. The SSC PS suggested that conducting a biomass survey later during the fishing season may yield useful information about Pacific saury on the eastern side of the survey area that may be able to better inform the stock assessment.

26. The SSC PS suggested that, as an experimental analysis, Japan explore using the VAST model, if possible, to extrapolate the results of the biomass survey beyond the easternmost survey boundary i) to examine the sensitivity of biomass estimates and trend to the area definition (questioning the appropriateness that the current east boundary is the same as the longitude of the easternmost track line) and ii) to investigate if the amount of Pacific saury might have increased recently. Japan replied that it was not positive about conducting such analysis for the following reason: an extrapolated estimation current VAST setting might lead to misleading results because fish distribution is not determined only by the environment that is currently considered but also by the oceanographic structures and mobility of the fish.

27. The SSC PS encouraged Japan to continue to conduct its biomass survey and Members to conduct research surveys or share data from existing research surveys that could complement the Japanese biomass survey and provide useful information for understanding the abundance, spatio-temporal distribution, and migration patterns of Pacific saury.

Agenda Item 7. Fishery-dependent abundance indices

7.1 Review of any updates and progress

28. Japan informed the SSC PS that Members have held intersessional discussions on the method of extracting the CPUE in the CPUE standardization.

29. Korea informed the SSC PS that it would reflect the intersessional discussion on CPUE standardization, including spatial heterogeneity, and submit the results at the next meeting.

7.2 Recommendations for future work

30. The SSC PS encouraged Members to continue engaging in communication on the CPUE standardization process to share each other's skills and views.

Agenda Item 8. Biological and environmental information relevant to Pacific saury

8.1 Review of any updates and progress

31. Japan presented information on the geographic variation in feeding of Pacific saury in June and July in the North Pacific Ocean (NPFC-2021-SSC PS08-IP08). The main prey of Pacific saury were *Neocalanus plumchrus*, *N. cristatus*, *Calanus* and Euphausiids. Analysis of gut content showed that Pacific saury gut fullness is high when they feed on *Neocalanus* copepods. Prey availability might be higher in relatively cold water since *Neocalanus* copepods were mainly distributed in cold water in the northern part of the surveyed area. May to August is an important season for Pacific saury to rapidly increase their size by feeding on abundant *Neocalanus* copepods. This information might be useful for developing a more efficient and appropriate exploitation/management strategy of Pacific saury.

8.2 Recommendations for future work

32. The SSC PS encouraged Japan and other Members to conduct further analyses of the spatial distribution and abundance of Pacific saury and environmental conditions and to make any relevant information available to other Members.

Agenda Item 9. Stock assessment using "provisional base models" (BSSPM)

9.1 Review of results and implications to management

33. Chinese Taipei presented an updated stock assessment for Pacific saury in the North Pacific Ocean using BSSPM (NPFC-2021-SSC PS08-WP01). The models estimate the lowest biomass level in 2020 (median B_{2020}/B_{MSY} = 0.43, 80 percentile range 0.27 – 0.66), followed by a slight increase in 2021 (median B_{2021}/B_{MSY} = 0.55, 80 percentile range 0.35 – 0.85). An increasing trend in the fishing mortality is estimated from 2004 to 2018 and the recent average fishing mortality is estimated to be below F_{MSY} (median $F2018\text{-}2020/F_{MSY}$ = 0.94, 80 percentile range 0.48 – 1.90). It should be noted that the models estimate a slight decrease in the fishing mortality in 2020 (median $F2020/F_{MSY}$ = 0.75, 80 percentile range 0.40 – 1.42). The ensemble MCMC results from the two base cases indicated that the 2020 stock status is likely within the yellow quadrant on the Kobe plot (Prob [$B2020<B_{MSY}$ and $F2020<F_{MSY}$] = 71.56%).

34. China presented its Pacific saury stock assessment results (NPFC-2021-SSC PS08-WP02 (Rev. 1)). The estimated median B_{2020} from the two base case scenarios was 390,700 and 404,050 metric tons, respectively. The median B_{2020}/B_{MSY} and F_{2020}/F_{MSY} over the two base case scenarios were 0.33 and 0.99, respectively. Over two base case scenarios, large interannual variability was shown in biomass trajectory during the most recent years. A decreasing biomass trend was found in 2019 and 2020, followed by an increase in 2021. The probability of the population being in the red Kobe quadrant in 2020 was estimated to be around 48%.

35. Japan presented an updated stock assessment for Pacific saury in the North Pacific Ocean using

BSSPM (NPFC-2021-SSC PS08-WP03). The 2021 median depletion level was only 19.5% of the carrying capacity. B-ratio (B/B_{MSY}) and F-ratio (F/F_{MSY}) in 2020 were 0.339 and 1.033, respectively. B-ratio over 2019-2021 and F-ratio over 2018-2020 were 0.378 and 1.480 respectively. The probability of the population being in the green Kobe quadrant in 2020 was estimated to be nearly 0%, while that of being in the red Kobe quadrant was assessed to be around 54%. For population outlook, the projection results showed that increased catch compared to the current level may cause a severe decline in the population size.

36. The SSC PS reviewed the stock assessments presented by Members and aggregated the results, recognizing their similarities (Annex D).

9.2 Development of recommendations to the Commission to improve conservation and management

37. The SSC PS recommends that the SC consider and endorse the following rationale and approach in its scientific advice to the Commission:
    (a) The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) is much larger than the TAC would be based on the F_{MSY} catch approach ($B_{2021}*F_{MSY}$ = 192,804 tons) and the current biomass is much lower than B_{MSY}. Reducing F in the short term may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 419,000 tons).
    (b) A harvest control rule (HCR) that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world.

9.3 Recommendations for future work

38. The SSC PS agreed that it may be useful to examine the temporal patterns of the process errors in the stock assessment models to investigate the potential link with environmental factors.

39. The SSC PS agreed to develop a Figure (or two) showing a map of the extent of the general distribution of the Pacific saury stock, the extent of the Japanese biomass survey, the general life history migration pattern of the species as it is currently understood, and the boundaries of Members' EEZs and the Convention Area.

Agenda Item 10. New stock assessment models

10.1 Review of any updates and progress

40. No updates were provided.

10.2 Data sharing protocol for new models

41. Discussion of the data sharing protocol for new models was deferred.

10.3 Recommendations for future work

42. The SSC PS agreed to continue the work to develop age-structured stock assessment models, and encouraged Members to prepare and submit specifications with preliminary results at the next SSC PS meeting.

Agenda Item 11. Toward setting of biological reference points (RPs) and development of Management Strategy Evaluation (MSE)

11.1 Joint SC-TCC-COM Small Working Group on MSE for Pacific saury

43. The Science Manager presented an update on the progress with setting up a joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific saury (SWG MSE PS). The Commission endorsed the Terms of Reference of the SWG MSE PS and selected Dr. Toshihide Kitakado (Japan) and Mr. Justin Turple (Canada) as the co-Chairs of the SWG MSE PS. The 1st SWG MSE PS meeting will take place on 21-22 February 2022. The meeting agenda is available on the website.

11.2 Recommendations for future work

44. The SSC PS held initial discussions on possible approaches to developing harvest control rules. The SSC PS agreed to hold further discussions and develop recommendations for future work at its next meeting based on the outcomes of the 1st SWG MSE PS meeting.

Agenda Item 12. Review of the Work Plan of the SSC PS

45. The SSC PS reviewed the 2021-2025 SSC PS 5-Year Rolling Work Plan (NPFC-2021-SSC PS08-WP04).

Agenda Item 13. Other matters

13.1 Draft agenda and priority issues for next meeting

46. The Chair presented the agenda and priorities for the next meetings based on the SSC PS Work Plan. The priorities are to:
    (a) Review standardized CPUE up to 2021.
    (b) Review the Japanese fishery-independent survey results up to 2022.
    (c) Update BSSPM analyses and provide recommendations to the SC/Commission.
    (d) Review progress on new assessment models and finalize a set of models and specification.
    (e) Start discussion on development and evaluation of HCR as a short-term task.

47. The SSC PS recommends holding two 4-day formal SSC PS meetings in 2022 (30 August to 2

September and November or December) and intersessional SSC PS meetings. The SSC PS also recommends that the SWG MSE PS hold an intersessional meeting in 2022 to review the outcomes of the SSC PS09 meeting.

48. The SSC PS agreed to extend the deadline for the submission of working papers related to Members' CPUE standardization and the Japanese biomass survey estimates to the SSC PS09 meeting. The abovementioned papers must be submitted, at the latest, 10 days prior to the SSC PS09 meeting.

13.2 Invited expert

49. The SSC PS expressed its appreciation for the continued valuable contributions of the invited expert, Dr. Larry Jacobson. The SSC PS recommends that Dr. Jacobson be invited to the next SSC PS meetings.

13.3 Election of SSC PS Chair

50. The SSC PS re-elected Dr. Toshihide Kitakado to serve as its Chair.

13.4 Other matters

51. No other matters were discussed.

Agenda Item 14. Recommendations to the Scientific Committee

52. The SSC PS recommends the following to the SC:
    (a) Endorse the stock assessment report (Annex D).
    (b) Endorse the SSC PS Work Plan (NPFC-2021-SSC PS08-WP04).
    (c) Allocate funds for the participation of an invited expert in the next SSC PS meetings.
    (d) Select Dr. Toshihide Kitakado (Japan) to serve as Chair of the SSC PS.
    (e) Hold two 4-day formal meetings (30 August to 2 September and November or December), and intersessional meetings of the SSC PS in 2022.
    (f) Consider and endorse the rationale and approach described in paragraph 37 in its scientific advice to the Commission.

53. The SSC PS recommends that the SWG MSE PS hold an intersessional meeting in 2022 to review the outcomes of the SSC PS09 meeting.

Agenda Item 15. Adoption of the Report

54. The SSC PS08 Report was adopted by consensus.

Agenda Item 16. Close of the Meeting

55. The meeting closed at 13:55 on 14 December 2021, Tokyo time.

Annexes:

Annex A – Agenda
Annex B – List of Documents
Annex C – List of Participants
Annex D – Stock Assessment Report for Pacific Saury

Please refer to the NPFC website for the complete annexes.

6th Scientific Committee Meeting

15-18 December 2021
Virtual
Meeting Report

Agenda

Agenda Item 1. Opening of the Meeting

Agenda Item 2. Adoption of Agenda

Agenda Item 3. Meeting arrangements

Agenda Item 4. Review of reports and recommendations from the Small Scientific Committees (SSC BF-ME and SSC PS) and the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA)

- 4.1 Technical Working Group on Chub Mackerel Stock Assessment
- 4.2 SSC on Bottom Fish and Marine Ecosystems
- 4.3 SSC on Pacific Saury

Agenda Item 5. Priority species

- 5.1 Summary of progress on the remaining four priority species
  - 5.1.1 Neon flying squid
  - 5.1.2 Japanese flying squid
  - 5.1.3 Japanese sardine
  - 5.1.4 Spotted mackerel
- 5.2 Development of summary sheets for all priority species
- 5.3 Identification of data needs and data gaps and strategies to fill those gaps

Agenda Item 6. Progress in data collection, management and security

- 6.1 Information management and security regulations
  - 6.1.1 Procedures for sharing code
- 6.2 Data collection
  - 6.2.1 Information about species belonging to same ecosystem or dependent/associated with target stocks
  - 6.2.2 Data gaps and needs that could be filled by an observer program
  - 6.2.3 Scientific need for electronic monitoring
- 6.3 NPFC data management system (DMS)

Agenda Item 7. Scientific projects for 2022 and 2023

- 7.1 Ongoing/planned projects

7.2 New projects
7.3 Review and prioritization of projects

Agenda Item 8. Cooperation with other organizations
8.1 Reports on the joint NPFC-PICES activities since the SC05 meeting, including a report from PICES Secretariat
8.2 Joint PICES-ICES WGSPF, PICES topic session on small pelagic fish (SPF) and PICES-ICES SPF symposium
8.3 Joint NPFC-PICES workshop/course on VME indicator identification
8.4 SC representation at PICES meetings
8.5 NPFC/NPAFC Memorandum of Cooperation and Work Plan
8.5.1 NPFC's participation in the NPAFC's multinational IYS survey in the North Pacific Ocean
8.5.2 Review of the five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation
8.6 Partnership with the Fisheries and Resources Monitoring System of FAO (FIRMS)
8.7 FAO ABNJ Deep-sea fisheries project
8.8 FAO-GFW collaboration on AIS
8.9 Cooperation with other organizations

Agenda Item 9. 2021-2025 Research Plan and Work Plan
9.1 Five-year Research Plan
9.2 Five-year Work Plan

Agenda Item 10. Other matters
10.1 Review of the Scientific Committee Terms of Reference (TOR)
10.2 Selection of SC Chair and vice-Chair
10.3 Coordination between SC and TCC
10.4 Other issues

Agenda Item 11. Advice and recommendations to the Commission

Agenda Item 12. Next meeting

Agenda Item 13. Press release

Agenda Item 14. Adoption of the Report

Agenda Item 15. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 6th Meeting of the Scientific Committee (SC) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America and Vanuatu. The European Union (EU), the United Nations Food and Agriculture Organization (FAO), the North Pacific Anadromous Fish Commission (NPAFC), the North Pacific Marine Science Organization (PICES) and the Pew Charitable Trusts (Pew) attended as observers. The meeting was opened by Dr. Janelle Curtis (Canada), who served as the SC Chair.

2. The Executive Secretary, Dr. Dae Yeon Moon, welcomed the participants to the meeting, expressing his regret that, due to the ongoing COVID-19 pandemic, this year's meeting of the SC has had to be held virtually again. He pointed out that the Commission's work should be based on the best science available to ensure the long-term conservation and sustainable use of marine resources and the protection of marine ecosystems in the Convention Area and that the SC's contributions will help to better inform the Commission's Conservation and Management Measures (CMMs). The Executive Secretary thanked the SC for its hard work over the past six years and noted that this work continues to grow in importance each year and now includes a management strategy evaluation for Pacific saury and the first performance review of the Commission.

3. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

4. The SC agreed to hear an update from the EU on its chub mackerel fisheries operation plan and impact assessment under Agenda Item 10.4 Other issues.

5. The agenda was adopted without revision (Annex A). The List of Documents and List of

Participants are attached (Annexes B, C).

Agenda Item 3. Meeting arrangements

6. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.

Agenda Item 4. Review of reports and recommendations from the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA) and the Small Scientific Committees (SSC BF-ME and SSC PS)

4.1 Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA)

7. The TWG CMSA Chair, Dr. Vladimir Kulik (Russia), summarized the outcomes and recommendations of the 4th TWG CMSA meeting (NPFC-2021-TWG CMSA04-Final Report).

8. The SC reviewed the recommendations of the TWG CMSA and endorsed the following recommendations:
   (a) The TWG CMSA recommended the Work Plan of the TWG CMSA (NPFC-2021-TWG CMSA04-WP12 (Rev. 1)).
   (b) The TWG CMSA recommended hiring an external expert to continue the work to develop an operating model (PopSim) and test chub mackerel stock assessment models, if needed, in the next year.
   (c) The TWG CMSA recommended holding two meetings in 2022, possibly in spring and fall, with the specific dates and meeting format to be determined intersessionally via correspondence.

9. The SC noted that the TWG CMSA intends to conduct a preliminary stock assessment for chub mackerel in 2022 and a complete stock assessment in 2023.

4.2 SSC on Bottom Fish and Marine Ecosystems

10. The Chair of the SSC on Bottom Fish and Marine Ecosystems (SSC BF-ME), Dr. Chris Rooper (Canada), summarized the outcomes and recommendations of the 2nd SSC BF-ME meeting (NPFC-2021-SSC BFME02-Final Report).

11. The SC reviewed the recommendations of the SSC BF-ME and endorsed the following recommendations:
   (a) Adopt the species summaries of North Pacific armorhead (Annex D), splendid alfonsino (Annex E), sablefish (Annex F), and blackspotted and rougheye rockfishes (Annex G).
   (b) Adopt the Terms of Reference for stock assessment for North Pacific armorhead and splendid alfonsino.

(c) Endorse the updated 2021-2025 SSC BF-ME 5-Year Rolling Work Plan (NPFC-2021-SSC BFME02-WP03 (Rev. 1))
(d) Endorse the revised CMM 2021-05 (Annex L).
(e) Endorse the revised CMM 2019-06 (Annex M).
(f) Select Dr. Chris Rooper (Canada) to serve as Chair and Dr. Felipe Carvalho (USA) to serve as vice-Chair of the SSC BF-ME.
(g) Select Dr. Kota Sawada (Japan) to serve as the new SWG NPA-SA Lead.
(h) Recommend that the Commission co-sponsor the PICES WG-47 Workshop on "Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions" by contributing the equivalent of $5,000 USD.

4.3 SSC on Pacific Saury

12. The Chair of the SSC on Pacific Saury (SSC PS), Dr. Toshihide Kitakado (Japan), summarized the outcomes and recommendations of the 7th and 8th SSC PS meetings (NPFC-2021-SSC PS07-Final Report, NPFC-2021-SSC PS08-Final Report).

13. The SC reviewed the recommendations of the SSC PS and endorsed the following recommendations:
(a) Endorse the stock assessment report (Annex N).
(b) Endorse the SSC PS Work Plan (NPFC-2021-SSC PS08-WP04).
(c) Allocate funds for the participation of an invited expert in the next SSC PS meetings.
(d) Select Dr. Toshihide Kitakado (Japan) to serve as Chair of the SSC PS.
(e) Hold two 4-day formal meetings (30 August to 2 September and November or December), and intersessional meetings of the SSC PS in 2022.
(f) Consider and endorse the rationale and approach in its scientific advice to the Commission described in paragraph 37 of the SSC PS08 meeting report, i.e.:
i. The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) is much larger than the TAC would be based on the F_{MSY} catch approach (B_{2021}*F_{MSY} = 192,804 tons) and the current biomass is much lower than B_{MSY}. Reducing F in the short term may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 419,000 tons).
ii. A harvest control rule (HCR) that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world.

14. The SC noted that Vanuatu is a small island developing state which is still developing its fishery, and that Vanuatu urges the SC to consider its aspirations to rebuild its fleet to 16 fishing vessels and increase catches accordingly when making recommendations to the Commission in the future.

15. The SC endorsed the reports provided by the TWG CMSA, the SSC BF-ME, and the SSC PS.

Agenda Item 5. Priority species

5.1 Summary of progress on the remaining four priority species

16. The SC discussed long-term work towards conducting stock assessments for Japanese flying squid (JFS), neon flying squid (NFS), spotted mackerel (SM), and Japanese sardine (JS), and agreed that it would be helpful for each Small Working Group (SWG) to summarize any potential challenges to conducting a stock assessment for its assigned species.

5.1.1 Neon flying squid

17. The SWG NFS Lead, Dr. Luoliang Xu, reported on the SWG NFS' intersessional activities. The SWG NFS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, SM, and JS), set up a Mendeley page for exchanging information, reviewed fisheries and fishing history of NFS, reviewed the outcomes of Japan's NFS research survey, reviewed Members' available NFS data, and developed a species summary document for NFS.

18. The SC discussed future tasks for the SWG NFS and agreed on the following:
    (a) Update the NFS species summary document
    (b) Develop a data template and share data for NFS
    (c) Compile NFS CPUE data and agree on CPUE indices
    (d) Continue research on the spatial structure of the NFS stock
    (e) Evaluate the spatial structure of NFS life history and stocks relative to fisheries
    (f) Evaluate the influence of environmental variables on the life history and biology of NFS
    (g) Review Members' approaches to stock assessments of NFS
    (h) Discuss potential strategies for effectively managing NFS
    (i) Summarize any potential challenges to conducting a stock assessment for NFS

19. The SC noted that NFS has a complicated life-history and biology. It is a short-lived species, is likely susceptible to fluctuations in biomass subject to environmental conditions, is highly migratory, has separate areas of reproduction and feeding, and has seasonal cohorts. Better understanding of the stock structure will be particularly important.

5.1.2 Japanese flying squid

20. The SWG JFS Lead, Dr. Kazuhiro Oshima, reported on the SWG JFS' intersessional activities. The SWG JFS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, SM, and JS), set up a Mendeley page for exchanging information, reviewed fisheries and fishing history of JFS, and developed a species summary document for JFS.

21. The SC discussed future tasks for the SWG JFS and agreed on the following:
    (a) Update the JFS species summary document
    (b) Update and review Members' JFS catch and effort data
    (c) Compile JFS CPUE data and agree on CPUE indices
    (d) Continue research on the spatial structure of the JFS life history and stock relative to the fishing footprint
    (e) Continue long-term research on the influence of environmental variables on the life history and biology of JFS
    (f) Review Members' approaches to stock assessments of JFS and the results of Japan's domestic stock assessment
    (g) Summarize any potential challenges to conducting a stock assessment for JFS

5.1.3 Japanese sardine

22. The SWG JS Lead, Dr. Chris Rooper, reported on the intersessional activities of the SWG JS. The SWG JS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, SM, and JS), set up a Mendeley page for exchanging information, conducted a review of Members' fisheries, reviewed Members' available data, and developed a species summary document for JS.

23. The SC discussed future tasks for the SWG JS and agreed on the following:
    (a) Update the JS species summary document
    (b) Develop a data template and share data for JS
    (c) Compile JS CPUE data and agree on CPUE indices
    (d) Continue research on the spatial structure of the JS life history and stocks relative to the fishing footprint
    (e) Evaluate the influence of environmental variables on the life history and biology of JS
    (f) Review Members' approaches to stock assessments of JS and the results of Japan's domestic stock assessment
    (g) Summarize any potential challenges to conducting a stock assessment for JS

5.1.4 Spotted mackerel

24. The SWG SM Lead, Dr. Shota Nishijima, reported on the SWG SM's intersessional activities. The SWG SM has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, SM, and JS), set up a Mendeley page for sharing information, reviewed fisheries and fishing history of SM, reviewed Members' available SM data, developed a species summary document for SM, discussed the need to correctly identify chub mackerel and SM given that combined data for both species are submitted to NPFC, and discussed which common name to use for SM given that the FAO species database lists "blue mackerel" rather than "spotted mackerel" as the common name for this species.

25. The SWG SM Lead explained that the SWG SM recommends that the common name "blue mackerel" be used for *Scomber australasicus* going forward. The SC endorsed the recommendation and agreed to change the name of the SWG to the SWG on blue mackerel (SWG BM).

26. The SC discussed future tasks for the SWG BM and agreed on the following:
    (a) Update the BM species summary document
    (b) Review the results of Japan's domestic stock assessment of BM
    (c) Summarize any potential challenges to conducting a stock assessment for BM
    (d) Share information and papers on species identification of BM and chub mackerel
    (e) Continue data collation for BM

5.2 Development of summary sheets for all priority species

27. The SWG NFS Lead presented the species summary document for NFS (NPFC-2021-SC06-WP09 (Rev. 1)). The SC reviewed, revised and adopted the species summary document (Annex H).

28. The SWG JS Lead presented the species summary document for JS (NPFC-2021-SC06-WP03). The SC reviewed, revised and adopted the species summary document (Annex I).

29. Members offered suggestions for how to update the species summary document for JS in the intersessional period.

30. The SWG JFS Lead presented the species summary document for JFS (NPFC-2021-SC06-WP08). The SC reviewed, revised and adopted the species summary document (Annex J).

31. Members offered suggestions for how to update the species summary document for JFS in the intersessional period.

32. The SWG BM Lead presented the species summary document for BM (NPFC-2021-SC06-WP07 (Rev. 1)). The SC reviewed, revised and adopted the species summary document (Annex K).

33. Members offered suggestions for how to update the species summary document for BM in the intersessional period.

5.3 Identification of data needs and data gaps and strategies to fill those gaps

34. The SC tasked the SWGs for JFS, NFS, JS and BM with working to identify data needs and data gaps, and strategies to fill those gaps.

Agenda Item 6. Progress in data collection, management and security

6.1 Information management and security regulations

35. The Science Manager provided an update on the ongoing work to develop an overarching policy for data use and management that pertains to the SC and the Technical and Compliance Committee (TCC).

6.1.1 Procedures for sharing code

36. The SC reviewed the Regulations for Management of Scientific Data and Information and discussed the development of procedures for sharing code. The SC agreed that it would be useful for the Secretariat to establish an NPFC Github page for the sharing of code. The Chair agreed to draft additional text for the Regulations for Management of Scientific Data and Information on how to share code if Members choose to do so, with assistance from Canada. The text would be submitted to SC07 for discussion, revision and endorsement.

6.2 Data collection

6.2.1 Information about species belonging to the same ecosystem or dependent/associated with target stocks

6.2.2 Data gaps and needs that could be filled by an observer program

6.2.3 Scientific need for electronic monitoring

37. The SC agreed that collecting information on non-targeted species is important for facilitating the work and research of the SC. The SC agreed that the establishment of an observer program in the NPFC Convention Area would facilitate the collection of more data for such non-targeted species, as well as for NPFC priority species. The SC noted that each fishery has its own data needs, data gaps and logistical matters and would require its own observer program. The SC agreed to task its subsidiary bodies including the SWGs with identifying data needs and data

gaps for non-target species and priority species. Specifically, the SC tasked the subsidiary bodies with reporting the data needs and outlining methods (e.g. human or electronic observers) that could be used to collect the necessary data at SC07. The SC noted there remain some issues with electronic monitoring, including data storage, that require further discussion.

6.3 NPFC data management system (DMS)

38. The Data Coordinator, Mr. Sungkuk Kang, reported on the progress in the development of the SC-related data management system (NPFC-2021-SC06-IP03). Updates have been made to the Members Home, Significant dates/Events, Pacific Saury Weekly Report, Collaboration, and Annual reports sections. The NPFC GIS Map has recently been updated to include Pacific saury catch and effort data with sea surface temperature per grid from 1994 to 2020. At the request of the SSC BF-ME, the Secretariat has developed provisional maps of combined, gear-specific footprints by different gear types and time periods. These maps will be available in the Members' Area of the NPFC website soon.

Agenda Item 7. Scientific projects for 2022 and 2023

7.1 Ongoing/planned projects

7.2 New projects

7.3 Review and prioritization of projects

39. The Science Manager presented a draft list of scientific projects that were discussed during the meetings of the SC and its subsidiary bodies.

40. The SC reviewed the list of proposed scientific projects and endorsed it for consideration by the Commission (Annex O).

Agenda Item 8. Cooperation with other organizations

41. The Science Manager presented a compiled list of cooperation opportunities and requests from other organizations, for consideration by the SC (NPFC-2021-SC06-IP02 (Rev. 1)).

8.1 Reports on the joint NPFC-PICES activities since the SC05 meeting, including a report from PICES Secretariat

42. The Executive Secretary of PICES, Dr. Sonia Batten, reported on recent and upcoming PICES activities of relevance to the NPFC:
    (a) NPFC and PICES representatives participated in each other's annual meetings.
    (b) The NPFC has representation in the PICES-ICES joint Working Group on Small Pelagic Fish (WG43).
    (c) The NPFC is co-sponsoring the PICES-ICES-FAO Small Pelagic Fish Symposium.

(d) The PICES Fishery Science Committee and the NPFC proposed a topic session for PICES-2022.

(e) WG47 proposed a 2-day workshop for PICES-2022 on "Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions."

(f) PICES and NPFC will hold a joint international course/workshop on VME indicator taxa identification in 2022 with financial contributions of $15,000 USD from each organization.

(g) The ICES-PICES Sustainability of Marine Ecosystems Through Knowledge Networks (SMARTNET) program was endorsed by Intergovernmental Oceanographic Commission in June 2021 as a UN Decade of Ocean Sciences program.

8.2 Joint PICES-ICES WGSPF, PICES topic session on small pelagic fish (SPF) and PICES-ICES SPF symposium

43. Dr. Chris Rooper provided an overview of the PICES topic session on "Environmental variability and small pelagic fishes in the North Pacific: Exploring mechanistic and pragmatic methods for integrating ecosystem considerations into assessment and management" to be held in autumn 2022.

44. Dr. Chris Rooper provided an update on the activities of the Joint PICES-ICES WGSPF, including plans to organize joint PICES-ICES-FAO SPF symposia at regular intervals, with the first to be held in Lisbon, Portugal in November 2022.

8.3 Joint NPFC-PICES workshop/course on VME indicator identification

45. The Science Manager reminded the SC that the SSC BF-ME agreed to postpone the VME indicator taxa identification course and that the SC endorsed this decision when it endorsed the SSC BF-ME02 meeting report.

8.4 SC representation at PICES meetings

46. The SC agreed that Members will provide nominations on or before 15 April 2022 for NPFC representatives to the PICES Annual Meeting in September/October 2022 and the PICES-ICES-FAO International Symposium on Small Pelagic Fishes in November 2022. Nominations should specify the meeting in question, the name of the proposed participant, and one or two sentences about how the participant meets each of the six criteria endorsed by the SC (part of a member's delegation to NPFC, anticipated contributions, expertise, financial need, early career scientist, and willingness to report back to the SC on key meeting outcomes of interest to the NPFC). The SC Chair will work with Chairs of the SC's subsidiary bodies to select one

SC representative to the former meeting and three SC representatives to the latter.

47. The SC recommends that the Commission financially support the travel of one member of the SC or its subsidiary bodies to participate in the PICES Annual Meeting, if financial support is necessary, and three members of the SC or its subsidiary bodies to participate in the PICES-ICES-FAO International Symposium on Small Pelagic Fishes in November 2022, if financial support is necessary.

8.5 NPFC/NPAFC Memorandum of Cooperation and Work Plan

8.5.1 NPFC's participation in the NPAFC's multinational IYS survey in the North Pacific Ocean

48. The Science Manager presented an update on NPFC's participation in the NPAFC's multinational IYS survey in the North Pacific Ocean (NPFC-2021-SC06-IP01 (Rev. 1)). He reminded the SC of the suggestions that the NPFC has made to the NPAFC and that following have been included in the research survey program:
    (a) Encouragement to cover all stations within the agreed survey area, in particular in its southern part, even if there will be no salmon catch on those stations, to catch more species of NPFC interest.
    (b) For non-salmon species, ensure all of them are identified, counted and weighed.
    (c) Conduct additional analyses of the NPFC priority species: Mandatory information – length, weight, sex, stomach content. Optional information/samples (if possible) – maturity stage, fish scale, otolith (or fish heads for otolith analyses)).
    (d) Encouragement to share raw data on priority species with the NPFC.

8.5.2 Review of the five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation

49. The Executive Director of the NPAFC, Dr. Vladimir Radchenko, provided an update on the activities of the NPAFC and outlined the draft five-year Work plan to implement NPAFC/NPFC Memorandum of Cooperation, 2021-2025 (NPFC-2021-SC06-OP02) for consideration by the SC.

50. The SC reviewed and revised the SC-related items in the work plan (Annex P).

8.6 Partnership with the Fisheries and Resources Monitoring System of FAO (FIRMS)

51. Mr. Aureliano Gentile (FAO) presented a summary of the latest exchanges between the NPFC and the FIRMS Secretariat, an overview of FIRMS, and a draft stocks and fisheries inventory for the NPFC (NPFC-2021-SC06-OP03). FAO invited the SC to once again consider whether the NPFC should enter into an arrangement with FIRMS, and whether that should be a Partnership Arrangement or a Collaborative Arrangement.

52. The SC supported the NPFC entering into an arrangement with FIRMS. The SC recommends that the Commission consider entering into an arrangement with FIRMS and decide whether to do so under a Partnership Arrangement or a Collaborative Arrangement.

8.7 FAO ABNJ Deep-sea fisheries project

53. Dr. William Emerson (FAO) presented an update on the key activities and next steps of the ABNJ Deep Sea Fisheries (DSF) Project (NPFC-2021-SC06-OP04). The FAO ABNJ DSF project has been developed in partnership with RFMOs, ICES and industry. The Concept Note was approved on 2 June 2020, and the full project document submitted to the Global Environment Facility (GEF) on 25 November 2021. Currently 6 of 7 deep-sea RFMOs (including NPFC), ICES, NOAA, and two industry groups have formally submitted co-financing partnership letters to join the project. The 5-year project is expected to start in mid-2022. FAO thanked the NPFC for its support and looks forward to working with the NPFC and the other partners to ensure successful and sustainable DSF.

54. The Executive Secretary reiterated the NPFC's commitment to supporting and collaborating with the DSF Project in its second phase.

8.8 FAO-GFW collaboration on AIS

55. The Science Manager reminded the SC that it recommended that the NPFC collaborate with FAO and Global Fishing Watch (GFW) on the use of AIS data for scientific analyses at SC05. He informed the SC that the FAO has requested the NPFC to develop a proposal for such collaboration.

56. The SC encouraged Members to consider ways to collaborate with FAO and GFW on the use of AIS data for scientific analyses and agreed to revisit this matter at its next meeting.

8.9 Cooperation with other organizations

57. In response to a question from Pew regarding collaboration between the NPFC and WCPFC, the Executive Secretary explained that the two RFMOs have been working on establishing a Memorandum of Understanding for the sharing of information, but this process has been delayed due to the ongoing pandemic.

Agenda Item 9. 2021-2025 Research Plan and Work Plan

9.1 Five-year Research Plan

9.2 Five-year Work Plan

58. The SC reviewed its 2021-2025 Five-Year Rolling Research Plan (NPFC-2021-SC06-WP01) and Work Plan (NPFC-2021-SC06-WP02 (Rev. 1)). The Research Plan and the Work Plan of the SC and its subsidiary bodies are attached as Annex Q.

Agenda Item 10. Other matters

10.1 Review of the Scientific Committee Terms of Reference (TOR)

59. The SC reviewed its TOR and determined that no changes are currently needed.

10.2 Selection of SC Chair and vice-Chair

60. The SC selected Dr. Janelle Curtis (Canada) to continue to serve as the SC Chair and Dr. Jie Cao (China) to continue to serve as the SC vice-Chair.

10.3 Coordination between SC and TCC

61. The Science Manager updated participants on the TCC SWG Ops discussions on effort indicators in the CMMs for priority species. Members discussed the current effort indicators and had no revisions.

62. Based on the discussion above, the SC identifies the following as matters for coordination between the SC and the TCC:
    (a) Revision of CMMs 2021-05 and 2019-06 (Annexes L and M)
    (b) Draft Work plan to implement NPAFC/NPFC Memorandum of Cooperation (Annex P)
    (c) Effort indicators in the CMMs for priority species (paragraph 61)

10.4 Other issues

63. The EU provided an updated fisheries operation plan, including the most recent Japanese stock assessment. The EU presented an impact assessment for a chub mackerel fishery within the NPFC Convention Area, the fishing area, target species, fishing method, quantity, data collection and a risk-based assessment for the proposed fisheries (NPFC-2021-SC06-OP01).

64. Japan suggested that catch information for target and non-target species from similar fisheries operated by the EU in areas under the jurisdiction of other RFMOs be included in the EU's paper to the next SC meeting.

65. The SC noted that, without a stock assessment of chub mackerel in the Convention Area, it is difficult to provide scientific advice on the EU's proposed fisheries operation plan.

Agenda Item 11. Advice and recommendations to the Commission

66. Based on the recommendations from its SSCs and TWG CMSA, the SC recommends that the Commission:

(a) Endorse the revised Research Plan and Work Plan (Annex Q).

(b) Endorse the proposed scientific projects (Annex O).

(c) Consider species summary documents as reference information when taking decisions on the management of the NPFC priority species (Annexes D-K).

(d) Consider the scientific meetings schedule for 2022 as described in paragraph 68.

(e) Consider holding an informal web meeting of the SWG MSE PS in 2022 to review the outcomes of the SSC PS09 meeting.

Chub Mackerel

(f) Hire an external expert to continue the work to develop an operating model (PopSim) and test chub mackerel stock assessment models, if needed, in the next year.

Bottom Fish and Marine Ecosystems

(g) Endorse the revised CMM 2021-05 (Annex L).

(h) Endorse the revised CMM 2019-06 (Annex M).

(i) Co-sponsor the PICES WG-47 Workshop on "Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions" by contributing the equivalent of $5,000 USD.

Pacific Saury

(j) Endorse the stock assessment report (Annex N).

(k) Allocate funds for the participation of an invited expert in the next SSC PS meetings.

(l) Consider the following to improve conservation and management of Pacific saury:

i. The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) is much larger than the TAC would be based on the F_{MSY} catch approach ($B2021*F_{MSY}$ = 192,804 tons) and the current biomass is much lower than B_{MSY}. Reducing F in the short term may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 419,000 tons).

ii. A harvest control rule (HCR) that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world.

Data Sharing

(m) Update the data shared by TWG CMSA, SSC BF-ME and SSC PS in accordance with their Work Plans.

Cooperation with Other Organizations

(n) Financially support the travel of one member of the SC or its subsidiary bodies to participate in the PICES-2022 Annual Meeting, if necessary.

(o) Financially support the travel of three members of the SC or its subsidiary bodies to participate in the PICES-ICES-FAO International Symposium on Small Pelagic Fishes in November 2022, if necessary.

(p) Endorse the revised science-related items of the five-year Work Plan to implement the NPAFC/NPFC Memorandum of Cooperation (Annex P).

(q) Consider entering into an arrangement with FIRMS and decide whether to do so under a Partnership Arrangement or a Collaborative Arrangement.

67. In relation to other tasks for the SC specified in CMMs and the Convention, the SC informs the Commission of the following:

Chub Mackerel

(a) The TWG CMSA will conduct a preliminary stock assessment for chub mackerel in 2022.

(b) The TWG CMSA may hold informal web meetings to check progress and plan intersessional work.

Bottom Fish and Marine Ecosystems

(c) The SSC BF-ME will update the species summaries of North Pacific armorhead, splendid alfonsino, sablefish, and blackspotted and rougheye rockfishes.

(d) The SC adopted the Terms of Reference for stock assessment for North Pacific armorhead and splendid alfonsino (available on the website).

(e) The SSC BF-ME selected Dr. Chris Rooper (Canada) to serve as Chair and Dr. Felipe Carvalho (USA) to serve as vice-Chair of the SSC BF-ME.

(f) The SSC BF-ME selected Dr. Kota Sawada (Japan) to serve as the new SWG NPA-SA Lead.

(g) The SSC BF-ME will hold informal web meetings of the SWG NPA-SA and SWG VME to check their progress and plan intersessional work.

Pacific Saury

(h) The SSC PS selected Dr. Toshihide Kitakado (Japan) to serve as Chair of the SSC PS.

(i) The SSC PS will hold informal web meetings to check progress and plan intersessional work.

Other priority species

(j) The SC agreed that the common name “blue mackerel” be used instead of “spotted mackerel” for *Scomber australasicus* and that the SWG SM will henceforth be known as the SWG BM.

(k) The SC will update the species summaries of NFS, JFS, JS and BM.

Observer Program

(l) The SC will continue discussions on the establishment of an observer program in the

NPFC Convention Area, including identifying data needs and data gaps for non-target species and priority species. Specifically, the SC tasked the subsidiary bodies with reporting the data needs and outlining methods (e.g. human or electronic observers) that could be used to collect the necessary data at SC07.

SC Chair and Vice Chair

(m) The SC selected Dr. Janelle Curtis (Canada) to continue to serve as the SC Chair and Dr. Jie Cao (China) to continue to serve as the SC vice-Chair.

Cooperation with Other Organizations

(n) The SC endorsed the suggestions to the research survey program of the NPAFC/IYS 2022 pan-Pacific winter high seas expedition (paragraph 48).

EU Fisheries Operation Plan

(o) Without a stock assessment of chub mackerel in the Convention Area, the SC noted it is difficult to provide scientific advice on the EU's proposed fisheries operation plan.

Agenda Item 12. Next meeting

68. The SC suggested the following meeting schedule for 2022:
    (a) TWG CMSA05: 16-19 May
    (b) SSC PS09: 30 August to 2 September
    (c) TWG CMSA06: 5-8 September
    (d) SSC BF-ME03: 8-10 December
    (e) SSC PS10: 12-15 December
    (f) SC07: 16-17 and 19-20 December

69. With regard to the meetings tentatively scheduled for December, the SC agreed that the abovementioned schedule would be preferable if the meetings are to be held in person. If the meetings are to be held virtually, the SC agreed to revisit the schedule in the intersessional period and seek to adjust it as appropriate.

Agenda Item 13. Press release

70. The SC endorsed the press release for the publication on the NPFC website after the meeting.

Agenda Item 14. Adoption of the Report

71. The SC06 Report was adopted by consensus.

Agenda Item 15. Close of the Meeting

72. The meeting closed at 10:39 on 18 December 2021, Tokyo time.

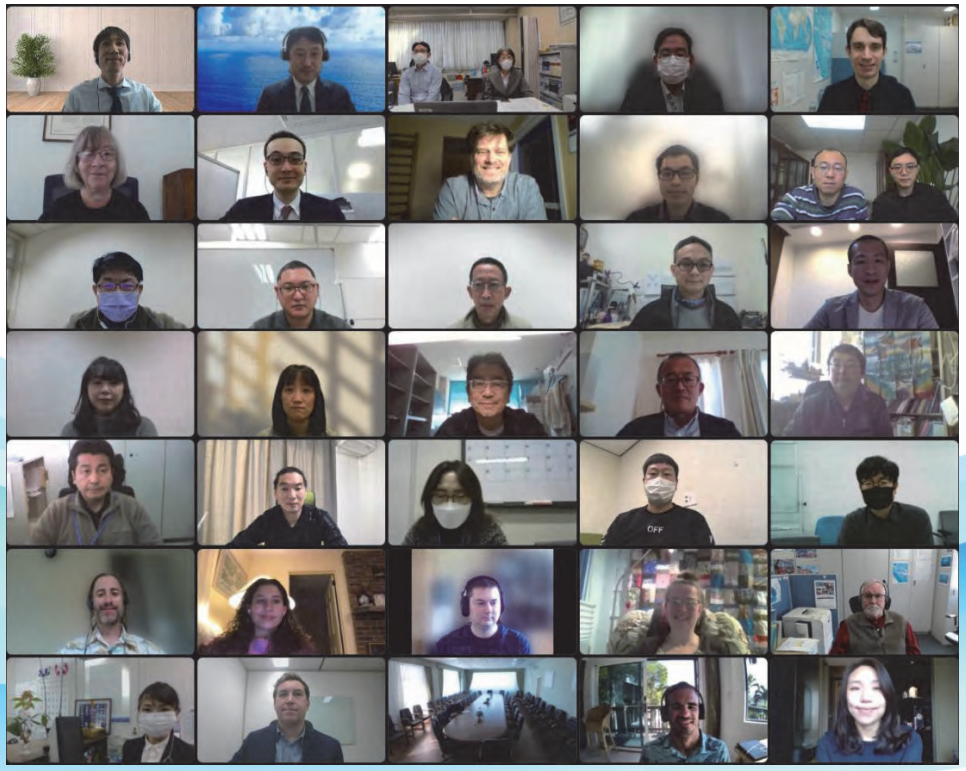
Annexes:

Annex A – Agenda
Annex B – List of documents
Annex C – List of participants
Annex D – Species summary for North Pacific armorhead
Annex E – Species summary for splendid alfonsino
Annex F – Species summary for sablefish
Annex G – Species summary for blackspotted and rougheye rockfishes
Annex H – Species summary for neon flying squid
Annex I – Species summary for Japanese sardine
Annex J – Species summary for Japanese flying squid
Annex K – Species summary for blue mackerel
Annex L – Revised CMM 2021-05 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean
Annex M – Revised CMM 2019-06 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northeastern Pacific Ocean
Annex N – Stock Assessment Report for Pacific Saury
Annex O – Scientific projects
Annex P – Five-year Work Plan (2021–2025) to implement NPAFC/NPFC Memorandum of Cooperation
Annex Q – Five-Year Research Plan and Work Plan of the Scientific Committee

Please refer to the NPFC website for the complete annexes.

1st Meeting of the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury

21-22 February 2022
Virtual
Meeting Report



Agenda

Agenda Item 1. Introductory items

1.1 Opening of the meeting

1.2 Adoption of agenda

1.3 Meeting logistics

Agenda Item 2. Role of the joint SWG MSE PS and review of the Terms of Reference

2.1 Commission's request and CMM 2021-08

2.2 Confirmation of NPFC priority on management

2.3 Review of the Terms of Reference

Agenda Item 3. General overview of an MSE process

3.1 Basic and general concept of MSE

3.2 Reference points, stock status and risks

3.3 Potential issues regarding MSE for Pacific saury (and small pelagic fish in general)

Agenda Item 4. Initial discussion toward development of an interim harvest control rule (HCR) for the short-term goal

4.1 Management objectives and some constraint conditions for the regulation of fishery

4.2 Technical matters on operating models, HCRs, performance measures and simulation

Agenda Item 5. Initial discussion toward development of management procedures (MPs) for the mid-term goal

5.1 Management objectives and some constraint conditions for the regulation of fishery

5.2 Technical matters on operating models, MPs, performance measures and simulation

Agenda Item 6. Functioning within NPFC

6.1 Roles and scientific contributions from the SC and SSC-PS

6.2 Roles and contributions from the TCC

6.3 Others

Agenda Item 7. Other matters

7.1 Selection of an external expert

7.2 Capacity building (glossary and demonstration)

7.3 Others

Agenda Item 8. Timeline and future process

8.1 Timeline

8.2 Future meetings

Agenda Item 9. Recommendations to the Commission

Agenda Item 10. Adoption of report

Agenda Item 11. Close of the meeting

MEETING REPORT

Agenda Item 1. Introductory items

1.1 Opening of the meeting

1. The 1st meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America and Vanuatu. The Pew Charitable Trusts (Pew) attended as an observer. Dr. Penelope Ridings and Dr. Andrew Wright attended as Secretariat Guests in their role as Panelists for the first NPFC Performance Review. The meeting was opened by Dr. Toshihide Kitakado (Japan) and Mr. Justin Turple (Canada), who served as Co-Chairs.

1.2 Adoption of agenda

2. The agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

1.3 Meeting logistics

3. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.

4. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Role of the joint SWG MSE PS and review of the Terms of Reference

2.1 Commission's request and CMM 2021-08

5. The Science Manager explained the Commission's request to establish the SWG MSE PS, as described in paragraph 15 of Conservation and Management Measure 2021-08 for Pacific Saury.

2.2 Confirmation of NPFC priority on management

6. The Science Manager explained the NPFC priority on management, highlighting the following:
   (a) Adopting measures, based on the best scientific information available, to ensure that fisheries resources are maintained at or restored to levels capable of producing maximum sustainable yield (Article 3(b) of the Convention);
   (b) Adopt, where necessary, management strategies for any fisheries resources (Article 7(1)(d) of the Convention);
   (c) Provide analysis to the Commission of alternative conservation and management measures (Article 10(4)(j) of the Convention).

2.3 Review of the Terms of Reference

7. The SWG MSE PS reviewed the Terms of Reference (TOR) and determined that no revisions are currently necessary.

Agenda Item 3. General overview of an MSE process

3.1 Basic and general concept of MSE

8. Dr. Kitakado outlined the basic and general concept of MSE, highlighting the following necessary steps (not necessarily in sequence):
   (a) Identification of management objectives and performance measures;
   (b) Development of operating models (OMs);
   (c) Development of management procedures (MPs);
   (d) Simulation testing of MPs with the OMs;
   (e) Selection of an MP based on simulation performance;
   (f) Implementation of the MP.

9. Dr. Kitakado explained the difference between projection based on stock assessment and projection in MSE, the difference between an MP and a harvest control rule (HCR), and what an OM is and how it differs from an assessment model (see NPFC-2022-SWG MSE PS01-IP01 for details).

10. In response to a request for further clarification of the difference between OMs and assessment models and how each accounts for uncertainty, Dr. Kitakado explained that both assessment models and OMs consider a certain level of uncertainty but that OMs can also consider an additional level of uncertainty compared to assessment models. Dr. Kitakado suggested that reference case scenarios could be developed for the OM with a similar level of uncertainty to the current assessment model and that these would provide the main outcomes when testing the MPs. In addition, additional scenarios with a greater level of uncertainty could be developed to

test the robustness of the MPs.

11. In response to a request for further elaboration on performance measures/metrics, Dr. Kitakado explained that performance measures/metrics measure the extent to which a management objective is being met. These include measures/metrics for both conservation and fisheries performance.

3.2 Reference points, stock status and risks

12. Dr. Kitakado provided an overview of reference points and explained that limit reference points indicate a biological limit beyond which the state of stock/fishing mortality is undesirable and that target reference points indicate a desired level of biomass/harvest.

13. Dr. Kitakado provided an overview of Kobe plots, Majuro plots, and combined plots as means of representing stock status.

3.3 Potential issues regarding MSE for Pacific saury (and small pelagic fish in general)

14. Dr. Kitakado explained some potential issues regarding MSE for Pacific saury that were raised at the NPFC Biological Reference Point/Harvest Control Rule/Management Strategy Evaluation Workshop held in 2019, namely:
    (a) Pristine biomass (B_0) is not always well estimated for short-lived and highly variable stocks, such as small pelagic species, and B_0-based reference points should not be used for such species;
    (b) The importance of tailoring reference points to life history characteristics such as growth and maturity and also to variability in recruitment, understanding the weaknesses and uncertainties inherent in reference points, and testing the robustness of reference points for fishing mortality and spawning stock biomass;
    (c) Age-structured stock assessment models would be more appropriate than age-aggregated models and age-structured operating models are preferable to length-based operating models.

Agenda Item 4. Initial discussion toward development of an interim harvest control rule (HCR) for the short-term goal

4.1 Management objectives and some constraint conditions for the regulation of fishery

4.2 Technical matters on operating models, HCRs, performance measures and simulation

15. Dr. Kitakado summarized the outcomes of the 8th meeting of the Small Scientific Committee on Pacific Saury (SSC PS08), focusing on the following recommendations:
    (a) The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury

(333,750 tons) is much larger than the TAC would be based on the F_{MSY} catch approach (B_{2021}*F_{MSY} = 192,804 tons) and the current biomass is much lower than B_{MSY}. Reducing F in the short term may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 419,000 tons);

(b) A harvest control rule that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world.

16. Dr. Kitakado presented a strawman proposal for technical developments toward setting an interim HCR for the short-term (NPFC-2022-SWG MSE PS01-WP01), using a Shiny application, to facilitate the discussions of the SWG MSE PS.

17. The SWG MSE PS considered potential reference points. Noting that, according to Article 3(b) of the Convention, fisheries resources are to be maintained at or restored to levels capable of producing maximum sustainable yield, the SWG MSE PS agreed that first priority should be given to MSY-based reference points. In the case of target and limit reference points for the stock, these could be B_{tar} = c*B_{MSY} or c*K and B_{lim} = c*B_{MSY} or c*K. In the case of target and limit reference points for the fishing intensity, these could be F_{tar} = c*F_{MSY} and F_{lim} = c*F_{MSY}. In addition, the SWG MSE PS suggested that reference points based on a certain percentage of fish stock level, such as F_{tar} = F(100c% of K or B_0) and F_{lim} = F(100c% of K or B_0%), could also be considered.

18. The SWG MSE PS discussed three types of management objective: recovery of the stock, avoiding unsustainable state of the stock, and achieving high and stable catch.

19. Regarding recovery of the stock, the SWG MSE PS agreed that this should be given the highest priority in light of the current status of the stock. Furthermore, noting the short-lived nature of the species, the SWG MSE PS agreed that a shorter timeframe for achieving recovery would be appropriate. The SWG MSE PS also noted that, with a depleted stock, it is common practice at other regional fisheries management organizations (RFMOs) to set a high probability of achieving recovery. The SWG MSE PS agreed to give further consideration to the following objectives: 1. The stock status is recovered above B_{tar} within “xx” years with “pp” probability (for example, xx could be 2-5 and pp could be >80%); and 2. The stock status is maintained above the B_{tar} level over “yy-yy” years with “qq” probability.

20. Regarding avoiding unsustainable state of the stock, the SWG MSE PS agreed to give further consideration to the following two objectives: 1. The annual probability that the stock drops

below B_{lim} should not exceed "pp" probability; or 2. The annual probability that the fishing mortality exceeds F_{lim} should not exceed "pp" probability. The SWG MSE PS noted that if the objective for recovery is to be established based on B, setting the objective for sustainability based on F should be avoided because these two objectives may cause confusion.

21. Regarding achieving high and stable catch, the SWG MSE PS agreed to give further consideration to the following two objectives: 1. Catch is high and stable as much as possible; and 2. Maximum interannual variation of TAC over yy period should be less than xx%.

22. Regarding OMs, the SWG MSE PS considered Option A and Option B as described in NPFC-2022-SWG MSE PS01-WP01. The SWG MSE PS weighed the pros and cons of the two options and agreed to prioritize Option A (the use of the current interim stock assessment model, BSSPM, as a basis with consideration of uncertainties in estimated parameters and process errors) given the short timeframe available for achieving the short-term objectives of the SWG MSE PS TOR to develop an HCR. At the same time, the SWG MSE PS agreed that Option B (development of an age-structured model) is more scientifically comprehensive and could be considered as a potential additional model, if it is possible to develop such a model in time. The SWG MSE PS also noted that the BSSPM model in Option A has limited capability of predicting future biomass, and there is a need for improvement for evaluating interim HCRs.

23. The SWG MSE PS agreed to give further consideration to an empirical or model-based HCR. In the case of a model-based HCR, the following points need to be considered:
    (a) Selection of an input of "B" for HCR (single recent year or 2- or 3-years average?);
    (b) Maximum change in TAC over two consecutive years (within "xx" %);
    (c) Parameters can be tuned to meet a priority objective over the reference scenarios;
    (d) Frequency of application of HCR (every year considering the short-lived nature of the species and environmental concern?);
    (e) Safeguards for exceptional circumstances.

24. The SWG MSE PS recognized the usefulness of the Shiny application and recommended the Commission allocate funds for the development of a simulation platform for the evaluation of HCR.

Agenda Item 5. Initial discussion toward development of management procedures (MPs) for the mid-term goal

5.1 Management objectives and some constraint conditions for the regulation of fishery

5.2 Technical matters on operating models, MPs, performance measures and simulation

25. The SWG MSE PS noted that, before it can hold detailed discussions about work towards its mid-term goal, there needs to be more progress on the development of a new age-structured stock assessment model that is better able to predict future biomass trends. The SWG MSE PS agreed to focus on its short-term goal until such progress is made and to defer discussions on its mid-term goal.

26. Pew suggested that the NPFC should work towards establishing an MSE process based on an ecosystem framework that takes into account environmental factors.

Agenda Item 6. Functioning within NPFC

6.1 Roles and scientific contributions from the SC and SSC PS

27. The SWG MSE PS reviewed the roles and expected scientific contributions from the SC and the SSC PS.

6.2 Roles and contributions from the TCC

28. The SWG MSE PS reviewed the roles and expected contributions from the TCC.

6.3 Others

29. The SWG MSE PS agreed to conduct intersessional technical work on developing a concrete proposal for reference points and management objectives and developing and evaluating HCRs as a short-term task (conditioning of OMs and listing up of possible/candidate HCRs).

Agenda Item 7. Other matters

7.1 Selection of an external expert

30. Dr. Kitakado suggested the selection of Dr. Larry Jacobson as the external expert for the development of the interim HCR, noting Dr. Jacobson's contributions to the work of the SSC PS.

31. The SWG MSE PS recommends the hiring of Dr. Larry Jacobson as the external expert for the development of the interim HCR.

7.2 Capacity building (glossary and demonstration)

32. The SWG MSE PS reviewed a glossary of terms for harvest strategies, management procedures and management strategy evaluation developed by the joint tuna RFMO (NPFC-2022-SWG MSE PS01-IP01) and requested that the Secretariat use this as a basis for developing the SWG MSE PS's own MSE glossary in cooperation with co-Chairs and Members.

33. Pew provided an overview of harveststrategies.org, an online resource with harvest-strategy-related material for fisheries scientists, managers, and other stakeholders (NPFC-2022-SWG MSE PS01-OP01).

7.3 Others

34. No other matters were discussed.

Agenda Item 8. Timeline and future process

8.1 Timeline

8.2 Future meetings

35. The SWG MSE PS discussed and drafted a timeframe for 2022 and early 2023 with proposed meetings and tasks (Annex D).

Agenda Item 9. Recommendations to the Commission

36. The SWG MSE PS01 recommends that the Commission:
    (a) Allocate funds for the development of a simulation platform for the evaluation of HCR.
    (b) Hire Dr. Larry Jacobson as an external expert to support the development of an interim HCR.
    (c) Endorse the timeframe for 2022 and early 2023 including the proposed meetings and tasks (Annex D).

Agenda Item 10. Adoption of report

37. The SWG MSE PS01 Report was adopted by consensus.

Agenda Item 11. Close of the Meeting

38. The meeting closed at 12:40 on 22 February 2022, Tokyo time.

Annexes:

Annex A – Agenda
Annex B – List of documents
Annex C – List of participants
Annex D – Proposed timeframe for 2022 and early 2023

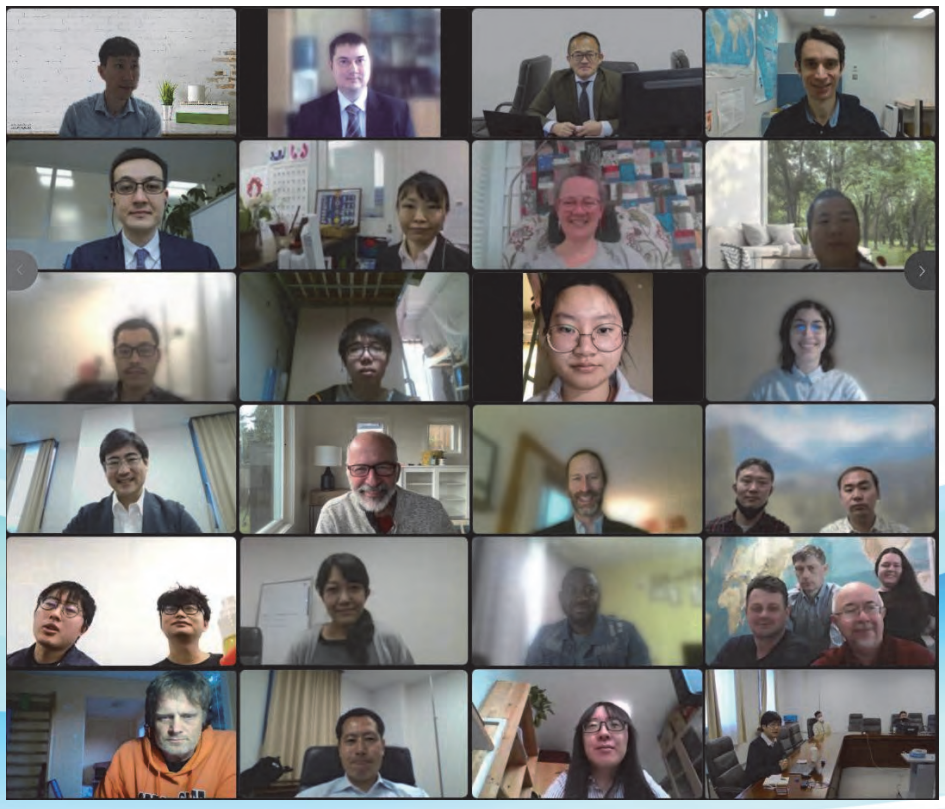
Please refer to the NPFC website for the complete annexes.

5th Meeting of the Technical Working Group on Chub Mackerel Stock Assessment

16-19 May 2022

Virtual

Meeting Report



Agenda

Agenda Item 1. Opening of the Meeting

Agenda Item 2. Adoption of Agenda

Agenda Item 3. Overview of the recommendations and outcomes of previous NPFC meetings relevant to chub mackerel

- 3.1 4th TWG CMSA and 6th SC meeting
- 3.2 7th Commission meeting
- 3.3 Intersessional meetings of SWG OM

Agenda Item 4. Review of Terms of Reference and Protocols of the TWG CMSA

- 4.1 Terms of Reference
- 4.2 CPUE Standardization Protocol
- 4.3 Stock Assessment Protocol
- 4.4 Protocol for the Operating Model Development

Agenda Item 5. Member's fisheries information and research activities

- 5.1 Description of fisheries, inter alia, fishing seasons and fishing grounds
- 5.2 Research activities

Agenda Item 6. Stock assessment model for chub mackerel

- 6.1 Progress of the intersessional works
- 6.2 Data generation by PopSim as input to the candidate stock assessment models
- 6.3 Report on the performance of the candidate stock assessment models
- 6.4 Discussion on the ranking of the candidate stock assessment models
- 6.5 Selection of the model for chub mackerel stock assessment
- 6.6 Recommendations and timelines for future work

Agenda Item 7. Development of data for the stock assessment of chub mackerel

- 7.1 Data inventory (catch, size, abundance indices, etc.) and updates
- 7.2 Review of standardized fishery-dependent/independent indices, inter alia, standardized abundance indices from China and Russia
- 7.3 Review of biological parameters
- 7.4 Observer Program

7.5 Recommendations for future work

Agenda Item 8. Future projection of chub mackerel

Agenda Item 9. Biological reference points

9.1 Candidate biological reference points for chub mackerel

Agenda Item 10. Review of the Work Plan of the TWG CMSA

Agenda Item 11. Other matters

11.1 Timeline and intersessional activities before TWG CMSA06

11.2 Other issues

Agenda Item 12. Recommendations to the Scientific Committee

Agenda Item 13. Adoption of Report

Agenda Item 14. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 5th Meeting of the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA) of the North Pacific Fisheries Commission (NPFC) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, the European Union (EU), Japan, and the Russian Federation. Dr. Jim Ianelli attended as a Secretariat Guest in his role as a Panelist for the first NPFC Performance Review. An invited expert, Dr. Joel Rice, participated in the meeting.

2. The meeting was opened by the TWG CMSA Chair, Dr. Vladimir Kulik (Russia). Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

3. The Agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

Agenda Item 3. Overview of the recommendations and outcomes of previous NPFC meetings relevant to chub mackerel

3.1 4th TWG CMSA and 6th SC meetings

4. The Chair provided an overview of the 4th TWG CMSA meeting and its recommendations, which the 6th Scientific Committee (SC) meeting endorsed and recommended to the Commission.

3.2 7th Commission meeting

5. The Science Manager, Dr. Alex Zavolokin, reported that the 7th Commission meeting was postponed and that the new dates for the meeting are still under discussion among Members.

3.3 Intersessional meetings of SWG OM

6. The Lead of the Small Working Group on Operating Model (SWG OM), Dr. Shota Nishijima (Japan), provided an overview of the discussions and outcomes of the 2nd intersessional meeting of the SWG OM (NPFC-2022-TWG CMSA05-WP01).

Agenda Item 4. Review of Terms of Reference and Protocols of the TWG CMSA

4.1 Terms of Reference

7. The TWG CMSA reviewed the Terms of Reference and determined that no revisions are currently required.

4.2 CPUE Standardization Protocol

8. The TWG CMSA reviewed the CPUE Standardization Protocol and determined that no revisions are currently required.

4.3 Stock Assessment Protocol

9. The TWG CMSA reviewed the Stock Assessment Protocol and determined that no revisions are currently required.

4.4 Protocol for the Operating Model Development

10. The TWG CMSA reviewed the Protocol for the Operating Model Development and determined that no revisions are currently required.

11. The TWG CMSA reaffirmed that the decision on selecting the stock assessment model will be made by the TWG CMSA, based on technical work and discussions conducted by the SWG OM.

Agenda Item 5. Review of Member's fisheries and research activities

5.1 Description of fisheries, inter alia, fishing seasons and fishing grounds

5.2 Research activities

12. China presented a review of its chub mackerel fishery and research activities (NPFC-2022-TWG CMSA05-IP02 & IP03). In 2021, China operated 105 purse seine vessels and 3 trawl vessels in the Convention Area. Total catch was 108,266 mt with higher catch at 40-44 degrees north latitude than in the other areas. The average length of caught individuals was 246 mm. The trend in average fork length from 2016-2021 was a gradual increase to a stable level. The main age at catch in 2021 was 2+ and 3+. China collects and analyzes fishing logbooks every year and sends research specialist staff to fishing vessels or ports to collect sample data. It is also providing annual training for fishermen and enterprises.

13. Russia presented a review of its chub mackerel fishery and research activities in 2021 (NPFC-2022-TWG CMSA05-IP01). In 2021, the main fishing grounds were in the Japanese exclusive economic zone (EEZ) from January to March, before shifting to open waters in May, then to the Russian EEZ from June, and back to the Japanese EEZ in November and December. Monthly catch-per-unit-effort (CPUE) was highest in January, February, March, and December. Monthly catch was highest in January, February, October, and December. From 2016 to 2021, total annual catch was highest in 2018, followed by 2021 (87,388 mt). In terms of research activities, Russia conducted two multipurpose and multispecies trawling surveys in the upper epipelagic zone of the Northwestern Pacific Ocean in 2021, the first in June-July and the second in August-September.

14. Japan presented a review of its chub mackerel fishery and research activities (NPFC-2022-TWG CMSA05-IP05). Japan's catch comes from large-scale purse seine vessels, small-scale purse seine vessels, set nets, and dip nets and other gears. The majority of catch is from large-scale purse seine vessels. Monthly catch follows the same pattern across recent years, with lower catch in May to September, and higher catch in autumn and winter. The map of quarterly fishing effort shows the same seasonal change across recent years, with a lot of effort in the northern part of Japan in the fourth quarter. The map of quarterly catch follows the same pattern as the quarterly effort map. In terms of research, Japan conducted recruitment surveys in summer and autumn. The CPUEs of the two surveys are used as recruitment indices. The CPUEs of its dip net fishery and egg survey are used as spawning stock biomass (SSB) indices. The CPUE in 2019 decreased relative to 2018 and remained higher compared to before 2010. Japan also conducts an annual domestic stock assessment using virtual population analysis (VPA). The results indicate that recruitment has remained at a higher level after a strong cohort in 2013, SSB has been at a higher level since 2014, and the exploitation rate has been at a historically lower level after 2010.

15. The TWG CMSA held further discussions on a standardized approach for aggregating catch-at-age data for future stock assessment of chub mackerel. For the development of the operating model, Japan has been aggregating data by a fishing year beginning in July, while China and Russia have been aggregating data by calendar year. Japan pointed out that aggregating the data by a fishing year beginning in July better reflects the biology and ecology of chub mackerel. China and Russia explained that changing the way they aggregate their data could create issues and additional work, and that developing calendar-year-based management measures from a stock assessment based on a fishing year could be problematic. Japan suggested that, as a compromise, a fishing year starting in April could be used. Further discussions were held under

agenda item 7.3 (see paragraphs 43-44).

Agenda Item 6. Stock assessment model for chub mackerel

6.1 Progress of the intersessional works

16. China presented an updated stock assessment based on age-structured assessment program (ASAP) for the operating model for chub mackerel in the North Pacific Ocean in 2022 (NPFC-2022-TWG CMSA05-WP04). The biomass of chub mackerel was at a high level before 1980, then declined to a low value, before recovering since 2005, with a similar trend for abundance and spawning stock biomass (SSB). During 1985-2005, fishing mortality for chub mackerel was high and stock abundance was very low.

17. China presented a stock assessment based on a Bayesian state-space production model (BSSPM) for the operating model for chub mackerel in the North Pacific Ocean (NPFC-2022-TWG CMSA05-WP05). The input data and base case scenario were confirmed by TWG CMSA04. However, due to the model assumptions of BSSPM, different natural mortality, maturity and weight matrix could not be considered in the stock assessment. The estimated median B_{2019} from the base case scenario was 562 (80%CI 121 - 1,081) $\times 10^4$ metric tons. The median B_{2019}/B_{MSY} and F_{2019}/F_{MSY} were 1.53 (80%CI 0.51 - 2.08) and 0.22 (80%CI 0.07 - 0.37), respectively. During the most recent years, the biomass of chub mackerel remained at a high value, with relatively low fishing mortality. The probability of the population being in the green Kobe quadrant in 2019 was estimated to be greater than 77%.

18. Japan pointed out that the shape of the posterior distribution for some parameters was unusual and asked China for further clarification. China pointed out that this kind of wide range is common due to specifications such as non-informative priors and acceptable for posterior distributions, but agreed that work could be done to improve it if needed, such as increasing the number of MCMC iterations or setting informative priors.

19. Japan noted that in the Kobe plot for the BSSPM results, F remains below F_{MSY} but B fluctuates, and suggested that the process errors estimated for each year be checked as they may be having a large influence on the results.

20. Russia presented an updated preliminary chub mackerel stock assessment using cohort analysis with Kalman filter (KAFKA) and using all indices provided by Members for six scenarios (NPFC-2022-TWG CMSA05-WP07). The analysis has been updated following SWG OM02 by correctly applying the M values. Maximum SSB estimates were obtained for scenarios with the highest weight and maturity values. Fishing mortality had similar dynamics for all scenarios,

with the exception of the last 5 years. For scenarios with higher estimates of maturity at age, the estimate of fishing mortality was the highest. Retrospective analysis showed no serious biases under the base-case scenarios. Biological reference points based on hockey-stick stock-recruitment relationship were estimated. Across all scenarios, the best matches were observed for the abundance indices.

21. Japan pointed out that it had submitted a paper to Russia with questions about some model configurations of KAFKA at SWG OM02. Russia stated that it would provide the answers to the extent possible by 31 May 2022, explaining that some of the answers can only be provided by the developer of the model.

22. Japan presented the updated results of tuned VPA and state-space assessment model (SAM) under the determined scenarios to include biological uncertainties on natural mortality, weight, and maturity (NPFC-2022-TWG CMSA05-WP06). A few model configurations were changed from the previous analysis to avoid overfitting and stabilize parameter estimation, which will be useful for the application of these models to pseudo-data generated from the operating model. Abundance estimates were lower compared to the previous assessment due to the change in M, but qualitative results have not changed significantly. SAM demonstrated lower retrospective bias than VPA.

23. The SWG OM Lead summarized the intersessional progress made since SWG OM02 and remaining issues.

6.2 Data generation by PopSim as input to the candidate stock assessment models

24. The invited expert explained the process of generating pseudo data using PopSim as input to the candidate stock assessment models and the progress to date. Pseudo data have been developed, checked and disseminated to the SWG OM. The SWG OM is in the process of running models on pseudo data and summarizing the results. Results will be compared to the true data results via the performance measures.

25. The NPFC Performance Review Panelist noted that PopSim has limited capabilities. It may be worthwhile to compare the simulated data (graphically) with real data side by side. A "Turing test" (computer-generated vs human-collected data) may help provide context for simulation-testing the models.

26. The TWG CMSA reviewed the progress and suggested technical improvements for generating new pseudo data, including:

(a) an alternative method of estimating selectivity for the KAFKA model.
(b) incorporating the dynamics of ages 7-14 (age classes 8-15 in the PopSim setting).
(c) an alternative method of incorporating the non-linear exponent and observation error.

27. The TWG CMSA agreed that pseudo data originated from different stock assessment models under the same scenario will be randomized and summarized into a single pseudo dataset.

6.3 Report on the performance of the candidate stock assessment models

28. The invited expert explained that he is currently waiting for Members to submit their results for the newest pseudo data, after which he will compare the results to the true data.

29. Japan presented a first analysis of the fitting of VPA and SAM to pseudo data generated from PopSim for chub mackerel in the Northwestern Pacific (NPFC-2022-TWG CMSA05-WP08).

30. Japan explained the shared package OMutility had several bugs and suggested that the package be re-distributed with these bugs fixed after this meeting.

31. The TWG CMSA noted that the OMutility package developed by Japan cannot be used for BSSPM and encouraged China to calculate the performance measures using its own resources.

6.4 Discussion on the ranking of the candidate stock assessment models

6.5 Selection of the model for chub mackerel stock assessment

32. The TWG CMSA reviewed and revised the table of priority performance measures for evaluating the stock assessment models (Annex D).

33. The TWG CMSA discussed how to conduct the retrospective analysis. For the retrospective analysis, the TWG CMSA agreed to calculate Mohn's Rho using SSB, B, and weighted average F by catch-weight-at-age. The TWG CMSA noted the importance of conducting model diagnostics such as retrospective analysis, while also recognizing the difficulty of interpreting the results of such an analysis conducted in a simulated framework. The TWG CMSA agreed to discuss how much weight should be given to the retrospective analysis results after conducting the analysis and reviewing the results.

34. The TWG CMSA recognized the need to hold further discussions on priority performance measures for evaluating the stock assessment models, including consideration of the following:
(a) Reducing their dimension – which performance measures are correlated or uncorrelated?

(b) How do different performance measures conflict among the models?
(c) How should the relative weight for self-test and cross-test be allocated? (Good performance in self-test is usually of particular importance.)
(d) What situations in particular should be avoided (e.g. large overestimation of F_{MSY})?

6.6 Recommendations and timelines for future work

35. The TWG CMSA drafted a timeline of tasks leading up to the TWG CMSA06 meeting (Annex E).

Agenda Item 7. Development of data for the stock assessment of chub mackerel

7.1 Data inventory (catch, size, abundance indices, etc.) and updates

36. China explained its methodologies for sampling, ALK development, and estimating catch-at-age from the ALK, and presented its updated data for length and age distribution, length-weight relationship, catch-at-age, and number-at-age (NPFC-2022-TWG CMSA05-IP04).

37. The TWG CMSA reviewed and updated the table of data potentially available for stock assessment of chub mackerel (Data availability for CMSA).

7.2 Review of standardized fishery-dependent/independent indices, inter alia, standardized abundance indices from China and Russia

38. Russia presented the standardized CPUE for chub mackerel caught by the Russian pelagic trawl fishery in 2015-2021 (NPFC-2022-TWG CMSA05-WP03). Production and natural factors were used as predictors. To analyze the influence, generalized additive models (GAM) were used. The choice of the best model was made using the Akaike information criterion (AIC) and Bayesian information criterion (BIC). The selected model includes coordinates, day of the year, vessel length, engine power, number of fishing vessels and sea surface temperature (SST). The influence of considered factors on CPUE was interpreted and described.

39. Japan pointed out that the method for filtering data targeting chub mackerel was confounded with the response variable. It suggested Russia explore alternative approaches, such as Biseau 1998.

40. China presented the standardized CPUE for chub mackerel caught by China's lighting purse seine fishery up to 2020 (NPFC-2022-TWG CMSA05-WP09). China conducted CPUE standardizations using generalized linear model (GLM) and GAM. Four groups of independent variables were considered in the CPUE standardization: spatial variables (latitude and longitude), temporal variables (year and month), vessel length and environmental variables

(SST, and chlorophyll-a). Log-CPUE was treated as the dependent variable and its error was assumed to follow a normal distribution in each model. The model selections of GLM and GAM were based on BIC. China recommended using the best GAM model to estimate the standardized CPUE for the chub mackerel fishery.

41. Japan suggested some potential improvements in usage of explanatory variables and extraction of abundance trend to China's CPUE standardization and shared them via correspondence.

42. The TWG CMSA requested China to further improve its CPUE standardization by following the CPUE Standardization Protocol for Chub Mackerel when next updating its CPUE standardization.

7.3 Review of biological parameters

43. Japan gave a presentation on how chub mackerel biological behavior and fishing activity correspond to different months of the year and the pros and cons of different ways of defining the fishing year. Use of a fishing year beginning in July or April would avoid splitting the fishing period, enable the setting of the timing at which fish get older to the beginning of the fishing year, and enable the use of one-year data to calculate weight-at-age. Use of a calendar year would split the fishing period, result in chub mackerel getting older in the middle of the year, and only enable half-year data to be used to calculate weight-at-age.

44. The TWG CMSA noted differences in which part of the year Members collect their length data, which can create issues for jointly calculating catch-at-age and weight-at-age. The TWG CMSA agreed to submit fishery (catch-at-age, weight-at-age, maturity-at-age, if possible) data based on a quarterly calendar at its next meeting.

45. Japan gave a presentation on the density-dependent growth and body condition of chub mackerel in the western North Pacific (NPFC-2022-TWG CMSA05-IP06), based on Kamimura et al. (2021, ICES Journal of Marine Science). There has been an increase in the abundance of chub mackerel in recent years, especially after 2013, leading to a decrease in growth and condition factors. Japan's analysis shows that condition factors are negatively related to the abundance of chub mackerel and that growth rate is positively correlated to condition factors, i.e., more abundance leads to a slower growth rate. At least in quarters 1-3, the density-dependent effect plays a substantial role in the decline in condition factor and growth rate of chub mackerel and continuous biological monitoring is therefore important.

7.4 Observer Program

46. The Science Manager summarized the relevant discussions from the TWG CMSA04 and SC06 meetings and reminded the TWG CMSA that the SC has tasked all its subsidiary bodies, including the TWG CMSA, with reporting the data needs and outlining methods (e.g. human or electronic observers) that could be used to collect the necessary data at SC07.

47. The TWG CMSA noted that Members do not currently report bycatch of non-priority species from their chub mackerel fisheries. In the Convention Area, such species are caught by the Chinese and Russian chub mackerel fisheries and the TWG CMSA requested that the Members provide such information, as well as an overview of its domestic observer program for its chub mackerel fishery, at the next meeting. As for Members' national waters, the TWG CMSA was unsure if these also fall under the scope of the task assigned by the SC and requested clarification from the SC on this point.

48. The TWG CMSA agreed to review data or data description on fisheries bycatch in the chub mackerel fisheries and present these data at the next TWG CMSA, if possible.

7.5 Recommendations for future work

49. Regarding the issue of how to define the fishing year, the invited expert suggested that the TWG CMSA consider structuring the stock assessment data on a year-quarter basis, which would allow models to be built to avoid splitting the fishing period, fit to the variation on monthly catch, and provide catch for each of the recruitment, spawning and settlement periods.

Agenda Item 8. Future projection of chub mackerel

50. The TWG CMSA Vice Chair, Dr. Kazuhiro Oshima (Japan), gave a presentation on the aims of conducting future projections and a table of possible options for the basic specifications for conducting future projections for chub mackerel.

51. The TWG CMSA reviewed and revised the table of options (Annex F). The TWG CMSA agreed to continue to further discuss and refine the options.

Agenda Item 9. Biological reference points

9.1 Candidate biological reference points for chub mackerel

52. The TWG CMSA requested the invited expert to prepare a list of candidate biological reference points for chub mackerel, using the consultancy report *Review of Target and Limit Reference Points* prepared by Laurence Kell as the reference, and to present the list at the next meeting.

53. Japan shared the reference points used in its domestic chub mackerel stock assessment and

explained the procedure used to determine them. The reference points, which were enacted from 2020 and will be updated in 2025, are as follows:

Reference points	Spawning Stock Biomass (10^3 tons)
Target (MSY)	1545
Limit	562
Ban	67

54. The TWG CMSA agreed to hold further discussions of candidate biological reference points for the provision of chub mackerel management advice at its next meeting using the reference points used in the Japanese domestic chub mackerel stock assessment and the list to be prepared by the invited expert as the starting point.

Agenda Item 10. Review of the Work Plan of the TWG CMSA

55. The TWG CMSA reviewed and updated the Work Plan of the TWG CMSA (NPFC-2022-TWG CMSA05-WP02 (Rev. 1)).

Agenda Item 11. Other matters

11.1 Timeline and intersessional activities before TWG CMSA06

56. The timeline and intersessional activities before TWG CMSA06 are as described in Annexes E and G.

57. The TWG CMSA expressed its appreciation for the valuable contributions and support of the invited expert. The invited expert agreed to extend the term of his consultancy through the TWG CMSA06 meeting so that he can continue to support the development of the operating model and testing of stock assessment models.

11.2 Other issues

58. No other issues were discussed.

Agenda Item 12. Recommendations to the Scientific Committee

59. The TWG CMSA agreed:
    (a) To run the models using the latest pseudo data by the 2nd meeting of the SWG OM (12 August) (Annex E).
    (b) To use the revised performance measures for evaluating the stock assessment models in the development of the operating model (Annex D).
    (c) To submit fishery (catch-at-age, weight-at-age, maturity-at-age, if possible) data based

on a quarterly calendar to the next TWG CMSA meeting.

(d) To update and improve the standardized abundance indices and other data for use in the stock assessment as discussed under agenda item 7 and provide standardized abundance indices to the next TWG CMSA meeting.

(e) To hold further discussions of candidate biological reference points for the provision of chub mackerel management advice at its next meeting using the reference points used in the Japanese domestic chub mackerel stock assessment and the list to be prepared by the invited expert as the starting point.

(f) To review data or data description on fisheries bycatch in the chub mackerel fisheries and present these data at the next TWG CMSA, if possible.

60. The TWG CMSA recommended the following to the SC:

(a) The TWG CMSA recommended the Work Plan of the TWG CMSA (NPFC-2022-TWG CMSA05-WP02 (Rev. 1)).

(b) The TWG CMSA requested the SC to provide clarification on whether national waters fall under the scope of the task assigned by the SC to its subsidiary bodies of reporting the data needs and outlining methods that could be used to collect the necessary data.

Agenda Item 13. Adoption of the Report

61. The report was adopted by consensus.

Agenda Item 14. Close of the Meeting

62. The meeting closed at 12:00 pm on 19 May 2022, Tokyo time.

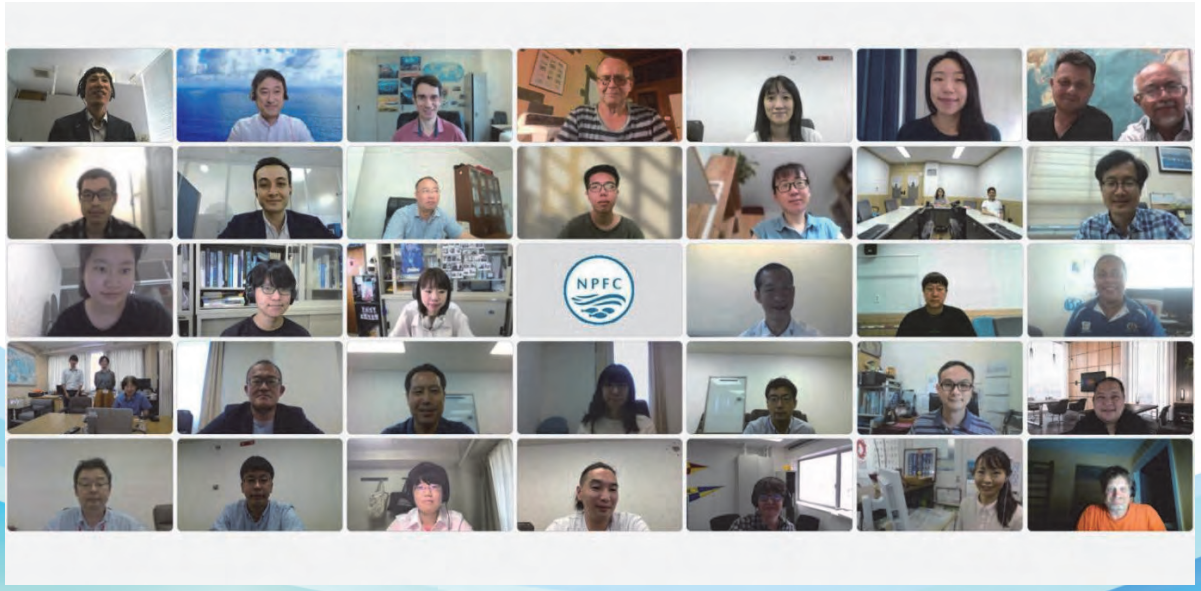
Annexes:

Annex A – Agenda
Annex B – List of Documents
Annex C – List of Participants
Annex D – Priority performance measures for evaluating the stock assessment models
Annex E – Timeline of tasks for the Small Working Group on Operating Model and external expert
Annex F – Options for the basic specifications for conducting future projections for chub mackerel
Annex G – Flowchart for the development of operating models and testing stock assessment models

Please refer to the NPFC website for the complete annexes.

9th Meeting of the Small Scientific Committee on Pacific Saury

30 August - 2 September 2022
Virtual
Meeting Report



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MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 9th Meeting of the Small Scientific Committee on Pacific Saury (SSC PS09) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, and Vanuatu. Dr. Larry Jacobson participated as an invited expert.

2. The meeting was opened by Dr. Toshihide Kitakado (Japan), the SSC PS Chair, who welcomed the participants. The Science Manager, Dr. Aleksandr Zavolokin, outlined the procedures for the meeting. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

3. The agenda was adopted without revision (Annex A). The List of Documents and Participants List are attached (Annexes B, C).

Agenda Item 3. Overview of the outcomes of previous NPFC meetings

3.1 SSC PS08 and SC06 meeting

4. The Chair presented the outcomes and recommendations from the SSC PS08 meeting and the 6th meeting of the Scientific Committee (SC06).

3.2 SWG MSE PS01

5. The Chair presented the outcomes and recommendations from the 1st meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific saury (SWG MSE PS01).

6. The Science Manager explained that the Commission was scheduled to meet in March but that the meeting was postponed. The Commission has therefore not been able to consider the recommendations of the SC or its subsidiary bodies.

Agenda Item 4. Review of the Terms of References of the SSC PS and existing protocols

4.1 Terms of References of the SSC PS

7. The SSC PS reviewed the Terms of References of the SSC PS and determined that no revisions are currently necessary.

4.2 CPUE Standardization Protocol

8. The SSC PS reviewed the catch-per-unit-effort (CPUE) Standardization Protocol and determined that no revisions are currently necessary.

4.3 Stock Assessment Protocol

9. The SSC PS reviewed the Stock Assessment Protocol and determined that no revisions are currently necessary.

Agenda Item 5. Member's fishery status including 2022 fishery

10. Canada presented its Pacific saury catch information (NPFC-2022-SSC PS09-IP01). Canada does not have a commercial fishery targeting Pacific saury, but occasionally takes Pacific saury as bycatch. No bycatch of Pacific saury was taken by commercial fishing in 2020 or 2021, nor by research surveys in recent years. Pacific saury has been found to be a part of the diet of Rhinoceros Auklets and in some years, Pacific saury constitutes a substantial part of Rhinoceros Auklet prey. This year, Canada also found Pacific saury in the diet of adult salmon.

11. Russia suggested that it may be useful to conduct genetic studies of Pacific saury in the Eastern Pacific Ocean. Canada suggested that it could arrange for tissue and other samples from Pacific saury taken in the Eastern Pacific Ocean to be shared with any Members interested in conducting such studies.

12. Russia presented its fisheries status (NPFC-2022-SSC PS09-IP02). Total catch in 2021 was approximately 600 metric tons (MT), the lowest after 1991. Since 2014, the number of Russian saury fishing vessels has decreased every year. In 2020, the number of fishing vessels was 2, the lowest since 1991. 3 vessels operated in 2021. Nominal CPUE in 2021 was 4.2 MT/vessel/day, the lowest since 2000. In 2020 and 2021, the fishing grounds were mainly outside the Russian exclusive economic zone (EEZ) and were further east in 2021 compared to 2020.

13. China presented its fisheries status (NPFC-2022-SSC PS09-IP04). Total catch in 2021 was 33,511 MT, the lowest since 2018. As of 25 July, the total catch in 2022 is 6,902 MT. A total

of 59 vessels are operating in 2022, a decrease of 7 from 2021. Accumulated catch in 2022 has so far been lower than 2021, but still at an average level compared to historical levels. Seasonal catch in 2022 has so far been similar to that of 2021. The nominal CPUE has declined since 2018. So far in 2022, it has been 4.79 MT/vessel/day, the lowest since 2013. The fishing grounds so far in 2022 have been similar to those in 2021.

14. Vanuatu presented its fisheries status (NPFC-2022-SSC PS09-IP09 (Rev.1)). Total annual catch peaked at 8,231 MT in 2018. Total catch in 2021 was 1,270 MT. Vanuatu's Pacific saury fishery began in 2004. In total, it has authorized 16 vessels. The number of operating vessels has been 4 since 2015. A comparison of accumulated catch in recent years shows a trend of abundance increasing from October. Annual comparison of the seasonal catch shows that the main fishing season has been shifting to later in the year in recent years. Nominal CPUE in 2021 was 5.3 MT/day, the lowest since 2013. The main fishing grounds are between 150°E and 170°E. They are mainly in east early in the season, before shifting to the west. In 2021, the fishing season started late due to port measures related to COVID-19.

15. Japan presented its fisheries status (NPFC-2022-SSC PS09-IP06 (Rev. 1)). In 2021, 125 vessels were registered, a decrease of 2 from the previous year. The annual catch was 18,407 MT, the lowest since 1950. Accumulated catch until September in 2021 was higher than in 2019 and 2020 but was the lowest after the middle of October. 10-day catches were higher than 2020 until early October but lower than 2021 from mid-October. Nominal CPUE was 0.57 MT/haul, the lowest since 2000. Most of the fishing grounds were located on the high seas. Since 2010, the fishery ground has gradually moved east, particularly after 2019. Most of the fish caught in 2021 were age-1 fish. In 2022, the Japanese fishing season for Pacific saury started in August. 113 vessels are registered, a decrease of 8 from 2021. The vessels are mainly operating in the high seas. As of 26 August, the accumulated catch in 2022 is only 70 MT.

16. Korea presented its fisheries status (NPFC-2022-SSC PS09-IP07). Total catch in 2021 was 4,365 MT, a new historical low following the historical low in 2020. As of the end of July, the accumulated catch in 2022 is 862 MT. The number of vessels operating has gradually decreased from 2015 to 2022, and has decreased from 10 in 2021 to 8 in 2022. A yearly comparison of seasonal catch showed similar trends across years. Nominal CPUE was 4.5 MT/vessel/day in 2021, the historical low. Fishing grounds are usually west of 170°E at the start of the fishing season and tend to move westwards over time.

17. Chinese Taipei presented its fisheries status (NPFC-2022-SSC PS09-IP08). The catch recovered to around 180,000 tons in 2018 and has shown a declining trend since then. 93

vessels operated in 2021, compared to 87 in 2020. In 2022, the accumulated catch as of the end of July was 4,069 MT, compared to 4,895 MT for the same period last year. Through July, the seasonal catch in 2022 has been the lowest since 2001. From May to July 2022, the nominal CPUE has been about 1 MT/haul, which is less than that of the same periods in 2021 (1.21 MT/haul) and 2022 (1.32 MT/haul). Compared to 2021, fishing grounds are observed to be located further north in 2022.

18. The Science Manager presented the compiled data on Pacific saury catches in the northwestern Pacific Ocean from 1950 to 2021 (NPFC-2022-SSC PS09-WP01).

19. The Science Manager presented the cumulative catch of Pacific saury as of mid-August in 2020, 2021 and 2022. The cumulative catch in 2022 is approximately 14,342 MT compared to 23,701 MT in 2021 and 9,875 MT in 2020. Although the accumulated catch as of mid-August was higher in 2021 compared to 2020, the total annual catch was actually lower in 2021 than in 2020.

Agenda Item 6. Fishery-independent abundance indices

6.1 Review of results of abundance estimation including 2022 Japanese biomass survey

20. Japan presented the results of 2022 Japanese biomass survey and the Japanese survey biomass index of Pacific saury up to 2022 estimated using the Vector Autoregressive Spatio-temporal (VAST) model (NPFC-2022-SSC PS09-WP07). The 2022 survey area covered 143ºE to 165ºW and Pacific saury occurred in the area between 155ºE and 165ºW. The survey was conducted by three ships (Kaiyo-maru, Hokko-maru and Hokuho-maru). The survey area of the Hokko-maru and Hokuho-maru covered the main distribution area of Pacific saury in 2022. The Kaiyo-maru, which has not ever been used for the previous surveys for Pacific saury, used a different-sized trawl net to the Hokko-maru and Hokuho-maru. The relative fishing efficiency of this net was estimated using a statistical model, and the value was used to calibrate the input for the VAST analysis. The effect of the relative fishing efficiency was confirmed to be small and negligible for the final outcomes of the abundance index. A VAST model was applied to the Japanese fishery-independent survey data to predict the Pacific saury distribution and estimate the biomass index from 2003 to 2022. The VAST model with a quadratic function of sea surface temperature (SST) and log(SST) for encounter probability and positive catch rate, respectively, was selected by AIC. The estimated biomass index from the selected VAST model with minimum AIC indicated similar year trends with the index from the swept area method. In 2020, the estimated biomass index dropped to its lowest level since 2003. In 2022, it recovered but remained at a low level.

21. The SSC PS agreed to use the Japanese survey biomass index of Pacific saury up to 2022 estimated using VAST as an input for the stock assessment.

6.2 Review of plans of future biomass surveys

22. Japan stated that it would present its future biomass survey plans at the SSC PS10 meeting.

6.3 Recommendations for future work

23. The SSC PS commended Japan for using the new vessel nearshore in the 2022 survey where catch rates were very low so that the uncertainty in fishing efficiency had little effect on the VAST analysis. The SSC PS encouraged Japan to conduct additional work on the relative fishing efficiency and size selectivity of the new vessel if it is to be used more extensively in future.

24. The SSC PS noted that the use of the Kaiyo-maru for this year's biomass survey was due to exceptional circumstances and that Japan does not envision having to use the vessel for next year's survey. The SSC PS suggested that, if the Kaiyo-maru or another vessel with a different net to the usual survey vessels is to be used for the survey in the future, calibration of the different net should be built into the survey. For example, Japan could consider conducting experimental surveys to increase data availability or designing overlapping survey areas between the new vessel and one of the reference vessels to enable analyses of relative catchability between the two vessels.

25. The SSC PS noted that there was higher uncertainty in the earlier time period in the VAST model and suggested that Japan investigate the reason for the difference in the CV over time.

26. The SSC PS encouraged Japan to continue to conduct its biomass survey and Members to conduct Pacific saury or multispecies research surveys or share data from existing research surveys that could complement the Japanese biomass survey and provide useful information for understanding the abundance, spatio-temporal distribution, and migration patterns of Pacific saury.

27. Russia explained that it conducts annual multi-species surveys that mostly take place in the Russia EEZ but occasionally partially cover the Convention Area. The SSC PS noted that these surveys could provide useful information for the Pacific saury stock assessment and encouraged Russia to share further details about the surveys at the SSC PS10 meeting, if possible.

Agenda Item 7. Fishery-dependent abundance indices

7.1 Review of Members' standardized CPUEs

28. Russia presented a standardization of CPUE data for Pacific saury from 1994 to 2021 using a generalized linear model (GLM) (NPFC-2022-SSC PS09-WP03). Russia recommended using the standardized CPUE derived from GLM as input for the stock assessment.

29. The SSC PS agreed to use Russia's standardized CPUE derived from GLM as an input for the stock assessment.

30. Chinese Taipei presented a standardization of CPUE data for Pacific saury from 2001 to 2021 using GLM and a generalized additive model (GAM) on the assumption of lognormal distribution of errors (NPFC-2022-SSC PS09-WP04). Chinese Taipei recommended using the standardized CPUE derived from GAM as input for the stock assessment.

31. The SSC PS agreed to use Chinese Taipei's standardized CPUE derived from GAM as an input for the stock assessment.

32. China presented a standardization of CPUE data for Pacific saury from 2013 to 2021 using GLM and GAM on the assumption of lognormal distribution of errors (NPFC-2022-SSC PS09-WP06). China recommended using the standardized CPUE derived from GAM as an input for the stock assessment.

33. The SSC PS agreed to use China's standardized CPUE derived from GAM as an input for the stock assessment.

34. Japan presented a standardization of CPUE data for Pacific saury from 1994 to 2021 using GLM (NPFC-2022-SSC PS09-WP08). Japan recommended using the standardized CPUE derived from GLM as input for the stock assessment.

35. The SSC PS agreed to use Japan's standardized CPUE derived from GLM as input for the stock assessment.

36. Korea presented a standardization of CPUE data for Pacific saury from 2001 to 2021 using GLM (NPFC-2022-SSC PS09-WP09 (Rev. 2)). Korea recommended using the standardized CPUE derived from GLM as input for the stock assessment.

37. The SSC PS agreed to use Korea's standardized CPUE derived from GLM as an input for the

stock assessment.

38. Vanuatu explained that it has not been able to conduct a standardization of its CPUE data for Pacific saury and has instead submitted its nominal CPUE data from 2013 to 2021 as part of NPFC-2022-SSC PS09-IP05.

7.2 Review of joint CPUE

39. Chinese Taipei presented a joint CPUE standardization of Pacific saury in the Northwestern Pacific Ocean from 2001 to 2021 using a VAST model (NPFC-2022-SSC PS09-WP05). The spatio-temporal effect had the largest influence on the time series of estimated CPUE among all variables. The results indicated that the annual standardized CPUE trend had a fluctuating pattern over the studied periods, and the annual standardized CPUE value was at the lowest level below average (2001-2020) in 2021. The correlation analysis indicated that the joint index could resolve the issue of inconsistency among individual indices.

40. At the suggestion of the SSC PS, Chinese Taipei conducted further analysis to investigate any potential CPUE-SST effect on the joint CPUE standardization. The analysis showed that using categorical SST effects improved the fitting, but there was a lack of clear evidence for interactions between SST and Month, which some Members thought was surprising. The SSC PS agreed that this should be the subject of future research. However, the SSC PS agreed that the estimated joint CPUE seems robust to the uncertainty and is acceptable for use in this assessment.

41. At the suggestion of the SSC PS, Chinese Taipei conducted a comparison of the standardized joint CPUE indices beginning in 1994 with that beginning in 2001. The indices were found to be comparable. Chinese Taipei also conducted a comparison of the standardized joint CPUE indices beginning in 1994 with both the Russian and Japanese standardized CPUEs beginning in 1994.

42. The SSC PS agreed to use the standardized joint CPUE beginning in 1994 as an input for the stock assessment.

43. The SSC PS expressed its appreciation to Chinese Taipei for conducting the joint CPUE standardization and encouraged other Members to collaborate with Chinese Taipei on future joint CPUE standardization work.

44. The finalized table of abundance indices is attached to the report as Annex D. A plot of

Members' standardized CPUEs is attached to the report as Annex E.

7.3 Recommendations for future work

45. Chinese Taipei presented an evaluation of the influence of spatial treatments on CPUE standardization using a real-world application and a simulation based on the Taiwanese stick-held dip net fishery for Pacific saury in the Northwestern Pacific Ocean (NPFC-2022-SSC PS09-IP03). Several spatial treatments to standardize CPUE data were evaluated using Generalized Linear Mixed Models (GLMMs). The performance of three spatially stratified approaches in GLMMs were compared. An influence analysis was constructed to quantify discrepancies between unstandardized and standardized indices and assist in identifying the annual influence of explanatory variables in GLMMs. A simulation to corroborate the results from the case study was developed and the four spatial treatments were evaluated. Results from the real-world application indicated that VAST was statistically superior to the other approaches. The influence analysis indicated that the interaction of year and spatial effect or spatio-temporal variable had a major influence on the standardized CPUE. Both simulation scenarios showed that VAST performed the best, with the lowest model error and bias, for estimating relative abundance indices. Although the spatial clustering approach created a flexible shape for the area strata, the simulation results under preferential samplings showed that clustering with a stronger emphasis placed on average CPUE could lead to bias in estimated abundance indices. However, spatial clustering that balanced average CPUE with spatial proximity could be a reasonable alternative if it is not possible to apply a spatio-temporal approach. The study highlighted importance of conducting influence analysis and the better performance of a spatio-temporal approach.

46. The SSC PS encouraged Members to conduct future CPUE standardizations using two methods, their existing one and one applying VAST, and compare the results, if possible.

47. The SSC PS agreed to conduct further research on the potential CPUE-SST effect on the joint CPUE standardization.

Agenda Item 8. Biological information on Pacific saury

8.1 Review of any updates and progress

48. No updates were provided.

8.2 Distribution and migration patterns of juvenile Pacific saury

49. No information on distribution and migration patterns of juvenile Pacific saury was provided.

8.3 Recommendations for future work

50. The SSC PS encouraged Member scientists to continue to engage in research on the biology of Pacific saury and to provide any new information at future SSC PS meetings.

Agenda Item 9. Stock assessment using "provisional base models" (BSSPM)

9.1 Review and update of the existing specification

51. The SSC PS reviewed and revised the existing specification of the stock assessment BSSPM (Annex F). One previous base case model (former B1) was downgraded to a sensitivity case because the Japanese early CPUE series seemed less informative for population dynamics. The former B2 remained as a base case (NB1). Conversely, a previous sensitivity case model with the joint CPUE (former S2) was elevated to another base case model (NB2), while another former sensitivity case S1 was kept for the continuity analysis.

52. China noted that frequent changes of base case scenarios were made in the past few years and suggested the new base case scenarios should be as stable as possible in the future for easier comparison of interannual benchmark stock assessments unless substantial improvement is necessary.

53. The invited expert suggested that technical improvements to models are also important, and it is sometimes necessary to sacrifice comparability with previous assessments.

54. The SSC PS agreed about the importance of maintaining a record of changes and their effects as progress is made.

55. The SSC PS noted that the mode trends estimated for years prior to 1994 are based on catch data only and may be highly uncertain. The SSC PS agreed to include a sentence to that effect in the stock assessment report wherever results from the early years are presented.

9.2 Recommendations for future work

56. The SSC PS agreed to continue to evaluate models through diagnostics and finalize base-case model(s) at the next SSC PS meeting.

Agenda Item 10. New stock assessment models

10.1 Data available

10.2 Review of any progress on new stock assessment models

57. Chinese Taipei presented a study to develop a preliminary stock assessment model in Stock Synthesis 3.30 for Pacific saury in the Northwestern Pacific Ocean (NPFC-2022-SSC PS09-

WP10). The model incorporated historical catch, standardized CPUE, and length composition data. Various model diagnostics were conducted, including virgin recruitment (R0) likelihood profile, a runs test to evaluate randomness of residuals, and residual plots of the observed versus expected data. The study recognized that there is still uncertainty in life history parameters including maturation, growth, natural mortality, as well as the input length composition data. To improve the stock assessment in the future, it is recommended that model development work continue, that data conflicts and modelling uncertainties be reduced, and that input assessment data be re-evaluated and improved. The preliminary results produced by the study should not be used to determine stock status and conservation of Pacific saury in the Northwestern Pacific Ocean.

10.3 Finalization of specification for new stock assessment models

10.4 Recommendations for future work

58. The SSC PS welcomed the work done by Chinese Taipei and offered a number of technical suggestions. The SSC PS encouraged Chinese Taipei to continue to develop the model and interested Members to collaborate with Chinese Taipei to conduct this work.

Agenda Item 11. Development and evaluation of an interim harvest control rule (HCR) as a short-term task

11.1 Management objectives, reference points and tuning criteria

11.2 Conditioning of operating models (OMs)

11.3 Possible/candidate HCR

11.4 Simulation platform

59. The Chair summarized the discussions of the 1st SWG MSE PS meeting and the intersessional meeting of the SSC PS in relation to management objectives, reference points, tuning criteria, conditioning of operating models, possible/candidate HCRs, and the simulation platform. Although no major points requiring change were raised, it was pointed out that, with regard to the application of the HCR, it is necessary to prepare an explanation in the SWG MSE PS and the Commission meetings so that the participants will have a clear understanding of the data to be used, timing of stock assessment and TAC decisions as well as revisions, if any, during the fishing season.

11.5 Recommendations for future work

60. The SSC PS agreed to continue to progress its work in line with the schedule and recommendations agreed to at the SWG MSE PS01 meeting (SWG MSE PS01 Report, Annex D). This project will use a simulation platform (computer program) that is working but needs some modification and reprogramming. The SSC PS emphasized the importance of securing

funding to complete work on the program so that harvest control rule work can be completed comprehensively and successfully. The SSC PS noted that clear instruction and work schedule for SSC PS is desirable.

Agenda Item 12. Other matters

12.1 Observer Program

61. The Science Manager reminded the SSC PS of the SC's discussions on the establishment of an NPFC observer program. The SC agreed that collecting information on non-targeted species is important for facilitating the work and research of the SC and that the establishment of an observer program in the NPFC Convention Area would facilitate the collection of more data for such non-targeted species and for NPFC priority species. Furthermore, the SC has tasked its subsidiary bodies with identifying data needs and data gaps for non-target species and priority species, outlining methods (e.g. human or electronic observers) that could be used to collect necessary data, and reporting this information at SC07.

62. The Science Manager also presented a table compiled by the SSC PS04 of scientific data which can be collected and/or validated by at-sea observers, fishermen, electronic reporting systems and other means for Pacific saury (SSC PS04 Report, Annex E).

63. The SSC PS noted that the assessment of non-targeted species may not fall within the ToR of the SSC PS while by-catch information of Pacific saury in fisheries targeting other species could be useful for its research. The SSC PS requested the Secretariat to prepare a paper with the relevant background information and the aforementioned table and to present it at the next SSC PS meeting to facilitate fuller discussions.

12.2 Draft agenda and priority issues for next meeting

64. The SSC PS agreed on the following priorities for the next meeting:
    (a) Conduct the updated stock assessment.
    (b) Discuss progress on the development of age-structured stock assessment models.
    (c) Discuss the scientific aspects of developing HCRs.

12.3 Other

65. The next SSC PS meeting will be held virtually by default due to the uncertainty brought about by the pandemic, unless any significant development arises.

Agenda Item 13. Adoption of the Report

66. The SSC PS09 Report was adopted by consensus.

Agenda Item 14. Close of the Meeting

67. The meeting closed at 11:30 on 2 September 2022, Tokyo time.

Annexes:

Annex A – Agenda

Annex B – List of Documents

Annex C – List of Participants

Annex D – Updated total catch, CPUE standardizations and biomass estimates for the stock assessment of Pacific saury

Annex E – Time series of Members' standardized CPUE, joint standardized CPUE and Japanese survey index from 1980-2021

Annex F – Specifications of the BSSPM for the updated stock assessment

Please refer to the NPFC website for the complete annexes.

6th Meeting of the Technical Working Group on Chub Mackerel Stock Assessment

5 - 8 September 2022

Virtual

Meeting Report

Agenda

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Agenda Item 2. Adoption of Agenda

Agenda Item 3. Overview of the recommendations and outcomes of previous NPFC meetings relevant to chub mackerel

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3.2 Intersessional meetings of SWG OM

Agenda Item 4. Stock assessment model for chub mackerel

4.1 Progress of the intersessional works

4.2 Data generation by PopSim as input to the candidate stock assessment models

4.3 Report on the performance of the candidate stock assessment models and options to rank them

4.4 Ranking of the candidate stock assessment models

4.5 Selection of the model for chub mackerel stock assessment

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Agenda Item 5. Development of data for the stock assessment of chub mackerel

5.1 Research activities and review of biological parameters

5.2 Review of fishery (catch-at-age, weight-at-age, maturity-at-age, if possible) data based on a quarterly calendar

5.3 Updates and improvements to the standardized abundance indices and other data for use in the stock assessment

5.4 Recommendations for future work

Agenda Item 6. Future projection of chub mackerel

Agenda Item 7. Biological reference points

7.1 Candidate biological reference points for chub mackerel

Agenda Item 8. Review of the Work Plan of the TWG CMSA

Agenda Item 9. Other matters

9.1 Timeline and intersessional activities before TWG CMSA07

9.2 Observer Program

9.2.1 Review of data or data description on fisheries bycatch in the chub mackerel fisheries

9.3 Selection of Chair and vice-Chair

9.4 Other issues

Agenda Item 10. Recommendations to the Scientific Committee

Agenda Item 11. Adoption of Report

Agenda Item 12. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 6th Meeting of the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA) of the North Pacific Fisheries Commission (NPFC) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, the European Union (EU), Japan, and the Russian Federation. An invited expert, Dr. Joel Rice, participated in the meeting.

2. The meeting was opened by the TWG CMSA Vice Chair, Dr. Kazuhiro Oshima (Japan), who chaired the meeting on behalf of the TWG CMSA Chair, Dr. Vladimir Kulik (Russia), who was unable to attend the meeting. The Science Manager, Dr. Aleksandr Zavolokin, outlined the procedures for the meeting. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

3. The TWG CMSA agreed to add a new agenda item, Agenda Item 9.3 Selection of Chair and vice-Chair, to the provisional agenda.

4. The revised provisional agenda was adopted (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

Agenda Item 3. Overview of the recommendations and outcomes of previous NPFC meetings relevant to chub mackerel

3.1 5th TWG CMSA

5. The Vice Chair provided an overview of the 5th TWG CMSA meeting and its recommendations.

3.2 Intersessional meetings of SWG OM

6. The Lead of the Small Working Group on Operating Model (SWG OM), Dr. Shota Nishijima (Japan), provided a brief overview of the discussions of the 3rd and 4th intersessional meetings

of the SWG OM. He provided more details under agenda 4.1.

7. The Science Manager presented the outcomes and recommendations from the 1st meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific saury (SWG MSE PS01).

Agenda Item 4. Stock assessment model for chub mackerel

4.1 Progress of the intersessional works

8. The SWG OM Lead provided a detailed summary of the progress made in the intersessional period, including in the SWG OM03 (NPFC-2022-TWG CMSA06-WP06) and SWG OM04 (NPFC-2022-TWG CMSA06-WP07) meetings. The SWG OM has revised the pseudo data, distributed a new version of the OMutility package and continued to improve it, and conducted the calculations of performance measures for the candidate models.

9. The SWG OM Lead presented a list of errors/problems in the work conducted so far for correction and improvement by the TWG CMSA. The pseudo data used by KAFKA were not the most recently updated data, and therefore the results presented for the KAFKA model should not be evaluated at this stage. To progress the analysis, Russia will submit estimates using the correct pseudo data by 25 September. The invited expert noted that if results from any model are not received by 1 November 2022, then those results cannot be evaluated and presented in accordance with the schedule.

10. China and Japan shared the latest input and output data to/from the newest version of OMutility for all their models for cross-checking via the NPFC Collaboration site. Russia is requested to do the same when the results are available.

4.2 Data generation by PopSim as input to the candidate stock assessment models

11. The invited expert reported the results of the re-estimation of the pseudo data using PopSim as input to the candidate stock assessment models. The re-estimation was conducted based on various technical improvements suggested by the SWG OM. The outputs from the BSSPM model have different interpretation because the BSSPM could not be used as a data generation model and therefore cannot be evaluated in the 'self-test'. BSSPM could return the performance measures of total biomass, exploitation ratio and depletion statistics, which were not identical with those from the age-structured stock assessment models.

12. China asked Members whether Mohn's rho in the retrospective analysis needed to be calculated using OMutility. Japan suggested using OMutility because the weighted average F is not outputted within ASAP and performance measures should be standardized among Members.

4.3 Report on the performance of the candidate stock assessment models and options to rank them

13. China presented the results of fitting ASAP to pseudo data and performance measures for the chub mackerel operating model (NPFC-2022-TWG CMSA06-WP12).

14. China presented the results of fitting BSSPM to pseudo data and performance measures for the chub mackerel operating model (NPFC-2022-TWG CMSA06-WP13).

15. Japan presented a calculation of performance measures by fitting VPA and SAM to pseudo data for chub mackerel in Northwestern Pacific (NPFC-2022-TWG CMSA06-WP08 (Rev. 1)).

16. The invited expert presented the results of the self- and cross-tests for ASAP, SAM, VPA, and KAFKA. Regarding KAFKA, he explained that the results were only being shown for illustrative purposes and should not be considered because they were calculated using old data. Regarding BSSPM, he explained that, due to the nature of the model, cross-tests could, to some extent, be conducted, but not a self-test. The invited expert invited the TWG CMSA to consider the results and to decide on the scenarios on which to base the performance measures, the priority performance measures, and the parameterizations of the performance metrics.

17. Japan presented a simple comparison between the estimated and true parameters of performance measures and metrics for ASAP, SAM and VPA to produce a rough overview of each estimation model's characteristics. Based on the results, Japan suggested that performance measures related to MSY (B_{MSY} and F_{MSY}) could be given a lower priority because their estimates become unstable depending on the assumption of the stock-recruitment relationship.

18. Japan presented a summary of the performance metrics in self-tests and cross-tests of ASAP, SAM and VPA. Based on the results, Japan suggested that SAM showed the best prediction ability based on calculations of the simple geometric mean of median absolute error (MAE), and that different weighting of performance measures will be possible.

19. China expressed its appreciation for the work done by Japan but pointed out that in order for the TWG CMSA to be able to fully consider the results, this information should be submitted in the form of formal papers.

20. Regarding the scenarios on which to base the performance measures, the invited expert recommended selecting one, or at most two scenarios, potentially A and B. Comprehensive review of scenarios C-F is encouraged to inform the relative consistency of models across scenarios. Because the TWG CMSA was unable to determine which scenario would be more

appropriate, it agreed to use Scenarios A and B as the base cases with each being given equal weight.

21. The TWG CMSA held discussions on the prioritization of performance measures and formulated a preliminary list of performance measures prioritized by tier. The TWG CMSA agreed to continue to work intersessionally towards finalizing the list.

22. The TWG CMSA agreed that, apart from KAFKA, the testing of the candidate stock assessment models using the pseudo data is complete and that analysis of the results of the testing is possible.

4.4 Ranking of the candidate stock assessment models

23. The TWG CMSA agreed that none of the candidate stock assessment models outperformed all the others for all scenarios and across all performance measures, so it needs to select the model that performs best among the candidates. The invited expert noted that a tiered approach to ranking candidate performance measures was presented at the SWG OM04 and was re-presented in this TWG CMSA06 meeting. To facilitate an objective ranking of candidate stock assessment models, the invited expert urged the group to select priority performance measures and metrics to facilitate the selection of the stock assessment model.

24. The invited expert suggested that the SAM model may be the best of the candidate models because of the low relative bias in the results, which was supported by Japan. However, some Members did not agree that the SAM model was the best and pointed out that there are still issues with it that need to be further considered.

25. The TWG CMSA agreed that the KAFKA model could not be ranked as its results were not yet available.

26. The TWG CMSA held initial discussions on a format for summarizing the quantitative and qualitative aspects of the candidate models. The TWG CMSA agreed to work intersessionally to finalize the format for the qualitative aspects by November 2022.

4.5 Selection of the model for chub mackerel stock assessment

27. Japan considered that it is possible to select the best-performing model as scheduled based on the available information and recommendation provided by the invited expert. However, some other Members considered that further analysis of the results is necessary to reach the conclusion. The TWG CMSA was unable to reach consensus on the selection of a model for the chub mackerel stock assessment and agreed to continue analyses and discussions of the test.

For doing so, it was agreed to conduct intersessional work to select priority performance measures and performance metrics for more structured comparison of the candidate models.

28. The TWG CMSA agreed to select one base stock assessment model, while recognizing that, if appropriate, an ensemble approach could be taken, whereby multiple versions of the same base stock assessment model, e.g., with different assumptions or specifications, could be used to conduct the stock assessment.

29. The TWG CMSA agreed that the selection of the base stock assessment model does not preclude the development and consideration of other potential stock assessment models in the future. If another potential stock assessment model is demonstrated to outperform the initial stock assessment model, the new model could be used in combination with or replace the initial model.

4.6 Recommendations and timelines for future work

30. The TWG CMSA drafted a timeline of tasks leading up to the TWG CMSA07 meeting (Annex D).

Agenda Item 5. Development of data for the stock assessment of chub mackerel

5.1 Research activities and review of biological parameters

31. No new information was presented.

5.2 Review of fishery (catch-at-age, weight-at-age, maturity-at-age, if possible) data based on a quarterly calendar

32. China presented its chub mackerel fishery data based on a quarterly calendar (NPFC-2022-TWG CMSA06-WP03 (Rev. 1)). The data consist of quarterly catch-at-age, weight-at-age and maturity-at-age for 2018 to 2021.

33. Japan presented its chub mackerel fishery data based on a quarterly calendar (NPFC-2022-TWG CMSA06-WP02). The data consist of quarterly catch-at-age and weight-at-age from 2010 to 2020 and quarterly maturity-at-age from 2006 to 2020. Japan explained that due to the current data availability, it could only reproduce quarterly catch-at-age and weight-at-age data on a fishing year basis (July to June of the following year) since 2010. Japan also pointed out that catch-at-age and weight-at-age can change significantly depending on when age is incremented, so it is important for the TWG CMSA to clarify how this should be done.

34. Russia informed the TWG CMSA that it is currently preparing its quarterly fishery data for 2016 to 2021. The preliminary data have been prepared and are currently being checked. Catch

generally occurs in Q2 to Q4, with the maximum catch in Q4. The age determination is conducted using an age-length key developed by Japan.

35. Japan presented a plot comparing the quarterly weight-at-age data from China and Japan. Japan pointed out that there is a large gap between China's and Japan's weight data for ages 0 to 3. Japan further explained that, if the age of China's weight-at-age data for each age-class is reduced by 1, the data seem to match Japan's data. Japan suggested that this indicates that the difference may be due to the different date that Japan and China use to increment age (Japan: July 1; China: January 1). Russia also pointed out the importance of using the same approach to determine when age is incremented.

5.3 Updates and improvements to the standardized abundance indices and other data for use in the stock assessment

36. China presented a standardization of CPUE data for chub mackerel from 2014 to 2020 (NPFC-2022-TWG CMSA06-WP14) using a generalized linear model (GLM) and a generalized additive model (GAM). China recommended using the standardized CPUE derived from GAM as input for the stock assessment.

37. The TWG CMSA reminded all Members that it is important that they follow the CPUE Standardization Protocol for Chub Mackerel when next updating their CPUE standardizations.

38. The TWG CMSA discussed methods for extracting the yearly standardized CPUE and evaluating the associated uncertainty. The TWG CMSA agreed that Members could correspond via email to determine how to extract the yearly standardized CPUE prior to the next TWG CMSA meeting to be held in spring 2023.

39. The TWG CMSA discussed the method by which China extracts chub mackerel data from aggregated mackerel (i.e., blue mackerel and chub mackerel) data. China explained that it has calculated the annual proportions of blue mackerel and chub mackerel catch based on samples taken from its purse seine fishery and that blue mackerel accounts for roughly 6 to 15% of the aggregated mackerel data, but that this information has not been incorporated in the CPUE and catch-at-age data. The TWG CMSA requested China to submit a document on the annual proportion of blue mackerel and chub mackerel catch in order to be able to refer to that information in the data preparation for the chub mackerel stock assessment.

40. Japan presented a standardization of the abundance index for recruitment of chub mackerel from 2002 to 2021 (NPFC-2022-TWG CMSA06-WP11 (Rev. 1)). The year trends of the recruitment indices were derived from standardized CPUE, by applying the delta-GLM-tree

models to the data from surface trawl surveys in summer (June and July; 2002-2021) and autumn (September and October; 2005-2021). Japan recommended using the standardized recruitment survey indices derived from delta-GLM-tree as input for the stock assessment.

41. Japan presented a standardization of CPUE data from the dip-net fishery targeting mature chub mackerel from 2003 to 2021 using delta GLM (NPFC-2022-TWG CMSA06-WP09). Japan recommended using the standardized CPUE derived from this fishery as the abundance index of spawning biomass for the stock assessment.

42. Japan presented a standardization of monthly egg survey data from 2005 to 2021 as an abundance index for spawning stock biomass of chub mackerel using the vector autoregressive spatio-temporal (VAST) model (NPFC-2022-TWG CMSA06-WP10). Japan recommended using the standardized monthly egg survey data derived from VAST as input for the stock assessment.

5.4 Recommendations for future work

43. The TWG CMSA agreed to:
    (a) continue submission and comparison of the quarterly fishery data on schedule (Annex E).
    (b) follow the CPUE Standardization Protocol of the TWG CMSA and standardize how to extract yearly CPUE.
    (c) separate fishery data such as catch-at-age and abundance indices by chub mackerel and blue mackerel.
    (d) hold further discussions on standardizing how to increment chub mackerel age for the stock assessment.

Agenda Item 6. Future projection of chub mackerel

44. The TWG CMSA reviewed the table of possible options for the basic specifications for conducting future projections for chub mackerel agreed to at the TWG CMSA05 meeting. The TWG CMSA agreed that no revisions are currently required.

Agenda Item 7. Biological reference points

7.1 Candidate biological reference points for chub mackerel

45. The invited expert presented a list of candidate biological reference points for chub mackerel using the consultancy report *Review of Target and Limit Reference Points* by Dr. Laurence Kell as reference (NPFC-2022-TWG CMSA06-WP05).

46. Japan presented the general rules used for setting reference points in Japan and the reference

points used for the Japanese domestic chub mackerel stock assessment. Japan explained that domestic stock assessments are categorized based on the level of uncertainty, and reference points are set according to the category. In the case of chub mackerel, the reference points are SB_{MSY} (average spawning biomass when average catch achieves the maximum (MSY) under stochastic projections under constant fishing mortality, selectivity, and assumed stock-recruitment relationship with stochastic deviations), F_{MSY} (fishing mortality coefficient when achieving SB_{MSY}), and $SB_{0.6MSY}$. Japan suggested that the TWG CMSA could apply a similar system as the Japanese one and select reference points after evaluating the uncertainties in the estimation of the reference points.

47. Based on the presentations, the TWG CMSA compiled a table of candidate biological reference points for chub mackerel (Annex F).

Agenda Item 8. Review of the Work Plan of the TWG CMSA

48. The TWG CMSA reviewed and updated the Work Plan of the TWG CMSA (NPFC-2022-TWG CMSA06-WP01 (Rev. 1)).

Agenda Item 9. Other matters

9.1 Timeline and intersessional activities before TWG CMSA07

49. The timeline and intersessional activities before TWG CMSA07 are as described in Annexes D and E.

50. The TWG CMSA expressed its appreciation for the valuable contributions and support of the invited expert. The invited expert agreed to extend the term of his consultancy through the TWG CMSA07 meeting so that he can continue to support the development of the operating model and testing of stock assessment models.

9.2 Observer Program

51. The Science Manager reminded the TWG CMSA that the SC has tasked all its subsidiary bodies, including the TWG CMSA, with reporting the data needs and outlining methods (e.g., human or electronic observers) that could be used to collect the necessary data at SC07 and summarized the relevant discussions from the TWG CMSA05 meeting.

52. The TWG CMSA noted that an observer program might be able to fill potential data gaps, but that observer data do not seem to be highly important to the work of the TWG CMSA. The TWG CMSA noted that the assessment of non-targeted species likely does not fall within the ToR of the TWG CMSA. The TWG CMSA requested the Secretariat to prepare a paper with the relevant background information and to present it at the next TWG CMSA meeting to

facilitate fuller discussions.

9.2.1 Review of data or data description on fisheries bycatch in the chub mackerel fisheries

53. China presented a description of the bycatch in its chub mackerel fisheries (NPFC-2022-TWG CMSA06-WP04). The most common bycatch species are Japanese sardine, squids and Pacific saury.

54. Russia informed the TWG CMSA that there is mainly a mixed-stock Russian fishery targeted at mackerels and Japanese sardine. Bycatch pelagic species may include Japanese anchovy, sea bream and squids.

9.3 Selection of Chair and vice-Chair

55. The TWG CMSA recommended that the SC select Dr. Kazuhiro Oshima (Japan) to serve as the TWG CMSA Chair.

56. The TWG CMSA recommended that the SC select Dr. Qiuyun Ma (China) to serve as the TWG CMSA Vice-Chair.

9.4 Other issues

57. No other issues were discussed.

Agenda Item 10. Recommendations to the Scientific Committee

58. The TWG CMSA agreed:
    (a) To continue to work intersessionally towards finalizing the list of priority performance measures and metrics, including the relative importance between self-tests and cross-tests.
    (b) To continue analyses and discussions toward the selection of a model for the chub mackerel stock assessment.
    (c) To select a base stock assessment model(s) for evaluation at the next TWG CMSA meeting through intersessional discussions.
    (d) To continue submission and comparison of the quarterly fishery data on schedule (Annex E).
    (e) To follow the CPUE Standardization Protocol of the TWG CMSA and standardize how to extract yearly CPUE.
    (f) To separate fishery data such as catch-at-age and abundance indices by chub mackerel and blue mackerel.
    (g) To hold further discussions on standardizing how to increment chub mackerel age for the stock assessment.

59. The TWG CMSA recommended the following to the SC:
    (a) The TWG CMSA recommended the Work Plan of the TWG CMSA (NPFC-2022-TWG CMSA06-WP01 (Rev. 1)).
    (b) The TWG CMSA recommended that the SC select Dr. Kazuhiro Oshima (Japan) to serve as the TWG CMSA Chair.
    (c) The TWG CMSA recommended that the SC select Dr. Qiuyun Ma (China) to serve as the TWG CMSA Vice Chair.
    (d) The TWG CMSA recommended extending the consultancy agreement with the external expert to support the TWG CMSA in selecting a model for stock assessment of chub mackerel in 2023.
    (e) The TWG CMSA requested the SC to provide clarification on whether national waters fall under the scope of the task assigned by the SC to its subsidiary bodies of reporting the data needs and outlining methods that could be used to collect the necessary data.

Agenda Item 11. Adoption of Report

60. The report was adopted by consensus.

Agenda Item 12. Close of the Meeting

61. The meeting closed at 12:50 on 8 September 2022, Tokyo time.

Annexes:

Annex A – Agenda
Annex B – List of Documents
Annex C – List of Participants
Annex D – Timeline of intersessional work toward the selection of a model for stock assessment of chub mackerel
Annex E – Timeline for submission of fishery data and abundance indices
Annex F – Reference points used by other Regional Fisheries Management Organizations and some NPFC Members

Please refer to the NPFC website for the complete annexes.

2nd Meeting of the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury

12 - 13 September 2022
Virtual
Meeting Report

Agenda

Agenda Item 1. Introductory items
- 1.1 Opening of the meeting
- 1.2 Adoption of agenda
- 1.3 Meeting logistics

Agenda Item 2. Overview of the outcomes of previous NPFC meetings
- 2.1 SWG MSE PS01
- 2.2 SSC PS09

Agenda Item 3. Development of an interim harvest control rule (HCR) as a short-term task
- 3.1 Management objectives
- 3.2 Reference points and tuning criteria
- 3.3 Conditioning of operating models (OMs)
- 3.4 Listing up possible/candidate HCRs and constraints therein
- 3.5 Performance measures
- 3.6 Simulation platform
- 3.7 Template for presentation of results
- 3.8 Other matters

Agenda Item 4. Initial discussion toward development of management procedures (MPs) as a mid-term goal
- 4.1 Management objectives and some constraint conditions for the regulation of fishery
- 4.2 Technical matters on operating models, MPs, performance measures and simulation

Agenda Item 5. Implementation schedule and safeguard for exceptional circumstances
- 5.1 Implementation schedule of an HCR
- 5.2 Mid-term plan of implementation and its review process
- 5.3 Definition of exceptional circumstances

Agenda Item 6. Other matters
- 6.1 Capacity building
- 6.2 Others

Agenda Item 7. Timeline and future process
- 7.1 Timeline

7.2 Future process with assistance of SSC PS
7.3 Workplan till SWG MSE PS03 meeting

Agenda Item 8. Recommendations to the Commission

Agenda Item 9. Adoption of report

Agenda Item 10. Close of the meeting

MEETING REPORT

Agenda Item 1. Introductory items

1.1 Opening of the meeting

1. The 2nd meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, and Vanuatu. The Pew Charitable Trusts (Pew) attended as an observer. Dr. Larry Jacobson participated as an invited expert. The meeting was chaired by Dr. Toshihide Kitakado (Japan) who is the co-Chair of the SWG MSE PS. Dr. Kitakado opened the meeting and welcomed the participants.

1.2 Adoption of agenda

2. The agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

1.3 Meeting logistics

3. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.

4. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Overview of the outcomes of previous NPFC meetings

2.1 SWG MSE PS01

5. The Chair presented the outcomes and recommendations from the SWG MSE PS01 meeting (NPFC-2022-SWG MSE PS02-IP01).

2.2 SSC PS09

6. The Chair presented the outcomes and recommendations from the 1st Intersessional Meeting of

the Small Scientific Committee on Pacific Saury (SSC PSint01; NPFC-2022-SWG MSE PS02-WP01) and the 9th Meeting of the Small Scientific Committee on Pacific Saury (SSC PS09).

Agenda Item 3. Development of an interim harvest control rule (HCR) as a short-term task

7. The SWG MSE PS noted that the provisions of Article 3(b) and 3(c) of the Convention and paragraph 7, Annex II, of the 1995 United Nations Fish Stock Agreement provide a framework for discussions of the HCR and MSE, specifically that management measures shall ensure that fisheries resources are maintained at or restored to levels capable of producing maximum sustainable yield (MSY), that measures shall be based on a precautionary approach, and that the fishing mortality rate which generates MSY should be regarded as a minimum standard for limit reference points.

3.1 Management objectives

8. The SWG MSE PS reviewed the three types of management objective discussed at SWG MSE PS01: recovery of the stock, avoiding unsustainable state of the stock, and achieving high and stable catch. The SWG MSE PS agreed to continue to base discussions around these three objectives below, putting higher priority on (a);
   (a) Recovery of the stock:
      i. The stock status is recovered above B_{tar} within "xx" years with "pp" probability (for example, xx could be 2-5 and pp could be >80%);
      ii. The stock status is maintained above the B_{tar} level over "yy-yy" years with "qq" probability.
   (b) Avoiding unsustainable state of the stock:
      i. The annual probability that the stock drops below B_{lim} should not exceed "pp" probability;
      ii. The annual probability that the fishing mortality exceeds F_{lim} should not exceed "pp" probability.
   (c) Achieving high and stable catch:
      i. Catch is high and stable as much as possible;
      ii. Maximum interannual variation of TAC over yy period should be less than xx%.

3.2 Reference points and tuning criteria

9. The SWG MSE PS considered the list of preliminary reference points discussed at the SSC PSint01 and developed it further, as shown below. The SWG MSE PS agreed that the list of ranges for biological reference points contains typical values but is purposely wide for computational, discussion and exploratory purposes. The default values are for demonstration purposes. Neither implies any advice or decision about recommended harvest guidelines for

Pacific saury.

Reference point	Default value	Potential range
$B_{tar} = c*B_{MSY}$	c = 1	c = 0.8 – 1.2
$B_{lim} = c*B_{MSY}$	c = 0.35	c = 0.2 – 0.5
$F_{tar} = c*F_{MSY}$	c = 1	c = 0.8 – 1.2
$F_{lim} = c*F_{MSY}$	c = 1.35	c = 1.2 – 1.5

3.3 Conditioning of operating models (OMs)

10. The SWG MSE PS noted the previous discussions on the conditioning of OMs in the SWG MSE PS01 and the SSC PSint01 and agreed to continue this work.

3.4 Listing up possible/candidate HCRs and constraints therein

11. The SWG MSE PS considered the three HCR options discussed at the SSC PSint01 and developed them further, together with implementation schedules, as described in Annex D. The SWG MSE PS agreed to continue to develop the HCR options, while indicating initial preference for Option 2.

12. Two of the HCR options (Options 2 and 3) would allow for the adjustment of the total allowable catch (TAC) based on the stock assessment result one year ago during the fishing season. The SWG MSE PS noted that being able to make such an adjustment is important in light of the biological characteristics of Pacific saury, namely its short lifespan and interannual fluctuation in recruitment strength. At the same time, the SWG MSE PS noted that a mid-season TAC adjustment could be challenging for managers and industry, and that various options, such as constraints on the level of adjustment or limiting the making of adjustments only to exceptional circumstances, should be considered. The SWG MSE PS noted that it is essential for such discussions to be held among scientists and managers, and encouraged both Member scientists and managers to attend future meetings.

3.5 Performance measures

13. The SWG MSE PS reviewed the performance measures discussed at the SWG MSE PS01 and agreed to continue to base discussions around them. The possible performance measures reflecting the management objectives are as follows:
    (a) Recovery of the stock:
        i. Probabilities that the stock status is above B_{tar} at 1, 2, …, 5, 10, 15 years after the HCR is implemented;
        ii. Probabilities that the stock status is in Kobe green quadrant at 5, 10, 15 years after the

HCR is implemented.

(b) Avoiding unsustainable state of the stock:
   i. Probabilities that the stock status is below B_{lim} at 1, 2, …, 5, 10, 15 years after the HCR is implemented;
   ii. Probabilities that the fishing mortality exceeds F_{lim} at 1, 2, …, 5, 10, 15 years after the HCR is implemented.

(c) Achieving high and stable catch:
   i. Average catch by 1-5, 6-10, 11-15 years after the HCR is implemented;
   ii. Annual catch variation by 5, 10, 15 years after the HCR is implemented;
   iii. Probabilities that the TAC hits the predetermined maximum change by 5, 10, 15 years after the HCR is implemented.

3.6 Simulation platform

14. The SWG MSE PS reaffirmed the usefulness of the Shiny application and recommended that the Commission ensure the adequate allocation of funds, as soon as possible, for the development of a simulation platform for the evaluation of HCR. Funding for support of HCR analyses by the SSC PS may be required as well.

15. The SWG MSE PS noted that the seasonal pattern of catches should be considered in testing potential adjustments to quotas in year t set in year t-1. Under Option 2, survey and preliminary CPUE data for year t would become available for use in adjustments at the first assessment meeting in August when the survey data become available. This implies that managers might adjust the TAC in late August or early September. A cursory examination showed that seasonal patterns in catch vary between Members and years. The fraction of total seasonal catch by August or September may be considerable in some years, limiting the Commission's ability to reduce catch in some cases. There are three technical points to note with respect to seasonal catch patterns in HCR simulation analyses under Option 2:
   (a) Seasonal catch patterns may generally affect the efficacy of adjustment procedures.
   (b) Efficacy may vary from year to year.
   (c) If seasonal patterns are deemed important, they might be simulated based on observed patterns and able to account for possible implementation errors.

3.7 Template for presentation of results

16. The SWG MSE PS agreed to defer the development of a template for the presentation of results to its next meeting.

3.8 Other matters

17. No other matters were discussed.

Agenda Item 4. Initial discussion toward development of management procedures (MPs) for the mid-term goal

4.1 Management objectives and some constraint conditions for the regulation of fishery

18. The SWG MSE PS agreed to focus on its short-term goal until sufficient progress is made and to defer discussions on its mid-term goal.

19. The SWG MSE PS noted that efforts should be made to ensure as smooth a transition as possible from the short-term goal when setting the HCR to the mid-term goal when developing the MPs.

20. The SWG MSE PS noted Pew's suggestion that the NPFC should work toward establishing an MSE process based on an ecosystem framework that takes into account environmental factors.

4.2 Technical matters on operating models, MPs, performance measures and simulation

21. The SWG MSE PS reaffirmed that it will continue to work to develop an age-structured stock assessment model, without going into technical details.

Agenda Item 5. Implementation schedule and safeguard for exceptional circumstances

5.1 Implementation schedule of an HCR

22. The implementation schedules for the three HCR options are described in Annex D.

23. The SWG MSE PS agreed to analyze a relatively limited range of simple HCRs used in other fisheries. These approaches use an F_{MSY} proxy applied at high biomass levels and a single $B_{threshold}$ value to reduce F as biomass approaches zero. The F_{MSY} proxy approach reduces the need for difficult policy decisions because it is generally recognized that healthy stocks can be fished at maximum sustainable levels, particularly if F is reduced as biomass declines to relatively low levels. The Commission's decision regarding $B_{threshold}$ levels must be based on policy and scientific considerations including simulation results. However, the analyses and range of options considered can be guided and reduced using precedents in other fisheries. This approach recognizes the need to implement an improved approach for Pacific saury in the near term (1-2 years) and it will be possible to improve it later. A simple approach is expected to perform relatively well.

24. The SWG MSE PS agreed that the short 2-year lifespan of Pacific saury and the assessment cycle with one-year delay are expected to reduce HCR performance. To overcome this point,

the SWG MSE PS considered Options 2 & 3, which could modify the quota in year t (originally set in year t-1) with survey and preliminary data from the current year. This is an important but potentially difficult task complicated by scientific and management cycles, and data availability. Nevertheless, the SWG MSE PS agreed to concurrently estimate the potential performance gains from in-season adjustments under Options 2 and 3 and provide concrete proposals. Meanwhile, the SWG MSE PS will also consider the administrative and procedural requirements for in-season adjustments.

25. The SWG MSE PS requested the SSC PS to conduct the technical work in relation to developing the HCR and MPs.

5.2 Mid-term plan of implementation and its review process

26. The SWG MSE PS noted that normally after the completion of HCR and MPs, reviews are conducted within the timeframe of two to three years, but considering the nature of Pacific saury, regular review might be warranted at the beginning of this time period.

5.3 Definition of exceptional circumstances

27. The SWG MSE PS noted that exceptional circumstances can be the population dynamics falling beyond the range of the confidence interval and the unavailability of fisheries independent surveys.

28. The SWG MSE PS noted that the finalized HCR should include definitions of exceptional circumstances.

Agenda Item 6. Other matters

6.1 Capacity building

29. The SWG MSE PS agreed to defer discussions on capacity building to its next meeting.

30. The SWG MSE PS suggested that being able to hold in-person meetings would facilitate more effective hands-on capacity building.

6.2 Others

31. No other matters were discussed.

Agenda Item 7. Timeline and future process

7.1 Timeline

32. The SWG MSE PS reviewed and revised the timeframe agreed to at SWG MSE PS01 (Annex

F).

7.2 Future process with assistance of SSC PS

7.3 Workplan till SWG MSE PS03 meeting

33. The SWG MSE PS recommended that its next meeting be held in person, if possible, and be funded by the Commission if needed.

Agenda Item 8. Recommendations to the Commission

34. The SWG MSE PS02 recommends that:
    (a) the Commission ensure the adequate allocation of funds for the development and utilization of a simulation platform for the evaluation of HCR.
    (b) the next SWG MSE PS meeting be held in person, back-to-back with the annual Commission meeting, and be funded by the Commission if needed.
    (c) the Commission endorse the timeframe for 2024 including the proposed meetings and tasks (Annex F).

35. The SWG MSE PS requested the Secretariat to include the above funding requests in the revised 2022 budget for presentation at the Special Commission meeting on 18 October 2022.

36. The SWG MSE PS agreed that future meetings should include both scientists and managers to facilitate communication and completion of this important work.

Agenda Item 9. Adoption of report

37. The SWG MSE PS02 Report was adopted by consensus.

Agenda Item 10. Close of the Meeting

38. The meeting closed at 12:55 on 13 September 2022, Tokyo time.

Annexes:

Annex A – Agenda
Annex B – List of documents
Annex C – List of participants
Annex D – Proposed options of Harvest Control Rules
Annex E – Timeframe of NPFC meetings toward setting a Harvest Control Rule
Annex F – Timeline and tasks

Please refer to the NPFC website for the complete annexes.

1st Special Commission Meeting

18 October 2022
Virtual
Meeting Report

Agenda

Agenda Item 1. Opening of the Meeting

1.1Welcome Address

1.2Appointment of Rapporteur

1.3Adoption of Agenda

1.4Meeting Arrangement

Agenda Item 2. Selection of a new Executive Secretary of NPFC

2.1 Report from the Chair of the Selection Committee

2.2 Selection and appointment of a new Executive Secretary

Agenda item 3. Financial statements for 2022

3.1 2022 budget

3.2 2022 Member's contribution

Agenda Item 4. Other matters

4.1 Dates of the next annual meetings of TCC, FAC and the Commission

4.2 Election of TCC Chair and vice-Chair

4.3 Renewal of the Compliance Monitoring Scheme (CMM 2019-13)

Agenda Item 5. Adoption of the report

Agenda Item 6. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 1st Special Meeting of the North Pacific Fisheries Commission (NPFC) took place as a virtual meeting via WebEx, on 18 October 2022, and was attended by Members from Canada, China, the European Union (EU), Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America, and Vanuatu. The Pew Charitable Trusts (Pew) and the Australian National Centre for Ocean Resources and Security (ANCORS) attended as observers. The meeting was opened by Dr. Vladimir Belyaev (Russia), who served as the Commission Chair.

1.1 Welcome Address

2. The Chair welcomed the participants to the meeting and explained that the main aims of the meeting were to appoint a new Executive Secretary and to adopt the budget for 2022.

1.2 Appointment of Rapporteur

3. Mr. Alexander Meyer was appointed as the Rapporteur.

1.3 Adoption of Agenda

4. The Secretariat proposed to add three items to the provisional agenda under Agenda Item 4. Other Matters: 4.1 Dates of the next annual meetings of TCC, FAC and the Commission; 4.2 Election of TCC Chair and vice-Chair; and 4.3 Renewal of the Compliance Monitoring Scheme (CMM 2019-13). The Commission agreed to the proposal.

5. The agenda was adopted (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

1.4 Meeting Arrangement

6. The Acting Executive Secretary, Dr. Alex Zavolokin, outlined the meeting arrangements.

Agenda Item 2. Selection of a new Executive Secretary of NPFC

2.1 Report from the Chair of the Selection Committee

7. The Chair of the Panel for selecting the new Executive Secretary, Vice-Chair of the Commission, Mr. Shingo Ota (Japan), reported on the outcomes of the interviews and the subsequent voting process conducted by Members on 23 June 2022 to identify the preferred candidate for the position of the Executive Secretary (NPFC-2022-COMsm01-WP01). Of the candidates, Dr. Robert Day received majority support in the voting process and was therefore the preferred candidate according to the NPFC Staff Selection Process. The Panel Chair recommended that the Commission appoint Dr. Day as the new Executive Secretary.

2.2 Selection and appointment of a new Executive Secretary

8. All Members supported the recommendation of the Panel Chair and the Commission appointed Dr. Robert Day as the new Executive Secretary.

9. The Commission noted that, in accordance with the NPFC Staff Selection Process, Dr. Day will be notified at the conclusion of the Commission's meeting and that contract negotiations are to be conducted by the Commission's Chair.

10. The Commission requested that the Chair, with the help of the Vice-Chair and the Secretariat, consult with Dr. Day to determine the earliest date at which he can assume the position of Executive Secretary and provide notification of this date to the Commission. The Commission agreed that all procedures should be finalized as soon as possible, preferably within 1 month depending on the time required for visa issuance and other matters.

Agenda Item 3. Financial statements for 2022

3.1 2022 budget

3.2 Status of Member Contributions

11. The Acting Executive Secretary reported on income and expenditures in 2020 and 2021 financial years, the proposed 2022 budget, and Members' contributions for 2022 (NPFC-2022-COMsm01-WP02).

12. The Commission reviewed the draft budget proposed by the Secretariat. The Commission agreed to keep the budget at the level adopted at its previous regular meeting (JPY 157,271,403). The Commission adopted the budget for 2022 and requested the Secretariat to recalculate Members' contributions with the inclusion of the EU and to revise the budget tables, and to circulate this information to Members following the meeting.

13. The EU expressed concern over adopting the budget before the figures for Members' contributions and the budget tables have been finalized. The EU stated that it would not oppose this decision given the exceptional circumstances but urged the Commission to not make this a precedent for future budget decisions.

14. The adopted budget and Members' contributions for 2022 are attached (Annex D, E). The details are available in the revised budget paper (NPFC-2022-COMsm01-WP02 (Rev. 1)).

Agenda Item 4. Other Matters

4.1 Dates of the next annual meetings of TCC, FAC and the Commission

15. The following schedule and venues were adopted:
    (a) Technical and Compliance Committee (TCC): 18-21 March in Japan;
    (b) Finance and Administration Committee (FAC): 22 March in Japan; and
    (c) Commission: 23-25 March in Japan

4.2 Election of TCC Chair and vice-Chair

16. As there were no nominations, the Commission requested that the Chair and the Secretariat consult with Members intersessionally to identify potential candidates for the TCC Chair and TCC Vice-Chair positions.

4.3 Renewal of the Compliance Monitoring Scheme (CMM 2019-13)

17. The Compliance Manager, Ms. Judy Dwyer, explained that the CMM 2019-13 For the Compliance Monitoring Scheme will expire on 29th of November 2022, three years after its entry into force.

18. The Commission agreed to a 1-year rollover of the Compliance Monitoring Scheme.

Agenda Item 5. Adoption of the Report

19. The report was adopted by consensus.

Agenda Item 6. Close of Meeting

20. The Commission meeting closed at 10:50 a.m. on 18 October 2022, Tokyo time.

Annexes:

Annex A – Agenda
Annex B – List of Documents
Annex C – List of Participants
Annex D – Budget for 2020-2022
Annex E – Members' Annual contributions for 2022

Please refer to the NPFC website for the complete annexes

3rd Meeting of the Small Scientific Committee on Bottom Fish and Marine Ecosystems

8-10 December 2022
Virtual
Meeting Report

Agenda

Agenda Item 1. Opening of the Meeting

Agenda Item 2. Adoption of Agenda
- 2.1 Summary of SSC BF-ME02 meeting

Agenda Item 3. Stock assessment and scientific advice on the management of North Pacific armorhead (NPA)
- 3.1 Review of Members fishing statistics for NPA in 2022
- 3.2 NPA monitoring survey and Adaptive Management Procedure (AMP)
  - 3.2.1 Review of the results from 2022 monitoring survey
- 3.3 Review of Members' research and joint research activities on NPA
  - 3.3.1 Analysis of recruitment relationships to oceanography
  - 3.3.2 Update on analyses or progress on biomass estimates from the NPA acoustic survey
  - 3.3.3 Species summary document for NPA update

Agenda Item 4. Stock assessment and scientific advice on the management of splendid alfonsino (SA)
- 4.1 Review of Members fishing statistics for SA in 2022
- 4.2 Review of Members' research and joint research activities on SA
  - 4.2.1 Species summary document for SA update
  - 4.2.2 SA maturity

Agenda Item 5. Stock assessment and scientific advice on the management of sablefish
- 5.1 Review of Members fishing statistics for sablefish in 2022
- 5.2 Review of Members' research and joint research activities on sablefish
  - 5.2.1 Updated stock status for sablefish (Canada and USA)
  - 5.2.2 Results of analysis of sablefish association with VME indicators
  - 5.2.3 Update catch limits relative to stock status if needed
  - 5.2.4 Species summary document for sablefish update

Agenda Item 6. Progress on data-limited approaches to assessment of NPA and SA
- 6.1 Update from SWG NPA-SA
  - 6.1.1 Data sharing and spatial resolution of shared data

6.1.2 Joint work on life history based approach to stock assessment
6.1.3 Update on CPUE standardization work
6.1.4 Review of Fish ID guide

Agenda Item 7. Assessment and scientific advice on the management of Vulnerable Marine Ecosystems (VME)
7.1 Review of Members' research and joint research activities on VME
7.1.1 Review of progress towards developing a definition of VMEs
7.1.2 Assessing the relative risk of SAIs
7.1.3 Update on trade-off analysis between VME protection and sablefish fishing
7.1.4 Update on progress on standardizing an approach to defining SAI
7.1.5 Joint Canada-USA seamount cruise
7.1.6 Japanese sea-floor survey in 2022
7.1.7 Research on bottom ecosystems of the Emperor Seamount Chain by Russia
7.2 Review of intersessional activities of the SWG VME
7.2.1 Recommendations on gear specific encounter thresholds
7.2.2 Review and discussion of scientific basis for move on rule and size of area closures
7.2.3 Proposals for revisions to VME indicator species list
7.2.4 Discussion of draft objectives for recovering VMEs
7.3 Data sharing for VME management
7.3.1 Discussion and revision of terms of reference for sharing VME data
7.3.2 Generation of template for data sharing for VME data
7.4 Significant and adverse impacts (SAI) assessment
7.4.1 Literature review of impacts of fishing activities on VME

Agenda Item 8. Data collection and reporting
8.1 Review of the template for collection of scientific observer data

Agenda Item 9. 5-Year (2022-2026) Rolling Work Plan
9.1 North Pacific armorhead
9.2 Splendid alfonsino
9.3 Sablefish
9.4 Vulnerable marine ecosystems
9.5 Other ecosystem components

Agenda Item 10. Review of CMMs 2021-05 and 2019-06 for bottom fisheries and protection of vulnerable marine ecosystems and CMM 2019-10 for sablefish

Agenda Item 11. Other matters

11.1 Inter-sessional work and priority issues for next meeting

11.2 Update on PICES WG47 Seamount Ecology

11.3 Other issues

Agenda Item 12. Recommendations to the Scientific Committee

Agenda Item 13. Next meeting

Agenda Item 14. Adoption of the Report

Agenda Item 15. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 3rd Meeting of the Small Scientific Committee on Bottom Fish and Marine Ecosystems (SSC BF-ME03) took place as a virtual meeting via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, and the United States of America. The Deep Sea Conservation Coalition (DSCC) and the Pew Charitable Trusts (Pew) attended as observers. Dr. Ryan Gasbarro and Ms. Derya Whaley-Kalaora participated as invited experts.

2. The meeting was opened by the SSC BF-ME Chair, Dr. Chris Rooper (Canada), who welcomed the participants. The Science Manager, Dr. Aleksandr Zavolokin, outlined the procedures for the meeting. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

3. The Chair proposed the following amendments to the agenda:
   (a) A new agenda item on the summary of the SSC BF-ME02 meeting should be added as Agenda Item 2.1.
   (b) A new agenda item on the splendid alfonsino (SA) maturity should be added as Agenda Item 4.2.2.
   (c) A new agenda item on the joint Canada-USA seamount cruise should be added as Agenda Item 7.1.5.
   (d) A new agenda item on the Japanese sea-floor survey in 2022 should be added as Agenda Item 7.1.6.
   (e) A new agenda item for a vulnerable marine ecosystems (VME) presentation by Russia should be added as Agenda Item 7.1.7.

4. The SSC BF-ME agreed to the proposed revisions.

5. The revised agenda was adopted (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

2.1 Summary of SSC BF-ME02 meeting

6. The Chair summarized the discussions and outcomes of the SSC BF-ME02 meeting.

Agenda Item 3. Stock assessment and scientific advice on the management of North Pacific armorhead (NPA)

3.1 Review of Members fishing statistics for NPA in 2022

7. The Science Manager presented the fishing catch and effort statistics for NPA including the latest available data for 2021. Total catch in 2021 was around 25 tons, the lowest level since 2002. 1 Japanese trawl and 1 Japanese gillnet vessel were in operation targeting NPA and SA in the Convention Area, and 1 Russian longline vessel was in operation targeting skilfish in the Convention Area.

3.2 NPA monitoring survey and Adaptive Management Procedure (AMP)

3.2.1 Review of the results from 2022 monitoring survey

8. The Science Manager presented the results of the monitoring survey for NPA in the Emperor Seamounts in 2022 (NPFC-2022-SSC BFME03-IP02). The fishing vessel Kaiyo Maru No. 51 conducted four trawl hauls for at least one hour each in the Koko Seamount from March to June 2022. The criteria for high recruitment were not met.

3.3 Review of Members' research and joint research activities on NPA

3.3.1 Analysis of recruitment relationships to oceanography

9. The Chair informed the SSC BF-ME that the joint research conducted by Canada, Japan, Korea, Russia, and the United States on the effects of oceanography on NPA recruitment in the Emperor Seamounts, which was presented at the previous meeting as NPFC-2021-SSC BFME02-WP02, has been published as a paper in *Fisheries Oceanography* (NPFC-2022-SSC BFME03-IP03).

3.3.2 Update on analyses or progress on biomass estimates from the NPA acoustic survey

10. Japan presented updated NPA distribution information and abundance estimates based on acoustic surveys conducted on Colahan and C-H Seamounts from 2016 to 2020 (NPFC-2022-SSC BFME03-WP05). Five acoustically important fish were identified by three species identification methods. NPA were mainly distributed on the flat top of C-H Seamount and on the northwestern slope of Colahan Seamount. The estimated abundance of NPA on C-H Seamount indicated an increasing trend. Although the abundance on Colahan Seamount was mostly similar to the value for C-H Seamount, the estimated density was lower because the

area of Colahan Seamount is larger than the one of C-H Seamount.

11. The Lead of the Small Working Group on North Pacific Armorhead and Splendid Alfonsino (SWG NPA-SA), Dr. Kota Sawada (Japan), suggested that the abundance estimates for NPA could be used for comparing with the standardized catch-per-unit-effort for NPA.

12. The Chair suggested that it may be useful to collect acoustic data from the Japanese vessel conducting the monitoring survey. Japan agreed but explained that it would need to consult with the vessel to see if this would be possible.

3.3.3 Species summary document for NPA update

13. The SWG NPA-SA Lead presented an updated species summary of NPA in the Emperor Seamounts (NPFC-2022-SSC BFME03-WP13).

14. The SSC BF-ME recommends that the SC adopt the updated species summary (Annex D).

Agenda Item 4. Stock assessment and scientific advice on the management of splendid alfonsino (SA)

4.1 Review of Members fishing statistics for SA in 2022

15. The Science Manager presented the fishing catch and effort statistics for SA including the latest available data for 2021. Total catch in 2021 was around 700 tons, the lowest level since 2002. 1 Japanese trawl and 1 Japanese gillnet vessel were in operation targeting NPA and SA in the Convention Area, and 1 Russian longline vessel was in operation targeting skilfish in the Convention Area.

4.2 Review of Members' research and joint research activities on SA

4.2.1 Species summary document for SA

16. The SWG NPA-SA Lead presented the updated species summary of SA in the Emperor Seamounts (NPFC-2022-SSC BFME03-WP14).

17. The SSC BF-ME recommends that the SC adopt the updated species summary (Annex E).

18. The SSC BF-ME noted that Members' annual reports indicated the catch of both NPA and SA in 2021 were the lowest in the time series of that fishery (although NPA catch has reportedly increased slightly in 2022). Effort has also declined so that only a single trawl and single gillnet vessel are currently operating in this fishery. Since its inception in 2019 the monitoring survey has not detected positive signs of recruitment for NPA. Members continue to be concerned about the two stocks and the SSC BF-ME agreed to task the SWG NPA-SA to monitor the

effectiveness of current management measures in sustaining the fishery.

4.2.2 SA maturity

19. Japan presented an analysis for defining the reproductive season and maturity stages, and estimating the size at sexual maturity of SA in the Emperor seamounts (NPFC-2022-SSC BFME03-WP06). The analysis was conducted based on biological data of SA in the Emperor seamounts shared by NPFC Members. Size at sexual maturity was estimated by calculating the fork length at which 50% of the population reaches sexual maturity (FL_{50}). Monthly changes in gonadosomatic index and maturity stages based on macroscopic and microscopic analyses suggested that reproduction occurs from March through December, with July being the intense spawning period. The FL_{50} values estimated by a logistic regression model ranged between 257 and 365 mm. This wide range may be due to the different fish sizes used in the analysis, as well as variations in fish size and growth by sampling location and year. Therefore, further analysis considering temporal and spatial variability in fish size is needed to produce a more reliable estimate of FL_{50} for conducting a stock assessment of SA in the Emperor Seamounts area.

Agenda Item 5. Stock assessment and scientific advice on the management of sablefish

5.1 Review of Members fishing statistics for sablefish in 2022

20. Canada informed the SSC BF-ME that no Canadian vessels have fished for sablefish in the Convention Area since 2020.

5.2 Review of Members' research and joint research activities on sablefish

5.2.1 Updated stock status for sablefish (Canada and USA)

21. Canada presented a summary it prepared together with the United States on the current sablefish status in the eastern North Pacific including the NPFC Convention Area (NPFC-2022-SSC BFME03-WP11 (Rev. 2)). The most recent domestic stock assessments conducted by Canada and the United States all indicate that the sablefish stock is healthy and not subject to overfishing. In the NPFC Convention Area, there has been no fishery catch or effort since 2020.

5.2.2 Results of analysis of sablefish association with VME indicators

22. Canada presented the results of an analysis to determine if there is a significant association between Northeast Pacific Ocean sablefish and VME indicator taxa for the entire stock (from California to Alaska) using data collected from fisheries-independent bottom trawl surveys (NPFC-2022-SSC BFME03-WP19). The data from trawl surveys on the west coast of North America throughout the sablefish range indicate that none of the VME indicator species have a significant impact on sablefish CPUE. Scleractinian (stony coral) presence was associated with a decrease in sablefish abundance. The data showed that sea whips and sea pens (Pennatulaceans) were the only structure-forming taxa that had a positive effect on sablefish

catch. This likely reflects the preference for soft substrates for both the fish and the invertebrates, rather than a particular dependence of sablefish on sea whips. Regardless of the mechanism of the association, it might be expected that areas with Pennatulaceans would be fished to a larger extent than areas without them, due to the potential for higher sablefish catch rates in these substrates.

5.2.3 Update catch limits relative to stock status if needed

23. Canada informed the SSC BF-ME that it is evaluating potential changes to the sablefish catch limits for the NPFC Convention Area to reflect its domestic conservation measures, namely the closure of seamounts in its exclusive economic zone (EEZ) to fishing.

5.2.4 Species summary document for sablefish

24. The SSC BF-ME reviewed the updated species summary of sablefish (NPFC-2022-SSC BFME03-WP15).

25. The SSC BF-ME recommends that the SC adopt the updated species summary (Annex F).

26. The SSC BF-ME reviewed the updated species summary of blackspotted and rougheye rockfishes (NPFC-2022-SSC BFME03-WP16).

27. The SSC BF-ME recommends that the SC adopt the updated species summary (Annex G).

Agenda Item 6. Progress on data-limited approaches to assessment of NPA and SA

6.1 Update from SWG NPA-SA

28. The SWG NPA-SA Lead presented a summary of the intersessional progress made by the SWG NPA-SA on the tasks it was assigned by SSC BF-ME02 (NPFC-2022-SSC BFME03-WP07 (Rev.1)). Further details are described in Agenda Items 6.1.1–6.1.4 below.

6.1.1 Data sharing and spatial resolution of shared data

29. The SWG NPA-SA Lead explained that the SWG NPA-SA agreed to use seamount names as a spatial resolution for the data template to analyze spatial variations in life history. It also reviewed discrepancies in the shared data and agreed to:
    (a) aggregate Kammu and Yuryaku Seamounts into Milwaukee.
    (b) convert standard length (SL) and total length (TL) into fork length (FL) using the following equations:
        ➢ NPA: SL=0.90 FL, SL=0.88 TL, FL=0.97TL (newly estimated),
        ➢ SA: SL=0.91 FL, SL=0.77 TL, FL=0.84TL (Shotton 2016).
    (c) conduct separate analyses for different methods to assess maturity.

Furthermore, the SWG NPA-SA noted the difference of measurement resolutions and the lack of age data for NPA in shared data.

6.1.2 Joint work on life history based approach to stock assessment

30. The SWG NPA-SA Lead explained that the SWG NPA-SA has:
    (a) conducted analysis of monthly changes in length potentially for length-based analyses for NPA and agreed that estimating the growth of NPA from length frequency distribution is not recommended.
    (b) conducted analysis of the relationship between fecundity and fatness to evaluate fecundity changes for NPA.
    (c) started analysis of the growth curve for SA and recommended to use Template Model Builder (TMB) in R for fitting models to data.
    (d) started analysis of the maturity ogive for SA and suggested that temporal and spatial variation should be considered to evaluate the effect of location and year.
    (e) started evaluation of spatial variation in life history for SA and noted the possible use of different spatial aggregations (to complement small sample size for some seamounts) and possible confounding effects (e.g. gear and season), and that density dependent effect may be considered as a factor in future analyses.

6.1.3 Update on CPUE standardization work

31. The SWG NPA-SA Lead explained that the SWG NPA-SA has:
    (a) agreed to conduct CPUE standardization separately by Members based on their own data and submit standardized CPUEs to the SWG NPA-SA.
    (b) encouraged Members to continue discussion on methodology and framework for CPUE standardization.
    (c) re-affirmed that CPUE standardization is a low priority task and agreed to focus on a life history based approach to stock assessment.

6.1.4 Review of Fish ID guide

32. The SWG NPA-SA Lead presented a field guide for identification of fishes of the Emperor Seamount Chain captured by bottom fisheries (NPFC-2022-SSC BFME03-WP08).

33. The SSC BF-ME endorsed the field guide and requested the Secretariat to edit it based on the recommendations of the SWG NPA-SA and to present the edited version at the next SWG NPA-SA meeting.

34. Japan presented a proposal regarding the scientific name to be used when referring to the oreosomatid fish in the Emperor Seamounts area (NPFC-2022-SSC BFME03-WP09). An

oreosomatid fish (oreo) of the genus *Allocyttus* is one of the target stocks of bottom fisheries in the Emperor Seamounts area. However, its taxonomic identity was uncertain, because two different scientific names, i.e., *A. verrucosus* and *A. folletti*, have been used for it. Recently, Hoshino et al. (2022) concluded that the oreosomatid fish in the Emperor Seamounts area is *A. folletti*, based on morphological analyses. Japan therefore requests the Secretariat to revise the NPFC website and other relevant materials to use the scientific name *Allocyttus folletti*, instead of *A. verrucosus*, when referring to this fish.

35. The SSC BF-ME recommends that the SC endorse the use of the scientific name *Allocyttus folletti*, instead of *A. verrucosus*, when referring to the oreosomatid fish in the Emperor Seamounts area.

36. The SSC BF-ME recommends that the SC establish a formal procedure for changing species' scientific and common names used by the NPFC.

Agenda Item 7. Assessment and scientific advice on the management of Vulnerable Marine Ecosystems (VME)

7.1 Review of Members' research and joint research activities on VME

7.1.1 Review of progress towards developing a definition of VMEs

37. Canada presented an update to its proposed quantitative approach to identifying VMEs originally described in NPFC-2021-SSC BFME02-WP05 (NPFC-2022-SSC BFME03-WP03). In this approach, Canada used predictive habitat models to identify areas likely to be VMEs and visual data to identify VMEs, as outlined by the NPFC framework for identifying data that can be used to identify VMEs in the NW and NE parts of the NPFC's Convention Area (Conservation and Management Measure (CMM) 2021-05 for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the NW Pacific Ocean and CMM 2019-06 For Bottom Fisheries and Protection of VMEs in the NE Pacific Ocean). Canada's quantitative approach is based on work by Rowden et al. (2020), who identify thresholds related to the amount of VME indicator taxa in an area and how it contributes to an increase in associated species richness as a result of providing structural complexity. Canada's proposed approach to identifying VMEs shows an example of an extension of the Rowden et al. (2020) approach to presence/absence data and models. Preliminary results from the Cobb-Eickelberg seamount chain study area detect a VME density threshold of 0.57 VME indicators taxa/m^2 and a VME occurrence threshold of 0.78. Applying these thresholds to visual data and predictive habitat models results in a total area of 750m^2 identified as VMEs on Cobb Seamount and a total area of 1,542 km^2 identified as likely to be VMEs along the Cobb-Eickelberg seamount chain, respectively. Canada recommends that the SSC BF-ME and the SC endorse this process as one of the NPFC's processes for identifying VMEs and areas likely to be VMEs in the Convention Area.

With the endorsement of the SSC BF-ME and the SC, Canada intends to move forward with using this method to identify VMEs and areas likely to be VMEs in the eastern part of the Convention Area.

38. The SSC BF-ME recommends that the SC endorse the process proposed by Canada in NPFC-2022-SSC BFME03-WP03 as one of the NPFC's processes for identifying VMEs and areas likely to be VMEs in the Convention Area, and Canada's use of this method in the eastern part of the Convention Area.

39. The DSCC presented an overview of the Project on a Community Consensus on Designation of VMEs from Imagery under the Deep-Ocean Stewardship Initiative (NPFC-2022-SSC BFME03-OP02). The project seeks to clarify which taxa are considered VME indicator species, whether a VME can be identified from a single image, what criteria can be used to designate a VME from a single image, and what thresholds (density or diversity) need to be met to make a designation with a single image of a VME. An initial assessment has identified inconsistencies in VME taxa lists among different regional fisheries management organizations (RFMOs), shown that it is possible to designate a VME from a single image, and found that a wide range of natural VME densities have been observed. In future, it is recommended that a wider study be conducted to allow a range of values for building thresholds.

40. The SSC BF-ME agreed to consider the methodology outlined by the DSCC as a potential alternative process for identifying VMEs in the NPFC Convention Area.

7.1.2 Assessing the relative risk of SAIs

41. Dr. Ryan Gasbarro, an invited expert, presented an assessment of the relative risk of significant adverse impacts (SAIs) to VMEs in the northeast part of the NPFC's Convention Area (NPFC-2022-SSC BFME03-WP02). The assessment focuses specifically along part of the Cobb-Eickelberg seamount chain where most of Canada's fishing effort for sablefish in the NPFC Convention Area has taken place. It draws on the fishing footprint of Canada's sablefish fishery from 2006 to 2020 and its overlap with the distribution of VMEs and areas likely to be VMEs. The assessment describes the occurrence, spatial scale, and footprint of cumulative fishing activities for sablefish in the NPFC Convention Area. It also describes how these data were used with the distribution of VMEs and areas likely to be VMEs to assess the relative risk of SAIs. The assessment categorizes 1 km x 1 km grid cells in the study area into areas at high, medium, or low relative risk of SAI. To fall into the highest relative risk category, both the cumulative fishing footprint and the VME indicator occurrence probability had to have values above the highest thresholds. Most (94%) of the grid cells are in the medium-risk category and 5% are in the high-risk category. High-risk areas are found on Brown Bear, Cobb, and Warwick

Seamounts, where cumulative (i.e., summed over time) fishing is greater. This assessment can be used to inform precautionary management decisions, including spatial closures, to protect VMEs and areas likely to be VMEs from SAIs.

42. It was noted by the DSCC that a high proportion of grid cells are in the medium and high risk categories, which suggested action should be taken. However, the Chair noted that some of the underlying species distribution models could be improved and these inaccuracies may be elevating the perceived risk to VMEs. Canada also noted that it was quantifying the relative risk of SAI but that it is unknown how these relative risk categories correspond to potential impacts to VMEs. The invited expert also explained that most of the areas in the medium risk category had no or limited cumulative fishing effort.

7.1.3 Update on trade-off analysis between VME protection and sablefish fishing

43. Canada provided an update on its spatial optimization analysis for balancing the objectives of sablefish fishing and conserving VMEs in the northeastern part of the NPFC Convention Area (NPFC-2022-SSC BFME03-WP04). The process was first outlined in NPFC-2020-SSC BFME01-WP13 (Rev. 1), and has been updated based on results from updated methods proposed to identify VMEs and areas likely to be VMEs. The analysis provides results from a range of scenarios with differing conservation targets and parameters to be selected by managers and demonstrates how areas for protection can be identified.

7.1.4 Update on progress on standardizing an approach to defining SAI

44. The SSC BF-ME agreed to task the Small Working Group on VME (SWG VME) to continue to work to develop a standardized approach to defining SAI.

45. Canada expressed its intention to conduct risk management work in parallel to the continued work to develop a standardized approach to defining SAI. Canada aims to assess the relative risk of SAIs in the eastern NPFC Convention Area in order to provide management advice for preventing potential SAIs.

7.1.5 Joint Canada-USA seamount cruise

46. Canada introduced the Joint Canada-USA International Seamount Survey (JCUISS) designed to study deep-sea coral and sponge communities on seamounts in international waters (NPFC-2022-SSC BFME03-WP12). The main focus of this survey was on benthic invertebrates and fish and the primary objective is to generate spatially-explicit data using underwater stereo cameras that can be used to map the distribution of deep-sea corals and sponges at the seamounts, document their size structure, visible impacts of human activity, and their species associations. As secondary objectives, the survey also collected eDNA samples, observations

of marine mammals and birds, oceanographic data and zooplankton samples, and fisheries acoustic data and acoustic doppler current profiler data.

7.1.6. Japanese sea-floor survey in 2022

47. Japan presented a report on its sea-floor visual survey to identify the distribution of VME indicator species in the area around the site where the high-density cold-water corals distribution reported in NPFC-2021-SSC BFME02-WP9 was confirmed (NPFC-2022-SSC BFME03-WP10). The survey was conducted by the Kaiyo Maru research vessel in Southeastern Koko and Yuryaku Seamounts from 22 July to 20 August 2022. Thirty-four sites were set in the Koko Seamount and thirty-five sites were set in the Yuryaku Seamount. The depth ranges were 448-736 m in Koko and 476-653 m in Yuryaku. On Koko Seamount, the survey found small patches of relatively dense *Acanella* sp. gorgonian corals extending from K46 to K49 to the north and south, and until K52 to the west. On the northwestern slope of Yuryaku Seamount, it found a relatively dense distribution of several gorgonians and, more sparsely, some Scleractinian corals around Y23 to Y25. On the southeastern part of Yuryaku Seamount, the survey found a relatively dense distribution of several large gorgonians and some Scleractinian or Antipatharian corals. Going forward, Japan intends to conduct further analysis to determine the detailed extent of the relatively dense coral communities at the three identified sites, compare the results of this survey with the results of the US research (Baco et al. 2020), and examine whether these communities can be defined as VMEs and therefore whether they should be subjected to SAI assessment.

7.1.7 Research on bottom ecosystems of the Emperor Seamount Chain by Russia

48. Russia presented results from research on the bottom ecosystems of the Emperor Seamount Chain based on the results of two Russian marine expeditions conducted in 2019 and 2021 (NPFC-2022-SSC BFME03-IP05). The surveys were conducted with a remotely operated underwater vehicle that performed 33 dives at depths of 2,182 m to 338 m across 158 sampling stations. Several stations containing abundant coral populations were recognized and reported at the Koko and Milwaukee Seamounts. Gorgonians were the main component of these communities. Dense populations of Hexactinellidae (glass sponges) were recognized at Jingu Seamount, with unique rich and diverse fauna. Echinoderm communities, which play a dominant role in their ecosystems, were recognized at the Ojin, Koko, and Kimmei Seamounts.

7.2 Review of intersessional activities of the SWG VME

49. The SWG VME Lead, Dr. Janelle Curtis (Canada), presented summaries of the 1st and 2nd intersessional meetings of the SWG VME (NPFC-2022-SSC BFME03-WP17 & WP18) as well as subsequent email correspondence. Further details are described in Agenda Items 7.2.1–7.2.4 below.

7.2.1 Recommendations on gear specific encounter thresholds

50. The SWG VME Lead explained that the SWG VME reviewed and discussed the gear-specific encounter thresholds used by other RFMOs and the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) based on "Approaches used by other RFMOs and CCAMLR to avoid SAIs on VMEs" (Cryer and Soeffker (2019) SPRFMO SC7-DW18).

51. The SSC BF-ME agreed that it would be useful to understand the basis by which other RFMOs' encounter thresholds were determined by taxa and gear-type. The SSC BF-ME recommends that the SC establish a project for doing so. The SSC BF-ME noted that the NPFC does not currently have an encounter threshold for longline and pot gears, in contrast to several RFMOs and CCAMLR.

7.2.2 Review and discussion of scientific basis for move on rule and size of area closures

52. The SWG VME Lead explained that the SWG VME discussed the move-on rules and area closures applied by other RFMOs and CCAMLR based on Cryer and Soeffker (2019). The SWG VME has also identified the estimates of VME patch sizes presented in Williams et al. 2020 *FMARS* (0.02–1.16 km^2), patch size estimated by Japan from visual surveys (< 1 nm in length) and by Dr. Amy Baco-Taylor at SWG VME02 (linear length of coral reef ranged from ~3–786 m) for informing move-on distances.

53. Taking into account the estimated patch sizes of VME organisms based on observations from visual studies in the Convention Area and a literature review, the SSC BF-ME recommends that a move-on rule of 1 nautical mile be set for all bottom fishing gear. The SSC BF-ME agreed to revisit this matter as new information becomes available.

7.2.3 Proposals for revisions to VME indicator species list

54. The SWG VME Lead explained that the SWG VME agreed to recommend that the NPFC's list of VME indicator taxa be revised to Alcyonacea (which now includes the Gorgonacea), Antipatharia, and Scleractinia. However, recent revisions to coral taxonomy (McFadden et al. 2022) made these changes outdated.

55. The SWG VME Lead explained that the SWG VME agreed to discuss recommending that only three sub-orders in the Alcyonacea (Scleraxonia, Holaxonia and Calcaxonia) be included on the list of VME indicator taxa because of the differences in ecological characteristics and their larger size, however, due to the taxonomic revisions Alcyonacea is no longer an accepted taxonomic grouping (McFadden et al. 2022).

56. The SSC BF-ME agreed not to revise the list of corals on the NPFC list of VME indicator taxa in the manner recommended by the SWG VME, noting the difficulty and impracticality of revising the list each time new taxonomic research emerges.

57. Some Members emphasized the importance of large structure-forming corals, regardless of their taxonomic definition.

58. The SWG VME Lead explained that the SWG VME agreed to discuss recommending the addition of Porifera to the list of VME indicator taxa.

59. The SSC BF-ME recommends that the SC add the Hexactinellida and Demospongiae classes to the VME indicator taxa list.

60. The SSC BF-ME agreed to consider the order Pennatulacea as a VME indicator taxa.

7.2.4 Discussion of draft objectives for recovering VMEs

61. The SWG VME Lead explained that Canada has drafted objectives for recovering VMEs centered on uniqueness or rarity, functional significance of the habitat, fragility, life-history traits of component species that make recovery difficult, structural complexity, and connectivity, and circulated the draft objectives among SWG VME participants for comment.

62. Noting the decadal timeframe of VME recovery and that it has discussed this matter for a number of years without making much progress, the SSC BF-ME agreed that further discussions on recovering VME should be a lower priority for the SWG VME.

7.3 Data sharing for VME management

7.3.1 Discussion and revision of terms of reference for sharing VME data

63. The Chair presented draft terms of reference for sharing VME data for the consideration of the SSC BF-ME (NPFC-2022-SSC BFME03-WP20).

64. The SSC BF-ME reviewed the terms of reference for sharing VME data and recommends that the SC adopt them (Annex H).

7.3.2 Generation of template for data sharing for VME data

65. The Chair presented a draft template for sharing VME data (NPFC-2022-SSC BFME03-WP21), reflecting Members' responses to a questionnaire about visual surveys (NPFC-2022-SSC BFME03-IP01).

66. The SSC BF-ME reviewed the template for sharing VME data and recommends that the SC adopt it (Annex I).

7.4 Significant and adverse impacts (SAI) assessment

7.4.1 Literature review of impacts of fishing activities on VME

67. Ms. Derya Whaley-Kalaora, an invited expert, provided an update to the literature review presented at SWG VME02 on the recovery of VMEs from impacts of fishing activities.

Agenda Item 8. Data collection and reporting

8.1 Review of the template for collection of scientific observer data

68. The SSC BF-ME reviewed the template for collection of scientific observer data and determined that no revisions are currently required.

69. Regarding the SC's request for advice about whether or not there are any types of data that would be relevant to the SSC BF-ME's work that could be collected by a regional NPFC EM system or observer program, the SSC BF-ME reaffirmed that Members' existing observer programs are adequate for collecting the necessary data.

Agenda Item 9. 5-Year Rolling Work Plan

9.1 North Pacific armorhead

9.2 Splendid alfonsino

9.3 Sablefish

9.4 Vulnerable marine ecosystems

9.5 Other ecosystem components

70. The SSC BF-ME reviewed, revised and endorsed the 2022-2026 SSC BF-ME 5-Year Rolling Work Plan (NPFC-2022-SSC BFME03-WP01 (Rev. 1)).

Agenda Item 10. Review of CMMs 2021-05 and 2019-06 for bottom fisheries and protection of vulnerable marine ecosystems and CMM 2019-10 for sablefish

71. The Science Manager explained that the revisions to CMMs 2021-05 and 2019-06 that had been proposed by SSC BF-ME02 and endorsed by SC06 had not yet been considered by the Commission due to the postponement of the Commission meeting.

72. The SSC BF-ME reviewed and further revised CMM 2021-05 (Annex J).

73. The SSC BF-ME noted that in Paragraph 4A of CMM 2021-05, there is some ambiguity around the referenced effort limits of February 2007. The SSC BF-ME recommends that the SC recommend that the Commission consider amending the CMM to address this issue.

74. The SSC BF-ME reviewed and further revised CMM 2019-06 (Annex K).

75. The SSC BF-ME has suggested an encounter threshold for demosponges and Hexactinellidae sponges at 500 kg in CMM 2021-05 and CMM 2019-06 and noted that this will be reviewed in the SWG VME.

76. The SSC BF-ME reviewed CMM 2019-10 and determined that no changes are currently necessary.

Agenda Item 11. Other matters

11.1 Inter-sessional work and priority issues for next meeting

77. The SSC BF-ME discussed intersessional work and agreed priority issues for the next meeting as described under Agenda Item 12.

11.2 Update on PICES WG47 Seamount Ecology

78. The SC Chair, Dr. Janelle Curtis, provided an update on the activities of PICES Working Group 47 (WG-47) on Ecology of Seamounts (NPFC-2022-SSC BFME03-OP01). In 2022, WG-47 objectives included (1) identifying environmental and ecological predictors of patterns in the distribution and biodiversity of seamount taxa, (2) applying one or more modeling approaches to predict the distribution of seamount taxa in the North Pacific Ocean, (3) using available data to predict climate induced changes in the distributions of seamount fauna, and (4) convening a topic session on seamount ecology. The WG-47 co-convened a two-day Workshop on "Distributions of pelagic, demersal, and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions," as well as an annual business meeting, at PICES-2022 in Busan, Korea. In 2023, it will convene a session on "Seamount biodiversity: VMEs and species associated with seamounts in the North Pacific Ocean" at the 2023 PICES Annual Meeting in Seattle, USA. This session will focus on improving understanding of seamount biodiversity, exchanging ideas on methods to identify VME areas, and identifying potential indicators for assessing and monitoring the biodiversity of seamount taxa, and is of interest to both PICES and NPFC, which have identified VMEs as a priority area for cooperation in the NPFC-PICES Framework for Enhanced Scientific Collaboration in the North Pacific. The co-convenors therefore request that NPFC co-sponsor this session by contributing the equivalent of $5,000 USD.

79. The SSC BF-ME supported the request for the NPFC to co-sponsor the PICES session on "Seamount biodiversity: VMEs and species associated with seamounts in the North Pacific Ocean" by contributing the equivalent of $5,000 USD.

11.3 Other issues

80. No other issues were discussed.

Agenda Item 12. Recommendations to the Scientific Committee

81. The SSC BF-ME agreed to:

(a) Task the SWG NPA-SA to:

i. Continue joint work on life history based approach to stock assessment

ii. Consider other possible approaches to stock assessment, especially for NPA

iii. Assist the Secretariat to edit the fish ID guide

iv. Update species summaries

v. Monitor the effectiveness of current management measures in sustaining the bottom-fish fishery for NPA and SA, given the historically low catch and effort in the fishery and continuing low levels of recruitment in monitoring surveys since 2019

vi. Conduct CPUE standardization and comparison with other indices of abundance (e.g., acoustic survey abundance) (lower priority)

(b) Request Russia to provide a report on the skilfish fishery and stock at SSC BF-ME04

(c) Task the SWG VME to:

i. Review the basis for gear specific and taxa specific encounter thresholds from other RFMOs (SC suggested project)

ii. Synchronize and refine approaches to defining SAI so that one method can be applied to the eastern and western North Pacific Ocean

- Determine data requirements and spatial/temporal resolution for SAI assessment

iii. Review VME indicator taxa from coral relative to taxonomy revisions for Octocorallia and review the appropriateness of adding Pennatulaceans to the list of VME indicator taxa

iv. Bring together observation data on VME from visual survey sources

v. Update and refine quantitative definition of VME

- Include consideration of single-image methodology (Baco-Taylor et al.)

vi. Develop management objectives for recovering VME sites (lower priority)

82. The SSC BF-ME recommends the following to the SC:

(a) Adopt the updated species summaries of North Pacific armorhead (Annex D), splendid alfonsino (Annex E), sablefish (Annex F), and blackspotted and rougheye rockfishes (Annex G), and inform the Commission about the trends in catch and effort and other scientific information relevant to management of NPA and SA.

(b) Endorse the field guide for identification of fishes of the Emperor Seamount Chain captured by bottom fisheries (NPFC-2022-SSC BFME03-WP08).

(c) Endorse the use of the scientific name *Allocyttus folletti*, instead of *A. verrucosus*, when referring to the oreosomatid fish in the Emperor Seamounts area.
(d) Establish a formal procedure for changing species' scientific and common names used by the NPFC.
(e) Endorse the process proposed by Canada in NPFC-2022-SSC BFME03-WP03 as one of the NPFC's processes for identifying VMEs and areas likely to be VMEs in the Convention Area, and Canada's use of this method in the eastern part of the Convention Area.
(f) Establish a project for understanding the basis by which other RFMOs' encounter thresholds were determined by taxa and gear-type.
(g) Recommend to the Commission that a move-on rule of 1 nautical mile be set for all bottom fishing gear.
(h) Endorse the Hexactinellida and Demospongiae classes as VME indicator taxa.
(i) Adopt the terms of reference for sharing VME data (Annex H).
(j) Adopt the template for sharing VME data (Annex I).
(k) Endorse the updated 2022-2026 SSC BF-ME 5-Year Rolling Work Plan (NPFC-2022-SSC BFME03-WP01 (Rev. 1)).
(l) Endorse the revised CMM 2021-05 (Annex J).
(m) Endorse the revised CMM 2019-06 (Annex K).
(n) Recommend that the Commission consider amending CMM 2021-05 to address the ambiguity around the referenced effort limits of February 2007 in Paragraph 4A.
(o) Recommend that the Commission co-sponsor the PICES session on "Seamount biodiversity: VMEs and species associated with seamounts in the North Pacific Ocean" by contributing the equivalent of $5,000 USD.

Agenda Item 13. Next meeting

83. The SSC BF-ME recommends holding a 3-day virtual meeting or a 2.5-day in-person meeting of the SSC BF-ME in 2023 and requests the guidance of the SC and Commission for determining the date, format and location of the meeting.

84. The SSC BF-ME agreed to hold intersessional meetings of the SWG NPA-SA and SWG VME.

Agenda Item 14. Adoption of the Report

85. The SSC BF-ME03 report was adopted by consensus.

Agenda Item 15. Close of the Meeting

86. The meeting closed at 11:35 on 10 December 2022, Tokyo time.

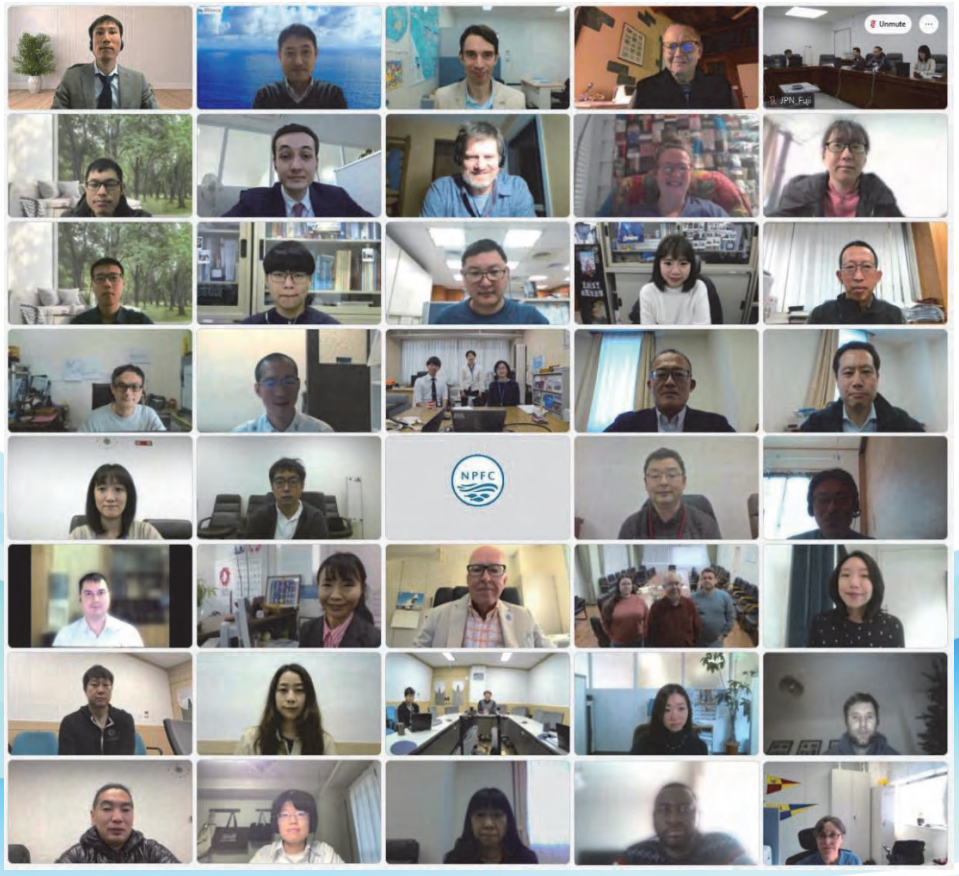
Annexes:

Annex A – Agenda
Annex B – List of documents
Annex C – List of participants
Annex D – Species summary for North Pacific armorhead
Annex E – Species summary for splendid alfonsino
Annex F – Species summary for sablefish
Annex G – Species summary for blackspotted and rougheye rockfishes
Annex H – Terms of Reference for Data Sharing for Visual Data on the Distribution and Abundance of VME Indicator Taxa
Annex I – Template for sharing VME data
Annex J – Revised CMM 2021-05 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean
Annex K – Revised CMM 2019-06 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northeastern Pacific Ocean

Please refer to the NPFC website for the complete annexes.

10th Meeting of the Small Scientific Committee on Pacific Saury

12-15 December 2022
Virtual
Meeting Report



Agenda

Agenda Item 1. Opening of the Meeting

Agenda Item 2. Adoption of Agenda

Agenda Item 3. Overview of the outcomes of previous NPFC meetings
- 3.1 SSC PS09 meeting
- 3.2 SWG MSE PS02

Agenda Item 4. Review of the Terms of References of the SSC PS and existing protocols
- 4.1 Terms of References of the SSC PS
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Agenda Item 5. Member's fishery status including 2022 fishery

Agenda Item 6. Fishery-independent abundance indices
- 6.1 Review of any updates and progress
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Agenda Item 7. Fishery-dependent abundance indices
- 7.1 Review of any updates and progress
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Agenda Item 8. Biological information on Pacific saury
- 8.1 Review of any updates and progress
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Agenda Item 9. Stock assessment using "provisional base models" (BSSPM)
- 9.1 Review of results and implications to management
- 9.2 Recommendations for future work

Agenda Item 10. New stock assessment models
- 10.1 Review of results
- 10.2 Recommendations for future work

Agenda Item 11. Development and evaluation of an interim harvest control rule (HCR) as a short-term task
- 11.1 Management objectives, reference points and tuning criteria
- 11.2 Conditioning of operating models (OMs)
- 11.3 Possible/candidate HCR
- 11.4 Simulation platform
- 11.5 Recommendations for future work

Agenda Item 12. Development of recommendations to improve conservation and management of Pacific saury stock

Agenda Item 13. Review of the Work Plan of the SSC PS

Agenda Item 14. Other matters
- 14.1 Observer Program
- 14.2 Priority issues and timeline for next meeting
- 14.3 Invited expert
- 14.4 Other

Agenda Item 15. Recommendations to the Scientific Committee and SWG MSE PS

Agenda Item 16. Adoption of the Report

Agenda Item 17. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 10th Meeting of the Small Scientific Committee on Pacific Saury (SSC PS10) took place as a virtual meeting via WebEx, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, and Vanuatu. The Pew Charitable Trusts (Pew) attended as an observer. Dr. Larry Jacobson participated as an invited expert.

2. The meeting was opened by Dr. Toshihide Kitakado (Japan), the SSC PS Chair, who welcomed the participants. The Science Manager, Dr. Aleksandr Zavolokin, outlined the procedures for the meeting. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

3. The agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

Agenda Item 3. Overview of the outcomes of previous NPFC meetings

3.1 SSC PS09

4. The Chair presented the outcomes and recommendations from the SSC PS09 meeting.

3.2 SWG MSE PS02

5. The Chair presented the outcomes and recommendations from the 2nd meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific saury (SWG MSE PS02).

Agenda Item 4. Review of the Terms of References of the SSC PS and existing protocols

4.1 Terms of References of the SSC PS

6. The SSC PS reviewed the Terms of References (ToR) of the SSC PS. With regard to paragraph 8, “To explore the design of the Management Strategy Evaluation framework,” the SSC PS noted that this is now the task of the SWG MSE PS and that the role of the SSC PS is “to

provide support for the technical work related to the Management Strategy Evaluation". The SSC PS agreed to revise paragraph 8 accordingly and recommends that the SC endorse the revised ToR (Annex D).

4.2 CPUE Standardization Protocol

7. The SSC PS reviewed the catch-per-unit-effort (CPUE) Standardization Protocol and determined that no revisions are currently necessary.

4.3 Stock Assessment Protocol

8. The SSC PS reviewed the Stock Assessment Protocol and determined that no revisions are currently necessary.

Agenda Item 5. Member's fishery status including 2022 fishery

9. Korea presented its fisheries status (NPFC-2022-SSC PS10-IP01 (Rev. 1)). The Korean fishing vessels caught 3,438 MT of Pacific saury as of November 2022, which was a historical low. Annual catch has continued to decrease since 2018. The number of vessels operating has continued to decrease from 2015 to 2022. Accumulated catch remained low throughout the season apart from a slight increase between September and October. Nominal CPUE was 4.5 MT/vessel/day in 2021, a historical low. Fishing grounds were observed to be further south in 2022 compared to 2021. Over the fishing season, the fishing grounds move from east to west.

10. Chinese Taipei presented its fisheries status (NPFC-2022-SSC PS10-IP02). The catch recovered to around 180,000 tons in 2018 and has shown a declining trend since then. 93 vessels operated in 2021, compared to 87 in 2020. In 2022, the accumulated catch as of the end of November was 40,963 MT, compared to 34,040 MT for the same period last year. Vessels arrived in the fishing grounds earlier than in the previous year. Through November, seasonal catch in 2022 has been better than the previous year. From May to November 2022, the nominal CPUE has been about 1 MT/haul, which is slightly less than that of the same period in 2021. Compared to 2021, fishing grounds were observed to be further north in 2022. Over the fishing season, the fishing grounds move from east to west.

11. Japan presented its fisheries status (NPFC-2022-SSC PS10-IP03). In 2022, 113 vessels were registered, a decrease of 12 from the previous year. The annual catch as of November 2022 was 17,868 MT. The final annual catch for 2022 will be the lowest since 1950. The trend in 10-day catches has been similar to that in 2021. Previously, the peak catch was in October or September, but more recently it has been in November. Relative seasonal catch indicates that the high season has been getting shorter in recent years. Nominal CPUE was 0.51 MT/haul, the lowest since 2000. Most of the fishing grounds in 2022 were located on the high seas. In recent

years, the fishing grounds in August have moved south, and fishing grounds have moved eastward after 2019. As of the end of September, more than 70% of the fish caught in 2022 were age-1 fish.

12. Vanuatu presented its fisheries status (NPFC-2022-SSC PS10-IP04). Total annual catch peaked at 8,231 MT in 2018. Total catch in 2022 was 929 MT, the lowest after 2018. Vanuatu's Pacific saury fishery began in 2004. In total, it has authorized 16 vessels. The number of operating vessels was 4 from 2015 to 2021 and was 3 in 2022. The main fishing season has usually been from July to November. Looking at relative accumulated catch, fishing operations began later than previous years and catch increased from September. The largest abundance of catch was recorded from the end of September to the beginning of October. Nominal CPUE in 2022 was 5.7 MT/day. The main fishing grounds began in the east early in the season, before shifting to the west. Fishing grounds did not cross 165ºE longitude in 2021 and 2022.

13. China presented its fisheries status (NPFC-2022-SSC PS10-IP05). As of December 2, total catch in 2022 was 35,443 MT. A total of 63 vessels have been operating in 2022, a decrease of 3 from 2021. Cumulative catch in 2022 has been lower than in 2021 in the early fishing season but is at a historically average level overall. The seasonal distribution of catches in 2022 has been similar to that of 2021, with the main season from September to November, but with catch much lower than in previous years. So far in 2022, nominal CPUE has been 6.21 MT/vessel/day, the lowest since 2013. The fishing grounds in 2022 have been more dispersed than in 2021.

14. Russia informed the SSC PS that it has not fished for Pacific saury this year. It reminded the SSC PS of the 2021 fisheries status information that it previously presented, namely that there continues to be a declining trend in catch and that the total catch in 2021 (610 MT) was the lowest since 1991.

15. The Science Manager presented the cumulative Pacific saury catches as of 3 December for 2022. The cumulative catch in the Convention Area by all Members was 94,623 MT. The total catch and trends in 2022 were similar to those in 2021, but almost 25% less than the total catch in 2020.

16. The SSC PS noted unusual fishing activity by some Members east of 170°E in June and July 2022 in addition to 2021. According to CMM 2021-08 for Pacific Saury, Members of the Commission are encouraged to take measures for fishing vessels flying their flags to refrain from fishing for Pacific saury in the areas east of 170°E from June to July. In relation to this, Japan presented the results of an analysis of the longitudinal distribution of age-0 Pacific saury in June and July under Agenda Item 8.1.

17. The SSC PS encouraged Members to provide up-to-date size frequency data from fisheries and the Japanese survey, even if it is preliminary and not highly precise, at future meetings. These data will be used to monitor recruitment variability and trends in size composition.

18. The SSC PS agreed to update the template for the submission of each Member's fisheries status information by adding new slides for presenting standardized effort (catch/stdCPUE), size and age compositions, size box compositions, and annual change of body length and/or size box compositions (indicating age compositions if possible) for the whole fishing season and for August to November (available on the website).

19. The SSC PS requested Japan and Chinese Taipei to present analyses of the monthly center of gravity of the Pacific saury stock as a coordinate based on the VAST output for the Japanese biomass survey and the joint CPUE standardization, respectively, for future meetings.

Agenda Item 6. Fishery-independent abundance indices

6.1 Review of any updates and progress

20. No updates were provided.

6.2 Review of plans of future biomass surveys

21. Japan informed the SSC PS that it plans to conduct its biomass survey with the usual area coverage and method in 2023.

22. The SSC PS expressed its appreciation to Japan for conducting the biomass survey in 2022, as well as for planning to do so again in 2023.

6.3 Recommendations for future work

23. The SSC PS encouraged Japan to conduct experiments on the calibration of the catchability coefficient so as to enable the use of an absolute abundance estimate, rather than a relative abundance estimate, as an abundance index in the Pacific saury stock assessment.

24. The SSC PS encouraged Japan to conduct analyses to confirm whether or not any vessel effects are occurring in the VAST model.

Agenda Item 7. Fishery-dependent abundance indices

7.1 Review of any updates and progress

25. No updates were provided.

7.2 Recommendations for future work

26. The SSC PS agreed to calculate and present the standardized effort (catch/stdCPUE) for individual Members' fisheries and for the combined fishery at future meetings.

Agenda Item 8. Biological information on Pacific saury

8.1 Review of any updates and progress

27. Japan presented a description of the longitudinal distribution of age-0 Pacific saury in June and July based on the VAST output using the Japanese survey data (NPFC-2022-SSC PS10-WP02). In the latest three years, the age-0 fish have mainly been distributed in the eastern region in June and July. Japan calculated cumulative percentages of age-0 biomass from west to east for all years. The age-0 biomass in the waters west of 170°E has been below 20% of the total biomass and has rapidly increased along the longitude east of 170°E in the last decade, except in 2017. Japan suggested that this supported the longitude of 170°E as the boundary for protecting most juvenile fish specified in the present CMM for Pacific saury.

8.2 Recommendations for future work

28. The SSC PS suggested that the spatial evaluation of age-0 survey catch should be extended in the next assessment to identify and quantify any benefits from potential season and area closures designed to protect age-0 fish. In particular, the effects on catch should be evaluated.

Agenda Item 9. Stock assessment using "provisional base models" (BSSPM)

9.1 Review of results and implications to management

29. China presented an updated stock assessment for Pacific saury using BSSPM (NPFC-2022-SSC PS10-WP03). The estimated median B_{2021} from the two base case scenarios was 266,250 (80%CI 124,400-426,500) and 622,750 (80%CI 165,500-1,173,000) MT, respectively. The median B_{2021}/B_{MSY} and F_{2021}/F_{MSY} over the two base case scenarios were 0.31 (80%CI 0.20-0.46) and 0.73 (80%CI 0.47-1.25), respectively. Over the two base case scenarios, large interannual variability was shown in biomass trajectory during the recent years. A decreasing biomass trend was found in 2019 and 2020, followed by an increase in 2021 and 2022. The probability of the population being in the yellow Kobe quadrant in 2021 was estimated to be greater than 79%.

30. Japan presented an updated stock assessment for Pacific saury using BSSPM (NPFC-2022-SSC PS10-WP04 (Rev. 2)). The 2022 median depletion level was only 25.1% (80%CI=14.1-39.4%) of the carrying capacity. Furthermore, B-ratio (=B/B_{msy}) and F-ratio (=F/F_{msy}) in 2021 were 0.288 (80%CI=0.191-0.406) and 0.740 (80%CI=0.468-1.140), respectively. For those three-year-average values, B-ratio over 2020-2022 and F-ratio over 2019-2021 were respectively 0.377 (80%CI=0.251-0.558) and 1.169 (80%CI=0.765-1.689). In addition, the

probability of the stock being in the green Kobe quadrant in 2021 was estimated to be nearly 0%, while the probability of being in the yellow Kobe quadrant was assessed to be greater than 80%. On the weight-of-evidence available now, the current Pacific saury stock is determined to be overfished. Based on the updated results, applying the formula from the total allowable catch (TAC) calculation used in the 2019 Commission meeting would give $F_{MSY}*B_{2022}$=229,000 MT. However, considering the current overfished population level and applying a simple discount exploitation rate depending on the current B-ratio, an appropriate catch would be $(B_{2022}/B_{MSY})*F_{MSY}*B_{2022}$=122,000 MT.

31. Chinese Taipei presented an updated stock assessment for Pacific saury in the North Pacific Ocean using BSSPM (NPFC-2022-SSC PS10-WP05). The ensemble time-series of biomass is estimated to have had an increasing pattern since 2000 with two peaks in 2003 and 2005, before dramatically decreasing over time and falling below B_{MSY} in 2009 – 2022. It should be noted that the models estimate the lowest biomass level in 2020 (median B_{2020}/B_{MSY} = 0.29, 80 percentile range 0.18 – 0.51) followed by a slight increase in 2021 and 2022 (median B_{2021}/B_{MSY} = 0.33, 80 percentile range = 0.19 – 0.56; median B_{2022}/B_{MSY} = 0.45, 80 percentile range = 0.23 – 0.77). In the most recent three years (2020 – 2022), the biomass was estimated to be below B_{MSY} (median $B_{2020\text{-}2022}/B_{MSY}$ = 0.36, 80 percentile range = 0.22 – 0.60). A steady increase in fishing mortality is estimated to have occurred from 2004 to 2018, but a decreasing trend in fishing mortality was found from 2019 to 2021. The recent average fishing mortality is estimated to be above F_{MSY} (median $F_{2019\text{-}2021}/F_{MSY}$ = 1.21, 80 percentile range = 0.71 – 2.16) while the fishing mortality in 2021 is less than F_{MSY} (median F_{2021}/F_{MSY} = 0.75, 80 percentile range = 0.43 – 1.45). The ensemble MCMC results from the two base cases indicated that the 2021 stock status is likely within the yellow quadrant (Prob [$B_{2021}<B_{MSY}$ and $F_{2021}<F_{MSY}$] = 72.82%)

32. The SSC PS reviewed the stock assessments presented by Members and aggregated the results, recognizing the agreement in trends among them (Annex E). Results of combined model estimates indicate that the stock declined with an interannual variability from near carrying capacity in the mid-2000's after a period of high productivity to current low levels. The results also indicated that B was below B_{MSY} (median average B/B_{MSY} during 2020-2022 = 0.368, 80%CI 0.232-0.564) and F was above F_{MSY} (average F/F_{MSY} during 2019-2021 = 1.192, 80%CI 0.757-1.883). The results further indicated that recent stock biomass remains at a historically low level in recent years. The biomass trend shows a small increase in recent years through 2021 and a marked increase in the Japanese biomass survey between 2021 and 2022. The harvest rate has also been declining from a peak in 2018 and was less than F_{MSY} during 2021. However, caution is required in interpreting these results, given historically low nominal CPUEs (see Annex E, Fig. 5) through 2022, relatively high fishing effort in 2021, and

variability inherent in fisheries-independent surveys.

9.2 Recommendations for future work

33. The SSC PS agreed to conduct further analyses to investigate the possible sources of the scale uncertainty shown by the retrospective analyses.

Agenda Item 10. New stock assessment models

10.1 Review of results

34. No updates were provided.

10.2 Recommendations for future work

35. The SSC PS agreed to work collaboratively towards the development of an age-structured model for use as the Pacific saury operating model and stock assessment model.

Agenda Item 11. Development and evaluation of an interim harvest control rule (HCR) as a short-term task

11.1 Management objectives, reference points and tuning criteria

11.2 Conditioning of operating models (OMs)

11.3 Possible/candidate HCR

11.4 Simulation platform

36. The SSC PS reviewed the outcomes of the SSC PS09 and SWG MSE PS02 meetings relating to management objectives, reference points, tuning criteria, conditioning of OMs, and possible/candidate HCR.

37. The Chair presented some preliminary simulation outcomes using some OMs based on the BSSPM to evaluate two possible HCRs (HCR1 and HCR2 out of three HCRs as discussed in SWG MSE PS02) for demonstration purposes. The work will be continued through conditioning the OMs based on the updated BSSPM assessment and further discussed in SWG MSE PS meetings.

38. The Chair informed the SSC PS that the Commission approved the allocation of funding for the development of a simulation platform using the Shiny application for the evaluation of HCR, as was proposed by the SWG MSE PS.

11.5 Recommendations for future work

39. The SSC PS agreed to continue to progress its work in line with the timeline and tasks agreed to at the SWG MSE PS02 meeting (SWG MSE PS02 Report, Annex F).

Agenda Item 12. Development of recommendations to improve conservation and management of Pacific saury stock

40. The SSC PS recommends that the SC consider and endorse the following rationale and approach in its scientific advice to the Commission:
    (a) The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) based on historical catch is much larger than a TAC that would be based on the F_{MSY} catch approach (B_{2022}*F_{MSY} = 205,015 tons. The current biomass is much lower than B_{MSY} and the TAC for 2021-2022 did not reduce fishing mortality (F) in recent years. An HCR that reduces F when biomass is low may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 403,000 tons). A reduction to the TAC for 2021-2022 would increase the probability of higher biomass and catch levels in the Pacific saury stock.
    (b) An HCR that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world. For example, if an HCR that reduces F linearly when biomass is below B_{MSY} (see Annex E, Figure 8) is applied, the TAC calculated based on such an HCR (B_{2022}*F_{MSY}*(B_{2022}/B_{MSY}) = 101,885 tons could be similar with the current catch (98,000 tons, preliminary as of 17 December 2022).
    (c) Note, however, the performance of the above HCRs has not been evaluated by a formal MSE framework for Pacific saury. They were used as simple illustrations of common approaches used elsewhere.

Agenda Item 13. Review of the Work Plan of the SSC PS

41. The SSC PS reviewed, revised and endorsed the 2022-2026 SSC PS 5-Year Rolling Work Plan (NPFC-2021-SSC PS10-WP01 (Rev. 1)).

Agenda Item 14. Other matters

14.1 Observer Program

42. The Science Manager presented a summary of information regarding the existing scientific observer programs of Members and those of other RFMOs (NPFC-2018-SC03-WP03 (Rev. 1)) as of April 2018. For pelagic fisheries, there is no coordination in the Members' observer programs neither in terms of the type of observer program nor in coverage and data requirements. Russia, Korea and Chinese Taipei collect data on fishing vessels at sea by observers and electronic reporting system, respectively, while other Members carry out in-port scientific observations. Specifications for observer training, observer program design, number of observers and required data differ among Members. All "general" RFMOs (NAFO, NEAFC, SEAFO, SIOFA, SPRFMO) and CCAMLR have developed at least one observer program. Most of general RFMO OPs have been set up primarily to collect scientific data, but in three

of six cases, it includes compliance tasks with one general RFMO focusing on a compliance observer program. Almost all RFMOs for highly migratory species have observer programs with both science and compliance components, but with different balances. The SSC PS has previously developed a template for identification of scientific data which can be collected and/or validated by at-sea observers, fishermen, electronic reporting systems and other means, dividing the different types of data into four categories: data that can only be collected by observers at sea; data that can be collected by fishermen at sea; data which are preferably collected by observers, but a degree of cover can be achieved by other means; and data which can be collected equally well by other means.

43. The SSC PS considered the background information presented by the Science Manager and agreed to hold further discussions on the necessity of a regional scientific observer program and data gaps for the task of the SSC PS at its next meeting.

44. The SSC PS agreed that there may be important data that can be collected by an observer program and electronic monitoring programs, which will be useful for the stock assessment. Thus, the necessity and benefit of observer and electronic monitoring programs should be discussed more fully in future meetings.

14.2 Priority issues and timeline for next meeting

45. The SSC PS agreed on the following priorities for the next meeting:
    (a) Review standardized CPUE up to 2022.
    (b) Review the Japanese fishery-independent survey results up to 2023.
    (c) Update BSSPM analyses and provide recommendations to the SC/Commission.
    (d) Review progress on new assessment models and finalize a set of models and specification.
    (e) Review progress on development and evaluation of HCR as a short-term task.

14.3 Invited expert

46. The SSC PS expressed its appreciation for the continued valuable contributions of the invited expert, Dr. Larry Jacobson. The SSC PS recommends that Dr. Jacobson be invited to the next SSC PS meetings.

14.4 Other

47. No other issues were discussed.

Agenda Item 15. Recommendations to the Scientific Committee

48. The SSC PS recommends the following to the SC:
    (a) Endorse the revised Terms of Reference of the SSC PS (Annex D).

(b) Endorse the stock assessment report (Annex E).
(c) Endorse the SSC PS Work Plan (NPFC-2022-SSC PS10-WP01 (Rev. 1)).
(d) Allocate funds for the participation of an invited expert in the next SSC PS meetings.

Agenda Item 16. Adoption of the Report

49. The SSC PS10 report was adopted by consensus.

Agenda Item 17. Close of the Meeting

50. The meeting closed at 14:05 on 15 December 2022, Tokyo time.

Annexes:

Annex A – Agenda
Annex B – List of Documents
Annex C – List of Participants
Annex D – Revised Terms of Reference of the SSC PS
Annex E – Stock Assessment Report for Pacific Saury

Please refer to the NPFC website for the complete annexes.

7th Scientific Committee Meeting

16-20 December 2022
Virtual
Meeting Report

Agenda

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  - 7.1.3 Japanese flying squid
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Agenda Item 8. Progress in data collection, management and security

- 8.1 Information management and security regulations
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  - 8.2.3 Scientific needs for electronic monitoring

8.3 NPFC data management system (DMS)

Agenda Item 9. Scientific projects for 2023 and 2024

9.1 Ongoing/planned projects
9.2 New projects
9.3 Review and prioritization of projects

Agenda Item 10. Cooperation with other organizations

10.1 Reports on the joint NPFC-PICES activities since the SC06 meeting, including a report from the PICES Secretariat
10.2 Update on the joint NPFC-PICES workshop/course on VME indicator identification
10.3 SC representation at scientific meetings
10.3.1 Report on joint PICES-ICES-FAO small pelagic fish (SPF) symposium
10.3.2 SC representation in joint PICES/ICES Working Group on Small Pelagic Fish (WGSPF)
10.3.3 Report on PICES topic session on SPF
10.3.4 Process for selecting SC representatives at future scientific meetings
10.4 NPFC/NPAFC Memorandum of Cooperation and Work Plan
10.4.1 Report on the NPAFC's multinational IYS survey in the North Pacific Ocean
10.5 FAO ABNJ Deep-sea fisheries project
10.6 Partnership with the Fisheries and Resources Monitoring System of FAO (FIRMS)
10.7 Cooperation with other organizations

Agenda Item 11. 2022-2026 Research Plan and Work Plan

11.1 Five-year Research Plan
11.2 Five-year Work Plan

Agenda Item 12. Other matters

12.1 Review of the Scientific Committee Terms of Reference (TOR)
12.2 Coordination between SC and TCC
12.2.1 Fishing effort indicators
12.3 Other issues

Agenda Item 13. Advice and recommendations to the Commission

Agenda Item 14. Next meeting

Agenda Item 15. Press release

Agenda Item 16. Adoption of the Report

Agenda Item 17. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 7th Meeting of the Scientific Committee (SC) took place as a virtual meeting via WebEx, and was attended by Members from Canada, China, the European Union (EU), Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America and Vanuatu. Panama attended as a Cooperating non-Contracting Party. The Deep Sea Conservation Coalition (DSCC), the United Nations Food and Agriculture Organization (FAO), the North Pacific Anadromous Fish Commission (NPAFC), the North Pacific Marine Science Organization (PICES), the Pew Charitable Trusts (Pew), and the Southern Indian Ocean Fisheries Agreement (SIOFA) attended as observers. Dr. Penelope Ridings attended as a Secretariat Guest in her role as the Chair of the NPFC Performance Review Panel. The meeting was opened by Dr. Janelle Curtis (Canada), who served as the SC Chair.

2. The Executive Secretary, Dr. Robert Day, welcomed the participants to the meeting. He expressed appreciation for the contributions of Members and observers to the work of the NPFC, and commended the SC and its subsidiary bodies for the dedicated efforts they have made to advance the scientific work of the NPFC, despite the challenging conditions posed by the pandemic. The Executive Secretary also emphasized the value of the NPFC's cooperation with other organizations. In closing, he encouraged the SC and its subsidiary bodies to continue to work collaboratively and cooperatively to produce the best scientific information possible.

3. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

4. The SC agreed to hear an update from the EU on its chub mackerel fisheries operation plan and impact assessment under Agenda Item 12.3 Other issues.

5. The agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

Agenda Item 3. Meeting arrangements

6. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.

Agenda Item 4. NPFC Performance Review recommendations for the Scientific Committee

7. The Chair of the NPFC Performance Review Panel, Dr. Penelope Ridings, summarized the outcomes and recommendations of the Performance Review applicable to the SC. The Performance Review found that the SC has initiated a comprehensive and ambitious program of scientific research, that the scientific research draws not only on Members' scientific experts but also on independent experts, that the SC is working on the development of management strategy evaluations (MSEs) leading to harvest control rules (HCRs) and has initiated a science-management dialog to that end, and that the SC has done valuable work-planning in relation to the NPFC's large number of priority stocks. The Performance Review has also identified, as the main issues, the poor or unknown status of some stocks, issues with data collection and data gaps, and the unknown extent of bycatch. Of the Performance Review Recommendations, 25 are of relevance to the SC.

8. The SC noted that the Performance Review report will be formally reviewed and endorsed by the Commission at its next meeting in March 2023. The SC tasked its subsidiary bodies, including the four informal small working groups, pending the approval of the report by the Commission, to review relevant recommendations from the Performance Review report at their intersessional meetings or through email correspondence in 2023, evaluate their ability and necessary timelines to achieve the objectives in those recommendations, and to report on the outcomes of their reviews at the SC08 meeting.

Agenda Item 5. Review of reports and recommendations from the Small Scientific Committees (SSC BF-ME and SSC PS) and the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA)

5.1 Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA)

9. The TWG CMSA Vice Chair, Dr. Kazuhiro Oshima (Japan), summarized the outcomes and recommendations of the 5th and 6th TWG CMSA meetings (NPFC-2022-TWG CMSA05-Final Report, NPFC-2022-TWG CMSA06-Final Report).

10. The SC reviewed the recommendations of the TWG CMSA and endorsed the following recommendations:
    (a) The TWG CMSA recommended the Work Plan of the TWG CMSA (NPFC-2022-TWG CMSA05-WP02 (Rev. 1)).
    (b) The TWG CMSA recommended that the SC select Dr. Kazuhiro Oshima (Japan) to serve

as the TWG CMSA Chair.

(c) The TWG CMSA recommended that the SC select Dr. Qiuyun Ma (China) to serve as the TWG CMSA Vice Chair.

(d) The TWG CMSA recommended extending the consultancy agreement with the external expert to support the TWG CMSA in selecting a model for stock assessment of chub mackerel in 2023.

11. The SC considered the request from the TWG CMSA to provide clarification on whether national waters fall under the scope of the task assigned by the SC to its subsidiary bodies of reporting the data needs and outlining methods that could be used to collect the necessary data. The SC agreed that national waters do fall under the scope of this task as the data from national waters are important for understanding the life history of the NPFC priority species, especially migratory species, and species belonging to the same ecosystem or dependent upon or associated with target stocks.

12. The SC endorsed the reports provided by the TWG CMSA.

13. The SC noted that the TWG CMSA intends to select a stock assessment model(s) for chub mackerel at its next meeting in 2023.

14. The SC tasked the TWG CMSA with preparing a species summary document for chub mackerel.

5.2 SSC on Bottom Fish and Marine Ecosystems

15. The Chair of the SSC on Bottom Fish and Marine Ecosystems (SSC BF-ME), Dr. Chris Rooper (Canada), summarized the outcomes and recommendations of the 3rd SSC BF-ME meeting (NPFC-2022-SSC BFME03-Final Report).

16. The SC reviewed the recommendations of the SSC BF-ME and endorsed the following recommendations:

(a) Adopt the updated species summaries of North Pacific armorhead (Annex D), splendid alfonsino (Annex E), sablefish (Annex F), and blackspotted and rougheye rockfishes (Annex G), and inform the Commission about the trends in catch and effort and other scientific information relevant to management of NPA and SA.

(b) Endorse the field guide for identification of fishes of the Emperor Seamount Chain captured by bottom fisheries (NPFC-2022-SSC BFME03-WP08).

(c) Endorse the use of the scientific name *Allocyttus folletti*, instead of *A. verrucosus*, when referring to the oreosomatid fish in the Emperor Seamounts area.

(d) Establish a formal procedure for changing species' scientific and common names used by the NPFC.
(e) Endorse the process proposed by Canada in NPFC-2022-SSC BFME03-WP03 as one of the NPFC's processes for identifying VMEs and areas likely to be VMEs in the Convention Area, and Canada's application of this method in the eastern part of the Convention Area.
(f) Establish a project for understanding the basis by which other RFMOs' encounter thresholds were determined by taxa and gear-type.
(g) Recommend to the Commission that a move-on rule of 1 nautical mile be set for all bottom fishing gear.
(h) Endorse the Hexactinellida and Demospongiae sponge classes as VME indicator taxa.
(i) Adopt the terms of reference for sharing VME data.
(j) Adopt the template for sharing VME data.
(k) Endorse the updated 2022-2026 SSC BF-ME 5-Year Rolling Work Plan (NPFC-2022-SSC BFME03-WP01 (Rev. 1)).
(l) Endorse the revised CMM 2021-05 (Annex L).
(m) Endorse the revised CMM 2019-06 (Annex M).
(n) Recommend that the Commission consider amending CMM 2021-05 to address the ambiguity around the referenced effort limits of February 2007 in Paragraph 4A in addition to the revisions recommended in paragraph 16(l).
(o) Recommend that the Commission co-sponsor the PICES 2023 session on "Seamount biodiversity: VMEs and species associated with seamounts in the North Pacific Ocean" by contributing the equivalent of $5,000 USD.

17. The SC agreed to discuss the establishment of a formal procedure for changing species' scientific and common names used by the NPFC, including how to handle the issue of a species not having a 3-letter ASFIS code in FAO, as is the case with *Allocyttus folletti*, at SC08.

18. The SC endorsed the report provided by the SSC BF-ME.

5.3 SSC on Pacific Saury

19. The Chair of the SSC on Pacific Saury (SSC PS), Dr. Toshihide Kitakado (Japan), summarized the outcomes and recommendations of the 9th and 10th SSC PS meetings (NPFC-2022-SSC PS09-Final Report, NPFC-2021-SSC PS10-Final Report).

20. The SC reviewed the recommendations of the SSC PS and endorsed the following recommendations:
(a) Endorse the revised Terms of Reference of the SSC PS.
(b) Endorse the stock assessment report (Annex N).

(c) Endorse the SSC PS Work Plan (NPFC-2022-SSC PS10-WP01 (Rev. 1)).
(d) Allocate funds for the participation of an invited expert in the next SSC PS meetings.
(e) Consider and endorse the following rationale and approach in its scientific advice to the Commission:
    i. The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) based on historical catch is much larger than a TAC that would be based on the F_{MSY} catch approach (B_{2022}*F_{MSY} = 205,000 tons). The current biomass is much lower than B_{MSY} and the TAC for 2021-2022 did not reduce fishing mortality in recent years. A harvest control rule (HCR) that reduces F when biomass is low may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 403,000 tons). A reduction to the TAC for 2021-2022 would increase the probability of higher biomass and catch levels in the Pacific saury stock.
    ii. An HCR that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world. For example, if an HCR that reduces F linearly when biomass is below B_{MSY} is applied, the TAC calculated based on such an HCR (B_{2022}*F_{MSY}*(B_{2022}/B_{MSY}) = 101,000 tons) could be similar with the current catch (98,000 tons, preliminary as of mid-December 2022).
    iii. Note, however, the performance of the above HCRs has not been evaluated by a formal MSE framework for Pacific saury. They were used as simple illustrations of common approaches used elsewhere.

21. The SC endorsed the reports provided by the SSC PS.

22. The SC Chair expressed her intention to work with the Secretariat and the SSC PS to develop a summary of species information about Pacific saury that is similar in format to the species summary documents prepared for other priority species.

5.3.1 Selection of vice-chair of SSC PS

23. No nominations were received for the position of vice-chair of the SSC PS.

Agenda Item 6. Report and recommendations from the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS)

24. The co-Chair of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific saury (SWG MSE PS), Dr. Toshihide Kitakado (Japan), informed participants about progress of the SWG MSE PS including the outcomes and recommendations of its 1st and 2nd meetings (NPFC-2022-SWG MSE PS01-Final Report, NPFC-2022-SWG

MSE PS02-Final Report).

Agenda Item 7. Priority species

7.1 Summary of progress on the remaining four priority species

25. The Leads of the Small Working Groups (SWGs) on neon flying squid (NFS), Japanese flying squid (JFS), Japanese sardine (JS), and blue mackerel (BM) reported on the SWGs' intersessional activities, including the relevant outcomes of the 1st and 2nd joint meetings of these SWGs, in the respective sections below (7.1.1 – 7.1.4). Detailed summaries of the joint SWG meetings are available in NPFC-2022-SC07-WP05 (1st meeting) and NPFC-2022-SC07-WP06 (2nd meeting).

7.1.1 Neon flying squid

26. The SWG NFS Lead, Dr. Luoliang Xu (China), reported on the SWG NFS' intersessional activities. The SWG NFS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, BM, and JS), developed a data template and shared catch and effort data in accordance with the template, evaluated the population dynamics and environmental impacts on NFS and developed a template for sharing relevant information/literature on the subject, reviewed previous stock assessment methods used on NFS (swept area, depletion model, surplus-production models) or other similar species (SAM model for JFS), discussed potential strategies for effective management, and updated the species summary document for NFS.

27. The SWG NFS Lead presented the updated species summary document for NFS (NPFC-2022-SC07-WP07).

28. The SC reviewed and endorsed the species summary document for NFS (Annex H).

29. The SC discussed future tasks for the SWG NFS and agreed on the following:
    (a) Update the species summary
    (b) Discuss potential data sharing needs
    (c) Share data for NFS, including unpublished data if possible
    (d) Update catch and effort data
    (e) Calculate nominal CPUE
    (f) Evaluate environmental variables on recruitment, life history parameters, and fisheries population dynamics
    (g) Share literature relevant to understanding the fishery population dynamics of NFS, including unpublished literature if possible
    (h) Discuss the possibility of linking footprint and effort data on NFS using GIS tools
    (i) Explore the application of existing stock assessment models or develop a new stock

assessment model for NFS

(j) Share JFS stock assessment code for developing a stock assessment model for NFS

(k) Conduct other research that may contribute to the provision of management advice

7.1.2 Japanese sardine

30. The SWG JS Lead, Dr. Chris Rooper (Canada), reported on the intersessional activities of the SWG JS. The SWG JS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, BM, and JS), evaluated the spatial structure for Japanese sardine, developed a data sharing template and shared catch and effort data in accordance with the template, evaluated the population dynamics and environmental impacts on JS and developed a template for sharing relevant information/literature on the subject, reviewed the methods and results of Japan's domestic stock assessment of JS conducted since 1976, and updated the species summary document for JS.

31. The SWG JS Lead presented the updated species summary document for JS (NPFC-2022-SC07-WP08).

32. The SC reviewed and endorsed the species summary document for JS (Annex I).

33. The SC discussed future tasks for the SWG JS and agreed on the following:

(a) Update the species summary

(b) Discuss potential data sharing needs

(c) Share data for JS, including unpublished data if possible

(d) Update catch and effort data

(e) Calculate nominal CPUE

(f) Share literature relevant to understanding the fishery population dynamics of JS, including unpublished literature if possible

(g) Discuss the possibility of linking footprint and effort data on sardines using GIS tools

(h) Evaluate environmental variables on recruitment, life history parameters, and fisheries population dynamics

(i) Review the latest domestic JS stock assessment conducted by Japan

7.1.3 Japanese flying squid

34. The SWG JFS Lead, Dr. Kazuhiro Oshima (Japan), reported on the SWG JFS' intersessional activities. The SWG JFS has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, BM, and JS), evaluated the spatial structure of JFS life history stages and stocks relative to fisheries, conducted a literature review about the influence of environmental variables on the life history and biology of JFS, reviewed the results of Japan's JFS domestic

stock assessment conducted since 1999, summarized potential challenges to conducting a stock assessment for JFS in the Convention Area, and updated the species summary document for JFS.

35. The SWG JFS Lead presented the species summary document for JFS (NPFC-2022-SC07-WP09).

36. The SC reviewed and endorsed the species summary document for JFS (Annex J).

37. The SC discussed future tasks for the SWG JFS and agreed on the following:
    (a) Update the species summary
    (b) Discuss potential data sharing needs
    (c) Share data, including unpublished data if possible
    (d) Update and review Members' JFS catch and effort data
    (e) Share literature relevant to understanding the fishery population dynamics of JFS, including unpublished literature if possible
    (f) Continue research on the spatial structure of the JFS life history and stock relative to the fishing footprint
    (g) Evaluate environmental variables on recruitment, life history parameters, and fisheries population dynamics
    (h) Discuss the possibility of linking footprint and effort data on JFS using GIS tools
    (i) Review the latest domestic JFS stock assessment conducted by Japan

7.1.4 Blue mackerel

38. The SWG BM Lead, Dr. Shota Nishijima (Japan), reported on the SWG BM's intersessional activities. The SWG BM has met twice intersessionally (as part of the joint meetings of the SWGs on JFS, NFS, BM, and JS), reviewed the species identification method used by Japan to distinguish BM and chub mackerel, discussed a data sharing template for BM, reviewed the catch composition of BM and chub mackerel in the Chinese and Japanese fisheries, reviewed research by Russia to differentiate chub mackerel and blue mackerel using the Japanese species identification method, updated the species summary document, reviewed the methods and results of Japan's domestic BM stock assessment, summarized the potential challenges to conducting a stock assessment for BM in the Convention Area, and discussed and agreed to the separation of fishery data such as catch-at-age and abundance indices by chub mackerel and BM.

39. The SWG BM Lead presented the species summary document for BM (NPFC-2022-SC07-WP10).

40. The SC reviewed and endorsed the species summary document for BM (Annex K).

41. The SC discussed future tasks for the SWG BM and agreed on the following:
    (a) Update the species summary
    (b) Discuss potential data sharing needs
    (c) Share data, including unpublished data if possible
    (d) Update Members' estimated catch and effort for BM
    (e) Update Members' data on catch composition of BM and chub mackerel
    (f) Review historical catch and estimate the proportion of BM and chub mackerel, if possible
    (g) Review the feasibility of calculating the proportion of BM and chub mackerel catch by gear
    (h) Collect data on size and/or age composition of BM, if possible
    (i) Continue to explore options for distinguishing BM and chub mackerel catch
    (j) Evaluate environmental variables on recruitment, life history parameters, and fisheries population dynamics
    (k) Review the latest domestic BM stock assessment conducted by Japan

42. China informed the SC about its research on the proportion of BM and chub mackerel catch. The SC requested China and other Members to provide information about catch composition of BM and chub mackerel to the next SWG BM and TWG CMSA07 meetings.

43. The SC agreed that the four SWGs on NFS, JS, JFS, and BM would discuss leadership of those groups intersessionally.

7.2 Identification of data needs and data gaps and strategies to fill those gaps

7.2.1 Spatial data summarized by year and 1 x 1 degree resolution

44. The SC noted the importance of spatial information to inform the Commission's management decisions and that this is reflected in the tasks of its SWGs on NFS, JS, JFS, and BM as well as the workplans of SSC PS and SSC BF-ME.

45. The SWG JS Lead presented annual and monthly CPUE indices for JS (NPFC-2022-SC07-WP11 (Rev. 1)). For the annual index, CPUE was calculated for each year by gear type for each Member. For the monthly index, CPUE was calculated two ways: for each month by gear type for each Member with effort being either the number of operational days or the number of sets of gear type.

46. The SC discussed the value of different measures of fishing effort to calculate CPUE, including

the number of days fished and total number of sets. CPUE based on the number of sets may be more stable than a CPUE based on the number of days fished, although a decision on which measure of fishing effort to use should be made on a case by case basis. It was pointed out that the number of sets may be a hyperstable measure of effort, so more analysis may be needed in order to determine the best measure of effort.

7.3 Stock assessment of NFS, JS, JFS, and BM

7.3.1 Top-down prioritization

47. The SC agreed that NFS is a priority for stock assessment, but that it was difficult to rank the four species according to top-down prioritization for stock assessment.

48. The SC agreed to task the SWGs for NFS, JS, JFS, and BM to work collectively to assess capacity to build stock assessment models for each species, and to present recommendations for the top-down prioritization of the stock assessment of these species at SC08.

7.3.2 Capacity

7.3.3 Funding availability

49. The SC agreed to defer discussions of the capacity and funding availability for the stock assessment of these species until SC08, when it will have received the recommendations of the respective SWGs.

Agenda Item 8. Progress in data collection, management and security

8.1 Information management and security regulations

50. The Compliance Manager, Ms. Judy Dwyer, provided an update on the ongoing work to develop an overarching policy for data use and management that pertains to the Commission and its subsidiary bodies (NPFC-2022-SC07-IP05).

8.1.1 Procedures for sharing code

51. The Chair presented a proposal to revise the SC's Regulations for Management of Scientific Data and Information aimed at facilitating the sharing of computer code (NPFC-2022-SC07-WP03).

52. The SC reviewed and endorsed the proposal. The SC recommends that the Commission adopt the revised Regulations for Management of Scientific Data and Information (Annex O).

8.2 Data collection

8.2.1 Information about species belonging to the same ecosystem or dependent/associated with target stocks

53. The SC noted that, in accordance with Article 10, paragraph 4(d), one of the functions of the SC shall be to assess the impacts of fishing activities on fisheries resources and species belonging to the same ecosystem or dependent upon or associated with the target stocks. The SC also noted, however, that the Commission has not made specific requests for advice on these topics.

8.2.2 Data gaps and needs that could be filled by an observer program

54. The Science Manager presented a summary of information regarding the existing scientific observer programs of Members and those of other RFMOs (NPFC-2018-SC03-WP03 (Rev. 1)) as of April 2018. For pelagic fisheries, there is no coordination in the Members' observer programs neither in terms of the type of observer program nor in coverage and data requirements. Russia, Korea and Chinese Taipei collect data on fishing vessels at sea by observers and electronic reporting system, respectively, while other Members carry out in-port scientific observations. Specifications for observer training, observer program design, number of observers and required data differ among Members. All "general" RFMOs (NAFO, NEAFC, SEAFO, SIOFA, SPRFMO) and CCAMLR have developed at least one observer program. Most general RFMO Observer Programs have been set up primarily to collect scientific data, but in three of six cases, it includes compliance tasks with one general RFMO focusing on a compliance observer program. Almost all RFMOs for highly migratory species have observer programs with both science and compliance components, but with different balances. The SSC PS has previously developed a template for identification of scientific data which can be collected and/or validated by at-sea observers, fishermen, electronic reporting systems and other means, dividing the different types of data into four categories: data that can only be collected by observers at sea; data that can be collected by fishermen at sea; data which are preferably collected by observers, but a degree of cover can be achieved by other means; and data which can be collected equally well by other means.

8.2.3 Scientific needs for electronic monitoring

55. The SC noted that there remain some issues with electronic monitoring, including data storage, that require further discussion.

8.3 NPFC data management system (DMS)

56. The Data Coordinator, Mr. Sungkuk Kang, reported on the progress in the development of the SC-related data management system (NPFC-2022-SC07-IP02). Updates have been made to the Members Home, Significant dates/Events, Pacific Saury Weekly Report, Collaboration, and Annual reports sections. The NPFC GIS Map has recently been updated to include Pacific saury catch and effort data with sea surface temperature per grid from 1994 to 2021. At the request of the SSC BF-ME, the Secretariat has developed bottom fishing maps of combined, gear-

specific footprints by different gear types and time periods. These maps are available on the NPFC website. Work is ongoing to overlay VME maps over the bottom fishing maps.

57. The SC requested the Data Coordinator to add specific dates to the timestamps for posts on the Collaboration site.

Agenda Item 9. Scientific projects for 2023 and 2024

9.1 Ongoing/planned projects

9.2 New projects

9.3 Review and prioritization of projects

58. The Science Manager presented a draft list of scientific projects that were discussed during the meetings of the SC and its subsidiary bodies (NPFC-2022-SC07-WP04 (Rev.1)).

59. The SC reviewed the list of proposed scientific projects and endorsed it for consideration by the Commission (Annex P).

Agenda Item 10. Cooperation with other organizations

60. The Science Manager presented a compiled list of cooperation opportunities and requests from other organizations, for consideration by the SC (NPFC-2022-SC07-IP04 (Rev. 1)).

10.1 Reports on the joint NPFC-PICES activities since the SC06 meeting, including a report from PICES Secretariat

61. The Executive Secretary of the North Pacific Marine Science Organization (PICES), Dr. Sonia Batten, reported on recent and upcoming PICES activities of relevance to the NPFC (NPFC-2022-SC07-OP05), highlighting the following:

(a) Participation by NPFC and PICES representatives at each other's annual meetings

(b) NPFC representation to the joint Working Group on Small Pelagic Fish (WG 43)

(c) Involvement by some NPFC scientists, including the Chair of the NPFC SC, in the Working Group on the Ecology of Seamounts (WG 47)

(d) Co-sponsoring of a topic session, "Environmental variability and small pelagic fishes in the North Pacific: exploring mechanistic and pragmatic methods for integrating ecosystem considerations into assessment and management" by the NPFC at the PICES-2022 Annual Meeting in Busan, Korea in September 2022.

(e) Co-convening by NPFC SC members of a workshop at PICES-2022 with members of WG 47 on "Distributions of pelagic, demersal and benthic species associated with seamounts in the North Pacific Ocean and factors influencing their distributions"

(f) Co-sponsoring of the PICES-ICES-FAO Small Pelagic Fish Symposium

(g) Plans to hold a PICES 2023 session on "Seamount biodiversity: VMEs and species

associated with seamounts in the North Pacific Ocean"

(h) Agreement by the NPFC and PICES to hold a joint international course/workshop on VME indicator taxa identification, and approval of financial contributions of US$15,000 from each organization

62. The Executive Secretary of PICES presented information about the Basin Scale Events to Coastal Impacts (BECI) project. The goal of BECI is to develop a coordinated monitoring system for the North Pacific Ocean that supports regional downscaled models that would help understand the effects of climate change on fisheries production. BECI is anticipated to be run as a PICES special project. The Executive Secretary of PICES invited the NPFC to support and cooperate with BECI and help it to achieve its goals that in turn would support greater understanding of the marine ecosystem and its effects on species of interest to the NPFC.

63. The SC expressed its support for the development and implementation of the BECI project in line with the *NPFC-PICES Framework for Enhanced Scientific Collaboration*.

10.2 Joint NPFC-PICES workshop/course on VME indicator identification

64. The Science Manager informed the SC that the VME indicator taxa identification course had been postponed due to the Covid-19 pandemic. The SC agreed to postpone the course further and suggested that if any Members other than the original planned host (Russia) are interested in hosting the course, they could express their interest to the Secretariat and initiate intersessional discussions on the subject.

10.3 SC representation at PICES meetings

10.3.1 Report on joint PICES-ICES-FAO small pelagic fish (SPF) symposium

65. The Science Manager provided a report on the PICES-ICES-FAO SPF symposium held in Lisbon, Portugal from 7 to 11 November 2022 (NPFC-2022-SC07-IP03). The theme of the symposium was "Small Pelagic Fish: New Frontiers in Science for Sustainable Management." The NPFC co-sponsored the symposium and was represented by the SSC PS Chair (who was also a member of the Steering Committee of the SPF symposium) and the Science Manager.

10.3.2 SC representation in the joint PICES/ICES Working Group on Small Pelagic Fish (WGSPF)

66. Dr. Chris Rooper (Canada) provided a report on the activities of the joint PICES/ICES Working Group on Small Pelagic Fish in 2022 of relevance to the NPFC. These include:

(a) The PICES topic session on "Environmental variability and small pelagic fishes in the North Pacific: exploring mechanistic and pragmatic methods for integrating ecosystem considerations into assessment and management" co-sponsored by the NPFC

(b) A WGSPF Business meeting prior to the PICES-2022 Annual Meeting
(c) The PICES-ICES-FAO SPF symposium on "Small Pelagic Fish: New Frontiers in Science for Sustainable Management" co-sponsored by the NPFC
(d) A workshop to plan reporting and follow-up projects to the PICES-ICES-FAO SPF Symposium
(e) A proposal to hold a topic session on "improved detection and understanding of factors affecting changes in North Pacific forage communities and implications to ecosystems" at the 2023 PICES Annual Meeting

67. The SC noted the need for a new NPFC representative to the WGSPF, in addition to the SSC PS Chair, Dr. Toshihide Kitakado. The SC agreed to appoint the TWG CMSA Chair, Dr. Kazuhiro Oshima, as the NPFC's representative.

10.3.3 Report on PICES topic session on SPF

68. Jhen Hsu provided a report on the PICES topic session on Small Pelagic Fish held in Busan, Korea on 27 September 2022. The session was co-sponsored by the NPFC and its theme was "Environmental variability and small pelagic fishes in the North Pacific." The session comprised 12 talks and two posters in the poster session. At the session, Jhen Hsu presented research related to the joint CPUE standardization collaborative work done by the SSC PS.

69. The SC congratulated Jhen Hsu for winning the best oral presentation award from PICES' Fisheries Science Committee for her presentation.

10.3.4 Process for selecting SC representatives at future scientific meetings

70. The SC Chair presented a proposal for a method to evaluate and rank nominations for SC representatives to be financially supported to participate in relevant scientific meetings (NPFC-2022-SC07-IP01).

71. The SC endorsed the proposed method and agreed that if there is any discrepancy among the rankings by the Chairs of the SC and its subsidiary bodies, they will work together to determine the best candidate to support.

72. The SC agreed to recommend that the Commission financially support the travel of one member of the SC or its subsidiary bodies to participate in the 2023 PICES Annual meeting in Seattle, USA, if necessary.

10.4 NPFC/NPAFC Memorandum of Cooperation and Work Plan

73. The Science Manager reminded the SC of the suggested revisions it made at the SC06 meeting

to the draft five-year Work plan to implement NPAFC/NPFC Memorandum of Cooperation, 2021-2025 (NPFC-2022-SC07-OP02).

74. The SC reviewed and reaffirmed its endorsement of the revised science-related items in the work plan. The SC recommends that the Commission endorse the revised science-related items of the five-year Work Plan to implement the NPAFC/NPFC Memorandum of Cooperation (Annex Q).

10.4.1 Report on the NPAFC's multinational IYS survey in the North Pacific Ocean

75. The Executive Director of the NPAFC, Dr. Vladimir Radchenko, presented a progress report on the 2022 International Year of the Salmon (IYS) Winter High Seas Research Expedition in the North Pacific Ocean (NPFC-2022-SC07-OP01). Five expedition vessels from Canada, Russia, and the United States covered more than 1.5 million km^2 by a regular integrated survey to study Pacific salmon distribution and winter ecology from February to April 2022. These vessels spent 182 days at sea including 96 days on survey, completed 126 survey stations, and caught 1,623 salmon, mostly sockeye (46.1%) and chum (35.5%). Catches of NPFC species of interest were rare due to the survey's limitation to northern and eastern parts of the NPAFC Convention Area. The Executive Director of the NPAFC expressed the NPAFC's appreciation for the financial, planning and information-sharing contributions made by the NPFC to the research expedition.

10.5 FAO ABNJ Deep-sea fisheries project

76. Dr. Tony Thompson (FAO) presented an update on the ABNJ Deep Sea Fisheries (DSF) Project (NPFC-2022-SC07-OP04). The work of the project has four main components: strengthening and implementing regulatory frameworks, strengthening effective management of deep-sea fisheries, cross-sectoral interactions on deep-sea fisheries, and knowledge management and communication. An inception workshop will be held in January 2023. The initial activities include development of an e-learning package for the *Step-wise guide for the implementation of international legal and policy instruments related to deep-sea fisheries and biodiversity conservation in the areas beyond national jurisdiction*, review of the implementation of the Deep-sea Fisheries Guidelines, rapid assessment of stock status (including armorhead, alfonsino and sablefish), and preparation for a symposium on ecosystem production models and the prevention of ecosystem overfishing with RFMO partners. An overarching focus in year 1 of the project will be improved data collection by onboard observers for compliance and scientific purposes. The NPFC SC is invited to consider the planned activities of the DSF Project and to identify areas of common interest and cooperation.

10.6 Partnership with the Fisheries and Resources Monitoring System of FAO (FIRMS)

77. The Science Manager reminded the SC that at SC06, it recommended that the Commission consider entering into an arrangement with FIRMS and decide whether to do so under a Partnership Arrangement or a Collaborative Arrangement. However, due to postponement of the NPFC's 7th Commission meeting, the Commission has not yet been able to consider the recommendation.

78. The SC re-affirmed its support for the NPFC entering into an arrangement with FIRMS. The SC recommended that the Commission consider entering into an arrangement with FIRMS and decide whether to do so under a Partnership Arrangement or a Collaborative Arrangement.

10.7 Cooperation with other organizations

79. There was no discussion of cooperation with any other organizations.

Agenda Item 11. 2022-2026 Research Plan and Work Plan

11.1 Five-year Research Plan

11.2 Five-year Work Plan

80. The SC reviewed its 2022-2026 Five-Year Rolling Research Plan (NPFC-2022-SC07-WP01) and Work Plan (NPFC-2022-SC07-WP02). The Research Plan and the Work Plan of the SC and its subsidiary bodies are attached as Annex R.

Agenda Item 12. Other matters

12.1 Review of the Scientific Committee Terms of Reference (TOR)

81. The SC reviewed its TOR and determined that no changes are currently needed.

12.2 Coordination between SC and TCC

82. Based on the discussion above, the SC identifies the following as matters for coordination between the SC and the TCC and requests the Secretariat to inform the TCC:
    (a) Revision of CMMs 2021-05 and 2019-06 (Annexes L and M)
    (b) Ambiguity around the referenced effort limits in Paragraph 4A, CMM 2021-05
    (c) Draft Work plan to implement NPAFC/NPFC Memorandum of Cooperation (Annex Q)

12.2.1 Fishing effort indicators

83. No updates were provided.

12.3 Other issues

84. The EU provided an updated fisheries operation plan (FOP) and impact assessment for a chub mackerel fishery within the NPFC Convention Area (NPFC-2022-SC07-WP12). The updated fisheries operation plan and impact assessment include the most recent scientific information

available and take into account comments and suggestions made during previous Technical Working Group on Chub Mackerel Stock Assessment, Scientific Committee and Commission meetings. The EU FOP takes into account the current state of the art and information available regarding potential impacts of the fishing operations proposed on target and possible bycatch species, as well as on the marine ecosystem. In addition, the proposed EU FOP would allow, through a dedicated sampling program, the data collection and provision of valuable scientific information in a data-poor zone of the Convention Area, therefore it would contribute to more robust future stock assessments of chub mackerel in the Convention Area.

85. The SC reviewed the EU's updated fisheries operation plan and impact assessment for a chub mackerel fishery within the NPFC Convention Area and noted that the EU has provided all the requested information. The SC recommends that the Commission note the updated EU FOP submitted to SC7.

86. The SC noted that, without a stock assessment of chub mackerel in the Convention Area, it is difficult to provide scientific advice on the EU's proposed fisheries operation plan.

87. Japan stated that the Japanese Government has implemented MSY-based management since 2020 for chub mackerel. Effort control of purse seiners operating in the Japanese EEZ under the stock recovery program has been carried out since 2003. The Kobe plot provided from the latest stock assessment result showed that the stock was overfished and overfishing occurred in the terminal year (2020). Future SSB (in 2030) was projected under catch by not only Japan but also China and Russia, which reported their catch to the NPFC. The proposed 20,000 mt of EU chub mackerel catch would not allow the achievement of the management objective of recovery of SSB to above SSB_{MSY} with a probability of 50% or more in light of the current stock status.

Agenda Item 13. Advice and recommendations to the Commission

88. Based on the recommendations from its SSCs and TWG CMSA, the SC recommends that the Commission:
    (a) Endorse its 5-Year Rolling Research and Work Plans (Annex R).
    (b) Endorse the proposed scientific projects (Annex P).
    (c) Make the species summary documents publicly available on the NPFC's website.
    (d) Consider the species summary documents as reference information when taking decisions on the management of the NPFC priority species (Annexes D-K), including the information about the trends in catch and effort and other scientific information relevant to management of NPA and SA.
    (e) Consider the scientific meetings schedule for 2023 as described in paragraph 90.

Chub Mackerel

(f) Extend the consultancy agreement with the external expert to support the TWG CMSA in selecting a model for stock assessment of chub mackerel in 2023.

(g) Note the updated EU fisheries operation plan submitted to SC07.

Bottom Fish and Marine Ecosystems

(h) Endorse the revised CMM 2021-05 (Annex L).

(i) Endorse the revised CMM 2019-06 (Annex M).

(j) Consider amending CMM 2021-05 to address the ambiguity around the referenced effort limits of February 2007 in Paragraph 4A in addition to the revisions recommended in paragraph 88(h).

(k) Establish a scientific project for understanding the basis by which other RFMOs' encounter thresholds were determined by taxa and gear-type.

(l) Co-sponsor the PICES 2023 session on "Seamount biodiversity: VMEs and species associated with seamounts in the North Pacific Ocean" by contributing the equivalent of $5,000 USD.

Pacific Saury

(m) Endorse the stock assessment report (Annex N).

(n) Allocate funds for the participation of an invited expert in the next SSC PS meetings.

(o) Consider the following to improve conservation and management of Pacific saury:

i. The current annual TAC for 2021-2022 specified in CMM 2021-08 for Pacific saury (333,750 tons) based on historical catch is much larger than a TAC that would be based on the F_{MSY} catch approach (B_{2022}*F_{MSY} = 205,000 tons). The current biomass is much lower than B_{MSY} and the TAC for 2021-2022 did not reduce fishing mortality in recent years. A harvest control rule (HCR) that reduces F when biomass is low may increase the probability of achieving long-term sustainable use of Pacific saury (i.e. higher long-term catch closer to MSY of around 403,000 tons). A reduction to the TAC for 2021-2022 would increase the probability of higher biomass and catch levels in the Pacific saury stock.

ii. An HCR that reduces the target harvest rate and TAC when biomass falls below its target level may be appropriate for Pacific saury. This type of HCR is used in managing many fisheries around the world. For example, if an HCR that reduces F linearly when biomass is below B_{MSY} is applied, the TAC calculated based on such an HCR (B_{2022}*F_{MSY}*(B_{2022}/B_{MSY}) = 101,000 tons) could be similar with the current catch (98,000 tons, preliminary as of mid-December 2022).

iii. Note, however, the performance of the above HCRs has not been evaluated by a formal MSE framework for Pacific saury. They were used as simple illustrations of common approaches used elsewhere.

Data Sharing

(p) Adopt the revised Regulations for Management of Scientific Data and Information (Annex O).

(q) Update the data shared by the SC, TWG CMSA, SSC BF-ME and SSC PS, including subsidiary SWGs, in accordance with their Work Plans.

Cooperation with Other Organizations

(r) Financially support the travel of one member of the SC or its subsidiary bodies to participate in the 2023 PICES Annual meeting in Seattle, USA, if necessary.

(s) Endorse the revised science-related items of the five-year Work Plan to implement the NPAFC/NPFC Memorandum of Cooperation (Annex Q).

(t) Consider entering into an arrangement with FIRMS and decide whether to do so under a Partnership Arrangement or a Collaborative Arrangement.

89. In relation to other tasks for the SC specified in CMMs, SC's rolling five-year work plan, SC's TOR, and the Convention, the SC informs the Commission of the following:

Chub Mackerel

(a) The SC selected Dr. Kazuhiro Oshima (Japan) to serve as the TWG CMSA Chair.

(b) The SC selected Dr. Qiuyun Ma (China) to serve as the TWG CMSA Vice Chair.

(c) The TWG CMSA will select a model(s) for stock assessment of chub mackerel at its next meeting in 2023.

(d) The TWG CMSA will develop a species summary document for chub mackerel.

(e) The SC noted that, without a stock assessment of chub mackerel in the Convention Area, it is difficult to provide scientific advice on the EU's proposed fisheries operation plan.

Bottom Fish and Marine Ecosystems

(f) The SC endorsed the field guide for identification of fishes of the Emperor Seamount Chain captured by bottom fisheries (NPFC-2022-SSC BFME03-WP08).

(g) The SC endorsed the use of the scientific name *Allocyttus folletti*, instead of *A. verrucosus*, when referring to the oreosomatid fish in the Emperor Seamounts area.

(h) The SC will discuss the establishment of a formal procedure for changing species' scientific and common names used by the NPFC, including how to handle the issue of a species not having a 3-letter ASFIS code in FAO, at SC08.

(i) The SC endorsed the process proposed by Canada in NPFC-2022-SSC BFME03-WP03 as one of the NPFC's processes for identifying VMEs and areas likely to be VMEs in the Convention Area, and Canada's application of this method in the eastern part of the Convention Area.

Pacific Saury

(j) The SC endorsed the revised Terms of Reference of the SSC PS.

(k) The SC Chair expressed her intention to work with the Secretariat and the SSC PS to develop a summary of species information about Pacific saury that is similar in format to

the species summary documents prepared for other priority species.

Other Priority Species

(l) The SC will update the species summaries of NFS, JFS, JS and BM.

(m) The SC will discuss the top-down prioritization of the stock assessment of NFS, JFS, JS and BM, as well as the capacity and funding availability for the stock assessment of these species, at its next meeting.

Data Collection and Sharing

(n) The SC adopted the terms of reference for sharing VME data.

(o) The SC adopted the template for sharing VME data.

(p) The SC will continue discussions on the establishment of an observer program in the NPFC Convention Area.

Cooperation with Other Organizations

(q) The SC expressed its support for the development and implementation of the BECI project in line with the *NPFC-PICES Framework for Enhanced Scientific Collaboration*.

(r) The SC agreed to postpone the joint NPFC-PICES course on VME indicator identification.

(s) The SC selected Dr. Kazuhiro Oshima as a NPFC representative to the PICES/ICES WGSPF in addition to the SSC PS Chair, Dr. Toshihide Kitakado.

(t) The SC developed a guideline for the evaluation and ranking of nominations for SC representatives to be financially supported to participate in relevant scientific meetings.

Performance Review

(u) The SC tasked its subsidiary bodies, including the four informal small working groups, pending the approval of the report by the Commission, to review relevant recommendations from the Performance Review report at their intersessional meetings or through email correspondence in 2023, evaluate their ability and necessary timelines to achieve the objectives in those recommendations, and to report on the outcomes of their reviews at the SC08 meeting.

Agenda Item 14. Next meeting

90. The SC suggested the following meeting schedule for 2023:

(a) TWG CMSA07: at a date to be further discussed intersessionally

(b) SSC PS11: 28-31 August 2023

(c) SSC-BF-ME04: 7-9 December 2023

(d) SSC PS12: 11-14 December 2023

(e) SC08: 15-16 and 18-19 December 2023

(f) TWG CMSA08: Late January 2024

91. The SC noted the dates of the 3rd SWG MSE PS meeting, 28 February – 1 March 2023, and recommends that the 4th SWG MSE PS meeting be held back-to-back with the next SSC PS meeting (e.g. on 1-2 September 2023).

92. The Secretariat will liaise with Chairs and Members to determine the format and venue of the scientific meetings scheduled for 2023.

93. The SC's subsidiary bodies will hold informal web meetings to check progress and plan intersessional work, when needed.

Agenda Item 15. Press release

94. The SC endorsed the press release for publication on the NPFC website after the meeting.

Agenda Item 16. Adoption of the Report

95. The SC07 report was adopted by consensus.

Agenda Item 17. Close of the Meeting

96. The meeting closed at 10:55 on 20 December 2022, Tokyo time.

Annexes:

Annex A – Agenda
Annex B – List of documents
Annex C – List of participants
Annex D – Species summary for North Pacific armorhead
Annex E – Species summary for splendid alfonsino
Annex F – Species summary for sablefish
Annex G – Species summary for blackspotted and rougheye rockfishes
Annex H – Species summary for neon flying squid
Annex I – Species summary for Japanese sardine
Annex J – Species summary for Japanese flying squid
Annex K – Species summary for blue mackerel
Annex L – Revised CMM 2021-05 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean
Annex M – Revised CMM 2019-06 - Conservation and Management Measure for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northeastern Pacific Ocean
Annex N – Stock Assessment Report for Pacific Saury
Annex O – Revised Regulations for Management of Scientific Data and Information
Annex P – Scientific projects
Annex Q – Five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation
Annex R – Five-Year Research Plan and Work Plan of the Scientific Committee

Please refer to the NPFC website for the complete annexes.

3rd Meeting of the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury

28 February – 1 March 2023
Virtual
Meeting Report

Agenda

Agenda Item 1. Introductory items

1.1 Opening of the meeting

1.2 Adoption of agenda

1.3 Meeting logistics

Agenda Item 2. Overview of the outcomes of previous NPFC meetings

2.1 SWG MSE PS02

2.2 SSC PS10

Agenda Item 3. Review progress on development of an interim harvest control rule (HCR) as a short-term task

3.1 Management objectives

3.2 Reference points and tuning criteria

3.3 Conditioning of operating models (OMs)

3.4 Candidate HCRs and constraints therein

3.5 Performance measures

3.6 Simulation platform

3.7 Template for presentation of results

3.8 Other matters

Agenda Item 4. Discussion toward development of management procedures (MPs) as a mid-term goal

4.1 Management objectives and some constraint conditions for the regulation of fishery

4.2 Technical matters on operating models, MPs, performance measures and simulation

Agenda Item 5. Implementation schedule and safeguard for exceptional circumstances

5.1 Implementation schedule of an HCR

5.2 Mid-term plan of implementation and its review process

5.3 Definition of exceptional circumstances

Agenda Item 6. Other matters

6.1 Selection of co-Chair

Agenda Item 7. Timeline and future process

7.1 Timeline

7.2 Future process with assistance of SSC PS
7.3 Workplan till SWG MSE PS04 meeting

Agenda Item 8. Recommendations to the Commission

Agenda Item 9. Adoption of report

Agenda Item 10. Close of the meeting

MEETING REPORT

Agenda Item 1. Introductory items

1.1 Opening of the meeting

1. The 3rd meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) took place in the format of video conferencing via WebEx, and was attended by Members from Canada, China, the European Union, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, and Vanuatu. The Pew Charitable Trusts (Pew) and the World Wildlife Fund attended as observers. Dr. Larry Jacobson participated as an invited expert. The meeting was chaired by Dr. Toshihide Kitakado (Japan) who is the co-Chair of the SWG MSE PS. Dr. Kitakado opened the meeting and welcomed the participants.

1.2 Adoption of agenda

2. The agenda was adopted without revision (Annex A). The List of Documents and List of Participants are attached (Annexes B, C).

1.3 Meeting logistics

3. The Science Manager, Dr. Aleksandr Zavolokin, outlined the meeting arrangements.

4. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Overview of the outcomes of previous NPFC meetings

2.1 SWG MSE PS02

5. The Chair presented the outcomes and recommendations from the SWG MSE PS02 meeting (NPFC-2023-SWG MSE PS03-WP01).

6. With regard to HCR options that would allow for in-season adjustment of the total allowable catch (TAC), the invited expert pointed out the possibility that simulations may overstate the performance of these HCRs if a significant amount of time is required between the

identification of a circumstance requiring an in-season adjustment and the implementation of the Commission's response.

2.2 SSC PS10

7. The Chair presented the outcomes and recommendations from the 10th Meeting of the Small Scientific Committee on Pacific Saury (SSC PS10; NPFC-2023-SWG MSE PS03-WP01).

8. The SWG MSE PS discussed the issues with using BSSPM model projections. Besides the problems that the SSC PS has previously noted, the Chair cautioned that the current operating model (OM) based on BSSPM may provide optimistic projections for a stock starting at a low biomass level in the absence of current information about stock status as demonstrated in projection analysis for stock assessments and because random process errors in simulations do not provide information about directional changes. China agreed that such simple projections are somewhat unreliable but pointed out that a small recovery trend in the Pacific saury stock has been observed in the latest few years. These observations resulted in substantial discussion among the participants and efforts to model process errors in a realistic manner.

9. Japan expressed concern about the current stock status of Pacific saury, pointing out that biomass and catch are at historically lowest levels. Japan further pointed out that the situation surrounding the Pacific saury fishery has changed significantly over time, such as more fishing being conducted in the high seas, increased size of fishing vessels, advances in fishing-related technologies, and more frequent at-sea transfers, and questioned whether some Members' calculations of CPUE, which are based on days rather than hauls, fully capture catchability or effort.

10. China pointed out that, according to the Annual Summary Footprint for Pacific saury, the number of some Members' fishing vessels has increased in the high seas over the years, while that for some other Members has been stable following the relevant Articles of CMM for Pacific saury. China further pointed out that the SSC PS has agreed on the need to study environmental effects and understand the relative impact of the environment on Pacific saury population dynamics. China highlighted the importance of this work and called for it to be accelerated.

11. The SWG MSE PS agreed to request the SSC PS to hold technical discussions on improving the quality of CPUE indices.

Agenda Item 3. Review progress on development of an interim harvest control rule (HCR) as a short-term task

12. The Chair presented a preliminary demonstration with the Shiny application to evaluate the performance of several HCRs (NPFC-2023-SWG MSE PS03-WP01).

13. The SWG MSE PS noted that the three HCR options show recovery in a short time period. This may be due to BSSPM's optimistic and slightly unrealistic assumption of the high potential of recovery, which is in part because the unfavorable conditions of recent years have not been considered. The SWG MSE PS also noted that the three HCRs (HCR0: F_{MSY}*B, HCR1: a usual hockey-stick type of HCR, and HCR3: a hybrid version of HCR1 with an in-season adjustment based on Japanese fishery-independent survey) show different speeds of recovery between HCR0 and HCR1/HCR3 showing an increased chance of the population recovering in a shorter time period for HCR1/HCR3. The SWG MSE PS further noted that the HCR parameters of the three options are preliminary and could be tuned based on further discussion.

3.1 Management objectives

3.2 Reference points and tuning criteria

14. The SWG MSE PS reviewed and updated the three types of management objectives discussed at SWG MSE PS01 and SWG MSE PS02. The SWG MSE PS agreed to continue discussions around these three objectives below, putting higher priority on (a).
    (a) Recovery of the stock:
        i. The stock status is recovered above $B_{tar} = B_{MSY}$ within "xx" years with "pp" probability (for example, xx could be xx=4-6 and "pp" could be pp=60-80%);
        ii. The stock status is maintained above the B_{tar} level over "yy-yy" years with "pp" probability.
    (b) Avoiding unsustainable state of the stock:
        i. The annual probability that the stock drops below B_{lim} should not exceed "pp" probability;
        ii. The annual probability that the fishing mortality exceeds F_{lim} should not exceed "pp" probability.
    (c) Achieving high and stable catch:
        i. Catch is high and stable as much as possible;
        ii. Maximum interannual variation of TAC over "yy-yy" period should be less than 40%.

15. With regard to the maximum interannual variation of TAC, depending on the simulation results, the SWG MSE PS discussed the possibility of limiting this to 20 or 25% if the TAC is set based on an average of multiple years.

16. The SWG MSE PS reviewed the list of preliminary reference points discussed at the SSC PSint01 and SWG MSE PS02. The SWG MSE PS reaffirmed that the list of ranges for biological reference points generally contains typical values, although $1*F_{MSY}$ may be more appropriate as F_{lim} rather than F_{tar}. Regardless, the range is purposely wide for computational, discussion and exploratory purposes. The default values are for demonstration purposes.

Neither implies any advice or decision about recommended harvest guidelines for Pacific saury.

Reference point	Default value	Potential range
$B_{tar} = c*B_{MSY}$	c = 1	c = 0.8 – 1.2
$B_{lim} = c*B_{MSY}$	c = 0.35	c = 0.2 – 0.5
$F_{tar} = c*F_{MSY}$	c = 1	c = 0.8 – 1.2
$F_{lim} = c*F_{MSY}$	c = 1.35	c = 1.2 – 1.5

17. The SWG MSE PS noted that the current OM shows a somewhat optimistic recovery process for the reasons identified in paragraph 8, and further development of process error assumptions in the model is needed to make "pp" and "time frame" calculations, as indicated in objective (a) in paragraph 14, more realistic.

18. The SWG MSE PS agreed to continue to look at different combinations of HCR parameters, such as setting the overall discount rate to F_{MSY}.

3.3 Conditioning of operating models (OMs)

19. The SWG MSE PS noted the previous discussions on the conditioning of OMs in the SWG MSE PS01, SSC PSint01, and the SWG MSE PS02 meetings.

20. The SWG MSE PS agreed that Option A is to be used as the default option. However, it also noted that, since the current assumptions, which do not account for environmental effects, are somewhat optimistic for population recovery, there is an urgent need to extend the current OM with BSSPM by incorporating environmental information.

21. The SWG MSE PS noted that a great deal of uncertainty exists regarding the environmental factors driving variability in Pacific saury. It is therefore important that recommended HCR options are robust and perform well under a range of assumptions. The SWG MSE PS therefore agreed to structure its testing analyses around a range of hypotheses including:
    (a) Long-term climate change over next 10-15 years (some reasonable, but not necessarily perfect, patterns to be developed);
    (b) Short-term change over 5 years;
    (c) Random (constant mean) but high variation.

22. The SWG MSE PS agreed to also continue development of age-structured models so that it may be used to condition a set of OMs if feasible.

3.4 Candidate HCRs and constraints therein

23. The SWG MSE PS considered the candidate HCRs and the constraints therein and agreed on the need to hold further discussions on the following:
    (a) Choice of an input value of "B" for HCR (average of recent 2 years as a default, and single recent year for trial since this option may be used for HCR2 and HCR3 with some in-season adjustment);
    (b) Maximum allowable change in TAC over two consecutive years (within 40%, but 20-25% when the value of B is based on the average of two years);
    (c) HCR parameters can be tuned to meet a higher priority objective. To do so, however, more concrete and specific objectives need to be set.

24. The SWG MSE PS noted the need to confirm the feasibility of HCR2 and HCR3 with in-fishing season adjustment of TACs. One possible way is to set a preliminary and precautionary TAC, and increase it when a good sign of abundance is detected in the Japanese fishery-independent survey. The SWG MSE PS also discussed the possibility of setting a trigger level for determining if the TAC should be adjusted or not.

25. The SWG MSE PS agreed to use HCR = Recent F (such as recent three-year average) * B for demonstration purposes.

3.5 Performance measures

26. The SWG MSE PS reviewed the performance measures discussed at SWG MSE PS01 and SWG MSE PS02 and agreed to continue to base discussions around them. The possible performance measures reflecting the management objectives are as follows:
    (a) Recovery of the stock:
        i. Probabilities that the stock status is above B_{tar} at 1, 2, …, 5, 10, 15 years after the HCR is implemented;
        ii. Probabilities that the stock status is in Kobe green quadrant at 5, 10, 15 years after the HCR is implemented.
    (b) Avoiding unsustainable state of the stock:
        i. Probabilities that the stock status is below B_{lim} at 1, 2, …, 5, 10, 15 years after the HCR is implemented;
        ii. Probabilities that the fishing mortality exceeds F_{lim} at 1, 2, …, 5, 10, 15 years after the HCR is implemented.
    (c) Achieving high and stable catch:
        i. Average catch by 1-5, 6-10, 11-15 years after the HCR is implemented;
        ii. Annual catch variation by 5, 10, 15 years after the HCR is implemented;
        iii. Probabilities that the TAC hits the predetermined maximum change by 5, 10, 15 years after the HCR is implemented.

27. The SWG MSE PS noted that, in addition, the first calculated TAC by HCRs will also need to be presented.

3.6 Simulation platform

28. The Chair reported on progress in the development of the Shiny application.

29. At the request of the SWG MSE PS, the Chair agreed to share the code for the Shiny application for interested participants to use. The Chair explained that the Shiny application was primarily for the convenience of Members, and it is currently conditioned based on the 2022 stock assessment. However, the Chair may conduct final calculations using the same code without the Shiny interface and include information from the 2023 stock assessment, which may provide different results.

30. The invited expert also recommended that the Shiny application output include metadata (e.g. date, settings, etc.) when simulations are run.

3.7 Template for presentation of results

31. The SWG MSE PS agreed to defer the finalization of a template for the presentation of results to its next meeting.

3.8 Other matters

32. No other matters were discussed.

Agenda Item 4. Discussion toward the development of management procedures (MPs) as a mid-term goal

4.1 Management objectives and some constraint conditions for the regulation of fishery

33. The SWG MSE PS agreed to focus on its short-term goal until sufficient progress is made and to defer discussions on its mid-term goal.

34. The SWG MSE PS reaffirmed the need to ensure as smooth a transition as possible from the short-term goal when setting the HCR to the mid-term goal when developing the MPs.

4.2 Technical matters on operating models, MPs, performance measures and simulation

35. The SWG MSE PS tasked the SSC PS to continue to work to develop an age-structured stock assessment model, without going into technical details. This will contribute to the more comprehensive MSE framework that will be used to develop the long-term MP.

Agenda Item 5. Implementation schedule and safeguard for exceptional circumstances

5.1 Implementation schedule of an HCR

36. The SWG MSE PS reviewed the implementation schedules for the three HCR options agreed to at the SWG MSE PS02 meeting and agreed that the HCR to be selected at COM08 should be recommended for use in setting the 2024 TAC (Annex D).

5.2 Mid-term plan of implementation and its review process

37. The SWG MSE PS reaffirmed that normally after the completion of HCR and MPs, reviews are conducted within the timeframe of two to three years, but considering the nature of Pacific saury, regular review might be warranted at the beginning of this time period.

5.3 Definition of exceptional circumstances

38. The SWG MSE PS reaffirmed that the exceptional circumstances can be the population dynamics falling beyond the range of the confidence interval and the unavailability of fisheries independent surveys.

39. The SWG MSE PS reaffirmed that the finalized HCR should include definitions of exceptional circumstances.

Agenda Item 6. Other matters

6.1 Selection of co-Chair

40. The Science Manager explained that the position of co-Chair of the SWG MSE PS representing the Technical and Compliance Committee (TCC) is currently vacant and invited nominations from Members.

41. As there were no nominations, the SWG MSE PS agreed to request the Commission to appoint a co-Chair.

Agenda Item 7. Timeline and future process

7.1 Timeline

42. The SWG MSE PS reviewed and revised the timeframe agreed to at SWG MSE PS02 (Annex E).

7.2 Future process with assistance of SSC PS

43. The SWG MSE PS compiled a list of technical tasks requiring the assistance of the SSC PS and potentially the assistance of the Commission:
    (a) Review CPUE indices (including joint CPUE) for possible improvement (see paragraphs 9 and 10)
    (b) Review BSSPM in light of handling of process error and environmental changes (bias correction, auto-correlation, fluctuation etc.)
    (c) Develop some working hypotheses for some OMs to test robustness of HCRs

(d) Test the performance of one-year biomass estimate or two-year average
(e) Test the performance over different constraints
(f) Run simulation with several combination of HCR parameters
(g) Run simulation separately over OM scenarios

7.3 Workplan till SWG MSE PS04 meeting

44. The SWG MSE PS developed a workplan of intersessional activities until the 5th SWG MSE PS meeting (Annex E).

Agenda Item 8. Recommendations to the Commission

45. The SWG MSE PS recommends that:
(a) the Commission ensure the adequate allocation of funds for the continued development and utilization of a simulation platform for the evaluation of HCR if needed.
(b) the SWG MSE PS04 and 05 meetings be held in person, with a hybrid option, and be funded by the Commission if needed.
(c) the invited expert, Dr. Larry Jacobson, be invited to the next SWG MSE PS meetings.
(d) the Commission endorse the timeframe through 2024 including the proposed meetings and tasks (Annex E).
(e) the Commission appoint a co-Chair of the SWG MSE PS representing the TCC.

46. The SWG MSE PS agreed that future meetings should include scientists, managers and stakeholders to facilitate communication and completion of this important work.

Agenda Item 9. Adoption of report

47. The SWG MSE PS03 Report was adopted by consensus.

Agenda Item 10. Close of the Meeting

48. The meeting closed at 13:10 on 1 March 2023, Tokyo time.

Annexes:

Annex A – Agenda
Annex B – List of documents
Annex C – List of participants
Annex D – Timeframe of NPFC meetings toward setting a Harvest Control Rule
Annex E – Timeline and tasks

Please refer to the NPFC website for the complete annexes.

5th Meeting of the Finance and Administration Committee

17 and 21 March 2023
Sapporo, Japan (Hybrid)
Meeting Report

Agenda

1. Opening of the Meeting

2. Appointment of Rapporteur

3. Adoption of Agenda

4. Financial Statement

    a. Audit Report for the 2021/2022 fiscal year

    b. Secretariat financial update for the first three quarters of 2022/2023 fiscal year (i.e., April 1 to December 31 2022)

    c. Status of Member Contributions for 2021/2022 fiscal year and 2022/2023 fiscal years to December 31, 2022

    d. Status of Other Funds as of December 31, 2022

        i. Working Capital Fund

        ii. Voluntary Contribution

        iii. Special Project Fund

5. Secretariat's Work Plan: Budget Estimates for 2023/2024 to 2025/2026

    a. Secretariat Work Plan 2023/2024 to 2025/2026

    b. Budget for 2023/2024

    c. Budget estimates for 2023/2024 and 2024/2025 and indicative budget estimates for 2025/2026 and 2026/2027

    d. Consideration of staff remuneration/benefits package:

        i. GS level

        ii. Professional level (including repatriation allowance)

6. Administration Matters

    a. NPFC Secondment and Internship programs

    b. Transparency

7. Performance Review and items of relevance to FAC

8. Other matters

9. Next meeting

10. Recommendations to the Commission

11. Adoption of the Report

12. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

1. The 5th Meeting of the Finance and Administration Committee (FAC) took place as a hybrid meeting in Sapporo, Japan and via WebEx, and was attended by Members from Canada, China, European Union, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America, and Vanuatu. Panama attended virtually (via WebEx) as observers.

2. Noting that a quorum was present, the FAC Chair, Mr. Dan Hull (USA) opened the meeting on 17 March 2023, and outlined procedural matters including the meeting schedule and administrative arrangements. The Chair noted that the meeting represents a return to normal procedures for NPFC and thanked the Secretariat's past and current staff for their efforts to ensure smooth operations throughout the pandemic.

Agenda Item 2. Appointment of Rapporteur

3. Dr. Shelley Clarke was appointed rapporteur for FAC05.

Agenda Item 3. Adoption of the Agenda

4. The provisional agenda, as proposed in NPFC-2023-FAC05-MIP02 and annotated in NPFC-2023-FAC05-MIP03, was adopted (**Annex A**). The List of Documents and Participants List are attached as **Annex B** and **Annex C**.

Agenda Item 4. Financial Statement

4.1 Audit Report for 2020/21 and 2021/22 Fiscal Years

5. The Executive Secretary, Dr Robert Day presented the audit reports for 2020/21 (NPFC-2023-FAC05-IP01) and 2021/22 (NPFC-2023-FAC05-IP02 rev 1) and noted their relevance to

FAC05-WP11 and the proposed changes to the management of the separate NPFC funds.

6. **Recommendation 1**: FAC05 recommended that the audit reports be adopted as presented.

4.2 Secretariat financial update for first three quarters of 2022/2023 fiscal year (i.e. April 1-December 31, 2022)

7. The Executive Secretary presented a financial update for the current fiscal year through 31 December 2022 (NPFC-2023-FAC05-WP01) with updates presented in a powerpoint presentation showing details to 31 March 2023 and noting a potential surplus (unaudited) of approximately ¥17,251,994.
8. **Recommendation 2**: FAC05 recommended that the financial update report be adopted as presented.

4.3 Status of Member contributions for 2021/2022 and 2022/2023 fiscal years to December 31, 2022

9. The Executive Secretary reported on the status of Member contributions through 31 December 2022, representing fiscal years 2021/2022 and 2022/2023 (NPFC-2023-FAC05-WP01).
10. It was noted that contributions from several Members have been delayed but are expected soon.

4.4 Status of other funds as of 31 December 2022, (including Working Capital Fund, Voluntary Contributions Fund and the Special Project Fund)

11. It was noted that the Working Capital Fund (WCF) is the subject of another FAC paper (NPFC-2023-FAC05-WP11) which will be dealt with under Agenda Item 8.
12. The Executive Secretary noted that Panama has committed to pay a voluntary contribution for 2022/23 as outlined in NPFC-2023-COM07-WP09 rev1 and had only recently been informed by the Secretariat of the amount.
13. The Executive Secretary clarified the difference between the Special Purposes Fund, which is specified in para. 26 of the NPFC Financial Regulations, and the Special Projects Fund, which was created to receive transfers of surplus funds from the Working Capital Fund at COM03 under para. 18.

Agenda Item 5. Secretariat's Work Plan and Budget

5.1 Secretariat's Work Plan for 2022/23

14. The Executive Secretary introduced NPFC-2023-FAC05-WP02 containing the Secretariat's Work Plan for 2023/24. He highlighted the continuing work supporting SC and the work of the SWG on MSE for Pacific saury, the continuing work supporting TCC and the TCC work plan, the further development of information technology systems and data products, the need to re-examine and streamline some of the Secretariat's human resources and administrative

systems, and opportunities for enhancing cooperation with related organizations and raising the profile of the NPFC with the public.

15. Members discussed the meetings proposed to be attended by Secretariat staff and noted the limited resources available to the Secretariat in terms of travel budgets and staff time.
16. **Recommendation 3**: FAC05 recommended that COM07 direct the Secretariat to employ the following general principles when prioritizing travel and human resources allocation and have the Secretariat report back to FAC06 on meeting attendance with regard to these principles:
    (a) Priority should be given to those meetings pertaining to management of fishery resources or fishing grounds like those managed by NPFC;
    (b) Priority should be given to attendance at annual Commission meetings rather than their subsidiary bodies, however, for the purposes of capacity building attendance at meetings of subsidiary bodies (e.g. the NPFC CM to attend the next WCPFC TCC to become familiar with regional processes and issues) should be considered;
    (c) Virtual attendance should be considered as a means of reducing travel cost and time but noting that staff time would still need to be invested;
    (d) Meetings may also be prioritized based on ease of access and relevance of the specific topics to be considered at each.
17. **Recommendation 4**: FAC05 recommends to COM07 that the Secretariat's Work Plan for 2023/24 be adopted as presented (**Annex D**).
18. **Recommendation 5**: FAC05 also recommends, noting the recommendation for allocation of ¥1,200,000 (US$10,000) to hold a meeting of the Joint SC/TCC/COM Small Working Group on MSE for Pacific saury as part of the Work Plan for the SWG MSE PS, that the Secretariat ensure that the review of future proposals for use of the Special Projects Fund follows the procedures from **Annex D** of FAC01 that was adopted through para. 27 of COM03.

5.2 Budget for 2023/2024, Budget Estimates for 2024/2025 and Indicative Budget Estimates for 2025/2026 and 2026/2027

19. The Executive Secretary presented an overview of the budgets for 2023/24 and 2024/25 and indicative budgets for the following two fiscal years (NPFC-2023-FAC05-WP01). He noted two concurrent financial pressures - inflation and devaluation of the yen. Reference was also made to the need for several separate considerations by FAC05 of issues under Agenda Item 8 – Other Matters, that could influence the budget.
20. The Executive Secretary invited comment on the issue of staff remuneration increments, for example, increments of 1% or 2% for the next fiscal year.
21. It was noted that the staff regulations require that remuneration considerations include both the remuneration of United Nations officials working in Japan as well as government officials working in Japan.
22. **Recommendation 6**. FAC05 recommended the budget for 2023/2024, the budget estimates

for 2024/2025 and the indicative budget estimates for 2025/2026 and 2026/2027, showing the Commission's projected annual budget of ¥160,804,996 plus ¥20,000,000 for hosting Commission meetings (see Agenda Item 8.5) which will be offset by a transfer of ¥20,000,000 from the Working Capital Fund to COM07 for its consideration (**Annex E**).

23. **Recommendation 7**: FAC05 recommended the Member contributions for 2023/24 and 2024/25 as also shown in NPFC-2023-FAC05-WP01 rev 2 to COM07 for its consideration (**Annex F**).

5.3 Consideration of Staff Remuneration Benefits Package

24. The Chair introduced NPFC-2023-FAC05-WP05 and NPFC-2023-FAC05-WP-06 on General Service (GS) and Professional level staff remuneration benefits packages and noted that decisions on these issues could affect budget totals. Discussions on these items were conducted in closed session due to their sensitive nature regarding financial and personnel matters.

5.3.1 GS Level

25. **Recommendation 8**: FAC05 recommends that COM07 task the Secretariat with conducting a review of GS remuneration packages as outlined in para. 5.2 of the staff regulations, i.e. that salaries be established in line with local conditions.
26. **Recommendation 9**: FAC05 recommends that COM07 task the Secretariat to review its staffing levels, including the Data Coordinator position, in line with recommendations in the NPFC Performance Review, for review at FAC06.

5.3.2 Professional Level including Repatriation Allowance

27. After reviewing NPFC-2023-FAC05-WP06, FAC05 recognized the important contributions of the former Compliance Manager and considered that all commitments between the Commission and the former Compliance Manager have been fulfilled.
28. **Recommendation 10**: Noting the exceptional nature of the Commission's request to delay the timing of his repatriation, and without setting any precedent for future staff remuneration issues, FAC05 recommends the issue of compensation to be paid to the former Compliance Manager, potentially from the Working Capital Fund, be considered by COM07 Heads of Delegation.
29. **Recommendation 11**: FAC05 recommended that COM07 task the Secretariat to undertake a broad review of the associated staff remuneration issues, including the fixed exchange rate provision.

Agenda Item 6. Administration Matters

6.1 NPFC Secondment and Internship Projects

30. The Executive Secretary introduced paper NPFC-2023-FAC05-WP04 which describes an application to extend a secondment (Ms Natsuki Hosokawa) and a new application for an intern position (Mr Jihwan Kim). The Secretariat recommends accepting both.
31. Regarding the internship application of Mr Kim, Korea noted that their internal processes had not been duly followed, but stated that they would agree to accepting Mr Kim because the Executive Secretary recommended his application.
32. **Recommendation 12**: FAC05 recommends to COM07 that the Commission accept the application for extension of a secondment to the Secretariat by Ms Natsuki Hosokawa and the application for an internship by Mr Jihwan Kim.

6.2 Transparency

33. The Executive Secretary introduced paper NPFC-2023-FAC05/TCC06-WP03 which considers updates to NPFC document rules including access to documents by accredited observers. He noted that the practice had been to provide documents to accredited and registered observers only once they have arrived at the meeting.
34. Members supported the proposed changes to the NPFC document rules outlined in the paper.
35. Some Members suggested that the Commission consider steps beyond those proposed in the paper because they consider that the NPFC data rules are still too strict. These Members called for all meeting documents to be made publicly available as is the case in other RFMOs.
36. Some Members requested that the Commission consider further action to provide meeting documents in advance of the meeting, other than confidential papers, to the public.
37. **Recommendation 13:** FAC05 recommends to COM07 to endorse the amendment to the document rules, recognizing that TCC will also be reviewing this WP and making a recommendation on this issue.
38. Members also noted their interest in ensuring that the NPFC document management system be efficient and facilitate access and understanding by Members. Such actions could include:
    (a) Avoid posting duplicate papers under multiple meetings;
    (b) Identify when new or revised papers are posted so that Members can easily identify and retrieve any new materials;
    (c) Consider an auto-notification function when new or revised papers are posted;
    (d) Better organize background and historical documents for ease of reference; and
    (e) Increase the use of circulars to keep stakeholders better informed of NPFC meetings (e.g., science meetings be circulated more broadly).

Agenda Item 7. Performance Review and Items of Relevance to FAC

39. Dr. Penelope Ridings, Chair of the NPFC Performance Review, made a brief presentation on the results of the NPFC Performance Review (NPFC-2023-FAC05-WP08) and noted specific issues for FAC.
40. She noted that the review team was comprised of 8 reviewers, including 4 internal experts who had a high level of familiarity with the workings of the NPFC. All work was done remotely using document research, a Member questionnaire and interviews of Chairs and others familiar with NPFC. As a result the team was not able to directly observe financial or administrative processes. While the performance review made a number of positive findings, it also identified certain financial and administrative issues, including the long-term sustainability of budgets and staffing levels, the utility of a corporate plan to guide the Secretariat at a strategic level and complement the annual Work Plan, and the need to work further to improve transparency.
41. Members requested clarification on one of the recommendations of the Performance Review Panel (Recommendation 8.3.1) which calls for proposals for new or revised CMMs to be accompanied by cost estimates for implementation which can form the basis for including necessary funds in the Commission's budget.
42. Dr. Ridings explained that the performance review panel anticipated that the Secretariat would provide a rough cost estimate to indicate when additional resources (e.g., database development or analytical capacity in the Secretariat) would be needed to effectively implement new measures.
43. Members also discussed the options proposed in the Secretariat's paper for responding to the findings of the performance review, with many expressing a preference for the Secretariat to coordinate a process whereby the subsidiary bodies would respond to the recommendations that are relevant to them. However, many of the same Members recognized the limited time available to the "small working groups" of subsidiary bodies to devote time to this task given their already full agendas. It was also noted that FAC did not currently have an intersessional process in place. Some Members also noted the challenges for subsidiary bodies to add this issue to their agendas, even virtually, in time to report their recommendations to COM08.
44. **Recommendation 14**: FAC05 generally supported the option of the Secretariat coordinating a process with NPFC bodies to provide feedback on the Performance Review Panel's recommendations to COM08, but deferred further details to discussions at COM07, recognizing that other subsidiary bodies will also review and provide comments.

Agenda Item 8. Other Matters

8.1 Draft MOUs with SPFRMO, WCPFC and ISC

45. Based on time constraints, FAC05 was not able to consider three proposed MOUs with WCPFC, SPRFMO and ISC. Current drafts of these MOUs are contained in NPFC-2023-FAC05-WP07, WP09 and WP12.
46. **Recommendation 15**: FAC05 recommended consideration of the draft MOUs with SPRFMO, WCPFC and ISC by COM07, recognizing that two of the MOUs (SPRFMO and WCPFC) are also on the TCC agenda.

8.2 Proposed amendments to staffing and evaluation policies

47. The Executive Secretary presented a proposal to revise the staff selection policy and individual performance review (NPFC-2023-FAC05-WP10). The Chair noted the Secretariat's paper updates two human resources-related issues.
48. In response to a question the Executive Secretary clarified that the proposed changes only applied to the selection and performance appraisal of NPFC staff other than the Executive Secretary. The proposal would place staff performance reviews directly under the purview of the Executive Secretary rather than involving the Chair and Vice-Chair of the Commission as well as Members and was highlighted in the NPFC Performance Review (para. 441-442).
49. FAC05 discussed the proposal and a revised working paper was produced (NPFC-2023-FAC05-WP10 rev1).
50. **Recommendation 16**. FAC05 supported and recommended to COM07 to consider the Secretariat's proposal (NPFC-2023-FAC05-WP10 rev1) on individual performance reviews for staff to revert to a simpler process that resides with the Executive Secretary, as suggested in the NPFC Performance Review.
51. FAC05 noted, but did not make recommendations on other aspects of NPFC-2023-FAC05-WP10 rev1 on the understanding that discussions will continue in the margins of COM07.

8.3 Proposal to simplify the audit process through establishing dedicated bank accounts

52. The Executive Secretary presented a proposal (NPFC-2023-FAC5-WP11) to simplify the maintenance and monitoring of NPFC funds, as well as an option related to the use of the funds currently set aside in the Working Capital Fund, including the funding of the General Fund at ¥30,000,000.
53. Members supported the creation of a general fund as an operating account, including separating pension and repatriation funds which are in need of replenishment after the retirement of the former Executive Secretary and Compliance Manager.
54. Members discussed the size of the reserve to be maintained in the Working Capital Fund with some suggesting a previous auditor's recommendation of a 6-month reserve is sufficient and others advocating smaller or larger reserves. Noting that there is as yet no decision on the amount of the cap referred to in the NPFC Financial Regulations, Members also discussed

whether the ultimately agreed reserve amount should be a floor, a target or a cap.

55. Members also raised other considerations including:
    (a) The relationship between the proposed funds and the Special Purposes Fund identified in the Financial Regulations;
    (b) Whether any changes to the Financial Regulations would be needed before re-structuring the funds as proposed;
    (c) The recognition that drawing down the Working Capital Fund can offset increasing operating expenditures in the short-term, but as that capital is reduced Member contributions may need to increase; and
    (d) If a Working Capital Fund draw-down is made, the desirability of using draw-downs gradually over multiple years in a way that can mitigate increases in annual Member contributions but also avoid year-to-year fluctuations that might create difficulties for national budgeting.
56. **Recommendation 17**. FAC05 recommends to COM07 that the Secretariat establish a General Fund (Financial Regulations 20.b) with a balance of ¥30,000,000 as of 1 April 2023 to serve as an operating fund for the Commission, separate from the Working Capital Fund which would more clearly serve as a contingency fund.
57. **Recommendation 18**. FAC05 recommends to COM07 that the Secretariat establish separate funds and accounts for pension and repatriation funds as outlined in WP11, consistent with the NPFC Financial Regulations.

8.4 Consideration of a Consultancy for a Legal Advisor

58. The Executive Secretary explained that hiring of a legal advisor for the NPFC seems to have been agreed in 2018 but was never implemented. Instead, short-term contracts have proceeded intermittently on a case by case basis (NPFC-2023-FAC05-WP13).
59. Some Members expressed doubts about the need to retain a legal advisor and how to address issues such as whether this independent advice might contradict advice from their domestic legal advisors. Questions also were raised as to how a legal advisor would be selected, how their advice would be actioned and whether the cost could be justified.
60. Other Members recognized that legal advice can be helpful in understanding complex issues but noted that such issues could be handled through contracting for legal advice as and when the need arises, thereby reducing costs.
61. **Recommendation 19**. FAC05 recommends to COM07 that the Secretariat make use, as needed, of short-term contracts for Commission-related oceans law advice and implications for the Secretariat until the need for a longer-term consultancy is more clearly identified.

8.5 Advice on Location of Meetings

62. NPFC-2023-COM07-WP10 describes an approach for funding meetings if no host is identified. The issue relates to how to support the costs of COM-related meetings (COM, TCC and FAC) in the event that no Member offers to host them.
63. Japan acknowledged that the default location of meetings organized through the Secretariat would be Tokyo or Yokohama. They noted that this approach aligns with other RFMOs such as IATTC and IOTC where the meetings, unless hosted by a Member, are held at the location of the Secretariat and with costs covered by the Commission.
64. Members thanked Japan for hosting many NPFC meetings to date and supported the approach outlined in NPFC-2023-FAC05-WP10.
65. Some Members questioned the estimate of ¥20,000,000 needed from the Commission budget to support a "no-host" meeting.
66. The Executive Secretary explained that this is the amount Japan estimated based on their experience hosting the current set of meetings in Sapporo and current costs. He noted that one option for Members would be to consider using the voluntary contributions from Panama, if renewed as CNCP, to defray a portion of the cost.
67. **Recommendation 20**: FAC05 recommends to COM07 that in the event of a "no-host" meeting of the Commission (and associated subsidiary bodies, i.e. TCC and FAC), the meeting would be held in Japan (Tokyo/Yokohama area) and require an allocation of ¥20,000,000 in the Commission 2023/24 budget to fully support the meeting costs for one set of meetings. This funding would need to be renewed in future years if no meeting hosts are identified.

8.6 FAC Chair and Vice-Chair

68. Mr. Dan Hull (United States) was nominated as FAC Chair. Mr. Luoliang Xu (China) was nominated as FAC Vice-Chair.
69. **Recommendation 21**. FAC05 recommends to COM07 that Mr. Dan Hull (United States) serve as FAC Chair and Mr. Luoliang Xu (China) serve as FAC Vice-Chair starting at the conclusion of the Commission meeting which appoints them and serving for a two-year term.

Agenda Item 9. Next Meeting

70. **Recommendation 22**: FAC05 recommended to COM07 that it consider holding the next meeting of the FAC (FAC06) in conjunction with the next meeting of the Commission (COM08).

Agenda Item 10. Recommendations to the Commission

71. The recommendations of FAC05 to COM07 contained in the report were adopted by consensus.

Agenda Item 11. Adoption of the Report

72. The report was adopted by consensus.

Agenda Item 12. Close of the Meeting

73. FAC05 closed at 19:19 on 21 March 2023.

Annexes:

Annex A – FAC05 Agenda
Annex B – FAC05 List of Documents
Annex C – FAC05 List of Participants
Annex D – Secretariat's Workplan for 2023/24
Annex E – Commission Budgets for 2023/24 to 2026/27
Annex F – Members Contributions for 2023/24 and 2024/25

Please refer to the NPFC website for the complete annexes.

6th Meeting of the Technical and Compliance Committee

18-21 March 2023

Sapporo, Japan (Hybrid)

Meeting Report

Agenda

1. Opening of the Meeting
    a. Welcome to Participants
    b. Selection of Meeting Chair
    c. Appointment of Rapporteur
    d. Introduction of Observers
    e. Adoption of Agenda
    f. Meeting Arrangements

2. Report from secretariat
    a. Fisheries Overview 2021 and 2022
    b. Transshipment Overview
    c. Data Management System Update and Initiatives for 2023

3. Review of MCS related issues from SC

4. SWG Reports on Progress, Priorities and Recommendations
    a. SWG Planning and Development - Report and Recommendations
    b. SWG Operations - Report and Recommendations

5. IUU Vessel List
    a. General Discussion
    b. Recommendation for Provisional IUU Vessel List to the Commission
    c. Recommendations for amendments to current NPFC IUU Vessel List to Commission

6. Vessel Monitoring System
    a. Secretariat report
    b. CLS Contract
    c. VMS Data Security Protocol

7. High Seas Boarding and Inspection
    a. Secretariat Report
    b. Members Reports

8. NPFC Data Sharing and Data Security Protocol

9. Review of Applications for CNCP Status

10. Compliance Monitoring Scheme
    a. Provisional Compliance Monitoring Reports for 2020 and 2021
    b. List of obligations for consideration for the Compliance Monitoring Scheme in 2022
    c. Expiry of CMM 2019-13

11. Conservation and Management Measures - New CMMs and Amendments

12. Cooperation with Other Organizations
    a. NPFC-NPAFC Work Plan
    b. Membership to IMCS Network

13. NPFC Rules for Transparency Pertinent to TCC

14. Draft Report of Performance Review- Recommendations relevant to TCC

15. Other Matters
    a. Consideration of Recommendations for TCC Chair/Vice Chair
    b. Consideration of EU fisheries operations plan

16. Review and Endorsement of TCC Work Plan for 2023/2024

17. Recommendations to the Commission

18. Next Meeting

19. Adoption of the Report

20. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

1.1 Welcome to Participants

1. The 6th Meeting of the Technical and Compliance Committee (TCC) took place as a hybrid meeting in Sapporo and via WebEx, and was attended by Members from Canada, China, European Union, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America, and Vanuatu. Panama attended as a Cooperating Non-Contracting Party (CNCP).

1.2 Selection of Meeting Chair

2. Noting that there is no current Chair of TCC, the Executive Secretary proposed that the interim Vice-Chair of TCC, Ms. Alisha Falberg (USA) serve as the Chair for this meeting.
3. All Members agreed to this proposal.

1.3 Appointment of Rapporteur

4. Dr. Shelley Clarke was appointed rapporteur for TCC06.

1.4 Introduction of Observers

5. The Australian National Centre for Ocean Resources, (ANCORS), Organization for Regional and Inter-regional Studies (ORIS) - Waseda University, PEW Charitable Trusts and the IMCS Network were welcomed as accredited observers to the meeting.

1.5 Adoption of Agenda

6. The agenda as presented in NPFC-2023-TCC06-MIP02, and annotated in NPFC-2023-

TCC06-MIP03 rev3, was adopted (**Annex A**). The List of Documents and the List of Participants are attached as **Annex B** and **Annex C**.

1.6 Meeting Arrangements

7. NPFC Compliance Manager, Ms. Judy Dwyer, outlined the meeting arrangements detailed in NPFC-2023-TCC06-MIP01.

Agenda Item 2. Report from the Secretariat

2.1 Fisheries Overview

8. The Compliance Manager presented a brief overview of fisheries (NPFC-2023-TCC06-IP01). Pacific saury is characterized as declining, mackerel are showing consistent catches, squid catches are slightly increasing, Japanese sardine fisheries' catches are increasing perhaps due to a range extension, and bottom fisheries (i.e. armorhead and splendid alfonsino) are generally declining.
9. Members thanked the Secretariat for the presentation but requested that future TCC fisheries overviews show tables rather than figures only. In particular, TCC06 requested that future fisheries overview information papers include more details and analysis of the number of authorized versus active vessels, effort limits, and integration of information on catch amounts with spatial catch information and species summary data available to the Scientific Committee and other relevant information. Some Members expressed their concerns regarding the increase in effort in recent years in the chub mackerel fishery in the Convention Area as shown in Figures 7-9 of the fisheries overview paper. These Members requested that the matter is considered under the Compliance Monitoring Review process and other agenda items.
10. The Compliance Manager stated that the overview covers the period from establishment of the Commission (i.e. since 2015) to the present but noted that in some cases, data quantity and quality has changed over time with the adoption of new CMMs.

2.2 Transshipment Overview

11. The Compliance Manager presented a brief overview of transshipment activities (NPFC-2023-TCC06-IP08). Under requirements which have been in place since 2015, the Commission receives annual reports from Members on transshipment activities, and an interim measure was developed in 2016 but applies only to bottom fisheries. However, in addition to the annual reports, some Members provide reports on individual transshipments. During the period 2015-2021 a total of 9,000 transshipment operations have been reported covering over 2 million tonnes of fish. Reported positions of

transshipments generally align with positions available from VMS and where this is not the case, anomalies are being investigated. Although there is a direct data entry function for transshipment data, to date it is not well-utilized.

12. TCC06 requested a more detailed analysis be presented in future TCC meetings including, *inter alia*, the number of vessels involved by flag, comparisons of pre-notifications and transshipment reports by flag, quantities of fish transshipped by species, locations of transshipments and alleged violations.
13. Some Members, however, noted the existence of important gaps in data available to the Secretariat, some of which are expected to be remedied through adoption of a new CMM on transshipment.

2.3 Data Management System Update and Initiatives for 2023

14. NPFC's Data Coordinator, Mr. Sungkuk Kang presented a brief update on the development of the Commission's data management system as it relates to TCC (NPFC-2023-TCC06-IP02). Topics covered included a "Members Home and Quick Links" section on the top page, access to VMS information for use in HSBI activities, plans to enhance database integration, creation of an E-transshipment notification and declaration section, and improvements to the Vessel Registry and other compliance sections on the website.
15. Members appreciated the Secretariat's ongoing effort to provide additional functionality to the NPFC website and to support them in submitting and accessing relevant information.
16. TCC requested a number of further developments be considered. These included new and easy-to-use features to support the Commission's anticipated transshipment CMM, such as an automatic reporting function, a feature to identify when new or revised documents have been uploaded, a weekly report showing the cumulative catch of Pacific saury by each Member, and additional information (date of listing, flag and date of last information update) for each vessel in the IUU Vessel List.

Agenda Item 3. Review of MCS related issues from SC

17. The Science Manager, Dr. Aleksandr Zavolokin, provided a summary of MCS matters for coordination between the Scientific Committee (SC) and the TCC (NPFC-2023-TCC06-IP06). These included (1) proposed revisions to CMM 2021-05 and CMM 2019-06 for bottom fisheries and protection of vulnerable marine ecosystems in the northwestern and northeastern Pacific Ocean; (2) request to the Commission to consider amending CMM 2021-05 to address the ambiguity around the referenced effort limits of February 2007 in Paragraph 4A; and (3) proposed revisions to science-related items of

the draft Work plan to implement NPAFC/NPFC Memorandum of Cooperation.

18. Regarding the recommendation on encounter thresholds for cold water corals and sponges, Members considered that bottom fishing in the location should cease when either is exceeded (using "or" rather than "and").
19. Some Members considered that further consideration of the numeric values of the encounter thresholds and the implications of adopting various effort metrics warranted further consideration.
20. Members inquired about the process for considering the recommendations and were informed that the paper was presented for TCC's information and that the Commission would be responsible for consideration of amendments to the relevant CMMs.
21. **Recommendation 1**. TCC06 recommended that the Scientific Committee's recommendation on VME encounter thresholds for cold water corals and sponges (NPFC-2023-TCC06-IP06 (referencing CMM2021-05 (para. 4g) and CMM2019-06 (para. 3j)) be amended so that action would be triggered if either is exceeded (i.e. using "or" rather than "and").

Agenda Item 4. SWG Reports on Progress, Priorities and Recommendations

4.1 SWG Planning and Development – Report and Recommendations

22. Amber Lindstedt (Canada), Co-Lead of the TCC SWG-Planning and Development (TCC SWG-PD), presented an annual summary of discussions, decision points and deliverables from the SWG's 2021-2022 meetings (NPFC-2023-TCC06-IP04). This included work on drafting the data sharing and data security protocol, updating the transshipment CMM, drafting a transparency policy for the TCC, and extending the Compliance Monitoring Scheme (CMS).
23. Members thanked the SWG for their efforts, noting the completion by the SWG of work in three topic areas and their hope for agreement on a new transshipment CMM to conclude the fourth topic.

4.2 SWG Operations – Report and Recommendations

24. Patricia DeMille (Canada), Co-Lead of the TCC SWG-Operations (TCC SWG-OP) presented a summary of work completed in 2021/2022 and 2022/2023 (NPFC-2023-TCC06-IP03). Topics covered included completed work on specification of boarding ladder guidelines, a review of vessel registry transition issues and data field updates, review of annexes to the proposed transshipment measure, review of new electronic IUU vessel listing process, and designing a standardized template to request VMS information. Pending work includes advising on responsibilities for vessels under charter,

definition of "serious violation" across all CMMs, and a review of effort indicators.

25. One Member suggested the SWG to take a more holistic approach to the issue of defining "serious violations".
26. One Member questioned whether there are any vessels under charter in the NPFC Convention Area, and as there was no information available to the contrary, suggested work related to chartering arrangements be removed from the TCC Work Plan (see Agenda Item 16).
27. Some Members queried the definition of "inspection presence" as it relates to the table, noting that the table documents HSBI and yet also contains overflight information.
28. Members noted two minor corrections to the SWG report's summary of operations: Japan noted that they did not have shipriders for either 2021 or 2022; and China noted that it did have surface assets in 2022.

Agenda Item 5. IUU Vessel List

5.1 General Discussion

29. The Compliance Manager presented the current situation with regard to the NPFC IUU Vessel List, draft IUU Vessel List, and IUU Vessel process, explaining that twelve vessels were proposed for 2022 and another 22 vessels for 2023 (NPFC-2023-TCC06-WP01 rev 1). The existing IUU Vessel List contains 36 vessels, all of which are stateless. For 2022, eleven vessels are nominated for the Provisional IUU Vessel List on the basis of refusing boarding and inspection whereas one is suspected of transshipping without authorization. For 2023, nominations for the Provisional IUU Vessel List are on the basis of refusing boarding (eight vessels), unauthorized transshipment or bunkering (eight vessels), improper vessel marking (seven vessels), failure to report on the VMS (seven vessels), unsafe boarding ladders (six vessels), and mis-reporting (five vessels). It was noted that some vessels are nominated based on more than one issue. Some of the activities highlighted in the 2023 Provisional IUU Vessel List nominations mirror those identified under the Compliance Monitoring Scheme.
30. The Chair reminded Members that the task is to decide which of the 34 nominated vessels should be forwarded to the Commission as the Provisional IUU Vessel List.
31. Members agreed that given the large number of vessels nominated that discussions should be structured around groups of vessels with similar nomination characteristics.

5.2 Recommendation for Provisional IUU Vessel List to the Commission

5.2.1 Vessels Submitted by USA

32. USA, as the submitting Member, noted that all the vessels it nominated for activities in 2021-2022 related to refusing HSBI. According to the HSBI report, the vessels flagged to China insisted that personal protection equipment (PPE), specifically Tyvek suits, were required for HSBI personnel but this is not a requirement under the HSBI CMM (CMM 2021-09). In the case of another vessel flagged to Russia, the flag State's explanation of the HSBI refusal also referenced COVID-related and other communication issues but also cited other explanations for the circumstances around the refusal and the actions taken by the flag State in response.
33. China, as the Member flagging some of the nominated vessels, responded that the refusals happened under special circumstances of the COVID pandemic. They were ordered by authorities, rather than deciding for themselves to refuse HSBI for the sake of the health and safety of the vessel's crews and HSBI inspectors. China considers that the use of PPE is mandatory under the guidelines "NPFC High Sea Boarding and Inspection in a COVID-19 Environment – Best Practices" and therefore it was appropriate for the vessels to refuse boarding to inspectors not wearing PPE. China also noted that before the pandemic, these vessels accepted Members HSBI activities and during the pandemic, these vessels accepted other Members' HSBI activities who followed strictly the best practice. China further mentioned that with the adjustment of China's domestic COVID-19 policy and the amendment to the best practices. the HSBI in the Convention Area will become smooth.
34. Russia, as the Member flagging some of the nominated vessels, responded that its vessel was operating under government quarantine procedures effective at the time. Russia stated that a misunderstanding arose because of a lack of familiarity with HSBI procedures which had just gone into effect. Russia noted that no other problems with the vessel were found.
35. Some Members noted that some vessels flagged to China had accepted HSBI boardings from USA and other authorized inspectors during the pandemic. These Members stated that the current HSBI CMM (CMM 2021-09) is binding and guidelines for "NPFC High Sea Boarding and Inspection in a COVID-19 Environment – Best Practices" are not binding. Therefore, neither the use of PPE nor any other COVID preventative measure is mandatory, and there is no rationale for any Member to decide unilaterally that failure to use any particular best practice measure is a basis for denying HSBI.

5.2.2 Vessels Submitted by Japan

36. A first group of two vessels was introduced by Japan. It noted that both vessels are carrier vessels thought to be transshipping without authorization.
37. Panama, as the flag authority for the two nominated vessels at the time of the

infringement, stated that one of the vessels was de-flagged on 8 February 2023 and fined US$860,000. Panama informed TCC06 that it supports the listing of this vessel on the Provisional IUU Vessel List. The other vessel is currently under administrative sanction, has been fined US$735,000, and is not allowed to re- flag or be sold. The authorities also support the listing of this vessel on the Provisional IUU Vessel List.

38. The European Union expressed its strong concern regarding the lack of effective flag State control over these vessels.
39. China provided further information about one of the vessels stating that its registration paperwork had been unexpectedly delayed until after the HSBI. The vessel ceased transshipment immediately, left the area, agreed not to transship in the NFPC Convention Area in the future, and agreed to comply with penalties and fines issued by its flag authorities.
40. A second submission was introduced by Japan. It noted that this vessel refused HSBI even though the inspectors were equipped with PPE. Also, Japan found that the vessel continued to transship despite the fact that it claimed there were four sick crew members onboard and HSBI would endanger the inspectors' health. Japan stated that the vessel failed to continually transmit VMS data.
41. China, as the flag Member of the nominated vessel, clarified that the carrier vessel was authorized to transship and the master never intended to deny HSBI but was simply acting in the interest of health and safety. China stated that misunderstanding and miscommunication between master and inspector led to the so-called refusal. The VMS failure was reported immediately and manual transmission was used.
42. A third group of vessels was introduced by Japan. It presented evidence that these three vessels had transshipped catch with an unauthorized carrier vessel in unconfirmed amounts with discrepancies between logbooks, transshipment reports and catch onboard ranging from 76-231t. Japan stated that during the boarding of one of the vessels, the boarding ladder collapsed.
43. China, as the flag Member of the nominated vessels, stated that the catch discrepancies can be explained by differences in estimating catch weights (e.g. by eye versus after being packed in cartons), and that food supplies, rather than catch, had been transferred. As a result of the incidents, China implemented training in catch estimation and recording, and imposed penalties on the order of US$100,000 on each of the three vessels for receiving cargo from the unauthorized carrier.
44. Several Members questioned whether the transfer between the unauthorized carrier and the fishing vessels involved fish catch or food supplies; asked for further documentation on the nature and amount of the fines imposed; and/or asked whether the sanctions have been completed and if not, whether the vessels are banned from fishing.
45. A fourth and final group of submissions was introduced by Japan. It noted that these

vessels all showed vessel marking issues such as a discrepancy between the call sign marked on the hull and the call sign shown in the NFPC vessel registry, and some vessels were not transmitting VMS. Also, Japan noted that boarding ladders were found to be inadequate, and some of the vessels received fuel from an unregistered tanker (see Agenda Item 5.2.4).

46. China, as the flag Member of the nominated vessels, responded that vessel marking can become difficult to read through a variety of operational or environmental causes. In addition, China stated that one vessel's IRCS was changed but not updated in databases in a timely manner. China considers that these issues are unintentional and technical in nature and should not be the basis for placing a vessel on the Provisional IUU Vessel List. China ordered them to repaint their identifiers and fined the vessels. China also stated that it had issued a circular regarding boarding ladders after the NPFC boarding ladder guidelines were adopted.
47. Some Members considered that the vessel marking violations may not be serious unless there is evidence that the vessels had intended to disguise their identity. Regarding the contact with the unauthorized tanker, one Member stated it is relevant to know whether the fuel received was used to support fishing activities. Other Members referred to the discussion under Agenda Item 5.2.4.

5.2.3 Vessels Submitted by Canada

48. Canada introduced a group of vessels stating that these vessels were not transmitting VMS data and/or had poor or no vessel markings. Canada stated that in one case the vessel had been manually reporting to the FMC, but the data were not provided to the Secretariat until after the vessel was proposed for listing. Canada further noted that in another case the vessel failed to transmit VMS data and had no vessel markings.
49. Russia stated that one of its nominated vessels is a bunkering vessel and is thus not subject to the same requirements as fishing vessels. Russia noted that the VMS reporting issue involved a failure to report automatically to the Secretariat; this has been corrected. Russia further noted that the vessel complied with IMO requirements for vessel marking for tankers.
50. Panama stated that for one of its nominated vessels, the VMS malfunctioned in the transmission between the national VMS center and the Secretariat. Panama also stated that since there was continuous reporting to the national VMS center, the vessel was under the control of national authorities at all times, and these data have now been reported to the Secretariat.
51. With reference to vessels with marking issues, China referred to its previous discussion (see para. 46). China noted that for one of the vessels, there was a gap in VMS

reporting, but the vessel was reporting to national authorities throughout and later all of the missing data were sent to the Secretariat. China committed to working with the Secretariat to improve detection of VMS interruptions in the future.

5.2.4 Vessels not flagged to a Member

52. The Compliance Manager explained that one of the nominated vessels is not flagged to a Member or CNCP. The Secretariat wrote to the purported flag State Sierra Leone, which responded that the vessel had been de-flagged in September is now flagged to Palau. The Secretariat then wrote to Palau on 23 January 2023 but no response has been received.
53. The EU informed TCC06 that an EU national has been identified among the beneficial owners of a company related to the vessel, therefore the EU is investigating the case in line with its domestic legislation. The information available suggests that the vessel is currently flagged to Togo under the name RIWA.
54. One Member stated that as the vessel is a tanker, and is not engaged in fishing activities as defined in the NPFC Convention text, it cannot be listed on the Provisional IUU Vessel List.
55. Some Members considered that the NPFC Convention does require the listing of bunkers on the IUU Vessel List if they are operating at sea in direct support of fishing vessels.
56. One Member noted that under current regulations, there is no way for a non-CNCP to place bunkers on the NPFC vessel registry and this had led to a proposal for an amendment to allow this to happen.
57. After reviewing and discussing the details of the 34 vessels on the Draft IUU Vessel List, TCC06 did not include six vessels ((#20), (#23), (#25), (#28), (#32) and (#33)) on the Provisional IUU Vessel List because it considered that the flag Members had taken effective action in response to IUU fishing activities in question.
58. **Recommendation 2**. TCC06 recommended that COM07 consider the Provisional IUU Vessel List (**Annex D**).
59. China stated that it does not support the inclusion of its flagged vessels on the Provisional IUU Vessel List.
60. Panama asked that vessels which no longer fly its flag be listed in the Provisional IUU Vessel list with Panama shown as the previous flag.
61. TCC06 agreed to show Panama as a previous flag State for two of the vessels on the Provisional IUU Vessel List which were flagged to Panama at the time of the incidents for which they were listed, and for which there is no information about their new flag State.

5.3 Recommendations for amendments to current NPFC IUU Vessel List to the Commission

62. The Chair invited Members to propose revisions to the current NPFC IUU Vessel List contained in NPFC-2023-TCC06-WP19. The list contains 36 vessels and there is no new information about any of the vessels.
63. **Recommendation 3.** TCC6 did not recommend any proposed changes to the current NPFC IUU Vessel List.

Agenda Item 6. Vessel Monitoring System

6.1 Secretariat Report and CLS Contract

64. The Compliance Manager provided a summary report in accordance with the annual reporting requirements of CMM 2021-12 (NPFC-2023-TCC06-IP07). VMS came online in August 2021 and has been successfully implemented despite minor technical issues and some larger interruptions and outages. Expiry of SSL security certificates has been identified as one source of outages but will be minimized by sending reminders to those involved. Ongoing checks of the correlations between transshipment reports and VMS are conducted and anomalies are investigated. The current three-year service contract expires in August 2023 and a two-year extension is planned, however, a 12% increase in cost is expected due to inflation, and exchange rate issues will further increase costs. At present VMS data is shared with Members who have an inspection presence in the Convention Area. However, the provisions of para. 14 c) of the VMS Data Sharing and Data Security Protocol which allow this will expire at the conclusion of COM07 unless a decision is taken to extend them.
65. One Member thanked the Secretariat for the paper but in future requested that it contain more information on where and when reporting gaps have occurred.
66. One Member stated that aerial surveillance does not constitute an inspection presence in the Convention Area and noted that aerial surveillance assets are not registered with the Commission as authorized inspection assets under CMM 2021-09. This Member questioned the basis for sharing VMS data for the purpose of aerial surveillance.
67. Some Members had a different view noting the definition of “inspection presence” in CMM 2021-12 para 1(g), and supported the continued provision by the Secretariat of VMS data to those Members which maintain an inspection presence in the Convention Area via aerial surveillance. These Members suggested it might be valuable to amend CMM 2021-12 to clarify this point. A recommendation to COM07 was later made to task TCC through the proposed TCC Work Plan to develop and include appropriate provisions in the VMS CMM and its data sharing protocol to ensure the provision of VMS data to Members with an aerial inspection presence in the Convention Area to address this issue.

6.2 VMS Data Security Protocol

68. The Chair noted that para. 14 c) of the Data Sharing and Data Security Protocol for VMS Data will expire shortly and invited TCC06 to comment on this issue. The Chair further noted that this protocol was intended to be made an annex to CMM 2021-12 at COM06, but this was unintentionally overlooked.
69. Members noted that there are other proposals for amending CMM 2021-12 that could be incorporated into the same exercise depending on the outcomes of TCC06 discussions.
70. Some Members proposed that para 14 c) could be allowed to expire naturally because the ability to share VMS data derives from para 14 which remains in place.
71. **Recommendation 4**. TCC06 recommends that COM07 renew the Data Sharing and Data Security Protocol for VMS data as it pertains to paragraph 14c. which reads: *"Without prejudice and pursuant to CMM 2017-09, and following the notification process outlined above, the Secretariat shall make VMS data available electronically for the area defined in paragraph 14 b) as it is received, to each Member who has an Inspection Presence in the Convention Area. The provisions of this paragraph shall expire at the end of the next scheduled Commission meeting"* and extend the provision until COM08.
72. **Recommendation 5**. To align the VMS CMM with the acceptance of VMS Data Sharing and Security Protocol by the Commission in 2021 and to incorporate the Protocol into the VMS CCM, as intended, TCC06 recommends to COM07 that the following amendments be made to the VMS CMM:

> *Data access and use*
> *13. All VMS data received by the Secretariat shall be treated as confidential information in accordance with NPFC's Data-Sharing and Data-Security Protocol for Vessel Monitoring System (VMS) Data in Annex 2.*
>
> *14. ~~Subject to the adoption of~~ In accordance with the NPFC's Data-Sharing and Data-Security Protocols for Vessel Monitoring System (VMS) in Annex 2 ~~by the Commission~~, the Secretariat shall provide VMS data:*
> *(a) By electronic means to a Member who has an inspection presence in the Convention Area; or (b) upon request from a Member to support search and rescue (SAR)*
>
> *Data sharing and Security Protocol*

15. ~~Subject to~~ In accordance with NPFC's Data-Sharing and Data-Security Protocols for Vessel Monitoring System (VMS) Data in Annex 2, VMS data shall only be accessed and used for the purposes included in this measure or for any other purposes as agreed by the Commission.

*(Note from Secretariat: The updated CMM 2023-12 is NOT annexed to the TCC Report, as further amendments to the CMM were adopted at COM 07. The fully amended CMM 2023-12 can be found in **Annex AA** to the COM07 report.)*

Agenda Item 7. High Seas Boarding and Inspection

7.1 Secretariat Report

73. The Compliance Manager presented the annual report on HSBI (NPFC-2023-TCC06-IP09). There are currently 45 inspection vessels registered for HSBI by five Members. In 2020, due to the pandemic, there were only three inspections with nine violations observed, three of which were identified as serious. In 2021, there were 36 inspections conducted, and a further twelve which were refused. Of the inspections that were conducted, 23 violations were observed (ten related to vessel marking issues and seven related to mis-reporting or non-reporting) of which 13 were serious. In total over the 2018-2022 period, 85 vessels have been inspected during which 87 violations were observed on 49 vessels (28 related to vessel marking, 15 related to mis-reporting or non-reporting, and 13 related to refusal of boarding) of which 20 were serious. The Compliance Manager highlighted three issues for TCC06 consideration: a) expiry of para. 14 c) of the VMS Data Sharing and Data Security Protocol (see Agenda Item 6.2); b) the lack of a mechanism for the Secretariat to be notified if patrols are cancelled; and c) the lack of clarity regarding procedures for aerial surveillance.
74. Members thanked the Secretariat for the report and noted the previous discussion under Agenda Item 5.1 on aerial surveillance issues. It was suggested the future HSBI annual reports include more specifics on which vessels and flag Members were involved.
75. The Secretariat requested clarification on the interpretation of paragraph 31in the HSBI CMM (2021-09), i.e. whether "Commission" is equivalent to "Secretariat" in the context of transmitting copies of the boarding and inspection reports.
76. **Recommendation 6**. TCC06 recommended to COM07 that in para. 31 of CMM 2021-09 the second instance of the word "Commission" should be replaced with "Secretariat" (**Annex E**).

7.2 Members Reports

77. Noting that more information on HSBI is provided in Member's Annual Reports, and also in Member's submissions for the provisional IUU Vessel List, the United States, Japan, Canada and China presented brief reports of their HSBI activities for 2021 and 2022.
78. The European Union acknowledged the importance of Members' contributions to HSBI.

Agenda Item 8. NPFC Data Sharing and Data Security Protocols (for data other than VMS)

79. The Chair introduced work by the TCC SWG-PD on the NPFC data security protocol which is intended to serve as an overarching document for the NPFC's current Regulations for Management of Scientific Data and Information, and the Data Sharing and Data Security Protocol for VMS Data (NPFC-2023-TCC06-WP25).
80. The document was discussed and amended during TCC06 to produce NPFC-2023-TCC06-WP25 rev2)
81. **Recommendation 7**. TCC06 notes that the text in NPFC-2023-TCC06-WP25 rev2 will undergo further discussion in the margins of COM07 for consideration as a NPFC Data Security Protocol.

Agenda Item 9. Review of Applications for CNCP Status

9.1 CNCP status of Panama and other applications

82. The Secretariat explained that the only applicant for CNCP status for 2023/2024 is Panama (NPFC-2023-COM07-WP09, Circular 02-2022 and Circular 15-2023). The application was originally submitted in advance of the scheduled March 2022 Commission meeting, and subsequently updated in October 2022 and again in March 2023. The amount of the voluntary contribution for 2023/2024 has been communicated to Panama (US$65,000) and Panama has indicated its willingness to pay this amount.
83. Panama supplemented the Secretariat's introduction, indicating that they have actively engaged in NPFC management processes such as the IUU Vessel List and Compliance Monitoring Scheme, and taken several corrective actions in response to requests, and have progressively strengthened their vessel control systems.
84. Some Members considered that beyond confirming submission of information by Panama against all of the requirements (NPFC Rules of Procedures, Rule 10.4 a-e), further assessment is needed to understand whether Panama's commitment to implementing the NPFC CMMs is sufficiently clear and proactive, given the ongoing nature of IUU fishing activities in the Convention Area involving vessels flagged to Panama.
85. Some Members also considered that a decision on the CNCP application of Panama

could not be taken before the completion of discussions on the Compliance Monitoring Report and the assessment of past compliance for Panama, both in the NPFC and in other RFMOs (NPFC Rules of Procedures, Rule 10.6).

86. One Member stated that Panama's performance relates to its commitment to fully implementing the Commission CMMs and also to the requirements of those CMMs, noting the importance to the Commission of adopting a permanent CMM on transshipment.

87. The EU made the following statement:

"While recognizing the efforts and some progress achieved by Panama in strengthening its MCS capabilities and strengthening flag state control over its flagged vessels, the EU was concerned by the repeated serious infringements by Panama flagged vessels in NPFC (and other RFMOs). In particular, Panamanian flagged vessels committed serious infringements in NPFC in 2021 and 2022, however Panamanian authorities did not detect them proactively but only when other CPCs warned them. Therefore, already this element casts serious doubts over the capabilities of the Panamanian authorities to exercise proper control over their vessels. Moreover, despite the measures taken by the Panamanian authorities once they were informed of the IUU activities, those vessels were able to keep operating. This second element shows a lack of proper enforcement capabilities by the Panamanian authorities over their vessels. Subsequently, there are solid reasons to doubt regarding Panama current ability to exert effective control and enforcement over its flagged vessels, therefore, at this point of time the EU would like to express its strong reservation and reluctance in supporting the renewal of the CNCP status in NPFC. The EU suggested to defer the matter to the Commission for further consideration."

88. The Executive Secretary clarified that Panama's original application to renew its CNCP status was submitted in December 2021 in advance of COM07, which was originally planned for March 2022, and contained all the documentation required under 10.4 of the Rules of Procedure.

89. **Recommendation 8**. TCC06 requested further information from Panama, and some additional information was received. TCC06 referred the decision on Panama's CNCP status to COM07 for its consideration.

90. Panama made the following statement during report adoption process:

"The documentation related to the CNCP application of Panama has been submitted in accordance with rule 10.4 and 10.5 through official letter AG-919-2021, distributed by the NPFC through the circular 002/2022 (Jan 4, 2022) and reiterated through official letter AG-197-

2023, distributed by the NPFC through the TCC meeting documents NPFC-2023-COM07 -WP09 rev1 and circular 015/2023, additionally during the TCC06 further information was required about sanctions applied to vessels, as well as the certificate of cancellation of one vessel listed in the provisional IUU list and it was provided to the TCC06. Panama reiterates that, additional to the previous requirements, Panama remains at disposition to provide additional and specific requests for any information or clarification members may require."

Agenda Item 10. Compliance Monitoring Scheme

10.1 Provisional Compliance Monitoring Report for 2020-2021

91. The Compliance Manager presented NPFC-2023-TCC06-WP20 containing the draft Compliance Monitoring Report (CMR). A total of 44 agreed obligations were reviewed covering 11 CMMs selected on the basis that the Secretariat has sufficient information for assessment. Five Members received initial assessments of "non-compliance"; these assessments pertained to refusal of HSBI, vessel marking issues and one incident of unrecorded shark catch. After receiving responses from the Members concerned, only two Members remained with "non-compliance" assessments, both of which were in relation to refusal of HSBI. As this situation depends on the interpretation by Members of the requirements of HSBI COVID-19 guidelines, the Secretariat changed the two remaining "non-compliance" assessments to "potential compliance issue".
92. Members discussed some examples of specific issues related to the draft CMR (NPFC-2023-TCC06-WP20) including following:

(a) Confirmation from the Secretariat of the number of incidents involving shark handling (the Secretariat confirmed that there were 2, with one additional case of sharks found that was not reported as a violation);
(b) The reason for the apparent inconsistency between the Secretariat's fishery overview report (NPFC-2023-TCC06-IP01, Table 9) which shows an increase in effort for mackerels and the compliance assessment and compliance status assigned in the CMR under CMM2019-07 01 which requires Members to refrain from expanding effort on chub mackerel;
(c) The definition of "substantial" harvests that was applied in the assessment of obligation CMM 2021-11 01;

(d) How the obligation to remove or withdraw vessels on the NPFC IUU Vessel List from the NPFC Vessel Registry was assessed if the Member has no vessels on the NPFC IUU Vessel List; and
(e) Draft compliance assessments for vessel markings and HSBI.

93. TCC06 also discussed how the CMS could be improved. Some Members expressed the following points:

(a) The CMR should not merely be the Secretariat's assessment of compliance, rather it should be a vehicle for the Secretariat to present information that allows the Commission to assess the compliance of its Members;
(b) The TCC should focus on clarifying the nature of each obligation to be assessed such as assessing whether flag Members have adopted a binding commitment to implement the obligations, perhaps through a questionnaire to Members, and clarifying the process for assessing compliance related to incidents involving individual vessels under the "Flag State Investigation" process provided by the CMS;
(c) For each obligation assessed, a clear assessment protocol should be articulated including:
  i. how to determine whether the obligation is applicable;
  ii. what data can be applied to the assessment and how to determine whether those data are sufficient for the assessment;
  iii. if data were deemed insufficient for assessment, an identification of what factors contribute to the data gaps and how those data gaps might be remedied;
  iv. working definitions of any subjective terms so that assessments can be consistent from year to year; and
  v. definition of the evaluative criteria applied to decide the compliance rating;
(d) The CMR should be clearer in distinguishing between obligations that are "not applicable" (not relevant) as compared to those which are "not assessed" (e.g. due to data gaps);
(e) Timing of reporting, preparation of the draft CMR and the TCC should be considered, and potentially adjusted, to maximize the timeliness and effectiveness of the CMR;
(f) Analysis and recommendations in "Approaches to Evaluate and Strengthen RFMO Compliance Processes and Performance – A Toolkit and Recommendations" (NPFC-2023-TCC06-IP05) should be considered and applied to the CMS as appropriate.
(g) The relationship between the NPFC IUU Vessel List and the CMR should be better defined particularly with regard to which violations are most appropriately addressed by each process and any areas of overlap)

94. TCC06 noted the draft CMR for 2021. TCC06 did not adopt the draft CMR for 2021 due to a) several concerns raised by Members regarding the robustness and reliability of the assessments in the draft CMR; b) inconsistencies and lack of information for

supporting some assessments ; and c) the lack of time available to address compliance statuses provided in the report. TCC06 determined that it should focus on developing a more robust CMS during the inter-sessional period based on considerations contained in preceding paragraph.

95. **Recommendation 9**. TCC06 recommended COM07 task TCC with inter-sessional work on the CMS and CMR using the review of the draft CMR as captured in the TCC06 meeting report as a starting point.

10.2 Expiry of CMM 2019-13 and list of obligations for consideration for the Compliance Monitoring Scheme in 2022

96. The Compliance Manager introduced issues relating to the expiry of the CMS CMM (2019-13). The scheme was scheduled to expire in November 2022 but was granted a one-year extension by the special meeting of the Commission in October 2022. Another extension can be considered, but CMM 2019-13 contains an annex listing just three obligations to be evaluated in the CMR rather than the 44 obligations used in the 2021 draft CMR.

97. A number of options were developed to propose to the Commission to address the issues identified with the CMS/CMR process.

98. **Recommendation 10**: TCC06 recommends that COM07 consider the following options to address concerns identified within the CMS/CMR process:

(a) that the CMS be extended for one year while the inter-sessional work on a revised CMS proceeds;

(b) that COM07 endorse the list of 44 obligations assessed in the 2021 draft CMR leaving open the possibility to add any obligations arising from new CMMs adopted by COM07; and/or

(c) that all CMM clauses containing the word "shall" should be assessed in the CMR with the Secretariat reporting back on a) any data gaps which prevent the assessment of these obligations, and b) any obligations that lack sufficient specificity for objective assessment.

Agenda Item 11. Conservation and Management Measures – New CMMs and Amendments

11.1 Chub mackerel

99. The European Union introduced its proposal to amend the chub mackerel CMM (2019-07) and to allocate 20,000t to EU, and review the measure when the stock assessment is finalized (NPFC-2023-TCC06-WP04). The EU also introduced its Fisheries Operation Plan WP05 which is a proposed fishing plan for the EU pelagic trawler and impact assessment for its proposed Chub mackerel fishery (NPFC-2023-TCC06-WP05).

100. Members discussed several concerns with the proposal but did not raise any new technical or compliance concerns per se.
101. TCC06 notes the EU's proposal for chub mackerel without highlighting technical or compliance concerns for the consideration of COM07.

11.2 Amendments to Vessel Registry

102. China introduced its proposal (NPFC-2023-TCC06-WP06) to amend the vessel registry CMM (2021-01) to create an interim register for non-Member vessels supplying fuel to Member or CNCP fishing vessels in the Convention Area.
103. Members discussed several aspects of the proposal including potential ambiguities in how different types of vessels and operations are classified and handled in CMMs. Concerns were raised regarding the potential for non-Members to operate in the Convention Area without being bound to NPFC CMMs.
104. TCC06 noted the proposal to amend the vessel registry CMM will continue to be discussed amongst Members and will be considered by COM07.

11.3 HSBI COVID-19 Guidelines

105. Canada introduced a proposal to update the COVID-19 guidance for HSBI and specifically, to recommend the use of face masks during inspections, in line with current understanding and practice (NPFC-2023-TCC06-WP07 rev 1). Canada proposed that TCC06 recommend to COM07 to adopt this proposed non-binding recommendation, which supersedes all previous HSBI COVID-19 guidelines.
106. Several Members expressed support for the proposal, with some requesting minor clarification and suggesting minimal text adjustments.
107. TCC06 supports Canada's HSBI COVID-19 guidelines proposal in principle, noting that further amendments may be considered by COM07.

11.4 Protection of Sharks

108. Canada presented its proposed CMM to protect sharks in the Convention Area by prohibiting the retention of shark or shark parts and encouraging reporting obligations for incidental encounters and releases (NPFC-2023-TCC06-WP08). USA and the EU are co-sponsors of the proposal.
109. Members discussed whether NPFC fisheries are likely to interact with sharks and whether there is currently sufficient information available to understand what impacts these fisheries might be having on sharks. Some Members advocated taking a precautionary approach while others cautioned against implementing a measure that

might be too broad.

110. TCC06 noted the work on a draft CMM for sharks (NFPC-2023-TCC06-WP08, rev 2) and acknowledged that discussions will continue in the margins of COM07.

11.5 Pollution Prevention Measures

111. Canada introduced its proposal to adopt a CMM to reduce marine pollution in the Convention Area (NPFC-2023-TCC06-WP-09).

112. Members expressed support for the proposal while offering some minor amendments.

113. TCC06 generally supported the proposal for a CMM on pollution prevention, noting that discussions will continue as the proposal is submitted to COM07 for consideration.

11.6 Species-specific reporting

114. Korea explained its proposal to clarify the obligation of vessels to record and report the catches of Japanese sardine, neon flying squid and Japanese flying squid in the Convention Area (NPFC-2023-COM07-WP06).

115. Members expressed support for Korea's proposal noting a number of related national data reporting obligations are already in place and appreciating the need to clarify requirements.

116. TCC06 generally supports Korea's proposal to implement reporting requirements for three pelagic species with the expectation that discussions are ongoing and the draft measure will be considered at COM07.

11.7 Amendment to Vessel Registry

117. The TCC SWG-OPs introduced a proposal to remove reference to the "pending IMO #" field from Annex 1 (i) of the NPFC Vessel Registry (NPFC-2023-TCC06-WP11). This confirms that vessels will require an IMO number to register.

118. Members expressed support for this proposal and suggested deleting the outdated reference to 1 January 2020 in the description for this field.

119. **Recommendation 11**. TCC06 supports amendment to the vessel registry requirements to remove the field "pending IMO #" and remove the outdated field description and forwards it to the Commission for consideration (**Annex F**).

11.8 Transshipments and other Transfer Activities

120. The TCC SWG-PD presented new draft language for CMM 2016-03 that represents extensive work by the SWG-PD. This document was further discussed and amended

during TCC06 which resulted in NPFC 2023 WP12 rev3

121. **Recommendation 12**. TCC06 reviewed the draft CMM based on the work of the TCC SWG-PD and recommends that COM07 convene a small working group to assist in drafting and finalizing the text of the CMM for COM07's consideration.

11.9 Amendments to VMS Reporting Requirement

122. Japan introduced its proposal to remove mandatory VMS reporting for research vessels and remove requirements to provide course and speed when manually reporting (NPFC-2023-TCC06-WP14).

123. Some Members supported the proposed changes while others questioned whether they are necessary or helpful.

124. TCC06 noted the proposal to amend VMS reporting requirements by Japan and encouraged Japan to work with other Members to further the discussion at COM07.

11.10 Proposal to Suspend At-sea Transshipments

125. Japan introduced its proposal to adopt a temporary ban on transshipment at sea unless COM07 adopts a new CMM on transshipment (NPFC-2023-TCC06-WP15). Japan clarified that its objective was not to prevent transshipment but to ensure that all transshipment is effectively controlled and managed.

126. One Member expressed concern that the proposal would ban vessels operating legally from transshipping, while vessels operating illegally would continue to transship.

127. TCC06 noted the proposal by Japan to ban at sea transshipment unless COM07 adopts a new CMM on transshipment without further discussion with the expectation that discussions will continue at COM07.

11.11 Amendments to VMS CMM re: serious violations

128. Korea provided background to its proposal to revise the VMS CMM to require MTUs to be tamper-proof and clarify that it is a serious violation to intentionally tamper with or disable a VMS unit (NPFC-2023-TCC06-WP16 rev2). Korea is looking for clarity that the guidance contained in the annex to CMM 2021-12 is mandatory and that tampering with an MTU is a serious violation.

129. Members generally shared Korea's reading of the CMM but suggested different approaches to modifying the text.

130. **Recommendation 13**. TCC06 recommends that COM07 task TCC's SWG-OPs with continuing its work to consistently define what constitutes a serious violation across all CMMs.

131. TCC06 notes the proposal by Korea to amend the VMS CMM on the understanding that

Korea will continue to work on the proposal for the consideration of COM07.

11.12 Amendment of the HSBI reporting format

132. Japan explained that this proposal is not changing the elements of the HSBI report, only modifying the format of the report (NPFC-2023-TCC06-WP13).
133. Some Members requested more time to check the new format to ensure that there are no substantive changes.
134. TCC06 noted the proposal by Japan on the HSBI report format modifications and the fact that discussions will be continuing at COM07.

11.13 Climate Change

135. The USA summarized its proposal related to climate change (NPFC-2023-TCC06-WP27 rev1). Korea and Canada are co-sponsoring the proposal.
136. Members supported highlighting the importance of the issue, but some considered that it would be better formulated as a Commission decision or resolution rather than a CMM.
137. TCC06 expressed general support for the proposal on climate change but recommended COM07 to consider whether it should be a CMM or take another form.

11.14 Observer program for transshipments

138. Pew introduced its observer paper on establishing a transshipment observer program (NPFC-2023-TCC06-OP01), highlighting that it reviews the programs at IATTC, ICCAT, IOTC and CCSBT and covers observer training, cross-certification, data reporting and management, costs and cost recovery, and Secretariat roles and responsibilities.
139. TCC06 noted the observer paper from Pew on establishment of a transshipment observer program.

Agenda Item 12. Cooperation with other Organizations

12.1 NPFC-NPAFC Work Plan

140. The Compliance Manager introduced a paper on the Five-Year NPFC-NPAFC Work Plan showing elements of the plan that are relevant to TCC (NPFC-2023-TCC06-WP23). These mainly pertain to reporting/sharing of Pacific salmon bycatch data and other types of information exchange on MCS issues including suspicious (stateless and unregistered) vessels. Members were invited to comment on the Work Plan and if appropriate forward it to COM07.

141. Some Members posed questions about collection of bycatch data on Pacific salmon and about whether the Memorandum of Cooperation (MOC) has financial implications.
142. TCC06 noted the NPFC-NPAFC Work Plan under the NPFC-NPAFC Memorandum of Cooperation and anticipated that it would be discussed further at COM07, potentially with input from NPAFC to guide a decision.

12.2 IMCS Network

143. TCC06 considered an invitation for NPFC to join the IMCS network (NPFC-2023-TCC06-WP21).
144. Noting that the invitation posed no financial obligations, some Members supported joining the network as a useful way of obtaining valuable advice and support particularly when following up on stateless vessels.
145. Some Members posed questions about the proposed relationship and wished to consider the issue further.
146. TCC noted the invitation and referred it to COM07 for further discussion.

12.3 MOUs with SPRFMO and WCPFC

147. The Executive Secretary introduced draft MOUs with SPRFMO (NPFC-2023-TCC06-WP17) and WCPFC (NPFC-2023-TCC06-WP18) noting that a) all NPFC Members are members of one or both of these organizations, b) there are no financial implications associated with signing the MOUs, and c) there are several benefits to be gained by strengthening links with these organizations. TCC06 was invited to consider recommending to COM07 that the Executive Secretary be authorized to sign the MOU with SPRFMO and advance discussions on the MOU with WCPFC.
148. Some Members supported both MOUs in their current form.
149. Other Members questioned the need for one or both of the MOUs, or considered that further work on the text is required.
150. The TCC Chair encouraged Members to assist with re-drafting the MOUs in order to submit a revised version to COM07 for a decision.

Agenda Item 13. Document Rules

13.1 Considerations for Updates to NPFC Document Rules

151. The Executive Secretary presented NPFC-2023-TCC06-WP03 which proposes updates to the document rules to reflect changes to data accessibility via the website/collaboration site. He explained that these changes have implications for the discussion under Agenda Item 13.2 (Rules for Transparency) as it proposes to harmonize

rules for public access to all NPFC documents. The Executive Secretary noted that FAC05 has already endorsed the proposal for the consideration of COM07.

152. TCC06 did not reach consensus on the proposal to update the document rules as presented in NPFC-2023-TCC06-WP03.

153. **Recommendation 14**: TCC06 recommended that work on these issues continue in the margins with a view toward providing consensus text on document access rules for adoption by COM07.

13.2 NPFC Rules for Transparency Pertinent to TCC

154. The SWG-PD Co-lead introduced a paper covering NPFC rules for transparency as they pertain to TCC (NPFC-2023-TCC06-WP10). The content of this paper is the product of the TCC WG-PD and based on discussions held in 2021. It covers observer access to TCC meetings (can be admitted by a simple majority), public access to all meeting documents (treated in accordance with the NPFC Rules of Procedure), and confidentiality of compliance reports (paragraph 21 of CMM 2019-13 for the CMS).

155. The Executive Secretary clarified that under Rule 5 of the Rules of Procedure, NPFC meetings are open by default and under Rule 9, observers are allowed access to meetings of the Commission and its subsidiary bodies.

156. Some Members expressed that the proposal was not needed because transparency is addressed through the NPFC Rules of Procedure, which do not restrict observers from TCC SWG meetings. These Members stated that the existing rules should be followed and that unless the Commission has adopted rules to the contrary, then meetings of the subsidiary bodies and their working groups should be open as a default practice, consistent with the Rules of Procedure.

157. Some Members considered that the proposal represents a useful balance between transparency and confidentiality, embodies a compromise amongst Members with different views, clarifies access of observers to TCC SWG, and can serve as an opportunity to promote trust while allowing access under some circumstances.

158. **Recommendation 15**: TCC06 did not reach consensus on the draft Interim Rules of Transparency of TCC (NPFC-2023-TCC06-WP10) but recommends that work continue in the margins and the document be further considered at COM7.

Agenda Item 14. Draft Report of Performance Review – Recommendations Relevant to TCC

159. Dr Penny Ridings presented the technical and compliance-related findings of the First NPFC Performance Review (NPFC-2023-TCC06-WP26). The Performance Review Panel noted some early successes, including an active HSBI programme, a comprehensive IUU Vessel List, and establishment of VMS and CMS. However,

progress has lagged in some areas such as regulation and monitoring of transshipment and addressing IUU fishing. A total of 19 recommendations with relevance to TCC were presented, touching upon issues ranging from developing a permanent transshipment measure, expanding the observer programme, setting minimum requirements for port State measures, addressing stateless vessels and fishing with long driftnets, transitioning to a CMS based on data sources such as electronic reporting, encouraging non-Members to become CNCPs, and improving transparency with respect to access to documents and observer participation. As these issues are numerous and varied, the Commission would benefit from a clear strategy to help prioritize its work.

160. Members thanked Dr Ridings and the Performance Review Panel for their comprehensive and thorough work.

161. Members were referred to the report of the Performance Review Panel for more details on recommendations pertaining to carrier and bunker vessel activities.

Agenda Item 15. Other Matters

15.1 Consideration of Recommendations for TCC Chair/Vice-Chair

162. Alisha Falberg (USA) was nominated as TCC Chair. Amber Lindstedt (Canada) was nominated as TCC Vice-Chair.

163. **Recommendation 16**. TCC06 recommends to COM07 that Alisha Falberg (USA) serve as TCC Chair and Amber Lindstedt (Canada) serve as TCC Vice-Chair starting at the conclusion of the Commission meeting which appoints them and serving for a two-year term.

15.2 Consideration of EU fisheries operations plan

164. This item was discussed under Agenda Item 11.1.

Agenda Item 16. Review and Endorsement of TCC Work Plan for 2023/2024

165. TCC06 reviewed the TCC/SWG Work Plan for 2023-2024 (NPFC-2023-TCC06-WP22 rev1) against the progress made to date and in consideration of new items of work arising from TCC06.

166. **Recommendation 17**: TCC06 recommended that COM07 task TCC with the activities contained in the Work Plan (**Annex G**) with particular priority attached to work on the observer program related to transshipment, CMS and reconciling serious violations.

167. TCC06 noted that the Secretariat will continue to provide VMS data to Members with an aerial surveillance presence in the Convention Area as in past practice.

Agenda Item 17. Recommendations to the Commission and Adoption of the Report

168. The recommendations to COM07 contained in the report were adopted by consensus.

Agenda Item 18. Next Meeting

169. TCC06 asked COM07 to consider the timing and location of the next TCC meeting, in conjunction with the implications of these decisions for the CMS and ability of TCC to manage its workload.

Agenda Item 19. Adoption of the Report

170. The meeting report was adopted by consensus.

Agenda Item 20. Close of the Meeting

171. TCC06 closed at 15:37on 21 March 2023.

Annexes:

Annex A – Agenda
Annex B – List of Documents
Annex C – List of Participants
Annex D – Provisional IUU Vessel List
Annex E – CMM 2023-09 for High Seas Boarding and Inspection Procedures
Annex F – CMM 2023-01 on Information Requirements for Vessel Registration
Annex G – TCC 2023/24 workplan

Please refer to the NPFC website for the complete annexes.

7th Commission Meeting

22-24 March 2023
Sapporo, Japan (Hybrid)
Meeting Report

Agenda

1. Opening of the Meeting
    a. Welcome Address
    b. Appointment of Rapporteur
    c. Adoption of Agenda
    d. Meeting Arrangements

2. Membership of the Commission
    a. Status of the Membership
    b. CNCP status of Panama and other applications

3. Report from the Secretariat

4. Performance Review of the Commission

5. Report of the 6th and 7th Scientific Committee meeting

6. Report of the 6th Technical and Compliance Committee meeting
    a. Review of TCC Report
    b. Adoption of IUU Vessel List for 2023
    c. Adoption of Final Compliance Monitoring Report
    d. Consideration of other TCC issues identified during TCC05 or by COM07 meeting

7. Report of the 5th Finance and Administration Committee meeting
    a. Review of FAC Report
    b. Adoption of the proposed budget for 2023/2024 and 2024/2025

8. Report of the 1st, 2nd and 3rd Meetings of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS)

9. Conservation and Management Measures
    a. Review of the amendments to existing CMM's and any new CMMs

b. Updated EU fishing plan for chub mackerel

10. NPFC Data Sharing and Data Security Protocols

11. Cooperation with Other Organizations
    a. PICES
    b. NPAFC
    c. FAO: ABNJ, FIRMS
    d. WCPFC
    e. SPRFMO
    f. UN BBNJ
    g. IMCS Network - NPFC-2023-COM07-WP07
    h. Other Organizations

12. Other matters
    a. Selection of the Commission Chair and Vice Chair
    b. Selection of the TCC Chair and Vice Chair
    c. Secondment and Intern for 2023
    d. Transparency of the Commission
       Other business
    e. Press Release

13. Date and Place of next meeting of the Commission and its Committees

14. Adoption of the report

15. Close of the Meeting

MEETING REPORT

Agenda Item 1. Opening of the Meeting

Welcome Address

1. The Chair of the Commission (Dr. Vladimir Belyaev) called the Seventh meeting of the North Pacific Fisheries Commission (COM07) to order and presented his opening remarks. He noted the NPFC is responsible for one of the most productive ocean areas in the world and called on Members to work with flexibility and focus to improve the status of Pacific saury, mackerel and other stocks. Dr. Belyaev welcomed the European Union to a meeting of the Commission for the first time as a Member. He also thanked the Secretariat for progressing the work of the Commission despite not being able hold in-person meetings since 2019, and appreciated Japan for hosting FAC05, TCC06 and COM07 in Sapporo.
2. Mr. Masaki Kondo, Director General of the Bureau of Fisheries of the Hokkaido Government, welcomed participants to Sapporo on behalf of the host country. He highlighted the importance of addressing the plummeting stock of Pacific saury, stressing the importance of the species not only for Japan's seafood industry as a whole but also for local communities, particularly in Hokkaido, that depend on it. He urged the Commission to re-double its efforts to overcome disputes by relying on science and enhancing cooperation. Finally, he expressed hope that the sense of spring in the air this week would inspire a productive meeting (**Annex A**).
3. COM07 was attended by Members from Canada, China, the European Union, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, the United States of America, and Vanuatu. Panama attended as a Cooperating Non-Contracting Party (CNCP). Observers included Pew Charitable Trusts, World Wildlife Fund, International Monitoring Control and Surveillance Network, Organization for Regional and Inter-regional Studies (ORIS)-Waseda University, the Deep Sea Conservation Coalition, Australian National Centre for Ocean Resources and

Security (ANCORS), the North Pacific Anadromous Fish Commission (NPAFC) and the Fisheries and Resources Monitoring System (FIRMS) of the Food and Agriculture Organization of the United Nations.

1.1 Appointment of Rapporteur

4. Dr. Shelley Clarke was appointed rapporteur for COM07.

1.2 Adoption of Agenda

5. The provisional agenda, as presented in **Annex B**, was adopted. The list of documents and list of participants are attached as **Annex C** and **Annex D.**

1.3 Meeting Arrangements

6. The Executive Secretary (Dr Robert Day) presented the meeting arrangements (NPFC-2023-COM07/TCC06/FAC05-MIP01).

Agenda Item 2. Membership of the Commission

2.1 Status of the Membership

7. Korea, as the depositary of the Convention, informed COM07 that the European Union (EU) deposited its instrument of accession to the Convention on 21 Feb 2022. With this action the membership of the Commission reached nine Members.
8. The EU stated that it was pleased and honored to participate in the NPFC as a full Member and that it was looking forward to contributing to the conservation and sustainable management of NPFC marine biological resources and the protection of marine ecosystems while giving full effect to its membership through the adoption of its fishing plan (**Annex E**).

2.2 Cooperating Non-Contracting Party (CNCP) Status of Panama and Other Applications

9. Panama presented a statement and extensive supporting information (NPFC-2023-COM07-IP07) to COM07 (**Annex F**).
10. The TCC Chair informed COM07 that TCC06 had a robust discussion regarding renewing Panama's CNCP status but could not come to consensus. Therefore, TCC06 decided to refer the issue to COM07 for consideration.
11. Some Members supported Panama's application, noting the efforts Panama has made

in recent years but also the ongoing need to better control transshipment activities in the Convention Area.

12. Other Members expressed continuing concerns about Panama's ability to exercise appropriate flag State control, given re-occurring incidents involving carrier vessels flagged to Panama.
13. One Member noted that the issue of CNCP participatory rights had not been discussed at TCC06 and suggested that if COM07 granted CNCP status to Panama for the coming year, Panama's participatory rights should be limited to transshipment activities in the Convention Area.
14. **COM07 acknowledged the additional information provided by Panama and encouraged it to continue improving the monitoring, control and surveillance of its flagged vessels engaged in fishing operations in NPFC.**
15. **COM07 agreed to renew the CNCP status of Panama from 25 March 2023 until COM08 with participatory rights limited to carrier and bunker vessels, and also agreed that any new failure by Panama to comply with the Conservation and Management Measures adopted by the Commission will be dealt with in accordance with Rule 10, paragraph 18 of the NPFC Rules of Procedures, including considering the revocation of Panama's CNCP status.**
16. Panama thanked the Commission for renewing its CNCP status and pledged its full compliance with the NPFC CMMs as a firm partner in the fight against IUU fishing.

Agenda Item 3. Report from the Secretariat

17. The Executive Secretary, in accordance with Rule 6 of the Rules of the Procedure, provided a summary of highlights of the Secretariat's report on the Commission's activities for the 2021/2023 period (NPFC-2023-SR Secretariat's Report) including an update on the NPFC Data Management System (NPFC-2023-TCC06-IP02) distributed in advance of the meeting. His summary highlighted the heavier workload of the Secretariat in supporting meetings that needed to be held online or in hybrid form, and in parallel, the Secretariat's efforts to facilitate online access to data and other new other information technology services.
18. COM07 noted the Secretariat's report for February 2021-March 2023.

Agenda Item 4. Performance Review of the Commission

19. Dr. Penny Ridings presented the report of the NPFC Performance Review Panel (**Annex G**) noting that three other members of the Panel are attending COM07. All work amongst the team and with respondents was accomplished virtually and the report was completed in August 2022. A total of 68 recommendations were

produced in six areas in accordance with the Terms of Reference: science, conservation and management, compliance and enforcement, decision-making and dispute settlement, international cooperation, and finance and administration. The review noted that the Commission draws upon a large amount of international expertise to manage a diverse array of stocks, highlighting work on management strategy evaluation (MSE), harvest control rules (HCR), and a science-management dialogue. However, challenges in the form of data gaps for target species, lack of ecosystem information, and declining stocks are significant. Additional issues for the Commission going forward include the heavy workload of the subsidiary bodies, the lack of action on scientific advice at the Commission level, complications arising from stocks moving in and out of EEZs and the Convention Area, and the effects of climate change. Given the magnitude of these challenges, the Panel advised that prioritization of issues will be critical and that its report can be helpful in this regard.

20. Members thanked the Panel for their useful recommendations, adding that the Panel's report also serves as a valuable retrospective of all the work of the Commission.
21. The FAC Chair (Mr. Dan Hull) noted that FAC05 had considered the options for actioning the Performance Review Panel's work contained in NPFC-2023-FAC05-WP08 and generally supported the option of the Secretariat coordinating a process with NPFC bodies to provide feedback on the Panel's recommendations to COM08.
22. **COM07 agreed to task the Secretariat with developing a matrix, taking into account those of other RFMOs and CCAMLR, for the recommendations of the Performance Review Panel showing each recommendation, its priority and timeframe, the responsible body, the activities undertaken to date and their status (e.g. 'pending', 'significant progress', 'completed', etc.)**
23. **COM07 agreed that progress on actioning the recommendations of the Performance Review should remain as an agenda item for COM08 and subsidiary bodies.**
24. **COM07 agreed that the Performance Review Panel report be made publicly available on the "Key Documents" section of the NPFC website.**

Agenda Item 5. Report of the 6th and 7th Scientific Committee Meeting

25. The Chair of the Scientific Committee (Dr. Janelle Curtis) presented a summary of work by the Scientific Committee (SC) over the period 2021-2022. These reports are attached as **Annex H** for SC06 and **Annex I** for SC07. The SC and its formal subsidiary bodies, which are the Technical Working Group on Chub Mackerel Stock Assessment (TWG CMSA), the Small Scientific Committee on Bottom Fish and

Marine Ecosystems (SSC BF-ME), and the Small Scientific Committee on Pacific Saury (SSC PS) met formally over 19 days in 2021 (NPFC-2021-SC06-Final Report) and over 23 days in 2022 (NPFC-2022-SC07-Final Report). There were also intersessional meetings of the SSC PS as well as intersessional meetings of seven informal Small Working Groups. The TWG CMSA intends to select stock assessment models for chub mackerel at its next meeting in September 2023. The SSC BF-ME wishes to inform COM07 that catches and fishing effort for North Pacific Armorhead and splendid alfonsino are at historical lows. The SSC BF-ME recommended revisions to CMM 2021-05 and CMM 2019-06 concerning encounter thresholds and move-on distances for VMEs, and recommended a process used by Canada for identifying VMEs as one of the NPFC's processes. The SSC PS noted that Pacific saury catches have been at a historical low for the past few years. The SSC PS and SC will continue to support the work of the Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS) during the coming year (see Agenda Item 8).

26. Members expressed appreciation for the large amount of work accomplished by the SC in the period since the last meeting of the Commission.
27. Some Members requested clarification on when the stock assessment and scientific advice on chub mackerel would become available.
28. The SC Chair, as well as the Chair of the TWG CMSA (Dr Kazuhiro Oshima), responded that the formal stock assessment will be conducted after the stock assessment models are selected in September 2023 and a data preparation meeting is held in early 2024. They noted that subsequent work on HCRs is planned, similar to that underway for Pacific saury.
29. Some Members considered the work on chub mackerel is a priority and looked forward to its timely completion.
30. Russia stated that in para. 86 of the SC07 report, the SC noted that, without a stock assessment of chub mackerel in the Convention Area, it is difficult to provide scientific advice on the EU's proposed fishery operation plan.
31. The EU considered that its updated fishing plan for chub mackerel provides a useful summary of the latest data and scientific information available on this stock and a robust assessment of potential impacts on the target stock, possible bycatch species and the ecosystem. The EU further stated that based on the latest information available, the stock appears to be in quite healthy state and in the absence of any conservation concerns expressed by the SC for this stock, it should be possible for the Commission to discuss and hopefully allow the EU to exercise its participatory rights in the Convention Area, despite the absence of specific advice on the EU fishing plan. The EU also inquired about the reasons that did not allow the SC to

finalise the stock assessment of chub mackerel after many years of efforts and how this process could be facilitated.

32. The EU also queried whether there is an agreed NPFC document specifying the scientific data to be provided to the Commission for all key species and whether such a document would facilitate the work of the SC.

33. The SC Chair noted that there has only been a stock assessment for one of the Commission's eight priority species thus far (Pacific saury) and that Members contributed the relevant data for that assessment. The SC Chair considered that a policy document on the sharing of scientific data could be useful.

34. Japan noted that chub mackerel is a straddling stock of which the spawning ground and the main distribution area lie within the Japanese EEZ. Japan stated that due to Japanese fishers' great efforts to restore the stock, it has been at around the MSY level in recent years, according to Japan's stock assessment. However, since last year, catches in Japanese coastal waters have drastically decreased, and Japan is strongly concerned about the situation. Japan considered that under UNFSA's provisions regarding management of straddling stocks, the NPFC has to take conservation and management measures that do not undermine the effectiveness of Japan's management. In this regard, Japan requests the SC to complete the stock assessment of chub mackerel as soon as possible, so that effective management measures on chub mackerel can be introduced in the near future.

35. The United States and an Observer underscored the importance of the ongoing SC work on Vulnerable Marine Ecosystems (VME), and encouraged the SC to make reference to United Nations General Assembly Resolution 77-118 on Sustainable Fisheries which calls upon States to ensure application of the precautionary principle and on RFMOs to adopt CMMs to prevent the occurrence of significant adverse impacts.

36. An Observer noted that managing the impacts on VMEs through the use of "move-on rules" can lead to gradual degradation of habitats and questioned the high encounter thresholds for sponges proposed by the SC.

37. The SC Chair responded that the SC plans to conduct further reviews by taxa and by gear to better refine the encounter thresholds.

38. COM07 accepted the report and the recommendations of the Scientific Committee from SC06 (2021) and SC07 (2022), noting that decisions regarding the amendment of CMMs will be considered by COM07 under Agenda Item 9, and the participation of NPFC in the Food and Agriculture Organization of the United Nations (FAO) Fisheries and Resources Monitoring System (FIRMS) will be considered under Agenda Item 10.

Agenda Item 6. Report of the 6th Technical and Compliance Committee

6.1 Review of the TCC06 Report

39. The Chair of TCC (Ms. Alisha Falberg) presented her report on the outcomes of TCC06 (**Annex J**).
40. Members noted that a number of items were discussed at TCC06 but not resolved and that those discussions would continue at COM07 and be reported under other agenda items.
41. The EU suggested that future TCC agendas allocate more time to important issues such as IUU Vessel Lists and the Compliance Monitoring Report.
42. **COM07 adopted the report and recommendations of TCC06 including:**

(a) Renewing para. 14(c) of the Data Sharing and Data Security Protocol for VMS Data until COM08 (TCC Recommendation 4)

(b) Incorporating the Data Sharing and Data Security Protocol for VMS Data into the VMS CMM (TCC Recommendation 5)

(c) Replacing the second instance of the word "Commission" with "Secretariat" in para. 31 of CMM 2021-09 (TCC Recommendation 6) (Annex K)

(d) Amending the vessel registry requirements to remove the field "pending IMO #" and remove the outdated field description from CMM 2021-01 Annex 1 (TCC Recommendation 11) (Annex L)

(e) Tasking TCC's SWG-OPs with continuing its work to consistently define what constitutes a serious violation across all CMMs (TCC Recommendation 13)

(f) Tasking TCC with the activities contained in the TCC Work Plan for 2023-2024 (NPFC-2023-TCC06-WP22 rev1) (TCC Recommendation 17)

6.2 Adoption of IUU Vessel List for 2023

43. The TCC Chair informed COM07 that the Provisional IUU Vessel List for 2022/23 includes 28 vessels which are proposed to be added to the existing IUU Vessel List which currently contains 36 vessels.
44. The United States provided additional information and updates to COM07regarding the vessels it nominated to the NPFC IUU Vessel List:

(a) One Russia-flagged: Russia clarified the information it provided regarding the inclusion of its vessel on the draft NPFC IUU Vessel List and the action it took as flag State in response to the refusal of the attempted boarding and inspection. The United States had notified appropriate Russian contacts of the intent to board the vessel and the subsequent boarding denial by the Russian vessel on 10 Oct 2021. After a delay in processing the notification, the flag State authorities notified the

master of the vessel that they should accept the boarding and inspection on 15 Oct 2021. At that point, the USCG inspection vessel was no longer in the vicinity of the vessel to conduct the boarding. Russia acknowledged the vessel had committed a serious violation by refusing the boarding and that the vessel was obliged to accept the boarding regardless of the extenuating circumstances referenced, such as questions over interpretation of the voluntary COVID-19 best practice guidelines. Russia directed the vessel to return to port after leaving the Convention Area. Russia inspected the vessel in the port of Korsakov, Sakhalin after the vessel remained in quarantine. The Russian Coast Guard inspected the vessel two more times and found no evidence of other violations of NPFC CMMs. The period of inspection and loss of fishing days for the vessel lasted from 09 Nov 2021 to 09 Dec 2021. Russia also took actions as a flag State to clarify the requirement to accept high seas boarding and inspection under the NPFC and took steps to address internal communication issues that had contributed to the delay in directing the vessel to accept the boarding. Russia stated this issue should be treated in the context of non-compliance rather than the IUU vessel list as Russia had already taken appropriate actions to address the refusal of boarding as a flag State. Russia committed to direct its vessels to accept future boardings consistent with CMM 2021-09 to promote compliance with NPFC CMMs and assist in the Commission's efforts to combat IUU fishing.

(b) China-flagged fishing vessels nominated by the United States: China stated that it consistently adhered to combating IUU fishing activities together with NPFC Members and accepted most HSBI activities according to NPFC CMMs, but it had instructed fishing vessels flagged under its authority and operating in the Convention Area to refuse some boardings by authorized inspectors under CMM 2021-09 due to issues of interpretation regarding the nature of some provisions of the COVID-19 best practices adopted by COM06. China claimed that it had investigated the activities of these vessels and identified no other serious violations. The United States, supported by most other Members, noted the binding obligations to accept boardings in CMM 2021-09 are not affected by the voluntary best practices document and clarified that the voluntary recommendations contained in Annex F were not a legitimate basis to deny boardings. China indicated the refusal to accept boardings should be considered in the context of assessing the compliance of flag States with existing HSBI obligations, and not an IUU vessel listing issue, as the vessels were acting at the direction of the flag State. The USA, supported by several other Members, indicated that it considered China to have been non-compliant with the relevant obligations in CMM 2021-09. Noting the conditions of the COVID pandemic had changed, China agreed to the proposed

updates to the COVID best practice guidelines and is willing to join the consensus on the acknowledgement of the voluntary nature of the updated best practice guidelines related to COVID. China committed, as the flag State, to direct vessels to comply with future boardings, consistent with CMM 2021-09 to promote compliance with NPFC CMMs, and assist in the Commission's efforts to combat IUU fishing.

45. **COM07 decided not to include the United States-nominated vessels in the 2023 NPFC IUU Vessel List**.

46. Japan reported to COM07 regarding three vessels which appeared to be conducting transshipment operations with an unauthorized carrier vessel. Japan received information from China, the flag State of the vessels, that the vessels were confined to port pending a full investigation of the alleged transshipment of fish and have been de-registered. The vessels have also been fined for transferring cargo to an unauthorized carrier vessel.

47. **COM07 agreed not to include these Japan-nominated vessels (Vessel numbers 13, 14 and 15 from the NPFC Provisional IUU Vessel List) in the 2023 NPFC IUU Vessel List on the following conditions: the Chinese government will further investigate the case and take effective actions, such as, inter alia, prosecution or the imposition of sanctions of adequate severity. These three vessels must not be registered to the NPFC Vessel Registry and must not operate in the Convention Areas unless those sanctions have been fully complied with and Members are satisfied with the actions taken by the flag State. For this consideration, China will update the Members of the result of the investigation and relevant sanctions intersessionally and at TCC07.**

48. Japan also reported to COM07 on a carrier vessel, flagged to China, which denied HSBI by Japanese inspectors even though the inspectors were wearing personal protective equipment. For this case, Japan noted that it had received a positive response from China committing to a thorough investigation. The vessel has been de-registered, its license has been suspended for six months and it has received a stern warning to accept HSBI in future.

49. **COM07 agreed not to include this carrier vessel (Vessel number 20 from the Provisional IUU Vessel List) in the 2023 NPFC IUU Vessel List on the following conditions: the Chinese government will further investigate the case and take effective actions, such as, inter alia, prosecution or the imposition of sanctions of adequate severity. This vessel must not be registered to the NPFC Vessel Registry and must not operate in the Convention Areas unless those sanctions have been fully complied with and Members are satisfied with the actions taken by the flag State. For this consideration, China will update the Members of**

the result of the investigation and relevant sanctions intersessionally and at TCC07.

50. Japan reported on two further vessels, also flagged to China, which had been cited for a variety of offences including bunkering with an unregistered carrier.

51. COM07 agreed to not include these two fishing vessels in the 2023 NPFC IUU Vessel List, noting China's commitment to require its vessels to receive fuel from NPFC-registered tankers only.

52. Having taken these decisions with regard to the Provisional IUU Vessel List, four vessels remained.

53. COM07 considered the Provisional IUU Vessel List recommended by TCC06 and agreed to add four vessels, i.e. Zhong Fu Hao 111, Gloriwave (currently named Riwa), Qian Yuan and Shun Hang to the IUU Vessel List for 2023 (AnnexM).

54. Noting that TCC06 did not recommend any proposed changes to the NPFC 2021 IUU Vessel List, COM07 agreed to retain the 36 vessels on the existing list for a total of 40 vessels.

6.3 Adoption of Final Compliance Monitoring Report (CMR)

55. The TCC Chair reported to COM07 that TCC6 extensively discussed, but did not adopt, the CMR for 2021.

56. COM07 agreed to task TCC with inter-sessional work on the CMS and CMR using the review of the draft CMR as captured in the TCC06 meeting report as a starting point.

57. COM07 agreed that the CMM on CMS be extended for one year while the inter-sessional work on a revised CMM on CMS proceeds (Annex N).

58. COM07 endorsed the list of 44 obligations assessed in the 2021 draft CMR, leaving open the possibility to add any obligations arising from new CMMs adopted by COM07 (Annex N).

59. COM07 agreed that all CMM clauses containing the word "shall" should be assessed in the CMR with the Secretariat reporting back on a) any data gaps which prevent the assessment of these obligations, and b) any obligations that lack sufficient specificity for objective assessment.

Agenda Item 7. Report of the 5th Finance and Administration Committee Meeting

7.1 Review of FAC05 Report

60. The FAC Chair presented COM07 with the report of FAC05 (**Annex O**), noting that due to the recent infrequency of FAC meetings, there were many backlogged issues needing to be cleared. Consensus was reached on several issues, including the Commission's Budget for 2023/2024, Budget Estimates for 2024/2025 and Indicative Budget Estimates for 2025/2026 and 2026/2027. FAC05 did not have time to discuss the issues of MOUs with WCPFC, SPRFMO and ISC and referred them to COM07. Furthermore, the issue concerning a repatriation allowance for the former Compliance Manager was referred to Heads of Delegation, and the issue of the NPFC Staff Selection Policy as outlined in NPFC-2023-FAC05-WP10 rev1 was left open for discussion by COM07.

61. COM07 accepted the report of FAC05 and recommendations.

62. The FAC05 Chair provided COM07 an update on the request from the former Compliance Manager. COM07 recognized the important contributions of the former Compliance Manager and considered that all commitments between the Commission and the former Compliance Manager have been fulfilled.

63. Noting the exceptional nature of the Commission's request to delay the timing of the former CM's repatriation, and without setting any precedent for future staff remuneration issues, COM07 agreed that the request to review his repatriation package resulting from exchange rate fluctuations relative to those applied to salaries in the NPFC be addressed through a payment from the 2022/23 budget as an extraordinary expense and that this is in line with his request to the FAC Chair and Heads of Delegation.

7.2 Adoption of the proposed budgets for 2023/2024 and 2024/2025 and Member Contributions

64. One Member requested clarification on whether the issue of the repatriation allowance for the former Compliance Manager might have implications for the budgets agreed by FAC05, i.e. require them to be revisited.

65. The Executive Secretary explained that these repatriation funds, if agreed by COM07, could be sourced from the current year's budget and thus not affect the budgets agreed by FAC05.

66. COM07 adopted the proposed budgets for 2023/24 and 2024/25 (Annex P) and associated Member Contributions for 2023/24 and 2024/25 (Annex Q).

Agenda Item 8. Report of the 1st, 2nd and 3rd Meetings of the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS)

67. Dr. Toshihide Kitakado, the Co-Chair of the Joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific Saury (SWG MSE PS)

presented a summary of work accomplished during three meetings of the SWG (February 2022 (**Annex R**), September 2022 (**Annex S**) and March 2023 (**Annex T**); NPFC-2023-COM07-IP05). The SWG MSE PS Chair explained the management strategy evaluation (MSE) as an evaluation process of candidate management procedures for achieving stated management objectives through stochastic simulations. Prior to describing the SWG-related reports, the SWG MSE PS Chair noted the current stock status as follows: a) catches of Pacific saury are at an historical low in 2021 and 2022; b) an increasingly higher proportion of catch is being taken from the Convention Area ; c) the stock declined from high productivity status in mid-2000s to the current low levels; d) fishing pressure has been high compared to F_{msy} level for more than 10 years; e) although there was a slight increase in biomass from 2021 to 2022, recent stock biomass remains at an historically low level in recent years. The SWG MSE PS Chair also stressed the scientific advice from SSC PS and SC as follows: i) the current total allowable catch (TAC) specified in CMM 2021-08 is much larger than a TAC based on an F_{msy} catch approach; and ii) a simplified but commonly used approach in other RFMOs to harvest control rules (HCR) suggests that current catch levels are similar to what an HCR would recommend. The SWG MSE PS Chair further explained the main agreements in the SWG meetings. The SWG MSE PS Chair noted it had been decided that the primary management objective is stock recovery, with secondary objectives of avoiding an unsustainable stock status and achieving high and stable catches. Among three options for operating models, the current interim stock assessment (BSSPM) has been selected, noting, however, that this model cannot account for environmental effects and is relatively optimistic about stock recovery. Three HCRs are being examined: one is a typical HCR with a one-year time lag between the assessment and implementation, and the others incorporate a fishery-independent survey conducted by Japan just before the main fishing season for adjusting a preliminary TAC if changes in biomass (or its index) exceed a predetermined trigger level. The SWG anticipates selection of an HCR in 2024 that can be used to set the Pacific saury TAC at COM08.

68. Japan reiterated its concern about the status of Pacific saury stocks and the need for MSE work to continue as a basis for informed management decision-making.

69. In response to a question, the SWG MSE PS Chair explained in more detail how the survey-adjusted candidate HCRs could be used. First a preliminary and precautionary TAC would be set based on the assessment conducted in the previous year and if the results of the fishery-independent survey index meet a trigger level, the TAC would be adjusted just before the main fishing season. For example, if the index doubled, this would be taken as a sign of recovery and the TAC could be

adjusted upward. In contrast, if the index only increases by 10-20% then the TAC would remain as it is. Such trigger levels and the extent of adjustment are still being considered by the SWG MSE PS.

70. One Member expressed concern about HCRs that could change the TAC on short notice as this could present practical problems for domestic managers administrating the TAC as well as socio-economic issues for the fishery.
71. The Chair of the SWG MSE PS noted the concern for future consideration by the SWG MSE PS. However, he considers that dynamic HCRs (i.e. those that involve adjustment through the fishery-independent survey) may have a higher probability of achieving the agreed management objective of recovering the stock.
72. One Member appreciated the valuable information contained in the SWG MSE PS Chair's presentation and asked that it be posted as an Information Paper (NPFC-2023-COM07-IP05).
73. One Member reserved its position with regard to the three candidate HCRs, noting that it might wish to consider other candidate HCRs in future.
74. **COM07 accepted the reports and recommendations from the SWG MSE PS and thanked the SWG for its work.**

Agenda Item 9. Conservation and Management Measures

9.1 Review of the Amendments to Existing CMMs and any new CMMs

9.2 Chub mackerel (Secretariat note: CMM chub mackerel updates are identified in para. 105)

75. The European Union introduced its proposal to amend the chub mackerel CMM (2019-07) to allow the EU participating in this fishery, and giving effectively full effect to the EU's membership in NPFC (NPFC-2023-COM07-WP03 rev1). The EU also introduced its Fisheries Operation Plan containing an impact assessment for its proposed chub mackerel fishery (NPFC-2023-COM07-WP04 rev1). The EU noted that the proposed modest annual allocation (20,000t) represented only ~5% of the total annual catch of this species in the Convention Area. The EU further noted that to date no scientific, technical or compliance concerns have been raised with regard to the proposal by TCC or SC.
76. Some Members expressed concerns about the potential for operational conflicts with other fisheries in the area.
77. One Member considered that the proposal to catch such a large amount of chub mackerel in a short period of time might pose unacceptable risks to the ecosystem.
78. One Member, citing Article 3(h) of the Convention text, expressed concern with expanding fishing effort in the absence of scientific advice from the SC. It

suggested that the proposal be limited to one year as a trial, subject to review by SC08, TCC07 and COM08. It further stated this fishery should not be a basis for future decisions that refer to a historical catch in the Convention Area noting that in SPRFMO an "interest to fish" is considered to be 0.1% of the historical catch.

79. The EU noted that it had already committed to a clear catch limit, and its proposal would contribute useful scientific information on chub mackerel and other species to the Commission. The EU maintained that it should not be held to different standards than those applied to the Members fishing the other 95% of the catch.

80. The EU made the following statement:

"The EU expressed its disappointment with the position taken by the NPFC Members fishing for chub mackerel on the EU proposal. It reminded that since 2018 the EU has developed a thorough and comprehensive Fisheries Operation Plan, using the best available science. The EU also reminded that none of the Members was requested or developed such a detailed Fisheries Operation Plan for any of the current fishing operations taking in place in the Convention area. According to the EU, the last scientific information available presents a stock that has been recovering during the last years and currently it seems to be in the green quadrant of the KOBE plot, which means that it is at a healthy status. The EU stressed that the SC has not raised any concern on the status of the chub mackerel stock. The EU indicated that it had presented a proposal aiming at taking into account a range of conditions suggested to the EU by some Members. The EU noted that these conditions have not been imposed to any other Members and that in its view, they did not have any scientific basis, therefore the EU considered many of those conditions discriminatory and against the spirit and principles of UNCLOS and UNFSA. The EU urged the Commission to finalize the stock assessment of chub mackerel, a task that has been unresolved for already too many years and offered to support the Commission in finalising this important task (including through voluntary financial contributions if this could facilitate this process). The EU reiterated its concerns expressed at TCC, that while the EU is refused repeatedly access to the chub mackerel fishery, some members appear to be in breach with the key obligation under CMM2019-07 which requires to avoid increasing fishing effort for this stock. The EU indicated that this was clearly documented on figures 7 and 9 of the IP01 presented at TCC6. The EU urged these members to refrain from expanding their fishing effort for chub mackerel and to comply with the obligations of the CMM 2019-07. The EU indicated that it will

continue to work intersessionally with Members in a constructive spirit to make sure that next year, a compromise would be reached that would allow the EU to participate and operate in NPFC fisheries on an equal footing as other Members.".

81. Some Members stated that they had supported the EU proposal and need for additional scientific advice, and also shared the EU concern that some Members may not be complying with the effort limits in the current measure. While they encouraged Members to consider the EU proposal and seek a consensus outcome in future years, they did not share the EU's view that the lack of adoption of their proposal should be considered discriminatory treatment.
82. One Member stated that its fishing effort was kept within historical existing levels in accordance with CMM 2019-07 and it is willing to work with Members to maintain the sustainability of the stock.

9.3 Pacific Saury

9.3.1 Pacific Saury Proposal by Japan

83. Japan introduced its proposal for updating paras. 4, 5 and 6 of the current CMM for Pacific Saury (2021-08) covering TAC setting, catch limits for Members and seasonal closures (NPFC-2023-COM07-WP-05). Japan noted the need for revised allocations for Pacific saury and the serious situation that has developed in conjunction with increasingly intensive fishing on the high seas. Three factors were cited as contributing to this: a) the high seas fishing season has become longer; b) the use of technological advances such as high-performance sonar systems and aggregating lights; and c) high incidence of transshipment. As a result, fewer Pacific saury are migrating to coastal areas and this has had a devastating effect on local communities which rely on this stock. Japan proposes to reduce fishing mortality linearly when biomass is below B_{msy}. The proposal calls for a TAC of 101,000t in the Convention Area (as compared to a total catch of 170,000t over the entire range of the stock). The proposal also calls for a fishery closure from January to July, allowing the fishery to open in August when the fish are more mature, and due to higher fat content, have a higher market value. This is considered a more efficient use of limited resources.
84. One Member acknowledged the importance of the resource to local communities and supported the proposal.
85. Some Members considered the proposed TAC was too low. These Members also expressed concern that the proposed seasonal closure is too long and too burdensome on the fishing industry, particularly with regard to crewing contracts.

86. One Member called for a simulation study of the closure period to determine the optimal length of closure.
87. Japan noted that the seasonal closure is one way of reducing fishing effort and other ways could be considered.
88. An Observer supported the proposal by Japan and encouraged adoption of a HCR for Pacific saury in 2024.

9.3.2 Pacific Saury Proposal by Korea

89. Korea presented its proposal to update paras. 4, 5 and 6 in CMM 2021-08 Pacific saury (NPFC-2023-COM07- WP08 rev1). The proposal calls for a) a TAC in 2023 and 2024 of 205,000t; b) a reduction in catch by Members of 55% from the 2018 level unless Members have already complied with para. 14 of the existing measure, in which case a catch reduction of 45% would apply; and c) prohibition of fishing for Pacific saury in the areas east of 170°E from June to July as a means of protecting juvenile fish.
90. Vanuatu called upon the Commission to take into account the development aspirations of small island developing States (SIDS). In addition, Vanuatu was of the view that while the current stock is comparable to previous years, the biomass level likely recovered in 2021 and 2022, and Vanuatu will not oppose a more stringent measure as long as Members considered the special requirements of small island developing States.
91. One Member noted that distant water flag States must take full responsibility for their flagged vessels operating in the Convention Area.
92. One Member noted that the measure will not affect the management situation in domestic waters.
93. Some Members expressed concern that since para. 14 of the existing CMM is a voluntary provision, it should not be used as the basis for preferential treatment for those Members which voluntarily complied with it.
94. In discussions at COM07, this proposal was combined with the proposal for Pacific saury discussed under Agenda Item 9.3.

9.3.3 Combined Proposal

95. After further discussions in the margins of COM07 incorporating the discussions under Agenda Item 9.5, a revised proposal was produced (NPFC-2023-COM07-WP05 rev4) which provides Members with two options for effort control: a) reduce the number of vessels fishing for Pacific saury by 10% from 2018 levels; or b) limit fishing days to 180 days. Each Member can choose and notify the Secretariat of

their preferred option. Members which had fewer than five vessels in 2018 are exempt from these effort controls. A TAC of 150,000t would be authorized in the Convention Area for 2023 and 2024 compared to a total catch of 250,000t for the Pacific. The seasonal closure provision is mandatory and requires no fishing east of 170°E in June and July.

96. Canada expressed its disappointment that a more sustainable approach to managing Pacific saury had not been adopted at COM07, but in the absence of any opportunity for a better measure, stated that it was prepared to accept the proposal.

97. United States also expressed disappointment as it had anticipated setting a more precautionary TAC. However, this Member considered the effort control aspects of the proposed measure to be useful and it was prepared to support the proposal as progress towards more sustainable management, and on the understanding that the TAC can be revisited once the scientific advice on the stock is updated.

98. Vanuatu, referring to its special status as a small island developing state and as the smallest player in the Commission, urged the Commission to consider its aspirations under international instruments and NPFC Pacific saury CMM in future meetings.

99. One Member expressed its continuing concern about the Pacific saury stock which is in a depleted state due to fishing activities in high seas areas. This Member looks forward to better management of the stock in the future.

100. COM07 adopted an amended CMM for Pacific saury (Annex U).

9.4 Reporting requirements for Japanese sardine, neon flying squid and Japanese flying squid, and chub mackerel

101. Korea introduced its proposal (NPFC-2023-COM07-WP06 rev1) to add language to CMM 2021-11 requiring the recording and reporting Japanese sardine, neon flying squid, and Japanese flying squid in accordance with domestic recording and reporting requirements. Korea considered that these requirements could usefully be extended to include Pacific saury and chub mackerel as well.

102. Some Members supported the proposal with the inclusion of Pacific saury and chub mackerel.

103. The EU suggested that the reporting of effort data also be included, since it was a very basic and important reporting requirement in all RFMOs.

104. Korea agreed to further amend the proposal, including updates for Pacific saury and chub mackerel, with a view to adoption by COM07.

**105. COM07 adopted the following language for insertion into CMMs on Japanese sardine, neon flying squid and Japanese flying squid (Annex V), Pacific saury (Annex U), and chub mackerel (Annex W): "Members of the Commission and CNCPs shall ensure that fishing vessels flying their flag that fish for [<*insert*

***species*>] record their catches and report them to the relevant flag State authorities in accordance with their national data recording and reporting requirements".**

9.5 Amendment to vessel registry

106. China introduced its proposal to allow non-Members of NPFC to register tanker vessels on the NFPC vessel registry, noting that the proposal was discussed at TCC6 (NPFC-2023-TCC06-WP06 rev1).
107. China reported that there was no consensus on the proposal. China expressed its hope that the Commission will take up this issue in future discussions.

9.6 COVID HSBI guidelines

108. Canada introduced a proposal to update the COVID-19 guidance for HSBI in line with current understanding and practice (NPFC-2023-TCC06-WP07 rev2). Canada noted that this proposed non-binding recommendation supercedes all previous HSBI COVID-19 guidelines and has incorporated minor edits in response to comments received since TCC06.
109. COM07 adopted the revised NPFC High Seas Boarding and Inspection COVID-19 Recommendation (Annex X).

9.7 Sharks

110. Canada presented its proposed CMM to protect sharks in the Convention Area by prohibiting the retention of shark or shark parts and encouraging reporting obligations for incidental encounters and releases (NPFC-2023-COM07-WP08 rev3). USA co-sponsored the proposal. The text was clarified and amended to address concerns articulated by Members.
111. Some Members questioned whether the NPFC is competent to regulate, and in this case, prohibit directed fishing for sharks.
112. One Member considered that simply having shark fins onboard was not an indication of a directed shark fishery and that the amount of shark catch should be considered.
113. One Member expressed concern that the scope of the measure is too broad given that many NPFC fisheries do not normally have shark interactions.
114. Other Members stated that even though WCPFC has the mandate for some shark species in the NPFC Convention Area, it is still NPFC's responsibility to manage bycatch in the fisheries for which it is responsible. Furthermore, the measure is limited to those vessels included in the NFPC vessel registry and not otherwise registered to other RMFOs. These Members noted multiple incidents of shark fins

being identified onboard during NPFC HSBIs which suggests that a) there are shark interactions in NPFC fisheries and b) the practice may be widespread and needs to be banned immediately.

115. One Member suggested that the safe handling and release guidelines are based on longline fisheries and these guidelines don't align well with the types of gear used in the NPFC.

116. Some Members considered that proposals such as this should originate from the SC so they have scientific review before they reach the Commission for decision.

117. Some Members highlighted the importance of gathering useful data on shark interactions through the imposition of logbook recording and reporting requirements in the measure.

118. The Commission Vice-Chair suggested a way forward involving paring down the text to just two elements: a) a ban on shark finning; and b) a statement by the Commission that there are currently no directed shark fisheries therefore under Article 3(h) of the Convention any future directed fisheries would require an impact assessment of the long-term sustainability of any such fisheries should they occur.

119. One Member stated that it could accept recording and reporting requirements for retained sharks only.

120. Canada revised the proposal to reflect a ban on shark finning and a statement by the Commission that as there are currently no directed shark fisheries, any expansion of fishing effort must follow the process in Article 3(h) of the Convention.

121. Members discussed the shark interaction reporting requirements and agreed sharks should be reported by species where possible. Other minor adjustments were made to the text for clarity (NPFC-2023-COM07-WP08 rev5).

122. COM07 adopted a CMM on sharks (Annex Y).

9.8 Pollution prevention

123. Canada introduced its proposal to adopt a CMM to reduce marine pollution in the Convention Area (NPFC-2023-TCC06-WP09 rev3). Based on feedback from TCC06 and discussions in the margins of COM07, Canada noted that it had amended the proposal to better align with WCPFC and SPRFMO pollution measures.

124. COM07 adopted a CMM on pollution prevention (Annex Z).

9.9 Transshipment

125. COM07 discussed a draft of a CMM on transshipment and other transfer activities produced by TCC06 and amended the draft measure through a series of SWG meetings chaired by Amber Lindstedt (Canada) and held in the margins of COM07.

126. COM07 adopted an amended CMM on transshipment (Annex AA).

127. COM07 confirmed that violation of obligations contained in the CMM on transshipment would be considered in accordance with CMM 2019-02 "Conservation and Management Measure to Establish a List of Vessels Presumed to have carried out IUU Fishing Activities in the Convention Area of the NPFC".

128. Canada announced that it will make a voluntary contribution of US$40,000 for the Secretariat toward the development of the necessary applications for the Secretariat to effectively implement the reporting requirement functions in the transshipment measure that the Commission adopted.

9.10 HSBI Report Form

129. Japan presented a proposal to modify the format of the reports used to record the results of high seas boarding and inspections (NPFC-2023-TCC06-WP13 rev1).

130. COM07 adopted the amended format of the HSBI Boarding Inspection Report Form for inclusion in Annex C of the NPFC HSBI Implementation Plan (Annex BB).

9.11 Revision to VMS requirements for research vessels and manual reporting of course and speed

131. Japan introduced its proposal to exempt research vessels from mandatory VMS reporting by requiring them to report via AIS, and remove requirements to provide course and speed for all vessels when manually reporting (NPFC-2023-TCC06-WP14 rev 1). The AIS requirement would take the form of a new paragraph added to the VMS CMM (2021-12). The change to the requirement to provide course and speed would result in an amendment to para. 1(h) of the existing measure.

132. One Member considered that additional language should be added to cover requirements in the event of AIS malfunction.

133. Some Members suggested that the exemption for research vessels be implemented on a one-year trial basis and the results reviewed at TCC07.

134. Japan revised the proposal to reflect the proposed one-year trial period and a requirement for research vessels to notify authorities 30 days prior to initiating their cruises (NPFC-2023-TCC06-WP14 rev 2).

135. COM07 adopted an amended VMS CMM as it pertains to research vessels and the requirements to report course and speed when manually reporting (Annex CC).

9.12 Proposal to temporarily suspend transshipment

136. Japan introduced its proposal to adopt a temporary ban on transshipment at sea unless COM07 adopts a new CMM on transshipment (NPFC-2023-TCC06-WP15 rev1) which the United States is co-sponsoring. Japan clarified that the objective of the proposal is not to prevent transshipment but to ensure that all transshipment is effectively controlled and managed. It queried how, under current circumstances, flag States can effectively monitor the catch of their vessels and control the risk of IUU fishing.
137. Some Members did not support the proposed ban on the basis that it would cause onerous impacts to their fisheries.
138. Some Members considered that the effects of the measure would be to ban transshipment by legally operating vessels while allowing it to continue for those vessels operating illegally.
139. Japan withdrew its proposal on the basis of the adoption of the transshipment CMM (see Agenda Item 9.9).

9.13 VMS Tampering and Serious Violations

140. Korea introduced its proposal to revise the VMS CMM (2021-12) to require MTUs to be tamper-proof and clarify that it is a serious violation to intentionally tamper with or disable a VMS unit (NPFC-2023-TCC06-WP16 rev2). The proposal was further amended to replace "must" with "shall" (NPFC-2023-TCC06-WP16 rev3).
141. COM07 adopted an amended VMS CMM by adding a new paragraph (after para. 15 of the existing measure) which states "MTUs on fishing vessels shall be tamper-proof so as to preserve the security and integrity of VMS data." (Annex CC).

9.14 Climate change

142. The United States introduced a resolution on climate change (NPFC-2023-TCC06-WP27 rev2). Canada, the EU and Korea co-sponsored the proposal. The resolution calls for making the topic a standing item of the Commission and relevant subsidiary bodies which should make recommendations to help adapt to climate change and promote resilience in NPFC fisheries. The United States noted that format and wording of the proposal has been modified in response to Members' comments received in the margins of COM07.
143. **COM07 adopted a Resolution on climate change (Annex DD).**

9.15 Bottom Fishing CMMs

144. COM07 considered the recommendations of SC07 regarding amendments to CMM

2021-05 for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northwestern Pacific Ocean and CMM 2019-06 for Bottom Fisheries and Protection of Vulnerable Marine Ecosystems in the Northeastern Pacific Ocean. These amendments pertained to encounter thresholds for cold water corals and sponges, move-on rules, encounter reporting requirements, provisions for closures, and revision of text regarding catch limits for North Pacific armorhead and development of new fisheries for North Pacific armorhead and splendid alfonsino (CMM 2021-05 only).

145. In response to a question about how the move-on distance of 2NM was reduced to 1NM, the SC Chair explained that Deep Sea Conservation Coalition and SPRFMO data on VME patch sizes had been reviewed by the SC and it was determined that VME patch size was small enough that 1NM is sufficient.

146. In response to another question about the 500kg threshold for sponges, the SC Chair agreed that the threshold value is large and will be reviewed relative to other RFMO's thresholds by taxa and by gear type.

147. Canada, the EU and the United States considered that a 500kg threshold for sponges is tantamount to not setting a threshold at all. These Members referred to the SPRFMO threshold for the same taxa set at 25kg and emphasized the need to apply the precautionary approach.

148. One Member did not support the specification of any encounter threshold that had not been reviewed by the NPFC SC.

149. An Observer noting that the UN's second World Ocean's Assessment stated that bottom trawling is the greatest current threat to seamount ecosystems, urged the Commission to deliver on its commitment to protect VMEs by closing areas to fishing. This Observer referred to a recent groundswell of support for biodiversity protection signified by UNGA Resolution 77-118, the Kunming-Montreal Global Biodiversity Framework and negotiation of the Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction (BBNJ). He also noted that deep sea sharks are amongst the most vulnerable of shark taxa.

150. COM07 adopted amended CMMs based on the recommendations of the SC, but tasked SC08 with reporting back to COM08 regarding the appropriateness of the 500kg encounter threshold for sponges based on a review by taxa, gear type and the use of encounter thresholds in other RFMOs (Annexes EE and FF).

Agenda Item 10. NPFC Data Sharing and Data Security Protocols

151. The TCC Chair introduced work by TCC06 on the NPFC Data Sharing and Data Security Protocol (for data other than VMS) (NPFC-2023-TCC06-WP25 rev3).

Discussions have continued in the margins of COM07.

152. Members discussed para. 28, as proposed by one Member in TCC06, and agreed to delete it.

153. Members discussed whether in Annex 2(j), data in Section 2 of the Annual Report to the Commission by Members should remain as confidential data or whether this requirement could be relaxed.

154. One Member which preferred to keep Section 2 data confidential, stated it is working toward placing Annual Report-Section 2 data in the public domain and hoped to revisit this issue in future.

155. COM07 adopted the NPFC Data Sharing and Data Security Protocol (Annex GG).

Agenda Item 11. Cooperation with Other Organizations

11.1 NPAFC

156. The Science Manager presented NPFC-2023-TCC06-WP23 rev2 containing a draft Work Plan to implement the Memorandum of Cooperation (MOC) between NPFC and the North Pacific Anadromous Fish Commission (NPAFC).

157. One Member expressed concern regarding the exchange of bycatch data on Pacific salmon, particularly as the NPFC has no mechanism to collect such data, as well as the financial implications that might arise from the MOC.

158. Dr Vladimir Radchenko (NPAFC) explained that no financial obligations are imposed through the MOC and considered that the exchange of information on salmon bycatch in NPFC fisheries would be very useful for both organizations. NPAFC would like to consider adopting the MOC at its next meeting in May 2023.

159. One Member referred to an agreement at TCC04 which provides for voluntary reporting of salmon encounters for NPFC fisheries. This Member suggested that the Pacific salmon bycatch data exchange under the MOC could be done on a voluntary basis.

160. COM07 approved the Work Plan with NPAFC on the basis that there are no associated financial obligations and that bycatch information would be provided voluntarily (Annex HH).

11.2 FAO FIRMS

161. The Science Manager presented NPFC-2023-COM07-WP13 describing collaborative and partnership agreements with FAO's Fisheries and Resources Monitoring System (FIRMS). The overall goal of participating in FIRMS is to

allow decision-makers access to information, such as fisheries status and trends, to develop effective policies.

162. Mr. Aureliano Gentile (FAO) explained that a partnership agreement carries no cost implications aside from occasional travel to steering committee meetings. Partners have a vote in FIRMS decision-making and thus can drive products that are of interest to them. Collaborative agreements are designed for research and academic organizations.

163. COM07 agreed to enter into a partnership agreement with the FAO FIRMS (Annex II).

11.3 WCPFC

164. The Executive Secretary summarized the progress toward a Memorandum of Understanding (MOU) with the Western and Central Pacific Fisheries Commission (NPFC-2023-TCC05-WP18). This draft of the MOU was shared with the WCPFC Executive Director (at the time, Mr. Feleti Teo), and has undergone an initial legal review in WCPFC, but would now need to be shared formally with the new WCPFC Executive Director.

165. COM07 adopted the text of the MOU with WCPFC and tasked the Executive Secretary with coordinating the execution of the MOU with the WCPFC Executive Director (Annex JJ).

11.4 SPRFMO

166. The Executive Secretary summarized the status of the draft MOU with the South Pacific Regional Fisheries Management Organization (SPRFMO) (NPFC-2023-FAC05-WP07). He noted that the wording of this MOU is drawn from the draft MOU with WCPFC and had been earlier circulated to Members at COM06. There has been some discussion of this MOU with SPRFMO in the past, but if this draft is endorsed by COM07, the Executive Secretary will provide the updated text to the SPRFMO Executive Secretary for his review.

167. The draft MOU text was further revised through discussion with Members at COM07 who requested some clarification of language and content (NPFC-2023-FAC05-WP07 rev 3).

168. COM07 adopted the text of the MOU with SPRFMO and tasked the Executive Secretary with coordinating the execution of the MOU with the SPRFMO Executive Secretary (Annex KK).

11.5 IMCS Network – NPFC-2023-COM07-WP07

169. The Executive Secretary reminded COM07 of an invitation by the IMCS network for NPFC to formally join the organization (NPFC-2023-TCC06-WP21).

170. Ms. Sarah Lenel (IMCS Network) explained that the network is an informal voluntary organization, focused on cooperation and information exchange. It was established in 2001 and currently has over 80 members. The IMCS Network coordinates the Tuna Compliance Network, which allows compliance managers and Chairs and Co-Chairs of relevant bodies to share lessons learned. Ms. Lenel noted that the level of participation in the IMCS Network is left to the organization to decide and there are no financial obligations imposed.

171. COM07 agreed to become a member of the IMCS Network.

11.6 ISC

172. The Executive Secretary noted that a draft MOU with the International Scientific Committee (ISC) had been presented to FAC05 as NPFC-2023-FAC05-WP12. Due to time constraints FAC05 did not make any recommendations regarding this draft MOU.

173. COM07 adopted the text of the MOU with ISC and tasked the Executive Secretary with discussing its development with the ISC Chair (Annex LL).

Agenda Item 12. Other Matters

12.1 Selection of the Commission Chair and Vice Chair

174. Mr. Shingo Ota (Japan) was nominated as Commission Chair. Ms. Jung-re Riley Kim (Korea) was nominated as Commission Vice-Chair.

175. COM07 selected Mr. Shingo Ota (Japan) and Ms. Jung-re Riley Kim (Korea) as Chair and Vice-Chair of the Commission, respectively, for a two-year term beginning at the conclusion of COM07.

12.2 Selection of Chairs and Co-Chairs of Subsidiary Bodies

176. COM07 confirmed the TCC06 nominations of Ms. Alisha Falberg (United States) as Chair and Ms. Amber Lindstedt (Canada) as Vice Chair of TCC for a two-year term.

177. COM07 confirmed the FAC05 nominations of Mr. Dan Hull (United States) as Chair and Mr. Luoliang Xu (China) as Vice-Chair of the FAC for a further two-year term.

178. COM07 confirmed Mr. Derek Mahoney (Canada) as the Co-chair representing TCC for the Small Working Group on Management Strategy Evaluation for

Pacific saury.

12.3 Confirmation of Secondments and Interns

179. COM07 confirmed FAC05's recommendation of a one-year extension of the secondment of Ms. Natsuki Hosokawa from the Fisheries Agency of Japan to NPFC and the appointment of Mr. Jihwan Kim (Korea) to a 6-month internship.

12.4 Transparency of the Commission

180. The Executive Secretary explained that there are two aspects to this agenda item. First, NPFC-2023-FAC05/TCC06-WP03 discusses updates to the document rules to reflect changes to data accessibility via the website/collaboration site. FAC05 endorsed the approach outlined by the paper; TCC06 also considered the paper but did not make a recommendation.

181. COM07 adopted the revision to the NPFC Document Rules (Annex MM).

182. Some Members indicated they are interested in seeing documents made available to the public more broadly and would work intersessionally with the Secretariat on proposed language.

183. Second, NPFC-2023-TCC06-WP10 presented a proposal to TCC06 by the SWG-PD covering rules for observer access to TCC SWG meetings, public access to all meeting documents, and observer access to compliance reports. TCC06 could not reach consensus on these proposals. Discussions continued at COM07 resulting in a revised proposal (NPFC-2023-TCC06-WP10 rev1) for Rules of Transparency Pertinent to TCC to be implemented on an interim basis for a one-year period.

184. Some Members maintained that such an interim policy should not be required as the TCC SWG meetings should be open as a default practice consistent with the NPFC Rules of Procedure. Nevertheless, these Members considered that the policy represents a positive step forward from recent practices and were prepared to accept it.

185. COM07 adopted the Interim NPFC Rules of Transparency Pertinent to TCC for a one-year period through TCC07 (Annex NN).

12.5 Staff Selection Rules

186. The FAC Chair provided some background to the issue of the staff selection policy (NPFC-2023-FAC05-WP10). The paper contains two parts, and the latter part—Staff annual review of performance— was agreed by FAC05 and endorsed by

COM07 when it endorsed the report of FAC05. The first part of the paper deals with staff selection policy. This part has been the subject of ongoing discussion in the margins of COM07.

187. While there was no consensus to adopt the first four pages of the document as a whole, Members did agree to adopt one section of the text in NPFC-2023-FAC05-WP10 rev2.

188. COM07 adopted the paragraphs contained under "Appointment terms(s)" as a revised NPFC staff selection policy (Annex OO).

12.6 Press Release

189. COM07 endorsed the Press Release for publication on the NPFC website.

Agenda Item 13. Date and Place of Next Meeting

190. COM07 confirmed tentative dates for TCC07 as 9-12 April 2024, for FAC06 as 13 April 2024 and for COM08 as 15-18 April 2024 in Japan, with a priority on Tokyo/Yokohama area, taking into account price and availability.

Agenda Item 14. Adoption of the Report

191. The report was adopted by consensus.

Agenda Item 15. Close of the Meeting

192. COM07 closed at 23:12 on 24 March 2023.

Annexes:

Annex A – Opening Remarks by Japan
Annex B – Agenda
Annex C – List of Documents
Annex D – List of Participants
Annex E – Statement from the European Union
Annex F – Statement from Panama
Annex G – Report of the North Pacific Fisheries Commission Performance Review Panel
Annex H – Report of the 6th Meeting of the Scientific Committee
Annex I – Report of the 7th Meeting of the Scientific Committee
Annex J – Report of the 6th Meeting of the Technical and Compliance Committee
Annex K – CMM 2023-09 for High Seas Boarding and Inspection Procedures
Annex L – CMM 2023-01 on Information Requirements for Vessel Registration
Annex M – NPFC IUU Vessel List - 2023
Annex N – CMM 2023-13 For the Compliance Monitoring Scheme
Annex O – Report of the 5th Meeting of the Finance and Administration Committee
Annex P – Budgets for 2023/24 and 2024/25
Annex Q – Assessed Contributions for 2023/24 and 2024/25
Annex R – Report of the 1st meeting of the Small Working Group on Management Strategy Evaluation for Pacific Saury
Annex S – Report of the 2nd meeting of the Small Working Group on Management Strategy Evaluation for Pacific Saury
Annex T – Report of the 3rd meeting of the Small Working Group on Management Strategy Evaluation for Pacific Saury
Annex U – CMM 2023-08 for Pacific Saury
Annex V – CMM 2023-11 for Japanese Sardine, Neon Flying Squid and Japanese Flying Squid
Annex W – CMM 2023-07 for Chub Mackerel
Annex X – HSBI COVID-19 recommendation
Annex Y – CMM 2023-14 on Sharks
Annex Z – CMM 2023-15 on the Prevention, Reduction, and Elimination of Marine Pollution
Annex AA – CMM 2023-03 on Transshipments
Annex BB – HSBI Boarding Inspection Report Form
Annex CC – CMM 2023-12 on the Vessel Monitoring System (VMS)
Annex DD – Resolution 2023-01 on Climate Change
Annex EE – CMM 2023-05 for Bottom Fisheries and Protection of VMEs in the NW Pacific

Ocean

Annex FF – CMM 2023-06 for Bottom Fisheries and Protection of VMEs in the NE Pacific Ocean

Annex GG – NPFC Data Sharing and Data Security Protocols

Annex HH – Five-year Work Plan to implement NPAFC/NPFC Memorandum of Cooperation

Annex II – FIRMS arrangement

Annex JJ – MOU WCPFC

Annex KK – MOU SPRFMO

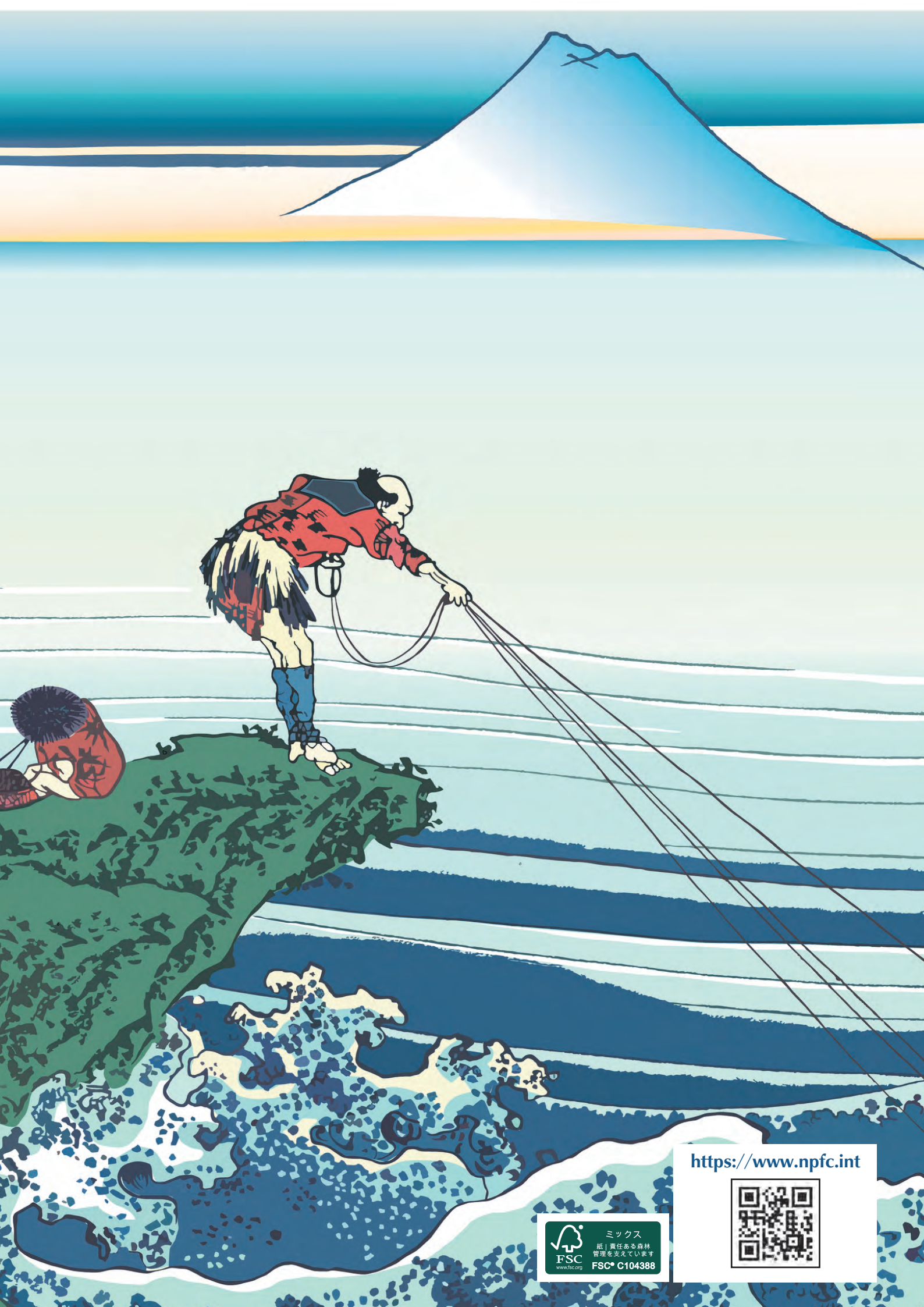
Annex LL – MOU ISC

Annex MM – NPFC Document Policy

Annex NN – Interim rules of transparency pertinent to TCC

Annex OO – NPFC Staff Selection Policy

Please refer to the NPFC website for the complete annexes.



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