North Pacific Fisheries Commission

15th Meeting of the Small Scientific Committee on Pacific Saury
REPORT

1-4 September 2025

This paper may be cited in the following manner:

Small Scientific Committee on Pacific Saury. 2025. 15th Meeting Report. NPFC-2025-SSC PS15-Final Report. 25 pp. (Available at www.npfc.int)

2nd Floor Hakuyo Hall,
Tokyo University of Marine Science and Technology,
4-5-7 Konan, Minato-ku, Tokyo
108-8477, JAPAN

TEL +81-3-5479-8717
FAX +81-3-5479-8718
Email secretariat@npfc.int
Web www.npfc.int

Contents

North Pacific Fisheries Commission
15th Meeting of the Small Scientific Committee on Pacific Saury

1-4 September 2025
WebEx

REPORT

Agenda Item 1. Opening of the Meeting

1. The 15th Meeting of the Small Scientific Committee on Pacific Saury (SSC PS15) 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 the Republic of Vanuatu. The Ocean Foundation and the Pew Charitable Trusts attended as observers. Dr. Quang Huynh participated as an invited expert.

2. The meeting was opened by Dr. Toshihide Kitakado (Japan), the SSC PS Chair, who welcomed the participants.

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

4. Mr. Alex Meyer was selected as rapporteur.

Agenda Item 2. Adoption of Agenda

5. The agenda was adopted (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 PS14 and SC09

6. The Chair presented the outcomes and recommendations from the SSC PS14 meeting and the 9th meeting of the Scientific Committee (SC09).

3.2 SWG MSE PS06

7. The Chair presented the outcomes and recommendations from the 6th meeting of the joint SC-TCC-COM Small Working Group on Management Strategy Evaluation for Pacific saury (SWG MSE PS06).

3.3 COM09

3.3.1 CMM 2025-08 for Pacific Saury

8. The Science Manager explained that the Commission adopted a revised Conservation and Management Measure (CMM) for Pacific Saury at its 9th Meeting. He highlighted the revisions to the catch management section of the CMM, including changes to catch limits and updated reporting requirements.

9. China pointed out that changes in management measures, particularly the option for Members to adopt an overall catch limit instead of an Olympic fishery and the addition of paragraph 10c to the CMM at COM09, have resulted in changes in some Members' fishing strategies, which may influence the catch per unit effort (CPUE) standardization for Members' fisheries.

3.3.2 Others

10. The Science Manager highlighted that the Commission continued to discuss the establishment of a Regional Observer Program and that this would be discussed further by the SSC PS under agenda item 12.2.

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

11. The SSC PS reviewed the Terms of References (ToR) of the SSC PS and determined that no revisions are currently necessary.

4.2 CPUE Standardization Protocol

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

4.3 Stock Assessment Protocol

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

Agenda Item 5. Member's fishery status including 2025 target fisheries and bycatch

14. Canada presented Pacific saury catch information (NPFC-2025-SSC PS15-IP02). Canada does not have a commercial fishery targeting Pacific saury, but occasionally takes Pacific saury as bycatch and in research surveys. In 2024, 87 individuals were caught by Canadian surveys. Canada has started taking length-weight measurements of Pacific saury from its surveys and can make these data available to other Members.

15. China presented its Pacific saury fisheries status (NPFC-2025-SSC PS15-IP03). Total catch

in 2024 was 40,503 MT, after bottoming out in 2021. In 2025, total catch up to 20 August has been 19,959 MT and a total of 49 vessels have been operating, a decrease of 10 from 2024. As of 20 August, nominal CPUE has been 10 MT/vessel/day in 2025. Standardized effort was 4,671 vessel days in 2024. The fishing grounds in 2025 have moved to the north in August compared to 2024. A yearly comparison of body length compositions has been conducted from 2014 to 2024, and larger fish seem to have been caught in 2025 compared to 2024 based on size box compositions.

16. China also provided additional comments. China highlighted the negative socio-economic impacts on its fishing industry as a result of the decreasing TAC. China also explained that its fishing vessels have observed better conditions than what is suggested by the NPFC's stock assessment and that they have expressed concern about the accuracy of the assessment. In particular, fishing vessels have observed larger-sized fish being caught recently, including in June and July of 2025. Furthermore, fishing grounds have continued to shift northward in recent years. China emphasized the need to develop a more complex model that can account for seasonal and annual variation in spatio-temporal distribution for the full Pacific saury MSE.

17. In terms of bycatch, China explained that Pacific saury is taken as bycatch in its mackerel fishery and that it would provide further details at SSC PS16.

18. Japan presented its Pacific saury fisheries status (NPFC-2025-SSC PS15-IP04). Landings and nominal CPUE in 2024 were 38,695 MT and 1.05 MT/haul, respectively, slightly higher than in 2023, but remain at low levels. In 2020–2024, relative accumulated catch reached 50% by mid-October and 98% by mid-November. The highest seasonal catch in 2024 was at the end of October, at 9,559 MT. By month, catch in October was the largest at 44%. Standardized effort was 77,365 hauls in 2024, the second highest level in the last 5 years. The fishing grounds in August and September were mainly formed in the high seas, but after October, the main fishing grounds moved to the Japanese exclusive economic zone (EEZ). The percentage of age-1 fish in catch was 87.7%, the third highest since 2000, but mean body length was the smallest. The 2025 fishing season started on 10 August. 95 fishing vessels were registered, 2 fewer than in 2024.

19. Japan shared further observations, noting that individuals caught so far this year have been larger and fatter than previous years, and that the fishing grounds have shifted northwards.

20. Regarding bycatch, Japan explained that the level of Pacific saury bycatch from other fisheries is low and is reported in Japan's annual report. Bycatch of other species in the stick-held dip net Pacific saury fishery is rare.

21. Korea presented its Pacific saury fisheries status (NPFC-2025-SSC PS15-IP07). Annual catch decreased continuously from 2018 to 2023, but it has increased slightly since 2024. As of July 2025, the annual catch has reached 1,818 MT, about 29% higher than the same period in 2024. 14 to 10 stick-held dip net vessels operated from 2015 to 2022 each year. Their number has decreased gradually since then due to the continued low level of Pacific saury catch. In 2025, 4 fishing vessels are in operation compared with 5 vessels in 2024. Nominal CPUE in 2024 was 4.95 MT/vessel/day, an increase from 2023. The standardized effort was 2,230 days in 2024, a significant increase from 2023. Fishing operations have taken place between 145°E and 170°E in recent years. Fishing operations in June and July 2025 shifted southward compared to 2023 and 2024. In 2024, the fork-length (FL) range was 25–33 cm, with a mean value of 28.4 cm. It was lowest in June (27.7) and highest in September (28.7). From 2008 to 2025, the mean FL ranged from 26 to 29 cm, and no significant annual trend was observed. In terms of size box composition (S: 18–30 cm; M: 23–33 cm; L: 27–34 cm; 2L: 29–34 cm (fork length)), in 2025, the M ratio was dominant in June, while the L ratio was dominant in July, compared with the S and M ratios being dominant for the same months in 2024. Annually, the L ratio used to be dominant until 2016, but the M ratio has been dominant since then.

22. Korea confirmed that Pacific saury is not taken as bycatch in its other fisheries.

23. Vanuatu presented its Pacific saury fisheries status (NPFC-2025-SSC PS15-IP08). Total annual catch peaked at 8,231 MT in 2018, before dropping to a historical low in 2022. As of the end of August, total catch in 2025 has been 1,001 MT. The number of operating vessels was 4 from 2015 to 2021 and was 3 in 2022. Only 2 vessels were active in 2023 and 2024. So far in 2025, 4 vessels are active. An annual comparison of accumulated catch shows a trend of abundance increasing from August. By mid-August 2025, catch has already exceeded that of past years, indicating a faster and earlier accumulation rate. An annual comparison of the relative seasonal catch shows that there are usually two peaks in the fishing season. In 2024, the peaks were around late September and late October. In 2025, the first peak appeared in mid-August, showing a shift in seasonal pattern. Nominal CPUE so far in 2025 has been 1.4 MT/haul or 9.1 MT/day. Generally, the main fishing grounds begin in the east early in the season, before shifting to the west. In 2025, fishing grounds were further to the east and the north. Looking at the size box compositions (S: less than 6 pcs/kg; 1: 6–9 pcs/kg; 2: 10–12 pcs/kg; 3: 13–15 pcs/kg; 4: 15–18 pcs/kg; 5: more than 19 pcs/kg), caught individuals have generally been larger in 2025. The proportion of bycatch, comprising sardines and mackerel, in the Pacific saury fishery is very low compared to Pacific saury catch.

24. Chinese Taipei presented its Pacific saury fisheries status (NPFC-2025-SSC PS15-IP09). The historical catch reached its highest in 2014. The catch in 2024 was 69,486 MT. 70 vessels conducted fishing activities in 2024. In 2025, accumulated catch by the end of July was 16,015

MT, which was more than that of the same period in 2024 (7,030 MT). The nominal CPUE during the period of June to July is about 2.44 MT/haul in 2025, compared to 1.68 MT/haul and 2.32 MT/haul for the equivalent period in 2024 and 2023, respectively. In 2025, the fishing grounds have been further to the south and west. Looking at monthly size box composition (S: less than 6 pcs/kg; 1: 6–9 pcs/kg; 2: 10–12 pcs/kg; 3: 13–15 pcs/kg; 4: 15–18 pcs/kg; 5: more than 19 pcs/kg), in 2025, size 3 was dominant in June, while size 1 and 2 were dominant in July. As of the end of July, bycatch accounted for 0.003% of the total catch and comprised mostly sardine.

25. Russia informed the SSC PS that one vessel has begun fishing operations in search of Pacific saury but that no catch has been taken before September in 2025. Russia explained that the latest available information about its fisheries status was presented at SSC PS14 (NPFC-2024-SSC PS14-IP09) and that it would provide any updates as necessary at SSC PS16.

26. The Science Manager presented the cumulative catch of Pacific saury in the Convention Area as of mid-August in 2020, 2021, 2022, 2023, 2024, and 2025. The cumulative catch in 2025 is approximately 62,267 MT compared to 34,760 MT in 2024, 36,487 MT in 2023, 14,342 MT in 2022, 23,701 MT in 2021, and 9,875 MT in 2020. There have also been changes in some Members' seasonal fishing operation dynamics.

27. The SSC PS noted that Members' recent fisheries-dependent information suggests that Pacific saury fishing conditions may generally be improving in 2025, as indicated by increased total catch, catch-per-unit-of-effort and increased size of catch.

28. The compiled data on Pacific saury catches in the northwestern Pacific Ocean from 1950 to 2024 are available in NPFC-2025-SSC PS15-WP07 (Rev. 1).

Agenda Item 6. Fishery-independent abundance indices

6.1 Review of results of abundance estimation including 2025 Japanese biomass survey

29. Japan presented a report of its 2025 biomass survey (NPFC-2025-SSC PS15-IP05). The Japanese biomass survey was conducted with two research vessels, both using the same type of trawl (NST-99). The survey was conducted at 136 stations from 1 June to 8 July and covered the area from 143°E to 165°W. A total of 51,608 individuals were caught in the survey. Pacific saury occurred between 147°E and 165°W. The age-1 fish were mainly distributed between 167°E and 175°E. Comparing the surveys in 2024 and 2025, the abundance of age-1 fish in the survey area decreased west of 160°E in 2025, and Pacific saury was more abundant around the date line in 2025.

30. Japan presented the Japanese survey biomass index of Pacific saury up to 2025 using the

Vector Autoregressive Spatio-temporal (VAST) model (NPFC-2025-SSC PS15-WP01). Japan applied the VAST model to Japanese fishery-independent survey data to predict the Pacific saury distribution and estimate the biomass index from 2003 to 2025. The estimated biomass index from the selected VAST model with minimum Akaike information criterion (AIC) indicated similar year trends with the index from a design-based approach. In 2020, the estimated biomass index dropped to the lowest level historically since 2003. It subsequently recovered but remains lower than the historical average in 2025. The retrospective analysis indicated that the biomass index estimates derived from the VAST model would be robust to data updates. Japan recommended using the estimated biomass indices in the stock assessments

31. China noted that the center of distribution for age-0 and age-1 fish has shifted to the east and north and that there may be larger fish that are now outside the usual survey area. China suggested that this may support the application of dome-shaped selectivity when developing the new stock assessment models.

32. At the suggestion of the SSC PS, Japan conducted analyses to test the robustness of its VAST model to the assumption of sea surface temperature (SST). Japan concluded that SST had little influence on the biomass indices estimated by the model.

33. The SSC PS noted that for age-1 fish, the estimated SST effect appeared to predict higher biomass at lower SSTs, which appeared to be an anomaly when compared to observed data. Japan explained that in low SST, the frequency of encounters tends to be low but the density of the schools encountered tends to be high, and that when the relationship between SST and encounter probability and the relationship between SST and density are considered simultaneously, the density in the northern areas is generally predicted to be low.

34. The SSC PS agreed to use the Japanese survey biomass index of Pacific saury up to 2025 using the VAST model as an input for the stock assessment.

35. The SSC PS thanked Japan for continuing to conduct its biomass survey and for presenting the associated analyses in a timely manner each year.

6.2 Review of plans of future biomass surveys

36. Japan informed the SSC PS that it plans to conduct its biomass survey with the usual method in 2026.

6.3 Recommendations for future work

37. The SSC PS suggested that Japan consider conducting additional analyses to further refine the

estimate of catchability in the Japanese biomass survey.

38. Canada suggested that it would be valuable to add some more sampling stations above and below the transect lines, even if only to a partial extent, for calibration of the unsampled areas and assisting the VAST model's prediction in previous years. Japan agreed that this would enhance the coverage of the survey but pointed out that it would be difficult to implement due to time and effort constraints.

39. Canada suggested that Japan explore setting prediction resolution of the VAST model to 1 km x 1 km rather than at the knots. Canada explained that this would not change the outcome but might show a finer granularity on the map, which might provide useful new insights. Canada offered to follow-up with Japan about conducting this work in the intersessional period.

Agenda Item 7. Fishery-dependent abundance indices

7.1 Review of Members' standardized CPUEs up to 2024

40. Japan presented a standardization of CPUE data for Pacific saury from 1994 to 2024 using GLM (NPFC-2025-SSC PS15-WP02). Japan recommended using the standardized CPUE derived from GLM as an input for the stock assessment.

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

42. Japan presented a progress report on the application of the VAST model in CPUE standardization for the Japanese fishery of Pacific saury (NPFC-2025-SSC PS15-WP03). The standardized CPUE derived from the selected VAST model with minimum AIC indicated similar year trends with that derived from the conventional method with the GLM. Evaluations of the impacts of the shortened fishing season revealed that the year trends of standardized CPUE from the VAST model were at least robust to missing data at the late stage of the Japanese fishing season.

43. Chinese Taipei presented a standardization of CPUE data for Pacific saury from 2001 to 2024 using GLM on the assumption of lognormal distribution of errors (NPFC-2025-SSC PS15-WP04). The analysis employed two approaches: a non-divided period approach and a two-divided period approach. Chinese Taipei recommended using the standardized CPUE derived from GLM with the two-divided period approach as an input for the stock assessment, as this approach accounted for the impact of fishing efficiency changes due to the significant replacement of older fishing vessels with new ones.

44. The SSC PS noted that Chinese Taipei's CPUE standardization included month-year

interactions as variables but that there were no data in November 2024. At the suggestion of the SSC PS, Chinese Taipei conducted further analyses to evaluate the impact of excluding November from the prediction of standardized CPUE. Chinese Taipei concluded that its CPUE standardization is robust to the lack of November 2024 data.

45. The SSC PS agreed to use Chinese Taipei's standardized CPUE derived from GLM using the two-divided period approach as an input for the stock assessment.

46. China presented a standardization of CPUE data for Pacific saury from 2013 to 2024 using GLM and generalized additive model (GAM) on the assumption of lognormal distribution of errors (NPFC-2025-SSC PS15-WP05). China recommended using the standardized CPUE derived from GAM as an input for the stock assessment.

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

48. Korea presented a standardization of CPUE data for Pacific saury from 2001 to 2024 using GLM (NPFC-2025-SSC PS15-WP06). Korea recommended using the standardized CPUE derived from GLM as input for the stock assessment.

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

50. Russia presented a standardization of CPUE data for Pacific saury from 1994 to 2024 using a GLM (NPFC-2025-SSC PS15-WP08). Russia recommended using the standardized CPUE derived from GLM as input for the stock assessment.

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

7.2 Review of joint CPUE

52. Chinese Taipei presented a joint CPUE standardization of Pacific saury in the Northwestern Pacific Ocean from 1994 to 2024 using a spatio-temporal modelling approach, specifically, the R package sdmTMB (NPFC-2025-SSC PS15-WP10 (Rev. 1)). Chinese Taipei evaluated the feasibility of using sdmTMB as an alternative to the VAST model for CPUE standardization of Pacific saury. A comparison of the outputs using data through 2023 found that sdmTMB produced results consistent with previous VAST assessments, while offering greater transparency and reproducibility. Based on this, Chinese Taipei updated the joint CPUE index through 2024 using sdmTMB. The updated standardized CPUE index indicated

pronounced fluctuations over time, lower levels in recent years compared to the mid-1990s, and a slight increase in 2023–2024. Chinese Taipei recommended using the joint CPUE standardization derived from sdmTMB as an input for the stock assessment.

53. The SSC PS agreed to use the standardized joint CPUE derived from sdmTMB as an input for the stock assessment.

54. Canada suggested that Chinese Taipei explore the use of a barrier mesh for sdmTMB, which would be unlikely to change the trend but may eliminate or minimize the large residuals on the western side of the map, where there are few data points.

55. 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

56. The SSC PS encouraged Members to explore the use of spatio-temporal modeling (e.g. using VAST or sdmTMB) for conducting their CPUE standardizations to account for differences in spatial and/or temporal coverage over time.

57. The SSC PS suggested that Japan share their code for their CPUE standardization using the VAST model in NPFC-2025-SSC PS15-WP03.

58. The SSC PS encouraged Members to investigate whether changes in the management measures under the Pacific saury CMM may have affected fisheries operations and consequently CPUE.

Agenda Item 8. Biological information on Pacific saury

8.1 Review of any updates and progress

59. No updates were provided.

8.2 Recommendations for future work

60. The SSC PS encouraged Members to share any updated information about the biology or ecology of Pacific saury at future meetings.

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

9.1 Review and update of the existing specification

61. China presented its observations on Pacific saury stock assessments and management measures implemented to date (NPFC-2025-SSC PS15-IP11). China noted that the annual

BSSPM assessment has indicated that stock size has been increasing since 2020 but the stock status has deteriorated over the years. China believed that either the HCR does not work well or, more likely, the HCR is working and the stock is recovering as expected or even faster, as signals and indicators in 2025 suggest, but the BSSPM failed to accurately estimate the stock status and provide correct management advice due to unforeseen technical issues (i.e., retrospective pattern/scaling problems). China encouraged the SSC PS to continue tackling these technical issues but expressed difficulty endorsing the BSSPM assessment results if the issues persist, as the results would not reflect reality. Given the limited time and capacity, China suggested allocating more time to developing a seasonal age-structured stock synthesis (SS3) model, which is biologically more realistic than production models. China also recommended that the SSC and SC initiate a peer review process as soon as possible for the Pacific saury stock assessments to ensure quality control.

62. Japan pointed out that although the stock may be showing some signs of recovery, it has not yet recovered to an adequate level and that the retrospective analysis suggests the existence of overestimation tendency in the current model, which can also explain the situation China pointed out. Japan agreed that the SSC PS should continue working on improving its assessments, including further refining the BSSPM and developing the SS3 model.

63. Canada did not think there was a serious discrepancy between observations of a modest recovery in the state of the stock and the BSSPM assessment results given the input data from the 2024 & 2025 surveys and 2023 & 2024 CPUEs. Canada also pointed out that the scaling issues in the BSSPM mostly appear in the early period of the assessed years when there were no survey data and less CPUE data.

64. Chinese Taipei suggested that the SSC PS could tackle some of the issues with the BSSPM by incorporating more diagnostics, such as hindcasting and predictive checks. Chinese Taipei also suggested that it would be useful to explore more robust reference points than B_{MSY}.

65. The SSC PS agreed to maintain the framework of the existing specification of the stock assessment using BSSPM and to include an additional year of data for all indices to be finalized at SSC PS16 (Annex F).

9.2 Recommendations for future work

66. The SSC PS agreed to continue to further improve the BSSPM, including refining the current settings and conducting additional diagnostics.

67. The SSC PS agreed to compare the stock assessment results using the BSSPM against the results using the SS3 model, if it is ready, at SSC PS16, to adopt results from the model that

performs better, and to develop management advice accordingly.

Agenda Item 10. New stock assessment models

10.1 Review of the outcomes of WG NSAM02 meeting

68. The Working Group on New Stock Assessment Models for Pacific Saury (WG NSAM) Lead, Dr. Libin Dai, presented the outcomes of the first and second WG NSAM meetings in 2025 (NPFC-2025-SSC PS15-IP10). He explained that the seasonal SS models that WG NSAM is developing are able to model the fishery and population dynamics of Pacific saury more plausibly than annual models. Model diagnostics (retrospective analysis, hindcasting) indicated the model cannot be used for projection at this stage. However, improving the fit to the Japanese survey in recent years might solve these problems. Several hypotheses were developed to explain the trend of fishery mean size during recent years, and it will be important to decide which are most likely. The base and sensitivity scenarios will likely be revision of models presented at the WG NSAM02 meeting, based on diagnostic results and biological plausibility.

69. The individual WG NSAM meeting summaries are available in NPFC-2025-SSC PS15-RP01 & RP02.

70. The SSC PS agreed to change the name of WG NSAM to the Small Working Group on New Stock Assessment Models for Pacific Saury (SWG NSAM), as was proposed at the WG NSAM02 meeting.

10.2 Review of any progress on new stock assessment models

71. Japan presented a description of the Japanese fisheries-independent survey and the Pacific saury length composition data collected from the survey (NPFC-2025-SSC PS15-IP01 & IP06). Japan explained that, as requested by WG NSAM, it has prepared these length composition data and shared them on the NPFC Collaboration site for WG NSAM's work to develop an SS3 age-structured assessment model. Japan also presented a simple analysis showing trends in mean size over time for age-0 and age-1 fish based on these data. Japan also presented a simple analysis showing mean body length over time for age-0 and age-1 fish based on these data. The mean body length of age-1 fish has declined in recent years, consistent with the hypothesis that the decline in mean length of exploited fish reflects poorer growth conditions.

72. The SSC PS noted that there was no clear pattern for age-0 fish but that this may be due to greater natural variability in the body length of age-0 fish, which are still growing and include multiple seasonal cohorts, and sampling variability.

10.2.1 Stock Synthesis 3 (SS3)

73. The invited expert presented the results of various diagnostic tests he conducted to assess the SS3 model being developed by WG NSAM (NPFC-2025-SSC PS15-WP09). He conducted a jitter analysis, Bayesian MCMC analysis, likelihood profiling, retrospective analysis, and hindcasting. These tests suggested that the model cannot reliably estimate stock size unless there is prior information on the catchability coefficient for Age 1 fish for the Japanese biomass survey and that WG NSAM should consider developing this prior. There is also a need to develop appropriate reference points to use for any potential total allowable catch (TAC) advice. The invited expert plans to conduct further analyses using various sensitivity scenarios identified in WG NSAM once the models have been updated with new data.

74. The invited expert presented a preliminary comparison of SS3 with the BSSPM, while noting that the two models are not directly comparable (NPFC-2025-SSC PS15-IP12). The two models are of the same order of magnitude. Biomass is much more variable in the age-structured model due to the short lifespan of Pacific saury and the seasonal time step. A comparison of the maximum value of F-at-age showed similar trends between the two models, especially in the later years, when size composition and CPUE data are available.

75. Japan stated that the challenges the BSSPM assessment faces, including the lack of predictability, is widely recognized within NPFC including the commissioners and the expectations for the new age structured model to address these challenges is high. However, despite the great progress made in the WG NSAM to date, it still struggles to accurately characterize the dynamics of the stock and Japan has concerns whether even the new model can deal with the "predictability" issue in a satisfactory manner given the short-lived and recruitment (i.e. environment)-driven nature of the Pacific saury stock.

10.2.2 State-space age-structured model

76. Japan informed the SSC PS that it had no updates to provide but that it will continue its work to further develop a state-space stock assessment model (SAM) for Pacific saury and present its work to the SSC PS at the appropriate timing.

10.3 Recommendations for future work

77. The SSC PS made suggestions for further improvements to the SS3 model and additional diagnostics to be conducted, including setting of a uniform distribution for q from 0 to 1 (or a proxy because SS3 allows to assume prior for logarithm of q) for the survey catchability, as has been used in the provisional BSSPM assessment; ASPM diagnostics; and some other retrospective analyses for B-ratio and other MSY-related quantities in addition to the biomass level. The SSC PS requested that the invited expert continue to develop and refine the SS3 model and encouraged Members to support the invited expert in his work.

78. The SSC PS noted that the WG NSAM will hold another meeting ahead of SSC PS16, at which it plans to update the SS3 model specification for all case scenarios, identify base and sensitivity cases, and draft a stock assessment report and recommendations for review at SSC PS16. As a lower priority, WG NSAM will also try to incorporate environmental covariates in key population/fishery processes.

Agenda Item 11. Toward development of management procedures (MPs) as a mid-term goal

11.1Work plan and progress in SWG MSE PS06

79. The Chair summarized the work done to date to complete the development of an interim HCR and previous discussions by the SWG MSE PS on the mid-term goal of developing a full management procedure (MP).

80. The SSC PS noted that the current schedule for the development of a full MP in the comprehensive MSE process may be overly ambitious in light of resource constraints and the existing heavy workload, including the ongoing development of the SS3 models, which will serve as the basis for conditioning the operating models in the MSE simulation and potentially as the estimation model in the MP itself. The SSC PS agreed to discuss the MP work and its schedule further at SSC PS16 after first completing the upcoming stock assessment.

11.2 Other

81. No other points were raised.

Agenda Item 12. Other matters

12.1 Data provision templates

82. The Science Manager provided an update on the development of the data provision templates. He explained that the Small Working Group on Data (SWG Data) is working intersessionally to finalize the templates. SWG Data Members and Chairs of SC subsidiary groups are invited to provide final comments and suggestions.

12.2 Observer Program

83. The Science Manager reminded the SSC PS that the Commission previously requested that the SC provide guidance to the Technical and Compliance Committee (TCC) on the scientific aspects of a regional observer program (ROP), that the TCC Chair posed specific questions to the SC and its subsidiary bodies, and that the SC and its subsidiary bodies, including the SSC PS, provided responses. The Science Manager explained that these responses were provided to the TCC but the Commission considered them to be insufficient and recommended that the SC and the TCC continue to work on this matter. Based on this, the TCC Chair has posed

additional questions to the SC and its subsidiary bodies concerning critical data points, current level of confidence in NPFC stock assessments, monitoring of rare events, data for development of management procedures and accounting for potential effects of climate change, and electronic monitoring systems. The Small Working Group on Observer Program held a virtual meeting to answer the questions in July 2025. Based on the outcomes of this meeting, the SC Chair drafted a working paper outlining responses to the questions and circulated it to Members for review.

12.3 Draft agenda, priority issues and timeline for next meeting

84. The SSC PS outlined an agenda and timeline for SSC PS16. An updated timeline with a list of expected documents will be circulated to SSC PS Members shortly after the meeting.

85. The SSC PS noted that as the stock condition improves, there is a disconnect and time lag between observations on the fishing grounds and model updates. The SSC PS noted that it is desirable to find a process that would allow the inclusion of the most recent catch and CPUE in the assessment (either BSSPM or SS3) and reduction of the time lag between the data availability and the TAC calculation from the assessment.

86. Canada suggested that one option would be to update and approve the assessment early in the calendar year (e.g., February) using the most recent data, which would allow the most recent information to be available to the Commission. Canada noted that the timing would not allow the SC to review and approve the Pacific saury assessment, but suggested that, given the identical makeup of the SSC PS and SC participants, perhaps the approval of the Pacific saury assessment could be done in a February SWG MSE PS meeting prior to submission to the Commission. In addition, the data preparatory meeting, which is currently held in autumn, could be shifted to December and held in conjunction with the SC meeting.

87. Some concerns were raised with submitting the Pacific saury assessment directly to the SWG MSE PS and bypassing the SC, which is the NPFC's highest-level scientific body, whereas the SWG MSE PS is a body for consolidating scientific advice and facilitating dialog between scientists and managers.

88. The SSC PS agreed to discuss this matter further at SSC PS16.

12.4 Other

89. No other matters were discussed.

Agenda Item 13. Adoption of Meeting Report

90. The report was adopted by consensus.

Agenda Item 14. Close of the Meeting

91. The Chair thanked the participants for their constructive discussions, the invited expert for his hard work, the Vice-Chair for his support, and the Secretariat and Rapporteur for their assistance.

92. The meeting closed at 10:55 on 4 September 2025, Tokyo time.

LIST OF 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 and joint standardized CPUE from 1980-2024 and Japanese survey index from 2003-2025

Annex F – Specifications of the BSSPM

Annex A:

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 PS14 and SC09
- 3.2 SWG MSE PS06
- 3.3 COM09
  - 3.3.1 CMM 2025-08 for Pacific Saury
  - 3.3.2 Others

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 2025 target fisheries and bycatch

Agenda Item 6. Fishery-independent abundance indices
- 6.1 Review of results of abundance estimation including 2025 Japanese biomass survey
- 6.2 Review of plans of future biomass surveys
- 6.3 Recommendations for future work

Agenda Item 7. Fishery-dependent abundance indices
- 7.1 Review of Members' standardized CPUEs up to 2024
- 7.2 Review of joint CPUE
- 7.3 Recommendations for future work

Agenda Item 8. Biological information on Pacific saury
- 8.1 Review of any updates and progress
- 8.2 Recommendations for future work

Agenda Item 9. Stock assessment using "provisional base models" (BSSPM)
- 9.1 Review and update of the existing specification
- 9.2 Recommendations for future work

Agenda Item 10. New stock assessment models
- 10.1 Review of the outcomes of WG NSAM02 meeting
- 10.2 Review of any progress on new stock assessment models
  - 10.2.1 Stock Synthesis 3 (SS3)
  - 10.2.2 State-space age-structured model
- 10.3 Recommendations for future work

Agenda Item 11. Toward development of management procedures (MPs) as a mid-term goal
- 11.1 Work plan and progress in SWG MSE PS06
- 11.2 Other

Agenda Item 12. Other matters

- 12.1 Data provision templates
- 12.2 Observer Program
- 12.3 Draft agenda, priority issues and timeline for next meeting
- 12.4 Other

Agenda Item 13. Adoption of Report

Agenda Item 14. Close of the Meeting

Annex B:

List of Documents

MEETING INFORMATION PAPERS

Number	Title
NPFC-2025-SSC PS15-MIP01	Meeting Information
NPFC-2025-SSC PS15-MIP02	Provisional Agenda
NPFC-2025-SSC PS15-MIP03 (Rev. 1)	Annotated Indicative Schedule

WORKING PAPERS

Number	Title
NPFC-2025-SSC PS15-WP01	Japanese survey biomass index of Pacific saury up to 2025 using VAST model
NPFC-2025-SSC PS15-WP02	Standardized CPUE of Pacific saury (*Cololabis saira*) caught by the Japanese stick-held dip net fishery up to 2024
NPFC-2025-SSC PS15-WP03	Progress report on application of the VAST model in CPUE standardization for the Japanese fishery of Pacific saury
NPFC-2025-SSC PS15-WP04	Standardized CPUE of Pacific saury (*Cololabis saira*) caught by the Chinese Taipei stick-held dip net fishery up to 2024
NPFC-2025-SSC PS15-WP05	Standardized CPUE of Pacific saury (*Cololabis saira*) caught by the China's stick-held dip net fishery up to 2024
NPFC-2025-SSC PS15-WP06	Standardized CPUE of Pacific saury (*Cololabis saira*) caught by the Korean's stick-held dip net fishery up to 2024
NPFC-2025-SSC PS15-WP07 (Rev. 1)	Compiled data on Pacific saury catches in the NWPO
NPFC-2025-SSC PS15-WP08	Standardized CPUE of Pacific saury (*Cololabis saira*) caught by Russian vessels up to 2024
NPFC-2025-SSC PS15-WP09	Pacific saury SS3 assessment: Exploration and diagnostics after WGNSAM
NPFC-2025-SSC PS15-WP10 (Rev. 1)	Joint CPUE standardization of the Pacific saury in the Northwest Pacific Ocean by using the spatio-temporal modelling approach

INFORMATION PAPERS

Number	Title
NPFC-2025-SSC PS15-IP01	Length composition data from the Japanese survey
NPFC-2025-SSC PS15-IP02	Saury Catch in Canada (updated with 2024 data)
NPFC-2025-SSC PS15-IP03	Fishery Status of PS in China Including 2025
NPFC-2025-SSC PS15-IP04	Pacific saury fishing condition in Japan in 2024 and 2025
NPFC-2025-SSC PS15-IP05	2025 Japanese biomass survey
NPFC-2025-SSC PS15-IP06	Introduction of Japanese survey and length composition data to be provided
NPFC-2025-SSC PS15-IP07	Korean Stick-held dip net (SHDN) Fishery Status up to July 2025
NPFC-2025-SSC PS15-IP08	Fishery Status for Pacific saury: Report from Vanuatu Fisheries Department
NPFC-2025-SSC PS15-IP09	Fishery status for Pacific saury: Report of Chinese Taipei
NPFC-2025-SSC PS15-IP10	Progress Summary of WG NSAM 2025-01&02
NPFC-2025-SSC PS15-IP11	Some observations on Pacific saury stock assessment and management
NPFC-2025-SSC PS15-IP12	Pacific saury SS3 assessment: Preliminary comparison with surplus production model

REFERENCE DOCUMENTS

Number	Title
NPFC-2025-SSC PS15-RP01	1st intersessional meeting of the Working Group on New Stock Assessment Models
NPFC-2025-SSC PS15-RP02	2nd intersessional meeting of the Working Group on New Stock Assessment Models
NPFC-2024-SSC PS14-Final Report	SSC PS14 report
NPFC-2024-SC09-Final Report	SC09 report
NPFC-2025-SWG MSE PS06-Final Report	SWG MSE PS06 report
NPFC-2025-COM09-Final Report	COM09 report
	CMM 2025-08 for Pacific Saury
	Terms of References of the SSC PS
	CPUE Standardization Protocol for Pacific Saury
	Stock Assessment Protocol for Pacific Saury

Annex C:

List of Participants

CHAIR

Toshihide KITAKADO
kitakado@kaiyodai.ac.jp

CANADA

Chris ROOPER
chris.rooper@dfo-mpo.gc.ca

CHINA

Libin DAI
libin.dai@qq.com

Chuanxiang HUA
cxhua@shou.edu.cn

Qiuyun MA
qyma@shou.edu.cn

Zi YANG
yangzi_004763@126.com

JAPAN

Kazuhiro OSHIMA
oshima_kazuhiro28@fra.go.jp

Taiki FUJI
fuji_taiki65@fra.go.jp

So FUKAZAWA
so_fukazawa330@maff.go.jp

Midori HASHIMOTO
hashimoto_midori91@fra.go.jp

Miyuki MEKUCHI
mekuchi_miyuki07@fra.go.jp

Shingo MINAMIKAWA
minamikawa_shingo69@fra.go.jp

Shuya NAKATSUKA
nakatsuka_shuya49@fra.go.jp

Shin-Ichiro NAKAYAMA
nakayama_shinichiro16@fra.go.jp

Miyako NAYA
naya_miyako88@fra.go.jp

Satoshi SUYAMA
suyama_satoshi77@fra.go.jp

Haruo Tominaga
haruo_tominaga170@maff.go.jp

KOREA

Hyejin SONG
hyejinsong@korea.kr

RUSSIA

Dmitrii.ANTONENKO
dmantonenko@yandex.ru

Igor CHERNIENKO
igor.chernienko@tinro.vniro.ru

Vladimir KULIK
vladimir.kulik@tinro.vniro.ru

CHINESE TAIPEI

Wen-Bin HUANG
bruce@gms.ndhu.edu.tw

Yi-Jay CHANG
yjchang@ntu.edu.tw

Tung-hsieh CHIANG
chiangdon@ofdc.org.tw

Kevin Pranata GINTING
811254007@gms.ndhu.edu.tw

Jhen HSU
jhenhsu@ntu.edu.tw

Shih-Chi HUANG
shihchi1030@ms1.fa.gov.tw

VANUATU
Rocky KAKU
rky.kaku@gmail.com

OBSERVERS

The Ocean Foundation
Rebecca SCOTT
rscott@oceanfdn.org

The Pew Charitable Trusts
Raiana MCKINNEY
rmckinney@pewtrusts.org

INVITED EXPERTS
Quang HUYNH
quang@bluematterscience.com

RAPPORTEUR
Alex MEYER
meyer@urbanconnections.jp

NPFC SECRETARIAT
Robert DAY
rday@npfc.int

Alex ZAVOLOKIN
azavolokin@npfc.int

Sungkuk KANG
skang@npfc.int

Annex D:

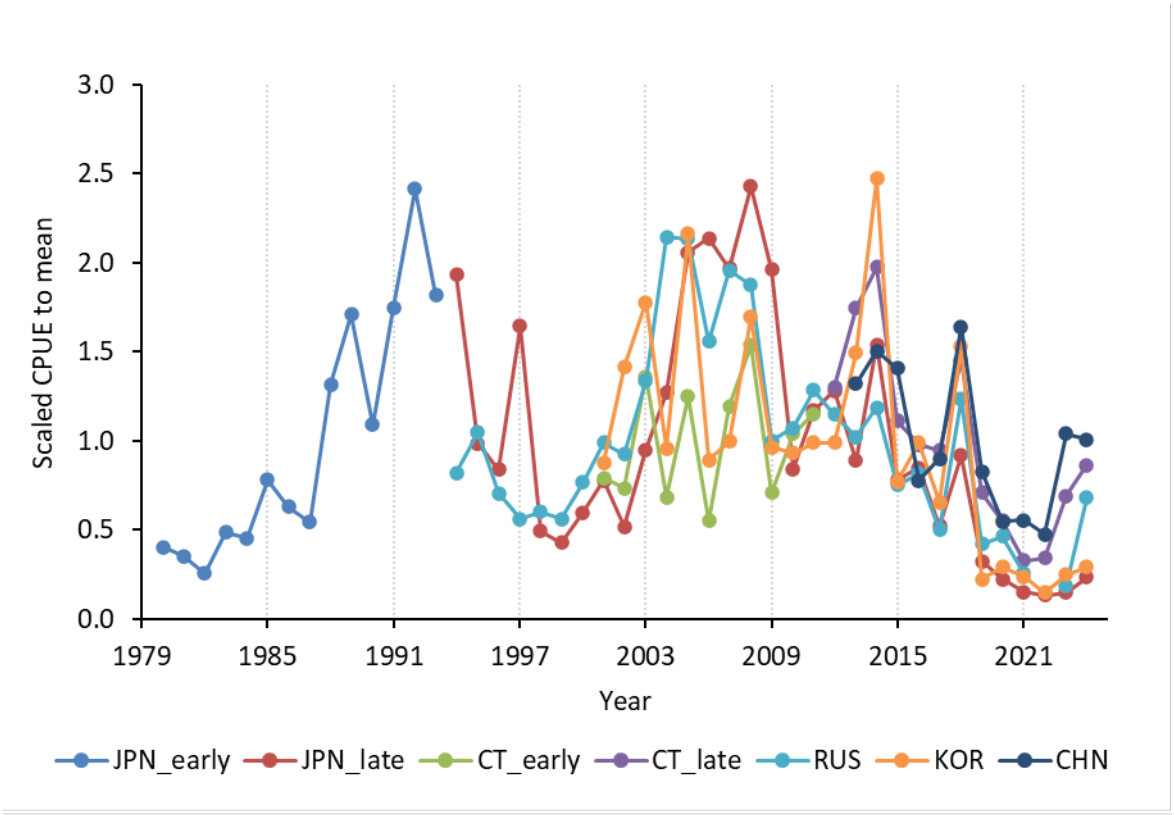
Updated total catch, CPUE standardizations and biomass estimates for the stock assessment of Pacific saury

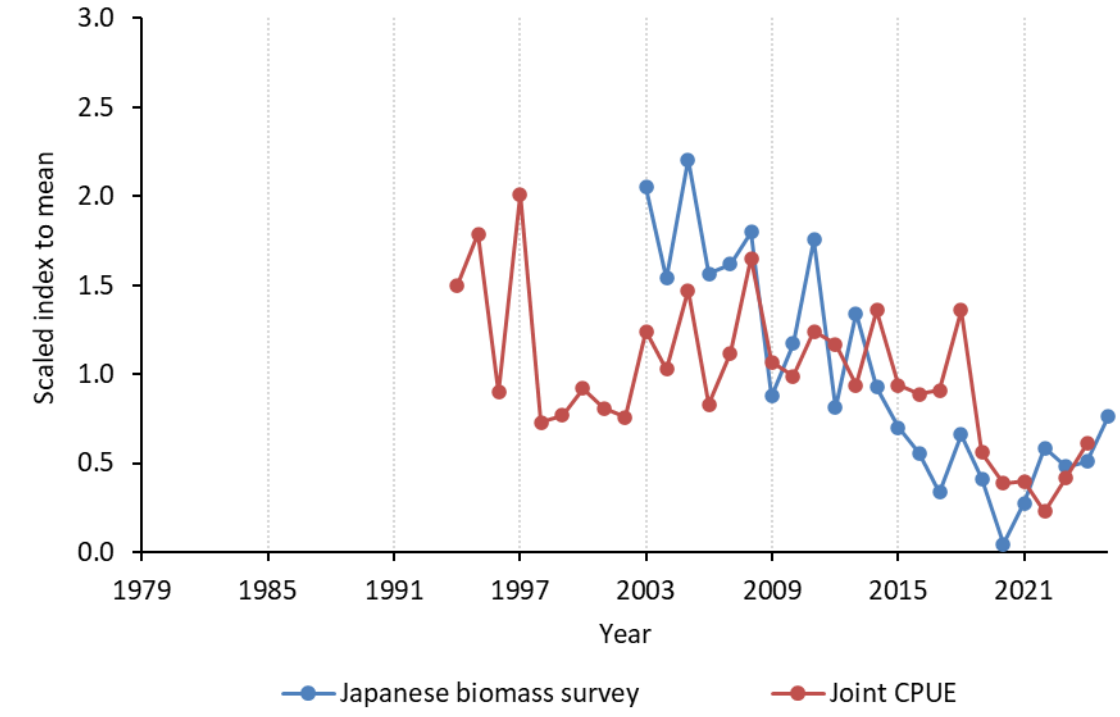
Year	Total catch (metric tons)	Biomass JPN (VAST, 1000 metric tons)	CV (%)	CPUE CHN (metric tons/ vessel/ day)	CPUE JPN_early (metric tons/ net haul)	CPUE JPN_late (metric tons/ net haul)	CPUE KOR (metric tons/ vessel/ day)	CPUE RUS (metric tons/ vessel/ day)	CPUE CT_early (metric tons/ net haul)	CPUE CT_late (metric tons/ net haul)	Joint CPUE (sdm TMB)	CV (%)
1980	238510				0.72							
1981	204263				0.63							
1982	244700				0.46							
1983	257861				0.87							
1984	247044				0.81							
1985	281860				1.40							
1986	260455				1.13							
1987	235510				0.97							
1988	356989				2.36							
1989	330592				3.06							
1990	435869				1.95							
1991	399017				3.13							
1992	383999				4.32							
1993	402185				3.25							
1994	332509					4.10		16.73			1.50	0.315
1995	343743					2.09		21.33			1.79	0.314
1996	266424					1.78		14.37			0.90	0.306
1997	370017					3.49		11.46			2.01	0.337
1998	176364					1.05		12.29			0.73	0.361
1999	176498					0.91		11.43			0.77	0.312
2000	286186					1.27		15.60			0.92	0.295
2001	370823					1.65	7.94	20.19	1.44		0.81	0.269
2002	328362					1.10	12.79	18.90	1.33		0.76	0.259
2003	444642	1147.8	31.7			2.02	16.09	27.25	2.47		1.24	0.258
2004	369400	862.1	22.0			2.70	8.66	43.73	1.24		1.03	0.251
2005	473907	1234.9	33.9			4.37	19.56	43.50	2.27		1.47	0.246
2006	394093	876.2	32.9			4.54	8.07	31.79	1.00		0.83	0.236
2007	520207	905.4	34.6			4.18	9.03	39.97	2.17		1.12	0.238
2008	617509	1006.6	28.5			5.16	15.34	38.26	2.79		1.65	0.224
2009	472177	490.6	22.3			4.16	8.74	20.43	1.29		1.07	0.237
2010	429808	655.7	30.5			1.79	8.43	21.85	1.89		0.99	0.230
2011	456263	981.8	33.2			2.48	8.95	26.24	2.09		1.24	0.248
2012	460544	453.8	21.0			2.72	8.96	23.42		2.60	1.17	0.256
2013	423790	751.2	31.5	11.34		1.89	13.52	20.86		3.48	0.94	0.233
2014	629576	519.2	24.1	12.93		3.27	22.38	24.26		3.94	1.36	0.210
2015	358883	391.5	24.4	12.11		1.66	6.97	15.31		2.22	0.94	0.247
2016	361688	312.2	31.1	6.67		1.80	8.96	16.64		1.95	0.89	0.224
2017	262640	188.5	30.8	7.73		1.11	5.91	10.18		1.89	0.91	0.22

2018	435881	370.6	31.5	14.11	1.95	13.87	25.15	2.90	1.36	0.238
2019	195251	230.7	23.4	7.10	0.69	2.03	8.60	1.41	0.56	0.176
2020	139779	25.2	105.8	4.71	0.47	2.63	9.45	1.10	0.39	0.228
2021	92117	154.8	30.5	4.77	0.32	2.16	5.18	0.65	0.40	0.262
2022	100085	327.1	20.3	4.09	0.28	1.33		0.68	0.23	0.250
2023	118250	270.2	32.4	8.94	0.31	2.23	3.81	1.38	0.42	0.308
2024	155558	284.6	19.0	8.67	0.50	2.63	13.88	1.72	0.61	0.262
2025		428.0	26.5							

Annex E:

Time series of Members' standardized CPUE and joint standardized CPUE from 1980-2024 and Japanese survey index from 2003-2025





Annex F:

Specifications of the BSSPM

	Base case (B1)	Base case (B2)	Sensitivity case (S1)	Sensitivity case (S2)
Initial year	1980	1980	1980	1980
Biomass survey	$q_{bio} \sim \mathrm{U}(0,1)$ (2003-2025)	Same as left	Same as left	Same as left
CPUE	CHN(2013-2024) JPN_late(1994-2024) KOR(2001-2024) RUS(1994-2021, 2023-2024) CT(2001-2011, 2012-2024)	Joint CPUE (1994-2024)	CHN(2013-2024) JPN_early(1980-1993, time-varying q) JPN_late(1994-2024) KOR(2001-2024) RUS(1994-2021, 2023-2024) CT(2001-2011, 2012-2024)	JPN_early(1980-1993, time-varying q) Joint CPUE (1994-2024)
Hyper-depletion/ stability	A common parameter for all fisheries with a prior distribution, b ~ U(0, 1)	b ~ U(0, 1)	A common parameter for all fisheries but JPN_early, with a prior distribution, b ~ U(0, 1) [b for JPN_early is fixed at 1]	b ~ U(0, 1) for joint CPUE. [b for JPN_early is fixed at 1]
Prior for other than q_{bio}	Own preferred options	Own preferred options	Own preferred options	Own preferred options