North Pacific Fisheries Commission

NPFC-2026-SSC NFS04-Final Report

4th Meeting of the Small Scientific Committee on Neon Flying Squid
REPORT

28–30 July 2026

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North Pacific Fisheries Commission
4th Meeting of the Small Scientific Committee on Neon Flying Squid

28–30 July 2026
Hybrid

REPORT

Agenda Item 1. Opening of the Meeting

1. The 4th Meeting of the Small Scientific Committee on Neon Flying Squid (SSC NFS04) was held in a hybrid format, with participants attending in-person in Tokyo, Japan, or online via WebEx, on 28–30 July 2026, and was attended by Members from Canada, China, Japan, the Republic of Korea, the Russian Federation, Chinese Taipei, and the United States of America. The Pew Charitable Trusts (Pew) attended as an observer. Dr. Rujia Bi participated as an invited expert.

2. The meeting was opened by the SSC NFS Chair, Dr. Luoliang Xu (China), who welcomed the participants. As he was unable to attend the meeting in person, the meeting was chaired by the Scientific Committee (SC) Chair, Dr. Jie Cao.

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. Review of Commission meeting updates related to NFS

6. The SC Chair summarized the discussions and outcomes of the SSC NFS03 meeting.

7. The Science Manager informed the SSC NFS that the Commission separated Conservation and Management Measure (CMM) 2025-11 for Japanese Sardine, Neon Flying Squid and Japanese Flying Squid into two CMMs, one for Japanese sardine (CMM 2026-18) and one for neon flying squid (NFS) and Japanese flying squid (CMM 2026-11). Besides the removal of references to sardine, CMM 2026-11 included some minor editorial amendments from the previous CMM, but did not contain any substantive changes.

8. The Science Manager explained that the SC had tasked each of its subsidiary bodies with considering fishery-dependent and fishery-independent indicators of stock status, incorporating climate-related tasks into the workplan, defining invited experts' roles and tasks for 2026–2027, adding a table of activities and timeline to meeting reports, identifying science-based options for operationalizing the precautionary approach, updating the data call, reviewing Members' sampling programs for transshipped catch if any, and discussing the frequency of benchmark and annual stock assessments.

9. The Data Coordinator, Mr. Sungkuk Kang, introduced the completed GIS map of NFS monthly catch and effort developed by the Secretariat. He invited Members to share any feedback they may have with the Secretariat.

Agenda Item 4. Updates on Members' fishery

4.1 Review of 2025 fishery status (3rd NFS SSC) and preliminary reports on the ongoing 2026 fishing season

10. China presented its NFS fishery status up to 2025 (NPFC-2026-SSC NFS04-IP02). Most of China's NFS catch was taken by squid jigging vessels. The annual catch has remained relatively stable in recent years, with a total of 12,457 MT in 2025. In 2025, most catches (11,987 MT) occurred in the Convention Area east of 170°E. China operated 78 vessels in 2025, 42 fewer vessels than in 2024. The fleet reported a total of 5,207 fishing days, 3,586 fewer days than in 2024. In 2025, both catches and fishing effort were higher east of 170°E than west of 170°E. Nominal catch-per-unit-effort (CPUE) was 0.59 MT per vessel day in the Convention Area west of 170°E and 2.92 MT per vessel day in the Convention Area east of 170°E. West of 170°E, catches occurred from June to November, whereas east of 170°E catches were generally concentrated from May to July but extended through October in 2025.

11. Japan explained that it had no updates to the information it provided at SSC NFS03 (NPFC-2026-SSC NFS03-IP04).

12. Chinese Taipei presented its NFS fishery status up to 2025 (NPFC-2026-SSC NFS04-IP01). Catch peaked at 9,022 MT in 2004 and was 89 MT in 2025. Catch is mainly from the Convention Area west of 170ºE. Only four vessels harvested squid in 2025, down from a peak of 91 in 2019. Only one vessel operated in the Convention Area east of 170ºE. The four vessels operated from August to September. In 2025, the nominal CPUE was 0.2 MT/day in the western region and 2.9 MT/day in the eastern region. The fishing grounds in 2025 expanded compared to recent years. Captains utilize commercial weight categories when reporting daily catch data via an electronic logbook system. These are classified into the following groups: <300 g; 300–400 g; 400–600 g; >600 g; and miscellaneous.

13. In response to a request for clarification, Chinese Taipei explained that in 2025, one of its vessels targeted only NFS, while the other vessels alternated between targeting Pacific saury and NFS. Chinese Taipei explained that for vessels that target both species, when the Pacific saury catch has been low for several days in a row, these vessels decide to target NFS and will move to the NFS fishing grounds to do so.

14. Korea explained that it had no updates to the information it provided at SSC NFS03 about the status of its NFS fishery in 2025 (NPFC-2026-SSC NFS03-IP05). Korea reminded the SSC that, except when exploratory jigging operations were conducted, all Korean NFS catch is taken by stick-held dip net (SHDN) vessels, with NFS caught incidentally using handlines during SHDN operations, and that NFS is not a primary target species. In 2025, only five vessels were active and only four of them reported catch of NFS, which totaled 28 MT. Korea also provided preliminary information for 2026 and explained that stick-held dip net vessels have been operating in the Convention Area, but to date, there have been no NFS catches.

Agenda Item 5. Review and updates of biological information for NFS

15. China presented an updated analysis of the size composition, length-weight relationship, and sexual maturity of NFS based on squid jigging surveys conducted by the Chinese research vessel "Songhang" in the Northwest Pacific Ocean during the summer months (June to August) from 2022 to 2025 (NPFC-2026-SSC NFS04-WP06). A total of 3,908 NFS individuals were measured during the survey period. The dominance of individuals in the 180–250 mm mantle length (ML) range suggests that the sampled squids were mainly medium-sized individuals. Most individuals were at immature stages, indicating that the summer survey samples were tentatively considered to be mainly composed of the winter-spring cohort. The low proportion of large individuals may be related to the seasonal timing of the survey. The longer right tail in female ML distribution may be related to sex-specific energy allocation during maturation. However, the interpretation requires further investigation. Females may continue somatic growth to increase reproductive capacity, whereas males may mature earlier at smaller sizes.

16. China explained that it currently has four years of data from these squid-jigging surveys and that it intends to begin work to develop a standardized fishery-independent index based on these surveys once the data from the 2026 survey become available.

5.1 Development of a common sampling protocol for age and size data collection by interested members

17. No papers were submitted under this agenda item.

Agenda Item 6. Updates on surveys and fishery-independent abundance indices

6.1 Presentation about survey prepared by Members (e.g., Japan, China) in advance

18. Japan presented an updated CPUE standardization for the autumn and winter-spring cohorts of NFS based on Japanese driftnet surveys in the Northwest Pacific Ocean from 2001 to 2025 (NPFC-2026-SSC NFS04-WP09). The individuals caught by the driftnets were divided into cohorts based on their ML. The autumn cohort was mainly caught at stations east of 170ºE, while the winter-spring cohort had a wider distribution. Generalized additive models (GAMs) were used to standardize the CPUE, incorporating temporal (year and ten-days), spatial (latitude and longitude), and environmental (sea surface temperature (SST)) variables. The standardized CPUE estimated by GAM showed large interannual variation for both cohorts. However, neither cohort exhibited clear increasing or decreasing trends over the years. Japan suggested that this standardized CPUE could serve as a fishery-independent abundance index for future NFS stock assessments.

19. In response to a request for clarification, Japan explained that the 2025 survey area was reduced compared to other years due to extreme weather conditions that made it impossible to conduct the survey in offshore areas. In response to the suggestion to use the cohort definition based on 170°E, it was explained that previous discussions had confirmed that a similar cohort definition could be achieved using ML.

20. The SSC NFS thanked Japan for presenting the updated CPUE standardization for the autumn and winter-spring cohorts of NFS based on Japanese driftnet surveys. The SSC NFS encouraged Japan to continue to develop this work and suggested some technical refinements for Japan to consider (e.g. error distributions assumed in the standardization model).

6.2 Discussion on the feasibility of integrating fishery-independent abundance data into stock assessments in a timely manner

21. The SSC NFS reviewed the timing of the availability of Members' fishery-independent abundance data and considered meeting timings that would enable the incorporation of the most recent data in stock assessments. The SSC NFS held further discussions under agenda item 7.3.

Agenda Item 7. Updates on fishery-dependent abundance indices up to 2025

7.1 Member presentations on CPUE standardization analysis

22. Japan presented a standardized CPUE for the autumn cohort of NFS caught by the Japanese squid jigging fishery in the North Pacific from 2005 to 2025 (NPFC-2026-SSC NFS04-WP03). The cohort was defined as individuals caught in areas east of 170°E longitude. GAMs were applied to standardize the nominal CPUE, incorporating temporal (year and month) and spatial (longitude and latitude) variables. The model with the lowest Akaike information criterion

(AIC) value was selected as the best performing model. The standardized CPUE estimated by the best GAM showed a similar trend to the nominal CPUE, with the lowest value in 2011 and the highest value in 2025. Japan suggested that this standardized CPUE could serve as a fishery-dependent abundance index in future stock assessments of this species.

23. The SSC NFS thanked Japan for presenting the updated CPUE standardization for the autumn cohort of NFS caught by the Japanese squid jigging fishery in the North Pacific. The SSC NFS encouraged Japan to continue to develop this work and suggested some technical refinements for Japan to consider.

24. China presented an updated CPUE standardization for NFS caught by the Chinese squid jigging fishery from 2005 to 2025 in the Northwest Pacific Ocean (NPFC-2026-SSC NFS04-WP05). Standardized CPUE indices for the winter–spring and autumn cohorts were updated through 2025 using GAM, random forest (RF), and gradient boosting machines (GBM). A Tweedie-GAM was also applied to evaluate the effects of zero-catch treatment and CPUE distributional assumptions on the standardization results. The winter-spring cohort showed a marked decline in CPUE after 2008 and remained at a relatively low level with minor fluctuations in recent years. The autumn cohort showed an increasing trend after 2017. It subsequently declined and showed a recovery in 2025. The three main models produced generally consistent interannual trends, and the Tweedie-GAM sensitivity analysis did not substantially change the overall interpretation of temporal patterns. China suggested that the broadly consistent temporal patterns across models support the robustness of the standardized CPUE indices, which could be further evaluated as candidate abundance indices for use in future stock assessment of this species.

25. The SSC NFS thanked China for presenting the updated CPUE standardization for NFS caught by the Chinese squid jigging fishery in the Northwest Pacific Ocean. The SSC NFS encouraged China to continue to develop this work. In particular, the SSC NFS suggested that China investigate the treatment of the effect of environmental variables on catchability and population in the model. It also noted that the model diagnostics suggested the need for further exploration of the model configuration. For the model selection, the SSC NFS suggested that China conduct a cross-validation to measure and compare the predictive accuracy of its GAM, RF, and GBM models. China noted that the proportion of zero-catch observations was approximately 15% and that it varied among years.

26. Chinese Taipei presented an updated CPUE standardization for NFS caught by Chinese Taipei’s squid jigging fishery in the Northwest Pacific from 2016 to 2025 (NPFC-2026-SSC NFS04-WP04). Chinese Taipei’s NFS fishery is a part-time fishery alongside the Pacific saury fishery, targeting the winter-spring cohort. The fishery was temporarily halted in 2010 and between 2012 and 2015. Catch and effort data for this fishery were collected from 2016 to

2025. The CPUE standardization was conducted using a generalized linear model (GLM) incorporating temporal, spatial, environmental, and vessel-related factors. All main explanatory variables were included in the final models and were statistically significant. The standardized CPUE decreased from 2016 to 2018, remained stable between 2019 and 2022, and gradually declined from 2023 to 2025. Chinese Taipei suggested that this standardized CPUE could serve as a fishery-dependent abundance index in future stock assessments of this species.

27. The SSC NFS thanked Chinese Taipei for presenting the updated CPUE standardization for the winter-spring cohort of NFS caught by Chinese Taipei's squid jigging fishery in the Northwest Pacific and encouraged Chinese Taipei to continue to develop this work.

28. Japan presented an updated CPUE standardization for the winter-spring cohort of NFS caught by the Japanese squid jigging fishery in the North Pacific from 2005 to 2025 (NPFC-2026-SSC NFS04-WP08). The cohort was defined as individuals caught in areas west of 170°E longitude. The model with the lowest AIC value was selected as the best performing model. The standardized CPUE exhibited a similar trend to the nominal CPUE on both a calendar-year and fishing-year (April to March) basis, characterized by high interannual variability. Model performance metrics indicated that the fishing-year model clearly outperformed the calendar-year model. Japan suggested that the adoption of a fishing year instead of a calendar year for future stock assessments would better reflect the biological and operational seasonal dynamics of the winter-spring cohort. Japan suggested that this standardized CPUE could serve as a fishery-dependent abundance index in future stock assessments of this species.

29. The SSC NFS thanked Japan for presenting the updated CPUE standardization for the winter-spring cohort of NFS caught by the Japanese squid jigging fishery in the North Pacific. The SSC NFS encouraged Japan to continue to develop this work, including exploring the incorporation of environmental variables.

30. The SSC NFS reviewed the updated CPUE Standardization Protocol for NFS (NPFC-2026-SSC NFS03-WP11). The SSC NFS recommended that the SC endorse the updated CPUE Standardization Protocol for NFS (Annex D).

7.2 Progress on joint CPUE standardization

31. The invited expert, Dr. Rujia Bi, presented an updated joint spatiotemporal CPUE standardization for NFS using joint CPUE, and R package built on Template Model Builder (TMB; NPFC-2026-SSC NFS04-IP03). The updated NFS data extend through 2025 and remain heterogeneous across fleets, regions, and seasons. The model now supports flexible covariates in both population and catchability components. Numeric effects can be linear or

smooth; factors can be fixed or random. Different SST scenarios were considered to evaluate whether environmental effects are better represented through catchability or population distribution. The final interpretation of the results should consider index behavior, CV, convergence, Hessian diagnostics, and biological plausibility.

32. The SSC NFS thanked the invited expert for presenting the updated joint spatiotemporal CPUE standardization work. The SSC NFS requested that the invited expert continue to develop this work and provide suggestions for further technical work and sensitivity analyses. The SSC NFS further requested that the invited expert provide more detailed information about model diagnostics and model selection in the future.

7.3 Discussion on strategies for the timely integration of fishery-dependent abundance indices into the stock assessment process

33. The SSC NFS reviewed the timing of the availability of Members' fishery-dependent abundance data and discussed meeting timings that would enable the incorporation of the most recent data in stock assessments. Taking into account the main fishing seasons of the fisheries of China (April to July and July to November for the autumn and winter-spring cohorts, respectively), Japan (May to September and December to February for the autumn and winter-spring cohorts, respectively), Chinese Taipei (May to November for the winter-spring cohort), the Republic of Korea (June to November for the winter-spring cohort), and the Russian Federation (August to October for the winter-spring cohort), as well as the timing of the Chinese and Japanese fishery-independent surveys (June to August), and considering when these data become available, it was suggested that a data preparatory meeting be held in May 2027 and a stock assessment meeting in September 2027. A table of the timing of data availability by Member is attached as Annex E.

34. The SSC NFS reviewed and updated the data call for NFS for 2026/2027 (NPFC-2027-SC11-IP01 (Rev. 5)).

35. The SSC NFS recommended the holding of a 4-day virtual meeting at the end of May 2027 and a 3 or 4-day hybrid meeting at the end of September 2027.

Agenda Item 8. Fisheries stock assessment

8.1 Review of progress on the surplus production models

36. Japan presented a preliminary application of the stochastic surplus production model in continuous time (SPiCT) to NFS in the North Pacific (NPFC-2026-SSC NFS04-WP10). Japan applied the SPiCT to the winter-spring cohort of NFS in the North Pacific, using annual total catch data reported by NPFC Members, two fishery-dependent indices derived from Japanese

and Chinese commercial fisheries, and a fishery-independent index obtained from the Japanese scientific driftnet survey. The assessment used data from the 20-year period of 2005–2024, during which annual catch data and all three indices were available, to estimate stock dynamics through 2025. For all input indices, the preliminary relationships with the annual catch data aligned with the general structural assumptions of the surplus production framework. The final parameter estimates were well constrained, with narrow confidence intervals; however, slight diagnostic issues remained in the retrospective analysis. The relative weights of the three indices estimated within the state-space model reflected differences in their reliability: the Chinese fishery CPUE exhibited the lowest estimated observation error, whereas the Japanese fishery CPUE showed the highest error, likely due to large annual fluctuations. The Japanese survey CPUE index was in the middle. Although some runs yielded statistically acceptable estimates, these results remain preliminary and should not be used to determine the stock status at this stage. Nevertheless, Japan believed that this work demonstrated that the SPiCT framework integrating multiple indices has strong potential as a robust tool for assessing the stock status of this species.

37. The SSC NFS thanked Japan for presenting a preliminary application of SPiCT to NFS in the North Pacific. The SSC NFS encouraged Japan to continue to develop this work, including exploring the effect of applying finer-scale time-steps such as monthly or seasonal time-steps, investigating the retrospective pattern through one-index-out and other analyses, and exploring other parameter settings such as more biologically plausible shape parameters for the surplus production curve or using fractional timestamps (timeI) for seasonal timing.

38. China presented a preliminary stock assessment of NFS in the Northwest Pacific Ocean through 2025 using Just Another Bayesian Biomass Assessment (JABBA; NPFC-2026-SSC NFS04-WP07). The assessment incorporated NPFC-compiled catch data and Chinese squid-jigging CPUE series, including nominal CPUE and standardized CPUE indices derived from GAM, RF, and GBM. A total of 12 assessment scenarios were conducted, combining three stock units (winter-spring cohort, autumn cohort, and stock-wide population) with four abundance indices. The stock-wide assessment based on GAM-standardized CPUE was selected as the base-case scenario, with additional retrospective analysis and short-term projections conducted. All 12 assessment scenarios showed satisfactory convergence and model diagnostics, and the three GAM-based assessments showed acceptable retrospective stability. The application of different abundance indices could influence the results of the JABBA runs. The preliminary results indicated that the estimated 2025 stock-status point for each winter-spring scenario fell within the yellow quadrant, while the estimated 2025 stock-status for each autumn-cohort scenario fell within the green quadrant. For the stock-wide population, the estimated 2025 stock-status for the three standardized CPUE scenarios fell within the yellow quadrant, whereas the nominal CPUE scenario fell within the green quadrant, indicating sensitivity to CPUE selection. In all scenarios, the 2025 F/F_{MSY} estimates were

below 1, while the projections showed increasing stock risk at higher catch levels. The projections indicated higher estimated risk under higher catch scenarios. Given the preliminary nature of the assessment, the results should be interpreted cautiously and should not be used alone to determine future catch levels.

39. The SSC NFS thanked China for presenting a preliminary stock assessment of NFS in the Northwest Pacific Ocean using JABBA. The SSC NFS encouraged China to continue to develop this work, including investigating the relationship between r and k and exploring the effect of changing the prior values for each, analyzing the sensitivity of the model to alternative CV assumptions for the observation error distribution, and exploring the effects of different CPUE scenarios and different treatments of the abundance indices. The SSC NFS also requested that China provide more detailed information about how JABBA handles prior values and plots their distribution in the future.

8.2 Discussion of model configurations: cohort structures, input data (standardized CPUE, joint CPUE, survey indices), data weighting strategies, prior distribution selection, climate change impact and other related matters

40. Japan presented a plot of standardized CPUE for the winter-spring cohort by Member.

41. The SSC NFS requested that China and Japan conduct test runs of the JABBA and SPiCT models for the winter-spring cohort using the following input data and configurations, for review at SSC NFS05. The SSC NFS suggested using China's RF-based CPUE among the four standardized Chinese fishery CPUE series for the test runs, while the remaining CPUE series (GAM, GBM, and Tweedie-GAM) would be used for sensitivity analyses.
    (a) Input data (2005–2025): total catch, Japanese survey index, Chinese CPUE index (RF), Japanese CPUE index, Chinese Taipei CPUE index; Configuration: annual time step, calendar year
    (b) Input data (2005–2025): total catch, Japanese survey index, joint CPUE index; Configuration: annual time step, calendar year

42. The SSC NFS encouraged that Japan could develop annual catch and CPUE index on a fishing-year basis and provide them for future stock assessment.

43. Japan presented a plot of standardized CPUE for the autumn cohort by Member.

44. The SSC NFS requested that China and Japan conduct test runs of the JABBA and SPiCT models for the autumn cohort using the following input data and configurations, for review at SSC NFS05:
    (a) Input data (2005–2025): total catch, Japanese survey index, Chinese CPUE index, Japanese

CPUE index; Configuration: annual time step, calendar year

(b) Input data (2005–2025): total catch, Japanese survey index, joint CPUE index; Configuration: annual time step, calendar year

(c) Input data (2004–2025): total catch, Japanese survey index, Chinese CPUE index, Japanese CPUE index; Configuration: annual time step, calendar year

(d) Input data (2004–2025): total catch, Japanese survey index, joint CPUE index; Configuration: annual time step, calendar year

45. The SSC NFS requested Japan to compile the values and CVs of the fishery-dependent and fishery-independent indices by Member for each cohort intersessionally and provide them for the test runs prior to SSC NFS05 (2026 NFS data sharing).

46. The United States suggested that when deciding on which abundance indices should be used in the actual stock assessment, it would be useful to plot and review the correlation coefficient, such as Spearman's correlation coefficient, for each pair of indices.

47. The SSC NFS noted the observer paper NPFC-2026-SSC NFS04-OP01 and requested that the author present it at SSC NFS05.

Agenda Item 9. Review of the SSC NFS Work Plan

48. The SSC NFS reviewed and updated the SSC NFS Work Plan (NPFC-2026-SSC NFS04-WP01 (Rev. 1)). The SSC NFS recommended that the SC adopt the SSC NFS Work Plan.

Agenda Item 10. Other matters

49. The SC Chair reminded the SSC NFS of the following taskings from SC10:

(a) Review Members' sampling programs for transshipped catch.

(b) Discuss science-based options for operationalizing precautionary approach.

50. Regarding science-based options for operationalizing precautionary approach, the United States suggested that in the future, the SSC NFS could discuss Members' acceptable levels of risk and quantify the risk of underharvest or overharvest as part of a management strategy evaluation process. The United States suggested that this work could be initiated in a stepwise manner, with the SSC NFS focusing on developing and conducting its first stock assessment for the time being.

51. Regarding the review of Members' sampling programs for transshipped catch, the SSC NFS noted that:

(a) Biological samples from both transshipped and non-transshipped Chinese catch are collected by fishing crews at the point of capture, before transshipment occurs.

(b) There is no transshipment of Japanese catch in the Convention Area.

(c) There is no transshipment of Chinese Taipei catch in the Convention Area.

52. The SSC NFS reviewed and updated the species summary for NFS (NPFC-2026-SSC NFS04-WP02 (Rev. 1)). The SSC NFS recommended that the SC adopt the updated species summary.

53. The SSC NFS reviewed and updated the table of intersessional activities and timelines for the 2026 operational year (Annex F).

54. The SSC NFS updated the invited expert's roles and tasks to support the work of the SSC NFS in 2026–2027 (Annex G).

55. The SSC NFS recommended that the SC continue to hire an invited expert in 2027 to support the SSC NFS during its meetings and to conduct other work to support the SSC NFS as appropriate.

Agenda Item 11. Recommendation to SC

56. The SSC NFS agreed to:
   (a) continue analyses of Members' individual CPUE standardizations and the joint CPUE standardization and to explore areas where potential improvements could be made.
   (b) further develop and evaluate surplus production models, including JABBA and SPiCT, for potential use in an NFS stock assessment.
   (c) continue to conduct any other relevant work, including the determination of the input data, to prepare for the conducting of the first NFS benchmark stock assessment.
   (d) complete data preparation and discuss model settings and specifications at the SSC NFS05 meeting in May 2027 and subsequently finalize the first stock assessment using updated input data at the SSC NFS06 meeting in September 2027.
   (e) explore the potential use of MSE methods and tools.

57. The SSC NFS recommended that the SC:
   (a) endorse the updated CPUE Standardization Protocol for NFS (Annex D).
   (b) adopt the SSC NFS Work Plan (NPFC-2026-SSC NFS04-WP01 (Rev. 1)).
   (c) adopt the updated species summary for neon flying squid (NPFC-2026-SSC NFS04-WP02 (Rev. 1)).
   (d) continue to hire an invited expert in 2027 to support the SSC NFS during its meetings and conduct other work to support the SSC NFS as appropriate.
   (e) endorse the holding of a 4-day virtual meeting at the end of May 2027 and a 3 or 4-day hybrid meeting at the end of September 2027.

Agenda Item 12. Adoption of Report

58. The SSC NFS04 Report was adopted by consensus.

Agenda Item 13. Close of the Meeting

59. The SSC NFS thanked the SC Chair for his leadership.

60. The SC Chair thanked the SSC NFS for its engaged participation and constructive contributions, as well as the Secretariat and Rapporteur for their assistance.

61. The meeting closed at 10:25 on 30 July 2026, Tokyo time.

LIST OF ANNEXES

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Annex D – CPUE standardization protocol for neon flying squid
Annex E – Timing of data availability by Member
Annex F – SSC NFS intersessional activities and timelines for 2026-2027
Annex G – Invited expert's roles and tasks to support the work of the SSC NFS in 2026-2027

Annex A:
Agenda

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Agenda Item 9. Review of the SSC NFS Work Plan

Agenda Item 10. Other matters

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Annex B:

List of Documents

MEETING INFORMATION PAPERS

Number	Title
NPFC-2026-SSC JS01-MIP01 (Rev. 1)	Meeting Information
NPFC-2026-SSC NFS04-MIP02	Provisional Agenda
NPFC-2026-SSC NFS04-MIP03 (Rev. 1)	Annotated Indicative Schedule

WORKING PAPERS

Number	Title
NPFC-2026-SSC NFS04-WP01 (Rev. 1)	Five-Year Work Plan of the SSC NFS
NPFC-2026-SSC NFS04-WP02 (Rev. 1)	Species Summary for Neon Flying Squid
NPFC-2026-SSC NFS04-WP03	Standardized CPUE for the autumn cohort of neon flying squid caught by Japanese squid jigging fishery in the North Pacific from 2005 to 2025
NPFC-2026-SSC NFS04-WP04	Standardized CPUE of Neon flying squid (*Ommastrephes bartramii*) caught by Chinese Taipei's squid jigging fishery from 2016 to 2025
NPFC-2026-SSC NFS04-WP05	Standardized CPUE Indices for Neon Flying Squid Using Chinese Squid-Jigging Fishery Data from 2005 to 2025
NPFC-2026-SSC NFS04-WP06	Size composition of neon flying squid based on Chinese squid jigging survey in the Northwest Pacific Ocean
NPFC-2026-SSC NFS04-WP07	Updated stock assessment of Neon flying squid in the Northwest Pacific using JABBA model up to 2025
NPFC-2026-SSC NFS04-WP08	Standardized CPUE for the winter-spring cohort of neon flying squid caught by Japanese squid jigging fishery in the North Pacific from 2005 to 2025
NPFC-2026-SSC NFS04-WP09	Standardized CPUE for the autumn and winter-spring cohorts of neon flying squid based on Japanese driftnet surveys from 2001 to 2025
NPFC-2026-SSC NFS04-WP10	Preliminary stock assessment of the winter-spring cohort of neon flying squid using the stochastic surplus production model in continuous time (SPiCT) from 2005 to 2024

INFORMATION PAPERS

Number	Title
NPFC-2026-SSC NFS04-IP01 (Rev. 1)	Neon Flying Squid Fishery - Chinese Taipei
NPFC-2026-SSC NFS04-IP02	Neon flying squid fishing conditions in China in 2025
NPFC-2026-SSC NFS04-IP03	Extending Joint CPUE Standardization for Neon Flying Squid
NPFC-2026-SSC NFS04-IP04 (Rev. 1)	SSC NFS intersessional activities and timelines for the 2026 operational year
NPFC-2027-SC11-IP01 (Rev. 5)	Scientific Committee Data Call – 2026/2027

OBSERVER PAPERS

Number	Title
NPFC-2026-SSC NFS04-OP01	Simulation Methods for the Assessment and MSE for Short-Lived Species

Annex C:
List of Participants

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Annex D:

CPUE standardization protocol for neon flying squid

(revised in July 2026)

CPUE is catch per unit effort obtained either from fishery independent or fishery dependent data. The use of CPUE in a stock assessment implicitly assumes that CPUE is proportional to stock abundance/biomass. However, many factors other than stock abundance/biomass may influence CPUE. Thus, any other factors, other than stock abundance/biomass, that may influence CPUE should be removed from the CPUE index. The process of reducing/removing the impacts of these factors on CPUE is referred to as CPUE standardization.

<u>The following protocol is developed for the CPUE standardization:</u>

(1) Provide a description of the type of data (logbook, observer, survey, etc.), and the "resolution" of the data (aggregated, set-by-set etc.).

(2) Identify potential explanatory variables (i.e., spatial, temporal, environmental, and fisheries variables) that may influence CPUE values.

(3) Plot annual/monthly spatial catch, effort and nominal CPUE distributions and determine temporal and spatial resolution for CPUE standardization.

(4) Make scatter plots (for continuous variables) and/or box plots (for categorical variables) and present correlation matrix if possible to evaluate correlations between each pair of those variables.

(5) Describe selected explanatory variables based on (2)-(4) to develop full model for the CPUE standardization.

(6) Specify model type and software (packages) and fit the data to the assumed statistical models (i.e., GLM, GAM, Delta-lognormal GLM, Neural Networks, Regression Trees, Habitat based models, and Statistical habitat based models).

(7) Evaluate and select the best model(s) using methods such as likelihood ratio test, information criterions, cross validation etc.

(8) Provide diagnostic plots to support the chosen model is appropriate and assumption are met (QQ plot and residual plots along with predicted values and important explanatory variables, etc.).

(9) Extract yearly and, if needed, seasonally standardized CPUE and standard error by a method that is able to account for spatial heterogeneity of effort, such as least squares mean or expanded grid. If the model includes area and the size of spatial strata differs or the model includes interactions between time and area, then standardized CPUE should be calculated with area weighting for each time step. Model with interactions between area and season or month requires careful consideration on a case by case basis. Provide details on how the CPUE index was extracted.

(10) Calculate uncertainty (SD, CV, CI) for standardized CPUE for each year. Provide detailed explanation on how the uncertainty was calculated.

(11) Provide a table and a plot of nominal and standardized CPUEs over time. When the trends between nominal and standardized CPUE are largely different, explain the reasons (e.g. spatial shift of fishing efforts), whenever possible.

DOCUMENT TEMPLATE FOR PRESENTING STANDARDIZED CPUE OF NFS

Title: Standardized CPUE of Neon flying squid (*Ommastrephes bartramii*) caught by the MEMBER's FISHING METHOD (e.g., squid jigging) fishery from XXXX to 20XX

Author's Name(s)

Affiliation(s)

Summary

- Summarize the results

Introduction

- Brief introduction of the fish and description of the fishery of corresponding member.

Method

- Describe the way of separating the two cohorts if applicable.

The data

- Spatial and temporal patterns of catch and effort (Fig. 1)
- Available covariates with explanation on resolution and coverage (Table 1)
- Correlations among the variables (Fig. 2)
- If there are any candidate environmental covariates, describe explanations and the reason for including them.

Full model description and model selection

- Type and assumptions of the model
- Response and explanatory variables and interactions
- Assumed error distribution
- Formulation of full model

- Model selection method

Yearly trend extraction

- How to extract yearly trend from the selected model
- How to evaluate uncertainty of the extracted trend, if necessary

Result and discussion

- Result of the model selection, at least for the full and best models (Table 2)
- Interpretation of the selected model
- Model diagnosis: for example, Analysis of deviance table (Table 3), tendencies of the residuals (Fig. 3) and percentage of the deviance explained
- The extracted yearly trend (Table 4), comparing with the nominal CPUE (Fig. 4)
- Further discussion

References

Figures and tables

APPENDICES

- **Appendix I:** Checklist for the CPUE standardization protocol

**All tables and figures in this document template are provided as examples. Authors should modify the tables and figures as needed, including the table fields. If results are separated by cohorts, please present the results from both models.*

Table 1 Summary of explanatory variables used in GLM*.

Variables		Number of categories	Detail	Note
Year	*Year*	25	1994–2018	
Month	*Month*	5	August–December	
Vessel size	*Grt1*	10	$Grt<20$, $20\leqq Grt<40$, ..., $180\leqq Grt<200$ tons	at intervals of 20 tons

Table 2 Result of model selection

No	$\eta(t_i)$	ϕ	Adj. R^2	Dev. expl. %	BIC	d
1	$\beta_0+\beta^Y_{year_i}$	0.84	0.122	13.9	211201	26
2	$\beta_0+\beta^Y_{year_i}+\beta^M_{month_i}$	0.83	0.132	15.1	210828	29
3	$\beta_0+\beta^Y_{year_i}+\beta^M_{month_i}\middle|\beta^Y_{year_i}$	0.79	0.155	18.7	210330	97
4	$\beta_0+\beta^Y_{year_i}+\beta^M_{month_i}\middle|\beta^Y_{year_i}+\beta^V_{Idves_i}$	0.73	0.194	23.0	**209391**	148
5	$\beta_0+\beta^Y_{year_i}+\beta^M_{month_i}+\beta^V_{Idves_i}$	0.76	0.171	19.3	209958	80

β_0 – intercept, $\beta^Y_{year_i}$ – coefficient of i-th year ($year_i$), $\beta^M_{month_i}$ – coefficient of i-th month ($month_i$), $\beta^V_{Idves_i}$ – coefficient of i-th unique ID of a vessel ($Idves_i$).

Table 3 Analysis of deviance table

	SS	Df	F	Pr(>F)	Signif. codes
Year	453.8	24	39.35	< 2.2e-16	***
Month	117.3	1	244.06	< 2.2e-16	***
Grt1	265.9	7	79.03	< 2.2e-16	***
Year:Month.int	1067.4	72	30.85	< 2.2e-16	***
Year:Area.int	296.3	48	12.85	< 2.2e-16	***
Year:Grt.int	258.6	48	11.21	< 2.2e-16	***
Month.int:Area.int	45.4	6	15.734	< 2.2e-16	***
Month.int:Grt.int	33.5	6	11.624	4.74E-13	***
Area.int:Grt.int	39.4	6	13.651	1.50E-15	***
Residuals	19277.7	40113			

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Table 4 Nominal and standardized CPUEs of XXXX fishery for NFS from 1994 to 2018.

Year	Nominal CPUE (metric ton / hauls)	Standardized CPUE	CV (%)	95% CI	
				Lower	Upper
1994	5.38	2.93	3.53	2.74	3.14
1995	4.41	2.16	6.53	1.90	2.44
1996	2.40	1.62	4.69	1.48	1.77
1997	4.77	3.58	12.93	2.79	4.63
1998	1.44	1.02	3.86	0.94	1.09
1999	1.45	0.75	3.97	0.70	0.81
2000	2.18	1.37	4.38	1.26	1.49
2001	3.18	2.06	5.64	1.84	2.32
2002	1.93	1.15	5.66	1.02	1.29
2003	3.21	2.17	4.27	2.01	2.37
2004	3.65	2.51	3.95	2.33	2.71
2005	6.63	4.38	4.05	4.03	4.72
2006	6.03	3.93	4.30	3.61	4.28
2007	7.81	4.05	4.31	3.73	4.40
2008	7.81	4.93	4.06	4.56	5.31
2009	4.60	3.58	4.43	3.29	3.92
2010	2.73	1.49	3.66	1.37	1.59
2011	4.45	2.36	4.01	2.19	2.55
2012	3.65	2.31	4.31	2.12	2.52
2013	3.04	1.43	3.88	1.33	1.55
2014	5.42	2.49	3.64	2.32	2.67
2015	2.65	1.34	4.43	1.23	1.46
2016	2.82	1.50	5.94	1.33	1.68
2017	1.40	1.08	4.23	1.00	1.17
2018	2.96	1.40	3.91	1.30	1.52

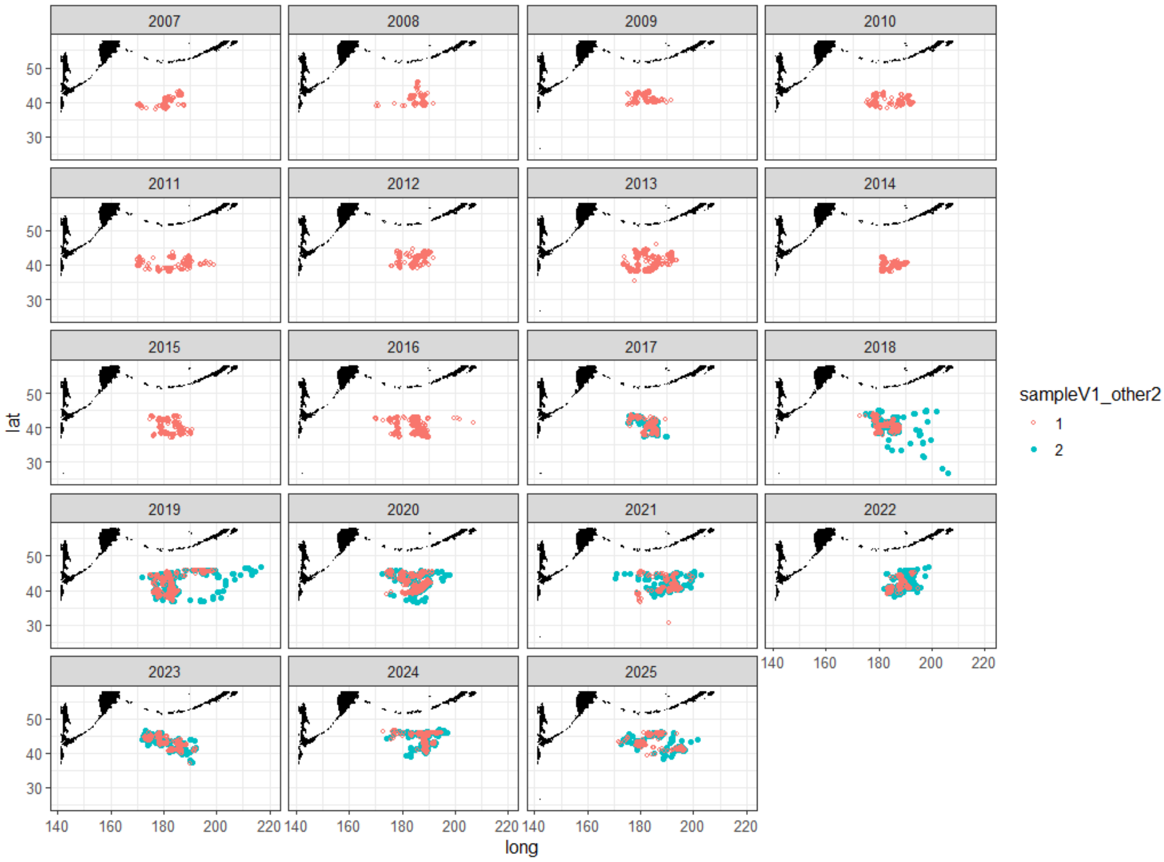

Fig. 1 Inter-annual variation of fishing ground of XXXX fishery for NFS from 1994 to 2018.

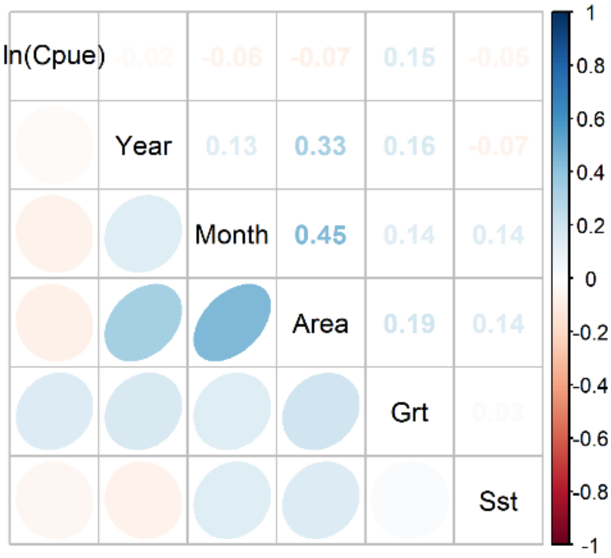

Fig. 2 Correlation matrix of explanatory variables used in the analysis.

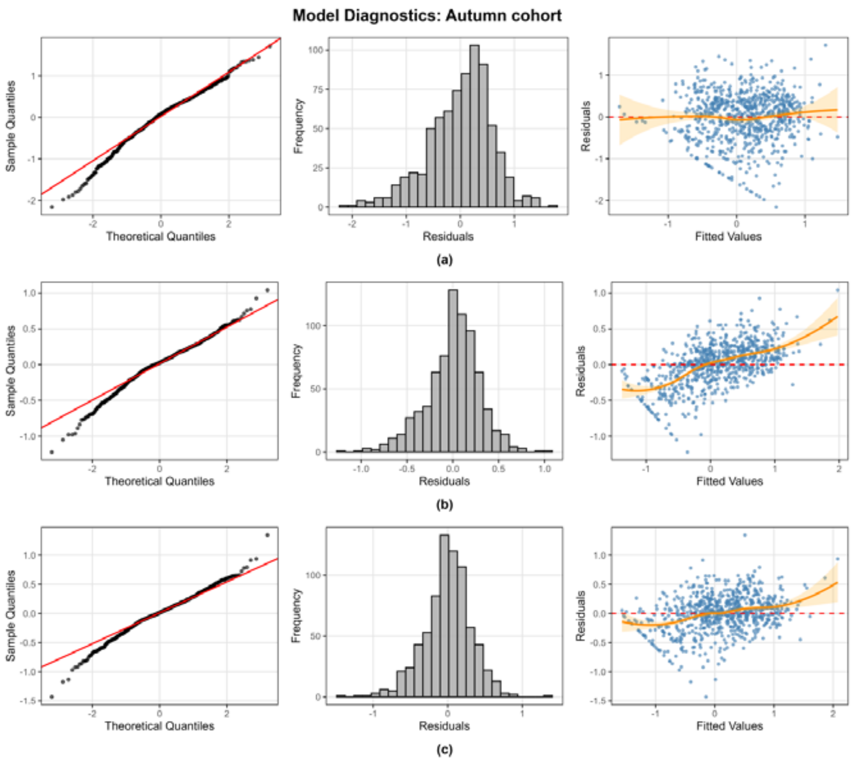

Fig. 3 Diagnose figures for the best model.

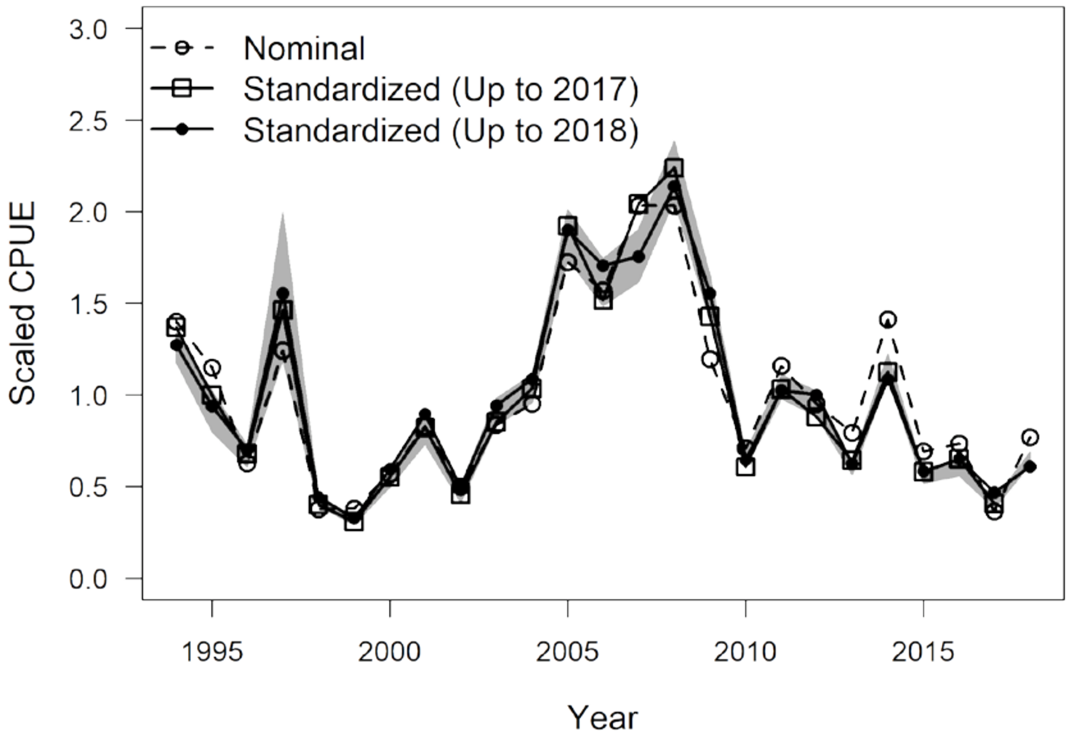

Fig. 4 A scaled nominal CPUE series and two scaled standardized CPUE series with catch and effort data up to 2017 (terminal year-1) and 2018 (terminal year). Gray zone indicates 95% confidence band for the standardized CPUE up to 2018.

Appendix I Checklist for the CPUE standardization protocol

Appendix1. Checklist for the CPUE standardization protocol

1	Provide a description of the type of data (logbook, observer, survey, etc.), and the "resolution" of the data (aggregated, set-by-set etc.).	Yes (Section 2.1, Paragraph 1-2)
2	Identify potential explanatory variables (i.e., spatial, temporal, environmental, and fisheries variables) that may influence CPUE values.	Yes (Section 2.1, Paragraph 4)
3	Plot annual/monthly spatial catch, effort and nominal CPUE distributions and determine temporal and spatial resolution for CPUE standardization.	Yes (Fig. 1, Fig. 2)
4	Make scatter plots (for continuous variables) and/or box plots (for categorical variables) and present correlation matrix if possible to evaluate correlations between each pair of those variables.	Yes (Table 1, Fig. 3)
5	Describe selected explanatory variables based on (2)-(4) to develop full model for the CPUE standardization.	Yes (Section 2.1 and 2.2)
6	Specify model type and software (packages) and fit the data to the assumed statistical models (i.e., GLM, GAM, Delta-lognormal GLM, Neural Networks, Regression Trees, Habitat based models, and Statistical habitat based models).	Yes (Section 2.2)
7	Evaluate and select the best model(s) using methods such as likelihood ratio test, information criterions, cross validation etc.	Yes (Table 3)
8	Provide diagnostic plots to support the chosen model is appropriate and assumption are met (QQ plot and residual plots along with predicted values and important explanatory variables, etc.).	Yes (Fig. 4-6)
9	Extract yearly and, if needed, seasonally standardized CPUE and standard error by a method that is able to account for spatial heterogeneity of effort, such as least squares mean or expanded grid. Provide details on how the CPUE index was extracted.	Yes (Section 2.4, Paragraph 1-2)
10	Calculate uncertainty (SD, CV, CI) for standardized CPUE for	Yes (Table 4)

	each year. Provide detailed explanation on how the uncertainty was calculated.	
11	Provide a table and a plot of nominal and standardized CPUEs over time. When the trends between nominal and standardized CPUE are largely different, explain the reasons (e.g. spatial shift of fishing efforts), whenever possible.	Yes (Fig. 7, Table 5)

Annex E:

Timing of data availability by Member

	Year	X												X+1											
Member	Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
China	Survey						Survey (WS)												Survey (WS)						
Japan	Survey						Survey (WS&Autumn)												Survey (WS&Autumn)						
China	Fishery				Autumn												Autumn								
China	Fishery							WS												WS					
Japan	Fishery	WS				Autumn							WS					Autumn							WS
Korea	Fishery						WS												WS						
Russia	Fishery																								
Chinese Taipei	Fishery						Autumn												Autumn						
Chinese Taipei	Fishery					WS												WS							
Vanuatu	Fishery																								
Option 1				DP				SA								DP				SA					
Option 2						DP					SA							DP					SA		
Option 2.1						DP				SA								DP				SA			

Autumn – autumn cohort of NFS, WS – winter-spring cohort of NFS, DP – data preparatory meeting, SA – stock assessment meeting

Annex F:

SSC NFS intersessional activities and timelines for 2026-2027

Activity/Task	Deadline	Responsibility and Reference/Comment
Members		
Data sharing	See Data call	• Members operating NFS fisheries and/or conducting research surveys • Collaboration site / SC database
Updates on Members' fishery status and research activities up to 2026	**May 7, 2027** (two weeks prior SSC NFS05)	• Members operating NFS fisheries and/or conducting research surveys • IP (ppt slides) • See template for fisheries status information for NFS
Updates of biological information for NFS	Same as above	• If available • WP or IP
Common sampling protocol for collecting NFS age and size data	Same as above	• If available • WP
Standardized fishery-dependent and fishery-independent abundance indices up to 2026	Same as above	• Members operating NFS fisheries and/or conducting research surveys • WP • See CPUE Standardization Protocol for NFS
Stock assessment modelling results	Same as above	• If available • WP • See Stock Assessment Protocol for NFS
Research on climate change impacts on NFS	Same as above	• If available • WP or IP
Members' sampling programs for transshipped catch, subject to discussion at SC11	Same as above	• Members doing transshipments of NFS • WP or IP
Fishery-dependent indicators: a. Standardized CPUE (see above) b. Cohort-specific mean size at catch, if available c. Total catch (eAR)	Same as above	• Members operating NFS fisheries • WP

Fishery-independent indicators: a. Abundance index from surveys conducted by China and Japan up to 2025 b. Size composition from surveys conducted by China and Japan up to 2025	Same as above	• China, Japan • WP
Chair/Secretariat/Invited expert		
Data call	**Aug 2026**	Secretariat Post the updated data call on the website https://www.npfc.int/sc-data-call
Invited expert's roles and tasks for the 2026 operational year (annexed to SSC NFS04 report)	Same as above	Secretariat/Chair Deliver to invited expert, draft/update a consultancy agreement
Annotated Indicative Schedule	**May 7, 2027** (two weeks prior SSC NFS05)	Secretariat
Work Plan of the SSC NFS	Same as above	Chair/Secretariat Update up to 2031
Species summary for neon flying squid update	Same as above	Chair/Secretariat Include 2026 data
Updated joint CPUE standardization up to 2026	Same as above	Invited expert
Science-based options for operationalizing precautionary approach	Same as above	Chair/Secretariat in consultation with SC Chair and Members
Report on the model configurations, diagnostics, and results of the JABBA and SPiCT models developed by China and Japan	Same as above	Invited expert

Annex G:

Invited expert's roles and tasks to support the work of the SSC NFS in 2026-2027

(up to SSC NFS05 in May 2027)

1. Participate in the SSC NFS04 meeting, 28-30 July 2026 (2.5 days) and SSC NFS05 meetings (end May 2027, 4 days, 4 hours/day).
2. Continue to develop the joint spatiotemporal CPUE standardization work and communicate with Members on how best to utilize their data.
3. Check the model configurations, diagnostics, and results of the JABBA and SPiCT models developed by China and Japan and ensure the configurations are as similar as possible, and provide a report to SSC NFS05.
4. Provide constructive scientific feedback during SSC NFS meetings, including advice on data, indices, model assumptions, analytical methods and interpretation of results.
5. Actively intervene during SSC NFS meetings when technical clarification is needed.
6. Maintain active intersessional communication with the Chair and Members, as appropriate, to support ongoing technical work and follow-up actions agreed during meetings.

Reference: Policy for the selection and extension of invited experts for supporting the Scientific Committee and its subsidiary groups