ANNEX 04a

26th Meeting of the
International Scientific Committee for Tuna
and Tuna-Like Species in the North Pacific Ocean
Taipei City, Chinese Taipei
22-29 June 2026

REPORT OF THE ALBACORE WORKING GROUP DATA PREPARATION WORKSHOP [1]

27 October – 2 November 2025
Yokohama, JAPAN
6-8 January 2026 (JST)
Virtual Follow-Up

June 2026

[1] Prepared for the 26th Meeting of the International Scientific committee on Tuna and Tuna-like Species in the North Pacific Ocean (ISC) held June 22-29, 2026, in Taipei City, Chinese Taipei. Document should not be cited without permission of the authors.

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REPORT OF THE ALBACORE WORKING GROUP WORKSHOP

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1. OPENING AND INTRODUCTION

An intersessional workshop of the Albacore Working Group (ALBWG or WG) of the International Science Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) was first convened in-person at Japan Fisheries Research and Education Agency (FRA), Yokohama, Japan 27 October – 2 November 2025 and a follow-up virtual meeting was held January 6 – 8, 2026 (JST). The main goal of this workshop was to explore and prepare the fisheries data and plan analyses for the upcoming stock assessment of North Pacific albacore tuna (NPALB; *Thunnus alalunga*) in March 2026.

The Fisheries Resources Institute, Japan Fisheries Research and Education Agency (FRA), welcomed participants from Canada, Chinese Taipei (TWN), Japan, and the Inter-American Tropical Tuna Commission (IATTC) to the in-person workshop and the United States of America (USA) joined the virtual follow-up meeting. The participants and their affiliations are listed in **Attachment 1**.

The ALBWG Chair briefly described the specific objectives of the meeting: 1) review updated stock assessment input data from each fishery and updated research on NPALB; 2) conduct and review an exploratory run of the 2023 stock assessment model with updated input data to assess the impact of recent trends and develop solutions to parameterization issues; 3) identify tasks for the 2026 stock assessment and create a workplan for the next ALBWG meeting in March 2026; and 4) address requests for advice from the tuna Regional Fisheries Management Organizations (RFMOs).

2. MEETING LOGISTICS

2.1 Meeting protocol

The ALBWG Chair noted all perspectives and research are welcome and that the efforts of the WG at this meeting would be collegial and follow the scientific method with an emphasis on empirical testing, open debate, documentation and reproducibility, reporting uncertainty, peer review, and constructive feedback to authors and presenters.

2.2 Review and adoption of agenda

The draft agenda was circulated prior to the meeting, reviewed, and adopted at the workshop (**Attachment 2**). A list of working papers and presentations can be found in **Attachment 3**.

2.3 Assignment of rapporteurs

Rapporteuring duties were assigned to Haikun Xu and Peter Kuriyama. Sarah Hawkshaw, the ALBWG Chair, had the overall responsibility of assembling the report.

2.4 Distribution of Documents and Working Paper Availability

Twelve (12) working papers (WP) and four presentations were submitted and assigned numbers for the workshop (**Attachment 3**). Working papers will be publicly available through the ISC website (http://isc.fra.go.jp/) and author contact details will be provided for the other related materials.

3. REVIEW WORK ASSIGNMENTS

The WG chair briefly reviewed the table of work assignments developed at previous WG meetings and the WG discussed plans to update the work assignments during the in-person and virtual meetings (**Table 1**).

4. REVIEW UPDATED STOCK ASSESSMENT INPUT DATA

4.1 Catch, CPUE Indices, Size Compositions

4.1.1. Japan Longline/Pole-and-Line/Miscellaneous

Updated North Pacific albacore catch by Japanese fisheries. Yuichi Tsuda, Naoto Matsubara, Yoshinori Aoki, Hirotaka Ijima, Keisuke Sato (ISC/25/ALBWG-02/01)

This document updates North Pacific albacore (*Thunnus alalunga)* catch data by Japanese fisheries through 2023 for the upcoming 2026 stock assessment. Total annual catch fluctuated between 16,273 mt and 32,616 mt in 2021-2023, primarily taken by longline (LL) and pole-and-line (PL) fisheries. Catch data is compiled from logbooks and landing reports, with estimation procedures adjusted for small-scale coastal fleets. The longline catch, dominated by the coastal

fleet, shows a long-term stabilization, but spatial analysis highlights a significant 50% contraction of fishing grounds since the 1990s, linked to distant water vessels shifts and economic factors. The pole-and-line catch trend remains volatile, with effort shifting from distant water to offshore vessels since 2005. Spatially, the main effort concentration moved from Area 3 to Area 2 in the second quarter, largely due to distant water fleets targeting skipjack tuna and economic factors. Miscellaneous catches, primarily from Purse Seine, showed a notable increase in 2023 (4,409 mt). These updated data and observed trends are crucial for the next stock assessment model.

Discussion

The WG thanked the authors for these updated data and analyses. The WG asked why the purse-seine catch in 2023 was so much higher than in 2021 and 2022 and the authors clarified that it depends on fishing strategy. The purse-seine fishers will target switch and also catch skipjack in this fishery. Typically, the price of albacore is stable whereas the price of skipjack can vary, so fishers adjust the fishing strategy based on economic consideration. The WG noted that the JPPL and JPLL fishing grounds have shrunk substantially over time and agreed with the authors that this detail must be considered carefully. **The WG acknowledged that the 2024 data would not be available until February 2026 and recommended reviewing again during the 2026 stock assessment meeting in March.**

Updated the size data for North Pacific albacore tuna from Japanese fisheries for the 2026 stock assessment. ***Yuichi Tsuda, Yoshinori Aoki, Hirotaka Ijima, Naoto Matsubara (ISC/25/ALBWG-02/02)***

This paper details the update and review of Japanese albacore (Thunnus alalunga) size data for the upcoming 2026 stock assessment. Understanding the size structure of catches is crucial as it reflects fishery selectivity, which varies across Japanese fleets (longline, pole-and-line, etc.). The updated dataset incorporates newly collected port sampling and research/training vessel data up to 2024 and corrects a significant filtering error that had erroneously excluded observer data in the previous 2023 assessment. This correction resulted in a substantial increase in the total number of size samples. Despite the sample size increase, comparisons of length frequency distributions for major fisheries (LL and PL) showed a high degree of consistency with the 2023 stock assessment data. The analysis confirmed key biological and operational characteristics, such as the longline fleet sampling larger, adult fish in lower-latitude spawning areas and the pole-and-line fleet targeting smaller, juvenile fish in northern feeding grounds. This data consistency and improved coverage, particularly for adult-indicator areas (Area 2), support the robust estimation of selectivity for the upcoming 2026 stock assessment.

Discussion

The WG thanked the authors for their WP and updated dataset. The WG noted that the correction of the filtering error added more samples to the observer size data and the authors explained that this is not likely to impact the results of the stock assessment because length frequency distribution is similar to what was used in the previous stock assessment. **The WG recommended that the corrected data be used in the upcoming stock assessment.**

A Mixture model for defining fleet units from Japanese longline logbook data for North Pacific Albacore tuna (Thunnus alalunga). *Hirotaka Ijima and Yuichi Tsuda* (*ISC/25/ALBWG-02/03*)

This study proposes a framework for incorporating the spatiotemporal variability in catch size variability driven by movement and growth into stock assessments, independent of tagging data or pre-defined area boundaries. We focus on the Japanese longline fishery for North Pacific albacore (Thunnus alalunga). A mixture model for the mean weight per operational unit was executed quarterly on logbook data, automatically extracting size classes using Year, Month, and a 5° × 5° grid as keys. This consistent classification of the entire dataset achieved a non-pooling design, defining fleets via a statistical Area-as-Fleet approach. This resulting fleet definition was then applied to the length composition data, 5° × 5° catch amount, and Japanese yearbook statistics. Furthermore, a novel CPUE standardization using a spatiotemporal joint species model was applied to the data mapped to a 1° × 1° resolution. As a result, the existing 20 area divisions were simplified to 12, and length frequency data became usable across all fleets.

Discussion

The WG thanked the authors for this important analysis and agreed with the updates to 2024 analysis which included weighting by number of catch and low spatial resolution (1x1) to follow the other data sets. The WG agreed that this method is not very reliable for a juvenile index because of spatial distribution of the fishing ground and JPLL effort are shrinking and the hot spot for juveniles is close to the boundary. Sex ratio data suggests that the area for the adult index should extend beyond Area 2 so the WG agreed that this proposed adult index should cover the JPLL fleet in the whole NPALB spatial area in quarter 1. The WG agreed with the authors that this approach is not feasible for the JPPL fisheries due to poor-quality mean body weight data. The WG had substantial discussion about the change in fleet definition this analysis would cause. This mixture model approach would cause a large difference from the previous approach and any modifications would need to be applied consistently across all longline fleets. The WG noted that the mixture model in this analysis can be used to reduce the number of fleets and change the indices. **The WG recommended that the authors continue to develop this model and present updates at the next model improvements meeting.** The authors will collaborate with the other countries with LL fleets to see if this method could be applied to their fleets and decide what to do with the PL fleets.

Evaluation of size data sets and applicability of mixture models in the Japanese pole-and-line fishery. ***Hirotaka Ijima and Yuichi Tsuda (ISC/25/ALBWG-02/04)***

The Japanese pole-and-line fishery substantially affects North Pacific albacore. However, size selectivity is difficult to estimate because the highly variable and multimodal observed lengths preclude a clear size selectivity function. To address this issue, we applied a mixture model approach that uses visually estimated mean fish weight per set from logbooks. We then compared the derived length composition with port-sampled lengths to evaluate accuracy and utility. The mean-weight mixture model did not reliably identify cohorts (poor fit and unstable classification) and revealed digit preference in logbook entries, with spikes at 4 and 10 kg. The length composition derived from the classified mean weights was inconsistent with the port-sampled lengths. By contrast, comparisons with catch amount indicated that the port-sampled data successfully captured high-catch strata and are representative of the fleet. Resampling lengths in proportion to catch numbers yielded a composition broadly consistent with the raw port samples, thereby confirming the trimodal distribution observed in port sampling. These findings suggest that logbook mean weight does not reflect average catch size per set. Consequently, we do not recommend mean-weight-based mixture models for defining fleets. Because the port-sampled lengths are representative, they should be used with catch-proportional resampling (or weighting) to set effective sample sizes. Therefore, given the strong spatial overlap among cohorts, the conventional area-as-fleet approach warrants re-evaluation.

Discussion

The WG noted that the mixture model does not work well for the JPPL fishery and the authors clarified that the fishing locations are more restricted/concentrated and the fishery targets multiple species. This fishery has a very dynamic fishing strategy, potentially causing the cluster method to not work well for this fishery. The WG noted that the number of pole-and-line fisheries in the current benchmark assessment model is very high considering that time-varying selectivity is applied to those fisheries. The proposed new pole-and-line fishery definition includes a smaller number of fisheries by grouping the fisheries in Areas 3 and 5 in Quarters 1 and 2 and in Quarters 3 and 4. The authors noted that in Q1/Q4 there is almost no fishing by the JPPL fishery in the southern area and then in Q2/Q3 the fishery moves north when the majority of the fishing is occurring for this fishery. The authors will continue to develop this new analysis for defining fleets to be used in the future. The authors also plan to check whether the new grouping can be easily tested in the current model structure without changing the fleet definition in stock synthesis. Specifically, check whether it can be done by simply mirroring the selectivity of the fisheries that belong to the same group. Additionally, the authors will compare the length-frequency and selectivity, if possible, and collaborate with US on the time-varying selectivity for use on the JPPL fishery. **The WG recommended continuing research on this mixture model.**

Implementation and evaluation of the mixture model approach for North Pacific albacore stock assessment. ***Hirotaka Ijima and Yuichi Tsuda (ISC/25/ALBWG-02/05)***

The conventional area-as-fleet approach in the North Pacific albacore assessment is undermined by spatial variation. It produces unrealistic CPUE fluctuations and increases structural uncertainty. To address this issue, we applied a mixture-model approach to Japanese longline fishery data. We then evaluated Stock Synthesis 3 (SS3) runs configured with alternative fleet definitions (F1–F10) within this framework. Compared with existing models, our approach reduced uncertainty in estimates of spawning stock biomass (SSB), yielding the narrowest 95% confidence interval. It also dampened the magnitude of interannual recruitment fluctuations, indicating a potential improvement in model fit. Changes in fleet definition had little effect on the spawner-per-recruit (SPR) estimates. Overall, the mixture-model approach helps resolve data conflicts and improves model fit for the North Pacific albacore assessment, offering a practical alternative to the previous area-based method.

Discussion

The WP discussed the difference in the depletion from the preliminary stock assessment results using the 2023 model with updated data and the authors presented an update during the meeting that was more similar to that used last year. **The WG recommended that that authors continue to develop this analysis for use in the future.**

Updated Standardized CPUE for North Pacific Albacore by Japanese Longline by using INLA. ***Naoto Matsubara, Hirotaka Ijima, and Yuichi Tsuda (ISC/25/ALBWG-02/06)***

This document briefly reports on the standardized JPLL (Japanese longline) CPUE estimated using the INLA package as a backup index for the ISC North Pacific albacore stock assessment. Compared to the previous submission in 2023, only the data were updated; the data aggregation method and the standardization model itself were unchanged. Standardized CPUE was successfully estimated without convergence and model diagnostics issues.

Discussion

The WG thanked the authors for preparing this updated index as an alternative for comparison. The WG noted the change in the index in the earlier years and the authors explained that the model is instable and there was an update in the area used. The WG agreed with the authors that adding more area to the index standardization does not seem to change the trends in the JPLL index estimates however this method appears to be unstable with the addition of updated data. **The WG recommended not using this index option as the main index in the base case model given the apparent instability of the method but a bridging analysis will be needed for transitioning to a new method. Therefore, the WG recommended using this index option as a backup for the 2026 stock assessment.**

Standardized CPUE for North Pacific Albacore by Japanese Longline. Naoto Matsubara, Haikun Xu, Makoto Nishimoto, Yoshinori Aoki, Hirotaka Ijima, and Yuichi Tsuda *(ISC/25/ALBWG-02/07)*

This document reports on the development of a new Japanese longline CPUE for the ISC North Pacific albacore stock assessment. Following the discussions at the March 2025 working group meeting, the following tasks were undertaken:

- Change the R package from VAST to sdmTMB package for CPUE standardization
- Estimation of standardized CPUE using sdmTMB across the entire ISC area and the data rich area (west of 180degE).
- Development of an adult index for albacore based on standardized size composition and standardized CPUE

All models successfully converged. Whether the new adult index will be applied in the stock assessment will be discussed within ALBWG during the data prep meeting.

Discussion

The WG noted that estimating the selectivity of the adult index can be difficult. The WG discussed using the double-normal selectivity curve with steep ascending and descending limbs for the index. The fit to length compositions can be poor if albacore is not fully selected within the plateau of double-normal selectivity however this test can only be done in the assessment model. The WG also noted that the maturity at 80 cm is close to 0, so 85 cm was the best option as the first bin for the adult female index. The WG agree that the results showed that indices from all areas and data-rich areas exhibited similar overall trends, although some RichArea indices showed declining trends late in recent years. Given the shrinking spatial footprint of the effort the **WG recommended using the All Areas/85-100cm index as the main index in the 2026 stock assessment. The WG recommended considering the length specific indices as options. Given that the sdmTMB-derived CVs were unrealistically low for all models the WG recommended that the authors continue to investigate CV options, including if the length specific indices CVs can be combine, and in the meantime use CV scaled to a mean of 0.2 the 2026 stock assessment.**

4.1.2. Taiwan Longline/Miscellaneous

Catch and Length Information of North Pacific Albacore by Taiwanese Fleets Pacific Albacore by Taiwanese Fleets. *Zi-Wei Yeh and Yi-Jay Chang (ISC/25/ALBWG-02/Presentation01)*

This presentation summarizes the catch, CPUE, and size composition data of North Pacific albacore (*Thunnus alalunga*) from Taiwanese longline fisheries during 2019–2024. Catch data were categorized into Fleet 28 (north of 25°N) and Fleet 29 (equator–25°N) following the definitions used in previous stock assessments. Fleet 28 catches were mainly from the DWLL fishery and concentrated in quarters 1 and 4, while Fleet 29 catches were dominated by STLL vessels and showed a steady increase over the past three years. Trends in catch, effort, and nominal CPUE indicated that DWLL catches occurred mainly in Area 5 and STLL catches in Areas 2 and 4, where CPUE has increased in recent years. The Fleet 28 size composition was derived

by integrating daily vessel-specific length data with logbook catches and aggregating by spatial and temporal strata. The resulting length-frequency data showed minor interannual variation, with slightly larger fish observed in Q4 2021 and Q1 2022. The overall consistency between updated and previous datasets confirms the reliability of the submitted data.

Discussion

There are two area-specific TWN LL fleets in the 2023 stock assessment (north and south), but each area could be split into two (distant-water and coastal-offshore vessels). There are not enough size data for the distant-water fleet in the southern area (F29) so selectivity may need to be mirrored to that of other fleets fishing in similar areas. The WG asked why there is an increase in the catch of the STLL fleet and the authors explained that there has been an increase in migration of vessels that previously fished in the Indian ocean to the Pacific Ocean. The WG noted the substantial increase in the albacore nominal CPUE in Area 2 by the STLL fleet. **The WG recommended using the updated data in the 2026 stock assessment.**

Spatiotemporal modelling for size-specific CPUE standardization of albacore tuna in the north Pacific Ocean caught by Taiwanese longline fisheries. ***Zi-Wei Yeh and Yi-Jay Chang (ISC/25/ALBWG-02/08)***

This study applied size-specific spatiotemporal models to standardize catch-per-unit-effort (CPUE) of North Pacific albacore (Thunnus alalunga) from Taiwanese distant-water longline fisheries. Operational logbook records (1995 - 2024) and length-frequency samples (2004 - 2024) were integrated to construct daily size-specific CPUE, with albacore-targeted fleets identified through cluster analysis. Standardization was conducted using a delta-lognormal model in sdmTMB, incorporating spatial random effects and size-specific spatiotemporal variation. The resulting abundance indices revealed contrasting trends between life stages: adult abundance peaked in 2010 and 2013 but declined thereafter, whereas juvenile abundance increased sharply after 2018, reaching record highs in 2021 - 2022. These findings highlight the importance of size-specific modeling for developing robust abundance indices to support future stock assessments.

Discussion

The WG discussed the setup of the SPDE mesh used in the analysis. The authors reported that several mesh configurations had been tested, and the resulting index estimates showed only minor differences. The WG also raised a question regarding possible convergence issues in the occurrence model. The presenter clarified that no such issues were encountered. Because a cluster analysis of species composition was first conducted to identify albacore-targeting vessels, and only data from these specialized vessels were used, approximately 80% of the logbook records included corresponding albacore length data. Given the high sample size at the operation level, the model estimation process did not experience convergence problems. Regarding the size-specific CPUE standardization model, the presenter confirmed that it was divided into ten bins. The WG discussed the restricted spatial distributions predictions in 2009

and 2015. The authors suggested that these patterns may relate to oceanographic and habitat features. There was further discussion on handling spatial and spatiotemporal effects in the CPUE standardization models. The authors presented additional analyses using the AR1 and the ≤80 cm size bin for juveniles in the virtual follow-up meet based on the WG's suggestions. The WG noted that there are two bins for the juvenile sizes and this may cause an issue with selectivity. **The WG recommended using the AR1 CPUE standardization model for the TWNLL juvenile index with the updated size bins and various options for selectivity as sensitivity analysis in the 2026 stock assessment.**

4.1.3. EPO Surface (Canada/US)

Summary of Canadian albacore tuna fisheries data. Sarah Hawkshaw *(ISC/25/ALBWG-02/Presentation02)*

Canada has one commercial fishery for highly migratory species in the Pacific Ocean, a troll fishery targeting juvenile north Pacific albacore tuna (*Thunnus alalunga*). The fishery operates predominantly within the Canadian and United States waters within Area 5. Annual fishing effort ranged between 2,117 and 10,021 vessel-days in the history between 1995-2024. Fishing effort was relatively high before 2012, and has exhibited a decreasing trend since 2012 with the lowest effort in 2023. Annual catch varied from 1,151 mt and 7,851 mt between 1995-2021. Catch had an increasing trend between 1995 and 2004, remained relatively high in 2005-2011, and has shown a decreasing trend since 2011 to the lowest record in 2023. Catch per unit effort had an increasing trend between 1995 and 2014, declined annually in 2015-2017, but has increased since a low period in 2017. Fork lengths of sampled fish have been measured since 2007 by on board sampling program. The dominant mode of the length frequency distribution in each year remained around 68.1 cm indicating the catch is primarily age-2 fish.

Discussion

The WG noted the decreasing fishing effort since 2000 and discussed the causes for this. The author explained that the fleet has been shrinking over time as the dominant demographic in this fishery are participants who also participate in other Canadian fisheries and have chosen to participate in those fisheries instead. Additionally, participants have been retiring and the next generation of Canadian albacore fishery participants is not well developed. Therefore there has been a decrease in boats participating in this fishery. **The WG recommended combining the quarterly catch with the US and Mexico surface fleets for the 2026 stock assessment.**

Preliminary catch and size composition time series of the U.S. and Mexico surface fishery for the 2026 north Pacific albacore tuna assessment. Peter Kuriyama and Steven Teo *(ISC/25/ALBWG-02/09)*

The objective of this paper is to describe the data sources and methods used to develop preliminary, seasonal catch and size composition time series of the U.S. and Mexico albacore

surface fleet in the north Pacific Ocean, in preparation for the 2026 stock assessment. The approach for this paper is the same as for the 2023 assessment. In order to simplify model structure, it is proposed that albacore landings from all U.S. gears, except handline and longline, and all Mexico gears be combined as part of the Eastern Pacific Ocean (EPO) surface fleet. Three main sources of data were used: 1) annual landings of albacore tuna in metric tons by gear in the north Pacific Ocean reported to the ISC by the U.S. and Mexico; 2) catch-effort information from U.S. fishermen logbooks; and 3) size composition (fork length) information from a U.S. port sampling program. Size composition data in 1 cm bins were first matched to logbooks to obtain average fishing location for specific vessel-trips, and subsequently aggregated into area/month/year strata. Strata with <3 sampled trips were discarded because large spikes were evident in preliminary size compositions. Size compositions from these strata were combined into seasonal size compositions by performing a weighted average of the size compositions of all strata by year and season. Strata weights were calculated as the relative proportion of albacore catch in each stratum within each season and year, using the albacore catch in number recorded in the abovementioned logbook program. Similarly, the input sample size for the size composition data was considered to be the number of sampled fish with length measurements divided by 100. The catch in a season was calculated by multiplying the estimated proportion of catch in weight for that season with the total annual catch of the U.S. and Mexico surface fishery for the year. The 2020 and 2023 assessments used an algorithm that matched size information from a specific vessel-trip to the corresponding vessel-trip in the logbook database. The same algorithm was used in this study. The difficulty in matching the port sampling data with the logbook data resulted in the size composition time series starting only in 1977, and predominantly in Season 3. The initial input sample sizes (number of fish / 100) ranged from 0.13 to 545, with an average of 63. It is recommended that the ALBWG use the catch and size composition time series described in this working paper for the 2026 stock assessment of north Pacific albacore tuna. In addition, it is recommended that the ALBWG rescale the initial input sample size of the size composition data of this and other fleets in the assessment (i.e., reweighting the size composition data) and set a minimum input sample size, before fitting the size compositions in the assessment model. Finally, it is also recommended that the seasonal Canadian albacore catches be combined with the U.S. and Mexico surface fishery for the 2026 assessment.

Discussion

The WG thanked the authors for the updated analysis and presentation. The WG noted a flat trend in one year and the authors agreed to investigate. **The WG recommended combining the quarterly catch with the Canadian surface fleets for the 2026 stock assessment.**

4.1.4. US Longline

Preliminary catch and size composition time series of the U.S. pelagic longline fleets for the 2026 north Pacific albacore tuna assessment Peter Kuriyama and Steven Teo *(ISC/25/ALBWG-02/10)*

The objective of this paper is to describe the data sources and methods used to develop seasonal catch (in metric tons) and size composition (raised to the catch) time series for two U.S. pelagic longline fleets based in the north Pacific Ocean, for use in the 2026 assessment. Noting that the ALBWG has not yet finalized the fleet structure for the assessment, the fleet structure and methods for this study were the same as that used for the 2020 and 2023 assessments. Two U.S. pelagic longline fleets (26 and 27; numbering matches that used in the assessment input files) were defined, based on the consistency of size compositions within areas. Fleet 26 consists of vessels fishing in a northern area with mostly juvenile and sub-adult albacore, using primarily shallow-set fishing gear. Fleet 27 consists of vessels fishing in a southern area with mostly large, adult albacore, using primarily deep-set fishing gear. Size composition data in 1 cm bins from an observer sampling program were subdivided into 10x10° area/month/year strata. Size compositions of stratas in each fleet were combined into seasonal size compositions by performing a weighted average of the size compositions of all stratas in each fleet by year and season. The initial input sample sizes for the size compositions were calculated as the number of fish sampled divided by 100 in each fleet by year and season. The total annual landings by U.S. pelagic longline fishery were subdivided into the seasonal landings for Fleets 26 and 27, based on the relative proportion of albacore catch in each area and season using logbook data, and the size composition of albacore in each area and season. Seasonal albacore catch in metric tons for Fleets 26 and 27 of the U.S. pelagic longline fishery in the north Pacific Ocean are shown. Most of the albacore catch occurred in the area defined for Fleet 27. Seasonal size compositions (raised to the catch) for Fleets 26 and 27 of the U.S. pelagic longline fishery are shown. Input sample sizes ranged from 0.1 to 104 for Fleet 26, and 0.1 to 387 for Fleet 27. It is recommended that the ALBWG use the seasonal catch and size composition time series described in this working paper for the 2026 stock assessment of north Pacific albacore tuna. As in the 2023 assessment, it is also recommended that the ALBWG rescale the initial input sample size of the size composition data of this and other fleets in the assessment (i.e., reweighting the size composition data) and set a minimum input sample size and/or number of fish sampled, before fitting the size compositions in the assessment model.

Discussion

The WG thanked the authors for the presentation of these updated data. **The WG recommended using these updated data in the 2026 stock assessment.**

4.1.5. Non-ISC Longline

A Summary of North Pacific Albacore Tuna Fishery Data Reported by Non-ISC Countries. Sarah Hawkshaw *(ISC/25/ALBWG-02/11)*

The ALBWG will be conducting a benchmark assessment of the NPALB in 2026. This Working Paper summarizes the annual catch, size composition, and the spatial distribution of catch from 1994 to 2024 reported for NPALB by countries that do not submit data directly to the ISC. These countries do submit data directly to the two Regional Fisheries Management Organizations (RFMOs) responsible for the management of NPALB: the Inter-American Tropical Tuna Commission (IATTC) and the Western and Central Pacific Fisheries Commission (WCPFC). These two data sources were reviewed for the inclusion in the upcoming 2026 stock assessment. Several non-ISC countries have reported catches of NPALB but China and Vanuatu had the most significant catches throughout the timeseries. These data were also compared to data used in the 2017, 2020 and 2023 stock assessments. Relatively large differences in the catches of China and Vanuatu longline fleets were noted between 2017 and 2020 (ISC/20/ALBWG-01/04) but no difference was found between the 2020 and 2023 catch data reported by China and only minor differences in the Vanuatu catches in some years (ISC/23/ALBWG-01/03). It was also found that Vanuatu had some significant catches reported in numbers of fish, rather than in weight, in the IATTC area in recent years, 2020-2024.

Discussion

The catch in number from VUT in recent years is very high and is likely caused by mis-reporting. The WG noted that these data likely do not have a large impact on the stock assessment results. The authors will continue to investigate the jump in the VU catch reported in number of fish in recent years. **The WG recommended that the Non-ISC data be included in the 2026 stock assessment.**

4.2. Other data (aging data, sex composition, etc.)

Updated sex composition data for biological samples of North Pacific albacore tuna from Japan. *Norihiko Yokoyama, Yuki Hongo, Yoji Nakamura, Motoshige Yasuike, Naoto Matsubara and Yuichi Tsuda (ISC/25/ALBWG-02/12)*

This document provides updated sex composition data for North Pacific Albacore tuna (*Thunnus alalunga*) biological samples collected by Japan for upcoming 2026 stock assessment. Samples were collected from commercial, research and training vessels, covering the western central Pacific Ocean. Sex determination for the total of 3,352 individuals utilized conventional macroscopic and histological observation, supplemented by a highly accurate gene-based quantitative PCR (qPCR) method for small or immature gonads. The analysis yielded an overall female proportion of 0.32 (1,024 females / 2,177 males), consistent with recent findings from the previous report. Significant sexual dimorphism was evident: mean fork length (FL) was 99.6

cm for males and 89.7 cm for females, and individuals larger than 100 cm FL were predominantly male (female contribution less than 20 %). Geographically, males were dominant south of 25N. These comprehensive sex data, stratified by size and area, are expected to contribute to enhancing the precision and biological realism of the North Pacific Albacore stock assessment.

Discussion

The WG asked whether the unknown fish in Area 3 presented in Figure 5 and 6 can be sex determined using the genetic method analysis? The authors explained that if samples were available the genetic method could be used on them, however the unknowns recorded did not have gonad or muscle samples collected for these records. The WG noticed that the sex ratio data could be used in the adult female index. However, the data locates only in the data-rich area defined for the adult index. We need to consider this information when deciding which area to use for the adult index, data-rich vs. the whole area. The WG asked how long it takes to determine the sex of a fish using the genetics technology and how much the method would cost? The authors explained that they are still working on the methodology. They estimated that the PCR analysis takes around 1 hour for ~96 samples but that the data preparation and DNA extraction can take much longer. They estimated that each sample could cost about 2000 yen for the PCR run but there are additional costs to prepare and extract DNA. The authors will continue with this work and coordinate with Taiwan to collect additional samples from the Northern area covered by their observer program. **The WG recommended that the authors coordinate with the US to develop a working paper to document the methods so both set of data can be explored in the 2026 stock assessment.**

Re-Analysis of the aging data from Japan. ***Yuichi Tsuda and Norihiko Yokoyama (ISC/25/ALBWG-02/Presentation03)***

This presentation described a re-evaluation of otolith-based age data for North Pacific albacore tuna from Japan. This work was undertaken in response to concerns raised by the ISC ALBWG about inconsistencies with expected growth curves. Previous aging methods appeared to overestimate ages, promoting a recommendation for methodological review and international collaboration. Japan researchers conducted an independent re-analysis of aging methods, collaborating with Fish Aging Services (FAS) in Australia, which has expertise in South Pacific albacore age estimation. Paired otoliths from 48 fish were used: one otolith from a pair was analyzed by FAS, while the other was re-read in Japan. The initial thin-section intensity-ring approach was abandoned because it was prone to misinterpreting pseudo-rings and instead only the FAS method was used. The FAS method relies on thicker sections and interpretation of shading patterns and edge structures. The re-read age estimates showed strong agreement with FAS results and aligned well with the growth curve used in the 2023 stock assessment. These results indicate that the revised Japanese aging approach is consistent and reliable, making the updated age data comparable to those currently used in assessment model. Japan

plans to re-read approximately 200 otolith samples collected between 2021 and 2025 using the FAS approach. All updated age data will be submitted for inclusion in the 2026 stock assessment model.

Discussion

The WG thanked the authors for the presentation of these updated data. The WG agreed that the updated analysis provided a similar growth curve to what was used in the 2023 stock assessment. The WG also discussed the sensitivity analysis of conditional length-at-age, which would be estimated within the assessment model. This is difficult because we do not have information about sex specific size data. **The WG recommended that these data be combined with the US data and used in the updated 2026 stock assessment in order to investigate potentially estimating growth within the model.**

5. REVIEW 2023 NPALB STOCK ASSESSMENT

The WG briefly reviewed the 2023 stock assessment focusing on summarizing the fleet and area definitions. The WG discussed potential updates to the previous structure based on updated analyses and the known aspects of North Pacific albacore biology captured in the conceptual model (Figure 1).

Preliminary Update of 2023 North Pacific Albacore Base Case Model. ***Steven Teo, Peter Kuriyama, Matt Craig, Owyn Snodgrass, Yuichi Tsuda, Naoto Matsubara, Yi-Jay Chang, Zi-Wei Yeh, and Sarah Hawkshaw (ISC/25/ALBWG-02/Presentation04)***

The WG presented a preliminary update to the 2023 NPALB base case assessment model, covering the model period from 1994–2021, with updated data extending through 2024 for each of the fleets. This update incorporated revised catch data for all fleets, including JPLL, TWLL, USLL, EPOSF, and other fleets. Catch updates generally resulted in negligible differences relative to the 2023 base case, with the exception of some changes in the F35 and minor shifts in TWLL catch. Size composition data were updated for all fleets through 2024, while maintaining the same data weighting schemes and model structure as the 2023 assessment. A key change in the update was the revision and extension of the adult abundance index for the JPLL Area 2 fleet (F12), now covering 1996–2024 with updated coefficients of variation. Model comparison results indicated that the updated index had a meaningful influence on model outputs, whereas catch revisions had minimal impact. Differences were observed in estimated female spawning stock biomass, fishing mortality relative to $F_{\%SPR}$, and recruitment trajectories when compared with the 2023 base case. Model diagnostics included comparisons of index fits, ASPM outputs, and R0 likelihood profiles, highlighting changes driven primarily by the updated F12 index. The presentation also introduced newly available data not yet fitted in the model, including sex-specific size compositions and sexed conditional age-at-length data from USLL and

EPOSF fleets, as well as historical datasets previously excluded from assessments for consideration. The working group identified several considerations for a full model update, including treatment of TWLL catch shifts, resolution of F35 catch differences, evaluation of whether to fully update size composition data, and the potential need for a bridging model. Looking ahead to the 2026 assessment, suggested priorities included simplifying fleet structure, improving abundance indices, and evaluating the incorporation of sex-specific size and age-at-length data to improve model realism and performance.

Discussion

The WG noted the differences in the historical catches and the main index estimates, particularly in early years. It was noted that the updated index used also included the expanded area which may account for some of the differences. **The WG recommended simplifying the JPLL fleets to those targeting juvenile and adult similar to what was used in the 2020 stock assessment model fleet structure and the JPPL fleet can remain separated for now.**

6. 2026 STOCK ASSESSMENT PLANNING

The WG discussed the preliminary scenarios for the base case in the upcoming 2026 assessment (Table 3) and agreed that the biological parameters and assumptions should remain largely the same to those used in the 2020 and 2023 assessments, unless new information becomes available. The WG members also noted that during the model development phase some additional biological parameters estimations will be investigated.

6.1. Review options for base case scenario and sensitivities

The WG reviewed the base case scenario and sensitivity analyses from the 2023 assessment and identified several sensitivity runs to consider for the 2026 stock assessment. The WG will discuss these further during the March meeting. The WG noted that exact sensitivity analyses will depend on the model structure of the base case model. The WG reviewed the candidate abundance (CPUE) indices for adult and juvenile and preliminary decisions concerning use in 2026 stock assessment model (Table 2). The WG also reviewed the approach used for the future projections in the 2023 assessment and identified updates needed for the 2026 assessment (Table 4). A working paper will be presented and discussed with information about the updated future projection software at the March stock assessment workshop. The WG agreed that the latest version of SS (3.30.24) would be used for the 2024 assessment as it produced the same results as the 2023 version during the preliminary runs.

7. WORK PLAN AND ASSIGNMENTS FOR 2026 STOCK ASSESSMENT WORKSHOP

The WG agreed that the data format for submission would be similar to the 2023 assessment and identified a data submission deadline and the date and location of the stock assessment workshop (**Attachment 4**).

8. OTHER MATTERS

8.1. Review WCPFC stock assessment reporting template

The WG briefly discussed the WCPFC stock assessment reporting template and will consider its use for the 2026 stock assessment.

8.2. Options for addressing NC request for science advice on impacts of fleets in terms of fishing intensity

The ALBWG presented a summary of the updated scientific advice for translating fishing intensity into catch and effort, which included a recommendation "that allocation rules be provided by the RFMOs to guide the calculation of fleet-specific target SPRs based on the current total SPR". Based on this recommendation the WCPFC Northern Committee requested that the ISC ALBWG provide estimates of the historical impact of each fleet group on the NPALB stock expressed in terms of fishing intensity ($F_{\%SPR}$). "*Canada proposed that the ISC provide estimates of the historical impact of each fleet group on the stock. After discussion on this proposal, the NC agreed to request the ISC to provide such estimates based on fishing intensity during the time periods of 2002-2004 and 1999-2015, and to guide fleet-specific reductions in fishing intensity should the female spawning stock biomass fal below the threshold reference point as mandated by the harvest strategy.*" (See Pg. 8 of NC21 Summary Report). Specifically, the NC requested that these estimates be calculated for agreed historical reference periods, 2002-2005 and 1999-2005, to quantify each fleet group's average fishing intensity and proportional contribution to the total fishing pressure.

It was also requested by NC that the fleet groupings used in the previous advice for translating fishing intensity into catch and effort be reevaluated and slightly altered to accommodate requests from some countries, "*Japan suggested that Japanese longline fisheries could be divided into two categories (albacore targeting and albacore bycatching) based on the ratio of North Pacific albacore in the entire catch*" and "*Vanuatu agreed to be separated as a distinct fleet group, whereas Korea agreed to maintain its longline fleet as a distinct fleet group*."

The purpose of this request is to support potential fleet reductions in fishing intensity under the NPALB harvest strategy, should the stock fall below the threshold reference point, and to inform future allocation and implementation discussions across fleet groups.

Discussion

The WG discuss how to approach providing science advice on the historical impact of each fleet group on the stock and decided to produce a science advice document with clear messaging about interpreting the estimates of the historical impact of each fleet group on the stock. The WG agreed that all estimates should be based on the 2026 stock assessment base case model configuration. These proportions will not be updated unless an exceptional circumstance is triggered and the ALBWG identify the need to reassess historical impacts, or an alternative historical period is identified to inform allocation discussions. Give examples of how these fleet group specific proportions could be used to inform allocation discussions for NPALB in relation to the adopted harvest strategy. **The WG recommended discussing this approach at the March 2026 stock assessment workshop.**

8.3. Review exceptional circumstances criteria

The approach to exceptional circumstances for NPALB is based on a set of agreed criteria covering stock dynamics, fleet dynamics, and application/implementation considerations, which were developed by the ALBWG (**ISC25/ANNEX 04/Attachment 5**) and supported by the ISC Plenary and endorsed by the WCPFC NC and IATTC SAC. These criteria are to be formally evaluated within the stock assessment process with results documented in assessment reports. If exceptional circumstances are identified, this may trigger reconsideration of management assumptions or analyses ensuring that harvest strategy implementation remains scientifically robust and responsive to unusual or unforeseen conditions.

Discussion

The WG plans to assess the exceptional circumstances criteria during the 2026 stock assessment, consider any new or emerging information, and provide a clear summary of findings. No evidence of exceptional circumstances has been presented to the WG to date.

9. CLEARING OF MEETING REPORT

The WG Chair prepared a draft of the meeting report, which was reviewed by the WG prior to adjournment of the workshop. After the workshop, incorporated final edits, then distributed a final draft via email for approval by WG members. The final report will be forwarded to the Office of the ISC Chair for review and approval by the ISC26 Plenary.

10. ADJOURNMENT

The ALBWG meeting was adjourned at 615PM on January 7, 2026 (PST). The WG Chair thanked the WG members for presenting their research and contributing to this successful data preparation workshop.

Table 1. Work assignments identified at the March 2025 Modelling Improvements meeting, progress made at October/November 2025 Data Preparation meeting and assignments for the March 2026 Stock Assessment meeting.

Assignment	Lead(s)	Mar 2025 Modelling Improvements	Oct/Nov 2025/Jan 2026 Data Preparation	Mar 2026 Stock Assessment
Standardized CPUE and size for JPLL using **VAST/sdmTMB** package à Juvenile and **Adult index**	Matsubara, N., Xu, H., Ijima, H. and Tsuda, Y.	- New analysis presented in **ISC/25/ALBWG-01/02**. -The WG requested that authors: 1) Explore updating the model in sdmTMB; 2) Expand the spatial coverage of the index beyond Area 2; 3) Document methods used to determine adult female size cut off (ie. size bins).	- New analysis presented in **ISC/25/ALBWG-02/07** and follow up presentation of additional options at virtual meeting. -The WG will consider using this method for the adult index in the stock assessment and compare to other candidates. - AllArea 85-100cm version was identified as the best option.	-Updated WP will be presented for used in the 2026 stock assessment cycle. - Consider as ***main adult index*** in stock assessment
Comparison analysis with CPUE standardization method for the **JPLL adult index** used in the **2023 Stock Assessment (RINLA-ExpandedArea)**	Nishimoto, M., Ijima, H., Matsubara, N., and Tsuda, Y.	- The WG recommended this index should be updated with 2024 data for comparisons in the 2026 stock assessment. **- No further development of this index is recommended.**	- Updated analysis with expanded area presented in **ISC/25/ALBWG-02/06**. -The WG will compare this updated version to any newly developed indices being considered for the 2026 stock assessment in a bridging analysis. - This index will be available as a back up for the 2026 stock assessment.	- No further updates to this analysis will be made and this index will be used in a bridging analysis with other candidate indices. - Available as ***a backup index*** for the 2026 stock assessment

Assignment	Lead(s)	Mar 2025 Modelling Improvements	Oct/Nov 2025/Jan 2026 Data Preparation	Mar 2026 Stock Assessment
Updated standardized CPUE from Taiwanese distant-water longline fisheries – **TWN LL Juvenile and adult**	Yi-Jay Chang, Jhen Hsu, and Zi-Wei Yeh	-Updated analysis presented in **ISC/25/ALBWG-01/04** - Coordinate with JPLL index about the adult female size cut off. - Coordinate with JPLL method in sdmTMB for CPUE index.	-Updated analysis presented in **ISC/25/ALBWG-02/08**. -The WG recommended using the AR1 CPUE standardization model for the TWNLL juvenile index with the updated size bins and various options for selectivity as sensitivity analysis in the 2026 stock assessment.	- Updated WP for 2026 stock assessment cycle. - Include as a juvenile index ***sensitivity run*** in stock assessment
Candidate relative abundance indices of juvenile albacore tuna for the US surface fishery in the north Pacific Ocean **EPO Surface Juvenile index**	Teo, S. and Peter Kuriyama	- Updated analysis presented in **ISC/25/ALBWG-01/01** - Authors provided an update of the spatial distribution of effort by years.	-The WG discussed running as a juvenile index sensitivity run in stock assessment	- Updated WP for 2026 stock assessment cycle. - Include as a juvenile index ***sensitivity run*** in stock assessment
CPUE standardization considering spatial fish-	Ijima, H., Matsubara, N., Jusup M.,	-Updated analysis presented in **ISC/25/ALBWG-01/03** - R-INLA mixture model approach.	- Research track analysis	

Assignment	Lead(s)	Mar 2025 Modelling Improvements	Oct/Nov 2025/Jan 2026 Data Preparation	Mar 2026 Stock Assessment
size distribution à **JPLL Adult and Juvenile indices**	and Tsuda, Y.	- This approach does not work with an area-as-fleet approach - Comparisons to the previous method used in the 2023 stock assessment and WP#2 will be required.		
A spatiotemporal population model for stock assessment	Ijima, H., Jusup, M. and Tsuda, Y.	-Updated analysis presented in **ISC/25/ALBWG-01/06** - The WG recommended the authors continue to work on improving this method and compare to other methods. -Consider this a research track method	- Research track analysis (ICCAT version)	
Fleet definitions in the stock assessment	All WG members	- The WG discussed the options for fleet definitions for the upcoming stock assessment compared to 2023. - Will we keep the area-as-fleet approach? If so **ISC/25/ALBWG-01/03** mixture model approach will not work. But **ISC/25/ALBWG-01/02 & 04** can be applied. -Potentially combining F01/02 which is the 2020 fleet structure.	- Fleet definitions updated based on **ISC/25/ALBWG-02/03, 04 & 05** For JPLL and JPPL fleets.	**-** Discuss impacts of updated fleet definitions in stock assessment meeting.

Assignment	Lead(s)	Mar 2025 Modelling Improvements	Oct/Nov 2025/Jan 2026 Data Preparation	Mar 2026 Stock Assessment
Growth	US and Japan	-Updated analysis presented in **ISC/25/ALBWG-01/05 &12** - WG recommended adding previous data collected to the updated analyses (ie. TWN and old Japan data) - The WG recommended that Japan and US collaborate on aging and growth analysis and present at next meeting -WG recommended exploring additional growth curves for comparison	- New aging analysis presented in **ISC/25/ALBWG-02/ *Presentation03*** - The WG recommended that these data be combined with the US data and used in the updated 2026 stock assessment in order to investigate potentially estimating growth within the model.	- Updated WP to be presented
Maturity	Japan	-Updated analysis presented in **ISC/25/ALBWG-01/12** - Focused on spawning seasonality -WG recommended that previous assumptions about spawning seasonality from previous stock assessment	- The WG considered updates to the conceptual model and potential sensitivity analyses - The WG agreed to use the same maturity assumptions as 2020/23	
Sex composition	US and Japan	-Updated analysis presented in **ISC/25/ALBWG-01/05 & Presentation 04** -US will prepare sex comp data presented in WP#5 for the assessment model. -Japan will work on preparing sex composition data and	- The WG discussed sensitivities (ie. Sex ratio, growth, spawn timing, selectivity) to stock assessment - Updated sex composition data of biological samples collected by Japan was presented in **ISC/25/ALBWG-02/12**	- Discuss sensitivities

Assignment	Lead(s)	Mar 2025 Modelling Improvements	Oct/Nov 2025/Jan 2026 Data Preparation	Mar 2026 Stock Assessment
		discuss inclusion in stock assessment model. -WG recommended showing the updates in a sensitivity run of the stock assessment at the next meeting.	- The WG recommended that the authors coordinate with the US to develop a WP to document the methods and explore in the 2026 stock assessment.	
Spawning seasonality	Ijima, H.	-Updated analysis presented in **ISC/25/ALBWG-01/Presentation 03 & WP12** - WG recommended work continue on developing this analysis as time permits -WG recommended to explore as a sensitivity analysis to the current assumption of Q2 (April 1)	- Research track analysis	
Updating catch and size composition data and previous abundance index estimates	All WG members	- WG recommended all WG providing updated data for an update run to the 2023 stock assessment structure. -Japan will provide an update to the main abundance index (up to 2024) from the 2023 assessment. - S. Teo will send out a reminder email (August) with the spreadsheet structure	- All WG members to provide updated data with new fleet structure by Jan 16, 2026.	

Assignment	Lead(s)	Mar 2025 Modelling Improvements	Oct/Nov 2025/Jan 2026 Data Preparation	Mar 2026 Stock Assessment
Presenting evaluation of exceptional circumstances criteria in stock assessment	Hawkshaw, S.	- The WG reviewed the one minor update made to criteria wording at ISC24. - WG recommended including exceptional circumstances in the next stock assessment	- No evidence of exceptional circumstances has been presented to the WG to date	- The WG will assess exceptional circumstances criteria during the stock assessment, consider any new or emerging information, and provide a clear summary of findings.
Fishing intensity conversion to catch and effort controls	All WG members	- Request was made at NC to analyze the relationships between fleet-specific SPRs, and effort for JPLL fishery that targeted NPALB. - Authors presented WP **ISC/25/ALBWG-01/09** with updated analyses. - Authors presented WP **ISC/25/ALBWG-01/11.** - WG recommended that information from **ISC/25/ALBWG-01/09 & 11** be included in an updated science advice document for interpreting fishing intensity. - Although WG agreed they need time to consider analyses and other options in the case of **ISC/25/ALBWG-01/11**. And only a more general statement about the options for allocation can be	- The WG discussed historical impacts of fleets using fishing intensity	- Use 2026 stock assessment outputs to estimate historical impacts of each fleet - The WG will develop a science advice document for the ISC26 Plenary

Assignment	Lead(s)	Mar 2025 Modelling Improvements	Oct/Nov 2025/Jan 2026 Data Preparation	Mar 2026 Stock Assessment
		included in science advice document. - Present update to ISC25 and SAC and NC meetings.		
Evaluate and document historical high seas drift gillnet catch by member countries.	Teo, S.	- Author provided update on plans for next WG meeting.	- Research track analysis	
Projection and MSE code archiving	All WG members	- WG briefly discussed		
MSE updates	All WG members	- In 2024 WG received training to use the MSE code and discussed potential updates that would need to be made if additional MSE was required. - In 2025, WG briefly discussed	- No further discussion but keep this on research track for future	
Ensemble models? Grid? Sensitivity runs?	All WG members	- The WG discussed the most important uncertainties for the stock assessment. -WG recommended initially only looking at sensitivities and discuss alternative options based	- The WG briefly discussed the most important uncertainties for the stock assessment	- The WG will discuss further during the stock assessment meeting

Assignment	Lead(s)	Mar 2025 Modelling Improvements	Oct/Nov 2025/Jan 2026 Data Preparation	Mar 2026 Stock Assessment
		on preliminary results presented at the next WG meeting.	-WP will be presented with preliminary sensitivity runs and WG will discuss how to proceed.	
Time-varying age based selectivity sensitivity	Kuriyama P. and Teo S.	- **ISC/25/ALBWG-01/07** - WG recommended checking hindcasting validation - Using age specific sigma for selectivity - Plots of actual selectivities		

Table 2. Descriptions of candidate abundance (CPUE) indices for adult and juvenile and preliminary decisions concerning use in 2023 stock assessment model. A: Area; Q: Quarter.

Criteria	**INLA Adult: A2 & Q2** (JPLL; 2023 Main Index)	**INLA Adult: large A2 & Q2** (JPLL; 2023 Main Index with expanded area)	**orgTMB Adult: large area & Q1** (JPLL)	**sdmTMB Adult: all area & Q1** (JPLL; AllArea 85-100cm)	**sdmTMB Adult: rich area & Q1** (JPLL)	**sdmTMB Mat adult: all area & Q1** (JPLL; LF Wei)	**sdmTMB Mat adult: rich area & Q1** (JPLL; LF Wei)	**sdmTMB Female: all area & Q1 (JPLL; Sex ratio Wei)**	**sdmTMB Female: rich area & Q1 (JPLL)**	**sdmTMB Juvenile: rich area & Q1/Q4 (TWLL; AR1)**	**EPO juvenile index**
Supporting Working Paper	Presented at data prep	ISC/25/ALB WG-02/06	ISC/23/ALB WG-01/03	ISC/25/ALB WG-02/07	ISC/25/ALB WG-02/07	ISC/25/ALB WG-02/07	ISC/25/ALB WG-02/07	Not presented but similar to **AllArea 85-100cm**	Not presented	ISC/25/ALB WG-02/08	WP at March meeting
Preliminary Decisions	No longer using	Bridging index and back-up	Research Track	Main candidate index	Example Not using	Example Not using	Example Not using	Example Not using	Example Not using	Sensitivity index	Sensitivity index
Analysis	Spatio-Temporal GLMM (ZINB) HBF, & vessel ID as random effects. Location (1°×1°) & year as spatio-temporal effects.	Spatio-Temporal GLMM (ZINB) HBF, fleet vessel ID as random effects. Location (1°×1°) & year as spatio-temporal effects.	Multi species spatio-Temporal GAMM (TW) HBF, vessel ID as random effects. Location (1°×1°) with AR1 as spatio-temporal effects. SST as spline	Spatio-Temporal GAMM (Delta LN) year as fixed effects. vessel ID as random effects. HBF as spline effects. Location (1°×1°) with AR1 as spatio-temporal effects.	Spatio-Temporal GAMM (Delta LN) year as fixed effects. vessel ID as random effects. HBF as spline effects. Location (1°×1°) with AR1 as spatio-temporal effects.	Spatio-Temporal GAMM (Delta LN) year as fixed effects. vessel ID as random effects. HBF as spline effects. Location (1°×1°) with AR1 as spatio-temporal effects.	Spatio-Temporal GAMM (Delta LN) year as fixed effects. vessel ID as random effects. HBF as spline effects. Location (1°×1°) with AR1 as spatio-temporal	Spatio-Temporal GAMM (Delta LN) year as fixed effects. vessel ID as random effects. HBF as spline effects. Location (1°×1°) with AR1 as spatio-temporal	Spatio-Temporal GAMM (Delta LN) year as fixed effects. vessel ID as random effects. HBF as spline effects. Location (1°×1°) with AR1 as spatio-temporal	Multi species spatial GLMM (Delta LN) year as fixed effects. Location (1°×1°) as spatial effects. Location (1°×1°) with IID as size-specific spatio-	

			effects.				effects.	effects.	effects.	temporal effects.	
Time series	1996 – 2024	1996 – 2024	1994 – 2024	1994 – 2024	1994 – 2024	1994 – 2024	1994 – 2024	1994 – 2024	1994 – 2024	2004 – 2024	
Spatial Distribution	Area 2	Area 2	125E – 125W	120E – 120W	120E – 180E	120E – 120W	120E – 180E	120E – 120W	120E – 180E	north of 25°N	
Does the index cover the spatial distribution of adult females	Yes- Majority of adult female distribution	Yes- Majority of adult female distribution	Yes- Consistent with larval distribution	Yes- Majority of adult female distribution	Yes- Majority of adult female distribution	Yes- Majority of adult female distribution	Yes- Majority of adult female distribution	Yes- Adult female distribution	Yes- Adult female distribution	No- Majority of Juvenile distribution	
Size/age range	Length comp with peak 100cm (80-120cm)	Length comp with peak 100cm (80-120cm)	Length comp with peak 100cm (80-120cm)	5cm bin (85-105cm)	5cm bin (85-105cm)	5cm bin (85-105cm) Mat prob	5cm bin (85-105cm) Mat prob	5cm bin (85-105cm) Mat Female prob	5cm bin (85-105cm) Mat Female prob	5cm bin (-85cm)	
Home work				Continue investigating options for estimating CV						Continue to investigate selectivity	

Table 3. Preliminary parameterization of the base case model for the 2026 stock assessment of north Pacific albacore. Parameterization implemented in 2020 and 2023 stock assessment were also shown for comparison.

Parameter	2020 Assessment	2023 Assessment	2026 Assessment	Notes
Model period	1994-2018	1994-2021	1994-2024	Will not do 1966 to 2021 sensitivity run due to issues with early squid driftnet bycatch data.
Stock structure	Single, well-mixed stock (Same as 2017)	Same as 2020	Same as 2023	Single, well-mixed stock
Fleet structure	Fleets added	Updated JPNLL fleet structure	Updated JPLL fleet structure back to the 2020 fleet structure	The 2023 assessment used the updated fleet structure for the JPNLL fisheries.
Natural mortality	(Same as 2017) Female age-0: 1.36 y^{-1} Female age-1: 0.56 y^{-1} Female age-2: 0.45 y^{-1} Female age-3+: 0.48 y^{-1} Male age-0: 1.36 y^{-1} Male age-1: 0.56 y^{-1} Male age-2: 0.45 y^{-1} Male age-3+: 0.39 y^{-1}	Same as 2020	Same as 2020	Fixed parameter; 2023 assessment investigated estimating differential in the sex specific mortality. Based on Teo (2017); Kinney and Teo (2016).
Growth	(Same as 2017) Sex-specific growth model; Length at age-1 (L_1): CV=0.06 Female: 43.504 cm Male: 47.563 cm Asymtotic length (L_∞): CV=0.04 Female: 106.57 cm Male: 119.15 cm Growth rate (K): Female: 0.29763 yr^{-1} Male: 0.20769 yr^{-1}	Same as 2020	Consider estimating growth curve in the model using updated age data ? – explore sex specific structure outside model - Otherwise same as 2020	Fixed parameter; 2023 assessment investigated estimating growth model to include in a sensitivity run. Based on Xu et al. (2014).
Stock recruitment	(Same as 2017) Beverton-Holt, steepness = 0.9	Same as 2020	Same as 2020	Fixed parameter; 2023 assessment investigated estimating
Maturity	(Same as 2017)	Same as 2020	Same as 2020	Based on Ueyanagi (1957);

Parameter	2020 Assessment	2023 Assessment	2026 Assessment	Notes
	50% at age-5, 100% at age-6			Chen et al. (2016)
Fecundity	(Same as 2017) Proportional to spawning biomass	Same as 2020	Same as 2020	Ueyanagi (1957)
Spawning season	(Same as 2017) 2	Same as 2020	Same as 2020	Ueyanagi (1957); Chen et al. (2010)
Length-weight	(Same as 2017) Seasonal length weight relationships	Same as 2020	Same as 2020	Watanabe et al. (2006)
Selectivity		Selectivities by fleet	Selectivities by fleet	See stock assessment report
CV of indices	(Same as 2017) Average CV of 0.2 only if CV is less than 0.2	Fixed CV of 0.2 for all years except 2020 and 2021 which had fixed CV of 0.3.	Same as 2020	
Size composition effective sample size	Since most albacore fisheries only record the number of fish, an analysis of the EPO surface fishery (F33) was used to relate the number of fish sampled to the number of trips. Based on this analysis, it was assumed that 100 fish sampled were equivalent to a sampled trip. Size composition records with sample size of <1 were considered unrepresentative and removed. The input sample sizes for each fishery were further rescaled by a multiplier (0.1626) so that the average input sample size for fishery with the most fish sampled (F01) was ~30	Since most albacore fisheries only record the number of fish, an analysis of the EPO surface fishery (F33) was used to relate the number of fish sampled to the number of trips. Based on this analysis, it was assumed that 100 fish sampled were equivalent to a sampled trip. Size composition records with sample size of <1 were considered unrepresentative and removed. The input sample sizes for each fishery were further rescaled by a multiplier (0.274) so that the average input sample size for fishery with the most fish sampled (F28) was ~30. The 2020 and 2021 size composition data were down weighted by a 0.1 multiplier	Update in March	2023 assessment investigated several potentially weighting scenarios.

Parameter	2020 Assessment	2023 Assessment	2026 Assessment	Notes
Initial conditions	(Same as 2017) initF and early recruitment deviates estimated without fitting to initCatches. This is to initialize the model age structure to be consistent with the abundance index and composition data during the model historical period. The TWN LL fleet in areas 3/5 was used as the initF fleet due to the wide range of sizes of fish that were caught.	Same as 2020	Update in March	2023 assessment investigated other initial fleets

Table 4. List of future projection runs to for the 2026 assessment that are consistent with the management objectives described in the harvest strategies adopted by IATTC and WCPFC.

2020 Assessment	2023 Assessment	2026 Assessment
Software package: SSfuture C++; ssfcpp; ssfcpp20191125.cpp *(Ijima 2020)*	**Software package:** SSfuture C++; ssfcpp; Updated version ***(*ISC/23/ALBWG-01/07*)***	**Software package: Update March**
Future Harvest Scenarios: 1) Constant catch (average of 2013-17) 2) Constant $F_{2015\text{-}2017}$	**Future Harvest Scenarios:** 1) Historical F (2005-2019) 2) Constant $F_{2017\text{-}2019}$	**Future Harvest Scenarios:** 1) Historical F (2005-2022) 2) Constant $F_{2020\text{-}2022}$
Outputs: SSB and fixed line for preliminary LRP (20**%$SSB_{current,F=0}$**)	**Outputs:** 1) Annual SSB 2) **Obj A:** Annual SSB with respect to new LRP (**14%$SSB_{current,F=0}$); Showing 60% and 95% CIs** 3) **Obj B:** Annual depletion (Age1+) relative to average **depletion** (Age1+) **in 2006-2015** 4) **Obj C:** Annual $F_{\%SPR}$ relative to **TRP ($F_{45\%}$)**	**Outputs:** 1) Annual SSB 2) **Obj A:** Annual SSB with respect to new LRP (**14%$SSB_{current,F=0}$); Showing 60% and 95% CIs** 3) **Obj B:** Annual depletion (Age1+) relative to average **depletion** (Age1+) **in 2006-2015** 4) **Obj C:** Annual $F_{\%SPR}$ relative to **TRP ($F_{45\%}$)**

Attachment 1

List of Participants

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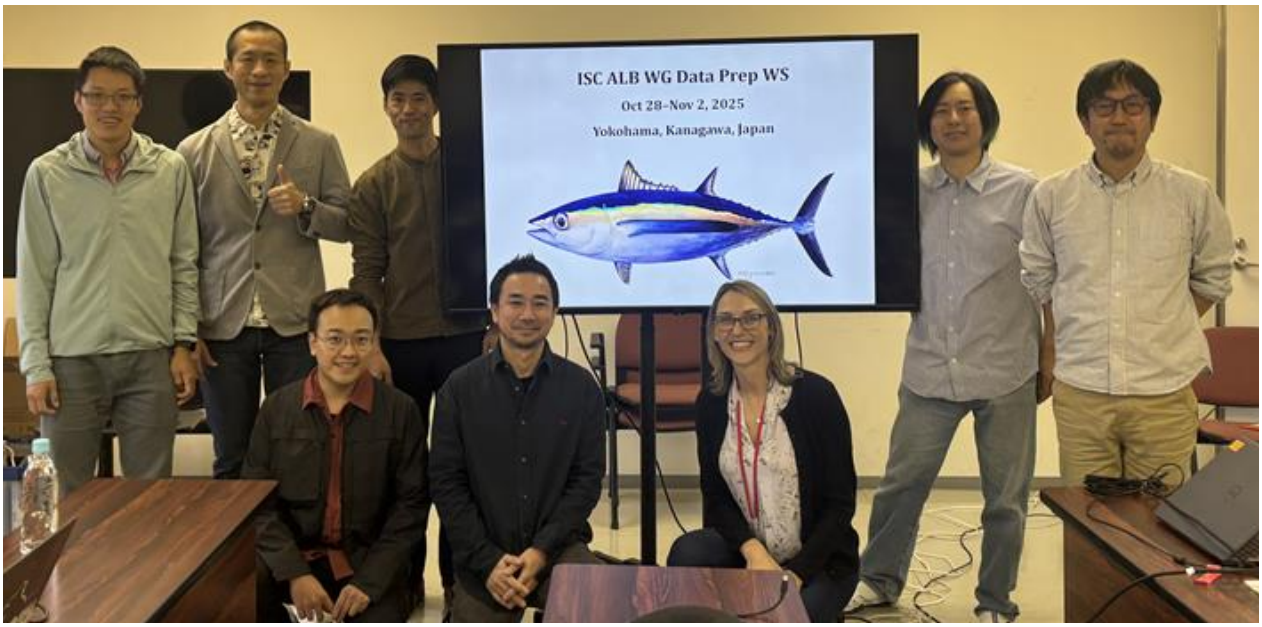

The Albacore Working Group October 2025 in-person (left to right) – Haikun Xu, Yi-Jay Chang, Zi-Wei Yeh, Naoto Matsubara, Yuichi Tsuda, Sarah Hawkshaw, Norihiko Yokoyama, Hirotaka Ijima. Yoshinori Aoki and Makoto Nishimoto not pictured.

The Albacore Working Group January 2026 virtual follow-up (left to right/top to bottom) – Sarah Hawkshaw, Naoto Matsubara, Hirotaka Ijima, Yuichi Tsuda, Norihiko Yokoyama, Peter Kuriyama, Yi-Jay Chang, Steve Teo, and Haikun Xu. Zi-Wei Yeh not pictured.

Attachment 2

ALBACORE WORKING GROUP (ALBWG)

International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean

DATA PREPARATION WORKSHOP

27 October – 2 November 2025

9AM-5PM Daily Local JST Time

Virtual Follow-up January 6-8, 2026 (JST)

Japan Fisheries Research and Education Agency (FRA)
Yokohama, JAPAN

DRAFT AGENDA

1. Opening of workshop
   - 1.1. Welcoming Remarks
   - 1.2. Chair's Remarks
   - 1.3. Meeting Arrangements
   - 1.4. Introductions
2. Meeting Logistics
   - 2.1. Meeting Protocol
   - 2.2. Review and Adoption of Agenda
   - 2.3. Assignment of Rapporteurs
   - 2.4. Group Photo
3. Review 2025 Work Assignments
4. Review Updated Stock Assessment Input Data
   - 4.1. Catch, CPUE Indices, Size Compositions
     - 4.1.1. Japan Longline/Pole-and-Line/Miscellaneous
     - 4.1.2. Taiwan Longline/Miscellaneous
     - 4.1.3. EPO Surface (Canada/US)
     - 4.1.4. US Longline
     - 4.1.5. Non-ISC Longline
     - 4.1.6. High seas drift net (Japan, Taiwan, & Korea)
     - 4.1.7. Other
   - 4.2. Other data (aging data, sex composition, etc.)
5. Review 2023 NPALB stock assessment
   - 5.1. Conceptual Model
   - 5.2. Biology (stock structure/reproduction/growth/movement)
   - 5.3. Fishery definitions

5.4. Abundance indices
5.5. Base case, sensitivities and future projections
5.6. Assumptions and uncertainties
5.7. Model diagnostics
5.8. Reference points, management objectives and stock status
5.9. Review runs with updated datasets

6. 2026 Stock Assessment Planning
   6.1. Review options for base case scenario and sensitivities
   6.2. Historical period
   6.3. Fishery definitions
   6.4. Structural assumptions
   6.5. Biological parameters (M, growth form, maturity schedule)
   6.6. Identify main abundance indices
   6.7. Review initial conditions
   6.8. Diagnostic analyses, uncertainty and model selection
   6.9. Review future harvest scenarios and projections
7. Work Plan and Assignments for March 2026 Stock Assessment Workshop
   7.1. Data format and submission deadlines
   7.2. Stock assessment software version
   7.3. Future research
   7.4. Location and timing of next workshop
8. Other matters
   8.1. Review WCPFC stock assessment reporting template
   8.2. Options for addressing NC request for science advice on impacts of fleets in terms of fishing intensity – review fleet groupings and reporting
   8.3. Review exceptional circumstances criteria
   8.4. Review climate change considerations

9. Clearing of Meeting Report
10. Adjournment

Attachment 3

List of Working Papers and Presentations

Number	Title and Authors	Availability
ISC/25/ALBWG-02/01	Updated North Pacific albacore catch by Japanese fisheries. Yuichi Tsuda, Naoto Matsubara, Yoshinori Aoki, Hirotaka Ijima, Keisuke Sato	ISC Website
ISC/25/ALBWG-02/02	Updated the size data for North Pacific albacore tuna from Japanese fisheries for the 2026 stock assessment. Yuichi Tsuda, Yoshinori Aoki, Hirotaka Ijima, Naoto Matsubara.	ISC Website
ISC/25/ALBWG-02/03	A Mixture model for defining fleet units from Japanese longline logbook data for North Pacific Albacore tuna (Thunnus alalunga). Hirotaka Ijima and Yuich Tsuda	ISC Website
ISC/25/ALBWG-02/04	Evaluation of size data sets and applicability of mixture models in the Japanese pole-and-line fishery. Hirotaka Ijima and Yuich Tsuda	ISC Website
ISC/25/ALBWG-02/05	Implementation and evaluation of the mixture model approach for North Pacific albacore stock assessment. Hirotaka Ijima and Yuich Tsuda	ISC Website
ISC/25/ALBWG-02/06	Updated Standardized CPUE for North Pacific Albacore by Japanese Longline by using INLA. Naoto Matsubara, Hirotaka Ijima, and Yuichi Tsuda	ISC Website
ISC/25/ALBWG-02/07	Standardized CPUE for North Pacific Albacore by Japanese Longline. Naoto Matsubara, Haikun Xu, Makoto Nishimoto, Yoshinori Aoki, Hirotaka Ijima, and Yuichi Tsuda	ISC Website
ISC/25/ALBWG-02/08	Spatiotemporal modelling for size-specific CPUE standardization of albacore tuna in the north Pacific Ocean caught by Taiwanese longline fisheries. Zi-Wei Yeh and Yi-Jay Chang.	ISC Website
ISC/25/ALBWG-02/09	Preliminary catch and size composition time series of the U.S. and Mexico surface fishery for the 2026 north Pacific albacore tuna assessment Peter Kuriyama and Steven Teo	ISC Website

Number	Title and Authors	Availability
ISC/25/ALBWG-02/10	Preliminary catch and size composition time series of the U.S. pelagic longline fleets for the 2026 north Pacific albacore tuna assessment. Peter Kuriyama and Steven Teo	ISC Website
ISC/25/ALBWG-02/11	A Summary of North Pacific Albacore Tuna Fishery Data Reported by Non-ISC Countries. Sarah Hawkshaw	ISC Website
ISC/25/ALBWG-02/12	Updated sex composition data for biological samples of North Pacific albacore tuna from Japan. Norihiko Yokoyama, Yuki Hongo, Yoji Nakamura, Motoshige Yasuike, Naoto Matsubara and Yuichi Tsuda	ISC Website
Presentation 01	Catch and length information of north Pacific albacore by Taiwanese fleets. Zi-Wei Yeh and Yi-Jay Chang	Contact the author
Presentation 02	Summary of Canadian albacore tuna fisheries data. Sarah Hawkshaw	Contact the author
Presentation 03	Re-Analysis of the aging data from Japan. Yuichi Tsuda and Norihiko Yokoyama	Contact the author
Presentation 04	Preliminary Update of 2023 North Pacific Albacore Base Case Model. Steven Teo, Peter Kuriyama, Matt Craig, Owyn Snodgrass, Yuichi Tsuda, Naoto Matsubara, Yi-Jay Chang, Zi-Wei Yeh, and Sarah Hawkshaw	Contact the author

Attachment 4

Meetings and Workplan

Date	Location	Task/Event
January 6-8, 2026	Virtual	Follow up data preparation meeting
January 16, 2026	Email	Finalized Data from all WG members
March 23-30, 2026	La Jolla, USA	ALBWG workshop: Benchmark Stock Assessment
June 2026	TBD	IATTC SAC
June 21-30, 2026	Taiwan	ISC26 Plenary/ALBWG meeting
July 2026	TBD	NC22