ISC/26/ANNEX/04b

ANNEX 04b

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 STOCK ASSESSMENT WORKSHOP [1]

23 – 27 March 2023
La Jolla, CA, United States of America
1 April 2026
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.

Left Blank for Printing

REPORT OF THE ALBACORE WORKING GROUP WORKSHOP

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

23 – 27 March 2023
Southwest Fisheries Science Center
La Jolla, CA, United States of America
Virtual Follow-Up
1 April 2026

1. OPENING AND INTRODUCTION

An intersessional workshop of the Albacore Working Group (ALBWG or WG) of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) was convened at the Southwest Fisheries Science Center (SWFSC), La Jolla, CA, USA. The main goal of this workshop was to develop a new benchmark stock assessment for North Pacific albacore tuna (NPALB; *Thunnus alalunga*) in order to update the scientific stock status and conservation advice for this stock.

Annie Yau, Fisheries Resources Division Director at the NOAA Southwest Fisheries Science Center welcomed scientists from Canada, Chinese Taipei, Japan, the United States of America (USA), and the Inter-American Tropical Tuna Commission (IATTC) to the Southwest Fisheries Science Center, both in-person and virtually. She thanked the ALBWG for their important work on the NPALB stock and wished the group a productive meeting. The participants and their affiliations are listed in **Attachment 1**.

The ALBWG Chair briefly described the specific objectives of the meeting: (1) complete a new benchmark stock assessment of the NPALB, (2) to develop scientific advice and recommendations on current status, future trends, conservation and research needs of NPALB, and 3) address requests for advice from the tuna Regional Fisheries Management Organizations (RFMOs).

This report is a record of the discussions and decisions of the ALBWG during the workshop in which the 2026 stock assessment of NPALB was conducted. The 2026 stock assessment model structure and assumptions, results, interpretation, scientific advice and recommendations are

documented in a separate assessment report available from the ISC website at: https://www.isc.fra.go.jp/working_groups/albacore.html

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 collaborative and follow the scientific method with an emphasis on best practices in stock assessment 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. Sarah Hawkshaw, the ALBWG Chair, had the overall responsibility of assembling the report.

2.4 Distribution of Documents and Working Paper Availability

Three (3) working papers (WP) 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 further details.

3. REVIEW WORK ASSIGNMENTS

The WG chair briefly reviewed the table of work assignments developed at previous WG meetings and the discussed plans to update the work assignments relevant to delivery of the 2026 stock assessment (**Table 1**).

4. REVIEW CONCEPTUAL MODEL AND FISHERY DEFINITIONS

The WG briefly reviewed the conceptual model and fishery definitions that would be used for the 2026 stock assessment focusing on summarizing the updates made since the last stock assessment in 2023.

The WG discussed changes to the previous structure based on updated analyses and the known aspects of NPALB biology captured in the conceptual model. Key fleet structure decisions for

the assessment include reverting the JPLL adult/juvenile in Areas 1/3 that were split in 2023 back to the unified 2020 stock assessment (pre-split) configuration, grouping fishing Areas 3/5 as a northern region and Areas 2/4 as a southern/tropical region, and designating the Area 2 JPLL as the main abundance index. An additional change was to separate the other non-ISC longline fisheries from the VULL fleet so that fleet group fishing intensities can be calculated independently. The remaining fleet structure retained its 2023 definitions for the other JPLL fisheries, JPPL, TWLL, KRLL, CNLL, EPOSF and the purse seine and miscellaneous fisheries (Japan and Taiwan). **The WG recommended using the updated fleet structure (See ISC/26/ALBWG-01/01: Table 1) because it is better supported by the data and more stable, while still capturing the dominant fishing signal needed for assessment objectives and fleet specific requests for science advice.** It was agreed that no further fleet restructuring is needed at this stage, although fleet definitions may need to be revisited if any persistent data conflicts arise throughout the stock assessment development.

5. REVIEW WORKING PAPERS AND INPUT DATA

The WG conducted a review of the data sources and data preparation methods that had been identified at the data preparation meeting in Yokohama, Japan (ISC/26/ANNEX/XX). The review encompassed a discussion of issues that arose during data compilation and preparation, highlighting both challenges that were addressed prior to final submission and issues that remained unresolved at the time of the final data submissions.

Discussion

The WG discussed the issue of high catches in numbers reported by Vanuatu in the recent years that was identified at the data preparation meeting. This issue has been resolved following clarification with the IATTC data coordinator who clarified that Vanuatu had recently submitted revised catch data reported in weights rather than numbers for recent years. **The WG agreed these updated data should be included in the stock assessment development going forward.**

The WG also briefly discussed a trip ID duplication error that was identified in the US surface fleet logbook database due to a recent update to the system. **The WG agreed that the updated data should be used in the stock assessment and that a working paper should be presented at the next meeting documenting the errors and updates to the data.**

6. BASECASE MODEL DEVELOPMENT

Development of a preliminary model for the 2026 north Pacific albacore tuna stock assessment. Kuriyama, P., and Teo, S.L.H. (ISC/26/ALBWG-01/01)

The objective of this working paper is to describe the development of the preliminary model for the 2026 assessment of NPALB. We developed the model in a stepwise fashion by incorporating

the data submitted by ALBWG members, previously agreed upon model structure and biological parameters, and the best features of the previously suggested improvements. The model is expected to have a main model period of 1994 – 2024. Three types of data were fitted in this study: fishery-specific catches, size compositions, and abundance indices. The geographic area and spatial stratification of this study followed that of the previous assessments (Pacific Ocean north of the equator (0°) to 55°N and from 120°E to 100°W).

Thirty-five fisheries were defined for this study on the basis of gear, fishing area, season, and unit of catch (numbers or weight), and all catch and effort data were allocated to these fisheries. Note that there were six fleets (S36-S41) that were indices of abundance calculated for a specific range of albacore lengths. Catch was reported and compiled in weight (metric tons) or 1000s of fish. Catch for most fisheries were almost identical to the 2023 assessment.

This working group paper describes the motivations for two main features of the development model. The first decision was to implement time-varying age selectivity for the three fleets with the largest catch amounts, Japanese pole and line (JPPL) areas 3 & 5 (A35) and calendar quarter 2 (Q2), JPPL A35 Q3, and eastern Pacific Ocean surface fleet (EPOSF). The models that had time-invariant and time-varying selectivity both had very similar fits to the F10 Japanese longline (JPLL) index of abundance (which was used in the 2023 benchmark assessment) and estimates of recruitment and spawning stock biomass. There were improvements in the fits to the length composition data, thus the additional complexity to selectivity forms was adopted. The second decision was to use the F10 index of abundance over the new S36 JPLL index of abundance calculated from data spanning all the ISC areas and Q2. The models fit well to either the F10 or S36 index of abundance, and the fits to the length composition data were very similar. Additionally, models fit to either index had very similar estimates of recruitment and spawning stock biomass. However, an ASPM conducted on the S36 index model could not estimate unfished recruitment (R0) parameter. Thus, the development model will proceed fitting to the F10 index which seems to contain information on the population scale. This development model is considered to be a reasonable starting point for further investigation in the upcoming albacore working group meeting.

Discussion

The WG thanked the authors for conducting this preliminary analyses and agreed it provided an important starting point to guide the development of a base case model and sensitivity runs for the 2026 stock assessment. The WG supported the overall stepwise model development approach and noted that the proposed model structure, biological assumptions, and data treatment were largely consistent with the 2023 stock assessment.

The WG discussed several diagnostic explorations conducted to better understand data conflicts and model behavior. The WG reviewed comparisons between ASPM and ASPM-R formulations to evaluate the influence of length composition data on population scale and abundance estimates. Explorations involving upweighting of the abundance index were used to identify length-frequency datasets contributing most strongly to data conflicts, indicating that F1 and F9 length compositions had the greatest impact on index fit. **The WG recommended focusing further refinement efforts on fleets F1 and F9, including broadening the age range of selectivity for fleet F1 to better represent contributions of older fish**.

The WG also discussed the evaluation of time-invariant versus time-varying age-based selectivity, particularly for fleets with higher catches. **The WG recommended the use of time-varying selectivity implemented using a two-dimensional autoregressive (2DAR) process for the JPLL fleet in Area 1/3 (Quarter 1), JPPL fleets in Areas 3/5 (Quarters 2 and 3), and the EPOSF** because this provided clear improvements in fits to length composition data without changing recruitment and spawning biomass estimates. The WG noted that this approach appeared more stable than the time block based time-varying selectivity used previously.

The WG thoroughly reviewed the choice of the main abundance index by comparing model diagnostics using the F10 (JPLL A2Q2) index with the newer spatiotemporal S36 (JPLL covering all ISC areas). While model fits to both indices produced similar biomass and recruitment trajectories, the WG members agreed that the S36 index did not appear to contain sufficient information on population scale based on the ASPM diagnostics and the inability to reliably estimate R_0. **The WG recommended using the fleet F10 index as the primary index of abundance for continued model development.**

The WG also reviewed exploratory inclusion of the TWN juvenile index and noted its minor influence on spawning biomass and recruitment estimates, while producing mixed effects on length-composition fits. Moreover, the model that also includes the TWN juvenile index did not show any improvement in performance based on ASPM diagnostics. **The WG recommended that the TWN juvenile index be explored as a sensitivity analysis by adding this to the base case model with the fleet F10 as the adult index**, with further work needed to refine its selectivity before consideration for inclusion in the base case.

The WG also investigated how to model the selectivities of Chinese and Vanuatu longline fleets. Comparison was made between the assessment models where these selectivities were mirrored or estimated using the superyear approach. A noticeable difference in the estimates of spawning biomass was observed, and the difference was not caused by fitting to the size composition data since down-weighting them did not significantly reduce the difference. The superyear approach showed mixed results: the composition fit was improved for one Chinese

longline fleet (F29 Area 3/5) while it was degraded for the other Chinese longline fleet (F30 Area 2/4) and the Vanuatu longline fleet (F31). **The WG recommended estimating the selectivity for the Chinese longline fleet (F29 Area 3/5) which showed improved fit, while mirroring the other two selectivities from existing ones that match most closely.** The WG also recognized that the details of the collection protocols and data processing for size composition data for these fleets were unknown and further investigation was needed in the future to understand these data more.

The WG developed the parameterizations of the base case model (further details in Table 3):

1. Period: 1994 – 2024
2. Fleet structure: Fleets-as-areas framework without explicit spatial movement. Changed from 2023 stock assessment include: reversion of the JPLL fleets to the unified 2020 stock assessment configuration, and separation of small-scale non-ISC longline from VULL.
3. Fitting to one primary adult female abundance index: F10 index (JPLL in A2Q2 from 1996 to 2024).
4. Fixed, sex- and age-specific values, with higher mortality for females than males. Steepness of the Beverton-Holt stock-recruitment relationship is fixed at 0.9.
5. Fixed, sex-specific age-length relationships based on established studies; estimation of growth parameters potentially considered in sensitivity analyses.
6. Length selectivities by fleet and several fleets fishing predominantly on juvenile fish had additional age selectivities to represent the availability by age.
7. Additionally some fleets had high year to year variability in size compositions therefore time-varying selectivity was implemented using a two-dimensional autoregressive (2DAR) process on age selectivity for the JPLL A1/3 Q1, JPPL A35 Q2, JPPL A35 Q3, and EPOSF fleets.

6.1. Structural and biological assumptions

The WG discussed the key structural and biological assumptions underlying the current assessment, including the assumption of a single, well-mixed stock with no explicit spatial structure, fixed and time-invariant natural mortality, growth, and stock–recruitment parameters, and the use of simplified selectivity structures across fleets. While these assumptions are consistent with the previous assessments, the WG noted uncertainty regarding the ability to fully capture spatial heterogeneity, temporal variability in biological processes, and changes in fishing practices. The WG also discussed uncertainty associated with the treatment of selectivity and size-composition data, including the use of time-varying selectivity for selected high-catch fleets. **The WG recommended that the implications of these structural**

and biological assumptions be evaluated through important sensitivity analyses and clearly documented in the 2026 stock assessment report.

6.2. Initial conditions

The initial conditions for the base-case model are the same as that used in the 2023 assessment:

1. estimate an initial F for F26 (TWLL Area 3/5) while not fitting to equilibrium catch, to capture the initial fished state of the population;
2. estimate 10 years of early recruitment deviations, to set up the initial age structure, and
3. estimate a deviation from the virgin recruitment (R1) at the start of the model

7. DIAGNOSTIC ANALYSES

The WG recommended that the same diagnostic analyses in the previous NPALB stock assessment to evaluate model performance for the 2026 stock assessment update. These included analyses of model convergence (jitter analysis), age-structured production models (ASPM), age-structured production models with recruitment (ASPM-R), likelihood profiling of unfished recruitment (R_o), residual patterns for CPUE and size-composition data, retrospective analyses, fits to indices and size compositions, hindcasting, and catch-curve analyses.

The WG reviewed the results of these diagnostics during the development of the base case model. Jitter analyses indicated that the model converged reliably to a stable maximum likelihood estimate, and ASPM diagnostics showed that the estimated production function and catch trends reasonably explained observed changes in the abundance index. Likelihood profiles demonstrated that both CPUE and size-composition data informed population scale, particularly on the lower end of the R_o range. While size-composition data had a larger influence on R_o, they were generally consistent with CPUE in terms of estimating R_o. Residual and catch-curve analyses indicated consistency between information content in the size-composition data and the CPUE index.

Overall, the **WG agreed that the diagnostic results were satisfactory and supported the base case model as providing an appropriate representation of NPALB population dynamics for the 2026 assessment**.

8. SENSITIVITY ANALYSES

The ALBWG identified several sensitivity runs to include with the base case model in order to assess model performance and the range of uncertainty associated with a particular parameterization. Below is a list of sensitivity runs to be tested for the 2026 stock assessment:

A. Natural mortality (M):
    1. constant M of 0.3 across sexes and ages (same as approach used in 2014 assessment);
    2. constant M of 0.48 and 0.39 for female and male of all ages, respectively; and
    3. estimated M with Lorenzen based on prior from Kinney and Teo (2017).
B. Stock-recruitment steepness (h):
    4. alternative values for the steepness parameter (h=0.75; 0.80 and 0.85); and
    5. adding prior based on Brodziak et al. (2011).
C. Growth:
    6. CV of Linf is fixed higher (0.06 or 0.08) than base case; and
    7. estimating growth.
D. Size composition weighting:
    8. down weighting each individual fleet; and
    9. down weighting all fleets so the input sample size is maximum 50 (currently 150).
E. Selectivity:
    10. different sigmas (up/down 0.25)
    11. turn off 2DARs
    12. no age selectivities
    13. assuming that the US longline fishery in Area 2/4 has an estimated descending limb in size selectivity; and
F. Index standardization models:
    14. S36 for adults all area include ASPM/ASPMR
    15. TWNLL JUV S37 in addition to F10 include ASPM/ASPMR
    16. GLM Juvenile: Area 3/5 & Quarter 3/4 (EPO) in addition to F10.
G. Initial conditions
    17. investigate other initial fleets – check what was done in 2023
H. Same model structure as in 2023 stock assessment.
    18. use 2023 model structure with updated data

9. PROJECTIONS SCENARIOS

Update of SSfutur C++ ver. 2.0.4 for Future Projections of the North Pacific Albacore stock. Ijima, H., Matsubara, N., and Tsuda, Y.(ISC/26/ALBWG-01/03)

This paper describes updates to SSfutur C++ (ssfcpp) version 2.0.4, developed to support forward projections in the 2026 ISC North Pacific albacore stock assessment. The new version improves compatibility with Stock Synthesis 3 (SS3) by stabilizing single-sex models, expanding spawning-season options, and revising the catch equation used for total allowable catch (TAC) scenarios. Deterministic projections showed close agreement between ssfcpp and SS3 for

spawning stock biomass, catch, and numbers-at-age. Stochastic simulations further demonstrated that ssfcpp can represent uncertainty in future stock trajectories. These results indicate that ssfcpp v2.0.4 meets current assessment needs, while also highlighting remaining issues related to initial-value generation and the treatment of uncertainty. Future work will focus on bootstrap-based initialization and additional functionality to support management strategy evaluation (MSE).

Discussion

The WG reviewed the updated future projection analyses conducted using the revised ssfcpp framework and agreed that the projections were appropriate for evaluating potential stock trajectories under alternative harvest scenarios. For the 2026 assessment, **the WG recommended maintain the historical fishing mortality period at F2005–2019, reflecting a temporally stable reference period prior to recent changes in fishing patterns, and to update the constant fishing mortality scenario using the most recent data period, F2021–2023 (Table 4).** The WG noted that these revisions improved consistency between the projection assumptions and current fishery conditions while avoiding potential bias associated with reduced fishing in recent years. The WG also emphasized that assumptions underlying these scenarios should be clearly documented alongside projection results and conservation advice.

10. STOCK STATUS AND CONSERVATION

10.1. Biological reference points and management objectives

The WG discussed the reference points that would be estimated and presented in the stock assessment and agreed to use the same biomass and fishing intensity reference points as the 2023 assessments for the 2026 stock assessment (Table 5).

10.2. Review exceptional circumstances criteria

The adopted harvest strategies of the WCPFC and IATTC for North Pacific albacore tuna include provisions for the identification and evaluation of exceptional circumstances that may warrant suspension or modification of the current strategies. Consistent with this requirement, the ALBWG evaluated the adopted criteria for identifying exceptional circumstances for North Pacific albacore tuna, including indicators related to stock and fleet dynamics, application of the stock assessment, and implementation of management measures. Based on the information available and the evaluation criteria, the ALBWG found no evidence to indicate that exceptional circumstances were present with respect to the conservation and management of the stock.

Discussion

The WG confirmed that no evidence of exceptional circumstances had been presented to the WG to date and **recommended including a summary of the 2026 evaluation of exceptional circumstances criteria in the 2026 stock assessment report.**

10.3. Stock status and conservation advice

The WG reviewed the text describing current stock status and conservation information for the executive summary and stock assessment report.

The WG recommends the following for stock status:

1. The stock is likely not overfished relative to the threshold (30%$SSB_{current, F=0}$) and limit (14%$SSB_{current, F=0}$) reference points adopted by the WCPFC and IATTC, and

2. The stock is likely not experiencing overfishing relative to the target reference point ($F_{45\%SPR}$).

The WG recommends the following conservation information:1. If fishing intensity over the next ten years is maintained at the current fishing intensity ($F_{2021\text{-}2023}$), the female SSB is expected to increase to 109,384t by 2034, with a 100.0% probability that female SSB will remain above the 14%$SSB_{current, F=0}$ LRP for all 10 years and the harvest strategy management objectives of the IATTC and WCPFC (IATTC Resolution C-23-02; WCPFC Harvest Strategy 2023-01) will likely be met.

2. If fishing intensity over the next ten years is similar to the 2005 – 2019 period, the female SSB is expected to increase to 67,340t by 2034, with a 99.1 % probability that female SSB will remain above the 14%$SSB_{current, F=0}$ LRP for all 10 years and the harvest strategy management objectives of the IATTC and WCPFC (IATTC Resolution C-23-02; WCPFC Harvest Strategy 2023-01) will likely be met. The WG noted that the stock status and conservation advice developed in the 2026 stock assessment are consistent with the management objectives of IATTC and WCPFC for this stock: 1) maintain SSB above the limit reference point, with a probability of at least 80% over the next 10 years; 2) maintain depletion of total biomass around historical (2006 – 2015) average depletion over the next 10 years; and 3) maintain fishing intensity at or below the target reference point with a probability of at least 50% over the next 10 years (IATTC Resolution C-23-02; WCPFC Harvest Strategy 2023-01).

11. RESEARCH RECOMMENDATION

Recent research by the ALBWG have included exploring CPUE standardization methods, improvements to abundance indices, understanding growth, selectivity, and sex ratio, expanding biological sampling programs, and exploring fleet-specific data issues.

The WG identified the following recommendations to improve the stock assessment model:

1. Further investigation of appropriate adult abundance index for the NPALB stock especially with respect to expanding the spatial domain of the CPUE standardization model to reduce the effect of time-varying availability on the standardized abundance index, which in the model is assumed to be proportionally influenced solely by population abundance;
2. Investigate factors that preclude estimation of population scale from the JPLL all ISC area (S36);
3. Reexamine fleet structure for the NPALB stock;
4. Evaluate potential juvenile indices from the Taiwan longline fisheries in (Areas 3/5), the Japanese pole-and-line and/or EPO surface fisheries;
5. Investigate why model estimates are very sensitive to the variability in Linf, improve growth curves, and examine regional and temporal differences in length-at-age from collected data;
6. Investigate how to better model variability in availability in size and/or age to the juvenile fisheries;
7. Investigate alternative modeling options for spawning seasonality and maturity;
8. Investigate the conflict in size composition data between fleets;
9. Investigate how to model and integrate the fleet specific sex ratio data that has been collected;
10. Estimate historical high seas drift gillnet removals by member countries;
11. Explore ocean productivity as drivers of albacore trends and dynamics.

12. ADMINISTRATIVE MATTERS

12.1. Workplan for completing assessment report

The WG is required to submit its updated benchmark stock assessment report to the Office of the ISC Chair no later than May 30, 2026. In order to meet this deadline the WG agreed to do additional work on developing the stock assessment and will have another virtual meeting on April 1, 2026 (EPO)/April 2, 2026 (WPO) to finalize the report and stock assessment details.

12.2. Update national contacts for the ALBWG

The following were confirmed as contacts for ALBWG matters:

Canada – Sarah Hawkshaw
Chinese Taipei – Yi-Jay Chang
Japan – Yuichi Tsuda and Naoto Matsubara
Korea – Heewon Park
Mexico – Michel Dreyfus

USA – Peter Kuriyama and Steve Teo
IATTC – Haikun Xu
SPC – Paul Hamer

12.3. Time and place of next ALBWG meetings

The WG developed a work plan for completing the 2026 stock assessment and other meetings attended by the WG members for 2026 (Attachment 4).

13. OTHER MATTERS

13.1. Review WCPFC stock assessment reporting template

The WG briefly discussed the WCPFC stock assessment reporting template and decided to include this as an appendix in the 2026 stock assessment report.

13.2. Review requests for science advice from RFMOs

Science advice on historical impacts of fleets in terms of fishing intensity

During NC21 discussions, it was proposed that the ISC provide estimates of the historical impact of each fleet group on the stock in terms of fishing intensity. Two specific historical period, 2002–2004 and 1999–2015, were requested to be used in the calculations. The purpose of these estimates is to quantify each fleet group's average fishing intensity and proportional contribution to total fishing pressure during the agreed reference periods. This information will support the development of fleet-specific reductions in fishing intensity if the current SSB estimate ever falls below the threshold reference point, as required by the harvest strategy.

The WG recommended using the methods developed in ISC24-ALBWG-01_07 to calculating the fleet group fishing intensity using the updated 2026 stock assessment estimates and then calculating the annual proportion of fishing intensity for each fleet using the methods outlined in ISC25-ALBWG-01_11.

The WG discussed how to prepare the science advice requested at NC21. It was agreed that this advice is intended to support harvest strategy implementation and does not alter stock status determination, reference points, or assessment conclusions therefore it should not be included as part of the stock assessment report and the **WG recommended that a separate document be prepare which outlines the science advice and recommendations** (Attachment 5).

14. 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, final edits were incorporated and then a

final draft was distributed 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.

15. ADJOURNMENT

The ALBWG meeting was adjourned at 9PM on April 1, 2026 (PST). The WG Chair thanked the WG members for presenting their research and contributing to the 2026 NPALB stock assessment.

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.	-No update provided. -This index did not fit well and more research is needed before the next 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 updates since data prep meeting -The RINLA-Expanded Area version of this model will be used for the main index in 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.	- No updates - 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	- No updates - 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	- No updates

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)	- No updates
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.	- Minor updates to the fleet structure compared to 2023. - Clumping the JPLL fleets similar to 2020 and splitting non-ISC longline fleets from Vanuatu - Discuss impacts of updated fleet definitions.

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.	- No updates -WP planned for modelling improvements workshop
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	- No updates - Discuss research at next workshop
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**	- The WG discussed 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 discussed and assessed exceptional circumstances criteria during the stock assessment, considered any new or emerging information, and will provide a clear summary of findings in the stock assessment report.
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 WG discussed historical impacts of fleets using fishing intensity	- Use 2026 stock assessment outputs to estimate historical impacts of each fleet - The WG developed a science advice document to presented at the ISC26 Plenary for approval

Assignment	Lead(s)	Mar 2025 Modelling Improvements	Oct/Nov 2025/Jan 2026 Data Preparation	Mar 2026 Stock Assessment
		the options for allocation can be 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	- The WG briefly discussed the most important uncertainties for the stock assessment	- The WG discussed sensitivity runs

Assignment	Lead(s)	Mar 2025 Modelling Improvements	Oct/Nov 2025/Jan 2026 Data Preparation	Mar 2026 Stock Assessment
		discuss alternative options based 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 2026 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 85-105cm)	**sdmTMB Adult: rich area & Q1** (JPLL)	**sdmTMB Mat adult: all area & Q1** (JPLL; LF Wei) / **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	Not presented but similar to **AllArea 85-100cm**	Not presented	ISC/25/ALB WG-02/08	ISC23-ALBWG-03/06
Preliminary Decisions	No longer using	Main candidate index	Research Track	Sensitivity Index	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 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 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.	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-temporal effects.	GLM-based approach: catch and effort data were aggregated into strata of 1 x 1° spatial blocks by month.
Time series	1996 – 2024	1996 – 2024	1994 – 2024	1994 – 2024	1994 – 2024	1994 – 2024	1994 – 2024	1994 – 2024	2004 – 2024	1999-2024

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 85-105cm)	**sdmTMB Adult: rich area & Q1** (JPLL)	**sdmTMB Mat adult: all area & Q1** (JPLL; LF Wei) / **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**
Spatial Distribution	Area 2	Area 2	125E – 125W	120E – 120W	120E – 180E	120E – 120W	120E – 120W	120E – 180E	north of 25°N	Area 5
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- Adult female distribution	Yes- Adult female distribution	No- Majority of Juvenile distribution	No – catch consists of juvenile albacore
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 Female prob	5cm bin (85-105cm) Mat Female prob	5cm bin (-85cm)	Primarily ages 2 - 4
Notes from WG				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	Same as 2020	Fixed parameter; similar to 2023 assessment investigate 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 biomass4	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	The length composition data were filtered to have a minimum initial input sample size of 0.1. The highest input sample size was 545.39 and a variance adjustment value of 0.27522 was applied to all fleets. This was to scale the maximum input sample size to be about 150	2026 assessment sensitivities investigated impact of downweighting all fleets and each fleet individually

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	Same as 2020	2026 assessment sensitivities 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:** SSfutur C++ (ssfcpp) version 2.0.4 Updated version *(***ISC/26/ALBWG-01/03***)*
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 (2005-2019) 2) Constant F (2021-2023)
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**	**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 ($F_{45\%}$)**

	3) **Obj B:** Annual depletion (Age1+) relative to average **depletion** (Age1+) **in 2006-2015** 4) **Obj C:** Annual $F_{\%SPR}$ relative to **TRP ($F_{45\%}$)**	

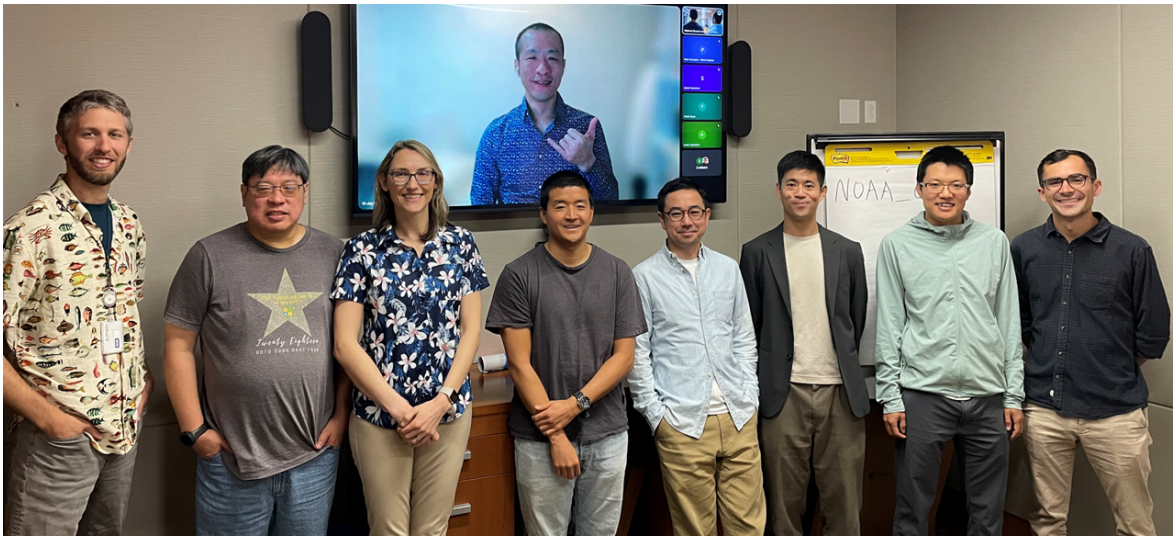
Table 5. List of important stock assessment estimated values and reference points from the 2023 stock assessment and those proposed for the 2024 stock assessment.

2023 Assessment Estimates	Preliminary 2026 Assessment Estimates
MSY (t)	MSY (t)
SSB_{MSY} (t)	SSB_{MSY} (t)
SSB_0 (t)	SSB_0 (t)
SSB_{2021} (t)	SSB_{2024} (t)
$SSB_{current,\ F=0}$ (2021 estimate)	$SSB_{current,\ F=0}$ (2024 estimate)
$SSB_{2021}/SSB_{current,\ F=0}$	$SSB_{2024}/SSB_{current,\ F=0}$
$SSB_{2021}/30\%SSB_{current,\ F=0}$	$SSB_{2024}/14\%SSB_{current,\ F=0}$
$SSB_{2021}/14\%SSB_{current,\ F=0}$	$SSB_{2024}/30\%SSB_{current,\ F=0}$
$Depletion_{B2021}$/ $Depletion_{B2006\text{-}2015}$	$Depletion_{B2024}$/ $Depletion_{B2006\text{-}2015}$
$F_{\%SPR,2018\text{-}2020}$	$F_{\%SPR,2021\text{-}2023}/F_{\%SPR,MSY}$
$F_{\%SPR,2011\text{-}2020}$	$F_{\%SPR,2014\text{-}2023}$
$F_{\%SPR,2018\text{-}2020}/F_{\%SPR,MSY}$	$F_{\%SPR,2021\text{-}2023}$
$F_{\%SPR,2011\text{-}2020}/F_{45\%}$	$F_{\%SPR,2014\text{-}2023}/F_{45\%}$
$F_{\%SPR,2018\text{-}2020}/F_{45\%}$	$F_{\%SPR,2021\text{-}2023}/F_{45\%}$
$F_{\%SPR,2018\text{-}2020}/F_{\%SPR,2002\text{-}2004}$	$F_{\%SPR,2021\text{-}2023}/F_{\%SPR,2002\text{-}2004}$

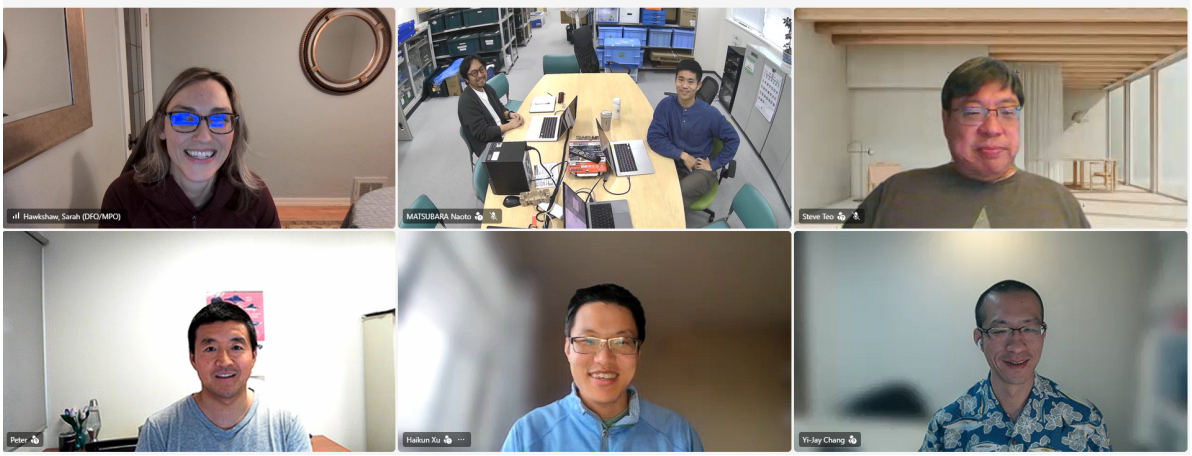
Attachment 1

List of Participants

Canada Sarah Hawkshaw Institute of Ocean Sciences 9860 West Saanich Road Sidney, BC, Canada V8L 4B2 Sarah.Hawkshaw@dfo-mpo.gc.ca	**Chinese-Taipei** Yi-Jay Chang National Taiwan University, Institute of Oceanography No. 1, Sec. 4, Roosevelt Rd, Taipei, 10617, Taiwan yjchang@ntu.edu.tw
Japan Yuichi Tsuda Fisheries Research Institute, Japan Fisheries Research and Education Agency 2-12-4 Fukuura, Kanazawa, Yokohama Kanagawa 236-8648 JAPAN tsuda_yuichi58@fra.go.jp	Naoto Matsubara Fisheries Research Institute, Japan Fisheries Research and Education Agency 2-12-4 Fukuura, Kanazawa, Yokohama Kanagawa 236-8648 JAPAN matsubara_naoto84@fra.go.jp
United States of America Steven Teo NOAA/SWFSC 8901 La Jolla Shores Drive La Jolla CA 92037 USA steve.teo@noaa.gov	Pete Kuriyama NOAA/SWFSC 8901 La Jolla Shores Drive La Jolla CA 92037 USA Peter.kuriyama@noaa.gov
Alexander Jensen NOAA/SWFSC 8901 La Jolla Shores Drive La Jolla CA 92037 USA alexander.jensen@noaa.gov	
Inter-American Tropical Tuna Commission Haikun Xu Inter-American Tropical Tuna Commission 8901 La Jolla Shores Drive La Jolla CA 92037 USA hkxu@iattc.org	**Invited Scientist** Max Titcomb University of California San Diego Scripps Institution of Oceanography 9500 Gilman Drive La Jolla, CA 92093 mctitcomb@ucsd.edu



The Albacore Working Group March 2026 (left to right) – Alex Jensen, Steve Teo, Sarah Hawkshaw, Peter Kuriyama, Yuichi Tsuda, Naoto Matsubara, Haikun Xu, Max Titcomb, and Yi-Jay Chang participated virtually.



The Albacore Working Group April 2026 virtual follow-up (left to right/top to bottom) – Sarah Hawkshaw, Hirotaka Ijima, Naoto Matsubara, Steve Teo, Peter Kuriyama, Haikun Xu, and Yi-Jay Chang.

Attachment 2

ALBACORE WORKING GROUP (ALBWG)

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

STOCK ASSESSMENT WORKSHOP

23-27 March 2026

Southwest Fisheries Science Center

La Jolla, CA, UNITED STATES OF AMERICA

1 April 2026 (PST)

Virtual Follow-Up

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 Work Assignments
4. Review conceptual model and fishery definitions
5. Review Working Papers and Input Data –
   5.1. Catch, CPUE Indices, Size Compositions
   5.2. Other Data (aging data, sex composition, etc.)
   5.3. Data Issues
6. Base Case Model Development
   6.1. Structural and biological assumptions
   6.2. Initial conditions
   6.3. Review preliminary models
7. Diagnostic Analyses
8. Sensitivity Analyses
9. Projections Scenarios
10. Stock status and Conservation
    10.1. Biological reference points and management objectives
    10.2. Review exceptional circumstances criteria
    10.3. Stock status and conservation advice

11. Research Recommendations
12. Administrative Matters
    12.1. Workplan for completing assessment report
    12.2. Update national contacts for the ALBWG
    12.3. Time and place of next ALBWG meetings
13. Other matters
    13.1. Review WCPFC stock assessment reporting template
    13.2. Review requests for science advice from RFMOs
    13.3. Review climate change considerations
14. Clearing of Meeting Report
15. Adjournment

Attachment 3

List of Working Papers and Presentations

Number	Title and Authors	Availability
ISC/26/ALBWG-01/01	Development of a preliminary model for the 2026 north Pacific albacore tuna stock assessment. Peter Kuriyama and Steven Teo	ISC Website
ISC/26/ALBWG-01/02	Climate Change Considerations for the North Pacific Albacore Stock Assessment. Sarah Hawkshaw	ISC Website
ISC/26/ALBWG-01/03	Update of SSfutur C++ ver. 2.0.4 for Future Projections of the North Pacific Albacore stock. Hirotaka Ijima, Naoto Matsubara, and Yuichi Tsuda	ISC Website

Attachment 4

Meetings and Workplan

Date	Location	Task/Event
April 1, 2026	Virtual	Follow up meeting to finalize report
June 2026	La Jolla	IATTC SAC
June 21-30, 2026	Taiwan	ALBWG meeting/ISC26 Plenary
July 2026	Japan	NC22
August 2026	Samoa	SC22
Spring 2027	Canada	Modelling improvements workshop
Spring 2028	TBD	Modelling improvements workshop
Winter 2028	TBD	ALBWG workshop: Data Preparation
Spring 2029	TBD	ALBWG workshop: Stock Assessment 2029

Attachment 5

Science advice on interpreting historical impacts of fleets fishing for north Pacific albacore tuna in terms of fishing intensity

BACKGROUND

The Western and Central Pacific Fisheries Commission (WCPFC) Northern Committee (NC) and the Inter-American Tropical Tuna Commission (IATTC) harvest strategies for north Pacific albacore (NPALB; WCPFC NC Harvest Strategy 2023-01; IATTC Resolution C-23-02) include harvest control rules that mandate reductions in fishing intensity ($F_{\%SPR}$) if the female spawning stock biomass (SSB) falls below the adopted reference points. The Albacore Working Group (ALBWG) of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) provided scientific advice translating fishing intensity into traditional management controls, such as catch and effort (ISC/25/ANNEX/10). The analyses supporting this advice separated the annual total fishing intensity estimated in the 2023 stock assessment into fleet-specific fishing intensities, and demonstrated strong relationships between fleet-specific fishing intensities and catch, and moderate relationships with effort for some fleet groups, indicating that fishing intensity can be managed by these traditional measures. In order for this advice to be implemented, the ALBWG recognized that allocation rules needed to be provided by the WCPFC and IATTC to guide the calculations of fleet-specific fishing intensities according to the harvest strategies. In response, WCPFC NC members requested that the ISC provide estimates of the historical impact of each fleet group on the North Pacific albacore tuna (NPALB) stock expressed in terms of fishing intensity ($F_{\%SPR}$). Specifically, the NC requested that these estimates be calculated for the historical reference periods: 2002–2004 and 1999–2015. 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.

Overall, the purpose of this request is to ensure that, should the NPALB stock decline below the threshold reference point, management bodies have the necessary information to support potential fleet-specific allocation of reductions in fishing intensity, and to inform harvest strategy implementation discussions.

SUMMARY OF ANALYSES

The ALBWG applied analytical methods previously developed to estimate the annual proportional historical impacts of each fleet group on the NPALB stock. The annual fleet-specific spawning potential ratios (SPRs) for each fleet group were first estimated using outputs from the updated 2026 NPALB stock assessment (ALBWG 2026) and applying the methods from Teo et al., 2024 (Table 2). The annual proportional impact of each fleet group was then calculated using the annual fleet-specific SPRs and the annual total SPR from the stock assessment, applying methods in Teo and Kuriyama (2025; Table 3). The average proportional impact of

each fleet group during the 2002 – 2004 and 1999 – 2015 time periods was then calculated using the arithmetic means of the fleet-specific SPRs and the total SPR for the two time periods (Tables 4).

SCIENTIFIC ADVICE AND RECOMMENDATIONS

The ALBWG advises that the fleet-specific fishing intensity estimates presented in this document provide a biologically consistent and transparent characterization of the historical impacts of major NPALB fleet groups on the stock. By expressing fleet-specific impacts in terms of spawning potential ratio ($F_{\%SPR}$), these estimates account for differences in selectivity, age composition, and biological contribution to female SSB, allowing impacts across diverse gears and fisheries to be compared on a common scale. These metrics are therefore more appropriate than catch or effort alone for evaluating relative historical fishing impacts and informing harvest strategy implementation.

The average fleet-specific proportional impacts estimated for the requested historical reference periods, 2002–2004 and 1999–2015 (Table 4) represent suitable indicators of each fleet group's relative contribution to total fishing pressure during those periods. These averaged values are particularly appropriate for informing discussions on proportional reductions in fishing intensity, should the harvest control rules be triggered by the stock falling below the threshold reference point. However, the interpretation and use of these estimates should recognize that fleet-specific fishing intensity is conditional on historical stock and fishery conditions, including recruitment, availability, and selectivity patterns.

The ALBWG therefore notes that the historical fleet-specific proportional impact estimate values are likely to change slightly with updated stock assessment outputs. The ALBWG recommends using the 2026 stock assessment results to inform the upcoming discussions around allocation rules required should the SSB fall below the threshold reference point. The ALBWG does not recommend recalculating the fleet specific proportional impacts for the historical periods for subsequent stock assessments unless there is a specific need related to an identified exceptional circumstance.

The ALBWG reiterates that while this scientific advice provides quantitative estimates of historical fleet-specific fishing intensity, the development and application of explicit allocation rules for translating total fishing intensity targets into fleet-specific fishing intensities remain the responsibility of the RFMOs.

Once allocation rules are agreed upon, the ALBWG's previous scientific advice on interpreting fleet-specific fishing intensity in terms of catch and effort management measures can be applied. The ALBWG is prepared to provide further technical support or updated analyses as requested to facilitate transparent and effective implementation of the NPALB harvest strategy.

ADDITIONAL RESOURCES

In addition, the ALBWG has also developed an online tool to help discussions by the WCPFC NC and IATTC on allocation rules and harvest strategies for north Pacific albacore (https://connect.fisheries.noaa.gov/NPALB_harvest_strategy_tool).

REFERENCES

Teo, S. L. H., H.-H. Lee, D. Tommasi, S. Hawkshaw, Y.-J. Chang, Y. Tsuda, and Y. Kwon. 2024. Relationships between fleet-specific spawning potential ratios and measures of catch and effort for North Pacific albacore tuna. ISC/24/ALBWG-01/07. Working document submitted to the ISC ALBWG, 11-18 March, 2024, Institute of Ocean Sciences, Fisheries and Oceans Canada, Sidney, British Columbia, Canada.

Teo, S. L. H. and Kuriyama, P. 2025. Estimating fleet-specific allocations of spawning potential ratios. ISC/25/ALBWG-01/11. Working document submitted to the ISC ALBWG, 10-14 March 2025, held at the National Taiwan University, Institute of Oceanography in Taipei, Taiwan.

TABLES

Table 1. Fleet groups are from the 2026 North Pacific albacore (NPALB) stock assessment.

Fleet Group	Fleet Group Name	Fleet ID	Units of Effort	Fleet Group Description
1	JPLLalbtgt (NPALB targeting)	F1/F2/F9/F12/ F13/F16	Hooks, Vessels, Days	Japan longline; targeting NPALB (A13_Q1/2 & A2_Q1/4)
2	JPLLnontgt (NPALB Non-targeting)	F3 to F8 & F10/F11 & F14/F15 & F17/F18	Hooks, Vessels, Days	Japan longline; all areas; all seasons; (except A13_Q1/2 and A2_Q1/4)
3	JPPL	F19 to F23	Vessels, Days, Poledays, Avg poles, SKJ catch	Japan pole-and-line; all areas; all seasons
4	USLL	F24/F25	Hooks, Vessels, Sets	US longline; all areas; all seasons
5	TWLL	F26/F27	Hooks, Vessels, Days	Taiwan longline; all areas; all seasons
6	KRLL	F28	Hooks	Korea longline; all areas; all seasons
7	CNLL	F29/F30	Hooks	China longline; all areas; all seasons
8	VULL	F31/F32	Hooks	Vanuatu longline; all areas & seasons
9	OTHLL	F33	Hooks	Others longline; all areas & seasons
10	EPOSF	F34	Vessels, Days	EPO Surface fleet (primarily US and Canada); all seasons

11	PSDNMISC	F35	NA	Purse seine and miscellaneous fleets from Japan and Taiwan

Table 2. Estimated fleet-specific spawning potential ratios (SPRs) for each fleet group described in Table 1 using estimates from the 2026 North Pacific albacore (NPALB) stock assessment.

Year	Fleet Group Name										
	JPLL albtgt	JPLL nontgt	JPPL	USLL	TWLL	KRLL	CNLL	VULL	OTHLL	EPOSF	PSDN Misc
1994	0.861	0.867	0.814	0.994	0.999	1.000	1.000	1.000	1.000	0.903	0.985
1995	0.866	0.878	0.866	0.993	0.963	1.000	1.000	1.000	1.000	0.921	0.978
1996	0.849	0.874	0.827	0.991	0.931	0.999	1.000	1.000	1.000	0.875	0.990
1997	0.801	0.862	0.750	0.989	0.918	0.997	1.000	1.000	1.000	0.859	0.982
1998	0.817	0.861	0.833	0.993	0.916	0.998	1.000	1.000	1.000	0.861	0.977
1999	0.840	0.844	0.557	0.989	0.910	0.999	0.998	1.000	1.000	0.839	0.955
2000	0.819	0.882	0.835	0.993	0.900	1.000	1.000	1.000	1.000	0.848	0.972
2001	0.831	0.868	0.746	0.990	0.902	0.999	0.994	1.000	0.999	0.866	0.988
2002	0.817	0.904	0.666	0.996	0.902	0.999	0.995	0.979	0.993	0.862	0.974
2003	0.833	0.927	0.694	0.996	0.914	0.998	0.989	0.975	0.998	0.800	0.984
2004	0.866	0.920	0.611	0.997	0.934	0.999	0.988	0.936	1.000	0.742	0.924
2005	0.807	0.916	0.834	0.997	0.933	0.995	0.992	0.946	1.000	0.807	0.977
2006	0.807	0.895	0.786	0.998	0.933	0.998	0.981	0.942	1.000	0.864	0.992
2007	0.806	0.881	0.661	0.997	0.957	0.998	0.998	0.947	0.999	0.836	0.962
2008	0.844	0.896	0.843	0.996	0.956	0.994	0.997	0.957	0.999	0.842	0.975
2009	0.822	0.886	0.667	0.997	0.964	0.999	0.998	0.976	0.999	0.828	0.977
2010	0.820	0.893	0.786	0.995	0.958	0.998	0.986	0.962	0.998	0.820	0.992
2011	0.841	0.875	0.761	0.991	0.951	0.999	0.956	0.942	0.999	0.857	0.993
2012	0.800	0.899	0.727	0.990	0.963	0.998	0.921	0.967	0.993	0.864	0.966
2013	0.848	0.889	0.734	0.996	0.940	0.998	0.952	0.956	0.992	0.824	0.984
2014	0.854	0.884	0.745	0.997	0.964	0.998	0.975	0.959	0.996	0.792	0.978
2015	0.806	0.899	0.744	0.997	0.955	0.999	0.974	0.951	0.996	0.823	0.983
2016	0.843	0.917	0.767	0.997	0.949	0.999	0.988	0.978	0.997	0.818	0.962
2017	0.813	0.929	0.725	0.998	0.939	0.997	0.981	0.965	0.994	0.839	0.979
2018	0.855	0.925	0.691	0.999	0.931	0.999	0.981	0.965	0.992	0.886	0.965
2019	0.871	0.920	0.890	0.999	0.922	0.999	0.969	0.961	0.994	0.933	0.990
2020	0.880	0.928	0.762	0.998	0.946	0.999	0.976	0.970	0.998	0.913	0.967
2021	0.839	0.920	0.931	0.997	0.921	0.996	0.990	0.958	0.997	0.952	0.993
2022	0.928	0.945	0.944	0.998	0.944	0.998	0.989	0.962	0.995	0.915	0.995
2023	0.908	0.941	0.920	0.995	0.934	0.999	0.992	0.979	0.998	0.956	0.969
2024	0.904	0.951	0.962	0.998	0.922	0.996	0.997	0.983	0.995	0.954	0.994

Table 3. Estimated annual historical fleet-specific proportional impact (%) on North Pacific albacore (NPALB) stock using estimates from the 2026 North Pacific albacore (NPALB) stock assessment. Fleet groups described in Table 1. The proportional impact can also be thought of as the fleet-specific share of the SPR shown in Table 2. Each row sums to approximately 100%.

Year	Fleet Group Name										
	JPLL albtgt	JPLL nontgt	JPPL	USLL	TWLL	KRLL	CNLL	VULL	OTHLL	EPOSF	PSDN Misc
1994	24.1	23.0	33.0	0.9	0.1	0.0	0.0	0.0	0.0	16.5	2.4
1995	25.3	22.8	25.4	1.3	6.8	0.0	0.0	0.0	0.0	14.5	3.9
1996	22.9	18.9	26.5	1.2	10.1	0.2	0.0	0.0	0.0	18.8	1.4
1997	23.8	16.0	30.8	1.2	9.3	0.4	0.0	0.0	0.0	16.4	2.0
1998	25.1	18.6	22.7	0.9	11.0	0.2	0.0	0.0	0.0	18.5	2.9
1999	14.1	13.8	45.4	0.9	7.7	0.1	0.1	0.0	0.0	14.2	3.8
2000	24.5	15.5	22.2	0.9	13.0	0.0	0.0	0.0	0.0	20.3	3.5
2001	20.7	15.8	32.4	1.1	11.6	0.1	0.7	0.0	0.1	16.1	1.4
2002	19.7	9.9	39.1	0.4	10.2	0.1	0.5	2.1	0.7	14.6	2.6
2003	18.4	7.7	36.2	0.4	9.1	0.2	1.1	2.5	0.2	22.5	1.7
2004	11.7	6.9	38.7	0.2	5.6	0.1	1.0	5.4	0.0	23.9	6.5
2005	24.8	10.3	21.1	0.3	8.1	0.6	0.9	6.5	0.0	24.8	2.7
2006	24.5	12.8	27.4	0.3	8.0	0.2	2.3	6.9	0.0	16.8	1.0
2007	20.1	11.8	37.8	0.3	4.1	0.2	0.2	5.1	0.1	16.6	3.7
2008	22.6	14.7	22.7	0.6	6.0	0.8	0.4	5.9	0.1	22.9	3.4
2009	19.7	12.2	39.9	0.3	3.7	0.1	0.2	2.5	0.1	18.9	2.4
2010	22.9	13.1	27.8	0.6	5.0	0.2	1.7	4.6	0.2	22.9	0.9
2011	19.0	14.8	29.9	1.0	5.6	0.1	5.0	6.6	0.1	17.0	0.8
2012	22.2	10.7	31.5	1.0	3.8	0.2	8.3	3.4	0.7	14.7	3.5
2013	17.0	12.2	31.5	0.4	6.5	0.3	5.1	4.6	0.8	19.9	1.7
2014	16.8	13.1	31.0	0.3	3.9	0.2	2.8	4.5	0.4	24.7	2.4
2015	22.4	11.2	30.5	0.3	4.8	0.1	2.8	5.2	0.4	20.3	1.9
2016	20.0	10.2	30.8	0.3	6.2	0.1	1.5	2.6	0.3	23.4	4.6
2017	22.3	8.0	34.4	0.2	6.9	0.3	2.1	3.9	0.7	19.0	2.3
2018	17.5	8.8	40.7	0.2	8.1	0.2	2.1	4.0	1.0	13.6	4.0
2019	23.9	14.4	20.1	0.2	14.0	0.2	5.4	7.0	1.1	12.0	1.7
2020	17.9	10.5	37.9	0.3	7.8	0.1	3.4	4.4	0.3	12.8	4.7
2021	32.8	15.7	13.5	0.5	15.5	0.8	2.0	8.0	0.5	9.3	1.4
2022	18.8	14.1	14.5	0.6	14.3	0.6	2.8	9.7	1.1	22.2	1.3
2023	22.7	14.4	19.8	1.1	16.0	0.3	1.9	5.1	0.4	10.7	7.5
2024	28.4	14.3	11.0	0.6	22.8	1.2	1.0	4.7	1.3	13.1	1.6

Table 4. Estimated average historical fleet-specific spawning potential ratio (SPR) and proportional impact (%) on North Pacific albacore (NPALB) stock for the requested historical time periods 2002-2004 and 1999-2015. Estimates are from the 2026 stock assessment and fleet groups are described in Table 1. The proportional impact can also be thought of as the fleet-specific share of the SPRs. The total SPR is the product of the fleet-specific SPRs.

Fleet Group	Average SPR 2002-2004	Average proportion of SPR 2002-2004 (%)	Average SPR 1999-2015	Average proportion of SPR 1999-2015 (%)
JPLLalbtgt	0.839	16.3	0.827	19.8
JPLLnontgt	0.917	8.1	0.892	12.0
JPPL	0.657	38.1	0.729	32.6
USLL	0.996	0.4	0.995	0.6
TWLL	0.917	8.1	0.938	6.8
KRLL	0.999	0.1	0.998	0.2
CNLL	0.990	0.9	0.982	1.9
VULL	0.964	3.5	0.965	3.8
OTHLL	0.997	0.3	0.998	0.2
EPOSF	0.801	20.5	0.830	19.4
PSDNMisc	0.961	3.8	0.975	2.7
Total	0.337	100.0	0.383	100.0