Report of the 2025 ICCAT Atlantic Bigeye tuna Stock Assessment Meeting

(hybrid/Madrid, Spain, 14-18 July 2025)

The results, conclusions and recommendations contained in this report only reflect the view of the Tropical Tunas Species Group. Therefore, these should be considered preliminary until the SCRS adopts them at its annual Plenary meeting and the Commission revises them at its annual meeting. Accordingly, ICCAT reserves the right to comment, object and endorse this report, until it is finally adopted by the Commission.

1. Opening, adoption of agenda and meeting arrangements

The hybrid meeting was held in-person at the ICCAT Secretariat in Madrid (Spain) from 14 to 18 July 2025. Dr. Shannon Cass-Calay (External Expert), the Species Group ("the Group") rapporteur and meeting Chair, opened the meeting and welcomed participants. Dr. Miguel Neves dos Santos, ICCAT Assistant Executive Secretary, welcomed the participants and wished them success in their meeting.

The Chair proceeded to review the Agenda which was adopted with some changes (**Appendix 1**). The List of Participants is included in **Appendix 2.** The List of papers and presentations presented at the meeting is attached as **Appendix 3**. The abstracts of all SCRS documents and presentations presented at the meeting are included in **Appendix 4**. The following participants served as rapporteurs:

Sections	*Rapporteur*
Items 1 and 13	M. Ortiz
Item 2	C. Mayor, J. Garcia
Item 3,4,5,6	R. Sant'Ana, G. Merino, G. Correa, A. Urtizberea, A. Kimoto, M. Narváez, M. Lauretta
Item 7	R. Sant'Ana, G. Merino
Item 8	S. Cass-Calay
Item 9	G. Diaz, M. Ortiz, M. Neves dos Santos
Item 10	S. Wright, N. Walker, K. Vert-Pre, M. Neves dos Santos
Item 11	S. Cass-Calay, C. Brown, K. Vert-Pre
Item 12	S. Cass-Calay

2. Summary of input data for stock assessment

The Group reviewed the most recent fisheries statistics available in the ICCAT database system (ICCAT-DB) for bigeye tuna (BET) and, to a minor extent, for yellowfin tuna (YFT) and skipjack (SKJ). The review of the fishery statistics included Task 1 data (T1NC Nominal Catches) and Task 2 data (T2CE: Catch and Effort, T2SZ: Size frequency observed samples, T2CS: Catch at Size estimations). These datasets, along with the most up-to-date tagging data for tropical tunas, were made available to the Group.

The SCRS catalogue, presented in **Table 1**, summarises the existing Task 1 and Task 2 datasets for the bigeye tuna stock for the period 1994-2023. The bigeye tuna catches in T1NC by major gear and year for the period 1950 to 2023 are presented in **Table 2**.

Document SCRS/P/2025/061 summarized all available statistical information on tropical tunas (BET, YFT, SKJ) currently available in the ICCAT-DB, with a primary focus on bigeye tuna. It included a review of all the Task 1 and Task 2 datasets as well as the tools provided to facilitate the visualization and exploration of these data. Additionally, the document highlighted several issues in the ICCAT-DB that should be addressed to enhance overall data quality.

Task 1 Nominal Catches

Complementing the presentation, two Excel files were provided containing respectively, the nominal catches (landings and dead discards) and live discards. The T1NC dashboard, developed in line with the 2021 SCRS recommendation, was also updated and made available to the Group. This dashboard enables visual and interactive querying of the T1NC dataset, thereby facilitating its exploration.

While evaluating T1NC, the Group noted an increasing trend in catches of the three main tropical tuna species (BET, YFT, SKJ) between 2006 and 2023 (**Figure 1**), with approximately 70% of the total catches reported from purse seine (PS) gear. In contrast, a declining trend in bigeye tuna catches was observed from 2016 to 2023 (**Figure 2**).

The Secretariat informed the Group about the differences in the nominal catches (T1NC) data between the 2025 Bigeye data preparatory meeting (ICCAT, 2025) held in April 2025 and the most updated data currently available in the ICCAT database, as of 11 July 2025. It was noted that most of the discrepancies were related to catch data reported for 2024, as well as the submission of 2003 data by Panama to fill a gap identified during the 2025 Bigeye data preparatory meeting (ICCAT, 2025). Panama will submit an SCRS document explaining how these data were recovered to the 2025 Subcommittee of Statistics meeting.

The Secretariat also informed the Group about the consistent reduction of T1NC data reported without a gear type (UNCL gear), which became minimal after 2012. However, historical bigeye tuna catches without gear discrimination (UNCL gear) still exist before 2012. Additionally, the Secretariat informed the Group of the efforts made to properly classify the catches initially reported as Catches (C) into Landings (L), Landings from *Faux Poissons* (LF), and Dead Discards (DD). In the case of bigeye tuna, all records have been successfully reclassified into these categories.

Task 2 catch/effort

The Secretariat presented the detailed Task 2 Catch and Effort (T2CE) catalogue with important metadata to the Group, noting that no major improvements, including historical revisions, were made recently. The bigeye tuna SCRS catalogue (**Table 1**) was also used to provide a comparative summary of Task 1 and Task 2 datasets.

During the presentation of the T2CE catalogue, the Secretariat highlighted several issues affecting data quality, including high levels of temporal and spatial aggregation in some datasets. Certain records were historically submitted at annual or quarterly resolution instead of the monthly resolution currently required by SCRS. Moreover, some purse seine datasets lacked effort information expressed in number of sets, which is the expected unit for this gear. The use of overly large spatial grids (e.g., 5°x10° or 10°x10° degrees) was also observed, not meeting the minimum spatial resolution currently required by the SCRS, 5°x5° for longliners and 1°x1° for the rest of gears. Furthermore, catch and effort data from purse seine fleets targeting tropical tunas in some instances lacked classification by fishing mode (i.e., FAD *vs.* free school) making it difficult to clearly identify this category.

Task 2 size data

The detailed Task 2 Size data (T2SZ) catalogue was provided to the Group. The Secretariat noted that no major improvements, including historical revisions, were made after the 2025 Bigeye data preparatory meeting (ICCAT, 2025)

3. Methods and model settings

The Secretariat noted that the longline index for the period 1959-1978 was incorrectly labelled as Japan-US in the 2025 Bigeye data preparatory meeting report (ICCAT, 2025), and it should be Japan-Brazil. The values of this index were correct in the report.

3.1 Stock Synthesis (SS)

Document SCRS/2025/151 presented a preliminary stock assessment model using Stock Synthesis (SS) version 3.30.23 (Methot and Wetzel, 2013). Recommendations agreed by the Group during the 2025 Bigeye data preparatory meeting (ICCAT, 2025) were implemented sequentially in a stepwise manner, in order to explore changes in exploitation and biomass estimates, developing a total of 10 iterative model runs (**Table 3**). A provisional reference case was “run 9” in **Table 3** and a suite of diagnostics were presented.

The model considered one area, aggregated sex and four seasons, covering the period 1950-2023, with initial stock biomass (1950) assumed in virgin stock condition and fleet structure comprising 22 fleets (**Table 4**).

Sensitivity runs were analyzed estimating sigma R (standard deviation of recruitment deviates) inside the model, using growth inputs from Waterhouse *et al.* (2022), F_method 4 (a fleet-specific superset of F_Methods 2 and 3, recommended for modeling F in SS) and re-weighting Dirichlet multinomial method. Model diagnostics included retrospective and hindcast analysis, jitters of starting parameters, profiling of stock-recruitment (R_0, steepness, and sigmaR) and growth parameterization (asymptotic length), runs tests of the residuals to the fits to the indices and length composition data, all conducted using SS built-in diagnostics (Taylor *et al.*, 2021), R program (R core team 2023), and the SS3Diags R package (Carvalho *et al.*, 2021). Model predictive ability was tested using the hindcasting cross-validation approach of Kell *et al.* (2021).

The Group noted that historically the purse-seine (PS) fleets operating on free-schools tend to catch both smaller and larger size bigeye tunas, however size data indicated that recently PS fleets operating on free-schools catch predominantly larger size bigeye tunas. Therefore, the Group agreed to assume a time varying selectivity for this fleet.

The Group noticed the change in the mean size distribution of bigeye tuna for some of the fleets and discussed the assumptions of time varying selectivity in the purse seine free school fleets (PSFSC), baitboat (BB) South Dakar and North Dakar in the preliminary reference model. The time varying selectivity increased the number of parameters estimated by the model, but it did not seem to have an impact on the convergence of the model, so the Group agreed to maintain the time varying selectivity parameterization for these fleets.

The Group discussed the few size data available for the handline (HL) Brazil fleet and recommended the collection of this data to be submitted as part of ICCAT Task 2. The previous assessment mirrored the selectivity of this fleet to the BB North Dakar fleet, however, the Group agreed that considering the change in selectivity towards smaller fish, it was more appropriate to mirror the North Other longline (LL) fleet which catches larger fish than the BB North Dakar fleet.

It was noted that during the assessment model development, some of the size composition data was excluded from the LL Others fleet ID. Overall, they represented size data from limited number of samples and sporadic sampling, usually as a result from the combination of data from several small fleets. The exclusion of these data improved the model fit.

Presentation SCRS/P/2025/063 provided a sensitivity run for a preliminary SS reference case that incorporated the Canary baitboat index, following the recommendations from the 2025 Bigeye data preparatory meeting (ICCAT, 2025). This analysis demonstrated that the results and diagnostics were virtually identical to those from the preliminary reference model, which omitted this specific index.

The Group clarified that while this analysis was requested during the 2025 Bigeye data preparatory meeting (ICCAT, 2025), its inclusion was solely as a sensitivity run. It was noted that the Canary baitboat index was not intended to be included in the reference base case model, given prior discussions that highlighted the index's coverage of a very limited geographical area where stock availability is influenced by oceanographic conditions.

The Group requested additional sensitivity runs to finalize a reference case:

R_0 profiling:

- A narrower range for the R_0 profile for the reference model.
- Remove the early Joint LL catch per unit effort (CPUE) index.

Analyze the impact of the juvenile indices:

- Compare the model that considers only one juvenile index: the echosounder BAI index.
- A second evaluation with only the PS-FAD as juvenile index.

- And a third evaluation, that removes all juvenile indices (i.e. using only the Joint LL index).

Analyze the effect of upweighting the Joint LL CPUE index:

- Up weighting the likelihood of the Joint LL CPUE by increasing the lambda value in SS3.
- Down weighting all length data composition.
- Assume a CV of 0.1 for the late period of the Joint LL CPUE index.

After reviewing all sensitivity runs, the Group agreed to use the preliminary reference case as the final SS reference case for the Atlantic bigeye tuna stock assessment and the use of both juvenile indices as part of the grid as an axis of uncertainty.

The Group further discussed the members of the uncertainty grid based on the proposal at the 2025 Bigeye data preparatory meeting (ICCAT, 2025) (**Table 9** in ICCAT, 2025). The Group agreed to maintain the proposal of 18 total uncertainty grid models, by selecting the 25th and 75th percentiles and the median (i.e. 50th percentile) for natural mortality (M) values (average M on ages 4-10+ are 0.26, 0.32, 0.39) with weighting (0.37, 0.38, 0.25) from the lognormal distribution of the M estimation. The Group recalculated the percentiles and modified the 75th percentile value from 0.4 in the Data Preparatory report to 0.39.

The Group discussed that an alternative of using the 80th percentiles scenario (i.e. 10th and 90th percentiles) included values of M that when used in the assessment model resulted in implausible SSB trends and recruitment deviates.

The final uncertainty grid was as follows:

Uncertainty Grid Factor	# levels	Scenarios axis of uncertainty
Natural Mortality	3	Average M on Ages 4-10+ (weighting) = 0.26 (0.37), 0.32 (0.38), 0.39 (0.25)
Steepness	3	Steepness = 0.7, 0.8, 0.9
Juvenile Index of Abundance	2	Acoustic buoy or Purse Seine FOB
Total Uncertainty Grid Models	18	

Document SCRS/2025/159 explored the relative effect of fleet structure and data weighting assigned to abundance indices in SS models for bigeye tuna, showing that outcomes from assessment are sensitive to assumptions on the fleet structure and associated selectivities.

The Group recognized the value of testing an alternative fleet structure of 19 fleets, which aligns with those used for the Atlantic yellowfin and skipjack tuna. However, the Group agreed to assume 22 fleets structure as in the 2021 Bigeye tuna stock assessment meeting (ICCAT, 2021) by separating the CTP longline fleets (North, tropical and South) from the other longline fleets due to the differences in selectivity in comparison to other longline fleets.

3.2 Surplus Production models

SPiCT

Document SCRS/2025/145 assessed the Atlantic bigeye tuna stock using dynamic biomass models: the Stochastic surplus production model in continuous time (SPiCT, Pedersen and Berg, 2017) and *mpb* (Kell, 2016) models. The SPiCT assessment used total catch data and two joint longline indices from 1959-1978 (delta-lognormal index from Japan and Brazil in Region 2) and 1979–2023 (multi-national lognormal index in Region 2). All results were validated through various model checks, e.g., convergence, residuals, production curve, and retrospective analysis.

The Group clarified that SPiCT model is based on a Bayesian approach and inquired about some model settings. The author clarified as follows:

- The model started in 1950,
- priors for intrinsic growth (r): mean = 0.15 with CV = 0.15,
- carrying capacity (K): uninformative prior with the range between 0 and 20 times of the historical highest catch,
- the initial depletion prior: mean = 1 with standard deviation in log scale = 0.00995

The author noted that this is the second ICCAT assessment that used the SPiCT software after the Porbeagle assessment in ICCAT, and further analysis is planned.

JABBA

SCRS/2025/158 provided preliminary results of the Atlantic bigeye tuna stock assessment applying Just Another Bayesian Biomass Assessment (JABBA). The models used total catch data and joint longline indices from 1959-1978 (delta-lognormal index from Japan and Brazil in Region 2) and 1979–2023 (continuity delta-lognormal index from some CPCs in Region 2, or multi-national lognormal index in Region 2). Three scenarios with varying steepness values (0.8 (continuity run), 0.7, and 0.9) were explored. The document provided convergence diagnostics, residual analysis, a runs test for randomness, retrospective analysis, and hindcasting.

The Group inquired if the authors tried different surplus production functions and priors for *r*. The authors commented that Pela-Tomlinson's function and some different *r* priors were applied, but the results were similar to the original results. This analysis was developed with an informative prior on *r* informed by the posterior distributions from the 2021 JABBA runs as suggested by Gelman *et al.* (2013). It was explained that *r* priors in the 2019 and 2021 stock assessments were developed from the Age-Structured Equilibrium Model (ASEM) using life history parameters. The Group discussed the approach of learning from the previously developed models (e.g. using the posteriors estimates from last assessment as input priors in the current assessment JABBA runs) and concluded that it was efficient in the present situation (see Gelman *et al.*, 2013).

The authors further explained that the CV of the *r* prior needed to be tightened, and more Monte Carlo Markov Chain (MCMC) iterations were required compared to the 2021 JABBA runs to achieve a complete convergence of all parameters estimated inside the model and ensure a good mixing of the Markovian chains.

4. Model diagnostics

4.1 Stock Synthesis (SS)

The preliminary reference model ("run 9" in **Table 3**) underwent an important revision, with the joint longline CPUE's contribution to the likelihood function increased by a factor of ten. This adjustment was adopted to achieve a better fit to the Joint longline CPUE data. This revision successfully improved the model's fit with the joint longline index and was considered an important improvement to the model.

The model converged to a stable solution, with only 2 runs with divergent solutions across the 30 jittered runs at different parameter starting values (**Figure 3**). The final model gradient was 4.72675e-05, lower than the target of 0.0001.

There was a general lack of fit to the acoustic buoy index, but a relatively better fit to the joint longline CPUE after reweighting (**Figure 4**). In general, the residual errors of the indices showed some non-random residual patterns, evidenced by the diagnostic runs test (**Figure 5**). However, the Group agreed that the fits to the trend of the index were quite good.

A conflict in recent trend between the purse seine FOB index and the buoy acoustic index was apparent, with a decline in the purse seine and a general increase in the buoy biomass indices across the time series. Due to the conflicting trends, the Group recommended the two juvenile indices be modeled in separate runs as an axis of uncertainty in the grid approach.

Model selectivity estimation was primarily diagnosed by fits to the aggregated length composition and the preliminary reference model generally provided an acceptable fit to the combined length composition data across all fleets (**Figure 6**).

Fleet selectivity estimates were length based and consistent with the 2021 Bigeye tuna stock assessment meeting (ICCAT, 2021) (**Figure 7**). The major exceptions were that time blocks were applied to the PS FSC, BB South Dakar and random walk for BB North Dakar, and a change in the assumptions of the Brazilian HL fleet selectivity. The runs test for length compositions indicated non-random residual fits for most fleets (**Figure 8**).

The estimated stock-recruitment curve and time series of estimated recruitment deviations are presented in **Figure 9**. Likelihood profiles of R_0 and steepness are shown in **Figure 10**, along with a profile on M.

All indices failed the runs test diagnostic; the joint longline index failed the model's hindcast analysis (**Figure 11**). For the buoy acoustic index, while the model did not pass the runs test, the hindcasting analysis for seasons 2 and 4 indicated its predictive capacity. The retrospective analysis showed consistent biomass time series estimates across the five-year data removal runs (**Figure 12**) with Mohn's rho values within acceptable ranges.

The Group did not detect any major concerns in the additional sensitivity runs requested during the meeting that would require revising the reference case.

During the meeting the Group analyzed the trends in the recruitment deviates and showed that the reference model did not show any significant trend (**Figure 13**). However, the scenarios with h=0.7 and M=0.26 showed a significant positive trend and the lowest maximum sustainable yield (MSY) values, while the scenarios with high M and any of the steepness value showed negative significant deviates and the highest MSY (**Figure 14**).

This analysis supported the weighting approach that the Group agreed for each of the M-values with highest weight for the M=0.32 (38%), the low M scenario M=0.26 (37%) value and the lowest weighting for the highest M scenario M=0.39 (25%).

4.2 Surplus Production models

SPiCT

Diagnostics for the SPiCT runs were presented in document SCRS/2025/145. The performance of the stock assessment results using SPiCT was validated against a set of diagnostics of the check list available for this model (Kokkalis *et al.*, 2024).

JABBA

Model fits were consistent across scenarios, with process errors centered around zero and no strong temporal patterns. No conflict between indices was observed, and both retrospective and hindcasting analyses demonstrated model stability and predictive skill (SCRS/2025/158).

The Group inquired if the Joint LL index of abundance passed the runs test in any of the scenarios evaluated. The authors clarified that of the Joint LL indices (Early 1959 - 1978) did pass the runs test, however the later Joint LL index (1979 – 2023) did not pass the runs tests in any scenario.

5. Model results

5.1 Stock Synthesis (SS)

Results for the stock assessment of bigeye tuna were provided with the final reference model ("run 9" in **Table 3**), showing a declining trend in spawning biomass since the beginning of the time series until 2000, remaining relatively stable after that point and increasing for the most recent years (**Figure 15**).

In terms of exploitation rate (reported as proportion of the population removed by fishing, in biomass), it increased sharply between 1965 and 1998, with high fishing mortality estimated in 1998 and 1999, declining afterwards particularly for the last four years (**Figure 16**). The trend of exploitation rate relative to maximum sustainable yield showed a consistent pattern to the 2021 Bigeye tuna stock assessment meeting (ICCAT, 2021).

Following the decisions during the 2025 Bigeye data preparatory meeting (ICCAT, 2025), a model ensemble approach (i.e. uncertainty grid) was agreed to address the uncertainty of biological and index information. Within the uncertainty grid analysis (**Figure 17**), models corresponding to average M on ages 4-10+ equal to 0.39, 0.9 steepness, and echosounder buoy-derived abundance index (BAI) scenario projected the most optimistic stock trajectories (these scenarios were assigned lower weight compared to the other levels of M). This model indicated that the spawning stock biomass remained above SSB_{MSY} and fishing mortality stayed below F_{MSY} throughout the time series.

Models with a lower steepness (h=0.7) and with average M on ages 4-10+ equal to 0.26, and incorporating the Purse Seine fishing on floating objects (FOB) index for juvenile abundance, resulted in a more pessimistic trend overall compared to higher M scenarios (**Figure 17**). For these models, relative biomass was estimated to be below 1 after the mid-1990s, with only limited signs of recent recovery. Also, fishing mortality showed a sharp increase in the post-1990s, declining only towards 2020.

Despite these variations in absolute levels, general trends across all grid models were consistent: biomass declined initially then increased in recent years, while fishing mortality generally increased before declining towards the end of the series.

5.2 Surplus Production models

SPiCT

SPiCT model results showed the population has recovered to sustainable levels following ICCAT's catch reductions (**Figure 18**). The *SPiCT* model found overfishing occurred between 1992 and 2019, but current biomass and fishing mortality are now sustainable, with no signs of overexploitation in the beginning of year 2024.

JABBA

The results across all scenarios also indicate a consistent pattern of historical depletion followed by recent recovery (**Figure 18**). Biomass has increased to levels near or above B_{MSY}, and fishing mortality has declined to sustainable levels in recent years. Overall, results suggest the stock is within sustainable biological limits.

5.3 Synthesis of stock assessment results

The Group noted that two important sources of uncertainty referred to in the advice from the 2021 Bigeye tuna stock assessment (ICCAT, 2021) (i.e., the development of joint longline index and the assumptions regarding natural mortality) have been addressed for this assessment. As further described elsewhere in this report and the 2025 Bigeye data preparatory meeting report (ICCAT, 2025), the Group is in agreement that the development of the joint longline index and the assumptions regarding natural mortality for this assessment were improved.

The Group noted the improvement in stock status compared to the 2021 Bigeye tuna stock assessment (ICCAT, 2021)and sought to understand whether this is due to changes in modelling assumptions or the data collected since the last assessment.

Noting that the 2021 Bigeye tuna stock assessment (ICCAT, 2021) provided an estimate of stock status for 2019 (based on data available at that time), the Group used the 2025 stock assessment to look back to see whether our view of stock status back in 2019 (**Table 5**) had changed.

The estimated stock status of 2019 was very similar between the 2025 stock assessment and the 2021 Bigeye tuna stock assessment (ICCAT, 2021), suggesting the changing model assumptions in 2025 did not strongly affect our historic view of the stock status. Therefore, the more optimistic stock status in 2023 compared to 2019 appears to be primarily due to new data since the last assessment (e.g. catch, CPUE and size composition data for recent years). This suggests that the stock has been recovering since 2019, consistent with catches below the total allowable catch (TAC) of bigeye tuna since 2005, except for 2016 to 2019 (**Figure 2**).

The Group noted that the patterns in the MSY-based reference points were similar to those from the 2021 Bigeye tuna stock assessment meeting (ICCAT, 2021). The increase in catches of small bigeye tuna (starting in 1960's) lead to a reduction of the estimated MSY and F_{MSY} and an increase in SSB at MSY (**Figure 19**).

The Group also examined the recent patterns (2017-2023) in the age-specific exploitation rates estimated within SS (derived by dividing the predicted catch at age in number across all fleets by the estimated numbers at age). The Group found value in looking at these estimates three ways – first the 'raw' estimates (**Figure 20**, top panel), then scaled within each year to the age with the highest exploitation rate so to provide an approximation of the 'overall fishery selectivity' for each year (**Figure 20**, middle panel), and then scaled within each age to the value for that age for 2017 so to show the relative changes for each age in recent years (**Figure 20**, bottom panel).

The Group noted that the absolute levels of exploitation rates generally declined over this period for all ages with the exploitation rate for the smaller ages (1-2 yrs) declining slightly more than for the older ages (5+ yr) (**Figure 20**, bottom panel). Despite this slight difference across ages, the general shape of the overall selectivity was consistent across the last 2 years (2022-2023), however the selectivity in 2021 deviates mainly for older ages (4+) which may add uncertainty to the stock projections that use the average selectivity from 2021 to 2023 (**Figure 20**, middle panel).

A fishery "impact plot" was generated from the reference case model (**Figure 21**). This involved running the model (without estimation) with the catches for each fishery set to zero (this was done separately for Groups of fleets). This plot provides an indication of the relative impacts of the different fisheries on the stock integrating catches, selectivity and the biology of bigeye tuna (e.g. growth, natural mortality and maturity).

The fishery impact plot results were similar to those from the 2021 Bigeye tuna stock assessment meeting (ICCAT, 2021). It was noted that the impact of reduced PS-FOB catches in the most recent years of the stock assessment are not reflected in this impact analysis, as there will be a lag between the reduced catch and the impact on the spawning stock biomass.

6. Stock Status and Projections

Stock Status

The Chair expressed gratitude to the modelers and the technical team for their efforts and for thoroughly preparing all materials for the meeting.

The Group reviewed the stock assessment results for each of the alternative stock assessment models (SS, JABBA and SPiCT) and discussed whether the Group should add the production model results to the uncertainty grid proposed at the 2025 Bigeye data preparatory meeting (ICCAT, 2025). The Group agreed to use the production model results (**Figure 18**) as complementary tools to support the results by the SS. This is a consistent approach to the 2021 Bigeye tuna stock assessment (ICCAT, 2021) and the 2024 Atlantic yellowfin stock assessments (ICCAT, 2024). Additionally, it was noted that in recent assessments where biomass dynamic models have been used to support the results of the integrated model SS, the trends and final status have been very similar.

The Group decided to provide final management advice based solely on the SS models. The Group also considered that the age-structured models can be used for responding to the Commission's requests related to the juvenile/mature fishing mortality and the relative fishing mortality associated with the main fishing gear types.

The final SS ensemble of 18 uncertainty grid results was weighted based on the probability function density extracted from the estimation of the natural mortality M distribution. Uncertainty on the ensemble grid results (80 % confidence intervals) was estimated using the multivariate lognormal (MVLN) approach with 200,000 iterations (Walter *et al.*, 2019). **Figure 17** shows the results of the stock status for each of the grid models in the ensemble approach. The weighted result across all 18 grid members is shown in **Table 6** and **Figure 22**. The estimated spawning stock biomass declined between 1950 and the late 2000s and then fluctuated around SSB_{MSY} for about 20 years. The spawning stock biomass in the recent four years (2020-2023) showed a rapid increasing trend. Regarding fishing mortality, a pronounced increase was observed until the end of the 1990s, at which point it exceeded F_{MSY} (**Figure 22**). Subsequently, from 2005 onwards, fishing mortality decreased, remaining below F_{MSY} for the remainder of the series. Kobe plot with the indication of the stock status for each of the SS 18 uncertainty grid in the ensemble approach is provided in **Figure 23**.

The median estimate of the relative spawning biomass (SSB_{2023}/SSB_{MSY}) was 1.23 (80% CI: 0.81 - 1.85), indicating that the stock was not overfished in 2023. The median estimate of the relative fishing mortality (F_{2023}/F_{MSY}) was 0.59 (0.36 - 0.98, 80% CI), indicating that overfishing was not occurring in 2023. The median of the MSY was estimated at 86,030 t (79,702 - 114,311 t, 80% CI). The probability of the stock being in each quadrant of the Kobe plot in 2023 is provided in **Figure 24**. The corresponding probabilities are 73.8% to be in the green quadrant (i.e. not being overfished and not subject to overfishing), 17.1% to be in the yellow quadrant (i.e. being overfished but not subject to overfishing), and 9.1% in the red quadrant (i.e. being overfished and subject to overfishing), based on the results of 200,000 trials.

Projections

The Group updated the methods for projections used in the 2021 Bigeye tuna stock assessment (ICCAT, 2021) for the current assessment. The following stock projection settings were agreed by the Group:

- The model ensemble comprised all 18 SS models in the uncertainty grid (3 natural mortality scenarios, 3 steepness scenarios, and 2 alternative juvenile indices).
- A 15-year projection period was modeled, 2024-2038 (which corresponds to 2 times the generation time of bigeye tuna).
- 2024 catches were fixed at 56,359 t (average of task 1 NC for the last 3 years, 2021 to 2023), and 2025 catches were fixed at the TAC of 73,011 t (Rec. 24-01 para 3).
- 22 alternative constant catch scenarios were modeled for the period 2026 to 2038: including the current TAC of 73,011 t and catches from 50,000 – 100,000 t in 2,500 t increment intervals.
- Future recruitment was predicted from the estimated stock recruitment relationship for each grid model without an annual recruitment deviation.
- Fleet selectivity was assumed as the average selectivity from the last three years of the assessment model (2021-2023).
- The fleet catch proportion by season was calculated using the average of the last three years (2021-2023) and held constant over the projection period.
- Projections were conducted using the MVLN approach described in Walter *et al*. 2019 with 200,000 iterations.

The results of projections of the SS for each of the constant catch scenarios are shown across the 18 uncertainty grid models in **Figure 25**. The estimated Kobe II Strategy Matrices are presented in **Table 7**.

7. Tropical Tunas Management Strategy Evaluation (MSE) process

Western Atlantic skipjack MSE

Document SCRS/2025/157 presented an update on the development status of the Western Atlantic Skipjack tuna MSE. In this new phase, development focused on reconditioning the operational models in light of newly available information (e.g., catch and abundance indices updated through 2024), evolving the code structure developed for this MSE, including proposed management procedures, developing a new management procedure (MP) option, presenting preliminary results generated from closed-loop simulations, and a proposal for developing robustness tests to assess the potential effects of climate change on the behavior of the proposed management procedures.

The authors noted that the development of this MSE was following the schedule proposed during the last 2025 Bigeye data preparatory meeting (ICCAT, 2025), with some tasks already advanced, such as the development of robustness tests based on climate change.

During the presentation, the Group raised several points that should be considered in the simulations, including the need to better adjust the MP tuning process to ensure better agreement with the management objectives defined for this stock, particularly regarding the Safety objective (e.g., LRP). Also in this context, concerns were raised about the behavior of MPs that resulted in some cases where the PGK went below the limit defined in the management objective (at least 60%) for a number of years, even though the average indicators structured for the periods defined for the MSE showed indicators within the limits defined for this performance metric. The authors reminded the Group that these results are still preliminary and require fine-tuning of the process to achieve better performance for the different MPs tested.

Regarding robustness tests to assess potential effects of climate change, the Group considered it important to include scenarios that address both the variability of recruitment variations and potential effects on their central tendencies also. Additionally, there were no recommendations for changes to the parameters defined for constructing the proposed scenarios, and the ones presented were accepted.

Finally, considering that these results are still preliminary, the authors proposed a new discussion stage to be conducted before the 2025 September Species Group meeting, so that a new round of results could be presented, based on the implementation of the fine-tuning that will be carried out after the current meeting.

Multi-stock tropical tunas MSE

Presentation SCRS/2025/P/062 summarized the current multi-stock tropical tunas MSE, focusing on how the MPs function. The main MSE components - Operating Models (OMs), Observation Error Model, and Candidate Management Procedures (CMP) - were complete, and the process may soon move to a new phase involving communication with the Commission and stakeholders. The presentation discussed ongoing evaluations of initial CMP versions and explained their practical application, outlining MPs for either only bigeye tuna or all three species.

In the bigeye tuna MP, catch advice uses a surplus production model (SPiCT) to guide the harvest control rule and set TAC. The MP calculates the required fleet effort for the bigeye tuna quota, then projects the OMs of yellowfin and skipjack under this effort at each step. Alternatively, separate Management Procedures (MPs) could be used for all three species, setting limits based on the most restrictive catch requirement and adjusting catches accordingly. It was noted that the MSE could be used to evaluate whether MPs that include biomass dynamic models as their estimator are useful or not to manage these stocks.

The Group noted limited communication with the Commission about this MSE and recommended start planning now. First, confirm the simulated MP is suitable and practical. Managers will need clear guidance on management advice and measures after adopting the MP for tropical tunas.

The Group noted that current MSE and stock assessment projections use recent average fleet allocations, but MSE could also estimate alternative allocation scenarios. The Group discussed how current and future allocation decisions may affect CMP evaluations.

8. Responses to the Commission

At the 2025 Bigeye data preparatory meeting (ICCAT, 2025) in April, the Group agreed to a process to prepare responses to Commission. In accordance with that plan, the Tropical Tunas officers, the SCRS Chair and Secretariat staff met intersessionally to review the list of potential responses and identify those feasible to address in 2025 (**Table 8**).

On 2 July 2025, the Bigeye Tuna rapporteur hosted an online meeting to communicate the outstanding responses to the Group and establish appropriate points of contact to conduct the necessary work. That work is underway. To the extent possible draft responses should be circulated to the Tropical Tuna Species Group by 1 September 2025. Responses will be finalized at the 2025 SCRS annual meeting.

9. Recommendations

9.1 Research and Statistical recommendations

The Group reiterated previous recommendation on the development of a standard methodology to statistically reweigh raw size frequency data to ensure they are as representative of fleet/fishery operations as possible. The Group recommended that this discussion be continued in the future meeting of the SCRS Working Group on Stock Assessment Methods (WGSAM).

The Group recommended that the SCRS WGSAM develops recommendations and guidelines on the ensemble model weighting scheme. For example, to seek functional distributions of steepness from scientific literature.

The Group recommended that discussions on the topic of creating a biological sample archive be carried out in 2026, involving all SCRS Species Groups that collect biological samples within their research programmes. The objective of these discussions would be to clearly define the need for such an archive, identify a potential location(s) for an archive(s), and develop a carefully considered description of requirements and estimated costs. It is suggested that a technical subgroup with expertise in biological sampling and storage/archiving be created for this purpose.

The Group noted that some of the available size frequency data are not fully representative of the dynamics of the ICCAT fleets and fisheries and that this could bias the results of the stock assessment. The evolution of the Brazilian handline fleet's fishing dynamics has been evident in recent years, however information on its catch composition, in terms of the length patterns of the organisms caught, still requires improvement. The Group recognized the importance of collecting and making this data available, particularly regarding its effects and impacts on tropical tuna stock assessments. Therefore, the Group recommended that such data be reported in the near future.

The Group recommended that the Secretariat propose an update color-coded schema for the SCRS Catalogue Tables at the next meeting of the Subcommittee on Statistics given that the submission of T2CS data is no longer mandatory.

9.2 Management Recommendations

The annual TAC for bigeye tuna was set at 73,011 t for 2025. In addition, Rec. 24-01 para. 3 set "*The annual Total Allowable Catch (TAC) for bigeye tuna shall be set at 73,011 t for 2025. This TAC level shall be continued for 2026 and 2027 if the stock assessment to be conducted in 2025 indicates that the probability of the stock being in the green zone in 2034 in K2SM (hereinafter called "the probability") is at or more than 65%*".

According to the Kobe II Strategy Matrix (K2SM), a future constant catch of 73,011 t will have a high probability (91%) of maintaining the stock in the green quadrant of the Kobe plot in 2034.

10. Tropical Tunas Research Program update on ongoing activities and future planning

Ongoing activities and future planning

SCRS/P/2025/060 presented an update on the Tropical Tuna Research and Data collection plan (TTRaD) including Terms of Reference (ToRs) status and activities, the workplan for 2025, and a summary of the core themes for the next six years (2026–2031) with estimated costings (2026–2029) and priorities (2026).

The Group discussed the need for a centralised archive(s) for the effective storage, maintenance, management and sharing of biological samples, including genetics (tissue), gonads and hard structures (otoliths, spines and vertebrae). This need has been identified in multiple species Groups (not just tropical tunas). However, although not yet quantified, the launch of a biological sampling archive centralised store is expected to have a substantial impact on the SCRS budget and therefore a clear case needs to be made regarding why such an archive is needed. It is recommended that cross-cutting discussions occur across Species Groups, starting in 2026, to detail this rationale, as well as to define requirements and provide a well-considered estimate of costs involved.

The preliminary budget estimate for 2026 is substantially higher than the budget for 2025. Therefore, it is particularly important that the Group provides full details, including how the proposed research activity will support management advice and the provision of responses to Commission, and prioritise the importance of each activity.

The Poseidon project (SCRS/2025/152) accounts for the largest fraction of the proposed budget. SCRS/P/2025/064 presented additional information on the data requirements of the Poseidon model along with an alignment with ICCAT priorities and budget justification.

While the value of tools that allow investigation of management options is recognised, it was requested to outline the data and gear coverage that are needed for Poseidon project to be successful, so that the feasibility of obtaining the data can be considered when prioritising activities. It was also suggested to provide a detailed breakdown of costs and how Poseidon project addresses the Commission's requests, as required by current guidance on budget requests.

The Group discussed the feasibility of collecting detailed vessel level data, particularly for the proposed expansion to include detailed longline fleet(s) data. It was noted by the presenter that the requested data can be provided in an aggregated and anonymised manner (e.g. replacing vessel identification with an assigned unrelated number), although outcomes from the model will reflect the quantity, detail and representativeness of the data that are input.

It was suggested to hold an intersessional online meeting prior to the SCRS meeting in September 2025 to further develop the research plan and related budget, including starting to draft the relevant ToRs.

With respect to the Poseidon project, the Group requested that further details on minimum data requirements, and the effect on results if more complete data are made available, be provided for this intersessional meeting. The Group will also need to consider how the proposed expansion to include longline data will inform advice to the Commission.

The SCRS Chair highlighted that Species Groups are being asked to develop six-year strategic plans and commended the Tropical Tuna Species Group for their efforts in this respect.

Progress of ongoing work to address research plan objectives

The Group reviewed the progress to date on refining the Poseidon-Atlantic model to simulate tropical tuna purse seine fisheries, incorporating updated biological, environmental, and fishing fleet data (SCRS/2025/152). The end goal of this project is to support ICCAT management decisions, especially regarding FAD regulations. The Group expressed its gratitude for this work, and made suggestions to refine it, including the inclusion of vessel monitoring system (VMS) and/or automatic identification system (AIS) and/or logbook data to improve the characterization of fleet dynamics, and updating the data included in the model to more accurately describe recent fleet operations, which have changed since 2022 in response to fishing regulations.

The Group noted that the selectivity used for FOB fishing appeared to have been used for free school (FSC) as well, and that the mortalities used for the various gears appeared to have been truncated (with values at older ages not included). It was suggested that the authors collaborate with stock assessment leads to ensure that these parameters were consistent with the stock assessments, which was accomplished during the meeting and the relevant plots were updated in the document (SCRS/2025/152) and presented to the Group.

The Group also reviewed preliminary results of an effort to estimate annual exploitation rates for Atlantic skipjack tuna (SCRS/2025/150). The objective of this project is to develop tagging-derived estimates of fishing mortality (F), natural mortality (M) and total mortality (Z) for the eastern and western stocks of Atlantic skipjack, and to incorporate these estimates into the Report of the 2022 Skipjack tuna stock assessment meeting (ICCAT, 2022) models to determine whether the inclusion of this information improves the management advice. The Group expressed appreciation for this work and reiterated the value of ongoing efforts to use the Atlantic Ocean Tropical Tuna Tagging Programme (AOTTP) data to estimate important life history parameters.

Several recommendations were made to refine the preliminary estimates including: estimating M or Z by age, using a mixing parameter or distance travelled from point of release to infer mixing (rather than excluding data based on time at liberty less than two quarters), limiting the analysis to the eastern Atlantic to reduce the effect of shifts in AOTTP tagging effort, and evaluating the effect of fleet-specific tag reporting rates. The Group also discussed that estimates of F and M could be highly confounded and recommended focusing mostly on Z. Thus, it expressed borrowing M estimates from existing stock assessments were appropriate. Finally, the Group recommended this work be expanded in the future to explore the applicability of the methods to other species beyond skipjack, considering different fleet overlaps and behaviour.

11. Spatial analysis of tropical tunas fisheries

The Group reviewed a presentation on the Spatial Depletion Analysis of Atlantic bigeye tuna stock using a Spatio-Temporal Population Model (STPM) (SCRS/2025/156). The objective of this work is to develop a spatially explicit model capable of estimating depletion levels and catchability variations across regions, with the options of integrating environmental variables, spatial carrying capacity, migration, and fleet dynamics, as well as adjusting to different time steps (e.g. annual, seasonal, etc.).

The Group expressed strong interest in the potential of spatial modelling for improving stock assessments, recognizing its value for understanding density-dependent habitat selection and regional impacts of fishing. However, they also emphasized the need for caution in interpreting spatial outputs, particularly color-coded depletion maps, to avoid miscommunication about stock status. It was pointed out that the main area identified to have the lowest depletion coincides with the main area of fishing effort (roughly the eastern tropical Atlantic). The presenter explained that this is due to the productivity of that area. Several recommendations were made to refine the STPM approach, including clearer differentiation between observed and predicted CPUE values, and further explanation of how this CPUE analysis differs from traditional methods used for generating abundance indices.

The Group discussed how the model accounts for environmental plasticity and the statistical assumptions underlying its structure. It was proposed the use of environmental parameters to estimate habitat in order to refine the spatio-temporal distribution of bigeye tuna for the evaluation of fishing impact when matching with effort and catches by 5°x5° square. There was also discussion about fleet behaviour changes, such as recent movements toward equatorial areas, which could affect depletion estimates.

Finally, inquiries were made regarding the open-source availability of the STPM code, to which the presenter responded that the software remains under development and will be released following the completion of related publications.

12. Other matters

No other matters were discussed during the meeting.

13. Adoption of the report and closure

The report was adopted during the meeting. The Chair of the Group thanked all the participants for their efforts. The meeting was adjourned.

References

ICCAT. 2022. Report of the Skipjack Stock Assessment Meeting. Collect. Vol. Sci. Pap. ICCAT, 82(5), SCRS/2025/008: 419-554 (2022)

ICCAT. 2025. Report of the 2025 ICCAT Atlantic Bigeye Tuna Data Preparatory meeting. Collect. Vol. Sci. Pap. ICCAT, 82(5), SCRS/2025/005: 1-96 (2025)

Carvalho, F., Winker H., Courtney D., Kapur M., Kell L. Cardinale M., Schirripa M., Kitakado T., Yemane D., Piner K.R., Maunder M.N., Taylor I., Wetzel C.R., Doering K., Johnson K.F., Methot R.D. 2021. A cookbook for using model diagnostics in integrated stock assessments. *Fish. Res*. 240,105959.

Gelman, A., Carlin, J. B., Stern, H. S., Dunson, D. B., Vehtari, A., & Rubin, D. B. 2013. Bayesian Data Analysis (3rd ed.). CRC Press.

Kell, L. (2016). *mpb* 1.0.0. A package for implementing management procedures, that can be simulation testing using Management Strategy Evaluation. https://github.com/laurieKell/mpb.

Kell, L.T., Sharma, R., Kitakado, T., Winker, H., Mosqueira, I., Cardinale, M. and Fu, D., 2021. Validation of stock assessment methods: is it me or my model talking? *ICES Journal of Marine Science*, *78*(6), pp.2244-2255.

Kokkalis A., Berg C.W., Kapur M.S., Winker H., Jacobsen N.S., Taylor M.H., Ichinokawa M., Miyagawa M., Madeiros-Leal W., Nielsen J.R., and Mildenberger T.K. 2024. Good practices for surplus production models. Fish. Res. 275:107010.

Methot Jr, Richard D., and Chantell R. Wetzel. 2013. Stock synthesis: a biological and statistical framework for fish stock assessment and fishery management. *Fisheries Research* 142: 86-99.

Pedersen, M.W. and C. W. Berg. 2017. A stochastic surplus production model in continuous time. *Fish and Fisheries*, 18: 226-243. url:, doi:10.1111/faf.12174.

Taylor, I.G., Doering, K.L., Johnson, K.F., Wetzel, C.R. and Stewart, I.J., 2021. Beyond visualizing catch-at-age models: Lessons learned from the r4ss package about software to support stock assessments. *Fisheries Research*, *239*, p.105924.

Walter, J., Hiroki, Y., Satoh, K., Matsumoto, T., Winker, H., Ijurco, A.U., Schirripa, M., 2019. Atlantic bigeye tuna stock synthesis projections and kobe 2 matrices. Collect. Vol. Sci. Pap. ICCAT 75, 2283–2300.

Waterhouse, L., Ailloud, L., Austin, R., Golet, W. J., Pacicco, A., Andrews, A. H., ... & Hoenig, J. M. (2022). Updated growth models for bigeye tuna (*Thunnus obesus*) in the Atlantic Ocean. *Fisheries Research*, *253*, 106317.

Table 1. Bigeye tuna Atlantic and Mediterranean (A+M) standard SCRS catalogue on statistics (Task 1 and Task 2) by stock, major fishery (flag/gear combinations ranked by order of importance) and year (1994 to 2023). Only the most important fisheries (representing ±97.5% of Task-1 total catch) are shown. For each data series, Task 1 (DSet= "t1", in t) is visualized against its equivalent Task 2 availability (DSet= "t2") scheme. The Task 2 colour scheme, has a concatenation of characters ("a" = T2CE exists; "b" = T2SZ exists; "c" =T2CS exists) that represents the Task 2 data availability in the ICCAT-DB.

Species	Stock	Status	FlagName	GearGrp	DSet	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Rank	%	%cum
				T1 Total		134932	128057	120767	110249	107948	121422	103434	91636	75801	88282	90043	67954	59192	69895	63172	76427	75750	76492	71317	66977	75308	79563	79190	78252	72599	74905	57554	47209	62641	59226			
Score	6.83																																					
BET	A+M	CP	Japan	LL	t1	38503	35477	33171	26490	24330	21833	24605	18087	15306	19572	18509	14026	15735	17993	16684	16395	15205	12306	15390	13397	13603	12390	10365	10994	9881	9341	8991	8696	12298	12271	1	20.99	20.99
BET	A+M	CP	Japan	LL	t2	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ac	abc	abc	1		
BET	A+M	NCC	Chinese Taipei	LL	t1	19680	18023	21850	19242	16314	16837	16795	16429	18483	21563	17717	11984	2965	12116	10418	13252	13189	13732	10819	10316	13272	16453	13115	11845	11630	11288	9226	4093	8181	10274	2	16.54	37.53
BET	A+M	NCC	Chinese Taipei	LL	t2	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	2		
BET	A+M	CP	EU-España	PS	t1	12700	9971	8970	6240	4863	5508	6901	5923	7038	6595	4187	3155	3416	3359	5456	8019	7910	8050	7485	6849	6464	5908	7206	6387	5141	5349	3068	3857	3907	3629	3	7.38	44.91
BET	A+M	CP	EU-España	PS	t2	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	a	abc	abc	abc	3		
BET	A+M	CP	China PR	LL	t1	428	476	520	427	1503	7347	6564	7210	5840	7890	6555	6200	7200	7399	5686	4973	5489	3720	3231	2371	2232	4942	5852	5514	4823	5718	3614	1638	3249	5415	4	5.39	50.30
BET	A+M	CP	China PR	LL	t2	b	b	b	-1	a	a	a	ab	ab	a	ab	ab	ab	a	ab	ab	ab	ab	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	4		
BET	A+M	CP	EU-España	BB	t1	9848	8073	6248	6260	2165	8563	4084	3897	3164	4158	3838	4417	3783	3007	1959	3868	2819	4506	2913	2389	3463	3508	3835	4811	2991	3631	2925	2611	2357	2074	5	4.91	55.21
BET	A+M	CP	EU-España	BB	t2	ac	ac	ac	abc	ac	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	a	abc	abc	abc	5		
BET	A+M	NCO	NEI (Flag related)	LL	t1	8964	10697	11862	16565	23484	22190	15092	7907	383																						6	4.71	59.92
BET	A+M	NCO	NEI (Flag related)	LL	t2	-1	-1	-1	-1	-1	-1	-1	-1	-1																						6		
BET	A+M	CP	EU-France	PS	t1	11045	6975	7091	4646	4108	3936	4544	4172	3802	3735	2813	2136	2481	808	1040	2194	3320	3663	3766	3253	3817	2981	4623	3737	4095	5078	2192	2028	4186	2390	7	4.61	64.53
BET	A+M	CP	EU-France	PS	t2	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	7		
BET	A+M	CP	EU-Portugal	BB	t1	3036	9629	5810	5437	6334	3314	1498	1605	2420	1572	3161	3721	4626	4872	2738	5121	2872	6470	5986	5240	3737	3012	1677	2698	3870	2917	2810	2922	2895	2185	8	4.59	69.13
BET	A+M	CP	EU-Portugal	BB	t2	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	ab	ab	ab	ab	ab	ab	8		
BET	A+M	CP	Ghana	PS	t1			1328	2970	3138	6648	3468	5621	5606	5330	6201	5444	2136	2369	2868	3558	5370	3030	4111	2503	3373	5336	4856	3524	3111	2729	2912	2219	3647	2369	9	4.25	73.38
BET	A+M	CP	Ghana	PS	t2			abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	ab	ab	ab	ab	ab	9		
BET	A+M	CP	Ghana	BB	t1	4738	5517	3423	7204	7509	5056	2164	4242	873	3731	11687	3416	171	190	504	957	883	511	358	460	802	582	338	314	525	188	248	2	25	2	10	2.68	76.06
BET	A+M	CP	Ghana	BB	t2	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	ab	ab	ab	ab	ab	10		
BET	A+M	CP	Curaçao	PS	t1			1893	2890	2919	3428	2359	2803	1879	2758	3343	13	441	272	1734	2465	2747	3488	2950	1998	2357	2573	3598	2844	3530	2787	1519	1758	824	143	11	2.51	78.57
BET	A+M	CP	Curaçao	PS	t2			ab	ab	ab	a	ab	ab	ab	ab	ab	b	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	a	11		
BET	A+M	CP	Panama	PS	t1	5378	4304	1934	431	175	319	378	89	63	686	1521	2461	2521	3057	2360	2490	3085	3531	1736	2853	2341	1289	2022	1559	1664	2555	1183	940	1138	1174	12	2.22	80.79
BET	A+M	CP	Panama	PS	t2	ab	ab	ab	ab	ab	a	ab	ab	ab	a	ab	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	12		
BET	A+M	CP	Brazil	LL	t1	596	1935	1707	1237	644	2024	2762	2534	2582	2374	1453	1015	1423	927	785	1009	1055	1452	1165	1377	1966	2606	2322	2171	1595	1630	1705	1857	2556	2148	13	2.04	82.82
BET	A+M	CP	Brazil	LL	t2	ab	ab	a	a	a	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	a	a	a	a	ab	ab	ab	ab	ab	ab	ab	13		
BET	A+M	CP	Brazil	HL	t1													3	7	0	69	22	210	555	2012	4332	4967	5336	5086	3401	4563	4251	4339	3633	4192	14	1.89	84.71
BET	A+M	CP	Brazil	HL	t2													-1	-1	-1	-1	a	-1	-1	-1	a	-1	-1	ab	ab	a	ab	a	a	a	14		
BET	A+M	CP	Korea Rep	LL	t1	386	423	1250	796	163	124	43	1	87	143	629	770	2067	2136	2599	2134	2646	2762	1908	1151	1039	677	562	432	623	540	587	674	763	724	15	1.16	85.87
BET	A+M	CP	Korea Rep	LL	t2	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	abc	15		
BET	A+M	CP	Philippines	LL	t1					1154	2113	975	377	837	855	1854	1743	1816	2368	1874	1880	1399	1267	532	1323	1964										16	0.98	86.85
BET	A+M	CP	Philippines	LL	t2					a	a	a	-1	-1	a	a	a	a	a	a	ab	ab	abc	abc	abc	abc										16		
BET	A+M	CP	Panama	LL	t1	7709	5623	2843	1667	1077		484	473	148														315	105	404	497	465	219	202	157	17	0.90	87.75
BET	A+M	CP	Panama	LL	t2	-1	-1	-1	-1	-1		a	-1	-1														-1	-1	-1	a	a	a	a	ab	17		
BET	A+M	CP	EU-France	BB	t1	2187	2000	2357	1746	1942	2001	1922	1590	795	760	572	595	571	507	141	269	156	238	175	25	74	45	135	127	171	195	80	15	135	27	18	0.87	88.62
BET	A+M	CP	EU-France	BB	t2	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	18		
BET	A+M	CP	Cape Verde	PS	t1												1151	1433	1283	482	605	655	1076	734	1377	2361	2921	1799	1144	1469	920	627	168			19	0.81	89.43
BET	A+M	CP	Cape Verde	PS	t2											b	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	ab	abc	ab	a	a			19		
BET	A+M	CP	Guatemala	PS	t1										736	831	1054	977	851	1024	922	1029	288	273	168	1007	340	1103	1602	1488	1623	906	791	868	601	20	0.74	90.18
BET	A+M	CP	Guatemala	PS	t2										ab	ab	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	20		
BET	A+M	CP	USA	LL	t1	943	982	713	795	696	930	532	682	536	284	310	312	521	381	428	430	443	603	582	509	584	574	386	568	389	580	495	668	668	700	21	0.69	90.87
BET	A+M	CP	USA	LL	t2	ab	ab	ab	ab	ab	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	21		
BET	A+M	CP	Senegal	BB	t1	8	180	136	218	735	1372	915	1159	497	322	490	770	1318	1292	734	1143	954	455	432	599	359	501	577	287	159	222	513	184	92	161	22	0.68	91.54
BET	A+M	CP	Senegal	BB	t2	a	a	ac	a	a	ab	a	ab	ab	ab	ab	ac	ac	ac	ac	ac	ac	ac	ac	ac	ac	ac	ac	ac	ac	ac	ac	ac	c	ab	22		
BET	A+M	CP	Belize	PS	t1					195		87	96								186	246	704	1246	1274	1362	1654	1290	1366	1782	1986	839	473	764	803	23	0.66	92.20
BET	A+M	CP	Belize	PS	t2					a		ab	ab		b						abc	ab	ab	ab	ab	ab	ab	ab	abc	a	a	a	a	a	a	23		
BET	A+M	CP	El Salvador	PS	t1								3														992	1450	1826	2634	2464	1518	1492	1500	1397	24	0.61	92.82
BET	A+M	CP	El Salvador	PS	t2								a														abc	abc	abc	abc	abc	abc	abc	abc	abc	24		
BET	A+M	CP	Senegal	PS	t1																						429	895	2686	2707	1826	2188	518	645	994	25	0.52	93.33
BET	A+M	CP	Senegal	PS	t2																						abc	abc	ac	ac	ac	ac	ac	ac	ab	25		
BET	A+M	CP	EU-España	LL	t1	153	176	233	268	385	116	598	211	333	427	417	104	337	346	268	327	751	700	585	865	928	868	604	594	468	398	241	308	444	388	26	0.52	93.85
BET	A+M	CP	EU-España	LL	t2	ab	ab	ab	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	b	b	b	b	b	-1	b	b	b	ab	26		
BET	A+M	CP	Maroc	LL	t1						700	770	857	913	889	929	519	887	700	802	795	276	99	90	88	80	100	100	100	122	212	291	774	851	888	27	0.52	94.37
BET	A+M	CP	Maroc	LL	t2						-1	-1	-1	-1	b	abc	abc	abc	abc	ab	ab	-1	-1	-1	-1	b	ab	a	ab	a	-1	a	-1	-1	c	27		
BET	A+M	CP	St Vincent and Grenadines	LL	t1					1412	1870	1215	506	15	103	18		114	567	171	292	396	37	25	15	30	496	622	889	428	503	220	136	568		28	0.43	94.80
BET	A+M	CP	St Vincent and Grenadines	LL	t2					-1	-1	-1	-1	a	a	a		a	a	a	a	a	a	ab	a	ab	a	ab	ab	ab	abc	ab	abc	ab		28		
BET	A+M	CP	Guinée Rep	PS	t1		334	2394	885								72		60	20	22	402	525	1804	1674	1111								5	101	29	0.38	95.17
BET	A+M	CP	Guinée Rep	PS	t2		a	a	a								-1		-1	-1	-1	-1	-1	ac	ac	ac								a	a	29		
BET	A+M	CP	Namibia	LL	t1	708			3		286	482	280	196	150	133	276	228	26	112	48	133	26	196	35	186	371	236	48	14	41	562	1134	1993	619	30	0.34	95.52
BET	A+M	CP	Namibia	LL	t2	a			-1		a	-1	ab	a	-1	ab	ab	ab	ab	ab	ab	ab	ab	a	ab	a	a	a	abc	abc	abc	abc	abc	abc	abc	30		
BET	A+M	NCO	Vanuatu	PS	t1	2713	2610	2016	828		314																									31	0.34	95.86
BET	A+M	NCO	Vanuatu	PS	t2	a	a	a	a		a																									31		
BET	A+M	CP	USA	RR	t1	263	20	147	334	228	318	34	366	50	192	101	165	447	127	71	78	124	253	130	367	285	449	170	260	495	232	298	286	515	234	32	0.28	96.14
BET	A+M	CP	USA	RR	t2	ab	ab	b	ab	ab	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	32		
BET	A+M	CP	Venezuela	PS	t1	140	140	131	205	214	75	181	513	1055	690	611	92	211	220	102	122	49	223	87	70	121	88	112	269	146	20	73	122	26	36	33	0.25	96.39
BET	A+M	CP	Venezuela	PS	t2	ab	ab	b	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	33		
BET	A+M	CP	Maroc	PS	t1	977	553	654	255	336	744	390	324	241	510	216	267	42														90	150	165	171	34	0.24	96.63
BET	A+M	CP	Maroc	PS	t2	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab														a	a	a	a	34		
BET	A+M	CP	EU-Portugal	LL	t1		33					1		170	83	42	332	443	633	619	484	527	273	133	100	131	112	500	431	332	184	196	101	52	70	35	0.24	96.87
BET	A+M	CP	EU-Portugal	LL	t2		a					-1		a	a	a	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	35		
BET	A+M	NCO	Mixed flags (EU tropical)	PS	t1	457	582	169	301	193	143	281	28	8	198	378	294	189	348	337	375						66	286	132	191	158	381				36	0.22	97.09
BET	A+M	NCO	Mixed flags (EU tropical)	PS	t2	-1	-1	-1	-1	b	b	-1	-1	-1	-1	-1	-1	-1	b	b	b	b	b	b	b	b	-1	-1	-1	-1	-1	-1				36		
BET	A+M	CP	Canada	LL	t1	111	147	133	161	109	244	285	220	265	161	135	169	172	137	107	107	97	121	155	190	186	249	166	208	233	193	95	247	321	341	37	0.22	97.31
BET	A+M	CP	Canada	LL	t2	a	a	a	a	a	ab	ab	abc	ab	ab	ab	ab	ab	ab	ab	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	37		

Table 2. Total bigeye tuna reported and estimated (by the Group) Task 1 Nominal Catches (t), landings and dead discards (Atlantic [ATL] and Mediterranean Sea [M]) by gear group between 1950–2023.

ATL+M															
Year	Bait boat	Longline	Purse seine	Other surf.											TOTAL
	BB	LL	PS	GN	HL	HP	HS	RR	TL	TN	TP	TR	TW	UN	
1950	808														808
1951	1651														1651
1952	2018														2018
1953	2951														2951
1954	2932														2932
1955	4808														4808
1956	2769	10													2779
1957	8266	454													8720
1958	3837	453													4290
1959	6254	1478													7732
1960	6127	2986													9113
1961	5805	11255													17060
1962	7112	16020													23132
1963	10927	15112													26039
1964	5698	17928	5												23631
1965	9822	29572													39394
1966	5320	20046	20												25386
1967	11434	13726	92												25252
1968	3792	19683	436												23911
1969	9660	24149	2926												36735
1970	10296	28526	3058		0										41880
1971	11617	39904	3508		0										55029
1972	9296	33293	4383		0										46972
1973	13620	38453	4589		0										56662
1974	17922	39535	6246		0										63703
1975	14632	41347	4648		0										60627
1976	10380	27847	6441		0										44668
1977	13469	29531	11730		0			5							54735
1978	14708	28796	8837		0			22						68	52431
1979	9725	27560	8199		98			8						240	45830
1980	12350	41787	9204		1			9						246	63597
1981	10124	41658	15676	8	88		32	14						173	67773
1982	6950	51851	14512	2	79		43	44				52		24	73557
1983	9853	33757	15661	0	31	0		27				78		27	59435
1984	11480	43303	15947	111	39	3		19				2	0	72	70978
1985	17518	52595	7481	1	86			210				0	0	118	78010
1986	15661	39942	9279	2	103	0	15	300				16	0	113	65433
1987	13444	35570	7682	2	100	0	6	206				40	0	272	57323
1988	9747	47766	8392	4	159		7	135				13		151	66375
1989	12673	58420	7024	21	119	0	15	181				18	0	250	78722
1990	18280	56537	10160	21	48		6	50				7	0	154	85264
1991	17745	61655	17476	5	111	1	8	77				6	15	112	97211
1992	16248	62484	20852	4	126	0	35	114				17	79	147	100106
1993	16466	62890	33805	17	88		5	155				12	84	266	113789
1994	20352	78908	34699	88	161		9	272				34	156	252	134932
1995	25687	74882	26927	4	64		9	30	1			8	195	250	128057
1996	18342	74930	27132	3	31		9	157	11			8	0	144	120767
1997	21277	68306	20120	0	9		30	347	4			6	5	144	110249
1998	19173	71851	16479	0	0	0	13	247	9			31	0	144	107948
1999	22197	77224	21322	61	13		11	329	14			40	29	181	121422
2000	12141	72010	18823	49	8	0		53	31			142	17	159	103434
2001	14430	56123	20360	68	34			382	9			108	48	74	91636
2002	8460	47350	19766		16			67	2			40	45	57	75801
2003	11233	55356	21242	0	10			213	5			22	0	201	88282
2004	20238	49400	20113		7	0		109	6			54	1	115	90043
2005	13104	37961	16155		12			199	3			88	339	94	67954
2006	10605	34183	13852	0	31	1		490	6			5	11	8	59192
2007	10561	46231	12654	1	27	0		159	0			13	238	11	69895
2008	6307	41063	15582	0	76	4		115	2			3		20	63172
2009	11548	43533	21088	0	131	3		97	0			7	0	21	76427
2010	7842	42516	24904	7	32	2		138	1			14	1	292	75750
2011	12659	37900	24787	4	418	2		454	2			83	1	182	76492
2012	10459	34944	24903	1	782	6		186	0		0	29	0	8	71317
2013	9195	32245	22753	61	2257	4		389	0		0	66		6	66977
2014	8715	36770	24862	12	4587	9		312	7		0	29	0	5	75308
2015	7970	40381	25210	41	5335	3		498	1			123	0	1	79563
2016	6710	36345	29662	134	5611	4		249	0			238	235	1	79190
2017	8366	35191	27479	1026	5424	2		333	1	0		104	319	8	78252
2018	7932	32092	27959	3	4013	1		542				40	4	13	72599
2019	7341	33905	27606	512	5237	0	0	236				28	32	9	74905
2020	6848	27315	17897	50	5025	7	2	300		0		45	66	0	57554
2021	6141	21022	14706	37	4897	4	1	290	1	0		55	52	1	47209
2022	6861	32790	17823	360	4215			521		0		26	44	1	62641
2023	4677	35009	13957	4	5136			236	1			111	90	5	59226

Table 3. List of step-wise model runs from the continuity model to the reference case SS model.

Run	Name	Description	Log-like	Gradient	n_param
1	00_BC_2021	BaseCase 2021:17_h08_sigmaR04 run with v3.30.23	5858.12	5.63E-05	139
2	00_BC	Base Case fleet order modified, rec ditribution method	5858.12	5.73E-05	139
3	01_update_catch	Update catch	5858.07	9.98E-05	139
4	02_update_cpue	Update cpue	5840.25	7.73E-05	140
5	03_update_length	Update length, remove Re-weighing from 2021 of the length composition and update boundaries	4060.62	7.98E-05	140
6	04_update_M	Natural mortality 0.32 average age 4-10	4073.8	8.15E-05	140
7	05_recDevs_BCR	Update recruitment deviates and biased correction ramp	4063.12	1.40E-05	144
8	06_Selectivity_2TB_1RW	Re-parameterized Splines, add time varying selectivity to fleet 3, 6 and 8	3850.15	3.23E-05	180
9	07_HLbraSel	Brazil handline selectivity mirror to Other LL N (fleet 18)	3850.9	6.97E-06	180
10	08_upCPUE_BCR	upweight LL Joint CPUE	3007.84	4.48E-05	180
11	09_Francis	Re-weighing LC with francis method	4225.41	4.73E-05	171
12	Continuity	Continuity	4262.26	3.22E-05	171
13	Sens_PSFADcpue	PSFAD cpue in LKL and not BAI	4213.87	0.000529806	171
14	Mlow_022	Average M for ages 4-10,0.22	4407.99	1.59E-05	171
15	Mlow_026	Average M 0.26	4297.93	3.77E-05	171
16	Mhigh_04	Average M for ages 4-10,0.4	4219.98	0.000422935	171
17	Mhigh_048	Average M for ages 4-10,0.48	4267.81	2.99E-05	171
18	H07	Steepness 07	4226.74	1.41E-05	171
19	H09	Steepness 09	4225.45	0.000185094	171

Table 4. Fleet structure for bigeye tuna Stock Synthesis input model for the 2025 stock assessment.

N	*Name*	*Years*	*Selectivity*
1	PS early	1965-1985	cubic spline
2	PS transition	1986-1990	cubic spline
3	PS Free School	1991-2023	cubic spline, time-varying
4	PS FOB	1991-2023	cubic spline
5	BB+PS Ghana	1965-2023	cubic spline
6	BB South Dakar	1950-2023	cubic spline, time-varying
7	BB North Dakar early	1962-1980	double-normal
8	BB North Dakar late	1981-2023	double-normal, time-varying
9	BB North Azores	1962-2023	double-normal
10	LL North Japan	1957-2023	double-normal
11	LL Tropical Japan	1956-2023	double-normal
12	LL South Japan	1959-2023	double-normal
13	LL North CTP	1962-2023	double-normal
14	LL Tropical CTP	1962-2023	logistic
15	LL South CTP	1962-2023	logistic
16	RR West Atlantic	1979-2023	double-normal
17	PS West Atlantic	1979-2023	cubic spline
18	LL North Other	1959-2023	double-normal
19	LL Tropical Other	1957-2023	double-normal
20	LL South other	1962-2023	double-normal
21	HL Brazil	1985-2023	mirrored to fleet 18
22	Other	1950-2023	cubic spline

Table 5. Summary of the Atlantic bigeye stock status estimated at the 2022 stock assessment and the current 2025 stock assessment. LB lower bound, UB upper bound of estimate.

Stock assessment and year reference	**Stock Status**					
	SSB / SSB_{MSY}			F / F_{MSY}		
	Median	LB	UB	Median	LB	UB
2021 SA - 2019	0.94	0.71	1.37	1	0.63	1.35
2025 SA - 2019	0.97	0.63	1.5	0.91	0.54	1.53
2025 SA - 2023	1.23	0.81	1.86	0.59	0.36	0.98

Table 6. Relative spawning stock biomass (t) at the end of the year and fishing mortality from the Stock Synthesis from the combined uncertainty grid models. Values were estimated using the MVLN approach.

	SSB/SSBmsy			F/Fmsy		
Year	Median	80%LCI	80%UCI	Median	80%LCI	80%UCI
1950	3.49	3.09	3.93	0.00	0.00	0.00
1951	3.48	3.09	3.93	0.01	0.01	0.01
1952	3.48	3.09	3.92	0.01	0.01	0.01
1953	3.47	3.08	3.91	0.01	0.01	0.01
1954	3.46	3.07	3.90	0.01	0.01	0.01
1955	3.45	3.06	3.89	0.02	0.02	0.02
1956	3.45	3.06	3.88	0.01	0.01	0.01
1957	3.43	3.05	3.86	0.03	0.03	0.04
1958	3.42	3.04	3.86	0.02	0.01	0.02
1959	3.41	3.03	3.84	0.03	0.02	0.04
1960	3.40	3.02	3.82	0.03	0.03	0.04
1961	3.36	2.99	3.78	0.07	0.05	0.08
1962	3.32	2.95	3.72	0.09	0.07	0.11
1963	3.27	2.91	3.67	0.10	0.08	0.12
1964	3.23	2.88	3.63	0.09	0.08	0.11
1965	3.17	2.82	3.55	0.16	0.13	0.19
1966	3.14	2.80	3.53	0.10	0.09	0.12
1967	3.13	2.78	3.51	0.10	0.09	0.13
1968	3.12	2.78	3.51	0.10	0.08	0.12
1969	3.08	2.74	3.47	0.15	0.12	0.18
1970	3.04	2.70	3.41	0.17	0.14	0.21
1971	2.95	2.63	3.32	0.23	0.19	0.28
1972	2.91	2.59	3.26	0.20	0.17	0.25
1973	2.84	2.53	3.18	0.25	0.20	0.30
1974	2.76	2.46	3.09	0.28	0.23	0.35
1975	2.69	2.39	3.01	0.28	0.23	0.34
1976	2.62	2.32	2.96	0.21	0.17	0.26
1977	2.54	2.22	2.92	0.27	0.21	0.34
1978	2.46	2.09	2.90	0.27	0.21	0.35
1979	2.42	1.98	2.97	0.25	0.18	0.33
1980	2.35	1.85	2.97	0.35	0.26	0.48
1981	2.24	1.73	2.90	0.38	0.27	0.54
1982	2.18	1.64	2.88	0.42	0.29	0.62
1983	2.19	1.62	2.97	0.35	0.24	0.52
1984	2.19	1.59	3.02	0.41	0.27	0.62
1985	2.21	1.58	3.09	0.45	0.29	0.69
1986	2.24	1.59	3.17	0.38	0.25	0.59
1987	2.25	1.59	3.20	0.33	0.21	0.52
1988	2.24	1.58	3.18	0.39	0.25	0.60
1989	2.11	1.49	2.99	0.47	0.31	0.73
1990	2.01	1.42	2.85	0.53	0.34	0.81
1991	1.91	1.34	2.72	0.63	0.41	0.97
1992	1.80	1.26	2.58	0.67	0.44	1.05
1993	1.70	1.18	2.44	0.80	0.52	1.24
1994	1.55	1.07	2.24	1.01	0.65	1.57
1995	1.38	0.95	1.99	1.07	0.69	1.66
1996	1.21	0.83	1.77	1.12	0.72	1.75
1997	1.10	0.75	1.60	1.11	0.71	1.75
1998	1.05	0.71	1.55	1.14	0.72	1.82
1999	1.00	0.67	1.50	1.32	0.82	2.12
2000	0.99	0.65	1.52	1.17	0.72	1.91
2001	1.02	0.66	1.57	1.06	0.64	1.75
2002	1.03	0.67	1.59	0.90	0.54	1.49
2003	0.98	0.64	1.51	1.05	0.63	1.73
2004	0.95	0.61	1.47	1.09	0.65	1.80
2005	0.99	0.64	1.52	0.84	0.50	1.40
2006	1.02	0.67	1.56	0.72	0.44	1.20
2007	0.99	0.65	1.51	0.85	0.52	1.40
2008	0.96	0.64	1.45	0.80	0.49	1.30
2009	0.91	0.60	1.38	0.97	0.60	1.58
2010	0.89	0.59	1.34	0.99	0.61	1.62
2011	0.88	0.58	1.34	1.00	0.61	1.64
2012	0.93	0.61	1.43	0.91	0.55	1.51
2013	0.98	0.64	1.50	0.84	0.51	1.40
2014	0.97	0.63	1.48	0.93	0.57	1.53
2015	0.93	0.61	1.42	1.00	0.60	1.64
2016	0.91	0.60	1.40	1.00	0.61	1.65
2017	0.93	0.61	1.43	0.99	0.60	1.64
2018	0.95	0.62	1.46	0.91	0.54	1.52
2019	0.98	0.63	1.50	0.91	0.54	1.52
2020	1.07	0.70	1.65	0.67	0.40	1.13
2021	1.18	0.78	1.81	0.52	0.31	0.88
2022	1.21	0.80	1.83	0.65	0.39	1.07
2023	1.23	0.81	1.85	0.59	0.36	0.98

Table 7. Estimated probabilities of the Atlantic bigeye tuna stock being below F_{MSY} (overfishing not occurring), above B_{MSY} (not overfished) and above B_{MSY} and below F_{MSY} (green zone) in a given year for a given constant catch level (t) projection scenario, based upon Stock Synthesis 2025 assessment outcomes.

Probaility F<=F_{MSY}

Catch (t)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
50000	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
52500	97%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%
55000	97%	98%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%
57500	95%	97%	97%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%
60000	94%	96%	97%	97%	98%	99%	99%	99%	100%	100%	100%	100%	100%
62500	93%	94%	95%	96%	97%	98%	98%	99%	99%	99%	100%	100%	100%
65000	92%	93%	94%	95%	96%	97%	97%	98%	98%	99%	99%	99%	99%
67500	90%	91%	92%	93%	94%	95%	96%	96%	97%	97%	98%	98%	99%
70000	88%	89%	91%	92%	92%	93%	94%	95%	95%	96%	96%	97%	97%
72500	86%	88%	89%	89%	90%	91%	91%	92%	93%	93%	94%	94%	95%
73011	86%	87%	88%	89%	90%	90%	91%	91%	92%	93%	93%	94%	94%
75000	84%	86%	86%	87%	87%	88%	88%	89%	89%	90%	90%	91%	91%
77500	82%	83%	84%	84%	84%	85%	85%	85%	86%	86%	86%	87%	87%
80000	80%	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%
82500	78%	78%	78%	78%	78%	77%	77%	77%	76%	76%	76%	75%	75%
85000	75%	75%	75%	74%	74%	73%	72%	72%	71%	70%	70%	69%	69%
87500	73%	73%	72%	71%	70%	69%	68%	67%	66%	65%	64%	63%	62%
90000	71%	70%	69%	67%	66%	64%	63%	62%	60%	59%	58%	57%	56%
92500	68%	67%	65%	64%	62%	60%	58%	57%	55%	54%	53%	51%	50%
95000	66%	64%	62%	60%	58%	56%	54%	52%	50%	49%	47%	46%	46%
97500	63%	61%	59%	56%	54%	51%	49%	47%	46%	44%	43%	43%	42%
100000	61%	58%	56%	53%	50%	47%	45%	43%	42%	40%	40%	40%	39%

Probability SSB>=SSB_{MSY}

Catch (t)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
50000	86%	91%	94%	97%	98%	99%	100%	100%	100%	100%	100%	100%	100%
52500	86%	90%	94%	96%	98%	99%	100%	100%	100%	100%	100%	100%	100%
55000	85%	90%	93%	96%	97%	99%	99%	100%	100%	100%	100%	100%	100%
57500	85%	89%	92%	95%	97%	98%	99%	99%	100%	100%	100%	100%	100%
60000	85%	88%	91%	94%	96%	97%	98%	99%	99%	100%	100%	100%	100%
62500	84%	88%	90%	93%	95%	96%	97%	98%	99%	99%	99%	100%	100%
65000	84%	87%	89%	92%	94%	95%	96%	97%	98%	98%	99%	99%	99%
67500	83%	86%	89%	90%	92%	94%	95%	96%	97%	97%	98%	98%	99%
70000	83%	85%	87%	89%	91%	92%	93%	94%	95%	96%	96%	97%	97%
72500	83%	85%	86%	87%	89%	90%	91%	92%	92%	93%	94%	95%	95%
73011	83%	85%	86%	87%	88%	89%	90%	91%	92%	93%	93%	94%	95%
75000	83%	84%	85%	86%	87%	88%	88%	89%	89%	90%	91%	92%	92%
77500	82%	83%	84%	84%	85%	85%	85%	86%	86%	87%	87%	88%	88%
80000	82%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%
82500	82%	82%	82%	81%	81%	80%	80%	80%	79%	79%	78%	78%	78%
85000	81%	81%	80%	79%	79%	78%	77%	76%	75%	74%	73%	73%	72%
87500	81%	81%	79%	78%	76%	75%	73%	72%	71%	70%	68%	67%	66%
90000	81%	80%	78%	76%	74%	72%	70%	68%	66%	65%	63%	62%	60%
92500	80%	79%	77%	74%	71%	69%	67%	64%	62%	60%	58%	56%	55%
95000	80%	78%	75%	72%	69%	66%	63%	60%	58%	56%	54%	52%	51%
97500	80%	77%	74%	70%	67%	63%	60%	57%	54%	52%	50%	49%	48%
100000	79%	77%	73%	68%	64%	60%	56%	53%	50%	48%	47%	46%	45%

Probability F<=F_{MSY} and SSB>=SSB_{MSY}

Catch (t)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
50000	86%	91%	94%	97%	98%	99%	100%	100%	100%	100%	100%	100%	100%
52500	86%	90%	94%	96%	98%	99%	100%	100%	100%	100%	100%	100%	100%
55000	85%	90%	93%	96%	97%	99%	99%	100%	100%	100%	100%	100%	100%
57500	85%	89%	92%	95%	97%	98%	99%	99%	100%	100%	100%	100%	100%
60000	84%	88%	91%	94%	96%	97%	98%	99%	99%	100%	100%	100%	100%
62500	84%	88%	91%	93%	95%	96%	97%	98%	99%	99%	99%	100%	100%
65000	84%	87%	90%	92%	94%	95%	96%	97%	98%	98%	99%	99%	99%
67500	83%	86%	89%	90%	92%	93%	95%	96%	96%	97%	98%	98%	98%
70000	83%	85%	87%	89%	90%	92%	93%	94%	94%	95%	96%	96%	97%
72500	83%	85%	86%	87%	88%	89%	90%	91%	92%	93%	93%	94%	94%
73011	83%	84%	86%	87%	88%	89%	90%	90%	91%	92%	92%	93%	94%
75000	82%	83%	84%	85%	86%	87%	87%	88%	88%	89%	90%	90%	91%
77500	81%	82%	83%	83%	83%	84%	84%	85%	85%	85%	85%	86%	86%
80000	79%	80%	80%	80%	80%	81%	81%	81%	81%	81%	81%	81%	81%
82500	77%	78%	78%	77%	77%	77%	77%	76%	76%	76%	75%	75%	75%
85000	76%	75%	75%	74%	74%	73%	72%	71%	71%	70%	70%	69%	68%
87500	73%	72%	72%	71%	70%	69%	68%	67%	65%	64%	64%	62%	62%
90000	71%	70%	69%	67%	66%	64%	63%	61%	60%	59%	58%	57%	55%
92500	68%	67%	66%	64%	62%	60%	58%	56%	55%	54%	52%	51%	50%
95000	66%	64%	62%	60%	58%	56%	54%	52%	50%	48%	47%	46%	45%
97500	63%	61%	59%	56%	54%	51%	49%	47%	46%	44%	43%	42%	42%
100000	60%	59%	56%	53%	50%	47%	45%	43%	41%	40%	40%	39%	39%

Table 8. Responses to Commission pertaining to tropical tunas to be addressed in 2025.

TRO	In 2025 or as soon as possible thereafter, the SCRS should provide advice to the Commission on the maximum number of FAD sets per vessel or per CPC in the Convention area, Rec. 24-01 para 34.
TRO	The IMM Working Group and SCRS shall review the requirements of paragraphs 39, 40 and 41 and make recommendations to remove duplication and streamline FAD data and reporting obligations, in light of any future FAD registry and associated technology change, Rec. 24-01 para 42.
TRO	The SCRS and the IMM Working Group shall review the information reported by CPCs and shall, as necessary, provide recommendations on additional drifting FAD management options for consideration by the Commission, including recommendations on improved drifting FAD designs, Rec. 24-01 para 51.
TRO	SCRS shall provide advice on the improvements to observer programs including how coverage should be stratified across vessels, seasons and areas to achieve maximum effectiveness, Rec. 24-01 para 67.
TRO	The port sampling programme developed by the SCRS in 2012 shall be continued for landing or transhipment ports. Data and information collected from this sampling programme shall be reported to ICCAT each year, describing, at a minimum, the following by country of landing and quarter: species composition, landings by species, length composition, and weights. Biological samples suitable for determining life history should be collected as practicable. SCRS shall report each year on the implementation of the port sampling programme broken down by CPCs, Rec. 24-01 para 73.
TRO	The ICCAT Secretariat shall work with the SCRS in preparing an estimate of capacity in the Convention area, to include at least all the fishing units that are large-scale or operate outside the EEZ of the CPC they are registered in. All CPCs shall cooperate with this work, providing estimates of the number of fishing units fishing for tuna and tuna-like species under their flag, and the species or species groups each fishing unit targets (e.g. tropical tunas, temperate tunas, swordfish, other billfish, small tunas, sharks, etc.). This work shall be presented to the next meeting of the SCRS in 2025 and forwarded to the Commission for consideration, Rec. 24-01 para 79b.
TRO	SCRS shall consider the interim limit reference point (LRP) of 0.4*B_{MSY} for Atlantic bigeye tuna, yellowfin tuna, and the eastern stock of skipjack tuna. The SCRS will advise on final LRPs for Atlantic bigeye tuna, yellowfin tuna, and the eastern stock of skipjack tunas, Rec. 24-02 para 2.
TRO	When assessing stock status and providing management recommendations to the Commission, the SCRS shall consider the interim limit reference point (LRP) of 0.4*B_{MSY} for Atlantic bigeye tuna, yellowfin tuna, and the eastern stock of skipjack tuna. The SCRS will advise on final LRPs for Atlantic bigeye tuna, yellowfin tuna, and the eastern stock of skipjack tunas, Rec. 24-02 para 3.
TRO	The Commission calls on the SCRS to evaluate the differential impacts of fishing operations (e.g., purse seine, longline, and baitboat) on the whole range of the stock, including on juvenile mortality and yield at MSY, as well as other impacts of these fisheries, including impacts on bycatch, ecosystem impacts and socio-economic impacts, Rec. 24-02 para 4.
TRO	According to the timeline set out in Annex 2, the SCRS shall run the MP and advise the Commission of the resulting TAC per the process specified in Annex 2, Rec. 24-04 para 5.
TRO	In 2025, the SCRS shall finalize tuning of the MP to achieve the status objective specified in paragraph 2 for review and adoption by the Commission at its 2025 Annual Meeting. This measure will be revised in 2025, Rec. 24-04 para 8.

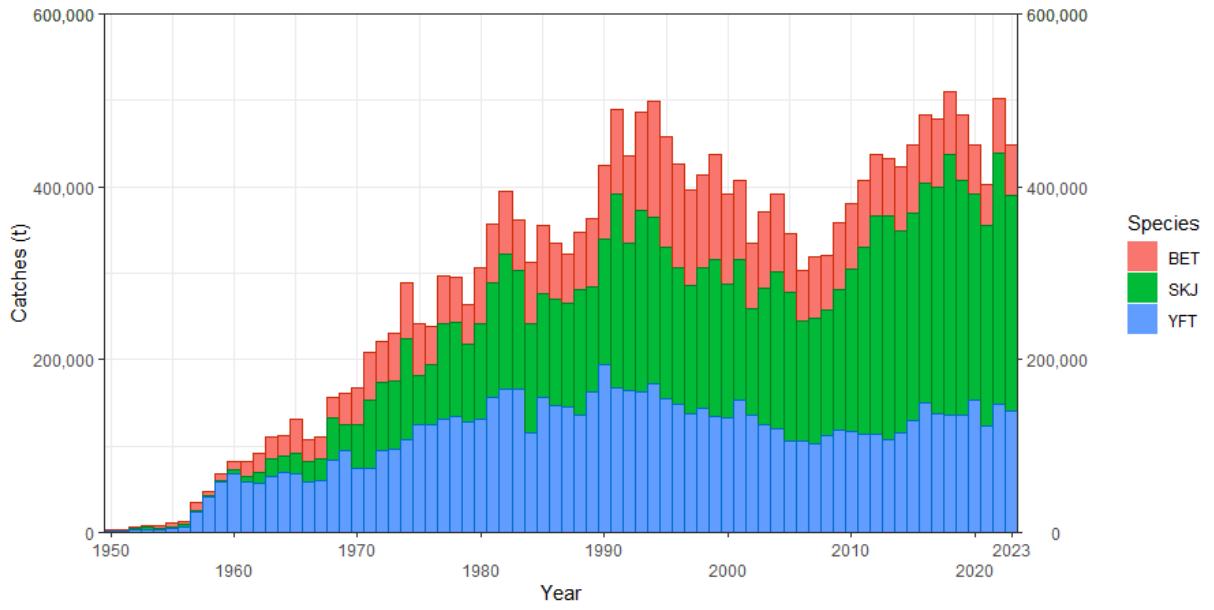

Figure 1. Cumulative Atlantic Task 1 nominal catches (t), including reported and best estimates of total catches, of the three main tropical tuna species (BET, YFT, SKJ) in the Atlantic and Mediterranean (A+M), between 1950–2023.

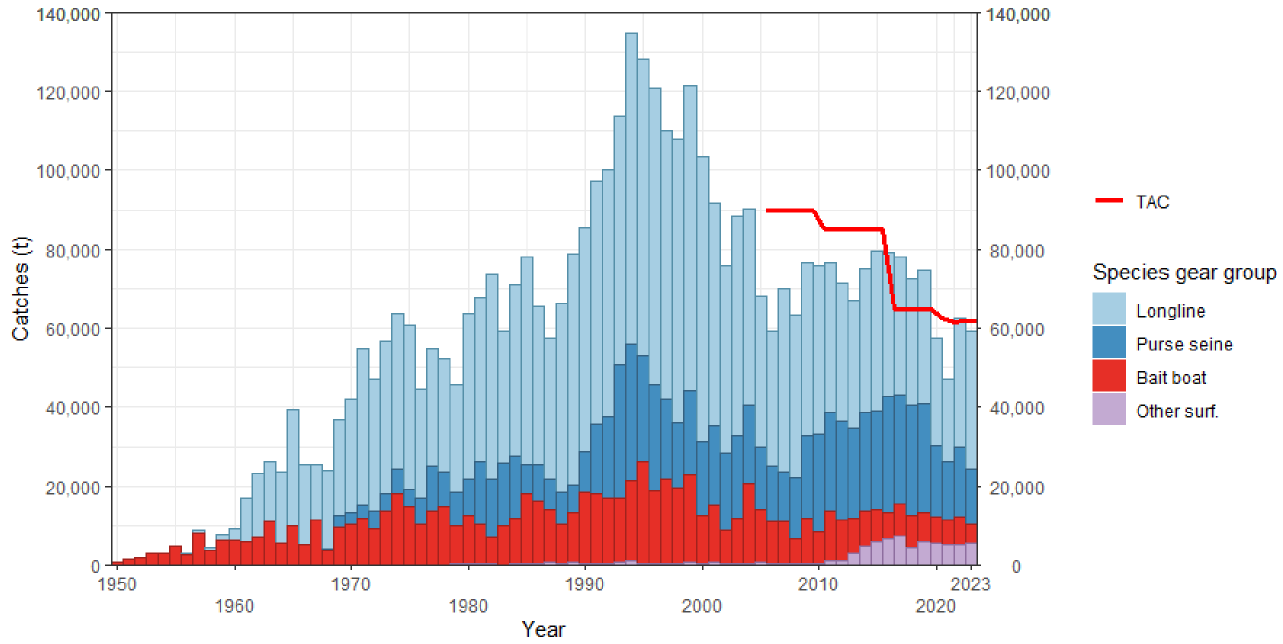

Figure 2. Cumulative Atlantic Bigeye tuna Task 1 nominal catches (t) by major gear in the Atlantic and Mediterranean (A+M) between 1950–2023.

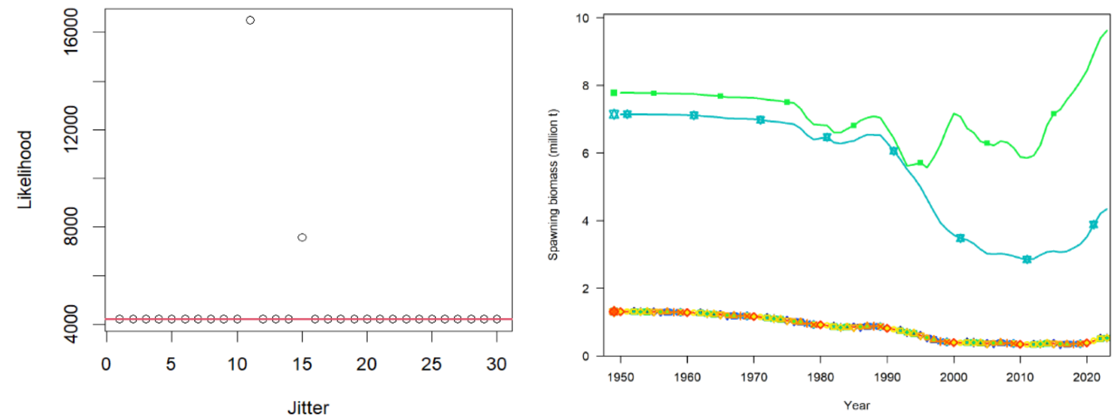

Figure 3. Jitter analysis of the Atlantic Bigeye tuna stock synthesis reference case model. The left panel shows the likelihood of the model solution, and the right panel shows the annual trend of SSB (million t) of each run.

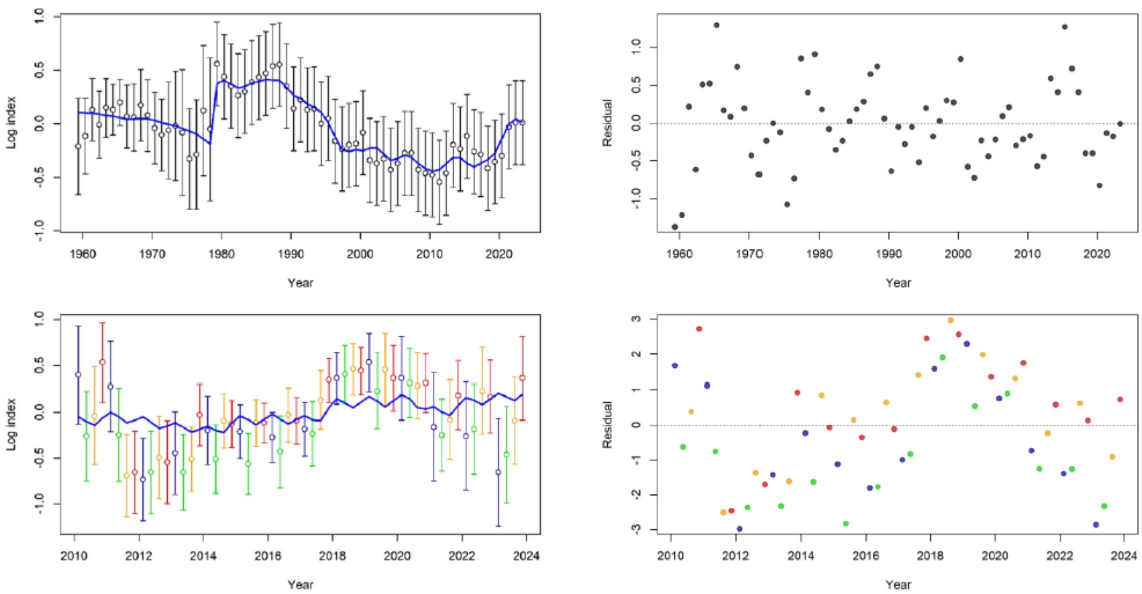

Figure 4. Stock Synthesis reference case model fits (left panels) and residuals (right panels) to the Atlantic bigeye tuna indices of relative abundance. Joint CPC longline index shown in the upper panels, and the buoy acoustic index is shown in the lower panels.

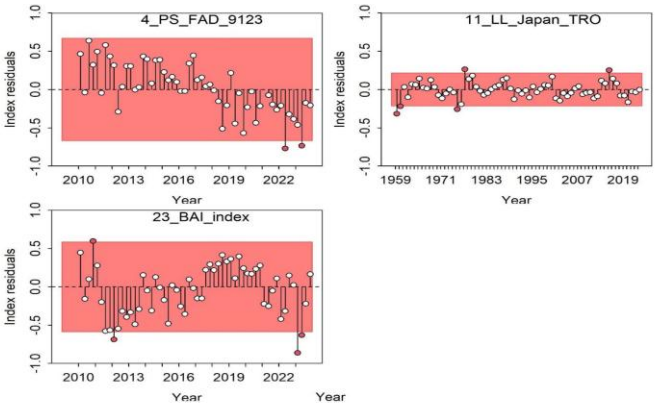

Figure 5. Stock Synthesis diagnostics runs test on residual fits to the abundance indices of Atlantic bigeye tuna. Note the PS_FAD index was not fit directly in the reference case model but was recommended to be included as part of the uncertainty grid.

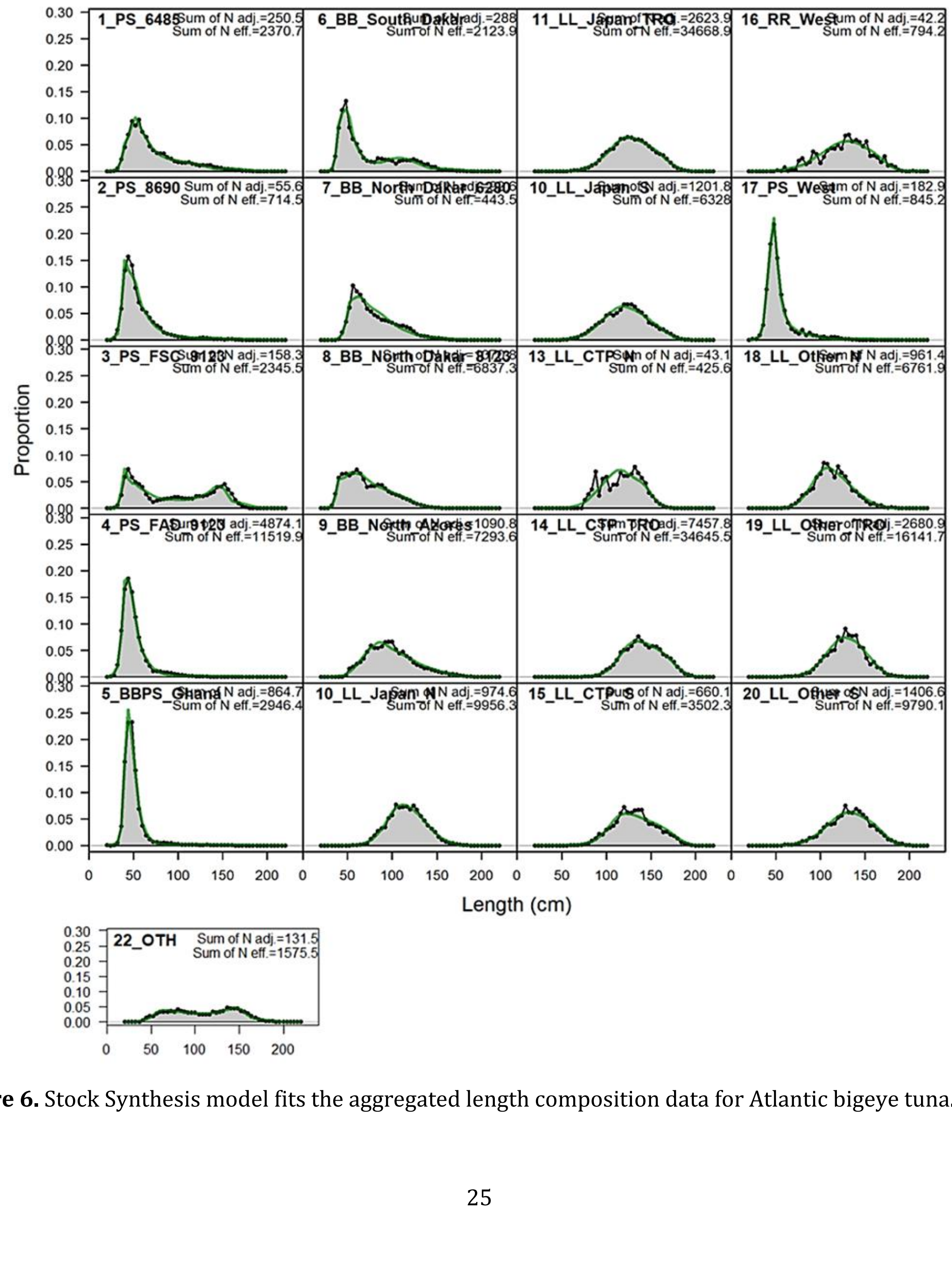

Figure 6. Stock Synthesis model fits the aggregated length composition data for Atlantic bigeye tuna.

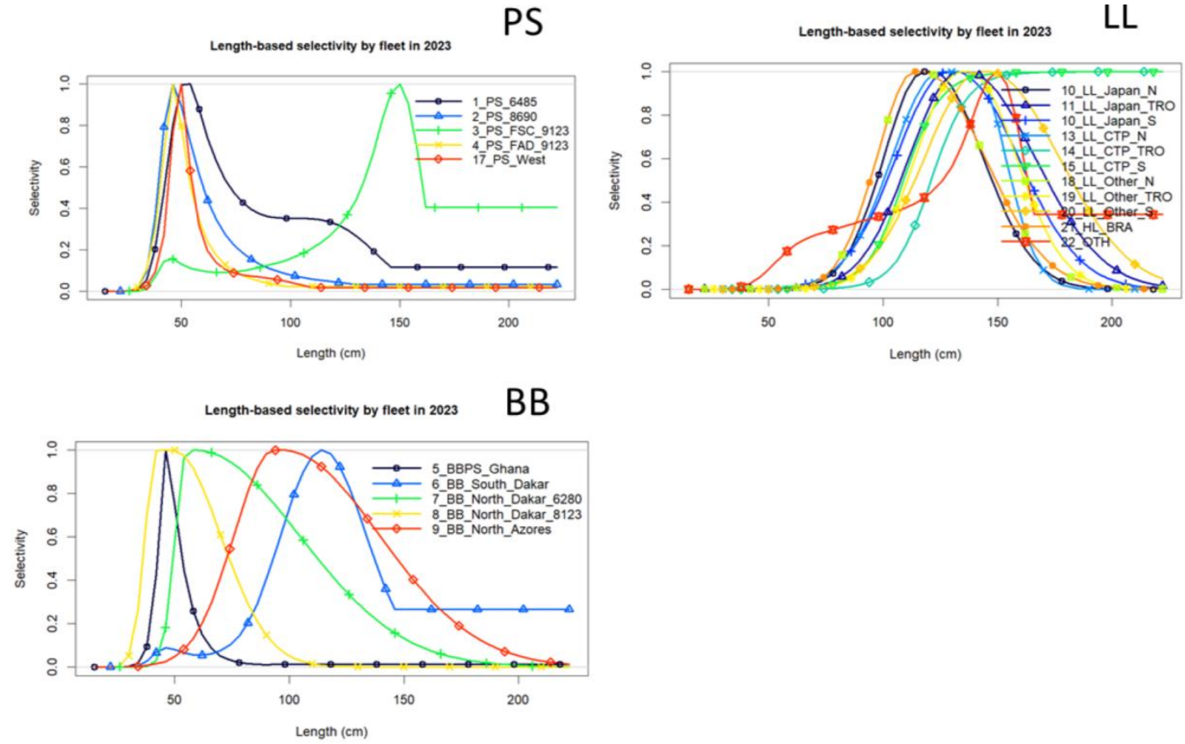

Figure 7. Stock Synthesis estimated fleet selectivities of Atlantic bigeye tuna.

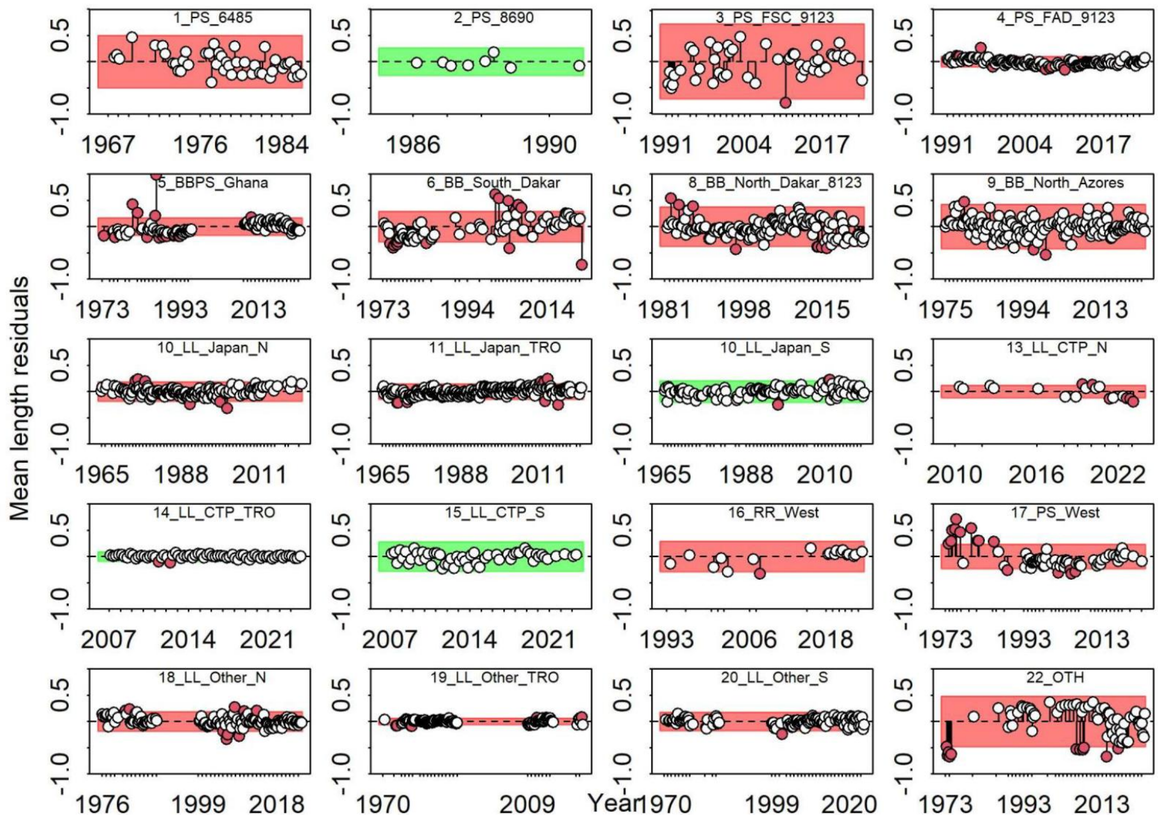

Figure 8. SS3 diagnostic runs test on residual fits to Atlantic bigeye tuna length composition data for the reference case model.

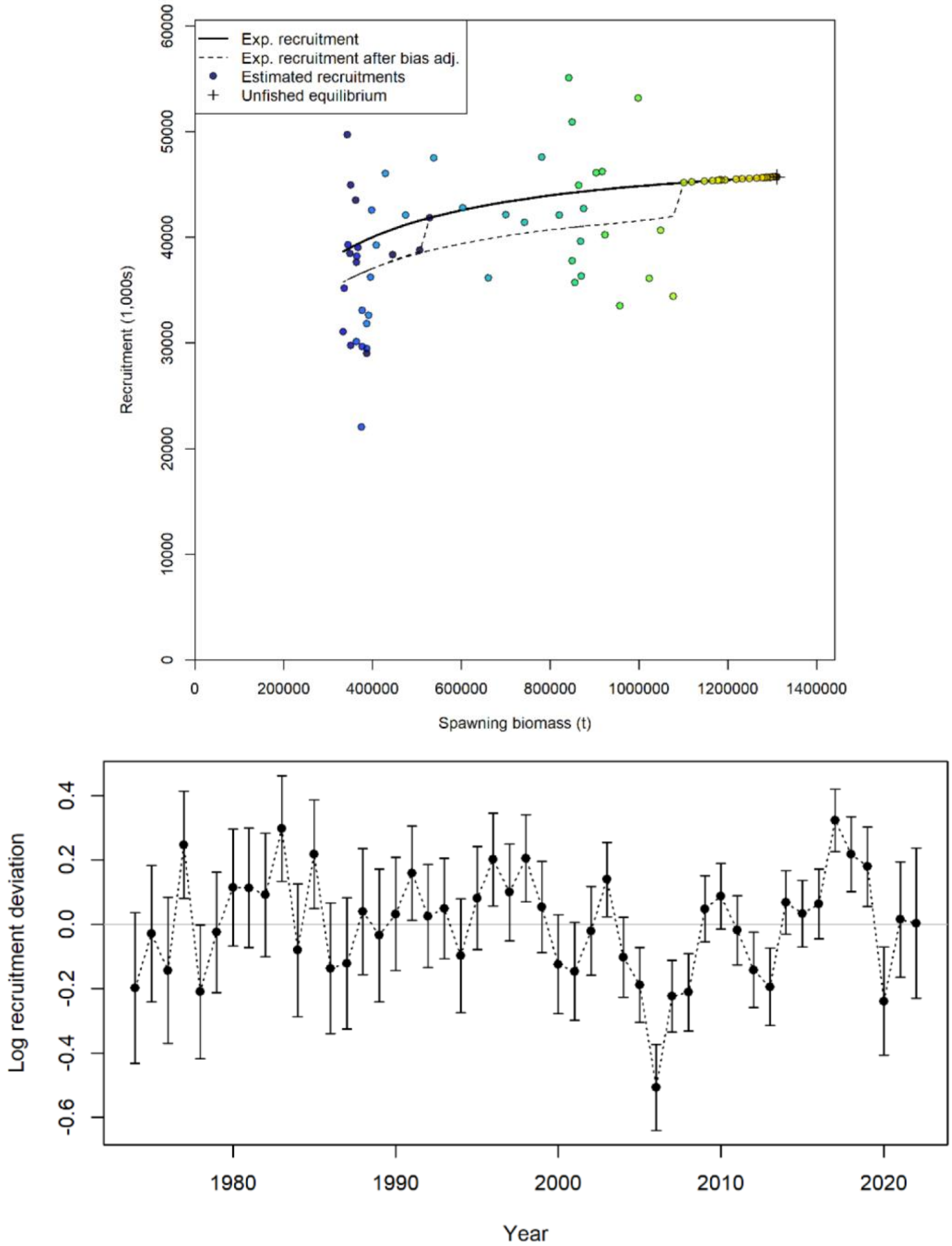

Figure 9. Stock Synthesis estimated Beverton-holt stock recruitment curve (upper panel) and recruitment deviations (lower panel).

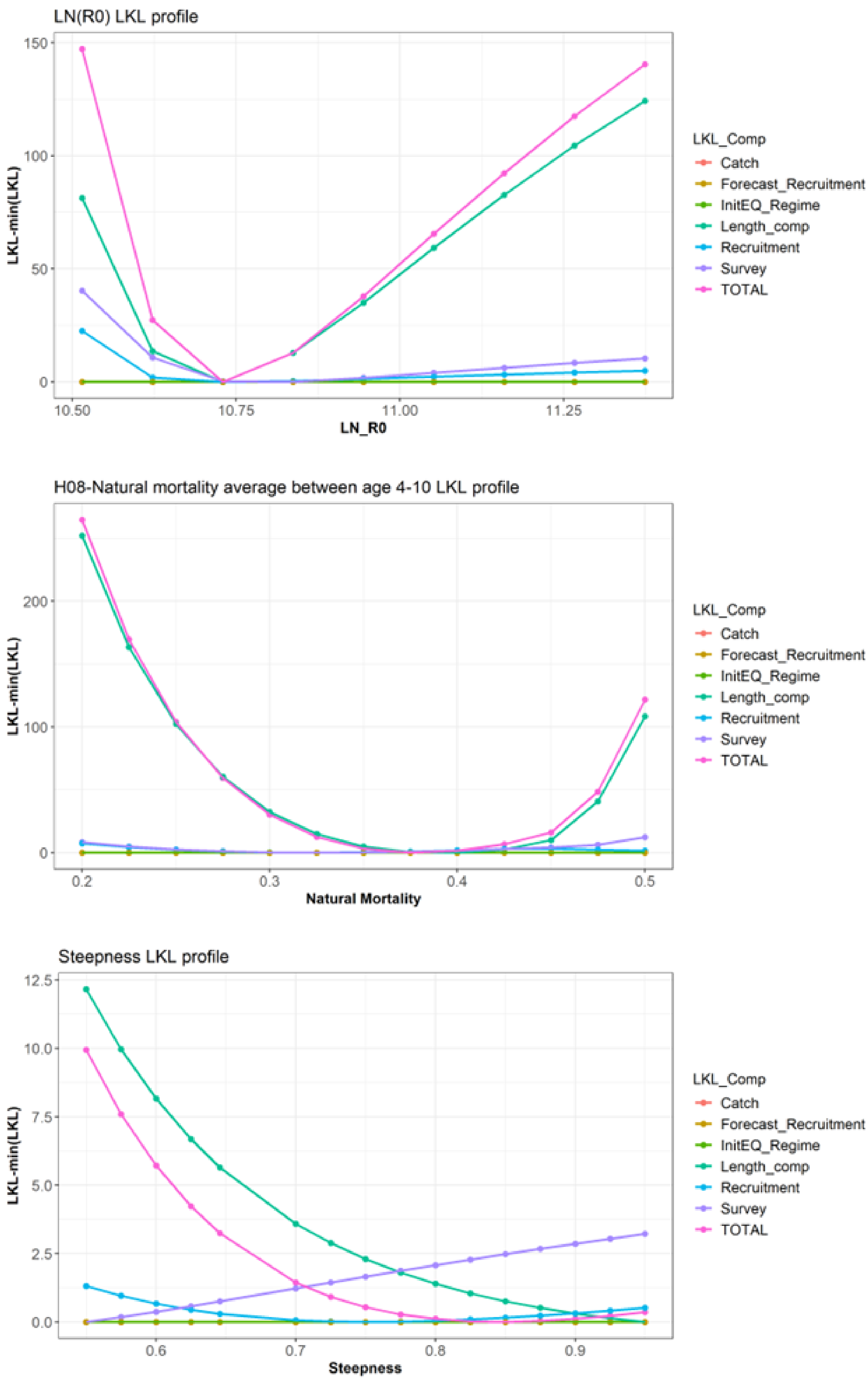

Figure 10. Likelihood profile analysis of stock-recruitment and natural mortality (M) parameters in the Stock Synthesis reference case model.

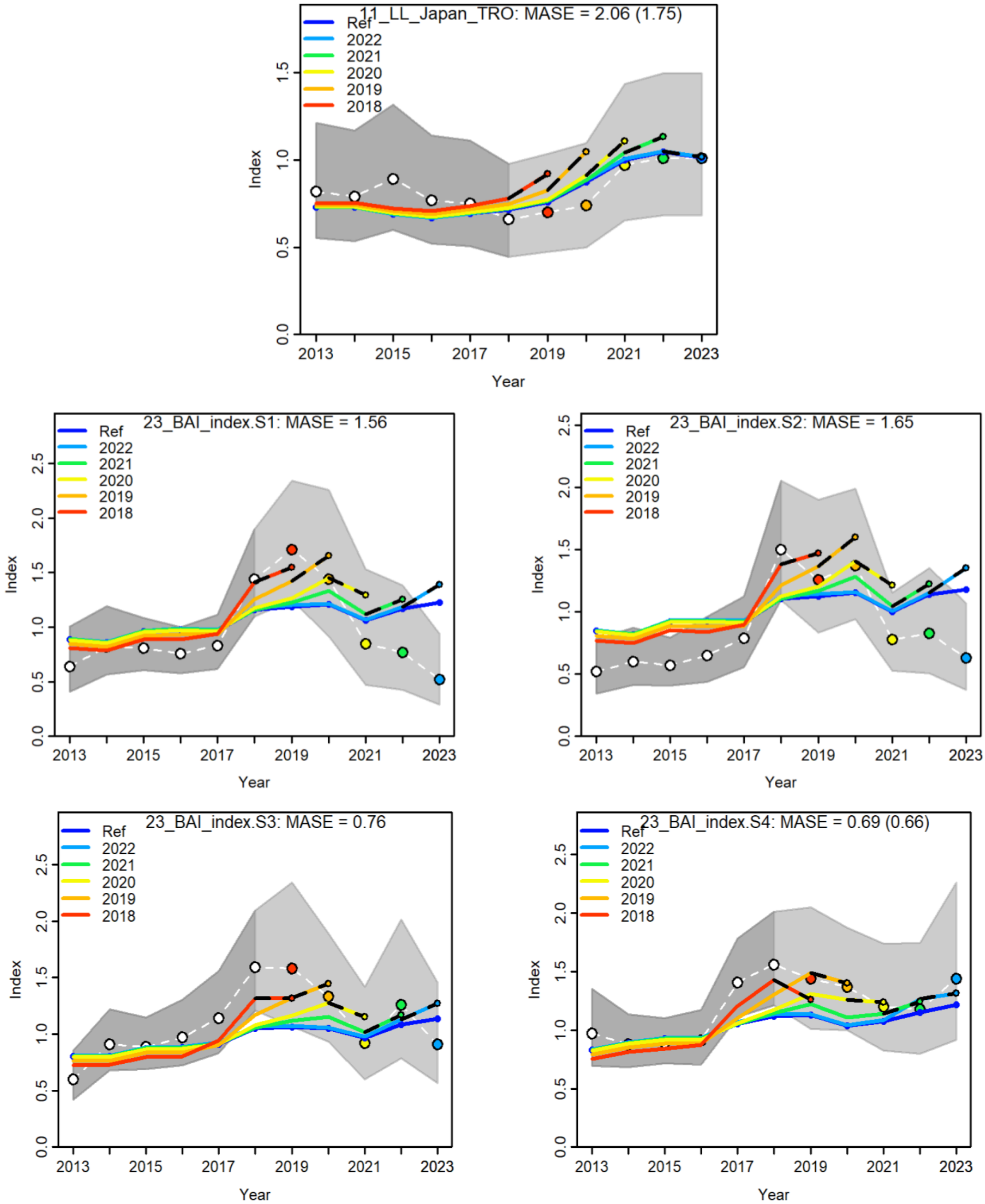

Figure 11. Predicted bigeye tuna indices of abundance hindcast analysis of the Stock Synthesis reference case.

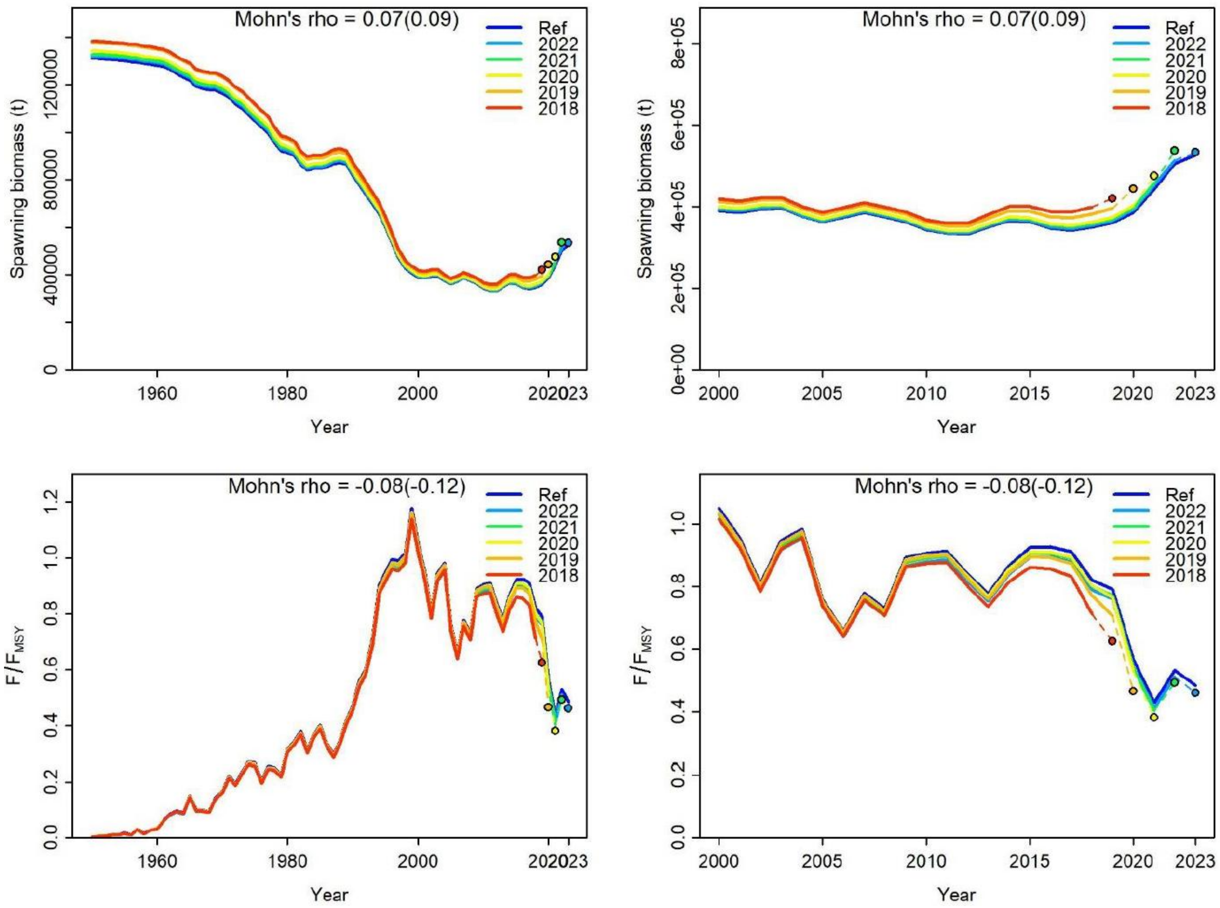

Figure 12. Retrospective analysis of the Stock Synthesis reference case model for Atlantic bigeye tuna. Top panels show the spawning stock biomass estimates with 1 to 5 years removed, and the lower panels show the estimated relative exploitation rate across retrospective runs. Left panels show the full assessment period, while right panels focus on the 2000-2023 period.

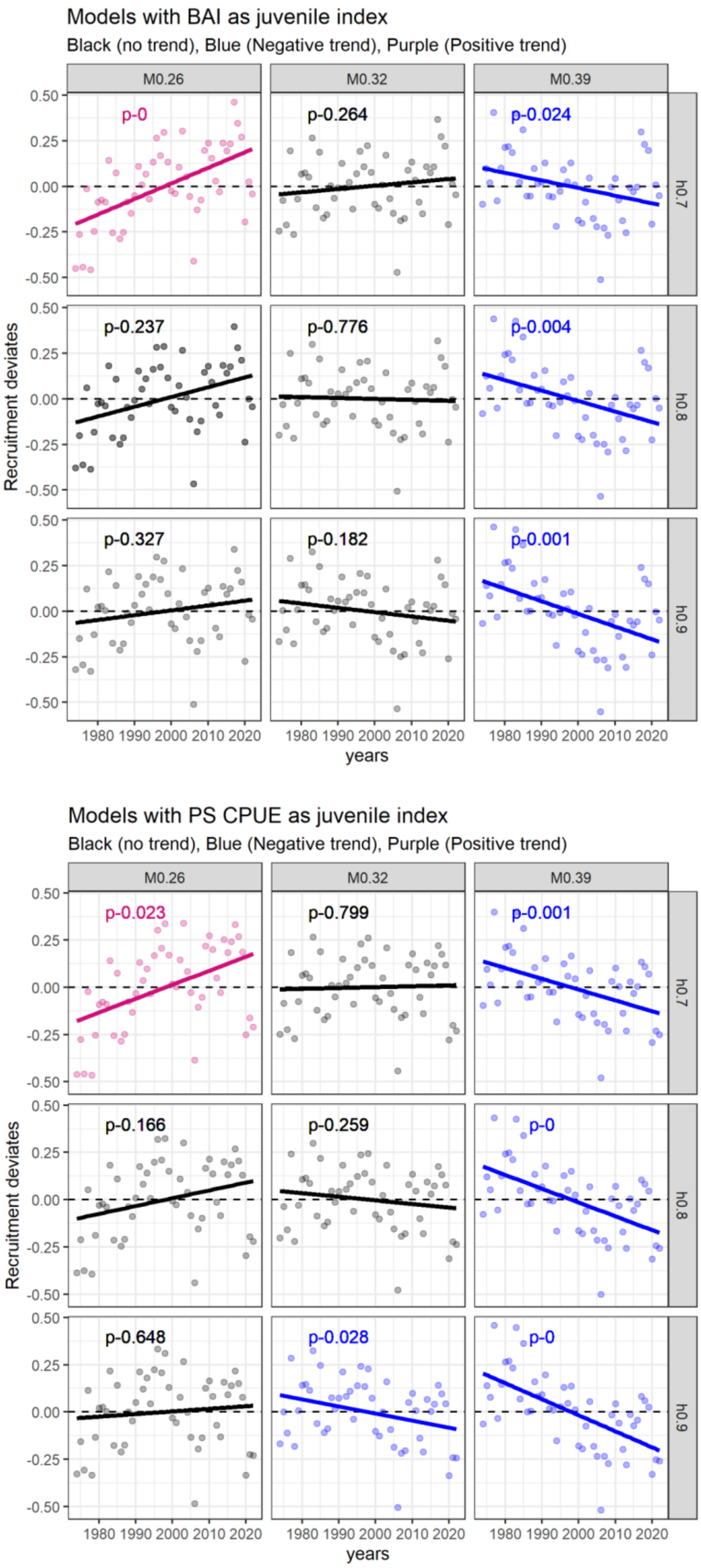

Figure 13. Analysis of the trends of recruitment deviates for the Stock Synthesis 18 uncertainty grid. The lines with red color show the significant positive trend of the recruitment deviates ($p<0.05$), the blue color show the significant negative trend of the recruitment deviates ($p<0.05$), and black lines show the no significant trend ($p>0.05$).

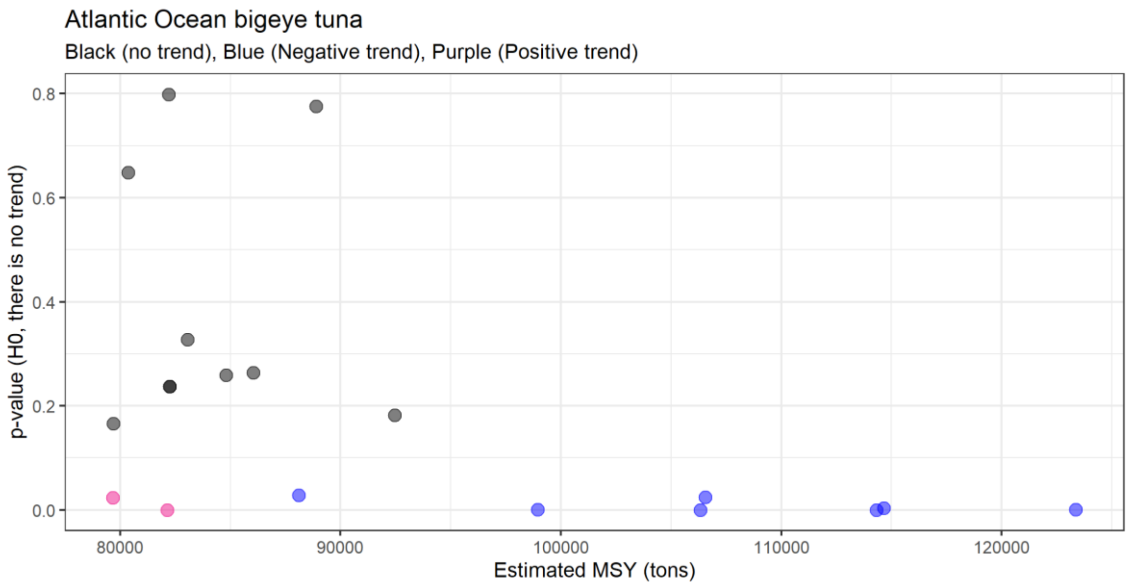

Figure 14. The MSY and p-values of the Stock Synthesis 18 uncertainty grid. The red dots show the MSY values for scenarios with significant positive trend on the recruitment deviates (p<0.05), the blue dots for significant negative trend on the recruitment deviates (p<0.05) and black dots for no significant trend (p>0.05).

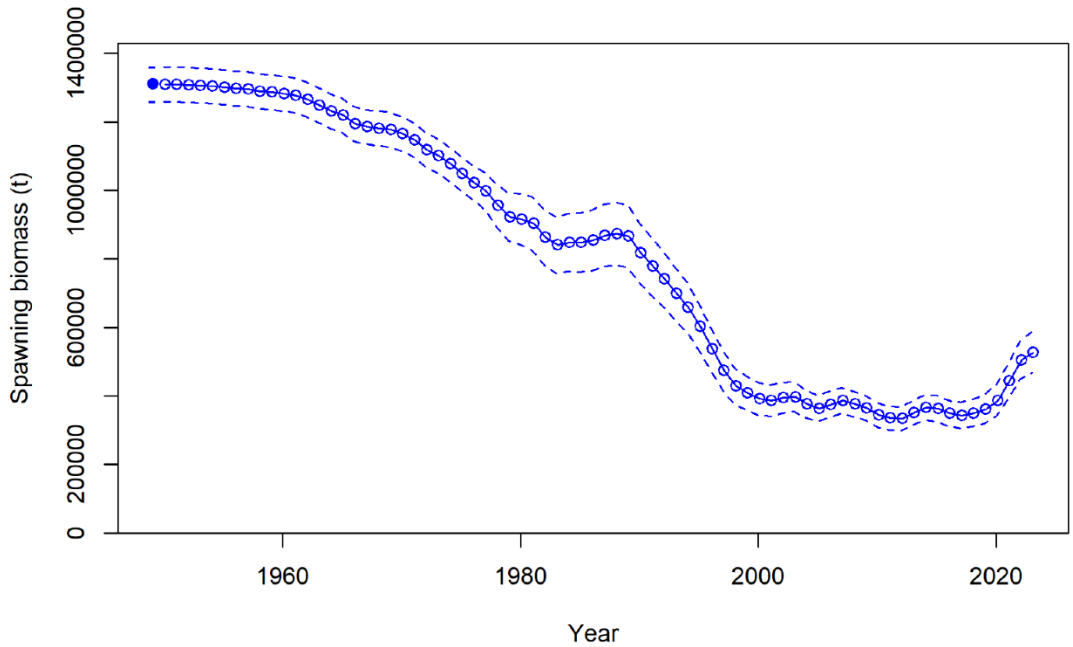

Figure 15. Stock Synthesis reference case model estimated spawning stock biomass (t) of Atlantic bigeye tuna with 95% confidence intervals.

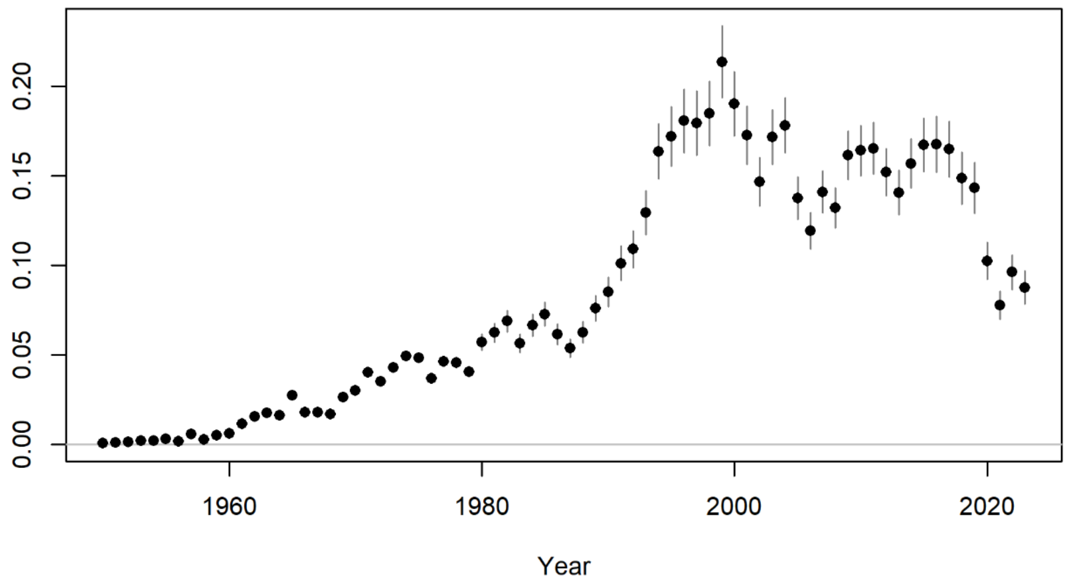

Figure 16. Annual exploitation rate (*y-axis*) estimates from the reference case stock synthesis model with 95% confidence intervals.

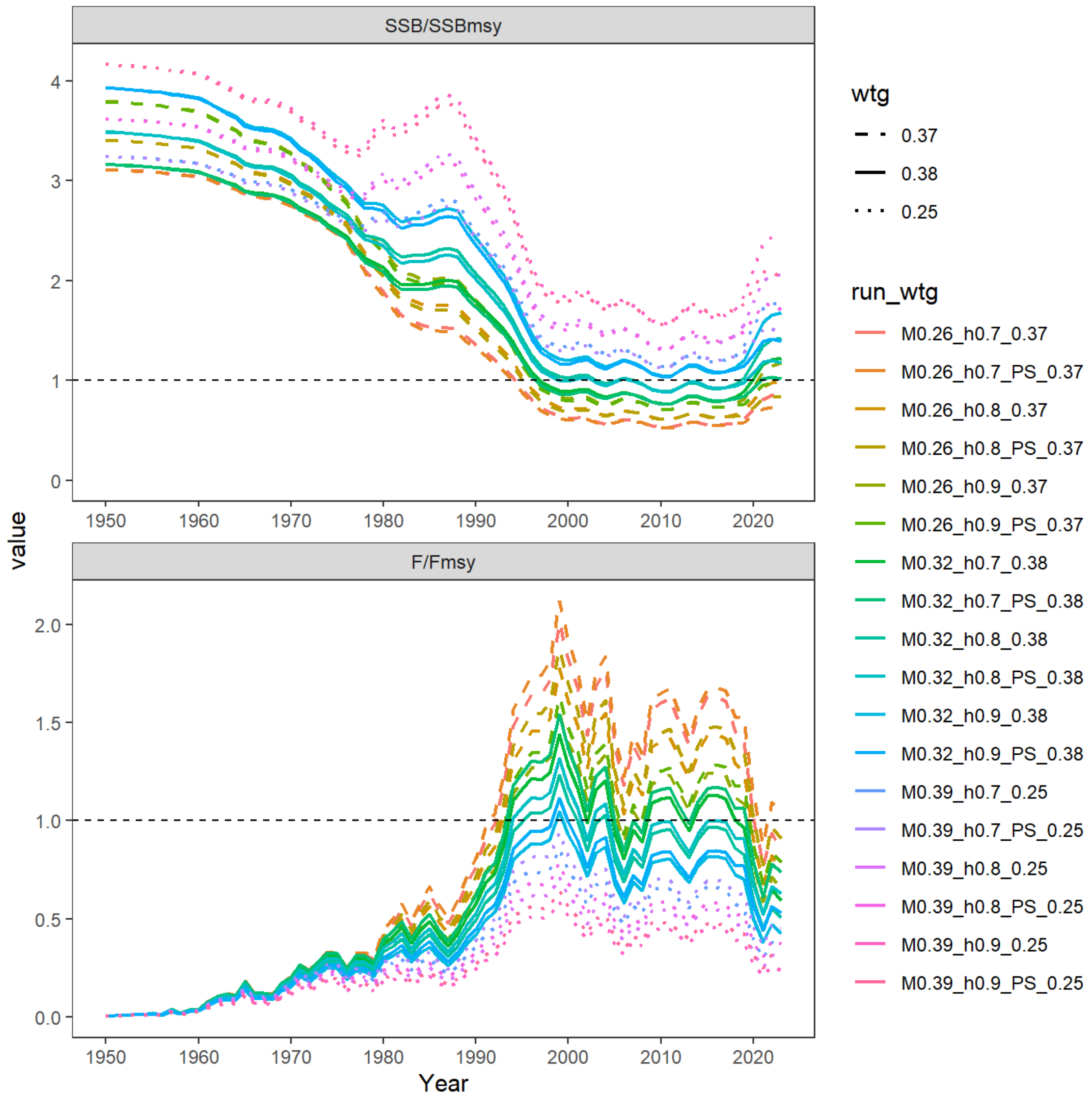

Figure 17. Relative abundance (spawning biomass SSB/SSB_{MSY}) (top) and fishing mortality (F/F_{MSY}) (bottom) historical mean trends for the Atlantic bigeye stock estimated by each model from the Stock Synthesis uncertainty grid. Line types represent the weighting values for M (dashed line: 0.37 for M=0.26, solid line: 0.38 for M=0.32, dotted line: 0.25 for M=0.39).

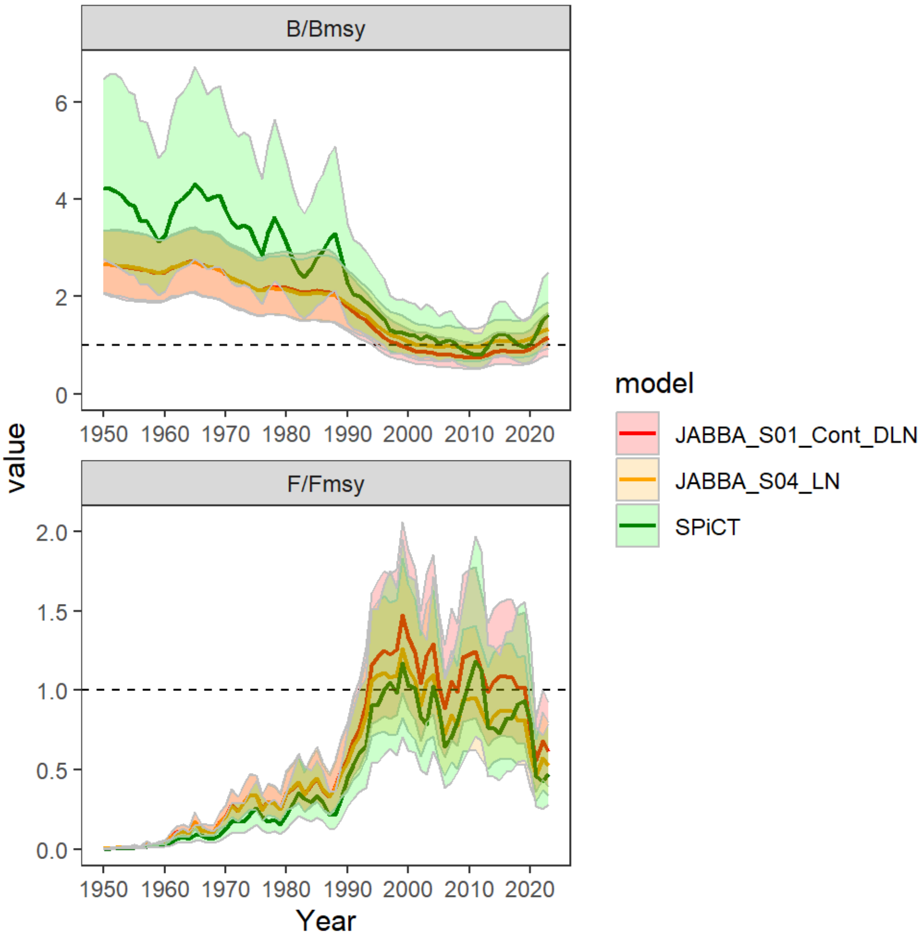

Figure 18. Relative biomass (B/B_{MSY}) and fishing mortality (F/F_{MSY}) estimated trends by SPiCT and by JABBA scenarios S01 (red lines), with 80% confidence intervals (green lines) and with continuity joint longline delta-lognormal index and S04 (orange lines) with multi-national joint longline reference case lognormal index with 95% credibility intervals.

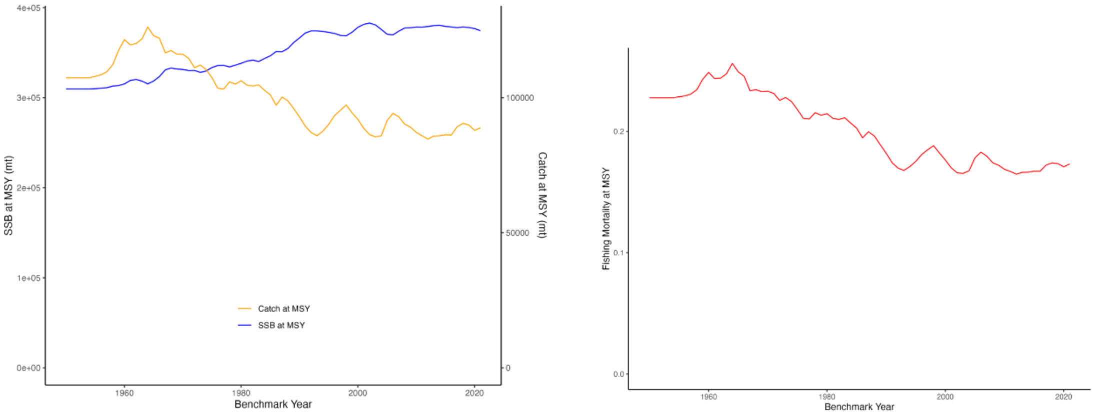

Figure 19. Dynamic SSB/SSBMSY and catch at MSY (left panel) and F/FMSY (right panel) by benchmark year, demonstrating the effects of changes in selectivity for bigeye tuna using the SS 2021 reference case.

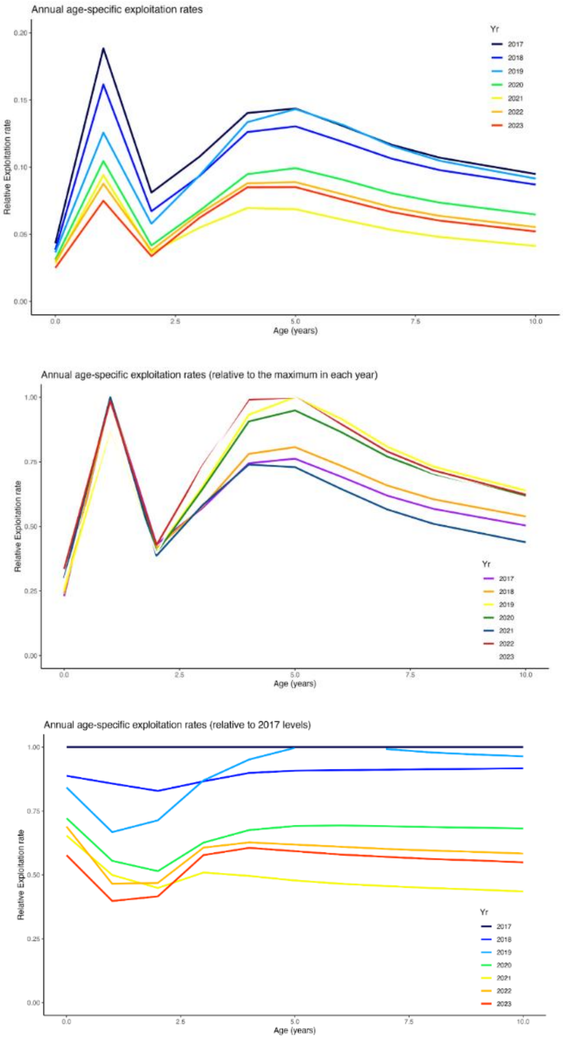

Figure 20. Patterns in recent estimates of age-specific exploitation rates estimated from the reference case model. Top panel - the 'raw' estimates; Middle panel - estimates scaled within each year to the age with the highest exploitation rate; and Bottom panel - estimates scaled within each age to the value for that age in 2017.

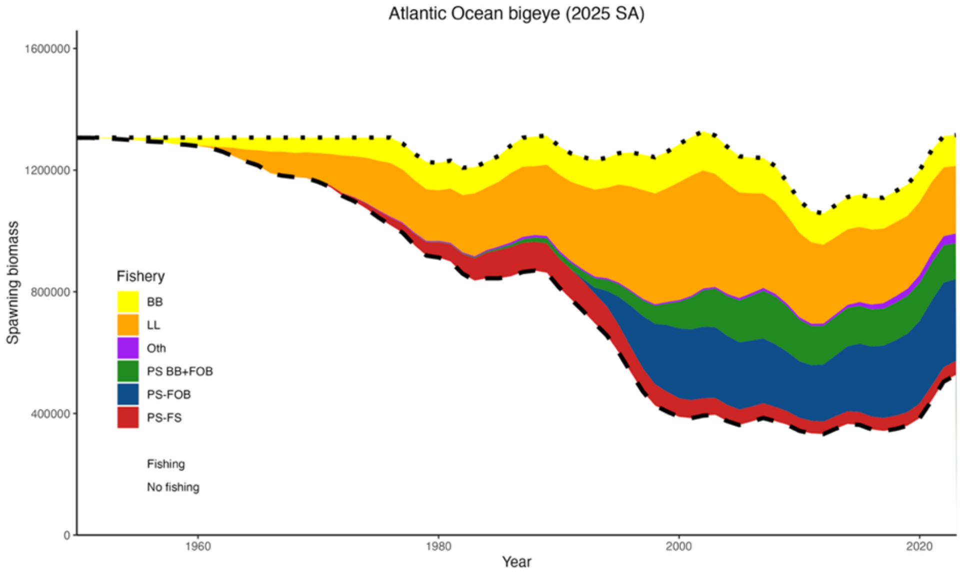

Figure 21. Estimated impact plot on the expected spawning stock biomass (t) of bigeye tuna by each of the main fleet/gear fisheries based on the 2025 stock synthesis reference model assessment. The upper broken line indicates the expected SSB under no fishing, while the bottom broken line indicates the SSB trend with all fishing mortality. The shade areas correspond to the estimated SSB impact by each main fleet/gear fishery.

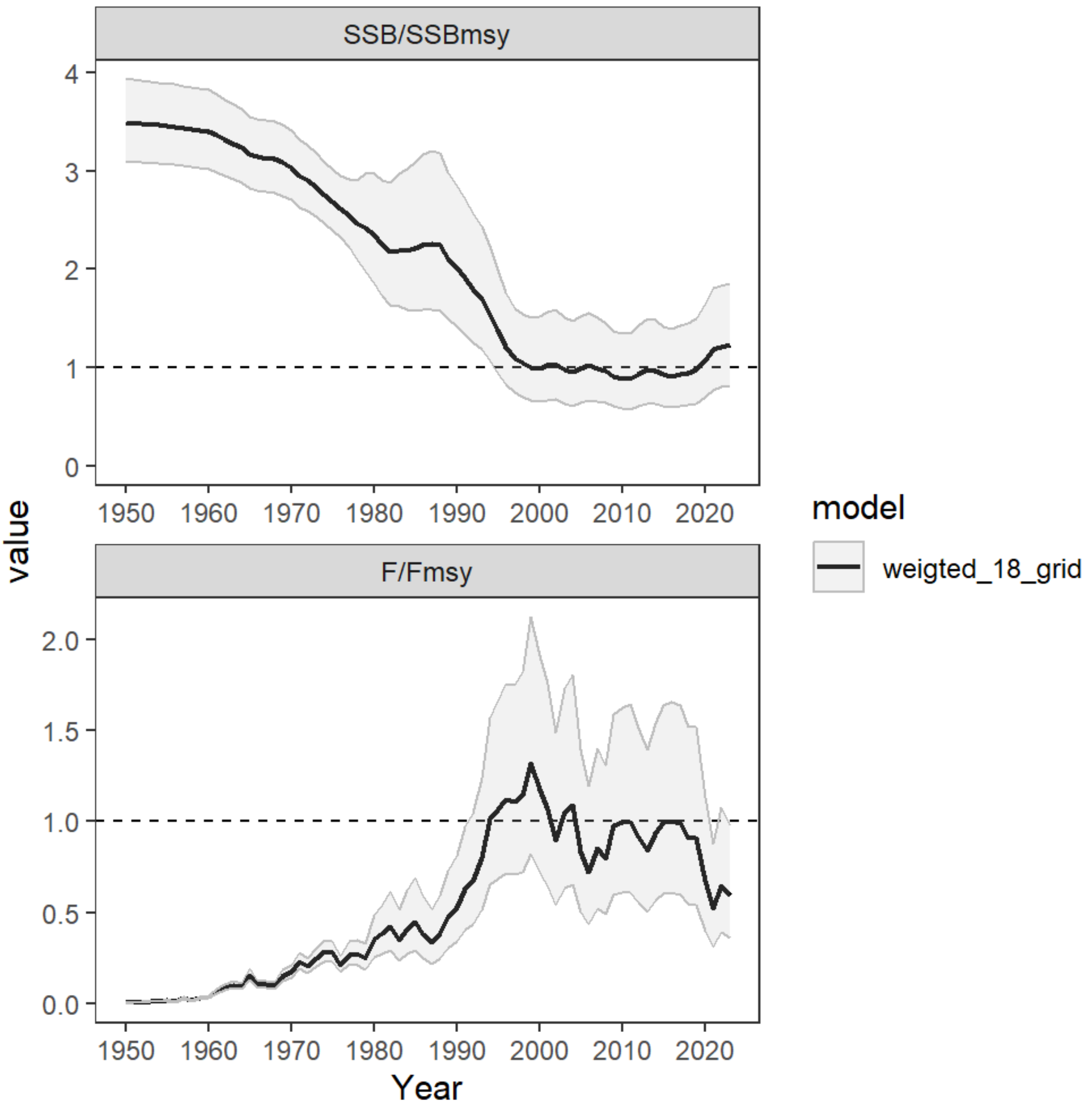

Figure 22. Relative spawning stock biomass (SSB/SSB_{MSY}) (top) and fishing mortality (F/F_{MSY}) (bottom) historical mean trends for the Atlantic bigeye stock from the Stock Synthesis 18 uncertainty grid results weighted based on the natural mortality M distribution using the MVLN approach.

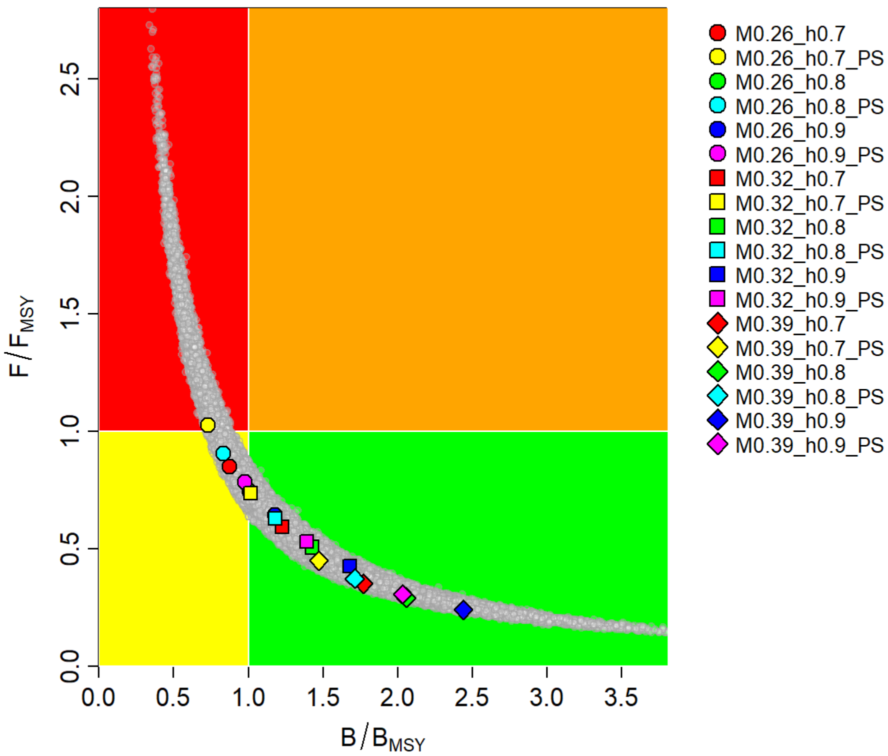

Figure 23. Kobe plot with the indication of the stock status for each of the Stock Synthesis 18 uncertainty grid in the ensemble approach. The naming convention for the model runs are based on the levels for the ensemble grid: natural mortality (M=0.26, 0.32, or 0.39), steepness (h = 0.7, 0.8, or 0.9), and the specific juvenile abundance index included (BAI=acoustic buoy index or PS = purse seine FAD CPUE). For example, e.g., M0.32_h0.8_BAI is the model where natural mortality is 0.32, steepness is 0.8, and the acoustic buoy index was used.

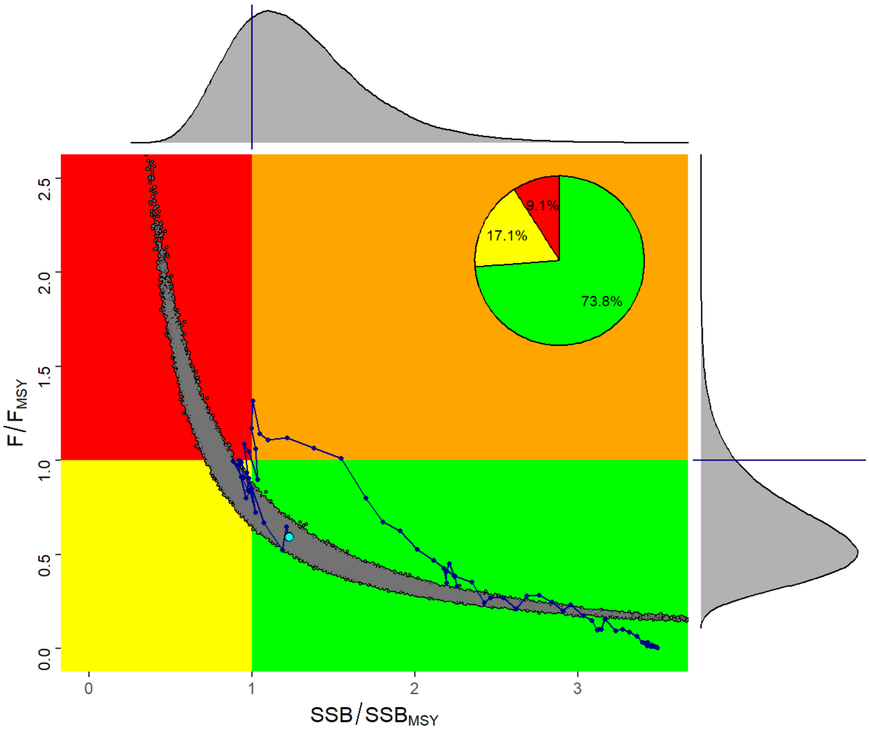

Figure 24. Kobe plot for the 2025 Atlantic bigeye tuna Stock Synthesis 18 uncertainty grid models by MVLN (20,000 iterations). The line indicates the stock status trajectory starting in 1950. The inserted pie indicates the proportion of MVLN trials within each quadrant of the Kobe plot.

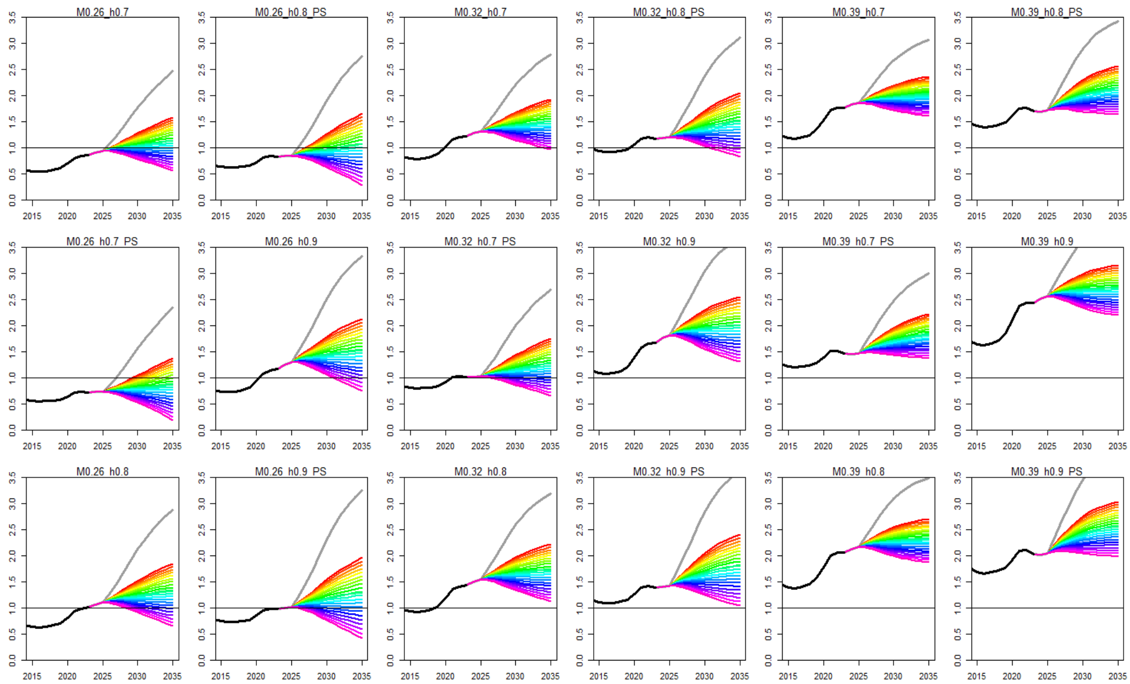

Figure 25. Projected SSB/SSB$_{MSY}$ trajectories across fixed TAC scenarios for the Stock Synthesis18 uncertainty grid models. The black line shows the SSB/SSB$_{MSY}$ estimates for the deterministic model run to 2023, 2024 (average catch 2021-2023 Task 1 NC) and 2025 (TAC of 73,011 t), as fixed catch scenarios with no variation across runs. Zero catch scenarios are shown in gray, and the colored lines show the constant catch stock projection scenarios between 50,000 t and 100,000 t by 2,500 t increments, plus the current TAC (73,011 t) for the period 2026 to 2038.

Appendix 1

Meeting agenda

1. Opening, adoption of agenda and meeting arrangements

2. Summary of input data for stock assessment

   2.1 Catches
   2.2 Size

3. Methods and model settings

   3.1 Stock Synthesis
   3.2 Surplus Production models

4. Model diagnostics

   4.1 Stock Synthesis
   4.2 Surplus Production models

5. Model results

   5.1 Stock Synthesis
   5.2 Surplus Production models
   5.3 Synthesis of stock assessment results

6. Stock status and projections

7. Tropical tunas MSE process

   7.1 SKJ-W MSE
   7.2 Multi-stocks tropical tunas MSE

8. Responses to the Commission

9. Recommendations

   9.1 Research and statistics
   9.2 Management

10. Tropical Tunas Research Programme update on ongoing activities and future planning

11. Spatial analysis of tropical tunas fisheries

12. Other matters

13. Adoption of the report and closure

Appendix 2

List of participants[1] *

CONTRACTING PARTIES

BRAZIL
Leite Mourato, Bruno
Profesor Adjunto, Laboratório de Ciências da Pesca - LabPesca Instituto do Mar - IMar, Universidade Federal de São Paulo - UNIFESP, Rua Carvalho de Mendoça, 144, Encruzilhada, 11070-100 Santos, São Paulo
Tel: +55 1196 765 2711, Fax: +55 11 3714 6273, E-Mail: bruno.mourato@unifesp.br; bruno.pesca@gmail.com; mourato.br@gmail.com

Sant'Ana, Rodrigo
Researcher, Laboratório de Estudos Marinhos Aplicados - LEMA Escola Politécnica - EP, Universidade do Vale do Itajaí - UNIVALI, Rua Uruquai, 458 - Bloco E2, Sala 108 - Centro, CEP 88302-901 Itajaí, Santa Catarina
Tel: +55 (47) 99627 1868, E-Mail: rsantana@univali.br

CANADA
Duprey, Nicholas
Senior Science Advisor, Fisheries and Oceans Canada, 200-401 Burrard Street, Vancouver, BC V6C 3R2
Tel: +1 604 499 0469, E-Mail: nicholas.duprey@dfo-mpo.gc.ca

CHINA, (P.R.)
Dong, Sisong
Shanghai Ocean University, 999 Huchenghuan Road, Pudong, Shanghai, China, 201306, No. 999 Huchenghuan Road, Pudong, 201306 Shanghai
Tel: +86 138 191 99187, E-Mail: dongsisong@126.com

Feng, Ji
Researcher, Shanghai Ocean University, 999 Hucheng Huan Rd, 201306 Shanghai
Tel: +86 159 215 36810, E-Mail: fengji_shou@163.com

Jiang, Mingfeng
College of Marine Living Resource Sciences and Management. Shanghai Ocean University, 999 Hucheng Huan Road, 201306 Shanghai
Tel: +86 156 767 66515, E-Mail: jmf822221@163.com

Wang, Yang
Research Assistant, Shangai Ocean University, 999 Hucheng Huan Road, Shanghai, 201306
Tel: +34 695 999 886, E-Mail: shouwyh@163.com

Zhang, Fan
Professor, Shanghai Ocean University, 999 Hucheng Huan Rd, 201306 Shanghai
Tel: +86 131 220 70231, E-Mail: f-zhang@shou.edu.cn

CÔTE D'IVOIRE
Diaha, N'Guessan Constance
Chercheur Hydrobiologiste, Laboratoire de biologie des poissons du Département des Ressources Aquatiques Vivantes (DRAV) du Centre de Recherches Océanologiques (CRO), 29, Rue des Pêcheurs - B.P. V-18, Abidjan 01
Tel: +225 21 35 50 14; +225 21 35 58 80, E-Mail: diahaconstance@yahoo.fr; diahaconstance70@gmail.com; constance.diaha@cro-ci.org

EL SALVADOR
Galdámez de Arévalo, Ana Marlene
Técnico de Oficina de Pesca Internacional, Centro para el Desarrollo de la Pesca y Acuicultura (CENDEPESCA), Head Final 1ª Avenida Norte, 13 Calle Oriente y Av. Manuel Gallardo, Santa Tecla, La Libertad
Tel: +503 619 84257, E-Mail: ana.galdamez@mag.gob.sv

* Head Delegate
[1] Some delegate contact details have not been included following their request for data protection.

Hernández Rodríguez, Numa Rafael
Jefe de División de Administración, Ministerio de Agricultura y Ganadería, Centro de Desarrollo de la Pesca y la Acuicultura (CENDEPESCA), Final 1º Ave. Norte y ave. Manuel Gallardo, Santa Tecla, La Libertad
Tel: +503 221 01760, E-Mail: numa.hernandez@mag.gob.sv

EUROPEAN UNION

Jonusas, Stanislovas
Unit C3: Scientific Advice and Data Collection DG MARE - Fisheries Policy Atlantic, North Sea, Baltic and Outermost Regions European Commission, J-99 02/38 Rue Joseph II, 99, 1049 Brussels, Belgium
Tel: +3222 980 155, E-Mail: Stanislovas.Jonusas@ec.europa.eu

Alves, Adriana
Direção Regional do Mar, Rua Virgílio Teixeira, Lota Funchal, 1º piso, 9004-562 Funchal, Madeira, Portugal
Tel: +351 291 203 200, E-Mail: adriana.alves@madeira.gov.pt

Alzorriz, Nekane
ANABAC, Txibitxiaga 24 entreplanta, 48370 Bermeo, Bizkaia, Spain
Tel: +34 94 688 2806; +34 650 567 541, E-Mail: nekane@anabac.org

Coelho, Rui
Researcher, Portuguese Institute for the Ocean and Atmosphere, I.P. (IPMA), Avenida 5 de Outubro, s/n, 8700-305 Olhão, Portugal
Tel: +351 289 700 508, E-Mail: rpcoelho@ipma.pt

Crespin, Rosalie
ORTHONGEL, 5 Rue des Sardiniers, 29900 Concarneau, France
Tel: +33 649 711 587, E-Mail: rcrespin@orthongel.fr

Ferreira de Gouveia, Lidia
Técnica Superior, Biologist, Secretaria Regional de Mar e Pescas - Direção Regional do Mar, Lota do Funchal 1 piso - Rua Virgílio Teixeira, 9004-562 Funchal, Madeira, Portugal
Tel: +351 291 203200, Fax: +351 291 229856, E-Mail: lidia.gouveia@madeira.gov.pt

Liniers Terry, Gonzalo
Instituto Español de Oceanografía (IEO, CSIC), Calle Corazón de María 8, 28002 Madrid, Spain
Tel: +34 915 107 540, E-Mail: gonzalo.liniers@ieo.csic.es

Meléndez Arteaga, Josu
AZTI, Txatxarramendi Ugartea z/g, 48395 Sukarrieta, Bizkaia, Spain
Tel: +34 667 143 565, E-Mail: jmelendez@azti.es

Merino, Gorka
AZTI - Tecnalia /Itsas Ikerketa Saila, Herrera Kaia Portualdea z/g, 20100 Pasaia - Gipuzkoa, Spain
Tel: +34 94 657 4000; +34 664 793 401, Fax: +34 94 300 4801, E-Mail: gmerino@azti.es

Morón Correa, Giancarlo Helar
AZTI, Txatxarramendi ugartea z/g, 48395 Sukarrieta, Bizkaia, Spain
Tel: +34 671 750 079, E-Mail: gmoron@azti.es

Pascual Alayón, Pedro José
Investigador, Ministerio de Ciencia, Innovación y Universidades, Instituto Español de Oceanografía, C.O. de Canarias, Vía Espaldón, Dársena Pesquera, Parcela 8, 38180 Santa Cruz de Tenerife, Islas Canarias, Spain
Tel: +34 922 549 400; +34 686 219 114, Fax: +34 922 549 500, E-Mail: pedro.pascual@ieo.csic.es

Urtizberea Ijurco, Agurtzane
AZTI-Tecnalia / Itsas Ikerketa Saila, Herrera kaia. Portualdea z/g, 20110 Pasaia, Gipuzkoa, Spain
Tel: +34 667 174 519, Fax: +34 94 657 25 55, E-Mail: aurtizberea@azti.es

GHANA

Dovlo, Emmanuel Kwame
Director, Fisheries Scientific Survey Division, Fisheries Commission, P.O. Box GP 630, Accra, Tema
Tel: +233 243 368 091, E-Mail: emmanuel.dovlo@fishcom.gov.gh

GUATEMALA
Avalos Castillo, Cristopher Giovanny
Dirección de Normatividad de la Pesca y Acuicultura - DIPESCA
Tel: +502 470 09012, E-Mail: cristopheravalosdipesca@gmail.com

GUINEA (REP.)
Soumah, Mohamed
Responsable de Système d'Information Helieutique, Chef de Service Informatique du Centre National des Sciences Halieutiques de Boussoura (CNSHB), 814, Rue MA 500, Corniche Sud Madina, Boussoura, BP: 3738 Conakry
Tel: +224 622 01 70 85, E-Mail: soumahmohamed2009@gmail.com

JAPAN
Ijima, Hirotaka
Scientist, Highly Migratory Resources Division, Fisheries Stock Assessment Center, Japan Fisheries Research and Education Agency, 2-12-4 Fukuura, Kanazawa, Kanagawa Yokohama 236-8648
Tel: +81 45 788 7925, E-Mail: ijima_hirotaka69@fra.go.jp

Kawano, Masataka
Technical Official, International Affairs Division, Fisheries Agency of Japan, Ministry of Agriculture, Forestry and Fisheries, 1-2-1, Kasumigaseki, Chiyoda-ku, Tokyo 100-8907
Tel: +81 3 3502 8460, Fax: +81 3 3504 2649, E-Mail: masataka_kawano320@maff.go.jp

Kondo, Tomohiro
Deputy Director, Fishery Division, Economic Bureau, Ministry of Foreign Affairs, 2-2-1 kasumigaseki, Chiyoda-ku, Tokyo 1550033
Tel: +81 3 5501 8000, Fax: +81 3 5501 3664, E-Mail: tomohiro.kondo-2@mofa.go.jp

Uozumi, Yuji
Advisor, Japan Tuna Fisheries Co-operation Association, Japan Fisheries Research and Education Agency, Tokyo Koutou ku Eitai 135-0034

KOREA (REP.)
Lee, Mi Kyung
Scientist, National Institute of Fisheries Science, 216 Gijanghaean-ro, Gijang-eup, Gijang-gun, 46083 Busan
Tel: +82 51 720 2332, Fax: +82 51 720 2337, E-Mail: ccmklee@korea.kr; cc.mklee@gmail.com

Lim, Jung-Hyun
Scientist, National Institute of Fisheries Science (NIFS), 216, Gijanghaean-ro, Gijang-eup, Gijang-gun, 46083 Busan
Tel: +82 51 720 2331, Fax: +82 51 720 2337, E-Mail: jhlim1@korea.kr

MAURITANIA
Braham, Cheikh Baye
Halieute, Géo-Statisticien, Modélisateur; Chef du Service Statistique, Institut Mauritanien de Recherches Océanographiques et des Pêches (IMROP), BP 22 Nouadhibou
Tel: +222 2242 1038, E-Mail: baye.braham@gmail.com; baye_braham@yahoo.fr

MEXICO
Ramírez López, Karina
Instituto Mexicano de Pesca y Acuacultura Sustentables (IMIPAS), Centro Regional de Investigación Acuícola y Pesquera - Veracruz, Av. Ejército Mexicano No.106 - Colonia Exhacienda, Ylang Ylang, C.P. 94298 Boca de Río, Veracruz
Tel: +52 5538719500, Ext. 55756, E-Mail: karina.ramirez@imipas.gob.mx; kramirez_inp@yahoo.com

MOROCCO
El Joumani, El Mahdi
Ingénieur Halieute, Institut National de Recherche Halieutique "INRH", Laboratoire de pêche au Centre Régional de l'INRH-Laayoune, Avenue Charif Erradi N 168 Hay el Ouahda 01, Laayoune
Tel: +212 661 114 418, E-Mail: eljoumani@inrh.ma; Eljoumani.mehdi@gmail.com

Khassil, Abderrhmane
Ingénieur halieute, Institut National de Recherche Halieutique (INRH), 2, BD Sidi Abderrahman, Ain Diab., Code postal 20180 Casablanca
Tel: +212 616 468 817, E-Mail: khassil@inrh.ma

Serghini, Mansour
Institut national de recherche halieutique, Route Sidi Abderrahmane Club équestre Ould Jmel, 20000 Casablanca
Tel: +212 660 542 229, E-Mail: serghini@inrh.ma; serghini2002@yahoo.com; serghinimansour@gmail.com

NAMIBIA
Nambahu, Taimi
Senior Fisheries Biologist, Ministry of Fisheries and Marine Resources, Large Pelagic Species, 1 Strand Street P.O. BOX 912, 9000 Swakopmund Erongo
Tel: +264 644 101 000, Fax: +264 644 04385, E-Mail: Taimi.Nambahu@mfmr.gov.na

PANAMA
Pino, Yesuri
Jefa encargada del Departamento de Evaluación de Recursos Acuáticos, Ministerio de Desarrollo Agropecuario, Autoridad de los Recursos Acuáticos de Panamá, Evaluación de los Recursos Acuáticos, Edificio Riviera, Ave. Justo Arosemena, Calle 45 Bella Vista, 05850
Tel: +507 511 6036, E-Mail: yesuri.pino@arap.gob.pa

Herrera Armas, Miguel Ángel
Deputy Manager (Science), OPAGAC, C/ Ayala 54, 2º A, 28001 Madrid, Spain
Tel: +34 91 431 48 57; +34 664 234 886, Fax: +34 91 576 12 22, E-Mail: miguel.herrera@opagac.org

SENEGAL
Sow, Fambaye Ngom
Chercheur Biologiste des Pêches, Centre de Recherches Océanographiques de Dakar Thiaroye, CRODT/ISRA, LNERV - Route du Front de Terre - BP 2241, Dakar
Tel: +221 3 0108 1104; +221 77 502 67 79, Fax: +221 33 832 8262, E-Mail: ngomfambaye2015@gmail.com; famngom@yahoo.com

SIERRA LEONE
Mansaray, Mamoud
Principal Fisheries Officer, Ministry of Fisheries and Marine Resources (MFMR), 7th Floor Youyi Building, Freetown
Tel: +232 762 55590, E-Mail: mansaraymamoud85@gmail.com

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND
Walker, Nicola
Centre for Environment, Fisheries and Aquaculture Science (CEFAS), Lowesfolk Suffolk NR33 0HT
Tel: +44 1502 524450, E-Mail: nicola.walker@cefas.co.uk

Wright, Serena
Fisheries Scientist, Centre for Environment, Fisheries and Aquaculture Science (Cefas), ICCAT Tagging Programme, St. Helena, Pakefield Road, Lowestoft NR33 0NG
Tel: +44 1502 52 1338; +44 797 593 0487, E-Mail: serena.wright@cefas.co.uk

UNITED STATES
Díaz, Guillermo
NOAA-Fisheries, Southeast Fisheries Science Center, 75 Virginia Beach Drive, Miami, Florida 33149
Tel: +1 305 361 4227; +1 305 898 4035, E-Mail: guillermo.diaz@noaa.gov

Lauretta, Matthew
Fisheries Biologist, NOAA Fisheries Southeast Fisheries Center, 75 Virginia Beach Drive, Miami, Florida 33149
Tel: +1 305 209 6699, E-Mail: matthew.lauretta@noaa.gov

Peterson, Cassidy
Fisheries Biologist, NOAA Fisheries, Southeast Fisheries Science Centre, 101 Pivers Island Rd, Miami, FL 28516
Tel: +1 910 708 2686, E-Mail: cassidy.peterson@noaa.gov

Schueller, Amy
NOAA, 101 Pivers Island Road, Beaufort, NC 28557
Tel: +1 252 666 7408, E-Mail: amy.schueller@noaa.gov

URUGUAY
Domingo, Andrés
Dirección Nacional de Recursos Acuáticos - DINARA, Laboratorio de Recursos Pelágicos, Constituyente 1497, CP 11200 Montevideo
Tel: +5982 400 46 89, Fax: +5982 401 32 16, E-Mail: dimanchester@gmail.com

Jiménez Cardozo, Sebastián
Co-Convenor of ACAP's Seabird Bycatch Working Group, Constituyente 1497, 11200 Montevideo
Tel: +598 997 81644, E-Mail: jimenezpsebastian@gmail.com; sjimenez@mgap.gub.uy

Mas, Federico
Dirección Nacional de Recursos Acuáticos - DINARA, Laboratorio de Recursos Pelágicos, Constituyente 1497, CP 11200 Montevideo
Tel: +5982 400 46 89, Fax: +5982 401 32 16, E-Mail: f.masbervejillo@gmail.com; fmas@mgap.gub.uy

VENEZUELA
Arocha, Freddy
Asesor Científico, Instituto Oceanográfico de Venezuela, Universidad de Oriente, A.P. 204, 6101 Cumaná Estado Sucré
Tel: +58 424 823 1698; +58 412 692 8089, E-Mail: farochap@gmail.com

Narváez Ruiz, Mariela del Valle
Lab. 34, Edif. Instituto Oceanográfico de Venezuela, Universidad de Oriente, Departamento de Biología Pesquera, Av. Universidad, Cerro Colorado, DBP-31 Laboratory, 6101 Cumaná Estado Sucré
Tel: +58 412 085 1602, E-Mail: mnarvaezruiz@gmail.com

Rodríguez, Dhaniella
Gerente Regional, Centro Nacional de Investigación en Pesca y Acuicultura de la República Bolivariana de Venezuela, Parque Central, Piso 17, Torre Este, 1040 Caracas
Tel: +58 2125072424, E-Mail: ingdhaniela7@gmail.com

Villamizar, Victoria
Parque Central, Piso 17, Torre Este, 1040 Caracas
Tel: +58 414 5007753, E-Mail: vikvillamizar79@gmail.com

Vivas Jiménez, Maria Daniela
Ministerio del Poder Popular de Pesca y Acuicultura., Parque Central. Piso 17, 1040 Caracas
Tel: 04242808103, E-Mail: minpescaven@gmail.com

OBSERVERS FROM COOPERATING NON-CONTRACTING PARTIES, ENTITIES, FISHING ENTITIES

CHINESE TAIPEI
Su, Nan-Jay
Associate Professor, Department of Environmental Biology and Fisheries Science, National Taiwan Ocean University, No. 2 Beining Rd., Zhongzheng Dist., 202301 Keelung City
Tel: +886 2 2462 2192 #5046, Fax: +886-2-24622192, E-Mail: nanjay@ntou.edu.tw

OBSERVERS FROM NON-GOVERNMENTAL ORGANIZATIONS

BRAZILIAN ASSOCIATION OF FISH INDUSTRIES - ABIPESCA
Pestana, Lais
Assessora Técnica de Pesca e Aquicultura, Associação Brasileira das Indústrias de Pescados - ABIPESCA, 70830-010 Brasília, DF, Brazil

EUROPÊCHE
Harley, Shelton James
EUROPÊCHE, 6 Rankin St, 6012 Wellington, Wadestown, New Zealand
Tel: +64 215 58915, E-Mail: sheltonjharley@gmail.com

INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION - ISSF
Restrepo, Víctor
Chair of the ISSF Scientific Advisory Committee, International Seafood Sustainability Foundation, 3706 Butler Street, Suite 316, Pittsburgh PA 15201-1802, United States
Tel: + 1 305 450 2575; +1 703 226 8101, Fax: +1 215 220 2698, E-Mail: vrestrepo@iss-foundation.org; vrestrepo@mail.com

THE OCEAN FOUNDATION
Hordyk, Adrian
Blue Matter Science, 2150 Bridgman Avenue, Vancouver British Columbia V7P2T9, Canada
Tel: +1 604 992 6737, E-Mail: adrian@bluematterscience.com; a.hordyk@oceans.ubc.ca

Scott, Rebecca
The Ocean Foundation, 1320 19th St. NW, 5th Floor, Washington 20036, United States
Tel: +1 484 707 2461, E-Mail: rscott@oceanfdn.org

OTHER PARTICIPANTS

SCRS CHAIRPERSON
Brown, Craig A.
SCRS Chairperson, Sustainable Fisheries Division, Southeast Fisheries Science Center, NOAA, National Marine Fisheries Service, 75 Virginia Beach Drive, Miami, Florida 33149, United States
Tel: +1 305 586 6589, E-Mail: drcabrown@comcast.net; craig.brown@noaa.gov

EXTERNAL EXPERT
Cass-Calay, Shannon
United States
Tel: +1 305 775 8571, Fax: +1 305 361 4562, E-Mail: shannon.calay@calay-oss.com; shannon.calay@gmail.com

Norelli, Alexandra
PhD Student, University of Miami, Cooperative Institute for Marine & Atmospheric Studies, Marine Elite Analytics, CIMAS Office 303, RSMAS, 4600 Rickenbacker Causeway, Miami FL 33149, United States
Tel: +1 203 918 0949, E-Mail: alex.norelli@gmail.com; apn26@miami.edu; alexandra.norelli@rsmas.miami.edu

Vert-pre Kirk, Katyana
Marine Elite Analytics, 8901 La Jolla Shores Dr, La Jolla, CA, 92037, United States
Tel: +1 206 484 4837, E-Mail: vertpre.katyana@gmail.com

*****

ICCAT Secretariat
C/ Corazón de María 8 – 6th floor, 28002 Madrid – Spain
Tel: +34 91 416 56 00; Fax: +34 91 415 26 12; E-mail: info@iccat.int

Neves dos Santos, Miguel
Ortiz, Mauricio
Mayor, Carlos
Kimoto, Ai
Deprez, Bruno
García, Jesús
De Andrés, Marisa

ICCAT INTERPRETERS
Baena Jiménez, Eva J.
Calmels, Ellie
Godfrey, Claire
Liberas, Christine
Linaae, Cristina
Pinzon, Aurélie

Appendix 3

List of papers and presentations

Doc Ref	Title	Authors
SCRS/2025/145	Atlantic bigeye tuna stock assessment using biomass dynamic models. A comparative between SPiCT and MPB.	Merino G., Urtizberea A., Moron-Correa G., Santiago J.
SCRS/2025/150	Progress toward the estimation of mortality rates for Atlantic skipjack tuna derived from AOTTP conventional tagging data	Cass-Calay S., Ailloud L.
SCRS/2025/151	Preliminary 2025 stock synthesis assessment model for bigeye tuna in the Atlantic Ocean.	Urtizberea A., Lauretta M., Ortiz M., Kimoto A., Angueko D., Calay S., Correa G.M., Harlye S.J., Ijima H., Liniers G., Merino G., Narvaez M., Wright S.
SCRS/2025/152	Calibrating the preliminary Poseidon-Atlantic model for purse seine tropical tuna fisheries	Powers B., Vert-Pre K.A., Norelli A., Grande M., Merino G., Moreno G., Die D., Murua H., Erauskin-Extramiana M., Restrepo V.
SCRS/2025/156	Spatial depletion analysis of Atlantic bigeye tuna stock using a Spatio-Temporal population model (SPTM)	Ijima H., Nishimoto M., Jusup M.
SCRS/2025/157	The tuning of the tuna: redesigning harvest strategies for the western Atlantic skipjack tuna	Sant'Ana R., Mourato B.L., Hordyk A.
SCRS/2025/158	Through a Bayesian lens: revisiting the status of Atlantic bigeye tuna with JABBA	Sant'Ana R., Mourato B.L., Kimoto A., Ortiz M.
SCRS/2025/159	Testing of different fleet structures and data weighting in stock synthesis for bigeye tuna stock assessment	Jiang M., Song. S., Zhang F.
SCRS/P/2025/060	Tropical Tuna Research and Data Collection Plan: 2026 – 2029 costings and strategy	Wright S.
SCRS/P/2025/061	Summary of updated statistical data available for bigeye tuna	Secretariat
SCRS/P/2025/062	Management Procedure for multistock MSE: How will it work when adopted	Merino G., Urtizberea A., Laborda A., Correa G.M., Santiago J., Arrizabalaga H.
SCRS/P/2025/063	A sensitivity run using Canary baitboat standardized CPUE	Liniers G.,
SCRS/P/2025/064	Justification for Poseidon Atlantic model for purse seine tropical tuna fisheries	Vert-Pre K.A., Powers B., Norelli A., Grande M., Merino G., Moreno G., Die D., Murua H., Erauskin-Extramiana M., Restrepo V.
SCRS/P/2025/065	Responses to Commission tropical tunas	Cass-Calay S.

Appendix 4

SCRS document and presentations abstracts as provided by the authors

SCRS/2025/145 - Biomass dynamic models have been developed periodically to support the stock assessments of Atlantic tropical tunas. In this document we have configured an application of a biomass dynamic model using the SPiCT R-package, which is included in the ICCAT software catalogue. This package is used to estimate recent trends in biomass and fishing mortality, reference points (MSY, B_{MSYy} and F_{MSY}) and the uncertainty around them. We propose this model to replace the software used in recent years (*mpb*). For this, we compare the estimates of the two models when fitting the same catch and CPUE data. Overall, both models indicate that the stock has recovered to sustainable levels, most likely due to catch reductions implemented in ICCAT after a period of overfishing.

SCRS/2025/150 - Reliable estimates of fishing (F) and natural mortality (M) are essential to stock assessment and fisheries management because they determine the impact of fishing on the population and scale the productivity of the stock. Multi-year tagging studies, such as AOTTP, can be used to estimate annual mortality rates assuming aspects of tag recovery (e.g. reporting, shedding, tag-induced mortality) can be quantified. To estimate total mortality (Z) and its components (F+M), we applied a Hoenig (1998) instantaneous tag return model using the fish methods package in R (Nelson 2023). Z was estimated at 0.67 for skipjack tuna 35-80 cm SFL during the years 2016-2023. For smaller skipjack (35-49 cm) the estimated Z was higher (0.72). Estimates of M and F depended largely on the assumed tag reporting rate (λ), and to a lesser extent on the tag survival (φ). The estimated M decreased with lower λ while F increased. Lower φ also resulted in a lower M and higher F, but the effect was smaller. In comparison to the 2022 stock assessment and previous studies, estimates of M from this study appear lower than expected. In preliminary examinations, the estimates were sensitive to the recovery years used in the analysis, and the number of quarters assumed for full mixing of the tagged fish into the target population. Both will be considered as these preliminary estimates are refined.

SCRS/2025/151 - We present the provisional Stock Synthesis population assessment results of Atlantic bigeye tuna for the period 1950 to 2023. The recommendations outlined by the SCRS tropical tuna work group at the data preparatory meeting were implemented successfully. A reference case model is presented with a suite of diagnostics. The model structure is fully compatible with the Atlantic yellowfin and East Atlantic skipjack Stock Synthesis models for integration into the multi-stock management strategy evaluation. The influence of key fixed parameters (steepness and natural mortality) and an alternative juvenile index of abundance (purse seine FOB index) are to be evaluated using the uncertainty grid model ensemble approach after adoption of a reference case model during the assessment workshop.

SCRS/2025/152 - This report presents the third progress update for the POSEIDON-Atlantic project, which adapts the POSEIDON model, originally developed for the eastern Pacific, to the eastern Atlantic tropical tuna purse seine fishery targeting yellowfin (YFT), skipjack (SKJ), and bigeye (BET) tuna. The model aims to support analyses of fleet behavior, FAD usage, ICCAT management measures, and socioeconomic dynamics. Since SCRS/2025/092, significant updates have been integrated, including Species Distribution Models, vessel-specific characteristics, and flag-specific fishing preferences. These enhancements enabled testing of four behavioral algorithms: VPS, Where the Money Is (WMI), MVT, and Where FADs Are (WFA), using short-term calibration exercises. Two-step, long-term calibrations employing genetic and particle swarm optimization were completed for the two best-performing algorithms, WFA and WMI, yielding errors of 9.1% and 11.1%, respectively. A future calibration will test “Where the Biomass Is,” a hybrid approach potentially better suited to Atlantic dynamics. Next, the project will analyze policy scenarios, focusing on FAD management impacts. The report highlights the importance of increased data-sharing to strengthen the model’s reliability as a decision-support tool for sustainable fisheries management in the Atlantic region.

SCRS/2025/156 - This study reports progress in developing a Spatio-Temporal Population Model (STPM) that statistically separates the spatio-temporal structure of population dynamics and estimates temporal changes in catchability. The STPM is a state-space model consisting of a process model and an observation model. In the process model, we incorporated spatial dependent parameter and process error. The observation model explicitly modeled catchability using both total catch and raw CPUE data. An example analysis using 1979–2023 data for Atlantic bigeye tuna showed a contraction in the stock's spatial distribution and a consistent upward trend in catchability, both of which were successfully distinguished and quantified by the STPM. Furthermore, evaluating spatial depletion rates suggested that fishing impact may vary across different oceanic regions. STPM is highly flexible, providing a useful foundation for future improvements and statistical comparisons. We plan to continue developing this model for its application in stock assessment.

SCRS/2025/157 - This document summarizes the current status of the development of the western Atlantic skipjack tuna management strategy evaluation (SKJ-W MSE).

SCRS/2025/158 - The stock assessment of Atlantic bigeye tuna considered three scenarios (S01, S02, S03) with varying steepness values, using standardized CPUE indices. Model fits were consistent across scenarios, with residuals centered around zero and no strong temporal patterns. Retrospective and hindcasting analyses demonstrated model stability and predictive skill. Time series of B/B_{MSY} and F/F_{MSY} revealed a historical decline followed by recent recovery, with biomass currently near or above B_{MSY} and fishing mortality near or below F_{MSY}. Kobe plots for 2023 place the stock in the green quadrant across all scenarios, indicating that overfishing is not occurring and the stock is not overfished. Overall, results suggest the stock is within sustainable biological limits and robust to alternative model assumptions.

SCRS/2025/159 - This study examines the relative influence of fleet structure and data weighting schemes on stock assessment results for bigeye tuna using Stock Synthesis. Six alternative model scenarios were evaluated, including changes to fleet structure configuration and adjustments to the weights assigned to abundance indices. The results demonstrate that modifications to fleet structure have a substantial impact on assessment outputs, whereas varying the weights of indices such as the BAI has only a minor effect. These findings indicate that assessment outcomes are far more sensitive to assumptions about fleet composition than to adjustments in data weighting. Our results highlight the importance of accurately specifying fleet structure in stock assessment modeling to ensure credible and robust management advice for bigeye tuna fisheries.

SCRS/P/2025/060 - This presentation provided an update on the Tropical Tuna Research and Data collection plan (TTRaD) including Terms of Reference (ToRs) status and activities, the workplan for 2025, and a summary of the core themes for the next six years (2026–2031) with estimated costings (2026–2029) and priorities (2026).

SCRS/P/2025/061 - This presentation provided an overview of the most recent statistical information on tropical tunas available in the ICCAT database, with a primary focus on bigeye tuna (BET). It reviews all Task 1 and Task 2 datasets and describes tools developed to support data exploration, such as the updated T1NC dashboard. It also identifies several data quality issues that warrant attention. Regarding Task 1 Nominal Catches (T1NC), the document summarizes BET catches by gear and year and notes a declining trend in catches since 2016. It outlines discrepancies between the datasets available during the 2025 Data Preparatory Meeting and those used in the stock assessment session, mainly due to updated 2024 submissions and the recovery of historical data. It further details the reclassification of BET catch records into landings, landings from *faux poissons*, and dead discards in line with SCRS standards. Finally, the document presents a detailed review of Task 2 Catch and Effort (T2CE) and Size (T2SZ) data, highlighting persistent limitations such as low spatial or temporal resolution and missing information on effort and fishing mode in some records.

SCRS/P/2025/062 - It summarizes the current multi-stock tropical tunas MSE, focusing on how the Management Procedures (MPs) function. The main MSE components - Operating Models, Observation Error Model, and Candidate Management Procedures - are complete, and the process may soon move to a new phase involving communication with the Commission and stakeholders. The presentation discussed ongoing evaluations of initial CMP versions and explained their practical application, outlining MPs for either bigeye tuna only or all three species. In the bigeye tuna MP, catch advice uses a surplus production model (SPiCT) to guide the harvest control rule and set total allowable catch (TAC). The MP calculates the required fleet effort for the bigeye quota, then projects the OMs of yellowfin and skipjack under this effort at each time step. Alternatively, separate management procedures (MPs) could be used for all three species, setting limits based on the most restrictive catch requirement and adjusting catches accordingly.

SCRS/P/2025/063 - This presentation detailed a sensitivity model run that incorporates the standardized CPUE from the Canary baitboat (BB) fleet. The analysis used a modified version of the Stock Synthesis reference model to evaluate the impact of including this additional index. The Canary BB standardized CPUE was presented at the Data Preparatory meeting (document SCRS/2025/076), and the Group suggested to use it for a sensitivity run. Following what was done for other CPUE series, the index values were scaled to have a mean of 1, and the associated coefficients of variation (CVs) were upscaled to achieve a mean CV of 0.2. The Canary BB CPUE index was linked to the selectivity pattern of the North Azores baitboat fleet, maintaining biological realism. Index fits and parameter estimation, match closely the reference run. Results from this sensitivity run match the reference model almost exactly, indicating minimal impact from the inclusion of the Canary BB. This suggests that the additional index does not alter the reference model's interpretation significantly, but its inclusion could provide a useful robustness test or serve as supporting evidence in future assessments.

SCRS/P/2025/064 - This response to SCRS 's request outlines the justification for developing the POSEIDON-Atlantic model, a spatially explicit tool designed to simulate tropical tuna fisheries and evaluate the impact of management measures on purse seine (PS) and longline (LL) fleets. The model supports ICCAT's need for robust, science-based decision-making by enabling rapid testing of management scenarios, including FAD regulations and fishery closures and integrating socio-economic assessments. It responds directly to ICCAT Rec. 24-01 by evaluating differential gear impacts and potential spatial measures. The project requires detailed vessel- and action-level data to calibrate fleet behavior and capture spatial dynamics. Ultimately, POSEIDON aims to deliver an integrated framework for assessing ecological, biological, and economic trade-offs to inform ICCAT's 2027 management review.

SCRS/P/2025/065 - The ICCAT Commission frequently requests additional information or analyses to better inform management decisions. These requests generally pertain to stock assessments, the efficacy of management measures, or other scientific matters necessary for informed decision-making. The SCRS then undertakes the necessary research and analysis and presents its findings in the form of reports and presentations at subsequent meetings. This presentation describes several active Commission requests that the Tropical Tunas Species Group has agreed to address in 2025. The work is underway and to the extent possible, drafts will be circulated in early September. Final responses will be reviewed, revised as needed and adopted by the SCRS at its 2025 Annual Meeting.