INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS

COMMISSION INTERNATIONALE POUR LA CONSERVATION DES THONIDES DE L'ATLANTIQUE

COMISION INTERNACIONAL PARA LA CONSERVACION DEL ATUN ATLANTICO

REPORT OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS (SCRS)

(Hybrid/ Madrid (Spain) – 29 September – 3 October 2025)

October 2025

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Report of the Standing Committee on Research and Statistics (SCRS)
(Hybrid/ Madrid (Spain) – 29 September – 3 October 2025)

1. General remarks by the SCRS Chair and the Executive Secretary

The 2025 Meeting of the Standing Committee on Research and Statistics (SCRS), held in a hybrid format, was opened on Monday, 29 September 2025 by Dr Craig Brown, Chair of the Committee.

General remarks by the SCRS Chair, Dr Craig Brown

The SCRS Chair welcomed all participants, both online and in-person, and expressed his appreciation for the level of participation, as well as for the level of participation throughout the year. The Chair noted the enormous volume of scientific work carried out during the year by the various Working Groups with the support of the Secretariat and pointed out that this meant that this Committee had in front of it a large task to review this work. However, the Chair reminded the Committee that now was the opportunity to all work together across the Working Groups in collaboration to develop the consensus scientific advice to include in its annual report to the Commission.

Furthermore, the Chair highlighted that this year the new format of the Species Executive Summaries was applied and reminded the Committee that the science budget discussion should take into consideration the current financial constraints. A special reference was made to the draft SCRS Strategic Plan for the period 2026-2031, encouraging the Committee to carefully review this most recent draft so that discussions later in the meeting would be more productive. The Chair expressed his confidence in the Committee and wished all a good meeting.

General remarks by the ICCAT Executive Secretary, Mr Camille Jean Pierre Manel

The ICCAT Executive Secretary, Mr Camille Jean Pierre Manel, addressed the meeting, welcomed all the participants and congratulated all the scientists who have worked closely with the Secretariat, as well as to all the staff of the Secretariat for their remarkable commitment.

He also highlighted the discussions within the Commission on the budget, which suggest a realignment of available financial resources due to a slowdown in expected increases, but particularly to a trend towards reduction in voluntary financial contributions in a context marked by a high and growing number of requests to the Secretariat. He added that this situation requires the Commission's subsidiary bodies to readjust their objectives and activities to the resources available, as failure to do so could have an impact on the current conduct of activities, such as the number of meetings, their format, and insufficient coverage by the Meeting Participation Fund.

The Executive Secretary invited the SCRS to take the budgetary constraints into account in its planning, and called for a limitation on the number of meetings and of their format and duration. Although the exercise seems complex, he trusts that it remains possible. Moreover, he noted with satisfaction, a trend of reduction in the number of meetings in recent years and expected that this effort at streamlining will continue in the years to come. Finally, he reiterated the Secretariat's full commitment and availability to the SCRS and expressed his wish for a fruitful meeting.

The opening address of the Executive Secretary is contained in **Appendix 1**.

2. Adoption of agenda and arrangements for the meeting

The agenda was approved with a few changes and is provided in **Appendix 2**. Full assessments were carried out this year on shortfin mako (SMA), bigeye tuna (BET), and white marlin (WHM). Additionally, intersessional meetings were held for the Subcommittee on Ecosystems and Bycatch (SC-ECO), Working Group on Stock Assessment Methods (WGSAM), the Small Tunas Species Group and the Bluefin Tuna Species Group. Additionally, there was a meeting of the Standing Working Group on Dialogue between Fisheries Scientists and Managers (SWGSM), as well as one SCRS Science Strategic Plan Meeting.

The following scientists served as rapporteurs of the various species sections (agenda item 9) of the 2025 SCRS Report.

YFT - Yellowfin tuna	M. Lauretta
BET - Bigeye tuna	S. Cass-Calay
SKJ - Skipjack tuna	D. Angueko (East), R. Sant'Ana (West)
ALB – Albacore	H. Arrizabalaga (North Atlantic), B. Mourato (South Atlantic), J. Ortiz de Urbina (Med)
BFT - Bluefin tuna general	C. Brown (Coordinator), J. Walter (West), T. Rouyer (East)
BIL - Billfishes	K. Ramírez
SWO - Swordfish	K. Gillespie (Coord. and North), L. G. Cardoso (South), G. Tserpes (Med)
SMT - Small tunas	C. N'Guessan
SMA - Shortfin mako	R. Forselledo
BSH - Blue shark	R. Forselledo
POR - Porbeagle	R. Forselledo
SBF - Southern bluefin	
WGSAM -	F. Zhang

The following served as Co-convenors:

Ecosystems and bycatch	A. Domingo and A. Hanke
Statistics	P. Lino

The Secretariat served as rapporteur for all Agenda items.

3. Introduction of Contracting Party delegations

The Executive Secretary introduced the 39 Contracting Parties present at the 2025 meeting both online and in person: Algeria, Angola, Belize, Brazil, Canada, China (P.R.), Costa Rica, Côte d'Ivoire, Cuba, Curaçao, Egypt, El Salvador, European Union (EU), Gabon, The Gambia, Ghana, Guatemala, Guinea (Rep.), Japan, Korea (Rep.), Liberia, Mauritania, Mexico, Morocco, Nigeria, Norway, Panama, Russian Federation, São Tomé e Príncipe, Senegal, Sierra Leone, South Africa, Saint Vincent and the Grenadines, Tunisia, Türkiye, United Kingdom, United States, Uruguay, and Venezuela. The List of Participants at the Species Groups Meetings and the Plenary Sessions is attached as **Appendix 3**.

4. Introduction and admission of observers

Representatives from one Cooperating non-Contracting Parties, Entities, or Fishing Entities (Chinese Taipei), two inter-governmental organizations (Agreement on the Conservation of Albatrosses and Petrels (ACAP), and Sargasso Sea Commission) and 17 non-governmental organizations (Birdlife International (BI), Defenders of Wildlife, Deutsche Stiftung Meeresschutz/German Foundation for Marine Conservation (DSM), Ecology Action Centre (EAC), Europêche, Federation of European Aquaculture Producers (FEAP), Fishery Improvement Plan (FIP), Federation of Maltese Aquaculture Producers (FMAP), Global Fishing Watch, International Seafood Sustainability Foundation (ISSF), Marine Stewardship Council (MSC), Monterey Bay Aquarium, Pew Charitable Trusts (PEW), Pro Wildlife, The Billfish Foundation, The Ocean Foundation, The Shark Trust and Worldwide Fund for Nature (WWF) were admitted as observers and welcomed to the 2025 meeting of the SCRS (see **Appendix 3**).

5. Admission of scientific documents and presentations

As of 29 September 2025, a total of 208 scientific papers and 111 scientific presentations had been submitted at the different SCRS meetings. The List of SCRS Papers and Presentations is attached as **Appendix 4.**

Besides the scientific documents and presentations, there are 11 reports of 9 intersessional meetings, 1 subcommittee meeting and 1 Working Group meeting, 47 Annual Reports from the Contracting Parties, and non-Contracting Cooperating Parties, Entities and Fishing Entities, as well as various documents by the Secretariat.

6. Report of ICCAT Secretariat activities on statistics and science

The Secretariat summarized its activities, data reported, publications, website updates, and other information contained in the 2025 Secretariat Report on Research and Statistics related to fisheries and biological data submitted for 2024, which included revisions to historical data. The activities and information included in this report refer to the period between 2 September 2024 and 1 September 2025 (the Reporting Period).

Between September 2024 and September 2025, the Secretariat managed extensive data, IT, and meeting support, addressing persistent issues with data quality and Task 2 gaps while advancing Integrated Online Management System (IOMS) integration, publishing major outputs, and supporting 38 meetings and 78 research contracts. Progress included the development of new modules, IT upgrades, and international collaborations, although modernization delays and workload pressures persisted.

The Committee expressed its appreciation for the substantial work carried out by the Secretariat, noting that the resources available had not increased commensurately with the workload. Questions were raised regarding the application of data filters (Filter 1) to process submissions. The Secretariat clarified that e-form version control was included in the Filter 1 process and that, with IOMS implementation, only the latest versions of the forms could be processed. The Form Manager in IOMS was active and processed all ST forms, with uploaded submissions checked for coding and other errors, although this process was currently initiated by the Secretariat. It was noted that future enhancements might allow filters to be applied automatically and responses sent directly to users. Additional refinements were under development to improve feedback, including a feature to provide CPCs with automatic status updates on their submissions, thereby reducing workload for both CPCs and the Secretariat.

The Committee noted that creating catch distribution (CATDIS) for species such as blue shark and shortfin mako for the full historical period back to 1950 would be extremely difficult. It therefore enquired whether CATDIS products for these species could be generated for the most recent decade (2015 onwards). The Secretariat responded that, given current availability of Task 1 and Task 2 data, this would remain a difficult task due to substantial data gaps.

The Secretariat also presented a report on JCAP-3 activities during the reporting period. The document "Coordinator's report on activities of the ICCAT/Japan Capacity-Building Assistance Improvement Project (Phase 3) (JCAP-3) 2024/2025" summarized the launch of the ICCAT/Japan Capacity-Building Assistance Project (Phase 3) (JCAP-3) in December 2024, following the completion of JCAP-2. The Steering Committee was established and approved funding for eight new national projects across Africa to improve data collection, reporting, and observer training. Activities in 2025 included training courses in Ghana, São Tomé e Príncipe, Gabon, Egypt, Nigeria, and Guinea (Rep.), covering species identification, data improvement, electronic tagging, and sustainable fishing practices. Senegal also benefitted from a research grant for advanced training on abundance indices and species distribution modelling. Financially, the project was supported by €98,859 from Japan, together with a JCAP-2 carryover, with most expenditures directed to workshops, training and data improvement.

The Committee discussed JCAP-3 and emphasized the importance of capacity building within the ICCAT community. The Fisheries Agency of Japan confirmed its intention to continue funding the programme, and the Committee expressed its appreciation to Japan both for coordinating the fund and for the governments that had used it to support their capacity-building initiatives. It was further noted that this contribution enabled Brazil to initiate preliminary work for the western skipjack MSE. All CPCs that received JCAP funding expressed their gratitude to Japan.

Discussion

The Committee acknowledged and thanked the Secretariat for the extensive, efficient and hard work of the Secretariat to deliver the SCRS requests, and keeping the usual standards under such an increasing heavy workload.

The Committee also welcomed the proposal for collaboration between ICCAT and the General Fisheries Commission for the Mediterranean (GFCM), related to research activities in the Mediterranean under the ecosystem, bycatch, and fisheries commonality and monitoring activities. It was highlighted by Mediterranean CPCs the benefit of this agreement to facilitate the integration of common activities within their national research activities especially for small pelagic species. GFCM participants were welcomed to the upcoming ICCAT workshop on the impact of ICCAT fisheries on sea turtles in the Mediterranean Sea, noting that the meeting's objectives were already set and work was progressing on specific tasks.

The Committee acknowledged and thanked Japan for their financial support for several capacity building projects carried out throughout 2024. The Committee also thanked Japan for the new 5-year ICCAT/Japan Capacity Building Assistance Project (Phase 3) that started in December 2024.

7. Review of national fisheries and research programmes

The Annual Reports made available electronically included the information as submitted by CPCs which could be reviewed and validated by the Secretariat by 1 October 2025. Further updates may be required for the Commission, as some information may be pending validation or correction.

8. Reports of intersessional SCRS meetings

In 2023, the Committee agreed that the individual intersessional meeting summaries (previously contained within this section 8) should no longer be included in the SCRS annual report. Any specific notes about any particular intersessional meeting made by the Committee, would be included below this section.

This table shows all Detailed Reports of the intersessional meetings held in 2025 (including links). These Reports have been posted in the ICCAT Collect. Vol. Sci. Pap. Vol. 82 and in the ICCAT meetings webpage.

Item No.	*Detailed Report*
8.1	Working Group on Stock Assessment Methods (WGSAM)
8.2	Shortfin Mako Shark Data Preparatory Meeting
8.3	White Marlin Data Preparatory Meeting
8.4	Bluefin Tuna Species Group Intersessional Meeting
8.5	Bigeye Tuna Data Preparatory Meeting
8.6	Subcommittee on Ecosystems and Bycatch Intersessional Meeting
8.7	Small Tunas Species Group Intersessional Meeting
8.8	Shortfin Mako Shark Stock Assessment Meeting
8.9	White Marlin Stock Assessment Meeting
8.10	Meeting of the Standing Working Group on Dialogue between Fisheries Scientists and Managers (SWGSM)
8.11	SCRS Science Strategic Plan Meeting
8.12	Bigeye Tuna Stock Assessment Meeting

Discussion

Working Group on Stock Assessment Methods

The Committee thanked Dr Michael Schirripa for serving as Chair of the Working Group on Stock Assessment Methods (WGSAM) for more than 10 years. The Committed also thanked Dr Carmen Fernandez for acting as rapporteur during the 2025 meeting, and wished success to Dr Fan Zhang as the new WGSAM Chair.

The Committee considered the 2026 workplan, originally proposed at the Meeting of the Working Group on Stock Assessment Methods in February 2025 to reflect 2025 work across Committees. It recognized the need to revise the workplan before endorsement.

New tasks for the WGSAM include reviewing statistical methodologies for estimating discards presented in 2025 by CPCs. The Committee cautioned that this review could duplicate work already conducted by Species Groups and stressed the need for clear terms of reference to define the roles of WGSAM and Species Groups for conducting such reviews.

The Committee considered a proposal for creating a dedicated subgroup of Management Strategy Evaluation (MSE) experts within the SCRS to support MSE development and standardization. It was argued that if these responsibilities are endorsed and retained, the WGSAM should extend its meetings to five days to accommodate the growing MSE workload and preserve time for other methodological issues.

The Committee also committed to reviewing best practices for stock assessment and to addressing non-stationarity in future work.

The Committee considered the recommendation to complete MSE processes within two years. It recognized that technical work might conclude within that timeframe, but emphasized that the broader process, including Commission and SCRS feedback, requires more time. The Committee noted that the Species Groups already conduct multiple processes (SWO, TRO, ALB, BFT) in parallel and MSE represents an ongoing activity.

The Committee reviewed the proposal for an MSE Coordinator. It acknowledged the importance of the function but raised concerns about costs and overlap with existing Secretariat expertise. Some participants supported creating an ad hoc expert working group on MSE to address the external review recommendations, provided it fits within the existing SCRS structure, while others emphasized the need for a dedicated Coordinator. Participants agreed that Secretariat staff have the expertise, but neither the time to handle all tasks, nor technical capacity to do all the analyses requested by the Committee. Wherever it might fit into the organizational chart, this Working Group has the potential to contribute to SCRS activities on MSE in a variety of ways.

The Committee discussed participation in the Bycatch Estimator Tool (BYET) (the R package BycatchEstimator) workshop. It identified limited fluency in the R programming language as a barrier and suggested postponing the 2026 training workshop until completion of the Shiny App. The Chair asked whether the Shiny App would be ready before the training. Under the current plan and budget, the contractor will attend the course to support participants, but the App itself may not be available.

The Committee emphasized that CPCs attending the workshop should begin applying the Bycatch Estimator Tool in their official statistical data submissions, while recognizing that the tool remains under development and may not be immediately operational or even necessary for some CPCs that have their own tools dedicated for this purpose.

Finally, the Committee discussed the WGSAM's potential role in reviewing bycatch estimation methods. The Committee also questioned whether the WGSAM should review methods that Species Groups have already examined and that CPCs already use. The Committee suggested that the WGSAM review and provide feedback on the CPCs' own methodologies, if necessary, in 2026. However, it stressed that the SCRS must clarify several aspects of the process for reviewing methods used at the SCRS including the criteria used, as well as roles for the WGSAM, Species Group, and the CPCs in determining the validity of methods.

Intersessional Meeting of the Small Tunas Species Group

The Committee expressed its appreciation to the Small Tunas Species Group and noted the substantial amount of work accomplished within a limited timeframe. It emphasized the crucial role of capacity-building workshops in advancing stock assessment work for small tunas. These efforts represented an important step toward fulfilling the Committee's objective of providing robust scientific advice, and the Committee highlighted the importance of close involvement of the Working Group on Stock Assessment Methods in this process. It emphasized the need to ensure careful scrutiny of any data-limited methods applied to small tunas.

White Marlin Data Preparatory and Assessment Meetings

The Committee noted that estimated fishing mortality for white marlin declined and remained low over the last ten years. However, the stock showed limited recovery. The prevailing hypothesis was that not all mortality sources, including bycatch, were accounted for. The Committee requested that the SCRS Chair raise this point with the Commission and recommended that all relevant data be reported. It further noted that generating and applying a combined index using data from all CPCs would greatly improve the white marlin stock assessment.

Bigeye Tuna Data Preparatory and Assessment Meetings

The Committee considered the 2025 Atlantic bigeye tuna stock assessment (Anon., 2025j), which applied an uncertainty grid of 18 model runs to estimate stock status and develop management advice. Among the achievements highlighted were the statistical treatment of natural mortality and the weighting of models according to a lognormal probability distribution. It was noted that the process was well organized, with intersessional work and steady progress allowing many key decisions to be resolved in advance, and it commended the rapporteur and modelling teams for their contributions. The overall procedure was noted as an example of efficiency, completeness, and transparency.

The Committee also discussed the importance of diagnostics and expressed concern about mixing subjective judgments with statistical tests. It observed that in some cases diagnostics failed, yet models continued to be used, which could undermine confidence in the advice. It concluded that the Committee would benefit from establishing a clear hierarchy distinguishing essential diagnostics that assessments must pass, from those that may be relaxed, in order to provide greater consistency and transparency in the assessment process.

Some elements of the Executive Summary generated debate. With respect to the current yield, the Committee agreed to report 2024 values in the relevant table rows and to include the 2025 TAC in the "Management measures in effect" of the Executive Summary. The Committee discussed how to capture the recommendations in effect for this and other stocks, agreeing to: (i) refer to the specific Recommendation numbers without attempting to summarize their contents, and (ii) to list the most recent Recommendation(s) currently in effect.

9. SCRS Science Strategic Plan

The Chair provided an overview of the process to develop the draft SCRS Science Strategic Plan 2026-2031, which included three hybrid meetings (2024 SCRS Workshop, 2025 SWGSM and SCRS Science Strategic Plan meetings) and an online drafting process which was open to all SCRS delegations in the first phase in 2025, and also open to all participants of the SCRS Science Strategic Plan Meeting for the second phase. Comments and proposed edits from CPCs were taken into account at the SWGSM and again in September 2025.

The Chair also provided an overview of the draft Strategic Science Plan, including an explaining the structure of the document and giving a summary of the contents at the level of goals within each element. Finally, the Committee was shown some requests for modifications received in the last round of comments from CPCs which had not yet been addressed in the draft Strategic Science Plan.

The Committee reviewed the process used to draft the strategic plan and provided a brief overview of its contents. It noted that the current version lacked a coherent strategic framework and emphasized the need for a clear set of ranked research priorities aligned with the Commission's objectives, including explicit links to financial requirements. After further discussion, the Committee acknowledged that, given the significance of the document which requires extensive discussion, the Committee will not likely have enough time to properly discuss the strategic plan, neither during future SCRS Plenary meetings nor intersessional period in near future given the amount of work required by the Commission. Therefore, the Committee decided to postpone the discussion on the strategic plan until it finds better time and method to discuss it.

The Committee agreed to append the Strategic Plan in its current form as **Appendix 5** to this report.

Discussion

The Chair presented the "SCRS Chair's draft proposal to advance the development of the SCRS Science Strategic Plan". The process would begin with Commission input in 2025, followed by formation of a small drafting group open to all SCRS scientists. Objectives would be linked to budgets, assigned measurable metrics, and a draft plan submitted to the SCRS Plenary for review and possible approval before consideration by the Commission. The SCRS Chair first asked whether members could dedicate time to the drafting group and noted that a key element of revising the plan would be aligning it with the budget.

The Committee highlighted the value of scientific contributions to ICCAT, noting that reported catches for many species are at historically high levels. However, it also expressed concern that completing the plan in 2026 would not be feasible given the Commission's workload demands. The Committee therefore proposed pausing further work on the plan until adequate time is available.

10. Report of the Meeting of the Subcommittee on Ecosystems and Bycatch

The Co-convenors of the Subcommittee on Ecosystems and Bycatch summarized the key activities of the Subcommittee in the last year as well as its Workplan, and its recommendations.

Pertaining to ecosystems

The Subcommittee on Ecosystems and Bycatch reviewed progress on the ICCAT EcoCard, indicator development, and the application of ecosystem approaches to fisheries management. It recommended refining and updating indicators, advancing EcoCard development through dedicated workshops, and strengthening coordination with other tuna RFMOs on ecosystem-related initiatives.

The Committee requested that the number of days for each meeting, together with an explanation for the days requested, be provided. Estimates of the number of days and the supporting rationale were presented in advance of the final text adoption.

The Committee thanked Dr Alexander Hanke for serving as Co-convener responsible for the ecosystem component for 14 years, for his dedication, commitment and leadership during his tenure. It was announced that Dr Eider Andonegi would assume this role after the 2025 Commission meeting.

Pertaining to bycatch

The Subcommittee on Ecosystems and Bycatch reviewed progress on sea turtles, seabirds, gear modifications, and data coordination, and advanced the design of a new Bycatch Research and Data Collection Programme (PIRDCaF). It recommended precautionary measures for vulnerable shark species, continued evaluation of mitigation measures for seabirds, improved reporting on emerging gear types, and recommended convening a workshop to finalize the programme and reinforce collaboration with other tuna RFMOs.

The Committee noted that more collaborative projects are needed using standardized data and methods. In response, the Co-convener noted that it would continue with its collaborative initiatives. The Committee emphasized that such collaboration, supported by standardized approaches, is essential for advancing the new PIRDCaF and for strengthening coordination with other tuna RFMOs.

The Committee questioned whether an in-person workshop was necessary to finalize the PIRDCaF and whether participation from parties outside ICCAT was required. The Co-convenor responded that an in-person workshop would be ideal to complete the product, and that it would be preceded by a series of online meetings to advance the work in preparation.

The Report of the 2025 Meeting of the Subcommittee on Ecosystems and Bycatch is provided here.

11. Report of the Meeting of the Subcommittee on Statistics

The Report of the 2025 Meeting of the Subcommittee on Statistics is provided here. However, due to time limitations during that meeting, the report was adopted by correspondence.

Also due to time constraints, several agenda items were elevated to the SCRS Plenary for decision. The SCRS reviewed and endorsed the following items:

- The Committee approved a change to the processing workflow for Tasks 1, 2 and 3. Each year, on 1 September, the Secretariat shall finalize the compilation of all Task 1/Task 2/Task 3 information. Three days later, a Circular shall be issued to all CPCs informing them of the data currently held in the ICCAT-DB for their review. CPCs shall submit within 10 days any modifications they deem necessary. The Secretariat shall then compile these changes; after this 10-day window, no new data will be added to the dataset for the Committee review, except in cases where additions are required to correct Secretariat errors or where expressly requested by the Committee.

- The Committee approved, on a temporary basis, the inclusion of the TPL gear code to allow reporting of the so-called trapline/meka ring gear. To better characterize effort, an additional effort field measured as number of traps/rings will be included; a second, effort measure (number of hooks) should be reported. Reporting by CPCs will be voluntary.

- The Committee approved the use of SFA for *Istiophorus platypterus* and the discontinuation of SAI for that species.

Other SC-STAT recommendations endorsed by the SCRS:

- Holding a 2-day online intersessional meeting in 2026 and report back to the Committee about its usefulness. Based on the latter, the Committee agreed to the possibility of holding this meeting every two years.

- The Secretariat shall work together with an ad hoc group to modify form ST09, aiming to include the minimum feasible subset of additional information requested by Rec. 22-12, and to determine how to deal with potential discontinuities caused by changing the structure of form ST09. The result of the work of the ad hoc group will be presented at the 2026 Meetings of the Subcommittee on Ecosystems and Bycatch and Subcommittee on Statistics.

- The Committee recommended that scientists from all CPCs interested in participating in the ad hoc group to modify the ST09 form, should contact the Secretariat before the end of 2025.

- Establish an ad hoc working group to standardize the T1NC tables included in the Executive Summaries.

- Establish an ad hoc working group to review and update the *ICCAT Rules and Procedures on data protection, access, and dissemination*, and to propose text amendments and an implementation timeline at the 2026 Committee plenary meeting.

- Establish an ad hoc working group to define a standardized procedure for addressing reporting gaps via estimates ("carryovers") and to produce guidance for Species Groups/Executive Summaries.

- Establish a small ad hoc working group to refine the Secretariat's CSV flat-file proposal for ST04 (Size Samples), inviting CPCs currently using specially agreed formats to participate, and to consider defining analogous flat-file specifications for ST05 (Catch-at-Size) and ST03 (Catch and Effort).

- Any CPC wishing to participate in any of the above ad hoc groups is invited to contact the Secretariat by 31 December 2025.

- The Committee recommended that the L-W relationship for BFT for the Cantabrian Sea for the period of June to August (SCRS/2025/179) be used to monitor quota consumption during farming activities in the Cantabrian Sea, and that it be added to the ICCAT list of L-W equations for farms.

- Following the BFT Species Group recommendation, the Committee recommended that the BFT Species Group review the conversion factors of GGWT to RWT during the 2026 intersessional meeting thoroughly and to make specific recommendation on their validity and possible update, to be reviewed in 2026 by the Subcommittee on Statistics. In the meantime, according to document SCRS/2025/171 and to avoid issues with the conversion factors currently in use for BFT-E, it was recommended that the ICCAT conversion factors web page update the text as follows:

  RWT = beta*GGWT (Atlantic), RWT kg, GGWT kg 1,16 ICCAT, 1997, indicating the correct geographic coverage as "Atlantic Ocean and Mediterranean Sea".

  The line referring to the factor for Mediterranean (based on the 1993 publication) should be removed.

12. Discussions at the Intersessional Meetings of the Commission relevant to the SCRS

12.1 Intersessional Meeting of Panel 2

The SCRS Chair informed the Committee of the discussions and decisions taken during the Intersessional Meeting of Panel 2 (hybrid/Madrid, Spain, 4-6 March 2025).

The text below is consistent with the Report of the Intersessional Meeting of Panel 2.

Bluefin tuna growth on farms

The SCRS Chair informed that Panel 2 continues to have concerns with the SCRS 2022 bluefin tuna growth table and that Japan will continue to investigate its appropriateness, with the intention of submitting a paper on the matter as necessary in the future.

Exceptional catch of bluefin tuna

The Panel 2 noted that Senegal reported exceptional catches of bluefin tuna and landed 225 t of bluefin tuna from free schools off Guinea-Bissau, by one of its purse-seiners licensed for tropical tuna, mistaking the fish for yellowfin tuna. In addition, Senegal expressed its intention to conduct biological sampling of the seized bluefin tuna and share the data in order to contribute to ICCAT's scientific work, particularly the Atlantic-Wide Research Programme for Bluefin Tuna (ICCAT GBYP).

Other matters

It was agreed that the Panel 2 Chair would make a request to the SCRS on the impact on the current management procedure (MP) of allowing the carry over of unused allocation beyond 5% of a CPCs initial allocation to increase the TAC in the following year (*Recommendation by ICCAT amending the Recommendation 22-08 establishing a multi-annual management plan for bluefin tuna in the eastern Atlantic and the Mediterranean* (Rec. 24-05)). The specific request to the SCRS is contained in item 19.14 of this report.

There were no other discussions relevant to the SCRS in this meeting.

12.2 Meeting of the Electronic Monitoring Systems Working Group (EMS WG)

The SCRS Chair informed the Committee of the discussions and decisions taken during the Meeting of the Electronic Monitoring Systems Working Group (EMS WG) (hybrid/ Brussels, Belgium, 17 June 2025).

The text below is consistent with the draft Report of the Meeting of the Electronic Monitoring Systems Working Group (EMS WG).

The SCRS Chair informed that discussions include a review of ongoing pilot projects (Res. 22-15), consideration of Rec. 23-18 on minimum EMS standards, and aspects of Res. 21-22 which established the EMS WG.

The SCRS Chair provided an "Overview of the SCRS Sub-group on Electronic Monitoring Systems (EMS Sub-group)". The EMS WG acknowledged that the SCRS continued to work in the Technical Sub-group on EMS, which focused mostly on EMS for smaller vessels ("small-scale fisheries"). Following a presentation by the United Kingdom on its on-going trial of an EMS on a small-scale pelagic longline vessel in the UK Overseas Territory (UK-OT) of Bermuda, several CPCs raised questions and concerns regarding the adaptation of EMS to small vessels. The EMS WG reiterated the importance of continued collaboration and coordination with the SCRS. Furthermore, the EMS WG agreed that it would be beneficial to amend the current Rec. 23-18 to account for small-scale fisheries, including the introduction of a new annex.

The EMS WG also reviewed progress of the ongoing pilot projects under Res. 22-15 on the use of stereoscopic cameras during the first transfer and the automation of video analysis. The ICCAT contractors from AQ1 and Polytechnical University of Valencia, explained technical aspects relating to image quality, error margins and the use of dual-camera systems as a safeguard in case of failure, while noting that work at sea presented unique challenges. It was also underlined that results obtained in the current ICCAT short-term contracts on this matter were not dependent on operator capacity, but rather on sample size.

12.3 18th Meeting of the Working Group on Integrated Monitoring Measures (IMM)

The SCRS Chair informed the Committee of the discussions and decisions taken during the 18th Meeting of the Working Group on Integrated Monitoring Measures (IMM) (hybrid/ Brussels, Belgium, 18-20 June 2025).

Since the meeting draft report has not yet been made available, the text below was produced based on notes taken by the SCRS Chair during the meeting.

The IMM was informed about the growing use of the traplines associated with the pelagic longline swordfish fishery in both the Atlantic and Mediterranean Sea, and of the existence of two pilot studies (EU-Portugal and EU-Spain) to assess the efficacy of the new trapline gear for swordfish catches and other species bycatch. Discussions included requesting the SCRS to provide its view on the catch rates of trapline, gear code and any other aspects related to the submission of information to ICCAT on the use of traplines, including the results of pilot studies.

The SCRS was also requested to continue close cooperation with the Commission (IMM), namely regarding the review of domestic Electronic Monitoring System (EMS) programmes submitted as required under the current ICCAT provisions.

12.4 Meeting of the Standing Working Group on Dialogue between Fisheries Scientists and Managers (SWGSM)

The SCRS Chair informed the Committee of the discussions and decisions taken during the Meeting of the Standing Working Group on Dialogue between Fisheries Scientists and Managers (SWGSM) (online, 8 July 2025).

The text below is consistent with the Co-chair's Report of the SWGSM.

Mr Ernesto Penas Lado (Commission Chair) and Dr Craig Brown (SCRS Chair) were elected as Co-chairs of the SWGSM.

Following extensive discussions on the different components of the draft SCRS Strategic Plan 2026-2031, the SWGSM agreed on an intersessional workplan to finalize drafting the document, considering the following steps:

- **By 18 July 2025:** SCRS Chair to send an email to the SCRS Science Strategic Plan Meeting participants, inviting them to participate in the process, and then giving them permission to edit documents;

- **By mid/22 August 2025:** Deadline for comments from the SCRS Science Strategic Plan Meeting participants;

- **By 25 August 2025:** SCRS Chairs to compile and deliver new version to the Secretariat, to be circulated before the end of August.

- **By 10 September 2025:** Deadline for final comments from CPCs to be received.

- **By mid-September 2025:** Deadline for the Secretariat to receive final version for translation and dissemination at the SCRS level.

The Secretariat informed the Group of the need to update the *Rules and Procedures for the protection, access to, and dissemination of data compiled by ICCAT*. Mr Penas Lado indicated that given the current workload it would be a good idea to advance the work in the SCRS Plenary meeting and include it in the meeting of the SWGSM in 2026.

12.5 Meetings of the Virtual Working Group on Sustainable Financial Position for ICCAT (VWG-SF)

The Secretariat informed the Committee of the discussions and decisions regarding the development of the new ICCAT budget template during the First Intersessional Meeting of the Virtual Working Group on a Sustainable Financial Position for ICCAT (VWG-SF) (online, 16 January 2025) and the Second Intersessional Meeting of the Virtual Working Group on a Sustainable Financial Position for ICCAT (VWG-SF) (online, 22 May 2025).

In light of the conclusions reached at the Annual Meeting of the Commission in 2024 as regards the format and content of the draft budget presentation for the coming years, the Secretariat developed and presented the new ICCAT budget template.

The VWG-SF approved the new budget template, which now includes, in Chapter 7, substantially more information on the ICCAT Science Envelope. Apart from the usual summaries of the Science budget for year 20XX, by major budgetary line of activity and research programme, new information on the increase/decrease of the funding requests compared to the previous year and of possible voluntary contributions to the upcoming budgetary period are also provided. It also includes a balance table of the ICCAT Science Fund as of 31 December of the current year. In addition, the new template also contains summary tables with relevant information on the use of available funds over the past 5 years (provided in Appendix 1), together with the full list of activities to be developed during the budgetary period (Appendix 2). The latter Appendix should also include detailed information regarding the research activity and why funding is needed.

13. Executive Summaries on species

The Committee reiterated that in order to achieve a more rigorous understanding of these Executive Summaries from a scientific point of view, the previous Executive Summaries should be consulted, as well as the corresponding detailed reports which are published in the Collective Volume of Scientific Papers.

The Committee also pointed out that the texts and tables of these Summaries generally reflect the information available in ICCAT immediately prior to the SCRS plenary sessions, since they were prepared during the meetings of the Species Groups. Therefore, the catches reported to ICCAT during or after the SCRS meeting cannot be included in these Summaries.

13.1 YFT - Atlantic yellowfin tuna (Thunnus albacares)

Introduction

A stock assessment was conducted for yellowfin tuna in 2024 (Anon., 2024k), using data through 2022, applying an age structured model, Stock Synthesis. Management advice (Kobe Matrices) was developed using constant catch projections at 0 t, and 100,000 to 150,000 t. The uncertainty was characterized by using the 80% confidence intervals from 4,000 Monte Carlo iterations on the most influential fixed parameters, natural mortality (M) and steepness (*h*). A summary of the stock status is provided below (**Table 1**). **Table 2** provides estimated catches and discards by gear, for the period 2000-2024. The Kobe Phase Plot and uncertainty of current status estimates is summarized in **Figure 1**. **Table 3** provides estimated probabilities (%) that both the fishing mortality will be below F_{MSY} and spawning stock biomass will be above SSB_{MSY} in future years under different constant catch scenarios.

Table 1. Atlantic yellowfin tuna summary table.

Indicator		*Stock Status*
Maximum Sustainable Yield (MSY)[1]	121,661 t (107,485 t - 188,456 t)[3]	2022
TAC (2024)	110,000 t	
Current (2024) Yield[2]	140,302 t	
Relative Spawning Biomass (SSB_{2022}/SSB_{MSY})	1.37 (0.91-2.15)	
Relative Fishing Mortality ($F_{2020-2022}/F_{MSY}$)[1]	0.89 (0.40-1.46)	
Stock Status	Overfished: NO (19% probability of being overfished)[4] Overfishing: NO (42% probability of overfishing)[4]	
Management measures in effect	Rec. 24-01[5] TAC (2025) 110,000 t	

[1] Median of 4,000 Monte Carlo iterations of the Stock Synthesis base case.
[2] Provisional and subject to revision as of 23 September 2025.
[3] Median and 80% confidence intervals are shown.
[4] As estimated from the Kobe plot probability in each quadrant.
[5] Rec. 24-01 only entered in force in June 2025, but other previous Recommendations (Rec. 22-01and Rec. 17-01) also applied to YFT stock.

Table 2. Estimated catches and discards of Atlantic yellowfin tuna by gear, for the period 2000-2024.

			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL	A+M		131964	152905	136464	124935	119574	105091	105912	102844	111874	117915	117424	113186	114389	107007	115701	129867	150334	136919	135956	136283	153931	122371	149107	140357	140302
Landings		Bait boat	16584	19522	17407	13720	19379	13407	15187	15099	10342	10080	10741	14531	10328	8350	9872	9983	11100	8710	8016	7676	7180	6463	8566	6514	5332
		Longline	27266	23079	17793	19394	29705	25393	22723	29545	22342	22097	20051	18964	19006	16398	14479	14370	18012	16348	16301	17714	16128	13556	16797	26445	24777
		Other surf.	7274	7128	5478	8911	7891	7176	8655	5547	2987	3261	3727	3951	6510	11213	14134	16068	19559	23043	19393	16814	20503	19077	24590	19541	21065
		Purse seine	78789	102789	95465	81604	61064	58061	58595	51812	75189	81045	81886	74131	76665	69711	75813	88138	100133	87885	91203	93061	108958	82225	97637	86520	88134
Landings(FP)		Bait boat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	3
		Purse seine	2051	387	321	1305	1535	1054	747	836	1008	1423	1012	1601	1872	1332	1401	1168	1528	867	991	992	1116	1005	1459	1298	927
Discards		Bait boat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.1	0
		Longline	0	0	0	0	0	0	5	6	5	9	8	9	8	3	3	3	3	4	11	9	25	26	27	32	42
		Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.4
		Purse seine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	137	0	63	40	17	20	19	25	2	23
Landings	CP	Angola	35	34	34	34	34	0	0	23	98	0	0	0	0	0	0	0	0	2	3	0	1	8	15	5	9
		Barbados	155	142	115	178	211	292	197	154	156	79	129	131	195	188	218	262	324	270	248	121	173	213	202	237	188
		Belize	326	406	0	0	0	0	143	1164	1160	1346	2058	3214	5902	5246	7069	7132	5660	6170	8743	10107	9341	8197	10118	9647	13613
		Brazil	6145	6239	6172	3503	6985	7223	3790	5468	2749	3313	3677	3615	4639	7277	11645	13643	16682	18362	16381	12907	13183	13664	15716	18894	17729
		Cabo Verde	1851	1684	1953	1868	3236	6019	5648	4568	7905	4638	5856	6002	4603	7513	4507	7866	6990	2837	5584	3699	6259	2043	974	329	1210
		Canada	105	125	70	73	304	240	293	276	168	53	166	50	93	74	34	59	19	193	15	108	75	110	198	175	160
		China PR	1674	1056	697	1050	1305	1185	1085	1124	649	462	427	346	264	211	92	170	468	578	359	321	461	140	529	2444	2747
		Costa Rica	5	4	0	1	1	0.3	7	9	7	4	6	14	15	32	120	117	139	183	114	74	117	150	54	52	115
		Cuba	0	0	65	65	65	65	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Curaçao	5776	4945	4619	6667	4747	24	1939	1368	7351	6293	5302	4413	6792	3727	5152	6267	8012	6661	7615	7773	9081	7729	3122	1250	**0**
		Côte d'Ivoire	673	213	99	302	565	175	482	216	626	573	470	385	1481	2077	324	251	315	952	116	2649	4460	2117	3336	2914	2637
		EU-Denmark	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		EU-España	24851	31105	31469	24884	21414	11795	11607	13667	24490	32862	25587	21060	18886	12016	14380	21199	19625	12665	10908	14756	19618	10202	11363	11522	13665
		EU-France	29923	31870	34444	33040	23962	22679	18940	13733	16115	19049	20798	22749	18919	20647	23223	21093	26488	26178	25069	18609	17089	13262	17240	14043	15959
		EU-Ireland	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		EU-Italy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0	0	**0**
		EU-Latvia	36	72	334	334	334	334	334	0	0	0	200	143	15	0	0.3	23	0	0	0	0	0	0	0	0	**0**
		EU-Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**0**
		EU-Netherlands	0	0	0	0	0	0	0	0	0.4	1	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		EU-Portugal	194	4	6	4	5	167	334	953	479	1250	653	579	447	339	71	76	127	137	638	256	129	22	134	479	1423
		El Salvador	0	933	0	0	0	0	0	0	0	0	0	0	0	0	0	2736	8573	6228	5496	3893	8813	6135	6239	4176	7027
		FR-St Pierre et Miquelon	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0.0	0	0	0	0	0	0	0	0	0	**0**
		Gabon	162	270	245	44	6	2	44	0	1	0.2	0.1	0	0	0	0	0	1	3	0	0	0	0	0	0	
		Gambia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
		Ghana	12673	23845	18546	15839	15444	13019	14037	15570	16521	15858	20252	18501	16470	13921	18939	19659	20218	20398	24346	26243	26435	21264	29550	22159	25452
		Great Britain	0	0	0	0	0	0	0	0	0	0.1	23	21	22	1	0	0.0	0	0	0	0	0.2	0	0	0	**0**
		Grenada	403	759	593	749	460	492	502	633	756	630	673	686	663	674	675	1167	1607	1257	1391	818	784	369	1036	2208	1163
		Guatemala	0	0	0	2207	1588	2906	5265	3461	3736	2603	3124	2803	2949	4023	3754	5200	2720	3718	2539	2957	2594	1856	4237	2550	**0**
		Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	892	892	199	0	2	11	9	6	0	8	10	8	7	4	1	4
		Guinée Rep	0	0	0	0	0	0	0	0	0	0	298	293	1559	1484	823	0	0	0	0	0	0	322	1327	913	378
		Japan	4061	2691	2105	2754	6260	4247	4643	9037	6252	4994	4580	4454	4662	4577	3824	3470	3376	3123	3093	4050	2656	3065	4192	5865	6247
		Korea Rep	142	3	8	209	984	675	283	573	993	433	380	490	498	212	116	47	368	411	455	507	579	373	481	732	555
		Liberia	0	0	0	0	0	0	0	0	0	0	0	49	71	89	100	88	76	88	2	6	1731	1740	3	5	2
		Libya	0	208	73	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		Maroc	2441	3000	2111	1675	814	1940	222	102	110	110	44	272	55	137	107	72	115	113	108	228	344	493	640	845	969
		Mauritania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	**0**
		Mexico	900	888	1135	1356	1209	1066	958	891	956	1211	917	1177	1416	1004	1044	960	1279	1241	1028	760	817	880	606	590	481
		Namibia	59	165	89	139	85	135	59	28	11	1	9	90	24	6	15	42	53	53	424	82	327	256	356	156	98
		Nigeria	0	0	0	0	0	0	0	0	0	0	12	3	1	0	0	0	0	0	0	0	0	0	0	0	**0**
		Panama	1322	646	1140	1700	1887	6170	11361	9590	6328	6101	7182	5484	6634	5894	5489	4782	6168	6694	6175	8245	10376	9650	11960	8555	1422
		Philippines	164	12	129	154	367	243	264	239	220	152	89	134	34	128	76	0	0	0	0	0	0	0	0	0	**0**
		Russian Federation	737	0	0	0	0	4	42	211	42	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		S Tomé e Príncipe	122	122	122	122	134	145	137	144	160	165	169	173	177	182	186	301	301	266	3	17	13	15	24	24	90
		Senegal	194	279	558	253	589	1106	1347	1071	720	1146	939	1235	1875	1081	603	1883	6850	3988	5060	8195	8177	8228	9407	17027	15164
		South Africa	191	342	152	298	402	1156	1187	1063	351	303	235	673	174	440	1512	925	706	387	389	551	700	398	1018	1746	1013
		St Vincent and Grenadines	4102	5080	1354	625	4265	3430	2781	3198	2630	2348	882	963	590	352	505	153	461	772	373	105	226	86	193	5	96
		Trinidad and Tobago	112	122	125	186	224	295	459	615	520	629	788	799	931	1128	1141	1179	1057	890	1214	982	973	1244	1080	1169	1164
		UK-Bermuda	31	37	48	47	82	61	31	30	15	41	37	100	66	36	12	10	9	25	32	50	52	74	61	36	49
		UK-British Virgin Islands	0	0	0	0	0	0	1	0	0.3	0	0	1	1	3	10	5	0	0	0	0	0	6	5	0	
		UK-Sta Helena	136	72	90	158	226	240	344	177	97	104	65	163	149	53	152	178	181	221	199	310	87	79	67	104	105
		UK-Turks and Caicos	0	0	0	0	0.0	0	0.0	1	0.4	0	0	0	0	6	2	0	0	0	0	0	0	0	0	0.0	0.0
		USA	7051	6703	5710	7695	6516	5568	7091	5529	2473	2788	2679	3315	4777	4177	3184	2798	4104	4444	2720	2625	3648	3948	7739	3081	3031
		Uruguay	45	94	91	95	204	644	218	35	66	76	122	24	6	7	0	0	0	0	0	0	0	0	0	0	**0**
		Venezuela	11663	18687	15033	7657	5792	5097	6514	3911	3272	3198	4783	4419	4837	5050	3776	3135	4227	5115	2791	2107	1952	1979	3174	3488	2867
	NCC	Chinese Taipei	5661	4805	4659	6486	5824	3596	1260	1947	1122	1391	824	1768	1070	1259	1041	1220	942	776	945	736	870	468	669	873	760
		Guyana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	183	181	3	43	116	164	108	0	
		Suriname	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	310	1297
	NCO	Argentina	0	0	0	0	327	327	0	0	0	5	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Benin	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Colombia	46	46	46	46	46	46	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Dominica	78	120	169	119	81	119	65	103	124	102	110	132	119	120	256	194	179	145	110	179	307	199	228	245	246
		Dominican Republic	226	226	226	226	226	226	226	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Faroe Islands	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0.0	0	0.1	0.0
		NEI (ETRO)	0	1510	1345	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		NEI (Flag related)	5269	2784	57	578	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	29	13	16	6	11	11	9	11
		Seychelles	38	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Sta Lucia	134	145	94	139	147	172	103	82	106	97	223	114	98	136	93	175	191	232	199	172	190	156	174	156	162
		Vanuatu	0	0	0	0	681	713	805	1038	1323	1147	743	341	331	146	17	0	0	0	0	0	0	0	0	0	
Landings(FP)	CP	Belize	0	0	0	0	0	0	0	0	0	19	50	71	27	109	35	0	0	0	0	0	0	0	0	0	**0**
		Cabo Verde	0	0	0	0	0	78	28	39	40	103	152	58	35	82	256	272	178	55	73	60	70	0	0	0	**0**
		Curaçao	0	0	0	0	0	15	25	22	16	176	95	89	114	86	78	0	0	0	0	0	0	67	0	0	**0**
		Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	2	267	116	24	0	0	0	0	0	0	0	0	0	**0**
		EU-España	714	0	0	335	368	142	154	67	270	279	352	358	140	146	353	517	571	440	285	366	276	260	312	285	286
		EU-France	914	344	309	672	597	244	128	33	52	203	181	344	347	129	115	333	352	162	296	293	291	388	990	557	644
		El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	60	90	78	83	0	202	83	401	**0**
		Guatemala	0	0	0	0	0	57	35	17	32	9	34	8	12	13	19	0	0	0	0	0	0	27	26	46	**0**
		Guinée Rep	0	0	0	0	0	72	0	66	20	67	95	389	876	487	461	0	0	0	0	0	0	0	0	0	**0**
		Panama	0	0	0	0	0	155	125	177	114	99	54	101	54	163	59	0	0	0	0	0	0	62	53	14	**0**
		St Vincent and Grenadines	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	NCO	Mixed flags (EU tropical)	423	42	13	298	570	292	251	416	464	467	0	181	0	0	0	0	367	121	259	191	480	0	0	0	
Discards	CP	Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.3	0.1	0.1	0.2	0.4	0.3	0	3
		EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	137	0	63	40	17	20	19	25	2	23
		EU-Portugal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.1	0.4
		Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	5	7	9	7	16	20
		Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0	0.0
		Mexico	0	0	0	0	0	0	5	6	5	9	8	9	7	3	3	3	3	3	5	3	4	5	3	4	2
		South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	**0.0**
		UK-Bermuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.0	0	0	**0**
		UK-British Virgin Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	
		UK-Sta Helena	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		USA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	13	17	13	17
	NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0	0	**0**

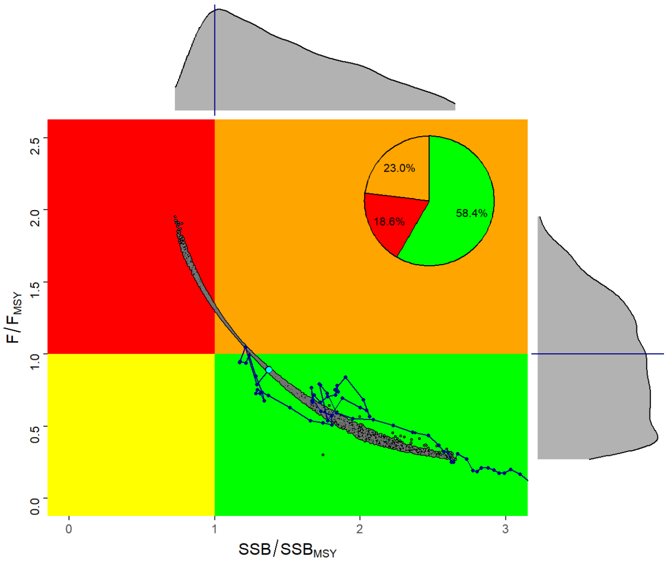


Figure 1. Kobe plot for the Atlantic yellowfin tuna stock status in 2022, estimated during the 2024 yellowfin stock assessment (Anon., 2024k). Grey dots are the 4,000 Stock Synthesis model runs; the blue circle is the median of these runs and marginal histograms represent the distribution of either SSB/SSB$_{MSY}$ or F/F$_{MSY}$. The black line indicates the stock status trajectory starting in 1958. The inserted pie indicates the probability of the stock being within each Kobe colour quadrant. The probability distributions shown in each axis represent uncertainty around current B/B$_{MSY}$ and F/F$_{MSY}$.

Outlook

In summary, 2022 stock biomass was estimated to be about 37% above B$_{MSY}$ (not overfished) and fishing mortality rates were about 11% below F$_{MSY}$ (no overfishing). Projections conducted in 2024 considered a number of constant catch scenarios. In most cases, catches less than 125,000 t led to, or maintained, a healthy stock status through 2034.

Management recommendation

The results of the Stock Synthesis base model were summarized to produce estimated probabilities of achieving the Convention objectives (SSB≥B$_{MSY}$, F≤F$_{MSY}$) for a given level of constant catch, for each year up to 2034 (**Table 3**). The Committee reiterated concern that catch levels, averaging about 141,000 t over the last 5 years (2018–2022), are expected to result in overfishing and lead to an overfished status if they continue. Furthermore, given that the TAC has been exceeded continuously by substantial amounts, existing conservation and management measures appear to be insufficient to limit harvest. The Committee recommended that the Commission establish a mechanism to ensure that the catches of YFT do not exceed any adopted TAC. The Committee noted that increased harvests of juveniles could have negative consequences for yellowfin long term MSY[1]. Should the Commission wish to increase long-term sustainable yield, the Committee continues to recommend that effective measures be found to limit catches associated with floating objects (FOBs) and other fishing mortality of small yellowfin tuna.

[1] Second Meeting of the Ad Hoc Working Group on FADs (Bilbao, Spain, 14-16 March 2016) (Anon., 2017).

Table 3. Kobe II matrices giving the probability that: a) $F \leq F_{MSY}$; b) $B \geq B_{MSY}$; and c) joint probability of $F \leq F_{MSY}$ and $B \geq B_{MSY}$, for given years, for various constant catch levels based on model results. Note that for the YFT the biomass (B) refers to spawning stock biomass (SSB).

a) Probability that $F \leq F_{MSY}$

Catch	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
0kt	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
100kt	92%	91%	90%	89%	89%	89%	88%	88%	88%	88%
105kt	90%	89%	87%	86%	85%	85%	84%	83%	83%	82%
110kt	88%	86%	84%	82%	81%	80%	79%	77%	76%	75%
115kt	86%	83%	81%	79%	76%	74%	72%	70%	68%	67%
120kt	83%	80%	77%	74%	71%	67%	65%	63%	62%	61%
125kt	81%	77%	73%	69%	65%	62%	60%	58%	56%	55%
130kt	78%	74%	68%	64%	60%	57%	55%	53%	51%	49%
135kt	75%	70%	64%	60%	56%	53%	50%	48%	46%	44%
140kt	71%	66%	61%	56%	51%	48%	45%	44%	42%	41%
145kt	68%	63%	57%	52%	48%	44%	42%	41%	39%	38%
150kt	65%	60%	54%	48%	44%	42%	39%	38%	36%	35%
155kt	62%	56%	51%	45%	42%	39%	37%	35%	34%	33%
160kt	60%	54%	47%	43%	39%	36%	34%	33%	31%	30%

b) Probability that $B \geq B_{MSY}$

Catch	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
0kt	93%	94%	97%	99%	100%	100%	100%	100%	100%	100%
100kt	90%	87%	86%	85%	85%	85%	85%	85%	84%	84%
105kt	89%	87%	85%	84%	83%	82%	81%	81%	80%	80%
110kt	89%	86%	84%	82%	81%	79%	78%	76%	75%	74%
115kt	89%	86%	83%	81%	78%	76%	74%	72%	69%	67%
120kt	89%	85%	82%	78%	75%	72%	69%	66%	64%	62%
125kt	89%	85%	81%	76%	72%	68%	64%	61%	59%	57%
130kt	89%	84%	80%	74%	70%	64%	60%	57%	54%	52%
135kt	88%	84%	78%	72%	66%	60%	56%	53%	50%	48%
140kt	88%	84%	77%	70%	63%	57%	53%	49%	46%	44%
145kt	88%	83%	76%	68%	59%	54%	49%	45%	43%	41%
150kt	88%	82%	74%	66%	56%	50%	46%	43%	40%	38%
155kt	87%	82%	73%	63%	54%	47%	43%	40%	38%	36%
160kt	87%	81%	72%	61%	51%	44%	41%	37%	35%	34%

c) Probability that $F \leq F_{MSY}$ and $B \geq B_{MSY}$

Catch	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
0kt	93%	94%	97%	99%	100%	100%	100%	100%	100%	100%
100kt	90%	87%	86%	85%	85%	85%	85%	85%	84%	84%
105kt	89%	87%	85%	84%	83%	82%	81%	81%	80%	80%
110kt	88%	86%	84%	82%	80%	79%	78%	76%	75%	74%
115kt	86%	83%	81%	79%	76%	74%	72%	70%	68%	66%
120kt	83%	80%	77%	74%	71%	67%	65%	63%	62%	61%
125kt	81%	77%	73%	69%	65%	62%	60%	58%	56%	55%
130kt	78%	74%	68%	64%	60%	57%	55%	53%	51%	49%
135kt	75%	70%	64%	60%	56%	53%	50%	48%	46%	44%
140kt	71%	66%	61%	56%	51%	48%	45%	44%	42%	41%
145kt	68%	63%	57%	52%	48%	44%	42%	41%	39%	38%
150kt	65%	60%	54%	48%	44%	42%	39%	38%	36%	35%
155kt	62%	56%	51%	45%	42%	39%	37%	35%	34%	33%
160kt	60%	54%	47%	43%	39%	36%	34%	33%	31%	30%

Additional supporting information

Numerous changes have occurred in the yellowfin fisheries over time. Associated changes in the impact (i.e. overall fishing mortality) of the fleets are apparent (**Figure 2**), including the decreased impact of the longline fisheries since the 1960s, the concurrent increase of early PS fisheries, the transition from PS-free school towards FOB associated fishing beginning, around 1990, and the recent increase by a new Brazilian "vessel associated-school" handline fishery operating in the western Atlantic. These handline catches increased nearly nine-fold from 1,570 t in 2012 to about 14,000 t in 2023 (**Table 2**).

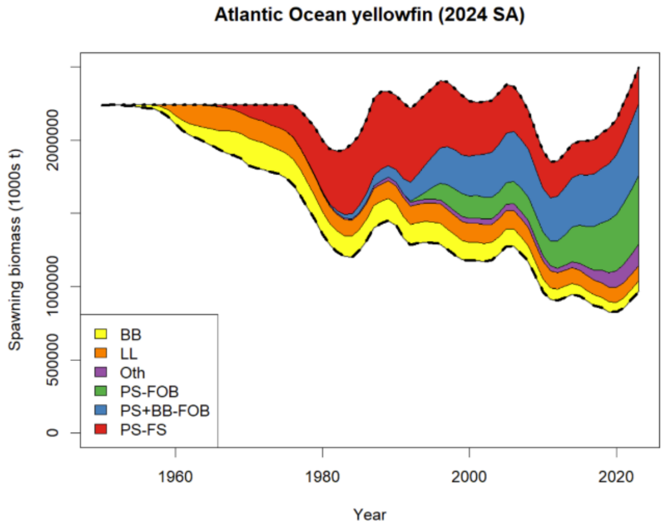


Figure 2. Impact plots represent the relative impact of each gear on the spawning biomass of the stock. Coloured areas represent model predicted increases in spawning biomass when catches of each gear are eliminated from the historical catches. The estimated unfished spawning biomass (dotted line) varies with recruitment deviations. The historical SSB trajectory, estimated by the stock assessment model, is indicated with a dashed line. The code PS FOB represents the purse seine fisheries operating on FOB/FADs. The code PS+BB-FOB reflects that these purse seine fleets have operated in association with baitboats (BB) in the past. The free school refers to the purse seine operations on free school banks.

Ages up to 18 years have been observed in the western Atlantic and the Ascension Islands using annual otolith increment counts which were validated using 14C bomb radiocarbon and/or oxytetracycline (OTC). Tagging studies of yellowfin in the Pacific and Indian Oceans suggest that natural mortality is age-specific, and higher for juveniles than for adults. Age-specific M estimates were updated in 2024 based on new research. The maximum age assumption remains as in the previous assessment, 18 years of age.

Three indices of abundance were used in stock assessment model runs to develop management advice (**Figure 3**), the joint-CPC tropical Atlantic (region 2) longline index (1979-2022), the acoustic echosounder buoy index associated with FOBs (2010-2022) and the purse seine free school index (1993-2022). Indices that reference adult biomass (the joint-LL and the purse seine free school index) have disparate trends. The joint-LL suggests the biomass of adult yellowfin tuna has remained generally stable or increased since 2019 while the purse seine free school index suggests a decline. The acoustic buoy index references juvenile yellowfin abundance in the eastern Atlantic and suggests a modest increase since 2012.

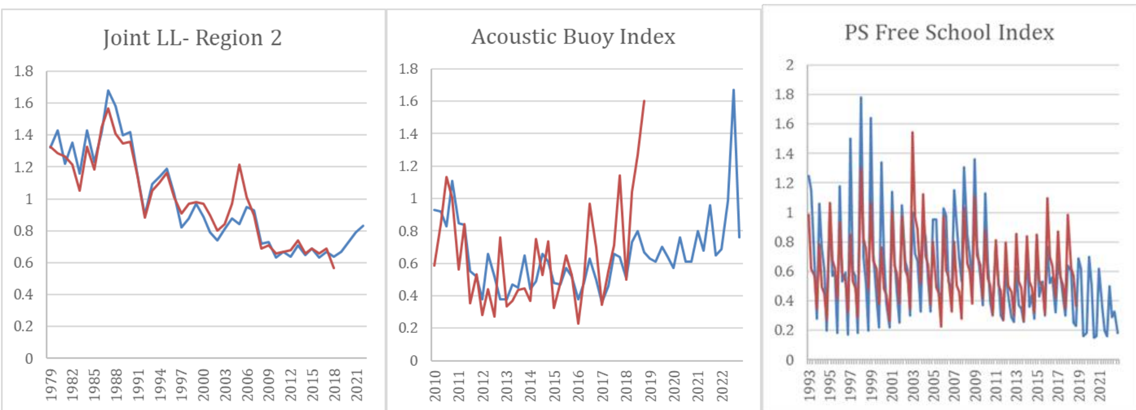


Figure 3. Standardized indices of Atlantic yellowfin tuna relative abundance fit within Stock Synthesis; the joint-CPC tropical Atlantic (region 2) longline index (1979-2022), the acoustic echosounder buoy index associated with FOBs (2010-2022) and the purse seine free school index (1993-2022). The red lines show the index used in the 2019 assessment, and the blue line shows the updated index provided for the 2024 assessment. Note: PS Free School index was estimated on a quarterly basis while the others are annual.

13.2 BET - Atlantic bigeye tuna (Thunnus obesus)

Introduction

A stock assessment was conducted for bigeye tuna in 2025 using fisheries data through 2023 (Anon., 2025j). Key uncertainties were explored using an uncertainty grid, including natural mortality, steepness, and the selection of an index to represent the abundance of juveniles. The results from 18 uncertainty grid models were weighted by their probability and combined to estimate the current stock status and develop management advice (K2SM). The resulting stock status is provided below (**Table 1**). The estimated catches and discards by gear, for the period 2000-2024 are shown in **Table 2.** The Kobe Phase Plot and uncertainty of current status estimates is summarized in **Figure 1**. The estimated annual probability (%) that the fishing mortality will be below F_{MSY} and the spawning stock biomass will be above SSB_{MSY} in future years under different constant catch scenarios is summarized in **Table 3.**

Table 1. Atlantic bigeye tuna summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)[1]	86,030 t (79,702 t - 114,311 t)[3]	2023
TAC (2024)	62,000 t	
Current (2024) Yield[2]	54,984 t	
Relative Spawning Biomass (SSB_{2023}/SSB_{MSY})	1.23 (0.81-1.85)[3]	
Relative Fishing Mortality (F_{2023}/F_{MSY})	0.59 (0.36-0.98)[3]	
Stock Status	Overfished: NO (26.2% probability of being overfished)[4] Overfishing: NO (9.1% probability of overfishing)[4]	
Management measure in effect	Rec. 24-01[5] TAC (2025) 73,011 t	

[1] Combined result of 18 stock synthesis model runs using data from 1950-2023.
[2] Provisional and subject to revision as of 23 September 2025.
[3] Point estimate, 80% bias corrected confidence intervals are shown.
[4] As estimated from the Kobe plot probability in each quadrant.
[5] Rec. 24-01 only entered in force in June 2025, but other previous Recommendations (Rec. 21-01, Rec. 22-01 and Rec. 23-01) also applied to the BET stock.

Table 2. Estimated catches and discards of Atlantic bigeye tuna by gear, for the period 2000-2024.

			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL	A+M		103434	91636	75801	88282	90043	67954	59192	69895	63172	76427	75750	76492	71317	66977	75310	79563	79214	78256	72600	74905	57556	47209	62641	59229	54984
Landings		Bait boat	12141	14430	8460	11233	20238	13104	10605	10561	6307	11548	7842	12659	10459	9195	8715	7970	6710	8366	7932	7341	6848	6141	6855	4672	4955
		Longline	72010	56123	47350	55356	49400	37961	34183	46231	41063	43533	42516	37899	34930	32245	36772	40379	36369	35195	32067	33890	27290	20996	32759	34988	34991
		Other surf.	459	723	226	451	293	733	552	449	220	258	487	1146	1012	2783	4960	6002	6472	7217	4616	6054	5495	5339	5167	5583	3815
		Purse seine	17460	20103	19552	20375	19094	15129	13310	11962	14810	20007	24235	23767	24080	22122	24253	24418	28624	26838	27284	26930	17026	14058	16793	13106	10472
Landings(FP)		Bait boat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	4
		Purse seine	1363	257	214	867	1019	1026	542	692	772	1081	669	1019	823	632	609	756	1038	602	673	666	868	646	1028	850	713
Discards		Bait boat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
		Longline	0	0	0	0	0	0	0	0	0	0	0	0.5	14	0.0	0.0	2	0.3	0.3	26	15	27	26	31	23	34
		Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.4	0.4	0.3
		Purse seine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	38	2	10	3	1	2	1	1
Landings	CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.0	0	0	0	0	0	**0**
		Barbados	18	6	11	16	19	27	18	14	14	7	12	7	15	11	26	30	19	16	29	14	20	25	24	28	14
		Belize	134	96	0	0	0	0	4	60	70	234	249	1218	1242	1336	1502	1877	1764	1961	2135	2307	991	600	1002	1190	1547
		Brazil	2768	2659	2582	2455	1496	1081	1479	1593	958	1189	1173	1841	2120	3623	6456	7750	7660	7258	5096	6249	6284	6499	7341	6364	4117
		Cabo Verde	2	0	1	1	1	1077	1406	1247	444	545	554	1037	713	1333	2271	2764	1680	1107	1418	880	576	171	2	5	5
		Canada	327	241	279	182	143	187	196	144	130	111	103	137	166	197	218	257	171	214	237	193	104	253	330	379	239
		China PR	6564	7210	5840	7890	6555	6200	7200	7399	5686	4973	5489	3720	3231	2371	2232	4942	5852	5514	4823	5718	3614	1638	3249	5415	5133
		Costa Rica	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	1	1	4	4	1	0.5	6	1	1	2
		Cuba	0	0	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Curaçao	3098	3757	2221	3203	3526	27	416	252	1721	2348	2688	3441	2890	1964	2315	2573	3598	2844	3530	2787	1519	1701	824	143	**0**
		Côte d'Ivoire	2	0	0	0	0	0	0	0	0	790	576	47	507	635	441	12	544	1239	384	2334	141	59	386	64	567
		EU-España	11250	10133	10572	11120	8365	7618	7454	6675	7494	11966	11272	13100	10914	10082	10736	10058	11469	11544	8400	9117	6067	6598	6424	5920	5258
		EU-France	5873	5533	4437	4048	2989	2814	2984	1525	1130	2313	3355	3507	3756	3222	3837	2801	4772	4039	4055	5118	2104	1809	3678	2103	1171
		EU-Ireland	0	10	0	0	0.1	33	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	**0**
		EU-Italy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	**0**
		EU-Portugal	1498	1605	2590	1655	3204	4146	5071	5505	3422	5605	3682	6920	6128	5345	3869	3135	2187	3146	4405	3146	3069	3106	3123	2787	2535
		El Salvador	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	992	1450	1826	2634	2464	1518	1492	1479	1196	1542
		FR-St Pierre et Miquelon	0	90	21	0.1	28	6	0	2	3	0	2	0	0	0.3	0.1	0	0	0	0	0	0	0	0	0	**0**
		Gabon	150	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Gambia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	
		Ghana	5632	9864	6480	9061	17888	8860	2307	2559	3372	4515	6253	3541	4468	2963	4175	5918	5194	3838	3636	2917	3160	2221	3672	2371	2345
		Great Britain	0	0	0	0	0	0	3	0	0	32	0.0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	**0**
		Grenada	0.4	0.2	0.3	0	0	0	0	10	31	0	0	0	0	0	0	18	23	33	27	19	11	0.3	1	11	3
		Guatemala	0	0	0	736	831	998	949	836	998	913	1011	282	262	163	993	340	1103	1602	1488	1623	906	768	855	596	**0**
		Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	50	0	58	0	3	10	17	4	11	7	8	6	6	5	1	4
		Guinée Rep	0	0	0	0	0	0	0	0	0	0	328	322	1516	1429	902	0	0	0	0	0	0	0	5	101	97
		Japan	24605	18087	15306	19572	18509	14026	15735	17993	16684	16395	15205	12306	15390	13397	13603	12390	10365	10994	9854	9327	8973	8679	12274	12254	14093
		Korea Rep	43	1	87	143	629	770	2067	2136	2599	2134	2646	2762	1908	1151	1039	675	562	432	623	540	587	674	763	724	728
		Liberia	57	57	57	57	0	0	0	0	0	0	0	0	0	0	0	0	27	98	1	3	222	29	0.1	3	0.1
		Libya	400	31	593	593	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		Maroc	1160	1182	1154	1399	1145	786	929	700	802	795	276	300	300	308	300	309	350	410	500	850	1033	1239	1363	1431	1503
		Mauritania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**0**
		Mexico	2	2	6	4	5	4	3	3	1	1	3	1	1	2	1	2	2	3	3	3	3	3	4	3	2
		Namibia	589	640	274	215	177	307	283	41	146	108	181	289	376	135	240	465	359	141	109	79	568	1185	2070	664	207
		Nigeria	0	0	0	0	0	0	0	0	0	0	3	1	0.2	0	0	0	0	0	0	0	0	0	0	0	**0**
		Panama	952	562	211	686	1521	2310	2415	2922	2263	2405	3047	3462	1694	2774	2315	1289	2337	1664	2067	3052	1648	1107	1328	1330	827
		Philippines	975	377	837	855	1854	1743	1816	2368	1874	1880	1399	1267	532	1323	1964	0	0	0	0	0	0	0	0	0	**0**
		Russian Federation	91	0	0	0	0	1	1	26	73	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		S Tomé e Príncipe	4	4	4	4	11	6	4	0	92	94	97	100	103	107	110	633	421	393	2	81	46	90	149	150	141
		Senegal	915	1159	497	322	490	770	1318	1293	734	1144	969	479	436	606	369	1031	1500	2978	2870	2272	2772	856	746	1174	582
		Sierra Leone	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		South Africa	249	239	341	113	270	221	84	171	226	159	145	153	47	435	332	193	121	257	282	432	357	380	464	619	572
		St Vincent and Grenadines	1921	1143	130	103	18	0	114	567	171	293	396	38	25	16	30	496	622	889	428	504	220	136	568	1	0.2
		Trinidad and Tobago	5	11	30	6	5	9	12	27	69	56	40	33	33	37	59	77	37	25	17	13	10	9	10	14	11
		UK-Bermuda	0	0.1	0.2	0.2	0.5	0.5	0	0.4	0.3	0.0	0.2	0.1	0.0	0.2	0.0	0.1	0	0	0	0.4	1	2	1	1	1
		UK-Sta Helena	8	5	5	4	6	18	25	18	28	17	11	190	51	19	17	44	77	70	45	4	0.1	0.1	1	1	0.2
		UK-Turks and Caicos	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0	0	0	0	0	0	**0**
		USA	574	1085	601	482	416	484	991	527	508	515	578	866	727	903	892	1082	568	836	921	829	801	968	1210	937	614
		Uruguay	25	51	67	59	40	62	83	22	27	201	23	15	2	30	0	0	0	0	0	0	0	0	0	0	**0**
		Venezuela	221	708	1241	847	1060	243	261	318	122	229	85	264	98	94	171	132	179	322	167	28	81	129	39	39	12
	NCC	Chinese Taipei	16795	16429	18483	21563	17717	11984	2965	12116	10418	13252	13189	13732	10805	10316	13272	16453	13115	11845	11630	11288	9226	4093	8181	10274	10144
		Guyana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	25	34	53	2	4	1	0	0	
		Suriname	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	214
	NCO	Dominica	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.1	0.2	0.4	0	0	0.2	0	0	0	
		Faroe Islands	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		NEI (ETRO)	0	362	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		NEI (Flag related)	15092	7907	383	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	4	1	0	0	1	0	0	0	
		Seychelles	58	0	162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Sta Lucia	0	1	2	2	0.1	2	0	0	0.1	0	0.2	0.4	0.2	0	0	6	10	25	13	13	9	3	3	2	3
		Vanuatu	0	0	0	0	104	109	52	132	91	34	42	39	23	9	4	0	0	0	0	0	0	0	0	0	
Landings(FP)	CP	Belize	0	0	0	0	0	0	0	0	0	12	46	42	16	41	23	0	0	0	0	0	0	0	0	0	**0**
		Cabo Verde	0	0	0	0	0	75	28	37	38	61	102	40	22	45	97	165	121	39	53	42	54	0	0	0	**0**
		Curaçao	0	0	0	0	0	13	25	20	13	117	59	46	60	34	42	0	0	0	0	0	0	57	0	0	**0**
		Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	2	95	45	0	0	0	0	0	0	0	0	0	0	**0**
		EU-España	474	0	0	223	244	143	88	49	190	250	211	216	98	80	143	334	398	323	216	265	200	224	299	243	255
		EU-France	607	229	205	446	397	222	79	26	51	150	122	394	192	56	54	191	233	108	213	201	233	289	689	405	461
		El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	201	**0**
		Guatemala	0	0	0	0	0	56	28	15	26	9	18	6	11	5	15	0	0	0	0	0	0	23	13	5	**0**
		Guinée Rep	0	0	0	0	0	72	0	60	20	22	74	203	288	245	209	0	0	0	0	0	0	0	0	0	**0**
		Panama	0	0	0	0	0	151	106	135	97	85	38	70	41	80	27	0	0	0	0	0	0	53	12	1	**0**
	NCO	Mixed flags (EU tropical)	281	28	8	198	378	294	189	348	337	375	0	0	0	0	0	66	286	132	191	158	381	0	0	0	
Discards	CP	Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.3	0.3	0.4	0.2	0.1	3	2	0.1	2
		EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	38	2	10	3	1	2	1	2
		EU-Portugal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.3	0.3	**0**
		Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	15	18	17	25	17	29
		Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0.2
		Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
		South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	0	0	0	0	0	**0**
		UK-Bermuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0.0
		USA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	6	5	6	2
	NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.5	14	0	0	0	0	0	0	0	0	0	0	0	**0**

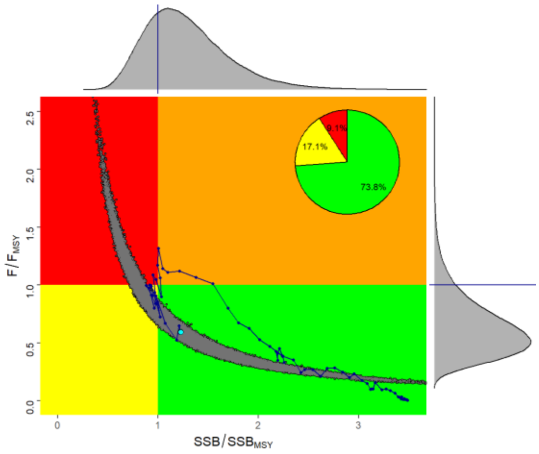


Figure 1. Kobe plot for the Atlantic bigeye tuna stock status in 2023, estimated during the 2025 stock assessment. The line indicates the stock status trajectory starting in 1950. The inserted pie chart indicates the probability of the stock being within each Kobe colour quadrant.

Outlook

The results from 18 uncertainty grid models were weighted by their probability and combined to estimate the current stock status and develop management advice (K2SM). The median estimate of the relative spawning biomass (SSB_{2023}/SSB_{MSY}) was 1.23, indicating that the stock was not overfished in 2023. The median estimate of the relative fishing mortality (F_{2023}/F_{MSY}) was 0.59, indicating that overfishing was not occurring in 2023. The median MSY was estimated at 86,030 t, which was above the 2024 yield. The probability of the stock being in each quadrant of the Kobe plot in 2023 is provided in **Figure 1**. The corresponding probabilities are 73.8% in the green quadrant, 17.1% in the yellow quadrant, and 9.1% in the red quadrant. Kobe II Strategy Matrices (K2SM) were developed to estimate the probability of achieving the Convention objectives ($SSB \geq SSB_{MSY}$, $F \leq F_{MSY}$) at levels of constant catch from 50,000-100,000 t, for each year up to 2038. The projections assumed that recent (2021-2023) fleet catchability, selectivity and the relative catch between fleets, would continue and recruitment would follow the estimated spawner-recruitment relationship.

Management recommendations

Rec. 24-01 para 3 set the TAC for bigeye tuna at 73,011 t in 2025 with a provision that subsequent TACs will be set based on the results of the 2025 stock assessment. For example, the TAC would continue at 73,011 t in 2026 and 2027 if the stock assessment conducted in 2025 indicated that the probability of the stock being in the green quadrant in 2034 was at least 65% and could be increased if the probability was at least 70%. According to the K2SM, a future constant catch of 73,011 t has a high probability (91%) of maintaining the stock in the green quadrant of the Kobe plot in 2034 (**Table 3**). Increases in the proportion of small fishes in the harvests has had a consequence for the total production of bigeye tuna fisheries, i.e. reduced yield at MSY (see Additional supporting information). Notwithstanding this, the Committee noted that fishing mortality has decreased in recent years and that F on age 1 has decreased by the greatest proportion (see item 19.30 of this report).

Table 3. Kobe II matrices giving the probability that: a) $F \leq F_{MSY}$; b) $B \geq B_{MSY}$; and c) and the joint probability of $F \leq F_{MSY}$ and $B \geq B_{MSY}$, for given years, and for various constant catch levels based on model results. Note that for BET the biomass (B) refers to spawning stock biomass (SSB).

a) Probability that $F \leq F_{MSY}$

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%

b) Probability that $B \geq B_{MSY}$

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%

c) Probability that $F \leq F_{MSY}$ and $B \geq B_{MSY}$

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%

Additional supporting information

The Committee noted that two important sources of uncertainty highlighted in the advice from the 2021 BET stock assessment (i.e. the development of joint longline index and the assumptions regarding natural mortality) were specifically addressed during this assessment. The Committee agreed that the development of the joint longline index and the assumptions regarding natural mortality for this assessment have been improved.

The Committee also noted the improvement in stock status compared to the 2021 assessment 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 assessment provided an estimate of stock status for 2019 (based on data available at that time), the Group used the 2025 assessment to look back to see whether our view of stock status back in 2019 had changed (**Table 4**).

Table 4. Summary of the Atlantic bigeye stock status estimated at the 2021 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	1.00	0.63	1.35
2025 SA - 2019	0.97	0.63	1.50	0.91	0.54	1.53
2025 SA - 2023	1.23	0.81	1.86	0.59	0.36	0.98

The estimated stock status in 2019 was similar between the current and the previous 2021 stock assessment, suggesting the changing model assumptions did not substantially affect our historic view of the stock status. Therefore, the Committee concluded the improved stocks status estimated in the 2025 stock assessment results from recovery of the stock.

The Committee also noted that the patterns in the MSY-based reference points were similar to those from the 2021 assessment (**Figure 2**).

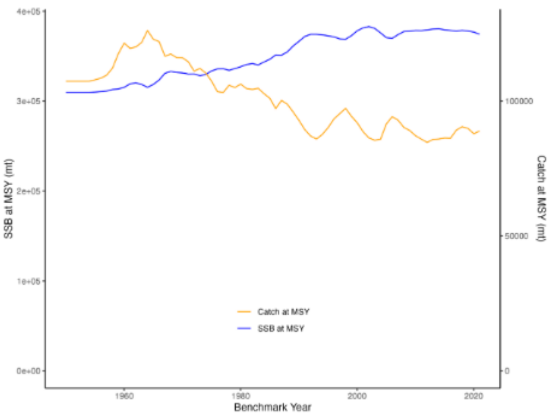


Figure 2. Dynamic SSB_{MSY} and catch at MSY indicating the effects of changes in selectivity for bigeye tuna.

13.3 SKJ - Skipjack (Katsuwonus pelamis)

Introduction

The last stock assessment for eastern and western Atlantic skipjack was conducted in 2022. For a complete and detailed description of the assessment, the state of knowledge and status of the eastern and western Atlantic skipjack tuna stocks, readers should consult the Report of the 2022 Skipjack Tuna Data Preparatory Meeting (Anon., 2022a) and the Report of the 2022 Skipjack Stock Assessment Meeting (Anon., 2022b). A summary of both stock status is provided below (**Tables 1a** and **1b**). **Table 2** provides estimated catches and discards by gear, for the period 2000-2024. The Kobe Phase Plots and uncertainty of current status estimates are summarized in **Figure 1**. **Table 3** provides estimated probabilities (%) that the fishing mortality will be below F_{MSY} and spawning stock biomass will be above SSB_{MSY} in future years under different constant catch scenarios.

Table 1a. Eastern Atlantic skipjack summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	216,617 t (172,735 – 284,658 t)[1]	2020
TAC (2024)	None	
Current (2024) Yield	181,999 t[2]	
Relative Biomass (B_{2020}/B_{MSY})	1.60 (0.50 – 5.79)[3]	
Relative Fishing Mortality (F_{2020}/F_{MSY})	0.63 (0.18 – 2.35)[3]	
Stock Status	Overfished: NO (18% probability of being overfished) Overfishing: NO (21% probability of overfishing)	
Management measure in effect	Rec. 24-01[4]	

[1] Median and 95% confidence interval estimated from the joint uncertainty grid.
[2] Provisional and subject to revision.
[3] Median and 95% confidence interval based on 90,000 iterations of the multivariate lognormal (MVLN) approximation for Stock Synthesis and 90,000 Markov chain Monte Carlo (MCMC) iterations for JABBA.
[4] Rec. 24-01 only entered in force in June 2025, but other previous Recommendation (Rec. 23-01, Rec. 22-01 and Rec. 21-01) included several measures that impacted fishing for the eastern stock (e.g. temporal closure on fishing for schools associated with FADs, limits to the number of FADs, changes in FAD design, etc.).

Table 1b. Western Atlantic skipjack summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	35,277 t (28,444 – 46,340 t)[1]	2020
TAC (2024)	None	
Current (2024) Yield	23,207 t[2]	
Relative Biomass (SSB_{2020}/B_{MSY})	1.60 (0.90 – 2.87)[3]	
Relative Fishing Mortality (F_{2020}/F_{MSY})	0.41 (0.19 – 0.89)[3]	
Stock Status	Overfished: NO (9% probability of being overfished) Overfishing: NO (3% probability of overfishing)	
Management measure in effect	Rec. 24-01[4]	

[1] Median and 95% confidence interval estimated from the joint uncertainty grid.
[2] Provisional and subject to revision.
[3] Median and 95% confidence interval based on 90,000 iterations of the multivariate lognormal (MVLN) approximation for Stock Synthesis.
[4] Rec. 24-01 only entered in force in June 2025, but other previous Recommendations (Rec. 23-01, Rec. 22-01 and Rec. 21-01) also applied to the western stock. No fleets were targeting western skipjack using FADs, so the impact of those Recommendations on the western stock and fisheries was likely to be minimal.

Table 2. Estimated catches and discards of Atlantic skipjack by area, gear and flag, for the period 2000-2024.

				2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL				155475	163315	122120	157358	181467	172499	138376	145663	145104	163604	187070	217112	251498	258603	232679	238811	253737	262508	301824	271130	237254	232201	289442	249031	205206
	ATE			126294	131909	100585	132678	154006	143982	111923	120223	123091	137829	161163	184724	218431	224007	205316	217742	231382	238495	278547	250999	218300	211941	267811	219304	181999
	ATW			29182	31406	21535	24679	27461	28517	26453	25440	22013	25774	25907	32388	33067	34596	27363	21069	22355	24013	23277	20131	18953	20260	21631	29727	23207
Landings	ATE		Bait boat	33705	56493	31167	34428	54194	48279	44700	44316	31863	35105	38607	38085	44814	30670	25682	23843	28875	25776	33437	24415	15677	16664	16194	11239	6097
			Longline	48	53	59	83	67	83	204	428	199	59	46	35	58	79	54	21	540	498	113	350	366	97	360	2179	403
			Other surf.	2399	867	597	562	1324	2672	5270	3436	3803	5137	5098	5885	6769	7206	2184	2527	2623	4698	5087	5432	5784	9814	10020	9850	20239
			Purse seine	79507	72492	67097	90836	90464	87660	58570	66817	81431	89059	112070	133696	159881	179759	170477	181824	187683	200669	231980	211524	189742	177116	233280	189549	150516
	ATW		Bait boat	25641	25719	18737	21990	24082	26028	23766	23898	20702	23518	22803	29468	30693	32187	24817	17538	16810	14648	14926	15410	14593	15573	11687	18752	15431
			Longline	11	16	269	26	206	207	286	53	49	20	854	353	62	642	470	218	824	311	342	429	215	423	1218	3596	2656
			Other surf.	467	374	413	367	404	316	355	280	361	202	306	708	498	792	837	728	1534	5703	4799	2397	2434	2515	7237	5678	4608
			Purse seine	3063	5297	2116	2296	2769	1967	2045	1209	901	2035	1943	1859	1814	975	1238	2506	3105	3293	3180	1881	1684	1746	1489	1702	511
Landings(FP)	ATE		Bait boat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	39	26
			Purse seine	10634	2004	1666	6769	7956	5288	3181	5226	5796	8471	5342	7023	6909	6293	6918	8897	11661	6761	7874	9069	6710	8211	7811	6442	4708
	ATW			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	82	59	29	15	26	0	0	0	
Discards	ATE		Bait boat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0
			Longline	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0.0	0	0	0	0	0	0	1	0.1	0.1
			Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.4	0.4	0.0
			Purse seine	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	631	0	94	56	208	22	35	106	6	10
	ATW		Longline	0	0	0	0	0	0	0.0	0.1	0.0	0.2	0.1	0.1	0.2	0	0.0	0.0	0	0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
			Purse seine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
Landings	ATE	CP	Algerie	89	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Angola	14	14	14	14	10	0	0	0	0	50	636	44	91	514	0	1	1	1	3	0	10	14	0	0	**0**
			Belize	229	278	0	0	0	0	0	0	0	1373	2714	7429	15554	6218	10779	12599	7730	9958	20748	17063	19180	18044	29134	23274	28728
			Brazil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1008	4948	2550	1476
			Cabo Verde	789	794	398	343	1097	7157	4754	5453	4682	4909	5155	7883	5535	16016	15254	17600	10925	7823	7852	5785	6068	1281	1250	715	993
			China PR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
			Curaçao	11056	15450	7246	12084	10225	101	3042	1587	6436	9143	9179	11939	12779	17792	18086	19621	22180	20660	24539	17360	10841	12398	3953	181	**0**
			Côte d'Ivoire	1173	259	292	143	559	1259	1565	1817	2328	2840	2840	5968	10923	8063	2365	254	675	1534	22	3241	990	1311	2266	335	1914
			EU-Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3
			EU-España	37226	30954	25466	44837	38751	28178	22292	23723	35124	36722	41235	56908	67040	66911	51628	46085	52110	57458	52912	48378	31804	37865	33569	30550	15563
			EU-France	18149	16320	16180	19336	21326	14850	7033	6196	4439	7790	14900	13067	13139	16173	17674	20960	19342	16574	23112	20438	12800	16178	21217	16452	3891
			EU-Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	**0**
			EU-Greece	0	0	0	102	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-Ireland	0	0	0	0	14	14	14	0	0	8	6	0	0	0	0	0	0.1	7	0	0	0	0	0	0	**0**
			EU-Italy	0	0	4	29	34	17	0	0	0	0	0	0	0	0	0	0	47	57	91	131	402	69	176	229	91
			EU-Lithuania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	95	0	0	6	0	0	0	0	0	0	**0**
			EU-Malta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	5	2	0.4	6	5	5	5
			EU-Netherlands	0	0	0	0	0	0	0	4	9	0	0	23	0	0	0	0	0.0	5	1	0	0	0	0.0	61	27
			EU-Portugal	1302	2167	2958	4315	8504	4735	11158	8995	6057	1084	12974	4143	2794	4049	1712	1347	708	1785	7480	2799	1033	6640	4026	4345	2654
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5452	14502	12981	15672	13103	14806	6446	10633	6585	7844
			Gabon	21	101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	
			Gambia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0	0	0	
			Ghana	36517	57540	40194	34435	47746	54209	31934	35419	38648	43922	45505	44169	54032	48064	49986	61849	54723	57496	68147	62855	63193	49477	76499	56486	65259
			Guatemala	0	0	0	2120	4808	6389	4959	5546	6319	4036	2951	2829	3631	4907	5811	7078	7386	9800	8648	7626	6503	5873	6839	5472	**0**
			Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	1224	1224	1010	0	1	1	3	1	0	1	1	1	1	1	1	
			Guinée Rep	0	0	0	0	0	0	0	0	0	0	1500	1473	7942	7363	5484	0	0	0	0	0	0	888	5133	2429	869
			Japan	0	1	0	0	0	0.1	0.2	0.1	1	1	1	1	4	5	2	4	1	1	3	5	2	3	3	3	10
			Korea Rep	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.1	1	0.4	0.1	1	1	1	1	0.2	1
			Liberia	0	0	0	0	0	0	0	0	0	0	0	40	61	80	49	98	21	19	29	21	6770	489	0.4	8	1
			Maroc	4091	1737	1303	3403	3843	4666	4032	1592	1309	2580	2343	2151	2267	2045	1068	576	258	750	3585	1258	3171	5503	4189	7683	15835
			Namibia	0.1	8	0	0	0	0	0	0	0	71	2	2	15	1	0	0	0.5	1	0.0	0.5	1	11	19	12	3
			Nigeria	0	0	0	0	0	0	0	0	0	0	45	12	4	0	0	0	6	2	0	0	0	0	0	0	**0**
			Panama	1559	281	342	2486	7126	11490	13468	18821	8253	8518	9590	12509	10927	14558	14165	8372	11510	8815	9089	10926	10626	10554	13192	12286	6593
			Russian Federation	374	0	0	0	0	0	392	1130	313	260	0	20	0	0	2	1	1	110	178	25	6	0	0	2	**0**
			S Tomé e Príncipe	179	179	179	179	117	166	143	0	229	235	241	247	254	260	266	360	380	346	15	36	40	87	120	12	134
			Senegal	1357	1284	1178	639	1456	5033	3858	4552	3045	4566	2743	5441	4477	4659	3931	5943	17082	25431	28476	30633	23286	29537	42671	42710	24924
			South Africa	7	1	1	2	2	1	0.5	0.2	4	4	2	6	8	2	5	2	2	1	2	2	1	1	2	5	2
			St Vincent and Grenadines	1422	1435	524	42	0	0	1	0.1	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	**0**
			Syria	0	0	0	0	0	0	0	38	36	0	0	0	15	17	0	0	0	0	0	0	0	0	0	0	**0**
			Türkiye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	418	425
			UK-Sta Helena	64	205	63	178	317	321	88	110	45	15	25	371	29	7	26	6	127	9	7	28	1	2	1	0.1	1
			Venezuela	0	35	2407	1197	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		NCC	Chinese Taipei	41	24	23	26	16	10	9	14	19	6	11	15	2	12	9	4	2	2	3	4	4	4	3	2	5
		NCO	Benin	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			NEI (ETRO)	0	760	148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	ATW	CP	Barbados	3	0	0	0	0	0	0	0	0	0	0	1	2	0.2	1	1	1	2	1	1	0.5	0.5	1	1	1
			Belize	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0.2	0	164	0	0	0	0	0	0	0	**0**
			Brazil	25164	24146	18338	20416	23037	26388	23270	24191	20846	23307	23456	30571	30863	32438	25195	18133	18231	20068	19687	17925	17432	18788	20544	28885	22437
			Cabo Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94	0	88	0	0	0	**0**
			Canada	0	0	0	0	0.0	0	0	0	0	0.0	0.0	0	0.0	0	0.0	0.0	0	0	0	0	0	0	0	0	**0**
			China PR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	8
			Costa Rica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	**0**
			Cuba	651	0	0	624	545	514	536	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Curaçao	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	100	123	157	35	30	0	151	0	**0**
			EU-España	1	0	0	0	0	0	0	5	11	0	0.0	0.1	0.1	0.1	0.2	0.1	641	223	109	192	124	78	147	0.0	0.1
			EU-France	0	0	0	0	0	0	0	0	0	0	17	10	0	0	0	0	25	224	282	23	2	210	10	15	25
			EU-Portugal	4	1	0.2	3	3	5	21	11	0	6	0.2	8	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66	30	81	25	0	70	0	37	0	**0**
			Ghana	0	0	0	0	0	0	0	0	0	0	0	0	232	67	160	265	160	411	1234	700	318	209	252	139	326
			Grenada	23	15	14	16	21	22	15	26	20	0	0	0	0	0	0	22	17	17	18	30	10	13	12	44	9
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	86	54	44	7	91	0	0	**0**
			Japan	0	0	0	0	0	0	1	0	0.0	0.1	0.1	0.2	1	0.4	1	0.4	0.1	0	0	0.0	0.0	0.1	0.3	1	0.2
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.4	0.2	0.3	**0**
			Mexico	2	10	6	6	9	7	10	7	8	9	7	9	8	5	5	7	10	6	6	4	4	3	3	4	3
			Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	543	410	161	185	0	0	22	40	0	31	0	**0**
			St Vincent and Grenadines	68	97	357	92	251	251	355	90	83	54	46	50	0.1	36	40	47	0	78	36	35	29	0	0	4	35
			Trinidad and Tobago	0	0	0	0	0	0	0	0.0	0.1	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0.0	
			UK-Bermuda	0.4	0.1	0.3	0.3	0.5	0.5	0.1	0.2	0.2	1	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.4	0.1	0.1	0.2	0.1	0.1	0.0
			UK-British Virgin Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.1	
			USA	44	70	88	79	103	30	61	66	67	119	95	107	99	326	183	94	179	199	78	46	68	65	103	75	37
			Venezuela	2890	6870	2554	3247	3270	1093	2008	921	757	2250	2119	1473	1742	1002	1186	2028	2335	2240	1296	940	636	696	215	457	108
		NCC	Chinese Taipei	0	1	16	14	27	28	29	2	8	0.1	2	1	11	1	2	21	17	34	32	27	19	19	8	8	15
		NCO	Argentina	1	0	0	0	30	0	0	0	0	3	12	0.1	0	0	0	0	0	0	0	0	0	0	0	0	
			Dominica	86	45	55	51	30	20	28	32	45	25	0	13	0	4	41	16	27	21	11	10	4	0	0	0	118
			Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	4	2	0	0.0	0	1
			Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	0.3	0	0.0	0	0	0	
			Sta Lucia	216	151	106	132	137	159	120	89	168	0	153	143	109	171	139	87	138	142	122	78	44	83	73	94	84
Landings(FP)	ATE	CP	Belize	0	0	0	0	0	0	0	0	0	114	395	368	179	636	301	0	0	0	0	0	0	0	0	0	**0**
			Cabo Verde	0	0	0	0	0	419	131	162	276	603	726	411	230	428	1362	1485	1046	327	512	355	410	0	0	0	**0**
			Curaçao	0	0	0	0	0	88	171	116	105	917	415	441	545	520	351	0	0	0	0	0	0	447	0	0	**0**
			Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	42	562	544	202	0	0	0	0	0	0	0	0	0	**0**
			EU-España	3700	0	0	1738	1907	713	437	366	1158	1994	1394	1842	983	998	1623	3028	3658	2788	1943	2396	1809	2035	2163	2020	2073
			EU-France	4740	1786	1601	3484	3096	918	346	206	287	1120	743	1480	1646	463	440	1716	1920	893	2169	1616	1681	2206	3355	2423	2661
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1518	2447	1640	1375	3626	0	2928	1223	1664	**0**
			Guatemala	0	0	0	0	0	260	69	66	162	59	136	51	102	72	93	0	0	0	0	0	0	180	496	287	**0**
			Guinée Rep	0	0	0	0	0	387	0	330	118	359	614	1778	2379	1670	2146	0	0	0	0	0	0	0	0	0	**0**
			Panama	0	0	0	0	0	796	548	977	693	680	354	609	284	962	400	0	0	0	0	0	0	415	613	88	**0**
		NCO	Mixed flags (EU tropical)	2194	218	65	1547	2953	1708	1478	3003	2998	2624	564	0	0	0	0	1150	2589	1113	1874	1077	2810	0	0	0	
	ATW	CP	Cabo Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	9	0	9	0	0	0	**0**
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	67	35	7	13	9	0	0	0	**0**
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	5	10	0	0	0	0	0	0	**0**
		NCO	Mixed flags (EU tropical)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51	8	14	13	2	8	0	0	0	
Discards	ATE	CP	Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	0.1
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	631	0	94	56	208	22	35	106	6	10
			EU-Portugal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	**0**
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0.0
			Russian Federation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.4	0.0	0.0
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	**0**
	ATW	CP	EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	**0**
			Mexico	0	0	0	0	0	0	0.0	0.1	0.0	0.2	0.1	0.1	0.1	0	0.0	0.0	0	0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
			UK-Bermuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	**0**
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	**0**

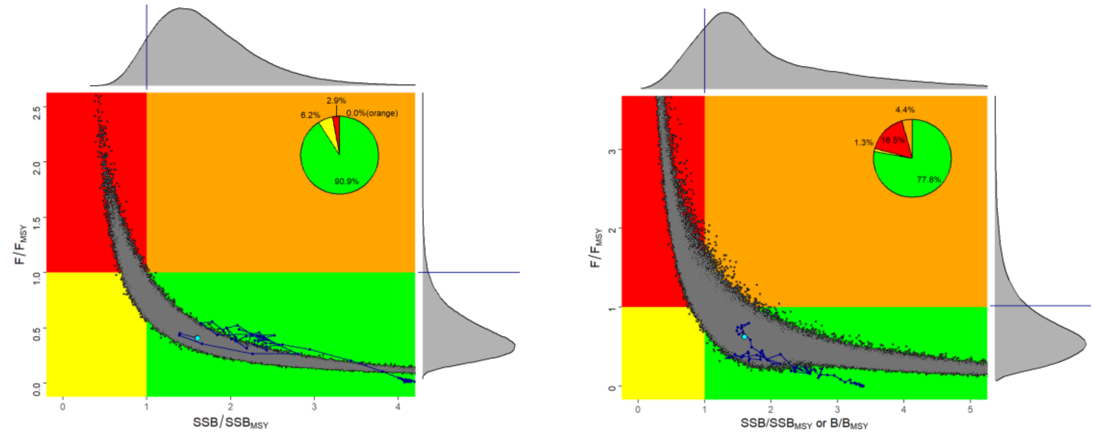


Figure 1. Kobe plots for the western (left) and eastern (right) Atlantic skipjack stock status in 2020, estimated during the 2022 stock assessment. The upper graph represents the smoothed frequency distribution of SSB_{2020}/SSB_{MSY} or B_{2020}/B_{MSY} estimates for 2020, while the right graph represents the smoothed frequency distribution of F_{2020}/F_{MSY} estimates for 2020.The inserted pie charts indicate the probability of the stock being within each Kobe colour quadrant. The line indicates the stock status trajectory starting in 1952 for western and eastern stocks.

Outlook

Eastern Atlantic

The combined results of the assessment, based on the median of the entire uncertainty grid, showed that in 2020 the East Atlantic skipjack tuna stock was in healthy condition. The median MSY was estimated as 216,617 t from the uncertainty grid of the deterministic runs. The results indicated a stock status of not overfished (18% probability of being overfished), with no overfishing (21% probability of overfishing) (**Table 1a**). However, there is large uncertainty in biomass estimates reflected in the long tails of the biomass distribution relative to B_{MSY} (95% confidence interval of 0.5 to 5.79 B/B_{MSY}). This large range of uncertainty in stock status estimates has implications on the estimated probabilities for each constant catch scenario in the projections that have been used to develop management advice.

Western Atlantic

The combined results of the assessment, based on the median of the entire uncertainty grid, showed that in 2020 the West Atlantic skipjack tuna stock was in healthy condition. The median MSY was estimated as 35,277 t from the uncertainty grid of the deterministic runs. The results indicated a stock status of not overfished (9% probability of being overfished), with no overfishing (3% probability of overfishing) (**Table 1b**).

Management recommendation

Eastern Atlantic

The stock status of eastern Atlantic skipjack tuna in 2020 was estimated with a high probability (78%) to be in a healthy condition (green quadrant of the Kobe plot), with that stock not overfished or subjected to overfishing. According to the Kobe II Strategy Matrix (K2SM), a future constant catch using the median MSY of 216,617 t will have about 55% probability of maintaining the stock in the green quadrant of the Kobe plot through 2028. Assuming a constant catch at MSY[2], the probability of the stock biomass being below 20% of B_{MSY} in 2028 was about 17%, and the probability of stock biomass being below 10% in 2028 was about 14%. Moreover, provisional catches for 2022 were substantially higher than the MSY estimated in the last stock assessment. The Commission should also be aware that fishing effort for skipjack also impacts other species that are caught in combination with skipjack particularly in the purse seine FOB fisheries (particularly juveniles of yellowfin and bigeye tuna).

[2] Projections were conducted with the MSY estimated for each model of the uncertainty grid.

Western Atlantic

The status of the western Atlantic skipjack stock in 2020 was estimated with a high probability (91%) to be in healthy condition (green quadrant of the Kobe plot), not overfished nor undergoing overfishing. According to the K2SM, a future constant catch using the median MSY of 35,277 t would have had about 70% probability of maintaining the stock in the green quadrant of the Kobe plot by 2028. Assuming a constant catch at MSY, the probabilities of the stock biomass being below 20% or 10% of the B_{MSY} until 2028 were less than 1%. The Committee recommended that the Commission adopt one of the MSE-tested Management Procedures (MPs) and that a TAC be set based on that MP for 2026 and beyond (see section 19.43 and 19.44 of this report).

Table 3. Kobe II matrices giving the probability that: a) $F \leq F_{MSY}$; b) $B \geq B_{MSY}$; and c) the joint probability of $F \leq F_{MSY}$ and $B \geq B_{MSY}$, in a given year for a given catch level (thousand t). B refers to SSB for the western SKJ stock, and total biomass for the eastern SKJ stock.

Eastern Atlantic

a) Probability that $F \leq F_{MSY}$

TAC (kt)	2023	2024	2025	2026	2027	2028
100	91%	92%	93%	93%	93%	94%
110	90%	92%	92%	93%	93%	93%
120	89%	91%	92%	92%	93%	93%
130	88%	90%	91%	92%	92%	92%
140	87%	89%	90%	91%	91%	92%
150	85%	87%	88%	89%	90%	90%
160	84%	85%	86%	87%	88%	88%
170	82%	84%	84%	85%	85%	86%
180	81%	81%	82%	82%	82%	82%
190	79%	79%	79%	78%	77%	76%
200	77%	76%	75%	73%	71%	70%
210	75%	73%	71%	68%	65%	63%
220	73%	70%	67%	63%	59%	57%
230	71%	67%	62%	57%	53%	50%
240	69%	63%	57%	51%	46%	42%
250	67%	60%	52%	45%	39%	35%
260	65%	56%	47%	38%	32%	27%
270	63%	52%	42%	33%	26%	20%
280	60%	48%	36%	27%	20%	14%
290	58%	44%	31%	21%	14%	10%
300	56%	40%	26%	16%	10%	7%

b) Probability that $B \geq B_{MSY}$

TAC (kt)	2023	2024	2025	2026	2027	2028
100	82%	88%	91%	92%	93%	93%
110	82%	88%	90%	92%	92%	93%
120	82%	87%	90%	91%	92%	92%
130	82%	87%	89%	91%	92%	92%
140	81%	86%	88%	90%	91%	91%
150	81%	85%	87%	89%	90%	90%
160	81%	84%	86%	87%	88%	89%
170	80%	83%	84%	85%	86%	87%
180	80%	81%	82%	82%	82%	83%
190	79%	80%	80%	79%	78%	77%
200	79%	78%	77%	74%	72%	70%
210	78%	76%	73%	70%	66%	63%
220	77%	74%	69%	64%	60%	58%
230	77%	72%	65%	59%	55%	52%
240	76%	69%	61%	54%	49%	45%
250	75%	66%	57%	49%	43%	37%
260	74%	63%	53%	44%	36%	29%
270	73%	61%	48%	38%	29%	19%
280	72%	57%	44%	32%	20%	12%
290	71%	54%	39%	24%	12%	9%
300	70%	51%	34%	17%	9%	7%

c) Probability that $F \leq F_{MSY}$ and $B \geq B_{MSY}$

TAC (kt)	2023	2024	2025	2026	2027	2028
100	82%	88%	91%	92%	93%	93%
110	82%	88%	90%	92%	92%	93%
120	81%	87%	90%	91%	92%	92%
130	81%	86%	89%	90%	91%	92%
140	81%	85%	88%	89%	90%	91%
150	80%	84%	86%	88%	89%	90%
160	79%	83%	84%	86%	87%	88%
170	79%	81%	83%	84%	84%	85%
180	78%	79%	80%	80%	81%	81%
190	77%	77%	77%	77%	76%	75%
200	76%	75%	74%	72%	70%	68%
210	75%	72%	70%	67%	63%	61%
220	73%	70%	65%	61%	57%	55%
230	71%	66%	60%	55%	51%	48%
240	69%	63%	55%	49%	45%	41%
250	67%	59%	50%	43%	38%	33%
260	65%	54%	45%	37%	31%	25%
270	62%	50%	40%	32%	24%	17%
280	60%	46%	34%	26%	17%	10%
290	58%	41%	30%	19%	10%	8%
300	55%	38%	25%	13%	7%	6%

Western Atlantic

a) Probability that $F \leq F_{MSY}$

TAC (1000s mt)	2023	2024	2025	2026	2027	2028
16	100%	100%	100%	100%	100%	100%
18	100%	100%	100%	100%	100%	100%
20	100%	100%	100%	100%	100%	100%
22	99%	100%	100%	100%	100%	100%
24	99%	99%	99%	100%	100%	100%
26	98%	98%	98%	99%	99%	99%
28	97%	97%	97%	97%	97%	97%
30	96%	95%	94%	93%	93%	92%
32	94%	92%	91%	89%	87%	85%
33	93%	91%	88%	86%	83%	80%
34	92%	89%	86%	82%	79%	75%
35	91%	87%	83%	78%	74%	70%
36	90%	85%	80%	75%	70%	65%
38	88%	81%	74%	67%	61%	56%
40	85%	76%	67%	59%	53%	48%

b) Probability that $B \geq B_{MSY}$

TAC (1000s mt)	2023	2024	2025	2026	2027	2028
16	99%	100%	100%	100%	100%	100%
18	99%	100%	100%	100%	100%	100%
20	99%	100%	100%	100%	100%	100%
22	99%	99%	100%	100%	100%	100%
24	99%	99%	99%	100%	100%	100%
26	98%	99%	99%	99%	99%	99%
28	98%	98%	98%	98%	98%	98%
30	98%	97%	96%	96%	95%	94%
32	97%	96%	94%	92%	90%	88%
33	97%	95%	93%	90%	87%	84%
34	96%	94%	91%	87%	83%	79%
35	96%	93%	89%	84%	79%	74%
36	96%	92%	87%	81%	75%	69%
38	95%	89%	82%	73%	66%	60%
40	94%	86%	76%	66%	59%	53%

c) Probability that $F \leq F_{MSY}$ and $B \geq B_{MSY}$

TAC (1000s mt)	2023	2024	2025	2026	2027	2028
16	99%	100%	100%	100%	100%	100%
18	99%	100%	100%	100%	100%	100%
20	99%	100%	100%	100%	100%	100%
22	99%	99%	100%	100%	100%	100%
24	99%	99%	99%	99%	100%	100%
26	98%	98%	98%	99%	99%	99%
28	97%	97%	97%	97%	97%	97%
30	96%	95%	94%	93%	93%	92%
32	94%	92%	91%	89%	87%	85%
33	93%	91%	88%	86%	83%	80%
34	92%	89%	86%	82%	79%	75%
35	91%	87%	83%	78%	74%	70%
36	90%	85%	80%	75%	70%	65%
38	88%	81%	74%	67%	61%	56%
40	85%	76%	67%	59%	53%	48%

13.4 ALB-AT Atlantic albacore tuna (Thunnus alalunga)

Introduction

For the North Atlantic stock, a model-based Management Procedure (MP) is in place since 2021 (*Recommendation by ICCAT on conservation and management measures, including a management procedure and exceptional circumstances protocol, for North Atlantic albacore* (Rec. 21-04)). A stock assessment was conducted for North Atlantic albacore tuna in 2023 using data through 1930-2021, applying both a stock synthesis (SS3) and a production model (Anon., 2023a). Both models provided similar results, and the Committee agreed to use the SS3 model to characterize stock status as well as to verify that catch projections are consistent with the catch advice provided by the MP. For the South Atlantic stock, the current status is based on the JABBA model stock assessment analyses conducted in 2020, utilizing fishery and survey data available up to 2018 (Anon., 2020a). A summary of the stock status is provided below (**Tables 1a and 1b**). **Table 2** and **Figures 1 and 2** provide estimated catches (landings and discards) by gear, for the period 2000-2024 for both stocks. The Kobe Phase Plot (**Figure 1**) illustrates the evolution of stock status and the uncertainty around the current stock status for both stocks.

Table 1a. North Atlantic albacore summary.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	41,995 t (38,860-45,130)[1]	2021
TAC (2024)	47,251 t	
Current (2024) Yield	24,420 t[2]	
Relative Spawning Biomass (SSB_{2021}/SSB_{MSY})	2.19 (1.21 - 4.01)[1]	
Relative Fishing Mortality (F_{2021}/F_{MSY})	0.45 (0.29 - 0.71)[1]	
Stock Status	Overfished: NO (0.4% probability of being overfished)[3] Overfishing: NO (<1% probability of overfishing)[3]	
Management measures in effect	Rec. 98-08, Rec. 21-04 and Rec. 23-05	
Recommended TAC for the period 2024-2026, as estimated following the MP adopted in Rec. 21-04[4]	47,251 t	

[1] Reference case model results (mean and 95% confidence intervals) based on catch data from 1930-2021.
[2] Provisional and subject to revision as of 26 September 2025.
[3] As estimated from the Kobe plot probability in each quadrant.
[4] The recommended TAC is capped by the maximum allowed increase of 25%, since the TAC obtained when applying the MP equation resulted in a higher value (F_{TAR}*B_{CUR} = 47,673.9 t).

Table 1b. South Atlantic albacore summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	27,264 t (23,734 - 31,567)[1]	2018
TAC (2024)	28,000 t	
Current (2024) Yield	20,694 t[2]	
Relative Biomass (B_{2018}/B_{MSY})	1.58 (1.14 - 2.05)[1]	
Relative Fishing Mortality (F_{2018}/F_{MSY})	0.40 (0.28 - 0.59)[1]	
Stock Status	Overfished: NO (0.06% probability of being overfished)[3] Overfishing: NO (<1% probability of overfishing)[3]	
Management measure in effect	Rec. 22-06	
TAC (2025)	28,000 t	

[1] Median and 95% credible interval (CRI) of the reference/base case model.
[2] Provisional and subject to revision as of 26 September 2025.
[3] As estimated from the Kobe plot probability in each quadrant.

Table 2. Estimated catches (landings and discards, t) of North and South Atlantic albacore tuna by gear, for the period 2000-2024.

				2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL				64511	65048	54462	53586	48501	54199	61416	42274	39350	37640	38636	44115	50704	44095	40361	40835	44783	42299	46831	50400	49358	56323	55106	49786	45114
	ATN			33123	26252	22716	25567	25957	35318	36963	21991	20483	15391	19411	19989	25432	24671	26638	25635	30400	28475	29786	34922	31274	31355	31601	28115	24420
	ATS			31388	38795	31746	28019	22545	18882	24453	20283	18867	22248	19225	24126	25272	19424	13723	15201	14383	13825	17045	15478	18084	24968	23505	21671	20694
Landings	ATN		Bait boat	11072	6123	6638	7840	8128	10458	14273	8496	7931	4994	6026	5530	8816	4975	7341	9265	14455	12196	11330	12662	11855	11696	11069	12008	8140
			Longline	7320	7372	6235	7826	7037	6911	5223	3237	2647	2619	3913	3666	3510	6298	3076	4541	5448	5025	4567	4758	5714	4834	4371	4438	4185
			Other surf.	5971	2808	365	470	577	624	625	525	274	427	231	359	344	816	163	136	95	139	62	179	116	115	288	170	182
			Purse seine	191	263	93	211	344	99	162	198	70	101	70	3	176	40	35	116	50	38	39	65	21	30	1	1	1
			Trawl	3547	5374	5376	3846	2369	7001	6385	3429	4321	2811	2026	6852	6678	6558	9184	5771	6299	6611	8820	10816	7577	8309	9713	5914	7426
			Troll	5023	4312	4009	5373	7501	10224	10296	6105	5239	4440	7146	3578	5909	5891	6660	5597	3753	4165	4807	6292	5938	6250	6134	5536	4479
	ATS		Bait boat	6815	10343	9710	6973	7475	5084	5876	3375	4350	7926	3748	5938	6931	5211	4765	4965	2949	1846	3228	2852	4297	4434	7014	3349	4567
			Longline	24399	28039	21671	20626	14735	12977	17740	15087	13218	12113	13471	16445	17846	13888	8907	10104	11243	11674	13715	12473	13747	20509	16254	18106	15990
			Other surf.	116	389	325	85	300	323	395	1762	1219	2066	1651	1538	66	266	7	0.2	108	114	84	113	17	0.0	198	116	97
			Purse seine	58	25	39	323	16	499	442	58	81	144	355	205	428	58	44	131	83	190	19	3	11	21	36	69	20
			Trawl	0.0	0	0.4	12	18	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Troll	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	
Discards	ATN		Longline	0	0	0	0	0	0	0	0	0	0	0	0	0.2	93	179	209	300	302	160	151	53	121	0.2	35	1
			Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
			Trawl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	13	8
			Troll	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0
	ATS		Longline	0	0	0	0	0	0	0	0	0	0	0	0.3	1	0.1	0.0	0	0	0	0	37	11	4	2	32	19
			Purse seine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.0	0	0	0	0	0	0
Landings	ATN	CP	Barbados	0	2	5	8	10	13	9	7	7	4	6	4	20	22	13	16	38	32	15	7	10	13	12	14	4
			Belize	0	0	0	0	0	0	0	22	26	39	416	351	155	230	79	1	399	448	385	216	326	201	212	381	323
			Brazil	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	148	83	14	0	41	19
			Cabo Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
			Canada	122	51	113	56	27	52	27	25	33	11	14	28	34	32	47	32	20	17	26	31	12	40	27	25	19
			China PR	16	57	196	155	32	112	202	59	24	27	142	101	21	81	35	21	103	124	124	129	208	291	240	191	279
			Costa Rica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	5	11	5	1	1	2	1	1	1
			Cuba	0	0	1	322	435	424	527	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0
			Côte d'Ivoire	0	0	0	0	0	0	0	0	0	25	53	39	146	0	0	0	151	549	0	76	14	30	0	27	109
			EU-España	16000	9177	8952	12530	15379	20447	24538	14582	12725	9617	12961	8357	13719	10502	11607	14126	17077	13964	15691	16536	16205	17408	16870	17293	12462
			EU-France	5718	6005	4320	3456	2444	7266	6559	3179	3009	1139	1293	3352	3370	4625	6716	3441	4229	4191	5824	7881	4753	5397	6362	2889	3538
			EU-Ireland	3464	2093	1100	755	175	306	521	596	1517	1997	788	3597	3575	2231	2485	2390	2337	2492	3102	3213	2938	2879	3374	3035	4003
			EU-Netherlands	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0
			EU-Portugal	278	1175	1953	553	513	556	119	184	614	108	202	1046	1231	567	2609	929	1111	2527	498	2493	1596	501	281	223	94
			FR-St Pierre et Miquelon	0	0	4	0	7	2	0	3	0.2	0	0.0	0	0	0.3	0.1	0	0	0	0	0	0	0	0	0	0
			Great Britain	15	0	0	0	0	6	19	30	50	67	118	57	50	133	136	31	0.1	0	0	0	77	165	121	110	5
			Grenada	12	21	23	46	25	29	19	20	15	18	18	18	0	0	0	79	50	62	37	23	22	6	3	11	2
			Guatemala	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Japan	688	1126	711	680	893	1336	781	288	402	288	525	336	400	1745	267	276	297	366	196	334	260	225	248	216	225
			Korea Rep	0	0	0	0	0	59	45	12	59	82	110	60	200	184	64	5	13	8	27	48	116	115	124	106	128
			Liberia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	90	3	0	0	0	0	2	0.0
			Maroc	0	0	55	81	120	178	98	96	99	130	0	0.2	0	0	0	0	20	20	20	25	29	40	60	90	120
			Mexico	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0	0	3	1	2	0.4	7	0.3	1	1	0.1	0.2	0
			Panama	0	0	0	0	0	0	96	298	113	45	154	103	0	246	108	103	200	0	196	185	176	183	181	171	0
			Philippines	0.0	0	0	0	0	9	0	8	19	54	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0
			Senegal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
			Sierra Leone	0	91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			St Vincent and Grenadines	704	1370	300	1555	89	802	76	263	130	135	177	329	305	286	328	305	291	297	173	180	252	202	0	0	0.2
			Trinidad and Tobago	2	11	9	12	12	9	12	18	32	17	17	23	47	67	71	95	71	48	33	22	16	27	22	12	10
			UK-Bermuda	2	2	0.2	0.1	0.5	0.5	0	0.2	0.2	0.3	0.4	1	0.2	0.3	1	0.4	1	0.4	0.4	1	2	4	5	2	4
			UK-Turks and Caicos	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	2	0	0	0	0	0	0	0	0	0	0
			USA	406	322	480	444	646	488	400	532	257	189	221	369	409	819	458	354	250	238	103	221	328	296	311	180	228
			Venezuela	299	348	162	346	457	175	321	375	222	398	288	247	312	181	285	351	287	301	165	221	246	299	317	213	180
		NCC	Chinese Taipei	5299	4399	4330	4557	4278	2540	2357	1297	1107	863	1587	1367	1180	2394	947	2857	3134	2385	2926	2770	3549	2896	2806	2782	2446
			Guyana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	3	1	0.1	0	0	0	
			Suriname	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	213
		NCO	Dominica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1	1	0.1	2	0.5	0	0	0	0.1
			Dominican Republic	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	
			Sta Lucia	0.5	3	2	10	0	2	2	2	2	0	130	2	3	2	0	0.2	2	1	0	1	0.3	0.3	0.3	2	
			Vanuatu	0	0	0	0	414	507	235	95	20	140	187	196	172	228	195	0	0	0	0	0	0	0	0	0	
	ATS	CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	168	0	5	0	0	0	0	0	0	0	2	0	3
			Belize	2	0	0	0	0	0	54	32	31	213	303	365	171	87	98	0	123	219	311	158	162	31	15	0	1
			Brazil	4412	6862	3228	2647	522	556	361	535	487	202	271	1269	2077	2016	462	490	658	497	343	854	534	502	543	524	605
			Cabo Verde	0	0	0	0	0	8	46	24	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
			China PR	89	26	30	26	112	95	100	35	25	89	97	80	61	65	34	120	94	185	116	132	184	10	31	91	116
			Curaçao	2	0	0	0	0	0	0	0	0	21	4	4	24	0	0	1	14	10	0	0	0	0	18	0	0
			Côte d'Ivoire	0	0	0	0	0	0	0	0	0	47	43	45	50	0	0	0	0	0	6	19	45	47	20	17	50
			EU-España	288	573	836	376	81	285	367	758	933	1061	294	314	351	369	259	418	195	347	303	186	30	37	32	30	24
			EU-France	23	11	18	63	16	443	347	12	50	43	109	50	151	40	41	54	64	78	16	3	10	21	16	3	19
			EU-Portugal	486	41	433	415	9	43	8	13	49	254	84	44	11	1	3	1	9	9	11	3	2	3	3	2	5
			Ghana	0	0	0	53	0	0	0	5	10	14	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Great Britain	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Guatemala	0	0	0	0	0	0	40	0	0	0	56	0	0	15	0	1	3	1	0	0	0	0	0	0	0
			Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0.2	0	0	1	0	0	0	0	0	
			Guinée Rep	0	0	0	0	0	0	0	0	0	0	7	7	74	0	0	0	0	0	0	0	0	0	0	0	0
			Japan	554	341	231	322	509	312	316	238	1370	921	973	1194	2903	3106	1131	1752	1096	1189	2985	1506	900	1645	1835	1541	2623
			Korea Rep	18	1	0	5	37	42	66	56	88	374	130	70	89	33	2	4	48	86	167	170	131	131	153	88	167
			Maroc	0	0	14	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Namibia	2418	3419	2962	3152	3328	2344	5100	1196	1958	4936	1320	3791	2420	848	1057	1062	994	214	888	260	2166	8165	6319	5773	274
			Panama	0	0	0	15	0	17	0	87	5	6	1	0	12	3	18	6	5	13	1	13	31	17	12	5	0
			Philippines	0.1	0	0	0	0	52	0	13	79	45	95	96	203	415	18	0	0	0	0	0	0	0	0	0	0
			Senegal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	24	0	0	0	0	0
			South Africa	3610	7236	6507	3469	4502	3198	3735	3797	3468	5043	4147	3380	3553	3510	3719	4030	2065	1785	2572	2455	4026	3823	5587	2670	4882
			St Vincent and Grenadines	2116	4303	44	0	0	0	65	160	71	51	31	94	92	97	110	100	107	101	98	31	0	14	23	0.3	0
			Trinidad and Tobago	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0.1	
			UK-Sta Helena	58	12	2	3	1	35	62	46	94	81	3	120	2	2	0	0	0	0	0	0	0	0	0	0	0
			USA	1	2	8	2	1	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0.0	0	0	0
			Uruguay	90	135	111	108	120	32	93	34	53	97	24	37	12	209	0	0	0	0	0	0	0	0	0	0	0
		NCC	Chinese Taipei	17221	15833	17321	17351	13288	10730	12293	13146	9966	8678	10975	13032	12812	8519	6675	7157	8907	9090	9227	9626	9851	10519	8894	10895	11905
		NCO	Argentina	0.0	0	0.4	12	18	0.0	0	0	0	0	130	43	0	0	0	0	0	0	0	0	0	0	0	0	
			Seychelles	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Vanuatu	0	0	0	0	0.1	684	1400	96	131	64	104	85	35	83	91	0	0	0	0	0	0	0	0	0	
Discards	ATN	CP	Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.1	0.0	0.0	0	0	0	0.3	0
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	13	8
			EU-Portugal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0
			Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	1	0.0	0.1	0	1
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0.0	0
			Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0
			UK-Bermuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.1	0.0	0	0.0
			Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	93	179	209	300	302	160	151	52	121	0	17	0
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0
	ATS	CP	Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.0	0	0	0	0	0	0
			Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	11	4	2	24	19
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	7	0
			South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.0	0	0	0	0	0	0	0	0	0	0
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.2	1	0	0	0	0	0	0	0	0	0	0	0	0

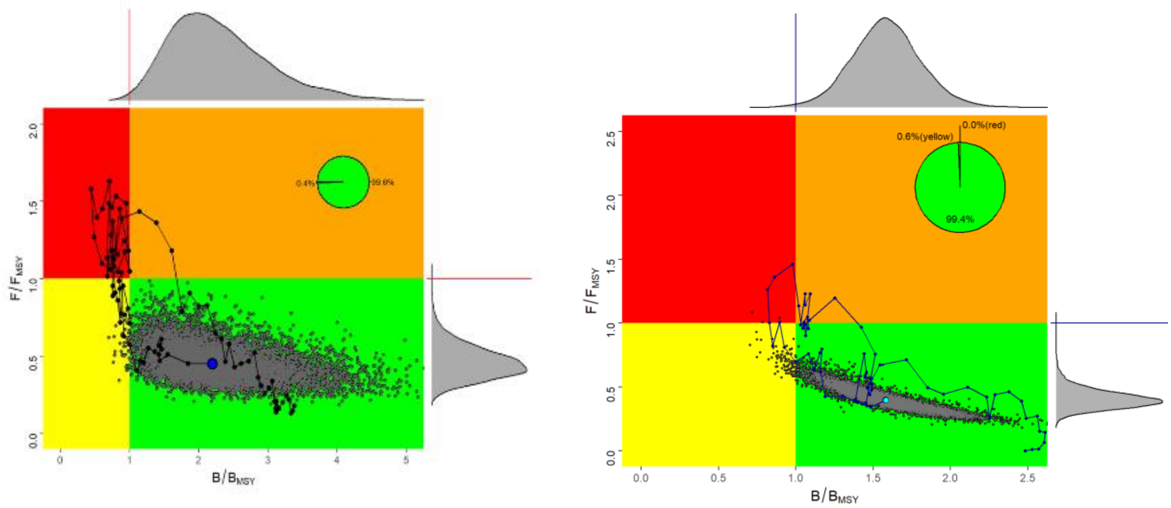


Figure 1. Kobe plot for the North (left) and South (right) Atlantic albacore tuna stock status in 2021 and 2018, respectively. The North Atlantic plot shows the stock status trajectory from 1930 to 2021, and the South Atlantic from 1958 to 2018, as estimated during the 2023 stock assessment (Anon., 2023a) and the 2020 stock assessment (Anon., 2020a), respectively. The line, in both plots, indicates the stock status trajectory starting in 1930 and 1958, respectively. The inserted pie chart indicates the probability of the stock being within each Kobe color quadrant.

Outlook

North Atlantic

Abundance indices for the North stock showed an overall increasing trend during the last decades (**Figure 4**). Although highly uncertain, the 2021 spawning stock biomass was estimated to be well above SSB_{MSY} (not overfished), with fishing mortality well below F_{MSY} (no overfishing). The stock is in the green quadrant of the Kobe plot with 99.6% probability. The current high biomass supports catches above MSY in the short term, including at levels of the current total allowable catch (TAC) of 47,251 t.

South Atlantic

For the South Atlantic stock, the abundance indices indicate an increasing trend in recent decades (**Figure 5**) and the 2018 status shows that the stock is not overfished and not subject to overfishing with greater than 99% probability of being in the green quadrant of the Kobe plot. The Kobe matrix indicates that catches at the MSY level (~27,000 t) would likely keep biomass above B_{MSY} and fishing mortality below F_{MSY} (90% probability) through 2033 (**Table 3c**).

Management recommendation

North Atlantic

Rec. 21-04 outlines the adopted MP for the northern stock, which was chosen to achieve the management objective of maintaining the stock in the green area of the Kobe plot with at least 60% probability while maximizing long-term yield.

In the 2023 North Atlantic albacore stock assessment (Anon., 2023a), the Committee noted that the relative abundance of North Atlantic albacore has continued to increase over the last two decades and the stock was estimated to be in the green area of the Kobe plot with a greater than 99% probability. The Committee applied the MP to calculate the TAC for the 2024-2026 period. The TAC obtained by applying the MP was 47,251 t. Since no exceptional circumstances (ECs) were detected, the Committee recommended implementing this TAC.

South Atlantic

In 2022, the Commission adopted a total allowable catch (TAC) of 28,000 t for the South Atlantic albacore stock for the period 2023–2026, as established under *Recommendation by ICCAT on the southern Atlantic albacore catch limits for the period 2023-2026* (Rec. 22-06). The Committee noted that, based on the available data, reported catches have remained consistently below 28,000 t since 2004 (**Table 2**).

Table 3. South Atlantic albacore estimated probabilities (in %) based on Bayesian surplus production model that the fishing mortality is below or equal to F_{MSY} (a), biomass is above or equal to B_{MSY} (b) and both (c). Projections for constant catch levels (16,000 t to 34,000 t) are shown.

a) Probability that $F \leq F_{MSY}$

TAC | Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
16000	100	100	100	100	100	100	100	100	100	100	100	100	100
18000	100	100	100	100	100	100	100	100	100	100	100	100	100
20000	100	100	100	100	100	100	100	100	100	100	100	100	100
21000	100	100	100	100	100	100	100	100	100	100	100	100	100
22000	100	100	100	100	100	100	100	100	100	100	99	99	99
23000	100	100	100	100	100	100	99	99	99	99	99	99	99
24000	100	100	100	99	99	99	99	99	99	99	99	98	98
25000	100	100	99	99	99	99	98	98	98	98	98	97	97
26000	99	99	99	99	98	98	98	97	97	96	95	95	94
27000	99	99	98	98	97	97	96	95	94	93	92	91	90
28000	99	98	98	97	96	95	93	92	91	89	87	86	84
29000	99	98	97	96	94	93	90	88	85	82	80	77	74
30000	98	97	96	94	91	89	85	81	78	73	70	65	62
32000	97	95	92	88	82	76	69	62	56	49	44	39	35
34000	95	91	85	77	67	57	48	40	32	27	22	19	16

b) Probability that $B \geq B_{MSY}$

TAC | Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
16000	100	100	100	100	100	100	100	100	100	100	100	100	100
18000	100	100	100	100	100	100	100	100	100	100	100	100	100
20000	100	100	100	100	100	100	100	100	100	100	100	100	100
21000	100	100	100	99	99	99	99	99	99	99	99	99	99
22000	100	100	100	99	99	99	99	99	99	99	99	99	99
23000	100	100	100	99	99	99	99	99	99	99	99	99	98
24000	100	99	99	99	99	99	99	99	98	98	98	98	98
25000	100	100	99	99	99	99	98	98	98	98	97	97	97
26000	100	99	99	99	99	99	98	98	97	97	96	95	95
27000	100	99	99	99	98	98	97	97	96	95	94	93	92
28000	100	99	99	99	98	97	96	95	94	93	91	90	88
29000	100	99	99	98	98	97	96	94	92	90	88	85	83
30000	100	99	99	98	97	96	94	92	89	86	83	79	76
32000	100	99	99	98	96	93	89	85	80	74	68	62	56
34000	100	99	98	96	93	89	82	75	66	58	49	42	36

c) Probability that $F \leq F_{MSY}$ and $B \geq B_{MSY}$

TAC | Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
16000	100	100	100	100	100	100	100	100	100	100	100	100	100
18000	100	100	100	100	100	100	100	100	100	100	100	100	100
20000	100	100	100	100	100	100	100	100	100	100	100	100	100
21000	100	100	100	99	99	99	99	99	99	99	99	99	99
22000	100	100	100	99	99	99	99	99	99	99	99	99	99
23000	100	100	99	99	99	99	99	99	99	99	99	98	98
24000	100	99	99	99	99	99	99	98	98	98	98	98	98
25000	100	99	99	99	99	98	98	98	98	97	97	97	96
26000	99	99	99	98	98	98	97	97	96	96	95	94	94
27000	99	99	98	98	97	97	96	95	94	93	92	91	90
28000	99	98	98	97	96	95	93	92	90	89	87	85	83
29000	99	98	97	96	94	93	90	88	85	82	79	77	74
30000	98	97	96	94	91	89	85	81	78	73	69	65	61
32000	97	95	92	88	82	76	69	62	56	49	44	39	35
34000	95	91	85	77	67	57	48	40	32	27	22	19	16

Additional supporting information

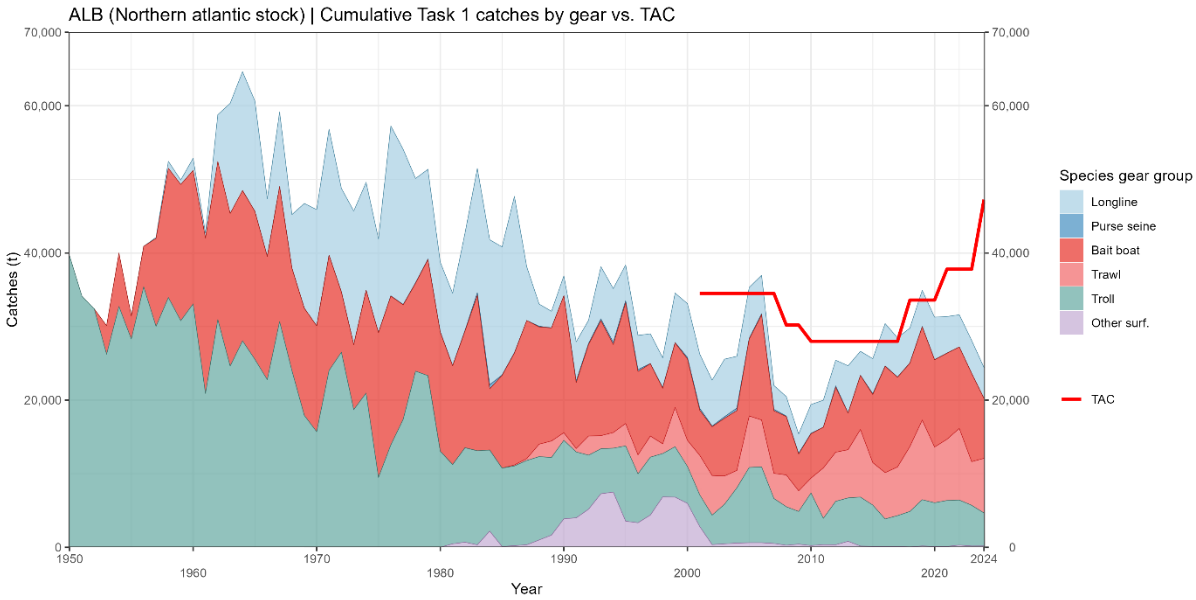


Figure 2. Total albacore catches (landings and dead discards, t) available in Task 1 nominal catches reported to ICCAT (Task 1) by main gear for the North Atlantic stock including TAC (red line).

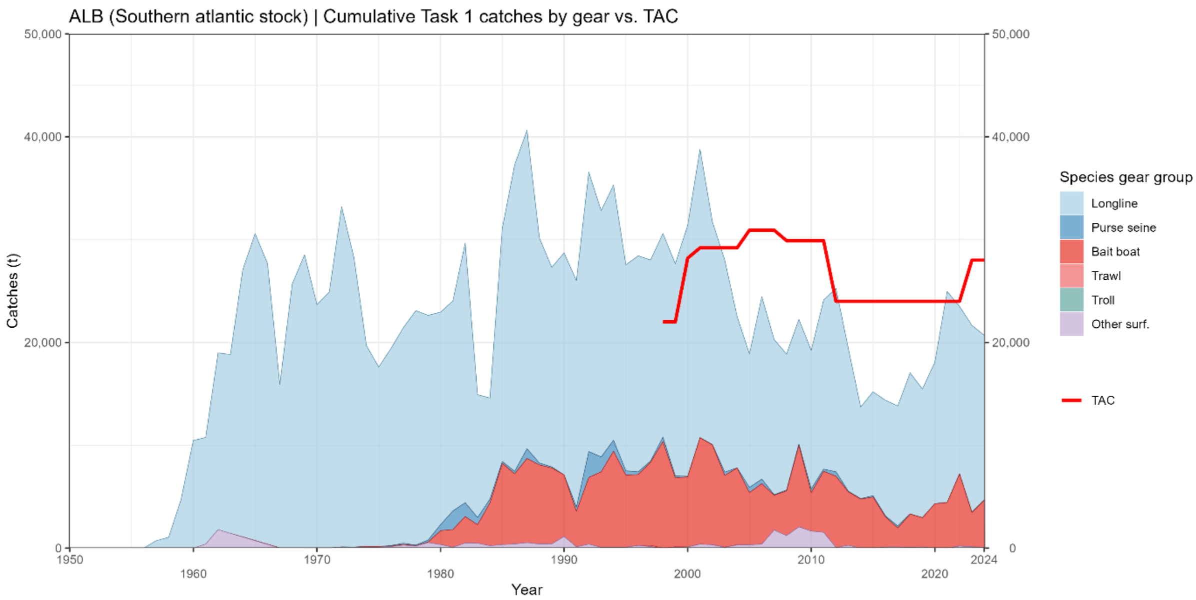


Figure 3. Total albacore catches (landings and dead discards, t) available in Task 1 nominal catches by main gear for the South Atlantic stock including TAC (solid line).

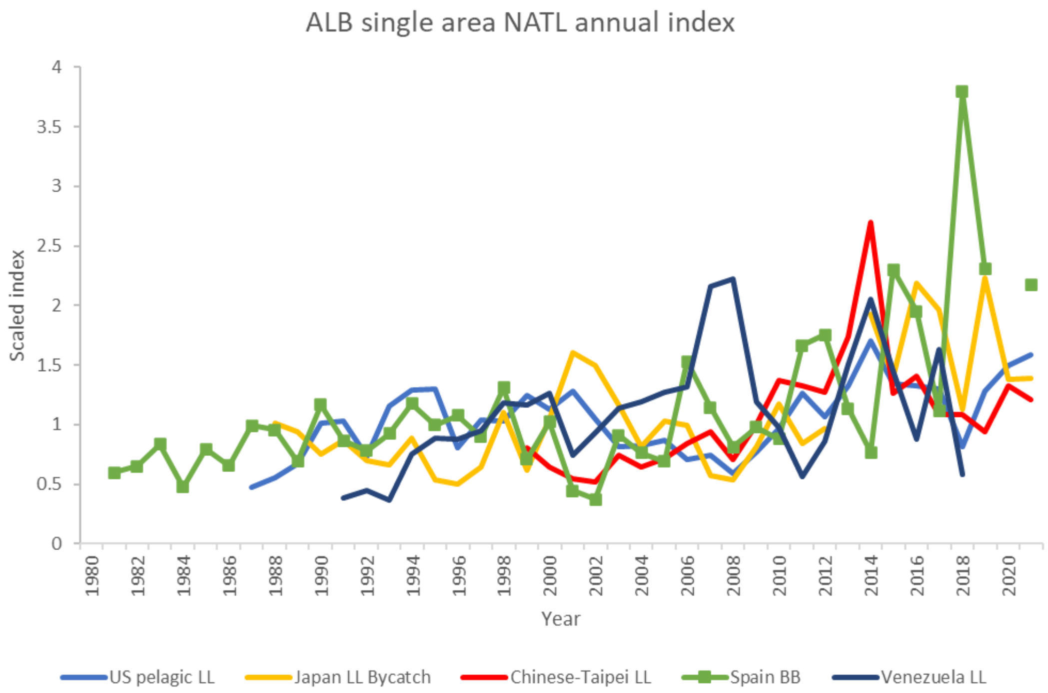


Figure 4. North Atlantic albacore standardized catch rate indices used in the 2023 stock assessment (Anon., 2023a) from the surface fishery (baitboat) which take mostly juvenile fish, and from the longline fisheries which take mostly adult fish.

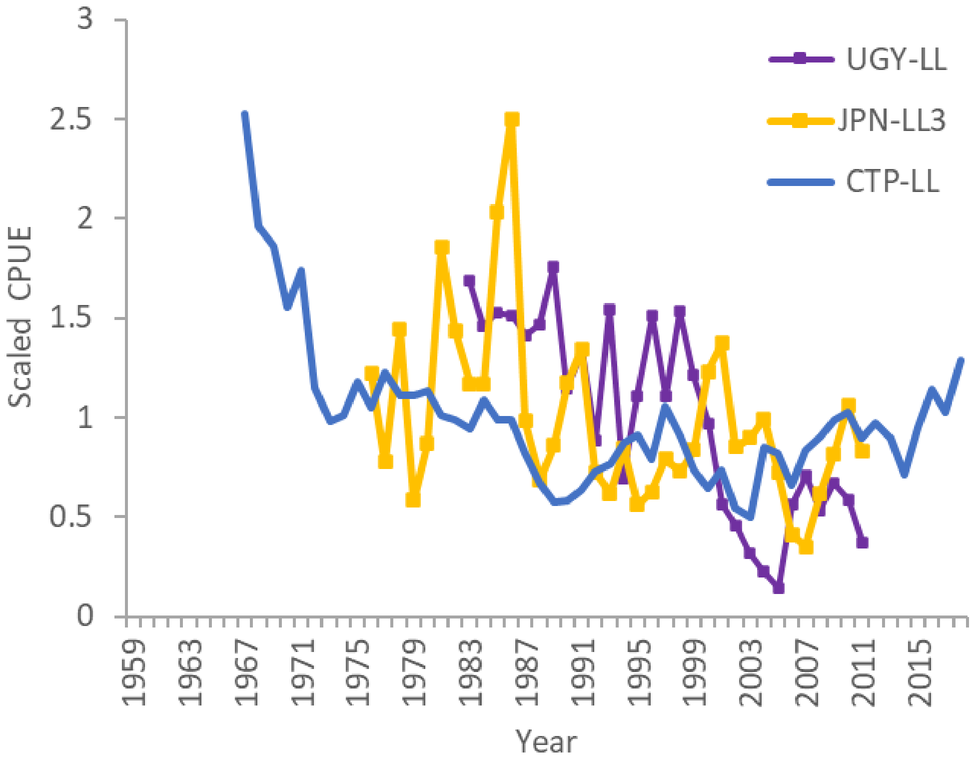


Figure 5. Standardized longline catch per unit effort (CPUE) indices for South Atlantic albacore used in the 2020 stock assessment.

*13.15 ALB-MD Mediterranean albacore tuna (*Thunnus alalunga*)*

Introduction

The current status of the Mediterranean albacore stock is based on the stock assessment (Anon., 2024f) carried out in 2024, which was conducted using catch and catch per unit effort (CPUE) data up to 2022. Two scenarios, defined based on the treatment of the available larval abundance index, were analyzed using a Bayesian state space surplus production model (JABBA) (Anon., 2021a, Anon., 2024f). A summary of the stock status is reported in **Table 1**. **Table 2** provides estimated catches (landings and discards, t) available in Task 1 nominal catches for the period 2000-2024. The Kobe Phase Plots for both scenarios are summarized in **Figure 1**.

Table 1. Mediterranean albacore summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	Scenario 1: 3,564 t (2,584 t - 4,663 t) Scenario 2: 4,174 t (2,831 t - 7,936 t)[1]	2022
TAC (2024)	2,500 t	
Current (2024) Yield	2,423 t[2]	
Relative Biomass (B_{2022}/B_{MSY})	Scenario 1: 0.58 (0.31-1.10) Scenario 2: 1.44 (0.59-2.64)[1]	
Relative Fishing Mortality (F_{2022}/F_{MSY})	Scenario 1: 1.22 (0.66-2.10)[1] Scenario 2: 0.42 (0.13-1.17)[1]	
Stock Status	Overfished: Scenario 1 – YES; Scenario 2 - NO Overfishing: Scenario 1 – YES; Scenario 2 - NO	
Management measures in effect	Rec. 22-05; Rec. 24-08: TAC for years 2025-2026: 2,500 t.	

[1] Median and 95% credibility intervals for the Bayesian surplus production model under the two alternative scenarios considered.
[2] Provisional and subject to revision as of 26 September 2025.

Table 2. Estimated catches (landings and dead discards, t) of Mediterranean albacore tuna by area, gear, and flag for the period 2000-2024.

			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL	MED		5577	4870	5608	7898	4874	3529	5965	6520	2970	4024	2124	4628	2047	1503	2400	3800	4396	3176	2863	2762	2675	2895	2295	2421	2423
Landings		Bait boat	88	77	29	0	0	0.3	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Longline	2796	2597	3704	4248	2335	1997	3026	4101	2694	2160	1719	2327	1959	1392	2343	3235	4333	3087	2378	2656	2497	2798	2112	2261	2241
		Other surf.	2693	2196	1757	46	87	169	134	182	246	634	404	1408	8	18	27	5	4	2	2	8	29	1	34	20	13
		Purse seine	0	0.3	1	3557	2452	1362	2803	2237	25	1230	0	869	68	86	15	543	34	82	481	30	66	72	110	129	138
		Trawl	0	0	0	48	0	0	0	0	5	0.1	0	0.3	0	0	5	7	9	3	2	2	5	13	1	0	0.0
		Troll	0	0	117	0	0	0	2	0.5	1	0.2	1	0	6	0	3	0.2	0.2	2	1	67	62	5	0.2	0.0	7
Discards		Longline	0	0	0	0	0	0	0	0	0	0	0	25	6	7	8	10	16	0	0	0	16	5	39	11	24
Landings	CP	EU-Croatia	0	0	0	0	0	0	0	0	0	0	2	7	12	20	30	11	7	2	2	1	1	0.4	0.3	0.1	0.2
		EU-Cyprus	6	0	12	30	255	425	507	712	209	223	206	222	315	350	377	495	542	568	624	714	632	513	448	346	301
		EU-España	152	200	209	0.5	138	189	382	516	238	204	277	343	389	244	283	53	51	206	71	68	67	133	98	134	100
		EU-France	0	0.3	1	0	0	0	0	2	1	0.3	1	2	0.3	0.4	1	1	0	0	0	15	15	24	36	13	9
		EU-Greece	1786	1840	1352	950	773	623	402	448	191	116	125	126	126	165	287	541	1332	608	522	297	158	182	145	245	256
		EU-Italy	3630	2826	4032	6913	3671	2248	4584	3970	2104	2727	1109	2501	1117	615	1353	1602	1490	1348	1044	1287	1423	1192	1154	1167	1296
		EU-Malta	4	4	2	5	10	15	18	1	5	1	2	5	19	29	62	37	56	4	104	77	13	137	50	30	**0**
		EU-Portugal	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		Egypt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	246	77	396	429	278	316	622	177	164	159
		Japan	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		Korea Rep	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		Libya	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	750	800	0	30	21	19	17	20	150	110
		Maroc	0	0	0	0	0	0	0	0	0	120	0	0	0	0	0	0	0	0	0	0	0	10	10	10	10
		Syria	0	0	0	0	0	0	0	19	14	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	**0**
		Tunisie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		Türkiye	0	0	0	0	27	30	73	852	208	631	402	1396	62	71	0.3	53	25	44	38	4	16	58	118	150	150
Discards		EU-Cyprus	0	0	0	0	0	0	0	0	0	0	0	25	6	7	8	10	16	0	0	0	16	5	37	8	23
		EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	2	3	0.5

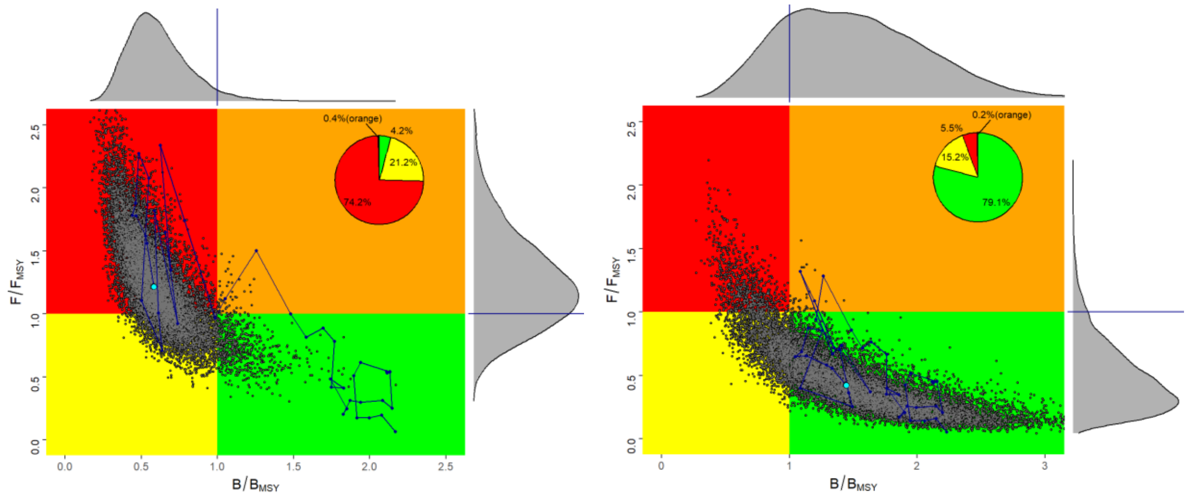


Figure 1. Mediterranean albacore stock status trajectories of B/B_{MSY} and F/F_{MSY} over time (1980-2022) with uncertainty around the current estimate (Kobe plots) for Bayesian surplus production model. The inserted pie indicates the probability of the stock being within each Kobe color quadrant, for scenarios 1 (left) and 2 (right). The probability distributions shown in each axis represent uncertainty around current B/B_{MSY} and F/F_{MSY}.

Outlook

The Committee emphasized that the substantial uncertainties in the assessment, which resulted in two very different stock statuses, prevent the provision of a clear outlook for the stock at this time. The two alternative scenarios considered would support substantially different TAC values in the future and the Committee was unable to judge which one reflects the most appropriate scenario.

The two alternative scenarios considered in the assessment were projected to 2036 using the current TAC (2,500 t) and probabilities of $B \geq B_{MSY}$ were at or above 60% by the end of the projection period for both scenarios. While the Committee was unable to judge which one of the scenarios was the most appropriate it appears that the current TAC will recover the stock and achieve $B \geq B_{MSY}$ with a probability higher than 60% regardless of which is the most appropriate scenario.

Management recommendations

In the 2024 Mediterranean albacore assessment, the Committee emphasized that the notable uncertainties prevented providing specific TAC advice. However, the Committee noted that, in both scenarios analyzed, the TAC (2,500 t) at that time would allow to meet the management objectives to recover the stock above B_{MSY} with a probability higher than 60%.

Before the Committee can provide robust management recommendations for the stock, further work is required to address key issues such as the treatment of the western Mediterranean larval index and the reliability of the available catch data. Uncertainty in total catch is of paramount importance in production models and, to the extent that the reported catches are inaccurate or incomplete, the ability of these models to reflect the stock dynamics accurately is undermined. Therefore, the Committee suggested re-evaluating the stock status only after addressing the main concerns expressed.

Additional information

The stock assessment for Mediterranean albacore (2024) was conducted using data up to 2022. A Bayesian state space surplus production model (JABBA) was used for assessment purposes. Main uncertainties in the data inputs to the model included possible under-reporting of the catch, CPUEs limitations in spatial and temporal coverage, treatment of the western Mediterranean larval index (split or not), which was crucial when characterizing the current state of the stock. Two scenarios were considered: one with the larval index as a continuous series and one splitting the index into two time series (2001-2005/2012-2022).

The results from these two scenarios provided very different perceptions of the stock status. The two scenarios were projected to 2036 with current TAC (2,500 t), and probabilities of $B \geq B_{MSY}$ were at or above 60% by the end of the projection period for both scenarios.

13.6 *BFT-Bluefin tuna* (Thunnus thynnus)

Introduction

In 2022, the ICCAT Commission adopted a Management Procedure (MP) for both the western Atlantic and eastern Atlantic and Mediterranean management areas (Rec. 22-09). The MP frees the assessment process from having to provide annual TAC advice and allows the stock assessment process to return to its traditional strengths which are to provide a determination of relative stock status. According to the adopted MP (Rec. 23-07), stock assessments will continue to be conducted but on a reduced frequency. A status assessment will be held in 2026 or 2027 as part of the MSE review process, pending further dialogue between the Committee and the Commission. Until such time as a new assessment occurs, the Committee retains the stock status determination from the most recent assessments: West (Anon., 2021d) and East Atlantic and Mediterranean (Anon., 2022f). Previous stock assessments utilized $F_{0.1}$ as a reasonable proxy for F_{MSY} as fishing at $F_{0.1}$ would, over the longer term, allow the resource to fluctuate around the true, but unknown, value of $B_{0.1}$ regardless of the future recruitment level. The Committee noted that $F_{0.1}$ was not used to evaluate status within the MSE as the F_{MSY} was estimated within each of the operating models.

Summaries of stock status and estimated catches and discards by gear for Eastern Atlantic and Mediterranean Sea and Western Atlantic are provided in **Tables 1** (a: East and b: West) and **2**, respectively.

Table 1a. Eastern Atlantic and Mediterranean Sea bluefin tuna summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	Unknown	2020
TAC (2024)	40,570 t	
Current (2024) Yield	39,426 t[1]	
Relative Fishing Mortality ($F_{CURRENT}/F_{0.1}$[2])	0.81 (0.48-1.62)[3]	
Stock Status [3]	Overfishing: NO	
Management measures in effect	Rec. 24-05 and Rec. 23-07	
Managed according to a Management Procedure: Recommended TAC for the period 2023-2025 of 40,570 t		

[1] As of 26 September 2025.
[2] $F_{CURRENT}$ refers to the geometric mean of the estimates (a proxy for recent F levels) for 2017-2020 for VPA, and for 2018-2020 for ASAP and SS. For the VPA and ASAP, F is measured as apical F, for SS F is exploitation rate in biomass.
[3] Mean and approximate 95% CI from integrating across the uncertainty for each model.

Table 1b. Western Atlantic bluefin tuna summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	Unknown	2020
TAC (2024)	2,726 t	
Current (2024) Yield	2,961 t[1]	
Relative Fishing Mortality ($F_{2018\text{-}2020}/F_{0.1}$)	0.53 (0.49-0.58)[2]	
Stock Status	Overfishing: NO (=<1% probability of overfishing)[3]	
Management measures in effect	Rec. 22-10 and Rec. 23-07	
Managed according to a Management Procedure: Recommended TAC for the period 2023-2025 of 2,726 t.		

[1] As of 26 September 2025.
[2] Mean and approximate 80% confidence interval from the multivariate lognormal approximation approach from the assessment.
[3] Biomass reference points to determine stock status were not estimated in the 2021 BFT-W Stock Assessment due to uncertainty in recruitment potential.

Table 2. Estimated catches and discards of Atlantic bluefin tuna by stock and gear, for the period 2000-2024.

				2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL				52775	52785	53319	52306	52125	51757	51813	62639	26463	21799	13197	11782	12689	14726	14889	18057	21314	25517	29853	33442	37255	37407	37800	41808	42387
	ATE			10061	10086	10347	7394	7402	9023	7529	8441	8243	6685	4379	3984	3834	4163	3918	4841	5968	7216	8157	9044	10874	10308	10477	10994	11010
	MED			39940	39914	39654	42606	42599	40977	42473	52560	16220	13135	6961	5791	7101	9082	9344	11374	13445	16451	19626	22092	24174	24789	24623	28250	28417
	ATW			2775	2784	3319	2305	2125	1756	1811	1638	2000	1980	1857	2007	1754	1482	1627	1842	1901	1850	2069	2306	2208	2310	2700	2564	2961
Landings	ATE		Bait boat	2032	2426	2635	1409	1902	2282	1263	2436	2393	1260	725	636	283	243	95	172	1085	1187	679	845	936	1031	1026	1036	1069
			Longline	3736	3303	2896	2748	2064	2700	2033	1705	2491	1951	1194	1125	1139	1167	1194	1467	1829	2208	2730	3128	3313	3249	3294	3632	3576
			Other surf.	509	558	631	521	290	424	831	502	181	297	124	35	49	141	210	193	261	295	340	320	381	359	368	430	448
			Purse seine	661	153	887	490	1078	1197	408	0	0.0	2	1	0.3	0.1	2	0.1	0	42	49	11	56	190	147	107	111	333
			Sport (HL+RR)	126	61	63	109	89	11	99	11	12	11	44	51	53	46	43	104	35	109	132	92	156	267	245	237	273
			Traps	2996	3585	3235	2116	1978	2408	2895	3788	3166	3164	2292	2137	2311	2564	2376	2905	2716	3362	4258	4594	5889	5255	5434	5541	5302
	MED		Bait boat	38	28	1	9	17	5	0	0	0	38	1	0	2	2	9	25	0.2	18	22	72	103	81	88	117	115
			Longline	3424	4144	3234	3484	3036	3427	3408	3269	2376	1344	1242	962	587	605	588	776	1523	1184	1518	1485	1638	1657	1785	2030	2253
			Other surf.	729	354	340	198	197	175	83	86	3	2	3	2	2	21	31	5	38	3	36	53	42	68	61	76	59
			Purse seine	33237	33043	34044	37291	37869	36639	38363	48994	13540	11448	4986	4293	6172	7982	8184	9993	11340	14493	17128	19515	21123	21987	21587	24659	24776
			Sport (HL+RR)	1773	1167	1520	1404	1325	619	494	117	149	160	448	356	202	240	289	373	308	472	616	611	865	740	717	875	841
			Traps	739	1177	515	221	154	112	125	93	152	144	281	165	125	222	232	192	227	272	300	353	399	252	384	407	349
	ATW		Longline	858	610	729	186	644	425	565	420	606	366	529	743	478	470	498	553	562	559	706	675	576	653	913	888	955
			Other surf.	283	201	107	139	97	89	85	63	78	121	107	147	117	121	119	138	93	123	77	168	134	175	209	190	189
			Purse seine	275	196	208	265	32	178	4	28	0	11	0	0	2	29	38	34	0	0	0	0	0	0	0	0	
			Sport (HL+RR)	1121	1650	2036	1399	1139	924	1005	1023	1134	1251	1009	888	917	692	810	1085	1204	1144	1263	1450	1482	1444	1521	1461	1783
			Traps	16	16	28	84	32	8	3	4	23	23	39	26	17	11	20	6	10	13	3	4	4	4	0.2	0	
Discards	ATE		Longline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	7	9	8	1	4	5	8
			Sport (HL+RR)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
	MED		Longline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0.5	82	16
			Purse seine	0	0	0	0	0	0	0	0	0	0	0	13	12	9	11	2	9	10	6	4	5	4	2	3	7
			Sport (HL+RR)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	ATW		Longline	222	105	211	232	181	131	149	100	159	207	174	202	224	145	139	19	29	10	18	7	8	31	54	25	33
			Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	2	2	4	3	3	1	1
			Purse seine	0	0	0	0	0	0	0	0	0	0	0	0	0	14	4	5	0	0	0	0	0	0	0	0	
			Sport (HL+RR)	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	
Landings	ATE	CP	China PR	80	68	39	19	41	24	42	72	119	42	38	36	36	38	37	45	54	64	79	89	101	101	72	116	113
			EU-Denmark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.2	1	3	6	6	5
			EU-España	3493	3633	4089	2172	2801	3102	2339	3680	3536	2409	1550	1483	1329	1553	1282	1655	1986	2509	2489	2729	3289	2953	3301	3464	3297
			EU-France	542	629	755	648	561	818	1218	629	253	366	228	135	148	223	212	254	343	350	461	462	557	559	540	637	671
			EU-Ireland	22	8	15	3	1	1	2	1	1	1	2	4	10	13	19	14	32	16	17	6	16	16	20	19	17
			EU-Netherlands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.4	0.1	0	0	0	0.0	1	**0**
			EU-Portugal	441	404	186	61	27	82	104	29	36	53	58	180	223	235	243	263	327	429	450	475	592	614	583	634	640
			Great Britain	0.4	0	0.1	0.3	0	0	0	0	0.0	1	0	0	0	0	0	0	3	0	0	0	0	2	5	22	40
			Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	7	0	0	0	0	0	
			Iceland	0	0	1	0	0	0	0	0	0	0	0	2	5	4	30	37	6	0.4	0	0	1	1	0.2	1	2
			Japan	2895	2425	2536	2695	2015	2598	1896	1612	2351	1904	1155	1089	1093	1129	1134	1386	1578	1905	2262	2514	2773	2779	2867	3083	2973
			Korea Rep	6	0.5	0	0.1	3	0	1	0	0	0	0	0	0	0	0	0	161	181	208	232	247	242	252	274	268
			Maroc	2228	2497	2565	1795	1953	2389	1923	2418	1947	1909	1348	1055	990	960	959	1176	1433	1703	2164	2476	3089	2884	2704	2611	2598
			Norway	0	0	0	0	0	0	0	0	0.3	0	0	0	0	0.3	0.1	8	44	51	12	49	194	152	123	117	153
			Senegal	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	225
			Sierra Leone	93	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		NCC	Chinese Taipei	144	304	158	0	0	10	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		NCO	Faroe Islands	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			ICCAT (RMA)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.1	0.2	0.3	0.5	1	6	2	2	2	2
			Seychelles	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	MED	CP	Albania	0	0	0	0	0	0	0	0	0	50	0	0	0	9	34	40	47	56	100	156	168	148	168	264	263
			Algerie	2083	2098	2056	1504	1440	1500	1673	1489	1311	0	0	0	69	244	244	370	448	1038	1300	1437	1649	1650	1655	1995	2011
			EU-Croatia	930	903	977	1139	828	1017	1022	825	834	619	389	371	369	384	385	456	515	630	738	827	903	903	816	988	958
			EU-Cyprus	61	85	91	79	105	149	110	1	132	2	3	10	18	17	18	22	59	110	133	151	153	169	168	189	184
			EU-España	2772	2234	2215	2512	2353	2758	2689	2414	2465	1769	1056	942	1064	948	1164	1238	1467	1688	2706	2660	2774	3228	2760	3243	3317
			EU-France	6794	6167	5832	5859	6471	8638	7663	10200	2670	3087	1755	805	791	2191	2216	2565	3054	3661	4360	4919	5316	5289	5303	5963	5965
			EU-Greece	622	361	438	422	389	318	255	285	350	373	224	172	176	178	161	195	218	235	267	313	354	327	424	367	397
			EU-Italy	3847	4383	4628	4981	4697	4853	4708	4638	2247	2749	1061	1783	1788	1938	1946	2273	2725	3196	3860	4286	4731	4699	4727	5136	5142
			EU-Malta	378	224	244	258	264	350	270	334	296	316	136	142	137	155	160	182	212	261	308	338	387	382	387	428	428
			EU-Portugal	61	64	0	2	0	0.3	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Egypt	0	0	0	0	0	0	0	0	0	0	0	0	64	77	77	155	99	124	181	263	122	327	67	0	5
			Iceland	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Japan	136	152	390	316	638	378	556	466	80	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Korea Rep	0	0	0	0	700	1145	26	276	335	102	0	0	77	81	81	0	0	0	0	0	0	0	0	0	**0**
			Libya	1549	1941	638	752	1300	1091	1327	1358	1318	1082	645	0	756	929	933	1153	1368	1631	1792	2052	2228	2232	2223	2530	2474
			Maroc	695	511	421	762	827	108	463	641	531	369	205	182	223	309	310	322	350	439	407	444	365	410	862	1053	1021
			Syria	0	0	0	0	0	0	0	50	41	0	34	0	0	0	0	40	47	57	66	72	79	0	79	0	**0**
			Tunisie	2184	2493	2528	791	2376	3249	2545	431	2679	1932	1042	852	1017	1057	1047	1248	1486	1783	2102	2380	2653	2730	2659	2698	3002
			Türkiye	1070	2100	2300	3300	1075	990	806	918	879	665	410	519	536	551	555	1091	1324	1515	1284	1771	2258	2266	2295	3282	3200
		NCC	Chinese Taipei	169	329	508	445	51	267	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		NCO	Gibraltar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	14	16	15	17	20	22	25	28	25
			ICCAT (RMA)	0	0	0	0	0	0	0	0	0	0	0	0	4	3	1	0.2	1	1	0.2	0.2	0.1	0.0	1	0.0	0.2
			NEI (Flag related)	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			NEI (combined)	109	571	508	610	709	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			NEI (inflated)	16458	15298	15880	18873	18376	14164	18343	28234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Palestine	0.4	0.3	1	0.4	1	0.5	1	1	3	2	2	2	1	1	1	2	2	2	2	2	10	2	2	1	
			Serbia & Montenegro	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

	ATW	CP	Brazil	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0.5	**0**
			Canada	549	524	604	557	537	600	733	491	575	530	505	474	477	480	463	531	466	472	550	666	580	626	613	598	616
			Cuba	0	0	74	11	19	27	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	1
			EU-Portugal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.2	**0**
			FR-St Pierre et Miquelon	0	0	3	1	10	5	0	4	3	2	8	0.4	0	0.3	0.2	9	0	0	0	0	0	0	0	0	**0**
			Grenada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
			Japan	492	506	575	57	470	265	376	277	492	162	353	578	289	317	302	347	345	346	406	406	407	410	657	610	702
			Korea Rep	0	0	0	0	0	1	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Mexico	29	10	12	22	9	10	14	7	7	10	14	14	51	23	51	53	55	34	80	39	28	63	60	39	16
			Panama	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			UK-Bermuda	1	1	0.5	0.3	0	0	0	0	0	0.3	0	0.3	0.4	1	0	0.3	0	0.5	0.4	0.3	1	1	0	1	**0**
			UK-British Virgin Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	
			UK-Turks and Caicos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0	0	**0**
			USA	1212	1583	1840	1426	899	717	468	758	764	1068	803	738	713	502	667	877	1002	986	1013	1185	1178	1177	1311	1291	1593
		NCO	Dominica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.1	0.0	0	0	0	0	0	0	0	
			ICCAT (RMA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	
			NEI (Flag related)	270	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Discards	ATE	CP	EU-Denmark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	**0**
			Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	7	9	8	1	4	5	8
	MED		Albania	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-Croatia	0	0	0	0	0	0	0	0	0	0	0	4	5	5	2	2	4	5	6	4	5	4	2	3	11
			EU-Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	5	3
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	77	10
			Libya	0	0	0	0	0	0	0	0	0	0	0	0	7	4	0	0	0	0	0	0	0	0	0	0	**0**
			Tunisie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	5	5	0	0	0	0	0	0	**0**
			Türkiye	0	0	0	0	0	0	0	0	0	0	0	8	0.2	0.2	0	0	0	0	0	0	0	0	0	0	**0**
	ATW		Canada	46	13	37	14	15	0	2	0.4	1	3	25	36	17	0	0	3	8	1	4	3	5	5	6	4	8
			Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.2	0.2	0	0.4	1	2
			Mexico	0	0	0	0	0	0	0	0	0	0	0	0.2	1	0	0	0.1	0.3	0	0	0	0	0.2	0.1	0.1	**0**
			USA	176	98	174	218	167	131	147	100	158	204	150	166	206	159	143	22	24	10	15	6	8	28	50	20	24

Outlook

The Eastern Atlantic and Mediterranean Sea Stock (BFT-E) and the Western Atlantic Stock (BFT-W) are both managed using a single MP tested under MSE to set separate TACs for the West and East areas. Based on the MSE analysis, the adopted MP (BR) is expected to maintain both stocks in the green quadrant of the Kobe matrix with 60% probability over the next 30 years.

The Committee believes that the newly available BFT-W CKMR information is a breakthrough in the BFT stock assessment. The Committee evaluated the effect of incorporating the CKMR estimate into the MSE through reconditioning. Incorporating the CKMR results into the OMs resulted in higher biomass and more positive relative status OMs for the western stock, than used in the adopted MSE (e.g., median western stock status in 2016 is about $1.0B_{MSY}$ after reconditioning v.s. about $0.7B_{MSY}$ before reconditioning). The reconditioned OM biomass estimates are within the range of those tested in the MSE; however, the revised distributions of biomass and stock status were different and influential on the MP. Based on the current EC criteria, the Committee did not reach consensus on whether the new information warranted a declaration of ECs (see item 19.12) according to the criterion of: "if stock is in states previously not considered plausible." As such, both the adopted BR MP and the retuned BR* MP, that takes into account CKMR, are presented for consideration by the Commission.

Management recommendation

The Committee provides the results of two MPs: 1) the adopted BR and 2) BR* retuned to meet the management objectives under the re-conditioned OMs for the Commission's consideration. Regardless of which option the Commission adopts the Committee is scheduled to review the MSE by 2028; this review will include the new western CKMR information (as agreed in 2025, that was the only new information to be taken into account in 2025) as well as updated information on stock mixing, movement and index revisions.

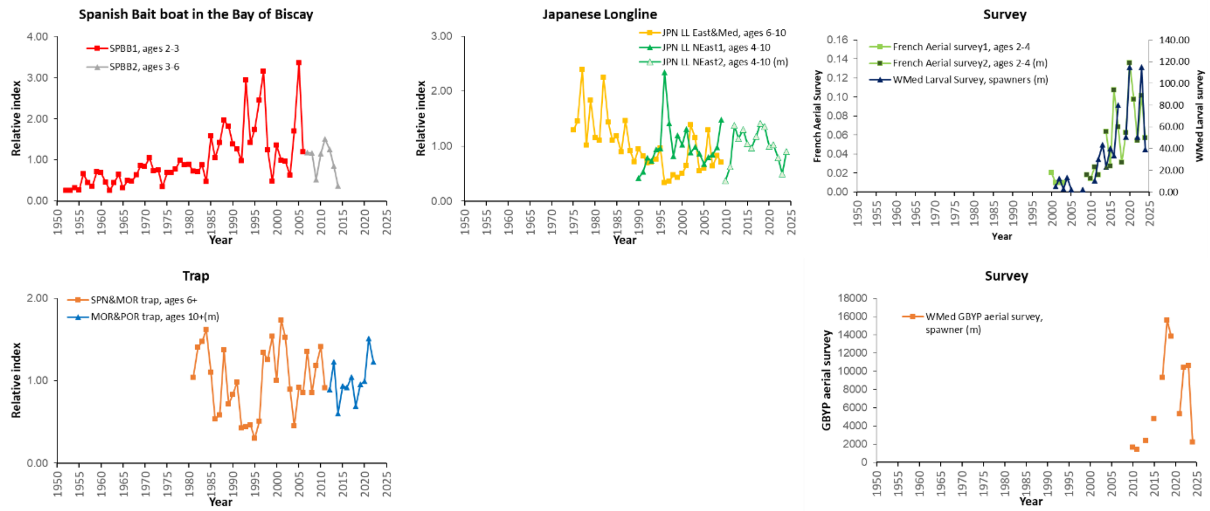
	East TAC (2026-2028)	***West TAC (2026-2028)***
BR - adopted MP[1]	48,403 t	2,568 t
BR* - CKMR retuned MP[2]	45,191 t	2,963 t

[1] Rec. 23-07
[2] Section 19.10 of this report and BRn9 in document Walter *et al.* (2025) (SCRS/2025/239).

Additional supporting information

The Committee recognized that environmental variability is an important factor affecting many aspects of bluefin tuna population dynamics and the data used to assess stock status such as the indices of relative abundance (**Figure 1**). Drivers of particular interest are those related to the occurrence of marine heatwaves, the displacement of mesoscale structures, and changes in productivity. Given the potential influence of observed environmental changes on the variability of abundance indices, the SCRS will attempt to integrate these variables into the construction of such indices.

East Atlantic and Mediterranean



West Atlantic

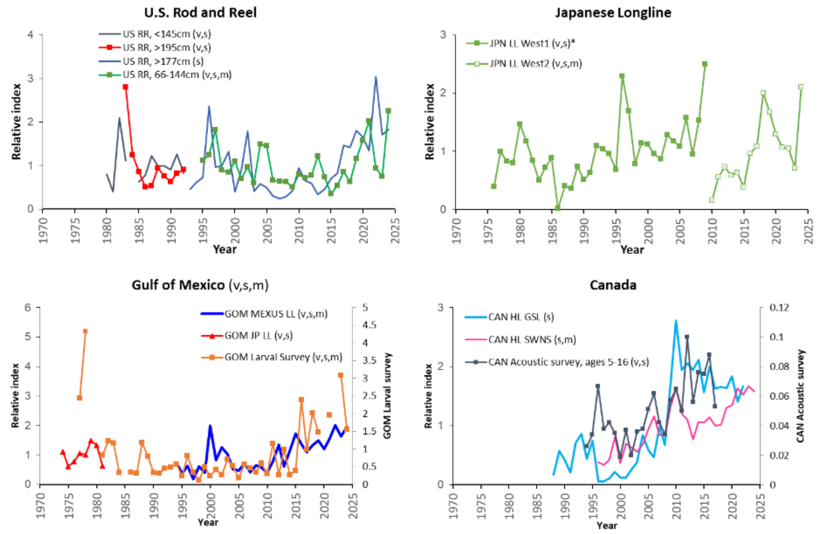


Figure 1. Plots of the updated fishery dependent and independent indicators used for the East Atlantic and Mediterranean bluefin tuna (top) and the West Atlantic (bottom) stocks. All fishery dependent indicators are standardized series and scaled to their averages. Indices denoted with an "s" were used in Stock Synthesis, indices with a "v" were used in VPA and indices with a 'm' are used in the MP. The Spanish BB series was split in two series to account for changes in selectivity patterns, and the latest series was calculated using French BB data due to the sale of the quota by the Spanish fleet. The Japanese longline CPUEs for the Northeast Atlantic and West Atlantic were split in 2009/2010 and the French aerial survey index was split in 2008/2009. The Moroccan-Portugal index data points for 2023 and 2024 reflected substantial changes in the fishing operations, hence the index data points for these years were not used. The 1986 low data point of the Japanese longline in the West Atlantic was removed in the Stock Synthesis models.

13.7 SBF-Southern bluefin

The Commission for the Conservation of Southern Bluefin Tuna (CCSBT) is charged with assessing the status of southern bluefin tuna. Each year the SCRS reviews the CCSBT report in order to know the research on southern bluefin tuna and the stock assessments carried out. The reports are available from the CCSBT.

13.8 BUM-Blue marlin (Thunnus thynnus)

Introduction

A stock assessment was conducted for blue marlin in 2024, through a process that included a Data Preparatory meeting in March 2024 (Anon., 2024a) and a Stock Assessment meeting in June 2024 (Anon., 2024i). The last year of fishery data used in the stock assessment was 2022, applying a grid approach that incorporated both surplus production and age-structured models to reflect uncertainty in biological parameters. A summary of the stock status is provided in **Table 1**. The estimated catches and discards by gear and also by CPC, for the period 2000-2024 are shown in **Table 2.**

Table 1. Blue marlin summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)[1]	3,331 t (2,323 t - 4,659 t)[3]	2022
Landing limit 2024	1,670 t	
Current (2024) Yield[2]	2,066 t	
Relative Biomass (B_{2022}/B_{MSY}) if applicable	0.67 (0.30-1.35)[3]	
Relative Fishing Mortality (F_{2022}/F_{MSY})[1]	0.91 (0.40-1.64)[3]	
Stock Status	Overfished: YES (84% probability of being overfished)[4] Overfishing: NO (39% probability of overfishing)[4]	
Management measure in effect	Rec. 19-05, Landing limit 2025 of 1,670 t	

[1] Base case/combined model: model results based on catch data from year-year.
[2] Provisional and subject to revision as of 23 September 2025.
[3] Point estimate, 95% bias corrected confidence intervals are shown.
[4] As estimated from the Kobe plot probability in each quadrant.

Table 2. Estimated catches and discards of Atlantic blue marlin (*Makaira nigricans*) by gear, for the period 2000-2024.

			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL	A+M		5414	4376	3808	4320	3118	3513	3070	4268	3607	3132	3018	2805	2813	2150	2774	2079	2153	2749	2000	1993	2408	2551	1795	1941	2066
Landings		Longline	3270	2595	1924	2229	1825	2004	1940	2369	2479	2073	1984	1462	1381	992	1302	1269	1227	1570	1105	1234	1400	1225	925	973	914
		Other surf.	2014	1635	1618	1767	1084	1433	989	1676	821	846	837	1040	1059	952	1212	584	637	795	490	496	744	988	559	514	465
		Sport (HL+RR)	71	123	216	305	174	51	103	179	269	152	177	247	292	142	200	112	220	276	256	134	136	181	159	307	384
Landings(FP)		Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	12	8
Discards		Longline	60	22	37	19	34	24	38	42	37	40	19	56	77	59	57	109	57	80	53	64	65	49	41	51	210
		Other surf.	0.1	2	11	0.4	1	1	0.5	0.3	1	21	1	0	5	4	3	5	13	29	97	65	64	108	80	83	85
		Sport (HL+RR)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2
Landings	CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	**0**
		Barbados	19	18	11	11	0	0	25	0	0	0	9	13	14	11	12	34	11	24	21	13	22	12	9	10	9
		Belize	0	0	0	0	0	0	0	4	0	3	3	7	47	19	8	5	13	1	6	0	2	0	0	0	9
		Brazil	476	780	387	579	205	612	298	262	182	150	135	114	84	114	105	89	79	64	37	20	13	2	3	5	3
		Cabo Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	**0**
		Canada	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0.5	1	0.1	0.3	0	0.1	0	0.1	0	0.3	0.0
		China PR	23	92	88	89	58	96	99	65	13	77	100	99	61	45	40	44	50	40	42	46	37	4	10	35	37
		Costa Rica	2	2	0	0.2	2	1	3	2	11	9	12	19	14	19	34	53	48	74	35	27	15	24	11	8	23
		Cuba	55	56	34	3	4	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Curaçao	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	2	20	15	2	6	1	**0**
		Côte d'Ivoire	288	208	111	171	115	21	8	132	66	72	54	17	48	48	87	15	72	44	32	163	41	148	6	70	81
		EU-España	140	94	29	12	51	24	91	39	58	166	260	132	191	148	209	288	225	321	106	103	437	461	204	53	23
		EU-France	305	329	340	340	345	360	361	358	395	265	281	285	264	162	303	190	168	209	152	171	282	162	174	216	288
		EU-Netherlands	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		EU-Portugal	22	18	8	32	27	88	105	135	158	106	142	54	65	26	23	46	50	57	74	19	28	37	36	48	45
		El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	1	0	0	0	**0**
		FR-St Pierre et Miquelon	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	**0**
		Gabon	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Ghana	639	795	999	415	470	759	405	683	191	140	116	332	234	163	236	88	44	162	60	44	53	278	121	196	42
		Great Britain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	**0**
		Grenada	87	104	69	72	45	42	33	49	54	32	69	53	32	63	63	56	53	54	62	69	49	31	30	79	38
		Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	23	0	15	0	0	0	**0**
		Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	
		Japan	883	335	267	442	540	442	490	920	1028	822	731	402	430	189	280	293	296	430	287	357	293	284	317	386	425
		Korea Rep	1	1	0	0.1	0.5	6	33	64	91	36	85	57	34	24	10	4	27	26	26	13	27	13	11	13	12
		Liberia	712	235	158	115	188	304	162	274	76	56	46	133	94	178	293	35	127	65	24	18	21	119	31	55	66
		Maroc	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	4	7	82	64	46	27	46	39	37	41
		Mauritania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	
		Mexico	68	37	50	70	90	86	64	91	81	93	89	68	106	86	67	72	66	60	68	51	39	43	29	44	35
		Namibia	0	0	3	0	5	9	57	0	50	2	23	10	0	8	36	8	32	57	84	53	51	70	8	99	11
		Panama	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	21	0.1	14	12	0	0	**0**
		Philippines	38	0	0	0	0	0	0	0	8	0	3	4	1	2	2	0	0	0	0	0	0	0	0	0	**0**
		Russian Federation	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		S Tomé e Príncipe	32	32	32	32	9	21	26	66	68	70	72	74	76	78	81	11	10	13	5	88	34	109	75	76	87
		Senegal	0	11	24	32	11	1	5	91	114	61	41	64	164	45	72	10	82	39	25	21	358	73	38	38	51
		Sierra Leone	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	
		South Africa	0.0	1	4	0	0	0	0	2	0	0	1	0.2	0.2	0.4	1	1	0.3	0	0	0	0	0.4	0.2	0.0	0.3
		St Vincent and Grenadines	0	0	20	0	0	0	0	1	3	2	1	0	0	2	0	0	0	2	2	1	2	2	0	0.4	
		Trinidad and Tobago	51	17	16	11	12	10	14	20	37	30	25	27	46	48	49	35	19	0.1	0.1	0.1	0.1	1	0.1	0.1	
		UK-Bermuda	2	2	2	2	2	2	2	2	2	0	1	2	2	3	3	3	2	1	2	1	1	1	1	1	1
		UK-British Virgin Islands	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		UK-Sta Helena	4	3	4	1	1	2	2	3	4	2	2	2	12	2	1	1	0.3	0.3	0.0	0.0	0.1	0	0	0	**0**
		UK-Turks and Caicos	0	0	0	0	0.1	0	2	1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		USA	24	16	17	19	26	16	17	9	13	6	4	6	14	9	1	9	19	13	20	17	17	22	22	23	18
		Uruguay	0	0	1	5	3	2	8	5	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		Venezuela	125	84	88	120	101	160	172	222	130	120	155	122	161	123	160	144	180	198	133	118	73	97	123	115	145
	NCC	Chinese Taipei	485	240	294	319	315	151	99	233	148	195	153	199	133	78	62	61	75	73	74	40	70	76	40	58	94
		Guyana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	29	27	128	39	75	81	0	
	NCO	Benin	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Dominica	0	64	69	75	36	44	55	58	106	76	76	60	0	0	85	62	49	74	52	45	64	54	54	57	55
		Dominican Republic	23	23	115	207	142	30	38	47	67	60	65	100	98	99	96	73	170	183	176	87	58	72	72	67	71
		Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0.3	0	0	0	0.1	1
		Mixed flags (FR+ES)	147	151	131	148	171	150	136	135	139	164	178	186	181	191	173	176	0	0	0	0	0	0	0	0	
		NEI (BIL)	53	184	258	167	89	7	160	209	205	177	0	34	0	0	0	0	0	0	0	0	0	0	0	0	
		NEI (ETRO)	492	274	17	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	8	12	0	2	5	4	4	4
		Seychelles	8	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Sta Lucia	12	5	9	18	17	21	53	46	70	72	58	64	119	99	111	53	91	134	93	82	78	61	85	0.0	49
		Togo	53	141	103	775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Vanuatu	0	0	0	0	2	1	0.3	0	0	0	7	8	6	3	2	0	0	0	0	0	0	0	0	0	
Landings(FP)	CP	EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	**0**
		EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12	8
Discards		Belize	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
		Brazil	0	0	0	0	0	0	2	0.2	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.2	0	0.1	7	0.0	0	**0**
		Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	1	0	0	0	**0**
		EU-España	0	0	0	0	0	0	0	0	0	18	0.4	0	1	4	3	5	7	7	80	57	55	102	71	76	176
		EU-France	0	0	0	0	0	0	0	0	0	1	0	0	2	1	0.3	0.5	6	11	12	9	5	5	8	7	2
		EU-Portugal	0	0	0	0	0	0	0	0	0	0	0	0	7	4	4	3	5	7	8	9	8	4	5	5	4
		El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	**0**
		Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2	0	0	0	**0**
		Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	8	16	8	2	14	57
		Korea Rep	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	1	0	0	0	0	0	0	0	0	**0**
		Mexico	0	0	0	0	0	0	0.2	0.4	0.2	0.3	0.2	0.0	0.1	0.1	0	0.1	0.0	0.2	0.0	0.1	0.0	0.1	0.1	0	**0**
		Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2	0.0	0	0	**0**
		UK-Bermuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0.4	0	0	0.1
		USA	60	25	49	19	35	25	36	42	38	42	19	50	39	55	53	81	25	47	22	24	20	9	16	18	15
	NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.4	32	0	0	24	27	26	16	22	21	20	18	13	32

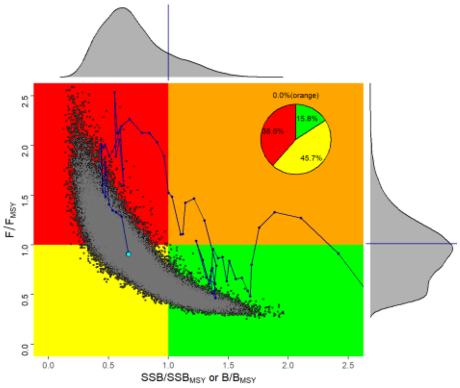


Figure 1. Kobe plot for the Atlantic blue marlin stock status in 2022, estimated during the 2024 Stock Assessment (Anon., 2024i). The line indicates the stock status trajectory starting in 1952. The inserted pie chart indicates the probability of the stock being within each Kobe colour quadrant. The probability distributions shown in each axis represent uncertainty around current B/B_{MSY} (SS3, SSB/SSB_{MSY}) and F/F_{MSY}.

Outlook

Projections results from the Bayesian Surplus Production and age-structured models indicated that constant catch scenarios equal to or less than 2,250 t resulted in a low probability (less than 5%) of stock biomass falling below critical thresholds (10% or 20% of B_{MSY}) by 2034. Higher catch scenarios showed increasing risk.

Management recommendation

The results of the final combined models were used to produce estimated probabilities of achieving the Convention objectives ($B \geq B_{MSY}$, $F \leq F_{MSY}$) for a given level of constant catch, for each year up to 2034 (**Table 3**). The Committee emphasizes that unaccounted uncertainties, mostly associated with the levels of landings and dead discards, continue to hamper the ability of the Committee to provide sound management advice. The results from the 2024 Stock Assessment models were used to support management advice under multiple constant catch scenarios, taking into account the uncertainties associated with landings and dead discards.

Given these uncertainties, the Committee reiterated its recommendation in 2024 that the Commission adopt catch limits based on total catch (i.e., landings plus dead discards) of 1,670 t or lower, rather than landings alone as in *Recommendation by ICCAT to establish rebuilding programs for blue marlin and white marlin/roundscale spearfish* (Rec. 19-05), and maintain these limits until the increasing biomass trend observed in the 2024 Stock Assessment is confirmed at the next blue marlin stock assessment. It is critical that CPCs report complete catch data, including both landings and dead discards, to ensure accurate assessments and effective management of the blue marlin stock.

Table 3. Kobe II matrices for Atlantic blue marlin giving the probability that $F \leq F_{MSY}$, $B \geq B_{MSY}$ and the joint probability of $F \leq F_{MSY}$ and $B \geq B_{MSY}$, between 2025 and 2034, with various constant catch levels (landing plus dead discards) based on Bayesian Surplus Production model and SS model base case model results.

a) Probability that $F \leq F_{MSY}$

Catch (t)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
0	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
1000	97%	98%	98%	99%	99%	99%	99%	99%	99%	99%
1250	93%	94%	95%	96%	96%	97%	97%	97%	98%	98%
1500	85%	87%	89%	90%	91%	92%	93%	94%	94%	95%
1750	74%	77%	80%	82%	84%	85%	86%	87%	88%	89%
2000	63%	66%	69%	71%	73%	75%	77%	78%	79%	80%
2250	52%	55%	58%	60%	62%	64%	66%	67%	69%	70%
2500	42%	45%	48%	50%	52%	53%	55%	56%	58%	59%
2750	35%	37%	39%	40%	42%	43%	44%	45%	46%	47%
3000	28%	30%	31%	32%	33%	34%	35%	36%	36%	37%
3250	23%	24%	24%	25%	26%	26%	27%	27%	27%	28%
3500	18%	19%	19%	19%	19%	20%	19%	20%	20%	20%

b) Probability that $B \geq B_{MSY}$

Catch (t)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
0	35%	45%	56%	65%	72%	78%	83%	86%	89%	92%
1000	32%	39%	46%	53%	59%	64%	69%	73%	76%	79%
1250	31%	37%	44%	50%	55%	60%	65%	69%	72%	75%
1500	30%	36%	41%	47%	52%	56%	60%	64%	67%	70%
1750	29%	34%	39%	44%	48%	52%	56%	59%	62%	65%
2000	29%	33%	37%	40%	44%	47%	51%	54%	56%	59%
2250	28%	31%	35%	38%	41%	43%	46%	48%	51%	53%
2500	27%	30%	32%	35%	37%	39%	41%	43%	45%	46%
2750	27%	29%	30%	32%	34%	35%	37%	38%	39%	40%
3000	26%	27%	28%	29%	30%	31%	32%	33%	34%	34%
3250	25%	26%	27%	27%	27%	28%	28%	28%	29%	29%
3500	25%	25%	25%	24%	24%	24%	24%	24%	24%	24%

c) Probability that $F \leq F_{MSY}$ and $B \geq B_{MSY}$

Catch (t)	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
0	35%	45%	56%	65%	72%	78%	83%	86%	89%	92%
1000	32%	39%	46%	53%	59%	64%	69%	73%	76%	79%
1250	31%	37%	44%	50%	55%	60%	65%	69%	72%	75%
1500	30%	36%	41%	47%	52%	56%	60%	64%	67%	70%
1750	29%	34%	39%	44%	48%	52%	56%	59%	62%	65%
2000	29%	33%	37%	40%	44%	47%	51%	54%	56%	59%
2250	28%	31%	35%	38%	40%	43%	46%	48%	51%	53%
2500	27%	30%	32%	35%	37%	39%	41%	43%	44%	46%
2750	26%	28%	30%	31%	33%	34%	36%	37%	38%	39%
3000	24%	25%	26%	28%	29%	30%	30%	31%	32%	32%
3250	21%	22%	22%	23%	23%	24%	24%	25%	25%	25%
3500	17%	18%	18%	18%	18%	19%	18%	19%	19%	19%

*13.9 WHM-White marlin (*Kajikia albida*)*

Introduction

The assessment of white marlin includes the combined assessment of white marlin (WHM) and roundscale spearfish (RSP). Because of difficulties in species identification, white marlin landings reported to ICCAT include roundscale spearfish and historical statistics of white marlin most likely comprise a mixture of the two species. A stock assessment was conducted for white marlin/roundscale spearfish in 2025, through a process that included the Atlantic White Marlin Data Preparatory Meeting in March 2025 (Anon., 2025b) and the Atlantic White Marlin Stock Assessment Meeting in July 2025 (Anon., 2025h). The last year of fishery data used in the assessment was 2023. The Committee agreed that it was not advisable to estimate stock projections for this stock assessment. Therefore, no projections scenarios were conducted, and no Kobe matrices were provided. A summary of the stock status is provided in **Table 1.** The estimated catches and discards by gear, for the period 2000-2024, are shown in **Table 2.** The Kobe Phase Plot and uncertainty of current status estimates is summarized in **Figure 1.**

Table 1. White marlin/roundscale spearfish summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)[1]	1,497 t (1,160 t - 1,937 t)[3]	
Landing limit 2024	355 t	
Yield 2024[2]	158 t	
Relative Biomass (B_{2023}/B_{MSY})	0.80 (0.394 – 1.611)[3]	
Relative Fishing Mortality (F_{2023}/F_{MSY})	0.191 (0.089 – 0.348)[3]	
Stock Status	Overfished: YES (73% probability of being overfished)[4] Overfishing: NO (<1% probability of overfishing)[4]	2023
Management measures in effect	Rec. 18-04 and Rec. 19-05 Landing limit 2025 of 355 t	

[1] Base case model results based on catch data from 1956-2023.
[2] Provisional and subject to revision as of 23 September 2025.
[3] Point estimate, 95% credibility intervals are shown.
[4] As estimated from the Kobe plot probability in each quadrant.

Table 2. Estimated catches and discards of white marlin/roundscale spearfish (*Kajikia albida, Tetrapturus georgii)* by gear, for the period 2000-2024.

			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL	A+M		1540	1078	1012	845	847	780	618	750	717	760	524	555	491	664	476	533	485	509	299	319	254	182	230	185	158
Landings		Longline	1408	970	834	756	759	700	538	631	608	635	437	434	394	480	392	484	440	451	233	223	204	137	181	123	89
		Other surf.	89	86	139	71	59	60	65	82	85	97	69	89	63	57	64	35	29	39	20	27	31	31	38	38	39
		Sport (HL+RR)	2	4	6	1	1	1	2	1	2	2	6	6	7	116	7	3	4	5	10	3	7	5	2	6	4
Discards		Longline	41	17	30	17	27	17	12	36	21	24	12	27	26	12	12	11	11	14	35	66	11	9	8	17	26
		Other surf.	0	1	4	0.1	0.4	0.3	0.2	0.2	0.4	2	0.1	0	1	0	0	0	0	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0
Landings	CP	Barbados	25	24	15	15	18	16	33	22	24	26	6	3	5	6	6	10	14	17	22	12	14	10	10	8	7
		Belize	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Brazil	108	172	407	266	83	244	90	52	55	53	36	85	77	352	102	121	67	47	62	76	46	0.3	41	17	3
		Cabo Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0
		Canada	5	3	2	1	2	5	3	2	2	1	2	1	2	3	5	3	1	2	1	1	1	2	1	1	1
		China PR	2	20	23	8	6	9	6	10	5	9	8	3	4	2	0	0.2	0.3	3	2	3	2	2	2	2	2
		Costa Rica	14	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Cuba	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0.4	0	0	0	0
		Côte d'Ivoire	1	2	2	3	1	1	1	1	3	2	1	1	0.5	1	1	1	1	1	1	0.3	0.3	0	1	1	0
		EU-España	186	61	6	22	64	58	51	46	36	17	113	5	35	42	99	125	96	118	11	11	44	56	47	15	11
		EU-France	0	0	0	0	0	0.2	0	0	1	0.4	0.1	0.3	0.2	0.1	0.2	0.2	1	1	0.2	0.4	0.1	2	0.4	1	0.0
		EU-Netherlands	0	0	0	0	0	0	0	0	0.0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0
		EU-Portugal	0	0	1	5	19	39	22	2	35	40	12	18	26	11	9	7	11	13	0	0.1	1	9	1	4	1
		El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0.1	0	0	0	0
		Gabon	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Ghana	8	21	2	1	1	1	0.0	1	4	4	3	1	1	1	1	1	1	0.1	0	0	0	0.1	0	0	0
		Grenada	0.5	15	8	14	33	10	12	11	17	14	14	15	14	14	14	37	15	9	11	19	14	1	5	13	5
		Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.0	0	0	0	0
		Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	
		Japan	83	56	16	33	36	34	39	21	34	43	41	31	42	24	6	8	9	10	6	11	7	8	3	9	3
		Korea Rep	0.4	0	0	11	40	7	0	113	96	78	43	43	0	0	0.2	0.2	0.2	0.2	0.1	0.3	1	0.1	0.0	0.0	0
		Liberia	4	3	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.4	0	0	1	0
		Maroc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.5	0	0.3	0	0	0	0
		Mauritania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	
		Mexico	11	13	16	15	28	25	16	14	14	19	20	28	36	30	20	26	20	12	16	9	10	12	8	8	9
		Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.0	0	0	0	0
		Philippines	0	0	0	0	0	0	0	0	1	1	2	2	1	2	2	0	0	0	0	0	0	0	0	0	0
		S Tomé e Príncipe	37	37	37	37	21	33	29	35	36	37	38	39	40	41	42	17	15	13	1	10	11	20	27	27	25
		Senegal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	1	0	0	0	0
		Sierra Leone	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	
		South Africa	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		St Vincent and Grenadines	0.1	1	0.3	44	0	0	0	0	0	0	0.1	0.0	0	0.4	0	0	0	8	8	5	9	0	0	1	4
		Trinidad and Tobago	4	2	5	13	6	7	5	13	11	12	15	15	39	33	38	32	20	30	27	26	28	0.4	18	0.0	6
		UK-Bermuda	0.4	0.1	0.5	0.1	0.5	0.5	1	1	0.5	0.4	0.4	0.3	0.1	0.2	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2
		UK-British Virgin Islands	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		USA	1	3	6	1	1	1	1	0.5	2	2	2	2	1	4	2	3	1	2	3	2	6	2	2	1	2
		Uruguay	21	20	1	9	2	5	9	3	6	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Venezuela	178	182	215	168	138	159	196	133	64	130	118	160	123	78	107	123	186	194	80	65	44	43	55	58	52
	NCC	Chinese Taipei	437	152	178	104	172	56	44	54	38	28	20	28	15	7	7	10	10	5	6	2	2	4	1	1	1
		Guyana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	4	0	0	0	0	0	
	NCO	Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.1	0	0	0	0	
		Mixed flags (FR+ES)	12	13	12	13	13	11	10	9	10	12	12	37	0	0	0	0	0	0	0	0	0	0	0	0	
		NEI (BIL)	34	77	4	30	134	42	37	170	204	199	0	11	0	0	0	0	0	0	0	0	0	0	0	0	
		NEI (ETRO)	322	180	11	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Seychelles	2	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Sta Lucia	1	0	0	0	0	0	0.4	0	0.4	0.1	0.1	0.3	2	1	1	1	0.5	1	1	0.2	1	0	0.1	0	
		Togo	1	2	0.2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Vanuatu	0	0	0	0	0	0.3	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	
Discards	CP	Brazil	0	0	0	0	0	0	2	19	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.3	0.1	0.2	3	1	1	1
		Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	2
		EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.1	0	0	0	0	0	0
		EU-Portugal	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2	2	1	1	1	1
		El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0
		Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0.3	0.2	1	1
		Korea Rep	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
		Mexico	0.1	0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0	0.0	0.0	0	0	0.0	0	0.0
		Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		UK-Bermuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0.2	0.1	0.0	0.1	0.0
		USA	41	18	33	17	27	17	10	8	10	14	8	23	21	10	11	8	3	5	2	2	1	1	1	1	1
		Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	54	1	0	0	10	16
	NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.2	2	0	0	2	2	2	1	3	3	1	1	0.3	1
	NCO	NEI (BIL)	1	0.4	0.2	0.1	0.1	0.2	1	10	11	11	2	2	2	1	0.3	0.3	4	6	3	4	3	2	3	3	3

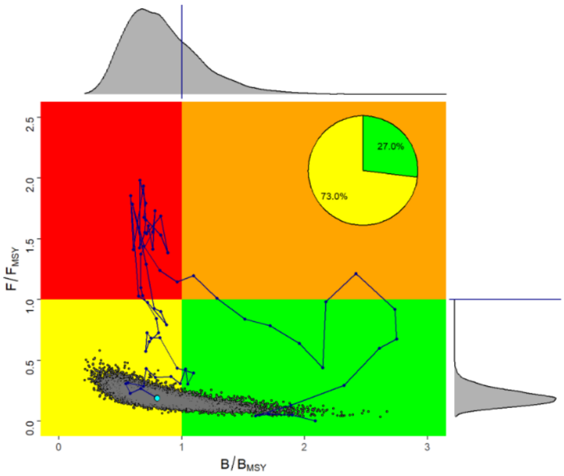


Figure 1. Kobe plot for the Atlantic white marlin/roundscale spearfish stock status in 2023, estimated during the 2025 Stock Assessment. The line indicates the stock status trajectory starting in 1956. The inserted pie chart indicates the probability of the stock being within each Kobe colour quadrant. The probability distributions shown in each axis represent uncertainty around current B/B_{MSY} and F/F_{MSY}.

Outlook

The Kobe plot for the base case[3] (**Figure 1**) shows a historical trajectory moving from the overfished and overfishing quadrant (red) in the 1970s toward the overfished but not overfishing quadrant (yellow) through the 1990s and early 2000s. The most recent estimate (2023) lies within the yellow quadrant, indicating that the stock remained below B_{MSY}, but was being fished at levels below F_{MSY}. The posterior distribution in the Kobe plot shows that 73% of the estimated biomass and fishing mortality combinations fall in the yellow quadrant, and 27% in the green quadrant, suggesting high probability that overfishing was not occurring but that the stock remained overfished.

The Committee also concluded that, given the uncertainty in stock recruitment dynamics in recent years, it was not advisable to estimate stock projections for this stock assessment. Therefore, no projections scenarios were conducted, and no Kobe matrices were provided.

The Committee noted that the relative biomass has not increased by much despite relative fishing mortality having declined considerably over that time period (**Figure 2**).

Management recommendation

The Committee noted that despite the recent reported catches have been below the 355 t landing limits established in the *Recommendation by ICCAT to establish rebuilding programs for blue marlin and white marlin/roundscale spearfish* (Rec. 19-05) para 2, the stock has shown limited signs of recovery. Concerns were raised by the Committee regarding the potential impact of unreported catches, including both dead and live discards, which introduce uncertainty into current catch estimates. In order to better assess the status of the stock and provide more robust management advice, it is essential that CPCs comply with the data reporting requirements (i.e. landings and estimates of discards, size data) and provide improved indices of abundance. Until this objective is reached, future white marlin/roundscale spearfish stock assessments will continue to be hampered by data uncertainties and will limit the ability of the Committee to provide robust management advice for this stock.

The Committee reiterated the importance that the Commission, at the very least, maintains the landing limit of 355 t as set in paragraph 2 of Rec. 19-05.

[3] The "base case" refers to the run coded Group 0_no_CTP_LL2 in the Report of the White Marlin Stock Assessment Meeting (Anon., 2025h) which was used for the summary of stock status.

The Committee concluded that the stock status of Atlantic white marlin/roundscale spearfish at the end of 2023 indicated that the biomass remained below B_{MSY} with a median B/B_{MSY} estimated at 0.80 (95% CRI: 0.394 - 1.611), and a fishing mortality below F_{MSY} with median F/F_{MSY} at 0.191 (95% CRI: 0.089 - 0.348) (**Figure 1 and Table 1**).

Additional supporting information

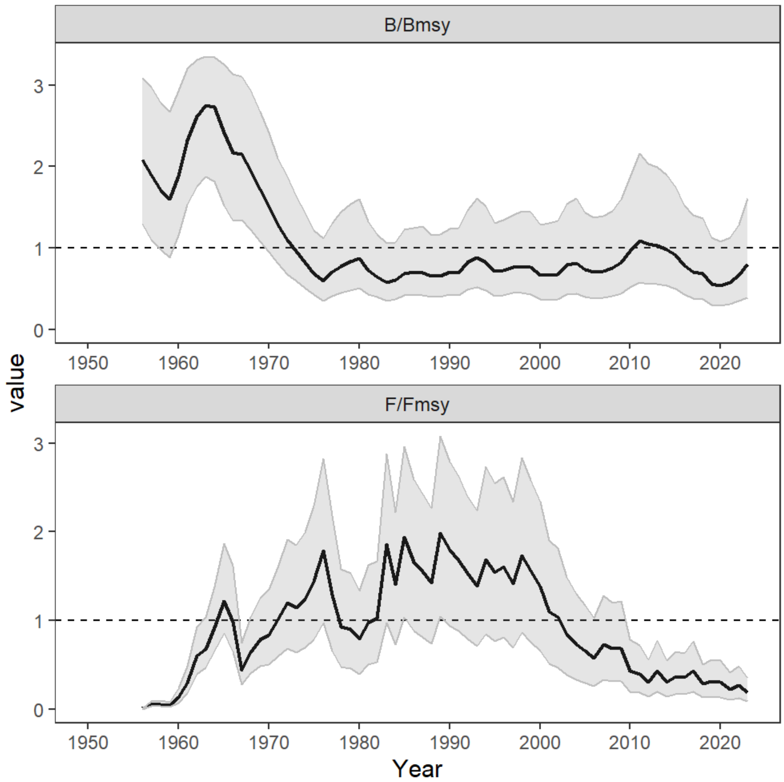


Figure 2. Trajectories of biomass relative to B_{MSY} (B/B_{MSY}) at the end of the years and fishing mortality relative to F_{MSY} (F/F_{MSY}) for the final base case model for the Atlantic white marlin, the shaded area indicates the 95% CRI bounds.

13.10 SAI-Sailfish (Istiophorus albicans)

Introduction

The most recent stock assessments for East and West sailfish were conducted in the Atlantic Sailfish Data Preparatory and Stock Assessment Meeting (Anon., 2023b) held in June 2023 using catch data available to 2021, through a process that included a single meeting for the data preparatory and stock assessment. The previous East and West stock assessments were conducted in the Sailfish Stock Assessment Meeting (Anon., 2017a) held in June 2016.

For the East stock, a single assessment platform was used - Just Another Bayesian Biomass Assessment (JABBA), a Bayesian Surplus Production based model. For the Western stock JABBA and Stock Synthesis (SS) models were used to determine stock status and to conduct projections to estimate the Kobe II Strategic Matrix (K2SM). However, post-meeting examination of SS results identified issues with the model solution that could not be addressed in time for the results to be presented here and included in the management advice. Therefore, the state of the stock for West Atlantic sailfish was based on the JABBA model runs. A summary of the stock status is provided below (**Table 1a and Table 1b**). The estimated catches and discards by gear, for the period 2000-2024 are shown in **Table 2.**

Table 1a. West Atlantic sailfish summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)[1]	1,612 t (1,357 t - 1,968 t)[3]	2021
TAC (2024)		
Current (2024) Yield[2]	1,295 t	
Relative Biomass (B_{2021}/B_{MSY}) if applicable	0.96 (0.59-1.45)	
Relative Fishing Mortality (F_{2021}/F_{MSY})[1]	0.59 (0.36-0.95)	
Stock Status	Overfished: YES (59% probability of being overfished)[4] Overfishing: NO (2% probability of overfishing)[4]	
Management measures in effect	Rec. 16-11: Limit catches to the level of 67% of MSY (1,030 t)	

Table 1b. East Atlantic sailfish summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)[1]	2,337 t (2,003 t - 2,833 t)[3]	2021
TAC (2024)		
Current (2024) Yield[2]	1,290 t	
Relative Biomass (B_{2021}/B_{MSY}) if applicable	1.83 (1.14-2.88)[3]	
Relative Fishing Mortality (F_{2021}/F_{MSY})	0.36 (0.21-0.59)[3]	
Stock Status	Overfished: NO (<1% probability of being overfished)[4] Overfishing: NO (<1% probability of overfishing)[4]	
Management measure in effect	Rec. 16-11: Limit catches to the level of 67% of MSY (1,271 t)	

[1] Base case/combined model: model results based on catch.
[2] Provisional and subject to revision as of 23 September 2025.
[3] Point estimate, 95% credibility intervals are shown.
[4] As estimated from the Kobe plot probability in each quadrant.

Table 2. Estimated catches and discards of Atlantic sailfish (*Istiophorus albicans*) by gear, for the period 2000-2024.

				2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL				3990	4603	4412	4141	4355	4110	3855	4143	3969	3767	3096	2947	2919	2328	2429	2580	3160	3618	2898	3894	2609	2667	2278	2351	2585
	ATE			1980	2805	2347	2639	2612	2266	1916	2578	2232	2138	1858	1554	1602	1342	1164	1247	1424	1650	943	2270	1218	1733	1183	1084	1290
	ATW			2009	1798	2065	1502	1743	1844	1939	1565	1737	1630	1239	1393	1318	986	1266	1333	1737	1967	1955	1624	1391	934	1095	1267	1296
Landings	ATE		Longline	198	568	752	497	335	365	580	590	628	627	517	547	552	458	423	436	340	356	499	965	357	217	371	434	332
			Other surf.	1231	1470	1497	1861	2057	1758	1289	1799	1496	936	902	871	986	755	730	749	1083	1191	435	1274	792	974	645	478	807
			Sport (HL+RR)	551	767	98	282	219	143	46	189	108	575	439	136	58	128	10	56	0	94	1	2	50	537	71	144	131
	ATW		Longline	1724	1661	1641	1163	1271	1706	1738	1300	1407	1154	1137	1240	1119	882	1116	1246	1648	1779	1778	1498	1344	772	983	1144	1173
			Other surf.	163	66	311	334	465	134	194	251	313	461	96	123	156	86	126	75	67	169	163	115	42	122	91	110	110
			Sport (HL+RR)	78	60	106	0.3	0.2	0.4	2	6	7	4	2	20	22	7	12	5	15	13	6	6	2	38	19	10	10
Landings(FP)	ATE		Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	5	3
Discards			Longline	0	0	0	0	0	0	0	0	0	0	0	1	5	0	0	6	1	4	2	6	5	2	3	14	9
			Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	5	6	23	14	2	13	9	8
	ATW		Longline	45	11	7	5	7	3	5	8	9	10	4	10	20	12	11	7	7	7	7	5	3	2	3	4	1
			Other surf.	0	0.1	0.3	0.1	0.1	0.4	0.3	0.0	0.3	1	0.3	0.0	0.4	0	0	0	0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0
Landings	ATE	CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	**0**
			Belize	0	0	0	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	1	3	0.2
			Brazil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1
			Cabo Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**0**
			China PR	4	5	11	4	4	8	16	8	1	4	5	2	4	1	1	2	2	4	2	11	25	1	4	169	26
			Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.5	0.1	0	0	**0**
			Côte d'Ivoire	45	47	65	121	73	93	78	52	448	74	24	108	192	80	99	55	38	405	35	959	404	336	60	85	182
			EU-España	8	195	245	197	169	202	214	228	242	327	208	197	258	231	302	333	225	236	278	325	108	107	286	88	148
			EU-France	0	0	0	0	0	0	0	0	0	0.4	0	0.2	1	0.2	0	0	8	12	8	33	8	2	11	4	5
			EU-Portugal	13	4	10	13	19	77	137	43	49	132	173	121	81	110	33	41	30	27	123	66	51	13	30	14	16
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	1	0	1	0	0	0	**0**
			Gabon	0	0.2	0	4	4	1	0	0	0	0	0.3	0	0	0	4	0	0	5	0	0	2	1	0.1	1	
			Ghana	275	568	592	566	521	542	282	420	342	358	417	299	201	220	191	99	238	267	82	78	68	0	0	0	**0**
			Great Britain	0	0	0	0	1	0	0	0	0	0.0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	**0**
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0.2	0	0	0	**0**
			Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1	3	0	0	0.5	2	3	5	3	28	12
			Japan	26	6	20	22	70	50	62	144	199	94	115	143	157	71	59	36	52	45	47	62	48	30	21	44	80
			Korea Rep	0.0	0	0	0	0	0	0	0	0	1	0.0	10	1	6	10	3	8	15	11	8	16	6	2	6	23
			Liberia	154	56	133	127	106	122	118	115	0	0	0	0	0	0	0	0	0	59	11	50	47	3	25	9	12
			Maroc	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Mauritania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	
			Namibia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	22	0	47	8
			Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	12	0	0	5	**0**
			Russian Federation	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			S Tomé e Príncipe	136	136	136	136	515	346	292	384	114	119	121	124	127	131	134	312	212	219	2	234	28	223	224	225	224
			Senegal	786	953	240	673	567	463	256	737	446	630	484	174	247	165	37	60	586	301	313	397	350	972	417	310	525
			Sierra Leone	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	
			South Africa	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0.0	0	0	0	0	0	0	0	0	0	**0**
			St Vincent and Grenadines	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	**0**
		NCC	Chinese Taipei	45	50	62	49	15	25	36	109	121	80	21	52	54	42	17	21	23	26	21	16	17	6	2	14	9
		NCO	Benin	5	12	2	2	5	3	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Mixed flags (FR+ES)	353	400	365	413	336	264	274	205	251	308	265	275	275	275	275	275	0	0	0	0	0	0	0	0	
			NEI (BIL)	28	269	408	213	55	1	105	43	20	11	0	44	0	0	0	0	0	0	0	0	0	0	0	0	
			NEI (ETRO)	77	43	3	2	16	7	8	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Seychelles	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Togo	23	62	55	95	135	47	31	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	ATW	CP	Barbados	44	42	26	27	26	42	58	42	0	0	18	36	36	39	44	54	56	42	20	15	15	20	18	17	9
			Belize	0	0	0	0	0	5	0	12	0	0	52	8	7	4	3	0	11	19	62	104	42	0	0	0	96
			Brazil	604	412	548	586	549	416	139	123	268	433	76	192	145	76	57	72	59	39	43	17	28	24	11	9	8
			Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.0	0.1	0	0	0	0	0	0	**0**
			China PR	4	3	0.5	0.3	1	0.0	0.3	0.2	0.5	2	1	1	2	0.4	1	1	3	6	2	9	160	8	5	92	32
			Costa Rica	0.1	0.5	0	0	0.0	0	0.5	1	1	1	1	2	3	1	5	14	9	13	14	6	2	4	1	3	3
			Cuba	208	68	32	18	50	72	47	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Curaçao	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
			EU-España	14	309	414	183	160	89	134	214	361	412	275	190	184	203	244	311	207	454	256	228	62	73	314	50	19
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1	1	2	35	15	7	12
			EU-Netherlands	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-Portugal	4	0	0	12	12	112	18	53	101	20	19	9	4	0.1	0	0	0	1	37	9	3	0.5	1	2	0.5
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**0**
			Grenada	164	187	151	171	112	147	159	174	216	183	191	191	191	191	191	210	137	165	150	111	97	61	58	177	90
			Japan	12	3	3	10	5	22	4	1	33	43	36	12	16	7	11	12	13	7	3	18	3	6	10	7	2
			Korea Rep	0	0	0	0	0	0	0	0	0	1	0.0	40	3	1	1	0	0	0	0	0	0	0	0	0	**0**
			Mexico	118	36	34	45	51	55	41	46	45	48	34	32	51	63	42	35	47	51	24	27	20	24	17	20	17
			Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	415	0	461	378	417	198	122	95	**0**
			St Vincent and Grenadines	0	2	168	3	86	73	59	18	13	8	7	4	4	3	4	1	85	8	10	5	19	0.4	0.1	0	**0**
			Trinidad and Tobago	3	7	6	10	12	12	17	16	35	20	20	41	73	34	29	51	53	64	51	56	47	43	37	31	36
			UK-British Virgin Islands	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			USA	76	58	103	0	0.2	0.1	0.1	0.0	3	3	0.1	0.0	7	3	2	2	3	3	3	3	1	1	2	2	1
			Venezuela	261	249	277	327	509	607	1042	549	382	416	498	591	543	341	612	554	597	1041	763	628	462	430	480	734	788
		NCC	Chinese Taipei	11	33	31	13	8	21	5	14	10	11	6	8	26	6	3	6	5	5	5	4	7	2	1	5	7
			Guyana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	33	37	0	0	0	0	0	
			Suriname	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	159
		NCO	Aruba	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Dominica	0	5	3	0	1	0	3	3	4	2	0	2	0	0	5	3	3	3	2	1	2	2	2	1	1
			Dominican Republic	67	81	260	91	144	165	133	147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.3	1	0	0	0	0	
			NEI (BIL)	297	268	0	0	0	0	68	81	252	17	0	21	0	0	0	0	0	0	0	0	0	0	0	0	
			NEI (ETRO)	41	23	1	1	9	4	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.4	0.1	1	0	0.2	0	0	0	
			Seychelles	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Sta Lucia	1	0	0	0.3	0	0	0	0	4	0	2	2	3	2	3	1	1	4	2	0	0	0	1	0	
Landings(FP)	ATE	CP	EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	0	**0**
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	3
Discards			Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	**0**
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	5	21	13	2	12	9	9
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	3	1	2	1	0	1	0.3	0.0
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	**0**
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	**0**
			Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0.3	0.3	11	2
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0.1	0.2	0	**0**
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.2	5	0	0	6	1	4	2	4	2	2	3	2	5
	ATW	CP	Brazil	0	0	0	0	0	0	1	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	**0**
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	**0**
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.0	0	0	0	0	0	0	0	0	0	**0**
			Mexico	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0
			USA	45	11	7	5	7	4	5	7	10	10	4	10	19	11	11	6	7	6	6	5	3	2	2	3	1
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0	0.4	0.1	0.3	1	0.5	0.3	0.4	0.4	0.4	0.1

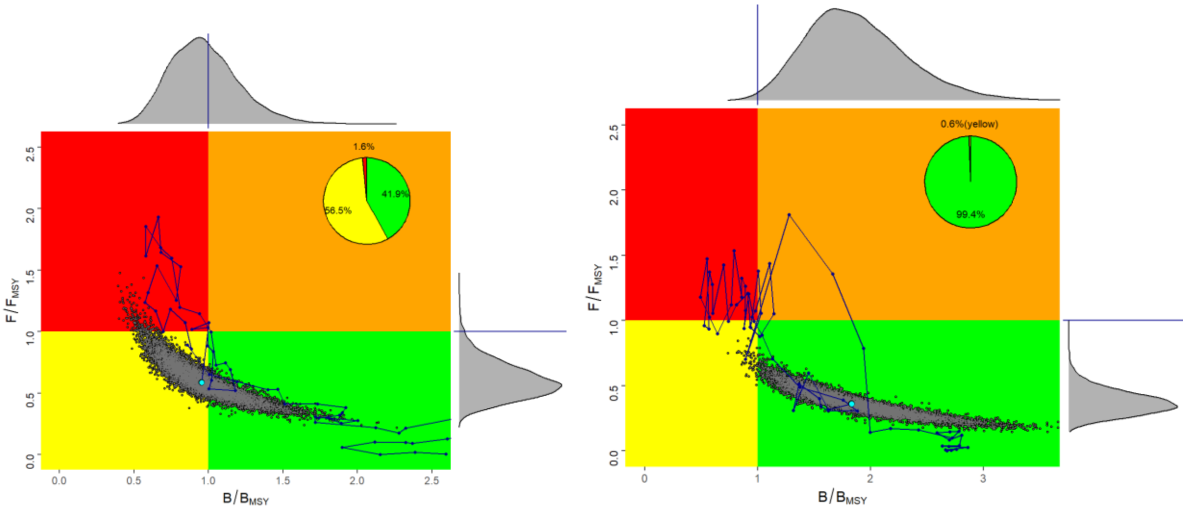


Figure 1. Kobe phase plot for the West (left panel) and East (right panel) Atlantic sailfish stock. Solid black dots and solid lines indicate the stock status trajectory, with the blue dot indicating the terminal year (2021), and grey dots are the interactions for the terminal year with the marginal distributions plotted in the lateral axis.

Outlook

Stochastic stock projections using the JABBA model were conducted for both stocks under various constant catch scenarios. For the East stock, projections included 11 scenarios constant catch scenarios (0; 1,000 t – 3,000 t with 250 t intervals; 2,337 t MSY level). For the West stock, the projections included 10 constant catch scenarios (0; 1,000 t - 2,000 t). The resulting K2SM provide the estimated probabilities of not experiencing overfishing ($F \leq F_{MSY}$), not being overfished ($B \geq B_{MSY}$), and jointly achieving both conditions (green quadrant) (**Table 3**).

Management recommendation

As in the 2016 Stock Assessment (Anon., 2017b), important sources of uncertainty still remain in the assessments of both the eastern and western stocks. Available abundance indices demonstrate conflicting trends for both stocks, and the Committee believes that reported catches, including dead discards, are significantly incomplete and unreported. These important sources of uncertainty should be taken into consideration by the Commission when adopting management measures. Nevertheless, it should be noted that there have been some improvements since the last stock assessment.

East Atlantic

The stock status of East sailfish indicates that the stock was not overfished and not experiencing overfishing. However, due to unquantified uncertainties, the Commission should consider managing catch levels that will keep the stock in the green quadrant of the Kobe phase plot with a high probability (**Table 3**).

Table 3. K2SM for the East Atlantic sailfish stock. Top: the probability that overfishing is not occurring ($F \leq F_{MSY}$); middle: the probability that the stock is not overfished ($B \geq B_{MSY}$); and bottom: the joint probability of being in the green quadrant of the Kobe plot (i.e., $F \leq F_{MSY}$ and $B \geq B_{MSY}$).

a) Probability that $F \leq F_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
1000	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
1250	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
1500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
1750	100%	100%	100%	99%	99%	99%	99%	99%	99%	99%
2000	99%	99%	98%	98%	97%	97%	96%	95%	94%	94%
2250	98%	97%	95%	94%	92%	90%	88%	86%	84%	83%
2336	98%	96%	94%	91%	89%	87%	84%	82%	79%	77%
2500	97%	94%	90%	86%	83%	79%	75%	71%	68%	65%
2750	94%	88%	82%	75%	69%	64%	58%	52%	48%	44%
3000	90%	81%	72%	62%	54%	46%	40%	35%	30%	27%

b) Probability that $B \geq B_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	98%	99%	100%	100%	100%	100%	100%	100%	100%	100%
1000	98%	99%	99%	99%	99%	99%	99%	100%	100%	100%
1250	98%	99%	99%	99%	99%	99%	99%	99%	99%	99%
1500	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%
1750	98%	98%	97%	97%	97%	97%	96%	96%	95%	96%
2000	98%	97%	97%	96%	95%	94%	93%	92%	91%	91%
2250	98%	97%	95%	93%	92%	90%	88%	86%	84%	82%
2336	98%	97%	95%	92%	90%	88%	85%	83%	81%	78%
2500	98%	96%	94%	91%	87%	84%	80%	77%	73%	70%
2750	98%	96%	92%	87%	82%	76%	71%	65%	60%	55%
3000	98%	95%	89%	83%	75%	67%	60%	52%	46%	40%

c) Probability that $F \leq F_{MSY}$ and $B \geq B_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	98%	99%	100%	100%	100%	100%	100%	100%	100%	100%
1000	98%	99%	99%	99%	99%	99%	99%	100%	100%	100%
1250	98%	99%	99%	99%	99%	99%	99%	99%	99%	99%
1500	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%
1750	98%	98%	97%	97%	97%	97%	96%	96%	95%	96%
2000	98%	97%	96%	96%	95%	94%	93%	92%	91%	91%
2250	98%	96%	94%	93%	91%	89%	87%	85%	82%	81%
2336	98%	96%	93%	91%	88%	86%	83%	81%	78%	76%
2500	97%	93%	90%	86%	82%	78%	74%	71%	67%	64%
2750	94%	88%	82%	75%	69%	63%	58%	52%	48%	44%
3000	90%	81%	72%	62%	54%	46%	40%	35%	30%	27%

West Atlantic

The Committee believes that the reported catches are significantly underreported. Given the important uncertainties described above, the Committee recommends that the results provided in the K2SM be interpreted with extreme caution. Should the Commission choose to continue setting the catch level at 67% of MSY, using the 2021 estimate of MSY, that value would be 1,030 t (**Table 4**).

Table 4. K2SM for the West Atlantic sailfish stock. Top: the probability that overfishing is not occurring ($F \leq F_{MSY}$); middle: the probability that the stock is not overfished ($B \geq B_{MSY}$); and bottom: the joint probability of being in the green quadrant of the Kobe plot (i.e., $F \leq F_{MSY}$ and $B \geq B_{MSY}$).

a) Probability that $F \leq F_{MSY}$

Probaility $F<=F_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
1000	95%	96%	97%	97%	98%	98%	98%	99%	99%	99%
1250	86%	87%	88%	89%	89%	90%	90%	90%	91%	91%
1500	74%	73%	72%	71%	70%	70%	69%	68%	68%	68%
1600	68%	66%	65%	63%	61%	60%	59%	57%	56%	55%
1700	63%	59%	56%	53%	51%	50%	47%	45%	44%	43%
1750	59%	55%	52%	49%	47%	45%	42%	40%	38%	37%
1800	56%	52%	48%	45%	42%	40%	37%	35%	33%	31%
1900	50%	45%	41%	37%	34%	30%	28%	26%	24%	22%
2000	45%	39%	34%	30%	26%	23%	21%	19%	16%	15%

b) Probability that $B \geq B_{MSY}$

Probability $B>=B_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	68%	87%	95%	98%	99%	100%	100%	100%	100%	100%
1000	68%	75%	80%	84%	87%	89%	91%	92%	93%	94%
1250	68%	71%	74%	76%	78%	79%	81%	82%	83%	83%
1500	68%	67%	67%	66%	66%	66%	65%	65%	64%	64%
1600	68%	66%	64%	62%	61%	60%	58%	56%	55%	54%
1700	68%	64%	61%	58%	55%	53%	51%	48%	47%	45%
1750	68%	63%	60%	56%	53%	50%	47%	44%	43%	40%
1800	68%	62%	58%	53%	50%	47%	44%	40%	38%	36%
1900	68%	61%	55%	49%	45%	41%	36%	33%	30%	28%
2000	68%	59%	52%	45%	40%	35%	30%	27%	23%	21%

c) Probability that $F \leq F_{MSY}$ and $B \geq B_{MSY}$

Probability $F<=F_{MSY}$ and $B>=B_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	68%	87%	95%	98%	99%	100%	100%	100%	100%	100%
1000	68%	75%	80%	84%	87%	89%	91%	92%	93%	94%
1250	68%	71%	74%	76%	78%	79%	81%	82%	83%	83%
1500	67%	66%	66%	66%	65%	65%	65%	64%	63%	63%
1600	65%	63%	61%	60%	58%	57%	56%	54%	54%	53%
1700	61%	58%	55%	52%	50%	48%	46%	44%	43%	42%
1750	59%	55%	52%	48%	46%	44%	41%	39%	38%	36%
1800	56%	52%	48%	45%	42%	39%	37%	34%	32%	31%
1900	50%	45%	41%	36%	34%	30%	28%	26%	24%	22%
2000	45%	39%	33%	30%	26%	23%	21%	19%	16%	15%

13.11 SWO-AT-Atlantic swordfish (Xiphias gladius)

Introduction

The status of the North and South Atlantic swordfish stocks was assessed in 2022, by means of applying statistical modelling to the available data up to 2020. Complete information on the data availability and assessment can be found in the Report of the 2022 ICCAT Atlantic Swordfish Data Preparatory Session (Anon., 2022a) and Report of the 2022 ICCAT Atlantic Swordfish Stock Assessment Meeting (Anon., 2022b). A summary of both stock status is provided below (**Tables 1a and 1b**). **Table 2** provides estimated catches and discards by gear, for the period 2000-2024. The Kobe Phase Plots and uncertainty of current status estimates are summarized in **Figure 1**. **Table 3** provides estimated probabilities (%) that both the fishing mortality will be below F_{MSY} and spawning stock biomass will be above SSB_{MSY} in future years under different constant catch scenarios.

Table 1a. North Atlantic swordfish summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	12,819 t (10,864 t - 15,289 t)[1]	2020
TAC (2024)	13,200 t	
Current (2024) Yield	11,001 t[2]	
Relative Biomass (B_{2020}/B_{MSY})	1.08 (0.71-1.33)[3]	
Relative Fishing Mortality (F_{2020}/F_{MSY})	0.80 (0.64-1.24)[3]	
Stock Status	Overfished: NO (37.1% probability of being overfished)[4] Overfishing: NO (14.7% probability of overfishing) [4]	
Management measure in effect	Rec. 24-10 TAC (2025): 14,769 t	
Managed according to a Management Procedure: Recommended TAC for the period 2025-2027 of 14,769 t		

[1] Median from base case JABBA and Stock Synthesis models; range corresponding to the lowest and highest 95% CIs from the two models.
[2] Provisional as of 27 September 2025 and subject to revision.
[3] Median and 95% quantiles from base case Stock Synthesis and JABBA models.
[4] As estimated from the Kobe plot probability in each quadrant.

Table 1b. South Atlantic swordfish summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	11,481 t (9,793 t-13,265 t)[1]	2020
TAC (2024)	10,000 t	
Current (2024) Yield	9,264 t[2]	
Relative Biomass (B_{2020}/B_{MSY})	0.77 (0.53-1.11) [3]	
Relative Fishing Mortality (F_{2020}/F_{MSY})	1.03 (0.67-1.51)	
Stock Status	Overfished: YES (91.5% probability of being overfished) [4] Overfishing: YES (55.6% probability of overfishing) [4]	
Management measures in effect	Country-specific TACs, Rec. 22-04	

[1] Median and 95% CIs from base case JABBA model.
[2] Provisional as of 27 September 2025 and subject to revision.
[3] Median and 95% quantiles from base case JABBA model.
[4] As estimated from the Kobe plot probability in each quadrant.

Table 2. Estimated catches and discards of Atlantic swordfish by stock, gear and country, for the period 2000-2024.

				2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL				27181	25139	23758	24078	25153	25544	25724	27935	23472	24814	24267	23914	24576	21282	20678	21103	21116	20837	19414	20339	19389	19287	19034	20581	20266
	ATN			11453	10011	9654	11444	12071	12378	11528	12306	11102	12146	11672	12709	13890	12078	10708	10758	10505	10300	9026	10248	10450	9787	10275	12215	11001
	ATS			15728	15128	14104	12634	13082	13165	14196	15629	12370	12668	12596	11205	10686	9204	9970	10345	10611	10537	10388	10091	8939	9500	8759	8366	9264
Landings	ATN		Longline	10520	8678	8799	10334	11410	11529	10896	11479	10394	11504	11077	11796	12976	11366	10090	10200	9917	9466	8403	9343	9747	9169	9745	11603	10291
			Other surf.	393	432	240	486	341	516	409	546	465	485	441	511	512	513	463	391	483	684	470	600	590	517	459	537	620
	ATS		Longline	15448	14302	13576	11714	12558	12917	13984	15318	11980	12301	12087	10854	10255	8958	9736	10047	10461	10281	10323	9975	8814	9323	8622	8213	9101
			Other surf.	278	826	527	920	523	248	212	221	384	368	361	277	291	246	189	254	148	145	36	65	66	47	52	43	105
Discards	ATN		Longline	539	896	607	618	313	323	215	273	235	151	148	392	391	199	156	167	105	149	152	304	113	99	68	74	70
			Other surf.	1	6	8	5	7	10	8	8	9	7	5	9	10	0	0	0	0	0.4	0.5	1	0.2	2	3	1	20
	ATS		Longline	1	0.1	0.3	0.4	1	0	0	91	6	0	147	74	140	0	46	43	2	111	26	50	57	128	85	110	58
			Other surf.	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	0	0	
Landings	ATN	CP	Barbados	13	19	10	21	25	44	39	27	39	20	13	23	21	16	21	29	20	21	18	10	12	13	8	9	8
			Belize	0	0	0	0	0	0	0	9	1	112	106	184	141	142	76	1	3	59	145	117	111	121	70	77	68
			Brazil	117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80
			Cabo Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	**0**
			Canada	968	1079	959	1285	1203	1558	1404	1348	1334	1300	1346	1551	1489	1505	1604	1579	1548	1188	782	995	1334	1377	1342	1923	1673
			China PR	22	102	90	316	56	106	72	85	92	92	73	75	59	96	60	141	135	81	87	92	96	44	38	105	103
			Costa Rica	1	0.3	0	1	4	3	2	4	11	6	11	23	21	22	30	34	26	44	43	23	19	51	26	27	39
			Cuba	0	0	10	3	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	**0**
			Côte d'Ivoire	0	0	0	0	0	0	0	0	0	25	30	0	0	0	0	0	0	0	0	0	26	8	17	0	2
			EU-España	4595	3968	3957	4586	5376	5521	5448	5564	4366	4949	4147	4889	5622	4084	3750	4013	3916	3586	3186	3112	3587	3235	3717	4957	4593
			EU-France	122	0	74	169	102	178	92	46	14	15	35	16	94	44	28	66	90	79	80	82	90	103	120	163	265
			EU-Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	**0**
			EU-Ireland	35	17	5	12	1	1	3	2	2	1	2	2	5	2	3	15	15	10	13	3	24	9	22	31	61
			EU-Netherlands	0	0	0	0	0	0	0	0	0.1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-Portugal	732	735	766	1032	1320	900	949	778	747	898	1054	1203	882	1438	1241	1420	1460	1871	1691	2392	2070	2165	1750	1967	1429
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	**0**
			FR-St Pierre et Miquelon	0	0	10	3	36	48	0	82	48	17	90	1	0	18	3	0	0	0	0	0	0	0	78	0	**0**
			Great Britain	1	0	0.1	0	0	0	49	0.2	0	2	0.3	0	0.2	0.0	0	0.2	0	0.2	0	0.1	0.0	0.2	0	0	**0**
			Grenada	84	0	54	88	73	56	30	26	43	0	0	0	0	0	0	39	29	36	36	22	15	4	7	16	7
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	**0**
			Japan	759	0	0	0	575	705	656	889	935	778	1062	523	639	300	545	430	379	456	325	355	406	311	431	448	548
			Korea Rep	0	0	0	0	0	51	65	175	157	3	0	0	0.0	64	35	0	9	19	9	9	14	13	17	20	18
			Liberia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	95	3	7	7	8	0.5	1	3
			Maroc	114	523	223	329	335	339	341	237	430	724	968	782	770	1062	1062	850	900	900	950	950	936	955	1085	1145	887
			Mexico	37	27	34	32	44	41	31	35	34	32	35	38	40	33	32	31	36	64	44	30	21	25	22	26	20
			Norway	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	**0**
			Philippines	0	1	4	44	5	0	8	0	22	28	0	17	37	9	14	0	0	0	0	0	0	0	0	0	**0**
			Russian Federation	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Senegal	0	0	0	0	0	0	0	38	41	87	113	148	44	43	49	78	146	112	89	121	33	6	0	54	17
			Sierra Leone	2	2	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	
			St Vincent and Grenadines	0.1	22	22	7	7	7	7	51	7	34	13	11	8	4	40	102	33	46	26	12	7	0	2	0	**0**
			Trinidad and Tobago	41	75	92	78	83	91	19	29	48	30	21	16	14	16	26	17	13	36	3	6	8	6	6	1	4
			UK-Bermuda	3	2	0.4	0.5	0.5	0.5	0.5	3	4	3	3	3	1	1	1	1	2	1	2	2	6	5	3	4	4
			UK-British Virgin Islands	0	0	0	0	4	4	7	0	3	0	0	4	0	0	0.4	0.3	0	0	0	0	0	0.4	0	0	
			UK-Turks and Caicos	0	0	0	0	0	0	0	0.2	0	0	0	0	0	13	17	0	0	0	0	0	0	0	0	0	**0**
			USA	2863	2217	2384	2513	2380	2160	1873	2463	2387	2730	2274	2551	3393	2824	1809	1581	1408	1294	1135	1449	1351	1142	1281	954	846
			Venezuela	44	21	34	45	53	55	22	30	11	13	24	18	25	24	25	40	60	62	38	37	17	15	19	32	39
		NCC	Chinese Taipei	347	299	310	257	30	140	172	103	82	89	88	192	166	115	78	115	148	78	162	115	144	66	145	170	198
			Guyana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	6	10	5	2	5	3	0	0	
		NCO	Dominica	0	1	0	0	0.1	0.2	0.4	0.3	0.3	1	0	0.0	0	0	0.4	0.0	0.1	1	0	0.4	0.1	0	0	0	
			Faroe Islands	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.3	2	0	1	0	0	0	
			Seychelles	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Sta Lucia	0	0	0	0.2	2	3	0.1	0.4	2	0.3	0.0	0.4	0	0.2	0.1	0.1	0.1	1	0	0	0	0	0.0	0	
			Vanuatu	0	0	0	0	35	29	14	0	0	0	10	23	15	2	4	7	0	0	0	0	0	0	0	0	
	ATS	CP	Angola	0	0	0	0	0	3	0	0	0	0	0	0	0	0	18	0	0	13	0	0	0	45	135	22	32
			Belize	8	0	0	0	0	0	0	120	32	111	121	207	197	136	45	111	176	166	115	55	2	2	2	0	19
			Brazil	4579	4082	2910	2920	2998	3785	4430	4153	3407	3386	2926	3033	2833	2384	2892	2599	2938	2410	2798	2863	2110	2823	2197	1984	2298
			China PR	344	200	423	353	278	93	300	473	470	291	296	248	316	196	206	328	222	302	355	211	89	37	188	109	128
			Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	**0**
			Côte d'Ivoire	20	19	19	43	29	31	39	17	24	145	156	58	89	133	68	48	58	41	57	123	19	14	24	4	65
			EU-España	6388	5789	5741	4527	5483	5402	5300	5284	4073	5183	5801	4700	4852	4184	4113	5059	4992	4656	4404	4224	4442	4470	3592	4092	4661
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	4	0	0.2	0	0	0.2	**0**
			EU-Portugal	392	393	380	354	345	493	440	428	271	367	232	263	184	125	252	236	250	466	369	323	335	224	210	360	293
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	**0**
			Gabon	0	0	0	9	2	1	0	0	0	2	0.2	0	0	0	0.1	0	0	0	0	0	0	0	0	0	
			Ghana	117	531	372	734	343	55	32	65	177	132	116	60	54	37	26	56	36	55	6	32	31	19	16	21	12
			Great Britain	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	**0**
			Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	
			Japan	790	685	833	924	686	480	1090	2155	1600	1340	1314	1233	1162	684	976	659	637	915	640	647	552	478	622	422	558
			Korea Rep	10	0.1	2	24	70	36	94	176	223	10	0	0	42	47	53	5	19	11	18	9	15	6	6	5	10
			Namibia	469	751	504	191	549	832	1118	1038	518	25	417	414	85	129	395	225	466	600	881	811	789	623	1100	665	402
			Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	**0**
			Philippines	0	6	1	8	1	1	4	58	41	49	14	35	15	35	58	0	0	0	0	0	0	0	0	0	**0**
			S Tomé e Príncipe	120	120	120	120	126	147	138	138	183	188	193	60	84	60	94	145	77	65	10	12	4	14	11	11	9
			Senegal	0	0	0	0	0	0	0	77	97	137	78	117	162	178	143	97	90	112	65	116	38	0	0	0	**0**
			South Africa	328	547	649	293	295	199	186	207	142	170	145	97	50	171	152	218	164	189	189	251	149	179	161	291	291
			St Vincent and Grenadines	0	0	0	0	0	0	0	10	7	16	4	3	2	2	19	0.3	5	9	4	15	9	32	76	0	**0**
			UK-Sta Helena	0	20	4	2	2	0.5	0	0.2	0.1	0	0	0	0	5	6	2	0	0	0	0	0	0	0	0	**0**
			USA	142	43	200	21	15	0	0	0	0	0	0.2	0	0	0.1	0	0	0	0	0	0	0.0	0	0	0	**0**
			Uruguay	713	789	768	850	1105	843	620	464	370	501	222	179	40	103	0	0	0	0	0	0	0	0	0	0	**0**
		NCC	Chinese Taipei	1303	1149	1164	1254	745	744	377	671	727	612	410	424	379	582	406	511	478	416	446	346	296	406	335	269	428
		NCO	Argentina	0.1	5	10	8	0.1	0	0	0	0	0	1	0.5	0	0	0	0	0	0	0	0	0	0	0	0	
			Mixed flags (FR+ES)	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Seychelles	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Togo	0	0	0	0	9	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Vanuatu	0	0	0	0	0	11	26	6	3	0	3	1	3	0.2	1	1	0	0	0	0	0	0	0	0	
Discards	ATN	CP	Canada	50	26	33	79	45	106	38	61	39	9	15	8	111	59	12	8	11	21	5	2	2	3	2	3	15
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1	0.2	0.3	0	0	4
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0.2	0.4	0.2
			EU-Portugal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	22
			Japan	0	567	319	263	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	5	4	2	3	4
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	170	46	19	0.1	2	0	0	0	0	0	0	0	0	**0**
			Mexico	0	0	0	0	0	0	0.1	0.1	0.1	0.0	0.2	1	0.1	0.1	0.0	0	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.1	0.1
			UK-Bermuda	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0.1	0.1	0.3	0.1	0.0	0.0
			USA	490	308	263	282	275	227	185	220	205	148	138	223	217	120	137	137	90	111	140	287	91	90	59	55	44
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.4	27	0	7	18	4	18	7	7	14	2	5	13	1
	ATS	CP	Brazil	0	0	0	0	0	0	0	91	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	27
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**0**
			Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.2	2	0.1	0.4	0.2
			Korea Rep	0	0	0	0	0	0	0	0	0	0	147	70	23	0	0.2	0	0	0	0	0	0	0	0	0	**0**
			South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	**0**
			USA	1	0.3	0.3	0.4	1	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	4	117	0	45	43	2	111	26	49	57	126	85	110	31

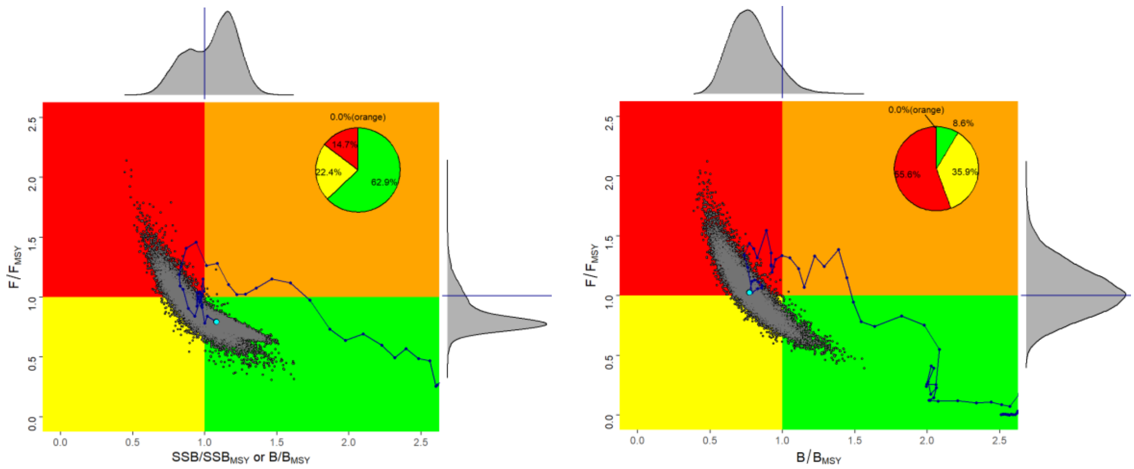


Figure 1. Kobe plots for the North (left) and South (right) Atlantic swordfish stock status in 2020, estimated during the 2022 stock assessment. The inserted pie charts indicate the probability of the stock being within each Kobe colour quadrant. The probability distributions shown in each axis represent uncertainty around current B/B_{MSY} and F/F_{MSY}. The black line indicates the stock status trajectory starting in 1950.

Outlook

North Atlantic

The stock is managed using a management procedure tested under MSE. Based on the MSE analysis, the adopted MP is expected to maintain the stock in the green quadrant of the Kobe matrix with 60% probability over the next 30 years.

Since its use in the 2022 stock assessment model, the Combined Index values for recent years have increased. This coincides with many consecutive years of catches below the TAC.

South Atlantic

The 2022 assessment stock status results were similar to the 2017 assessment, but updated information used in the 2022 assessment resulted in estimates of a less productive stock (MSY_{2020} = 11,481 t; MSY_{2015} = 14,570 t).

Results of projections from the 2017 assessment indicated that if catches remained below 11,000 t, there was a 60% chance of the stock falling within the green quadrant by 2020. The average catch for the period 2016-2020 was 10,125 t, yet the 2022 assessment indicated a 56% probability that the stock was within the red quadrant in 2020 (**Figure 1**). The Committee noted that this apparent inconsistency can be explained by the lower productivity (see above) of the stock determined in the 2022 assessment.

Projections were conducted for the base case JABBA model under constant TAC scenarios of 6 to 15 thousand tons, as well as a zero-catch scenario. Projections were implemented in 2023 and catches for 2021 and 2022 were assumed to remain constant (9,826 t) at the average from the previous three years. Under 2021-2022 catch levels (9,826 t), the South Atlantic swordfish stock had a 55% probability of being in the green quadrant of the Kobe plot by 2033 (**Table 3**).

Management recommendation

North Atlantic

Catch advice for 2025-2027 was generated by a management procedure (MP) adopted in 2024. The index used to inform the MP uses catch and effort data from 7 major fishing fleets. While the North Atlantic swordfish exceptional circumstances protocol is still being developed the index was updated in 2025 (with data to 2023) to support the interim evaluation of exceptional circumstances (see response 19.15).

South Atlantic

The current TAC of 10,000 t (Rec. 22-04) will result in a 52% probability of being in the green quadrant in 2033 (**Table 3**). Catch levels less than 10,000 t will accelerate rebuilding. The Committee also recognized that the above advice did not fully account for removals associated with the mortality of unreported dead and post release mortality of live discards, quota carryovers (30% at the time of the assessment, reduced to 10% in Rec. 22-04) nor quota transfers across the North and South stock management boundaries. The Committee emphasized the importance of these uncertainties and recommended that the stock be closely monitored in the upcoming years to confirm rebuilding.

Table 3. Kobe II matrices for South Atlantic swordfish stock giving the probabilities that: a) $F<F_{MSY}$ (overfishing not occurring); b) $B>B_{MSY}$ (stock not overfished) and c) joint probability that $B>B_{MSY}$ and $F<F_{MSY}$ (the “green zone”).

a) Probability that $F<F_{MSY}$

TAC (t)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
6000	95%	97%	98%	98%	99%	99%	99%	99%	100%	100%	100%
6500	92%	94%	96%	97%	98%	98%	99%	99%	99%	99%	99%
7000	88%	91%	93%	95%	96%	97%	97%	98%	98%	98%	98%
7500	82%	86%	89%	91%	93%	94%	95%	96%	96%	97%	97%
8000	75%	80%	83%	86%	88%	90%	91%	92%	93%	94%	95%
8500	68%	72%	76%	79%	82%	84%	85%	87%	88%	89%	90%
9000	59%	64%	68%	71%	74%	76%	78%	80%	81%	83%	84%
9500	51%	55%	59%	62%	65%	67%	69%	71%	72%	74%	75%
9826	46%	50%	53%	56%	58%	60%	62%	64%	65%	67%	68%
10000	43%	47%	49%	52%	54%	57%	59%	60%	62%	64%	65%
10500	35%	38%	40%	42%	44%	46%	48%	49%	50%	52%	53%
11000	29%	31%	32%	33%	35%	36%	37%	38%	39%	40%	40%
11500	23%	24%	25%	25%	26%	27%	27%	28%	28%	29%	29%
12000	18%	18%	19%	19%	19%	19%	19%	20%	20%	20%	20%
12500	13%	14%	14%	14%	14%	14%	14%	13%	13%	13%	13%
13000	11%	10%	10%	10%	10%	10%	9%	9%	9%	9%	9%
13500	8%	8%	7%	7%	7%	6%	6%	6%	6%	6%	5%
14000	6%	6%	5%	5%	5%	4%	4%	4%	4%	3%	3%
14500	5%	4%	4%	3%	3%	3%	3%	2%	2%	2%	2%
15000	4%	3%	3%	2%	2%	2%	2%	2%	1%	1%	1%

b) Probability that $B>B_{MSY}$

TAC (t)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	21%	48%	74%	90%	96%	99%	99%	100%	100%	100%	100%
6000	21%	33%	46%	59%	70%	77%	83%	88%	92%	94%	95%
6500	21%	32%	44%	56%	66%	74%	80%	85%	88%	91%	93%
7000	21%	31%	41%	52%	62%	70%	75%	80%	85%	88%	90%
7500	21%	30%	39%	48%	57%	65%	70%	76%	80%	83%	86%
8000	21%	29%	37%	45%	53%	60%	65%	70%	74%	78%	81%
8500	21%	28%	34%	41%	48%	54%	59%	64%	68%	72%	75%
9000	21%	27%	32%	38%	44%	49%	53%	58%	61%	65%	68%
9500	21%	26%	31%	35%	39%	44%	48%	51%	55%	58%	60%
9826	21%	25%	29%	33%	36%	40%	43%	47%	50%	52%	55%
10000	21%	25%	29%	32%	35%	39%	41%	45%	47%	49%	52%
10500	21%	24%	27%	29%	31%	34%	36%	38%	40%	41%	43%
11000	21%	23%	25%	26%	28%	29%	30%	32%	33%	34%	35%
11500	21%	22%	23%	24%	24%	25%	25%	26%	26%	27%	27%
12000	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%
12500	21%	20%	19%	19%	18%	18%	17%	17%	16%	16%	16%
13000	21%	19%	18%	17%	16%	15%	14%	13%	13%	12%	12%
13500	21%	18%	17%	15%	14%	12%	11%	10%	10%	9%	9%
14000	21%	18%	15%	13%	12%	10%	9%	8%	7%	7%	6%
14500	21%	17%	14%	12%	10%	8%	7%	6%	6%	5%	4%
15000	21%	16%	13%	10%	8%	7%	6%	5%	4%	3%	3%

c) Probability that $F<F_{MSY}$ and $B>B_{MSY}$

TAC (t)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	21%	48%	74%	90%	96%	99%	99%	100%	100%	100%	100%
6000	21%	33%	46%	59%	70%	77%	83%	88%	92%	94%	95%
6500	21%	32%	44%	56%	66%	74%	80%	85%	88%	91%	93%
7000	21%	31%	41%	52%	62%	70%	75%	80%	85%	88%	90%
7500	21%	30%	39%	48%	57%	65%	70%	76%	80%	83%	86%
8000	21%	29%	37%	45%	53%	60%	65%	70%	74%	78%	81%
8500	21%	28%	34%	41%	48%	54%	59%	64%	68%	72%	75%
9000	21%	27%	32%	38%	44%	49%	53%	58%	61%	65%	68%
9500	21%	26%	31%	35%	39%	44%	48%	51%	55%	58%	60%
9826	21%	25%	29%	33%	36%	40%	43%	47%	50%	52%	55%
10000	20%	25%	28%	32%	35%	39%	41%	45%	47%	49%	52%
10500	20%	23%	26%	29%	31%	33%	35%	38%	40%	41%	43%
11000	20%	22%	24%	25%	27%	28%	30%	31%	32%	33%	35%
11500	18%	19%	21%	22%	23%	23%	24%	24%	25%	26%	26%
12000	16%	16%	17%	18%	18%	18%	18%	18%	19%	19%	19%
12500	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
13000	10%	10%	10%	10%	9%	9%	9%	9%	9%	9%	8%
13500	8%	8%	7%	7%	7%	6%	6%	6%	6%	5%	5%
14000	6%	6%	5%	5%	5%	4%	4%	4%	4%	3%	3%
14500	5%	4%	4%	3%	3%	3%	3%	2%	2%	2%	2%
15000	4%	3%	3%	2%	2%	2%	2%	2%	1%	1%	1%

Additional supporting information

The Committee recognized that environmental variability and Climate Change are important factors affecting many aspects of swordfish population dynamics and the data used to assess stock status such as the indices of relative abundance. The Committee is working to address these themes through projects described in more detail in the workplan. Given the potential influence of observed environmental changes on the variability of abundance indices, the SCRS will attempt to integrate these variables into the construction of such indices.

The Committee noted the expanded use of trapline gear in the Mediterranean and Atlantic. Initial evidence suggests that catchability, selectivity, and bycatch differ for this gear, relative to typical longline gears. The Committee noted the importance of further research on this gear type and to track its use in ICCAT fisheries and encouraged CPCs to provide relevant data voluntarily in accordance with the recommendation from the Subcommittee on Statistics.

13.12 SWO-MD-Mediterranean swordfish **(Xiphias gladius)**

Introduction

The most recent assessment of the stock was conducted in 2020, making use of the available catch, effort and size information through 2018. Complete information on the data availability and assessment can be found in the Report of the 2020 Mediterranean Swordfish Stock Assessment (Anon., 2020b). **Table 1** shows a summary of the stock status. **Table 2** provides estimated catches and discards by gear, for the period 2000-2024. The Kobe Phase Plots for both scenarios are summarized in **Figure 1**.

Table 1. Mediterranean swordfish summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	13,325 t (10,899 t – 17,346 t)[1]	2018
TAC (2024)	9,015.810[2]	
Current (2024) Yield	8,450 t[3]	
Relative Biomass (B_{2018}/B_{MSY})	0.72 (0.38 - 1.29)[4]	
Relative Fishing Mortality (F_{2018}/F_{MSY})	0.93 (0.42 - 1.68)[4]	
Stock Status	Overfished: YES (86.7% probability of being overfished)[5] Overfishing: NO (41.1% probability of overfishing)[5]	
Management measures in effect	Rec. 03-04; Rec. 24-11 TAC (2025) 9,015.810 t	

[1] 95% credibility intervals of 30,000 Markov chain Monte Carlo (MCMC) iterations from Bayesian surplus production models.
[2] In addition, Egypt and Libya shall have catch limits of 125 t each.
[3] Provisional and subject to revision as of 24 September 2025.
[4] Median and 95% quantiles from base case.
[5] As estimated from the Kobe plot probability in each quadrant.

Table 2. Estimated catches (t) and discards of Mediterranean swordfish tuna by gear and flag for the period 2000-2024.

			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL	MED		15569	15006	12814	15694	14405	14622	14915	14227	13683	13235	14754	12640	11046	10070	10969	11983	12300	10390	8681	8176	7664	7512	7169	7546	8450
Landings		Longline	7129	7498	8042	10748	10877	10954	11323	11113	11479	11020	11918	10288	9131	9047	9718	10675	10878	8345	6938	8041	7603	7258	6946	7364	8320
		Other surf.	8440	7508	4772	4945	3519	3555	3576	3094	658	819	1347	1162	782	49	83	78	53	57	61	45	60	66	133	74	63
Discards		Longline	0	0	0	0	9	113	16	19	1546	1396	1488	1191	1133	973	1168	1230	1369	1988	1682	89	0.4	188	90	109	68
		Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
Landings	CP	Algerie	816	1081	814	665	564	635	702	601	802	468	459	216	387	403	557	568	671	550	528	517	501	447	472	472	472
		EU-Croatia	0	0	0	0	0	0	0	0	4	3	6	6	4	10	16	10	25	20	28	33	23	25	39	40	40
		EU-Cyprus	82	135	104	47	49	53	43	67	67	38	31	35	35	51	59	54	53	50	45	24	30	56	36	57	61
		EU-España	1436	1484	1498	1226	951	910	1462	1697	2095	2000	1792	1744	1591	1607	2073	2283	1733	1487	1387	1460	1434	1372	1462	1340	1476
		EU-France	0	12	27	20	19	22	20	14	14	16	78	81	12	66	127	182	179	113	86	71	110	96	66	69	81
		EU-Greece	1960	1730	1680	1230	1120	1311	1358	1887	962	1132	1494	1306	877	1731	1344	761	761	392	350	745	657	686	371	444	501
		EU-Italy	7515	6388	3539	8395	6942	7460	7626	6518	4549	5016	6022	5274	4574	2862	3393	4272	3946	2987	1779	2473	2250	2016	2079	2322	3081
		EU-Malta	175	102	257	163	195	362	239	213	260	266	423	532	503	460	376	489	410	330	308	407	361	391	380	360	374
		EU-Portugal	13	115	8	1	120	14	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		Egypt	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4	0	0	0	4	0	4	12	26	73	100
		Japan	2	1	1	0	2	4	0.4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		Korea Rep	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		Libya	8	6	0	10	2	0	16	0	0	0	0	0	0	0	0	585	960	30	70	26	22	19	21	250	120
		Maroc	2708	3026	3379	3300	3253	2523	2058	1722	1957	1587	1610	1027	802	770	770	480	1110	1000	1013	982	951	924	891	896	896
		Syria	0	0	0	0	0	0	0	37	28	0	0	0	9	4	0	0	0	0	0	0	0	0	0	0	**0**
		Tunisie	483	567	1138	288	791	791	949	1024	1011	1012	1016	1040	1038	1036	1030	1034	1007	1003	974	934	918	891	857	733	799
		Türkiye	370	360	370	350	386	425	410	423	386	301	334	190	80	97	56	35	77	441	427	414	402	390	379	382	381
Discards		Algerie	0	0	0	0	0	0	0	0	175	102	100	42	78	84	145	147	176	205	197	0	0	0	0	0	**0**
		EU-Croatia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.2	1	1
		EU-Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0.0	0.2	0.4
		EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	84	89	0	188	90	107	67
		EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.1
		EU-Greece	0	0	0	0	9	113	16	19	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		EU-Italy	0	0	0	0	0	0	0	0	724	751	817	734	618	456	538	670	623	907	535	0	0	0	0	0	**0**
		Maroc	0	0	0	0	0	0	0	0	343	278	301	160	201	193	198	123	285	350	355	0	0	0	0	0	**0**
		Tunisie	0	0	0	0	0	0	0	0	221	221	222	227	227	226	272	273	266	374	364	0	0	0	0	0	**0**
		Türkiye	0	0	0	0	0	0	0	0	55	43	48	27	10	14	16	10	20	151	148	0	0	0	0	0	**0**

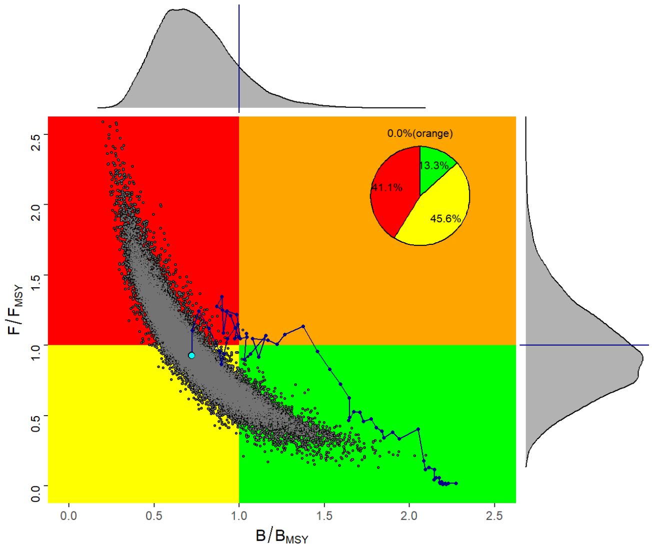


Figure 1. Kobe plot for the Mediterranean swordfish stock status trajectories for the combined posteriors in 2018, estimated during the 2020 stock assessment. The inserted pie chart indicates the probability of the stock being within each Kobe colour quadrant. The probability distributions shown in each axis represent uncertainty around current B/B_{MSY} and F/F_{MSY}. The black line indicates the stock status trajectory starting in 1950.

Outlook

The assessment of Mediterranean swordfish indicated that the stock is most likely overfished and current fishing mortality is just below F_{MSY} levels. The stock has been in an overfished state since the early 1990s because of the large catches in the 1980s and the selection pattern which captures many immature fish. Current catches are dominated, in terms of number, by fish less than 4 years old and the highest fishing mortality corresponding to fish of age 3. Additionally, estimated recruitment has been declining for the last 10 years.

Projections of different catch levels, based on the output of the production model assessment indicated that a TAC equal to 10,000 t would result in stock rebuilding with a 60% probability by 2028. Projections were not carried out beyond 2028 due to uncertainty with the models. Probabilities of the stock rebuilding increase with catches lower than 10,000 t. It should be noted, however, that these projection estimates were based on the assumption that future stock productivity would be around the average of the whole studied period. The declining recruitment in the terminal years of the assessment may be indicating that stock productivity was decreased and in that case stock projections should be interpreted with caution.

Management recommendations

Over the last 50 years stock biomass showed declining trends. Until about 2010, declining trends were rather modest accompanied by small-scale fluctuations. In the most recent period, the stock biomass has continued to decline. As expected, fishing mortality followed an opposite trend with sharper increases during the 1980s. Stock biomass estimates in 2018 was about 30% lower than that corresponding to MSY, while fishing mortality was around F_{MSY}. According to the Commission objectives the stock requires rebuilding and relevant scenarios were simulated assuming different levels of TACs. Analysis indicated that the probability of stock rebuilding by the end of the projection period (2028) was 60% if a TAC equal to 10,000 t was implemented. The probability increased if lower TACs levels were selected. As there are uncertainties on stock productivity, these estimates may be optimistic and should be interpreted with caution.

The Committee noted that since the establishment of minimum catching sizes, particularly after the recent size increase imposed through Rec. 16-05 the discard levels of undersized swordfish are increasing at least for certain fisheries and are largely dead. However, discards are not being reported for all fleets. Though an attempt has been made to statistically estimate discard levels and consider them in stock assessment models, the real volume of total discards is unknown due to this under-reporting. Such under-reporting leads to false estimates of the overall catch volume and consequently bias stock status estimates and projections of future stock size under different management measures.

Table 3. Kobe II matrices for the Mediterranean swordfish stock: a) F being below or equal to F_{MSY} (overfishing not occurring); b) B above or equal to B_{MSY} (not overfished) and; c) B above B_{MSY} and F below F_{MSY} (green zone) for a range of fixed total catches (0-15,000 t) over the projection horizon 2021-2028.

a) Probability that $F \leq F_{MSY}$

TAC | Year	2021	2022	2023	2024	2025	2026	2027	2028
0	100	100	100	100	100	100	100	100
7000	84	87	90	91	93	94	94	95
8000	76	80	83	85	87	88	90	90
9000	68	72	75	77	80	81	82	84
10000	58	62	65	68	70	72	73	74
10250	56	60	62	65	67	69	71	72
10500	54	57	60	62	64	66	68	69
10750	51	54	57	59	61	63	64	66
11000	49	52	55	57	59	60	61	63
11250	47	50	52	54	56	57	58	59
11500	45	47	49	51	53	54	55	56
11750	43	45	47	48	50	51	52	53
12000	41	43	44	46	47	48	49	50
12250	39	40	42	43	44	45	45	46
12500	37	38	39	40	41	42	42	43
12750	35	36	37	38	38	39	39	40
13000	33	34	35	35	36	36	36	36
14000	27	27	27	26	26	26	26	25
15000	22	21	20	20	19	18	18	17

b) Probability that $B \geq B_{MSY}$

TAC | Year	2021	2022	2023	2024	2025	2026	2027	2028
0	31	52	71	84	92	96	98	99
7000	31	41	51	59	67	72	77	81
8000	31	39	47	55	61	67	71	75
9000	31	38	44	50	56	60	64	68
10000	31	36	41	46	50	53	57	60
10250	31	36	40	45	49	52	55	58
10500	31	35	39	43	47	50	53	56
10750	31	35	39	42	45	48	51	53
11000	31	35	38	41	44	47	49	51
11250	31	34	37	40	43	45	47	50
11500	31	34	37	39	42	44	45	47
11750	31	34	36	38	40	42	43	45
12000	31	33	35	37	39	41	42	43
12250	31	33	35	36	37	38	39	40
12500	31	32	33	35	36	37	38	38
12750	31	32	33	34	35	35	36	36
13000	31	32	33	33	34	34	34	34
14000	31	30	30	29	29	28	28	27
15000	31	29	27	26	24	23	22	21

c) Probability that $F < F_{MSY}$ and $B > B_{MSY}$

TAC | Year	2021	2022	2023	2024	2025	2026	2027	2028
0	31	52	71	84	92	96	98	99
7000	31	41	51	59	67	72	77	81
8000	31	39	47	55	61	67	71	75
9000	31	38	44	50	56	60	64	68
10000	31	36	41	46	50	53	57	60
10250	31	36	40	45	49	52	55	58
10500	31	35	39	43	47	50	53	56
10750	31	35	39	42	45	48	51	53
11000	31	34	38	41	44	47	49	51
11250	31	34	37	40	43	45	47	49
11500	30	34	37	39	41	44	45	47
11750	31	33	36	38	40	42	43	45
12000	30	33	35	37	38	40	41	43
12250	30	32	34	35	37	38	39	40
12500	30	31	32	34	35	36	37	38
12750	29	31	32	33	33	34	35	35
13000	29	30	31	31	32	32	33	33
14000	25	25	25	25	25	25	25	24
15000	21	20	20	19	18	18	17	17

Additional supporting information

The Committee noted the expanded use of trapline gear in the Mediterranean and Atlantic. Initial evidence suggests that catchability, selectivity, and bycatch differ for this gear, relative to typical longline gears. The Committee noted the importance of further research on this gear type and tracking its use in ICCAT fisheries and encouraged CPCs to provide relevant data voluntarily in accordance with the recommendation from the Subcommittee on Statistics.

13.13 SMT-Small tunas

Introduction

The species under the Small Tunas Species Group include the following tuna and tuna-like species:

- BLF Blackfin tuna (*Thunnus atlanticus*)
- BLT Bullet tuna (*Auxis rochei*)
- BON Atlantic bonito (*Sarda sarda*)
- BOP Plain bonito (*Orcynopsis unicolor*)
- BRS Serra Spanish mackerel (*Scomberomorus brasiliensis*)
- CER Cero (*Scomberomorus regalis*)
- COM Narrow-barred Spanish mackerel (*Scomberomorus commerson*)
- FRI Frigate tuna (*Auxis thazard*)
- KGM King mackerel (*Scomberomorus cavalla*)
- LTA Little tunny (*Euthynnus alletteratus*)
- MAW West African Spanish mackerel (*Scomberomorus tritor*)
- SSM Atlantic Spanish mackerel (*Scomberomorus maculatus*)
- WAH Wahoo (*Acanthocybium solandri*)

Knowledge on the biology and fishery of small tunas is very fragmented. Furthermore, the quality of the knowledge varies according to the species concerned. This is due in large part to the fact that these species are often perceived to have little economic importance compared to other tunas and tuna-like species, and owing to the difficulties in conducting sampling of the landings from artisanal fisheries, which constitute a high proportion of the fisheries exploiting small tuna resources. The large industrial fleets often discard small tuna catches at sea or sell them on local markets mixed with other bycatches, especially in Africa. The amount caught is rarely reported in logbooks; however, observer program from purse seine fleets have recently provided estimates of catches of small tunas.

Small tuna species can reach high levels of catch and values in some years and have a very high relevance from a social and economic point of view, because they are important for many coastal communities in all areas and a main source of food. Their social and economic value is often not evident because of the underestimation of the total landing figures, due to the difficulties in data collection mentioned above. Several statistical problems are also caused by misidentification.

Scientific collaboration between ICCAT, Regional Fisheries Organizations (RFOs) and countries in the various regions is imperative to advance understanding of the distribution, biology and fisheries of these species.

A summary of the stock information is provided below (**Table 1**). **Table 2** provides estimated catches of small tunas, for the period 2000-2024.

Table 1. Small tunas summary table.

Indicator	*Species*												
	BLF	BLT	BON	BOP	BRS	CER	COM	FRI	KGM	LTA	MAW	SSM	WAH
Maximum Sustainable Yield (MSY)[1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Current (2025) TAC	ICCAT has never set TAC nor catch limits to small tunas												
Current (2024) Yield[2]	4069	4696	102489	311	933	0	0	23809	6432	30173	5422	7990	6017
Relative Biomass (SSB_{YEAR}/SSB_{MSY})	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Relative Fishing Mortality (F_{YEAR}/F_{MSY})	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Stock Status	See additional information section for the available information												
Management measures in effect	There are no ICCAT regulations in effect for small tunas. Several regional and national regulations are in place.												

[1] Not available
[2] As of 26 September 2025

Table 2. Estimated catches (t) of small tuna species by area, gear and flag for the period 2000-2024.

					20	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
BLF	TOTAL	ATL			2483	4034	4756	1303	1926	1031	1937	1927	1669	1442	1837	2083	2849	2134	1263	1386	2017	1481	1635	1542	2712	2880	4856	7603	4069
	Landings			All gears	2483	4034	4756	1303	1926	1031	1937	1927	1669	1442	1837	2083	2849	2134	1263	1386	2017	1481	1635	1542	2712	2880	4856	7603	4069
	Discards				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	Landings		CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Brazil	38	149	1669	1	118	91	242	233	266	10	9	46	124	110	299	325	228	192	392	410	820	1691	2273	5345	2608
				Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Costa Rica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Curaçao	45	45	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				EU-France	1040	1040	1040	0	0	0	0	0	0	0	32	19	26	0	14	12	14	14	6	28	15	17	30	35	90
				Grenada	164	223	255	335	268	306	371	291	290	291	291	291	291	291	0	0	0	0	0	94	73	0	36	108	43
				Mexico	0	12	0	10	9	10	10	12	6	7	6	9	5	4	4	4	5	4	4	3	3	2	3	3	1
				St Vincent and Grenadines	23	24	24	0	0	0	0	0	0	0	0	0	0	11	0	0	0	5	0	9	6	0	0	3	8
				Trinidad and Tobago	0	0	0	5	5	5	5	5	5	5	5	5	5	5	5	0	5	5	5	5	5	5	5	5	3
				UK-Bermuda	5	4	5	9	4	5	8	7	6	7	9	8	11	11	15	20	17	17	16	10	7	12	9	9	8
				UK-British Virgin Islands	0	0	0	0	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	
				UK-Turks and Caicos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				USA	326	474	334	414	675	225	831	422	649	619	911	967	1919	1326	585	761	1265	946	1074	756	1628	1054	2403	2027	1232
				Venezuela	696	1902	1211	319	732	225	237	777	231	293	331	473	237	191	200	161	294	146	120	74	61	26	22	8	5
			NCO	Dominica	83	54	78	42	20	38	47	29	37	45	41	37	39	37	39	24	34	34	17	24	8	0	0	0	
				Dominican Republic	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
				Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Sta Lucia	45	108	96	169	96	126	182	151	179	165	203	229	192	147	104	80	156	119	0	127	84	74	75	60	70
	Discards		CP	Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
BLT	TOTAL				3912	5796	6041	3794	6223	4231	4233	5617	6825	5557	7952	9484	6234	7653	3916	5571	5720	3348	4083	3432	3530	3686	5021	4469	4696
		ATL			902	1236	626	353	401	719	889	602	334	484	746	507	515	1158	367	755	467	232	228	215	184	211	43	126	1184
		MED			3010	4559	5416	3441	5823	3513	3344	5015	6491	5072	7206	8977	5719	6494	3549	4816	5253	3116	3855	3218	3347	3475	4978	4343	3512
	Landings	ATL		All gears	902	1236	626	353	401	719	889	602	334	484	746	507	515	1158	367	750	467	223	216	215	184	211	43	126	1183
		MED			3010	4559	5416	3441	5823	3513	3344	5015	6491	5072	7206	8977	5719	6494	3549	4816	5253	3116	3855	3218	3347	3474	4978	4343	3511
	Discards	ATL			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	9	12	0	0	0	0	0	1
		MED			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
	Landings	ATL	CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	1
				Brazil	0	0	0	0	0	0	0	0	0	0	0	0	94	406	0	133	131	34	72	0	0	0	0	0	**0**
				Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	222	0	1	0	0	20	0	0	0	**0**
				EU-España	0	0	0	0	0	0	0	0	0	0	25	0	1	0	14	50	0	5	5	0	1	0	0	0	**0**
				EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				EU-Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121	14	0	0	0	0	3	**0**
				EU-Lithuania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	76	0	6	14	27	1069
				EU-Netherlands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	**0**
				EU-Portugal	494	208	166	231	299	580	867	602	311	436	654	387	55	38	0	0	0	0	0	64	29	130	7	55	46
				Liberia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	8	3
				Mauritania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Russian Federation	408	1028	460	122	102	139	22	0	23	48	67	119	366	703	352	345	336	62	125	75	134	64	19	32	64
				Venezuela	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	**0**
			NCO	Sta Lucia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		MED	CP	Algerie	225	230	481	0	391	547	586	477	1134	806	970	1119	1236	577	1025	1984	1592	231	799	905	732	1802	3229	2251	1939
				EU-Croatia	0	0	0	0	0	0	0	0	0	0	8	13	9	10	12	15	15	25	37	27	15	17	54	51	21
				EU-España	1024	861	493	495	1009	845	1101	3083	3389	726	3787	3227	1620	2654	735	1191	1081	2170	774	1026	986	511	266	981	425
				EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
				EU-Greece	196	125	120	246	226	180	274	157	620	506	169	129	118	155	108	311	207	181	294	513	262	139	273	309	155
				EU-Italy	462	462	2452	1463	1819	866	143	158	342	732	574	653	613	892	0	0	1717	0	966	25	6	16	15	14	14
				EU-Malta	1	1	0	2	8	4	11	14	12	7	11	23	3	85	14	14	11	9	12	12	7	1	28	2	8
				Maroc	763	256	621	246	326	50	199	35	83	336	525	237	194	237	171	811	200	0	442	50	96	91	52	43	34
				Syria	0	0	0	0	0	0	0	99	75	87	81	84	83	83	0	0	0	0	0	0	0	0	0	0	**0**
				Tunisie	15	2300	932	989	1760	0	0	0	0	0	0	940	935	938	920	13	23	26	136	67	91	139	147	162	112
				Türkiye	316	316	316	0	284	1020	1031	993	836	1873	1081	2552	907	863	562	476	407	474	367	462	1070	737	809	482	803
			NCO	Palestine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	130	81	21	104	48	
				Serbia & Montenegro	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Discards	ATL	CP	EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	9	12	0	0	0	0	0	1
		MED		EU-Croatia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1

BON	TOTAL			27151	27637	23925	14424	15832	78767	41951	15628	16814	23710	28921	36783	48280	24847	27993	15706	54868	22757	46584	29676	44619	28546	92232	39405	102489
		ATL		5179	5400	8208	3307	4584	4391	9648	6381	6772	13691	16338	22341	8959	6482	4640	6712	10930	10959	11093	23931	17458	21818	36028	31960	49147
		MED		21972	22237	15717	11117	11248	74376	32303	9247	10042	10019	12584	14442	39321	18365	23352	8993	43938	11798	35491	5745	27160	6728	56204	7445	53342
	Landings	ATL	All gears	5179	5400	8208	3307	4584	4391	9648	6381	6772	13691	16338	22341	8959	6482	4640	6712	10930	10959	11093	23929	17458	21818	36024	31953	49143
		MED		21972	22237	15717	11117	11248	74376	32303	9247	10042	10019	12584	14442	39321	18365	23352	8993	43938	11798	35491	5745	27160	6728	56204	7445	53342
	Discards	ATL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	5	7	4
		MED		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Landings	ATL	CP	Angola	118	118	118	0	0	138	0	931	0	1962	1997	131	267	1134	2	3	3	2	0	0	5	5	2	1068	9
				Barbados	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Belize	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	10	0	0	0	0	0	0
				Brazil	0	0	0	0	0	90	0	0	0	0	0	171	0	38	0	1	2	1	23	15	0	0	0	5	2
				Curaçao	0	0	0	0	0	0	0	0	0	0	539	539	539	539	0	0	0	0	0	0	0	0	0	0	0
				Côte d'Ivoire	0	0	0	0	3	0	3	0	3	13	755	3	0	26	3	16	6	3510	42	2725	1757	6244	687	590	1739
				EU-Denmark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				EU-España	12	10	5	23	9	2	15	14	13	36	45	57	7	44	28	10	31	18	16	20	3	8	10	5	7
				EU-France	32	0	18	0	0	0	0	122	59	25	208	241	102	245	288	333	422	290	195	115	62	60	43	56	56
				EU-Germany	0	0	38	0	0	0	0	0	0	0	0	0	0	0	6	0	4	89	14	0	13	1	25	25	0
				EU-Ireland	0	0	0	0	48	0	0	0	0	56	125	91	108	100	0	0	0	0	0	0	0	0	0	0	0
				EU-Latvia	416	396	639	0	0	0	0	0	0	0	1019	2231	34	48	29	0	0	0	0	6604	518	522	1414	712	1309
				EU-Lithuania	0	0	793	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	686	385	596	138	903	313	1652
				EU-Netherlands	0	0	0	0	0	0	0	344	539	539	0	2047	104	1075	54	11	124	79	39	91	71	82	141	72	1086
				EU-Portugal	162	47	61	40	50	38	318	439	212	124	476	461	321	184	22	25	570	368	257	382	168	248	148	757	504
				Gabon	0	0	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
				Gambia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	724	732	715
				Great Britain	0	0	0	0	0	0	35	0	0	30	71	113	4	0	0	0	0	0	0	0	0	0	0	0	1
				Grenada	7	10	10	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	1	0	1	1	0	2	0
				Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	59	32	0	3	4	5	6	4	35	15
				Maroc	2163	1700	2019	928	989	1411	1655	1053	1419	2523	109	145	235	89	90	174	850	1417	4081	5679	5470	4516	10512	17888	19623
				Mauritania	0	0	0	0	0	0	1303	839	1850	2384	6890	9463	3193	514	1052	2543	4951	1546	1801	1927	5008	5386	10843	5619	13081
				Mexico	1293	1113	1032	1238	1066	654	1303	1188	1113	1063	1046	1080	1447	1534	1115	1110	1188	1361	1440	1258	954	693	430	692	605
				Norway	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0
				Panama	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Russian Federation	0	574	1441	461	16	79	316	259	52	368	1042	2293	848	125	416	308	850	666	573	617	1281	908	6969	732	2032
				S Tomé e Príncipe	0	0	0	0	0	0	0	0	0	145	147	149	153	158	162	267	207	211	2	0	0	0	0	0	
				Senegal	286	545	621	195	183	484	2304	1020	1380	4029	1677	2876	1453	514	1217	1711	1581	1226	1696	3982	1380	2915	2975	2460	6573
				Sierra Leone	11	245	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				St Vincent and Grenadines	0	0	0	15	18	0	16	23	27	15	6	20	0	0	0	0	0	0	0	0	0	0	0	0	0
				Trinidad and Tobago	117	56	452	188	280	81	7	16	38	68	68	14	9	16	16	0	16	16	16	16	16	16	16	16	10
				UK-British Virgin Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	2	1
				UK-Turks and Caicos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				USA	142	120	139	44	70	68	40	97	47	50	47	189	94	73	101	96	61	62	197	107	140	66	176	168	123
				Venezuela	2	0	61	13	0	16	18	19	12	38	10	21	7	4	9	0	0	0	0	0	0	0	0	0	0
			NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0	18	29	40	20	12	0	0	0	0	0	0	0
			NCO	Argentina	19	235	1	129	269	110	0	0	0	220	59	6	33	0	0	0	0	0	0	0	0	0	0	0	
				Dominica	0	0	0	0	0	6	16	16	9	4	0	0	0	0	1	2	7	1	0	2	6	0	0	0	
				Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	1	0	0	0	
				Sta Lucia	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Togo	0	0	0	0	1583	1215	2298	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Ukraine	399	231	656	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		MED	CP	Algerie	405	350	597	0	609	575	684	910	1042	976	1009	355	353	614	504	716	452	593	811	302	369	485	1216	841	825
				EU-Bulgaria	35	35	35	0	0	0	0	0	0	0	16	8	96	6	5	8	68	13	23	4	32	1	45	1	44
				EU-Croatia	0	0	0	0	0	0	0	0	0	0	59	41	31	56	56	34	20	22	28	42	31	24	13	22	19
				EU-Cyprus	14	0	10	10	6	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				EU-España	342	349	461	544	272	215	429	531	458	247	518	574	442	881	585	519	358	314	321	483	330	253	1967	317	129
				EU-France	0	0	27	0	0	0	0	15	34	20	23	13	12	30	25	103	60	217	52	86	57	45	51	60	52
				EU-Greece	1914	1550	1420	1538	1321	1390	845	1123	587	476	531	798	733	960	678	691	700	399	641	422	342	269	659	213	399
				EU-Italy	4159	4159	4579	2091	2009	1356	552	610	1323	1131	964	1197	472	1245	1053	750	697	540	605	616	570	499	480	456	478
				EU-Malta	1	0	1	0	1	1	11	7	7	3	6	1	3	2	0	2	3	0	2	1	1	0	2	0	0
				Egypt	1442	1128	1128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Libya	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	705	780	82	75	71	65	45	35	100	85
				Maroc	115	5	61	85	78	38	89	87	142	131	57	12	1	0	8	26	50	46	28	60	8	13	11	2	21
				Tunisie	1528	1183	1112	848	1251	0	0	0	0	0	0	1425	1415	1413	1407	867	1290	1993	1986	2079	2612	2498	1832	3350	2012
				Türkiye	12000	13460	6286	6000	5701	70797	29690	5965	6448	7036	9401	10019	35764	13158	19032	4573	39460	7578	30920	1578	22743	2595	49892	2083	49278
			NCO	Serbia & Montenegro	17	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Discards	ATL	CP	EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
				EU-Netherlands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	3
				Gabon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	
				UK-British Virgin Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		MED	CP	EU-Croatia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

BOP	TOTAL				1207	1012	923	736	581	217	32	1047	533	449	287	377	681	662	952	2239	805	560	126	171	105	220	146	246	311
		ATL			1062	858	786	713	573	215	32	875	426	442	273	335	657	641	939	1161	743	522	104	119	63	193	99	107	115
		MED			145	154	137	23	8	2	0	172	107	6	14	42	24	21	13	1078	62	38	22	52	43	27	47	138	196
	Landings	ATL		All gears	1062	858	786	713	573	215	32	875	426	442	273	335	657	641	939	1161	743	522	104	119	63	193	99	107	115
		MED			145	154	137	23	8	2	0	172	107	6	14	42	24	21	13	1078	62	38	22	52	43	27	47	138	196
		ATL	CP	EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				EU-Portugal	0	0	0	0	0	5	3	1	2	11	21	7	1	2	0	0	0	0	0	1	1	1	0	1	1
				Maroc	1048	830	780	706	503	132	0	634	391	273	199	213	642	555	867	1113	665	450	38	53	62	169	91	91	100
				Senegal	14	28	6	7	70	78	29	240	33	158	53	115	14	84	72	48	78	72	66	66	0	23	8	15	14
		MED		Algerie	135	145	128	0	0	0	0	0	0	0	0	9	7	3	3	2	2	1	0	1	0	0	4	5	11
				EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				EU-Portugal	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Maroc	10	9	9	20	7	1	0	172	107	6	14	30	15	16	8	8	33	3	8	6	35	11	1	0	100
				Tunisie	0	0	0	3	1	0	0	0	0	0	0	2	2	2	2	1068	27	33	14	45	7	17	43	133	86
BRS	TOTAL	ATL			4785	4553	7750	5137	3410	3712	3587	2253	3305	2681	1590	1055	613	853	1103	584	1221	1124	1106	1292	817	722	998	1087	933
	Landings			All gears	4785	4553	7750	5137	3410	3712	3587	2253	3305	2681	1590	1055	613	853	1103	584	1221	1124	1106	1292	817	722	998	1087	933
			CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	1
				Brazil	988	251	3071	2881	814	471	1432	563	1521	1042	0	3	0	6	2	1	1	1	1	135	0	0	3	5	2
				EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Grenada	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Trinidad and Tobago	1722	2207	2472	1867	2103	2720	1778	1414	1472	1498	1498	936	489	695	695	0	695	695	695	695	695	695	695	695	463
				Venezuela	1766	1766	1766	0	0	0	0	0	0	0	0	0	0	0	406	195	98	92	97	174	44	15	4	77	191
			NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	29	29	0	0	0	0	0	0	0
				Guyana	308	329	441	389	494	521	377	277	312	141	92	116	124	151	0	387	399	308	313	0	0	0	0	0	
				Suriname	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	288	78	12	293	310	276
CER	TOTAL				4	6	1	2	1	1	1	0	0	0	0	2	0	0	1	1	0	1	1	1	0	0	0	0	0
	Landings			All gears	4	6	1	2	1	1	1	0	0	0	0	2	0	0	1	1	0	1	1	1	0	0	0	0	0
			CP	EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Grenada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				St Vincent and Grenadines	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
			NCO	Dominica	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
				Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Sta Lucia	3	5	1	2	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	
FRI	TOTAL				8680	10151	5742	6108	8832	6154	8429	9789	7861	12384	14215	15471	18287	17597	17149	17074	21814	15703	17755	18397	18119	20669	18543	15317	23809
	Landings			All gears	3054	4506	3893	3107	5086	2933	5918	6019	5296	8237	8633	10515	9735	11829	10941	11088	13263	10431	11410	12267	13235	16482	13972	11516	21304
	Landings(FP)				5627	5646	1849	3001	3746	3221	2511	3770	2565	4147	5582	4956	8552	5768	6208	5845	8551	5194	6285	6103	4881	4178	4557	3795	2451
	Discards				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	141	0	78	60	27	3	9	14	7	54
	Landings		CP	Angola	38	38	38	0	0	0	0	95	0	63	19	59	39	22	47	2	1	0	0	0	0	0	1	1	0
				Belize	115	87	0	0	0	0	0	0	0	0	0	0	0	0	36	266	824	586	552	655	585	144	87	281	319
				Brazil	106	98	1117	860	414	532	603	202	149	313	204	347	259	227	293	308	271	445	282	109	272	100	69	151	135
				Cabo Verde	81	171	278	264	344	300	318	378	574	1312	711	853	1811	2461	5418	3556	2324	1795	4988	2236	2282	3649	1276	1302	1163
				Curaçao	1134	1006	713	507	497	0	150	106	485	364	0	235	238	481	1456	1151	1124	1576	1414	750	1071	1263	249	163	0
				Côte d'Ivoire	1	821	2	31	1356	4	354	541	14	813	161	297	38	2837	261	141	311	81	2	89	178	105	2	38	48
				EU-España	17	722	438	635	34	166	73	278	631	1094	950	877	1708	1234	1200	1682	2537	1608	1033	1129	926	1275	1381	1310	827
				EU-France	91	128	95	160	168	47	6	98	24	24	91	147	249	233	147	247	410	773	715	637	296	319	726	319	173
				EU-Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8	8	0
				EU-Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169	528	0	0	3529	272	253	163	422	593
				EU-Netherlands	0	0	0	0	0	0	0	9	150	90	0	164	5	85	119	6	90	45	233	13	6	0	8	88	259
				EU-Portugal	9	28	5	4	7	212	3	250	13	0	0	0	0	0	0	1	2	3	1	3	0	1	1	1	1
				El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	0	960	0	0	0	283
				Gabon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	
				Gambia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2254	1957	2013
				Ghana	118	39	31	0	3	0	2577	2134	1496	2786	3604	2295	2469	2382	0	0	0	0	0	0	0	0	0	0	1959
				Great Britain	0	0	0	0	0	0	0	0	0	6	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0
				Grenada	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Guatemala	0	0	0	0	0	0	0	98	74	81	78	48	63	0	26	0	71	63	311	249	155	178	0	0	0
				Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	1	3	2	2	1	505	169
				Guinée Rep	0	0	0	0	0	0	0	0	0	0	96	94	332	503	236	0	0	0	0	0	0	0	0	0	0
				Liberia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	1	0	0	0
				Maroc	629	486	591	236	696	227	52	135	179	9	19	862	554	55	21	90	125	200	3	93	492	209	166	452	3307
				Mauritania	0	0	0	0	0	0	269	169	377	492	1420	1953	661	101	211	806	996	311	362	394	1025	1005	2223	1018	2528
				Panama	0	0	0	12	394	975	970	1349	411	439	425	339	463	504	905	292	1356	1572	707	743	941	849	0	0	176
				Russian Federation	12	25	308	56	56	63	6	6	12	113	270	912	113	217	139	249	545	389	430	305	753	153	115	136	152
				S Tomé e Príncipe	200	200	200	200	234	215	290	0	275	149	153	298	307	315	324	636	536	467	14	482	521	546	461	471	471
				Senegal	0	4	0	13	288	151	83	119	383	15	217	201	341	16	22	1407	1133	391	249	807	2498	6337	4774	2860	6728
				St Vincent and Grenadines	0	208	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Trinidad and Tobago	245	0	0	0	414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				UK-Bermuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0
				Venezuela	210	444	34	113	182	42	165	52	48	54	215	508	85	150	71	64	70	115	67	26	0	92	6	34	0
			NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0	5	7	14	8	11	0	0	0	0	0	0	0
			NCO	Sta Lucia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Ukraine	48	0	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Landings(FP)		CP	Belize	0	0	0	0	0	0	0	0	0	100	154	71	86	78	107	0	0	0	0	0	0	0	0	0	0
				Cabo Verde	0	0	0	0	0	144	84	200	189	188	428	130	271	256	268	745	537	164	238	183	191	0	0	0	0
				Curaçao	0	0	0	0	0	29	55	29	36	225	233	139	214	149	224	0	0	0	0	0	0	326	0	0	0
				Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	3	177	81	236	0	0	0	0	0	0	0	0	0	0
				EU-España	3385	3580	1074	1942	2450	1327	1423	2585	1685	2636	3117	3023	5770	2792	3289	1533	1753	1351	1069	1192	900	1154	1522	1097	1258
				EU-France	2242	2066	775	1059	1296	1138	644	612	222	684	1214	815	1183	1466	1486	855	1046	468	886	864	731	1301	1227	1052	1193
				El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	435	793	895	1113	1071	0	964	355	847	0
				Guatemala	0	0	0	0	0	142	75	69	99	53	105	25	150	42	65	0	0	0	0	0	0	131	804	449	0
				Guinée Rep	0	0	0	0	0	168	0	24	37	0	174	518	542	672	441	0	0	0	0	0	0	0	0	0	0
				Panama	0	0	0	0	0	274	230	251	297	261	157	230	158	234	92	0	0	0	0	0	0	303	648	349	0
			NCO	Mixed flags (EU tropical)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2277	4422	2317	2979	2793	3060	0	0	0	
	Discards		CP	EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	141	0	78	60	26	3	9	13	6	54
				EU-Netherlands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
				Gabon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	

KGM	TOTAL				16342	15408	17258	15863	12830	11766	8252	17936	7344	7826	11697	10452	10151	9712	11698	10187	11076	11386	11893	10086	14783	8889	8773	17730	6432
	Landings			All gears	16342	15408	17258	15863	12830	11766	8252	17936	7344	7826	11697	10452	10151	9712	11698	10187	11076	11386	11893	10086	14783	8889	8773	17730	6432
	Discards				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Landings		CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	0	139	914	0	0	0	0	0	0	3	2	10157	4
				Brazil	2344	1251	2316	3311	247	202	316	33	0	0	1	1	0	0	0	0	0	0	0	190	305	550	56	38	109
				Grenada	9	4	5	0	0	0	0	0	0	0	0	0	0	0	0	13	4	5	4	18	11	2	1	3	2
				Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8	0	0	0	0	0	0
				Mexico	3688	4200	4453	4369	4564	3447	4201	3526	3113	3186	3040	3130	3090	3335	3019	3281	3130	3233	3825	3231	2505	1821	1003	1776	1533
				Namibia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	30	20
				St Vincent and Grenadines	137	0	0	0	0	0	67	0	0	7	9	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				Trinidad and Tobago	432	410	1457	802	578	747	661	567	1043	1001	1001	720	393	495	496	1	494	494	494	494	494	494	494	495	329
				UK-Bermuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				UK-British Virgin Islands	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	4	1	2
				USA	6780	6603	6061	6991	7129	7123	2837	13482	3013	3541	7584	6523	6573	5641	6607	6257	6891	7325	7368	5910	10809	5618	6812	4990	4232
				Venezuela	2424	2424	2424	0	0	0	0	0	0	0	0	0	0	0	659	274	238	129	48	28	123	99	39	81	63
			NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	4	2	2	2	4	5	0	1	0	1	0	0	0
				Guyana	214	239	267	390	312	245	168	326	174	91	59	75	90	99	0	358	314	192	143	1	0	0	0	0	
				Suriname	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	212	534	301	330	158	137
			NCO	Dominica	35	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Dominican Republic	226	226	226	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Jamaica	44	48	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
				Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
				Sta Lucia	9	1	1	0	1	1	1	2	0	1	3	4	1	1	0	0	0	0	0	0	0	0	1	1	
	Discards		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LTA	TOTAL				15319	16943	16723	17013	16357	11915	10128	18384	14213	17127	23080	25347	20865	21643	14224	24030	28885	29485	27020	25536	22340	18682	26842	24499	30173
		ATL			11830	13955	14080	16329	14918	10873	8320	16472	11954	14170	20910	21679	16679	17011	10619	17456	19097	14338	19134	15793	14994	13388	17731	14431	21438
		MED			3489	2988	2643	684	1439	1042	1808	1911	2259	2957	2170	3668	4186	4633	3605	6574	9788	15147	7886	9743	7346	5293	9111	10068	8735
	Landings	ATL		All gears	10258	11566	13476	14963	13352	10172	7417	13962	10137	12137	17433	17511	13060	13260	7968	10965	12248	10753	15804	11984	12026	11506	16115	12278	20389
		MED			3489	2988	2643	684	1439	1042	1808	1911	2259	2957	2170	3668	4186	4633	3605	6574	9788	15147	7886	9743	7346	5293	9110	10067	8733
	Landings(FP)	ATL			1571	2389	604	1366	1566	702	903	2510	1817	2033	3477	4168	3619	3751	2651	6287	6849	3478	3266	3740	2967	1848	1608	2139	971
	Discards				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	204	0	107	64	69	1	35	8	15	77
		MED			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
	Landings	ATL	CP	Angola	132	132	132	0	0	2	0	4365	0	128	1759	3455	1905	1085	10	6	1	4	3	0	6	6	0	0	6
				Belize	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1436
				Brazil	615	615	615	0	320	280	0	0	0	0	0	22	581	0	0	0	0	0	34	0	113	38	1047	398	519
				Cabo Verde	491	178	262	143	137	81	123	292	250	357	185	102	131	131	131	131	218	113	105	59	82	135	51	23	135
				Curaçao	0	0	5	9	0	0	0	0	0	0	38	38	76	57	0	0	0	0	0	4	2	105	20	5	0
				Côte d'Ivoire	123	1	0	0	153	287	427	2159	1791	1446	1631	50	1062	1433	152	102	111	1881	7583	2441	1815	1917	1293	742	1479
				EU-España	2	22	8	1	489	50	16	0	38	35	136	168	71	52	112	381	477	185	148	89	10	11	255	330	329
				EU-France	631	610	613	14	10	27	12	0	1	50	35	5	30	27	6	36	73	359	268	263	156	492	962	471	324
				EU-Lithuania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				EU-Netherlands	0	0	0	0	0	0	0	14	69	8	0	18	1	9	0	0	0	0	0	0	0	0	0	0	0
				EU-Portugal	50	0	2	16	19	21	24	43	10	6	5	14	4	18	0	0	7	32	35	43	3	6	23	43	10
				El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	191
				Gabon	301	213	57	173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Ghana	707	730	4768	8541	7060	5738	783	1335	745	1692	1465	1001	1274	1138	0	0	0	0	0	0	0	0	0	0	85
				Great Britain	0	0	0	0	0	0	0	0	0	7	15	23	38	0	0	0	0	0	0	0	0	0	0	0	0
				Grenada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
				Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120	15	45	88	38	50	0	0	0
				Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	10	11	10	11	1	1	4
				Guinée Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	631	907	1416
				Liberia	0	0	0	0	0	0	0	0	0	0	0	673	256	176	101	78	151	212	2	70	1	19	0	43	14
				Maroc	101	87	308	76	91	33	0	40	2	63	5	57	10	11	3	0	11	12	0	0	0	0	0	0	0
				Mauritania	0	0	0	0	0	0	670	423	943	1222	3549	4878	1634	252	529	1287	2478	774	901	984	2558	2462	5548	2479	6241
				Panama	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10	0	0	130
				Russian Federation	0	0	74	13	0	0	0	0	0	0	268	11	208	399	255	136	547	433	698	478	1742	304	232	145	187
				S Tomé e Príncipe	33	33	33	33	178	182	179	0	183	188	193	198	203	209	214	182	122	249	11	87	6	71	35	37	37
				Senegal	3546	5176	2866	4394	3508	2699	3826	3885	5108	5683	6371	4910	2769	5912	3774	5065	4855	3841	3672	4757	3100	3718	791	3670	5542
				South Africa	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				St Vincent and Grenadines	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	27	33	0	0	0	5
				Trinidad and Tobago	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				UK-Bermuda	2	1	5	4	5	7	5	5	4	3	4	5	6	3	3	4	2	1	1	2	3	5	1	3	3
				UK-Sta Helena	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				USA	1209	1451	1366	1492	1382	765	1351	1401	963	1245	1772	1875	2797	2333	2661	3537	3019	2577	2286	2580	2346	2146	5225	2982	2296
				Venezuela	2247	2247	2254	50	0	0	0	0	30	4	2	8	4	1	4	0	0	0	0	0	0	0	0	0	0
			NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12	16	54	48	0	0	0	0	0	0	0
			NCO	Benin	69	69	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Dominica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	
				NEI (ETRO)	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Sta Lucia	0	1	10	1	0	0	1	0	0	0	0	0	0	1	0	2	0	1	0	1	0	0	0	0	
		MED	CP	Algerie	494	407	148	0	158	116	187	96	142	119	131	98	6	157	341	204	268	444	298	242	233	195	792	312	372
				EU-Croatia	0	0	0	0	0	0	0	0	0	0	8	28	25	44	37	43	31	19	42	34	31	31	49	72	44
				EU-Cyprus	19	19	19	0	0	0	0	6	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				EU-España	8	82	32	0	41	262	116	202	212	86	299	488	441	235	300	456	384	486	289	640	493	413	578	456	520
				EU-France	0	0	0	0	0	0	0	0	0	0	1	42	0	0	0	1	0	0	0	4	7	9	12	20	13
				EU-Greece	195	125	132	0	0	112	69	72	183	148	165	301	276	363	289	271	501	299	489	635	955	408	644	554	511
				EU-Italy	0	0	16	24	38	34	203	224	486	1100	365	304	669	557	442	0	992	930	1032	1513	1204	803	767	1027	812
				EU-Malta	0	0	1	1	1	1	3	2	5	3	7	5	21	9	4	7	1	6	6	7	3	2	6	5	3
				Egypt	0	0	0	0	0	0	0	0	0	0	0	0	0	849	712	0	0	0	1003	0	0	0	0	0	1121
				Libya	5	4	4	0	0	0	0	0	0	0	0	0	0	0	0	102	1100	48	80	65	55	30	25	280	240
				Maroc	0	0	3	1	0	9	0	331	19	24	1	0	0	0	0	0	3	0	0	0	0	0	0	0	0
				Syria	370	370	330	0	0	0	0	193	133	163	148	155	304	230	0	0	0	0	0	0	0	0	0	0	0
				Tunisie	1453	1036	960	657	633	0	0	0	0	0	0	810	800	803	798	5165	6323	12434	4032	6152	4024	2940	5827	6551	4267
				Türkiye	750	750	750	0	568	507	1230	785	1074	1309	1046	1437	1645	1386	682	326	184	480	617	450	341	463	410	789	831
			NCO	Israel	119	119	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Palestine	60	60	129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Serbia & Montenegro	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Landings(FP)	ATL	CP	Belize	0	0	0	0	0	0	0	0	0	18	223	51	238	144	133	0	0	0	0	0	0	0	0	0	0
				Cabo Verde	0	0	0	0	0	45	76	265	214	189	262	266	179	438	178	850	458	128	146	132	109	0	0	0	0
				Curaçao	0	0	0	0	0	0	39	42	50	160	185	167	209	284	284	0	0	0	0	0	0	426	0	0	0
				Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	3	162	56	12	0	0	0	0	0	0	0	0	0	0
				EU-España	751	1197	209	656	508	206	213	1253	944	1181	1320	2067	1105	732	1182	1968	1885	1244	781	1102	831	329	752	560	547
				EU-France	821	1192	396	710	1058	367	205	262	122	241	901	1061	675	693	565	870	732	296	470	493	273	510	399	365	424
				El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	0	0	15	45	340	0
				Guatemala	0	0	0	0	0	35	178	92	118	17	121	43	126	145	64	0	0	0	0	0	0	171	213	489	0
				Guinée Rep	0	0	0	0	0	15	0	21	2	0	358	260	666	1186	202	0	0	0	0	0	0	0	0	0	0
				Panama	0	0	0	0	0	35	191	577	368	228	106	250	259	72	30	0	0	0	0	0	0	396	200	385	0
			NCO	Mixed flags (EU tropical)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2598	3774	1810	1825	2013	1753	0	0	0	
	Discards		CP	EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	204	0	107	64	69	1	35	8	15	77
				EU-Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		MED	CP	EU-Croatia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
				EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MAW	TOTAL	ATL		1321	881	1393	646	352	480	571	847	616	684	2384	1333	1128	3016	1460	1243	1489	1286	7066	1810	839	2823	1710	4523	5422
	Landings		All gears	1321	881	1393	646	352	480	571	847	616	684	2384	1333	1128	3016	1460	1243	1489	1286	7066	1804	839	2823	1710	4523	5422
	Discards			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	**0**
	Landings	CP	Angola	0	0	0	0	0	0	0	0	0	86	1650	249	221	1247	0	3	1	2	1	0	1	2	0	3	1
			Côte d'Ivoire	0	0	0	0	2	0	66	0	0	1	0	0	0	90	35	47	76	122	5827	601	305	392	312	186	639
			EU-Ireland	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-Lithuania	0	0	298	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-Netherlands	0	0	0	0	0	0	0	0	1	1	0	10	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Gabon	102	53	48	82	67	37	87	93	17	22	30	34	46	42	13	37	21	56	87	137	42	195	191	384	257
			Gambia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	724	789	810
			Mauritania	0	0	0	0	0	0	207	319	176	203	275	193	152	110	434	493	524	164	191	79	206	2042	381	2693	3308
			Russian Federation	0	0	0	15	0	0	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	**0**
			S Tomé e Príncipe	6	6	6	6	21	12	13	0	91	93	96	98	100	102	105	13	11	72	0	26	107	38	34	35	35
			Senegal	987	617	794	532	262	431	196	435	329	278	331	749	610	1426	870	649	856	870	961	961	178	154	68	434	372
		NCO	Benin	205	205	205	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Ukraine	21	0	42	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Discards	CP	Gabon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	
SSM	TOTAL			8220	8383	9414	9793	8119	10472	6308	6118	5900	6199	11788	10916	10156	12684	7798	7741	8669	8332	4332	12654	16691	11763	11530	9573	7990
	Landings		All gears	8220	8383	9414	9793	8119	10472	6308	6118	5900	6199	11788	10916	10156	12684	7798	7741	8669	8332	4332	12654	16691	11763	11530	9573	7990
		CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	**0**
			Belize	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	**0**
			EU-France	0	0	0	0	0	0	0	0	0	0	0	11	3	14	18	11	16	6	4	0	0	0	0	0	**0**
			EU-Portugal	0	0	0	0	0	1	26	16	0	2	20	7	2	0	0	0	1	0	0	0	0	0	0	0	**0**
			Gabon	0	0	265	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Grenada	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	1	0
			Mexico	4168	3701	4350	5242	3641	5723	3856	3955	4155	4251	4128	4026	3321	3581	3857	4077	3820	3701	4321	3870	2968	2157	1535	2220	1971
			UK-British Virgin Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			USA	3893	4524	4613	4552	4477	4747	2425	2147	1746	1946	7639	6871	6829	9089	3922	3652	4825	4611	6	8778	13722	9605	9994	7350	6019
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	5	11	0	0	0	0	0	0	**0**
		NCO	Dominica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Dominican Republic	158	158	158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	
			Saint Kitts and Nevis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Sta Lucia	0	1	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

WAH	TOTAL				2035	2318	2226	2067	2613	2467	1829	2581	2176	2354	2381	2844	3729	5235	3526	2554	17320	6881	6482	4894	8542	3220	4393	4075	6017
	Landings			All gears	2035	2318	2226	2067	2613	2110	1650	2296	1604	1883	2111	2367	3541	5128	3440	2548	17320	6866	6467	4887	8541	3219	4390	4071	6009
	Landings(FP)				0	0	0	0	0	357	179	285	572	471	269	477	85	0	0	0	0	0	0	0	0	0	0	0	
	Discards				0	0	0	0	0	0	0	0	0	0	0	0	104	108	86	6	0	14	15	6	2	1	2	4	8
	Landings		CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	**0**
				Barbados	41	0	0	34	45	26	41	36	27	17	30	29	22	21	17	10	11	10	7	9	7	5	11	12	16
				Belize	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	29	27	34	23	33	59	81
				Brazil	0	0	0	405	519	449	111	75	76	70	19	357	213	477	153	312	404	322	150	23	57	21	30	75	239
				Cabo Verde	487	578	500	343	458	449	555	524	351	472	470	470	445	445	445	445	490	228	298	293	196	151	117	44	173
				Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Costa Rica	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	5	4	2	3	1	1	0	2	1
				Curaçao	230	230	230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Côte d'Ivoire	0	0	0	0	16	3	1	11	0	5	5	12	9	95	1	25	1	1	1	61	62	19	0	32	26
				EU-España	32	38	46	48	305	237	110	66	38	73	53	87	35	50	41	50	59	51	79	61	53	45	54	97	69
				EU-France	0	0	0	0	0	0	0	0	0	1	0	4	0	0	46	45	38	159	61	79	58	61	51	107	49
				EU-Portugal	0	0	0	0	1	0	3	0	4	3	9	8	10	2	0	0	0	0	0	0	3	0	0	3	3
				El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Great Britain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Grenada	51	71	59	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	18	15	16	48	23
				Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	1	0	0	0	0	14	21	9	0	11	13	9	8	5	1	5
				Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	6	14	12	9	13	1376
				Liberia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**0**
				Maroc	0	0	0	0	0	0	0	0	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Mauritania	0	0	0	0	0	0	0	0	0	0	54	263	48	1591	46	122	13678	4271	4975	2707	7035	2026	603	2039	2698
				Mexico	0	0	0	0	35	0	0	0	0	0	0	0	0	0	16	12	18	15	12	14	15	11	9	14	7
				Panama	0	0	0	0	0	0	91	240	120	86	111	99	210	373	228	0	109	0	77	123	111	50	107	122	65
				S Tomé e Príncipe	52	52	52	52	94	88	76	0	131	235	241	247	254	260	266	100	70	172	1	157	8	102	60	61	61
				Senegal	0	0	0	5	0	1	1	0	0	2	6	0	11	24	0	3	7	0	0	0	0	23	89	55	1
				South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				St Vincent and Grenadines	46	311	17	40	60	0	241	29	24	31	40	31	5	32	24	9	11	126	82	27	30	0	16	5	19
				Trinidad and Tobago	2	1	9	7	6	6	7	6	6	5	5	7	9	9	9	9	10	8	7	6	6	5	7	8	5
				UK-Bermuda	61	56	91	87	88	83	86	124	117	101	81	100	88	75	76	86	95	92	68	82	60	67	76	68	52
				UK-British Virgin Islands	0	0	0	0	0	0	3	0	0	0	0	1	0	4	1	1	0	0	0	0	0	1	3	0	1
				UK-Sta Helena	15	22	25	18	17	11	20	13	18	29	19	31	12	16	16	10	15	16	9	5	5	6	5	13	9
				UK-Turks and Caicos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				USA	640	633	846	789	712	558	89	1123	495	522	653	584	999	460	1027	1153	2060	1204	530	974	633	455	2959	1037	793
				Venezuela	4	17	13	9	7	16	13	33	9	25	28	23	38	32	27	30	64	51	45	46	40	31	56	85	90
			NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	1132	1012	810	0	0	0	0	0	0	0	0	0	**0**
				Guyana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
				Suriname	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	47
			NCO	Aruba	50	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Dominica	46	11	37	10	6	8	15	14	16	10	13	13	0	0	20	10	10	6	3	10	5	0	0	0	31
				Dominican Republic	35	35	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Jamaica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Saint Kitts and Nevis	0	0	0	7	6	7	0	0	0	0	0	0	0	0	0	6	9	14	13	0	9	0	0	0	
				Sta Lucia	243	213	217	169	238	169	187	0	171	195	199	0	0	148	156	87	147	110	0	127	70	77	71	58	69
	Landings(FP)		CP	Belize	0	0	0	0	0	0	0	0	0	0	2	40	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Cabo Verde	0	0	0	0	0	92	9	55	60	22	29	25	4	0	0	0	0	0	0	0	0	0	0	0	**0**
				Curaçao	0	0	0	0	0	0	13	7	31	57	23	78	9	0	0	0	0	0	0	0	0	0	0	0	**0**
				Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				EU-España	0	0	0	0	0	92	63	44	224	262	136	240	56	0	0	0	0	0	0	0	0	0	0	0	**0**
				EU-France	0	0	0	0	0	28	10	3	16	26	26	17	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Guatemala	0	0	0	0	0	68	11	21	28	7	0	8	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Guinée Rep	0	0	0	0	0	10	0	8	15	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Panama	0	0	0	0	0	39	44	104	102	65	13	66	15	0	0	0	0	0	0	0	0	0	0	0	**0**
			NCO	Mixed flags (EU tropical)	0	0	0	0	0	28	30	44	97	26	39	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Discards		CP	EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	14	15	6	2	1	2	4	0
				Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	7
				Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				UK-British Virgin Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	104	108	86	0	0	0	0	0	0	0	0	0	**0**
COM	TOTAL	MED			1007	1166	1941	1769	1634	1033	1101	1622	1861	1932	1670	987	645	540	752	828	1089	1183	1192	880	68	135	71	0	
	Landings			All gears	1007	1166	1941	1769	1634	1033	1101	1622	1861	1932	1670	987	645	540	752	828	1089	1183	1192	880	68	135	71	0	
			CP	Algerie	405	350	597	839	609	575	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
				Egypt	548	778	1301	903	986	426	1087	1564	1810	1689	1578	939	494	478	658	699	895	1019	1017	696	0	0	0	0	**0**
			NCO	Israel	0	0	0	0	0	0	0	0	0	89	47	39	134	42	42	42	45	42	42	42	0	0	0	0	
				Lebanon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	49	67	52	69	59	0	0	0	0	
				Palestine	54	38	43	27	39	32	14	58	51	154	45	9	17	20	43	38	82	70	64	83	68	135	71	0	

Outlook

The standard fisheries indicators used to provide management advice to the Commission are not available for the small-tuna stocks/species due to the lack of required information to apply currently stock assessment frameworks adopted by SCRS. Please see the additional supporting information for the information available on the scientific literature on the status of some of the species/stocks under the Small Tunas Species Group.

Management recommendation

The provision of robust management advice by the SCRS relies on accurate reporting of Task 1 and 2 data and life history parameters. However, due to the nature of small tuna fisheries (i.e., multi-gear, multi-species, artisanal fisheries, etc.), information on fisheries data is difficult to collect, therefore proper monitoring programs should be implemented by CPCs. Although the Committee has started actions aiming at applying a range of data-limited stock assessment models, their robustness still needs to be evaluated before they can be used to provide management advice to the Commission. Moreover, although the Committee recognize that the use of data-limited models are important for small tunas as the first step for stock assessment, given the relevance of the catches of some of species and their economic importance for coastal States, more robust methods, such as those used for data rich species, should be applied in a near future, as more complete data become available.

Additional supporting information

Available informaton on the status of the stocks

In 2017, a Productivity and Susceptibility Analysis (PSA) was carried out for the small tuna caught by longline and purse seine fisheries in the Atlantic. Results showing that the top three stocks at risk in the Atlantic Ocean that should deserve most of the managers' attention were *E. alleteratus*, *A. solandri* and *S. cavalla*.

In 2018, preliminary results on the implementation of data-limited approaches for small tunas using simulation testing were provided and improved in 2019, when different approaches for the stock assessment of Atlantic and Mediterranean small tunas were carried out. Catch-based assessment models (Depletion based stock reduction analysis – DBSRA – and Simple stock synthesis – SSS) and Length based models (Length-based spawning potential ratio – LBSPR and Length-based integrated mixed effects model – LIME) were applied for 10 and six stocks, respectively. Also, the integrated assessment LIME, which used catch and length data, was applied for six small tuna stocks. Only LTA in the Southeast and WAH in the North West would show signs of overfishing for most of the models applied, deserving special attention in the future (**Table 3**).

Table 3. Summary of the current state of knowledge on the current stock status for small tunas in the Atlantic Ocean and the Mediterranean. Results taken from Pons *et al.*, 2019a. Red indicates values below reference levels (overfished) and green above reference values (not overfished).

	Data limited assessments						
	Last year assessed	*Length based*			*Catch based*		*Catch+Length*
		LBSPR	*LIME*	*LBSPR*	*DBSRA*	*SSS*	*LIME*
		Pons *et al.* (2019a)		Baibbat *et al.* (2019)	Pons *et al.* (2019b)		
		SPR	SPR		B/B_{MSY}	B/B_{MSY}	B/B_{MSY}
LTA_SE	2014-2016	0.13	0.27	--	0.69	0.94	1.83
BON_NE	2014-2016	0.23	0.71	0.34	1.63	1.98	2.02
WAH_NW	2014-2016	0.37	0.29	--	1.02	1.34	0.86
WAH_NE	2014-2016	0.55	0.38	--	--	--	--
BON_Med	2014-2016	0.59	0.22	--	--	--	--
LTA_Med	2014-2016	0.66	0.62	--	1.88	2.33	1.08
LTA_NW	2014-2016	0.66	0.48	--	--	--	--
FRI_SE	2014-2016	0.79	0.53	--	1.79	2.65	1.10
FRI_NE	2014-2016	0.83	0.46	--	1.64	2.50	1.29
LTA_NE	2014-2016	0.90	1.00	--	--	--	--

A data-limited MSE was also performed as preliminary exercise for Northwest WAH. The MSE pointed out that MPs based on catch-based methods are the most acceptable with respect a variety of performance metrics, while simulations for the length-based and fishing effort control methods did not present as satisfactory results (**Table 4**). The results from this initial exercise must be interpreted with caution because of considerable uncertainty in the parametrization of the operating model, which might strongly influence the performance of MPs.

Table 4. Summary of the Northwest Atlantic wahoo MSE results for selected MPs using the DLMtool package (Mourato *et al.*, 2019). Colour cells coding is used to denote if the particular MP falls within acceptable performance metric indicators (green – acceptable and red – not satisfied). Probability of not overfishing (**PNOF**; $F<F_{MSY}$); probability of spawning biomass being higher than half of spawning biomass at maximum sustainable yield (**P50**; $SB>0.5\ SB_{MSY}$); probability of spawning biomass being higher than spawning biomass at maximum sustainable yield (**P100**; $SB>SB_{MSY}$); probability of average annual variability in yield being lower than 20% (**AAVY**; Prob. AAVY < 20%); probability of average yield being higher than half of reference yield (**LTY**; Prob. Yield > 0.5 Ref. yield). Acceptable management procedures were defined as those that supported **PNOF**>70%, **P50**>90%, **P100**>70%, **AAVY**>50% and **LTY**>50%.

Management Procedures	PNOF	P50	P100	AAVY	LTY
Length-based methods					
LBSPR	0.74	0.93	0.65	0.120	0.86
minlenLopt1	0.75	0.95	0.72	0.110	0.83
matlenlim	0.75	0.96	0.74	0.095	0.81
Catch-based methods					
AvC	0.70	0.95	0.76	0.630	0.78
CC1	0.71	0.95	0.76	0.640	0.76
SPMSY	0.81	0.98	0.86	0.110	0.43
DBSRA	0.61	0.98	0.81	0.450	0.74
Fishing effort control methods					
curE	0.75	0.93	0.66	0.130	0.85
curE75	0.87	0.97	0.78	0.150	0.80

13.14 BSH-Blue shark (Prionace glauca)

Introduction

A stock assessment for blue shark was conducted for both Atlantic stocks in 2023 using data through 2021 and applying two modeling approaches: Just Another Bayesian Biomass Assessment (JABBA), and integrated statistical assessment model (Stock Synthesis, SS3). The complete description of the stock assessment process and the development of management advice can be found in the 2023 Report of the Data Preparatory Meeting (Anon., 2023c) and the 2023 Report of the Stock Assessment Meeting (Anon. 2023d). A summary of both stock statuses is provided below (**Tables 1a** and **b**). **Table 2** provides estimated catches, by landings and discards by gear, for the period 2000-2024. The Kobe Phase Plot and uncertainty of current status estimates is summarized in **Figure 1**. **Table 3** provides estimated probabilities (%) that both the fishing mortality will be below F_{MSY} and spawning stock biomass will be above SSB_{MSY} in future years under different constant catch scenarios.

Table 1a. North Atlantic blue shark summary table.

Indicator		*Stock Status*
Maximum Sustainable Yield (MSY)[1]	32,689 t (30,403 t - 36,465 t)	2021
TAC (2024)	30,000 t	
Current (2024) Yield[2]	24,564 t	
Relative Biomass (B_{2021}/B_{MSY})[3]	1.00 (0.75 - 1.31)	
Relative Fishing Mortality (F_{2021}/F_{MSY})[3]	0.70 (0.50 - 0.93)	
Stock Status	Overfished: NO (50.1% probability of being overfished)[4,5] Overfishing: NO (0.7% probability of overfishing)[4]	
Management measures in effect	Rec. 23-10, Rec. 04-10, Rec. 07-06	

[1] Geometric mean of both models, SS3 and JABBA, with a 95% confidence interval.
[2] Task 1catch as of 26 September 2025.
[3] Combined results from both models, SS3 and JABBA. Median with a 95% confidence interval in brackets.
[4] As estimated from the Kobe plot probability in each quadrant.
[5] Based on the median point of the estimates.

Table 1b. South Atlantic blue shark summary table.

Indicator		*Stock Status*
Maximum Sustainable Yield (MSY)[1]	27,711 t (23,128 t - 47,758 t)	2021
TAC (2024)	27,711 t	
Current (2024) Yield[2]	25,003 t	
Relative Biomass (B_{2021}/B_{MSY})[3]	1.29 (0.89 - 1.81)	
Relative Fishing Mortality (F_{2021}/F_{MSY})[3]	1.03 (0.45 - 1.55)	
Stock Status	Overfished: NO (8.78% probability of being overfished)[4] Overfishing: YES (54.52% probability of overfishing)[4]	
Management measures in effect	Rec. 23-11, Rec. 04-10, Rec. 07-06	

[1] Geometric mean of both models, SS3 and JABBA, with a 95% confidence interval.
[2] Task 1 catch as of 26 September 2025.
[3] Combined results from both models, SS3 and JABBA. Median with a 95% confidence interval in brackets.
[4] As estimated from the Kobe plot probability in each quadrant.

Table 2. Provides estimated catches, by landings and discards by gear, for the period 2000-2024.

				2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL				40655	35243	34329	38161	37500	43778	45474	50607	54481	59146	66986	76230	65375	58585	64792	63355	70240	68663	68551	65784	54746	55099	53519	54608	49632
	ATN			28161	21151	20458	23184	22054	22660	23517	27070	30882	35354	38929	40292	38912	37813	38132	40191	44086	40005	33979	27213	20963	21650	21846	23985	24564
	ATS			12448	14044	13854	14966	15320	21046	21768	23487	23518	23607	27799	35898	26421	20672	26253	22498	25417	28555	34514	38508	33709	33391	31637	30576	25003
	MED			45	47	17	11	125	72	189	50	81	185	259	40	42	100	408	665	737	103	58	64	73	59	36	47	65
Landings	ATN		Longline	27573	20856	19644	22926	21780	22385	23278	26811	30518	35035	38644	39983	38725	37604	37886	39335	42875	38831	32779	25994	19566	20180	20503	22684	23283
			Other surf.	475	189	746	204	210	209	194	205	235	216	117	102	67	100	118	732	1123	1036	1087	1025	986	1087	673	727	604
	ATS		Longline	12448	14043	13849	14960	15320	21043	21762	23417	23503	23601	27785	35427	25878	20387	24308	21736	24643	27662	33561	37610	32630	32682	30039	29061	23595
			Other surf.	0	1	4	6	0.1	3	6	10	0.3	6	14	468	411	152	1831	635	634	668	854	558	603	495	1329	1176	592
	MED		Longline	45	47	17	11	77	72	142	48	81	18	176	40	42	68	341	664	735	90	54	51	71	53	34	40	52
			Other surf.	0	0	0	0	48	0	47	2	0.4	167	83	0.1	0.0	32	67	1	2	13	4	13	3	6	1	1	1
Discards	ATN		Longline	113	105	68	55	63	66	45	53	129	102	167	205	119	109	128	124	88	138	112	193	411	383	669	572	675
			Other surf.	0	0.4	0.1	0.0	1	0.1	0.0	0.3	1	1	1	2	1	0	0	0.1	0.3	0.3	0.2	0.2	0	0	1	2	1
	ATS		Longline	0	0	0	0	0	0	0	60	14	0	0	4	132	132	114	122	139	218	99	340	477	213	268	340	816
			Other surf.	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	7	0.0	0.3	0	0.1	0.2	0.1	0.1
	MED		Longline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0.1	6	13
			Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0
Landings	ATN	CP	Barbados	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	6	7	4	2	2	2	3	2	5
			Belize	0	0	0	0	0	0	0	0	0	114	461	1039	903	1216	392	4	6	201	317	369	301	349	311	567	482
			Brazil	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
			Cabo Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	122	41
			Canada	624	581	836	346	965	1134	977	843	0.2	0.1	0.3	0.1	1	0.2	0.3	0.1	0.3	0.1	0.2	0.4	0.1	0.1	0	0.1	0
			China PR	0	185	104	148	146	132	142	367	109	88	53	109	98	327	178	1	27	2	6	18	65	2	13	9	9
			Costa Rica	0	0	0	0	0	0	0	0	0.4	1	3	6	14	8	5	3	2	0.5	0	0.1	0	0.2	0.1	1	2
			Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
			EU-Denmark	2	1	13	5	1	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
			EU-España	24112	17362	15666	15975	17314	15006	15464	17038	20788	24465	26094	27988	28666	28562	29041	30078	29019	27316	21685	16314	12325	13125	13057	14896	14856
			EU-France	395	207	221	57	135	120	99	161	119	84	122	115	31	216	112	262	352	124	94	80	57	49	46	45	45
			EU-Ireland	31	66	11	2	0.1	0.3	0	0.3	0.2	0.0	0.5	1	3	2	1	0	0	0.4	0	0	0	0	0	0	0
			EU-Netherlands	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			EU-Portugal	2081	2110	2265	5643	2025	4027	4338	5283	6167	6252	8261	6509	3768	3694	3060	3859	7819	5664	5195	4507	3836	4300	4102	4026	4059
			FR-St Pierre et Miquelon	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.1	0	0	0	0	0	0	0	153	0	0
			Great Britain	12	9	6	4	6	5	3	6	6	96	8	10	8	10	10	12	17	11	6	3	3	4	5	4	6
			Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0
			Japan	273	350	386	558	1035	1729	1434	1921	2531	2007	1763	1227	2437	1808	3287	4011	4217	4444	4111	3740	2130	1608	1818	1947	2386
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	537	299	327	113	0	10	103	92	113	48	16	0	0	0
			Liberia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	10	3	8	0.1	2	1
			Maroc	0	0	0	0	0	0	0	0	0	0	661	975	1072	999	1389	873	1623	1475	1644	1524	1498	1636	1532	1644	1644
			Mauritania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	0	0	0	0	0	0	0	0
			Mexico	0.1	6	2	3	4	3	3	0.1	2	2	0.3	0.2	0.2	0.2	1	0.1	0.3	0.1	0	0	0	0	0	0	0
			Panama	0	0	0	0	0	0	254	892	613	1575	1026	1071	1224	289	153	555	262	324	437	242	162	84	111	64	0
			Russian Federation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0
			Senegal	0	0	456	0	0	0	0	43	134	255	56	148	5	12	17	13	17	19	15	14	14	14	0	0	0
			St Vincent and Grenadines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	119	0	0	0	2	0	0	0	0
			Trinidad and Tobago	12	19	6	3	2	1	1	0.4	2	8	9	11	11	8	10	4	2	2	0.3	0.3	0.1	0.2	1	0.3	0.3
			UK-Bermuda	3	4	5	4	5	5	0.2	0.1	0.1	0.1	0.1	0	0.1	0.0	0	0	0	0	0	0	0	0	0	0	0
			USA	292	40	182	172	137	163	156	150	164	158	69	73	61	61	44	32	31	24	19	17	8	10	1	7	2
			Venezuela	43	47	29	40	10	28	12	19	8	73	75	117	98	52	114	131	118	108	113	56	59	11	9	16	15
		NCC	Chinese Taipei	165	59	203	171	206	240	588	292	110	73	99	148	94	113	77	220	259	42	122	8	38	49	11	52	199
			Suriname	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	64
	ATS	CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	16	80	22	96
			Belize	0	0	0	0	37	259	99	236	109	148	273	243	483	234	171	105	167	200	222	165	15	21	0	0	0
			Brazil	1687	2173	1971	2166	2103	2523	3334	2258	2407	1274	1501	2808	1607	2013	2551	2420	1334	2177	3011	3784	3435	4629	3328	2122	2512
			China PR	0	565	316	452	444	404	434	585	40	109	41	131	84	64	48	20	30	283	127	52	45	15	5	67	9
			Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
			Côte d'Ivoire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	16	9	8	247	1202	8	0	15	15	102
			EU-Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5
			EU-España	6951	7743	5368	6626	7366	6410	8724	8942	9615	13099	13953	16978	14348	10473	11447	10133	10107	11486	13515	18497	14717	16778	14061	14388	11878
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0
			EU-Netherlands	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			EU-Portugal	2134	2562	2324	1841	1863	3184	2751	4494	4866	5358	6338	7642	2424	1646	1622	2420	5609	6663	8015	6753	7350	5524	6092	5504	4834
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Ghana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1583	396	436	479	416	414	413	446	1287	1150	458
			Great Britain	0	0	0	0	0	0	239	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0
			Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	6	0	0.3	0.1	0.1	0.1	0.1	1	0.3
			Japan	221	182	343	331	209	236	525	896	1789	981	1161	1483	3060	2255	3232	2277	2127	3112	3495	2338	1795	1327	896	947	636
			Korea Rep	0	0	0	0	0	0	0	0	0	0	222	125	112	61	10	72	252	87	192	156	55	6	0	0	2
			Namibia	0	0	2213	2316	1906	6616	3536	3419	1829	207	2352	2957	1439	1147	2471	2137	2775	1357	3290	3665	4120	3237	4694	4483	3277
			Panama	22	0	0	0	0	0	0	0	521	0	0	0	0	0	0	0	0	0.0	0	0	15	0	1	1	0
			Russian Federation	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			S Tomé e Príncipe	0	0	0	0	0	0	0	0	0	0	0	143	147	152	156	206	183	182	190	94	11	50	25	26	26
			Senegal	0	0	0	0	0	0	0	0	0	0	0	203	51	60	105	18	15	11	15	39	22	25	0	0	0
			South Africa	0	83	63	232	128	154	90	82	126	119	125	318	158	179	524	402	356	418	403	292	52	181	100	51	61
			St Vincent and Grenadines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0
			USA	0	4	0.3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Uruguay	81	66	85	480	462	376	232	337	359	942	208	725	433	130	0	0	0	0	0	0	0	0	0	0	0
		NCC	Chinese Taipei	1353	665	1172	521	800	866	1805	2177	1843	1356	1625	2138	1941	2125	2128	1731	1853	1852	1276	716	1179	922	785	1461	296
	MED	CP	Algerie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	7	4	2	3	5	2	3
			EU-Cyprus	9	0	0	3	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.1	0
			EU-España	31	6	3	3	4	8	61	3	2	7	48	38	39	37	53	65	59	40	19	18	34	14	8	5	3
			EU-France	0	0	0	0	0	0	0	0.4	0.3	0.5	1	0.4	0.2	4	5	15	7	0.3	2	2	2	2	1	1	1
			EU-Italy	0	0	0	0	113	1	106	46	75	176	208	0	0	57	347	0	18	59	17	33	26	33	13	16	19
			EU-Malta	1	1	1	0.5	0	0.5	0.3	1	1	2	1	1	2	2	4	5	3	4	2	2	2	1	3	1	2
			EU-Portugal	5	41	14	3	0	56	22	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Japan	0	0	0	1	1	2	0	0	2	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Libya	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	580	650	0	10	6	6	5	6	15	25
Discards	ATN		Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	5	16	32	71	4	193	173	365	161	136
			EU-Denmark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0.1	0	0	5	3	3
			EU-Portugal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0
			Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	115	157	180	214	333	431
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	18	1	29	0	25	1	0.3	36	35	21
			Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
			Russian Federation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0	0	0	0	0	0
			UK-Bermuda	0	0	0	0	0	0	0	0	0	0.0	0.2	0.1	0	0	0.0	0	0.1	0	0	0	0	0.3	0.1	0.1	0.1
			USA	113	106	68	55	65	66	45	54	130	103	167	206	106	99	122	82	43	42	11	20	24	25	36	19	12
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.3	14	10	6	19	27	34	31	30	36	4	14	23	72
	ATS	CP	Brazil	0	0	0	0	0	0	0	60	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
			EU-Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0.0	0.3	0	0.1	0.2	0.1	0.1
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
			Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	175	316	81	76	114	210
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0.3	17	2	19	2	2	55	34	22
			Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
			South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	11
			USA	0	0.1	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	4	132	132	112	122	139	201	97	146	159	130	138	191	571
	MED	CP	EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0.1	6	13
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0

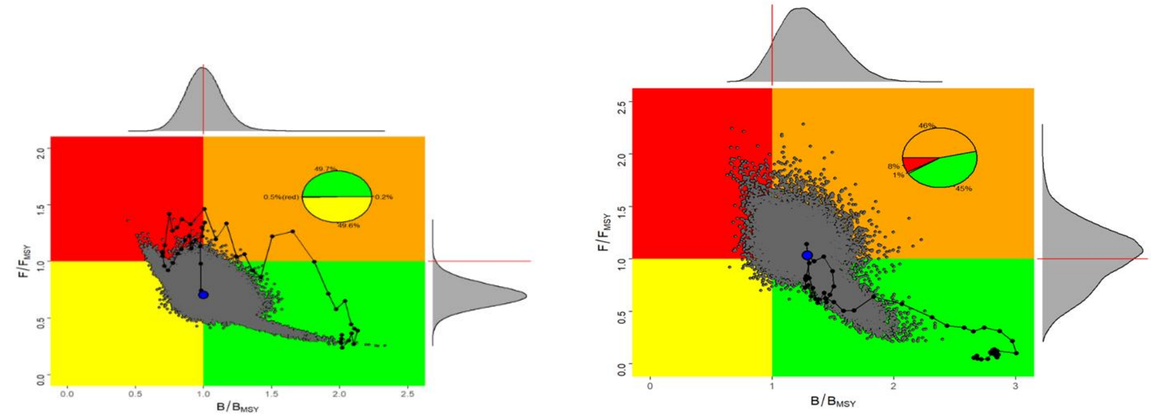


Figure 1. Kobe plot for the North (left) and South (right) Atlantic blue shark stock status in 2021, estimated during the stock assessment (Anon., 2023d). The lines indicate the stock status trajectory starting in 1971. The inserted pies charts indicate the probabilities of the stock being within each Kobe colour quadrant.

Outlook

The North Atlantic blue shark stock in 2021 was at the B_{MSY} level (not overfished) and fishing mortality was below F_{MSY} (no overfishing). The estimated MSY was 32,689 t (95% confidence interval range of 30,403 t – 36,465 t). Projections indicated that future constant catches at or above 35,000 t would result in probabilities greater than 50% of fishing mortality being above F_{MSY} (**Table 3**). For constant catches at or below MSY there was a transition period in the projections (2025-2029) where, the stock's probability of being in the green quadrant declined and then will begin increasing (**Table 3**). This transition period may reflect the age structure and recent predicted average recruitment trends.

The South Atlantic blue shark stock in 2021 was above the B_{MSY} level (not overfished), but fishing mortality was above F_{MSY} (undergoing overfishing). The estimated MSY was 27,711 t (95% confidence interval range of 23,128 t – 47,758 t). Projections indicated if average catch levels from 2019-2021 (about 35,000 t) were maintained, the stock was expected to rapidly decline in biomass, with a risk of falling below 20% of the estimated B_{MSY} reference level in a few years (**Table 3**).

Management recommendation

The results from the 2023 stock assessment showed that while the 2022 catches (22,057 t) for the North Atlantic stock would maintain the stock in the green quadrant of the Kobe plot with a high probability, the Committee noted that the TAC in Rec. 23-10 (39,102 t) would have a very low probability (3%) of maintaining the stock in the same quadrant by 2033. Therefore, the Committee recommended that the Commission reduce the TAC to catch levels that will maintain the stock in the green quadrant of the Kobe plot with a high probability (see **Table 3**). The Commission established a TAC of 30,000 t for North Atlantic blue shark (Rec. 23-10).

The results from the Stock Assessment (Anon., 2023d) showed that the 2021 South Atlantic blue shark stock status was estimated not to be overfished but undergoing overfishing. Recent catches (2019-2021; 35,203 t mean catch) were above the highest catch scenario used in the Kobe II Strategy Matrix and were not sustainable in the long term. Constant catches of 32,500 t (the highest constant catch scenario in the Kobe matrix) only had a 28% probability of being in the green Kobe quadrant by 2033. The Committee indicated that catches of 27,711 t (the estimated 2021 MSY) or less would immediately stop overfishing and will keep the stock in the green quadrant of the Kobe plot with at least a 54% probability (**Table 3**). The Commission established a TAC of 27,711 t for the South Atlantic blue shark (Rec. 23-11).

Table 3. Kobe II matrices for the North and South Atlantic blue shark stocks giving the probability that: a) $F<F_{MSY}$; b) $B>B_{MSY}$; and c) the joint probability of $F<F_{MSY}$ and $B>B_{MSY}$, for given years, for various constant catch levels based on model results. The constant catch scenario of 32,689 t and 27,711 t corresponds to the estimated MSY for the North and South Atlantic, respectively.

North Atlantic

a) Probability that $F<F_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
20000	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22500	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%
25000	95%	96%	96%	97%	98%	98%	99%	99%	99%	100%
27500	87%	87%	88%	89%	90%	92%	93%	94%	95%	95%
30000	75%	74%	74%	75%	76%	77%	78%	79%	80%	81%
32500	62%	60%	59%	59%	59%	59%	59%	59%	59%	59%
32689	61%	59%	58%	57%	58%	58%	58%	58%	58%	57%
35000	50%	47%	44%	43%	41%	39%	38%	37%	36%	35%
37500	40%	35%	31%	27%	24%	21%	19%	17%	15%	14%
40000	31%	24%	19%	14%	11%	8%	7%	5%	4%	4%

b) Probability that $B>B_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	71%	83%	95%	100%	100%	100%	100%	100%	100%	100%
20000	59%	58%	62%	73%	84%	91%	95%	97%	98%	99%
22500	58%	56%	59%	68%	78%	85%	90%	93%	95%	97%
25000	56%	53%	55%	63%	71%	77%	82%	86%	88%	91%
27500	55%	51%	52%	58%	64%	69%	73%	76%	78%	81%
30000	54%	49%	50%	53%	58%	61%	63%	65%	67%	68%
32500	53%	48%	47%	49%	51%	53%	53%	54%	54%	54%
32689	53%	47%	46%	48%	50%	52%	53%	53%	53%	53%
35000	53%	46%	44%	43%	44%	43%	42%	41%	40%	38%
37500	52%	44%	40%	38%	35%	33%	30%	27%	24%	22%
40000	51%	42%	36%	32%	27%	22%	18%	15%	13%	10%

c) Probability that $F<F_{MSY}$ and $B>B_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	71%	83%	95%	100%	100%	100%	100%	100%	100%	100%
20000	59%	58%	62%	73%	84%	91%	95%	97%	98%	99%
22500	58%	56%	59%	68%	78%	85%	90%	93%	95%	97%
25000	56%	53%	55%	63%	71%	77%	82%	86%	88%	91%
27500	55%	51%	52%	58%	64%	69%	73%	76%	78%	80%
30000	53%	49%	50%	53%	57%	60%	63%	65%	66%	67%
32500	51%	47%	46%	47%	49%	51%	51%	52%	52%	53%
32689	50%	46%	46%	47%	49%	50%	51%	51%	51%	51%
35000	46%	42%	40%	39%	38%	37%	36%	35%	34%	33%
37500	38%	33%	29%	26%	23%	21%	19%	17%	15%	14%
40000	30%	23%	18%	14%	11%	8%	7%	5%	4%	3%

South Atlantic

a) Probability that $F<F_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15000	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
17500	98%	99%	99%	99%	99%	99%	100%	100%	100%	100%
20000	95%	96%	97%	97%	97%	97%	98%	98%	98%	98%
22500	89%	90%	91%	91%	91%	91%	91%	92%	92%	92%
25000	80%	81%	80%	80%	79%	79%	78%	78%	78%	77%
27500	70%	69%	68%	66%	65%	64%	62%	61%	60%	59%
27711	69%	68%	67%	65%	63%	62%	61%	60%	59%	58%
30000	58%	57%	54%	52%	50%	48%	47%	45%	44%	43%
32500	47%	45%	42%	40%	37%	36%	34%	33%	32%	32%

b) Probability that $B>B_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	93%	99%	100%	100%	100%	100%	100%	100%	100%	100%
15000	83%	89%	93%	95%	97%	98%	99%	99%	99%	99%
17500	81%	86%	90%	92%	94%	95%	96%	97%	97%	98%
20000	79%	83%	86%	88%	89%	90%	91%	92%	93%	94%
22500	77%	79%	81%	82%	82%	83%	84%	84%	85%	86%
25000	75%	75%	75%	75%	75%	74%	74%	74%	74%	73%
27500	72%	71%	69%	68%	66%	64%	63%	61%	60%	60%
27711	72%	70%	69%	67%	65%	63%	62%	61%	60%	58%
30000	70%	67%	63%	60%	57%	54%	52%	50%	48%	47%
32500	68%	62%	57%	52%	48%	45%	42%	40%	39%	38%

c) Probability that $F<F_{MSY}$ and $B>B_{MSY}$

Catch (t)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
0	93%	99%	100%	100%	100%	100%	100%	100%	100%	100%
15000	83%	89%	93%	95%	97%	98%	99%	99%	99%	99%
17500	81%	86%	90%	92%	94%	95%	96%	97%	97%	98%
20000	79%	83%	86%	88%	89%	90%	91%	92%	93%	94%
22500	77%	79%	81%	82%	82%	83%	84%	84%	85%	86%
25000	74%	75%	75%	75%	74%	74%	73%	73%	73%	72%
27500	68%	68%	67%	65%	63%	61%	59%	59%	54%	53%
27711	67%	67%	66%	63%	61%	60%	58%	56%	55%	54%
30000	58%	57%	54%	51%	49%	47%	44%	43%	41%	40%
32500	47%	45%	42%	39%	37%	34%	32%	31%	29%	28%

13.15 SMA-Shortfin mako (Isurus oxyrinchus)

Introduction

A stock assessment for South Atlantic shortfin mako was conducted in 2025 using data through 2023 (Anon., 2025a; Anon., 2025g). The 2025 assessment for North Atlantic shortfin mako, conducted at the same time as the South assessment, did not provide reliable results and the Committee was not able to estimate the status of the North stock nor provide advice (Anon., 2025a; Anon., 2025g). The Committee plans to finalize the North Atlantic stock assessment in 2026. Therefore, the North Atlantic information provided below on stock status corresponds to the 2017 North Atlantic assessment (Anon., 2017a; Anon., 2017b) and the updated Kobe II strategy matrices, requested by the Commission, correspond to work done in 2019 (Anon., 2019). The complete description of both stock assessment process and the development of management advice can be found in the above cited meeting reports. A summary of both stock statuses is provided in **Tables 1a and 1b**, **Table 2** provides estimated catches, landings and discards by gear, for the period 2000-2024. The Kobe Phase Plot and uncertainty of current status estimates for the North and South stocks are summarized in **Figure 1**. Kobe II strategy matrices (**Table 3**) provide estimated probabilities (%) for the North and South stocks that both the fishing mortality will be below F_{MSY} and spawning stock fecundity will be above SSF_{MSY} in future years under different constant catch scenarios.

Table 1a. North Atlantic shortfin mako shark summary table.

Indicator		*Stock Status*
Maximum Sustainable Yield (MSY)	undetermined	2015
TAC (2024)[4]	250 t	
Current (2024) Yield[1]	944 t	
Relative Biomass (B_{2015}/B_{MSY})[2]	0.57 - 0.95	
Relative Fishing Mortality (F_{2015}/F_{MSY})[3]	1.93 - 4.38	
Stock Status	Overfished: YES (probability not estimated) Overfishing: YES (probability not estimated)	
Management measures in effect	Rec. 21-09, Rec. 04-10 and Rec. 07-06	

[1] Task 1 catch as of 26 September 2025.
[2] Range obtained from 8 Bayesian production and 1 SS3 model runs. Value from SS3 is SSF/SSF_{MSY}. Low value is lowest value from 4 production model (JABBA) runs and high value is from the SS3 base run.
[3] Range obtained from 8 Bayesian production and 1 SS3 model runs. Value from SS3 is SSF_{MSY}. Values from the production models are H (harvest rates). Low value is lowest value from 4 production model (BSP2JAGS) runs and high value is from the SS3 base run and highest value from 4 production model (JABBA) runs.
[4] Refers to total fishing mortality established in Rec. 21-09 para 4a.

Table 1b. South Atlantic shortfin mako shark summary table.

Indicator		*Stock Status*
Maximum Sustainable Yield (MSY)	1,648 t (1,519-1,795 t)	2023
TAC (2024)[3]	1,295 t	
Current (2024) Yield[1]	736 t	
Relative spawning stock fecundity (SSF_{2015}/SSF_{MSY})[2]	0.949 (0.763-1.179)	
Relative Fishing Mortality (F_{2023}/F_{MSY})[2]	1.052 (0.837-1.287)	
Stock Status	Overfished: YES (66.9% probability) Overfishing: YES (66.5% probability)	
Management measures in effect	Rec. 22-11, Rec. 04-10, Rec. 07-06	

[1] Task 1 catch as of 26 September 2025.
[2] Equally weighted combined catch scenarios. The combined time series were built with 10,000 iterations based on the multivariate lognormal (MVLN) approach for each scenario.
[3] Refers to total fishing mortality established in Rec. 22-11 para 3.

Table 2. Estimated catches, landings and discards of Atlantic shortfin mako shark by gear, for the period 2000-2024.

				2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL				5190	4796	5539	7225	6528	7150	6985	6946	5684	6740	7316	7193	7354	6289	6766	6238	6133	6412	5567	4840	4592	3442	3342	2089	1681
	ATN			2598	2682	3434	3987	4000	3842	3727	4158	3802	4543	4783	3724	4445	3611	3475	3294	3368	3134	2406	1896	1735	1187	781	1096	944
	ATS			2588	2107	2103	3235	2526	3291	3248	2786	1881	2196	2531	3467	2908	2678	3291	2943	2766	3278	3160	2944	2858	2255	2561	992	736
	MED			4	7	2	2	2	17	10	2	1	1	2	2	2	0.0	0.3	0.2	0	0	1	0.0	0.0	0.0	1	0.5	1
Landings	ATN		Longline	2270	2451	3163	3970	3645	3534	3454	3976	3623	4346	4588	3500	4147	3315	2588	2639	3119	2714	1998	1622	1625	521	18	6	4
			Other surf.	320	231	271	17	355	308	273	175	169	177	193	215	273	286	871	642	237	411	379	213	42	33	34	6	5
	ATS		Longline	2566	2090	2088	3204	2450	3277	3205	2745	1799	2190	2530	3405	2844	2643	3257	2928	2748	3110	3149	2926	2820	2234	2462	778	431
			Other surf.	22	18	15	31	76	14	43	30	82	7	1	62	55	34	31	12	13	162	7	8	29	9	3	0	0
	MED		Longline	4	7	2	2	2	17	10	2	1	0.5	2	2	2	0.0	0.3	0.2	0	0	0	0.0	0	0	0	0	0.0
			Other surf.	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	1	0.0	0.0	0	0	0.0	0.0
Discards	ATN		Longline	8	0	0	0	0	0	0	7	9	20	2	9	24	11	15	13	12	9	28	60	65	632	729	1083	865
			Other surf.	0	0	0	0	0	0	0	0.1	1	0.1	0.0	0.1	0.2	0	0	0.1	0.2	1	1	1	2	0.4	0	1	71
	ATS		Longline	0	0	0	0	0	0	0	12	0.2	0	0	0.2	9	1	3	3	4	5	3	10	8	13	96	214	305
			Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1	1	1	1	0.1	0	0.3	0.1	0.0
	MED		Longline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0.0	1	0.4	1
Landings	ATN	CP	Barbados	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	3	0	0	0	0	0	0	**0**
			Belize	0	0	0	0	0	0	0	0	0	23	28	69	114	99	1	1	1	9	12	2	0	3	0	0	**0**
			Brazil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2
			Cabo Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
			Canada	78	69	78	73	80	91	71	72	43	53	41	37	29	35	55	85	82	109	53	63	1	0.3	0	0.1	**0**
			China PR	0.2	0	0	0	0	0	0	81	16	19	29	18	24	11	5	2	4	2	0	0	0	0	0	0	**0**
			Costa Rica	0	0.1	0	0	0	0	0	0.2	1	1	1	2	2	1	2	1	1	0.5	1	0.2	0.4	0	0	0	**0**
			Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	**0**
			EU-España	1561	1684	2047	2068	2088	1751	1918	1814	1895	2216	2091	1667	2308	1509	1481	1362	1574	1784	1165	866	870	0	0	0	**0**
			EU-France	0	0	0	0	0	0	0	0	0	15	2	0.4	0.1	0.2	1	1	2	1	0.4	1	0.1	1	1	0.5	0.2
			EU-Netherlands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-Portugal	318	378	415	1249	473	1109	951	1540	1033	1169	1432	1045	1023	820	219	222	264	276	272	289	342	202	1	0.3	1
			FR-St Pierre et Miquelon	0	0	0	0	0	0	0	1	2	0	4	0.2	0	4	0.4	0	0	0	0	0	0	0	0	0	**0**
			Great Britain	3	2	1	1	1	0.2	0.1	0.0	1	15	0.0	0.3	0.2	0	0	0	0	0	0	0.0	0.0	0	0	0	**0**
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Japan	138	105	438	267	572	148	153	82	131	98	116	53	56	33	69	45	74	89	20	4	0	0	0	0	**0**
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	27	27	15	8	2	1	3	5	4	0	0	0	0	**0**
			Liberia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	**0**
			Maroc	0	0	0	147	169	215	220	151	283	476	636	420	406	667	624	947	1050	450	594	501	382	299	0	0	**0**
			Mauritania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	**0**
			Mexico	10	16	8	10	6	9	5	8	6	7	8	8	8	4	4	4	3	5	2	2	2	2	3	2	1
			Panama	0.2	0	0	0	0	0	0.4	49	33	39	0	0	0	19	7	0	0	0	0	0	0	0	0	0	**0**
			Philippines	0	0	0	0	0	0	0	0	1	1	0	2	0.4	1	2	0	0	0	0	0	0	0	0	0	**0**
			Russian Federation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	**0**
			Senegal	0	0	0	0	0	0	0	8	17	21	0	0	2	0.5	2	2	2	68	68	26	0	0	0	0	**0**
			St Vincent and Grenadines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0	0	**0**
			Trinidad and Tobago	3	6	2	3	1	2	1	1	1	1	1	0.5	2	1	1	1	1	2	2	1	1	1	1	0.3	0.1
			UK-Bermuda	0	0	0	0	0	0	0.2	0.2	0.4	0.3	0.2	0.2	0.3	0.1	0.0	0.0	0.3	0.1	0	0.2	0	0.1	0	0	**0**
			USA	414	350	372	106	477	422	353	319	296	314	350	332	371	363	961	572	271	302	165	57	48	39	41	0.3	**0**
			Venezuela	9	24	21	28	64	27	14	19	8	41	27	20	33	9	13	17	13	19	18	14	11	5	6	6	5
		NCC	Chinese Taipei	56	47	53	37	70	68	40	6	23	11	14	13	14	8	4	13	7	1	0	0	0	0	0	0	**0**
		NCO	Sta Lucia	0	0	0	0	0	0	0	0	0.3	0	0.3	1	0	1	0.0	0	0	0	0	0	0.1	1	0	0	
	ATS	CP	Angola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	7	23	14	2
			Belize	0	0	0	0	0	38	0	17	2	0	32	59	78	88	1	15	14	34	15	7	2	1	0	0	**0**
			Brazil	219	409	226	283	238	426	210	145	203	99	128	192	196	276	268	173	124	275	399	739	542	477	557	121	30
			China PR	305	22	208	260	68	45	70	77	6	24	32	29	8	9	9	5	3	1	0	0	0	0	0	0	**0**
			Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	**0**
			Côte d'Ivoire	9	15	15	30	15	14	16	25	0	5	7	0	20	34	19	11	13	161	4	8	14	9	1	0	**0**
			EU-España	1090	1235	811	1158	703	584	664	654	628	922	1192	1535	1207	1083	1077	862	882	1049	1044	1090	799	650	657	0	**0**
			EU-Portugal	388	140	56	625	13	242	493	375	321	502	336	409	176	132	127	158	393	503	300	243	449	357	358	0	**0**
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Great Britain	0	0	0	0	0	0	5	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	**0**
			Japan	264	56	133	118	398	32	111	72	115	108	103	132	291	114	182	109	77	96	93	53	1	0	0.2	0	**0**
			Korea Rep	0	0	0	0	0	0	0	0	0	0	29	13	7	7	4	4	18	8	9	1	0	0	0	0	**0**
			Namibia	0	0	459	375	509	1415	1345	1002	295	155	349	584	586	483	950	829	799	684	980	634	945	637	789	545	254
			Panama	1	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	**0**
			Philippines	0.2	0	0	0	0	0	0	0	0.5	1	3	2	2	20	16	0	0	0	0	0	0	0	0	0	**0**
			Russian Federation	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Senegal	0	0	0	0	0	0	0	0	0	0	0	13	34	23	0	11	6	39	4	7	0	0	0	0	**0**
			South Africa	116	70	12	116	101	111	86	224	137	146	152	218	108	250	476	613	339	305	244	110	46	70	66	96	140
			UK-Sta Helena	0	0	0	0	0	0	0	0	0	0	0	0.4	0.3	0.5	0.2	0.0	0.1	0.1	0.2	0.2	0	0	0	0	**0**
			Uruguay	35	40	38	188	249	146	68	36	41	106	23	76	36	1	0	0	0	0	0	0	0	0	0	0	**0**
		NCC	Chinese Taipei	162	120	146	83	180	226	166	147	124	117	144	203	150	157	158	152	92	85	64	42	52	35	13	2	5
		NCO	Vanuatu	0	0	0	0	52	12	13	1	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	MED	CP	EU-Cyprus	0	0	0	0	0	0	1	1	0.5	0.3	0.5	1	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			EU-España	3	2	2	2	2	2	4	1	0.2	0.2	1	2	2	0.0	0.3	0.2	0	0	0	0	0	0	0	0	**0**
			EU-France	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	0.0	0.0
			EU-Italy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.0	0	0	0	0	**0**
			EU-Portugal	1	5	0	0.2	0	15	5	0	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Japan	0	0	0	0	0	0.5	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			Maroc	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	**0**
Discards	ATN		Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	0.1	2	1	20	22	26	12	14
			China PR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	2	1	5	4	6
			Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	**0**
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	585	588	936	714
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0.3	0	0	0	1	0.1
			EU-Portugal	0	0	0	0	0	0	0	0	0	0	0	0	4	5	4	3	4	5	4	4	3	4	80	77	61
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	**0**
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	**0**
			Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	28	15	9	11	22
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.0	0	0	0	0	0.0	0.1	0.0
			Maroc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9	107
			Mexico	0	0	0	0	0	0	0	0.0	0	0	0	0	0.1	0	0	0.0	0.1	0.1	0.0	0	0	0	0.3	0.1	**0**
			Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	**0**
			Russian Federation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.0	0	0	0	0	0	**0**
			UK-Bermuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	**0**
			USA	8	0	0	0	0	0	0	7	10	20	2	9	18	5	11	8	6	4	2	1	3	4	10	29	10
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.0	1	0.2	0.4	1	1	0.3	22	5	12	1	2	7	2
	ATS	CP	Brazil	0	0	0	0	0	0	0	12	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			China PR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4	3	0.4
			Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	**0**
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	66	187	271
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	1	0.1	1	1	0.1	0	0.3	0.1	0.0
			EU-Portugal	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	12	11	11
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	**0**
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	**0**
			Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	9	1	3	6
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0	5	0	0	0.1	0.2	0.1
			Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	**0**
			South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0.2	8	0.0	2	2	3	3	2	2	2	2	13	9	18
	MED	CP	EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0.0	1	0.4	1

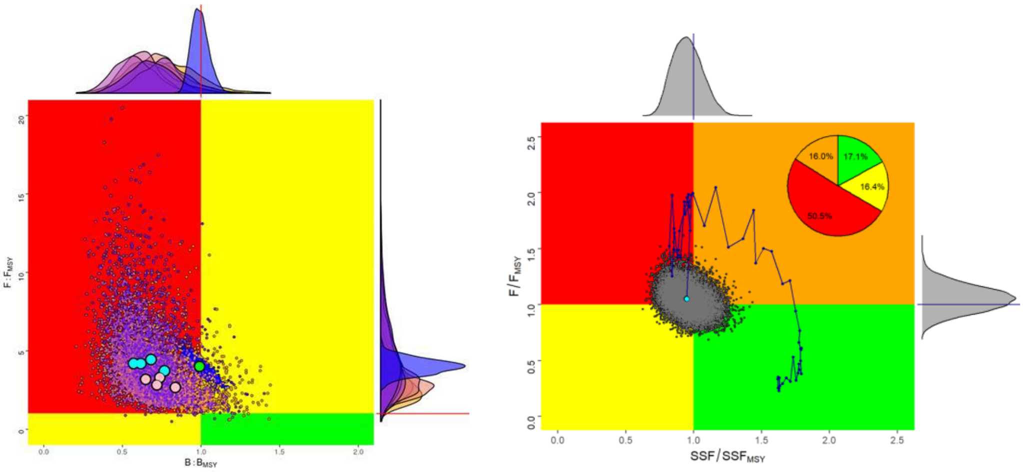


Figure 1. Kobe plot for the North (left) and South (right) Atlantic shortfin mako stock status in 2015 and 2023, estimated during the 2017 and 2025 stock assessments, respectively. The lines indicate the stock status trajectory starting in 1971. The inserted pie charts in the South plot indicates the probability of the stock being within each Kobe colour quadrant.

Outlook

Although all results indicated that the North Atlantic shortfin mako stock abundance in 2015 was below B_{MSY}, results of the production models (BSP2JAGS and JABBA) were more pessimistic (B/B_{MSY} deterministic estimates ranged from 0.57 to 0.85) and those of the age-structured model (SS3), which indicated that stock abundance was near MSY (SSF/SSF_{MSY} = 0.95 where SSF is spawning stock fecundity), were less pessimistic. Fishing mortality was overwhelmingly above F_{MSY}, with a combined 90% probability from all the models of being in an overfished state and experiencing overfishing.

For the South Atlantic shortfin mako, the estimate MSY was 1,648 t (95% confidence interval: 1,519-1,795 t). The median estimate of SSF_{2023}/SSF_{MSY} was 0.949 (95% confidence interval: 0.763-1.179), indicating the stock was likely to have been overfished in 2023. The median estimate of F_{2023}/F_{MSY} was 1.052 (95% confidence interval: 0.837-1.287), indicating that overfishing was likely to have been occurring in 2023. The probability of the stock being in each quadrant of the Kobe plot in 2023 for combined scenarios is provided in **Figure 1**. For the combined scenarios, the corresponding probabilities are 50.5% occurred in the red (being overfished and subject to overfishing), 17.1% in the green (not being overfished not subject to overfishing), 16.4% were in the yellow (being overfished but not subject to overfishing), and 16.0% were in the orange (not being overfished but subject to overfishing).

Management recommendation

North stock

The Committee agreed that the projections that addressed the exceptions in Rec. 17-08 indicated that any retention of shortfin makos will not permit the recovery of the stock by year 2070. A range of TAC options with a range of time frames and associated probabilities of rebuilding are included in **Table 3c**. Given the vulnerable biological characteristics of this stock and the pessimistic projections, to accelerate the rate of recovery and to increase the probability of success the Committee recommends that the Commission adopt a non-retention policy without exception in the North Atlantic as it has already done with other shark species caught as bycatch in ICCAT fisheries.

South stock

The results from the 2025 stock assessment showed that the 2023 South Atlantic shortfin mako stock status was estimated to be likely overfished and undergoing overfishing. Recent catches have largely declined compared to previous years (2020-2022: 2,558 t mean catch to 2023-2024: 864 t mean catch). These recent catches are below the current retention allowance established in Rec. 22-11 and included as a catch scenario in the Kobe II Strategy Matrix. The Committee indicated that total removals (including landings, dead discards and post release mortalities) of 1,295 t will bring the stock to the green quadrant of the Kobe plot with at least a 66% probability by 2050 (**Table 3c**). The Committee noted that higher total mortality rates would have very low probabilities of being in the green Kobe quadrant by 2050.

Table 3. Kobe II matrices for the North and South Atlantic shortfin mako shark stocks giving the probability that: a) $F \leq F_{MSY}$; b) $SSF \geq SSF_{MSY}$; and c) the joint probability of $F \leq F_{MSY}$ and $SSF \geq SSF_{MSY}$, for given years, for various constant catch levels based on model results.

North Atlantic

a) Probability that $F \leq F_{MSY}$

TAC (t)	2019	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
0	100	100	100	100	100	100	100	100	100	100	100	100
100	100	100	100	100	100	100	100	100	100	100	100	100
200	100	100	100	100	100	100	100	100	100	100	100	100
300	100	100	100	100	100	100	100	100	100	100	100	100
400	100	100	100	100	100	100	100	100	100	100	100	100
500	96	99	100	100	100	100	100	100	100	100	100	100
600	81	89	99	99	98	96	95	97	97	97	96	95
700	57	69	93	92	88	82	80	83	84	85	82	82
800*	32	45	76	77	70	63	62	64	67	67	65	63
900	15	24	57	58	51	46	44	47	51	49	49	48
1000	5	11	37	38	31	27	26	28	30	31	30	30
1100	2	4	19	21	17	13	11	13	14	14	14	13

b) Probability that $SSF \geq SSF_{MSY}$

TAC (t)	2019	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
0	46	42	24	14	11	33	53	60	63	67	72	81
100	46	42	24	13	10	29	49	56	59	61	66	73
200	46	42	24	13	9	26	47	54	55	57	61	66
300	46	42	24	12	9	22	42	50	52	53	56	60
400	46	42	24	12	8	19	39	47	49	50	52	55
500*	46	42	24	12	7	17	34	42	45	47	49	52
600	46	42	24	12	7	14	28	37	40	41	43	47
700	46	42	24	11	6	11	23	31	34	35	37	41
800	46	42	23	11	6	10	19	26	27	28	30	32
900	46	42	23	11	5	8	16	20	21	21	23	24
1000	46	42	23	11	5	7	12	16	16	15	15	17
1100	46	42	23	10	5	6	10	12	12	11	10	10

c) Probability that $F \leq F_{MSY}$ and $SSF \geq SSF_{MSY}$

TAC (t)	2019	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
0	46	42	24	14	11	33	53	60	63	67	72	81
100	46	42	24	13	10	29	49	56	59	61	66	73
200	46	42	24	13	9	26	47	54	55	57	61	66
300	46	42	24	12	9	22	42	50	52	53	56	60
400	46	42	24	12	8	19	39	47	49	50	52	55
500*	46	42	24	12	7	17	34	42	45	47	49	52
600	45	42	24	12	7	14	28	37	40	41	43	47
700	41	41	24	11	6	11	23	31	34	35	37	41
800	27	34	23	11	6	10	19	26	27	28	30	32
900	14	21	23	11	5	8	15	20	21	21	23	24
1000	5	10	20	10	5	7	12	15	15	14	14	16
1100	2	4	14	9	4	5	7	9	9	8	8	8

South Atlantic

a) Probability that $F \leq F_{MSY}$

Catch (t)	2026	2027	2028	2030	2032	2034	2036	2038	2040	2045	2050
0	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
500	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
750	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
1000	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
1295	76%	79%	80%	81%	80%	82%	85%	87%	89%	92%	94%
1500	36%	39%	40%	40%	38%	39%	41%	44%	46%	50%	53%
1650	16%	17%	17%	17%	15%	15%	16%	17%	18%	19%	21%
1750	10%	9%	9%	8%	7%	7%	7%	8%	8%	9%	10%
2000	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%
2250	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%

b) Probability that $SSF \geq SSF_{MSY}$

Catch (t)	2026	2027	2028	2030	2032	2034	2036	2038	2040	2045	2050
0	16%	16%	13%	28%	71%	94%	99%	100%	100%	100%	100%
500	14%	14%	10%	19%	51%	76%	88%	94%	97%	100%	100%
750	14%	13%	9%	16%	41%	62%	75%	83%	89%	98%	100%
1000	14%	12%	8%	12%	31%	47%	58%	64%	71%	87%	95%
1295	13%	11%	7%	9%	22%	31%	37%	40%	44%	56%	66%
1500	13%	11%	7%	8%	16%	22%	25%	26%	27%	33%	38%
1650	13%	10%	6%	7%	13%	16%	17%	17%	17%	20%	22%
1750	13%	10%	6%	6%	11%	14%	14%	13%	13%	14%	15%
2000	12%	9%	5%	4%	7%	8%	7%	6%	6%	5%	5%
2250	12%	9%	4%	3%	5%	4%	3%	3%	2%	2%	3%

c) Probability that $F \leq F_{MSY}$ and $SSF \geq SSF_{MSY}$

Catch (t)	2026	2027	2028	2030	2032	2034	2036	2038	2040	2045	2050
0	16%	16%	13%	28%	71%	94%	99%	100%	100%	100%	100%
500	14%	14%	10%	19%	51%	76%	88%	94%	97%	100%	100%
750	14%	13%	9%	16%	41%	62%	75%	83%	89%	98%	100%
1000	14%	12%	8%	12%	31%	47%	58%	64%	71%	87%	95%
1295	13%	11%	7%	9%	22%	30%	36%	40%	43%	56%	66%
1500	11%	10%	6%	7%	14%	18%	21%	22%	24%	29%	34%
1650	7%	7%	4%	5%	7%	9%	10%	10%	11%	13%	15%
1750	6%	4%	3%	3%	4%	5%	5%	6%	6%	7%	8%
2000	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%
2250	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%

13.16 POR-Porbeagle shark (Lamna nasus)

Introduction

A stock assessment for porbeagle was conducted for three of the Atlantic stocks (Northwest, Southwest and Southeast) in 2020 (Anon., 2020c), whereas the Northeast stock was assessed in 2022 in a joint process with the International Council on the Exploration of the Sea (ICES) (Anon., 2022g). The complete description of the stock assessment process and the development of management advice can be found in the Report of the 2020 Porbeagle Stock Assessment (Anon., 2020c) and Report of the 2023 Blue Shark Stock Assessment (Anon., 2023c). A summary of each stock status is provided below (**Table 1a to 1c**). **Table 2** provides estimated catches, by landings and discards by gear, for the period 2000-2024 (NW, NE, SW and SE stocks). The Kobe Phase Plot and uncertainty of current status estimates is summarized in **Figure 1**. **Table 3** provides for the NW-POR estimated probabilities (%) that both the fishing mortality will be below F_{MSY} and spawning stock biomass will be above SSB_{MSY} in future years under different constant catch scenarios.

Table 1a. Northwest Atlantic porbeagle summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	Not available	2018
TAC (2024)	N/A	
Current (2024) Yield[1]	4 t	
Relative Biomass (B_{2018}/B_{MSY})	0.57[2]	
Relative Fishing Mortality ($F_{2010\text{-}2018}/F_{MSY}$)	0.413[3]	
Stock Status	Overfished: YES (98% probability of being overfished) Overfishing: Unknown probability of overfishing	
Management measures in effect	Rec. 04-10, Rec. 07-06, Rec. 15-06	

[1] Task 1 catch as of 26 September 2025.
[2] Value obtained with the ICM model. The reference point used (SPR_{MER}) is a proxy for B_{MSY}.
[3] Value obtained with the SAFE approach for the Northwest Atlantic.

Table 1b. Northeast Atlantic porbeagle summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield	Not available	2021
TAC (2024)	N/A	
Current (2024) Yield[1]	15 t[1]	
ICES-ICCAT Yield in 2021	7.95 t[2]	
Relative Biomass (B_{2021}/B_{MSY})	0.464 (0.15-1.43)[3]	
Relative Fishing Mortality (F_{2021}/F_{MSY})	0.013 (0.0024-0.073)[3]	
Stock Status	Overfished: YES (unknown probability of being overfished) Overfishing: NO (unknown probability of overfishing)	
Management measures in effect	Rec. 04-10, Rec. 07-06, Rec. 15-06	

[1] Task 1 catch as of 26 September 2025.
[2] The value reported represents the total catches determined at the ICES-ICCAT Working Group on Elasmobranch Fishes (WGEF). While Task 1 reported catch for the Northeast stock was 15.4 t in 2021, the catch shown does not include all dead discards and includes no mortalities resulting from live releases.
[3] Range obtained from reference case SPiCT with 95% Bayesian credibility intervals.
[4] Value obtained with the SAFE approach for the Northwest Atlantic.

Table 1c. South Atlantic porbeagle summary table.

Indicator		***Stock Status***
Maximum Sustainable Yield (MSY)	N/A	2018
TAC (2024)	N/A	
Current (2024) Yield[1]	0.5 t[1]	
Relative Biomass (B_{2018}/B_{MSY})	Unknown	
Relative Fishing Mortality ($F_{2010\text{-}2018}/F_{MSY}$)	0.0113[2]	
Stock Status	Overfished: Undetermined (unknown probability of being overfished) Overfishing: NO (unknown probability of overfishing)	
Management measures in effect	Rec. 04-10, Rec. 07-06, Rec. 15-06	

[1] Sum of Task 1 catches for the Southwest and Southeast Atlantic stock areas as of 26 September 2025.
[2] Value obtained with the SAFE approach for the South Atlantic.

Table 2. Estimated catches, by landings and discards of Atlantic porbeagle by gear and area for the period 2000-2024.

				2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL				1769	1223	1074	887	954	740	642	671	619	495	152	120	225	323	78	104	41	48	27	16	14	15	22	23	19
	ANE			567	506	610	527	578	367	302	421	391	349	21	14	25	10	5	8	9	8	4	0.5	3	5	15	18	15
	ANW			988	574	282	164	264	237	217	101	141	84	114	85	162	284	35	93	30	39	19	16	11	10	7	6	4
	ASE			0	0.5	1	9	3	1	0	5	30	37	6	7	26	29	38	3	1	0.5	4	0	0	0	0.3	0	0.3
	ASW			214	141	181	187	105	133	122	143	55	26	10	14	12	0	0	0.1	0	0	0	0.0	0	0	0	0	0.2
	MED			0.5	1	0.0	0.1	3	2	1	0.4	2	1	1	0.4	2	0.2	0	0	1	1	0.2	0.2	0	0	0.0	0	0
Landings	ANE		Longline	33	41	83	142	275	63	62	301	229	143	9	2	1	1	0.5	5	3	1	0.1	0.1	0.4	0.0	0.3	0.4	0.3
			Other surf.	533	465	527	385	303	305	240	120	162	206	13	12	24	9	5	3	6	7	4	0.4	3	5	9	7	6
	ANW		Longline	985	566	269	151	252	226	208	91	131	67	83	68	134	248	14	15	10	10	6	0.1	0.2	0.2	0	0	0.2
			Other surf.	3	8	13	13	12	12	8	11	9	12	20	15	23	30	7	9	5	8	3	12	5	1	0.4	3	2
	ASE		Longline	0	0.5	1	9	3	1	0	5	30	36	6	7	25	29	13	3	1	0.4	4	0	0	0	0	0	0
			Other surf.	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	25	0	0	0	0	0	0	0	0	0	
	ASW		Longline	213	141	181	187	105	133	122	143	55	26	10	14	12	0	0	0.1	0	0	0	0	0	0	0	0	0
			Other surf.	0.1	0.1	0.3	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	MED		Longline	0.5	1	0.0	0.1	2	2	0	0.4	2	1	0.3	0.4	2	0.0	0	0	0.4	0.1	0.2	0.1	0	0	0.0	0	0
			Other surf.	0	0	0	0	1	0	1	0	0	0.0	0.5	0	0	0.1	0	0	1	1	0.0	0.0	0	0	0.0	0	
Discards	ANE		Longline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.1	3
			Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.1	4	10	5
	ANW		Longline	0	0	0	0	0	0	0	0	1	4	11	2	5	6	14	67	13	19	7	0.2	1	2	4	3	2
			Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	3	4	6	3	0.1	0.2
	ASE		Longline	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.0	0.1	0.0	0	0.0	0	0	0	0	0.3	0	0.3
			Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	
	ASW		Longline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0.2
			Other surf.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Landings	ANE	CP	EU-Denmark	73	76	42	21	20	4	3	2	1	0	0.3	0	2	0	0	0	0	0	0.1	0	0.1	0	0	0	0
			EU-España	13	24	54	27	11	14	34	8	41	77	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0
			EU-France	410	361	461	303	413	276	194	354	311	228	0	2	4	0	0	3	0	1	0.0	0	0.4	0.1	2	0.2	0.1
			EU-Germany	17	1	3	5	7	5	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			EU-Ireland	2	6	3	11	18	3	4	8	7	3	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			EU-Netherlands	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0.3	0	0	0	0.0	0.0	0	0	0	0
			EU-Portugal	7	4	10	101	50	14	6	0.1	3	17	7	0.3	0.4	0	0	0	0	0.0	0.0	0	0	0	0	0	0
			EU-Sweden	1	0.5	0	0	5	0.1	0	1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Great Britain	8	12	10	25	24	24	11	26	15	11	0.1	0.0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
			Iceland	2	3	2	1	1	0.3	1	0.1	1	0.2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Japan	0	0	0	0	0	0	0	12	0	3	2	1	1	0	0.2	0.1	2	0	0	0	0	0	0	0	0
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0
			Liberia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
			Maroc	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3	0.2	1	0	0	0	0	0	0	0	0
			Norway	22	11	14	19	24	8	27	10	12	10	12	11	17	9	5	4	6	6	3	0.3	3	5	8	7	7
			Russian Federation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
		NCO	Faroe Islands	13	8	10	14	5	19	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	ANW	CP	Barbados	0.2	0.4	0.1	0.1	0.1	0.1	0.4	0.1	0.4	0.5	0.5	2	3	13	1	2	1	1	1	0	0	0	0	0	0
			Canada	902	499	237	142	232	202	192	93	124	62	83	30	33	19	9	4	2	2	1	0.3	0.2	0.2	0	0	0.2
			Cuba	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			FR-St Pierre et Miquelon	13	2	1	2	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Japan	47	52	21	7	20	27	18	5	10	10	11	13	48	98	0	0	0	0	0	0	0	0	0	0	0
			Korea Rep	0	0	0	0	0	0	0	0	1	1	1	13	20	3	0.1	0	0	0	0	0	0	0	0	0	0
			USA	1	1	1	0.0	0.5	0.0	0.3	0.1	0.4	0.4	2	9	19	27	6	8	4	8	3	12	5	1	0.4	3	2
			Venezuela	6	2	0.2	0.1	0	0	0	0	1	3	3	9	19	69	4	6	4	8	4	0	0	0	0	0	0
		NCC	Chinese Taipei	19	18	22	12	8	7	5	3	2	2	3	7	15	50	1	5	4	0	0	0	0	0	0	0	0
	ASE	CP	EU-España	0	0.5	1	9	3	0	0	0.4	1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			EU-Portugal	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Ghana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0
			Guinea Ecuatorial	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			Japan	0	0	0	0	0	0	0	5	29	25	6	7	25	15	13	3	1	0.4	0	0	0	0	0	0	0
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	4	0	0	0	0	0	0
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	0	0	0	0	0	0	0	0	0	0	0
	ASW	CP	Brazil	60	67	74	49	37	52	32	23	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
			China PR	36	4	0	5	4	2	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			EU-España	7	13	1	0.2	0.3	0.2	3	5	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			EU-Netherlands	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			EU-Portugal	0	1	1	1	4	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Japan	7	4	3	2	11	3	3	4	12	10	2	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0
			Korea Rep	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Panama	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Philippines	0.3	0.1	0.2	0.2	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Uruguay	4	20	8	34	8	28	34	3	40	14	6	12	12	0	0	0	0	0	0	0	0	0	0	0	0
		NCC	Chinese Taipei	84	29	93	95	39	43	47	99	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		NCO	Falklands	0.1	0.1	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			NEI (Flag related)	15	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	MED	CP	EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0
			EU-Italy	0	0	0	0	2	1	1	0	2	0.0	0.5	0	0	0	0	0	1	1	0.2	0.2	0	0	0	0	0
			EU-Malta	0.5	1	0.0	0.1	0.5	1	0	0.4	0.4	1	0.3	0.4	2	0.2	0	0	0	0	0	0	0	0	0	0	0
Discards	ANE		EU-Denmark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.4
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			EU-France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	10	5
			EU-Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ANW	CP	Barbados	0	0	0	0	0	0	0	0	0.0	0.1	0.3	0.1	0.1	0.3	1	4	1	1	1	0	0	0	0	0	0
			Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	3	3	5	8	6	3	2
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5
			Japan	0	0	0	0	0	0	0	0	0.4	1	4	0.3	1	1	1	5	1	1	0	0	0	0	0	0	0
			Korea Rep	0	0	0	0	0	0	0	0	0.1	0.3	0.4	0.0	1	0.1	0.1	0	0	0	0	0	0	0	0	0	0
			UK-Bermuda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0
			USA	0	0	0	0	0	0	0	0	0.3	2	3	1	1	2	7	34	1	9	1	0.1	0	0	0	0.3	0
			Venezuela	0	0	0	0	0	0	0	0	0.1	1	2	0.3	1	1	3	14	4	7	4	0	0	0	0	0	0
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0.2	0.5	2	0.3	1	1	1	11	4	0	0	0	0	0	0	0	0
	ASE	CP	Curaçao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0
			EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0.2
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0
			Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0	0	0
			Korea Rep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0.1
			Panama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.0	0.1	0.0	0	0.0	0	0	0	0	0.0	0	0
	ASW	CP	EU-España	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
			El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		NCC	Chinese Taipei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	0	0.1

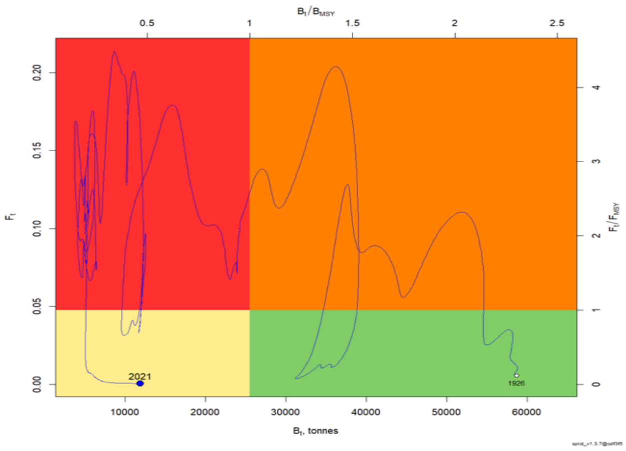


Figure 1. Kobe plot for the Northeast Atlantic porbeagle stock status in 2021, estimated during the 2022 stock assessment. The line indicates the stock status trajectory starting in 1926.

Outlook

Due to changes in management practices that would have affected the development of CPUE series and potentially length composition data, in 2020 the Committee was constrained to use non-traditional stock assessment methods. Overfished stock status could only be determined for the NW stock and overfishing stock status, for the combined stocks in the North Atlantic and the South Atlantic. The Committee formally assessed the NE stock together with the ICES WGEF in 2021-2022.

A Sustainability Assessment for Fishing Effects (SAFE) was used to evaluate whether the combined North and combined South Atlantic stocks were experiencing overfishing, and an Incidental Catch Model (ICM) was used to evaluate whether the NW Atlantic stock was currently overfished and to determine the stock's capacity for future removals. The 2022 stock assessment was carried out using the Surplus Production Model in Continuous Time (SPiCT) model.

Results of the SAFE approach indicated that neither the North Atlantic nor the South Atlantic stocks are undergoing overfishing. An equal mix of annual and biennial reproduction was considered the most likely scenario for the porbeagle population in the NW Atlantic, so these productivity assumptions were used for the base case formulation of the ICM. Two alternate parameterizations of the ICM were evaluated to determine the model's sensitivity to life history assumptions as well as to the assumed population size in 2018. The base case formulation of the ICM estimated biomass in 2018 to be 57% of the MSY proxy reference point (overfished). Due to the large reduction in recent reported removals, the Committee considered it unlikely that the stock is undergoing overfishing. Projections conducted with the ICM for the NW stock indicated that removals of less than 214 t would allow rebuilding with a 60% probability by 2070. If removals remained similar to 2014-2018 (mean = 47 t), the stock was predicted to rebuild with at least a 50% probability between 2030 and 2035. The Committee emphasized, however, that recent removals are very likely underestimated because few CPCs report dead discards, and post-release mortality of live discards was not taken into account.

For the Northeast stock, the exploited biomass was estimated in 2022 to be 50% of the MSY. The stock remains overfished, but overfishing is not occurring (**Figure 1**). During the 2022 Porbeagle Northeast Stock Assessment, long-term projections using constant catch were not presented (Kobe Strategy matrix was not created). Projections will be produced during the next porbeagle stock assessment.

Management recommendation

North Atlantic

The Committee recommended that the Commission work with countries catching porbeagle and relevant Regional Fisheries Management Organization (RFMOs) to ensure recovery of North Atlantic porbeagle stocks. Porbeagle fishing mortality should be kept at levels in line with scientific advice and with removals not exceeding the current level. New targeted porbeagle fisheries should be prevented, porbeagles retrieved alive should be released following best handling practices to increase survivorship, and all catches should be reported. Management measures and data collection should be harmonized as much as possible among all relevant RFMOs dealing with these stocks, and ICCAT should facilitate appropriate communication.

Porbeagle stocks are also subject to mortality from CPCs' coastal fisheries and countries that are not ICCAT Parties. Therefore, the Committee recommended that CPCs implement a live release requirement for all porbeagle caught in their waters and that ICCAT develop integrated management approaches (with other countries, other Regional Fisheries Bodies, FAO) to assure the sustainability of Atlantic porbeagle stocks.

Considering the underreporting of removals, and the current low stock status of the NW Atlantic stock, the Committee recommended that total removals (i.e. the sum of landings, dead discards, and post-release mortality of live releases) do not exceed current levels (including unreported removals) to allow for stock recovery. However, the Commission should be aware that actual removals (particularly dead discards and post-release mortalities of live releases) are higher than what is being reported and the Kobe matrix is overly optimistic to the extent that removals are underreported.

Considering the underreporting of removals, the current stock status of the NE Atlantic stock B_{2022}/B_{MSY}=0.464 (0.15-1.43), and the lack of reliable projections to build Kobe II Strategy Matrix (**Table 3**), the Committee recommended that total removals (i.e., the sum of landings and estimated dead discards) at the very least shall not exceed the average reported ICCAT catch since the implementation of the zero TAC recommendation (i.e., 2010-2021 which current estimates would be 9.3 tons) to allow for stock recovery.

South Atlantic

Although the Committee had, until now, considered two southern stock units (SW and SE), new information suggests a single stock of porbeagle in the South Atlantic, which may even extend across Indian and Pacific Ocean basins. Until more research on stock structure is undertaken, the Committee recommended leaving the management units as currently defined. The Committee was not able to draw any conclusions on the overfished status of the southern stock(s). It was noted that conventional data (e.g. landings, representative length compositions) cannot be collected for any northern or southern porbeagle stocks, so the Committee concluded that alternative (e.g. fishery independent) data collection methods that allow CPUE or length-frequency data (or other altogether different forms of data) to be collected are required to provide more reliable estimates of stock status in the North and in the South Atlantic.

Table 3. Kobe II strategy matrix showing the probability of being above the overfished reference point (a proxy for B_{MSY}) by 5-year time period for removals scenarios ranging from 0 to 24,000 individuals (0-734 t) for Northwest Atlantic porbeagle.

Animals (#)	Ton (mt)	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
0	0	2%	21%	47%	68%	83%	92%	96%	98%	99%	99%	100%
1000	31	3%	21%	44%	63%	77%	87%	92%	95%	97%	98%	99%
2000	61	2%	19%	40%	57%	71%	81%	87%	91%	94%	95%	96%
3000	92	1%	16%	35%	50%	62%	72%	79%	85%	88%	90%	92%
4000	122	2%	15%	32%	47%	58%	66%	73%	78%	82%	84%	87%
5000	153	2%	13%	27%	41%	50%	58%	64%	68%	72%	76%	78%
6000	183	1%	12%	25%	37%	45%	52%	57%	62%	65%	67%	70%
7000	214	2%	10%	22%	32%	39%	46%	50%	54%	57%	60%	62%
8000	245	2%	10%	19%	27%	34%	39%	44%	47%	50%	53%	55%
9000	275	2%	8%	17%	23%	30%	34%	38%	41%	43%	45%	47%
10000	306	2%	8%	14%	20%	25%	29%	31%	34%	36%	38%	39%
11000	336	1%	6%	13%	17%	21%	25%	27%	29%	31%	32%	33%
12000	367	2%	7%	11%	15%	18%	21%	23%	24%	26%	27%	28%
13000	398	2%	5%	9%	12%	14%	16%	18%	19%	20%	21%	22%
14000	428	2%	5%	7%	9%	12%	13%	14%	15%	16%	17%	18%
15000	459	1%	3%	5%	6%	8%	9%	10%	11%	11%	12%	12%
16000	489	2%	3%	4%	5%	6%	7%	8%	9%	9%	10%	10%
17000	520	2%	2%	3%	4%	5%	5%	6%	6%	6%	7%	7%
18000	550	2%	2%	2%	3%	3%	4%	4%	4%	5%	5%	5%
19000	581	2%	1%	2%	2%	3%	3%	3%	3%	3%	3%	4%
20000	612	2%	1%	1%	2%	2%	2%	2%	2%	2%	3%	3%
21000	642	2%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%
22000	673	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
23000	703	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
24000	734	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%

14. ICCAT Research Programmes

14.1 Atlantic-Wide Research Programme for Bluefin Tuna (GBYP)

GBYP Phase 14 started on 1 February 2024, with a duration of 23 months. From the financial point of view, years 2024 and 2025 have been managed separately, following initially the budget tables approved by the Commission in 2023. During the 2024 Commission meeting the Bluefin tuna workplan for 2025 presented by the SCRS was not fully approved, therefore the Secretariat requested in July 2025 an amendment to the original Grant agreement with the EU, both in terms of GBYP activities and budget.

The most relevant research activities completed or initiated during this reporting period (September 2024-August 2025) have been:

a) Data recovery and management

This has been an in-house activity centered on providing further support to the implementation at the ICCAT Secretariat of new information systems for data related to biological and electronic tagging studies, to facilitate science broad joint studies aiming improvement of parameterization of the models used for stock management.

b) Fishery independent indices: GBYP aerial surveys

The results from 2024 GBYP aerial surveys were analyzed, providing improved BFT-E stock abundance and biomass indices time series for the Western and Central Mediterranean, which could be used for reconditioning the Operating Models (OMs) within the BFT MSE. A strict update of the GBYP aerial index values in the Balearic Sea area was also carried out, to update the indices currently used within the framework of the BFT MSE. In addition, following the decision of the BFT Species Group taken during the April 2025 intersessional meeting, a new aerial survey was carried out in the Western Mediterranean in June 2025.

c) Tagging

The general support to BFT tagging activities has included: provision of conventional tags and advice to the CPCs teams; reward programme to enhance tag recovery; continuous updating of the ICCAT conventional and electronic tagging databases; and active and direct support to electronic tagging campaigns developed by CPCs research teams through provision of ICCAT owned tags. As a result of the Call for Expressions (EoI) of Interest to collaborate with the GBYP e-tagging programme launched in July 2024, 10 new Memorandum of Understanding (MoUs) were signed to deploy 51pop-up, 18 internal and 40 acoustic GBYP owned tags. Another MoU was signed with a BFT farming company for the deployment and data management of 5 pop up tags owned by the company. Most of the activities of these MoUs have already been concluded successfully, two are close to finish and other two could not be fully implemented due to force majeure reasons. In 2025 a new Call for EoI has been launched to support acoustic tagging activities in Gulf of Cadiz area and archival tagging in Mediterranean. As a result, three additional MoUs were signed aiming the deployment of 20 acoustic tags off the Algarve (Portugal) southern coast, plus 10 pop-up tags in Western and Central Mediterranean and 22 pop-up tags in Eastern Mediterranean. Acoustic tagging campaigns were successfully concluded, while that in the Western and Central Mediterranean is still ongoing and the campaign in the Eastern Mediterranean was cancelled due to force majeure reasons. The latter was a consequence of the decision taken at the very last moment by the company that had committed to provide logistic support for the campaign, to move all its fishing fleet to Central Mediterranean, due to the scarcity of schools in their Eastern Mediterranean fishing grounds at the beginning of the fishing season.

d) Biological studies

During year 2024 of GBYP Phase 14 this research line focused on genetic studies aiming at overcoming some knowledge gaps detected within the framework of the feasibility study for the implementation of Close-Kin Mark-Recapture (CKMR) approach carried out by the Bluefin tuna Species Group. Thus, a kinship analysis to evaluate the adequacy of larvae as source of juvenile fraction of the Eastern Atlantic and Mediterranean stock and a study to determine the frequency of the different Atlantic bluefin tuna mitochondrial haplotypes, aiming at setting the basis for improving the currently available single nucleotide polymorphisms (SNP) array for BFT genetic studies, were completed. In addition, the GBYP tissue bank incorporated 3998 new larvae samples. In 2025, a new contract has been awarded to develop genetic studies to improve the knowledge on populations structure, that is required for bluefin tuna stocks assessment and management. This new contract focus on further understanding the interbreeding between Eastern and Western Atlantic stocks, characterize their mixing dynamics, as well as ensuring the proper maintenance and enlargement of the GBYP Tissue Bank. The latter will consolidate the implementation of an Information System and allow better management of the samples and data generated within the biological studies.

e) Modelling

In line with the provision of *Recommendation by ICCAT establishing a management procedure for Atlantic bluefin tuna to be used for both the western Atlantic and eastern Atlantic and Mediterranean management areas* (Rec. 22-09), the BFT workplan for 2025 included several tasks aiming at evaluating the implications of new information regarding abundance, indices and stock mixing on the BFT MSE. Consequently, two contracts have been awarded in 2025, specifically to evaluate the impact of the: i) incorporation of West CKMR estimates; and ii) removal or changes in the frequency of GBYP aerial surveys and the inclusion of revised indices.

The GBYP Coordinator reported on progress made from September 2024 to August 2025 (Phase 14) across tagging, biological studies, aerial surveys, and modelling activities. It noted achievements such as updated biological and electronic tagging databases, successful aerial surveys in the Mediterranean (Balearic area), deployment and a high level of recovery of electronic and conventional tags, and genetic research on population structure. The next steps to be concluded by the end of Phase 14 (December 2025) include standardizing indices, further tag deployments, collaborative analyses, and additional studies to support MSE reconditioning.

The Committee noted the programme essential role in supporting BFT science and research. It observed that reconditioning would occur when new studies became available and inquired whether the plan was to recondition each time new research was completed, emphasizing that one of the purposes of MSE was to reduce workload and that frequent reconditioning appeared contrary to this objective. The BFT rapporteurs clarified that there were no plans to recondition the OMs every year and that the process was being conducted in line with Rec. 23-07. The Committee further emphasized the need to clarify decision-making procedures for off-cycle reconditioning across all species. It also sought clarification on what specific information collected through GBYP would be useful for MSE, noting that one example under consideration was evaluating the effects of eliminating indices or reducing the frequency of aerial surveys to every two years.

14.2 Small Tunas Year Programme (SMTYP)

Between 2018 and 2025, SMTYP continued collecting biological samples aimed at growth, maturity and stock structure studies on small tunas species (little tunny, LTA, *Euthynnus alletteratus*; Atlantic bonito, BON, *Sarda sarda*; and wahoo, WAH, *Acanthocybium solandri*). In that regard, a single contract was issued to a consortium of 12 institutions (11 CPCs) by the ICCAT Secretariat in 2018 that ended on 31 March 2019. In July 2019 a new contract was signed with the same consortium, which was carried over until 2023. In 2024 and 2025 new consortia were set up involving 13 entities from 10 CPCs.

The objective of the latter contract was to collect biological samples to:

i. fill specific size gaps for estimating the growth and maturity parameters for BON, LTA and WAH;
ii. determine the growth and reproduction parameters for BON, LTA, WAH, FRI and BLT;
iii. refine the stock structure analysis for WAH, BON, LTA FRI and BLT; and,
iv. investigate genetic species differentiation between FRI and BLT.

A number of documents and presentations were provided during the intersessional meetings with results of the ongoing activities within the SMTYP. In addition, the Group identified the priorities that should be considered in terms of the species and geographical areas to be sampled, and revised the biological data collected under the SMTYP biological collection contracts in the period 2024-2025. These priorities are presented in the small tunas workplan for 2026 (item 17.1.8), which also contains details on other relevant research activities to be developed throughout 2026-2029 including:

– updating the biological meta-database;
– estimation of length-weight relationships representative at the stocks/regional level;
– calibration and adopting internationally agreed maturity scales;
– further investigating and applying data limited methods to be used for the provision of management advice for these stocks.

The SMTYP detailed report will be prepared by the end of 2025 and posted on the ICCAT website.

14.3 Shark Research and Data Collection Programme (SRDCP)

The Shark Species Group (SSG) continued the collaborative study on the age and growth of the South Atlantic shortfin mako (samples provided by EU-Portugal, Uruguay, Japan, Namibia and Brazil). In 2025 the results of this study were presented during the Shortfin Mako Shark Data Preparatory Meeting (Anon., 2025a). One of the main changes from previous studies was the use of 2 band depositions until the age of maturity. After discussions on the best models presented, the Group agreed on this approach and decided to apply the same methodology for the North Atlantic study presented in 2017. Stock assessment for both stocks in 2025 were conducted considering these new results (Anon., 2025g).

In 2024, the SCRS established priorities for age and growth studies for priority shark species, most of which are a bycatch of ICCAT tuna or tuna-like fisheries in both North and South Atlantic. A previous survey on availability of shark vertebrae had been conducted, and priorities were established for longfin mako, oceanic whitetip and silky shark. The meta-data of available structures was compiled, and in 2025 there has been additional work on sectioning and imaging vertebrae from the priority species. The work is scheduled to continue in 2026 and the following years, with age readings and growth modeling for those species, likely starting with longfin mako and then advancing to the remaining priority species.

In 2022, a study on genetic analysis of porbeagle in the Atlantic Ocean was initiated. Results of this study obtained between 2023 and 2024 with full coverage of its distribution area clearly demonstrated the existence of two distinct genetic groups as two sibling species, the North Atlantic and the Southern Hemisphere porbeagles. Also, results strongly support no genetic differentiation between samples collected from the Northeast and the Northwest Atlantic Oceans as well as among samples collected from oceans in the Southern Hemisphere. In 2025, a new analysis to investigate the ongoing individual migration was initiated. Genome-wide genotyping-by-sequencing (GBS) of 106 juveniles collected from the southeastern Atlantic yielded the two-fold amount of sequencing data compared to the previous study. The analysis with identical by descent (IBD) detected several pairs of the second-degree (e.g. half-sibling) or third-degree (e.g. cousin) kinship relationships, both within and among cohorts, while most pairs were inferred to be unrelated. It was suggested that this approach is useful to investigate the connectivity of recent generations of this species among areas. Further improvement of Single nucleotide polymorphism (SNP) filtering and analysis of samples from the areas of interest will provide meaningful information.

Studies on movements, stock boundaries, habitat use and post-release mortality of shortfin mako caught on pelagic longline fisheries continued. The study of post-release mortality (PRM) assessment published by Miller *et al.* (2020) was updated and presented during the 2025 Shortfin Mako Data Preparatory Meeting. The updated document analysed information from 128 tags deployed by the SRDCP as well as from other national tagging programmes. To maximize tag comparability for the PRM analysis, we set the mortality threshold at 28 days. The overall PRM rate for shortfin mako sharks caught by pelagic longliners was 29.4%. With regards to shortfin mako movements, a total of 52 ICCAT satellite tags have been deployed, including 7 in the SW Indian Ocean to determine possible trans-oceanic movements.

The porbeagle electronic tagging has continued by teams from EU-France, EU-Portugal and Norway in the North Atlantic to better understand movements, stock boundary, and habitat use of this species. To date, a total of 9 ICCAT e-tags have been deployed, with one of the sharks showing a long migration (~5,000 km) in the North Atlantic. Canada has also deployed satellite tags on porbeagle in the NW Atlantic, and a joint analysis for the NE and NW Atlantic combining all available tags is planned. Tagging efforts for porbeagle in the NE Atlantic are planned to continue.

The movements, stock boundaries and habitat use of other shark species, considered as priority species by the SCRS, in the Atlantic Ocean are also part of the ICCAT e-tagging efforts. For those species, a total of 86 ICCAT miniPATs have been deployed to date by EU-Portugal, USA, Uruguay, Brazil, EU-Spain and the UK. The species tagged to date included silky (37), oceanic whitetip (20), smooth hammerhead (6), scalloped hammerhead (2), blue shark (15), bigeye thresher (4) and longfin mako (2). Dedicated ICCAT tagging campaigns have been conducted in 2024/25 in various priority areas, with the deployment of 38 tags in the eastern equatorial and central Atlantic area form the species lived above. Since 2024 there have been additional efforts to gather information on the movements of blue sharks between the Mediterranean and the NE Atlantic, with 8 tags deployed in 2025, including 3 in the western Mediterranean and 5 in the NE Atlantic. Regarding conventional tagging, ICCAT acquired in 2024 stainless steel dart tags, that have already been distributed for some observer programmes that have the opportunity to tag sharks.

In 2023 a new study on the reproductive biology of North Atlantic shortfin mako began, based on the quantification of reproductive hormones concentrations from muscle tissue samples collected from stored vertebrae. Preliminary results suggest, that like the porbeagle shark, muscle tissue can be used to assess reproductive characteristics (i.e. maturity, reproductive status) and can provide critical information regarding important reproductive habitats for North Atlantic shortfin mako. A campaign to obtain samples from gravid females was planned for late 2024, but due to time constrains, it was not possible to do it. Now the campaign was rescheduled for October 2025.

14.4 Enhanced Programme for Billfish Research (EPBR)

The EPBR continued its activities in 2025. The Secretariat coordinates the transfer of funds, information, and data. The overall programme coordinator and Eastern Atlantic Coordinator during 2025 was Dr Rui Coelho (EU-Portugal), and Ms Karina Ramírez López (Mexico) remained as the West Atlantic Coordinator. The original plan (established in 1986) for EPBR included the following objectives: 1) to provide more detailed catch and effort statistics, particularly for size frequency data; 2) to initiate an ICCAT tagging programme for billfish; and 3) to assist in collecting data for age and growth studies. These objectives have been expanded to evaluate adult billfish habitat use, study billfish spawning patterns, and billfish population genetics, as these are essential pieces of information for improving billfish assessments. The Billfish Species Group also revised the original plan in order to overcome the data gap issues, in particular in artisanal fisheries of developing CPCs, taking into account the findings of regional reviews.

The previously available specific funding for EPBR has now been combined with the general research fund (ICCAT Science Envelope). Project funding is now being allotted on a more competitive basis with other Species Groups. The United States Data Fund has been supporting the EPBR activities.

Since 2019, short-term contracts have been awarded for the collection of biological samples and analysis for the study of growth of billfish in the eastern Atlantic for the main billfish species that occur in this area (*Makaira nigricans*, BUM; *Kajikia albida*, WHM; and *Istiophorus albicans*, SAI). These contracts have engaged research teams from Senegal, Côte d'Ivoire, Gabon and São Tomé e Príncipe sampling from artisanal fisheries and teams from EU-Portugal sampling from industrial fisheries. Overall, a total of 735 samples have now been collected from the three species (237 BUM, 411 SAI and 87 WHM). More spines (n=651) than otoliths (n=278) have been collected. Sampling priority is being given to small and large size classes of each species. Preliminary results of a study to evaluate the use of otoliths to estimate the age and provide some preliminary otolith-based estimates of potential longevity of Atlantic blue marlin (*Makaira nigricans*) were provided and used during the 2024 Atlantic Blue Marlin Stock Assessment Meeting (Anon., 2024i). In 2025, a validation study for blue marlin otoliths using bomb radiocarbon was initiated, with the selection of appropriate otolith samples and extraction of otolith cores for 14C. Sampling, processing and analysis of spines and otoliths for the three species and the validation study for BUM will continue in 2026.

A reproductive study on blue marlin is underway in the Gulf of Mexico, led by Mexico (Mexican Institute for Research in Sustainable Fisheries and Aquaculture - IMIPAS), using samples from longline fishing fleet and recreational fisheries.

Satellite tagging in the eastern Atlantic within the EPBR started in 2023 and continued through 2024 and 2025, involving both dedicated campaigns (recreational fisheries) and opportunistic tagging. The priority area is in the NE Atlantic, where blue and white marlins occur in the summer/autumn, however other areas in the eastern Atlantic are also being considered. To date, 11 white marlins have been tagged in waters offshore to the southern Portuguese coast and two blue marlins have been tagged in the equatorial Atlantic. Thirty-one WHM have also been opportunistically tagged in tournaments with conventional tags. Of the 5 tags deployed in 2023/24, all popped up with days at sea ranging from 27 to 241 days, unfortunately these had very poor transmissions (battery issues). In 2025, new tags were provided by the manufacturer, so these are expected to have a better performance, these tags are still in the water. More dedicated trips for tagging in South Portugal are planned for this fall and other areas are being considered such as the Central East and SW Atlantic, with research teams from Brazil and São Tomé e Príncipe. Funding for 2026 is being requested to continue the tagging study in the Northeast and South Atlantic.

The Committee reviewed the Enhanced Programme for Billfish Research (EPBR) in 2025, noting Secretariat coordination, shifts in funding support, and ongoing short-term contracts. It outlined priorities such as adult habitat use, tagging, and expanded biological sampling and capacity building in developing CPCs.

14.5 Albacore Year Programme (ALBYP)

Studies of albacore reproduction continued for both the North and South Atlantic stocks.

In the North Atlantic, an international team of scientists from EU-Spain, Canada, Venezuela, and Chinese Taipei collected and analyzed 649 gonadal samples from Venezuelan and Chinese Taipei longliners, as well as baitboat and troll Spanish fleets. Sampling occurred year-round between 2019 and 2025. A total of 460 first dorsal fin spines were examined to determine age, with spine size distributions ranging from 49 to 114 centimeters and specimen ages spanning 1 to 11 years. Notably, older specimens (>9 years) were exclusively males. Analysis of 557 albacore gonads allowed assignment of maturity stages for individuals measuring 49 to 117 cm. All maturity stages were represented in this study. Approximately 60% of sampled individuals were either in the spawning capable phase (Stage III) or actively spawning (Stage IV), with Stage IV spawners observed from April through September. As documented in previous research, a spatial trend in maturity distribution was evident, with spawners concentrated between 15º and 25º N latitude.

The size at first maturity (L_{50}), estimated using logistic regression, was determined to be 72.56 cm for females and 80.02 cm for males. The corresponding ages at first maturity (A_{50}) were 3.79 years and 4.65 years for females and males, respectively. These values are lower than previously reported, suggesting that results should be interpreted cautiously due to the limited number of immature individuals in the samples.

In the South Atlantic, the reproductive biology study is being conducted by a consortium of scientists from Brazil, Uruguay, South Africa, Namibia, and Chinese Taipei. Biological sampling is being carried out since July 2021. The study used 441 samples for histological analyses collected by the Brazilian and Chinese Taipei fleets. Results suggest that southern albacore spawns in the tropical Southwest Atlantic between spring and summer. Estimated L_{50} values were 94.9 cm FL and 95.3 cm FL for males and females, respectively, and batch fecundity ranged from 0.14 to 1.7 million oocytes. Concerning the age study, 421 specimens were dissected for spines extraction, and a sub-sample of 258 were analyzed for age and growth estimations (fork lengths ranged from 66 to 125 cm). The maximum number of main translucent marks considered as a proxy for the age in years, was 8 marks for a 106 cm male. The growth of the species in the tropical Southwestern Atlantic area appeared to be extremely rapid during the first 2 years. A summary of the results obtained from samples analysed to date was presented at the 2025 SCRS Meeting.

Another component of the research programme relates to movements and habitat use of Atlantic albacore, which is being conducted by scientists from Brazil, EU, Japan, South Africa, Uruguay, and Chinese Taipei. In the North Atlantic, several tagging surveys targeting large individuals have been conducted off the Canary Islands, where 33 MiniPATs have been implanted. In addition, in the Bay of Biscay tagging has targeted small and medium size albacore, with 12 MiniPATs and 225 internal archival tags having already been deployed. Posters announcing €1,000 rewards were produced in Spanish, French, English, Portuguese, Chinese, and Japanese, and distributed through collaborating Albacore Species Group participants from different CPCs. To date, data from 50 archival tags have been gathered, which includes >9,000 tracking days. It is worth noting that for the first time sixteen albacores have been tagged for more than a year, including the first worldwide one-year PSAT tag retention time for this species and an overall recovery rate of 14.2% for the internal archival tags.

Juvenile albacore visited shallow waters of the Bay of Biscay in subsequent summers, while inhabiting deeper waters in the central and western Atlantic during the winter as well as travelling south to the Canary Islands before returning to the Bay of Biscay. Remarkably, two larger individuals stayed in the Bay of Biscay until late winter, showing a previously unknown behaviour for the species.

In the South Atlantic, new attempts to deploy MiniPATs will be done in September 2025. The teams will continue to deploy tags until early 2026 and an update of the results will be presented in 2026.

Finally, a short-term contract was issued to accomplish the technical tasks required to follow the albacore MSE schedule adopted by the Commission. According to this schedule, after adoption of the first ICCAT MP in 2021 (following adoption of a harvest control rule in 2017), it is necessary to check for the existence of exceptional circumstances on a yearly basis. In addition, in 2023 a new benchmark stock assessment using SS3 was conducted, which served as a basis for conditioning new operating models for the second round of the MSE framework, expected to be delivered in 2026. The contractors developed the reference and robustness OMs based on Stock Synthesis as part of the new MSE and tested the currently adopted MP on this new reference grid.

In addition, they finalized the new Observation Error Model by incorporating statistical properties of CPUE residuals in both the historical and future parts of the time series. Both components (OMs and OEM) were presented and adopted by the albacore working group. They also produced the necessary plots for the Albacore Species Group to discuss the detection of ECs, as requested by the ECP contained in the *Recommendation by ICCAT on conservation and management measures, including a Management Procedure and Exceptional Circumstances Protocol, for North Atlantic albacore* (Rec. 21-04).

14.6 Swordfish Year Programme (SWOYP)

The SWOYP was established in 2018 to address key uncertainties important for improving the scientific advice for management of the stocks. The three main research areas - ageing and growth, reproductive biology, and genetics - are each led by study coordinators who oversee work involving 23 institutions from 15 ICCAT CPCs. The work to date has been organized through a series of short-term contracts and in 2022 was formalized as an ICCAT research programme. Since project inception, 4,773 swordfish representing all three ICCAT managed stocks have been sampled for some combination of fin spines, otoliths, muscle tissue, gonads, and additional information has been collected on fish size, sex, maturity stage, and catch date, location and method. The SWOYP aims to improve knowledge of the stock distribution, age and sex of the catch, growth rates, age at maturation, maturation rate, spawning season and location, stock boundaries and mixing, thereby contributing to the next major advance in the assessment of swordfish status. In addition, tagging work supports studies on distribution, movement, and habitat use, which are important for the development of a species distribution model.

In 2018 and 2019, emphasis was placed on sample collection and standardization of sampling methods and processing among member institutions. Samples were collected in the major fishing areas in the North and South Atlantic and Mediterranean. Through all phases of the project, 4,773 samples have been collected from mostly longline fisheries, covering all three stocks. The majority of samples collected consist of an anal fin spine for age estimation, a piece of tissue for genetic analysis, including data on fish size, sex, location and catch date. Within this sample set are 3,582 fin spines, 1,392 otoliths, and 783 gonads. In recent project phases, the focus has been on sampling from designated sizes and spatio-temporal gaps. Sampling objectives for each component were defined and compared against collected samples to determine sampling gaps. As sampling effort is decreasing, the effort in processing and analysis on the collected samples has been increasing.

Subsequent processing and analysis of samples since 2019, has led to ageing and maturity reading efforts and calibration exercises, with an online swordfish biology workshop being conducted in 2021. The resulting data have contributed to preliminary work on revised growth models, and maturity ogives. In February 2023, SWOYP age readers and external experts refined swordfish ageing protocols and made significant progress on an age reading calibration exercise. Given the challenges of ageing swordfish (small size of swordfish otoliths and vascularization within fin spines), there still remains a great deal of uncertainty in existing age readings, particularly with age rings close to the otolith nucleus. Ageing and modelling is ongoing for both spines and otoliths. In 2023-24, an age validation exercise was initiated. Bomb radiocarbon analysis was applied to 59 samples collected under the SWOYP sampling programme and from NOAA otolith archives. Preliminary results indicate there has been age overcounting for early growth rings in some otoliths and that otolith mass can be a tool in age estimate refinement, but was generally a poor predictor for age. Additional validation analysis is underway to make better radiocarbon interpretations relative to age estimates and oceanography. In general, there were no surprises in terms of maximum age and age estimates of 10 to 12 years for swordfish near 250 cm were supported.

Reproduction and maturity analysis also continues to progress. Currently, 3,185 individuals using either microscopic or macroscopic techniques have an assigned maturity, of which 776 individuals have a maturity assignment using microscopic (histology) techniques. This increase in gonad sample sizes is an important step in refining maturity ogives. Additional samples are needed from hypothesized spawning areas in the Sargasso Sea and Gulf of Guinea. Samples from these fish will be important for genetic differentiation of stocks, understanding stock spawning period, and better estimating fecundity and recruitment.

The genetic analyses have resulted in sequencing of the swordfish genome, identification of SNPs important for stock differentiation, and preliminary estimates of stock boundaries and mixing areas. Epigenetic ageing is being conducted in unison with the ageing component. The first steps in this new project area starting from 40 specimens from South Atlantic stock, have identified a total of 612593 cytosine-phospho-guanine (CpG) sites for which methylation rates may be measured. Preliminary results obtained by correlating LJFL with length (used ad proxy of aging) pointed out 19413 significantly correlated to length. 82% of those fall into "functional genome" and in turn are involved in expression of genes related to aging biological processes. An elastic net regression model was applied to identify a minimum set of predictors. The model identified 57 optimal CpG sites for predicting fish length (as a proxy for age). Should the technique be successful, SWOYP may be better able to monitor for shifts in growth and maturity while not exclusively relying on the difficulty to obtain otoliths.

Work within each of the project areas will continue in 2026 with continued processing of samples, readings of otoliths/spines and age and growth modelling, histological staging of gonads and modelling, genetic analysis of tissues and collection of samples in areas where there are sampling gaps.

Tagging studies aim to analyze the vertical habitat-use and migration patterns of swordfish, and help to delimit the stock boundaries and mixing rate of swordfish between the Mediterranean Sea and the North and South Atlantic. 56 ICCAT funded tags have been acquired since 2018, when the tagging programme was implemented. To date, a total of 54 miniPAT tags have been deployed, including 46 in the Equatorial and NE Atlantic mixture areas, 4 in the South Atlantic and 4 in the Mediterranean Sea. An in-kind contribution of 10 miniPAT tags from Canada resulted in deployment of tags in a high priority spatial zone for the Swordfish Species Group, on the NW Atlantic. These studies indicate considerable horizontal movements and patterns of vertical movement through depth and temperature layers. These findings are important for improvements to the swordfish species distribution model which the Committee uses to better understand swordfish catch rates. In 2024/2025, dedicated tagging campaigns resulted in the successful deployment of 20 tags in the stock mixture area of the NE Atlantic, and also in the deployment of several other tags from other ICCAT tagging programs, namely sharks and billfishes. Additionally, in 2024, a tagging and sampling trip was planned to respond to a possible swordfish northward shift, by targeting fishing activities off Newfoundland and Labrador. This tagging trip was also very successful, and biological samples were collected from 7 swordfish (full samples), in addition to the release of 11 tagged swordfish (10 satellite tags and one acoustic tag). The tagging data from these tagged swordfish in the upcoming year will improve the understanding of habitat use of swordfish in the North Atlantic and in the stock mixture areas. Currently SWOYP has 9 satellite tags available to continue the work in late 2025, and expects to acquire some additional tags to deploy in the priority areas of stock mixture during 2026.

14.7 Tropical Tuna Research and Data Collection Programme (TTRaD)

The ICCAT Tropical Tuna Research and Data Collection Program (TTRaD) began its activities in 2024. The Secretariat coordinates the transfer of funds and distribution of information, and data.

The original plan for the TTRaD included the following objectives: 1) to provide more detailed catch and effort statistics, particularly for size frequency data; 2) to initiate an ICCAT tagging programme for tropical tunas; and 3) to assist in collecting data for age and growth studies. During past Tropical Tunas Species Group meetings, the Tropical Tuna Species Group requested that the objectives of TTRaD be expanded to provide a more long-term and costed workplan. Efforts to meet these goals since 2025 are highlighted below.

In 2025, the TTRaD prioritised Management Strategy Evaluation (MSE) developments, improved advice to the Commission through: spatio-temporal model development, utilising AOTTP tag data to improve estimates of exploitation/mortality; sample collection for age and growth; and, continuation of funds for tag recovery and maintenance of Atlantic Ocean Tropical tuna Tagging Programme (AOTTP) database.

MSE developments have been provided throughout the year at the 2025 Bigeye Tuna Data Preparatory Meeting (Anon., 2025d), the 2025 Bigeye Tuna Stock Assessment Meeting (Anon., 2025j) and intersessional meetings of the sub-groups on MSE.

For the western skipjack MSE, updates included reconditioning of operating models with updated data provided by each CPC up to 2024, the inclusion of robustness scenarios aimed at bringing potential perspectives on the influence of Climate Change on the stock, and the adaptation and development of new management measures to support the adoption of a Management Procedure (MP) aiming implementation in 2026.

For the multi-stock MSE, work has advanced with the development and assessment of multi-stock or hybrid harvest control rules (HCR) within Candidate Management Procedures (CMPs). Recent progress involved (1) using a surplus production model within a management procedure to generate TACs for each of the stocks (BET, YFT, SKJ-E) and, (2) incorporating the ability of the OMs to simulate fishing effort adjustments required by fleets to achieve the most restrictive TAC among the three stocks.

The age and growth study continued advancing, with ongoing specimen collection across the Gulf of Guinea and the Central and Southern Atlantic regions (presentation Diaha and N'Gom (2025) (SCRS/P/2025/104) and Diaha *et al.* (2025) (SCRS/2025/217)). Sampling efforts have yielded a significant number of specimens from the three target tuna species, surpassing the initial objectives. To enhance the scientific rigor of the study, a strategic recalibration of size-class distribution across the different geographical zones was undertaken. This proactive approach successfully mitigated identified sampling biases, thereby strengthening the overall representativeness of the collected samples. Regarding the analysis phase, the meticulous preparation of the hard structures - otoliths, spines, and vertebrae - is in its final stages. The vast majority of these samples have been expertly processed into microscopic slides. These preparations have subsequently undergone a rigorous, independent reading process conducted by three specialists to ensure analytical robustness. While the definitive age data analysis is pending the completion of the final batch of slides, preliminary findings have already been synthesized and presented graphically, offering an initial insight into the results. Work continued to improve results.

Efforts to estimate the total (Z), natural (M) and fishing (F) mortality of the three tropical tuna species using conventional tagging data is well underway. Preliminary estimates were made for the three species using a Hoenig (1998) instantaneous tag return model implemented in R. These estimates are described in Cass-Calay (2025a) (SCRS/2025/182), Cass-Calay (2025b) (SCRS/2025/183) and Cass-Calay (2025c) (SCRS/2025/184). Extensive efforts were made to characterize uncertainties that influence the mortality estimates, including the assumptions regarding mixing of tagged fish into the target population, the tag reporting and survival rates, and the sizes/ages considered in the analysis. The Committee made several recommendations to reduce the range of uncertainty to a manageable number. The contractor also described several approaches to incorporate the estimates into the stock assessment models, and with the assistance of the Committee a preferred approach was identified. The contractor agreed to integrate the feedback of the Committee in the development of the final estimates.

To support the development of responses to the Commission, an agent-based spatio-temporal model was developed (POSEIDON-EAO). Work on this model started in 2025 with a focus on securing vessel-level/observer data for purse seine fleets and delivering a proof of concept. The model was designed to evaluate fleet behaviour, FAD usage, ICCAT management measures, and socioeconomic dynamics. Since Powers *et al.* (2025) (SCRS/2025/152), the final calibration based on the "Where the Money Is" behavioural algorithm was selected and applied to test management scenarios. As outlined in Vert-Pre (2025) (SCRS/2025/185), a proof-of-concept model is now available that predicts fishery targets that closely align with ICCAT observed data, with an error of 0.67% in the calibration year (2022) and 14.53% in the validation year (2023). Initial model results suggested that reducing active FAD limits to moderate levels could lower ecological risks for juvenile bigeye by reducing reliance on FAD sets, while maintaining overall tuna catches at levels comparable to the current active FAD limit and proposed TAC.

14.8 Subcommittee on Ecosystems and Bycatch Research Programme

The Co-convener of the Subcommittee on Ecosystems and Bycatch, responsible for the bycatch component, presented a document (SC-ECO_01/2025) which sets out the general guidelines for the Bycatch Research and Data Collection Program (PIRDCaF). This document constitutes the basis for the work to be carried out during a dedicated workshop, aiming to finalize the draft program proposal and its presentation to the Committee for approval in 2026.

15. Progress related to work developed on MSE

Since September 2024, the SCRS has further developed substantial work on the ongoing ICCAT MSE processes. Additional details are provided below (items 15.1 to 15.7).

15.1 Work conducted for northern albacore

In 2017, the Commission adopted an interim Harvest Control Rule (HCR) for North Atlantic albacore (*Recommendation by ICCAT on a harvest control rule for North Atlantic albacore supplementing the multiannual conservation and management programme, Rec. 16-06* (Rec. 17-04)), which represents the first HCR adopted in the history of ICCAT. In 2021, the Commission adopted the first full Management Procedure (MP) (*Recommendation by ICCAT on conservation and management measures, including a management procedure and exceptional circumstances protocol, for North Atlantic albacore* (Rec. 21-04)), including the HCR, the specifications about how to determine stock status in the future, and an Exceptional Circumstances Protocol (ECP). The adopted HCR imposed an F_{TARGET}=0.8*F_{MSY}, a $B_{THRESHOLD}$=B_{MSY}, a B_{LIM}=0.4B_{MSY} and an F_{MIN}=0.1F_{MSY}, with a maximum Total Allowable Catch (TAC) of 50,000 t and a maximum TAC change of 25% in case of increase or 20% in case of decrease when B_{CURR}>$B_{THRESHOLD}$.

Since 2015, the SCRS has provided scientific advice and interacted with the Commission, to allow the Commission to adopt the recommendations mentioned above. This included testing several HCR variants, stability clauses, the effect of the carryover, scenarios about TAC implementation error, underreporting, number of available catches per unit effort (CPUEs), etc. In addition, an independent peer review was conducted during 2018, and a short-term contract has been issued to accomplish the technical tasks required to follow the albacore MSE schedule and Rec. 21-04 adopted by the Commission.

In 2023 a new benchmark stock assessment using Stock Synthesis 3 (SS3) was conducted. The contractors developed the SS3 model in collaboration with other participants of the albacore Species Group. This model was used in the stock assessment as a reference case. After the assessment, the model was further revised to improve diagnostic performance and to serve as a basis for conditioning new operating models for the second round of the MSE framework. This new MSE was developed with the Bioeconomic Impact Assessment model FLBEIA, which code available in the github repository.

During 2024, the contractor, in collaboration with the albacore Species Group, started the development of the new MSE framework. The reference grid of operating models (OMs) was advanced, including new age-length-key data, and a proposal on the criteria to discard unrealistic simulation runs.

In 2025, the contractor finalized the conditioning of the reference and robustness OMs. These are a sample of 400 models resulting from 4 axes of structural uncertainty (weight of CPUE, size and age-composition data) and 100 iterations for each axis with variability around a base natural mortality (M=0.36, CV=20%) and recruitment variability (sigmaR 0.4, CV=20%). The contractor also developed robustness OMs by reducing the baseline recruitment (R0) up to 20% for the projection period.

A new observation error model (OEM) that considered both historical and future uncertainty in CPUEs, as well as autocorrelation, was proposed. The Albacore Species Group welcomed the proposal and made some recommendations to improve it, namely, to incorporate autocorrelation in the historical part. In 2025, the OEM was finalized and adopted by the albacore Species Group. The contractors tested the adopted Management Procedure (MP) on the new reference uncertainty grid, using this final OEM. In addition, the MP included a different surplus production model (SPICT) as the stock status estimator.

Furthermore, the contractor developed a Trial Specification Document that is available in the ICCAT MSE website and ICCAT repositories, with all the documentation and details of the different components of the new MSE for North Atlantic albacore.

The ECP in Rec. 21-04 requires determining, on a yearly basis, if Exceptional Circumstances (ECs) exist. In this regard, the contractors produced the necessary plots for the albacore Species Group to discuss the detection of ECs according to the ECP contained in Rec. 21-04. The Committee evaluated the existence of ECs using both catch and CPUE related indicators and found no evidence of ECs that would prevent the application of the current TAC derived from the MP in place.

15.2 Work conducted for southern albacore

An initial MSE framework for South Atlantic albacore (ALB-S MSE) was approved by the Commission in 2024. The Committee agreed to create an ALB-S MSE technical team to develop the related work.

The MSE framework was built in R with openMSE package and fully open through a GitHub repository, a project website and a living Technical Specifications Document (available here).

The operating models (OMs) were conditioned based on a Stock Synthesis model using the same input datasets of the last ALB-S stock assessment conducted in 2020 (Anon., 2020a), with data spanning from 1956 to 2018.

The preliminary analysis compared two methods to characterize uncertainty on natural mortality and steepness: 1) a stochastic sampling of life history parameters with 200 draws; and 2) a discrete grid of nine operating models. Preliminary performance indicators were evaluated against the four management objectives set in *Resolution by ICCAT on development of initial operational management objectives for southern Atlantic albacore* (Res. 24-09). Additional details of this preliminary analysis are provided in Hordyk *et al.* (2025) (SCRS/2025/192). The next steps include the review and update of the OMs, including the main biological assumptions, which will require the Committee input and the new stock assessment outputs scheduled for 2026.

15.3 Work conducted for bluefin tuna

The 2025 Bluefin Tuna Species Group ICCAT Intersessional Meeting was held in hybrid format in Sète, France, (8-11 April 2025) (Anon., 2025c). The meeting focused on reviewing the western bluefin tuna (BFT-W) Close-Kin Mark Recapture (CKMR) study, considered some preliminary evaluation of whether this new information could be consequential for the MSE, and discussed plans for the 2026-2027 stock status assessment and MSE review. The Committee concluded that the CKMR estimate of western stock adult abundance was sound and represented a significant advancement in the knowledge of population scale. The Committee held a discussion on whether the CKMR results presented at the meeting triggered EC but did not reach consensus. The Committee endorsed a workplan for external contractors to work with the Bluefin tuna Species Group to complete additional analysis incorporating the BFT-W CKMR into the MSE used in 2022 via a lite-reconditioning of the OMs, including retuning of the MP if the OM reconditioning was successfully achieved. This was intended to investigate the impact of newly available information, and it was considered that it might also provide insights for the discussion at SCRS in 2025 to evaluate the occurrence of EC. Subsequently, in July, the BFT held an informal online meeting to review progress on the lite-reconditioning and provided further input on work to be achieved in time for the September Species Group meeting.

The Bluefin Tuna Species Group met during three days at the September 2025 SCRS Species Groups meeting, where a main task this year was to provide TAC advice for 2026-2028. The Committee reviewed the intersessional work done since the Sète meeting and agreed that the lite-reconditioning of the OMs, incorporating the CKMR results, was successfully achieved. The Committee was not able to achieve consensus on whether the CKMR results warranted the triggering of EC. Therefore, the Committee provided two sets of 2026-2028 TACs: one based on the 2022 adopted MP and another one based on the same MP tuned to the reconditioned OMs incorporating CKMR results. A workplan for stock status assessment in 2026 and comprehensive MSE review during 2026-2028 was prepared by the Committee.

The Committee discussed the BFT rapporteur's presentation and thanked them for providing a written summary of the Species Group's discussions as an SCRS document. It inquired about how the TACs were calculated, noting that the proportional changes differed between stocks. In response, the Rapporteur provided a brief response but referred to the supporting document Walter *et al.* (2025) (SCRS/2025/239) for a more complete description of how the TAC advice was generated.

Questions were also raised regarding the growth table and its relationship to monitoring stock removals. It was clarified that the table, which had been circulated for review, was developed from median farm growth rates across multiple sites, with the 75% interval chosen as the most reasonable reflection of uncertainty. The Committee asked how the 75% value had been determined and whether there was concern that it could underestimate growth in some cases. It was explained that the 75% CI value has been explored because the 95% CI raised concerns, as it represented a near upper limit for growth of individual fish, which might not achieve the intent of the Commission. The Committee was further informed that such extreme values as those from the upper 95% CI would not be expected when compared to growth estimates using the average of a large group of fish in a cage or on a farm. The table was circulated among the BFT Technical Sub-group on Growth in Farms who deemed it acceptable.

Regarding Exceptional Circumstances (ECs), some delegations did not agree that ECs had been triggered, motivating the request that TACs be provided under both the adopted MP (tuned to the 2022 OMs) and the retuned MP (tuned to OMs incorporating CKMR). The Committee observed that only one indicator had been raised in support of invoking ECs and that no consensus was reached on its interpretation. It further requested that some further information regarding the statistical evidence and criteria used to evaluate ECs (i.e., the Kolmogorov–Smirnov test) be explicitly documented in the record. The Committee considered this but to time constraints, agree to put it on the agenda for next year's intersessional meeting.

The Rapporteur noted in the presentation that this is a really positive situation for bluefin tuna stocks and fisheries and a testament to the good management that has been in place for bluefin tuna for several years now.

15.4 Work conducted for northern swordfish

The Commission adopted a management procedure (MP) (*Recommendation by ICCAT on conservation and management measures, including a management procedure, for North Atlantic swordfish* (Rec. 24-10)) for the North Atlantic swordfish stock at its annual meeting in 2024, and set a Total Allowable Catch (TAC) for the first management cycle (2025-2027). The adopted MP is empirical and uses an index ratio harvest control rule (HCR) to produce a TAC for a 3-year management cycle. The Commission selected management objectives (and probability thresholds, where applicable) for four categories: safety, status, variability, and yield.

Rec. 24-10 sets out tasks for the SCRS which include reviews of exceptional circumstances (ECs), applying the adopted MP, and a general Management Strategy Evaluation (MSE) review. Paragraph 18 requires that the SCRS continue work on robustness tests associated with Climate Change and minimum size limits with results due by 2027 and paragraph 21 requires that the SCRS provide analyses on the scientific elements of an exceptional circumstance protocol (ECP). Progress was made on both of these tasks in 2025. The SCRS completed preliminary work on assessing the effectiveness of minimum size limits. This work, along with analysis on Climate Change effects on MP performance, will continue in 2026.

In support of ECP development, the Committee provided feedback on scientific elements of a draft protocol. This work included analysis on impacts of data gaps in the combined index of abundance. The Committee updated the combined index with an additional data year. Following the general principles identified in the protocol, the Committee assessed EC criteria (see item 19.15 of this report).

15.5 Work conducted for western skipjack

Progress on MSE simulations

In 2014, the ICCAT SCRS adopted a Science Strategic Plan (2015-2020) to strengthen scientific advice under a precautionary framework, emphasizing advanced stock assessment methods, uncertainty treatment, and the adoption of Management Strategy Evaluation (MSE). Building on this foundation, the tropical tunas MSE was initiated in 2018, with a phased approach that started with development of a single-stock framework for western skipjack due to its simpler fishery dynamics and value as a capacity-building exercise. In 2020-21, the first SKJ-W MSE demonstrations conditioned Operating Models (OMs) using Stock Reduction Analysis and tested a range of Candidate Management Procedures (CMPs), including fixed TACs and index-based harvest control rules, within the openMSE platform. Early reviews highlighted the need to expand the framework to include additional fleets and longer historical data, leading to a revised setup in 2021-2022 incorporating catch, CPUE, and size composition data across five fleets, and later reconditioned with Stock Synthesis outputs.

Progress accelerated after the 2022 western skipjack assessment and the adoption of conceptual and then operational management objectives by the Commission (Res. 22-02; Rec. 24-04). Updated datasets, expanded scenarios, and refined simulations in 2023-2024 provided the technical basis for developing Candidate Management Procedures aligned with agreed objectives. Based on feedback from Panel 1, SCRS work in 2025 focused on reconditioning the operating models based on updated catch data, abundance indices, and size composition data, and then finalizing tuning of these CMPs, testing their robustness, including under Climate Change scenarios, and preparing final CMP performance results for Commission review. The adoption of a management procedure for western Atlantic skipjack would represent a critical milestone in the application of adaptive, precautionary, and performance-based management in ICCAT tropical tuna fisheries.

The final performance results for the SKJ-W CMPs are summarized in **Appendix 6**.

For a more detailed description of the SKJ-W MSE overall see document Sant'Ana *et al.* (2025b) (SCRS/2025/228)).

The Committee reviewed a presentation on the western Atlantic skipjack MSE and thanked JCAP for supporting the initial capacity building that made this work possible. The presentation summarized progress through 2025. The Committee noted in 2025, work cantered on refining and tuning CMP, testing robustness under uncertainty and Climate Change scenarios, and preparing final performance results. The results showed that four candidate procedures met the agreed performance standards and provided the technical basis for Commission review in 2025.

The Committee commended the Western skipjack rapporteur and the Tropical Tuna Species Group for the high quality of the material. The Committee noted that the TAC for the first management cycle under the MP is a key element to present to the Commission. The Committee also cautioned that continued reconditioning of the MSE could introduce significant delays and additional costs.

The Committee reviewed and adopted **Appendix 6**.

15.6 Work conducted for tropical tunas multi-stock MSE

In 2025, the tropical tunas MSE advanced with the development and assessment of multi stock or hybrid HCR within CMP. This MSE was developed with the Bioeconomic Impact Assessment model FLBEIA. Building on 2024 milestones - including finalizing OMs, Observation Error Model (OEM), and adopting Management Objectives - recent MSE progress involved (1) using a surplus production model within a management procedure to generate TACs for each of the three tropical tuna stocks (BET, YFT, SKJ-E) and, (2) incorporating the ability of the OMs to simulate fishing effort adjustments required by fleets to achieve the most restrictive TAC among the three stocks. The three stocks' TACs were derived using alternative target and threshold points in a Hockey Stick HCRs, one for each stock. The current simulations assumed that fleets would apply the minimum fishing effort to adjust to the TAC of one stock and this modulated their catch on the other two stocks. Additionally, a new Trial Specification Document (TSD) was created in line with other ICCAT MSEs, and visualization tools, like the Shiny app, were developed for CMP evaluation.

The Committee reviewed progress on the multi-stock MSE, including conditioning OMs, evaluating CMPs, and integrating multi-stock considerations into the framework. The Committee emphasized the need for sustained technical development, capacity building, and continued refinement of MSE processes to ensure robust management advice.

The Committee discussed the status of the multi-stock tropical tuna MSE, noting that the MSE is complex given its multi-stock scope, and that significant communication and support will be needed to ensure Commissioners are properly informed. The Committee noted that detailed information on both the western skipjack MSE and the multi-stock MSE is available, and that dialogue with Panel 1 is planned for the Intersessional Meeting of Panel 1 on Tropical Tunas MSE (online, 8 October 2025) and again early in 2026.

15.7 Work conducted for blue shark MSE

Details on the work conducted on blue shark MSE are provided in item 19.29 of this report.

15.8 Review of the Roadmap for the ICCAT MSE processes adopted by the Commission in 2024

The Committee discussed the MSE roadmap adopted by the Commission in the 2024 Annual meeting ("Review of the Roadmap for the ICCAT MSE processes adopted by the Commission in 2024", **Appendix 7**). Operational changes were made to be brought to the attention of the Commission at the 2025 Annual meeting.

15.9 Draft MSE Roadmap redesign

The Committee was provided with an alternative format to the ICCAT MSE roadmap document based on an EXCEL worksheet (document "Draft MSE Roadmap redesign"). The aim is to facilitate reading, comparison among processes and navigation. The Committee updated the MSE roadmap in the new format and recommended that the Commission consider replacing the current ICCAT MSE roadmap document format with the new format. However, further changes may be needed to improve consistency regarding the terminology used among the different MSEs.

Draft MSE Roadmap redesign

Stock	MP adoption (actual or planned)	ECP adoption (actual or planned)	Next year to run MP	Next stock status check	Next MP review	2025 Progress		2026 Workplan		2027 Workplan		2028 Workplan		2029 Workplan	
						SCRS	COMM	SCRS	COMM	SCRS	COMM	SCRS	COMM	SCRS	COMM
Northern Albacore	2021	2021	2026	2026	2026	Finalized OMs & estimation model. Tested current MP and alternatives specified in Rec. 21-05. Checked for ECs.		Present progress to PA2 at intersessional meeting. Run the current and alternative MPs to provide TAC for 2027-2029.	PA2 to meet intersessionally to provide feedback on how to finalize the MSE (objectives, performance indicators, MPs, tuning). Adopt 2027-2029 TAC at the annual meeting based on current or alternative MP.	Check for ECs. Conduct any pending analyses as requested by COM or SCRS.		Check for ECs. Test integration of using joint juvenile index in MP.		Bench-mark assessment (status check).	
Atlantic Bluefin	2022	2023	2025	2026-2027	2027-2028	SCRS to conduct additional retuning of OMs, incorporating the CKMR estimate of western stock abundance. Checked for ECs. Provided TACs for 2026-2028.	Adopt 2026-2028 TACs based on MP.	Conduct status check. Begin MP review. Present to PA2. Check for ECs.	Review progress on status check and MP review.	Continue MP review. Present to PA2 for feedback. Check for ECs.	Review progress on MP review.	Finalize any MP revisions. Present to PA2 for final feedback. Provide TACs for 2029-2031 based on current or alternative MP. Check for ECs.	Adopt 2029-2031 TACs based on current or alternative MP.		

Stock	*MP adoption (actual or planned)*	*ECP adoption (actual or planned)*	*Next year to run MP*	*Next stock status check*	*Next MP review*	*2025 Progress*		*2026 Workplan*		*2027 Workplan*		*2028 Workplan*		*2029 Workplan*	
						SCRS	*COMM*	*SCRS*	*COMM*	*SCRS*	*COMM*	*SCRS*	*COMM*	*SCRS*	*COMM*
Northern Swordfish	2024	2025	2027	2029	2030	Continued robustness testing, per Rec. 24-10. Developed EC criteria for ECP. Checked for ECs.	Adopt ECP at annual meeting.	Continued robustness testing, per Rec. 24-10. Check for ECs.		Check for ECs. Run MP.	Adopt 2028-2030 TAC based on MP.	Check for ECs.		Conduct status check. Check for ECs.	Review progress on status check.
Western Skipjack	2025	2026	2028	2031	2031	Finalized MSE, including reconditioning with data through 2024 and retuning CMPs. Additionally, develop Climate Change scenarios to test robustness of MPs.	PA1 to meet intersessionally to review final MSE results. Consider MP adoption at annual meeting, including the 2026-2028 TAC.	Develop EC criteria for ECP. Check for ECs.	Adopt ECP at annual meeting.	Check for ECs.		Check for ECs. Run the MP.	Adopt 2029-2031 TAC based on MP.		

Stock	***MP adoption (actual or planned)***	***ECP adoption (actual or planned)***	***Next year to run MP***	***Next stock status check***	***Next MP review***	***2025 Progress***		***2026 Workplan***		***2027 Workplan***		***2028 Workplan***		***2029 Workplan***	
						SCRS	***COMM***	***SCRS***	***COMM***	***SCRS***	***COMM***	***SCRS***	***COMM***	***SCRS***	***COMM***
Multi-stock Tropical tunas	2026	2027				Further developed MSE framework, incorporating PA1 feedback, including mechanism to implement multi-stock CMPs, development of TSD, and creation of Shiny visualization tool.	PA1 to meet intersessionally to provide guidance on how to handle: trade-offs in species yields; changes in effort over time; changes in gear use over time; and, variable allocations over time. Also to discuss CMP design and operational management objectives, considering how the multi-stock interactions are handled in the current MSE.	Refine MSE framework and evaluate multi-stock CMPs based on PA1 feedback.	PA1 to meet intersessionally to provide guidance on CMP design. Hold Ambassadors meeting. Consider MP adoption at annual meeting, including the TACs.	Provide final advice to PA1 on criteria for determining ECs and inclusion in the ECP to be developed by PA1 in consultation with the SCRS. Develop an ECP through an iterative consultation process that provides, inter alia, guidance on range of appropriate management responses should ECs be found to occur.	Adopt ECP at annual meeting (assuming 2026 MP adoption; otherwise, consider MP adoption). Continue use of the MP to set TACs on the predetermined timescale for MP setting. Adopt ECP as a new Annex in MP.	Evaluate existence of ECs in accordance with the ECP. Conduct periodic assessments to ensure that the conditions considered in MP testing are still applicable to the stocks.			

Stock	MP adoption (actual or planned)	ECP adoption (actual or planned)	Next year to run MP	Next stock status check	Next MP review	2025 Progress		2026 Workplan		2027 Workplan		2028 Workplan		2029 Workplan	
						SCRS	COMM	SCRS	COMM	SCRS	COMM	SCRS	COMM	SCRS	COMM
Southern Albacore	2027	2028				Secretariat compiled and shared necessary catch data for Stock Assessment by April per the workplan. SCRS established an ALB-S MSE Technical Team. Established ALB-S MSE Technical Team.	COMM (PA3) will be informed and provide feedback on SCRS work.	SCRS to conduct a stock assessment using Stock Synthesis 3. (2026) SCRS to agree on: - Major sources of uncertainty to be considered in the MSE; - MSE framework structure; - Reference and robustness set of OMs.	(2026) SCRS to incorporate feedback from COMM/PA3.	(2027): SCRS to finalize MSE and CMP testing.	(2027) SCRS to communicate final MSE results to PA3.	(2028) SCRS to engage with PA3 on development of an ECP. (2028 and beyond): SCRS to evaluate application of ECs, to the extent possible.	Adopt ECP at annual meeting.		
N/S Blue sharks	2028	2029				Conducted feasibility study.	Discuss operational management objectives and performance indicators.	Establish the BSH MSE Technical Team; Consideration of the OM main uncertainties for testing in the MSE Update MSE plan and roadmap.	Provide the final operational management objectives and performance indicators.	Agree on uncertainty / OMs, and develop the final OM. Further develop MSE process and plans.	PA4 to meet intersessionally (if needed) to provide guidance on CMP preferences and design.	CMP development and testing. Present results to PA4.	PA4 to meet intersessionally to provide guidance on final CMP preferences/shortlist.	Finalize MSE and CMP testing. Develop ECP Present results to PA4.	PA4 to meet intersessionally to review final MSE results. Hold Ambassadors meeting. Consider MP adoption at annual meeting, including the TACs.

15.10 SCRS Chair's proposal on the formation of Working Group on MSE or an MSE Subgroup of the WGSAM

There was general agreement that there are substantial potential benefits in the formation of a new Working Group on MSE, or alternatively a new MSE Sub-group of the WGSAM, which would be composed of SCRS scientists experienced with the various aspects of MSE processes. These benefits could include, for example, ensuring consistency across ICCAT MSE processes in approach and in presentation components when communicating with the Commission, reviewing all ICCAT MSE processes and providing advice as needed to address the inconsistencies in MSE expertise/experience across Species Groups.

There was also agreement on the need to develop clear Terms of Reference (ToRs) for such a Working Group or Sub-group. Such Terms of Reference may also provide clarity on whether these responsibilities would be addressed better through the formation of a Working Group or a Sub-group.

The Committee agreed that, during 2026, the Rapporteurs or their designees of those Species Groups with past or ongoing MSEs, together with the SCRS Chair and/or Vice Chair, shall collaborate through correspondence and/or online informal meetings to develop the ToRs, and make a recommendation to the SCRS or whether this work should be carried out by a new Working Group, on an MSE Sub-group of the WGSAM.

15.11 Management Strategy Evaluation (MSE) Technical Coordinator

The Canadian delegation presented its proposal for the MSE Coordinator. The Committee recalled the limited capacity of ICCAT to engage in additional MSE tasks. However, it was of the opinion that potential cost savings could be obtained considering the amount of budget allocated to MSE activities being conducted at the moment. Therefore, it compiled the table listed below to inform the Commission of those potential for savings to be realized through creating an MSE Coordinator position.

An MSE Coordinator position would allow for a single point of contact on all MSE development and implementation, consistency across time and efforts, and reduced workload for other scientists and Secretariat staff as the person could conduct some of the MSE work and serve as a standard reviewer. The participation of this MSE Coordinator in the development of MSEs and testing of MPs would also serve to address in part the unevenness in MSE knowledge and experience across the various Working Groups of the SCRS. The position's responsibilities would include:

- Develop a workplan for each MSE process in collaboration with the associated SCRS Species Groups and Commission Panels;
- Work towards synergies and consistencies between the various MSEs the Commission undertakes (including how results are presented, how objectives are framed, how adopted MPs are reviewed/updated/checked for ECs);
- Provide technical expertise in support of SCRS scientists in developing, completing and coding MSE work in collaboration with externally contracted experts;
- Support the technical work of the Species Groups with MP reviews/updates and EC checks; and,
- Provide an initial overview, as needed, to the SCRS and/or the Commission on what an MSE process might look like for a requested stock.

The Commission has currently implemented 3 MPs based on MSE (ALB-N, BFT and SWO-N). Two other MSE processes are underway (SKJ-W which will be considered for adoption at the 2025 Commission meeting and the tropical tuna multi-stock MSE, still underway). The Commission has requested that an MSE for ALB-S begin and the Committee plans to start work on this process in 2026. The Commission requested a feasibility study for BSH-N and BSH-S MSEs which the Committee has explored and has requested funds to start these MSEs in 2027 should the Commission still prioritize this work. Refer to the table below for a summary of the costs associated with the technical work for these MSEs. The Committee viewed that there could be significant reductions in MSE funding requests if this "MSE Technical Coordinator" position was added to the Secretariat staff.

Table of current MSE financial requests that the Committee has included in their budget for the next 2 biennial cycles (2026-2027 and 2028-2029), in Euros.

MSEs with adopted MPs	**2026**	**2027**	**2028**	**2029**
ALB-N	35,000	35,000	35,000	35,000
BFT	50,000	50,000	50,000	
SWO-N	30,000	10,000	5,000	15,000
Sub-total	***115,000***	***95,000***	***90,000***	***50,000***
MSEs underway				
SKJ-W	12,000	12,000	12,000	12,000
Multi-stock TRO	50,000	50,000	20,000	20,000
Sub-total	***62,000***	***62,000***	***32,000***	***32,000***
MSEs beginning soon				
ALB-S	*	*	35,000	35,000
BSH-N+S		60,000	60,000	60,000
Sub-total	***0***	***60,000***	***95,000***	***95,000***
TOTAL	**177,000**	**217,000**	**217,000**	**177,000**

*This process has external funding to support the work in 2026 and 2027.

16. Update of the stock assessment software catalogue

The Secretariat has been maintaining the ICCAT software catalogue and the GitHub site. Following the recommendation by the Committee in 2024, Github FLBEIA repository and openMSE webpage have been incorporated in the ICCAT software catalogue.

17. Consideration of plans for future activities

17.1 Annual workplans and research programmes

17.1.1 Subcommittee on Ecosystems and Bycatch workplan for 2026

Ecosystems

Consistent with the ongoing exercise of developing an EcoCard and implementing an ecosystem approach to fisheries management (EAFM) framework for ICCAT, a workplan was drafted considerate of the limited capacity of the Subcommittee. The priority items for the coming year are identified.

Pertaining to Ecosystems Report Card Development: Priority 1

The Subcommittee recognized the need to continue the development of indicators reviewed at the 2025 Meeting of Subcommittee on Ecosystems and Bycatch (Anon., 2025e) recognizing that many would be available for an update of the EcoCard in 2026. It was emphasized that development and/or updates of indicators for some of the other ecosystem components should also be prioritized. The EcoCard components identified for updates or development are described in the **Table** below. The schedule of updates for ecosystem components for which an indicator was adopted will be discussed at the 2026 meeting while those under development are expected to remain in the workplan until adopted.

It is recommended to host in person workshops to advance the work on the EcoCard in 2026 and 2027. The first is required to review indicators developed for select components of the EcoCard, and the second is to review indicators being proposed for the environmental component.

Pertaining to the work of the Sub-group on the Ecosystem Report Card: Priority 2

Prior to the 2026 Meeting of the Subcommittee on Ecosystems and Bycatch, the Sub-group on the Ecosystem Report Card will meet (October 2025) with the EcoCard teams to review the progress in developing or updating the indicators of the EcoCard.

Pertaining to the development of a Risk Screening Tool: Priority 2

Recognizing that the database supporting the risk screening of marine species potentially impacted by ICCAT fisheries has been updated (turtle and seabird species added), and the advanced state of the analytical approach, the Subcommittee recommended that the development of the risk screening tool be advanced to completion as soon as possible.

Advancements in the method are proposed for review in 2026 and entail exploring the use of artificial intelligent (AI) methods. Collaboration of experts with machine learning (ML) and AI methods experience are needed to advance the work.

Pertaining to the progress on case studies: Ongoing work

The case study groups are making progress towards achieving the objectives identified in the Terms of Reference (ToRs), in particular the Mediterranean and the Tropical Atlantic Case Studies. Progress made during the intersessional period will be presented in 2026. While there will be no formal review of the progress of the case studies in 2026, they continue to contribute through their support of indicator development for the EcoCard.

Pertaining to other ecosystem items

- *ECOtest: Priority 3*

  The Subcommittee will continue to advise on the development and validation of indicators and to explore the potential inclusion of marine turtle and seabird species.

- Response to Commission requests. Goals and objectives for components of the EcoCard.

Goal/Timing	*EcoCard Component*	*Objective*	*Contributor/s*
No expectation of development in 2026	Retained species: Not assessed	Perform Productivity and Susceptibility Analysis (PSA) for select retained unassessed species.	
Update for 2026	Retained species: Assessed	Update B_{RATIO} and/or F_{RATIO} values from recent assessments and deal with $F_{0.1}$ and MSE issue.	Alex/Eider
Update for 2026	Non-retained sharks (silky shark)	Increase the scope of the data used in the analysis. Include other gear types. Silky shark risk assessment based on Species Distribution Model (SDM) or vulnerability index.	Rui/Leire
Develop	Marine turtles	Perform risk assessment for loggerhead and leatherback turtles and indicator development Check progress of other tRFMOs.	Ochi/Andrés
Develop	Seabirds (albatross/petrel)	Create vulnerability indicator based on overlap of species distribution with longline & purse seine fisheries. ICCAT and/or Spatially Explicit Fisheries Risk Assessment (SEFRA) data.	James/Sachiko/Sebastian /Helen
Develop	Marine mammals	Discuss collaborations with the International Whaling Commission (IWC) and the International Council for the Exploration of the Sea (ICES). Following scoping exercise, develop index from Ecosim model of the tropical Atlantic.	Josu/Eider
Develop	Trophic structure, community and diversity indicators	Develop indicators from Ecopath with Ecosim (EwE) to monitor the biomass structure, size structure and trophodynamics of the ecological communities in the tropical Atlantic in response to fishing pressure and environmental drivers.	Josu/Eider/María José
No expectation of development in 2026	Habitat	Create indicators to monitor climate-induced and fishing-induced habitat changes in ICCAT species.	
Update and develop for 2026	Socio economic	Develop indicators based on socio-economic data. Develop tool to extract the socio-economic data adjusted for inflation and per ton of catch.	Sachiko/José Carlos/Diego

Goal/Timing	*EcoCard Component*	*Objective*	*Contributor/s*
Develop	Fishing pressure	Develop an indicator based on fishing effort or capacity.	Diego/TunaMed
Develop	Environmental pressure	Develop indicators that have a causal relationship with stock life history traits.	TunaMed/Diego/María José
Develop	Marine debris (abandoned, lost or otherwise discarded fishing gears (ALDFG))	Quantify annual ALDFG strandings.	Erin/Maitane

Bycatch

a) Conduct a workshop focused on the Bycatch Research and Data Collection Programme (PIRDCaF) of the Subcommittee.

The workshop would finalize the preparatory work already initiated by defining priorities and activities.

b) The bycatch of species is crosscutting across all species groups, and particularly sharks, so there is a need for coordination between these groups regarding the definition of bycatch species and appropriate reference points, the listing of species in ICCAT databases, among other issues.

c) Advance an assessment process of the impact of ICCAT fleets in the Mediterranean on the bycatch of other species (megafauna, endangered and protected species) that are not sea turtles.

Leverage the experience and collaborative work on the Mediterranean's sea turtles by extending activities to other taxonomic groups of interest to the Subcommittee.

d) Continue work within the Sub-group on Technical Gear Changes.

Within this Sub-group's objectives, activities relevant to bycatch can be framed.

e) Continue reviewing and refining the list of bycatch species in the ICCAT database.

The ICCAT databases contain a list of various taxa that require review by specialists.

f) Coordinate with other bycatch groups of tuna RFMOs to explore and reflect on different approaches for bycatch assessment and mitigation.

g) Continue the ongoing review of best-practice mitigation measures for seabird bycatch.

17.1.2 Subcommittee on Statistics Workplan for 2025/2026

Since 2017, the Secretariat has been developing the IOMS, released into production on 1 August 2021, a long-term, mission-critical project that requires full Secretariat commitment, and this work will continue throughout 2025-2026.

Additionally, the following tasks represent ongoing database improvements and maintenance that will continue throughout 2025 and beyond. Priority tasks for 2025/2026 include:

Tasks (ICCAT Secretariat)

- Finalize upgrade of all the ICCAT-DB system from Microsoft SQL Server 2016 to Microsoft SQL Server 2022.
- Improve the "client applications" that manage the databases of the ICCAT-DB system.
- Continue the development of the statistical/tagging dashboards (dynamic querying)
- Continue the tagging database development for both conventional and electronic tagging.
- Continue the Biological Sampling database development (includes data recovery/integration)
- Continue the standardization of the electronic forms (TG: tagging forms, CP: compliance forms)
- Extend the automatic data integration tools for the standardized electronic forms.
- Continue the development of the Geographic Information System (GIS) project (georeference all the pertinent ICCAT data available in ICCAT-DB).
- Continue the adaptation/migration of all the 50 databases of the ICCAT-DB system to the IOMS system.
- Continue the development of software libraries (in R and possibly Python) to standardize access and management of ICCAT public datasets.
- Continue the development of interactive applications to improve the dissemination of and simplify access to the core ICCAT public datasets through the web (T1 and T2 datasets, CATDIS, etc.).
- Study options to normalise in a single format (CSV) the existing agreed flat-form formats to provide Task 2 datasets (T2CE, T2SZ and T2CS). This work will provide preliminary guidance to the ad hoc working group on this subject.
- Review and develop proposals aiming to validate and potentially enrich Task 1, Task 2 and Task 3 datasets, using auxiliary information available at the Secretariat (VMS, FAD deployment, ICCAT Record of Vessels, etc.) to address SCRS scientific request, following the ICCAT data dissemination policy.
- Initiate the planning, design, development and data compilation for a database to manage SCRS recommendations (from all subsidiary bodies) and the SCRS's responses to the Commission, with the aim of facilitating traceability and improving effectiveness.

Intersessional activities (ad hoc working groups and meeting)

- Establish an ad hoc working group to standardize the T1NC tables included in the Executive Summaries.
- Establish an ad hoc working group to review and update the ICCAT Rules & Procedures on data protection, access, and dissemination, and to propose text amendments and an implementation timeline.
- Establish an ad hoc working group to define a standardized procedure for addressing reporting gaps via estimates ("carryovers") and to produce guidance for Species Groups/Executive Summaries.
- Establish an ad hoc working group to modify form ST09 to include the minimum feasible subset of additional information requested by the *Recommendation by ICCAT on the bycatch of sea turtles caught in association with ICCAT fisheries (combine, streamline, and amend Recommendations 10-09 and 13-11)* (Rec. 22-12)
- Establish a small ad hoc working group to refine the Secretariat's CSV flat-file proposal for ST04 (Size Samples), inviting CPCs currently using specially agreed formats to participate, and to consider defining analogous flat-file specifications for ST05 (Catch-at-Size) and ST03 (Catch and Effort).

- The Convener of the Subcommittee proposes holding an additional intersessional online meeting in 2026 (last week of February). Regarding the possibility of repeating this meeting bi-annually, the Subcommittee on Statistics agrees to hold this initial meeting and evaluate its usefulness.

17.1.3 Working Group on Stock Assessment Methods (WGSAM) Workplan

The following items were identified for the 2026 workplan. The Committee anticipates that work on these topics will extend beyond 2026.

On the Bycatch Estimation Tool (BYET)

- Conduct a debriefing of the 2025 ICCAT Workshop on the Use of the Bycatch Estimation Tool (BYET) with the BYET contractor to identify further development that may be required.

- Depending on the progress of the software development of BYET that does not require users to have R skill, conduct a new training workshop on the use of the BYET in 2026.

- Continue to review the submitted methods proposed to estimate the dead and live discards (bycatch) occurring in specific fisheries/fleets that have been forwarded from Species Groups and provide feedbacks to further improve those methods.

  Reviews will be based on a detailed description of the methods, model diagnostics for model evaluation (e,g, simulation testing) and, when possible, the performance against alternative modeling approaches.

On addressing the provision of management advice under non-stationary conditions

- A dedicated session in the 2026 meeting of the WGSAM first focusing on recruitment assumptions on projections and ways to characterize stock status under non-stationarity, with appropriate invited speakers. Preparatory work by the WGSAM should be done reviewing different alternatives for presentation at the meeting.

- This item was identified by the WGSAM as a priority following the discussions on the session on Climate Change, on how best to provide advice when using projections under non-stationary conditions.

On issues related to best practices in stock assessment

- To the extent possible, the WGSAM will review aspects of stock assessment brought to its attention by SCRS Species Groups in advance of the next meeting.

  Review and advise on best practices for assessments where the data have little contrast to estimate stock status reliably and where priors may have undue influence on results was proposed as a topic requiring attention.

17.1.4 Albacore workplan

The Mediterranean, South Atlantic, and North Atlantic albacore stocks were assessed in 2024, 2020, and 2023, respectively. In the case of North Atlantic albacore, a Management Procedure (MP) was adopted in 2021.

The main objectives for 2026 are to conduct a full stock assessment for South Atlantic albacore and develop the Management Strategy Evaluation (MSE) framework for this stock, to iterate the current MP for the North Atlantic albacore and test alternative new MPs under the new MSE framework, to apply the exceptional circumstances protocol (ECP) of the northern stock, and to continue with the research as defined in the Albacore Year Programme (ALBYP).

Two hybrid intersessional meetings are envisaged, a data preparatory meeting (5 days, March) and a stock assessment meeting (5 days, June-July).

North Atlantic stock proposed workplan

a) Stock assessment and MSE:

- Update (up to 2024, and if possible 2025) the following standardized CPUEs (single area, yearly scale, for MP iteration). *Deadline:* One week before the data preparatory meeting. *Deliverable:* SCRS documents, following the standards provided by the Working Group on Stock Assessment Methods (WGSAM). *Responsibility:* CPCs:

  - Japanese longline
  - Chinese Taipei longline
  - US longline
  - Spanish baitboat

- The biomass dynamic model (mpb) will be fit to the updated catch and Catch per unit effort (CPUE) data, in order to iterate the Management Procedure according to the *Recommendation by ICCAT on conservation and management measures, including a management procedure and exceptional circumstances protocol, for North Atlantic albacore* (Rec. 21-04). *Deadline:* One week before the assessment meeting. *Deliverable:* SCRS Document. *Responsibility:* MSE Contractor.

- Dialogue with Commission to guide the SCRS on updated management objectives and performance statistics.

- Finalize the new MSE and test alternative MPs (model based or empirical) to provide advice to the Commission on alternative new MPs. *Deliverable:* SCRS Document. *Responsibility:* MSE contractor.

- Document the new MSE in a consolidated document. *Deadline:* One week before the Species Groups meetings. *Deliverable:* SCRS Document. *Responsibility:* MSE Contractor.

- Determine whether exceptional circumstances occur, according to the indicators in the ECP (Rec. 21-04). *Deadline:* One week before the Species Group meeting. *Deliverable:* SCRS Document. *Responsibility:* MSE Contractor.

b) Research:

- The Committee reiterated the need to continue research activities within the ALBYP. Within biological studies, for 2026, the priority is to continue the electronic tagging studies. *Deadline:* One week before the Species Group meeting. *Deliverable:* SCRS documents. *Responsibility:* EU-Spain and Albacore Species Group.

South Atlantic stock proposed workplan

a) Stock assessment:

- The Committee endorsed conducting a full stock assessment for South Atlantic albacore in 2026 using an age structure model (e.g. Stock Synthesis) noting that this assessment will also provide the conditioning inputs for a future MSE. *Deliverables:* SCRS document *Deadline*: One week before the assessment meeting *Responsibility*: Rapporteur and CPC scientists.

b) MSE development:

- Following advice from the albacore Species Group, the Committee will: review and update Operating Model (OM) conditioning based on assessment-model outputs; amend uncertainty sets/OMs with any new information submitted to the assessment if needed; specify and agree additional robustness OMs; define and agree performance indicators consistent with *Resolution by ICCAT on development of initial operational management objectives for southern Atlantic albacore* (Res. 24-09) objectives; develop and agree candidate CMPs; and compile the updated MSE in a single consolidated document. *Deadline*: One week before the Species Group meeting. *Deliverable*: SCRS document. *Responsibility*: MSE Technical Team.

c) Research:

- The Committee reiterated the need to continue research activities within the ALBYP. Within biological studies, for 2026, the priority is to continue the reproductive biology and electronic tagging studies. D*eadline:* One week before the Species Group meeting. *Deliverable:* SCRS documents. *Responsibility:* Brazil, with the support of partner CPCs, Namibia, South Africa, Uruguay, and Chinese Taipei.

Mediterranean albacore stock proposed workplan

a) Research:

The Committee reiterated the need to continue research activities within the ALBYP. For 2026, the priorities are:

- To continue recovery of Task 1 and Task 2 data to allow building of alternative catch scenarios.

- To assess the reliability of the historical part of the larval index. In the 2024 Mediterranean Albacore Data Preparatory and Stock Assessment Meeting (Anon., 2024f), the Group identified that the calibration of gears (B60 and B90) for the sampling of larvae in the MED-W is a high research priority. The larval index in this area has strong influence on the assessment and the albacore Species Group needs to ensure that the abundances obtained from the different fishing methods are comparable, and that the gear calibration method is adequate, since this method was originally designed and parameterized for bluefin tuna. To address this key question, the team will assess the adequacy of gear calibration methods in the MED-W. The team will present results from processing experimental fishing samples (B90 and B60 samples collected in same locations) from the 2013 campaign, evaluate the options for processing historical samples from the 2019 experimental fishing campaign, analyse the larval abundance distribution from current available data and propose alternatives for the calibration procedures to be discussed by the albacore Species Group. This task will be conducted in cooperation with the Bluefin tuna Technical Sub-group on Early Life History.

- To develop a growth model for the Mediterranean stock that integrates the different studies on the matter available to date.

17.1.5 Billfishes workplan

Considering the recommendations from the SCRS, the Billfish Species Group will continue working on developing and implementing the research work plan (6 years) in 2026.

Catch (Task 1), catch and effort, and size data (Task 2)

CPCs catching billfishes (directed or bycatch) are required to report species-specific catches (including live and dead discards), catch and effort, and size information by the required spatial and temporal scale.

Discards

The Working Group on Stock Assessment Methods (WGSAM) has developed a generalized tool for the estimation of bycatch. The Bycatch Estimator Tool (BYET) uses observer data combined with either total effort data from logbooks or with landings to estimate total bycatch. CPCs should make every effort to take advantage of this tool and participate in any future workshop(s) in an effort to improve the estimation and reporting of billfish discards.

Life history parameters

Continue the Enhanced Programme for Billfish Research (EPBR) activities including:

- Age and growth studies on billfish (blue marlin, white marlin and sailfish) in the eastern Atlantic (West Africa) with regards to:
    - Continue sampling on the priority sizes, and sample processing of both spines and otoliths;
    - Continue age estimation and growth modelling;
    - Conclude age validation for blue marlin through bomb radiocarbon, while starting the work for white marlin;
    - Continue building a reference set for both spines and otoliths, with a repository of digital images of the structures.
- Continue the research and biological sampling of blue marlin from the Gulf of Mexico Mexican longline and recreational fisheries.

Tagging

- To continue the satellite tagging of blue and white marlin on the South Portugal coast in the recreational fishery and conduct opportunistic electronic and conventional tagging in other areas of the eastern Atlantic.

CPUEs

- Explore the possibility of estimating a multi-fleet LL CPUE as has already been done for other ICCAT species, to address the conflicting CPUE trends. As a first step, interested CPCs can join the online meetings for SMA to understand how the joint data can be combined

17.1.6 Bluefin Tuna workplan

The primary focus of the Committee on bluefin tuna for 2026 and beyond is to do the stock status assessment and MSE review, as follows:

- **September 2025** Data guillotine for indices, genetic and otolith composition data for "continuity" status assessment. Develop call for tenders for modeling contractors and MSE revision work. Discuss proposals for revised spatial structure. Develop a proposal for the Terms of Reference (TORs) for the status check models.

- Establishing a Modeling Subgroup to be composed of quantitative experts in stock assessment modeling composed of both western and eastern scientists.

- The main objectives set for the Modelling Subgroup are:

  - Objective 1. The Modeling Subgroup will be tasked with taking guidance from the BFT Species Group to develop stock assessment models for a continuity run as a first step to inform the status check.

  - Objective 2. The Modeling Subgroup will also be tasked with taking guidance from the BFT Species Group to develop the most plausible model for the status assessment and the initial framework for the MSE operating models, starting with the existing models and making modifications as guided by the BFT Species Group, with a specific recommendation for a simpler 4 areas model.

- Schedule of meetings and tasks:

1. 2026 Panel 2 meeting to initiate dialogue on workplan

2. Hold one intersessional meeting in April 2026 (online): data preparatory meeting (online)
   a. Initial Continuity model runs (MARS and area specific SS models) presentation
   b. Critical review of CPUE time series
   c. MSE review data scoping and recommendations
   d. Draft sensitivity "status assessment" model runs
   e. Finalize alternative model structure using MARS for stock mixing and
   f. Create MP developer teams

3. Hold one status assessment meeting (hybrid, in-person) in July 2026:
   a. Review sensitivity model runs
   b. Develop status assessment advice to include stock status based on fishing mortality and possibly biomass
   c. MSE review modeling scoping incorporating feedback from Panel 2 and MP developer teams.

4. Finalize status assessment in September 2026 and approve MSE structural assumptions and data guillotine for MSE data inputs.

5. Continue to support the Atlantic-Wide Bluefin Tuna Research Programme (GBYP) that will focus on supporting the stock status assessment and the MSE review, the tagging and electronic tagging database, the biological studies and conducting the Balearic Aerial Survey.

6. Annual index provision up to 2025 by 1 September 2026, and determination of Exceptional Circumstances at the Bluefin Tuna Species Group meeting.

7. Work on Responses to the Commission.

The tentative plan beyond 2026 is as follows:

- **March 2027:** Panel 2 meeting to present overview of the MSE structure
- **April 2027:** MSE workshop on OM conditioning and initial runs with MP

  (optional independent experts peer review of MSE framework, if substantively revised)
- **September 2027:** Sign off on conditioning
- **March 2028:** Panel 2 meeting, initial feedback on MP performance
- **April 2028:** Further development, vetting and tuning of MP and other Candidate Management Procedures with possible iterative online meetings for further development
- **September 2028:** Finalize Candidate MP to present to Panel 2 for 2029-2031 TAC advice
- **October 2028:** Extra Panel 2 meeting to select CMP and develop TAC advice
- **September 2029:** Revised EC protocols drafted

17.1.7 Sharks Workplan

The Shark Species Group (SSG) conducted a Shortfin Mako Shark Stock Assessment Meeting (Anon., 2025g) in 2025. The assessment for the North Atlantic stock did not provide reliable results. Thus, the SSG planned to continue the stock assessment in 2026. In preparation for the planned stock assessment of North Atlantic stock of shortfin mako for 2026, the Group will conduct the following activities:

- Hold a 3-day online (informal) meeting (mid-February) to evaluate the joint CPUE index for the North Atlantic and size data.
- Hold a 1 to 2-day online (informal) meeting to review CPUE indices and size data (TBD).
- Hold a 1-day (informal) online meeting to discuss grouping/time blocks of CPUE indices (TBD).
- Hold a 1-day online (informal) meeting to discuss and establish a protocol for model weighting (two weeks before stock assessment).
- Hold a 5-day stock assessment meeting (in June/July), using data through 2024.

The following tasks will be required for the shortfin mako stock assessment:

Data

- Provide catch data by CPC to produce the combined CPUE index by 30 November 2025.
- Update the sex-specific length-composition data from CPCs, including the year 2024, by 30 November 2025.
- For those CPCs not participating in the combined index, provide standardized CPUE series going through 2024 in the form of SCRS documents.
- Identify appropriate CPUE indices for use in shortfin mako stock assessment models.
- Updating the T1 nominal catch series by including the year 2024.

Assessment meeting

- Provide a set of model diagnostics according to the best practices for stock assessment models and recommendation from the WGSAM.
- Consider stock assessment model ensemble scenarios that take into consideration the main uncertainties identified by the SSG, and the respective model weighting schemes.
- Begin preparations for the North and South Atlantic blue shark MSEs, including BSH MSE Technical Team, considering operating model uncertainties, updating MSE roadmap and workplans.

Other

- Continue the activities of the Sharks Research and Data Collection Programme (SRDCP).
- Continue and/or expand participation in the SCRS Sub-group on Technical Gear Changes in order to participate in the tasks assigned to it (see the Second Report of the Sub-group on Technical Gear Changes, (Anon., 2022e) and SCRS/P/2025/035.
- Continue and/or expand participation in the SCRS Sub-group on EMS in order to participate in the tasks assigned to it.
- Start planning the 2027 intersessional meeting of the Sharks Species Group focused on the Mediterranean, with the aim to evaluate the possibilities of assessment of main shark species. The development of this meeting would be developed in coordination with the SC-ECO.

17.1.8 Small Tunas Workplan for 2026 and beyond

This workplan foresees both short and long-term objectives (see specific timeframes below).

Progress on the biological studies of small tunas

Background/objectives*:* The Small Tunas Year Programme (SMTYP) started in 2016-2017 with the initial aim of recovering SMT historical data (statistical and biological data) from the main ICCAT fishing areas, including the development of specific components of biological studies.

Leader/participation: The consortium led by BLUE IMPACT (Brazil) is available to continue coordinating the research activities developed within SMTYP in 2026.

Reproduction

Monthly sampling of gonads is essential for studying the reproductive biology of the different species in order to determine size at first maturity and the spawning season. Size frequencies have shown the absence of individuals in certain size classes during some months of the year, which represents a significant bias. On a regional scale, it is therefore essential to maintain the monthly collection of gonadal samples to fill these knowledge gaps (refer to the reference table).

These funds will go towards finalizing ongoing reproduction studies in the order of priority indicated below.

Priority: High priority - to conclude ongoing studies following the above mentioned order of priority and keep collecting monthly gonadal samples (for 1. BON 2. BLT 3. FRI 4. LTA 5. WAH) to fill knowledge gaps.

Timeframe: The reproduction studies on BON will be finalized by 2027 and the other ones will be finalized by 2029.

Age and growth

The collection of dorsal spines and otoliths for LTA, BON, WAH, BLT, and FRI remains a top priority to close key knowledge gaps on small tuna age and growth:

- LTA: In the NE Atlantic and Mediterranean, substantial samples are already available, with spines identified as the preferred structure. In the SE and SW Atlantic, additional samples, especially larger fish, and genetic validation are still needed.
- BON: A preliminary reference set exists in the NE Atlantic, with finalization expected by 2026. Other regions still require more standardized spine sampling.
- WAH: Major discrepancies between spines and otoliths highlight the need for standardized processing and better-quality images before reference sets can be finalized.
- BLT and FRI: Processed samples exist (e.g. Portugal), but most available material from other regions requires processing and genetic validation, with gaps in larger individuals.

The collection of hard structures for growth studies should follow the order of priority observing the most needed sizes: 1. BON (large samples and small samples), 2. LTA (large specimens to conclude studies in 2026), 3. WAH (small and large fish), 4. BLT and 5. FRI.

The budget will go also towards finalizing the current studies for all five species.

Priority: High priority - expand the collection of hard structures for BON and LTA in the South Atlantic, complement BLT and FRI sampling, and consolidate reference collections for BON, LTA, and WAH.

Timeframe: Final reference sets of hard structure images for BON, LTA, and WAH should be completed by September 2026. For BLT and FRI, a detailed plan will be proposed by September 2026, with completion expected by 2027. The estimation of growth parameters for the remaining species should be completed by 2029.

Genetics

1. Conclude studies on LTA (highest priority) on Mauritanian coast to determine the boundary between the stocks
2. Initiate stock structure (lower priority) studies for FRI and BLT and to support genetic differentiation between FRI (first priority) and BLT (second priority).

Priority: High priority - to keep collecting tissue samples to fill knowledge gaps for LTA, FRI, and BLT to finalize the genetic studies.

Timeframe**:** The genetic studies on LTA, BLT and FRI shall be completed by the end of 2029.

Leader/participation*:* University of Girona (Jordi Viñas).

Systematics and identification of species and stocks

Undertake a feasibility study to determine the requirements (financial, personnel, etc., sampling) for doing a morphometric and morphological comparison between fresh/frozen specimens of *Euthynnus alleteratus* from the Northeast Temperate Atlantic, the Southwest Atlantic, the Mediterranean Sea, and the eastern tropical Atlantic to assess if physical characters can be used to discriminate the two genetically different stocks.

Priority: Medium.

Timeframe: The feasibility study shall be completed by 2026.

Leader/Participation: To be determined.

Updating the biological meta-database

In 2016, the Small Tunas Species Group started gathering information on a biological meta-database. The Committee recognized the importance of continuously updating this database as new biological information becomes available, also developing criteria for replacing existing parameters when available. Such information is then provided to update the SMT Executive Summaries and will eventually be used for both qualitative and quantitative assessments for the different species and stocks.

Priority: Medium priority - to keep collecting tissue to fill knowledge gaps for BLT and FRI.

Timeframe**:** A SCRS paper/presentation will be presented annually to the Species Groups.

Leader/Participation: EU-Portugal, with collaboration of CPCs willing to participate, will continue to update the meta-database and provide updated information (in the form of SCRS papers or presentation) to the SMT Species Group. The updates will be presented on an annual basis. Dr Pedro G. Lino (EU-Portugal) and Mr Rubén Muñoz-Lechuga (EU-Spain) will be coordinating this activity.

Data mining and recovery contract

Data from the Northwest Atlantic are entirely absent from the minor tuna species database. CPCs with historical data on small tunas are encouraged to provide this information to ICCAT. This study will be essential for improving the quality of existing statistical data. In addition, a contract should be issued to carry out additional data mining activities in selected countries/regions.

Priority**:** High priority - CPCs with historical data on SMT to provide this information to ICCAT. This study will be essential for improving the quality of the existing statistical data. In addition, a contract should be issued to fill additional data mining activities in selected countries/regions.

Timeframe: A SCRS paper/presentation will be presented to the 2027 Species Group meeting.

Small tunas stock assessment

The overarching objective is to achieve a full stock assessment for at least one small tuna species by 2029, supported by standard biological and fisheries data. Building upon the outcomes of the 2024 Technical Capacity Building Course on the use of Data Limited Stock Assessment Methods for Small Tunas held from 10-13 September 2024 at the Secretariat, the Group recognizes the urgent need to strengthen age and growth studies (particularly for LTA, BON, BLT, and FRI).

By 2026, an expert Sub-group on Data-Limited Assessment Methods will be set up within SMT Species Group, and convene to evaluate the suitability of available datasets and life-history parameters, including growth, maturity, and stock structure. This sub-group will also design a roadmap to fill existing gaps through targeted sampling and intersessional collaboration. In parallel, efforts will focus on trying to develop standardized abundance indices from artisanal and industrial fisheries, with a view to harmonizing data across regions.

Annual progress reports will be provided to the Small Tunas Species Group, including updates on the data and parameters availability for the different stocks and the developed preliminary model structures. This stepwise approach is intended to increase the probability that, by 2029, the necessary foundations are in place for conducting a stock assessment of at least one priority small tuna species.

***Priority*:** High priority.

Timeframe: Online meetings will be carried out by the Sub-group in 2026. If they determine that a stock assessment meeting is feasible, then a five-day in-person stock assessment meeting will be held in 2027. The Sub-group will aim to conduct a stock assessment of one small tuna species (single stock). The Sub-group will report to the SMT Species Group in 2026 and 2027.

Leader/Participation: Pedro Lino, Mariela Narváez, Thierry Fredou.

Intersessional Meeting of the Small Tunas Species Group in 2027

To schedule intersessional meetings of the Small Tunas Species Group aiming to apply data-limited methods to selected stocks/species in 2027.

***Priority*:** High priority.

17.1.9 Swordfish Workplan

North and South Atlantic

Stock assessments for North and South Atlantic swordfish were conducted in 2022 (Anon., 2022b). An assessment for Mediterranean swordfish was conducted in 2020. The Committee requested two hybrid, intersessional meetings of the Swordfish Species Group in 2026 in order to complete assessments for the Mediterranean and South Atlantic stocks: a five-day data preparatory meeting and a five-day stock assessment meeting. Within those meetings and time permitting, the Species Group will make advancements to other workplan items listed below.

Life history project:

- *Background/objectives:* An understanding of the species biology, including age, growth and reproductive parameters is crucial for the application of biologically realistic stock assessment models and, ultimately, for effective conservation and management. Given the current uncertainties that still exist in those biological parameters, the Committee recommended that more studies on swordfish life history are carried out. Those should be integrated with an ICCAT swordfish research plan that is provided in the recommendations with financial implications.
- *Priority:* High priority.
- *Leader/Participation:* A consortium led by EU-Portugal and Canada with participation from several CPCs.
- *Timeframe:* Started in 2018 and currently ongoing; there is a request for funds to continue work throughout 2029.

Work related with northern Management Strategy Evaluation (MSE):

- *Background/objectives:* The initial focus specific for North Atlantic swordfish, which began in 2018 and involved some development of the framework to use in the OM development, was further developed in subsequent years. Consistent with the MSE implementation roadmap adopted by the Commission, various components of the MSE framework are ongoing and are outlined below and in the ICCAT MSE roadmap. Additional work is needed on robustness testing (including analysis on effectiveness of minimum size limits and climate change effects on swordfish).
- *Priority:* High priority.
- *Leader/Participation:* MSE contractor; core MSE technical team.
- *Timeframe:* Ongoing (see ICCAT MSE Roadmap in **Appendix 7**).

Pop-up Satellite Archival Tag (PSAT) deployment and tag data request for joint analyses:

- *Background/objectives:* The Committee has identified priority locations for deployment of PSATs in the Atlantic. For 2026, these include areas of stock mixture in the Northeast Atlantic and the Northwest Atlantic. Deploying PSATs in these locations will support ongoing work on stock structure and mixing, identification of spawning areas, and work on habitat suitability which is incorporated into catch per unit effort (CPUE) standardization and Climate Change related advice. The Committee continues to encourage all CPCs to provide their swordfish PSAT tag data to an ad hoc study group. As a minimum the data should include the temperature and depth by hour, date and one-degree latitude*longitude square. This will contribute to support the improvement of CPUE standardization through the removal of environmental effects as well as the better definition of stock boundaries. This activity is linked with another from the WGSAM workplan.
- *Priority:* High priority.
- *Leader/Participation:* Led by the EU-Portugal and Canada, with the participation of CPCs with PSAT data.
- *Timeframe:* Started in 2018, ongoing to date; to continue in 2026.

Continuing work on environmental effects:

- *Background/objectives:* Given the possibility of spatial and environmental effects being partially responsible for the conflicting trends of some of the influential indices of abundance, the Committee should further study this hypothesis during the coming years, use existing PSAT data to compliment this work, and determine how best to formally include these environmental covariates into the overall assessment process. The United States has taken a lead role in this investigation and likely collaborators would include scientists from Canada, Japan, and the EU (Spain and Portugal) as their indices of abundance are the most appropriate for this work. Expected deliverables would include quantified reduction in the conflicting indices of abundance from the temperate and tropic regions, which in turn should lead to a more stable stock assessment. Other products could include an increased understanding of the distribution of swordfish and perhaps a revisiting of the geographic structure of the data and the assessment. This work should be expanded to include the Mediterranean. Given projected Climate Change effects, the Group will explore future scenarios with updated data sources. This will support MSE work on development of robust climate advice. Additionally, the Species Group intends to support the ongoing work of the Subcommittee on Ecosystems and Bycatch (SC-ECO) to trial the provision of climate conditioned risk equivalent management advice for North Atlantic swordfish.
- *Priority:* High priority.
- *Leader/Participation:* TBD, with participation of SC-ECO, and other CPCs.
- *Timeframe:* Ongoing, to be considered at the next stock assessment.

Application of methods to estimate dead discarding of swordfish in ICCAT fisheries:

- *Background/objectives:* The Committee continued to note that dead discard reporting for all three swordfish stocks is poor. As such, the Committee noted the importance of applying dead discard estimation analyses (e.g. bycatch estimator tool (BYET) developed at the WGSAM) to swordfish stocks. The Committee will work with national scientists to implement discard estimation for major swordfish fleets in advance of the next stock assessment.
- *Priority:* High priority.
- *Leader/Participation:* WGSAM, CPC scientists.
- *Timeframe:* Ongoing, to continue in 2026.

Explore development of a combined CPUE index for the southern stock:

- *Background/objectives:* A small technical group will explore development of a combined index to improve the input data for the South Atlantic assessment models. To accomplish it, the ICCAT Task 2 catch and effort data will be the main data source, but also the detailed catch and effort data from different CPCs can ideally be used for this purpose, in case sharing data is possible.
- *Priority:* High priority.
- *Leader/Participation:* Collaborative work of CPCs scientists.
- *Timeframe:* Anticipated to start in 2026.

Revise and update conversions for the swordfish stocks:

- *Background/objectives:* The Swordfish Species Group recognized the need to develop conversions for new dressed formats and that the conversions provided on the ICCAT website may be incomplete or out of date and need to be updated
- *Priority:* Medium priority.
- *Leader/Participation:* Secretariat/Rapporteur.
- *Timeframe:* 2026

All stocks

Assess use of trapline gear

- *Background/objectives*: The Committee noted the growing use of trapline gear in the Atlantic and Mediterranean. The Committee considered new studies from EU-Italy, EU-Portugal and Japan. Early evidence suggests that catchability, selectivity, and bycatch for this gear differ from typical longline gear. The objective of this work is to identify when and where this gear type has been widely used and then update catch and effort records, with a view to estimating CPUE calibration coefficients or developing new CPUE series.
- *Priority:* High priority.
- *Leader/Participation:* Led by the SWO-MD rapporteur with participation from other CPCs.
- *Timeframe:* 2026

Mediterranean

For the Mediterranean stock, the last assessment was conducted in 2020 (Anon., 2020b). The next assessment should be completed in 2026 for Mediterranean swordfish but, in order to monitor stock trends, essential fisheries indicators (e.g. catch, indices of abundance), should be reviewed and developed by a sub-group in advance of the next stock assessment.

Given the above needs and taking into account the questions raised during the latest assessment the workplan will include:

- Review relevant fisheries and biological data.
- Update estimates of standardized CPUE indexes for the most important fisheries, taking into account the new trap-line gear.
- Obtain estimates of discard misreporting.
- Estimates of undersized catch.

Additionally, the Committee encourages national scientists to identify the effects of the environment on swordfish biology, ecology and fisheries. Future CPUE analyses should evaluate the benefits of taking into account important climate and oceanographic changes that have occurred recently in the Mediterranean Sea (e.g. eastern Mediterranean transient) and may have impacted the availability of the stock to some fisheries, and/or the recruitment success of the population.

- *Timeframe:* By the next stock assessment.
- *Priority:* Medium.
- *Participation*: All CPs.

17.1.10 Tropical Tunas Workplan for 2026

Management Strategy Evaluation (MSE)

The Committee will continue to support the development and eventual implementation of the SKJ-W and Multi-stock MSE. Continued development of these MSEs is enhanced by the ability of all members of the Committee to have a basic understanding of the MSE processes and to contribute to technical aspects of these.

Multi-stock MSE

In 2025, the tropical tunas multi-stock MSE advanced with the development and assessment of multi-stock or hybrid HCR within CMP. In 2026, the tropical tuna Species Group will interact with the Commission for guidance on the use of multi-stock CMPs and their future implementation. Technical work will continue to refine these CMPs based on management objectives (as suggested in Res. 24-02 para 3), and the realistic responses of fisheries to management measures, , and explore other Limit Reference Points (Res. 24-02 para 2). All updates will be documented and shared through SCRS and trial specification document (TSD) in intersessional meetings.

- January-March: Refine CMPs based on new management objectives, improve realism and responsiveness to changes in all three stocks. Document updates in TSD.
- April-July: Present progress on MSE and CMPs evaluations to the tropical tuna Species Group and SCRS.
- September: CMP refinement based on feedback from in-person meeting.
- September: Present the draft final multispecies MSE results to the SCRS during Species Group Meeting for adoption by Species Group and Plenary.
- September - November: Prepare communication materials for ICCAT Commission meeting.
- November: Present the multispecies MSE final results to Panel 1 for consideration for MP adoption.
- Prioritize Ambassador/Commission team meetings. If possible, this could start as early as October 2025 for introductory meetings.
- Virtual technical team meetings to be scheduled as needed.

The Committee proposes that Panel 1 holds an online 1-day meeting in coordination with the SCRS during the first semester of 2026 to advance work on the objectives of the multi-stock MSE.

SKJ-W MSE

In 2025, as a result of the discussions held during the 24th Special Meeting of the ICCAT Commission, new considerations regarding conceptual management objectives were proposed for the development of the MSE for western Atlantic skipjack tuna. Among these, the definition of a minimum acceptable probability of maintaining the stock at sustainable exploitation levels in the medium term (PGK ≥ 60%) and a maximum acceptable variation in the definition of a TAC (≤ 25%) were the key points that changed from the original CMPs and that guided the new developments of the western Atlantic skipjack tuna MSE in 2025 (for further details, see Rec. 24-04).

Throughout 2025, in order to meet the new definitions adopted by the ICCAT Commission and to incorporate the necessary updates into the input data for the western Atlantic skipjack tuna MSE, a range of analytical procedures were implemented. These included the reconditioning of operating models with updated data provided by each CPC up to 2024, the inclusion of robustness scenarios aimed at bringing potential perspectives on the influence of Climate Change on the stock, and the adaptation and development of new management measures to support the adoption of an MP in 2025. All these steps were aligned with the roadmap approved by the Commission in 2025.

In light of this roadmap and the planned adoption of an MP in 2025, the expected actions for the continued development of the western skipjack MSE will be:

- January – September: Development of the scientific aspects of the protocol for ECs.
- October – November: Provision of final inputs on the ECP to the ICCAT Commission.
- January – November: Preparation of communication materials related to this protocol.

Improvement of biological parameters

The Committee will continue to support activities related to the AOTTP programme and the continuation of the analysis of the AOTTP data. These activities will provide data on recaptured tagged fish, and reporting rates of tagged fish through seeding experiments. The work will be focused on the monitoring of recaptured fish and tag seeding in West Africa.

Biological parameters of all tropical tuna stocks continue to have large associated uncertainty, and in particularly those related to growth models and ageing. Although tagging is providing valuable information on growth, it tends to be restricted to a narrow range of lengths and ages. The range is defined by the smallest fish that can be tagged, by the survival rate of those fish and reporting behaviour of different fleets. Growth of small fish and of large fish is therefore not well informed by tagging. The Committee has therefore been engaged in the collection of samples for ageing. This collection has been particularly fruitful in West Africa with the support initially of the AOTTP and currently of ICCAT TTRaD. For 2026, the Committee recommend that this work be continued, with the addition of a validated reference age collection and standardized age key for input in skipjack stock assessment be produced (bomb radiocarbon age validation).

Deliverables for biological sampling programs listed above will include:

- An update on the numbers of samples collected by area and length
- Methods used to analyse samples and validation
- Updates to relevant parameters
- Submission of data to SCRS
- Commitment to present results at relevant tropical tuna meeting.

Workshops

In 2026, ITUNNES is organizing a workshop aimed at standardizing methodologies for age-growth analysis, reproductive status assessment, and data analysis. Funding is requested to broaden participation in this workshop, which would allow standardization of methods across different laboratories, seek various data sources, and ultimately conduct a joint analysis, thereby improving the estimates for the different tropical tuna stocks.

17.2 Intersessional meetings proposed for 2026

Given the current resources of the ICCAT Secretariat and existing levels of support from CPCs in terms of the participation of scientists, the Committee is limited in the number of formal SCRS meetings that can be conducted each year. This calendar reflects the priorities identified by the Committee for intersessional work requiring formal meetings to be carried out in 2026. The SCRS will also conduct numerous informal meetings not reflected in the calendar. The formal meetings include:

Stock assessment processes:

1) Albacore

ALB-S - last assessed in 2020 using data through 2018 (Report of the 2020 ICCAT Atlantic Albacore Stock Assessment Meeting (Anon., 2020a)).

The ALB-S stock assessment (one data preparatory and one assessment meeting) will be conducted using a statistically integrated assessment model (SS) which, in addition to providing stock status information, will serve as the basis for the Operating Models used for the ALB-S MSE. A status check and iteration of the ALB-N Management Procedure (MP) will also be addressed during the meetings.

2) Swordfish

SWO-S - last assessed in 2022 using data through 2020 (Report of the 2022 ICCAT Atlantic Swordfish Stock Assessment Meeting ((Anon., 2022d.)).

SWO-MD - last assessed in 2020 using data through 2018 (Report of the 2020 ICCAT Mediterranean Swordfish Stock Assessment Meeting (Anon., 2020d).

Based on the latest information available, the Committee will determine the terminal year of data for each swordfish assessment (both stocks to be assessed in parallel at the same meetings, one data preparatory and one for the assessments), excluding those recent years where the use of trapline has increased beyond negligible levels. At the time of this 2025 SCRS Plenary meeting, current information indicates that, for SWO-S data, from years up to 2023 or 2024 could be included in the stock assessment, and for SWO-Med, the terminal year of data would be set at 2022 or 2023. New information on trapline will also be used at this meeting.

3) Sharks

SMA-N - last assessed in 2017 using data through 2015 (Report of the 2017 ICCAT Shortfin Mako Assessment Meeting (Anon., 2017b).

A new assessment for SMA-N was undertaken in 2025. However, due to issues with the data, particularly conflicts between the available abundance indices, as well as the inclusion of new life history scenarios, the assessment model results were not considered suitable for management advice. During 2026, there will be dedicated effort by the SCRS to resolve the data issues, including by developing a joint abundance index for the North Atlantic, as well as to advance work on developing the BSH-N and BSH-S MSEs. One hybrid meeting will be held in 2026 to carry out the SMA-N stock assessment, as well as to advance work on developing the BSH-N and BSH-S MSEs that will be reviewed during that meeting.

Other intersessional meetings:

4) Bluefin tuna

The Bluefin Species Group plans an online only meeting to prepare data, and a hybrid meeting to carry out a status check, as part of the MP review process called for in Rec. 23-07.

5) **Tropical tunas**

Tropical Tunas Species Group to advance work on the tropical tunas multi-stock MSE.

6) **Working Group on Stock Assessment Methods** annual meeting.

7) **Subcommittee on Ecosystems and Bycatch** annual meeting.

8) **Ad hoc Working Group on Coordination of Tagging Information** one day online meeting to discuss topics regarding programme coordination, tag performance, tag recovery, etc.

9) **Intersessional Meeting of the Subcommittee on Statistics**

Due to the limited time available during the September meeting and the diversity and complexity of the subjects discussed by the Subcommittee, a 2-day online intersessional meeting was requested for 2026 with a view to evaluating the possibility of having this online meeting bi-annually.

Table 17.2.1 Below summarizes the SCRS meetings scheduled for 2026.

Tentative date	*No. days*	*Meeting*	*Format and Location*	*Interpretation*
3 February	1	Meeting of the Ad hoc Working Group on Coordination of Tagging Information	Online*	NO
24-25 February	2	Intersessional Meeting of the Subcommittee on Statistics	Online*	YES
9-12 March	4	First Intersessional Meeting of the Bluefin Tuna Species Group	Online*	NO
23-27 March	5	Swordfish Data Preparatory Meeting	Hybrid, Madrid (Spain)	YES
13-17 April	5	Albacore Data Preparatory Meeting	Hybrid, Madrid (Spain)	NO
20-22 April	3	Intersessional Meeting of Tropical Tunas Species Group (including MSE)	Hybrid, Madrid (Spain)	YES
18-22 May	5	Subcommittee on Ecosystems and Bycatch Meeting	Hybrid, Madrid (Spain)	YES
25-28 May	4	Working Group on Stock Assessment Methods Meeting	Hybrid, Madrid (Spain)	NO
8-12 June	5	North Atlantic Shortfin Mako Stock Assessment Meeting (including BSH MSE)	Hybrid, Madrid (Spain)	YES
22-25 June	4	Albacore Stock Assessment Meeting	Hybrid, Madrid (Spain)	YES
1-4 July	4	Second Intersessional Meeting of the Bluefin Tuna Species Group	Hybrid, (Japan TBC)	NO
13-17 July	5	Swordfish Stock Assessment Meeting	Hybrid, Madrid (Spain)	YES
21-26 September	6	Species Groups and Subcommittee on Statistics Meetings	Hybrid, Madrid (Spain)	YES
28 September-2 October	5	SCRS Plenary Meeting	Hybrid, Madrid (Spain)	YES

The September **Species Group Meetings** and the **SCRS Plenary** are also shown in the SCRS tentative calendar below.

* ICCAT online meetings will follow the usual working hours of ICCAT online meetings and may be adjusted based on the agendas and time differences between CPCs and their expected participation.

SCRS Calendar for 2026

	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE
January				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
February							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
									Tag WG																						SC Stat Inters.							
March							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
															BFT 1st Inters.														Med + SWO-S DP								
April			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					
															ALB DP							TT Inters.															
May					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
																						SC-ECO							WGSAM								
June	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30							
								SMA SA														ALB SA															
July			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
			BFT 2nd Inters.												Med + S-SWO SA																						
August						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
September		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						
																						Species Groups + SC-STAT							SCRS Plenary								
October				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
				SCRS Ple.																																	
November							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
December		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					

Free day in ICCAT

Online meeting

Secretariat meeting preparation/holidays

17.3 Date and place of the next meeting of the SCRS

The next meeting of the Standing Committee on Research and Statistics (SCRS) will be planned for 28 September to 2 October 2026, the Species Groups meetings from 21 to 25 September 2026 and the Subcommittee on Statistics on 25 (afternoon session) and 26 September 2026. These meetings will be held in Madrid (Spain) and be in a hybrid format.

18. General recommendations to the Commission

18.1 General recommendations to the Commission that have financial implications

18.1.1 Subcommittee on Ecosystems and Bycatch

Pertaining to Ecosystems

- The Committee recommended conducting a series of workshops to support EcoCard development. The focus of the first workshop in 2026 is to advance the development of indicators for a subset of components of the EcoCard, while the second workshop in 2027 will primarily focus on advancing the development of environmental indicators.

Pertaining to Bycatch

- The Committee recommended organizing a workshop in 2026 focused on the Subcommittee's Research and Data Collection Programme, as well as the development of guidelines for coordination with other bycatch groups of tuna RFMOs.

The breakdown of the funds (in Euros) requested related to Subcommittee on Ecosystems and Bycatch for the next two biennials periods is detailed in the table below (a breakdown of requested fund and associated activities for 2028/2029 will be provided in 2027):

SC-Ecosystems & Bycatch	***2026***	***2027***	***2028***	***2029***	***Explanations***
Workshops/meetings					
Workshop on ECOcard	21,575	21,575			Objective is to advance the work on different aspects of the EcoCard in 2026 and 2027. Funding aims for the attendance the 5-day workshop of up to 11 experts.
Workshop SC-ECO Data Collection Research Programme	20,000				The objective of the 5-day Workshop is to develop the Subcommittee's Research and Data Collection Programme and develop guidelines for coordination with other bycatch groups of tuna RFMOs. Funding to support the attendance of scientists
Subtotal	**41,575**	**21,575**	**0**	**0**	
Science coordination	1,108	1,147	0	0	The amount related to science coordination was estimated by the Secretariat as a proportion of the SC-ECO total budget in relation to the overall science budget (GBYP excluded). Total coordination costs estimated at €30,000 and €60,000 in 2026 and 2027, respectively.
TOTAL	**42,683**	**22,722**	**0**	**0**	

18.1.2 Subcommittee on Statistics

- *Continue Phase II and III of the ICCAT Regional Caribbean Data Collection Project* - The Committee recommended continuing supporting Phase II of the ICCAT Regional Caribbean Data Collection Project.

- *Cloud infrastructure* - Considering the need for further developments (following the feedback provided by CPCs and the SCRS), as well as the necessity to deploy the new public data dissemination applications on a dedicated cloud infrastructure, the Committee recommended that additional funds be set aside specifically for these purposes.

The breakdown of the funds (in Euros) requested related to Subcommittee on Statistics for the next two biennials periods (2026/2027 and 2028/2029) is detailed in the table below (a breakdown of additional requested fund and associated activities for 2028/2029 will be provided in 2027):

SC-STAT	***2026***	***2027***	***2028***	***2029***	***Explanations***
Other fisheries related studies					
Continue Phase II and III of Caribbean Project	90,000	36,000			The project aims to improve reporting and data analysis of fishery data of fleets capturing blue marlin and yellowfin tuna in the region. The U.S. has already committed to fully fund this activity, which shall be concluded in 2027.
Cloud infrastructure	4,500	4,500	4,500	4,500	Monthly renting of cloud servers with the required software, with potential to scale it up as required.
Hosting first transfer videos evaluation	10,000				Commissioning a comprehensive market evaluation to understand the cost-benefits, scalability and potential for either third party hosting of the AI server versus internal.
Subtotal	**104,500**	**40,500**	**4,500**	**4,500**	
Science coordination	2,784	2,152	299	297	The amount related to science coordination was estimated by the Secretariat as a proportion of the SC-STAT total budget in relation to the overall science budget (GBYP excluded). Total coordination costs estimated at €30,000 and €60,000 in 2026 and 2027, respectively.
TOTAL	**107,284**	**42,652**	**4,799**	**4,797**	

18.1.3 Albacore

The Committee recommended continued funding of the Albacore Year Programme (ALBYP) for the North Atlantic, South Atlantic and Mediterranean stocks. For 2026 and 2027, research on the North and South albacore stocks will be focused on biology and ecology and management strategy evaluation (MSE). In the South Atlantic, funds for biology and tagging studies are required until 2027. Funds to finalize the reproductive studies in the North are required in 2026. Funds for southern MSE will be required after 2027. In the North Atlantic, archival tagging and MSE work will continue, and a new joint surface index of abundance for the Northeast Atlantic will be elaborated (in 2028). In the Mediterranean, funds are required in 2026 to calibrate the larval index used in the last assessment.

The following list of activities are set by order of priority from highest to lowest:

- MSE development (North and South)
- Mediterranean larval survey calibration
- Biological studies (finalize reproductive and aging studies in North and South).
- Development of a Joint Northeast Atlantic juvenile index
- E-tagging (North)
- E-tagging (South)

The breakdown of the funds (in Euros) requested related to albacore for the next two biennials periods is detailed in the table below:

Albacore (ALBYP)	***2026***	***2027***	***2028***	***2029***	***Explanations***
Tagging					
Tags (ALB-S)		20,000			Further development of the southern stock electronic tagging initiative through the acquisition of 5 PSAT devices aimed at improving spatial-temporal movement data for stock assessment purposes.
Tags (ALB-N)		7,680	7,680	7,680	No new tag purchase in 2026. Purchase ~12 internal archival tags per year afterwards.
Rewarding, awareness, satellite and tagging material	6,144	2,560			Rewards for recoveries, satellite, tagging material associated to PSATs deployed.
Rewarding, awareness, geolocation and tagging material	5,000	6,936	6,936	6,936	Rewards for recoveries, geolocation, tagging material associated to internal archival tags deployed.
Tagging campaign (ALB-N)	7,000	9,000	9,000	9,000	Fish and charters.
Biological studies:					
Reproduction (ALB-S)	14,000	10,000			Further collect, ship and analyze additional samples aiming the conclusion of reproductive biology and age and growth studies by 2026 (North) and 2027 (South).
Age and growth (ALB-S)	2,500	2,500			
Reproduction and growth (ALB-N)	6,500				
Sample collection and shipping	1,500	1,500			
Other fisheries related studies					
Joint index of abundance juvenile NE ALB			25,000		Joint NE Atlantic juvenile Albacore index of abundance prior to next benchmark assessment. Expert for data analysis and meetings with data providers.
Calibration of ALB-MD larval survey	17500				Process and analyze samples of experimental fishing to provide a Mediterranean albacore specific calibration method to recalculate the index of abundance. This will provide response to Rec. 24-08 para 11.
Modelling:					

ALB-N MSE	35,000	35,000	35,000	35,000	Implement the ICCAT MSE roadmap.
ALB-S MSE			35,000	35,000	Implement the ICCAT MSE roadmap. External funding for 2026-2027 is already secured.
Subtotal	**95,144**	**95,179**	**118,616**	**93,616**	
Science coordination	2,535	5,058	7,882	6,186	The amount related to science coordination was estimated by the Secretariat as a proportion of the ALBYP total budget in relation to the overall science budget (GBYP excluded). Total coordination costs estimated at €30,000 and €60,000 in 2026 and beyond.
TOTAL	**97,679**	**100,237**	**126,498**	**99,802**	

18.1.4 Billfishes

The Committee recommends continued funding of the Enhanced Programme for Billfish Research (EPBR), including the main activities related to age and growth, age validation, and tagging.

During the period 2026-2029, research will be focused on the following areas, by order of priority:

- Continue the ageing and growth studies of the three priority billfish species in the eastern Atlantic (blue marlin (BUM), white marlin (WHM), sailfish (SAI)). This recommendation addresses item Rec. 19-05, para 19. The age validation through bomb radiocarbon and growth model analysis will continue. Ageing and growth studies for blue marlin will be completed in 2026, while for white marlin and sailfish these studies will be completed in 2027 and 2028/29, respectively. The otoliths collected in the eastern Atlantic will be used in these studies.

- Continue the e-tagging of the three priority billfishes (blue marlin, white marlin and sailfish). Priority area is the temperate NE Atlantic, while opportunistic tagging is to be carried out in other areas of the eastern Atlantic.

- In addition, the Committee recommended that research aimed at improving the basic biological data and population dynamics information for roundscale spearfish to be discussed throughout 2026 and 2027, for possible inclusion in future EPBR activities. This recommendation aims to evaluate the current assumption that the biological and population parameters of roundscale spearfish do not differ significantly from those of white marlin, and therefore do not justify a separate assessment.

The breakdown of the funds (in Euros) requested related to Billfishes for the next two biennials periods (2026/2027 and 2028/2029) is detailed in the table below:

Billfishes (EPBR)	***2026***	***2027***	***2028***	***2029***	***Explanations***
Tagging					
Tags	18,750	22,200	22,200	22,200	Acquisition of miniPAT tags for the tagging campaign and opportunistic tagging (from other ICCAT tagging campaigns).
Rewarding, awareness, satellite and tagging material	2,250	2,700	2,700	2,700	Rewarding, e-tags related services of data transmission (satellite) and tagging material.
Tagging campaign	10,000	10,000	10,000	10,000	Main priority area is the NE Atlantic (southern Portugal) with dedicated tagging campaigns. Continuing opportunistic e-tagging in other areas (eastern Atlantic, Southwest Atlantic), taking advantage of other ICCAT e-tagging campaigns for other species, 4 tags are expected to be deployed per campaign.
Biological studies:					
Age and growth	42,000	42,000	37,500	37,500	The plans from 2026 and beyond include: continue processing new samples; analyse current and new data; continue the development and/or complete the age and growth models. The annual costs related to age and growth include: processing and analysis (€17,000) and age validation (€25,000). Specifically, for age validation (bomb-radiocarbon), blue marlin started in 2025 and is expected to be completed in 2026. In 2026 we will start age validation for white marlin (to be conducted in 2026/2027), followed by sailfish in 2028-2029.
Sample collection and shipping	7,000	7,000	7,000	7,000	Additional samples to be collected for ageing and growth, collection of samples will focus on BUM (2026), WHM (2027), and SAI (2028/2029).
Subtotal	**80,000**	**83,900**	**79,400**	**79,400**	
Science coordination	2,131	4,459	5,276	5,247	The amount related to science coordination was estimated by the Secretariat as a proportion of the EPBR total budget in relation to the overall science budget (GBYP excluded). Total coordination costs estimated at €30,000 and €60,000 in 2026 and beyond, respectively.
TOTAL	**82,131**	**88,359**	**84,676**	**84,647**	

18.1.5 Bluefin tuna

The Committee recommended continued funding of the Atlantic-Wide Bluefin Tuna Research Programme (ICCAT GBYP). For the next year, research will be focused on the following areas by order of priority:

- Contract experts to support and carry out the status assessment (modelling)
- Contract experts to support BFT MSE
- Standardisation of aerial survey index to account for environmental variability (modelling)
- Conduct GBYP aerial survey in 2026 in the Balearic region (only) and update the annual GBYP aerial survey index
- Collection of biological samples for biological studies required for stock assessment
- Contribute to tagging research including electronic database development

The breakdown of the funds (in Euros) requested related to bluefin tuna for the next two biennials periods (2026/2027 and 2028/2029) is detailed in the table below:

Bluefin tuna (GBYP)	***2026***	***2027***	***2028***	***2029***	***Explanations***
Tagging					
Tags and tagging material	40,000	70,000	70,000	70,000	Electronic tags of different types.
Rewarding, awareness and satellite	37,500	37,500	40,000	40,000	Advertisements, physical tag recovery, rewards.
Development and maintenance of an electronic tagging database	30,000	10,000	10,000	10,000	Finishing developing the tagging database, fix most urgent issues, then yearly maintenance.
Tagging campaign	10,000		10,000		Eastern Mediterranean tagging support.
Biological studies					
Genetic	68,000	127,500	120,000	180,000	Epigenetic clock on different tissues providing aging that will be used for stock status determination and future MSE reviews (Rec. 23-07). Provision starting in 2028 if genetic tools for aging become operational.
BFT-W genotyping	15,000	15,000	15,000	15,000	Genotyping of BFT-W samples.
Sample collection and shipping	35,000	62,500	75,000	75,000	Field sample collection, shipping and preservation of samples.
Other (sample bank)	22,500	22,500	25,000	25,000	Tissue bank archiving and curation.
Aerial surveys	120,000	120,000	120,000	120,000	Yearly aerial survey over the Balearic area field operations.
Aerial survey index provision	12,000	20,000	20,000	20,000	Yearly index provision to the working group for EC assessment (Rec. 23-07).
Modelling:					
MSE	50,000	50,000	50,000		MSE review starting in 2026 (Rec. 23-07). The aim of the review is to ensure the MP is performing as expected and to determine whether there are conditions that justify its continuation, or that warrant: reconditioning the MSE OMs; retuning the existing MP; including new indices into a new MP; and/or considering alternate candidate MPs or development of a new MSE framework.

Bluefin tuna (GBYP)	***2026***	***2027***	***2028***	***2029***	***Explanations***
External expert for status assessment and MSE	50,000	50,000	30,000	30,000	Contractor for status assessment starting in 2026 as required in (Rec. 23-07). Development and implementation of a multi-stock assessment model that can incorporate mixing, movement and multi-stock dynamics. Continued support for MSE management procedure development and MSE expert support.
Aerial survey standardisation	65,000				Contractor for Aerial survey standardisation accounting for environmental variability.
Subtotal	**555,000**	**585,000**	**585,000**	**585,000**	
Science coordination	220,000	190,000	190,000	190,000	Salary of program coordinator (part-time, 80% in 2026 and 60% in 2027 and beyond); Salary of the Steering Committee (SC) external expert; travelling related to coordination activities (e.g. attendance to SC meetings and ICCAT meetings; participation on field work; etc.).
TOTAL	**775,000**	**775,000**	**775,000**	**775,000**	

18.1.6 Sharks

The Committee recommends continued funding of the Shark Research and Data Collection Programme (SRDCP) and other activities related with the Sharks-SG work.

For the next two years, research will be focused on the following areas, listed by order of priority:

- Provide funding for the SRDCP for Year 12 to:

  i) *Satellite tagging*: Continue studies on movement, habitat use, and post-release mortality for priority species (shortfin mako, longfin mako, oceanic whitetip, silky shark, bigeye thresher, hammerheads, porbeagle and blue shark), through satellite tagging. This includes acquisition of additional satellite tags, and dedicated tagging campaigns in the priority areas of the equatorial/tropical eastern Atlantic (2026) and the SW Atlantic (2027). This activity also continues opportunistic tagging in other areas, namely the NW Atlantic, NE Atlantic, and Mediterranean.
  ii) *Genetics*: Apply the approach used in the kinship analysis to investigate the genetic population structure of porbeagle. New samples collected from four areas in the Atlantic, as well as adjacent regions, will be analyzed.
  iii) *Age and growth*: Continue the study on age and growth study for the priority species (longfin mako, oceanic whitetip, silky shark, bigeye thresher, hammerheads, porbeagle and blue shark), including shipping of samples. Focus for 2026/2027 will be age and growth of longfin mako, and then 2028/2029 one of the other species priority species.
  iv) *Age validation*: Start an age-validation study for shortfin mako using with preference for bomb radiocarbon, using existing samples, with particular focus on validating the early growth and defining growth band periodicity throughout the lifespan. This work will be focused on the North Atlantic and will be conducted during 2026/2027.
  v) *Reproduction*: Continue the study on the reproductive biology of North Atlantic shortfin mako quantifying reproductive hormone concentrations from muscle tissue samples to determine maturity and reproductive status. This study will continue from 2027 onwards.

- Management Strategy Evaluation (MSE) for North and South stocks of BSH: As a result of work requested by the Commission (Rec. 23-10 and Rec. 23-11), a feasibility analysis was prepared and presented in 2025. The Committee agreed that these two MSE process (BSH-N and BSH-S) are technically feasible, cost-effective, and aligned with existing ICCAT MSE practice. The process with start in 2026 with preliminary work from a technical team, and will be intensified in the 2027/2029 period to be completed in that 3 year-time frame.

The breakdown of the funds (in Euros) requested related to sharks for the next two biennials periods (2026/2027 and 2028/2029) is detailed in the table below:

Sharks (SRDCP)	***2026***	***2027***	***2028***	***2029***	***Explanations***
Tagging					
Tags and tagging material	74000	81400	44400	44400	New tags (20 in 2026; 22 in 2027) to be acquired for the tagging campaigns and opportunistic tagging. Also includes value for acquiring tagging materials. Tags acquisition for 2028/2029 is more reduced (12 per year) with focus on other areas.
Rewarding, awareness and satellite	15600	17160	9360	9360	Value to cover rewarding, awareness and satellite transmissions
Tagging campaign	95000	12000	50000	50000	Dedicated tagging campaigns for the priority areas in the equatorial/tropical eastern Atlantic (2026), the SW Atlantic (2027) and other priority areas in 2028/2029. These data support stock mixture analysis and habitat suitability modelling for priority pelagic sharks.
Biological studies:					
Reproduction		15000	15000	15000	Continue the study on the reproductive biology of North Atlantic shortfin mako quantifying reproductive hormone concentrations from muscle tissue samples to determine maturity and reproductive status.
Age and growth	12000	12000	12000	12000	Continue the study on age and growth for the priority shark species. This includes continuation of the compilation of meta-data of samples, processing vertebrae, age readings and growth modelling. Species priorities are longfin mako in 2026/2027, and another of the priority sharks in 2028/2029. This line of work contributes with biological information, that can be used in any future assessments or other risk analysis for sharks.

Age validation	22500	22500			Conduct an age-validation study for shortfin mako using bomb radiocarbon with existing samples, with particular focus on validating the early growth and defining growth band periodicity throughout the lifespan. Work to be conducted in 2026/2027 and focused on the North Atlantic. This will contribute to clarify uncertainties in the life history that have a strong influence in the stock assessments.
Genetics	25000	25000			Apply the approach used in the kinship analysis to investigate the genetic population structure of porbeagle. New samples collected from four areas in the Atlantic, as well as adjacent regions, will be analyzed. The budget will cover sequencing, equipment, reagents, computer devices, and other related costs.
Sample collection and shipping	3000	3000			Continue sampling effort on priority shark species, including values for sample shipping.
Other fisheries related studies					
Temperature Depth Recorders (TDR)			10000*	10000*	Acquisition of Temperature Depth Recorders (TDR) (long-term study, requested by Rec. 21-09). * To be reviewed once the results of the experiments become available
Modelling:					
MSE		60000	60000	60000	Value related with the blue shark MSE for North and South Atlantic stocks. The process with start in 2026 with preliminary work from a technical team, and will be intensified in the 2027/2029 period to be completed in that 3 year-time frame. Budget is only requested for the period 2027/2029. This item addresses the Commission Rec. 23-10 and Rec. 23-11 on blue shark MSE.

Subtotal	**247,100**	**248,060**	**200,760**	**200,760**	
Science coordination	6583	13183	13340	13266	The amount related to science coordination was estimated by the Secretariat as a proportion of the SRDCP total budget in relation to the overall science budget (GBYP excluded). Total coordination costs estimated at €30,000 and €60,000 in 2026 and beyond.
TOTAL	**253,683**	**261,243**	**214,100**	**214,026**	

18.1.7 Small tunas

The Committee recommends continued funding of the Small Tunas Year Programme (SMTYP). For the next four years, research will be focused on the following areas by order of priority (from highest to lowest):

1. *Continuing support to the SMTYP:* The Committee recommended continuing with the ICCAT SMTYP research programme activities in 2026-2029 to further improve the biological information as follows:

   Growth

   - improving geographical coverage for growth, to fill gaps in growth and maturity. The species that are the highest priority are: 1. BON (large samples and small samples); 2. LTA (large specimens to conclude studies in 2026); 3. WAH (small and large fish); 4. BLT and 5. FRI.

   Reproduction

   - All species are missing monthly data. Priorities are: 1. BON; 2. BLT; 3. FRI; 4. LTA; 5. WAH

   Genetics

   - 1. Conclude studies on LTA (highest priority) on Mauritanian coast to determine the boundary between the stocks;

   - 2. Initiate stock structure (lower priority) studies for FRI and BLT and to support genetic differentiation between FRI (first priority) and BLT (second priority).

2. *Historical Data Mining*

Data from the Northwest Atlantic is entirely absent from the minor tuna species database. CPCs with historical data on small tunas (SMT) are encouraged to provide this information to ICCAT. This study will be essential for improving the quality of existing statistical data. In addition, a contract should be issued to carry out additional data mining activities in selected countries/regions.

The breakdown of the funds (in Euros) requested related to small tuna for the next two biennials periods (2026/2027 and 2028/2029) is detailed in the table below:

Small tuna (SMTYP)	***2026***	***2027***	***2028***	***2029***	***Explanations***
Biological studies:					
Reproduction	7,500	7,500	7,500	7,500	Monthly sampling of gonads is essential for studying the reproductive biology of the different species in order to determine size at first maturity and the spawning season. Size frequencies have shown the absence of individuals in certain size classes during some months of the year, which represents a significant bias. On a regional scale, it is therefore essential to maintain the monthly collection of gonadal samples (in order or priority: 1. BON 2. BLT 3. FRI 4. LTA 5. WAH) fill these knowledge gaps (refer to the reference table). These funds will go towards finalizing ongoing reproduction studies in the same order of priority indicated above
Age and growth	5,000	5,000	7,500	7,500	The collection of dorsal spines and otoliths for LTA, BON, BLT, and FRI remains a top priority to close key knowledge gaps on small tuna age and growth. LTA: In the NE Atlantic and Mediterranean, substantial samples are already available, with spines identified as the preferred structure. In the SE and SW Atlantic, additional samples—especially larger fish—and genetic validation are still needed. BON: A preliminary reference set exists in the NE Atlantic, with finalization expected by 2026. Other regions still require more standardized spine sampling. WAH: Major discrepancies between spines and otoliths highlight the need for standardized processing and better-quality images before reference sets can be finalized. BLT and FRI: Processed samples exist (e.g., Portugal), but most available material from other regions requires processing and genetic validation, with gaps in larger individuals. The priorities are: 1. BON (large samples and small samples); 2. LTA (large specimens to conclude studies in 2026); 3. WAH (small and large fish); 4. BLT and 5. FRI. The budget will go also towards finalizing the current studies for all five species.

Small tuna (SMTYP)	***2026***	***2027***	***2028***	***2029***	***Explanations***
Biological studies:					
Genetics	10,000	10,000	20,000	20,000	The main goal of the genetic studies is to differentiate species and analyze stock structure. The current focus is on BLT and FRI, with additional samples being collected for LTA. Collecting tissue samples to fill knowledge gaps for these three species is a top priority. This work is ongoing and receives annual updates. The genetic studies on LTA, BLT, and FRI are to be completed by the end of 2029. As concerns the potential LTA differentiation, the Group will continue the genetic analyses and it would be necessary to also collect detailed meristic data also, according to the scheme provided by FAO for the tuna species.
Sample collection and shipping (all species and research areas)	15,000	15,000	10,000	10,000	The sampling to be carried out must follow a rigorous protocol to complete the studies already underway. This protocol aims to ensure representative temporal coverage, thereby limiting seasonal effects. This approach will yield more reliable data for analysis.
Other fisheries related studies					
Statistical data recovery	10,000	10,000	10,000		Data from the Northwest Atlantic is entirely absent from the minor tuna species database. CPCs with historical data on SMT are encouraged to provide this information to ICCAT. This study will be essential for improving the quality of existing statistical data. In addition, a contract should be issued to carry out additional data mining activities in selected countries/regions.
Subtotal	47,500	47,500	55,000	45,000	
Science coordination	1,265	2,524	3,655	2,974	The amount related to science coordination was estimated by the Secretariat as a proportion of the SMTYP total budget in relation to the overall science budget (GBYP excluded). Total coordination costs estimated at €30,000 and €60,000 in 2026 and beyond, respectively.
TOTAL	**48,765**	**50,024**	**58,655**	**47,974**	

18.1.8 Swordfish

An ICCAT project on swordfish biology, genetics and satellite tagging started in 2018 and the Committee recommended that the project continue for 2026 given the current uncertainties and recommended continued funding of the SWOYP. This recommendation applies to the North and South Atlantic and Mediterranean stocks. An understanding of the species biology, including age, growth and reproductive parameters, as well as stock structure and mixing is crucial for the application of biologically realistic stock assessment models and, ultimately, for effective conservation and management. The Committee further recommended the use of a multi-stocks research cruise to fill spatial-temporal samples gaps that are common among ICCAT Species Groups and continues work on SWO-N MSE.

The activities planned that require funding, by order of priority, are detailed below:

- *Biology:* Continue the biology work within the SWOYP, including new sampling and analysis of new and previous samples. Focus on age and growth using spines and otoliths, reproduction using gonads, population genetics and epigenetics analysis. For growth, reproduction, and genetics the aim is to produce baseline growth curves, maturity ogives and stock boundaries and mixing by 2027, and then start a regular monitoring program from 2028 onwards to monitor for possible changes in population dynamics of the stocks, related to density-dependant mechanisms and/or environmental changes.

- *MSE for SWO-N:* Support work requested in Rec. 24-10 related to Climate Change and assessing the effectiveness of minimum size limits. Support evaluation of ECs.

- *Satellite tagging work*: Ongoing work prioritizing stock mixture area of the NE Atlantic and investigation of range shifts in the NW Atlantic. Continue opportunistic tagging in other areas, including the SW Atlantic, equatorial region and the Mediterranean.

- *CKMR/Gene tagging pilot study*: Conduct a feasibility study for the application CKMR/gene tagging for SWO-N, needed for estimating total stock biomass used as input for stock assessment.

The breakdown of the funds (in Euros) requested related to swordfish for the next two biennials periods (2026/2027 and 2028/2029) is detailed in the table below:

Swordfish (SWOYP)	***2026***	***2027***	***2028***	***2029***	***Explanations***
Tagging					
Tags and tagging material	44,400	44,400	120,000	120,000	New tags (12) to be acquired for the tagging campaign and opportunistic tagging. Also includes some value for acquiring tagging materials.
Rewarding, awareness and satellite	5,160	5,160			Value to cover rewarding, awareness and satellite transmission costs.
Tagging campaign	105,000	105,000			Dedicated annual tagging campaigns for priority areas in the NE Atlantic (stock mixture area), and NW Atlantic (larger swordfish). This work investigates stock mixing areas and recent northern shifts in swordfish distribution. Tagging data supports stock mixing analysis, habitat suitability modelling, and CPUE standardization.
Biological studies:					
Reproduction	9,200	9,200	9,200	9,200	Continue processing gonad samples, and data analysis for reproduction work. Aim to produce baseline maturity ogives by 2027 and then start a regular monitoring program for 2028 onwards to monitor changes in population dynamics. This work supports spawning stock biomass assumptions in the assessment model.
Age and growth	17,500	32,500	17,500	17,500	Processing and analysis of spines and otoliths; data analysis and growth modelling by stock, that support data inputs into the assessment models. Aim to produce baseline growth curves for Atlantic stocks by 2027 and then start a regular monitoring program from 2028 onwards to monitor changes in population dynamic. Age validation sample compilation will continue in 2026, for analysis in 2027.
Genetics	55,000	55,000	45,000	45,000	Continued population analysis for stock differentiation using double digest restriction-site associated DNA (ddRAD); continuation of the study on epigenetic ageing using Reduced Representation Bisulfite Sequencing (RRBS-SEQ). Further identification of SNPs for cost effective stock identification. Epigenetic ageing for age structure analysis and identification of maturity, that will be linked to the

Swordfish (SWOYP)	*2026*	*2027*	*2028*	*2029*	*Explanations*
					ageing studies. An analysis on stock boundaries and mixing will be presented in 2027. The program will then begin transition to monitoring for changes in population dynamics e.g. stock structure, epigenetic ageing, epigenetic maturity etc., to support assessment inputs.
Sample collection and shipping	6,000	6,000	6,000	6,000	Continue sampling effort on priority and missing areas/sizes as defined in the project summary. Also includes value for sample shipping.
Consumables	1,000	1,000			Vials for the collection of gonads samples and shipping to the laboratories.
Modelling:					
Absolute abundance estimation: CKMR/Gene tagging	15,000				Conduct a feasibility study that evaluates the cost, benefits and logistics of conducting CKMR and gene tagging for SWO-N, SWO-S and SWO-MD in order to provide estimates of absolute stock abundance for use in population models.
MSE	30,000	10,000	5,000	15,000	Value for the continue work on MSE, to support work requested in Rec. 24-10 related to Climate Change and assessing the effectiveness of minimum size limits, and support the evaluation of ECs. Includes funds for work in advance of the MSE review scheduled for 2030. Budget for work in 2027-2029 could be reduced to zero if an MSE coordinator is hired.
Workshop					
Workshop to conclude Atlantic and Mediterranean SWO ageing studies		12,000			Technical workshop for age readers to conclude ageing calibration and among readers for Atlantic and Mediterranean stocks. Costs related to travel and subsistence of three experts.
Subtotal	**288,260**	**280,260**	**202,700**	**212,700**	
Science coordination	7,680	14,895	13,469	14,055	The amount related to science coordination was estimated by the Secretariat as a proportion of the SWOYP total budget in relation to the overall science budget (GBYP excluded). Total coordination costs estimated at €30,000 and €60,000 in 2026 and 2027, respectively.
TOTAL	**295,940**	**295,155**	**216,169**	**226,755**	

18.1.9 Tropical tunas

The Committee recommends continued funding of the TTRaD. For 2026, research will be focused on the following areas by order of priority:

1. Continue *MSE developments* and implementation for SKJ-W and Multi-species Tropical Tunas MSE processes (€62,000);

2. Continue sample collection and analysis for *age and growth* including SKJ age validation in 2026 (€25,000);

3. Continuation of tag seeding, awareness and rewarding, including sample collection and storage (€5,000), to compliment age and growth ongoing analysis;

4. Fund the increased participation of scientists at a *workshop* on age-growth and reproduction of tropical tuna run by the ITUNNES project (€40,000);

An update of the TTRaD programme was carried out in 2025, including more detailed information on the activities, time frames, costs and deliverables during the next two biennial cycles of ICCAT funding (2026/2027 and 2028/2029).

The breakdown of the funds (in Euros) requested related to tropical tuna for the next two biennials periods (2026/2027 and 2028/2029) is detailed in the table below:

Tropical tuna (TTRaD)	*2026*	*2027*	*2028*	*2029*	*Explanations*
Tagging					
Tags and tagging material				45000*	Tags procured for new campaign (check validity of stock unit)
Rewarding, awareness and satellite	5,000	5000		5000*	Funding for tagging offices (2026 & 2027). *Cost in 2029 is an estimate and subject to revision based on results from the tagging workshop in 2028
Biological studies:					
Reproduction		30,000	20,000	10,000	SKJ updates (2027). BET updated (2028 & 2029). Conduct a feasibility study for maturation indicators to support the development of less invasive methods to assess maturity (2027).
Age and growth	25,000	60,000	30,000	30,000	Annual sample collection and update of parameters for all three species based on gaps. Age validation for SKJ (2026 & 2027).
Genetics		65,000	50,000*	50,000*	Feasibility and costing for epigenetic study (€15,000), and CKMR (€40,000) in 2027. *Sample collection in 2028 and 2029 estimated and subject to revision based on results from feasibility in 2027.
Other fisheries related studies					
Environmental habitat definition			50,000*	100,000*	Changes in productivity and distribution of tropical tunas in relation to the environment and climate (including an update to environmental habitat definition using available tag data). Species and budgets to be defined and revised based on outcomes from SEAPODYM in 2027.
MSE					
SJK-W MSE	12,000	12,000	12,000	12,000	Implement ICCAT MSE roadmap for SKJ-W as set by the Commission.
Multi-species Tropical tuna MSE	50,000	50,000	20,000	20,000	Implement ICCAT MSE roadmap for multi-species as set by the Commission.
Workshop					

Tropical tuna (TTRaD)	***2026***	***2027***	***2028***	***2029***	***Explanations***
Workshop to advance age and growth studies	40,000		50,000.00		Age-growth-reproduction workshop (funding to support the participation of relevant scientists).
Coordination tagging program			10,000		Workshop to coordinate new tagging campaign with funds to support expert attendance (2028).
Subtotal	**132,000**	**222,000**	**242,000**	**272,000**	
Science coordination	3,517	11,798	16,080	17,974	The amount related to science coordination was estimated by the Secretariat as a proportion of the TTRaD total budget in relation to the overall science budget (GBYP excluded). Total coordination costs estimated at €30,000 and €60,000 in 2026 and 2027, respectively.
TOTAL	**135,517**	**233,798**	**258,080**	**289,974**	

18.1.10 WGSAM

The Committee recommended:

- An additional Bycatch Estimation Tool (BYET) training workshop (3-days) be organized in 2026 (depending on the state of development of the BYET Shiny App) and 2027, with the expectation that this will increase the number of CPCs that will report (dead and live discards).

- Training workshops (5-days) for advanced technical MSE in 2026 and 2027.

The breakdown of the funds (in Euros) requested related to WGSAM for the next biennial period (2026/2027) is detailed in the table below (a breakdown of requested funds and associated activities for 2028/2029 will be provided in 2027):

WGSAM	***2026***	***2027***	***2028***	***2029***	***Explanations***
Workshops/Meetings					
Training workshops for the BYET	30,000*	30,000			It is estimated new training workshops needed to further develop CPCs capacity building to use BYET to comply with report requirements on bycatch. The funds should cover instructor's travel/subsistence and work, and the attendance of selected participants.
Training workshops for advanced technical MSE	40,000	40,000			It is estimated new advanced technical workshops are needed to further develop SCRS capacity building on MSE development. The funds should cover instructor's travel/subsistence and work, and the attendance of selected participants.
Modelling					
Further development of the BYET	20,000	20,000			To incorporate possible feedback from the training workshop held in 2025.
Subtotal	**90,000**	**90,000**	**0**	**0**	
Science coordination	2,398	4,783	0	0	The amount related to science coordination was estimated by the Secretariat as a proportion of the WGSAM total budget in relation to the overall science budget (GBYP excluded). Total coordination costs estimated at €30,000 and €60,000 in 2026 and 2027, respectively.
TOTAL	**92,398**	**94,783**	**0**	**0**	

* Training workshop only to be implemented once the development of the BYET Shiny App is concluded.

18.2 Other general recommendations

18.2.1 Subcommittee on Ecosystems and Bycatch

Pertaining to Bycatch

- The Subcommittee acknowledged the progress made by national scientists in characterizing the impact of ICCAT fisheries in the Mediterranean on sea turtles and recommended that these efforts continue and be extended to other bycatch species.

- The Subcommittee recommended continuation of its review of the existing seabird bycatch mitigation measures and to advise upon updates in its 2027 meeting, as necessary. It encourages members to submit relevant scientific information to the Subcommittee to support this review.

18.2.2 Subcommittee on Statistics

- Holding a 3-day online intersessional meeting in 2026 (possibly during the last week of February). Regarding the possibility of repeating this meeting bi-annually, the Committee agreed to hold this initial meeting and evaluate its usefulness.

- For the Secretariat to work together with an ad hoc group to modify form ST09 to include the minimum feasible subset of additional information requested by Rec. 22-12, and to determine how to deal with potential discontinuities caused by changing the structure of form ST09. The result of the work of the ad hoc group will be presented at the 2026 Meetings of the Subcommittee on Ecosystems and Bycatch and Subcommittee on Statistics.

18.2.3 Albacore

- The Committee reiterated its recommendation that an ad hoc group focus on the Mediterranean albacore fisheries statistics with the objective of having an overall and comprehensive review of the historical catch Task 1 and catch and effort Task 2 CE series. It should focus on historical catches associated with gears like purse seines, gillnets, etc., and consider catches that may have not been reported historically before monitoring programmes were in place. This ad hoc group will report to the Albacore Species Group on research projects, progress, and general recommendations on the historical series for the next assessment(s) of Mediterranean albacore, including potential alternative catch scenarios to be considered in future assessments or MSE efforts.

- In order to facilitate better management advice of the Mediterranean stock, research programmes should focus on key points identified in the 2024 and other recent stock assessments: improvement of fishery statistics through data recovery, larval survey calibration to allow for a long fisheries independent survey, an integrated growth analysis, improvement of r and K priors, development of a joint longline catch per unit effort (CPUE), and environmental effects it is proposed to hold a one-day online meeting for researchers interested in Mediterranean albacore, with the aim of defining research priorities and needs, and identifying potential synergies to enhance the group's capacity to respond to the Commission.

18.2.4 Billfishes

- The Committee recommends improving estimates of natural mortality (M) and considering developing a vector of natural mortality M at age for all billfish species.

- The Committee recommends a thorough review of the blue and white marlin and sailfish indices of abundance, including a clear definition of the catch used (landed, landed and discards), fishing effort definition, data source (logbook, observer programmes, others), and if the catch includes strictly identified white marlin versus roundscale spearfish. It should also include potential factors that may affect catchability in both target and bycatch fisheries. And exploring the possibility of estimating a multifleet LL CPUE as has already been done for other ICCAT species, in order to address the conflicting CPUE trends that the Committee faced during the billfish stock assessments.

18.2.5 Bluefin tuna

- Noting that the determinations of stock status, ECs and TAC advice require accurate estimates of the biomass of fish destined for farms at the time they are captured from the wild. Measuring fish as close as possible to capture eliminates back calculation of growth in farms, simplifying the process of monitoring and compliance for all involved parties. Recent advances in AI now make this possible. To achieve this objective the Committee recommends as an objective:

  - 100% of the original, unedited, stereo video footage be provided to a secure electronic server. This server would use validated AI algorithms to obtain independent and objective size estimates, available to each fishing operation and farm in near-real time.

  - Stereo-video measurements to be made at the time of transfer from the capturing method (purse seine, trap or other gear) to the transport cage or net pen or, if at-sea conditions make this impractical, when transferred into the farm. These measurements would be provided to the server as soon as possible.

As a first step towards that objective, the Committee recommends the Commission to consider implementing such an AI-driven process for mandatory collection and storage of length size measurements during first transfer of BFT.

- The Committee recommended that CPCs support the epigenetic clock ageing study by GBYP, through the collection of samples within their national sampling programmes.

18.2.6 Sharks

- The Committee recommended, following the experience of other SCRS Species Groups, producing a joint CPUE index for the continuation of the stock assessment of North Atlantic shortfin mako.

- The Committee recommends modifying the list of shark species included on the ICCAT statistics forms according to SCRS/2025/238.

18.2.7 Small tunas

- Taking into account the knowledge gap on the stock status of the small tuna species, the Committee recommended continuing the capacity building efforts on fundamental stock assessment concepts and the practical application of assessment models. Strengthening this foundational knowledge across CPCs is essential to ensure broader and more effective participation in SCRS activities, particularly in support of assessments for data-poor stocks and in enhancing the understanding of how scientific advice is developed and provided to the Commission.

- The Committee reiterated its concerns regarding the persistent data gaps in the ICCAT fisheries statistics database for small tuna. Particularly, the Group expressed concerns that small tuna catches, although having a very high social importance as a source of protein for coastal communities, are systematically under reported to ICCAT. This fact is due to many reasons that makes their monitoring very challenging, including: the artisanal nature of many fisheries; the wide geographical dispersion and remoteness of landing sites; the limited coverage or absence of national monitoring programs, which frequently prioritize species of higher commercial value; the lack of technical expertise in species identification and sampling protocols; and insufficient ICCAT funding available to assist developing countries in strengthening their monitoring systems. Considering these challenges, the Group recommended:

  - Scheduling a dedicated discussion to explore strategies for addressing this issue, with the goal of developing a long-term plan to improve small tuna fisheries data collection in the Mediterranean, particularly along the northern African coast and in Eastern Atlantic region.

  - SCRS scientists proceed with data recovery/data-mining activities and present the results as SCRS documents to the Small Tunas Species Group and the Subcommittee on Statistics, aiming at improving the planned activities related to the upcoming stock assessments.

18.2.8 Swordfish

The Committee recognized the expanding use of trap-line gear on swordfish longline fisheries and recommended the following actions to address this issue:

- CPCs implement measures that allow the use of this new gear to be recorded in their logbooks and fishery databases;

- CPCs and the SCRS to conduct work to understand the extent to which this gear is being used, specifically, the initial year in which the gear entered in the fishery and the associated historical catches; the area (Atlantic, Mediterranean or both); the fleets using the gear; the number of vessels using it; whether it is used alone or together with longline gear and, in such a case, in which proportion;

- CPCs and the SCRS, to conduct work on CPUE analysis specific to this gear, for both target and non-target species.

18.2.9 Tropical tunas

- The Committee reiterated a 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 Committee strongly encouraged efforts to advance spatial modeling, noting the potential for improving stock assessments, and recognizing the value for understanding density-dependent habitat selection and regional impacts of fishing.

18.2.10 Working Group on Stock Assessment Methods

Recommendation on MSE:

- It was recommended to decide whether MSE responsibilities, in terms of discussing and providing overall guidance on MSE best practices, should remain in the WGSAM or a new working group on MSE should be created. If the WGSAM continues to hold these MSE responsibilities, the WGSAM meetings should last five days.

19. Responses to the Commission's requests

Subcommittee on Statistics

19.1 The SCRS will advise the Commission on the suitability of the alternative approach proposed by CPCs, Rec. 16-14, para 4b

Background: *4 b) Notwithstanding paragraph a), for vessels less than 15 meters, where an extraordinary safety concern may exist that precludes deployment of an onboard observer, a CPC may employ an alternative scientific monitoring approach that will collect data equivalent to that specified in this Recommendation in a manner that ensures comparable coverage. In any such cases, the CPC wishing to avail itself of an alternative approach must present the details of the approach to the SCRS for evaluation. The SCRS will advise the Commission on the suitability of the alternative approach for carrying out the data collection obligations set forth in this Recommendation. Alternative approaches implemented pursuant to this provision shall be subject to the approval of the Commission at the annual meeting prior to implementation.*
The Committee did not receive any request for application of new approach.

19.2 SCRS assist EMS WG in reviewing EMS domestic programme submitted, as well as the implementation of those programmes and suggest improvements and adjustment to such programmes, Rec. 23-18, para 17

Background: *The EMS WG shall:*

- *review, with assistance of the SCRS where appropriate, the EMS domestic programme submitted pursuant to paragraph 15, as well as the implementation of those programmes and, if appropriate, suggest improvements and adjustment to such programmes to ensure that ICCAT scientific data collection and/or compliance monitoring requirements are met or that the EMS standards followed by the domestic programme are, with due consideration to the development status of CPCs, equivalent to those set out in this Recommendation.*

The Committee did not receive any new information regarding data derived from EMS domestic programmes.

Subcommittee on Ecosystems and Bycatch

19.3 In 2015, the SCRS shall conduct another fishery impact assessment to evaluate the efficacy of these mitigation measures. Based on this fishery impact assessment, the SCRS shall make appropriate recommendations, if necessary, to the Commission on any modifications, Rec. 11-09, para 8

Background: *In 2015, the SCRS shall conduct another fishery impact assessment to evaluate the efficacy of these mitigation measures. Based on this fishery impact assessment, the SCRS shall make appropriate recommendations, if necessary, to the Commission on any modifications.*

The Subcommittee is currently reviewing seabird mitigation measures and expects to complete its work and advise the Commission in 2027.

19.4 The Secretariat should collaborate with the SCRS to evaluate the possibility for the SCRS to provide expertise and advice for the implementation of the instruments, and explore ways in which the workload of the SCRS could accommodate this new task; Res. 23-23

Background: *The Secretariat should collaborate with the SCRS to evaluate the possibility for the SCRS to provide expertise and advice for the implementation of the instruments, and explore ways in which the workload of the SCRS could accommodate this new task;*

CPCs, the SCRS, and the Secretariat should report regularly to the Commission on progress on the above.

This is a Miscellaneous Resolution on the implementation of biodiversity instruments, namely:

1. The Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction.
2. The Kunming-Montreal Global Biodiversity Framework under the Convention on Biological Diversity.

The Resolution requests that:

1. The Secretariat collaborate with the SCRS to evaluate the possibility of the SCRS providing expertise and advice for the implementation of the instruments and exploring ways in which the workload of the SCRS could accommodate this new task.
2. The SCRS should investigate workable examples of how marine biodiversity can be conserved in a way that is compatible with the conduct of responsible and sustainable fisheries, including other effective area-based conservation measures (OECMs), either as complementary or alternative measures to other area-based approaches.
3. CPCs, the SCRS, and the Secretariat should report regularly to the Commission on progress on the above.
4. To add a standing agenda item on this issue to the annual meetings of the Commission and the SCRS.

During the 2024 Meeting of the Subcommittee on Ecosystems and Bycatch (SC-ECO) it was noted that the Resolution would require a considerable amount of the Subcommittee's time and capacity to address the request and that this would further impede progress on the development of the EcoCard. It was suggested that, given the Sargasso Sea Case Study's current objectives align with the Commission request, they could provide some limited responses.

2025 update

The conservation of marine biodiversity, and efforts towards implementing the Ecosystem Approach to Fisheries Management (EAFM) within areas beyond national jurisdiction are long-standing objectives of the Subcommittee. At the 2025 Meeting the Subcommittee on Ecosystems and Bycatch (SC-ECO) the work that was presented at the meeting that contributes to marine biodiversity conservation was reviewed. A list of ongoing work includes:

1. Ongoing work that improves knowledge and the conservation status of several Endangered, Threatened, and Protected (ETP) species or species groups, including seabirds in the South Atlantic, sharks in the tropical Atlantic ecoregion, or sea turtles in the Mediterranean. These approaches are being considered in the context of continued improvement within responsible and sustainable fisheries.

2. The Sargasso Sea's Socio-Ecosystem Diagnostic Analysis (SEDA) which offers a structured framework - similar to the Driving forces, Pressures, State, Impacts, and Responses (DPSIR) approach - for developing indicators related to climate impacts, connectivity, and trophic interactions. The Sargasso Sea case study demonstrates how indicators can be developed to support Biodiversity Beyond National Jurisdiction (BBNJ) requirements for best available science, adaptive management, and transboundary governance.
3. The further development of the ECOtest modelling platform which facilitates the development and validation of indicators for bycatch species.

4. The further development of Ecopath with Ecosim models that elaborate on the impacts of Climate Change and ICCAT fisheries on the food web and ecosystem function.

The Subcommittee considers that this response is preliminary. It will be updated as further results become available.

Albacore

19.5 The SCRS shall assess the occurrence of ECs and the Commission shall act in accordance with the Exceptional Circumstances Protocol sets out in Annex 2, Rec. 21-04, para 4

Background: *The SCRS shall assess the occurrence of exceptional circumstances (ECs) and the Commission shall act in accordance with the Exceptional Circumstances Protocol sets out in* ***Annex 2***.

The Committee revised the North Atlantic albacore ECP contained in the *Recommendation by ICCAT on conservation and management measures, including a management procedure and Exceptional Circumstances Protocol, for North Atlantic albacore* (Rec. 21-04), namely regarding the indicators related to catch and CPUE.

Catches have been lower than the TAC adopted using the HCR or MP for most years, with the exception of 2019 when it was exceeded by 3.5% (**Figure 19.5.1**).

Four CPUE indices were updated (the Japanese longline, Chinese Taipei longline, Spanish baitboat and US Longline) until 2024. The Committee discussed whether the updated CPUE series fell outside the 2.5% to 97.5% percentile range of values in any year from the OMs used in the MSE when the accepted MP was tested. Overall, all the CPUE series fell within the 2.5% and 97.5% percentiles of the simulated values, except for the Spanish baitboat where the CPUE exceeded marginally the range in 2018 (**Figure 19.5.2**). While the updated CPUE data indicate a larger than the simulated relative abundance, the Committee agreed that this is not a source of concern.

In summary, the Committee concluded that no exceptional circumstance(s) were identified that preclude the application of the MP.

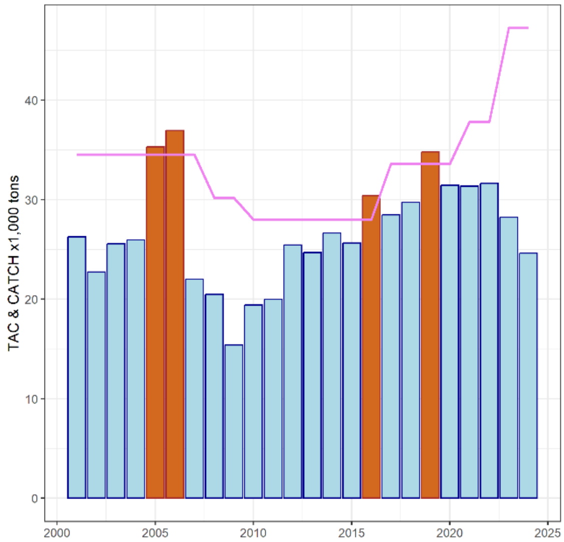


Figure 19.5.1 ALB-N reported catch (Task 1NC, bars) and TAC (solid line). Orange bars indicate years when the catch exceeded the TAC. Note that TAC was established with the ALB-N HCR or the MP started in 2018.

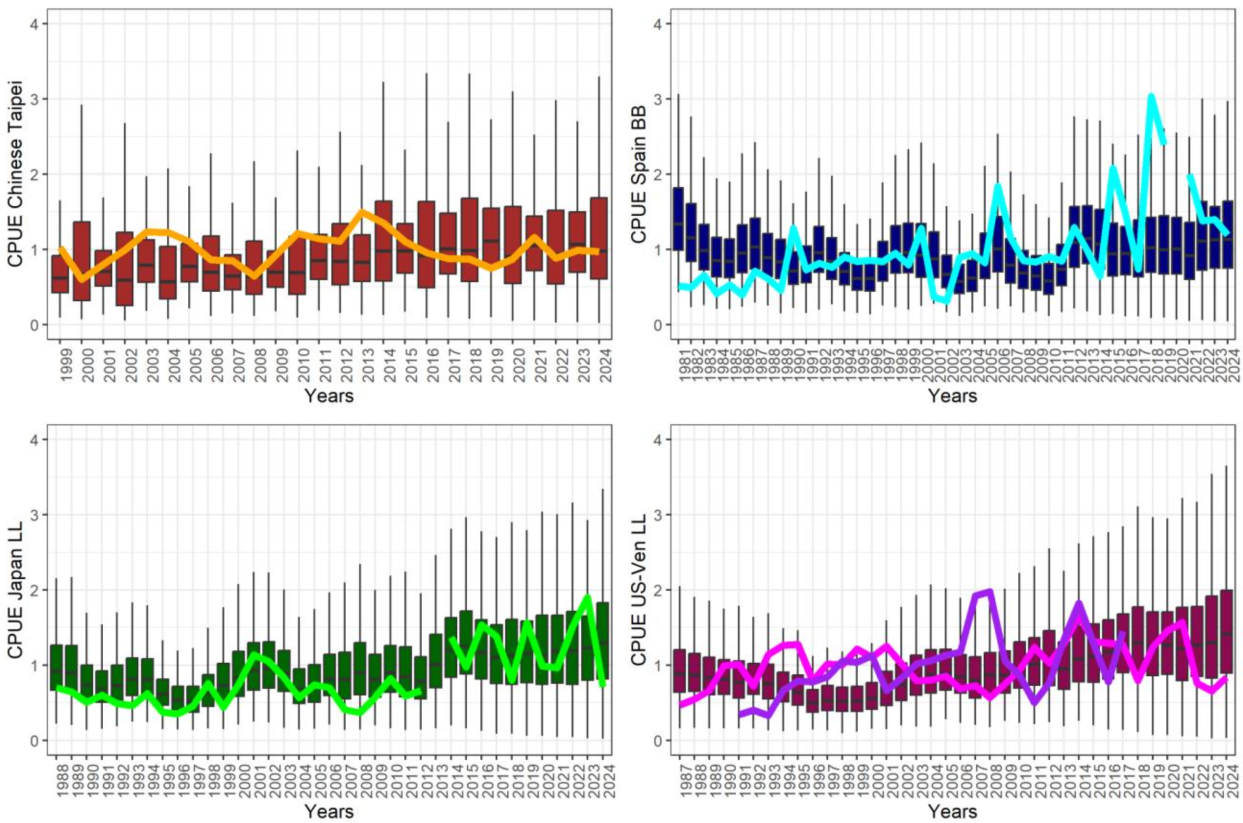


Figure 19.5.2 CPUE trajectories simulated in the MSE (boxplots) and updated standardized CPUEs (lines). Chinese Taipei-LL (orange), Spain-BB (blue), Japan-LL (green) and USA-LL (pink) were all updated to 2024, and Venezuela-LL (purple) has not been updated since 2017.

19.6 The SCRS shall provide an updated assessment of the state of the stock on the basis of the most recent data available, Rec. 24-08, para 11

Background: *In 2026, or in any subsequent year identified by the SCRS in 2025 due to data limitations that prevent it from proceeding with its work, the SCRS shall provide an updated assessment of the state of the stock on the basis of the most recent data available. It shall assess the effectiveness of this rebuilding plan and provide advice on possible amendments to the various measures within this plan. The SCRS shall advise the Commission on the appropriate characteristics of the fishing gear, the closure period in paragraph 9, as well as the minimum size to be implemented for Mediterranean albacore.*

The Committee recalled that the last stock assessment for Mediterranean albacore was conducted in 2024 using data up to 2022, and that despite some recent progress, major uncertainties - particularly regarding catch data and the treatment of the larval index - remain and continue to preclude a robust new assessment. It therefore advised that the next full assessment be scheduled not before 2027 and when these major uncertainties are addressed.

As stated in its 2024 response to the Commission (section 19.8 of the *Report for Biennial Period 2024-2025, Part I (2024), Vol. 2*), the Committee considered that changes to fishing gear would provide little benefit, as most catches are above the size at first maturity, and noted that the fall-winter closures adopted in 2022 may be contributing to reduced fishing effort, though their effect cannot yet be quantified. On minimum size, the Committee reiterated that such a measure would be of limited or no benefit given current catch composition and likely high discard mortality. The effectiveness of the rebuilding plan cannot yet be evaluated, as the available data do not reflect its recent implementation.

Billfishes

19.7 The SCRS shall review these data and determine the feasibility of estimating fishing mortality by commercial fisheries, Rec. 19-05, para 17

Background: *The SCRS shall evaluate the completeness of Task 1 and 2 data submissions, including estimates of total dead and live discards, and determine the feasibility of estimating fishing mortalities by industrial fisheries (including longline and purse seine), artisanal fisheries and recreational fisheries. If after conducting such evaluation, the SCRS determines that significant gaps in data reporting exist, the SCRS should explore approaches to estimate the level of unreported catches to include in future stock assessments in order to enhance the basis on which to provide management advice to the Commission.*

The Committee conducted a stock assessment of the Atlantic white marlin/roundscale spearfish stock in 2025 (Anon., 2025h) and was able to estimate fishing mortality by industrial (longline, purse seine), artisanal (gillnets) and recreational fisheries.

As part of the assessment, the Committee estimated fishing mortality by commercial fisheries (including longline and purse seine), recreational fisheries and artisanal fisheries for the Atlantic white marlin/roundscale spearfish using the integrated stock assessment model Stock Synthesis (SS3). Although the model from stock synthesis was not used for the management advice (due to poor model diagnostics), the Committee concluded that the analysis of relative fishing mortality among main fleet/gear was valid. The results of biomass and fishing mortality trends were similar between the JABBA and SS3 models (Anon., 2025h). It is important also to note that these results used the input catch series used in the 2025 stock assessment evaluation, and as indicated in the Committee management advice there are uncertainties particularly associated with reports of landings and discards from some fleets (e.g. Acevedo-Iglesias *et al*., 2025).

Document SCRS/2025/221 (Ortiz *et al*., 2025) provided an evaluation of the relative fishing mortality impact by main fleet/gear on white marlin/roundscale spearfish. Both blue marlin and white marlin/roundscale spearfish stocks are mainly caught as bycatch by the ICCAT commercial longline gears, and they account for the major source of mortality for these stocks. Based on the exploitation rate (i.e. biomass portion removed by fishing from the overall population biomass) it was estimated a standard fishing mortality unit (F')[4] that is comparable among the different gears selectivities. **Figure 19.7.1** shows the estimated annual standard F' by year and main fleet/gear groups for white marlin/roundscale spearfish.

[4] Definition of F' standard is provided in Ortiz *et al.* (2025) (SCRS/2025/221).

In **Figure 19.7.2** the same information is provided as the relative percent of mortality for each year and main fleet/gear.

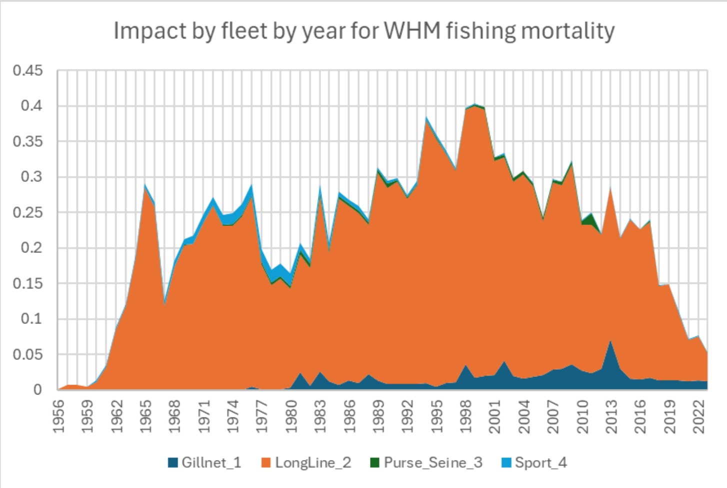


Figure 19.7.1 Estimated annual overall standard fishing mortality by fleet/gear selectivity for the white marlin/roundscale spearfish.

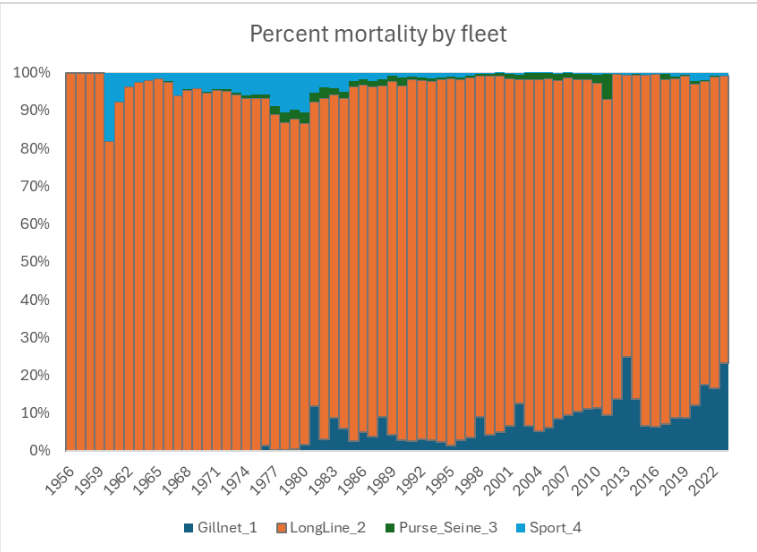


Figure 19.7.2 Relative annual standard fishing mortality by main fleet/gear for white marlin/roundscale spearfish.

The results indicated that the bycatch from the longline fleets is the main source of fishing mortality on average 83% for white marlin/roundscale spearfish in the last 5 years of the assessment. In the case of white marlin/roundscale spearfish, the gillnets (both commercial and artisanal or small-scale fisheries) account for 15.2%, while the sport recreational fisheries account for 1.3% of mortality, and 0.2% from the purse seine bycatch.
In summary, the estimates of fishing mortality impact by the main fleet/gear are directly related to the proportion of the catches reported.

The estimates are likely underestimated given that some of the models estimated 28% mortality as unreported. The Committee reiterates the need for accurate reporting of discards to be able to estimate the total mortality.

References

Anonymous. 2025h. Report of the 2025 ICCAT Atlantic White Marlin Stock Assessment Meeting (hybrid/ Madrid, Spain, 23-27 June 2025). Collect. Vol. Sci. Pap. ICCAT, 82(3), SCRS/2025/009: 1-92.

Acevedo-Iglesias, S., Herrera, M., Ramos, M.L., Baez, J.C., Ruiz, J., Rodriguez-Rodriguez, G., Rojo, V., Pascual-Alayón, P.J., Abascal, F. J. 2025. Bycatch trend and its fate of the Spanish-owned tuna purse seiners fleet from the Atlantic and Indian oceans: Impacts of the implementation of good practices. Marine Policy 177 106694.

Ortiz, M., Kimoto, A., Schirripa, M., Ramirez, K. 2025. Evaluation of the relative fishing mortality impact by main fleet gear on Atlantic white marlin stock. (in press) SCRS/2025/221.

19.8 Revise the statistical methodology used to estimate dead and live discards and provide feedback to CPCs, Rec. 19-05 para 16

Background: *No later than 2020, CPCs shall present to the SCRS the statistical methodology used to estimate dead and live discards. CPCs with artisanal and small-scale fisheries shall also provide information about their data collection programmes.*

The SCRS shall review these methodologies and if it determines that a methodology is not scientifically sound, the SCRS shall provide relevant feedback to the CPCs in question to improve the methodologies.

The SCRS shall also determine if one or more capacity building workshops are warranted to help CPCs to comply with the requirement to report total live and dead discards. If so, the Secretariat in coordination with the SCRS should begin organizing the SCRS-recommended workshop(s) in 2021 with a view to convening them as soon as practicable.

The Committee noted that, since the response to this request provided in the *Report for Biennial Period, 2024-25 Part I (2024), Vol. 2*, several CPCs (**Table 1**) have provided information on their statistical methodology to estimate dead and live discards of billfish species.

There is limited information provided by CPCs on the methods they employ for estimating discards. The Committee reiterated that it is important for the Committee to understand the methodology used by CPCs to estimate live and dead discards of billfish. The Committee reminded CPCs that have not yet presented documentation on the bycatch/discards (live and dead) estimation methodologies used of the obligation to do so. The Committee is discussing the development of a protocol to evaluate thoroughly the methodologies provided and to provide specific guidelines and recommendations.

In 2025 CPCs provided three SCRS documents on the statistical methodology to estimate discards of billfish species from the Spanish surface longline fisheries (Fernandez-Costa and Ramos-Cartelle, 2025 (SCRS/2025/180)), the Japanese longline fisheries in the Atlantic (Satoh *et al*., 2025 (SCRS/2025/203)), and from the Portuguese pelagic longline fleet (Coelho *et a*l., 2025a (SCRS/2025/029)). The Committee proposed that the statistical methodologies from each fishery should be reviewed at the SCRS Working Group on Stock Assessment Methods for a more comprehensive and in-depth evaluation as these methodologies are being used for several species.

The SCRS has conducted regional workshops on statistics of small-scale fisheries in West Africa and the Caribbean and has implemented a pilot project to improve data on blue marlin and yellowfin tuna caught by Caribbean fisheries. Artisanal and small-scale fleets do not often discard billfish as these species are retained and landed for local consumption. In most cases, landings represent the total catch.

In recent decades many sport vessels released most billfish caught, however, most of these fishing fleets do not report releases or landings consistently. The ratio of release versus landing from these fleets varies with time, between regions, and depending on whether fishing is done as part of a tournament.

To improve the quality of landing and discards of billfish it is recommended to continue to support the ongoing collaborative project between national statistical correspondents, national scientists, and ICCAT data monitoring experts. The project aims to improve small-scale and sport fishery data on Caribbean billfish and have the following elements:

- Thorough review of historical documents on small-scale and sport fisheries catching ICCAT species, particularly billfish;
- Review of national governance systems related to ICCAT fisheries;
- Interview key informants involved in fishery governance, operations, and monitoring;
- Technical support to improve the design, monitoring, and statistical estimation of catch, discards, and fishing effort;
- Improve biological sample collections.

To increase capacity building to estimate dead and live discards, the Committee developed and made available the Bycatch Estimation Tool (BYET). This tool is intended to provide a standardized method that CPCs can use to estimate such quantities as bycatch, dead and live discards, and other aspects of their fishery catch. The Committee recommends that CPCs make every effort to take advantage of this tool and future workshops to address the issues indicated in this request.

19.9 Explore potential technical changes to the terminal gear and fishing practices that could reduce bycatch and bycatch mortality. Design and implement a study(ies) to compare the effects of hook shape and size on catch rates, Rec. 19-05, para 21

Background: *The SCRS shall, in collaboration with CPCs, explore potential technical changes to the terminal gear (such as hook shape, hook size, leader type, etc.) and fishing practices (e.g. timing, soaking time, bait, depths, areas) that could reduce bycatch and bycatch mortality (at-vessel and post-release). As part of this process, the SCRS in collaboration with CPCs shall design and implement a study(ies) to compare the effects of hook shape and size on catch rates (considering both hooking and retention rates), at-haulback mortality, and post-release mortality. The experimental design should account for the influence of leader material types and consider potential operational differences among regions and fleets.*

There are several SCRS documents and presentations that have been provided by the Sub-group on Technical Gear Changes since 2021 to meetings of the Billfishes Species Group or the Subcommittee on Ecosystems and Bycatch: Anon. (2021b), Anon. (2022), and Coelho (2025) (SCRS/P/2025/035).

The work of the Sub-group on Technical Gear Changes continues, with the current main objective being the completion of the synthesis of the power analysis presented in Coelho (2025) (SCRS/P/2025/035), aiming at establishing future priorities for fisheries where the experimental trials can be carried out, and respective estimated effort/costs needed. A second objective is the preparation of a template for a data-call, from which statistical analysis can be carried out to determine other variables influencing catch rates and bycatch mortality.

The Committee noted that the Sub-group on Technical Gear Changes will continue to provide regular updates to the SCRS. The Committee reiterated that conducting field experiments on gear technology will require significant and long-term financial support from the Commission.

References

Anonymous. 2021b. Report of the Sub-group on Technical Gear Changes from the Billfish Species Group. Collect. Vol. Sci. Pap. ICCAT, 78(1): 67-74.

Anonymous. 2022. Second Report of the Sub-group on Technical Gear Changes. Collect. Vol. Sci. Pap. ICCAT, 79(5): 229-248.

Coelho, R. 2025. Update of the Sub-group on technical gear changes. SCRS/P/2025/035.

Bluefin tuna

19.10 According to the timeline set out in Annex 3, the SCRS shall run the MP specified in Annex 2 and advise the Commission of the resulting TAC for both the western management area and the eastern management area, Rec. 23-07, para 7

Background: *According to the timeline set out in* ***Annex 3****, the SCRS shall run the MP specified in* ***Annex 2*** *and advise the Commission of the resulting TAC for both the western management area and the eastern management area.*

The adopted MP (Rec. 23-07) was used to calculate the 2026-2028 TACs for the eastern Atlantic and Mediterranean Sea stock (48,403 t) and the western Atlantic stock (2,568 t).

As explained in the Bluefin Tuna Executive Summary (BFT_01) the Committee is providing a retuned version of the BR MP (BR*) which incorporates the western CKMR results and gives the 2026-2028 TACs of 45,191 t and 2,963 t for the eastern Atlantic and Mediterranean Sea stock and the western Atlantic stock, respectively.

Should the Commission choose BR* for use in setting the TAC for 2026-2028, the updated tuning values would be indicated in **Table 19.10.1** below.

Table 19.10.1 Control parameter values for the MP. A TAC variation reduction adjustment factor with VarCadj=0.5 has been applied.

CMP Name	*PGK*	*Cycle*	*Stability*	α_0	$\Delta\alpha$	β_0	$\Delta\beta$
BR*	60	3	+20/-35	1.235	0.125	0.950	0.000

19.11 SCRS shall assess the occurrence of exceptional circumstances (ECs) annually, Rec. 23-07, para 9

Background: *The SCRS shall assess the occurrence of exceptional circumstances annually and the Commission shall act in accordance with the exceptional circumstances protocol set out in Annex 4.*

In accordance with the ECP outlined in Rec. 23-07, the Committee was not able to achieve consensus on if the CKMR results warranted the triggering of EC which has resulted in two options of TAC for 2026-2028 being provided, one based on the adopted MP and another on an updated tuning of the adopted MP which incorporates the CKMR results. This determination of ECs is based upon an evaluation of the criteria outlined in Rec. 23-07, as elaborated below.

a) Stock dynamics

i. *Indices.* The primary quantitative indicator for EC relates to whether the combined indices fall outside of 95% prediction intervals. For 2024, neither of the combined indices falls outside of the 95% prediction intervals (**Figure 19.11.1**), resulting in no triggering of EC.

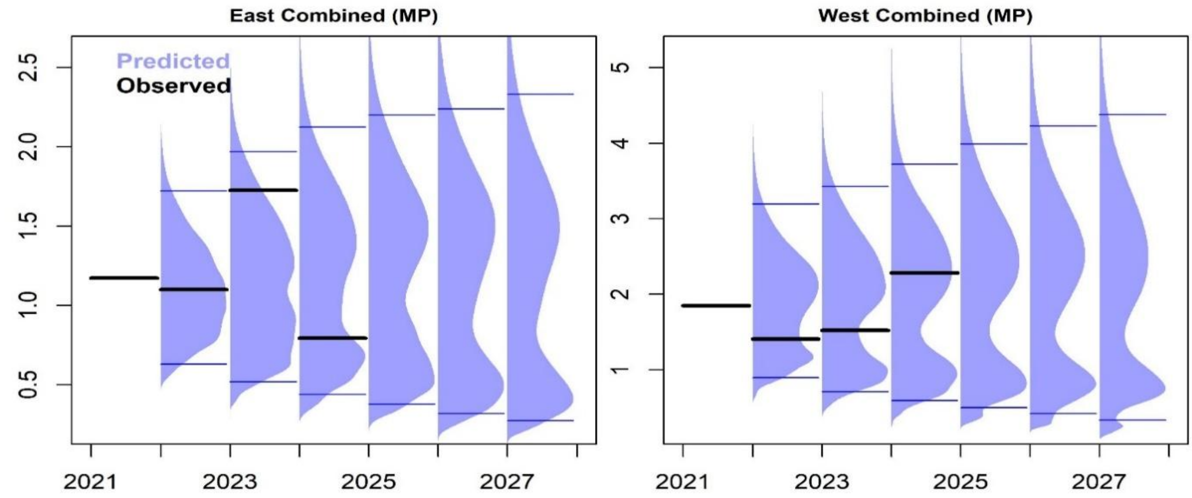


Figure 19.11.1 Standard marginal plots of observed composite indices (black bars) and distribution of posterior predicted data (blue density distribution) for the reference grid of OMs (n =2304, 48 OMs, 48 simulations each). Blue bars represent the 95% intervals. The Moroccan-Portuguese trap data point for 2024 was not used due to changes in temporal distribution of the catches that created unsolvable problems for the existing index standardization.

ii. *Abundance and life history or fishery dynamics*. BFT-W CKMR estimates of spawner abundance was presented and accepted as an estimate of western stock biomass scale. Based on the current criteria outline in the ECP (Rec. 23-07) the Committee was not able to achieve consensus on if the CKMR results warranted the triggering of EC.

The Committee undertook a 'lite-reconditioning' exercise where the 2022 MSE's West Area-High and West Area-Low scale axis was replaced by the CKMR western stock age 8+ biomass estimate (21kt, CV=0.2). This reduced the number of the original OMs in the 2022 MSE in half, from 48 to 24 OMs. **Figure 19.11.2** compares the CKMR estimate of western stock biomass in 2018 with the corresponding values obtained from the 48 original OMs, whereas **Figure 19.11.3** shows stock status in 2016 (SSB/SSB_{MSY}) corresponding to the 48 original OMs and the reconditioned 24 OMs incorporating the western CKMR results.

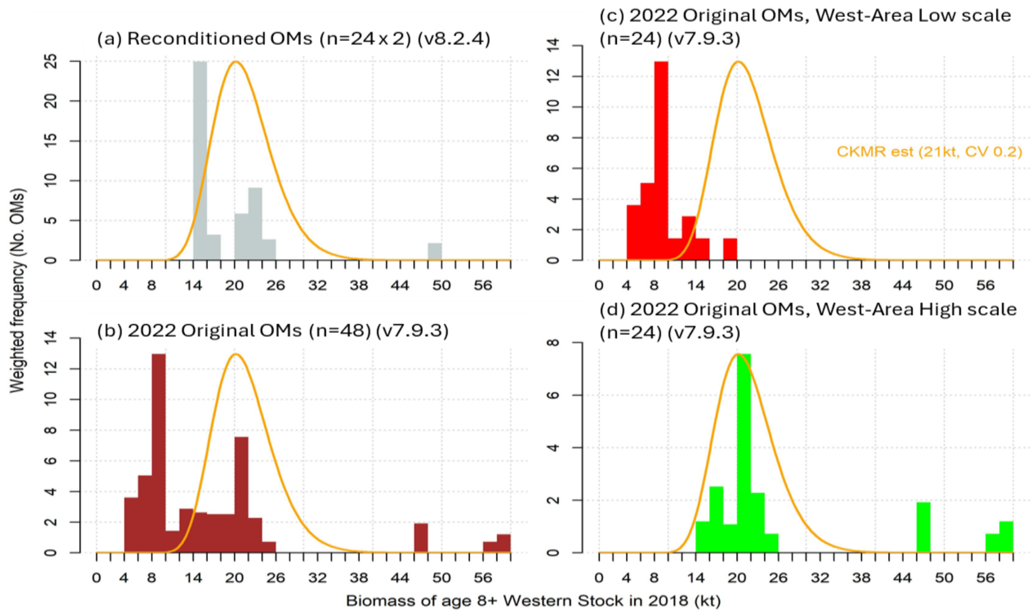


Figure 19.11.2 Plots of the western stock weighted frequency of OMs compared to the CKMR's estimates of western stock biomass of age 8+ animals (with a CV=20%). (a) the reconditioned 24 OMs incorporating the western CKMR results; (b) all 48 original OMs used in the 2022 MSE; (c) the 24 OM using West Area-Low scale used in the 2022 MSE; (d) the 24 OM using West-Area-High scale used in the 2022 MSE.

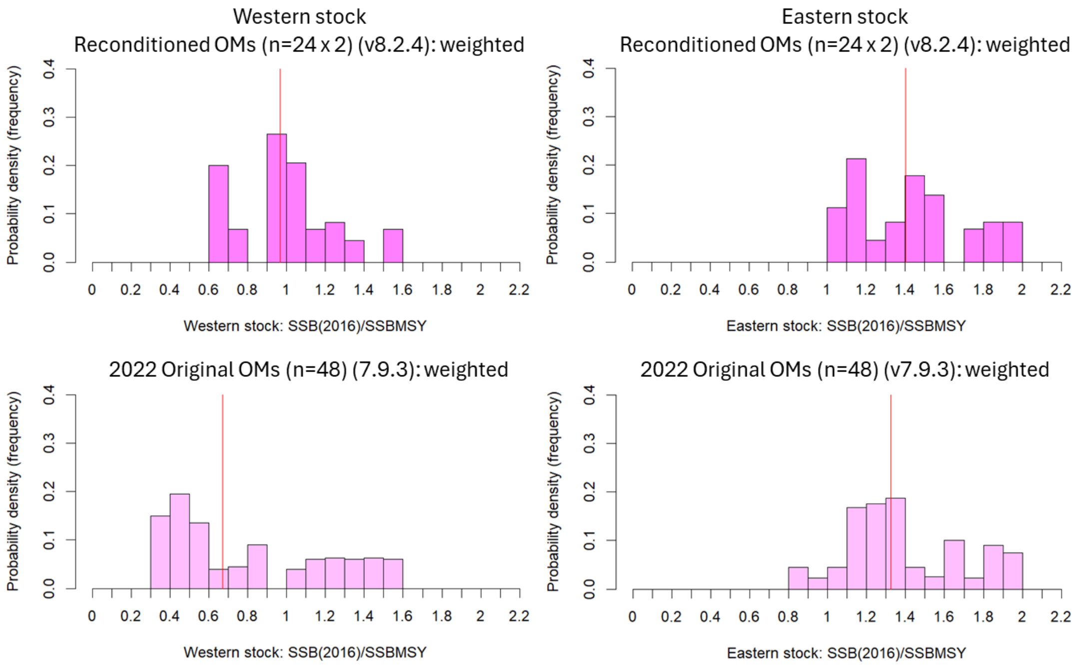


Figure 19.11.3 Plots of 2016 stock status in the western stock (left top: 48 original OMs used in the 2022 MSE; left bottom: the reconditioned 24 OMs incorporating the western CKMR results) and eastern stock (right top: 48 original OMs used in the 2022 MSE; right bottom: the reconditioned 24 OMs incorporating the western CKMR results). The vertical red line is the median of the OMs.

Based on these figures, some Committee members considered that the new CKMR results do not provide "evidence that the stock and/or fishery dynamics are in states not previously considered to be plausible in the context of the MSE", as the wording of the ECP indicates.

By contrast, other Committee members considered the new scientific evidence, provided by the CKMR results, a great improvement in the knowledge on western stock scale and substantially changes our understanding of the western stock status. This new understanding was consequential for how the OMs used in the MSE should be conditioned, and meaningfully impacted the performance of the adopted MP in achieving management objectives. Therefore, they considered ECs should be triggered.

Beyond this, there is no other evidence that life history or fishery dynamics are substantively different than those tested in the OMs.

b) Data availability for the MP

For 2024, all indices were updated, available and accepted by the Committee (**Figure 19.11.4**). Furthermore, there has been no triggering of EC for "data availability for the MP" within the ECP: in no year were three or more indices missing and no more than two indices were missing for two or more consecutive years. The Moroccan-Portugal trap data points for 2023 and 2024 were not used and the GOM larval survey index data point for 2022 was not available.

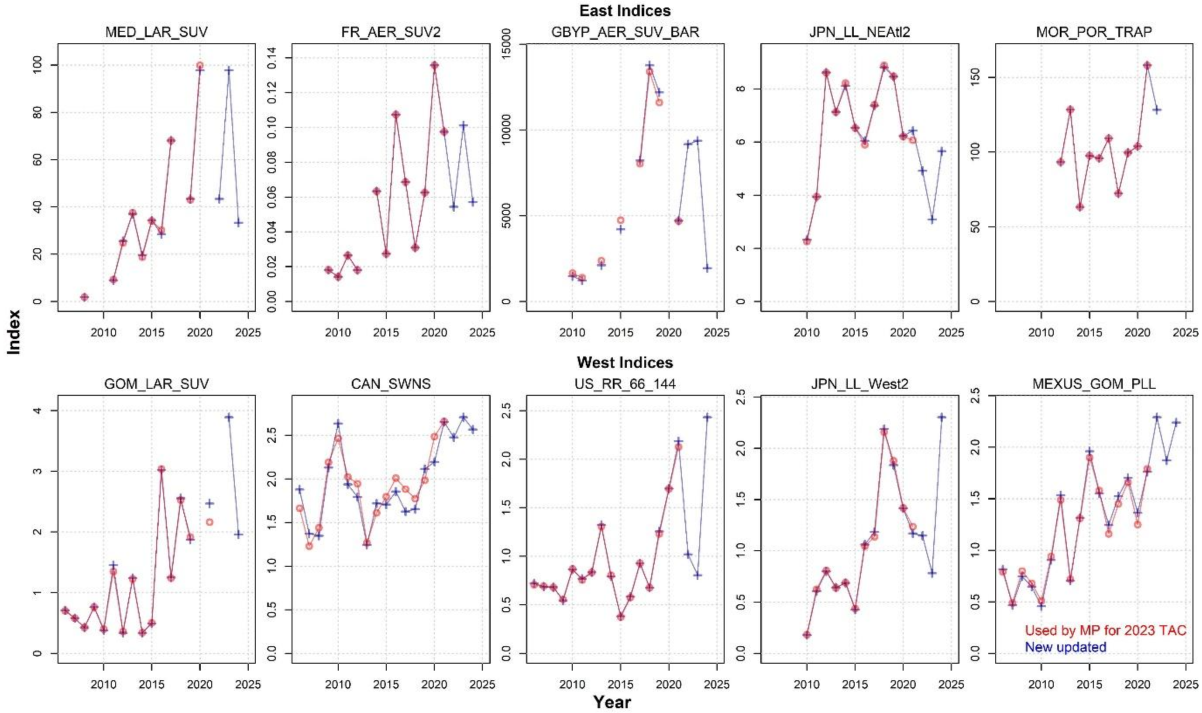


Figure 19.11.4. Plot of indices used in the 2022 MP calculation (red) and the new updated indices (blue) that were rescaled by the factor *k* and used in the MP calculations for 2026-2028 TACs. Red values are original indices used to determine the 2023-2025 TAC and in MSE conditioning; the blue values are strict updates of the indices through 2024 for use in the 2026-2028 TAC calculations. Within the past three years, the Moroccan-Portugal trap data points for 2023 and 2024 were not used and the GOM larval survey index data point for 2022 was not available.

c) Implementation of the TAC

The Committee confirmed that the reported catches in 2024 for East and West areas were both below the thresholds that would trigger ECs.

19.12 The SCRS should consider reviewing and updating the growth table published in 2022, as soon as possible and present those results to the Commission, Rec. 24-05, para 25; the SCRS shall evaluate the accuracy of video analysis software that incorporates AI and estimates the bluefin tuna length and provide advice to the Commission for its consideration, Rec. 24-05, para 173

Background (para 25): *Based on new available scientific information, including where relevant the result of the trials on Artificial Intelligence (AI) referred to in paragraph 167, the SCRS should consider reviewing and updating the growth table published in 2022, as soon as possible and present those results to the Commission.*

Background (para 173): *As soon as the technological developments are considered robust and ready for commercial scale-up, as well as the SCRS establishes the technical criteria, and guidelines for their selection, the SCRS shall evaluate the accuracy of video analysis software that incorporates AI and estimates the bluefin tuna length and provide advice to the Commission for its consideration.*

In 2025 the Committee reviewed documents on trials of Artificial Intelligence (AI) for counting and measuring the size of tunas caught and transferred from the purse-seine/trap to a cage, or from a cage to another cage. The documents confirm the feasibility of measuring fish and counting the fish using AI during the transfer, with a substantial reduction in processing time and increase in sample size. While counting with AI appeared to still require some refinements, the measurement appeared to be accurate and an automatic, rapid and objective system will provide substantial benefits. The Committee reiterated its two substantive recommendations to the Commission regarding the stereoscopic camera program:

1. Priority be given to implementing and validating a system for use of software and AI in conjunction with stereoscopic cameras and conventional cameras for estimating biomass at the first transfer from the purse seine/trap to the towing cage and other subsequent transfers.

2. The Committee reiterated that with the application of the technology, it requires that 100% of footage should be provided to SCRS rather than a 20% sample as so far required. The recent advances of AI allow for rapid and objective reading of the video footage and would facilitate an objective review of the video.

The primary objective of this work is to determine the biomass of fish removed from the water at the time of capture, estimating this biomass at the time of first transfer has many benefits of eliminating all of the confounding factors of fish weight gain or loss and mortality. Furthermore, the purse seiners have a strong interest in accurate knowledge of what has been removed as this is where and how the quota would be most effectively monitored. If they are under the quota then they could make additional sets and if over, release remaining fish. Given that the technology is advancing to the point that stereo videos can be used in that first transfer, this should be the top priority.

In 2025 the Committee did not receive any new scientific information that could be used to review and update the growth table published in 2022. Recent results presented to the Committee, regarding measurement at the first transfer from purse-seine/trap to towing cage using AI technology, showed that commercial scale-up and operational aspects related to the implementation during commercial operations could begin to be envisaged.

However, until AI tools can be fully implemented during commercial operations to estimate the biomass removed at the time of first transfer, from purse seine/trap to towing cage, noting its applicability not only depends on technical development but also on the operational feasibility at sea, the Committee recommends using the existing growth table. The table of the median provides the most likely expected growth rate that could be obtained. As the Committee understands that the growth table is also used for compliance purposes to identify growth rates that are unlikely to be achieved the Committee recommended using the upper 75% confidence interval, corresponding to the 87.5th percentile, as a flag for outlier growth (**Table 19.12.1**). The rationale is that the 95% upper confidence interval reports a near upper limit on growth rate, which is unlikely to be achieved across all operations at all times. Using such a growth rate to estimate the biomass removed at the time of first transfer could impair the ability to detect EC under the criterion listed in Annex 4 of Rec. 23-07, Table 1, principle (c).

Table 19.12.1 Matrix table of the estimated maximum growth in weight at harvest (kg) of farmed bluefin tuna as a function of size at caging (rows) and time in farms (columns) month after caging. The 1st year estimates are for each month, for the 2nd and 3rd year the estimates are for 3-month period, where the value indicated correspond to the mid-month. The values represent the upper 75% confidence interval, corresponding to the 87.5th percentile (Ortiz *et al*., 2022; Ortiz and Tsukahara, 2023). SFL – Straight fork length; LL – Lower limit; Fish size classes (SFL) – Small (<100cm), Medium (100-180cm), and Large (≥180cm).

Fish size	Size at caging	Time in farm (months)																			
class	**SFL LL cm**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**14**	**17**	**20**	**23**	**26**	**29**	**32**	**35**
small	70	14.7	17.6	23.9	35.5	41.4	42.4	46.8	49.1	51.1	41.4	41.5	57.2	56.0	62.3	63.4	64.1	69.4	77.5	85.6	88.7
small	80	21.1	23.4	30.4	41.9	47.8	48.9	53.3	55.5	57.5	47.8	47.9	63.6	62.4	68.8	69.9	70.5	75.8	89.1	92.0	91.8
small	90	31.2	23.0	40.5	52.1	58.0	59.0	63.4	65.7	67.7	58.0	58.1	73.7	72.6	78.9	80.0	80.7	85.9	99.2	102.1	101.9
medium	100	45.3	40.2	58.6	72.1	78.8	80.7	81.8	83.0	89.3	90.8	101.8	114.4	97.1	109.2	118.5	119.9	142.3	150.9	155.6	160.3
medium	110	56.3	51.2	69.6	83.2	89.8	91.8	92.8	94.0	100.3	101.9	112.8	125.5	108.1	120.2	129.5	131.0	146.5	161.9	169.1	171.4
medium	120	88.4	63.6	82.0	95.5	102.1	104.1	105.1	106.4	112.6	114.2	125.1	137.8	120.4	132.6	141.9	143.3	165.7	174.3	181.4	185.4
medium	130	83.7	79.4	97.8	111.3	118.0	119.9	121.0	122.2	128.5	130.0	141.0	153.6	136.3	148.4	153.8	159.1	181.5	190.1	197.2	199.5
medium	140	84.4	97.5	115.8	129.4	136.0	138.0	139.0	140.2	146.5	148.1	159.0	171.7	154.3	166.4	175.7	177.2	199.5	207.4	215.3	217.6
medium	150	106.3	119.3	137.7	151.3	157.9	159.8	160.9	162.1	168.4	169.9	180.9	178.5	176.2	188.3	197.6	199.1	221.4	230.0	234.7	239.4
medium	160	131.4	144.5	162.9	176.4	183.0	185.0	186.0	187.3	193.5	195.1	206.0	218.7	216.1	213.5	222.8	234.7	246.5	255.2	262.3	264.6
medium	170	156.6	169.7	188.1	198.2	208.3	210.2	211.3	212.5	218.8	220.3	231.3	243.9	226.5	238.7	248.0	249.4	271.8	280.4	287.5	304.9
large	180	164.9	190.0	223.3	243.6	252.7	255.2	254.4	254.2	263.6	264.1	285.5	286.6	272.6	286.8	297.0	313.6	317.1	320.6	326.1	345.1
large	190	192.2	217.3	250.7	270.9	280.0	282.5	281.7	281.6	290.9	291.4	312.8	313.9	299.9	312.1	324.3	340.9	328.4	340.9	353.4	372.4
large	200	222.1	247.1	280.5	300.7	306.5	312.3	311.6	311.4	320.8	321.2	342.6	343.8	329.8	344.0	357.4	370.7	358.2	377.8	390.5	403.3
large	210	254.0	279.1	312.4	332.6	341.7	342.6	343.5	343.3	352.7	353.1	374.5	375.7	361.7	375.9	386.0	388.1	390.1	409.7	415.1	434.2
large	220	286.6	311.7	345.0	365.3	374.4	376.9	379.7	382.5	385.3	385.7	407.2	408.3	394.3	408.5	418.7	435.3	438.8	442.3	447.8	466.8
large	230	318.9	344.0	377.3	397.6	406.7	409.2	408.4	408.2	416.3	424.4	432.5	440.6	426.6	440.8	451.0	467.6	455.1	474.7	480.1	499.1
large	240	351.4	380.6	409.7	430.0	439.1	441.6	440.8	440.6	450.0	450.4	471.9	473.1	475.7	479.5	483.4	500.0	487.5	507.0	512.5	528.0
large	250	376.7	401.6	434.9	455.1	464.2	466.7	465.9	465.8	475.2	475.6	497.0	498.2	484.2	498.4	503.2	508.0	512.9	532.3	537.7	556.9

References

Ortiz M., Mayor C., Alemany F., and Paga A. 2022. Analysis and results of weight gain of eastern bluefin tuna (*Thunnus thynnus*) in farms. Collect. Vol. Sci. Pap. ICCAT, 79(3): 992-1021.

Ortiz M., and Tsukahara Y. 2023. Interpolation of the growth table for farming bluefin tuna. Collect. Vol. Sci. Pap. ICCAT, 80(9): 231-237.

19.13 Farm CPCs shall endeavor to ensure that the growth rates derived from the eBCDs are coherent with the growth rates published by the SCRS in 2022. If significant discrepancies are found between the 2022 SCRS tables and growth rates observed, that information should be sent to the SCRS for analysis, Rec. 24-05, para 26

Background: *Farm CPCs shall endeavor to ensure that the growth rates derived from the eBCDs are coherent with the growth rates published by the SCRS in 2022. If significant discrepancies are found between the 2022 SCRS tables and growth rates observed, that information should be sent to the SCRS for analysis. Import CPCs and farm CPCs shall be encouraged to cooperate in monitoring the growth rates in a comprehensive manner through exchange of relevant data, without prejudice to applicable rules on the protection of personal data, and to report the result of the monitoring to Panel 2, as appropriate.*

The Committee has not received any data that allows evaluation that the growth rates derived from the eBCDs are coherent with the growth rates published by the SCRS in 2022.

19.14 Requests of Panel 2 to the SCRS, 2025 Intersessional Meeting of Panel 2

Background:

1. *Panel 2 discussed allocation[5] issues at its Intersessional meeting in March 2025. Several CPCs pointed out that due to various reasons, they may not be able to fully utilize their allocations and possibly use less than 95% of the allocation. Under paragraph 6 of Recommendation by ICCAT amending the Recommendation 22-08 establishing a multi-annual management plan for bluefin tuna in the eastern Atlantic and the Mediterranean (Rec. 24-05), a CPC is allowed to transfer a maximum of 5% of its annual (initial) quota if so requests when the underage is equal to or more than 5% of the quota. Thus, if a CPC uses, say, only 80% of the allocation, 15% of the allocation cannot be carried over to the following year and therefore unused. While this is good for the bluefin tuna stocks, it is an economic waste of the resources.*

2. *To avoid such economic waste as well as help allocation negotiations in 2025, one idea is to carry over the underage beyond 5%. While a 5% carry-over of a CPC is added to the CPC's allocation in the following year, such underages beyond 5% will be pooled and added to the Total Allowable Catch (TAC) in the following year. The carried-over amount could be distributed among CPCs in a manner to be agreed by Panel 2.*

3. *Under the current Management Procedure (MP), if the total catch for either the West area or the East area is 20% or more above the TAC for the respective area, this could constitute an exceptional circumstance (EC). This could be interpreted that if the carried-over amount is less than 20% of the TAC, it will be within the MP and does not trigger the exceptional circumstances protocol (ECP). It should be noted that the case envisaged under the MP is overharvests by CPCs whereas the case being considered by Panel 2 is utilization of unused allocations. Panel 2 believes that the impacts of this case on the stocks are much less than the case of overharvests.*

4. *Accordingly, Panel 2 would like to request the SCRS to answer the following questions[6] in sufficient time to inform discussions at the 29th Regular Meeting of the Commission:*

   (1) *Under the current MP, is it possible to carry over unused allocation beyond 5% of a CPC's initial allocation to increase the TAC in the following year?*

   (2) *If so, is 20% of the TAC a reasonable upper limit for the total carried-over amounts, which should include individual carry-overs by CPCs?*

   (3) *If 20% is too high, what is a reasonable figure?*

   (4) *If the assessment of this new approach requires another simulation testing within the Management Strategy Evaluation (MSE) framework, when can the SCRS conduct it?*

[5] In this paper, allocation and quota have the same meaning.
[6] If the SCRS needs to know how the carried-over amount is distributed among CPCs, please assume a pro-rata increase.

The Committee tested the impact of underage and carryover provisions by re-running the BR-MP using the existing MSE code with no changes, nor updates to the data. The following modifications to catches/removals were applied in each year:

- For the first year in simulations (2023) modify the BFT-E removals to be 20% lower than the calculated BFT-E TAC with the underages applied equally across the TAC allocation;
- In the second year, add the tonnage underage from the previous year to the current year's MP-based BFT-E TAC and the existing allocation key. Assume the TAC+carry forward will be removed in its entirety; and
- Then repeat this 2-yearly pattern for the remaining 28 years: underage then TAC+carry forward, underage then TAC+carry forward, etc. **Figure 19.14.1** illustrates the process.

The carryover considered for catches in the Eastern area makes a negligible difference to yield or conservation performance for both Eastern and Western stocks (**Table 19.14.1**). Technically, this allowance constitutes an adjustment to the existing BR management procedure as such a provision was not originally built into it. However, should the Commission wish to implement an allowance, 20% could be considered a reasonable upper limit to carryover in the Eastern area. The exercise assumed allocations according to the existing key and, for simplicity did not explore fleet or CPC specific underages or allocations. Assuming that no major changes allocations in occur between fleets with dramatically varying selectivity, the conclusions of this exercise should hold.

Responses to specific questions.

1. *Under the current MP, is it possible to carry over unused allocation beyond 5% of a CPC's initial allocation to increase the TAC in the following year?*

   From a scientific standpoint, this poses no concern for the resource.

2. *If so, is 20% of the TAC a reasonable upper limit for the total carried-over amounts, which should include individual carry-overs by CPCs?*

   The SCRS tested 20% as a reasonable upper limit to carryover in the Eastern area and found that it makes a negligible difference in conservation performance for both the Eastern and Western Stocks.

3. *If 20% is too high, what is a reasonable figure?*

   The SCRS tested 20%, hence 20% or less could be considered a reasonable figure.

4. *If the assessment of this new approach requires another simulation testing within the MSE framework, when can the SCRS conduct it?*

   It is completed.

Table 19.14.1 Stochastic Br30, AvC30, LD*15%, LD*10% and VarC values (weighted medians and 90%iles for the OM grid across all simulations) for the original BR and BR with Eastern carryover. AvC30 values are in thousand mt.

		PKG	Br30	LD*15%	LD*10%	AvC30	VarC
	EAST						
BR	Original	**0.60**	1.17 (0.33; 2.20)	0.41	0.33	41.35 (12.38; 72.23)	19.23 (10.26; 30.30)
	With carryover	0.60	1.18 (0.33; 2.20)	0.40	0.33	41.67 (12.66; 71.52)	41.35 (12.37; 72.23)
	WEST						
BR	Original	**0.60**	1.25 (0.43; 2.37)	0.40	0.27	2.46 (0.86; 3.60)	11.07 (4.89; 32.07)
	With carryover	0.60	1.25 (0.43; 2.37)	0.40	0.27	2.46 (0.86; 3.60)	11.02 (4.85; 31.87)

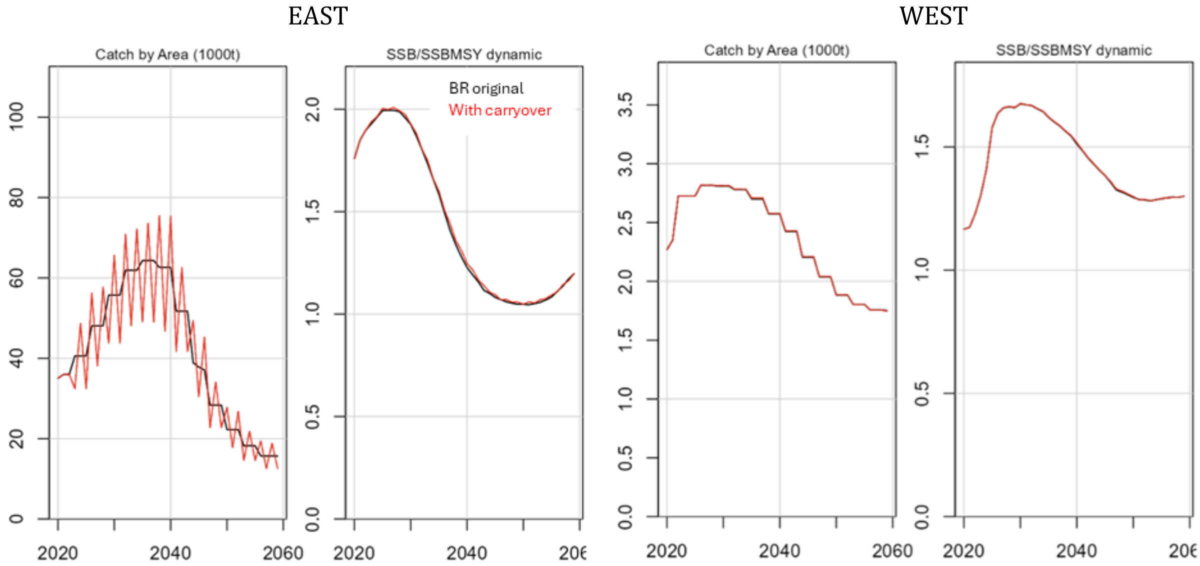


Figure 19.14.1 Median catch (by area) and SSB (by stock) projections averaged over all OMs in the grid and the replicate simulations for the adopted MP: original base case in black and with carryover (in red).

Swordfish

19.15 The SCRS shall apply the MP and advise the Commission of the resulting TAC for North Atlantic swordfish for the next three-year management cycle. The SCRS shall assess the occurrence of ECs annually, Rec. 24-10, para 5

Background: *The SCRS shall apply the MP specified in Annex 1 in accordance with the timeline set out in Annex 3 and advise the Commission of the resulting TAC for North Atlantic swordfish for the next three-year management cycle. The SCRS shall assess the occurrence of ECs annually, and the Commission shall act in accordance with the ECP once adopted pursuant to paragraphs 20 and 21.*

Based on paragraph 21 in Rec. 24-10 the Committee provides its recommendations for an ECP for the Commission's consideration. This draft ECP for SWO-N is based on the ECP for both BFT (Rec. 23-07) and ALB-N (Rec. 21-04).

Draft ECP for North Atlantic Swordfish

1. Principles of ECs

The following three general principles should be considered as a signal indicating the possibility that ECs exist:

a) When there is evidence that the stock and/or fishery dynamics are in states (as defined in **Table 19.15.1** a) not previously considered to be plausible in the context of the MSE, or when there is evidence that stock states or fishery dynamics included within the OMs for the MSE testing are no longer considered plausible.

b) When there is evidence that the data required to apply the MP are not available or sufficient, or are no longer appropriate (as defined in **Table 19.15.1** b); and/or,

c) When there is evidence that total catch is meaningfully above the TAC set using the MP (as defined in **Table 19.15.1** c).

It is not possible to define all scenarios in which ECs may occur/apply here. A protocol with general guidance for determining whether ECs exist and whether the implication(s) arising from them is sufficiently severe to warrant revising the advice from the MP is described below. The protocol should not be viewed as a definitive set of criteria/responses. Nor should it be viewed as a mechanism for making small adjustments. A finding of EC requires compelling scientific evidence, and EC actions should be taken only when maintaining the current MP is considered to be highly risky or highly inappropriate.

2. Indicators for ECs and process to determine if ECs occur

In light of the principles specified in Section 1, the SCRS should use the general guidance provided in **Table 19.15.1** and any other relevant information to evaluate annually whether ECs exist. If the SCRS determines that there is evidence of ECs, the SCRS will consider the direction and severity of the ECs (e.g. the degree to which CPUE values fall outside of their expected range and whether they are higher or lower than expected) and, where possible, examine its potential impacts on the performance of the MP.

Subsequently, the SCRS will inform the Commission of any such occurrence and the appropriate response. Triggering EC does not immediately result in TAC advice from the MP being rescinded; rather, it means that the SCRS needs to consider the evidence from the indicators in **Table 19.15.1**, and any other relevant information, and determine if a change in advice is warranted and whether certain further research work or adjustments to the MSE schedule is required.

With respect to identified ECs, such evidence would need to be sufficiently consequential that it would meaningfully affect TAC advice from the MP.

Table 19.15.1 General Guidance on indicators for North Atlantic swordfish ECs and timetable for conducting the evaluation.

Principle	***Indicator***	***Criterion***	***Frequency***
a) Stock and fishery dynamics	Indices	If, in any year, the observed combined index values fall outside the range from the 2.5 to 97.5 percentile of the simulated combined index used in the projections for testing the adopted MP.	Annually
	Abundance, life history and fishery dynamics	If there is evidence that the stock and/or fishery dynamics are in states not previously considered to be plausible in the context of the MSE or in conflict with a particular state included in simulation testing of the current MP.	Whenever information is available and after completion, presentation, and acceptance by the SCRS of a study as the new reference
b) Data availability for the MP	Indices	If data from two or more influential fleets contributing data to the combined index are missing[7].	Annually
c) Implementation of the TAC	Catch	If the total catch is 15% or more above the TAC set using the MP.	Annually

3. Actions to be taken in light of ECs

If the SCRS determines that ECs exist which preclude the application of the MP or make the application of the MP or the implementation of its results inadvisable based on the principles outlined in Section 1, the SCRS shall evaluate the nature of the EC and advise the Commission on:

a) Additional research which may bring more clarity on whether it is necessary to divert from the current MP revision schedule and TAC;

b) Alternative management options for the coming fishing year aimed at ensuring, at a minimum, stability in the status of the stocks, including the implications of: (i) maintaining the TAC decided through the MP, (ii) reducing the TAC in light of indications of stock decline, (iii) increasing the TAC in light of indications of stock increase that was not considered plausible during the MSE testing, and (iv) any other appropriate conservation and management actions;

c) Whether the existing MP should be slightly adjusted or whether development of a new MP is required; and

d) Whether a stock assessment or other SCRS-approved method of determining TACs is needed for providing management advice in the interim while a revised MP is developed.

Based on the SCRS advice on the above, the Commission shall decide on alternative management action(s). As needed and appropriate, the SCRS shall conduct a new stock assessment and/or provide advice on new candidate MPs as soon as possible.

See the flowchart below for a schematic representation of the above process:

The SCRS shall check if ECs exist using the indicators and criteria specified in **Table 19.15.1** and according to the indicated frequency.

[7] The influence of data omissions vary by CPC and the impact of the particular combination of missing CPC data will be assessed by the SCRS.

Year 1 & 2:

1. Update the Combined Index of abundance
2. Update catch
3. Consider evidence defined above and any other relevant information
4. Consider availability of data to inform the Combined Index

Year 3:

1. Check that all datasets required in running the MP are available
2. Re-run MP
3. Same checks as conducted in Years 1 & 2

If no ECs exist

The TACs calculated by the MP continues to be valid (in years 1-3) and the MP continues to be applied in year 3 to calculate the TACs for the next three-year management period.

If ECs exist

SCRS determines that ECs do not preclude the application of the MP and implementation of its results (i.e., TAC).

SCRS determines that EC precludes the application of the MP or makes the application of the MP or the implementation of its results (i.e., TAC) unadvisable.

The SCRS shall advise the Commission on:

a) Additional research which may bring more clarity on whether it is necessary to divert from the current MP revision schedule and TAC.

b) Alternative management options for the coming fishing year aimed at ensuring, at a minimum, stability in the status of the stocks, including the implications of: (i) maintaining the TAC decided through the MP, (ii) reducing the TAC in light of indications of stock decline, (iii) increasing the TAC in light of indications of stock increase that was not considered plausible during the MSE testing, and (iv) any other appropriate conservation and management actions;

c) Whether the existing MP should be slightly adjusted or whether development of a new MP is required; and

d) Whether a stock assessment or other SCRS-approved method of determining TACs is needed for providing management advice in the interim while a revised MP is developed.

Based on the SCRS advice on the above, the Commission shall decide on alternative management action(s). As needed and appropriate, the SCRS shall conduct a new stock assessment and/or provide advice on new candidate MPs as soon as possible.

The adopted management procedure (MP) was run in 2024 and provided total allowable catch (TAC) advice for the first management cycle (2025–2027). The Committee undertook analyses to support development of a draft exceptional circumstances protocol (ECP), below. The protocol is scheduled to be adopted by the Commission in 2025, entering into effect in 2026. Final criteria associated with the three core principles of the protocol have not been formally adopted by the Commission. The Committee has, nevertheless, made an evaluation in accordance with the draft specifications of ECs.

The Committee has determined that ECs do not occur for the 2025 EC determination. This determination is based upon an evaluation of draft criteria and elaborated here.

a) Stock dynamics

i. Indices. For 2023, the combined index of abundance does not fall outside of the conventional 95% prediction intervals (**Figure 19.15.1**).

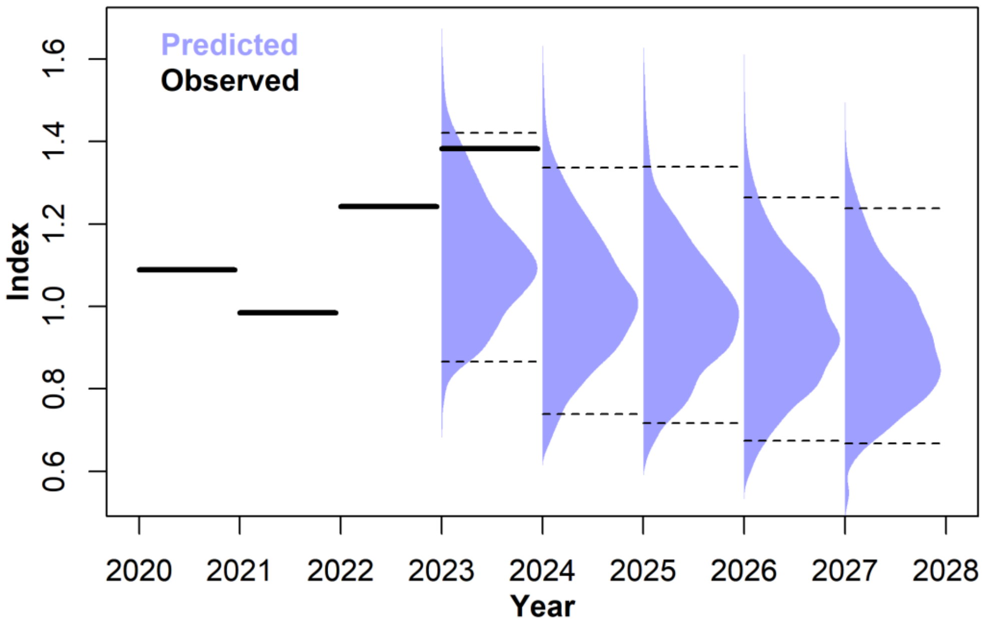


Figure 19.15.1 Plot showing the observed combined index (black horizontal bars; 2020-2023) and density distributions of the predicted combined index (blue distributions; 2023-2027) from the nine reference operating models (OMs) (80 simulations each). Black dashed lines represent the 2.5 and 97.5 percentiles of the predicted combined index across the nine OMs.

ii. Abundance and life history or fishery dynamics. No new evidence that abundance, life history or fishery dynamics are substantively different than those tested in the OMs that have emerged.

b) Data availability for the MP

The combined index of abundance was updated in 2025 with data to 2023. None of the data needed to construct the combined index were missing.

c) Implementation of the TAC

A TAC of 14,769 t was implemented in 2025. In 2026 the Committee will evaluate catch levels relative to this TAC.

19.16 The SCRS should continue to monitor and analyze the effects of this measure on the mortality of immature swordfish, Rec. 24-10, para 16

Background: *Notwithstanding the provisions of paragraph 15, any CPC may choose, as an alternative to the minimum size of 25 kg/125 cm LJFL, to take the necessary measures to prohibit the taking by its vessels in the Atlantic Ocean, as well as the landing and sale in its jurisdiction, of swordfish (and swordfish parts), less than 15 kg/119 cm LJFL, provided that, if this alternative is chosen, no tolerance of swordfish smaller than 119 cm LJFL, or in the alternative 15 kg, shall be allowed. For swordfish that have been dressed, a cleithrum to keel (CK) measurement of 63 cm can also be applied. A CPC that chooses this alternative minimum size shall require appropriate record keeping of discards. The SCRS should continue to monitor and analyze the effects of this measure on the mortality of immature swordfish.*

The Committee has been conducting work to evaluate the effectiveness of the minimum size limit. The Committee noted that high levels of at-haulback mortality in the longline fishery may be compromising minimum-size-limit objectives. However, the Committee also noted that the justification for the minimum size limit regulations, which have been in place since the 1990s, does not appear to be based on a quantitative analysis accounting for the biological characteristics of North Atlantic swordfish.

Considering the results of the biological studies that have been produced in recent years, the Committee intends to conduct such quantitative analyses investigating the role of minimum size regulation on the swordfish stock with respect to protecting against growth and recruitment overfishing, and accounting for the range of plausible biological characteristics and levels of discard mortality. Work on this issue is ongoing and the Committee will provide results of these analyses in 2026 or 2027.

19.17 All CPCs catching swordfish in the North Atlantic shall provide annually the best available data, including catch, catch at size, location and month of capture on the smallest scale possible. The SCRS shall review these data annually, Rec. 24-10, para 17

Background: *All CPCs catching swordfish in the North Atlantic shall provide annually the best available data to the SCRS, including catch, catch at size, location and month of capture on the smallest scale possible, as determined by the SCRS. The data submitted shall be for the broadest range of age classes possible, consistent with minimum size restrictions, and by sex when possible. The data shall also include discards (both dead and alive) and effort statistics, even when no analytical stock assessment is scheduled. The SCRS shall review these data annually.*

The Committee reviewed Task 1 and 2 data provided for the North Atlantic for 2024. Catch, effort, and size data for most CPCs were available. The Committee noted that discards data continue to not be available for most swordfish fisheries. Discard estimation analyses were provided by some CPCs and this issue is further addressed under item 19.18.

The Committee noted the use of trapline gear in some swordfish fisheries and emphasized the importance of identifying within data submissions when this gear type is in use and the configuration of the gear.

19.18 SCRS shall review these methodologies and, if it determines that a methodology is not scientifically sound, the SCRS shall provide relevant feedback to the CPCs, Rec. 24-10, para 19

Background: *No later than 15 July 2025, CPCs shall present to the SCRS the statistical methodology used to estimate dead discards and live releases. CPCs with artisanal and small-scale fisheries shall also provide information about their data collection programmes. The SCRS shall review these methodologies and, if it determines that a methodology is not scientifically sound, the SCRS shall provide relevant feedback to the CPCs in question to improve the methodologies. Once these methods are approved CPCs should update their catch reporting to incorporate these estimated dead and live discards.*

The Committee was provided with five SCRS documents in 2025 on proposed methods for discard estimation for longline fleets (Morocco, EU-Portugal, Japan, Canada, and EU-Spain). The Species Group conducted internal peer review of the methodologies and will be providing recommendations for revisions. The Committee considered that proposed methodologies should be submitted next to the Working Group on Stock Assessment Methods (WGSAM) for its review and feedback.

Sharks

19.19 Exemption of presentation of Shark Check Sheet, Rec. 18-06 para 3

Background: *3. CPCs may be exempt from the submission of the Check Sheet when vessels flying their flag are not likely to catch any sharks species covered by the abovementioned Recommendations in paragraph 1, on the condition that the concerned CPCs obtained a confirmation by the Shark Species Group through necessary data submitted by CPCs for this purpose.*

Following Rec. 18-06 para 3, the Commission has requested the SCRS to develop a procedure for CPC to request exemption of submission of the Shark Check Sheet. After discussion, the following procedure was proposed by the Committee:

1. Submission in year Y of a request for exemption from presentation of the Shark Check Sheet in year Y+1.

   a) The initial request in year Y must be submitted to the Secretariat to be reviewed by the SCRS by the same deadline as the Shark Check Sheet submission.

   b) The request must be accompanied by a written document clearly explaining the basis for the exemption, along with any necessary supporting data as stipulated in para. 2.

   c) The exemption may be requested for the entire Shark Check Sheet or only for recommendations with specific North/South implications.

   d) The initial request submission does not exempt the submission of the Shark Check Sheet from year Y-1.

2. SCRS assessment of the request.

   a) A representative from the CPC requesting the exemption must present the submitted document during the September Shark Species Group meeting of the same submission year.

   b) The Shark Species Group will review the document in order to assess the appropriateness of the exemption request, in line with the following guidelines:

      1. For CPCs that do not have active fleets targeting tuna and tuna-like species in the ICCAT area of competence:

         i. Declaration and evidence that the CPC does not have active fleets on fisheries targeting tuna and tuna-like species in the ICCAT area of competence.

      2. For CPCs that have active fleets on fisheries targeting tuna and tuna-like species in the ICCAT area of competence:

         i. The existence of a list of ICCAT shark species recorded in the area in which the CPC performs fishing activities for which the exemption is being requested.

         ii. Existence of scientific evidence (e.g., report based on onboard observer program data) clearly demonstrating the absence of interactions between the listed ICCAT sharks species and the fishing gears used by the CPCs requesting the exemption:
            a) The report should cover all seasons and include multiple trips, to ensure that rare bycatch events can be detected.

            b) The report should provide data with a high degree of spatial coverage of fishing effort by gear type.

3. If the SCRS does not confirm the request, the CPC will have to continue to submit the Shark Check Sheet in the following year. The CPC always have the right to resubmit an exemption request in the following years.

4. Each year, for a period of five years, the CPC exempt of completing the Shark Check Sheet will have to confirm annually in their Annual Report that no changes in their fisheries have been produced that might alter the conclusion that it qualifies for an exemption. To renew the exemption for the next 5-year period a new exemption request should be submitted in the year Y+5 in line with the requirements of 2.b.

5. In an absence of scientific evidence as defined in 2.b or if the SCRS determine that this "apparent" evidence no longer justifies an exemption, the SCRS would rescind the exemption status.

6. The Shark Check Sheet should be modified in order to reflect the SCRS confirmation of exemption. The following row on exemption should be included first in the Shark Check Sheet:

Rec. #	*Para #*	*Previously*	*Requirement*	*Status of implementation*	*Relevant domestic laws or regulations (as applicable, include text, refs, or links where this information is codified)*	*Note*
ALL SHARKS						
18-06 (All sharks)	**3**	None	Contracting Parties, and Cooperating non-Contracting Parties, Entities or Fishing Entities (hereafter referred to as CPCs) may be exempt from the submission of the Check Sheet when vessels flying their Flag are not likely to catch any sharks species covered by the Recommendations Rec. 04-10, 07-06, 09-07, 10-07, 10-08, 11-08, 11-15, and 15-06 on the condition that the concerned CPCs obtained a confirmation by the Sharks Species Group through necessary data submitted by CPCs for this purpose.	Yes or No		If "No" SHK Check Sheet must be fully completed. If "Yes" indicate date exemption received or date of request. If "Yes" also indicate if fully or partially exempt. If partially exempt, indicate in each Rec. field the exemption.

19.20 SCRS shall calculate the retention level of South Atlantic shortfin mako, Rec. 22-11 para 6 (and Rec. 21-09 para 5)

Background: *Permissible retention shall be pursuant to the following process:*

a) *Following the stock assessment in 2024 the SCRS shall use the approach in Annex 1, or alternative approaches after having their appropriateness confirmed by the SCRS, for determining the amount of permissible retention of South Atlantic shortfin mako in the future. To assist with this work, the SCRS shall, as appropriate, provide to the Commission estimates of post release mortality and, where needed, estimates of dead discards, taking into account data submitted by CPCs and other relevant information and analyses.*

b) *Starting in 2024 and annually thereafter, the SCRS will use Annex 1 to calculate a possible level of retention, including eligible CPCs' individual retention allowances, allowed in the subsequent year, and provide the results to the Commission.*

The Committee reviewed all data submissions for northern and southern shortfin mako for 2024. The reported data on landings, dead discards and live releases for the northern shortfin mako for 2024 are presented in the **Table 19.20.1**.

North Atlantic Shortfin Mako			
CPC	***Landed***	***Discards dead***	***Discards Live***
Belize			
Brazil	0,19		
Cabo Verde	1		
Canada	0	14	45
China PR		6	21
Chinese Taipei	0	2	2
Costa Rica			
EU-España	0	714	436
EU-France	0,01	0,06	0,15
EU-Netherlands			
EU-Portugal	1	61	112
Great Britain	0		
Japan	0	22	17
Korea Rep	0	0	
Liberia			
Maroc	0	107	131
Mexico	1	0	0,14
Panama			
Russian Federation			1
Sta Lucia			
Trinidad and Tobago	0	0	0
UK-Bermuda			0,09
UK-British Virgin Islands			
UK-Turks and Caicos			
USA	0	10	35
Venezuela	5		

Table 19.20.1 continued.

South Atlantic Shortfin Mako			
CPC	***Landed***	***Discards dead***	***Discards Live***
Angola	2		
Belize			
Brazil	30		
China PR		0,36	1
Chinese Taipei	5	18	12
Côte d'Ivoire			
Curaçao			
El Salvador			
EU-España	0	271	150
EU-France	0	0,02	0
EU-Portugal		11	19
Ghana			
Guatemala			
Japan	0	6	11
Korea Rep			
Namibia	254		
Panama			
Philippines			
Senegal			
South Africa	140	0	4
UK-Sta Helena	0		0,02
Uruguay			

Retention allowance for the northern stock

Considering all CPCs, the preliminary Committee estimates were as follows:

- Retained catch (landings): 8 t
- Dead discards: 935 t
- Live discards: 800 t

Using a post-release mortality rate of 29.4% (Domingo *et al.*, 2025) the "total fishing mortality from all sources" (the value needed for Rec. 21-09, Annex 1, paragraph 1a) for 2024 was estimated as 1,179 t.

According to Annex 1 of Rec. 21-09, these values are then subtracted from the amount established in Rec. 21-09, paragraph 4a, 250 t, to estimate the "dead bycatch retention allowance" in 2026 (see equation 1 below):

"limit from Rec. 21-09" – "fishing mortality 2024" = "dead bycatch retention allowance in 2026" (1)

If the "dead bycatch retention allowance" amount is negative, no retention is to be allowed in 2026.

The dead bycatch retention allowance was calculated to be -929. Therefore, the possible retention allowance for 2026 (calculated with Annex 1) is 0 t. In accordance with paragraph 1c of Annex 1, CPCs shall prohibit retaining onboard, transhipping, and landing, whole or in part, North Atlantic shortfin mako caught in association with ICCAT fisheries in year Y+1 (in this case 2026).

Retention allowance for the southern stock

Considering all CPCs, the preliminary Committee estimates were as follows:

- Retained catch (landings): 430 t
- Dead discards: 305 t
- Live discards: 198 t

Using a post-release mortality rate of 29.4% (Domingo *et al.*, 2025) the "total fishing mortality from all sources" (the value needed for Rec. 22-11, Annex 1, paragraph 1a) for 2024 was estimated as 794 t.

According to Annex 1 of Rec. 22-11, these values are then subtracted from the amount established in Rec. 22-11, paragraph 5, 1,295 t, to estimate the "dead bycatch retention allowance" in 2026 (see equation 1 below):

"limit from Rec. 22-11" – "fishing mortality 2024" = "dead bycatch retention allowance in 2026" (1)

If the "dead bycatch retention allowance" amount is negative, no retention is to be allowed in 2026.

The dead bycatch retention allowance was calculated to be 506 t. Therefore, according to paragraph d) of Annex 1, if the retention allowance established by Annex 1, paragraph 1 b) is greater than zero, CPCs may be eligible to retain up to the amount resulting from Annex 1, paragraph 2. The retention allowance for 2026 was calculated by CPCs and is presented in the following **Table 19.20.2**:

CPC	***Permitted Retention of Dead Fish*** Rec. 22-11 ***(Annex 1b)***
Angola	0,66
Belize	4,40
Brazil	59,77
China PR	0,62
Chinese Taipei	17,48
Côte d'Ivoire	5,04
Curaçao	0,00
El Salvador	0,00
EU-España	167,87
EU-France	0,04
EU-Portugal	49,02
Ghana	0,00
Guatemala	0,00
Japan	17,78
Korea Rep	1,10
Namibia	129,71
Panama	0,00
Philippines	0,66
Senegal	2,12
South Africa	44,12
UK-Sta Helena	0,03
Uruguay	0,65

According to Rec. 22-11, from 1 January 2025, any retention permissible shall be allowed only when the fish is dead on haulback, and the vessel has an observer or a functioning electronic monitoring system (EMS) on board to verify the condition of the sharks.

19.21 SCRS review and approve the methods and, if it determines that the methods are not scientifically sound, the SCRS shall provide relevant feedback to the CPCs in question to improve them, Rec. 22-11 (and Rec. 21-09) para 13

Background: *No later than 31 July 2022/2023, CPCs that reported annual average catches (landings and dead discards) of South Atlantic shortfin mako over 1 t between 2018-2020 shall present to the SCRS the statistical methodology used to estimate dead discards and live releases. CPCs with artisanal and small-scale fisheries shall also provide information about their data collection programs. The SCRS shall review and approve the methods and, if it determines that the methods are not scientifically sound, the SCRS shall provide relevant feedback to the CPCs in question to improve them.*

During 2025, the Committee was provided with three papers on proposed methods for discard estimation (Morocco, Serghini *et a*l. (2025) (SCRS/2025/214); Japan, Satoh *et al.* (2025) (SCRS/2025/203); and EU-Portugal, Coelho *et al.* (2025c) (SCRS/2025/147)). The Committee considers that proposed methodologies should be first submitted to the Working Group on Stock Assessment Methods (WGSAM) for its review and feedback.

The Committee agreed that all documents previously submitted regarding this matter should also be submitted to WGSAM for its review.

19.22 Evaluation of data completeness on sharks, Rec. 22-11 (and Rec. 21-09), para 15

Background: *The SCRS shall evaluate the completeness of Task 1 and 2 data submissions, including estimates of total dead discards and live releases. If, after conducting this evaluation, the SCRS determines that significant gaps in data reporting exist, or, following the review in paragraph 13, that the methodology used by one or more CPCs to estimate dead discards and live releases is not scientifically sound, the SCRS shall inform the Commission that the data for those CPCs are inappropriate for inclusion in the calculation of the retention allowance. In this case, the SCRS shall estimate dead discards and live releases for those CPCs for use in the retention allowance calculation.*

The revision of data completeness of Task 1 and 2 was done for the calculation of retention allowance. For more details, please refer to item 19.20, response to Rec. 21-09, paragraph 5c and Rec. 22-11, paragraph 6.

19.23 Derogation to retention prohibition for certain shark species, Rec. 22-11 (and Rec. 21-09), para 18

Background: *Notwithstanding paragraph 7, in the context of this Recommendation and only for vessels less than 15 meters, where an extraordinary safety concern exists that precludes deployment of an onboard observer, a CPC may exceptionally apply an alternative approach as set out in Recommendation 16-14. This derogation from paragraph 7, shall be without prejudice to the overall commitment of all CPCs as outlined in this measure to immediately end overfishing and to reduce mortality levels. Any CPC wishing to avail itself of this alternative approach must: 1) present the details of the approach to the SCRS based on the advice of the SCRS for evaluation and 2) obtain approval from the Commission (as stipulated in Recommendation 16-14).*

No documents nor requests were received by the Committee for its evaluation in 2025.

19.24 The SCRS shall continue to prioritize research areas for North Atlantic shortfin mako, Rec. 22-11, para 19 (and Rec. 21-09)

Background*: The SCRS shall continue to prioritize research into: identifying mating, pupping and nursery grounds, and other high concentration areas of North Atlantic shortfin mako; options for spatial-temporal measures; mitigation measures (inter alia, gear configuration and modification, deployment options), together with the benefits and disadvantages for the objectives of the rebuilding programme, aimed at further improving stock status; and other areas the SCRS deems helpful both to improving stock assessments and reducing shortfin mako mortality. In addition, CPCs are encouraged to investigate at-vessel and post-release mortality of shortfin mako including, but not exclusively through, the incorporation of hook-timers and of satellite tagging programs.*

The Shark Research and Data Collection Programme (SRDCP) started in 2014 with its focus on different aspects of the life history, stock structure, and fisheries of the shortfin mako. Since then, a large amount of work has been done, producing very valuable information regarding the age and growth of the species, stock structure, movements, habitat use and post release mortality.

In 2025, research on these aspects of the life history of the species were updated for the stock assessment conducted. Document SCRS/2025/023 (Coelho *et al.,* 2025a) analyzed the size distribution of the species in the Atlantic Ocean. This information, essential for the stock assessment, will also be used to continue working on the definition of areas of potential interest. Document SCRS/2025/034 (Domingo *et al.*, 2025) updated the information on post-release mortality using satellite telemetry information from 128 tags. This information was applied to the estimation of total removal in the assessment. Four documents reviewing the age and growth of the species were also presented.

In 2023, a line of research focused on the reproductive biology of this species was included in the SRDCP. The study focuses on the determination of different reproductive stages by quantifying hormone concentrations. First results were presented to the Committee in 2024 in document SCRS/2024/155 (Sulikowski *et al.,* 2024). This study continues, with the development of campaigns aiming to capture pregnant females, to confirm the applicability of this non-lethal technique.

The use of hook-timers and mini data loggers (TDRs, temperature and depth recorders) has been proposed to be explored as a potential long-term line of research that can be included as part of the activities of the SRDCP for the following years. The use of TDRs started in 2025. For more information, please refer to item 19.25 in reference to Rec. 22-11 and Rec. 21-09 paragraph 20.

19.25 The SCRS shall explore the benefits of installing mini data loggers to have a better understanding of the effects of the soaking time, fishing depths and environmental characteristics underpinning higher incidental catches of shortfin mako, Rec. 22-11 (and Rec. 21-09), para 20

Background: *Taking into account that hotspots of incidental catches may occur in areas and periods with specific oceanographic conditions, the SCRS shall launch a pilot project to explore the benefits of installing mini data loggers on the mainline and on the branchlines of longline fishing vessels which participate in the project on a voluntary basis targeting ICCAT species that have potential interactions with shortfin mako sharks. The SCRS shall provide guidance on the basic characteristics, minimum number and positions to install the mini data loggers with a view to have a better understanding of the effects of the soaking time, fishing depths and environmental characteristics underpinning higher incidental catches of shortfin mako.*

As stated before by this Committee, the design and implementation of a pilot study such as this will take several years to complete, so the Commission should not expect such a project to be undertaken quickly. During the 2023 Shark Research and Data Collection Programme (SRDCP) workshop the Committee proposed exploring the possibility of including in the activities of the programme the use of hook-timers and mini data loggers as a potential long-term line of research for the following years.

In 2025, the use of mini data loggers (time depth recorders (TDRs), temperature and depth recorders) started with the acquisition of 12 TDRs. The initial experiments were conducted on board Portuguese longline vessels, with an on-board observer. Preliminary results were presented to the Committee (Coelho *et al*., 2025b (SCRS/P/2025/098)) and considered positive. To continue with this study, more TDRs should be acquired and used to continue compiling data. As previously mentioned, this study will need substantial effort (number of TDRs and fleets/sets covered), especially to collect data on rarer species like shortfin mako. To do so, this study will require a significant amount of funding that would need to be assigned to the ICCAT SRDCP.

19.26 The SCRS shall provide to the Commission by 2024 updated advice on mitigation measures aimed at further reducing shortfin mako mortality, Rec. 22-11 (and Rec. 21-09), para 21a

Background: *The SCRS shall provide to the Commission by 2024, and whenever new information becomes available, updated advice on mitigation measures aimed at further reducing shortfin mako mortality. For that purpose, by 30 April 2024, CPCs shall submit to the SCRS information by fishery on the technical and other management measures they have implemented for reducing total fishing mortality of South Atlantic shortfin mako sharks, except the CPCs that have already provided this information to the ICCAT Secretariat. The SCRS shall review this information and advise the Commission on which tools and approaches have been most effective at reducing fishing mortality with a view to recommending specific measures that should be considered for adoption by the Commission.*

The Committee noted that no new documents were submitted in 2025, giving compliance to this Commission request.

Documents presenting information on the use and effectiveness of different mitigation measures have been presented to the Committee in the last few years. This information on mitigation measures has been discussed in various opportunities by the Committee subsidiary bodies (Sharks Species Group and SC-Ecosystems and Bycatch). The Committee recommended moving from areas of high concentration as a potential mitigation measure. However, there is still no definition nor recommendation on the most effective measures to reduce fishing mortality.

19.27 The SCRS shall advise the Commission by 2024 whether size restrictions are effective tools to meet required mortality reductions, Rec. 22-11 (and Rec. 21-09), para 21b

Background: *b) Taking into account the information on the technical and other management measures submitted by CPCs in subparagraph a) above, the SCRS shall assess the potential benefits of both minimum and maximum size limits for live retention (applied separately or in combination), in particular sex specific sizes at maturity based on the best available science, particularly when considered in combination with other management measures, to meet required mortality reductions. The SCRS shall advise the Commission by 2024 whether size restrictions are effective tools, especially when used in combination with other measures, to meet required mortality reductions.*

No documents were presented in 2025, giving compliance to the Commission request in Rec. 22-11 (and Rec. 21-09) para. 21b.

Based on the information available, the Committee does not have a conclusion on whether size restrictions are effective tools to meet the required mortality reductions.

19.28 The SCRS shall review the reported landings and discards of longfin mako, for the purpose of formulating management advice, Rec. 22-11, para 22 (and Rec. 21-09)

Background: *The SCRS shall review the reported landings and discards of longfin mako shark to identify any unexpected inconsistencies that could be the result of misidentification between the two mako species, for the purpose of formulating management advice.*

The Committee reviewed the reported nominal catches of longfin mako shark in the last years. Insofar as the possible reporting of shortfin mako as longfin mako, no unexpected inconsistencies related to possible misidentification of the species were found.

19.29 The SCRS shall inform the Commission on the feasibility, cost, options and tentative roadmap for developing an MSE framework for the management of North Atlantic (Rec. 23-10, para 11) and South Atlantic (Rec. 23-11, para 10) blue shark

Background: (Rec. 23-10) *Following up on the task given in Recommendation 19-07, the SCRS shall inform the Commission, by 2025 on the feasibility, cost, options and tentative roadmap for developing an MSE framework (including inter alia HCR with the associated limit, target and threshold reference points) for the management of this stock (BSH-N) in the ICCAT Convention area.*

(Rec. 23-11) *Following up on the task given in Recommendation 19-08, the SCRS shall inform the Commission, by 2025 on the feasibility, cost, options and tentative roadmap for developing an MSE framework (including inter alia candidate HCR with the associated candidate limit, target and threshold reference points) for the management of this stock (BSH-S) in the ICCAT Convention area.*

The Committee reviewed a feasibility analysis (SCRS/2025/078) and concluded that MSE development for North and South Atlantic blue shark stocks is technically feasible, cost-effective, and aligned with existing ICCAT MSE practices. The Committee noted that efficiency can be gained by implementing a joint approach for both stocks. Based on the feasibility analysis, two possible implementation schedules were discussed, either a two or three-year processes.

The Committee recommended the three-year option, with some preliminary work developed during 2026, and the core work conducted in the 2027-2029 period (i.e. the 3-year option beginning in 2027), allowing the Committee to dedicate more time in 2026 to terminate the North Atlantic shortfin mako stock assessment. Blue shark MSE in 2026 will involve the formation of the small technical group that will do the initial work, and then funding is requested to conduct the core MSE development in the 2027-2029 period. The Commission is asked to provide guidance on this timeline and budget, and to provide the quantitative management objectives for yield, safety, and stability for both blue shark stocks.

Tropical tunas

19.30 Fishing prohibited with FADs, Rec. 24-01, para 31

Background: *In order to reduce the fishing mortality of juvenile bigeye and yellowfin tunas, fishing for bigeye, yellowfin and skipjack tunas by purse seine and baitboat vessels in association with FADs, and activity by vessels supporting such vessels shall be prohibited during a 45 day-period in 2025 from 17 March to 30 April, throughout the Convention area. In 2025, the SCRS shall estimate the expected effects of the measures in this and previous Recommendations, in particular, the possible effects of increasing catch limits of CPCs with purse seiners in terms of change in bigeye juvenile mortality, based on the new bigeye stock assessment, and revise the K2SM. The Commission shall consider, as appropriate, based on the SCRS' work, whether to modify the FAD closure period or establish additional measures at its 2025 Regular Meeting. If the Commission cannot agree to any additional measures in 2025, a FAD closure period of at least the same length shall remain in place for 2026 and 2027.*

The Committee has addressed similar Commission requests in the past, most recently in 2024 (*Report for biennial period 2022-23, Part II, Vol 2*, items 19.29 and 19.38). This year, the Tropical Tuna Species Group prepared several relevant analyses for Atlantic Bigeye Tuna using the results of the reference case of the 2025 Atlantic Bigeye Tuna Stock Assessment Meeting (Anon.,2025j). These were reviewed by the Committee in September 2025 and are the basis for this response.

To illustrate the differential impacts of fishing operations (e.g., purse seine, longline, and baitboat) on the spawning potential of the bigeye tuna stock, the Committee prepared a fishery "impact plot" generated from the reference case model (**Figure 19.30.1**). 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 as defined in this 2025 Stock Assessment (e.g., growth, natural mortality, and maturity).

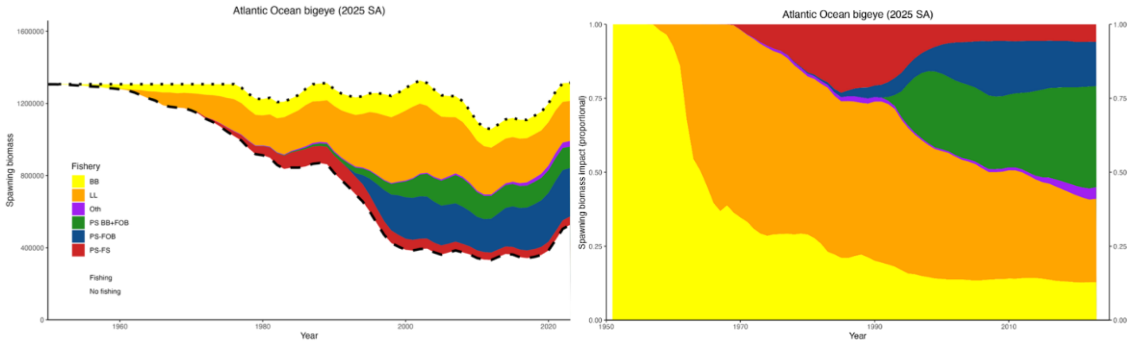


Figure 19.30.1. Estimated impact plot on the expected spawning stock biomass (t) of bigeye tuna by each of the main fleet/gear fisheries based on the 2025 SS reference model assessment (left panel). The upper broken line indicates the expected SSB under no fishing, while the bottom broken line indicates the SSB trend with all fishing mortality. The shaded areas correspond to the estimated SSB impact by each main fleet/gear fishery. The right panel shows the same information on percentage scale for each year.

The impact plot shows that impacts on SSB were primarily associated with bait boat and longline fishing in the 1960s-1970s. Fishing by purse seiners on free schools (PS-FS) began in the 1970s and increased until the 1990s, when fishing on floating objects (PS-FOB) became increasingly impactful. Currently, almost 50% of the impacts on SSB are associated with purse seine fishing on floating objects (PS-FOB and PS BB+FOB), although other fishing fleets/gears continue to have an important impact (LL: 27%; BB:13.5%). These results were similar to those from the 2021 Bigeye Tuna Stock Assessment (Anon., 2021c.). The Committee also noted that the expected effects of the recent full closure moratorium (e.g. reduced PS-FOB catches) on SSB are not fully reflected in the impact analysis, because there is a lag between reduced catches of younger bigeye tuna on floating objects, and the impact on spawning stock biomass. This impact pattern differs from the proportion of catches in weight by fishery type because of their selectivity (**Figure 19.30.2**).

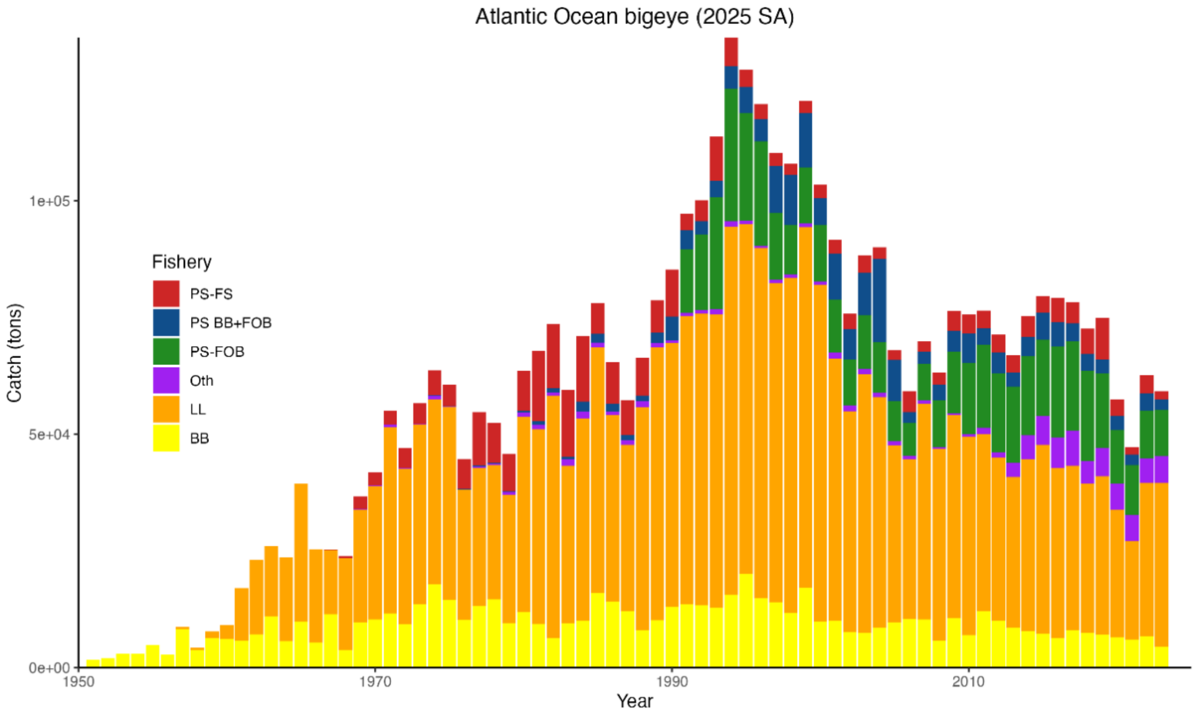


Figure 19.30.2 Catches (t) of bigeye tuna by major gear based on the data inputs of the 2025 stock synthesis reference model assessment.

The Committee also examined recent patterns (2017-2023) in age-specific exploitation rates (*F*) estimated within Stock Synthesis. The Committee found value in looking at these estimates three ways:

1. Fishing mortality estimates by age and year (**Figure 19.30.3** top panel).
2. Scaled within each year to the age with the highest exploitation rate. This scaling provides an approximation of the 'overall fishery selectivity' for each year (**Figure 19.30.3** middle panel).
3. Scaled within each age to the value for that age for 2017. This scaling illustrates the relative changes for each age in recent years (**Figure 19.30.3** bottom panel).

The Committee concluded that the absolute levels of exploitation (*F*) generally declined from 2017-2023 for all ages, with the exploitation rates for the youngest ages (1-2 yrs) declining slightly more (59% versus 43%) than for the older ages (5+ yrs) (**Figure 19.30.3** bottom panel). This suggests that recent management measures and fisheries trends has had some measurable effect on reducing catches of juvenile bigeye tuna. However, despite this slight difference across ages, the general shape of the overall selectivity was consistent during the last 2 years (2022-2023). The Committee noted that the selectivity in 2021 deviated mainly for older ages (4+) which could add uncertainty to stock projections that use the average selectivity from 2021 to 2023 (**Figure 19.30.3** middle panel).

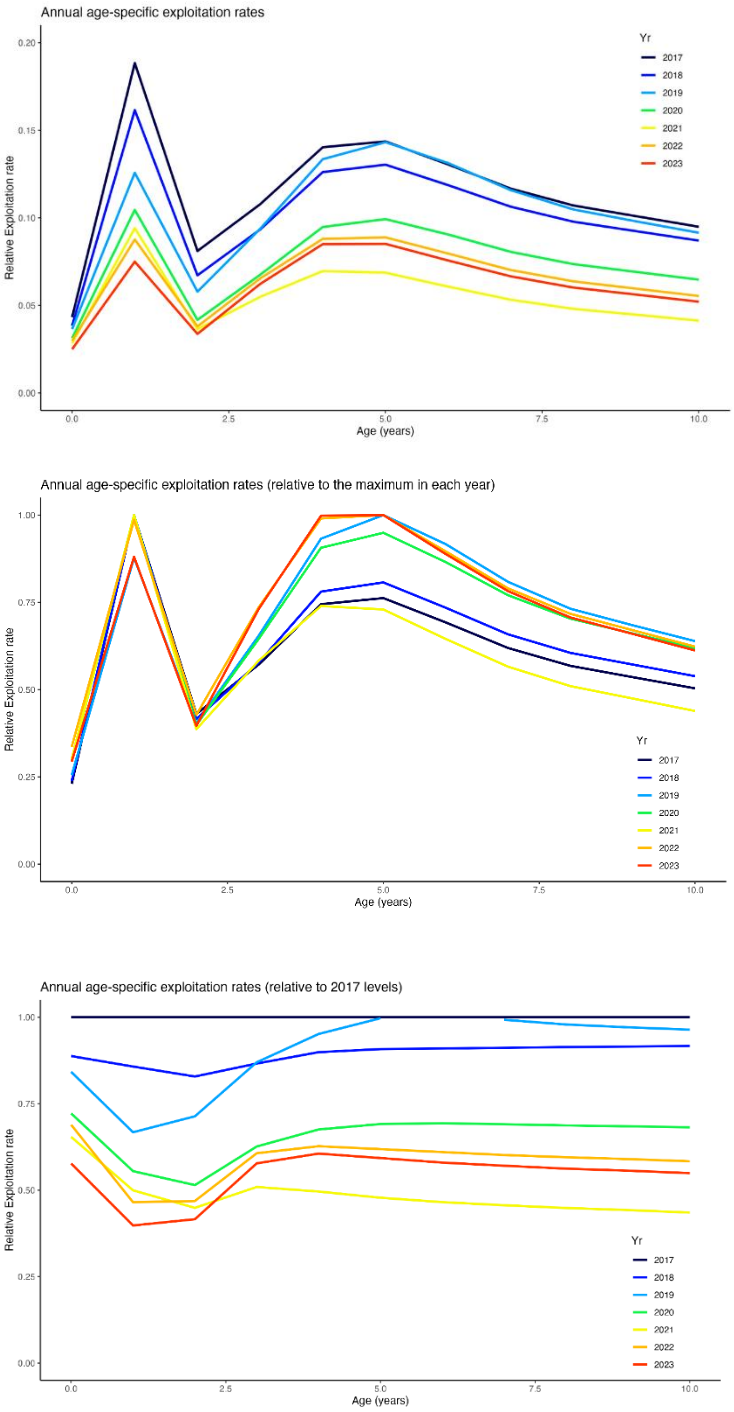


Figure 19.30.3 Patterns in recent estimates of age-specific exploitation rates of Atlantic bigeye tuna estimated from the reference case model. (*Top panel*) the 'raw' estimates; (*middle panel*) estimates scaled within each year to the age with the highest exploitation rate; and (*bottom panel*) estimates scaled within each age to the value for that age in 2017.

19.31 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

Background*: 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. To this purpose, the advice from the SCRS shall describe the data set used, the methodology, as well as the objectives set within the context of all tropical tuna fisheries. Nothing in this provision shall be construed as an amendment to the data provision standards applicable in ICCAT. SCRS shall evaluate and advise to the Commission on any change in the data provision standards to be required of all fleets fishing for tropical tunas. The information provided under this paragraph can only be utilized for the specific purposes expressed herein.*

In response to requirements in paragraph 34 of Rec. 24-01[8], El Salvador (SCRS/2025/235), Guatemala (SCRS/2025/236) and Panama (SCRS/2025/229), presented the Committee information on activities of their purse seine fleets on Fish Aggregating Devices (FADs) for the period 2018-2024. This included information on catch rates (catches by set by year) of yellowfin tuna and bigeye tuna on FADs, and data on the total number of sets on FADs registered in 2018 and 2024, as requested by the Commission. It was also noted that the three CPCs timely provided the historical FAD set data available from, at least, 2019, and included the number of FAD sets in their reports of Task 2 data (catch-and-effort) to the ICCAT.

The information presented refers to a maximum of 10 purse seiners, with quarterly catch rates (catch per set) of yellowfin tuna and bigeye tuna reaching a maximum of six tons per set, depending on the fleet, time-period (quarter) and species. The number of sets on FADs reported by country and year also varied, showing, overall, a decrease in the number of FAD sets from the 1,708 FAD sets recorded in 2018 for the three countries combined (El Salvador, Guatemala and Panama) to the 998 FAD sets recorded in 2024 (42% drop in FAD sets).

The Committee noted that the Commission required historical Task 2 CE data for FAD sets to be submitted by 1 August 2025. The data was compiled by the Secretariat (**Table 19.31.1**).

The Commission requested the SCRS to provide advice to the Commission on the maximum number of FAD sets per vessel or per CPC in the Convention area in 2025 or as soon as possible thereafter. The Committee noted that this request is quite complex as the catches and catch composition will depend on variables that are dynamic in nature (i.e. time-variant). Furthermore, the SCRS would benefit from additional guidance from the Commission regarding the specific quantitative management objectives to be achieved. The Committee also noted that the ongoing MSE work should consider these specific quantitative management objectives if they are adopted by the Commission.

The Committee noted that a project funded in 2025 (POSEIDON) was intended to facilitate the evaluation of management alternatives, including decisions regarding FAD management, and produced a proof of concept. Although the Committee could not achieve full consensus to recommend additional funding for that project in 2026, the Committee noted that continued work on POSEIDON could inform this, and other responses to the Commission regarding fisheries management. However, the completion of the POSEIDON project would require additional funding (€100,000) and also requires CPCs to provide high-resolution data (previously requested) as the available data are incomplete. In addition, a longline fleet component to the POSEIDON analysis is required to better reflect the impact of this gear over target species and bycatch, and linkage of those fleets with other fleets and/or gears. The addition of the longline component would require additional costs (€99,000).

[8] Paragraph 34 of Rec. 24-01 includes the following requirements for CPC having purse seine fisheries using Fish Aggregating Devices (only relevant parts included, with requirements in bold):
"[...] national scientists from CPCs with purse seine vessels shall submit analyses of the per fleet catch rates of bigeye and yellowfin on FADs from 2019 to 2023 and present these to the SCRS for their evaluation in 2025. Also, CPCs with purse seine vessels shall report to the SCRS by 15 July 2025 the required available historical FAD set data in the format required by the SCRS (Task 2 catch and effort through Form ST03-T2CE) for a minimum of the last five years (2019-2023). For those CPCs who have provided the historical FAD set data, the data of the latest year shall be provided. [...]"
"[...]"
"In addition, each CPC with purse seine fishing vessels is encouraged not to increase its total fishing effort on FADs from its 2018 level. CPCs shall report the difference between the 2018 level and the 2024 level to the Commission at the 2025 Annual Meeting."

Table 19.31.1 T2CE (Task 2 catch & effort) datasets reported to ICCAT (using eform ST03-T2CE or similar, until 1 August 2025) of PS ETRO fleets, covering the period 2019 to 2024. It summarises the total catches (landings plus discards of all species, kg) by calendar year, fishing flag (ETRO fleets), geographical strata, effort units, and fishing mode. All the datasets below were reported with a monthly resolution and with 1x1 or better geographical resolution. The preliminary 2024 data shown are for information purposes only.

GearCode	Flag	FleetCode	ValidInfoYN	GeoStrataCode	Eff1Type	Eff2Type	FishMode	2019	2020	2021	2022	2023	2024
PS	Belize	BLZ-BZ-ETRO	Y	1x1	D.FISH	NO.SETS	FAD						42312255
							FSC						1526000
					NO.SETS	D.FISH	FAD	23959250	26081000	25547500	38212211	32432277	
							FSC	4885500	3211672	684000	811000		
	Cape Verde	CPV-CV-ETRO	Y	1x1	NO.SETS	(blank)	FAD			605920			
							FSC			867530			
			N	1x1	FISH.HOUR	HOURS.SEA	FAD	5728460	5081860				
							FSC	2609520	5438450				
	Curaçao	CUW-CW-ETRO	Y	1x1	NO.SETS	SUC.SETS	FAD	20826550	15685790	17451320			
							FSC	8255230	6858030	5744510			
						(blank)	FAD				5173210	343000	
							FSC				3163610	1252900	
	El Salvador	SLV-SV-ETRO	Y	1x1	NO.SETS	SUC.SETS	FAD	21622720	19513100	13237260	15645260	12019490	10218530
							FSC	3468970	6653140	4944240	4469730	3074900	6669620
	EU-España	EU.ESP-ES-ETRO	Y	1x1	NO.SETS	FISH.HOUR	FAD	43963220	33183380	43791630	39245280	35558790	19437320
							FSC	13871720	14966990	6020110	8345960	7749130	10832690
	EU-France	EU.FRA-FR-ETRO	Y	1x1	FISH.HOUR	NO.SETS	FAD	23390732	15280643	21088704	27105527	19914279	5817637
							FSC	19086476	15028780	10204222	15783573	12531718	14721030
	Ghana	GHA-GH-ETRO-A	Y	1x1	NO.SETS	SUC.SETS	FAD	37148400	40720000	29022000	43469000	31238000	
							FSC	209000	109000	34000	137000	264000	
							n/a	9000			18000		
		GHA-GH-ETRO-P	Y	1x1	NO.SETS	SUC.SETS	FAD	42168000	40820500	33583000	56680000	44892000	
							FSC	170000	292000	235000	192000	45000	
	Guatemala	GTM-GT-ETRO	Y	1x1	NO.SETS	SUC.SETS	FAD	9568070	7950690	7093790	8510170	6511340	
							FSC	3246150	2252290	1722220	3874750	2727540	
	Guinée Rep	GIN-GN-ETRO	N	1x1	D.FISH	(blank)	FAD			1364002			2068000
							FSC						467000
							n/a						225000
					FISH.HOUR	D.FISH	FAD					4043000	
							FSC					307000	
					SUC.D.FI	(blank)	FAD				5880000		
							FSC				1201000		
	Maroc	MAR-MA-ETRO	Y	1x1	D.FISH	NO.SETS	FAD				1137823	955894	548630
					NO.SETS	D.FISH	FAD		405099	855013			
	Panama	PAN-PA-ETRO	Y	1x1	NO.SETS	SUC.SETS	FAD	13836450	12671360	13246400	17705115	15990500	8036950
							FSC	4478510	8333700	8014820	9307760	6269890	993590
	Senegal	SEN-SN-ETRO	Y	1x1	FISH.HOUR	NO.SETS	FAD						28363500
							FSC						10585000
					NO.SETS	FISH.HOUR	FAD				45730000	46286962	
							FSC				7993000	22169894	
							n/a					35696	
				LatLon	NO.SETS	FISH.HOUR	FAD	44226600	35050560	33783790			
							FSC	3002000	6031200	6838610			

Legend:

Indicates correctly reported effort in "number of sets" (ValidInfo="Y").
Indicates that a revision is required as some ICCAT requirements are not satisfied (effort not reported in number of sets and/or lack of FAD/FSC stratification).
Submissions may be missing for a particular year and a CPC confirmation is required.

***19.32 The SCRS and the IMM Working Group shall review the requirements of paragraphs 39, 40 and 41 and make recommendations to remove duplication and streamline FAD data and reporting obligations, Rec. 24-01** para 42*

Background: *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.*

At the IMM WG meetings made no recommendations were made to modify guidelines for the development of FAD management plans or the data collection and reporting requirements specified in Rec. 24-01. Likewise, the SCRS is not proposing any modifications. Therefore, the SCRS reiterated its support for the preparation of FAD Management Plans as described in Rec. 24-01 (p 37-39 and Annex 1), and for the data collection and reporting requirements outlined in Rec. 24-01 (p 40-41 and Annex 2 and 3).

19.33 SCRS shall review the information reported by CPCs and shall provide recommendations on additional drifting FAD management options, including recommendations on improved drifting FAD designs, Rec. 24-01, para 51

Background: *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.*

No new information was presented to the Committee in 2025, and the IMM Working Group made no specific recommendations. The Committee agrees that the guidelines that were established in Rec. 24-01 are sufficient at this time. The Commission should be aware that there are multiple initiatives that the industry is undertaking to adapt designs to the new requirements. A dedicated science-industry workshop could be useful at some point to share experiences and seek synergies.

19.34 In 2025 the SCRS shall provide advice on the improvements to observer programmes including how coverage should be stratified across vessels, seasons and areas to achieve maximum effectiveness, Rec. 24-01, para 67

Background*: CPCs shall submit all relevant data and administer scientific observer programs for tropical tunas in accordance with Rec. 16-14. In 2025, the SCRS shall provide advice on the improvements to observer programmes including how coverage should be stratified across vessels, seasons and areas to achieve maximum effectiveness. The SCRS shall consider available information to recommend, where appropriate, improvements to ICCAT standards*.

Observer programmes collect key data to support sustainable fisheries management. Observer programme sampling designs must balance cost, feasibility, accuracy, and precision, with required coverage levels depending on fishery characteristics and management goals. It is important to note that the Committee has recommended at least 20% coverage. For tropical tuna fisheries, ICCAT requires 100% observer coverage on purse seine vessels, but lower minimums (5–10%) for other gears and vessel sizes, which are often insufficient for reliable bycatch estimates.

As a general improvement of the observer programmes, the SCRS recommended higher levels of observer coverage using human observers and/or electronic monitoring. Clear guidelines have been defined on observer responsibilities in data collection and monitoring conservation measures for improvement of data provisioning (*Recommendation by ICCAT to establish minimum standards for fishing vessel scientific observer programs* (Rec. 16-14)).

Published methods exist to develop an optimized stratified sampling design when faced with limited resources and multiple objectives. Optimizing stratified sampling in fisheries requires carefully selecting strata, allocating samples, and understanding how these choices impact data collection, accuracy and efficiency. When defining strata, it is important to consider such factors as:

1) ***Spatial stratification***: to account for heterogeneous subregions based on factors like depth, habitat type, or known fish distribution patterns.
2) ***Temporal stratification***: to account for temporal variations in fish distribution or fishing activity by season, month or time of day.
3) ***Fishing effort***: to account for variations by fishing mode, gear type, or vessel characteristics.

Once the strata have been identified, samples can be allocated using:

1) ***Neyman allocation*** which emphasizes sampling in strata with greater variability and larger size to minimize the overall variance of estimates for a given sample size.
2) ***Proportional allocation****:* samples allocated in proportion to effort, or size/area of each stratum.
3) Machine learning techniques may also be useful to explore relationships between important variables and identify optimal stratification strategies.

Before any optimization strategy can be finalized, it is important to agree upon the relevant scientific and management objectives. It would be beneficial for the Commission to establish clear management objectives for the observer programme, and to communicate specific scientific questions the SCRS should address. The SCRS would then be better positioned to evaluate optimization strategies more efficiently.

19.35 SCRS shall report each year on the implementation of the port sampling programme broken down by CPCs, Rec. 24-01 para 73

Background: *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.*

The Committee noted that the port sampling program and the subsequent data submission through ST-10 is primarily fulfilled by CPCs using the fisheries data submission form ST-04 (size) and that data may be also collected by alternative sampling programs (e.g. fish houses, observer programs, etc.). The Committee noted that the port sampling program was historically implemented to collect information on catches by species and size that later was integrated with the regular Task 1, Task 2 CE and size data forms. Therefore, it is proposed that the ST-10 be discontinued.

The Committee does not have specific information on biological sampling programs (e.g. data, tissues) from national port sampling programs.

19.36 SCRS shall explore the efficacy of full fishery closures along the lines of those proposed in PA1-505A/2019, Rec. 24-01, para 79a

Background: *The SCRS shall explore the efficacy that full fishery closures along the lines of those proposed in PA1_505A/2019*[9] *might have to reduce the catches of tropical tunas to the agreed levels; and the potential of such scheme to reduce the catches of juvenile bigeye and yellowfin tunas, in line with recommendations from the SCRS:*

The Committee did not receive new information on this matter, and therefore it is not in a position to update the previous response (section 19.33 of the *Report for Biennial Period 2022-2023, Part II (2023), Vol. 2*).

[9] Available upon request from the ICCAT Secretariat or on the 2019 Commission meeting documents webpage.

19.37 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, Rec. 24-01, para 79b

Background: *Actions required from the SCRS and the ICCAT Secretariat:*

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.

Estimates represent analysis done with information submitted until 9 September 2025. SCRS/2025/161 presents an initial estimation of the fishing capacity for tropical tunas in the ICCAT Convention Area for the year 2024, focusing on large-scale vessels (20 meters or larger in length overall) using data primarily submitted via form ST01-T1FC. The study aims to partially fulfill the ICCAT Commission's request to estimate fishing capacity, emphasizing the tropical tuna fishery and multiple gear types including baitboats, handline, longline, purse seine, and unclassified gear groups. The report also identifies data gaps and provides recommendations to improve future capacity assessments. The information provided corresponds to data submitted until 9 September 2025 to the Secretariat with ST01 FC forms.

The estimated tropical tuna targeted capacity by Gear Group and Flag is presented using three metrics: (1) Number of fishing vessels, (2) Gross Tonnage (GT), and (3) Carrying Capacity (CC) in tonnes.

Table 19.37.1 shows the number of vessels ≥20m LOA reported as having fished in 2024 and that are likely to target tropical tunas. This should be considered a minimum estimate of capacity because some CPCs had not reported form ST01 as of the time these analyses were conducted. There were at least 483 vessels operating in 2024 with the following rounded percentages: 71% longliners, 11% purse seiners, 8% hand liners, 5% baitboats, and 5% unclassified.

Table 19.37.1 Estimated fishing capacity for 2024 in numbers of vessels likely targeting tropical tunas, by Flags that reported information between 2020 and 2023. Empty cells indicated information not received, zero values indicate no vessels reported in this category.

Flag/Gear	BB	HL	LL	PS	UN	Total
AGO	0	0	0	0	0	1
BLZ	0	0	20	11	0	31
BRA	2	26	37	4	0	69
CAN	0	0	2	0	0	2
CHN	0	0	26	0	0	26
CIV						
CPV	0	0	1	0	6	7
CUW						
EU-ESP						
EU-FRA	1	2	1	7	0	11
EU-PRT	21	4	1	0	0	26
GHA	0	4	0	16	0	20
GIN	0	0	0	1	0	1
GTM						
JPN	0	0	71	0	0	71
KOR						
LBR						
MAR	0	0	9	2	0	11
MEX	0	0	17	0	0	17
NAM	0	0	1	0	0	1
PAN	0	0	0	2	0	2
SEN	1	2	0	7	0	10
SLV	0	0	0	3	0	3
SUR	0	0	17	0	0	17
TAI	0	0	35	0	0	35
TTO						
USA	0	0	14	0	0	14
VEN	1	0	83	1	0	85
ZAF	0	1	7	0	16	24
Total	**26**	**39**	**342**	**54**	**22**	**483**

Table 19.37.2 shows the estimated GT (in volume) for vessels ≥20m LOA reported as having fished in 2024 and that are likely to target tropical tunas. This should be considered a minimum estimate of capacity because several CPCs had not reported form ST01 as of the time these analyses were conducted. The estimate also includes extrapolation of GT values not reported, so it is in part a model estimate. There was a total GT of at least 205,870 for vessels operating in 2024 with the following rounded percentages: 56% longliners, 36% purse seiners, 4% hand liners, 2% baitboats, and 1% unclassified.

Table 19.37.2 Estimated fishing capacity for 2024 in GT (dimensionless) of vessels likely targeting tropical tunas by Flags that reported information between 2020 and 2023. These estimates do not include updates on number of vessels from Table 19.x.1 done after 22 September 2025.

Flag/Gear	***BB***	***HL***	***LL***	***PS***	***UN***
AGO					
BLZ			1883	17677	
BRA	563	3975	4004	810	
CAN			240		
CHN			16237		
CIV					
CPV			79		651
CUW					
EU-ESP					
EU-FRA	370	260	125	12603	
EU-PRT	2870	487	119		
GHA		3132		20257	
GIN				940	
GTM					
JPN			49326		
KOR					
LBR					
MAR			1154	1007	
MEX			1835		
NAM			114		
PAN				1883	
SEN	741	449		12252	
SLV				5891	
SUR			1702		
TAI			24705		
TTO					
USA			1367		
VEN	177		11554	1274	
ZAF		85	1115		1962
Total	**4721**	**8387**	**115557**	**74594**	**2612**

Table 19.37.3 shows the estimated CC (in mt) for vessels ≥20m LOA reported as having fished in 2024 and that are likely to target tropical tunas. This should be considered a minimum estimate of capacity because some CPCs had not reported form ST01 as of the time these analyses were conducted. The estimate also includes extrapolation of GT values not reported, as well as a relationship between CC and GT based on a relatively low sample size, so it is in part a model estimate. There was a total CC of at least 119,261 t for vessels operating in 2024 with 56% longliners, 36% purse seiners, 4% hand liners, 2% baitboats, and 1% unclassified.

Table 19.37.3 Estimated fishing capacity for 2024 in CC (t) of vessels likely targeting tropical tunas, by Flags that reported information between 2020 and 2023 are included.

Flag/Gear	***BB***	***HL***	***LL***	***PS***	***UN***
AGO					
BLZ			1091	10240	
BRA	326	2302	2319	469	
CAN			139		
CHN			9406		
CIV					
CPV			46		377
CUW					
EU-ESP					
EU-FRA	214	151	72	7301	
EU-PRT	1662	282	69		
GHA		1814		11735	
GIN				544	
GTM					
JPN			28575		
KOR					
LBR					
MAR			668	583	
MEX			1063		
NAM			66		
PAN				1091	
SEN	429	260		7098	
SLV				3413	
SUR			986		
TAI			14312		
TTO					
USA			792		
VEN	103		6693	738	
ZAF		49	646		1136
Total	**2735**	**4858**	**66942**	**43212**	**1513**

Table 19.37.4 summarizes the three estimates of capacity for 2024 by Gear, without a breakdown by Flag. All three estimates are minimum estimates of capacity in the sense that not all CPCs have reported form ST01 with information on vessels that fished in 2024 likely targeting tropical tunas.

Table 19.37.4 Estimated total fishing capacity for 2024 by Gear Group. Three estimates of capacity are provided in terms of number of vessels, GT and CC.

Capacity	***BB***	***HL***	***LL***	***PS***	***UN***	***Total***
No. Vessels	26	39	342	54	22	**483**
GT	4721	8387	115557	74594	2612	**205871**
CC (mt)	2735	4858	66942	43212	1513	**119261**

Some of the previous studies used by the Committee to estimate the number of large-scale purse seiners active in a given year (e.g., Restrepo *et al.,* 2024) used data external to ICCAT such as AIS vessel positions to determine if individual vessels operated in the Atlantic Ocean. This could be done for CPCs that did not report ST01 but had authorized vessels on the ICCAT Vessel Record. This was not done in 2025 because it is very time-consuming.

At this point the SCRS concluded that more detailed metrics, such as CC times the number of Fishing Days will not be reliable until the recommendations listed below are addressed. Since the Commission clearly wants estimates of capacity as stated in paragraph 79b of Rec. 24-01, it is important that all CPCs that have fishing vessels report ST01-T1FC.

Recommendations for the SCRS (and SC-STATS)

- Define how Days Fished are to be measured for ST01 submissions.

SCRS recommendations to the Commission

- Improve compliance with timely reporting of ST01 and require CPCs to submit reports for missing years.
- Clarify that capacity tables (Fishing Plans) presented to Panel 1 must contain separate sections: One for active vessels, and another one for capacity aspirations.
- Require that vessel tonnage be reported in GT only (not allowing for GRT) in both ST01 and Vessel Record.
- Require that Fish Hold Volume (FHV, in m^3) be reported for all fishing vessels with LOA >=20m in ST01 and the Vessel Record. If FHV is reported for all vessels, Fish CC is not necessary. But if the Commission allows it, the latter should be in metric tons.

The Committee noted that if the Commission request estimates of Fishing Capacity on a regular basis (e.g. annually) CPCs should comply with the mandatory submission of electronic form ST01. This will allow the Secretariat to prepare a summary of the information related to total Fishing Capacity.

19.38 The SCRS will advise on final Limit Reference Points (LRPs) for Atlantic bigeye tuna, yellowfin tuna and the eastern stock of skipjack tunas, Res. 24-02, para 2

Background: *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.*

The multi-stock MSE is built upon the interim reference point (LRP) of 0.4*B_{MSY} as indicated by the Commission in Res. 24-02. Further options for LRP, including depletion based LRP will be explored in 2026.

19.39 SCRS should consider the following interim operational management objectives for the purpose of developing, testing and refining candidate management procedures, Res. 24-02, para 3

Background: *The following interim operational management objectives should be considered for the purpose of developing, testing and refining candidate management procedures:*

a. Stock Status: Bigeye tuna, yellowfin tuna, and the eastern stock of skipjack tuna should each have a 50% or greater probability of occurring in the green quadrant of the Kobe phase plot (no overfishing occurring and not overfished) during the XX-year projection period (as determined by the SCRS);

b. Safety: Bigeye tuna, yellowfin tuna, and the eastern stock of skipjack tuna should each have a 15% or less probability of falling below the limit reference point at any point during the XX-year projection period;

c. *Yield: Overall catch levels should be maximized to the extent possible with respect to each stock of bigeye tuna, yellowfin tuna, and the eastern skipjack tuna[10];*

d. *Stability: Any change in total allowable catch (TAC) between consecutive management periods for each stock of bigeye tuna, yellowfin tuna, and eastern skipjack tuna should be no more than a 25% increase or a 25% decrease.*

These management objectives will be considered when evaluating Candidate MPs. Furthermore, the trade-off among the four objectives will be illustrated when presenting the MSE results.

19.40 SCRS to evaluate the differential impacts of fishing operations 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, Res. 24-02 para 4

Background: *In the development of the operating models for the multi-stock tropical tunas MSE, the Commission calls on the SCRS, consistent with paragraph 75 of Recommendation by ICCAT replacing Recommendation 22-01 on a multi-annual conservation and management programme for tropical tunas (Rec. 24-01), 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.*

The evaluation of the differential impacts of fishing operations on the tropical tuna stocks, including juvenile mortality and yield at MSY will be evaluated with the multi stock tropical tunas MSE in 2026.

The impact on bycatch and ecosystem impacts cannot be addressed with the present multi stock tropical tunas MSE.

19.41 SCRS shall run the SKJ-W MP and advise the Commission of the resulting TAC per the process specified in Annex 2, Rec. 24-04 para 5

Background: *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 does not yet specify a single adopted management procedure. Per Rec. 24-04 para 8, the SKJ-W MP is to be added as Annex 3 in 2025 once the SCRS has finalized the MSE and CMP tuning. See item 19.42 for the full results of that final tuning. The corresponding 2026-2028 TACs for the four CMPs are as follows:

CMP	***SKJ-W TAC1 (2026-2028)***
CE	32,130 t
IR	30,844 t
SP	27,218 t
SPAH	28,266 t

19.42 SCRS shall finalize tuning of the MP to achieve the status objective specified in paragraph 2, Rec. 24-04 para 8

Background: *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, and the final MP specifications will become Annex 3 of this Recommendation.*

The SCRS finalized the tuning of four CMPs to achieve the objectives defined by the Commission in Rec. 24-04. The results of this process were fully endorsed by the SCRS and will be presented to the Commission for consideration, first at the Intersessional meeting of Panel 1 on tropical tunas MSE (online, 8 October 2025) and subsequently at the November 2025 Annual meeting, with the expectation of adopting a MP for the western Atlantic skipjack stock.

[10] The SCRS shall use yields over the short (e.g., 1-3 years), medium (e.g., 4-10 years), and long (e.g., 11-20 years) terms as primary performance indicators to evaluate this management objective.

The process of adjusting the CMPs was conducted with the aim of maximizing projected catches for the next 30 years (2026-2055), while simultaneously respecting the management objectives and performance limits established by the ICCAT Commission in 2024, which are: (a) a minimum 60% probability of maintaining the stock in the green quadrant of the Kobe plot in the medium term (4-10 years, PGK ≥ 60%) and a maximum 10% risk of breaching the limit reference point of 0.4 B_{MSY} (LRP ≤ 10%). This specific exercise used the reconditioned OMs defined on the uncertainty grid of the last assessment of this stock (Kimoto *et al.,* 2022), representing different hypotheses about productivity, natural mortality, and growth dynamics, ensuring that the CMPs were robust to a broad spectrum of uncertainty.

The performance results for each of the CMPs are presented in **Table 19.42.1** and **Figures 19.42.1 to 19.42.5**. Overall, all four CMPs successfully met the performance criteria defined by the ICCAT Commission (Rec. 24-04). The estimated performance values for PGK in the medium-term projection satisfied the threshold defined by the Commission (i.e., ≥60% probability of the stock remaining in the green quadrant of the Kobe plot), as well as those established for LRP (≤10% risk of breaching biological limits (LRP)) and VarC (i.e., ≤25% variability in TAC between management periods). In addition, the results allow for an expansion of catches throughout the 30-year projection period (AvC).

Figure 19.42.1 shows the trade-off between the probability of breaching the LRP and the probability of being in the Kobe green quadrant (PGK) over the medium-term and over the full 30-year projection period. To achieve PGK values close to 60% over the 30-year projection period, the expected LRP values would be around 0.15 (≃15%). LRP values of up to 10% result in PGK above 70%, still meeting the minimum requirements proposed by the Commission. **Figure 19.42.2** shows projections of biomass relative to SSB_{MSY}. There is a tendency for decline in the initial period of the trajectories for each CMP driven by the initial increase in TACs. This is followed by values approaching the target reference point (≃1) and, subsequently, a period of biomass rebuilding toward the end of the series. This pattern is common across all CMPs tested, with the main differences being the timing of these transitions and the speed of response (**Figure 19.42.2**). For CE and SP CMPs, the process occurs more sharply, whereas for IR and SPAH CMPs the adjustment is slower, with SPAH displaying the most stable trajectory over the 30-year projection horizon.

A similar response can be observed in the trajectories of fishing mortality relative to F_{MSY} (**Figure 19.42.3**). Here, increases in F/F_{MSY} explain the variation seen in SSB/SSB_{MSY}. Again, all CMPs exhibited this behaviour, however, the SP CMP reaches F_{MSY} ≃1 around the middle of the projected period, while the other CMPs remain below this limit. Overall, these patterns are consistent with the TAC trajectories estimated for each CMP (**Figure 19.42.4**). CE and SP CMPs showed the greatest variability throughout the series, although CE displayed greater TAC stability compared to SP. In contrast, IR and SPAH CMPs were generally more stable, with SPAH being the most stable of all over the entire projection period.

For a more detailed description of the tuning process and a comprehensive overview and results of the work conducted this year, as well as the planned activities for the coming years, see appendix to item 15.5 of this report , and the Slick Shiny App.

Table 19.42.1 Quilt table showing results for the four CMPs against key performance indicators for the reference set of OMs. See Appendix 1 for performance indicator descriptions. Darker shading indicates better performance, but some of the values are very similar, despite different shading.

MP	PGK	PGK_short	PGK_mid	PGK_long	LRP	LRP_short	LRP_mid	LRP_long	POF	PNOF	AvC	AvC_short	AvC_mid	AvC_long	VarC	VarC_mid	VarC_long
CE	0.71	0.95	0.68	0.68	0.10	0.00	0.03	0.13	0.24	0.76	31,640.63	32,129.52	40,161.90	26,157.76	0.14	0.11	0.13
IR	0.71	0.97	0.79	0.66	0.10	0.00	0.01	0.14	0.24	0.76	30,844.34	30,844.34	34,959.98	27,663.01	0.10	0.11	0.10
SP	0.71	1.00	0.89	0.61	0.10	0.00	0.00	0.14	0.25	0.75	30,298.89	27,217.88	30,321.19	28,152.37	0.12	0.11	0.12
SPAH	0.69	0.99	0.86	0.60	0.10	0.00	0.01	0.14	0.26	0.74	33,833.18	28,265.68	31,931.10	35,404.71	0.07	0.08	0.06

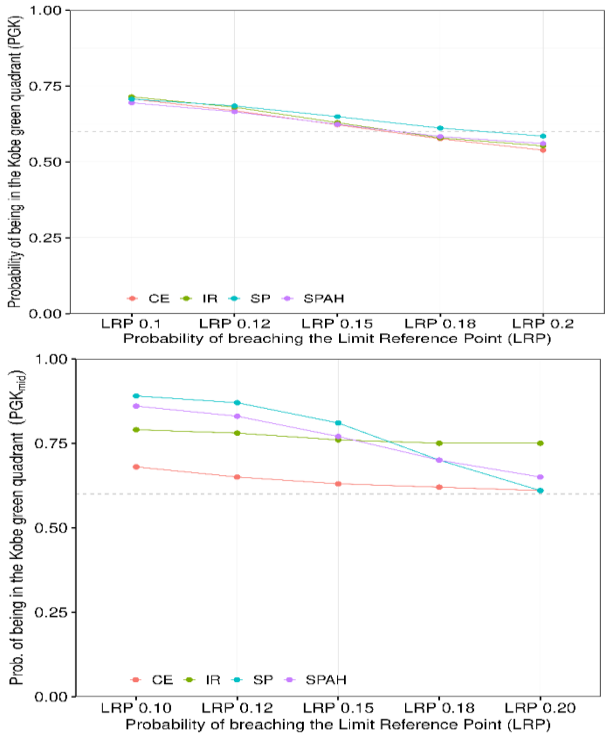


Figure 19.42.1 Trade-off relationship between the probability of breaching the LRP and the probability of being in the Kobe green quadrant (PGK) over the 30-years projection period (left panel) and medium-term (right panel) for the four CMPs. Each line shows the PGK performance as the risk of breaching the LRP increases from 10% to 20. The dashed horizontal line marks PGK=60%, the minimum level set in Rec. 24-04.

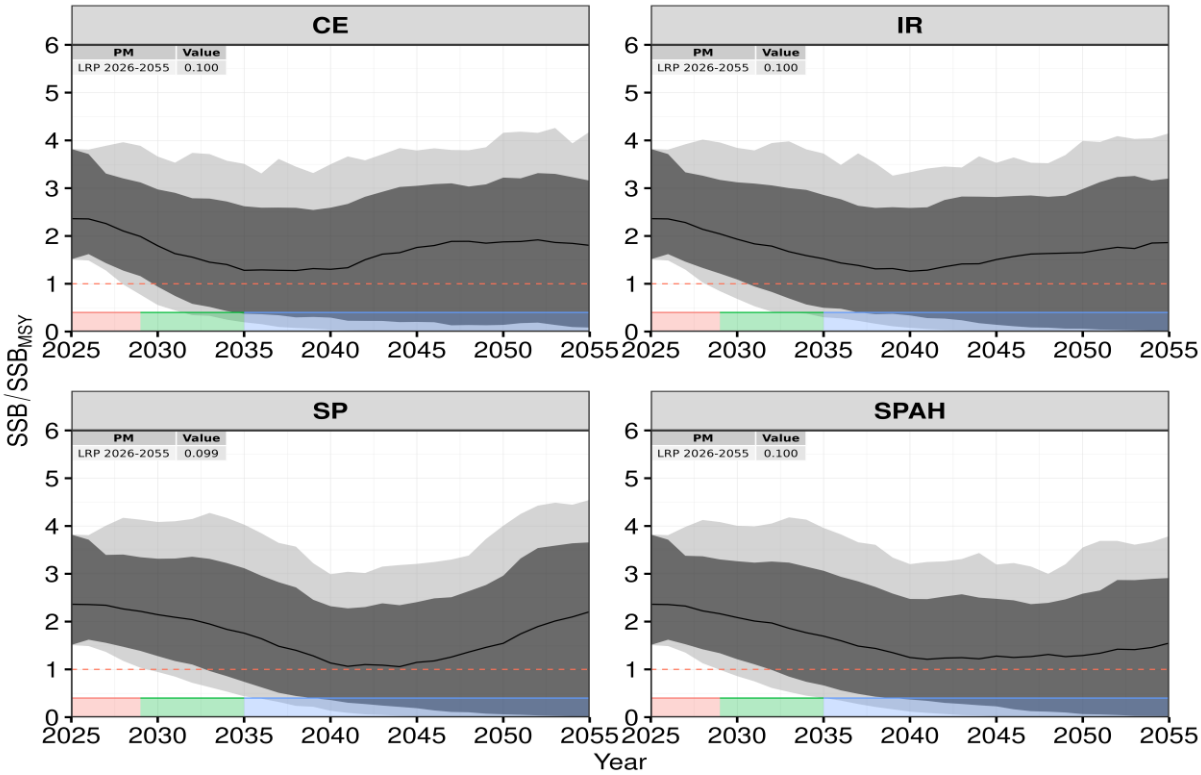


Figure 19.42.2 Projected spawning stock biomass relative to SSB_{MSY} (SSB/SSB_{MSY}) for western Atlantic skipjack tuna under four CMPs, projected for the period 2026-2055. The black line represents the median trajectory, while shaded areas correspond to 80% and 95% quantiles respectively. The horizontal dashed red line denotes the target reference point (SSB_{MSY} = 1). Coloured bars at the bottom indicate the reference B_{LIM} (0.4*SSB_{MSY}) for each time projection period (red colour: short; green colour: medium; blue colour: long).

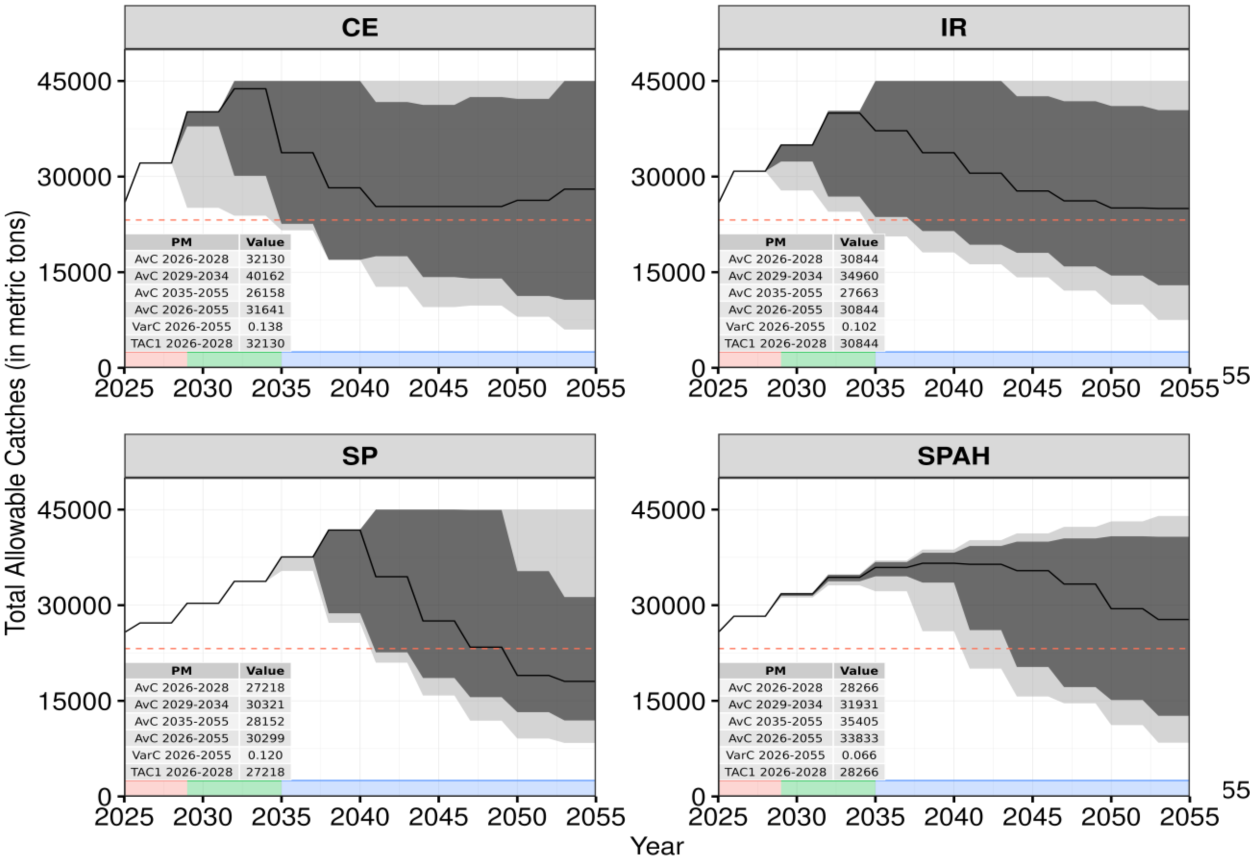


Figure 19.42.3 Projected fishing mortality relative to F_{MSY} (F/F_{MSY}) for western Atlantic skipjack tuna under four CMPs, projected for the period 2026-2055. The black line represents the median trajectory, while shaded areas correspond to 80% and 95% quantiles respectively. The horizontal dashed red line denotes $F_{MSY} = 1$. Coloured bars at the bottom indicate the reference of the time projection period (red colour: short; green colour: medium; blue colour: long). **Figure 19.42.4.** Projected TAC for western Atlantic skipjack tuna under four CMPs, projected for the period 2026-2055. The black line represents the median trajectory, while shaded areas correspond to 80% and 95% quantiles respectively. The horizontal dashed red line denotes the average catches for the last five years of the historical period. Coloured bars at the bottom indicate the reference of the time projection period (red colour: short; green colour: medium; blue colour: long).

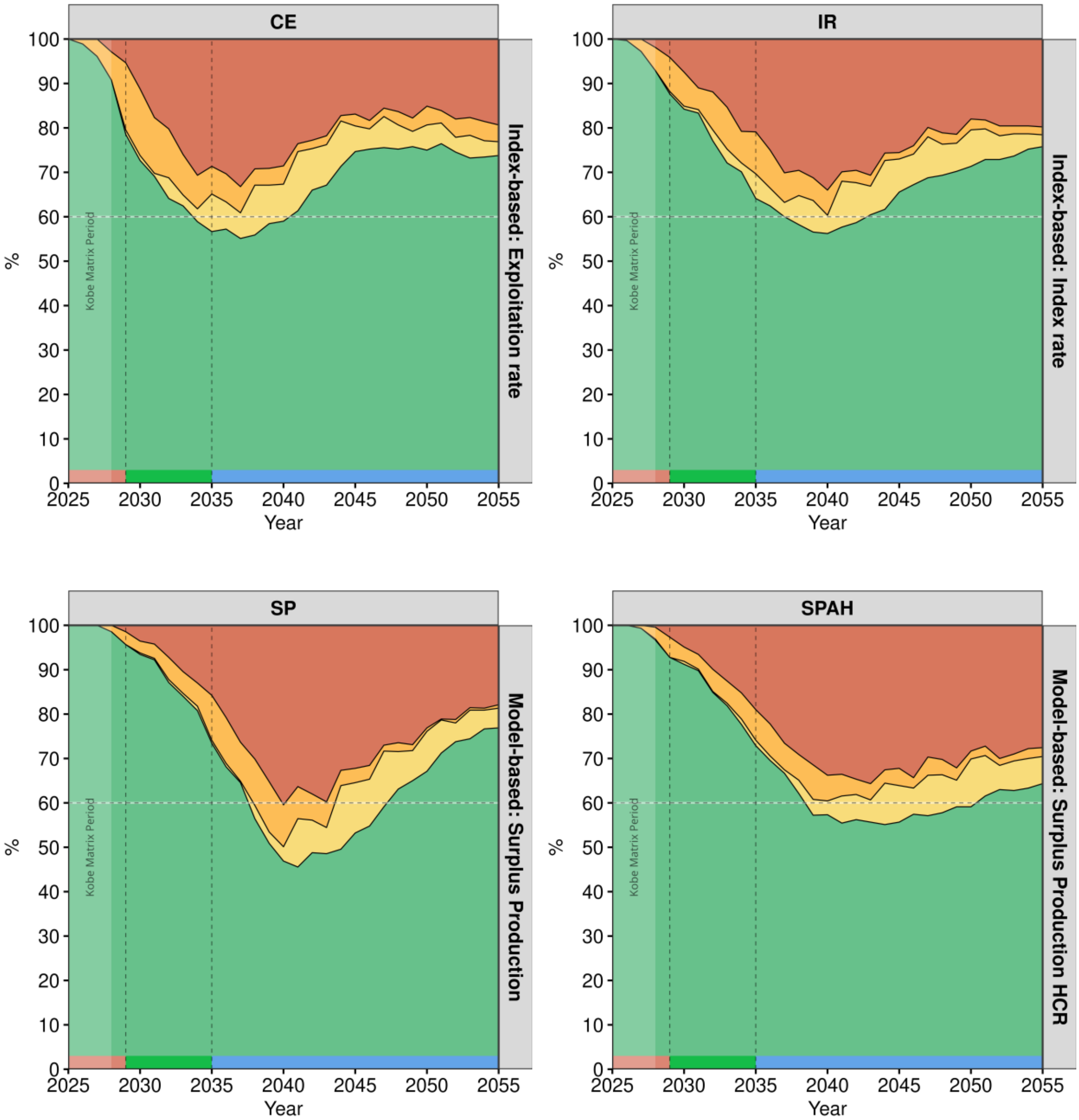


Figure 19.42.5 Kobe time plot showing the percentage (vertical axis) of simulations across all reference OMs that fall in each of the Kobe quadrants in each projection year (horizontal axis). Green indicates that the stock is neither overfished nor subject to overfishing. Orange means that the stock is subject to overfishing but not overfished. Yellow indicates that the stock is overfished but not subject to overfishing. Red means that the stock is both overfished and subject to continued overfishing. The vertical line delineates the different time periods, with red bars showing the short-term, while green depicts medium and blue long.

20. Other matters

20.1 Review the Rules and Procedures for the protection, access to, and dissemination of data compiled by ICCAT

ICCAT's Rules and Procedures for data protection, access, and dissemination identified key gaps, including unclear treatment of size-sampling datasets (T2SZ/T2CS), lack of explicit provisions for Task 3 data, undefined aggregation/anonymization standards, ambiguities around CPC authorization versus mandatory submissions, and incomplete guidance on exchanges with non-RFMOs.

In order to address these issues the Committee recommended establishing a virtual ad hoc group of the Subcommittee on Statistics that will have several informal online meetings in 2025 and 2026 to clarify dataset classifications, align rules with ICCAT Basic Texts, set minimum disclosure thresholds, and create a regular review cycle to ensure transparency, consistency, and scientific utility across evolving datasets. The ad hoc group will work through 2026 and present editorial proposals to address the current issues for the consideration of the Committee its 2026 Plenary meeting.

20.2 Deadline for the submission of SCRS documents and presentation to SCRS meetings

Due to time constraints, this topic was not discussed during the meeting and was postponed for next year's SCRS Plenary meeting.

20.3 New Guidelines for authors of scientific papers for the ICCAT SCRS and Collective Volume series

The Secretariat presented a proposal for updating the *Guidelines for authors of scientific papers for the ICCAT SCRS and Collective Volume Series*, and align these with journal-style standards: papers (in EN/FR/ES) must follow strict formatting. A detailed checklist covers layout (margins, spacing, pagination), table/figure preparation, formulas, and reference style, with model pages and keyword lists was provided. The document was accepted and is contained in **Appendix 10**.

20.4 Role of the SCRS in the implementation of biodiversity conservation instruments

The Sargasso Sea Commission reported the following.

Morocco's ratification on 27 September 2025 means that the United Nations High Seas Treaty has now reached the required 60 ratifications, enabling its entry into force in January 2026. Many ICCAT CPCs are parties to this landmark biodiversity conservation agreement.

The Sargasso Sea Commission is currently finalising a comprehensive Socio-Ecosystem Diagnostic Analysis (SEDA) of the Sargasso Sea, recognized as an Ecologically or Biologically Significant Marine Area. The SEDA demonstrates that this ecosystem supports spawning and nursery habitats for numerous ICCAT-managed species, including sharks and sea turtles. However, knowledge gaps remain regarding bycatch, cumulative impacts, and ecosystem connectivity.

There are several collaborative opportunities, particularly through the Subcommittee on Ecosystems and Bycatch (SC-ECO), including:

- Ecosystem Indicators: The SEDA can inform the development of the ecosystem report card, particularly in relation to indicators of climate-induced habitat changes and fishing pressure.

- Data Sharing: The SEDA summarises information on ecosystem connectivity and cumulative impacts will help strengthen ICCAT's ecosystem-based management approach.

- Other Effective Area-Based Conservation Measures: The SEDA can provide practical examples demonstrating biodiversity conservation and sustainable fisheries, supporting Res. 23-23.

- Climate-Integrated Advice: The SEDA's findings will help advance the SCRS's goal of developing climate-conditioned advice, which is essential for High Seas Treaty implementation.

The Memorandum of Understanding between ICCAT and the Sargasso Sea Commission demonstrates how regional initiatives can help advance the objectives of the High Seas Treaty while also strengthening ecosystem-based fisheries management.

20.5 Review of Chapter 3.1.2 of the ICCAT Manual: Description of fisheries:

Following the Committee request for a revision of Chapter 3.1.2. of the ICCAT Manual: Description of fisheries/Longline fisheries, an updated was provided as document PLE-SCRS_28. This revision includes updates with new scientific references and recent studies (including several from 2024-2025) covering longline fisheries, bycatch, and new fishing gear such as trap/loop systems. It also expanded descriptions of fishing practices, vessel types, and catch/effort trends, incorporating updated ICCAT data up to 2022. Overall, the revisions modernized the technical content and added the most recent research findings to provide an up-to-date overview. The document was adopted and the Secretariat will proceed with translation and publication of the updated chapter within the coming months.

20.6 Update of the MSE web page

Following the Committee request, the Secretariat presented a draft update to the ICCAT MSE webpage. The Committee was asked for its point of view on the structure. The Committee endorsed the structure and proposed that it might be useful for other aspects of the SCRS activities. The Committee adopted the webpage structure, which will be fully implement by the Secretariat during the next few months.

21. Adoption of the report and meeting closure

The Report of the 2025 SCRS meeting was adopted and the 2025 Meeting of the SCRS was adjourned.

Appendix 1

Opening address of Mr Camille Jean Pierre Manel, ICCAT Executive Secretary

SCRS Chair, SCRS Vice Chair,
Species Group Coordinators and Rapporteurs,
Scientific delegates,
Dear partners,
Dear interpreters,
Dear colleagues,
Dear in-person and online participants,

Good morning / good evening,

Once again, it is my pleasure and honour to warmly welcome you to this plenary meeting of the Standing Committee on Research and Statistics (SCRS).

True to its tradition, the SCRS, through its scientists from all its subsidiary bodies and in synergy with its partners, continues to make tremendous efforts during the intersessional period to achieve conclusive results. I would like to express my sincere gratitude to you, dear members of the SCRS. I would also like to extend my warmest thanks and congratulations to my dear colleagues who have worked closely with you, as well as to all the Secretariat staff for their remarkable commitment.

As we have noted in recent years, discussions within the Commission on the budget suggest a realignment of available financial resources, due to a slowdown in expected increases, but particularly to a reduction trend in voluntary financial contributions. This situation requires the Commission's subsidiary bodies to readjust their objectives and activities to the resources available, as failure to do so could have an impact on the current conduct of activities, such as the number of meetings, their format and insufficient coverage by the MPF.

Chair, dear delegates, it is in this context that the Secretariat would like to invite the SCRS to take this situation into account in its planning, as well as our recent calls for a limitation on the number of meetings. The exercise seems complex given the many present and future challenges, but it remains possible. Moreover, the Secretariat has already noted with satisfaction, while thanking the SCRS, the reduction in the number of meetings in 2025 and hopes that this effort at streamlining will continue in the years to come.

I would like to reiterate the Secretariat's full commitment and availability, and wish you a fruitful meeting.

Thank you for your kind attention!

Appendix 2

SCRS Plenary Agenda

1. General remarks by the SCRS Chair and the Executive Secretary
2. Adoption of agenda and arrangements for the meeting
3. Introduction of Contracting Party delegations
4. Introduction and admission of observers
5. Admission of scientific documents and presentations
6. Report of ICCAT Secretariat activities on statistics and science
7. Review of national fisheries and research programmes
8. Reports of intersessional SCRS meetings
9. SCRS Science Strategic Plan
10. Report of the Intersessional Meeting of the Subcommittee on Ecosystems and Bycatch
11. Report of the Meeting of the Subcommittee on Statistics
12. Discussions at the Intersessional Meetings of the Commission relevant to the SCRS

    12.1 Intersessional Meeting of Panel 2

    12.2 Meeting of the Electronic Monitoring Systems Working Group (EMS WG)

    12.3 18th Meeting of the Working Group on Integrated Monitoring Measures (IMM)

    12.4 Meeting of the Standing Working Group on Dialogue between Fisheries Scientists and Managers (SWGSM)

    12.5 Meetings of the Virtual Working Group on Sustainable Financial Position for ICCAT (VWG-SF)

13. Executive Summaries on species:

    13.1 YFT - Yellowfin

    13.2 BET - Bigeye

    13.3 SKJ - Skipjack

    13.4 ALB-AT - Atlantic albacore

    13.5 ALB-MD - Mediterranean albacore

    13.6 BFT - Atlantic bluefin tuna

    13.7 SBF - Southern bluefin

    13.8 BUM - Blue marlin

13.9 WHM - White marlin

13.10 SAI – Sailfish

13.11 SWO-AT - Atlantic swordfish

13.12 SWO-MD - Mediterranean swordfish

13.13 SMT - Small tunas

13.14 BSH - Blue shark

13.15 SMA - Shortfin mako

13.16 POR - Porbeagle

14. ICCAT Research Programmes

14.1 Atlantic-Wide Research Programme for Bluefin Tuna (GBYP)

14.2 Small Tunas Year Programme (SMTYP)

14.3 Shark Research and Data Collection Programme (SRDCP)

14.4 Enhanced Programme for Billfish Research (EPBR)

14.5 Albacore Year Programme (ALBYP)

14.6 Swordfish Year Programme (SWOYP)

14.7 Tropical Tuna Research and Data Collection Program (TTRaD)

14.8 Subcommittee on Ecosystems and Bycatch Research Programme

15. Progress related to work developed on Management Strategy Evaluation (MSE)

15.1 Work conducted for northern albacore

15.2 Work conducted for southern albacore

15.3 Work conducted for bluefin tuna

15.4 Work conducted for northern swordfish

15.5 Work conducted for western skipjack

15.6 Work conducted for tropical tunas multi-stock MSE

15.7 Work conducted for blue shark

15.8 Review of the Roadmap for the ICCAT MSE processes adopted by the Commission in 2024

15.9 Draft MSE Roadmap redesign

15.10 Proposal for a Group to address MSE issues that are cross-cutting across Species Groups

15.11 Management Strategy Evaluation (MSE) Technical Coordinator

16. Update of the stock assessment software catalogue

17. Consideration of plans for future activities

17.1 Annual workplans and research programmes

17.1.1 Subcommittee on Ecosystems and Bycatch Workplan

17.1.2 Subcommittee on Statistics Workplan

17.1.3 Working Group on Stock Assessment Methods (WGSAM) Workplan

17.1.4 Albacore Workplan

17.1.5 Billfishes Workplan

17.1.6 Bluefin Tuna Workplan

17.1.7 Sharks Workplan

17.1.8 Small Tunas Workplan

17.1.9 Swordfish Workplan

17.1.10 Tropical Tunas Workplan

17.2 Intersessional meetings proposed for 2026

17.3 Date and place of the next meeting of the SCRS

18. General recommendations to the Commission

18.1 General recommendations to the Commission that have financial implications

18.1.1 Subcommittee on Ecosystems and Bycatch

18.1.2 Subcommittee on Statistics

18.1.3 Albacore

18.1.4 Billfish

18.1.5 Bluefin tuna

18.1.6 Sharks

18.1.7 Small tunas

18.1.8 Swordfish

18.1.9 Tropical tunas

18.1.10 Working Group on Stock Assessment Methods (WGSAM)

18.2 Other general recommendations

18.2.1 Subcommittee on Ecosystems and Bycatch

18.2.2 Subcommittee on Statistics

18.2.3 Albacore

18.2.4 Billfishes

18.2.5 Bluefin tuna

18.2.6 Sharks

18.2.7 Small tunas

18.2.8 Swordfish

18.2.9 Tropical tunas

18.2.10 Working Group on Stock Assessment Methods (WGSAM)

19. Responses to the Commission's requests

20. Other matters

20.1 Review the Rules and Procedures for the protection, access to, and dissemination of data compiled by ICCAT

20.2 Deadline for the submission of SCRS documents and presentation to SCRS meetings

20.3 New Guidelines for authors of scientific papers for the ICCAT SCRS and Collective Volume series

20.4 Role of the SCRS in the implementation of biodiversity conservation instruments

20.5 Revision of Chapter 3.1.2 of the ICCAT Manual: Description of fisheries - Longline

20.6 Update of the MSE webpage

21. Adoption of the report and meeting closure

Appendix 3

List of participants* [1]

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Appendix 4

List of SCRS documents and presentations

List of documents

DocRef	Title	Authors
SCRS/2025/001	Working Group on Stock Assessment Methods Meeting (WGSAM)	Anon.
SCRS/2025/002	Shortfin Mako Shark Data Preparatory Meeting	Anon.
SCRS/2025/003	White Marlin Data Preparatory Meeting	Anon,
SCRS/2025/004	Bluefin Tuna Species Group Intersessional Meeting	Anon.
SCRS/2025/005	Bigeye Tuna Data Preparatory Meeting	Anon.
SCRS/2025/006	Subcommittee on Ecosystems and Bycatch Intersessional Meeting	Anon.
SCRS/2025/007	Shortfin Mako Shark Stock Assessment Meeting	Anon.
SCRS/2025/008	Small Tuna Species Group Intersessional Meeting	Anon.
SCRS/2025/009	White Marlin Stock Assessment Meeting	Anon.
SCRS/2025/010	SCRS Science Strategic Plan Meeting	Anon.
SCRS/2025/011	Bigeye Tuna Stock Assessment Meeting	Anon.
SCRS/2025/012	Subcommittee on Statistics (SC-STATS) meeting	Anon.
SCRS/2025/018	Training Workshop on the Bycatch Estimator Toolkit	Babcock E.A., Hartford W., and Adao A.
SCRS/2025/019	Report of the Project “External Review of the Overall ICCAT MSE Process	Garcia D., Altuna-Etxabe M., Citores L., Ibaibarriaga L., and Sánchez-Maroño S.
SCRS/2025/020	Report on the development of SSfuture C++ (version 2.0.1): Future projection software seamlessly connecting to SS3.	Ijima H.
SCRS/2025/021	*Istiophorus platypterus* is the valid scientific name for the Sailfish in the ICCAT area	Di Natale A., Arocha F., Ngom F., and Collete B.
SCRS/2025/022	Lost in Transit: FADs Drifting from Fishing Grounds to the Caribbean and the U.S. East coast.	Kimak, E, Kerstetter D., Pitchford T. Restrepo V., and Moreno G.
SCRS/2025/023	Revision of the Shortfin Mako Shark Size Distribution in the Atlantic	Coelho R., Arocha F., Baez, J.C., Baibbat S.A., Cardoso L.G., Carlson J., Courtney D., Da Silva C., Domingo A., Forselledo R., Bowlby H., Kerwath S., Kuo T-C., Lino P.G., Liu K-M. Macias D., Mariela N.R., Mas F., Mikihiko K., Moreno J., Mourato B., Ramírez K., Rosa D., Rueda L., Sabarros P., Salmerón P., Santos C.C., Santos M.N., Yasuko S., and Zhang X.
SCRS/2025/024	Updated Methods and Estimation of Shortfin Mako Shark Discards from the Portuguese Pelagic Longline Fleet in the Atlantic Ocean	Coelho R., Rosa D., and Lino P.
SCRS/2025/025	Standardized CPUE of the Shortfin Mako Shark Captured in the Portuguese Pelagic Longline Fishery in the North Atlantic, with Data Up Until 2023	Coelho R., and Lino P.
SCRS/2025/026	Standardized catch rates of the Atlantic stocks of shortfin mako (*Isurus oxyrinchus*) inferred from Spanish surface longline fishery targeting swordfish during the 1990-2023 period	Ramos-Cartelle A., García-Cortés B., and Fernández-Costa
SCRS/2025/027	Data-mining of shortfin mako shark (*Isurus oxyrinchus*) lengths of North and South Atlantic stocks from the Spanish surface longline fleet from the period 1993-2023.	Fernández-Costa J., Pérez-Casal P. and Ramos-Cartelle A.

DocRef	Title	Authors
SCRS/2025/028	An Incidental Catch Model for Shortfin Mako Assessment and Status Evaluation	Bowlby H., Cortes E., and Semba Y.
SCRS/2025/029	Methods and Estimation of discards for blue and white marlin from the Portuguese Pelagic Longline Fleet in the Atlantic Ocean.	Coelho R., Rosa D., and Lino P.G.
SCRS/2025/030	Update of standardized CPUE of shortfin mako (*Isurus oxyrinchus*) caught by Japanese tuna longline fishery in the Atlantic Ocean through 2023	Semba Y., Kai M.
SCRS/2025/031	Updated Size, Standardized CPUE and Catch Estimates of the Shortfin Mako Shark Caught by the Chinese Taipei Longline Fishery in the Atlantic Ocean	Kuo T-C., Liu Kwang-Ming, and Su Kuan-Yu
SCRS/2025/033	Standardized Catch Rates of Mako Sharks in the Western North Atlantic Ocean from the U.S. Pelagic Longline Observer Program 1992-2023	Zhang X., Courtenay D., and Carlson J.
SCRS/2025/034	Post-Release Mortality of Shortfin Mako in the Atlantic Ocean Using Satellite Telemetry	Domingo A., Baez J-C., Bowlby H., Cardoso G., Carlson John.,Coelho R., Cortes E., Da Silva C., Forselledo R., Kerwath S.,Macias D., Miller P., Natanson L., Ortiz de Urbina J., Rosa D., Santos C. C., Travassos P., and Mas F.
SCRS/2025/035	Exploratory Analysis of Shortfin Mako (*Isurus oxyrinchus*) Catches in the Spanish Mediterranean Waters	Rueda L., Báez J-C, García-Barcelona S., Moreno J., Borrego-Santos R., and Macías D.
SCRS/2025/036	Standardised CPUE indices of abundance for pelagic sharks, mako shark (*Isurus oxyrinchus*) and blue shark (*Prionace glauca*), off South Africa	Yemane D., Da Silva C., and Kerwath S.
SCRS/2025/037	A Preliminary Literature Database Review of Post-Release Live-Discard Mortality Rate Estimates for Mako Sharks	Hilton A., Courteney D.
SCRS/2025/038	CPUE Standardization for Shortfin Mako (*Isurus oxyrinchus*) in the Southwestern Atlantic Based on Brazilian and Uruguayan Longline Fishery Data (1978–2022)	Cardoso L.G., Kikuchi E., dos S. Rodrigues L., Freire M.A., Mourato B., Forselledo R.R., Mas F., Jiménez S., Domingo A., Sant'Ana R.
SCRS/2025/039	Spatio-Temporal Distribution of Shortfin Mako (*Isurus oxyrinchus*) in the Catch from Venezuelan Pelagic Longline Fleet in the Caribbean Sea and Adjacent Waters: Period 2004-2023.	Narváez M., Marín H., Evaristo E., Gutiérrez X., and Arocha. F.,
SCRS/2025/040	Preliminary Results on the Age and Growth of the Shortfin Mako Shark (*Isurus oxyrinchus*) in the South Atlantic Ocean	Marquez R., Santos C., Semba Y., Rosa D.., Jagger C., Forselledo R., Mas F., Domingo A., Sant'Ana R., Coelho R., and Cardoso L.G.
SCRS/2025/041	Conservation Status of Basking Shark *Cetorhinus maximus* and White Shark *Carcharodon carcharias* in the ICCAT Area	Ellis J., Bowlby H., Coehlo R., da Silva C., Domingo A., Forselledo R., Reeves S., and Taylor N.G.
SCRS/2025/042	Standardized Catch Per Unit Effort (CPUE) of Shortfin Mako (*Isurus oxyrinchus*) Caught by the Moroccan Longline Fleet Operating in the Atlantic Waters	Serghini M., Baibbat S.A., Bensbai J., Abid N., Ikkis A.
SCRS/2025/043	Review and preliminary analysis of size samples of Atlantic white marlin (*Kajikia albida*)	Ortiz M., Kimoto A., and Mayor C.

DocRef	Title	Authors
SCRS/2025/044	Atlantic white marlin (*Kajikia albida*) standardized catch rates from the industrial longline fishery of México (1993-2023)	Ramirez-Lopez K., Narváez M., Rojas-González R.I., Wakida-Kusunoki A.T., Marín H., Evaristo E., and Arocha F.
SCRS/2025/045	Size, Maturity, Length-Length and Length-Weight Relationships of Shortfin Mako, *Isurus oxyrinchus*, from the Southwestern Atlantic Ocean	Albornoz P., Mas F., Forselledo R., Jiménez S., and Domingo A.,
SCRS/2025/046	Updated growth parameters using mark-recapture data from the NOAA Fisheries Cooperative Shark Tagging Program	McCandless C., and Passerotti M.
SCRS/2025/047	Life History of Shortfin Mako (*Isurus oxyrinchus*) in the Northwest Atlantic Ocean	Carlson J., Passerotti M., and Natanson L.
SCRS/2025/048	Shortfin Mako (*Isurus oxyrinchus*) Catch and Effort Caught by the Venezuelan Artisanal Gillnet Off la Guaira: Period 2010-2022	Narvaez M., Marín H, Evaristo E, Gutiérrez X, and Arocha F.
SCRS/2025/049	A brief initial analysis of 'does the west CKMR estimate matter for the ABFT MSE'?	Butterworth D., and Rademeyer R.A.
SCRS/2025/050	Spatio-Temporal model for CPUE Standardization: Application to white marlin caught by Japanese Tuna Longline fishery from 1959 to 2023.	Kai M.
SCRS/2025/051	Update on standardized CPUE of Atlantic White Marlin index from the artisanal drift-gillnet fishery operating at the Billfish hotspot, off La Guaira, Venezuela (1991-2023).	Narvaez M., Evaristo E., Marin H., Marcano L.A., and Arocha F.
SCRS/2025/052	White marlin (*Kajikia albida*) standardized indices of abundance from the U.S. Recreational tournament fishery.	Lauretta M.
SCRS/2025/053	U.S. Pelagic Longline indices of abundance of white marlin and spearfish (*Tetrapturus spp.)*	Lauretta M.
SCRS/2025/054	Estimating the catches of the Atlantic White Marlin in the Uruguayan Pelagic Longline Fishery	Jimenez S., Forselledo R., Mas F., and Domingo A.
SCRS/2025/055	Species distribution models for silky shark in the eastern tropical Atlantic Ocean	Lopetegui-Eguren L, Arrizabalaga H., Murua H., Lezama-Ochoa N., Griffiths S., Lopez J., Ruiz-Gondra J., Sabarros P., Ramos-Alonso M., and Juan-Jordá M.,
SCRS/2025/056	Update on standardized catch rates for white marlin from the Venezuelan pelagic longline fishery off the Caribbean Sea and the western central Atlantic: period 1991-2017	Narvaez M., Marin H., Evaristo E., Gutierrez X., and Arocha F.
SCRS/2025/057	Origin of BFT from the Norwegian Sea based on Otolith Chemistry	Fraile I., Lastra P, Artetxe I., Arrizabalaga H., Nottestad L., Sorensen O., Urien A., Lange T., and Rooker J.
SCRS/2025/058	Can an unusual combination of SST and oceanography be considered an exceptional circumstance? The case of a Sardinian tuna trap in 2024 (western Mediterranean Sea).	DiNatale A.
SCRS/2025/059	Length frequency distribution of Bluefin tuna caught by the purse seine fleet in the Balearic Islands: period 2016-2024.	Navarro J.J.
SCRS/2025/060	Investigating important sources of uncertainty in the 2019 White Marlin Assessment	Schirripa M. J.
SCRS/2025/061	CPUE Standardization for White Marlin (*Kajikia albida*) from the Chinese-Taipei Longline fishery in the Atlantic Ocean.	Su N-J., Sung Y.F.
SCRS/2025/062	French aerial abundance index for 2009-2023, accounting for the environmental effect on bluefin tuna availability in the Gulf of Lion	Rouyer T., Derridj O., and Bal G.
SCRS/2025/063	A Summary of ABFT Stock Mixing Data	Hanke A.R., Artetxe I., Fraile I., Busawon D., Diaz Arce N., Arrizabalaga H., and Rodríguez-Ezpeleta N.

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SCRS/2025/064	A revised index of Bluefin tuna relative abundance based on Portuguese-Moroccan Trap Data	Hanke A.R., Akia S., Lino P., Coelho R., Abid N., and Walter J.
SCRS/2025/065	Determination of a length-weight relationships applicable to Atlantic bluefin tuna (*Thunnus thynnus*) caught in the Bay of Biscay (Cantabrian Sea)	Luque P.L., Artetxe-Arrate I., Arrizabalaga H., and Fraile I.
SCRS/2025/066	Improving the data for the BFT MSE	DiNatale A., Garibaldi F., and Piccinetti C.
SCRS/2025/067	The standardized CPUE for Japanese longline fishery in the Atlantic up to 2024 fishing year	Tsukahara Y., Fukuda H., and Nakatsuka S.
SCRS/2025/068	Modelling approaches: support to ICCAT tropical tunas multi-stock MSE process in 2024.	Merino G., Urtizberea A., Giancarlo M. Correa G.M., and Santiago J.
SCRS/2025/069	Updated Standardization of Fishery-Dependent Abundance Indices for Atlantic Bluefin Tuna in the Southern Gulf of St. Lawrence and Canada Atlantic coast within area of Scotian shelf using vast:1996-2023	Akia S., Hanek A.
SCRS/2025/070	Close-kin mark-recapture spawning stock abundance estimates of western Atlantic bluefin tuna (T*hunnus thynnus*)	Lauretta M., Grewe P., Bravington M., Walter J., Baylis S., Thomson R., Golet W., Zapfe G., Walter K., Hanke A., Busawan D., Aulich J., Potter N., Orbesen E., Reglero P., Alvarez-Berestegui D., Gerard T., Malca E., Pacicco A., Porch C., and Davies C.
SCRS/2025/071	Alternate approaches to accounting for environmental impacts in the stock assessment of western Atlantic bluefin tuna	Carrano C., Lankowicz K., Cadrin S., and Kerr L.
SCRS/2025/072	Back-calculated and habitat standardized larval abundances of Atlantic bluefin tuna in the Balearic Sea (western Mediterranean) (2001-2023)	Alvarez-Berastegui D., Tugores M.P., Torres A.P., Martín-Quetglas M., Santandreu M., Alvarez I., Balbín R., and Reglero P.
SCRS/2025/073	Results of the pilot study on AI-based automatic fish length estimation for Bluefin tuna in a Moroccan Atlantic farm	Abid N., Benziane M., Idrissi M.M., and Bensbai J.
SCRS/2025/074	Estimates of Vital Rates and Population Dynamics Parameters of Interest for Shortfin Makos in the North and South Atlantic Ocean	Cortés E.
SCRS/2025/075	Analysis of fishing selectivity of bigeye tuna (Thunnus Obesus, Lowe 1839) catches according two fishing strategies of Canary Islands baitboat fleet (2011-2023).	Pascual-Alayón P., Déniz S., Abascal F.J., and Ramos V.
SCRS/2025/076	Standardization of Atlantic bigeye (*Thunnus obesus*, Lowe 1869) tuna CPUE index of Canary Islands baitboat fleet (2009-2023).	Liniers G., Fernández C., Abascal F.J., Déniz S., and Pascual-Alayón P.J
SCRS/2025/077	Estimation of Ghana Tasks 1 and 2 Purse seine and Baitboat catch 2023: Data input 2025 BIGEYE stock assessment.	Ortiz M., Ayivi S., Kwame E.D., and Mayor C.
SCRS/2025/078	Feasibility of Management Strategy Evaluation of Northern and Southern Blue Shark in ICCAT Waters	Taylor N.G., Miller S., Coelho R., K., Fernandez C., Sant Ana R., and Liniers G.
SCRS/2025/079	Update of bigeye tuna (*Thunnus obesus*) catches in 2020	Jaranay M., Quelle P.
SCRS/2025/080	Estimates of bigeye tuna (*Thunnus obesus*) catches from the Spanish albacore surface fishery in the northeast Atlantic: from 2018 to 2023	Quelle P., Jaranay M., Déniz S., and Pascual-Alayón P.J.
SCRS/2025/081	Index of Abundance of Bigeye Tuna in the Atlantic Ocean Derived from Echosounder Buoys (2010-2024)	Uranga J.

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SCRS/2025/082	Update on the ITUNNES project: improving tropical tuna biological knowledge for end-users	Zudaire I., Luque P., Duparc A., Juan-Jordá M.J., Faucheux-Bourlot C., Manuzzi A., Erauskin-Extramiana M., Erkoreka O., Fraile I., Artetxe-Arrate I., Amate R., Melendez J., Cauquil P., Guerreiro A.G., Canha Â., Nunes A.M., Silva Sousa R.J., Mattlet A.F., Herrera M., Alzorriz N., Diaha C., Murua H., Salgado A., Ruiz J., and Díaz-Arce N.
SCRS/2025/083	Standardized catch per unit effort of bigeye tuna in the Atlantic Ocean for the European purse seine fleet operating on floating objects	Correa G.M., Uranga J., Grande M., Kaplan D.M., Imzilen T., Merino G., and Ramos-Alonso M.L.
SCRS/2025/084	Relative abundance estimates for Atlantic bigeye tuna obtained with data from multiple longline fleets	Matsumoto T., Ijima H., Su N.J., Lim J.H., Lin H., Lauretta M., Sant'Ana R., Coelho R., Forselledo R., Sung Y.F., Park H., Zhang S.F., Die D.J., Lino P., Jiménez S., Satoshi N., Lee S.I., Ji F., and Mas F.
SCRS/2025/085	Review and preliminary analysis of size samples of Atlantic Bigeye tuna (*Thunnus obesus*).	Ortiz M., Kimoto A.
SCRS/2025/086	Spatial Analysis and Standardization of CPUE for Bigeye Tuna (*Thunnus obesus*) from the Moroccan Longline Fishery operating south of the Moroccan Atlantic waters	Serghini M., Baibbat S.A., Bensbai J., Joumani M., Abid N., and Ikkis A.
SCRS/2025/087	Status and Future Development on the Management Strategy Evaluation for Western Skipjack Tuna (*Katsuwonus pelamis*)	Sant'Ana R., Mourato B.L.
SCRS/2025/088	Update on CPUE standardization for skipjack tuna (*Katsuwonus pelamis*) from the Venezuelan purse seine fishery in the Caribbean Sea and adjacent waters of the western central Atlantic for the period of 1987-2024	Narvaez M., Marín H., Evaristo E., Gutiérrez X., Marcano J. H., Arocha F.
SCRS/2025/089	CPUE standardization for bigeye tuna (*Thunnus obesus*) caught in the Chinese Taipei longline fishery in the Atlantic Ocean.	Su N-J., Sung Y.F.
SCRS/2025/090	Investigating potential North Atlantic swordfish climate-conditioned management approaches	Mormede S, Hanke A., and Gillespie K.
SCRS/2025/091	Ring-shaped Branchline in Japanese Longline Fisheries	Ochi D., Shiode D., Ijima H., Kai M., and Semba Y.
SCRS/2025/092	Progress in developing 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., and Restrepo V.
SCRS/2025/093	Report on the development of SSfuture c++ (version 2.0.2): future projection software seamlessly connecting to SS3	Iijima H
SCRS/2025/094	Task 1 Estimates of Bycatch in ICCAT Fisheries	Taylor N.G., Palma C., Mayor C. and Ortiz M.
SCRS/2025/095	Programa De Recopilación De Datos E Investigación Sobre La Captura Fortuita	Domingo A., Taylor N.G.
SCRS/2025/096	ICCAT Sub-Committee on Ecosystems and Bycatch: Ecosystem Report Card Sub-group Status of development for an indicator for threatened seabirds	Bell J., Wade H.
SCRS/2025/097	Spatial Indicators for Stock Assessment and Ecosystem Monitoring	Kell L.

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SCRS/2025/098	Spatiotemporal distribution and bycatch associated with surface longlines using traplines in the western Mediterranean	Macías, D, Moreno de la Rosa J., Garcías-Barcelona S., Alegría A., and Báez J.C.
SCRS/2025/099	Report on the workshop on small tuna reproductive biology	Diaha N.C., Sow F.N., Angueko D., Hajjej G., Baibbat S.A, Benounnas K., Silva G., Macias D., Puerto M.A., Rodríguez E.
SCRS/2025/101	Analysis of Loggerhead turtle (*Caretta caretta*) bycatch occurrence in the Mediterranean Sea and adjacent Atlantic waters	Rueda L., Báez, J-C. Coelho, R. Jiménez, S. Thasitis, I. Tserpes, G. Pappalardo, L. Macías, D. Moreno, J. Torreblanca, D. Taylor, N.G. Santos, M.N. Ramos, and L. Domingo, A.
SCRS/2025/102	Shark Bycatch Mitigation in Shallow Set Longlines	Keller B., Diaz G.
SCRS/2025/104	ACAP Best Practice Advice for Reducing the Impact of Iccat Pelagic Longline Fisheries on Seabirds	ACAP
SCRS/2025/105	An update to the sharks species list at ICCAT	Forselledo R., Domingo A., Taylor N.G., and Mayor C.
SCRS/2025/106	Gaps in the knowledge on sea turtle bycatch from the Mediterranean: an overview.	Torreblanca D., Rueda L., Domingo A., and Báez J-C
SCRS/2025/107	Preliminary food web model of the tropical Atlantic Ocean: evaluating the potential effects of fishing and climate change on the pelagic oceanic ecosystem: Preliminary food web model of the tropical Atlantic Ocean: evaluating the potential effects of fishing and climate change on the pelagic oceanic ecosystem	Meléndez-Arteaga J., Andonegi E., Juan-Jordá M-J., Zudaire I., Forrestal F., Die D., and Corrales X.
SCRS/2025/108	Model derived indicators to feed ICCAT products in support to the implementation of the EAFM: a preliminary proposal	Meléndez-Arteaga J., Andonegi E., Juan-Jordá M-J, Zudaire I., Forrestal F., Die D., and Corrales X.
SCRS/2025/109	Ecotest Indicator 2: A General-Purpose Stock Status Indicator for Sharks, Billfish and Tunas	Carruthers T, Taylor N.G.
SCRS/2025/110	Silky shark post-release survival in the Atlantic Ocean tropical tuna purse seine fishery: A baseline for Best Handling and Release Practices.	Grande M., Grande M., Krug I., Cuevas N., Salgado A., Murua J., Erauskin-Extramiana M., Onandia I., Ruiz J., and Santiago J.
SCRS/2025/111	Preliminary Estimates of Spatial Catch Per Unit Effort Using ICCAT Task 1 Catch Data and ICCAT Imputed Effort Data	Taylor N.G., Palma C., Mayor C. and Ortiz M.
SCRS/2025/112	Update of the Information System for Tuna of the Gulf of Mexico (Sia)	Ramirez-Lopez K., Rojas-López, H., Rojas-González, R., and Wakida-Kusunoki, A.
SCRS/2025/113	Longline Bycatch Analysis in the Gulf of Mexico	Ramirez-Lopez K., Rojas-González R.I., and Wakida-Kusunoki A.T.
SCRS/2025/114	Updated age and growth of wahoo (*Acanthocybium solandri*) in the Atlantic Ocean, based on dorsal fin spines and otoliths	Silva G., Pinheiro J.L., Cardoso H., Lechuga R., Pascual-Alayón P., Diaha C.N'G., Davy A., N'Gom F.
SCRS/2025/116	Updated distribution of Wahoo (*Acanthocybium solandri*) in the Mediterranean Sea	DiNatale A., Corsini-Foka M., Deidun A., and Zava B.
SCRS/2025/117	Advances on indicators of the TunaMed Observatory for the environmental component of the ICCAT EcoCard.	Alvarez-Berastegui D., Tugores P., Juza M.,Hernandez I., Omedes I., Sanz M., Soto M., Mourre B., and Reglero P.

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SCRS/2025/119	Revisiting the Genetic Population Structure of Atlantic Bonito (Sarda sarda)	Bartrès D., Ollé-Vilanova J., and Viñas J.
SCRS/2025/120	Quelques paramètres biologiques d'une espèce des thonidés mineurs ; le bonitou : *Auxis rochei* (Risso, 1810) pêché dans la zone centre d'Algérie	Benounnas K., Ferhani K., Bensmail S., and Mennad M.
SCRS/2025/121	Preliminary report of sampling activities in the SMTYP-2024	DaSilva G., Lucena Frédou F., Muñoz-Lechuga R., Viñas J., Macias D., Diaha N'G. C., Ngom Sow F., Angueko D., Hajjej G., and Baibbat S'A.
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SCRS/2025/123	An Update of the Moroccan Coastal Fleet Targeting Bonito (*Sarda sarda*) South of Moroccan Atlantic Waters	Bougharioun, M., Abid, N., Baibbat, S. A., Ikkiss, A., and Bensbai, J.
SCRS/2025/126	Strong beliefs weakly held: likelihood profiling in stock assessments	Kell L., Cardinale M., Rice J., Sant'Ana R., Taylor N., Dean D., and Courtney C.
SCRS/2025/127	Standardized catch rates for wahoo (*Acanthocybium solandri*) from the Venezuelan pelagic longline fishery off the Caribbean Sea and the western central Atlantic (1993-2023)	Narváez M., Marín H., Evaristo E., Gutiérrez X., and Arocha F.
SCRS/2025/128	Stock assessment of the South Atlantic shortfin mako shark, using Bayesian surplus production models (JABBA) and large grid model ensembles.	Coelho R.
SCRS/2025/129	Analysis and Comparison and of Catch Per Unit Effort Series Submitted for the 2025 South Atlantic Shortfin Mako Shark Assessment in the ICCAT Region	Rice J., Sant'Ana R., Kikuchi E., and Cardoso L G.
SCRS/2025/130	Analysis and Comparison and of Catch Per Unit Effort Series Submitted for the 2025 Assessment of Shortfin Mako Shark in the North Atlantic ICCAT Region	Rice J.
SCRS/2025/131	Stock Synthesis Version Update and Life History Review for the 2017 North Atlantic Shortfin Mako Shark Stock Synthesis (SS3) Model Run 3	Courtney D.
SCRS/2025/132	Preliminary Stock Synthesis (SS3) Model Runs Conducted for North Atlantic Shortfin Mako Shark (1950–2023)	Courtney D.
SCRS/2025/133	Application of Low-Fecundity Spawner-Recruitment Relationship to the 2025 Stock Assessment of Shortfin Mako in the North and South Atlantic	Kai M., Rice J., Courtney D., Sant Ana R., Cardoso L., and Kikuchi E.
SCRS/2025/134	Preliminary Stock Synthesis (SS3) Model Runs Conducted for South Atlantic Shortfin Mako Shark (1971–2023	Sant'Ana R., Kikuchi E., Courtney D., Rice J., Kai M., Bowlby H., Fernandez C., Kell L.T., and Cardoso L.G.
SCRS/2025/135	Bayesian production models applied to North Atlantic Mako Sharks using JABBA and JABBA-Select	Babcock E.A.
SCRS/2025/136	Continuity Runs and Projections of Shortfin Mako in the North Atlantic based on the 2017 Assessment, with catch updated until 2023	Rice J.
SCRS/2025/137	Current status of the white marlin (*Kajikia albida*) stock in the Atlantic Ocean 2025: Predecisional stock assessment model.	Schirripa M.
SCRS/2025/138	Reconditioning Operating Models for Atlantic Bluefin tuna MSE to include the Close-Kin Mark Recapture estimate of western stock scale.	Carruthers T.

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SCRS/2025/140	Stock status of Atlantic White Marlin in 2025: Initial JABBA model runs	Mourato B., Sant'Ana R., Kikuchi E., Cardoso L.G., Kimoto A. and Ortiz M.
SCRS/2025/141	Correlation analysis of white marlin indices of abundance CPUEs for assessment models	Ortiz M., Kimoto A.
SCRS/2025/143	Report of the 2025 Shark Tagging Campaign in the Tropical Atlantic, Within the Shark Research and Data Collection Programme (SRDCP)	Coelho R., Barbosa C., and Rosa D.
SCRS/2025/144	Report of the 2025 Shark Tagging Campaign in West Africa, Within the Shark Research and Data Collection Programme (SRDCP)	Coelho R., Schilling C, and Rosa D.
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SCRS/2025/146	Report of the 1stICCAT-WECAFC Technical Workshop	Anon.
SCRS/2025/148	Preliminary Evaluation of the New Trapline Gear Targeting Swordfish in the Portuguese Pelagic Longline Fishery in the Atlantic Ocean	Coelho R., Barbosa C., Rosa D., and Lino P. G.
SCRS/2025/149	A conservative estimate of ex-vessel revenues generated by ICCAT fisheries in 2018	Galland, G.R., Wilson A., McKinney R.
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.
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SCRS/2025/154	BR MP runs under the operating models for Atlantic bluefin tuna MSE re-conditioned to include the Close-Kin Mark Recapture estimate of Western stock scale	Butterworth D., Rademeyer R.A.
SCRS/2025/155	Statistical methodology used to estimate dead discards and live releases of swordfish in the Spanish surface longline fleet targeting swordfish.	Ramos-Cartelle A., Fernández-Costa J.
SCRS/2025/157	The Tuning of the Tuna: Redesigning Harvest Strategies for the Western Atlantic Skipjack tuna	Sant'Ana R., Leite Mourato B., 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., and Zhang F.
SCRS/2025/160	Revisión y actualización de las capturas desembarcadas por la flota artesanal venezolana a gran escala (VAOS fleet) dirigida a la pesca de especies CICAA con palangre pelágico en el Mar Caribe y Océano Atlántico centro-occidental	Evaristo E., Miranda J., Narvaez M., Marín H., and Arocha F.
SCRS/2025/161	Estimating fishing capacity for Tropical Tunas in the ICCAT convention area during 2024 using data submitted to the Secretariat: Initial results.	Restrepo V.R., Mayor C., Deprez B., and Palma C.

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SCRS/2025/162	Report of the technical capacity building workshop on small tuna ageing report of the technical capacity building workshop on small tuna ageing	Cardoso L.G., Diaha N.C, Muñoz-Lechuga R., Lino P., da Silva G., Quelle P., Sow F.N., Angueko D., and Kikuchi E
SCRS/2025/163	Índice estandarizado de abundancia de *Euthynnus alletteratus* (LTA); análisis espacio-temporal.	de la Rosa J., de la Rosa J.M., Torreblanca D., Macias D., and Báez J.C.
SCRS/2025/164	The effect of Eastern TAC "carryover" on the performance of the BR MP.	Rademeyer R.A., Butterworth D.S.
SCRS/2025/165	Shark bycatch associated to different Spanish Mediterranean pelagic longline métiers.	Macias D., Alegría A., de la Rosa J.M., García-Barcelona S., Rueda L., and Báez J.C.
SCRS/2025/166	Spatial distribution of blue shark and shortfin mako catches in Spanish longline fisheries in the North Atlantic Ocean.	Báez J.C., Alegría A., de la Rosa J., Salmerón F., Romero P., Torreblanca D., Ramos-Alonso M.L., and Macías-López D.
SCRS/2025/167	BR MP runs under the operating models for Atlantic bluefin tuna MSE re-conditioned to include the close-kin mark recapture estimate of western stock scale with both OM29 and OM35 updated now included (ABTMSE v8.1.0)	Butterworth D., Rademeyer R.A.
SCRS/2025/168	Updating the Ageing database of bluefin tuna (*Thunnus thynnus*) from the eastern and western Atlantic stock.	Quelle P., Chapela I., and Rodriguez-Marin E.
SCRS/2025/170	Advances on the use of spatiotemporal models for the catch per unit effort standardization of North Atlantic albacore for the Spanish baitboat and troll fisheries.	Correa G.M., Goikoetxea N., Arrizabalaga H., Santiago J., and Onandia I.
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SCRS/2025/173	Presence of small bluefin tuna YOY in the southern Spanish Atlantic coast.	Lopez-Gonzales J.A., Di-Natale A
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SCRS/2025/175	Standardized Catch per Unit of Effort of Albacore (*Thunnus alalunga*) from the Spanish Bait Boat Fleet for the Period 1981–2024 in the North-East Atlantic	Quelle P., Aranay M., and Ortiz, M.
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SCRS/2025/178	Specifications and capture mechanism of the trap-line ("meka-ring") gear used in Japanese tuna longline fishery	Ochi D., Shiode, D., Matsushita, H., Okamoto, K., Ijima, H., Kai, M., Semba, Y.
SCRS/2025/179	Determination of a length-weight relationships applicable to Atlantic Bluefin Tuna (*Thunnus Thynnus*) caught in the Cantabrian Sea	Lastra, P., Fraile, I., Artetxe-Arrate, I., Quelle, P., Arrizabalaga, H.
SCRS/2025/180	Statistical methodology used to estimate dead discards and live releases of blue marlin and white marlin/roundscale spearfish in the Spanish surface longline fleet targeting swordfish.	Fernandez-Costa J., Ramos A.
SCRS/2025/181	Standardized CPUE for North Atlantic Albacore by the Japanese Longline Fishery from 1975 to 2024 as Bycatch Period	Matsubara N., Aoki Y., and Tsuda Y.
SCRS/2025/182	Preliminary Estimates of Mortality for Atlantic Yellowfin Tuna, Derived from ICCAT Conventional Tagging Data	Cass-Calay S.
SCRS/2025/183	Preliminary Estimates of Mortality for Atlantic Bigeye Tuna, Derived from ICCAT Conventional Tagging Data	Cass-Calay S.

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SCRS/2025/185	Evaluating FAD Management Approaches for Purse Seine Tropical Tuna Fisheries	Vert-Pre K. A., Powers B., Norelli A., Grande M., Merino G., Moreno G., Die D., Murúa H., Erauskin-Extramiana M., and Restrepo V.
SCRS/2025/186	Revised Standardization of Fishery-Dependent Abundance Indices for Atlantic Bluefin Tuna in the Southern Gulf of St. Lawrence and Canada's Atlantic Coast Using VAST: 1996–2024	Akia S., Hanke A
SCRS/2025/187	Methodological Insights into Different Sampling Techniques for DNA Metabarcoding of Atlantic Bluefin Tuna Thunnus thynnus (Linnaeus, 1758) Stomach Contents	Žuvić L., Bakarić K., Ivanišević K., Talijančić I., Grubišić L., Žužul Vrgoč I., Hrabar J., and Šegvić Bubić T.
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SCRS/2025/189	Length frequency distribution of Bluefin tuna caught by the purse seine fleet in the Balearic Islands: period 2016-2025.	Navarro J.J.
SCRS/2025/190	ICCAT Atlantic-Wide Research Programme for Bluefin Tuna (GBYP) Phase 14 (2024-2025): Activity Report for the period September 2024-August 2025	Alemany F., Tensek S., and Pagá Garcia A.
SCRS/2025/191	Assessment of sampling effort and biometric patterns of bluefin tuna in the Carloforte and Portoscuso traps (western Mediterranean)	Tiralongo F., Campanile A., Zambetti A., Dimichino B., Saraceno P.I., Baiata P., and Pignalosa P.
SCRS/2025/192	Development and Demonstration of an MSE framework for southern Atlantic albacore	Hordyk A., Kikuchi E., Sant'Ana R., and Mourato B.
SCRS/2025/193	Estimation of Swordfish Discards for the Canadian Pelagic Longline Fleet in the Atlantic Ocean	Akia S., Gillespie K., Yin Y., Bowlby H., and Hanke A.
SCRS/2025/194	Protocol for Collecting, Processing, Storing, and Documenting Biological Samples for the ICCAT Swordfish Year Program	Gillespie K., Rosa D., Coelho R., Carnevali O., Gioacchini G., Macias D., Saber S., Busawon D., Quelle P., Stewart N., and Hanke A.
SCRS/2025/196	Status Update of the 2025 ICCAT Swordfish Tagging Campaign in the Gulf of Guinea	Gillespie K., da-Conceição I.
SCRS/2025/197	Preliminary Results from the 2024 ICCAT Tagging Campaign in the Northwest Atlantic	Busawon D.S., Gillespie K.
SCRS/2025/198	A Combined Index of Abundance for North Atlantic Swordfish 1963–2023	Gillespie K., Akia S., Hanke A., Coelho R., Ikkiss A., and Su N.
SCRS/2025/199	Fishing Swordfish with Traplines: Preliminary Catch and By-Catch Data in the Ligurian Sea	Garibaldi F., Bottero F., Buzzi A., Niedermuller S., Di Natale A., Lanteri L., and Pinto C.
SCRS/2025/201	Evaluation of the Impact of Missing Data in the Generation of the North Swordfish Combined Index on the Performance of the Management Procedure	Hordyk A., Gillespie K.
SCRS/2025/202	An Examination of the Impact of Minimum Size Limits on the Performance of the North Atlantic Swordfish Management Procedure	Hordyk A., Gillespie K.
SCRS/2025/203	Current Methods for Estimating Species-Specific Discard Mortality and Live Release by the Japanese Longline Fishery in the Atlantic Ocean	Satoh K., Semba Y., Kai M., Inoue Y., and Tsukahara Y.

DocRef	Title	Authors
SCRS/2025/207	Bluefin tuna larval abundances in the Balearic archipelago spawning ground (western Mediterranean), standardized time series from 2001 to 2024	Alvarez-Berastegui D., Tugores M.P., Torres A.P., Martín-Quetglas M., Balbín R., Santiago R., Santadreu M., Álvarez I., Aranda I., Calcina N., Carreño A., and Reglero P.
SCRS/2025/208	Pilot project to test the use of stereoscopic cameras during the first transfer of Bluefin tuna and the automation of video footage analysis	Muñoz-Benavent P., Martínez-Peiró J., Capó-Calabuig J., Andreu-García G., Morell-Monzó S., Puig-Pons V., and Espinosa V.
SCRS/2025/209	Support for Regional Caribbean Data Collection to Improve Reporting and Data Analysis, Phase 2	Shivlani, M., Arocha, F., Die, D., Geddes, K., Fernandez, M., and Narváez, M.
SCRS/2025/210	Relational database for biological samples. the case of the IEO database for direct ageing	Quelle P., Ramos-Cartelle A., and Rodríguez-Marín E.
SCRS/2025/211	Preliminary results on albacore (*Thunnus alalunga*) reproductive biology for the north Atlantic stock: years 2019 to 2025.	Macias D., Arocha F., Su N-J., Dheeraj B., Hanke A., Puerto M.A., Gomez M.J., Borrego-Santos R., Rodriguez E., Alegría A., Quelle P., Chapela I., Sanchez C., Castiñeiras B.G., Gutierrez O., Jaranay M., and Ortiz de Zárate V.
SCRS/2025/212	Preliminary analysis of the maturity in swordfish (Xiphias gladius) from Mediterranean Sea and north-south Atlantic Ocean.	Borrego-Santos R., Puerto M.A., Rodríguez E., Gómez-Vives M.J., Alegría A., Moreno J., García-Barcelona S., Saber S., Ortiz de Urbina J., Macias D., Gillespie K., Poisson F., Coelho R., Rosa D., Su N.J., Chang F.C., and Cheng C.Y.
SCRS/2025/214	Bycatch and Discards Estimates in Moroccan Artisanal Tuna Fisheries based on Application of a Stratified Sampling and Web-Based Platform for 2024	Serghini M., Bensbai J., Abid N., Amina N., Baibbat S.A., Ikkis A., Layachi M., Hamdi H., Joumani M., and Meryem
SCRS/2025/215	Revision of the Rules and procedure for the protection, access to, and dissemination of data compiled by ICCAT	ICCAT Secretariat
SCRS/2025/216	2025 Slope Sea larval bluefin tuna sampling design, initial catches, and potential utility of these samples in further research	Richardson D.E., Glancy S.G., Hernández C.M., Walter K.D., Jacobsen A., Marancik K.E., Walter III J.F., and Lauretta M.V.
SCRS/2025/220	BR MP runs under the operating models for Atlantic bluefin tuna MSE re-conditioned to include the close-kin mark recapture estimate of western stock scale assuming a CKMR CV of 0.2 (ABTMSE v8.2.3)	Butterworth D., Rademeyer R.A.
SCRS/2025/221	Evaluation of the relative fishing mortality impact by main fleet gear on Atlantic white marlin stock.	Ortiz M., Kimoto A., Schirripa M., Ramirez K.
SCRS/2025/222	2025 billfish tagging campaign in the Southern Portugal (NE Atlantic), within the Enhanced Programme for Billfish Research (EPBR)	Coelho R., Melo M. A., and Rosa D.
SCRS/2025/224	Pelagic longline sampling effort to determine reproductive status and stock relationships of Atlantic bluefin tuna on the Slope Sea	Lutcavage M., Lam T., and Heinisch G.
SCRS/2025/225	Size data collected under the Brazilian tuna fishing monitoring program (PMPA)	Travassos P., Duarte-Neto P., Comassetto L., Hamilton S., Sant´Ana R., Cardoso L.G.

DocRef	Title	Authors
SCRS/2025/226	Review of input data and fleet structure of the 2021 WBFT stock assessment by Stock Synthesis 3.3 for future assessments	Tsukahara Y., Fukuda H., Kimoto A., and Ortiz M.
SCRS/2025/227	Feasibility study for estimating ongoing individual migration between populations with novel genetic approach in porbeagle shark (*Lamna nasus*)	Ueda R., Takeshima H., Tahara D., Matsubayashi J., Kuraku S., and Semba Y.
SCRS/2025/230	Capabilities and advantages of HiDef digital aerial survey methods for Atlantic bluefin tuna	Macleod K.
SCRS/2025/233	Updates to the Indices Used in the Northern Swordfish Management Strategy Evaluation	Duprey N., Abid N., Bensbai J., Coelho R., Gillespie K., Hanke A., Ijima H., Ikkiss A., Lauretta M., Kai M., and Su N.
SCRS/2025/234	Collection of biological samples from Bluefin tuna caught by Senegalese purse seiner and landed in Dakar in 2024.	N'gom F., Sadio N.S., and Alemany F.
SCRS/2025/237	Report on the catch statistics for the shortfin mako (*Isurus oxyrinchus*) in Japan for the years 2005 and 2006.	Semba Y., Satoh K., and Kai M.
SCRS/2025/239	Informal summary of the 2025 ICCAT Bluefin Tuna Species Group meeting (24-26 September 2025)	Walter J., Rouyer T., and Kimoto A.

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SCRS/P/2025/001	Climate change or something else, the need to update management benchmarks	Merino G., Urtizberea A. and Correa G.
SCRS/P/2025/002	Open and reproducible science in stock assessments	Correa G.M., Urtizberea A., and Merino G.
SCRS/P/2025/003	MSE Simulations to evaluate North Atlantic Albacore HCR with FLBEIA and considering SPiCT as assessment model in the MP.	Urtizberea A., Merino G., Correa G.M., Laborda A., and Arrizabalaga H.
SCRS/P/2025/004	Harvest Control Rules for multi-stock tropical tuna fisheries.	Laborda A., Urtizberea A., Correa G.M., Arrizabalaga H., and Merino G.
SCRS/P/2025/005	Investigating potential North Atlantic swordfish climate-conditioned management approaches	Mormede S., Hanke A., and Gillespie K.
SCRS/P/2025/006	Comparing modeling approaches for estimating swordfish discards in the Canadian pelagic longline fishery	Yin Y., Akia S., Gillespie K., and Bowlby H.
SCRS/P/2025/007	Dynamic reference points with a changing climate	Bessell-Browne P.
SCRS/P/2025/008	Some thoughts on stock projections	Harley S.
SCRS/P/2025/009	Proposal on the ICCAT MSE website by Ad-hoc Sub-group on MSE Communication	Kimoto A., Taylor N., and Ortiz M.
SCRS/P/2025/010	Relationship between vertebral band pairs deposition and age in shortfin mako sharks	Ramos-Cartelle A., Carroceda A., and Fernández-Costa Jose
SCRS/P/2025/011	Reproductive biology and population structure of the shortfin mako shark (*Isurus oxyrinchus*) in the Southwestern Atlantic Ocean	Cabanillas Torpoco M., Márquez R., Oddone M.C., and Cardoso L.G.
SCRS/P/2025/012	Summary of available shortfin mako statistical data	ICCAT Secretariat
SCRS/P/2025/013	Tagging summary for Shortfin mako (SMA)	ICCAT Secretariat
SCRS/P/2025/014	North Atlantic Shortfin Mako Stock Synthesis Model Development	Courtney D., Rice J. and Zhang X.
SCRS/P/2025/015	Summary of available White Marlin statistical data	Mayor C.
SCRS/P/2025/016	Billfishes fisheries statistics of Sao Tome e Principe	Conceição I., and Quaresma H.
SCRS/P/2025/017	Catch characteristics and maturity stages of white marlin (*Kajikia albida*) landed by the artisanal fisherman of Cote d'Ivoire	Konan K.J., Diaha N.C., and Bahou L.

SCRS/P/2025/018	Tagging summary for Atlantic white marlin (WHM)	ICCAT Secretariat
SCRS/P/2025/019	Revisiting the review of 2021 stock assessment of western ABT for future stock assessment	Tsukahara Y., and Fukuda H.
SCRS/P/2025/020	Tracking *Thunnus thynnus* adult movements through Gibraltar Strait after acoustic tagging in tuna trap (South coast of Portugal)	Vilas C., Lino P.G., Mansilla O., Poço A., Nunes M., Hirofumi M., Alemany F., and Santos M.N.
SCRS/P/2025/021	Results on the suitability of different ABFT tissues for CKMR-related genetic analyses	Diaz-Arce N., Lino P., Rouyer T., Nunes M., Hirofumi M., and Rodriguez-Ezpeleta N.
SCRS/P/2025/022	Knowns and unknowns about ABFT mixing in the North Atlantic learnt from genetic and otolith microchemistry-based methodologies	Diaz-Arce N., Arrizabalaga H., Fraile I., Artetxe-Arrate I., and Rodriguez-Ezpeleta N.
SCRS/P/2025/023	Updated activities by the Bluefin tuna early life ecology subgroup	Alvarez-Berastegui D.
SCRS/P/2025/024	Updated analysis for the standardized CPUEs of the EU.PRT + MOR Traps	Lino P., Coelho R., and Abid N.
SCRS/P/2025/025	Are SSB estimates from WBFT CKMR valid	Bravington M.
SCRS/P/2025/026	MSE simulations for multi-stock Atlantic tropical tuna fisheries using hybrid HCRs	Urtizberea A., Merino G., Laborda A., Correa G.M., and Arrizabalaga H.
SCRS/P/2025/027	Tagging summary for Bigeye tuna (BET)	ICCAT Secretariat,
SCRS/P/2025/028	Summary of available Bigeye tuna statistical data	ICCAT Secretariat
SCRS/P/2025/029	Preliminary results on growth parameters estimation of BET from Côte d'Ivoire and Sénégal.	Constance, Sow F.N., Abekan E., Ba K., Apo-Aissan R., Sadio N., Djeneba C., Yao N.G.
SCRS/P/2025/030	Impact of management measures of the Fisheries of the Republic of Guinea on the proportion of tuna in the annual catches from 2019 to 2024 of vessels targeting other halibut species	Lansana K.
SCRS/P/2025/031	Assessment of Catch Composition and Bycatch in Albacore Longline Fisheries off the Egyptian Coast	Saber M.
SCRS/P/2025/033	A project to assess the efficacy of the new "trap/loop lines" gear for swordfish catches and other species bycatch.	Coelho R.
SCRS/P/2025/034	An ST09 form to capture requirements of Rec. 22-12	Taylor N.G.
SCRS/P/2025/035	Update of the Sub-group on technical gear changes	Coelho R.
SCRS/P/2025/036	Bycatch Estimation Tool for Turtles in the Mediterranean Sea	Anonymous
SCRS/P/2025/037	Update of economic indicators of ICCAT Eco-Card	Tsuji S.
SCRS/P/2025/038	Étude préliminaire des interactions des thonidés mineurs avec la pêche artisanale dans la région de Ghannouch-Gabès (Sud-Est de la Tunisie)	Hajjej G.
SCRS/P/2025/039	Preliminary estimate of Loggerhead sea turtle bycatch in pelagic longline fisheries from the Mediterranean and adjacent Atlantic waters	Lourdes-Ramos L.
SCRS/P/2025/040	Progress in CCSBT Spatially Explicit Fisheries Risk Assessment (SEFRA)	Tsuji S.

SCRS/P/2025/041	Morphometric Comparison of Juvenile Tuna Species in the Adriatic Sea", in which we demonstrated a methodology for distinguishing juvenile *Thunnus thynnus*from *Euthynnus alletteratus*and *Auxis rochei* using geometric morphometrics and clustering techniques based on body shape	Talijančić, I., Žuvić L., Grubišić L., and Šegvić-Bubić T.
SCRS/P/2025/042	Preliminary study of the interactions between small tunas and artisanal fisheries in the Ghannouch-Gabès region (Southeast Tunisia)	Hajjej G.
SCRS/P/2025/044	Summary of available Small Tunas statistical data	ICCAT Secretariat
SCRS/P/2025/045	Tagging summary for small tunas (SMT)	ICCAT Secretariat
SCRS/P/2025/046	Fisheries statistics of small tunas catches in São Tomé e Príncipe	Conceição I.
SCRS/P/2025/047	Update of the ageing analysis for Bullet tuna (*Auxis rochei*) after a genetic discrimination	Munoz-Lechuga R., Cabrera-Castro R., Mendoza A., Berlotti B., Viñas J., Ollé J., and Lino P.G.
SCRS/P/2025/048	From data gaps to assessment: reconstructing small tuna historical data for stock evaluation and management	Silva M. L. S., Andrade H.A, Cope J.M., Frédou T., Soares A.P.C., Barreto T.M.R.R., and Frédou F.L.
SCRS/P/2025/049	Small tuna research program: a review and perspectives	Fredou F, Silva G., Muñoz-Lechuga R., Viñas J., Macias D., Diaha C., Sow F.N., Angueko D., Hajjej G., Baibbat S'A.
SCRS/P/2025/050	Summer investigation of *Euthynnus alletteratus* from Egypt Mediterranean Sea "length variations and CPUE of purse seine"	Farrag M.
SCRS/P/2025/051	PROATUM – Sustainable Management of Brazilian Tuna Fisheries	Frédou T.
SCRS/P/2025/052	Preliminary Study of some Biological Parameters of the White King Mackerel Scomberomorus tritor, Cuvier, 1831, Landed in Capal	Angueko D.
SCRS/P/2025/053	First Insights into Shortfin Mako Movements in the Bay of Biscay: A Journey to Cape Verde	Erauskin-Extramiana M, Lopetegui-Eguren L, Salgado A, Claver C, Cabello de los Cobos M, Vossgaetter L, and Müller L.
SCRS/P/2025/054	Summary of available statistical data for the Shortfin Mako stock assessment	ICCAT Secretariat
SCRS/P/2025/055	2025 Shortfin Mako Stock Assessment Intersessional Work	Forselledo R.
SCRS/P/2025/057	Summary of available statistical data for the White Marlin stock assessment	Secretariat
SCRS/P/2025/058	North Atlantic shortfin mako shark (*Isurus oxyrinchus*) age and growth exercise considering 2 band pair formation per year of life until the size at maturity and 1 band pair onwards	Rosa D., Márquez R., Mas F., Mathers A., Natanson L., Domingo A., Carlson J., Coelho R., and Cardoso L.G.
SCRS/P/2025/059	General review of the draft 2026-2031 SCRS Science Strategic Plan	Brown C., Cardoso L.G.
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	ICCAT 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., and 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., and Restrepo V.
SCRS/P/2025/065	Responses to Commission Tropical Tunas	Cass-Calay S.
SCRS/P/2025/067	Status Update on the North Atlantic Swordfish MSE process in 2025	Gillespie K.
SCRS/P/2025/068	Evaluation of Exceptional Circumstances for the North Atlantic Swordfish MSE in 2025	Gillespie K., Hordyk A
SCRS/P/2025/069	ICCAT SW Atlantic SWO Tagging Trip Report	Bezerra N., Xavier C, Más F, Cardoso L, and Sant'Ana R
SCRS/P/2025/070	Updated north Atlantic albacore e-tagging research 2019-2025.	Cabello de los Cobos M., Arregui I., Onandia I., Markalain G., Uranga J., Lezama-Ochoa N., Ortiz de Zarate V., Delgado de Molina R., Santiago J., Abascal F. and Arrizabalaga H.
SCRS/P/2025/071	ICCAT Shark Tagging Trip Report	Gustavo-Cardoso L., Sant'Ana R., and Forselledo R.
SCRS/P/2025/072	Final reference and robustness Operating Models for the North Atlantic albacore MSE.	Urtizberea A., Correa G.M., Merino G., Arrizabalaga H., and Santiago J.
SCRS/P/2025/073	Observation Error Model for the North Atlantic albacore MSE.	Urtizberea A., Correa G.M., Merino G., Arrizabalaga H., and Santiago J.
SCRS/P/2025/074	Evaluation of alternative MPs for North Atlantic albacore using MSE.	Urtizberea A., Correa G.M., Merino G., Arrizabalaga H., and Santiago J.
SCRS/P/2025/075	Evaluation of BFT EC 2025	Walter J., Kimoto A., and Rouyer T.
SCRS/P/2025/077	Presentation on Task 1 and Task 2 statistics for Bluefin Tuna	ICCAT Secretariat
SCRS/P/2025/078	Presentation on Task 1 and Task 2 statistics for Billfishes	ICCAT Secretariat
SCRS/P/2025/079	Presentation on Task 1 and Task 2 statistics for Sharks	ICCAT Secretariat
SCRS/P/2025/080	Presentation on Task 1 and Task 2 statistics for Albacore	ICCAT Secretariat
SCRS/P/2025/081	Presentation on Task 1 and Task 2 statistics for Swordfish	ICCAT Secretariat
SCRS/P/2025/083	Reporting Status 2025 including Tagging and pending Task 1 & Task 2 Submissions	ICCAT Secretariat
SCRS/P/2025/084	Summary of ICCAT Secretariat dataset estimations	ICCAT Secretariat
SCRS/P/2025/085	ST/TG forms and templates revisions for 2026	ICCAT Secretariat
SCRS/P/2025/086	IOMS 2025 status update	ICCAT Secretariat
SCRS/P/2025/087	Data deficiencies in ICCAT Fisheries & Biological Data	ICCAT Secretariat
SCRS/P/2025/088	Bluefin tuna MSE - CKMR and Exceptional Circumstances 2025	Anon.
SCRS/P/2025/089	Update on the age and growth component of the Swordfish Year Program	Rosa D., Busawon D., Quelle P., Krusic-Golub K., Garibaldi F., Mariani A., Di Natale A., Schirripa M., Bezerra N.A., Su N.J., Cardoso L.G., Arocha F., Lombardo S., Campello T., Santos M.N., Travassos P., Brown C., Hanke A., Gillespie K., and Coelho R.
SCRS/P/2025/090	Update on the swordfish growth, reproduction and genetics studies under the SWOYP: Phase 7	Rosa D., Stewart N., Gioacchini G., Carnevali O., Hanke A., Gillespie K., and Coelho R.
SCRS/P/2025/091	Collection of biological samples and analysis for the study of growth of billfish in the eastern Atlantic: update on year 6	Rosa D., Ngom Sow F., Andrews A.H., Coelho R.

SCRS/P/2025/092	Filling knowledge gaps: age and growth studies on priority shark species within the SRDCP	Santos C. C, Domingo A., Junge C., Mas F., Bowlby H., Carlson J., Cardoso L. G., Passerotti M., Forselledo R., Joyce W., and Coelho R.
SCRS/P/2025/096	Update on Swordfish Age Estimation and Validation using Otoliths and Bomb Radiocarbon	Andrews A.H., Rosa D., Sow F. N., Krusic-Golub K., Coelho R., and Gillespie K.
SCRS/P/2025/097	Preliminary results of aging assessment by epigenetic analysis	Gioacchini G., Gillespie K., Rosa D., Coelho R., Stewart N., Hanke A., and Carnevali O.
SCRS/P/2025/098	Testing the use of Temperature-Depth Recorders (TDRs) on longline fishing vessels	Coelho R., Barbosa C., Domingo A., and Forselledo R.
SCRS/P/2025/099	Research Plan for the ICCAT Swordfish Year Program (SWOYP)	Gilespie K, Rosa D, Coelho R, Carnevali O, Gioacchini G, and Stewart N.
SCRS/P/2025/101	ICCAT AI Stereocamera Trial 2024-2025	Dell M.
SCRS/P/2025/105	Strict updates of MEXUS GOM LL, US RR 66-144 cm, and US RR>177cm,	Lauretta M.
SCRS/P/2025/107	The effect of marine heatwaves on the fitness of Atlantic bluefin tuna larvae in the Balearic spawning ground in 1982-2024	Reglero P., Juza M., Tugores P., Alvarez-Berastegui D., Balbin R., Hernández-Carrasco I., and Ottmann D.
SCRS/P/2025/108	Biología reproductiva del marlín azul o aguja azul (*Makaira nigricans*) en el golfo de México capturada incidentalmente por la flota palangrera mexicana en el golfo de México y por la flota de pesca deportiva en Veracruz.	Ramirez-Lopez K.
SCRS/P/2025/109	Update on the acoustic tagging of adult bluefin tunas in a tuna trap off the South coast of Portugal	Lino P.G., Mansilla O., Vilas-Fernandez C., Alemany F., Poço A., Nunes M., Morikawa H., and Santos M.
SCRS/P/2025/110	Historical Catch Reconstruction of West Atlantic Bluefin Tuna	Boustany A., McClenachan L., Van-Houtan K., Walter J., and Lauretta M.
SCRS/P/2025/111	ICCAT Bluefin tuna intersessional work on 'lite-reconditioning' and retuning incorporating WBFT Close-kin mark recapture	Walter J., and Rouyer T.
SCRS/P/2025/112	Evaluation of Exceptional Circumstances for North Atlantic albacore in 2025	Merino G., Urtizberea A., Correa G.M., Harrizabalaga H., and Santiago J.

Appendix 5

Draft 2026-2031 SCRS Science Strategic Plan

MISSION

To provide the Commission with science-based fishery management advice by developing, supporting, and carrying out the application of protocols and procedures for the collection, compilation, analysis and dissemination of fishery statistics for ICCAT species as well as other information reflecting the best available science to support science-based fishery management. To ensure that the Commission has complete and up to date statistics concerning fishing activities in the Convention area as well as relevant biological and ecological information.

VISION

A Scientific Committee with broad participation of competent scientists from all the CPCs that fish tuna and tuna-like species in the Atlantic Ocean and adjacent seas, working cooperatively in an effective and transparent way, with solid scientific and logistical support from the Secretariat, having good communication with and sufficient resources from the Commission, and as a result providing objective, reliable, timely, robust, and best available scientific advice to the Commission.

SCRS SWOT ANALYSIS

Strengths

- Transparency, international collaboration-cooperation and diversity of participation.
- Diversity of the analytical approaches.
- High scientific competence, credibility and international recognition.
- Scientific independence.
- Adaptability to new scientific challenges and emerging techniques/innovation/technology.
- Participation facilitated through online and hybrid (in-person and online options) meetings.

Weaknesses

Scientific participation concerns:

- Low numbers of scientists actively participating in the meeting analyses, discussions and writing.
- Limited expertise in some research and assessment activities.
- Insufficient numbers of CPC scientists willing and/or able to address increasing workload, usually due to domestic responsibilities.
- Lack of adherence to process rules (e.g. late submission of manuscripts).

Funding concerns:

- Insufficient financial and long-term support for scientific activities and research programmes.
- Frequently, inefficient use of funds provided to support scientific and research programmes.
- Limitations for the full utilization of the annual budget by the SCRS associated with current financial rules.

Data concerns:

- Insufficient quantity and quality of data in some cases (e.g. very limited reporting of discarding, or discard estimation creating challenges for accounting for total removals).
- Restrictions of data provision or access due to national data confidentiality policies in some cases limits its usefulness.
- Need to streamline the existing ICCAT's Confidentiality rules and data dissemination procedures to ensure that they cover all types of data managed by ICCAT.

- Gaps in data collection in some cases (e.g. achieving adequate sampling coverage for ICCAT biology programmes).

Communication concerns:

- Limited dialogue and channels of communication with the Commission.
- Need to improve communication with the Commission to establish a mechanism for the prioritization of Commission requests when time and resources are limited.
- Language barriers/lack of interpretation for most meetings.

Workload/efficiency concerns:

- Need to establish criteria for set priorities for carrying stock assessments and other demanding tasks across SCRS working groups when time and resources are limited.
- Effort focused on a limited number of stocks.
- Delays in developing responses to requests from the Commission due to insufficient data, lack of resources or requests not clearly formulated.
- In many instances, due to time limitations, a lack of critical, focused reviews of material presented to SCRS working groups.
- The number of SCRS meeting days on the official calendar is limited, in part due to the demands placed on the Secretariat to support the meetings, and there are required gaps between certain meetings in order to allow the Secretariat staff to prepare data sets, documents, etc. Certain parts of the year are also blocked off from meetings to allow Secretariat staff to take leave. This constrains the amount of tasks that the SCRS can address through official meetings.
- Lack of established mechanism or report structure for including the advice related to Climate Change, bycatch and ecosystem considerations in the current species management advice.
- Limited integration of economic and social considerations into scientific advice.

Opportunities

- Scientific collaboration and coordination among CPCs.
- Broader participation from developing CPCs.
- Collaboration with other tuna regional fishery management organizations (tRFMOs).
- Collaboration with other Organizations aligned with the objectives defined by the Commission.
- Broader external support to the work of the SCRS.
- Broader involvement from the fishing industry in support of scientific work.
- Use of new technologies (e.g. AI, Electronic Monitoring Systems (EMS), epigenetic ageing, Close-Kin Mark Recapture (CKMR)).
- More efficient use of provided funding.
- Continued support from the Commission to implement SCRS work.
- Improved communication with the Commission on their requests and priorities.
- Development of mechanisms/criteria to prioritize SCRS work.
- Improvement of fishery statistics & methods.
- Broader dissemination of scientific results.

Threats

- Increase in demands for advice from the SCRS with limited resources, both human and financial.
- Reduced contribution from CPCs in the SCRS (participation, meeting travel restrictions, research, data collection).
- Reduced effectiveness of meetings, as scientists who previously participated in person now participate online instead (often because CPCs are less likely to approve travel given the virtual attendance option). It is clear that online participants are generally less likely to intervene in discussions during hybrid meetings, and it is not possible to advance discussions in the margins of the meetings with online participants.
- Insufficient consideration of science in the decision-making process.
- Insufficient support for science activities from the Secretariat due to workload and staffing levels that may be insufficient to meet increasing demands.

- Unintended negative impacts of management regulations on data reporting, sample collection and interpretation of (fisheries dependent) data and information (e.g., retention bans, including size limits affecting data completeness and/or representativeness, reduced biological sampling opportunities).
- Potential lack of expertise in expanded interest areas of the Commission.
- The introduction of elements other than science during purely scientific meetings, which distracts from the work and affects the quality of the scientific advice. Delegations to SCRS meetings often include managers and stakeholders. Input from such non-scientists can often be important for scientists' understanding of the data and in the development of models which better reflect fishery conditions. While such input from managers and stakeholders is valued, the SCRS must produce reports and provide advice which are based on science and the available evidence, free from influence or modification to suit the interests of particular parties, regardless of whether they are scientists, managers, observers or other participants.
- Funds to support travel are declining, even among developed CPCs, resulting in lower numbers attending meetings in person and constraints that affect the effectiveness of the meetings.

VALUES

The following values should guide the conduct of scientists and observers that participate in the work of the SCRS:

I	**INTEGRITY**: The SCRS applies the highest ethical standards to all its scientific work. **INDEPENDENCE**: The SCRS provides advice that is objective and based on the best scientific information available, avoiding ideological or political pressure from any member, including scientists, managers, observers, or other participants with particular economic or financial interests.
C	**COOPERATION**: The SCRS values and encourages the participation of scientists from all CPCs, along with invited experts, acting through scientific collaboration and cooperation to cultivate a diverse set of expertise and to promote best available scientific practices.
C	**COMMITMENT**: The SCRS is totally committed to providing the best scientific advice in support of the Commission's objective of implementing science-based fishery management.
A	**ABILITY**: The SCRS strives to ensure the work of the Committee conforms to the highest scientific standards and state-of-the-art methodologies, constantly improving the foundation of knowledge to support the mandate.
T	**TRANSPARENCY**: The SCRS conducts its work in open sessions and encourages the participation of national scientists and external experts; the information, analyses and decision-making process are well-documented and easily accessible to all interested parties.

STRATEGIC PLAN ELEMENTS, WITH ASSOCIATED GOALS, OBJECTIVES AND STRATEGIES

1. DATA COLLECTION

GOAL 1.1 **CONTINUE TO IMPROVE, AS NEEDED, FISHERY DATA COLLECTION AND REPORTING FROM ALL FISHERIES THAT CATCH TUNA, TUNA-LIKE AND OTHER SPECIES UNDER PURVIEW OF THE COMMISSION IN THE AREA OF THE CONVENTION, TO HAVE A REPRESENTATIVE VIEW OF WHAT IS ACTUALLY HAPPENING IN THE FISHERY, SO THAT THE STOCKS CAN BE PROPERLY EVALUATED**

OBJECTIVES

1.1.1 Strengthen the collection of High-Quality Task 1, 2 and 3 data and to address data gaps that are identified

Strategies

1.1.1.1 Continue capacity training on data collection and reporting through ICCAT mechanisms and formats to improve the quantity and quality of data to support the development of scientific advice and effective management.

1.1.1.2 Review the current practices for data collection and reporting used by tuna RFMOs and research institutions and adopt those that improve ICCAT data.

1.1.1.3 Promote communication between SCRS scientists and external scientists, institutions and stakeholders with detailed knowledge of fishing conditions and practices, in order to evaluate whether the data are representative and appropriately reflect fishery dynamics.

Selected measurable target(s)

- At least three data reporting training workshops held by 2031 that foster improved data reporting for fisheries or regions identified by the SCRS as in need of improved data reporting.
- An analysis of data reporting practices to be conducted and reviewed by the Subcommittee on Statistics (SC-STAT).
- A decreasing trend in missing or lacking data items in the Secretariat's annual report on statistics over the period of this strategic plan.

1.1.2 Where the need is identified, improve resolution and precision of total catch composition, spatial distribution and fishing effort data across CPCs

Strategies

1.1.2.1 Demonstrate through simulation modelling, the effect on the precision of estimates of exploitation of different levels of information and provide the incremental costs of collecting such data.

1.1.2.2 Conform the effectiveness of electronic monitoring systems and other automated data collection methods to provide scientific data on catch and effort by: i) Monitoring the implementation in longline and purse seine tuna fleets, including evaluation of any resulting scientific data regarding detail and quantity sufficient to support SCRS science (to be carried out by CPC scientists and/or the SCRS), ii) Building on previous work by identifying minimum requirements for electronic monitoring of additional gears, small-scale fisheries, and artisanal fisheries.

1.1.2.3 Provide guidance to the Commission on the minimum temporal resolutions for the collection and recording of VMS data necessary for SCRS work, supported through analyses of the effect of VMS data temporal resolution on results.

1.1.2.4 Compiling comprehensive data on all fishing modalities (e.g. FADs) and especially on new fishing operations (e.g. traplines) by i) cooperating with the industry to obtain detailed information (historical and present), under agreed confidentiality rules (where needed), ii) proposing modifications to the confidentiality protocols as necessary to facilitate the use of high resolution data in scientific analyses.

Selected measurable target(s)

- Results of the simulation modelling exercise are reviewed by SC-STAT.
- SC-STAT reviews reports on EMS ability to provide high resolution data.
- SC-STAT evaluates the effect of high resolution VMS data on management advice.
- Modified confidentiality protocols increase analyses involving high resolution data.
- The characterization of the distribution and level of effort of trapline use, as well as quantifies its catchability compared to longline gears.

GOAL 1.2 INSTITUTE BIOLOGICAL SAMPLING PROGRAMMES COMMENSURATE TO THE NEEDS FOR THE ASSESSMENT OF THE DIFFERENT STOCKS UNDER THE CONVENTION

OBJECTIVES

1.2.1 Identify and reduce gaps in the types and quantity of biological data that are needed (stock structure, length, age, growth, maturity, fecundity, etc.) for the assessment of the different stocks

Strategies

1.2.1.1 Demonstrate through simulation modelling, the effect of collecting different types of biological data/information on the accuracy and precision of stock status advice and provide the incremental costs of collecting such data.

1.2.1.2 Advocate for scientific funding by the Commission of the sampling programs that will yield the biological data that reduces uncertainty in the science advice.

1.2.1.3 For stocks that lack sufficient information to conduct a quantitative assessment, identify the improvements in the biological information needed to carry out Ecological Risk Assessments (ERAs) and advise the Commission.

1.2.1.4 Demonstrate, through simulation modelling, the sampling required of a stock to achieve sufficient levels of precision in estimates of exploitation.

Selected measurable target(s)

- Simulation modelling is conducted for six stocks over six years.
- Identify stocks that are candidates for ERAs, and any biological data or other information needs for carrying out such ERAs by 2030.
- Sampling designs for all the main stocks under Commission responsibility elaborated by SCRS by 2030.

GOAL 1.3 DEVELOP PROGRAMMES AND DATABASES FOR THE COLLECTION AND COMPILATION OF ADDITIONAL DATA NECESSARY TO IMPROVE THE SCIENTIFIC ADVICE TO THE COMMISSION

OBJECTIVES

1.3.1 Enhance the collection and utilization of observer data

Strategies

Recommend to the Commission the adoption, as appropriate, of measures aimed at:

1.3.1.1 Calling for the collection in national observer sampling programmes of gear and vessel characteristics, and other information that can be used to standardise catch per unit effort (CPUE), as well as information to monitor the effectiveness of mitigation measures, and to estimate fishing capacity and changes in effective fishing effort.

1.3.1.2 Providing biological samples, and information and information to calculate life history parameters and movement, etc.

1.3.1.3 Improving estimation of dead and live discards and bycatch through the collection of comprehensive data on total catch composition and disposition through observer programmes (human and/or electronic, as appropriate) and advocating/providing statistically sound tools (i.e. the bycatch estimation tool). [Also we need to report disposition of bycatch and not mix estimates with data].

Selected measurable target(s)

- Analyses of gaps, requirements, and, where possible, the costs for essential information improvements, reflected in recommendations to the Commission.
- Evidence of increased analytical use of CPC observer data through 1) the number of documents submitted to the SCRS annually that utilize the newly obtained information; and 2) the SCRS's effective use of this information to provide scientific advice on relevant fisheries and stocks.

1.3.2 Elucidate data needs for provision of ecosystem approach to fishery management advice

Strategies

1.3.2.1 Define data collection needed for the implementation of Ecosystem Approach to Fisheries Management (EAFM) through application of ecosystem impact assessments to identify key ecosystem components which need to be monitored in order to more broadly apply EAFM.

1.3.2.2 Identifying oceanographic data sources that can be used to consider Climate Change and EAFM related issues in the SCRS advice.

1.3.2.3 If provided sufficient guidance from the Commission on socioeconomic objectives and relevant support, identify sources and components or socioeconomic indicators required for the implementation of this aspect of EAFM.

Selected measurable target(s)

- List of new data and information required for implementing the EAFM.
- List of oceanographic data sources for considering Climate Change and EAFM related issues into the SCRS advice.

GOAL 1.4 INFORMATION FOR ECOLOGICAL AND OCEANOGRAPHIC DATA (CLIMATE CHANGE) LINKS TO AVAILABLE DATA

OBJECTIVES

1.4.1 To identify specific data providers to support the development of environmental indicators. Data must be easily processed to produce the necessary input. Obtain/create tools to process the data. Develop synergy between ICCAT and Oceanographic Institutions

Strategies

1.4.1.1 Identify data providers, data sets and other products, documents and links of interest for the Species Working Groups, Subcommittee on Ecosystems and Bycatch (SC-ECO) and make them readily accessible to users on the ICCAT website.

1.4.1.2 Identify data processing tools to easily develop ad hoc environmental indicators.

1.4.1.3 Develop MOUs with the regional Global Ocean Observing System (GOOS) and Intergovernmental Oceanographic Commission (IOC) to work toward aligning of future strategic agendas regarding data collection, oceanographic product development and scientific priorities.

Selected measurable target(s)

- Develop an initial list of data providers, short description of data provided, and any current public access links by 2026

GOAL 1.5 CURATION OF BIOLOGICAL DATA NEEDED TO SUPPORT PROVISION OF ADVICE

OBJECTIVES

1.5.1 Develop a tissue archive(s) and relational databases to contain samples and data collected by current and historical ICCAT funded programmes

Strategies

1.5.1.1 Develop a centralized biological sample archive(s) or tissue (e.g. genetic samples) and hard parts (e.g. ageing), to support all SCRS research programmes.

1.5.1.2 Develop a database for genotype data.

1.5.1.3 Develop a database for age and growth data.

1.5.1.4 Develop a database for data on reproduction.

1.5.1.5 Develop a database for diet data related to stomach samples and stable isotopes.

1.5.1.6 Develop a database for stock mixing data based on genetic and stable isotope approaches.

Selected measurable target(s)

- Conduct cost/benefit analysis regarding the establishment of a centralized biological sample archive vs alternatives (e.g., multiple archives hosted in multiple CPCs).
- Depending on the outcome of the cost/benefit analysis, develop a plan and identify a site/host agency for a centralized biological sample archive by 2026.

2. DIALOGUE AND COMMUNICATION

GOAL 2.1 IMPROVE THE DIALOGUE WITH THE COMMISSION AND OTHER STAKEHOLDERS

OBJECTIVES

2.1.1 Support science-management dialogue on critical elements for the development of scientific advice, such as the Commission defining management objectives, reference points, acceptable probability levels for achieving/avoiding those reference points (i.e. management risk tolerance) and stock recovery timeframes, among others

Strategies

2.1.1.1 Support continued meetings of the Standing Working Group to Enhance Dialogue between Fisheries Scientists and Managers (SWGSM) (Rec. 13-18, Rec. 24-13), including the provision of scientific input to support such dialogue.

2.1.1.2 Fully utilize potential external funding and joint meeting opportunities (e.g. GEF-ABNJ) intended to facilitate such dialogue.

2.1.1.3 Provide the necessary information so that the Commission can define default initial management objectives and corresponding performance indicators common across stocks/Panels, which can facilitate initial scientific work (e.g. Management Strategy Evaluation (MSE)).

Selected measurable target(s)

- Identify priority issues for the Commission and SCRS each year to consider as topics for discussion by SWGSM.
- Development of default management objectives and corresponding performance indicators.

2.1.2 Improve the effectiveness of communication regarding Commission requests and SCRS responses

Strategies

2.1.2.1 Encourage consultation between Commission delegations, CPC scientists, SCRS Chair and Vice-Chair, and Secretariat to ensure that Commission requests being considered can be addressed with available data and resources by planned deadlines.

2.1.2.2 Working with the Commission and the Secretariat, streamline the process of identifying requests to the SCRS within new Recommendations, Resolutions and Commission Reports.

2.1.2.3 Continue to review outstanding Commission Requests at the first SCRS Officers' meeting each year, and modify SCRS Working Group workplans as necessary and appropriate to provide Responses.

2.1.2.4 To improve efficiency and timely progress, continue to empower SCRS Working Groups as appropriate to provide advice directly to Commission subsidiary bodies (e.g. Panels, Working Groups) that meet intersessionally, as has been done previously in the developments of MSEs and the testing of Management Procedures (MPs), as well as the provision of advice on the minimum standards of EMS. Such advice is subject to review by the SCRS at its Annual Meeting, but in order to assure the quality of this intersessional advice and minimize the likelihood for any changes at the SCRS Annual Meeting, the SCRS Chair and/or Vice-Chair should be involved in the process and SCRS scientists with relevant expertise should be involved or consulted to the extent possible (as has previously been done in the examples provided).

2.1.2.5 In collaboration with the Commission and the Secretariat, establish a process to identify the status of SCRS Responses (e.g. no response - pending necessary data, partial response, full response) accompanied by explanatory text when warranted.

Selected measurable target(s)

- Complete initial test of process designating Response status in 2026.
- By 2027, updated living document for the tracking of responses, consisting of a list/table of requests and responses. with response status characterized.

2.1.3 Institute periodic meetings with decision makers, SCRS scientists, and stakeholders with more opportunity for free interchange (i.e., not in the usual Commission format). This could be carried out through SWGSM meetings, or through establishing ad hoc working groups or holding special dedicated meetings (as has been done in the past)

Strategies

2.1.3.1 Instituting periodic meetings with Commissioners and stakeholders to discuss how they can tangibly contribute their knowledge of the fishery to the work of the SCRS.

2.1.3.2 Encouraging participation in the meetings by industry, NGOs and other stakeholders.

Selected measurable target(s)

- The identification of any aspects of SCRS work that would benefit from such a dialogue, communicated to the Commission (beginning in 2026).
- At least one SWGSM meeting (or alternative ad hoc SCRS-Commission stakeholders meeting, as determined to be appropriate in consultation with the Commission), conducted following the informal format of the SCRS Working Groups, to be held during the period of this strategic plan (if/when a topic is agreed upon with the Commission).

GOAL 2.3 **IMPROVE THE DIALOGUE WITHIN THE SCRS**

OBJECTIVES

2.3.1 Increase interaction between SCRS Officers

Strategies

2.3.1.1 Encouraging participation of SCRS Officers in regular and intersessional meetings of the Sub-Committees (Statistics and Ecosystems/Bycatch) and the Working Group on Stock Assessment Methods (WGSAM).

2.3.1.2 Encourage collaboration across Working Groups (where there is overlap) of work related to tagging, age, growth maturity studies, research surveys and gear trials.

2.3.1.3 Improve non-meeting communication tools available to SCRS Officers to allow regular dialogue between officers outside of formal meetings.

2.3.1.4 Continue holding an SCRS Officers' meeting early each year to review the Commission's adopted budget for the SCRS, new requests for SCRS advice, adopted SCRS schedule, etc., and to coordinate plans for the year.

2.3.1.5 Hold additional intersessional SCRS Officers' meetings as needed to address common issues and improve coordination.

Selected measurable target(s)

- An increasing trend in the participation of SCRS Officers in meetings and in scientific processes where joint participation is possible.
- Development of an integrated workplan for SCRS bodies in support of cross-cutting activities, (e.g., EAFM).

2.3.2 Enhancing meeting communication, active participation and effectiveness

Strategies

2.3.2.1 Enforcing the submission of work documents to the Secretariat at least 7 days in advance of meetings, to facilitate the meeting preparations of the Secretariat and meeting Chair, and enable participants and interpreters to become familiar with the documents before presentation and discussions.

2.3.2.2 The meeting Chair will determine if documents are relevant to meeting objectives and ensure that the appropriate time will be given to the relevant documents within the framework of the meeting agenda.

2.3.2.3 Facilitate participation of both online and in-person participants of hybrid meetings.

2.3.2.4 Clearly identify members of Subgroups carrying out intersessional work.

2.3.2.5 Develop a system that notifies meeting participants when a paper has been loaded to the meeting website for meetings they are registered to attend (ideally batched into new paper loaded that day).

Selected measurable target(s)

- A protocol is posted to the ICCAT website and distributed with all SCRS meeting notifications outlining the process for submitting SCRS documents prior to SCRS meetings.
- 100% of the workplans of Working Groups and Subcommittees established, which are included in the annual SCRS Report per established practice, to include (as appropriate for the tasks involved) deadlines and designated responsibilities, and be framed within the strategic plan, and take into account financial and technical conditions.

GOAL 2.4 **IMPROVE THE DIALOGUE WITH THE SCIENTIFIC COMMUNITY**

OBJECTIVES

2.4.1 Strengthen linkages and collaboration with other organizations (tRFMOs, other regional fishery management organizations such as the International Council for the Exploration of the Sea (ICES))

Strategies

2.4.1.1 Increasing the scientific exchange between the SCRS with other tRFMOs. This effort should include the development of clear objectives for structured cooperation with Inter-American Tropical Tuna Commission (IATTC), Indian Ocean Tuna Commission (IOTC), Commission for the Conservation of Southern Bluefin Tuna (CCSBT), and Western and Central Pacific Fisheries Commission (WCPFC), focusing on harmonizing data standards, sharing best practices, and exploring joint research on transboundary issues.

2.4.1.2 Prioritising the participation of scientists from other tRFMOs as guest experts or as peer reviewers.

2.4.1.3 Promoting scientific inter-tRFMO meetings on areas of common interest (species, assessment methods, data acquisition, Climate Change, EAFM, etc.), taking advantage of other fora in which best practices are being discussed. Such as the International Seafood Sustainability Foundation (ISSF) stock assessment workshops.

2.4.1.4 Extending the cooperation with ICES to all the shared shark species and in all areas of mutual interest (e.g. assessment methods, EAFM, Climate Change, MSE), and consider similar cooperation with other relevant RFMOs.

2.4.1.5 Encouraging the Chairs of the Shark groups of ICES and ICCAT SCRS to participate in the Shark assessment meetings of both organisations.

2.4.1.6 Communicating the ICES Agendas to SCRS scientists for the purposes of encouraging their participation, and consider doing so for other relevant RFMOs.

Selected measurable target(s)

- Broader participation of other tRFMO experts as reflected in the SCRS Working Group reports.
- External experts or scientists from other tRFMOs will participate in five SCRS meetings up to 2030.
- Continue scientific inter t-RFMOs meetings on topics of common interest before 2030.
- Number of meetings with joint participation of ICES-ICCAT.

3. PARTICIPATION AND CAPACITY BUILDING

GOAL 3.1 PRESERVE AND PROMOTE THE INDEPENDENCE AND EXCELLENCE OF THE SCRS AND ITS WORKING GROUPS

OBJECTIVES

3.1.1 Ensure the independence of the scientific process

Strategies

3.1.1.1 Ensure that the ethics outlined in the Values section of the SCRS Strategic Plan, which are intended to guide the conduct for scientists, other delegates, and observers, are followed. The Meeting Chair, SCRS Chair, and/or SCRS Vice Chair shall uphold these Values in conducting meetings in order to protect the independence of the scientific process.

3.1.1.2 The Values section in the SCRS Strategic Plan shall be presented by the meeting Chair at the beginning of all SCRS meetings and included in the meeting background documents. This could be part of the opening of the meeting, which includes introductory statements (e.g. by the meeting Chair and ICCAT Executive Secretary) and the description of meeting logistics. Alternatively, or additionally, the Values could be included in the meeting announcement of each SCRS meeting or the signed registration form.

Selected measurable target(s)

- All SCRS meetings will include a presentation of the Values section of the SCRS Strategic Plan in one or more of the approaches listed in Strategy 4.1.1.2 and inclusion of the Values section in the background documents folder, beginning no later than 2026 and continuing thereafter.

GOAL 3.2 IMPROVING SCIENCE CAPABILITIES OF THE SCRS

OBJECTIVES

3.2.1 Increase the capacity of the CPCs in meeting data-related obligations

Strategies

3.2.1.1 Develop programmes to assist CPCs in meeting data-related obligations.

3.2.1.2 Develop and/or review observer training materials that will assist CPCs with their observer systems.

Selected measurable target(s)

- In the Secretariat's annual report on statistics, achieve a 20% reduction in the specific data elements that are reported as lacking for each stock by 2031 relative to 2025 (as a reflection of the SCRS's effort, recognizing that data reporting is the responsibility of CPCs and that the SCRS has no direct control over this).

3.2.2 Increase the ability of the SCRS in the application of methods used in providing management advice on tuna stock management

Strategies

3.2.2.1 Continue evaluating the efficacy of the training activities conducted by the Secretariat and the SCRS in recent years.

3.2.2.2 Identify areas where an increase in scientific capacity is required. Define standardized curriculum contents required to address the need and establish capacity-building programmes or workshops as necessary.

3.2.2.3 Organizing regular training courses, workshops, webinars, and online courses.

3.2.2.4 Developing audiovisual, multimedia, and electronic training material adapted to the curriculum contents defined.

3.2.2.5 Bringing experts to meetings when there are clear and identified needs for the improvement in the knowledge/ability amongst participants to meet Commission objectives.

3.2.2.6 Attending meetings in other fora where contact can be made with experts in areas where the SCRS has deficiencies.

3.2.2.7 Developing and enhancing synergies and coordination of capacity-building initiatives with other organizations.

3.2.2.8 Evaluate the current state of technical capacity within the SCRS to carry out the current and anticipated tasks necessary to develop scientific advice for the Commission (e.g. stock assessment modelers, MSE experts and analysts, scientists with relevant research expertise).

The results of this evaluation would inform any calls for additional support from CPCs in the form of increased participation by scientists with the required technical skills that will be needed.

Selected measurable target(s)

- At least five courses conducted, and the training materials made publicly available on the ICCAT website by 2031.
- Evaluate technical capacity in 2026.
- Future technical capacity evaluations show improvement.

GOAL 3.3 **ENHANCE AND IMPROVE PARTICIPATION IN THE SCRS, WITH PARTICULAR EMPHASIS ON FOSTERING THE ACTIVE ENGAGEMENT OF SCIENTISTS FROM DEVELOPING CPCS IN ITS ACTIVITIES**

OBJECTIVES

3.3.1 Increase the active participation of scientists from CPCs that harvest substantial portions of the stock

Strategies

3.3.1.1 Highlight the importance of scientific participation for CPCs with active fisheries participation in a given stock. Participation should involve a functional role (contribute data, analysis that supports the provision of advice).

Selected measurable target(s)

- Within workplans, identify where active participation or contributions from specific CPCs are needed.

3.3.2 Increase scientific leadership within the SCRS by scientists from developing CPCs

Strategies

3.3.2.1 Emphasizing the need for cross-cultural leadership in the SCRS with Commissioners.

3.3.2.2 Recruiting aspiring individuals from amongst developing CPC scientists attending SCRS meetings.

3.3.2.3 Seeking possible special 'capacity building' funding support for time & travel for developing CPC scientists to serve in leadership positions.

3.3.2.4 Establishing mentoring programmes specifically targeted at aspiring developing CPC scientists.

Selected measurable target(s)

- Maintain at least 30% of the SCRS officers from developing CPCs.

3.3.3 Improve the balance of scientific leadership within the SCRS across regions (i.e., North America, Central America/Caribbean, South America, Europe, Africa and Asia) and gender

Strategies

3.3.3.1 Where practicable, seek to improve the balance of representation across regions and genders in the appointment of SCRS Officers.

Selected measurable target(s)

- Strive to ensure that all ICCAT regions (North America, South America, Europe, Africa and Asia) are represented among SCRS Officers (Chair or Vice Chairs) at any given time.
- Strive to increase the representation of women among officers over the period of this strategic plan.

3.3.4 Increase scientific participation in the SCRS by scientists from developing CPCs

Strategies

3.3.4.1 Advocate for increased travel/participation funding (MPF) of developing CPC scientists at intersessional, Species Groups, and plenary meetings.

3.3.4.2 Advocate for increased support for interpretation at meetings.

3.3.4.3 Initiating collaborative research projects with developing CPC scientists leading to SCRS/white journal papers.

3.3.4.4 Consider the consolidation of various capacity building efforts under a structured capacity development programme to support CPCs with limited means in contributing to, and benefiting from, ICCAT scientific work, potentially including training, technology transfer, twinning arrangements, and financial support.

Selected measurable target(s)

- By 2031, increase the annual total number of scientists from developing CPCs participating in SCRS meetings by 33% compared to 2025.
- Initiate three new collaborative projects with the involvement of scientists from developing CPCs by 2031.

4. RESEARCH

Note: Information on the research and data collection programmes of the SCRS Species Groups can be found here.

GOAL 4.1 **QUANTIFY THE MAJOR UNCERTAINTIES AFFECTING STOCK ASSESSMENT AND MANAGEMENT ADVICE**

OBJECTIVES

4.1.1 Identify the major uncertainties affecting management advice and the type of research needed to address them

Strategies

4.1.1.1 Compile metadata about relevant biological, environmental, ecosystem and/or fishery data that will allow characterization of quality of data as well as identification of knowledge gaps.

4.1.1.2 Conduct meta-analyses and reviews on the knowledge about biological parameters, fishery data, data processing and the assumptions made during the assessment process.

Selected measurable target(s)

- At least one cooperative SCRS or peer reviewed research paper for each main species identifying the main sources of uncertainty and ranges for different (e.g. biological) parameters.

4.1.2 Consider the relative importance of the different uncertainties in the prioritisation of future research

Strategies

4.1.2.1 Developing (and/or updating) long-term (6 year) research plans for each Species Group, taking into account uncertainties and any cost/benefit analysis results.

4.1.2.2 Prioritizing, considering factors such as the schedule of assessments, recent estimates of stock status, and Commission requests.

4.1.2.3 Develop regional ecological models in order to identify major dependencies among ICCAT species and fisheries where uncertainties prevent characterizing impacts.

Selected measurable target(s)

- At least one collaborative SCRS or peer reviewed research paper describing the relative merits of different research actions, for each main species.

GOAL 4.2 **ACQUIRE THE NECESSARY BIOLOGICAL KNOWLEDGE IN TUNA AND TUNA-LIKE SPECIES, AS WELL AS IN CRITICAL BYCATCH SPECIES COMMENSURATE TO THE NEEDS FOR THE ASSESSMENT OF THE DIFFERENT STOCKS UNDER THE CONVENTION**

OBJECTIVES

4.2.1 Improve biological knowledge on stock structure, migrations and life history (e.g. growth, maturity, fecundity, reproductive cycle)

Strategies

4.2.1.1 Identifying biological knowledge gaps within the Species Working Groups.

4.2.1.2 Promoting joint collaborative analyses of sparse biological datasets.

4.2.1.3 Designing and executing biological research programmes.

4.2.1.4 Evaluating spatio-temporal patterns in fisheries data and in fisheries-independent data.

4.2.1.5 Summarizing the outcome of the research programmes by characterizing the estimated biological parameters and their variability.

Selected measurable target(s)

- Development of SCRS and peer reviewed papers describing new biological findings.

4.2.2 Adopt a more long-term, strategic approach to research planning, taking into account identified research priorities and the appropriate sequencing of research activities, focused on improving advice to the Commission

Strategies

4.2.2.1 Conduct online subgroup meetings to develop a research plan covering a six-year time horizon, taking account any identified uncertainties and any evaluations of relative importance to the scientific advice. Research plan and any future modifications to be presented to the full species group for review and adoption.

4.2.2.2 Reflect research plan and any future updates in the respective research and data collection programme description that is available on the ICCAT website.

4.2.2.3 Develop a summary table covering six years that reflects the planned research activities. This summary table should line up with the new 4-year budget table format for SCRS research funding requests that is to be initiated in 2025. This should facilitate understanding how the research plan and budget requests correlate and will facilitate the generation of the research funding request budget tables in the future.

4.2.2.4 Consider the various research plans to seek opportunities to collaborate in research activities across Species Groups.

4.2.2.5 Consider the development of research plans for the other SCRS Working Groups that conduct/oversee research (i.e. Working Group on Stock Assessment Methods (WGSAM), SC-ECO, SC-STAT.

Selected measurable target(s)

- Development of research plans, along with a research plan summary table covering a six-year time horizon for each Working Group with an established research and data collection programme by 2026.

- Discussions within other Working Groups to consider if each should develop research programmes, to be scheduled for 2026.

4.2.3 Improve efficiency in use of provided research funding, through better estimation of costs in funding requests, and more effective use of funds during the time allotted for their use (usually the calendar year for which the funding was requested)

Strategies

4.2.3.1 Work with the Secretariat to develop and use guidance for estimating costs associated with carrying out various research aspects.

4.2.3.2 Carry out administrative tasks to enable research to be carried out during the allotted time for expending the funds. To provide maximum opportunity to conduct the research the administrative process should begin as early as possible. Terms of Reference for research activities should be prepared before the Annual Commission meetings for research to be carried out in the following calendar year. Ideally, Terms of Reference (ToRs) should be prepared before the Species Groups meetings in September, to provide an opportunity to review by the Groups. However, if necessary, the ToRs can be prepared by the Rapporteurs (or Conveners, and Chairs of other Working Groups, as appropriate).

4.2.3.3 Each Group's research plan, including the research summary table showing the planned timing of research activities, can serve as guidance in developing the research budget requests and ToRs. For instance, this can inform the writing of ToRs in advance of Species Groups meetings.

4.2.3.4 Take advantage of opportunities to collaborate in research activities across Species Groups (i.e. develop ToRs that facilitate tagging of additional species of interest in other Species Groups), in order to improve the efficient use of available funds.

4.2.3.5 Reference to the research plans outlined in the various research programmes in funding requests to the Commission, to explain how the research will support or improve the scientific advice to the Commission. Identify and explain research activities that will require multiple years to carry out.

Selected measurable target(s)

- Provision of ToRs before the Annual Commission meeting in the year before the year in which the research activity is to take place, with potential exceptions for cases where research activities would be scheduled later in the upcoming year.
- Completion of the funding research each year.
- Minimize underutilization of funds.

GOAL 4.3 IMPROVE THE STANDARDISATION OF THE FISHERY DEPENDENT INFORMATION

OBJECTIVES

4.3.1 Develop measures of standardized fishing effort for different fleets

Strategies

4.3.1.1 Agreeing, within the WGSAM, on methodologies to quantify standardized fishing effort.

4.3.1.2 Improve fishing effort distribution (EFFDIS) estimates for LL and expand for PS, GN and other fleet/gears.

Selected measurable target(s)

- Develop SCRS documents and WGSAM reports on the methodologies to quantify fishing capacity and standardized fishing effort.
- EFFDIS database improved and expanded to PS, GN and other gears, available on the website.

4.3.2 Further improve standardization of CPUEs for their use as reliable indices of abundance

Strategies

4.3.2.1 Developing standardized categories for different gear configurations that reflect different fishing strategies.

4.3.2.2 Continuing investigating methods to standardize CPUEs and their relative merits/efficiency under different circumstances (e.g. changes in catchability due to changes in gear configuration, environmental influences).

4.3.2.3 Developing collaborative efforts to perform joint CPUE standardization across national fleets.

4.3.2.4 Continue to explore the use of floating objects to monitor relative abundance.

4.3.2.5 Ensure that indices reflect a consistent age or size group or characterize changes over time in how ages or size groups are included in the indices.

4.3.2.6 Where possible, account for the effect of environmental variability on the indices, including if/how different components of the population may be affected differently.

4.3.2.7 Ensure that the presentation of CPUE indices follows the recommendations outlined by WGSAM related to a description of the data, its analysis and validation via diagnostics and that the subsequent review considers all these aspects prior to adopting the index for use in population models.

4.3.2.8 Develop guidance on CPUE standardization should be carried out when the resulting index is to be used within a MP (i.e. as part of a harvest control rule (HCR)). For example, such that a yearly update of a CPUE index doesn't radically affect its historical values.

4.3.2.9 Develop a code-repository framework for sharing code, fostering collaboration, cross-checking of results and ensuring reproducibility.

Selected measurable target(s)

- Increased use of combined standardized CPUEs across national fleets in stock assessment and/or MSE processes.
- Peer reviewed paper on the use of floating objects to monitor relative abundance.
- Increase in indices which follow recommended protocols and that address the impacts of environmental variability on the regional distribution and density of stocks supporting the index.

GOAL 4.4 **APPLY APPROACHES WHICH PROVIDE INFORMATION ON POPULATION DYNAMICS INDEPENDENT OF DATA FROM THE COMMERCIAL FISHERY/INCREASE IMPORTANCE OF FISHERY INDEPENDENT DATA IN ICCAT**

OBJECTIVES

4.4.1 Increase availability of fishery independent information to improve stock assessment and monitor the effect of management regulations

Strategies

4.4.1.1 Dedicated workshop on fisheries independent information for ICCAT (state of the art, as well as future development).

4.4.1.2 The development of fisheries independent indices/estimates of abundance (e.g. based on acoustics, aerial observations, egg-larvae surveys, scientific fishing, CKMR)), should be encouraged and, where shown to sufficiently support the provision of management advice, be sustained.

4.4.1.3 Implementing and/or continuing ICCAT species tagging programmes in support of developing fishery management advice (abundance, migration, mortality, etc.).

4.4.1.4 Conduct scoping exercises for ICCAT species under management to determine the potential to employ CKMR based studies to provide estimates of absolute abundance.

4.4.1.5 Continue to evaluate current, ongoing CKMR studies and, where appropriate, use the resulting outputs to inform estimates of stock status and management advice.

Selected measurable target(s)

- Carry out a dedicated workshop with specific recommendations on how to move forward.
- Increased number of SCRS papers with proposed designs or outcomes of fisheries independent research surveys.
- Develop and document experimental designs for the use of tagging (conventional or electronic) to improve scientific advice for key ICCAT species.
- An increasing trend in the use of fisheries independent indices/abundance estimates to inform management advice.

GOAL 4.5 **RESEARCH TO SUPPORT THE INCLUSION OF ECOSYSTEM/CLIMATE CHANGE/BYCATCH CONSIDERATIONS IN THE PROVISION OF SCIENTIFIC ADVICE**

OBJECTIVES

4.5.1 Identify and fill knowledge gaps so as to be able to provide scientific advice including ecosystem considerations

Strategies

4.5.1.1 Assessing the adequacy of existing ecosystem indicators in other forums and/or development of new indicators, including by characterizing if and how these indicators reflect effects on stocks that should be accounted for in scientific advice.

4.5.1.2 SC-ECO, WGSAM and Species Working Groups to address specific issues and/or organise specific workshops related to bycatch mitigation ,and multispecies stock assessments and management.

4.5.1.3 SC-ECO, WGSAM and Species Working Groups to address specific issues and/or organise specific workshops related to effect of climate on species dynamics and developing climate safe management plans.

4.5.1.4 Enhancing participation of researchers from different disciplines (oceanography, climate, ecological modelling, socioeconomics, etc.) in the SCRS process (especially on the SC-ECO) by invitation and appointment to specific tasks.

4.5.1.5 Contingent on guidance provided by the Commission defining socioeconomic objectives, assess the structural, logistical, personnel and other needs for the Commission to integrate the relevant socioeconomic components and indicators for the EAFM.

Selected measurable target(s)

- An increase in EAFM related workshops.
- Increasing number of people by research discipline participating in the SCRS.
- Increasing interaction between Climate Change and EAFM experts with WGSAM and Assessment Working Groups.
- The development of an Ecosystem Report card with indicators adopted for each component which is updated on a regular basis.

GOAL 4.6 **IMPROVE CONSISTENCY OF APPROACHES, COORDINATION, AND OVERALL PRIORITIZATION OF RESEARCH ACTIVITIES ACROSS WORKING GROUPS**

OBJECTIVES

4.6.1 Ensure that research activities and the associated administrative processes are consistent, where appropriate, across Working Groups

4.6.2 Confirm that research plans of Species Groups are aligned with the strategies and targets defined in the Strategic Plan

4.6.3 Improve coordination in carrying out research activities across Working Groups, to maximize opportunity (e.g. sampling) and efficiency

4.6.4 Although Working Groups are expected to prioritize research activities for which funding is requested, there is a need to prioritize research activities across Working Groups

4.6.5 Evaluate whether or not current Steering Committee(s) (i.e. GBYP Steering Committee) should be maintained

Strategies *(The strategies below are intended to achieve Objectives 4.6.1 - 4.6.5)*

4.6.1.1 Discuss within the SCRS whether these objectives should be addressed through the establishment of an SCRS Research Steering Committee and, if this is agreed.

4.6.1.2 Determine the scope of responsibilities for this Steering Committee.

4.6.1.3 Determine the membership of this Steering Committee.

4.6.1.4 Consider carefully whether or not the GBYP Steering Committee should be maintained.

Selected measurable target(s)

- Depending on the results of the SCRS discussions, develop a proposal for the establishment of an SCRS Research Steering Committee for the consideration of the SCRS in 2026.
- Discuss within the Bluefin Tuna Species Group whether or not the GBYP Steering Committee should be maintained and develop a recommendation to the SCRS. The SCRS will consider this in the development of any recommendation to the Commission regarding the GBYP.

5. PROVISION OF MANAGEMENT ADVICE, INCLUDING STOCK ASSESSMENTS AND MANAGEMENT STRATEGY EVALUATIONS

GOAL 5.1 PROVIDE OBJECTIVE, RELIABLE AND ROBUST SCIENTIFIC ADVICE TO THE COMMISSION IN SUPPORT OF THE CONVENTION OBJECTIVES

OBJECTIVES

5.1.1 Improve the capacity of the SCRS to complete high quality analysis and provide robust assessment advice

Strategies

5.1.1.1 Encouraging CPCs to increase the number of national scientists participating in SCRS meetings that share the workload of the SCRS. Working Groups to offer national scientists opportunities to participate in the assessment process working independently or as part of a mentoring initiative in order to build competence and capacity in conducting the analytical components of the advice process.

5.1.1.2 SCRS in collaboration with Secretariat to identify needed scientific support for the data and analytical requirements of often more sophisticated models.

5.1.1.3 Make better use of data preparatory meetings through quantifying, prioritizing, and integrating uncertainties identified in the previous assessment process and considering important environmental drivers that affect stock productivity as identified by SC-ECO.

5.1.1.4 Continuing use of methods to integrate sources of uncertainties (e.g. via MSE, see goal 3) into advice generated by the SCRS.

5.1.1.5 Score the quality of the fisheries and related data relative to the assessment approaches being used (see goal 2).

Selected measurable target(s)

- Update the Terms of Reference template for data preparatory and assessment meetings to include required analysis of the previous assessment's advice and uncertainty.

5.1.2 Continue improving stock evaluation (assessments and MSE by incorporating updated information on fishery and life history characteristics)

Strategies

5.1.2.1 Encouraging CPCs to provide set level detail of the fishing operations in order to develop better combined standardized CPUE time series when requested by Species Working Group Chairs.

5.1.2.2 Encouraging CPCs to conduct and/or support studies which address uncertainties in stock assessments through use of improved information on life history characteristics, such as: fecundity, age composition of catch, growth, stock structure, and spatial distribution patterns of the stocks of concern.

Selected measurable target(s)

- Increasing use of joint indices developed using CPC combined data at the finest level (e.g. set by set) of aggregation.
- Reduction in gaps related to gaps in life history characteristics across all ICCAT stocks.

- 10% of the catch measurements included in assessment length compositions and 1-5% included in age compositions.

5.1.3 Strengthen peer review process

Strategies

5.1.3.1 Inviting outside experts (e.g., from other RFMOs or from academia) to participate in the SCRS activities, particularly for stock assessments and MSE.

5.1.3.2 Promoting the publication of the SCRS scientific findings in the scientific peer-reviewed literature. Evaluate re-establishing specific agreements/processes for peer-review publications of SCRS scientific results.

Selected measurable target (s)

- Have at least one SCRS stock assessment each year peer-reviewed by an external expert.

GOAL 5.2 BALANCE THE ADEQUACY BETWEEN MODELS USED AND QUALITY OF AVAILABLE DATA AND KNOWLEDGE

OBJECTIVES

5.2.1 Provide scientific advice using methods of analysis that are appropriate for the quantity and quality of information available for a given stock

Strategies

5.2.1.1 Developing criteria to evaluate the importance of the different data elements depending on the life history and/or assessment model used.

5.2.1.2 Developing a meta-database with information on the quantity and quality of available fisheries, biological information, and mark-recapture data.

5.2.1.3 Encouraging CPCs to provide sufficient access to CPUE set-by-set data according to the needs and priorities identified by the different Species Groups and the subcommittees, while ensuring that appropriate protocols are followed to preserve the confidentiality of data.

5.2.1.4 Implementing strict data guillotines based on reasonable expectations for data reporting so that analysts have adequate time to fully vet and incorporate data into assessments and MSE.

5.2.1.5 Developing protocols for using robust population indicators annually (or other appropriate frequency) for species which are not necessarily being assessed.

5.2.1.6 Developing/utilizing a simulation framework to evaluate the performance of alternative modelling approaches for different data qualities.

Selected measurable target(s)

- Where possible, combine detailed CPUE data from the main several CPCs relative to each stock to generate a single combined index.
- Establishment of criteria to evaluate the importance of the different data elements depending on the life history and/or assessment model used.

- Working with the Secretariat, develop the protocol to score the quality of the fisheries and related data relative to the assessment approaches being used by 2027, and begin scoring data in this way by 2028.

GOAL 5.3 EVALUATE MANAGEMENT PROCEDURES THROUGH MANAGEMENT STRATEGY EVALUATIONS

OBJECTIVES

5.3.1 The SCRS should continue to evaluate Management Procedures for priority stocks (as identified by the Commission or by the SCRS)

Strategies

5.3.1.1 Determining and characterising major sources of scientific uncertainty in the assessment of ICCAT's stocks and fisheries.

5.3.1.2 Developing operating models to examine the impacts of these sources of uncertainty on management advice.

5.3.1.3 Conducting management strategy evaluations (MSE) to determine the most robust Management Procedures that achieve management objectives given the main scientific uncertainties.

5.3.1.4 Involving a greater number of ICCAT CPCs in MSE development.

5.3.1.5 Developing a suite of "standard" management objectives, associated performance indicators, acceptable risk, length of management period, robustness tests, graphics and plots, etc. These standard parameters could simply form a starting point, so as to narrow the range of testing and reduce the computational burden.

5.3.1.6 Thoroughly evaluate the need, role and expected benefit of the creation of a position at the Secretariat for an MSE Expert Coordinator, to inform any recommendation to the Commission. Although the evaluation to be conducted will more fully establish this, the initial considerations are that an MSE Expert Coordinator would allow for a single point of contact on all MSE development and implementation, consistency across time and efforts, and reduced workload for other scientists and staff as the person could conduct some of the work and serve as a standard reviewer. The participation of this MSE Expert in the development of MSEs and testing of MPs would also serve to address in part the unevenness in MSE knowledge and experience across the various Working Groups of the SCRS.

Selected measurable target(s)

- Produce a periodic review of MSE efforts in light of successes, lack of successes and the factors limiting future MSE progress and collate feedback from managers and stakeholders on the process thus far.
- Develop a standardized set of objectives, indicators, graphical tools, etc. to serve as a starting point for new MSE processes, taking into account already existing templates and tools.
- Evaluate the cost of developing computational and hosting resources at the Secretariat versus outsourcing for running MSE simulation analyses, displaying results (shiny app products, etc.), and providing background materials.

GOAL 5.4 ADVANCE PROVISION OF ECOSYSTEM AND CLIMATE ADVICE TO SUPPORT THE IMPLEMENTATION OF THE ECOSYSTEM APPROACH TO FISHERY MANAGEMENT (EAFM)

OBJECTIVES

5.4.1 Advance understanding of and quantify ecosystem and climate change impacts on commercial and non-commercial ICCAT species as well as associated ICCAT fisheries

Strategies

5.4.1.1 Developing studies to identify key ecosystem and climate drivers influencing the dynamics of ICCAT species.

5.4.1.2 Determining robust and credible methodologies for testing and quantifying climate change impacts on fish stocks, ecosystem and fisheries and applying these methods.

5.4.1.3 Formulating and testing hypotheses relating ecosystem and climate drivers to species' life history parameters (e.g. recruitment, growth, migratory patterns, etc.) and stock dynamics, for incorporation into stock assessments or MSEs.

Creation of a research effort to quantify and monitor in time and space (to the extent possible) the forage base for the various functional groups under ICCAT consideration.

Selected measurable target(s)

- SCRS documents presenting results of studies identifying key ecosystem and climate drivers and their impacts on ICCAT species dynamics.
- Development of regional ecosystem (multi-species, multi-functional group) operating models for hypothesis testing, scenario evaluation and support provision of climate- and ecosystem-based management advice.

5.4.2 Strengthen the implementation of the Ecosystem Approach to Fisheries Management (EAFM)

Strategies

5.4.2.1 Organising workshops to develop, evaluate and revise EAFM plans relevant to the tuna fisheries in the ICCAT Convention area.

5.4.2.2 Supporting dialogue on Integrated Ecosystem Assessment approaches within and between the RFMOs.

5.4.2.3 Taking advantage of any external funding mechanisms (e.g. GEF/ABNJ funding) that ICCAT may receive to support EAFM implementation actions, capacity building and research.

5.4.2.4 Defining and prioritizing data collection needs for the implementation of EAFM through application of integrated ecosystem assessments for identifying and monitoring key ecosystem components and indicators.

Selected measurable target(s)

- Host a workshop and invite external expertise to collaborate with the SC-ECO to review and update the existing Ecosystem Report Card.
- In line with other RFMOs, regularly review and update the Ecosystem Report Card to monitor the current state and trends of each ecosystem component using the adopted ecosystem indicators, ensuring this information is available to SCRS scientists and managers.

5.4.3 *Develop a workplan to integrate ecosystem-based approaches into stock assessment and MSE processes*

Strategies

5.4.3.1 Identifying and prioritizing relevant ecosystem and climate indicators for formal consideration within the SCRS work.

5.4.3.2 Formally and explicitly incorporate ecosystem and climate indicators into stock assessments and MSEs to the extent they are appropriate and constitute an improvement to the assessment.

5.4.3.3 Expand the development and application of ecosystem models consistent with the spatial distribution and ecological context of ICCAT stocks and fisheries and associated ecosystems.

5.4.3.4 Developing management advice that incorporates and considers ecosystem and climate-related risks.

5.4.3.5 Applying Integrated Ecosystem Based Approaches to the ICCAT Convention area.

5.4.3.6 Conduct studies including meta-analysis of year/area effects on ICCAT species abundance with the goal of determining historic and recent changes in the spatial distribution of these species, possible regime shifts in productivity, and other relevant characteristics.

5.4.3.7 Advance towards the use of MSE as a tool to apply the ecosystem approach to fisheries management by incorporating ecosystem objectives/reference points, accounting for projected impacts of Climate Change, and developing management procedures for bycatch species.

Selected measurable target(s)

- Complete studies including meta-analysis of year/area effects on ICCAT species abundance and distribution.
- Increasing prevalence of providing ecosystem and climate conditioned, risk equivalent advice for ICCAT stock and testing of robustness of management procedures to climate and ecosystem-driven impacts.

GOAL 5.5 SET PRIORITIES AND REASONABLE WORK PLANS CONSISTENT WITH COMMISSION OBJECTIVES FOR ASSESSING STOCKS AND TESTING MPS

OBJECTIVES

5.5.1 Prioritize and define the timing of stock assessment and MSE across SCRS Species Groups, consistent with the objectives identified by the Commission, in order to set reasonable yearly work plans that match the resources and capacity of the SCRS

Strategies

5.5.1.1 Develop criteria that could be used to prioritize stock assessments, research activities, MSE efforts, responses to the Commission, etc. when developing the yearly work plans. Potential criteria include: requested by the Commission or not, relative importance (e.g., total catch, value) of the species, stock recently assessed or not, existence of a rebuilding plan or not, availability of data to address the task, major uncertainties or other factors that inhibit conventional stock assessment but which could be addressed through MSE, maximum number of assessments/MSEs that can be managed per year, etc.

5.5.1.2 In determining the maximum number of MSE processes that can be undertaken each year, the stage of the process (e.g. early scoping, model development and refinement, management procedure testing, implementation, periodic review) as well as the availability of scientists experienced in MSE.

5.5.1.3 Identify and implement approaches to minimise the need for duplication of effort in applying both stock assessments and management procedures for the same stocks.

5.5.1.4 Develop and agree with the Commission, on a multi-year calendar with timing of assessments and MSE developments.

5.5.1.5 Develop an overall roadmap for the provision of science advice that integrates the products from SCRS bodies in a way that maximizes efficiency in terms of the meeting calendar, capacity of the SCRS bodies and other resources and which supports the emerging need to manage according to EAFM principles.

Selected measurable target(s)

- Establish a Subgroup (potentially a Subgroup of the Working Group on Stock Assessment Methods, that will develop scientific prioritization criteria for MSE processes to be initiated or advanced. This should include recommendations of the capacity of the SCRS to undertake simultaneous MSE efforts.
- Assess the suitability of MSE for all ICCAT managed stocks, and establish a priority ranking of suitable ICCAT-managed stocks based on the agreed prioritization criteria.
- Continue refining a roadmap that properly incorporates Commission objectives and which is consistent with the abilities and resource limitations of the SCRS.
- Implement the SCRS components of the MSE Roadmap as adopted by the Commission.
- Shorten MSE processes, targeting work completion for 2-3 years for each MSE process (conception to completion of CMP testing).

6. INNOVATION AND ARTIFICIAL INTELLIGENCE (AI)

GOAL 6.1 INCORPORATION OF AI TO SUPPORT THE WORK OF THE SCRS

The objectives below reflect a plan to evaluate the potential usage of AI with the work of the SCRS, including the support of the Secretariat, and implementation of such usage where deemed appropriate, while at the same time exercising caution recognizing that AI applications raise issues of transparency, interpretability, data security, and governance. Exploration should therefore proceed gradually, with clear safeguards.

Objectives

6.1.1 Explore AI for Data Management and Workflow Efficiency

Strategies

6.1.1.1 Assess whether AI can streamline data handling, cleaning, and integration across multiple sources.

6.1.1.2 Establish a small working group/subgroup to explore AI-driven automation of workflows.

6.1.1.3 Review opportunities for reproducibility and efficiency gains from pilot studies.

Selected measurable targets

- The establishment of a group/subgroup to explore automation of workflows (by 2026).

- Carry out pilot studies, and document results (preliminary results by 2027).

6.1.2 Explore AI for Stock Assessment and Scientific Analysis

Strategies

6.1.2.1 Evaluate AI-based methods (e.g., neural networks, machine learning classifiers) as complementary diagnostics.

6.1.2.2 Explore comparative testing of AI-based indicators alongside existing stock assessment models.

Selected measurable targets

- Document conditions where AI could add value to conventional approaches (initial report by 2027).

6.1.3 Explore AI for Advisory and Reporting Processes

Strategies

6.1.3.1 Explore AI-supported tools for report drafting and visual presentation.

6.1.3.2 Assess the feasibility of AI-assisted templates for uncertainty communication.

Selected measurable targets

- Document and make available any useful AI-supported tools for report drafting and visual presentation.

- Report on the feasibility of AI-assisted templates for uncertainty communication, and make them available if useful.

6.1.4 Explore AI for Communication and Capacity Building

Strategies

6.1.4.1 Investigate AI-assisted interpretation, translation, training, and outreach tools to support SCRS and stakeholders.

Selected measurable targets

- Carry out and report on pilot explorations of AI in interpretation, translation or training material development (initial reports by 2027).
- Conduct a meeting/working group session on AI methods and potential applications.

6.1.5 Explore Principles and Safeguards for Responsible AI Use

Strategies

6.1.5.1 Develop governance principles for AI use in ICCAT science.

6.1.5.2 Explore alignment with the United Nations Food and Agriculture Organization (FAO) and other RFMOs on responsible AI frameworks.

Selected measurable targets

- Produce a draft of initial "do's and don'ts" for AI use within SCRS processes (preliminary draft by 2026).
- Develop a more complete, flexible guidance document on acceptable and unacceptable uses of AI by 2028, revising as needed.
- Report on potential alignment with FAO and other RFMOs on responsible AI frameworks (by 2029).

6.1.6 Implementation and Coordination

Strategies

6.1.6.1 AI Coordination Subgroup: Establish an SCRS subgroup to coordinate exploration, training, pilot projects, and implementation.

Selected measurable targets

- The establishment of the AI Coordination Subgroup by 2026.

Appendix 6

Western Atlantic skipjack Management Strategy Evaluation (MSE): Background, Overview, & Final Results

(Prepared by the Tropical Tunas Technical Sub-Group on MSE in coordination with the SCRS Chair and the Western Skipjack Rapporteur)

This document describes core concepts and presents the final results of the western Atlantic skipjack tuna MSE. The intention is to facilitate discussions at the Intersessional Meeting of Panel 1 on Tropical Tunas MSE on 8 October 2025 to support decision-making for adoption of a management procedure (MP) at the 29th Regular Meeting of the Commission in November 2025.

1. Background

The SCRS Tropical Tunas Species Group has been developing a management strategy evaluation (MSE) framework for west Atlantic skipjack (SKJ-W) since 2020. In 2015, the Commission called for adoption of a management procedure (MP) for SKJ-W and seven other priority stocks based on an MSE (*Recommendation by ICCAT on the development of harvest control rules and of management strategy evaluation* (Rec. 15-07)). This call for an MSE has been echoed in every ICCAT tropical tunas measure since 2016, with *Recommendation by ICCAT on a Multi-annual Conservation and Management Programme for tropical tunas* (Rec. 16-01) setting initial performance indicators for tropical tunas. While the East Atlantic skipjack stock is included in the multispecies MSE with bigeye and yellowfin tunas, western Atlantic skipjack has been earmarked for its own MSE since the Commission adopted the "First Draft Roadmap for the Development of MSE and Harvest Control Rules (HCR)" in 2016; this is because western skipjack tuna are caught predominantly in a single-stock fishery.

External experts launched the MSE work in 2020 (Huynh *et al*., 2020) and since then, MSE development has been conducted by the SCRS (Mourato *et al*., 2022a, Mourato *et al*., 2022b, Santa Ana *et al*., 2023, Sant'Ana and Mourato, 2024a, Sant'Ana and Mourato, 2024b, Sant'Ana and Mourato, 2025, Sant'Ana *et al*., 2025a, and Sant'Ana *et al*., 2025b (SCRS/2025/228)). The Commission adopted conceptual management objectives for SKJ-W in 2022 (*Resolution by ICCAT on development of initial conceptual management objectives for western Atlantic skipjack* (Res. 22-02)) and operationalized them in 2024 (*Recommendation by ICCAT on a candidate management procedure for western Atlantic skipjack tuna* (Rec. 24-04)). Recommendation 24-04 also set a 3-year management cycle and an implementation schedule for the MP and called for final tuning of candidate MPs in 2025. The MSE work is now complete and ready for ICCAT to adopt an MP in 2025, in accordance with Rec. 24-04 and the Commission's workplan "Revised Roadmap for the ICCAT MSE processes adopted by the Commission in 2024".

2. MSE overview

The SKJ-W MSE is built using an open-source MSE software package called openMSE. The package can input information from assessment models, including those built with the Stock Synthesis framework (Anon., 2022b, in this case) to efficiently create – and then customize – an MSE framework for testing CMPs.

2.1 Indices of abundance

The western skipjack stock occurs from the U.S. coast to the southern Brazilian coast. Data from five different indices (baitboat - Brazil recent and earlier period, Brazil handline, Venezuela purse seine, and U.S.-Mexico longline) are used to condition the MSE. Three of these indices, Brazilian baitboat, Venezuelan longline, and U.S. - Mexico longline, were updated in 2025 with data through 2024. On average, Brazil takes approximately 90% of the total skipjack catch in the West Atlantic, with the bulk of remaining catches (7% on average) taken by Venezuela. The MSE's historical period is from 1952 through to 2024, and projections cover the subsequent 30 years through 2055.

2.2 Operating Models

Each operating model (OM) in the MSE represents a hypothesis or plausible scenario for the dynamics of the stock and fishery. The SKJ-W MSE includes 9 main OMs (i.e., the "reference set or grid of OMs") based on two major sources of uncertainty:

1. Recruitment/steepness: a measure of how the number of young fish produced each year is related to the abundance of the adult population; reflects stock productivity (3 options);
2. Growth: reflects the alternative biological parameters of the population, including different combinations of growth rate, asymptotic size, and natural mortality (3 options).

The 9 OMs allow for all combinations of these options (3x3=9). These 9 OMs were derived from the last stock assessment of the SKJ-W conducted in 2022 (Anon., 2022b). Thus, reflecting the same decisions made during the last stock assessment, the nine OMs scenarios are considered to be equally plausible, so they are equally weighted in this MSE. These nine OMs together make up the reference set of operating models.

There are also three "robustness" OMs to evaluate less likely but still possible scenarios. All three evaluate the potential impact of climate change on recruitment level and variability, assessing the impact on MP performance of both increases and decreases in future recruitment.

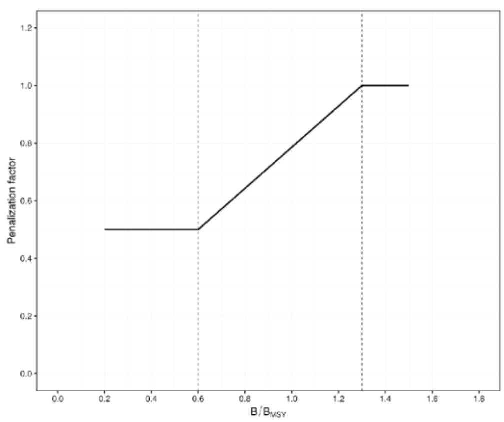
2.3 Management Objectives

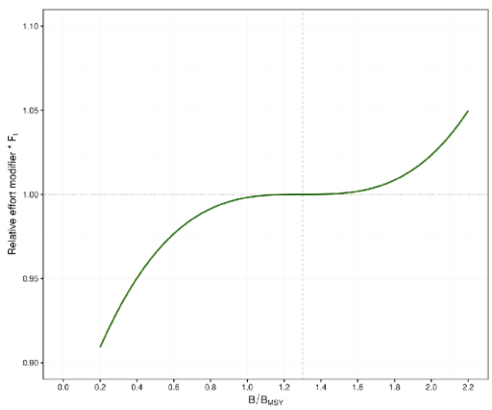
Recommendation 24-04 sets sixteen (16) key performance indicators SKJ-W MSE as the benchmark for evaluation of the Commission's four agreed management objectives (see **Addendum 1**). The limit reference point (B_{LIM}) is set at 0.4*SSB_{MSY} for western skipjack, as has been done for other stocks, including North Atlantic swordfish, North Atlantic albacore, Atlantic bluefin tuna, and the three other tropical tuna stocks. The target reference point is set at SSB_{MSY}.

2.4 Candidate Management Procedures (CMPs)

There are 4 CMPs, two empirical and two model-based. Per Rec. 24-04, all use a 3-year management cycle, calculate a single total allowable catch (TAC) for the West Atlantic, include a 25% limit on TAC change between management cycles, and are tuned to not exceed varying levels from 10% to 20% probability of breaching the limit reference point. All CMPs also include a 45,000 t maximum catch to meet the stability objective. The CMPs use a 1-year data lag, e.g. in 2025, the TAC for 2026 will be set with data available up to 2024. Full descriptions of the CMPs are available in Sant'Ana *et al*., 2025b (SCRS/2025/228), but briefly, these include:

- IR: An index ratio CMP. TACs are set based on the combined index but when the change of index is within the specified envelope, TAC is not changed;
- CE: A constant exploitation rate CMP.
- SP: A model-based CMP that that uses a surplus production model with a 130-60 hockey stick harvest control rule and an F_{TARGET} of 100%F_{MSY} (at left below).
- SPAH: A model-based CMP that uses a surplus production model with a non-linear harvest control rule (at right below).





3. Final results

Panel 1 provided feedback on the initial MSE results in 2023 and 2024, which the SCRS took into consideration when finalizing its CMP development work. These new final results are summarized below (**Table 1**, **Figures 1 to 4**) and described fully in document Sant'Ana *et al.*, 2025b (SCRS/2025/228).

The results have changed considerably since 2024 when Panel 1 agreed operational management objectives. This is because the operating models were reconditioned based on updated catch data, abundance indices, and size composition data, increasing the robustness of the analysis. **Figure 1** shows the tradeoff between the probability of breaching the LRP and the probability of being in the Kobe green quadrant (PGK). Meeting the Rec. 24-04 Safety objective of ≤10% probability of breaching the limit reference point results in a medium-term PGK of approximately 70%. A 60% PGK more closely aligns with a Safety objective of approximately 15%. **Figures 2 to 4** present the 10% LRP tuning results only.

The current MSE results can be now considered final as a basis for Commission adoption of final management objectives and an MP to set the TAC for 2026 and beyond. **Table 1 and Figures 2 to 4** indicate that all four remaining CMPs meet the performance standards set in the management objectives agreed in Rec. 24-04, with some variation in performance across the CMPs:

- **Figure 2** shows that all CMPs remain in the Kobe green quadrant over the short- and medium-terms with a probability ≥60%, meeting the Rec. 24-04 objective, except for CE, which dips below 60% at the end of the medium period. Each CMPs drops below the 60% probability over the long-term before recovering back above 60%. The SP CMP reaches the lowest PGK, at less than 50% in some years.
- **Figure 3** shows the biomass, fishing mortality and TAC trends for all 4 CMPs. Under all CMPs, the SKJ-W stock declines in the beginning of the projection period towards SSB_{MSY} before recovering to a higher level. The SP CMP comes the closest to dropping the stock below SSB_{MSY} to an overfished level. The SPAH CMP results in a biomass closest to the target by the end of the projection period, while the other three CMPs result in a biomass closest to $2.0*SSB_{MSY}$. These trends are consistent with the fishing mortality and TAC trends also shown in the figure.
- **Figure 3** also illustrates the greater catch stability in the SPAH and CE CMPs, with the SPAH CMP having the greatest stability. This comparative TAC stability performance is all seen in **Figure 4.**

Table 1. Quilt table showing results for the 4 CMPs against key performance indicators for the reference set of operating models. See **Addendum 1** for performance indicator descriptions. Darker shading indicates better performance, but some of the values are very similar, despite different shading.

MP	PGK	PGK_short	PGK_mid	PGK_long	LRP	LRP_short	LRP_mid	LRP_long	POF	PNOF	AvC	AvC_short	AvC_mid	AvC_long	VarC	VarC_mid	VarC_long
CE	0.71	0.95	0.68	0.68	0.10	0.00	0.03	0.13	0.24	0.76	31,640.63	32,129.52	40,161.90	26,157.76	0.14	0.11	0.13
IR	0.71	0.97	0.79	0.66	0.10	0.00	0.01	0.14	0.24	0.76	30,844.34	30,844.34	34,959.98	27,663.01	0.10	0.11	0.10
SP	0.71	1.00	0.89	0.61	0.10	0.00	0.00	0.14	0.25	0.75	30,298.89	27,217.88	30,321.19	28,152.37	0.12	0.11	0.12
SPAH	0.69	0.99	0.86	0.60	0.10	0.00	0.01	0.14	0.26	0.74	33,833.18	28,265.68	31,931.10	35,404.71	0.07	0.08	0.06

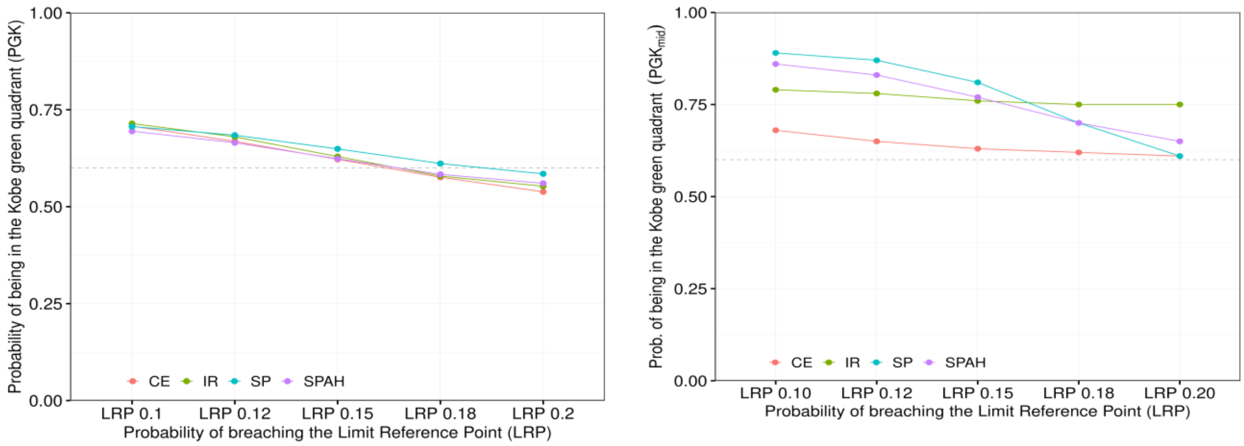


Figure 1. Trade-off relationship between the probability of breaching the Limit Reference Point (LRP) and the probability of being in the Kobe green quadrant (PGK) over the 30-years projection period (left panel) and mid-term (right panel) for the four CMPs. Each line shows the PGK performance as the risk of breaching the LRP increases from 10% to 20. The dashed horizontal line marks PGK=60%, the minimum level set in Rec. 24-04.

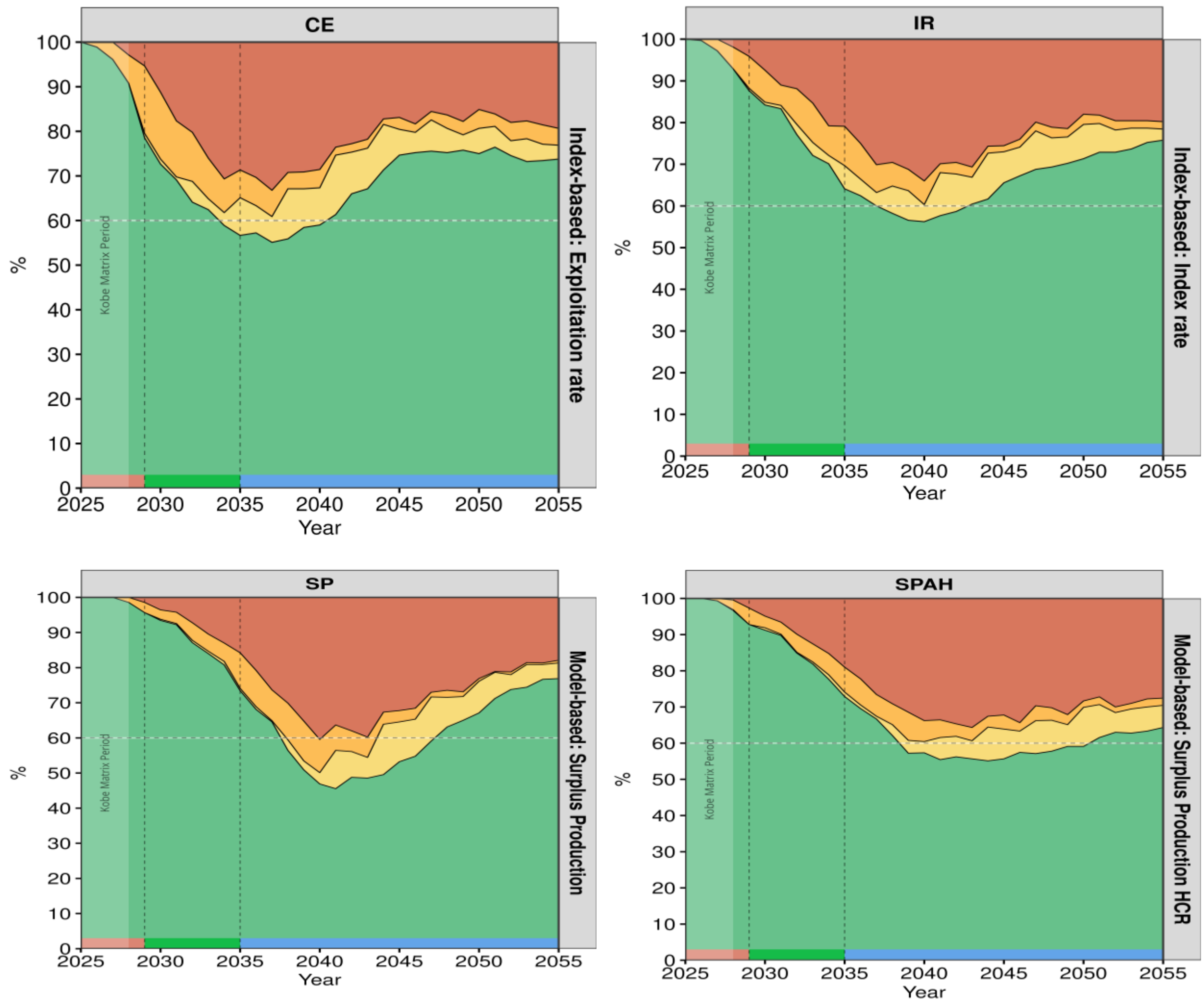


Figure 2. Kobe time plot showing the percentage (vertical axis) of simulations across all reference operating models that fall in each of the Kobe quadrants in each projection year (horizontal axis). Green indicates that the stock is neither overfished nor subject to overfishing. Orange means that the stock is subject to overfishing but not overfished. Yellow indicates that the stock is overfished but not subject to overfishing. Red means that the stock is both overfished and subject to continued overfishing. The vertical line delineate the different time periods, with red bars showing the short-term, while green depicts medium and blue long.

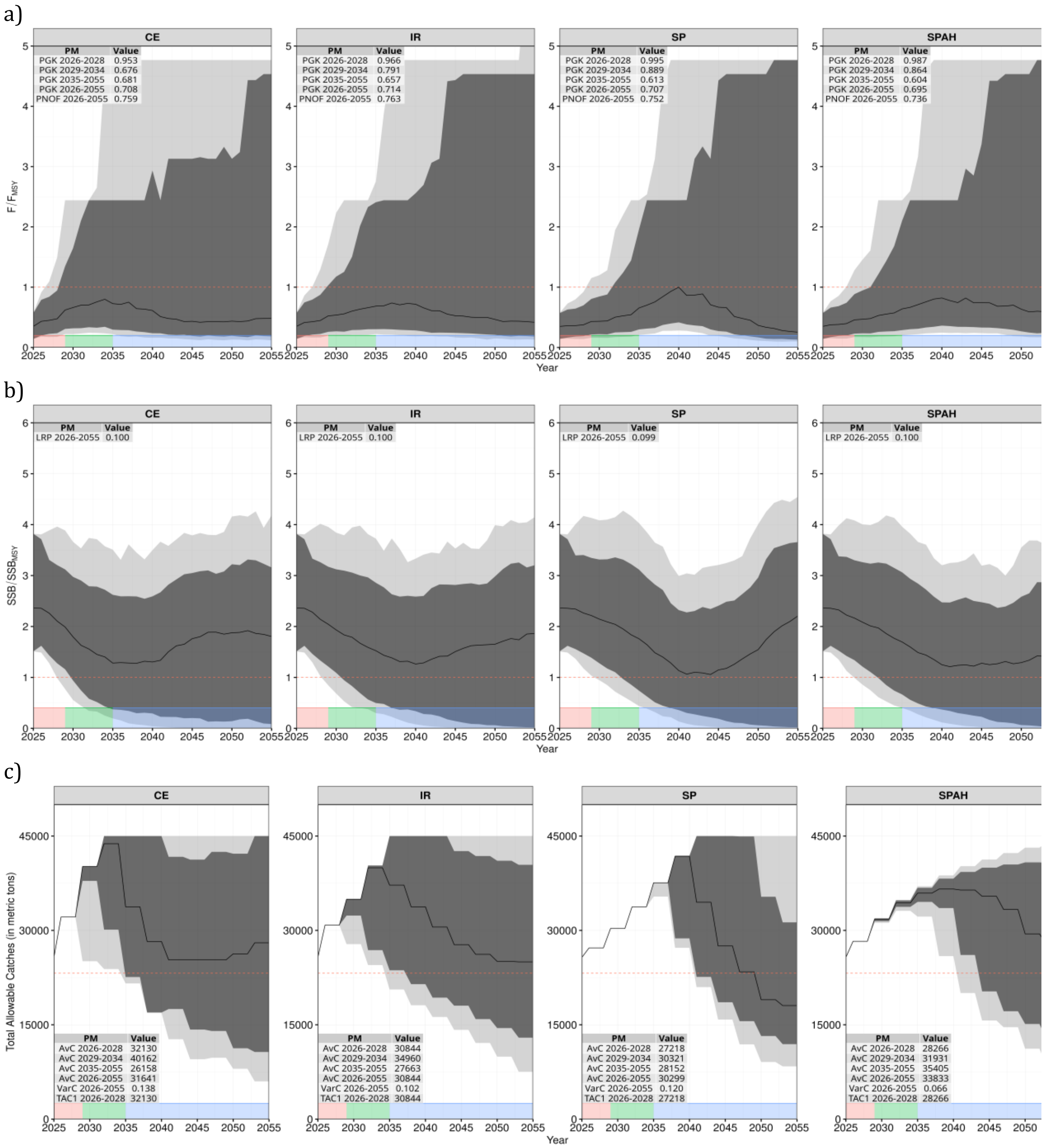


Figure 3. Trajectory of a) fishing mortality (F) relative to F_{MSY} (top row), b) spawning stock biomass (SSB) relative to SSB_{MSY} (middle row), and c) TAC (in tons, bottom row) for the 4 final CMPs. Results are summarized across all reference operating models. The black line represents the median trajectory, while shaded areas correspond to 80% and 95% quantiles respectively. The horizontal dashed red line denotes in a) F_{MSY}, b) SSB_{MSY}, and c) the average catches for the last 5 years of the historical period (2020-2024). Red bars show the short time period, while green depicts medium and blue long. The inset tables in c show the actual 2026-28 TACs for each CMP (TAC1).

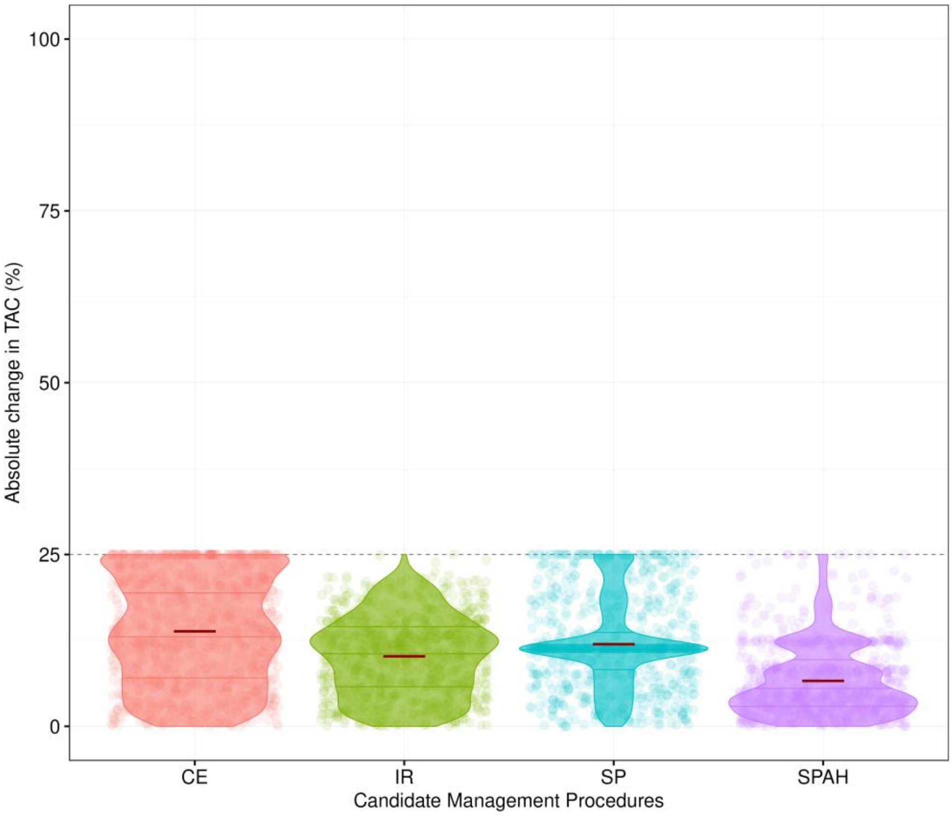


Figure 4. Violin plot for the change in TAC between management cycles. The width of the violin plot indicates the proportion of data points that are in each region of the plot (i.e. wide areas of the plot indicate a relatively large number of data points in that region, while narrow areas of the plot indicate few data points). The lines inside the violin plots indicate the 25, 50 and 75 percentiles, and the red line the mean of the distributions.

Other resources

West Atlantic Skipjack MSE interactive Shiny App (includes preliminary results): Under "Load an Example, select "Western Atlantic Skipjack Tuna"

Harveststrategies.org MSE outreach materials (multiple languages)

Addendum 1

Management objectives and the suite of corresponding performance indicators, per Rec. 24-04

Management Objectives	Corresponding Performance Indicators
Status The stock should have a 60% or greater probability of occurring in the green quadrant of the Kobe matrix over the medium-term (4-10 years) using a 30-year projection period.	**PGK_{short}**: Probability of being in the Kobe green quadrant (i.e., $SSB \geq SSB_{MSY}$ and $F<F_{MSY}$) in years 1-3 **PGK_{medium}**: Probability of being in the Kobe green quadrant (i.e., $SSB \geq SSB_{MSY}$ and $F<F_{MSY}$) in years 4-10 **PGK_{long}**: Probability of being in the Kobe green quadrant (i.e., $SSB \geq SSB_{MSY}$ and $F<F_{MSY}$) over years 11-30 **PGK_{all}:** Probability of being in the Kobe green quadrant (i.e., $SSB \geq SSB_{MSY}$ and $F<F_{MSY}$) over years 1-30 **POF:** Probability of $F>F_{MSY}$ over years 1-30 **PNOF:** Probability of $F<F_{MSY}$ over years 1-30
Safety There should be no greater than 10% probability of the stock falling below B_{LIM} ($0.4*SSB_{MSY}$) at any point during the 30-year projection period.	**LRP_{short}**: Probability of breaching the limit reference point (i.e., $SSB<0.4*SSB_{MSY}$) over years 1-3 **LRP_{medium}**: Probability of breaching the limit reference point (i.e., $SSB<0.4*SSB_{MSY}$) over years 4-10 **LRP_{long}**: Probability of breaching the limit reference point (i.e., $SSB<0.4*SSB_{MSY}$) over years 11-30 **LRP_{all}**: Probability of breaching the limit reference point (i.e., $SSB<0.4*SSB_{MSY}$) over years 1-30
Yield Maximize overall catch levels.	**AvC_{short}** – Median catches (t) over years 1-3 **AvC_{medium}** – Median catches (t) over years 4-10 **AvC_{long}** – Median catches (t) over years 11-30
Stability Any changes in TAC between management periods should be 25% or less.	**$VarC_{medium}$** – Variation in TAC (%) between management cycles over years 4-10 **$VarC_{long}$** – Variation in TAC (%) between management cycles over years 11-30 **Var_{all}** – Variation in TAC (%) between management cycles over years 1-30

Addendum 2

Key terminology used in this document

Limit reference point (LRP): A benchmark for an indicator that defines an undesirable biological state of the stock such as the B_{LIM} or the biomass limit which is undesirable to be below. To keep the stock safe, the probability of violating an LRP should be very low.

Management objectives: Formally adopted social, economic, biological, ecosystem, and political (or other) goals for a stock and fishery. They include high-level or conceptual objectives often expressed in legislation, conventions or similar documents. They must also include operational objectives that are specific and measurable, with associated timelines. When management objectives are referenced in the context of management procedures, the latter, more specific definition applies, but sometimes conceptual objectives are adopted first (e.g., Res. 22-02 for SKJ-W).

Management procedure (MP): Some combination of monitoring, assessment, harvest control rule and management action designed to meet the stated objectives of a fishery, and which has been simulation tested for performance and adequate robustness to uncertainties. Also known as a harvest strategy.

Management strategy evaluation (MSE): A simulation-based, analytical framework used to evaluate the performance of multiple management procedures relative to the pre-specified management objectives.

Operating model (OM): A model representing a plausible scenario for stock and fishery dynamics that is used to simulation test the management performance of CMPs. Multiple models will usually be considered to reflect the uncertainties about the dynamics of the resource and fishery, thereby testing the robustness of management procedures.

Performance indicator: A quantitative expression of a management objective used to evaluate how well an objective is being achieved by determining the proximity of the current value of the statistic to the objective. Also known as a performance metric or performance statistic.

Reference Grid: The operating models that represent the most important uncertainties in stock and fishing dynamics, which are used as the principal basis for evaluating CMP performance. The reference operating models are specified according to factors (e.g. natural mortality rate) that have multiple levels (possible scenarios for each factor, e.g. high / low natural mortality rate). Reference operating models are organized in a usually fully crossed orthogonal 'grid' of all factors and levels.

Robustness Set: Other potentially important uncertainties in stock and fishing dynamics may be included in a Robustness Set of operating models that provide additional tests of CMP performance robustness. They can be used to further discriminate between CMPs. Compared to the Reference Grid operating models, the Robustness Set models will be typically less plausible and/or influential on performance.

Appendix 7

Revised roadmap for the ICCAT MSE processes adopted by the Commission in 2024 and revised by the SCRS in 2025

This schedule is intended to guide the development of harvest strategies for priority stocks identified in *Recommendation by ICCAT on the development of Harvest Control Rules and of Management Strategy Evaluation* (Rec. 15-07). It builds on the initial roadmap that was appended to the 2016 Annual Meeting report, which has been revised regularly based on the SCRS advice and Commission decisions. It provides an aspirational timeline that is subject to revision and should be considered in conjunction with the stock assessment schedule that is revised annually by the SCRS. Due to the amount of cross-disciplinary dialogue that may be needed, intersessional Panel meetings and/or meetings of the Standing Working Group on Dialogue between Fisheries Scientists and Managers (SWGSM) will be necessary. However, the exact timeline for delivery is contingent on funding, prioritization, and other work of the Commission and SCRS. Tasks are divided into four categories: Commission intersessionally, SCRS development, SCRS implementation, and Commission at Annual Meeting. The table below contains the revisions suggested by the SCRS during its 2025 plenary meeting for Commission consideration, regarding the following MSE processes: North Atlantic albacore, Atlantic bluefin tuna, North Atlantic swordfish, multi-stock tropical tunas, Western Atlantic skipjack, South Atlantic Albacore and Blue shark.

		Northern Albacore	*Bluefin Tuna*	*Northern Swordfish*	*Tropical Tunas (BET, YFT, Eastern SKJ)*	*Western Skipjack*	*South Atlantic Albacore*	*Blue Shark*
2025	Commission intersessionally			COMM (PA4) to develop an exceptional circumstances protocol through an iterative consultation process with the SCRS that provides, inter alia, guidance on a range of appropriate management responses should exceptional circumstances be found to occur	COMM (PA1) provided guidance to the SCRS on how to handle: trade-offs in species yields; changes in effort over time; changes in gear; and, variable allocations over time. COMM (PA1) met intersessionally, with SCRS participation, to discuss CMP design and operational management objectives, considering how the multi-stock interactions are handled in the current MSE.	COMM (PA1) reviewed final MSE results.		Establish a small technical working group to begin considering key uncertainties for OM development.
	SCRS development	SCRS to finalize the grid of reference and robustness OMs based on Stock Synthesis as part of a new MSE. SCRS to finalize the improvement of the Observation Error Model. SCRS to test the adopted MP on the new reference uncertainty grid. SCRS to test alternative candidate MPs (e.g., based on JABBA model, or empirical).	SCRS to conduct additional retuning of OMs, incorporating the CKMR estimate of western stock abundance.	SCRS to provide final advice to COMM (PA4) on criteria for determining exceptional circumstances and inclusion in the exceptional circumstances protocol to be developed by Panel 4 in consultation with the SCRS. The SCRS to continue to develop robustness scenarios, as requested by COMM.	SCRS further developed MSE framework, incorporating feedback from COMM through PA1, including developing mechanisms to implement multi-stock CMP, development of TSD, and creation of Shiny visualization tool.	SCRS finalized MSE results, incorporating feedback from COMM through PA1 including - OM reconditioning with updated data through 2024, - CMP re-tuning	Secretariat compiled and shared necessary catch data for Stock Assessment by April per the workplan. SCRS established an ALB-S MSE Technical Team.	

		Northern Albacore	*Bluefin Tuna*	*Northern Swordfish*	*Tropical Tunas (BET, YFT, Eastern SKJ)*	*Western Skipjack*	*South Atlantic Albacore*	*Blue Shark*
2025	SCRS implementation	SCRS to evaluate existence of exceptional circumstances in accordance with the EC protocol.	SCRS to evaluate existence of exceptional circumstances in accordance with the EC protocol. SCRS to advise COMM of the TAC for 2026-2028 that results from the MP.	Should a final EC protocol be ready well in advance of the SCRS annual meeting, SCRS to evaluate existence of exceptional circumstances in accordance with that protocol.				

		Northern Albacore	*Bluefin Tuna*	*Northern Swordfish*	*Tropical Tunas (BET, YFT, Eastern SKJ)*	*Western Skipjack*	*South Atlantic Albacore*	*Blue Shark*
2025	Commission at Annual Meeting		COMM to continue use of the MP to set TAC on the predetermined timescale defined in the MP setting.	COMM to adopt exceptional circumstances protocol.		COMM to consider final evaluation of CMPs, and adopt an MP, including the TAC, at the Annual Meeting.	COMM (PA3) will be informed and provide feedback on SCRS work.	The SCRS shall inform the Commission, by 2025 on the feasibility, cost and options for developing an MSE framework. In this work, the SCRS should discuss and list the main sources of uncertainty, from the last assessment, that should be considered in the MSE. The Commission shall discuss operational management objectives, and performance indicators for CMPs.

		Northern Albacore	*Bluefin Tuna*	*Northern Swordfish*	*Tropical Tunas (BET, YFT, Eastern SKJ)*	*Western Skipjack*	*South Atlantic Albacore*	*Blue Shark*
2026 and beyond*	Commission intersessionally	(2026) PA2 will provide guidance to SCRS on updated management objectives and performance statistics.			In 2026, COMM (PA1) to provide guidance to SCRS on CMP design. Ambassadors' meetings to be held.	In 2026, SCRS to develop an exceptional circumstances protocol through an iterative consultation process that provides, inter alia, guidance on a range of appropriate management responses should exceptional circumstances be found to occur.		(2026): SCRS to finalize the uncertainty grid and OM conditioning. Discussion and testing what variables should be in the reference grid and which should be considered as robustness tests. (2026-2029): SCRS to work on OM and CMP development. A selection of CMPs with the best performance, as per COMM management objectives, should be selected by 2029. (2027-2029): COMM (PA4) to meet intersessionally, with SCRS participation, to: - discuss CMPs, operational management objectives, and performance indicators; - refine CMPs; - recommend final operational management objectives and identify performance indicators. Ambassadors' meetings to be held.

		Northern Albacore	*Bluefin Tuna*	*Northern Swordfish*	*Tropical Tunas (BET, YFT, Eastern SKJ)*	*Western Skipjack*	*South Atlantic Albacore*	*Blue Shark*
2026 and beyond*	SCRS development	SCRS to test alternative candidate MPs (e.g., empirical, constant catch, etc.). SCRS to complete new MSE in 2026.	In 2026, SCRS to review the MP in 2027-2028 as outlined in Rec. 23-07. In 2026, SCRS to conduct status check, to begin MP review, and to present results to COMM (PA2) for feedback. In 2027, SCRS to review the MP in 2028 as outlined in Rec. 23-07. In 2027, SCRS to continue MP review, and to present results to COMM (PA2) for feedback. In 2028, SCRS to finalize MP revisions, and to present results to COMM (PA2) for final feedback.	The SCRS to review the MP on a pre-determined schedule, as defined by COMM. The first review is scheduled for 2030.	SCRS to refine MSE framework and evaluate multi-stock CMPs based on COMM (PA1) feedback. In 2027, SCRS to provide final advice to COMM (PA1) on criteria for determining ECs and inclusion in the ECP to be developed by Panel 1 in consultation with the SCRS.	In 2026, SCRS to provide final advice to COMM (PA1) on criteria for determining ECs and inclusion in the ECP to be developed by Panel 1 in consultation with the SCRS. (2027) SCRS to further develop Climate Change scenarios to test robustness of MPs.	(2026) SCRS to conduct a stock assessment using Stock Synthesis 3. (2026) SCRS to agree on: - Major sources of uncertainty to be considered in the MSE; - MSE framework structure; - Reference and robustness set of operating models; (2026) SCRS to incorporate feedback from COMM/PA3. (2027): SCRS to finalize MSE and CMP testing. (2027) SCRS to communicate final MSE results to PA3. (2028) SCRS to engage with PA3 on development of an ECP.	

		Northern Albacore	*Bluefin Tuna*	*Northern Swordfish*	*Tropical Tunas (BET, YFT, Eastern SKJ)*	*Western Skipjack*	*South Atlantic Albacore*	*Blue Shark*
	SCRS implementation	SCRS to evaluate existence of exceptional circumstances in accordance with the EC protocol. SCRS to conduct periodic assessments to ensure that the conditions considered in MP testing are still applicable to the stock.	SCRS to evaluate existence of exceptional circumstances in accordance with the EC protocol. In 2028, SCRS to advise COMM of the TAC for 2029-2031 based on revised MP.	SCRS to evaluate existence of exceptional circumstances in accordance with the EC protocol. SCRS to conduct periodic assessments to ensure that the conditions considered in MP testing are still applicable to the stock. The implementation schedule specifies that the first assessment is to be conducted in 2029.	(2027): SCRS to develop an exceptional circumstances protocol through an iterative consultation process that provides, inter alia, guidance on range of appropriate management responses should exceptional circumstances be found to occur. (2028): SCRS to evaluate existence of exceptional circumstances in accordance with the EC protocol. SCRS to conduct periodic assessments to ensure that the conditions considered in MP testing are still applicable to the stocks.	SCRS to evaluate the existence of exceptional circumstances in accordance with the EC protocol. SCRS to conduct periodic assessments to ensure that the conditions considered in MP testing are still applicable to the stock. The first status check and review is scheduled for 2031.	(2028 and beyond): SCRS to evaluate application of exceptional circumstances, to the extent possible.	

		Northern Albacore	*Bluefin Tuna*	*Northern Swordfish*	*Tropical Tunas (BET, YFT, Eastern SKJ)*	*Western Skipjack*	*South Atlantic Albacore*	*Blue Shark*
2026 and beyond*	Commission at Annual Meeting	COMM to continue use of the MP to set management measures on the predetermined timescale defined in the MP setting. Per Rec. 21-04, COMM to consider adoption of new MP in 2026.	COMM to continue use of the MP to set TAC on the predetermined timescale defined in the MP setting. COMM to adopt 2029-2031 TAC based on revised MP in 2028.	COMM to continue use of the MP to set TAC on the predetermined timescale for MP setting.	(2026 or 2027): COMM to adopt an MP, including the TACs. COMM to adopt exceptional circumstances protocol in 2027 as a new Annex in MP. COMM to continue use of the MP to set TACs on the predetermined timescale for MP setting.	COMM to continue use of the MP to set TAC on the predetermined timescale for MP setting.	(2026) COMM (PA3) will be informed and provide feedback on SCRS work. (2027): COMM (PA3) at an intersessional meeting to review draft MSE results and narrow down CMPs. (2027): COMM (PA3) to adopt MP. (2028): COMM (PA3) to adopt ECP as a new Annex in MP.	(Nov 2029): COMM to adopt an MP. (2029): SCRS and COMM to finalize the EC protocol, to be adopted from this point forward.

* Assumes that the workplan is accomplished as described.

LIST OF ACRONYMS:

BET = Bigeye tuna
BFT = Bluefin tuna
COMM=Commission
CMP = Candidate Management Procedure
HCR = Harvest Control Rule
MP = Management Procedure
MSE = Management Strategy Evaluation
OM = Operating Model
SCRS = Standing Committee on Research and Statistics
TAC = Total Allowable Catch
TRO = Tropical tunas

Appendix 8

2025 Secretariat Report on Research and Statistics

The final 2025 Secretariat Report on Research and Statistics will be published in the *Report for Biennial Period 2024-2025, Part II (2025), Vol. 4.*

Appendix 9

List of Statistical and Tagging Correspondents by country

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Appendix 10

New Guidelines for authors of scientific papers for the ICCAT SCRS and Collective Volume Series

1. Introduction

The ICCAT Collective Volumes (also known as "Red Books") are produced annually and contain the Reports of SCRS Working Groups, the Detailed Reports of stock assessment sessions, and the scientific contribution papers (non peer-reviewed) submitted to the SCRS. Generally, there is one volume per year with 4-10 issues.

Scientific papers are solicited and received from scientists. Papers may be written in English, French or Spanish. There are no page limits for the contributed papers, although authors are urged to limit the content of their papers to the material that is essential to understand them. Papers are not peer-reviewed, except for some special editions, and responsibility for the contents rests upon the authors and not ICCAT.

2. Submission process

To be more consistent with the submission process of other learned journals, without sacrificing quality, authors are requested to follow formatting instructions closely. Failure to follow formats may result in your paper being returned to you for re-formatting. Publication of your document may be delayed or canceled, as a result. Please consult the checklist at the end of the document before submitting your document.

Prior to each SCRS meeting, there is a call for papers. Authors must provide the Secretariat with an electronic copy in MS Word or equivalent software (storage support or by e-mail) of all papers, including tables and figures. The deadline for the receipt of documents is one week before the start of the meeting where the paper is being presented. After the SCRS meetings, a notice is sent to all corresponding authors of SCRS documents, requesting them to indicate their intention to publish their documents in the ICCAT Collective Volume of Scientific Papers series, and to submit their papers by the deadline date stipulated in the notice.

3. Formats

First page of document should include the title, author(s) with addresses, including e-mail address, in a footnote, the summary (180-word limit) and keywords. Summaries will be translated by the Secretariat to the three official ICCAT languages and inserted on the first page. The summaries should include the subject of the investigation, a brief description of procedures applied and results, and conclusions (if any). As abstracts are subsequently included in bibliographic databases (ASFA, ICCAT), it is important that they represent the research clearly and concisely.

Keywords: Choose up to 10 from the list available **here** or from those contained in **Addendum 1 to Appendix 10**. The list includes the most common keywords in fisheries (in English only), which are used in the ASFA database. Regardless of the original language of the paper, keywords should only be in English.

General text must be in Cambria 10 (see margins below). Headings should be short, reflect a logical sequence, and follow the rules of multiple subdivision (i.e., there can be no subdivision without at least two subheadings). The entire text should be intelligible to readers and therefore, acronyms and abbreviations should be written out and all lesser-known technical terms should be defined the first time they are mentioned. Dates should be written as follows: 10 November 2026. Measures should be expressed as metric units, e.g., metric tons (t).

Tables should be inserted within the text and as close as possible to the place where first referenced, to facilitate readers understanding of what is shown in the tables. Tables should be cited in numerical order in the text. Tables should be numbered (in Arabic numbers) and the table headings should be placed above the table; avoid using grids. Table headings should be short but sufficient to allow the table to be intelligible on its own. All unusual symbols should be explained in the Table legend. Other incidental comments may be footnoted.

Figures should be inserted within the text and as close as possible to the place where first referenced, to facilitate readers understanding of what is shown in the figure. Figures should be cited in numerical order in the text. Figures should be numbered (in Arabic numbers) and the figure caption should be placed beneath the figure; avoid using grids. Clearly identify numerical scales, units and legends for the X and Y axes for each figure.

Formulas should be italics, with double spacing above and below the formula.

References to papers/documents that have been published: The format for references within the text should follow the name and year system. In the text, write "Smith and Jones (1999)" but if the reference is parenthetical, then write "(Smith and Jones, 1999)". In the References section, list alphabetically by the last name of the major author. References that have the exact same author(s) and published in the same year should be assigned a letter to distinguish between them (2002a for the first, 2002b for the second, etc.), and these should be cited as such in the text. Authors are responsible for completeness of all references. References format: Author (last name, followed by first name initials), year, title of report or manuscript, abbreviated title of the series in which the article was published, volume number, page numbers. The abbreviated title should be in accordance with the list of abbreviated titles of series (List of Title Word Abbreviations- ISO 4 - ISSN International Centre 45 rue de Turbigo 75003 Paris, France). For books, please provide publisher, city and country (see Section 4 for samples).

For your convenience, below is a summary of the formatting instructions and a model page is attached.

4. Summary of formatting instructions

Software:	MS Word or compatible software
Paper size:	A4
Margins:	Top, Bottom, Left, Right: 2.5 cm Headers: 1.5 cm; Footers: 2.0 cm Summaries: Indented by 1.2 cm (left and right).
Line spacing:	Text: Single Between paragraphs: Double Before major headings: Triple (For contributors using an East Asian version of MSWord, please ensure that the printed copy is indeed single-spaced)
Alignment:	Text must be justified
Page numbering:	Starting at 1 on the first page
Header:	First page only: SCRS/20XX/XXX [insert year and document number]
Font type:	Cambria
Font size:	Title of Document: Cambria 12 Rest of Document: Cambria 10 Footnotes: Cambria 8
Case:	Only the document title on the first page in CAPS
Tabs:	No paragraph indents. Only a suspended indentation of 0.75 cm in bibliographic references.
Files:	One file in MSWord (formatted according to above instructions)

5. Checklist

Before submitting your paper, have you…

- used MS Word or equivalent?
- used A4 paper, 2.5 cm margins, 1.5 cm headers and 2.0 cm footers?
- Cambria 12 caps **only** for title of the document? Cambria 10 font for text
- single spaced the text? double spaced between paragraphs?
- included a Summary and Keywords?
- kept to the 180 word limit for the Summary?
- used the “insert” “footnote” feature of MSWord to include the author(s) address(es)?
- cited all tables and figures in the manuscript text, numbered in the order in which they appear.
- refer to all of the tables and figures in the **boldface** text in the text?
- verified the bibliographic references in the text with the References section?
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John D. Smith, John D. Jones[2]

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SUMMARY

[Italics. Indent left and right margins by 1.2 cm.]

The Left and Right margins for the text of the Summaries should be INDENTED by 1.2 cm. The summary must be not more than 180 words and should not contain any citations. The Secretariat will translate the summaries into the two remaining ICCAT languages and insert them into the title page.

KEYWORDS [*Italics*, centered]

*Choose from the list available **here** or from those contained in **Addendum 1 to Appendix 10***

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1. Major headings: Bold, sentence case [triple space before starting a new major heading]

1.1 Sub-headings: Italics, bold, sentence case [double space before sub-headings and between paragraphs]

1.1.1 Sub-titles within sub-heading: Italics, lower case

Formulas

$$ {}^{g}YPR = \sum_{a} Y_a \cdot {}^{g}\overline{R}_a $$

[2] Affiliation, address, etc. Email address of lead author [Cambria 8], please use the “insert footnote” feature of MSWord.

Tables and Figures

[Number Tables and Figures consecutively (in Arabic numbers); Place table heading **above** the table; place figure captions **below** the figure. Cited tables and figures in the text should be **boldface** type (e.g.,"... as illustrated in **Table 1** and **Figure 1...").]**

Table 1. Headings of tables should be short but sufficient to allow the table to be intelligible on its own.

For tables:

- Please use Cambria 10;
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- Please do not paste "pictures" if possible, instead prepare or convert your table to MSWord;
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- Click on the picture, then go to "format," "picture," "layout" and choose "in line with text" for best results.

Figure 1. Captions for figures should be short but sufficient to allow the figure to be intelligible on its own.

References

Surname of first author, name or initial(s), Surname(s) of other author(s), name or initials. Year of publication. Title of paper. Journal or publication, Vol. No. (Issue): pages. DOI (insert web address when available).

Example:

Anon. 2003. Report of the 2002 Atlantic Swordfish Stock Assessment Session. Collect. Vol. Sci. Pap. ICCAT 55(4): 1289-1415.

Smith J.E., Brown C. Assessment of skipjack stocks. FAO Fish. Yearbook 22(5): 262-265.

Acevedo-Iglesias S., Herrera M., Ramos M.L., Báez J.C., Ruiz J., Rodríguez-Rodríguez G., Rojo V., Pascual-Alayón P.J., Abascal F.J. 2025. Bycatch trend and its fate of the Spanish-owned tuna purse seiners fleet from the Atlantic and Indian oceans: Impacts of the implementation of good practices, Marine Policy, Volume 177, 106694, https://doi.org/10.1016/j.marpol.2025.106694

Wood C.M., 1991. Acid-base and ion balance, metabolism, and their interactions, after exhaustive exercise in fish. Journal of Experimental Biology, 160(1), 285-308. https://doi.org/10.1242/jeb.160.1.285

Please see an example of the above in **Addendum 2 to Appendix 10**.

Addendum 1 to Appendix 10

List of Keywords*

Analysis	*Biology*				*Environment*	*Fishery*		*Statistics*	*Management*
Accuracy	Abundance	Electrophoresis	Nursery grounds	Spawning seasons	Bottom topography	Aquaculture products	Fishing nets	Aerial surveys	Coastal zone management
Artificial intelligence	Age at recruitment	Escapement	Otoliths	Stock identification	Climatic data	Aquaculture systems	Fishing technology	Age composition	Ecosystem management
Autocorrelation	Age determination	Ethology	Parasites	Stomach content	Convergence zones	Aquaculture techniques	Floating structures	Biological sampling	Exclusive Economic Zone
Catchability	Algal blooms	Evolution	Plankton	Tagging mortality	Current data	Artisanal fishing	Gillnets	By catch	Exclusive rights
Catch ratio	Animal morphology	Fecundity	Population characteristics	Taxonomy	Dissolved oxygen	Attracting techniques	High seas fisheries	Catch composition	Fishery boundaries
Computer programs	Animal reproductive organs	Feeding behaviour	Population density	Vulnerability	Environmental conditions	Bait fishing	Holding capacity	Catch statistics	Fishery disputes
Econometrics	Annual variations	Feeding migrations	Population dynamics	Yield	Environmental effects	Canning	Joint ventures	Data collections	Fishery management
Economic analysis	Behaviour	Fish diseases	Population genetics	Zoobenthos	Environmental factors	Capture fishery economics	Line fishing	Fish catch statistics	Fishery policy
Economic models	Biomass	Fish eggs	Population numbers	Zooplankton	Fishery oceanography	Coastal fisheries	Long lining	Fish conversion factors	Fishery regulations
Experimental research	Biometrics	Fish larvae	Population structure		Long-term changes	Commercial fishing	Multispecies fisheries	Fishery statistics	International waters
Fishery economics	Biochemical analysis	Fish physiology	Potential resources		Mercury	Echosounders	Net fishing	Fishery surveys	Legislation
Fishing mortality	Biophysics	Fishery biology	Potential yield		Mixed layer	Exploitation	Pelagic fisheries	Fishing effort	Licensing
Fishing power	Biotechnology	Fishery sciences	Predation		Oceanography	Fish detection	Processed fishery products	Imaging techniques	Overfishing
Gear selectivity	Blood cells	Food preferences	Prediction		Pelagic environment	Fish fillets	Purse seining	Length-weight relationships	Quota regulations
Least squares method	Body size	Forage fish	Proteins		Pollution effects	Fish handling	Radar	Logbooks	Resource conservation
Mathematical models	Body temperature	Genetics	Recruitment		River plumes	Fish products	Shark fisheries	Remote sensing	Season regulations
Multivariate analysis	Bones	Geographical distribution	Recruitment rate		Salinity	Fish storage	Ship design	Research vessels	Size limit regulations
Natural mortality	Breeding seasons	Growth curves	Reproductive behaviour		Seasonal variations	Fish utilization	Sport fishing	Size composition	Surveillance and enforcement
Numerical analysis	Breeding sites	Habitat	Reproductive cycle		Short-term changes	Fishery development	Trap fishing	Size distribution	Trade
Random processes	Buoyancy	Homing behaviour	Resource availability		Spatial variations	Fishery engineering	Trawling	Sonic tags	Underutilized species
Simulation	Chemical composition	Identification keys	Schooling behaviour		Surface layers	Fishery industry	Trolling	Statistical sampling	
Steady state	Density dependence	Juveniles	Sex determination		Surface salinity	Fishery products	Tuna fisheries	Tagging	
Stochastic processes	Depleted stocks	Life history	Sex ratio		Surface temperature	Fishery technology			
Stochastic models	Diving	Longevity	Sexual dimorphism		Temporal distribution	Fishing buoys			
Stock assessment	DNA	Migrations	Sexual maturity		Thermocline	Fishing capacity			
Time series analysis	Ecological aggregations	Morphometry	Spawning		Water pollution	Fishing gear			
Variance analysis	Ecological associations	Nervous system	Spawning grounds		Wind-driven circulation	Fishing grounds			
Yield predictions	Ecosystems		Spawning migrations			Fishing lines			
Yield/recruit									

* Species names or any other keywords can also be used.

Addendum 2 to Appendix 10

SILKY SHARK POST-RELEASE SURVIVAL IN THE ATLANTIC OCEAN TROPICAL TUNA PURSE SEINE FISHERY: A BASELINE FOR BEST HANDLING AND RELEASE PRACTICES

M. Grande[3], I. Krug[1], N. Cuevas[1], A. Salgado[1],
J. Murua[1], M. Erauskin-Extramiana[1], I. Onandia[1], J. Ruiz[1], J. Santiago[1].

SUMMARY

Popup Satellite Archival Tag (PSAT) marking programs are crucial for evaluating post-release survival (PRS) of Endangered, Threatened, and Protected (ETP) species that are incidentally caught in fishing operations. This study presents for the first time, results on post-release survival estimates of silky shark released during a fishing trip following protocols from the Code of Good Practices implemented by the OPAGAC fleet in a purse seine vessel. Twenty-three silky sharks were satellite tagged, and blood samples from 90 sharks were collected to evaluate lactate levels as an indicator of shark PRS. A vitality index based on state and behavior at release was also assigned to all the accidentally caught sharks. Subsequently, the relationship between mortality and vitality status, as well as the relationship between mortality and the lactate concentration in each captured individual, was established. The predicted silky shark survival rate for the overall trip was close to 26% based on satellite tag data and vitality index, while the survival rate predicted using lactate concentration threshold was 49%. Shark survivorship decreased as the brailing operation advanced and vitality index declined.

RÉSUMÉ

Les programmes de marquage par marques-archives pop-up reliées par satellite (PSAT) sont essentiels pour évaluer la survie après remise à l'eau (PRS) des espèces en danger, menacées et protégées (ETP) qui sont capturées accidentellement lors d'opérations de pêche. Cette étude présente pour la première fois des résultats sur les estimations de la survie suivant la remise à l'eau de requins soyeux relâchés lors d'une sortie de pêche suivant les protocoles du Code de Bonnes Pratiques mis en œuvre par la flottille de OPAGAC dans un senneur. Vingt-trois requins soyeux ont été marqués avec des marques satellites et des échantillons de sang de 90 requins ont été prélevés pour évaluer les niveaux de lactate en tant qu'indicateur du SRP des requins. Un indice de vitalité basé sur l'état et le comportement au moment de la remise à l'eau a également été attribué à tous les requins capturés accidentellement. Ensuite, la relation entre la mortalité et l'état de vitalité, ainsi que la relation entre la mortalité et la concentration de lactate dans chaque requin capturé, a été établie. Le taux de survie prédit pour le requin soyeux pour l'ensemble de la sortie était proche de 26% sur la base des données des marques satellites et de l'indice de vitalité, tandis que le taux de survie prédit en utilisant le seuil de concentration de lactate était de 49%. Le taux de survie des requins a diminué à mesure que l'opération de salabardage avançait et l'indice de vitalité a diminué.

RESUMEN

Los programas de marcado con marcas de archivo por satélite emergentes (PSAT) son cruciales para evaluar la supervivencia posterior a la liberación (PRS) de las especies en peligro, amenazadas y protegidas (ETP) que son capturadas incidentalmente en operaciones de pesca. Este estudio presenta por primera vez resultados sobre estimaciones de supervivencia tras la liberación de ejemplares de tiburón jaquetón liberado durante una marea siguiendo los protocolos del código de buenas prácticas implementado por la flota de OPAGAC en un buque de cerco. Se marcaron por satélite 23 ejemplares de tiburón jaquetón y

[3] AZTI, Marine Research, Basque Research and Technology Alliance (BRTA). Herrera Kaia, Portualdea z/g, 20110 Pasaia – Gipuzkoa, Spain.

se recogieron muestras de sangre de 90 tiburones para evaluar los niveles de lactato como indicador de la PRS del tiburón. También se asignó a todos los tiburones capturados accidentalmente un índice de vitalidad basado en el estado y el comportamiento en el momento de la liberación. Posteriormente, se estableció la relación entre la mortalidad y el estado de vitalidad, así como la relación entre la mortalidad y la concentración de lactato en cada ejemplar capturado. La tasa de supervivencia del tiburón jaquetón prevista para toda la marea se aproximó al 26 % a partir de los datos de las marcas por satélite y el índice de vitalidad, mientras que la tasa de supervivencia prevista utilizando el umbral de concentración de lactato fue del 49 %. La supervivencia de los tiburones disminuyó a medida que avanzaba la operación de salabardeo y disminuía el índice de vitalidad.

KEYWORDS

Silky shark, C. falciformis,
post-release survival, bycatch, FADs, purse seiners, tropical tuna

Introduction

Silky sharks (*Carcharinus falciformis*) are one of the most significant shark species bycaught by tuna fisheries globally (Oliver *et al*. 2015). This species is currently listed as vulnerable by the IUCN Red List of Endangered Species[4]. Silky shark bycatch primarily occurs in gillnets and longlines (Murua *et al*., 2021) but it is also the predominant elasmobranch species bycaught in purse seiners (Ruiz *et al*., 2017; Acevedo-Iglesias *et al*., 2025). Global Ecological Risk Assessments (ERAs) conducted for longline fisheries in the Atlantic have shown that silky sharks are at the highest risk (Cortés *et al*. 2010). Similarly, an ERA conducted in the Indian Ocean, which included longlines, gillnets and purse seiners, indicated that silky sharks are at the highest risk for longlines but not for purse seiners due to the implementation of Best Handling and Release Practices (BHRPs), which reduce their susceptibility to the purse seine gear (Murua *et al*. 2018; Acevedo-Iglesias *et al*., 2025). In this sense, studies on post-release survival of ETP species using satellite archival tags are essential for fishery impact assessment and identification of effective mitigation measures for shark conservation (Ellis *et al*., 2017). For example, best handling and release practices were identified as rapid and cost-effective conservation and management measure for reducing the vulnerability status of *Mobula mobular* in the Inter-American Tropical Tuna Commission (IATTC) area (Griffths and Lezama, 2021). However, studies on PRS in different gears and monitoring of the adoption and implementation of the measure were identified as essential to confirm the effectiveness of the recommended measure (Griffths and Lezama, 2021).

Due to the vulnerability of silky shark in fisheries associated with tuna and other pelagic species, the International Commission for the Conservation of Atlantic Tunas (ICCAT) has implemented measures to protect them. For example, ICCAT recommends that CPCs prohibit the retention, transshipment, or landing of silky sharks, whether dead or alive, and ensure their release back into the ocean (Rec 11-08). Observers are tasked with recording the number of silky sharks discarded or released, along with their status (i.e., dead or alive), to improve data collection and conservation efforts. European Union Council Regulations also establish that Member States shall encourage the release of live sea turtles, mobulids and rays, and sharks, and the prompt release unharmed, to the extent practicable, of all non-target species, as well as additional measures to improve the selectivity of fishing gears (EC) Nº 520/2007). The use of non-entangling FADs with no mesh net was also introduced in the ICCAT area to minimize potential entanglement of sharks (Rec. 24-01).

[4] https://www.azti.es/wp-content/uploads/2024/02/AZTI_Guia_BBPP_low.pdf

Due to their natural aggregative behaviour around floating objects and the overlap of juvenile silky shark habitats with tropical tuna purse seine fisheries (Lopez *et al*., 2020), silky sharks occur in FAD sets, representing the principal elasmobranch bycatch species in tropical tuna purse seiners (i.e., 75-95% of all shark interactions) (Filmalter *et al*., 2011; Gilman 2011; Garcia and Herrera, 2018; Hutchinson *et al*., 2019, Ruiz *et al*., 2017; Acevedo-Iglesias *et al*., 2025). Although FAD purse seine shark bycatch ratios remain low when compared to other fisheries (Garcia and Herrera, 2018; Perez-Roda *et al*., 2019; Gilman *et al*., 2020; Murua *et al*., 2021), given the vulnerable status of this species it is important to take actions to minimize any impact.

To reduce at vessel shark mortality, purse seine vessels have adopted Best Handling and Release Practices (BHRPs)[5] mostly based on guidelines by scientists (Poisson *et al*., 2014a; Grande *et al*., 2020; Zollett and Swimmer, 2019; Wain *et al*., 2022; Acevedo *et al*. 2025), often also supported by regional fisheries management organization (RFMO) conservation measures. In the case of the Spanish fleet OPAGAC and ANABAC voluntarily apply a Code of Good Practices (CGPs). The CGP includes BHRPs requirements for ETP species that are, since 2014, regularly revised by their members and scientific staff (Grande *et al*., 2020; Acevedo-Iglesias *et al*. 2025). Recently, the fleet has also started testing and implementing novel bycatch release devices (Murua *et al*., 2025). Some purse seine vessels are installing specific fauna release devices in their upper decks, such as hoppers, ramps, sorting grids, and velcros and in the lower deck, such as bycatch release conveyor belts and gutters (Murua *et al*., 2025). As a result, the percentage of sharks released alive has substantially increased since 2013, when the percentage of live releases was low, to reach 75% in 2022 according to Acevedo *et al*. (2025). PRS studies in purse seiners have indicated that the state of the specimen at release and their survival is highly dependent on the time and place at which the individuals arrive on deck, (e.g., entangled in the net, first brail, posterior brails) (Poisson *et al*. 2014b, Hutchinson *et al*., 2015, Eddy *et al*., 2016; Onandia *et al*., 2021) and the method of handling and release (Hutchinson *et al*., 2015; Onandia *et al*., 2021; Grande *et al*., 2022). At present purse seine silky shark PRS studies using PSATs have focused on the Pacific (Hutchinson *et al*., 2015; Eddy *et al*., 2016; Murua *et al*., 2024) and Indian Oceans (Poisson *et al*., 2014b) but there are no substantial estimates in the Atlantic Ocean to evaluate the impact of BHRPs from the CGPs towards reducing shark mortality. Therefore, this document aims to evaluate for the first time the post-release survival of silky shark in the Atlantic Ocean on a purse seine vessel where sharks have been released following BHRP guidelines.

1. Material and Methods

1.1 Field work

Research was conducted during a fishing trip on an OPAGAC purse seine vessel, in the tropical Atlantic from August 21st to September 19th, 2023. A total of 26 sets were carried out over the course of the trip (25 on floating objects or FOBs and one on a free school, FSC). Interactions with silky sharks were recorded in 25 sets (24 FOB sets and 1 FSC set). Most sets were located in the central part of the eastern tropical Atlantic, between latitudes 5N-10S and longitudes 10E-10W (**Figure 1**).

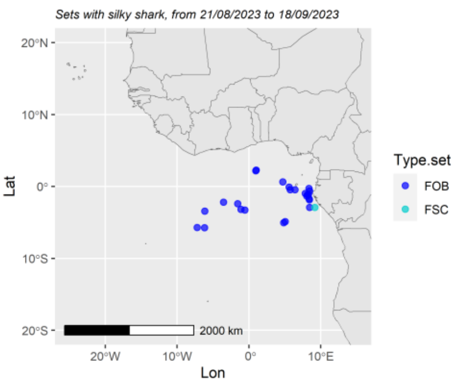

Figure 1. Positions of sets with incidental catch of silky shark (*C. falciformis*). FOB: sets on FADs; FSC: sets on a free school.

[5] https://www.azti.es/wp-content/uploads/2024/02/AZTI_Guia_BBPP_low.pdf

In each interaction with *C. falciformis*, the following information was recorded:

- sex (i.e., female, male, indeterminate or unknown),
- total length in cm (TL),
- number of the brail in which the specimen was taken on board (1^{st}, 2^{nd}, 3^{rd} brail and subsequent),
- position in the brail (up, medium, bottom),
- time when the shark was brailed on board and released,
- mode of release: (i) using the brailer, (ii) using light equipment such as stretcher, fabric, *sarria* or cargo net, (iii) manually from deck, (iv) after disentangling from hauling net;
- vitality index (i.e., state of the animal at release based on the states proposed by Heuter and Manire (1994):

  - (i) excellent (i.e., very active and energetic, strong signs of life on deck and when returned to water);
  - (ii) good (i.e., active and energetic, moderate signs of life on deck and when returned to water);
  - (iii) correct (i.e., tired and sluggish, limited signs of life, moderate revival time required when returned to water, slow or atypical swimming away);
  - (iv) poor (i.e., exhausted, no signs of life, bleeding from gills, jaw or cloaca, long revival time required when returned to water, limited or no swimming observed upon release);
  - (v) very poor or death (i.e., moribund, no signs of life, excess bleeding from gills, jaw, or cloaca, unable to revive upon return to water, no swimming movement, sinks).

  For this analysis, "good" and "correct" vitality indexes were grouped together, as it can often be difficult to distinguish between them.

- behavior after release (swim vigorously, swim slowly near the surface, sinks with little movement).

Additionally, in each interaction, the observer recorded whether the handling and release practices applied followed the guidelines defined in OPAGAC's CGPs[6] (Grande *et al*., 2020; Murua *et al*., 2025).

It is worth noting that at the time of the trip the vessel did not have any special shark release devices on board, such as a hopper, ramp or lower deck gutter. Consequently, all sharks were released from the upper deck, mainly by hand.

A total of 23 sharks were tagged with PSATs, of which 20 were Survivorship-PATs (SPATs)[7] and 3 MiniPATs[8] (Wildlife Computers, Inc.). The tags were attached with a 10 cm long monofilament tether protected by a silicon tube to prevent abrasion. A small titanium dart was used for 12 individuals, while the other 11 were tagged using a Domeier anchor. To facilitate the entry of the anchor, a small cut of two centimeters was previously made with a scalpel at the base of the dorsal fin (i.e., tether, anchor and scalpel were smeared with Betadine Antiseptic Cream 5% povidone iodine to prevent infections).

To evaluate the lactate levels, blood samples of 90 individuals (including the 23 tagged sharks) were taken from vessels in the caudal peduncle of silky sharks and measured "in situ" using a lactate meter[9] (Lactate plus).

1.2 Tag programming

SPAT tags were programmed to be released after 60 days of deployment and set by default to record maximum and minimum daily depths and temperatures, and ten-minute interval depth data for the end of the deployment (i.e., last 4 days). MiniPAT tags were programmed to be released 180 days after deployment. If depth exceeded 1,400-1,700 meters, or remained constant for more than 3 days, both being signs of the animal being dead, the pop-up tags were programmed to automatically release. Daily data recorded with MiniPATs corresponded to temperature, depth, and change in light-level for each UTC day, with light intensity data recorded every 600 seconds.

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[6] https://www.azti.es/wp-content/uploads/2024/02/AZTI_Guia_BBPP_low.pdf
[7] https://wildlifecomputers.com/our-tags/pop-up-satellite-tags-fish/spat/
[8] https://wildlifecomputers.com/our-tags/pop-up-satellite-tags-fish/minipat/
[9] https://www.laktate.com/producto/lactate-plus/

1.3 Post-release survival analysis

For each tagged shark, a fate was determined (i.e., dead or alive) based on the depth records transmitted by the SPATs and MiniPATs and the time elapsed from tagging to detachment. Sharks were considered to have survived the fishing operation if their tags indicated normal daily depth and horizontal migration behaviour for more than 10 days. This time frame was used following standard protocols employed in other shark PRS studies (Hutchinson *et al*., 2015), which are taken as a sign that sharks remained alive after the fishing event. If a premature tag release was identified and was not due to changes in the shark's vertical movement, the depth records, vitality state and lactate levels were analysed to investigate the cause of the tag detachment and assign a fate.

For satellite tagged individuals, a survival rate was assigned to each vitality index category, with differences being assessed by a Chi-square test. Later, the survivorship percentages by vitality index category were applied to predict the overall survivorship for all silky sharks caught in the trip.

In addition, for silky sharks that were both tagged and had blood samples taken, a Wilcoxon rank sum test was used to evaluate differences in lactate between survivors and dead sharks as determined from the PSAT data. This analysis also included four dead individuals that were blood sampled but not tagged. The logistic regression model was used to relate survivorship (based on tagging) and lactate concentration estimated from blood samples. This logistic regression model and maximum likelihood estimation were used to predict the probability of survival for the rest of sharks that were blood sampled but not tagged, using a 50% probability threshold from the survivorship curve (Hutchinson *et al*., 2015). The fitted values were then used to estimate a lactate survival threshold. This lactate threshold was applied to predict survival rates by vitality index and then to predict overall survivorship for all sharks captured during the fishing trip.

2. Results

2.1 Satellite Tagged Sharks

A total of 23 silky sharks were satellite tagged during the fishing trip. All deployed tags recorded and transmitted depth information throughout the tracking period. There were eight post-release mortalities identified. Six tags detached after the sharks reached excessive depths, while the other two detached after three days for unknown reasons. Fifteen sharks survived the fishing operation, with 14 showing normal behavior for at least ten days. In one case, there was a premature release at 9 days from deployment for unknown reasons (i.e. tag ID = 241509), but the shark exhibited normal vertical movements during its tracking period, active behavior (i.e. excellent vitality state) and low lactate levels (4.9 mmol/L) and was therefore counted as alive. Details of the tagged sharks are given in **Table 1**.

Table 1. Shark tagged in the Atlantic Ocean in a purse seiner during 2023.

Tag ID	*Sex*	*TL (cm)*	*Tag deployment date*	*Tag detachment* date	*Detachment reason*	*Days*
221665	male	215	11/09/2023	18/10/2023	premature	37
221668	male	172	15/09/2023	25/10/2023	premature	40
227461	male	198	10/09/2023	09/11/2023	programmed	60
227462	female	209	11/09/2023	10/10/2023	premature	29
227463	female	205	08/09/2023	07/11/2023	programmed	60
227464	male	153	01/09/2023	08/10/2023	premature	37
227465	female	127	03/09/2023	22/10/2023	premature	49
227467	female	142	09/09/2023	12/09/2023	premature	3
227468	female	107	13/09/2023	16/09/2023	depth	3
227469	female	121	03/09/2023	03/09/2023	depth	0

227470	female	113	04/09/2023	15/10/2023	premature	41
227472	male	206	09/09/2023	12/09/2023	premature	3
227473	male	189	13/09/2023	16/09/2023	depth	3
241509	male	193	10/09/2023	19/09/2023	premature	9
241814	male	122	02/09/2023	25/10/2023	premature	53
241816	female	217	28/08/2023	05/10/2023	premature	38
241818	female	185	28/08/2023	16/09/2023	premature	19
241819	male	166	30/08/2023	14/09/2023	premature	15
241824	female	100	28/08/2023	28/08/2023	depth	0
252187	male	171	13/09/2023	16/09/2023	depth	3
252208	female	124	14/09/2023	26/09/2023	depth	12
252210	female	124	17/09/2023	16/11/2023	programmed	60
252213	female	188	15/09/2023	15/09/2023	depth	0

2.2 Sharks bycaught and released

A total of 247 silky sharks were observed during the trip, of which 131 were females (53%), 108 were males (44%), and 8 were not sexed due to the observer not having enough time to identify them, as quick release for survival was prioritized. Individual sizes ranged from a minimum of 81 cm to a maximum of 252 cm, with a bimodal distribution (**Figure 2**).

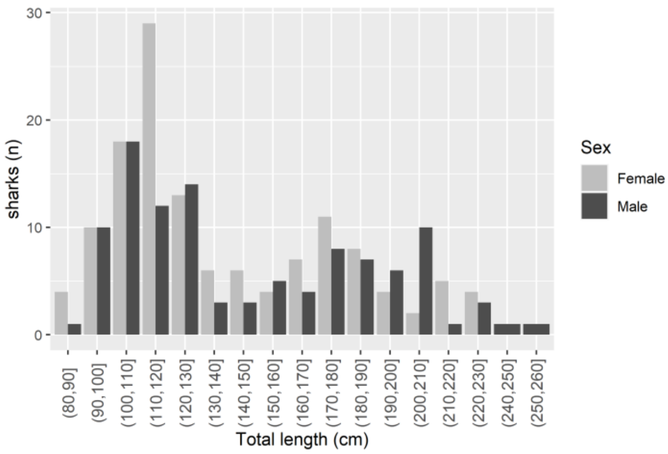

Figure 2. Size distribution of silky shark (*C. falciformis*) observed during the trip.

Vitality index was obtained for all the silky sharks caught during the fishing trip (**Table 2**). Sharks were handled and released applying BHRPs (Grande *et al*., 2020; Murua *et al*., 2025), mainly by hand on the upper deck:

- 4.9% (n=12) were entangled in the net when hauling (i.e., sharks entangled in the purse seine net during 'haul back' and removed by fishers as the net reached the deck; thus, these sharks were lifted on board before sacking up and brailing),

- and 95.1% were brailed and released (n=235).

Table 2. Number of sharks released by status and fishing operation stage released (i.e., entangled in the net or brailed).

Phase	VeryPoor/Dead	Poor	Correct_Good	Excelent	TOTAL (n)
Entangled	2	1	7	2	12
1st brail	9	5	8	4	26
2nd brail	20	5	8	2	35
3rd brail or later	115	22	36	1	174
TOTAL (n)	146	33	59	9	247

2.3 Post-release survival based on the vitality index

For tagged sharks, significant differences were detected in survivorship among vitality index categories (p-value < 0.01). The percentage of tagged sharks that survived according to the vitality index was 100% for those released in excellent condition, 84.6% for those in good or correct condition, 16.7% for sharks in poor condition and 0% for very poor or dead condition. By applying the survival rate by vitality index of the tagged individuals to all sharks in the trip, we predicted an overall survival rate of 26.1% for silky sharks accidentally captured (**Table 3**).

Table 3. Number of sharks by fishing stage and vitality index category. The predicted survival (%) is given for each category based in survivorship estimated from tagged animals by vitality index.

Phase	*Very Poor/Dead*	*Poor*	*Correct_Good*	*Excelent*	*Survival (n)*	*%*
Entangled	2	1 (1)	7 (1)	2	8	67.4
1st brail	9	5	8 (5)	4 (3)	12	44.6
2nd brail	20	5 (1)	8 (1)	2	10	27.4
3rd brail or subsequents	115 (1)	22 (4)	36 (6)	1	35	20.2
survival (n)	0	6	50	9	64	26.1
%	0	16.7	84.6	100.0		

(X) Number of tagged sharks.

2.4 Post-release survival based in lactate levels

Significant differences in lactate concentrations were found (Wilcoxon rank sum, n = 27, p-value = 0.01) between tagged and blood sampled sharks that survived the fishing operation (n=15) and dead sharks (n=12, eight tagged and four blood sampled but not tagged). Analyzing survival rates by lactate level intervals obtained from tagged individuals, we calculated the survival probability curve shown in **Figure 3.** We assume a survival threshold at 6.86 mmol/L, concentration at which the probability of survival was estimated as p = 0.5 from the survivorship curve (i.e., if [lactate] < 6.86 mmol/L then it was considered a "survivor" and above a "non-survivor"). Based on this survival threshold, a survivorship rate was estimated for each vitality state for those sharks that were blood-sampled and applied to all sharks in the trip to estimate an overall survival. The overall shark survival estimated using this extrapolation was 49.4% (**Table 4**).

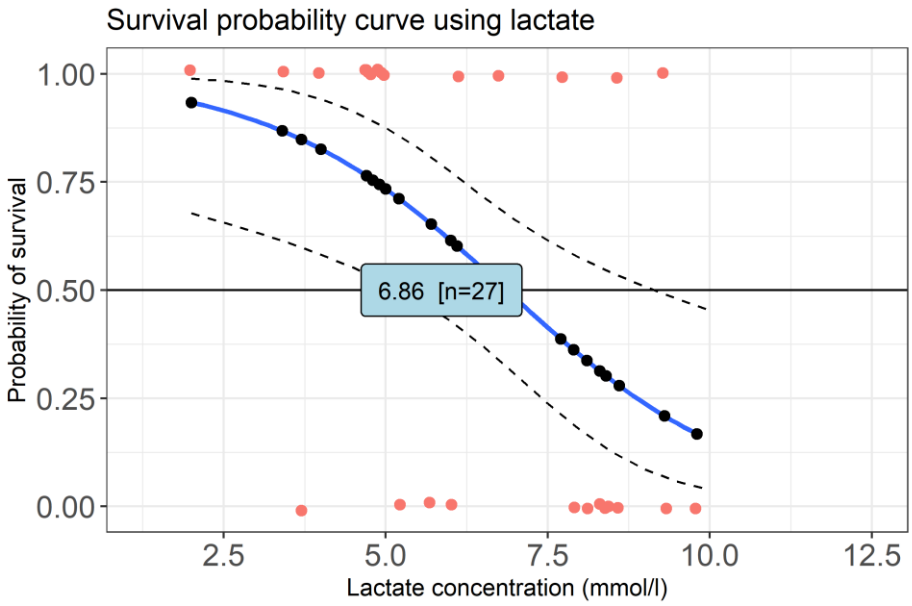

Figure 3. Logistic regression model for the estimated proportion of survival *C. falciformis* at lactate concentration (LC) intervals. Red points are the observations of shark with blood samples that were released and survived or died. Black points represent the predicted proportion of survival sharks. The solid blue line is the logistic regression curve.

Table 4. Predicted survival by fishing operation stage and vitality index. The predicted survival (%) is given for each category based in lactate threshold.

Phase	*Very Poor/Dead*	*Poor*	*Correct_Good*	*Excelent*	*Survival (n)*	*%*
Entangled	2	1	7	2	9	72.1
1st brail	9	5	8	4	16	61.8
2nd brail	20	5	8	2	18	50.4
3rd brail or later	115	22	36	1	79	45.6
survival (n)	48	19	46	9	122	49.4
%	32.6	58.8	77.3	100		

3. Discussion and conclusions

This study presents, for the first time, post-release survival rates for silky sharks in a tropical tuna purse seiner of the Atlantic Ocean using adopted BHRPs by this fleet's CGPs and which closely align with best practice recommendations by RMFOs. Based on pop up satellite archival tags and vitality index, the overall silky shark survivorship rate for the trip was estimated at 26.1%. When this survivorship rate was estimated by vitality stage linked to blood lactate levels, the overall survivorship estimated reached 49.4%. The differences between both indicators are mainly due to differences in survivorship rate by vitality state determined using telemetry or blood lactate threshold. We observed in previous experiments that there is a significant correlation between lactate levels and vitality states (Grande *et al*., 2022). However, in this research cruise, high variability in blood lactate levels was observed, mainly in larger sized animals, ranging from poor to correct vitality states. Some sharks apparently moribund in behavior did not show high lactate levels. Therefore, when applying the blood lactate threshold to assign a fate they were categorized as alive. This resulted in differences in survival rate estimates by vitality state between methods (**Table 5**). While it is possible that these sharks in the worst vitality state recovered and survived, it is also possible that they were damaged in ways unrelated to lactate levels, such as trauma sustained during the fishing operation.

Table 5. Percentage of survivorship by vitality state using tagging information alone and the blood lactate threshold.

	Survivorship (%)			
Method	***Very Poor***	***Poor***	***Correct_Good***	***Excelent***
Satellite tagging	0	16.6	84.6	100
Blood lactate threshold (6.8 mmol/L)	32.6	58.8	77.3	100

Blood lactate has been used previously as a predictor of shark post-release mortality (Moyes *et al*., 2006; Gallagher *et al*., 2014; Hutchinson *et al*., 2015). When the rate of demand for oxygen in cells exceeds the rate of supply by the cardiovascular system (during exercise, for example), animals undergo a shift from aerobic to anaerobic metabolism, and lactate is generated as a by-product of the anaerobic glycolysis (Wood, 1991). Lactate is gradually diffused from the white muscle into the blood, and the blood oxygenation carrying capacity of blood is diminished resulting in fish asphyxia (Gallagher *et al*., 2014). We observed that the lactate threshold estimated in this study is lower or more restrictive than observed in previous silky shark studies (Hutchinson *et al*., 2015; Onandia *et al*., 2021; Grande *et al*., 2022) (**Table 6**). Blood lactate levels are species specific and influenced by shark size, as rate of lactate accumulation tends to decrease with size and these specimens tend to display a higher ability to recover (Gallagher *et al*., 2014). Therefore, shark size could be one of the factors responsible for differences in lactate threshold estimates between the different studies. To further explore the patterns of the behavioral and physiological post-survival indicators used in this study more samples are needed to reduce variability. Currently, efforts continue to tag and collect more blood samples from sharks in the Atlantic Ocean and worldwide.

Table 6. Silky shark lactate survivorship threshold estimates.

Study	***n tagged***	***n blood sampled***	***Size (cm)***	***Lactate threshold (mmol/L)***
Hutchinson *et al*., 2015	28	87	115.2 ± 17.5	11.3
Onandia *et al*., 2021	28	45	136.8 ±22.8	8.2
This work	23	90	142.7 ± 40.7	6.9

The effects of satellite tag attachments on survival probability are unknown but expected to be low, given the extensive use of archival satellite tags to study the survivorship of bycaught elasmobranchs (Musyl and Gilman, 2019) and if performed by an experienced scientist. We assume that tag deployments had little or no effect on survival probabilities estimated in this study. However, we observed high rates of premature tag releases. With the information gathered, we cannot determine the reason yet, but prior studies have also reported failures related to battery issues (Stewart *et al*., 2024). In this study, the tags provided sufficient information to confirm that the sharks survived the fishing operation, as premature detachments occurred mainly after 10 days from deployment (the time threshold stablished to link the mortality with the fishing operation), except for tags 241509 which was detach in 9 days from deployment and classified as alive given the lactate level and vitality state, and 227467 and 227472 which detached in 3 days from deployment and classified as dead. In this sense, survivals could be masked by tag failure if occurring before the stablished time threshold, as in the case of the tag 241509, and impact on overall survival rate estimates.

As observed in previous studies on tuna purse seine vessels (Poisson *et al*., 2014; Hutchinson *et al*., 2015; Onandia *et al*., 2021; Grande *et al*., 2022), the PRS is higher when elasmobranchs are in good shape while still swimming in the net before sacking up. Mortality starts to rise from the moment the sack is formed and incrementally as time passes with the number of brails. The vitality index observed in our study simultaneously decreased with brail number. The overall survivorship rate estimated is slightly higher than previous studies in which BHRPs were also applied (Poisson *et al*., 2014; Hutchinson *et al*., 2015), but lower than in vessels where specific bycatch release devices were installed for shark release (Onandia *et al*., 2021; Grande *et al*., 2022; Murua *et al*., 2024). Initial estimates in 2014 and 2015 indicated an overall survivorship of 16-19% (Poisson *et al*., 2014; Hutchinson *et al*., 2015). Ten years later, we observed that survivorship estimates are slightly higher. The experience gained by the crew, in collaboration with scientists, could contribute to implementing more efficient practices on board. However, when manual handling is not supported with other specific tools that minimize handling stress and time on deck, the contribution of the experience to increase PRS may not be sufficient. For BHRPs to show greater reductions in elasmobranch mortality, handling and release protocols could be improved with the implementation of specific bycatch release devices, many of which are based on ideas originating from fishers themselves (Murua *et al*., 2025).

Acknowledgements

This study has been funded by OPAGAC. We would like to thank OPAGAC, ALBACORA and the crew members of the purse seine fishing vessel for making this study possible.

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