

REPORT OF THE 2026 ICCAT ATLANTIC SWORDFISH DATA PREPARATORY MEETING
(Online, March 23 to 27 March 2026)

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

1. Opening, adoption of agenda and meeting arrangements

The meeting was held from 23 to 27 March 2026. The Swordfish Coordinator, Dr Kyle Gillespie (Canada), opened the meeting with the Swordfish Species Group (the Group) and the Rapporteurs for the southern Atlantic and Mediterranean stocks, Dr Luis Gustavo Cardoso (Brazil) and Dr George Tserpes (European Union (EU)), respectively. The ICCAT Executive Secretary welcomed and thanked the participants. The Chairman proceeded to review the agenda, which was adopted without changes (**Appendix 1**).

The list of participants is included in **Appendix 2**. The list of SCRS documents and presentations provided at the meeting is attached as **Appendix 3**. The abstracts of all SCRS documents presented at the meeting are included in **Appendix 4**. The following served as rapporteurs:

<i>Sections</i>	<i>Rapporteur</i>
Items 1, 10	N.G Taylor.
Item 1.1	K. Gillespie, C. Brown
Item 2-2.3	ICCAT Secretariat
Item 2.4	L. Rueda, K. Gillespie
Item 2.5	L.G. Cardoso, K. Gillespie
Item 3	D. Rosa, R. Borrego-Santos
Item 3.2	D. Rosa, R. Borrego-Santos, K. Gillespie
Item 4.1	C. Mayor, G. Tserpes, L. Rueda, G. Liniers
Item 4.2	L.G. Cardoso, B. Mourato, R. Coelho
Item 5.1	G. Tserpes, K. Gillespie, A. Kimoto, G. Liniers
Item 5.2	B. Mourato, L.G. Cardoso, A. Kimoto
Item 5.3	K. Gillespie, L.G. Cardoso, G. Tserpes
Item 6	L. Rueda, R. Coelho, K. Gillespie
Item 7	K. Gillespie
Item 8	K. Gillespie, L.G. Cardoso, G. Tserpes
Item 9	K. Gillespie, L.G. Cardoso

1.1 Updates from the SCRS and the Commission

The SCRS Chair provided an overview of relevant measures adopted by the Commission in 2025. For the North Atlantic stock, the Commission adopted an exceptional circumstances (EC) protocol in the *Recommendation by ICCAT replacing Recommendation 24-10 on conservation and management of measures including a management procedure for North Atlantic swordfish (Rec. 25-10)*. The protocol provides guidance for determining whether ECs exist and whether the implications arising from them is sufficiently severe to warrant revising the advice from the Management Procedure (MP). The *Recommendation by ICCAT on the experimental use of traplines (Rec. 25-09)* sets out requirements for use of trapline gear in the ICCAT area. Of relevance to this Group, the Recommendation defines minimum data collection requirements for fisheries deploying the gear.

The SCRS Chair outlined a new effort to characterize the status of requests from the Commission to the SCRS. In the coming months, the ICCAT Secretariat will be working with Species Group Rapporteurs to review and determine the completion status of recent and historical requests for advice from the Commission.

The SCRS Chair reminded the Group of the upcoming Meeting of the Standing Working Group on Dialogue between Fisheries Scientists and Managers (SWGSM) scheduled for late April 2026. The agenda may include ICCAT's Climate Action Plan, and the Chair will be requesting support from Rapporteurs to produce an overview of completed and ongoing work within the SCRS to address climate change (e.g. environmental factors in CPUEs and assessment, climate change robustness tests in Management Strategy Evaluation (MSE) simulations, etc.).

2. Review of fishery statistics

2.1 Task 1 catches data and their spatial distribution

The ICCAT Secretariat presented document SCRS/P/2026/023, which provided a general overview of the available statistical information, as of 18 March 2026, on swordfish (*Xiphias gladius*) in the Atlantic and the Mediterranean. This overview included Task 1 data, comprising nominal catches (T1NC) and live releases (T1NC-DL), as well as Task 2 data, including catch and effort (T2CE), size samples (T2SZ), and catch-at-size (T2CS), in addition to CATDIS estimates. For all these components, the corresponding catalogues and detailed Excel files were presented, together with the available data visualization tools, including interactive dashboards.

The ICCAT Secretariat presented the information corresponding to T1NC, indicating that total nominal catches peaked in the late 1980s, reaching approximately 53,000 t, and have shown a general declining trend thereafter, with total catches for all stocks amounting to 28,546 t in 2024 (**Table 1**). It was noted that longline was the main fishing gear in terms of contribution to total catches, while in the early years harpoon was also of significance, and gillnet fisheries contributed notably during the 1980s and 1990s (**Figure 1**). Furthermore, a shift in the relative contribution of stocks was highlighted, from a clear dominance of the North Atlantic at the beginning of the series (1950s) to a more balanced distribution, with an increasing share of the Mediterranean and a growing importance of the South Atlantic over time. For 2024, reported catches amounted to 10,814 t for the ATN (**Figure 2**), 9,282 t for the South Atlantic (**Figure 3**), and 8,450 t for the Mediterranean (**Figure 4**). Finally, an analysis of the main fleets for the period 1995–2024 was presented, together with the evolution of dead discards, for which data are available from 1991 onwards and which show a significant decrease over the last five years (**Table 2**).

Document SCRS/P/2026/025 was presented by the ICCAT Secretariat proposing to subdivide the Mediterranean sampling areas into four subareas (**Figure 5**), with the objective of replacing the former Task 1 areas and improving the consistency and usefulness of statistical information in the Mediterranean Sea. The ICCAT Secretariat recalled that the proposed delimitation is based on 5° longitude increments, consistent with the current minimum spatial resolution reported in ICCAT datasets (5×5), particularly for forms ST03-T2CE (catch and effort), ST04-T2SZ size sampling, and ST05-T2CS catch-at-size estimations. A finer spatial resolution (e.g., 1×1) would be too detailed compared to the standard reporting resolution for longline fisheries (5×5) and could compromise the consistency of historical data classification.

The Group recognized that the subdivision into four areas represents a significant improvement compared to the current situation, as it provides explicit geographical boundaries instead of historically named areas without a clear spatial definition. It was highlighted that the main objective of the proposal was to enhance the quality and utility of statistics for the main ICCAT fisheries in the Mediterranean.

The Group noted that, regarding the boundary between the western and central Mediterranean, areas such as Sardinia, Sicily and the northern Ligurian Sea may be more consistent with the central Mediterranean in ecological terms, whereas areas such as the Gulf of Lion and the Balearic Islands are more aligned with the western component. Additionally, the Group considered an alternative boundary between the central and eastern Mediterranean, suggesting a line from the southern Middle East to the Libya–Egypt border that may better reflect ecological and fisheries conditions, emphasizing the need for a consistent spatial framework across ICCAT species.

The ICCAT Secretariat commented that this proposal had already been presented in the last meeting of the Subcommittee on Statistics (SC-STATS) and that some of the conclusions from that meeting were that several specific points that might require further refinement, including: i) the delimitation at the Strait of Gibraltar, in order to avoid the artificial allocation of Mediterranean catches to the northern Atlantic stocks;

ii) the position of the boundary between the central and eastern Mediterranean; iii) the treatment of the Sea of Marmara in relation to the Black Sea; and iv) the possible implications for CPCs whose coastlines would be split between two subareas (e.g. in the areas of Tunisia and Libya).

The Group noted concerns regarding the proposed delimitation of the Tyrrhenian Sea, highlighting that significant oceanographic and ecological differences exist with the Strait of Sicily, which may act as a partial barrier for some ICCAT species despite unclear migration patterns. In this context, the Group considered that the current allocation of the Tyrrhenian Sea to the central Mediterranean may need to be reassessed, including its possible inclusion in the western Mediterranean to better reflect regional characteristics.

In conclusion, while there was broad support for the proposed four-area subdivision, the Group agreed that further refinement is needed, particularly regarding boundary definitions and consistency across species. The issue remains pending and will be revisited in future species group discussions with the aim of reaching a final agreement.

Document SCRS/2026/033 described the revision of historical swordfish catch statistics reported by the Mexican fishing fleet in the Gulf of Mexico. The analysis was based on observer data and national information systems, showing revised catch estimates with low values in the early years, a peak around 2017, and more stable levels in recent years. The comparison with previously reported ICCAT data indicated substantial revisions for the period 1993–1995, improvements in validation for 1996–2000, and minimal differences from 2001 onwards. The document also highlighted improvements in data integration and standardization, as well as plans for further methodological and data enhancements.

During the discussion, the Group agreed to the proposed data revisions. It was noted that, for procedural reasons, these revisions will be subject to final review and approval by the SC-STATS at its upcoming meeting in September 2026.

Document SCRS/2026/053 presented statistics on swordfish bycatch from industrial, semi-industrial and artisanal fisheries in Guinea for the period 2010–2025. The document described the relative contribution of the different fleet segments, highlighting the increasing importance of the artisanal fishery and the emergence of the semi-industrial fishery since 2021. It also identified seasonal patterns in catches, with higher values occurring between March and May, and noted recent improvements in data collection and species identification supported through the ICCAT/Japan Capacity-building Assistance Improvement Project (Phase 3) (JCAP-3).

During the discussion, the Group acknowledged the efforts to compile and improve swordfish bycatch data for Guinea (Rep.) and noted that these represent new information for this fishery. Questions were raised regarding the extension of these efforts to other species, the temporal coverage of the data, and the geographical distribution of the catches, particularly in relation to stock boundaries.

The Group also discussed uncertainties regarding the origin and reporting of some catches, including the potential for double counting in the case of foreign fleets operating under agreements. It was noted that the data are based on national statistics and observer programmes, but that their reporting status within ICCAT requires clarification. A correction was made regarding the magnitude of artisanal catches reported for 2025. Considering these issues, the Group agreed to further review the data after the submission and examination of the corresponding statistical forms, with a view to taking a final decision on their inclusion in the ICCAT databases at the next meeting of the Group in September 2026.

Document SCRS/2026/046 presented estimates of swordfish discards from the EU-Spain longline fleet operating in the western Mediterranean, using the Bycatch Estimator Tool (BYET). The analysis was based on observer data collected between 2015 and 2024, covering 907 monitored fishing trips, combined with logbook data to estimate total fishing effort. Discards were estimated using model-based approaches considering factors such as fleet, year, quarter, and spatial distribution, with results indicating that discarding has increased in recent years, particularly following the change in minimum landing size in 2017. The study also showed that discard estimates obtained with the BYET are higher than those derived from currently applied non-model-based methods, suggesting that total catches and fishing mortality may be underestimated in current reporting frameworks.

During the discussion, the Group noted the importance of improving estimates of swordfish discards, particularly for their use in stock assessment. A question was raised regarding the spatial resolution of the data used in the analysis, noting that the use of $5 \times 5^\circ$ cells may be too coarse for Mediterranean fisheries, where finer-scale information is typically preferred.

It was clarified that, while observer data are available at a finer spatial resolution (set level), historical logbook data lack detailed spatial information, which limited the analysis to $5 \times 5^\circ$ resolution and constrained the time series to start in 2015. It was also noted that, although reporting at $5 \times 5^\circ$ resolution is acceptable for longline fisheries, more detailed spatial resolution would be desirable if available.

The Group acknowledged the advantages of the BYET as a robust statistical approach and encouraged its broader application. It was suggested that future analyses could combine existing approaches for fleets lacking specific estimates, while promoting the use of BYET by CPCs. The Group agreed on the need to encourage CPCs, particularly those that have participated in related capacity-building activities, to apply this tool and to present results in future meetings.

SCRS/P/2026/030 presented a preliminary study examining *Xiphias gladius* landed at Damietta (Egypt) in summer–autumn 2025, describing size structure, condition, and length–weight relationships ($b = 2.374$, indicating negative allometric growth) for 69 individuals, alongside catch and catch per unit effort (CPUE) patterns from targeted and bycatch fisheries for albacore tuna. Results showed peak targeted catches and CPUE in August–September (with differences driven by fishing effort), while bycatch peaked in July, highlighting the need for additional data to support biological characterization and stock assessment.

The Group thanked the presenter and noted its interest in receiving additional information from Egypt, as well as in collaborating on the preparation of biological samples.

2.2 Task 2 catch, effort and size

During the presentation of document SCRS/P/2026/023, the available data for swordfish were provided, including Task 2 catch and effort (T2CE) datasets, as well as Task 2 size samples (T2SZ) and catch-at-size data (T2CS), together with their corresponding detailed catalogues and data visualization tools. The ICCAT Secretariat highlighted the overall availability and structure of these datasets, including long time series of size data, as well as existing limitations in data coverage and consistency across fleets, areas and years for the North Atlantic stock (**Figure 6**), South Atlantic stock (**Figure 7**), and the Mediterranean (**Figure 8**).

In particular, issues related to data completeness and resolution were noted. This included document SCRS/P/2026/030 ($5 \times 5^\circ$ grids for longline fisheries and $1 \times 1^\circ$ grids for other gears), while acknowledging that higher spatial resolution is desirable when available. In addition, inconsistencies in size data reporting due to the use of different measurement types were highlighted. The presentation also recalled that T2CS remain optional, which contributes to gaps in the overall availability of size-structured information.

The ICCAT Secretariat presented document SCRS/2026/036 which reviewed and conducted a preliminary analysis of T2SZ for South Atlantic and Mediterranean swordfish, with the aim of preparing standardized inputs for stock assessment models. The size data, covering the period 1970–2024, were compiled, cleaned, and aggregated by year, quarter, and main gear type, including the removal of duplicates and outliers and the standardization of size measurements to a common metric. The analysis indicated that size sampling is generally consistent with catch distribution across gears, with longline fisheries accounting for the majority of samples. Minimum sample sizes of 30 and 15 fish per size-frequency sample were proposed for the South Atlantic and Mediterranean stocks, respectively. The results also showed that size distributions are broadly consistent across areas, while differences were observed between stocks, with smaller mean sizes in the Mediterranean compared to the South Atlantic.

Document SCRS/2026/049 presented a revision of historical size distributions of swordfish caught by the Mexican longline fleet in the Gulf of Mexico, based on observer data collected between 1993 and 2024. The analysis included 24,522 records of individual measurements (lower jaw fork length, LJFL), allowing the characterization of size distributions and identification of dominant size classes. Results indicated that most specimens fall within the range of approximately 120 to 170 cm LJFL, with relatively few very small or very large individuals, and an overall mean size of 150–160 cm. The study highlighted the potential for these data to improve the characterization of catch composition and to support future analyses of temporal trends in size structure.

The Group acknowledged the quality of the analysis and the value of the historical data recovered, noting the potential of these data to support further work on discard estimation and methodological comparisons. The Group encouraged continued analyses and welcomed plans to present additional results in upcoming meetings.

The Group endorsed the work and recommended that the data be submitted through the official reporting formats, to be reviewed at the next meeting of the Group in September 2026 and subsequently considered by the SC-STATS.

2.3 Tagging data

The ICCAT Secretariat presented SCRS/P/2026/024 which provided a summary of swordfish conventional and electronic tagging updated.

For conventional tagging, 20,366 tags were deployed and 815 recovered since the beginning of the different tagging programmes reported to ICCAT. **Table 3** shows releases and recoveries per year, and **Table 4** shows the number of recoveries grouped by number of years at liberty. Three additional figures summarise the geographical distribution of the swordfish conventional tagging available in ICCAT. The density of releases in 5x5° squares (**Figure 9**), the density of recoveries in 5x5° squares (**Figure 10**), the swordfish apparent movement (arrows from release to recovery locations) shown in **Figure 11**.

Regarding electronic tagging, a total of 303 deployed tags and 235 data transmissions have been reported. In this context, the ICCAT Secretariat reported that an analysis of the performance of Pop-up Satellite Archival Tags (PSATs) deployed within ICCAT electronic tagging programmes, focusing on Wildlife Computers miniPATs was recently conducted. It was noted that the latest versions of the PSATs showed increased reliability and address historical issues related to battery failures. In addition, the ICCAT Secretariat presented a case study showing a significant improvement in both the quantity and quality of the data transmitted by using the KINÉIS satellite constellation instead of ARGOS.

Additionally, two swordfish dashboards were prepared to examine dynamically and interactively the tagging data. The dashboards for the conventional tagging and electronics tags metadata are published on the [ICCAT website](#).

The Group noted that tagging data are essential for improving knowledge on stock structure, movements, and mixing, and emphasized their importance for identifying priority areas for future tagging activities and resource allocation.

2.4 Results from trapline gear studies

The document SCRS/2026/016 presented the ongoing results of a pilot project on the use of traplines in the EU-Portugal pelagic longline fleet operating in the eastern Atlantic. Species composition differed markedly between terminal hooks and traplines, with traplines capturing almost exclusively swordfish. Swordfish CPUEs were higher in traplines compared to hooks, while CPUEs of pelagic sharks were significantly higher in hooks. To date, catches of marine turtles or other vulnerable taxa have not been recorded in traplines. Continued monitoring and evaluation of this new terminal gear modification is ongoing, with this pilot project extending until the end of 2026.

The Group raised a question regarding the observed sizes of the swordfish, specifically whether the results refer to the entire longline gear or specifically to the terminal gear (i.e. traplines). The Group noted that it is important to distinguish whether swordfish were caught on hooks or on traplines. The authors clarified that the data are recorded at the individual level, distinguishing between trapline and hook catches. This level of detail is available through the observer database, while it is more difficult to obtain from logbooks. Nevertheless, for the pilot project the captains were instructed to measure individuals and also to separate them depending on the capture method, so this information is also reflected in the logbooks. The Group noted that, once official logbooks are used, it may be more challenging to maintain such detailed information. It was clarified that, for the pilot project, the logbooks were specifically designed to account for these details.

The Group suggested that, when both hooks and traplines are used within the same set, it would be useful to have information on the proportion of each gear type at the set level. It was confirmed that this information is available and can be calculated. The authors recommended that rather than the proportions, the exact number of traplines and hooks be recorded by set.

The Group asked for further clarifications about the type of gear used (steel or nylon) and the bait employed. The authors explained that both nylon and steel gangions are used. For traplines, fishers typically use artificial bait, sometimes alone or combined with a small number of mackerel. The Group also asked about the observed differences in the sizes of blue shark with respect to swordfish. The authors commented that there is no clear explanation for the observed differences in sizes of blue shark and swordfish, but it was noted that the sample size for blue shark is much smaller than for swordfish.

The Group inquired about the use of lights in the traplines, and authors clarified that LED lights are not used.

Due to the reduction of catches of blue shark when using traplines, the Group raised the issue whether fishers will be willing to reduce blue shark catches. The authors pointed out that fishers do not rely exclusively on traplines; rather, they use a flexible strategy depending on season and area, sometimes targeting more swordfish and at other times targeting blue shark more. Fishers may also benefit from cost savings associated with traplines, as they use artificial bait and reduce bait expenses.

The Group discussed the different capture mechanism of traplines and how this could affect CPUE and species composition, potentially making them a distinct fishing gear compared to hooks.

The Group noted that this pilot project follows a request from the Commission and all CPCs are encouraged to implement similar projects.

The authors further clarified that the pilot project began in 2025, although fishermen had already been experimenting with traplines for a few years before that, initially with very basic configurations. Since then, the design has improved significantly and become more efficient. It was added that, in a second phase of the project, it would be beneficial to conduct scientifically based designed experimental trials on traplines.

SCRS/2026/035 assessed the potential influence of the ring-shaped branch-line/traplines (Meka-ring) on swordfish CPUE using Japanese longline fishery data collected in the Atlantic Ocean between 2020 and 2025. In the North Atlantic, Meka-rings were deployed only once by a single vessel in 2022, resulting in the capture of just one swordfish. Given this extremely limited use, the effect of Meka-rings on CPUE during the study period was considered negligible. In the South Atlantic, one vessel continuously employed Meka-rings from 2021 to 2024 and recorded measurable swordfish catches over multiple years. However, the proportion of sets using Meka-rings remained very small relative to the overall fishing effort. Consequently, their influence on standardized CPUE estimates was expected to be limited. Overall, across both North and South Atlantic regions, the actual utilization of Meka-rings by Japanese longline vessels during the study period was minimal, and their effect on swordfish CPUE is therefore considered marginal.

The Group asked for further clarifications on the target species for this longline fleet. It was clarified that only one vessel in the North and one in the South were using the traplines. It was further explained that when targeting albacore, sometimes traplines are used, so other species may occasionally be caught, but swordfish are never specifically targeted, although there is some uncertainty about this.

The Group asked about the year 2025, specifically whether the vessel that previously used the traplines was still fishing or simply chose not to use them. The authors informed the Group that usage of traplines may vary by fishers, but the general understanding is that they stopped using them.

The Group noted that the SCRS needs to present results of their analysis of traplines by 2028, so it is important to identify differences in the use of traplines by fleet and to include information on the target species as well as the fleets, with data reported by both fleet and target species. Information on bycatch should also be provided.

SCRS/2026/047 provided an exploratory analysis on the use of traplines by the EU-Spain Mediterranean fleet targeting swordfish (surface longline, meso-pelagic, and bottom longline). Information on the three métiers was analysed between 2023 to 2025 with and without traplines. The results showed that larger sizes of swordfish were captured with traplines for the surface and bottom longline, as well as a reduction of discards. Comparison of CPUEs with hooks and traplines showed contrasting results for the three métiers. In addition, there was a reduction in the proportion of bycatch species, with a reduction also in the different species bycaught for the surface and bottom longline, whereas the number of different species bycaught increased in the mesopelagic longline when traplines were used. These results are considered to be preliminary, and more analyses need to be conducted.

The Group noted the importance of this work for understanding catch rates and selectivity for traplines among the different gear métiers. The Group suggested that statistical tests were needed before drawing conclusions, especially given the inconsistent proportion of sets using traplines in the data set.

The Group requested more information on the economic implications of using the various gear configurations. The author noted that this information was not available.

The Group asked whether there was overlap in gear use throughout the fishing season. The author clarified that there was limited temporal overlap among the métiers.

SCRS/2026/051 presented the results of a pilot project conducted in 2025 to evaluate the use of traplines in the EU-Spain longline fishery targeting swordfish within the ICCAT area. The study was based on data collected from three vessels of the Atlantic long-distance fleet (ATL) and thirty-seven vessels from the Mediterranean fleet (MED), using additional logbooks and onboard observers.

The Group inquired about the fishing operations when traplines are used. The authors explained that during fishing operations with traplines, these need to remain in the water as long as possible, requiring a longer soak time than hooks, so the engines are stopped when fishing with traplines.

The Group inquired about the cost differences between hooks and traplines. The authors explained that the use of traplines helps reduce expenses on bait, fuel, and hooks.

The Group noted that the actual CPUE for traplines requires further discussion and study before determining whether the gear is desirable for widespread usage. Regarding CPUE, it was explained that fishermen are not particularly concerned, as each captain has an authorized quota for swordfish. The authors clarified that fishermen appreciate that traplines reduce discards and have lower costs. As regards traditional hooks, losses of hooks during each fishing operation also result in additional costs.

2.5 Plan for intersessional work on data improvements

After reviewing available Task 1 and 2 data the Group agreed that no further catch and size data were required to support assessment work. The Group noted significant data gaps for discard reporting and recommended that the ICCAT Secretariat complete a discard estimation analysis for the Mediterranean to supplement discards in the official ICCAT records. This analysis should follow the same (or similar) methods to [Ortiz \(2020\)](#). An estimate for EU-Spain is not required as an analysis was provided in SCRS/2026/046. Discard estimation for the South Atlantic stock assessment models will follow methods described in [Schirripa \(2022\)](#).

3. Review of new and historical information on biology

3.1 Swordfish Year Programme (SWOYP) updates and new results

Document SCRS/2026/045 presented results on a habitat model for the swordfish yolk-sac larvae (YSL) using TUNIBAL surveys and environmental variables in the western Mediterranean. Spawning showed strong affinity for warm waters (>24°C) and intermediate salinity values (37.3–37.8), in the waterfront between Atlantic and Mediterranean waters. Environmental and phenological indicators show an increase in the suitability of reproductive habitat, both in intensity and spatial extent, and that the spawning season is occurring earlier in the year.

It was noted that changes in climate may lead to different responses. With fish being spawned earlier in the year, there is the potential for recruitment to the fishery to start earlier. It was also noted that the potential effects of climate change in later phases of swordfish life cycle may introduce higher uncertainty in the stock dynamics. The Group showed interest in continuing to have updates of this work.

Document SCRS/2026/041 presented results on Phase 7 of the biology programme under the SWOYP. Updated results were presented for reproduction and maturity. These were based on histological staging of gonads, age validation and growth modelling derived from otolith readings, and genetic analyses encompassing population structure and epigenetic ageing.

The Group acknowledged the great effort being conducted in this project through all its phases and highlighted the importance of updating parameter estimates for the different stocks. Additionally, it was noted that past analyses of sex ratio by area and temporal strata have been conducted showing different behaviour of males and females. The Group noted this work could be revisited and updated with detailed information as was done to describe the size distribution of swordfish in the Atlantic Ocean.

SCRS/P/2026/021 presented results on age and growth using otoliths, 927 otoliths were collected from three stocks. Using a frequentist approach, the von Bertalanffy model provided the best fit for both Atlantic stocks and produced relatively low L_{INF} but high growth rates (K). Using Bayesian methodology and applying informative priors increased L_{INF} toward published values while K remained amongst the highest reported.

The assignment of samples to the stock of origin was discussed. For this work the current stock boundaries are not being used, instead, the study used a combination of the stock boundaries and information from some samples used on genetics to determine stock of origin.

SCRS/P/2026/018 presented a new growth curve for South Atlantic swordfish stock. This curve was developed based on extensive sampling throughout the distribution of the swordfish fishery. The annual deposition of growth bands in anal fin spines has been validated. These findings offered valuable biological parameters for the population assessment, which is essential for understanding the health of the population and making informed decisions about its future.

The Group acknowledged the important contribution of this work given the spatial distribution of the samples and the sampled size range. It was highlighted that when working in highly migratory species, having collaborative efforts is of the utmost importance, not only for age and growth but also for reproduction, genetics, and other studies. It was proposed that the data presented could be included in a collaboration with the SWOYP to produce a combined growth curve. It was noted that in the Stock Synthesis model, growth data could be inputted in different ways; in this manner, the growth curve could be estimated in the assessment model.

SCRS/2026/055 presented reproduction information for swordfish in the western Mediterranean Sea. Updated results estimate that females reach L_{50} at 136.5 cm and L_{90} at 148.2 cm, with spawning activity occurring primarily from June to August. Results highlight the effect of different methodologies on the estimate of L_{50} and the need for expanded sampling to support sustainable management.

The Group acknowledged the update of the estimates of female maturity in the Mediterranean Sea, noting this is an improvement from previous work. It was noted that further improvement could come from the availability of samples from the eastern Mediterranean as it is suspected that L_{50} in that area could be even smaller than in the western Mediterranean.

SCRS/P/2026/029 showed an update on the genetic component of the SWOYP. A total of 814 swordfish were analysed revealing clear genetic separation between Mediterranean and Atlantic stocks, as well as differentiation between North and South Atlantic groups with evidence of mixing in the BIL94B area. Within the Mediterranean, allele frequency patterns identified two main genetic clusters (central vs. eastern Mediterranean) and showed that western Mediterranean swordfish display intermediate profiles indicative of a transition and admixture zone.

It was noted that large amounts of information are being produced in the different components of the SWOYP and that the information about the different areas must be consolidated to provide the best scientific outputs.

Document SCRS/2026/057 reported the outcomes of the 2025 ICCAT tagging campaigns conducted in the Gulf of Guinea, specifically in the seas surrounding São Tomé Island, São Tomé e Príncipe. The objective was to place electronic tags on swordfish, billfish, and sharks to support ongoing analyses on distribution, diving patterns, and habitat use for these ICCAT managed species. Overall, a total of 10 trips were conducted using trolling and buoy gears. Two sailfish and one blue marlin were successfully tagged.

The Group acknowledged the work conducted and supports its continuation because information on horizontal and vertical movements for swordfish in this area is scarce.

3.2 Updates to biological parameters

The Group reviewed the available information on age and growth and reproduction for the South Atlantic stock and Mediterranean stock (the table of parameters used in assessment modelling is listed in **Table 5**).

Regarding the South Atlantic, the Group decided to update the maturity L_{50} for the assessment modelling based on information presented in [Borrego-Santos et al. \(2025\)](#). In addition, the Group decided to have different scenarios for growth, using a spine-based growth curve and an otolith-based curve. Specifically, the Gompertz fit in [Quelle et al. \(2026\)](#) and the Bayesian fit in SCRS/P/2026/021 were selected. It was noted that additional samples from Uruguay (N = 45) had become available and could potentially be used to produce a new estimate of L_{50} for this area. However, due to time constraints, the Group agreed to retain the value presented in [Borrego-Santos et al. \(2025\)](#) and to consider updating it in the future if deemed relevant.

For the Mediterranean, the Group decided to maintain the spine-based growth curve by Tserpes and Tsimenides (1995); while updating the L_{50} to the values presented in SCRS/2026/055. The potential inclusion of samples from EU-Cyprus for estimating L_{50} was discussed; however, these were staged using a different methodology. Therefore, it is not possible to combine the data with [Borrego-Santos et al. \(2026\)](#) (SCRS/2026/055). EU-Cyprus will confirm the availability of the histological slides and if available, these can be restaged using the current methodology and incorporated in future analysis.

4. Review of available indices of relative abundance

4.1 Mediterranean stock

Four documents describing longline CPUE standardizations and associated time series were presented to the Group for the swordfish Mediterranean stock, corresponding to the following: EU-Greece, EU-Italy, EU-Spain, and Morocco.

SCRS/2026/039 presented standardized biomass indices for Greek surface longline fisheries in the eastern Mediterranean from 1987 to 2024. This index, previously used in assessments, indicated that recent standardized CPUE estimates were among the lowest estimated.

The Group asked if there were any known reasons for the estimated series dropping in the three final years of the series, specifically regarding fishing strategies or area-specific dynamics reflected in the data. The author responded that the dataset is not based on spatially balanced sampling, noting that the Levantine region had fewer samples in these final years. However, the sampling region was considered in the standardization process. Additionally, oceanographic anomalies may have influenced the estimates. The author further clarified that recent changes in fleet behaviour include a shift in activity towards albacore rather than moving further East.

The indices were obtained from the fitted model using marginal means, following the usual procedure. However, the Group noted that caution is required when applying this approach in the presence of a continuous random effect variable, as the coding of that variable can substantially influence the estimated marginal means. Such coding has the potential to introduce bias into the resulting estimates. It was made clear that in the present case, this specific effect balances out and sums to zero, leaving the marginal means unaffected.

The Group raised some concerns on the way a variable describing technological creep is introduced in the model, arguing the model could potentially assign changes in the population to the effort creep. The author clarified that this variable helps to stabilize the model, and that it has little effect on the overall fit.

It was made clear by the author that the data used to fit the model does not include sets that use traplines. Their usage in this fleet began in 2025 and it is estimated that roughly 25-30% of the boats use this gear.

SCRS/2026/042 provided a standardized index of swordfish abundance produced from CPUE data from the mesopelagic longline fisheries operating in the Ligurian Sea. It is a yearly time series that covers the period 2010-2023. A Generalized Linear Model (GLM) was used to produce the standardized index, using data prior to the introduction of traplines in the fleet.

Upon a request for clarification by the Group, the author indicated that the segment of the population that the mesopelagic fleet catches corresponded to large individuals.

The Group inquired about the nature of the soak time variable, and the author clarified that it is a categorical variable taking multiples of 24 hours as values. In a more advanced setting, this variable could be used along with the time of the day as explanatory variables or as an interaction in order to explain catchability.

The presentation of the document included a short time series (2023-2024) of nominal CPUE with data associated to the use of traplines by the mesopelagic longline fleet. The Group discussed the behaviour that swordfish may learn to avoid the fishing gears with time, which can affect the CPUE introducing changes in catchability. It can be explained by the species learning to avoid gears introduced. The slight 2023-2024 decline in nominal CPUE for the traplines combined with mesopelagic longlines could be attributed to this behaviour.

SCRS/2026/048 updates the standardized abundance index of swordfish (*Xiphias gladius*) in the Moroccan Mediterranean longline fishery (2012–2024) using a Generalized Linear Mixed Model (GLMM) based on catch and effort data. The results show a decline after 2012 followed by a relative stabilization since 2017, suggesting an effect of management measures. These findings contribute to stock assessment and highlight the importance of continuous monitoring to support sustainable management.

The Group reviewed the explanatory variables included in the model, noting that they account for both annual and seasonal effects, but the model does not incorporate other potentially relevant factors, such as spatial, operational, or technological variables. They requested additional clarification about the estimation of the annual index, particularly given that year is specified both as an interaction with month in the random component of the model, and a fixed effect.

Furthermore, the Group observed that the standardized and nominal CPUE series display very similar trends. They also inquired about the number of fishing operations conducted on each fishing trip, especially considering that trips last several days.

SCRS/2026/029 presented updated standardized abundance indices for the EU-Spain surface longline fishery targeting swordfish in the western Mediterranean for the period 1988-2024. Recent years (2019–2024) showed moderate CPUE values. Both series (number and biomass) exhibit notable annual fluctuations with no clear long-term trend, suggesting the stock has remained at intermediate abundance relative to historical levels.

The Group acknowledged the importance of the EU-Spain series for the Mediterranean assessment but requested clarification on the métiers used in the CPUE standardization. They asked for the data to be presented by métier and recommended that the bottom longline métier should not be included in the standardization. In response, the authors clarified that the bottom longline métier was not used in the CPUE standardization; only surface and semi-pelagic longline métiers were considered. Spanish scientists further clarified that there is a bottom longline specific métier targeting swordfish in the Spanish Mediterranean, which should not be confused with other bottom longline fisheries targeting different demersal species. They also noted that the EU-Spain has been annually reporting catches, as well as dead discards of swordfish, for this métier in Task 1 NC, coded as LLPB.

The Group inquired about the inclusion of additional explanatory variables that may significantly influence the standardization process. They noted that the Rebuilding Plan could affect CPUE trends. The authors acknowledged this possibility and indicated that sensitivity analyses could be conducted to evaluate its impact.

Finally, the Group requested clarification on which data were excluded from the series used for standardization. The authors explained that sets conducted with traplines were also excluded from the analysis.

4.2 South Atlantic stock

Six documents describing longline standardized CPUEs and associated time series were presented to the Group for the South Atlantic swordfish stock, corresponding to the following CPCs: Brazil–Uruguay (combined), EU–Spain, Japan, South Africa, and Chinese Taipei, as well as one multi-fleet collaborative index combining six data sets (Brazil, Chinese Taipei, EU–Portugal, EU–Spain, Namibia and South Africa).

The Group noted that all major longline fleets operating in the South Atlantic were represented, and that most indices previously used in earlier assessments had been updated and extended to 2024. In particular, the inclusion of a combined Brazil–Uruguay index and a multi-fleet collaborative index represent a substantial improvement in spatial coverage and integration of available data. The Group welcomed the continued effort for CPUE standardization studies and the high level of participation by CPC scientists, including the collaborative approaches to develop joint analyses across fleets.

SCRS/2026/018 presented updated standardized CPUE indices in number and weight for the Spanish LL targeting swordfish in the South Atlantic for the period 1989–2024. The indices were estimated using GLM procedures consistent with previous analyses, incorporating temporal, spatial, gear, and targeting-related factors. The standardized CPUE series showed a relatively stable trend from the early 1990s to the mid-2000s, followed by a gradual increase up to around 2017, a slight decline until 2020, and a renewed increase in recent years. The mean weight remained stable throughout the time series.

The Group noted the consistency between CPUE indices in number and weight, suggesting that recent increases are primarily driven by changes in catch rates rather than fish size.

SCRS/2026/034 presented standardized CPUE indices for the Japanese tuna longline fleet operating in the South Atlantic for the period 1962–2024. Given limited information on gear configuration and interannual changes in mean swordfish weight, the data were divided into three periods (Early: 1962–1975; Middle: 1976–1990; Late: 1991–2024), and CPUE standardization was conducted separately for each. The index was estimated using a spatio-temporal GLMM framework, incorporating spatial and temporal variation to account for changes in fishing distribution and targeting practices. The standardized CPUE series showed high values in the early 1960s, followed by a sharp decline in the late 1960s, moderate variability during the 1970s–1980s with a peak in the mid-1980s, and generally lower levels from the 1990s through the 2010s, with a slight increase in recent years.

The Group noted that the extended time series provides valuable information on early stock dynamics and spatial distribution patterns, which may be informative for stock assessment, particularly for estimating initial conditions. The Group also acknowledged the use of a spatio-temporal modelling approach to account for changes in fishing patterns over time.

SCRS/2026/050 described a delta-lognormal Generalized Additive Mixed Model (GAMM) that was fitted to 16,161 longline sets from the South African pelagic fleet (2004–2024). The analysis produced a standardized CPUE index for swordfish in weight. The model incorporated year, month, fishing tactic (clustering), a spatial smoother, and vessel as a random effect, with covariates selected via Akaike Information Criterion corrected (AICc). Marginal means were used to isolate the annual abundance trend, which indicated stable relative swordfish abundance since 2020, with catch rates peaking in winter (July–October).

The standardized CPUE series showed moderate interannual variability, with a decline in the early 2010s followed by an increase toward the late 2010s, reaching a peak around 2019, and remaining relatively stable thereafter.

The Group noted that the index is based on a well-established delta-lognormal modelling framework that accounts for zero-inflated catch data and incorporates key operational and spatiotemporal covariates. The inclusion of fishing tactic and spatial effects was considered important to account for changes in targeting behaviour and fishing distribution over time.

SCRS/2026/052 developed standardized CPUE indices for swordfish using combined catch and effort data from Brazilian and Uruguayan pelagic longline fleets for the period 1994–2024. The index was estimated using a delta-lognormal GLM framework, incorporating temporal, spatial, operational, and targeting-related covariates. Two model formulations were evaluated, with and without vessel effects. Both models showed similar temporal patterns, with higher CPUE values in the mid-1990s, followed by a decline in the early 2000s, a relatively stable period during the mid-2000s and early 2010s, and a gradual decrease in recent years, reaching the lowest levels at the end of the series.

The Group noted that the inclusion of vessel effects improved model performance and reduced variability in the standardized series. The combined Brazil–Uruguay dataset provides enhanced spatial coverage of the southwestern Atlantic, and the model including vessel effects was recommended as the preferred index.

SCRS/2026/056 developed standardized CPUE indices for swordfish using Chinese Taipei distant-water longline data in the South Atlantic for the period 1981–2024. A delta-lognormal GLM framework was applied, incorporating temporal, spatial, and targeting-related variables, including cluster-based fishing strategy and, in alternative model formulations, hooks between floats (HBF). Separate analyses were conducted for different time periods (1981–2024 and 1994/1995–2024) to account for changes in targeting practices and data availability. The standardized CPUE series showed higher values in the early 1990s, followed by a sharp decline in the late 1990s and subsequent stabilization at lower levels in recent years.

The Group noted that the inclusion of cluster-based targeting variables improved the representation of changes in fishing practices over time. The index was considered consistent with previous analyses and suitable for use in the stock assessment.

SCRS/2026/043 presented a collaborative multi-fleet CPUE standardization for South Atlantic swordfish using operational set-level data from Brazil, Chinese Taipei, EU-Portugal, EU-Spain, Namibia, South Africa, and Uruguay, covering the period 1978–2024. The analysis combined data from multiple longline fleets and evaluated both fleet-specific and joint clustering approaches to account for differences in targeting practices among CPCs. Standardized abundance indices were estimated using both GLM and delta approaches, including year, month, latitude, longitude, fleet, cluster, and fleet-cluster interaction terms. Two time periods were considered, 1978–2024 and 1994–2024, to account for known changes in fleet structure and targeting practices in some CPC datasets. The combined index showed higher catch rates in the mid-1990s followed by a general decline thereafter. For the period after 1994, the standardized trends were relatively stable across fleets, with a slight increase in recent years. Results were broadly similar across clustering strategies and temporal subsets, indicating that the standardized trends were not highly sensitive to these modelling choices.

The Group noted that this work represents an important collaborative effort among CPCs to develop a more spatially comprehensive abundance index for South Atlantic swordfish. The Group also noted that the delta approach using fleet-specific clustering and data from 1994–2024 explained more deviance and was recommended as the preferred formulation for the joint longline CPUE standardization.

The Group recommended that data inputs for blue and shortfin mako shark from Spain be re-examined.

5. Review of potential assessment models, specifications of data inputs, and modelling options

5.1 Mediterranean stock

The Group decided that the Bayesian Surplus Production model JABBA will be applied as primary model for advice. Total catch inputs will include reported landings and estimated dead discards that will be available as of 10 April 2026. Dead discard estimates will be provided by the ICCAT Secretariat following the methodology applied in the 2020 assessment (Ortiz, 2020), except for the Spanish longline fleet, for which updated estimates are available (SCRS/2026/046).

The base case model's production function will be Pella–Tomlinson. The shape parameter will be externally estimated using Age Structured Estimation Model (ASEM) simulations ([Winker et al., 2020](#)). For this estimation, an updated prior derived from recent maturity information (SCRS/2026/055), which estimates L_{50} at 136.5 cm, will be used. A complete list of biological parameters for the reference case is provided in **Table 6**.

Catch uncertainty will be incorporated by applying a coefficient of variation (CV) of 10 percent as a random error, along with a sensitivity run excluding catch uncertainty.

The base configuration for abundance indices will include the available standardized CPUE series listed below, while alternative index treatments will be explored through sensitivity analyses.

The Group agreed to use the following CPUE index series:

- Greece longline: 1987–2024
- Ligurian longline: 2010–2023
- Spain longline in weight: 1988–2024
- Morocco longline: 2012–2024

Coefficients of variation (CV) for CPUE series will follow the results of the standardization process, with a minimum value of 0.25 applied while preserving interannual variability. This will be implemented by adding a positive constant value to the CVs of each CPUE series such that the minimum CV equals 0.25.

Sensitivity analyses will include:

- A run with no random variation on the catch data.
- Incorporating historical CPUE series from Sicilian ([Tserpes et al., 2011](#)) and/or Ligurian fisheries ([Garibaldi and Tserpes, 2015](#)).

Additionally, other sensitivity analyses may also include:

- Removing discards estimation from catch data.
- Assuming alternative scenarios of early catches underreporting ([Anon., 2020](#)).
- Assuming alternative specifications to the initial depletion (ψ) relative to the 2020 assessment.
- Other configurations that the modelers deem appropriate during the model development process.

Two continuity runs using the strict 2020 swordfish stock assessment configurations with updated catch data and indices for years 2019-2024. They include a Schaefer model and a Pella-Tomlinson model with the shape parameter and r prior as specified in the Report of the 2020 Mediterranean Swordfish Stock Assessment Meeting ([Anon., 2020](#)).

Standard model diagnostics will be applied following [Carvalho et al. \(2021\)](#).

A4a Statistical catch-at-age

The assessment for all (a4a) statistical catch-at-age model will be used, following the framework applied in the 2020 swordfish stock assessment. The main life-history parameters that will be used are depicted in **Table 6**. For tuning the a4a model runs (base scenario), the Group agreed to apply the four individual indices that were updated in the current meeting:

- Greece longline: 1987–2024
- Italian (Ligurian) longline: 2010–2023
- Moroccan longline: 2012–2024
- Spanish longline: 1988–2024

Alternative runs will explore the potential of including additional historical CPUE indices from the Sicilian ([Tserpes et al., 2011](#)) and Ligurian fisheries ([Garibaldi and Tserpes, 2015](#)).

Catch inputs will encompass total removals from Task1NC. An additional scenario will incorporate discard estimates provided by the ICCAT Secretariat, consistent with the 2020 swordfish stock assessment (Anon., 2020). Updated length-composition data (LJFL), will be compiled by the ICCAT Secretariat according to the approach followed in the previous assessment (Ortiz and Palma, 2020), and will be later converted to catch-at-age according to the adopted growth parameters.

Stock Synthesis (SS)

The Group proposed to explore Stock Synthesis (SS) models on the Mediterranean stock. Consequently, the modelling team will attempt to conduct an exploratory modelling exercise using the SS platform. Its configuration will be aligned as closely as possible with the JABBA and a4a models to ensure comparability. The fleet structure will be defined based on the availability of abundance indices, and homogeneity of the length-composition data. The suggested fleet structure is in **Table 7**. Additional aggregation of fleets 6 through 9 is also envisioned.

5.2 South Atlantic stock

Surplus Production Model

The Bayesian Surplus Production model JABBA will be used, following the approach applied in the 2022 assessment (Parker *et al.*, 2022). JABBA is formally included in the [ICCAT stock assessment software catalogue](#) and has been widely adopted in recent assessments. Management advice for the 2022 swordfish stock assessment (Anon., 2022) was derived from JABBA model results, highlighting its relevance and robustness as an assessment platform.

The production function will be specified as Pella Tomlinson. Biological information will be incorporated through r priors (**Table 5**), derived under alternative formulations based on a continuity run from the 2022 swordfish stock assessment (Anon., 2022), as well as updated Gompertz (Quelle *et al.*, 2026) and Bayesian von Bertalanffy approaches (SCRS/P/2026/021). Steepness values of 0.7 and 0.8 will be explored. The r priors will be objectively derived using ASEM (see Winker *et al.*, 2020), based on available growth information for South Atlantic swordfish and other biological parameters. This approach ensures consistency with the parameterizations considered in the SS model, while incorporating uncertainty in key life history parameters. Uncertainty in natural mortality will be accounted for by assuming a mean value of 0.2 with a coefficient of variation of 30 percent. Based on these assumptions, the Group agreed to implement an uncertainty grid combining the alternative formulations and steepness values, as described in **Table 8**.

Catch inputs will consist of total removals from Task 1NC, including landings and reported dead discards. Additional discard estimates derived from SS, similar to the approach applied for the northern stock, will be incorporated in sensitivity analyses. Catch uncertainty will be explored by applying a coefficient of variation of 10 percent, in addition to a scenario without catch uncertainty.

The base scenario for abundance indices will use the joint longline CPUE series and EU-Spain longline with Japan longline and early Chinese Taipei longline, while sensitivity analyses will explore the use of individual CPUE indices.

Base scenario:

- Joint longline: 1994–2024
- EU-Spain longline in weight: 1989–2024
- Japan longline: 1962–1975, 1976–1990, 1991–2024
- Chinese Taipei longline: 1968–1990

Sensitivity analyses:

- EU-Spain longline in weight: 1989–2024
- Japan longline: 1962–1975, 1976–1990, 1991–2024
- Chinese Taipei longline: 1968–1990, 1998–2024
- Brazil-Uruguay longline with vessel effect: 1994–2024
- South Africa longline: 2004–2024

Coefficients of variation (CV) for CPUE series will follow the results from the standardization process, with a minimum value of 0.25 applied while preserving interannual variability (i.e. in each CPUE series, add a positive constant value on the CV to make the minimum CV of the series 0.25).

Age Structured Model

SS will be used as the age-structured assessment model, following the framework applied in the 2022 swordfish stock assessment (Mourato *et al.*, 2022).

The main life-history parameters that will be used are depicted in **Table 9**. For the SS model, the Group will explore a grid of alternative scenarios combining two growth curve hypotheses (Quelle *et al.*, 2026, SCRS/P/2026/021) and two steepness values (**Table 9**). The growth curve hypotheses include the Gompertz and Bayes von Bertalanffy growth models (VBGM), while steepness will be fixed at 0.7 and 0.8. This grid will be used to evaluate uncertainty associated with alternative assumptions on growth and stock recruitment dynamics, and to assess the sensitivity of model results to these key biological parameters.

The Group agreed to apply individual indices in the SS for the South Atlantic stock:

- EU-Spain longline in weight: 1989–2024
- Japan longline: 1962–1975, 1976–1990, 1991–2024
- Chinese Taipei longline: 1968–1990, 1998–2024
- Brazil-Uruguay longline with vessel effect: 1994–2024
- South Africa longline: 2004–2024

Based on the available data and the structure adopted for the current assessment, the SS model will be parameterized using a reduced set of fleets representing the main longline fisheries operating in the South Atlantic (**Table 10**).

Catch inputs will include total removals from Task1NC. Discards will be explicitly modelled by fleet, including discard mortality rates, following the approach used in the 2022 swordfish stock assessment (Anon., 2022).

Length-composition data (LJFL) will be compiled by the ICCAT Secretariat and assigned to the corresponding fleets and time periods. These data will be modelled assuming a multinomial distribution with 5 cm length bins. Effective sample sizes will be defined as the natural logarithm of the number of observations to reduce the influence of large sample sizes and avoid overweighting length data in the likelihood.

Model diagnostics will be assessed using the Carvalho *et al.* (2021) flow chart, using the R packages *ss3diags* and *r4ss*, and included the following steps:

- 1) checking that the hessian matrix is positive definite;
- 2) a residual analysis of CPUE and length composition fits;
- 3) a retrospective analysis with eight-year retrospective peels;
- 4) a model's prediction skill evaluation by applying a hindcasting cross-validation technique;
- 5) a likelihood profile evaluation of critical parameters (steepness, R_0 , and M).

5.3 Plan for intersessional work on assessment models

See section 8.

6. Review of discard estimation plans

SCRS/P/2026/027 described a proposed process and evaluation criteria for discard estimation methods. Within the proposal, CPCs submit methods to the relevant species group which then evaluates the method using criteria approved by the Working Group on Stock Assessment Methods (WGSAM). Once approved by the species group, the CPC submits revised statistical forms for final consideration from the SC-STATS. Evaluation criteria follow a similar format used for assessing CPUE indices.

The Group noted the burden being placed on WGSAM for evaluating all discard estimation plans and supported this revised process but noted that further consultation was needed with WGSAM and SC-STATS. The Group discussed a procedure to evaluate discard estimation methodologies, based on what is currently done with the CPUEs evaluation tables. The author noted that this plan is preliminary and invited participants in the Group to support development of a more detailed plan for review at WGSAM in May 2026. It was also noted that additional work was needed on the method evaluation table and that it should be evaluated against a variety of existing estimation methods.

The Group asked if presenting this paper with the discard evaluation criteria would replace the need for individual CPCs to present their own papers with the discard estimation methods. It was noted that, in the future, once an evaluation criteria table is developed and approved by WGSAM, it could be used by the Species Groups to evaluate the discard reporting methods for each CPC, eliminating the need for WGSAM to review each individual paper on discard estimation. However, the actual process to be conducted this year (i.e., 2026), whether CPCs still need to submit their estimation methods to the WGSAM, as requested in 2025 by the SCRS, was not clarified. The SCRS Chair concluded that all papers (both old and new submissions) on discard estimation methodology should be reviewed by WGSAM.

The Group noted that it would be useful to review which CPCs are not reporting discards at all, as currently only a small number are doing so. In addition, it would be good to produce a table describing which CPCs are reporting discards and the methods used. It was clarified that information on dead discards is available in Task1NC and the tables are produced. However, the Group emphasized that this work and evaluation relate to more than simply describing if and what CPCs are reporting discards, but to the actual methods being used. It is very important to specify the methods used to estimate discards (model or ratio based, data sources, coverage, etc.) and also if what is being reported are observations (observer records) or the values raised to total effort.

7. MSE matters

SCRS/P/2026/028 described the workplan for North Atlantic swordfish MSE in 2026. Following adoption of an MP in 2024, the SCRS was tasked with development of robustness tests for climate change and minimum size limits. The Swordfish Species Group will develop these tests in 2026 and will update the combined index of abundance to support exceptional circumstances evaluation.

The Group acknowledged this workplan and had no suggested revisions for the plan.

8. Recommendations and workplan

8.1 Recommendations

The Group developed the following recommendations:

To CPCs

The Group recommended that data updates provided by Mexico and Guinea (Rep.) be submitted to the ICCAT Secretariat using the appropriate statistical forms for final review from the Swordfish Species Group and the SC-STATS.

The Group noted the significant gaps in swordfish discard reporting and recommends that CPCs apply discard estimation procedures (e.g. BYET) and present their methods and results to the Species Group for review.

The Group recommended that CPCs further work on trapline gear studies using a variety of configurations, seasons, fleets, locations, etc. noting that the SCRS will need to report its findings to the Commission in 2028. Studies should consider catch rates, selectivity, bycatch, and socio-economic factors.

To the ICCAT Secretariat

The Group recommended that work on revisions of the statistical areas in the Mediterranean continue with further input from relevant Species Groups and the SC-STATS.

The Group recommended that the ICCAT Secretariat update discard estimation analyses for Mediterranean fleets in advance of the 2026 swordfish stock assessment (13-17 July 2026). This analysis should follow the same or similar methods as used for the previous 2020 Mediterranean swordfish stock assessment (Anon., 2020), noting that estimations for the Spanish fleets are not required (Ortiz, 2020). This work should be completed by 10 April 2026.

The Group recommended that the ICCAT Secretariat prepare updated swordfish catch-at-size data from 2019 to 2024 for the Mediterranean following the approach used in the previous assessment (Ortiz and Palma, 2020) by 15 May 2026.

To the Working Group on Stock Assessment Methods

The Group recommended that the WGSAM develop standard discard estimation evaluation criteria and that it considers a process for reviewing and approving these methods.

The Group recommends that the WGSAM review the a4a software and consider its inclusion in ICCAT's software catalogue.

To the Swordfish Species Group

The Group recommended that the SWOYP and other national scientists develop collaborative studies to further develop swordfish ageing and growth analyses.

The Group recommended updating the western Mediterranean swordfish spawning habitat indices presented in SCRS/2026/045 to include recent years and incorporating them into the Mediterranean Observatory and into the Ecosystem Report Card, to better monitor climate driven changes in habitat suitability, spatial extent, and phenology.

The Group recommended exploring the feasibility of developing a swordfish larval index as a climate-informed, fisheries-independent indicator to support future stock assessment models for the Mediterranean population.

8.2 Workplan

The Group discussed the major work items to be undertaken by the Swordfish Species Group in 2026.

Assessment model development

The assessment modelling teams formed during this meeting will proceed with model development using the parameters and data inputs agreed in this meeting and described in Section 5 of this report. It was noted that the teams should be given some flexibility to develop alternative modelling scenarios as informed by model diagnostics. The Group agreed that no further data revisions would be accepted apart from those associated with the discard estimation analysis for the Mediterranean, and revisions to the South Atlantic combined index of abundance that may result from data input checks for EU-Spain.

The modelling teams will meet informally to progress the work and if necessary, will consider holding an intersessional information session open to the broader group for feedback on model results in advance of the 2026 Swordfish Stock Assessment Meeting.

Trapline studies

The SCRS is scheduled to provide the Commission with analysis and advice on trapline gear in 2028. CPC scientists will continue their gear trials in 2026 and should be keeping in close contact to coordinate study methods.

Discard estimation

CPC scientists will continue their development and application of discard estimation methods. A sub-group of the Swordfish Species Group will present a proposal to the WGSAM on how these methods should be evaluated and adopted.

Management Strategy Evaluation

The North Atlantic Swordfish MSE will continue to work on robustness test related to climate change and minimum size limits. A technical team will be undertaking this work in collaboration with a technical contractor. The combined index of abundance will undergo a strict update with an additional data year and will be used to support the evaluation of exceptional circumstances.

Biological Studies

The Swordfish Year Programme will continue its studies on ageing and growth, reproduction, stock boundaries, and mixing.

9. Other matters

The ICCAT Secretariat provided the Group with an update on the use of science project funds between 2021-2025. It was noted that in most years the Group has made almost full use of available funds, 2024 being an exception. The underage in 2024 was the result of several years in a row of contract extensions followed by difficulties within a single calendar year to use multiple years of project funding. Project funds must now be used within a single calendar year, without carry forward. In 2025, 96% of funds were used and in 2026 the Swordfish Species Group was on track to fully use approved funds as contracts for most projects were signed or in the final stages of negotiation.

10. Adoption of the report and closure

The Group adopted the report and adjourned the meeting.

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Table 1. Estimated swordfish catches (landings + dead discards, t) of swordfish (*Xiphias gladius*) by area, gear and flag.

SWO-Table 1. Estimated catches (t) of Swordfish (*Xiphias gladius*) by area, gear, and flag (v1, 2026-03-20)
 SWO-Table 1. Capturas estimadas (t) de Pez espada (*Xiphias gladius*) por zona, arte y bandera (v1, 2026-03-20)
 SWO-Tableau 1. Prises estimées (t) de Espadon (*Xiphias gladius*) par zone, engin et pavillon (v1, 2026-03-20)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
TOTAL	52011	45254	46350	49725	49823	42750	40145	38571	39528	40136	40639	42502	47155	38550	38021	39205	39322	31332	31847	33395	33416	31228	28205	26739	26303	23187	22223	19214		
ATN	17176	15222	13205	12292	11622	10423	10111	9254	11444	12071	12176	11212	11322	11246	11627	12276	13260	12076	10776	10205	10200	9206	10246	10400	9207	10223	10223	10214		
ATS	21281	18289	18824	14607	15052	11278	11128	14184	12634	13362	13165	14196	15620	12370	12628	12506	11205	10696	9204	9970	11343	11611	10237	10388	10091	8939	6500	6779	6386	6260
MED	13615	12053	14383	14389	13989	13559	13096	12614	14005	14622	14915	14227	13863	13225	14754	12549	11046	10070	10089	11320	10280	8821	8176	7584	7512	7658	7584	7584	7584	
Landings																														
ATN	715	812	370	763	376	383	432	240	486	341	516	409	546	465	441	511	512	513	463	381	463	684	386	515	506	517	459	637	618	
ATS	2184	1769	1879	13748	14822	15448	14302	13576	11714	12558	12917	13884	15318	11990	12201	12067	10854	10205	8958	9798	10047	10261	10223	9975	8814	9203	8622	8313	9110	
MED	12854	12322	12204	11062	10171	10200	9279	9298	10204	11410	11526	12096	11474	10084	11004	11077	11296	11366	11006	10200	9217	9498	9498	9427	9030	8122	920	920	920	
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	0	0	
Discards																														
ATN	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	
ATS	0	1	21	10	6	1	0.1	0.3	0.4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
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	0	0	0	0	
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	0	0	
Landings																														
ATN	CP	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	
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	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	0	0	0	0	
Canada	1610	739	1089	1115	1119	968	1079	998	1285	1033	1058	1404	1344	1334	1300	1346	1501	1489	1505	1604	1579	1548	1188	782	996	1334	1377	1424	1923	1673
China PR	104	132	40	337	304	22	302	90	339	106	72	88	92	92	73	75	39	96	60	44	126	61	87	92	96	44	38	100	103	
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	0	0	0	0	
Cuba	86	7	7	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Curacao	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	
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	0	0	0	0	
EU-España	7176	5547	5140	4084	3996	4996	3968	3957	4596	5376	5521	5448	5964	4396	4949	4147	4889	5622	4984	3750	4013	3916	3586	3188	3112	3587	3236	3177	4957	
EU-Francia	84	97	154	104	104	122	0	74	189	100	178	120	46	14	15	25	16	94	24	66	96	79	80	82	90	103	120	100	265	
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	0	0	0	0	
EU-Ireland	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	
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	0	0	
EU-Portugal	1617	1703	963	773	777	752	736	786	1032	1200	900	949	778	747	888	1054	1203	882	1488	1241	1420	1450	1671	1691	2392	2070	2365	1700	1967	
EU-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	0	0	0	
FR-Saint-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	0	0	0	
Great Britain	1	5	11	2	1	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	
Grenada	1	4	15	15	42	84	0	54	88	73	56	30	26	43	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	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	0	0	0	
Japan	1043	1494	1218	1381	1089	759	0	0	0	0	575	705	656	889	935	778	1062	523	639	300	545	430	379	456	325	355	406	311	431	
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	0	0	
Liberia	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Maroc	79	462	267	292	119	114	523	223	329	335	339	341	237	430	724	968	762	770	1062	1062	850	900	900	950	950	986	955	1085	1146	
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	0	0	0	
Norway	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	
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	0	0	0	
Philippines	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	
Russian Federation	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	
Senegal	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	
Saint Leone	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	
St Vincent and Grenadines	4	3	1	0.4	1	0.1	22	22	7	7	7	7	5	11	7	34	13	11	8	4	40	102	33	46	26	12	7	2		
Trinidad and Tobago </																														

Table 2. Estimated swordfish catches (t), by stock and catch type (landings and dead discards), for the period 1990–2024. ATN – Northern Atlantic; ATS – Southern Atlantic; MED – Mediterranean.

Year	ATN		ATS		MED	
	Landings	Dead Discards	Landings	Dead Discards	Landings	Dead Discards
1990	15672		17305		16018	
1991	14719	215	13893		15746	
1992	15011	383	13813		14709	
1993	16330	408	16130		13265	
1994	14793	708	18958		16082	
1995	16579	526	21931		13015	
1996	14634	588	18288	1	12053	
1997	12574	451	18521	21	14693	
1998	11844	485	14017	10	14369	
1999	11093	529	15496	6	13699	
2000	10913	540	15726	1	15569	
2001	9110	902	15128	0	15006	
2002	9039	615	14104	0	12814	
2003	10820	623	12634	0	15694	
2004	11751	320	13081	1	14396	9
2005	12045	333	13165		14509	113
2006	11306	223	14196		14900	16
2007	12024	281	15538	91	14207	19
2008	10859	244	12364	6	12137	1546
2009	11989	157	12668		11840	1396
2010	11519	153	12448	147	13265	1488
2011	12308	402	11131	74	11450	1191
2012	13488	402	10547	140	9913	1133
2013	11880	199	9204	0	9096	973
2014	10552	156	9924	46	9801	1168
2015	10592	167	10301	43	10753	1230
2016	10400	105	10609	2	10931	1369
2017	10150	150	10426	111	8402	1988
2018	8874	152	10360	28	6999	1682
2019	9942	305	10040	51	8086	89
2020	10337	113	8880	59	7663	0
2021	9686	101	9370	129	7324	188
2022	10204	72	8674	85	7079	90
2023	12140	83	8256	110	7437	109
2024	10715	99	9223	59	8382	68

Table 4. Summary of swordfish conventional tagging data: number of recoveries grouped by number of years at liberty in each release year. The last column shows the recovery rate (%) in each release year.

Number of tag Swordfish (<i>Xiphias gladius</i>)												
Year	Releases	Recaptures	Years at liberty							Unk	Error	% recapt*
			< 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 10	10+			
1940	4	0										
1961	2	0										
1962	1	0										
1963	2	0										
1964	58	2		2								3%
1965	50	1					1					2%
1966	34	1					1					3%
1967	25	1									1	4%
1968	28	8	1	2	2	1			1	1		29%
1969	30	2		1					1			7%
1970	91	11	6		1			1	3			12%
1971	12	0										
1972	7	0										
1973	1	0										
1974	32	2		1			1					6%
1975	25	2			1				1			8%
1976	10	0										
1977	55	2		1	1							4%
1978	178	13	1	3	3	2	4					7%
1979	119	5	2	1			1	1				4%
1980	491	26	4	6	7	1		7	1			5%
1981	268	27	8	10	5	2		2				10%
1982	169	4	2	2								2%
1983	162	6	2	2	1				1			4%
1984	168	5		2					3			3%
1985	205	10	2	2	1	1	3	1				5%
1986	404	17	3	3	5	2		4				4%
1987	411	18	5	6	4	1		2				4%
1988	475	15	5	4	1			2	3			3%
1989	218	3		1				1	1			1%
1990	531	11	3	2	2	4						2%
1991	1610	55	12	8	15	12	3	3	2			3%
1992	1778	62	13	26	13	3	3	3	1			3%
1993	1573	63	23	11	7	7	4	8	3			4%
1994	1994	56	16	7	11	5	7	9			1	3%
1995	1187	41	12	5	10	3	8	2			1	3%
1996	690	29	12	4	8	2	2	1				4%
1997	779	29	12	6	1	3	3	3	1			4%
1998	417	25	8	4	5	1	2	3			1	6%
1999	261	8	1	2	1	1	1	2				3%
2000	194	12	6	5	1							6%
2001	166	2		1							1	1%
2002	297	12	5	3							4	4%
2003	313	12	5	1	2		1	1			2	4%
2004	358	23	5	4	3	2		2				6%
2005	463	15	3	5	2	1					4	3%
2006	885	29	6	6	1	3		2			11	3%
2007	445	19	5	4	6			1	1		2	4%
2008	222	17	4	4		3	3	1			2	8%
2009	110	5	2	1	2							5%
2010	84	8	3	2	2						1	10%
2011	230	17	8	6	2						1	7%
2012	155	7	4	1	1						1	5%
2013	149	5	3				2					3%
2014	106	3	1	1		1						3%
2015	60	5	2	1	2							8%
2016	82	3	2		1							4%
2017	106	5	1	1		1	2					5%
2018	193	7	6					1				4%
2019	248	15	13		1	1						6%
2020	184	18	17	1								10%
2021	286	14	8	2	2						2	5%
2022	236	6	5						1			3%
2023	194	1	1									1%
2024	30	0										
2025	1	0										
Unk	14	11									11	79%
Grand Total	20366	831	268	173	133	66	53	73	14	1	46	4.1%

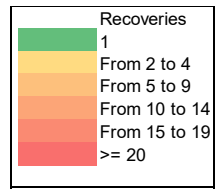


Table 5. Life history parameters used to derive r prior distributions for the JABBA model and to inform biological parameterization in the Stock Synthesis (SS) model for the South Atlantic swordfish assessment.

Parameter	Mean	Source
M	0.2 (CV – 0.30)	Last assessment
Bayes VBGM model		
L_{inf} (cm) female	304.4	SCRS/P/2026/023 (ICCAT Secretariat)
L_{inf} (cm) male	207.4	
k female	0.12	
k male	0.28	
t_0 female	-3.1	
t_0 male	-1.7	
Gompertz model		
L_{inf} (cm) female	318.3	Quelle <i>et al.</i> (2026)
L_{inf} (cm) male	220.8	
k female	0.16	
k male	0.25	
T female	2.3	
T male	0.5	
VBGM model		
L_{inf} (cm) female	307.9	García <i>et al.</i> (2016)
L_{inf} (cm) male	238.9	
k female	0.09	
k male	0.15	
t_0 female	-2.2	
t_0 male	-1.7	
Maturity parameters		
L_{50} (cm) female	150.7	Borrego <i>et al.</i> (2025)
L_{50} (cm) male	138.5	
L_{90} (cm) female	156.1	
L_{90} (cm) male	160	
Length-weight conversions (Length-weight parameters)		
a female	1.69E-06	Forselledo <i>et al.</i> (2017)
a male	4.61E-06	
b female	3.32	
b male	3.12	
Maximum age and productivity and size at first capture		
t_{max} (y)	25	Mourato <i>et al.</i> (2022)
L_c (cm)	119	25th percentile LF
h	0.7 and 0.8	Last assessment (2022)

Table 6. Life history parameters used for the parameterization of the Mediterranean swordfish assessment.

Paramete	Mean	CV	Distribution	Description	Source
M	0.206	0.25	lognormal	Natural mortality (1/year)	McAllister (2014)
L _{inf}	238.58	0.1	lognormal	Von Bertalanffy asymptotic length	Mean: ICCAT Manual CV: Working Group
K	0.185	0.1	normal	Von Bertalanffy growth parameter	Mean: ICCAT Manual CV: Working Group
t ₀	-1.404	0.2	normal	Von Bertalanffy age at zero length	Mean: ICCAT Manual CV: Working Group
a	9.61E-06	-	exponential	Weight at length parameter (GG-LJFL)	Tserpes <i>et al.</i> (2017)
b	3.059	-	non lognormal	Weight at length parameter (GG-LJFL)	Tserpes <i>et al.</i> (2017)
L ₅₀ *	136.5	0.2	lognormal	Length at 50% maturity	Mean: SCRS/2026/055 Manual CV: McAllister (2014)
d	0.2	0.2	lognormal	Parameter of the logistic maturity ogive	Working Group
h	0.83	0.14	beta	Steepness $h=0.2 + 0.8 \text{ Beta}$ (5.86. 1.59)	McAllister (2014)

Table 7. Proposed fleet structure for the proposed SS3 modelling exercise for the Mediterranean stock.

No.	Fleet Name	Index Years	Catch/Size	Flag/Gear
1	SPNLL	1988-2024	1950-2024	EU-Spain/longline
2	GRCLL	1987-2024	1981-2024	EU-Greece/longline
3	LIGLL	(1991-2009) 2010-2024	1968-2024	EU-Italy/longline
4	MORLL	2012-2024	1961-2024	Morocco/longline
5	SICGN	1990-2009	1972-2024	EU-Italy/gillnet
6	HP	NA	1968-2024	Harpoon
7	OthLL	NA	1970-2024	all other longline
8	OtherGN	NA	1957-2009	all other gillnet
9	Others	NA	1965-2024	all others

Table 8. Uncertainty grid for JABBA combining growth hypotheses, steepness values, r prior and B_{MSY}/K .

Scenario	Growth hypothesis	Steepness (h)	r prior and B_{MSY}/K
1	Gompertz model (Quelle <i>et al.</i> , 2026)	0.7	Will be estimated using ASEM (Winker <i>et al.</i> , 2020) methodology
2		0.8	
3	Bayes VBGM model (SCRS/P/2026/021 by Rosa <i>et al.</i> , 2026)	0.7	
4		0.8	
5	Continuity run (García <i>et al.</i> , 2016)	0.7	$\log(r) \sim N(\log(0.155), 0.117)$ and a fixed input value of $B_{MSY}/K = 0.38$
6		0.8	$\log(r) \sim N(\log(0.162), 0.121)$ and a fixed input value of $B_{MSY}/K = 0.35$

Table 9. Growth and steepness grid explored in the Stock Synthesis model.

Scenario	Growth hypothesis	Steepness (h)
1	Gompertz model (Quelle <i>et al.</i> , 2026)	0.7
2		0.8
3	Bayes VBGM model (SCRS/P/2026/021 Rosa <i>et al.</i> , 2026)	0.7
4		0.8

Table 10. Fleet structure for the South Atlantic swordfish Stock Synthesis model.

No.	Fleet Name	Index	Catch/Size	Flag
1	SPNLL	1989-2024	1986-2024	EU-Spain
2	BRA-URYLL	1994-2024	1958-2024	Brazil and Uruguay
3	JPNLL1	1962-1975	1956-1975	Japan
4	JPNLL2	1976-1990	1976-1990	Japan
5	JPNLL3	1991-2024	1991-2024	Japan
6	CTPLL1	1968-1990	1962-1990	Chinese Taipei
7	CTPLL2	1998-2024	1991-2024	Chinese Taipei
8	ZAFLL	2004-2024	1979-2024	South Africa
9	OthLL	NA	1960-2024	all other longline
10	Others	NA	1950-2024	all others

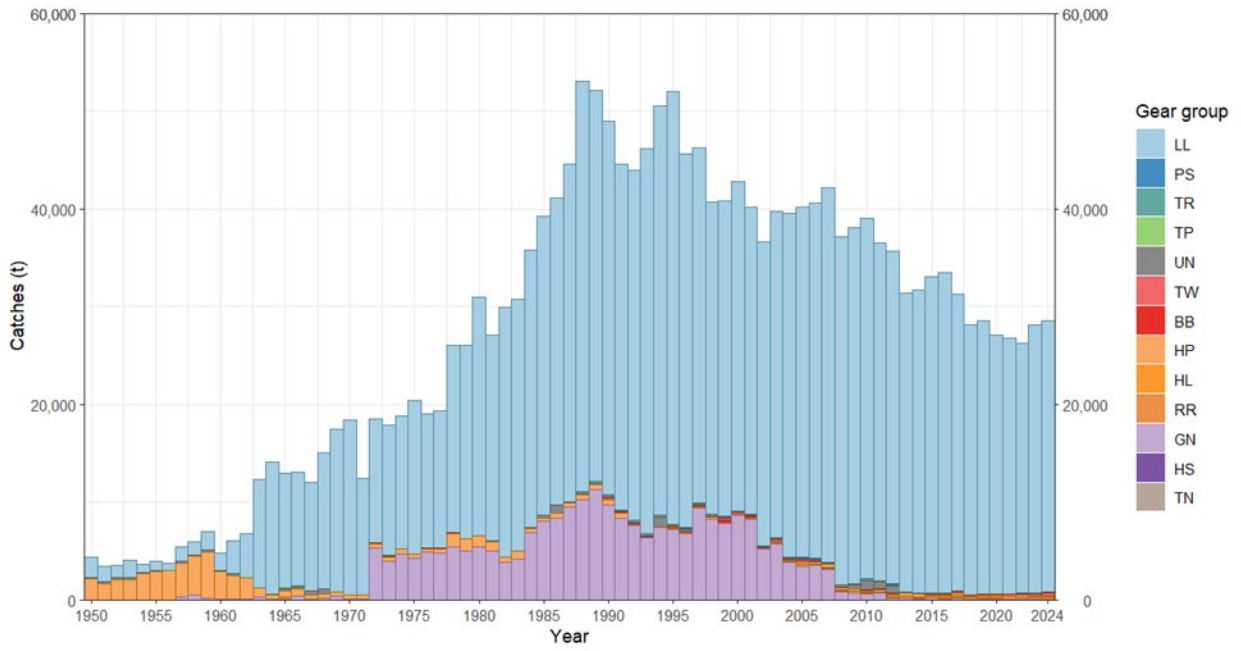


Figure 1. Annual swordfish catches (t) by main gear group in the Atlantic and Mediterranean during the period 1950–2024.

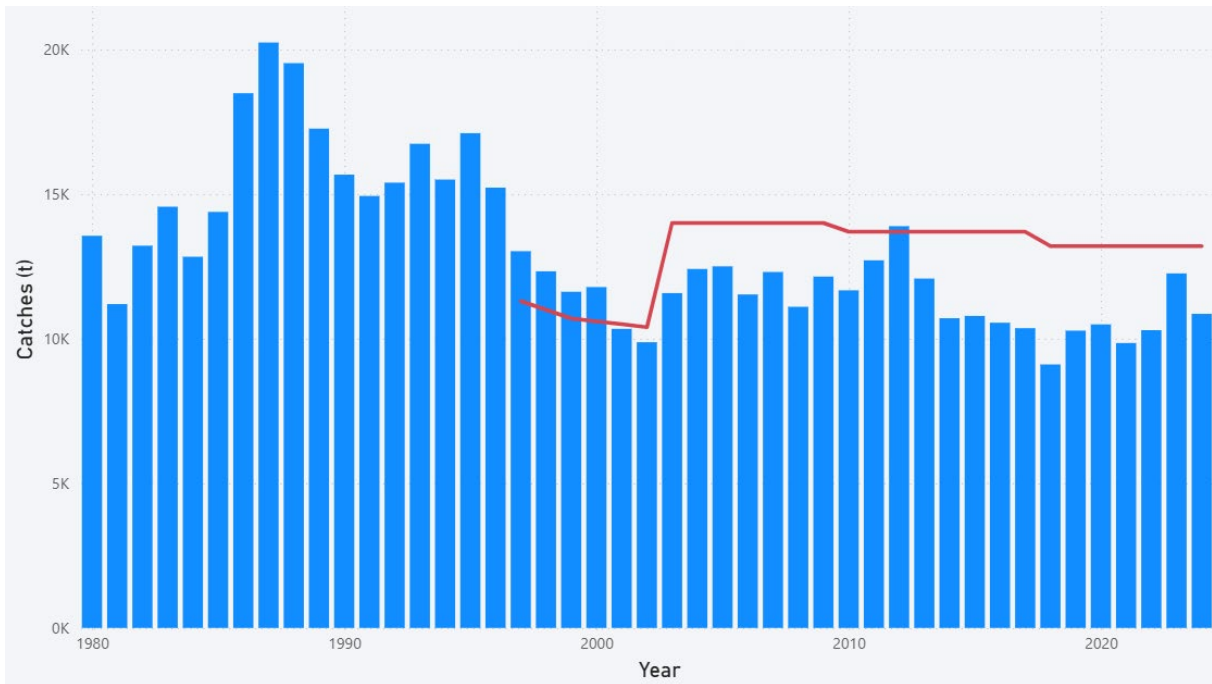


Figure 2. Annual nominal catches (t) of swordfish for the North Atlantic stock during the period 1980–2024. The red line represents the annual TAC.



Figure 3. Annual nominal catches (t) of swordfish for the South Atlantic stock during the period 1980–2024. The red line represents the annual TAC.

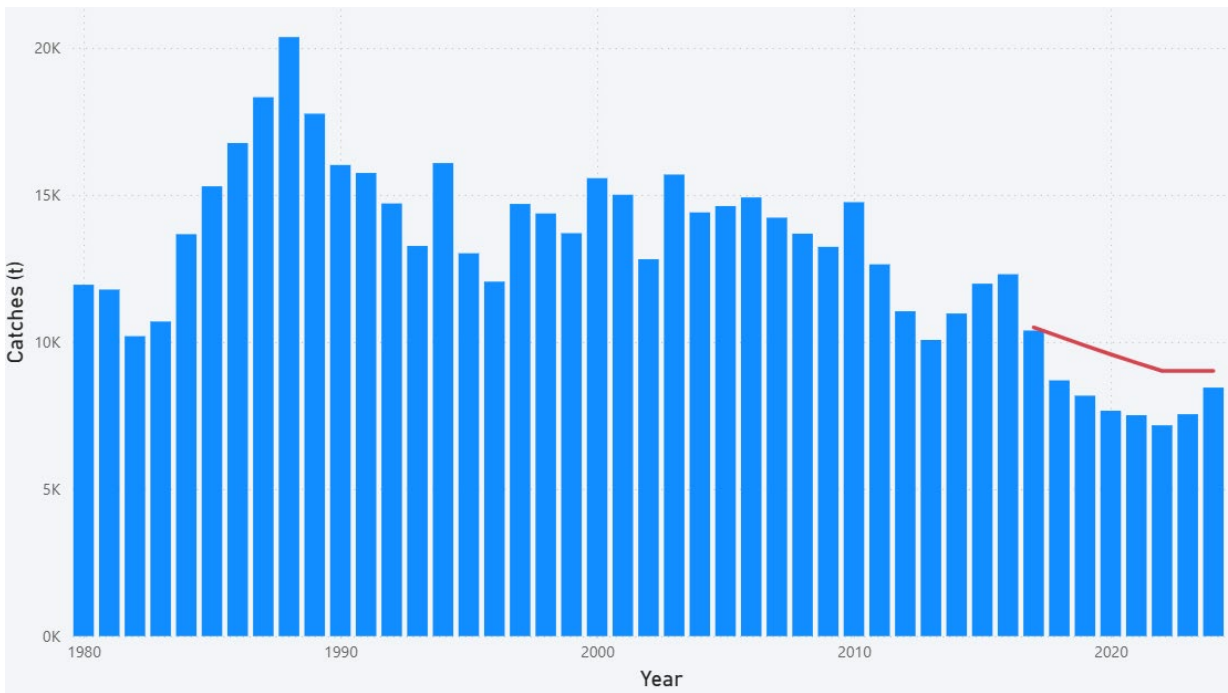


Figure 4. Annual nominal catches (t) of swordfish for the Mediterranean stock during the period 1980–2024. The red line is the annual TAC.

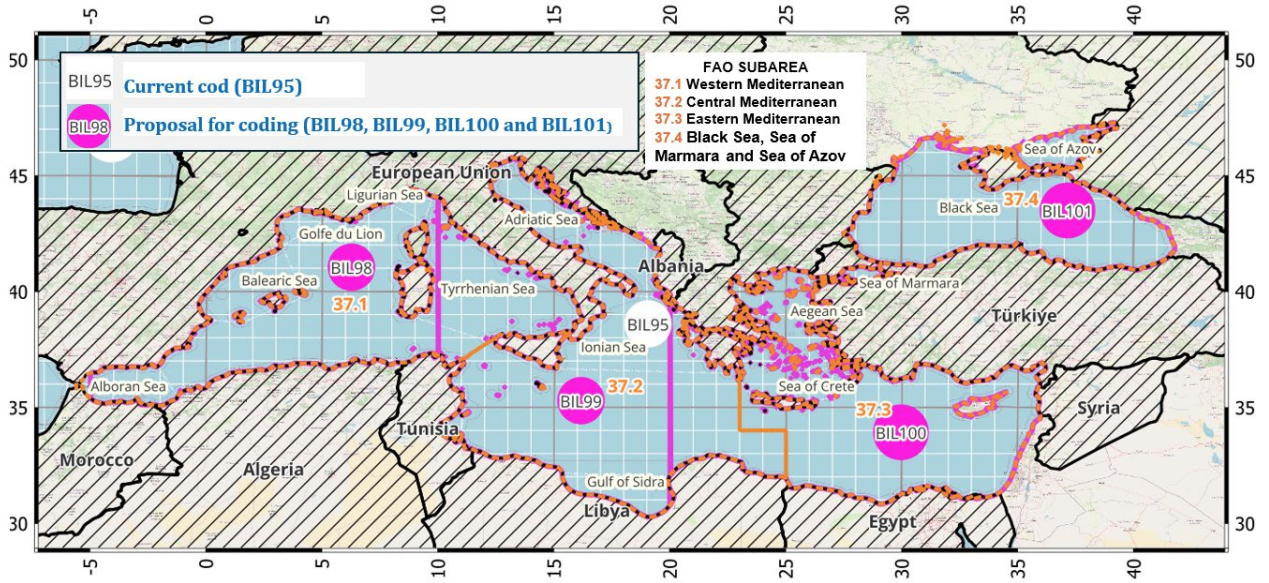


Figure 5. Proposed subdivision of sampling areas for the Mediterranean.

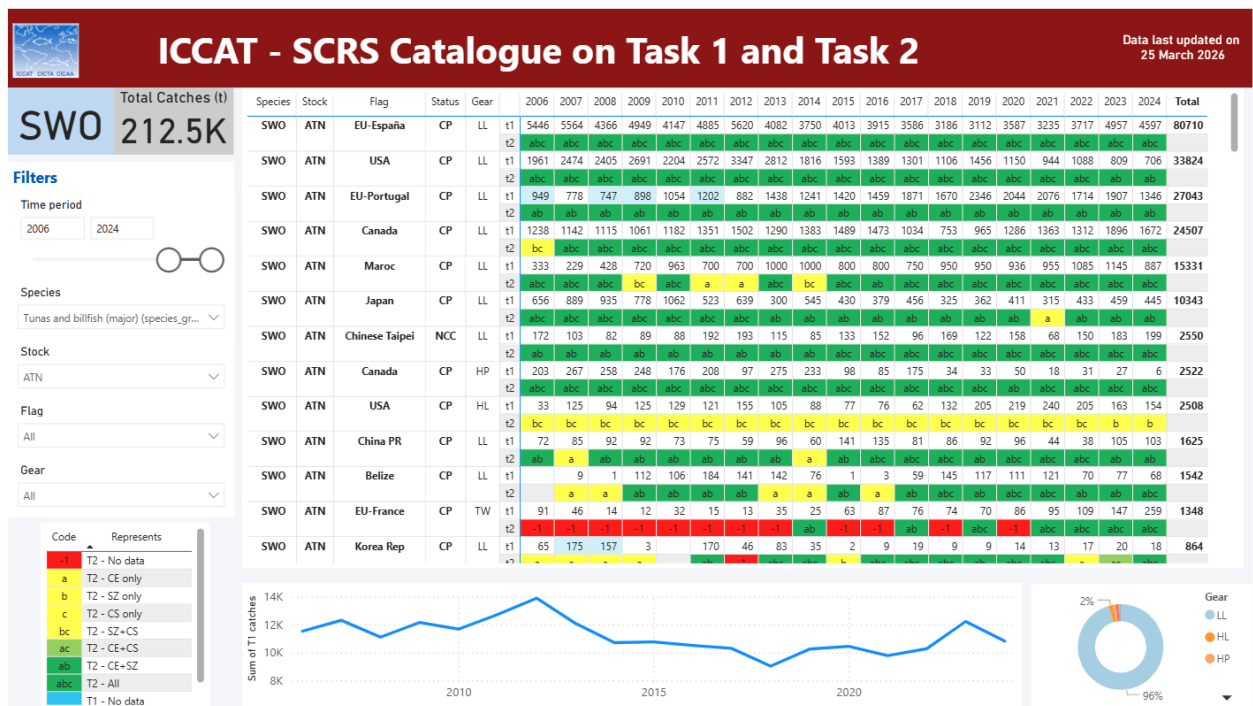


Figure 6. SCRS Catalogue dashboard showing the availability of Task 1 and Task 2 swordfish data for the North Atlantic stock for the period 2006–2024.

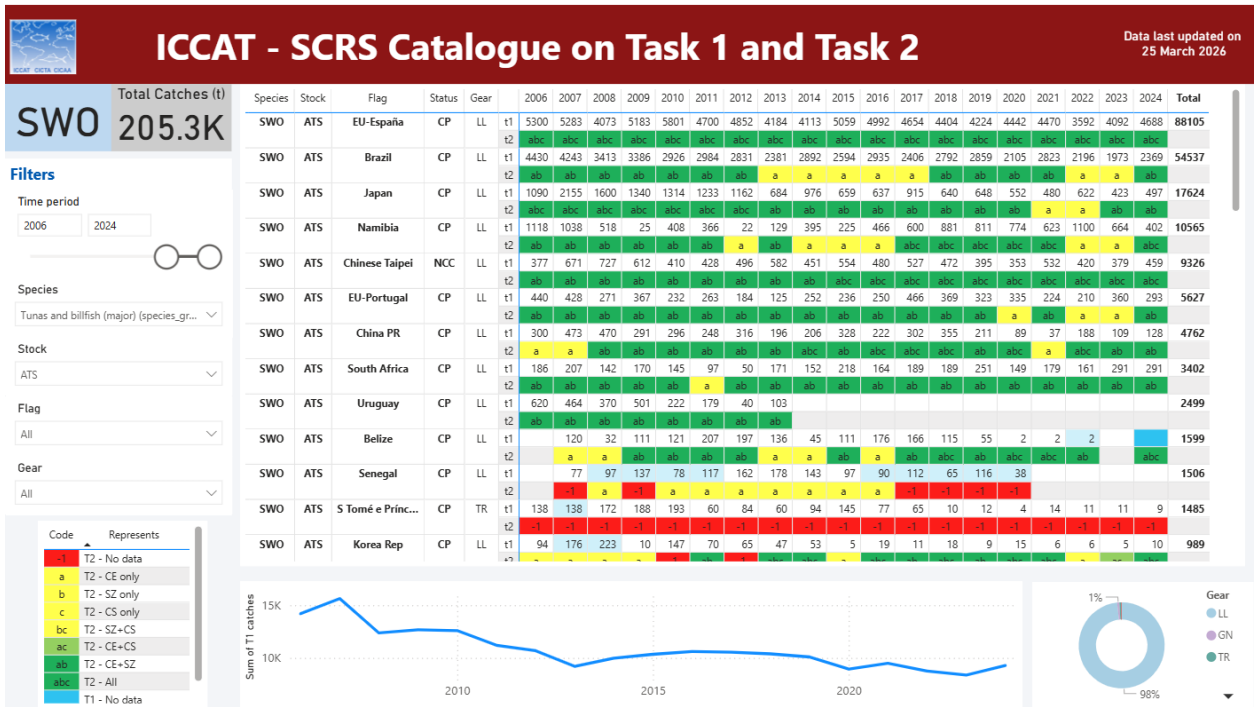


Figure 7. SCRS Catalogue dashboard showing the availability of Task 1 and Task 2 swordfish data for the South Atlantic stock for the period 2006–2024.

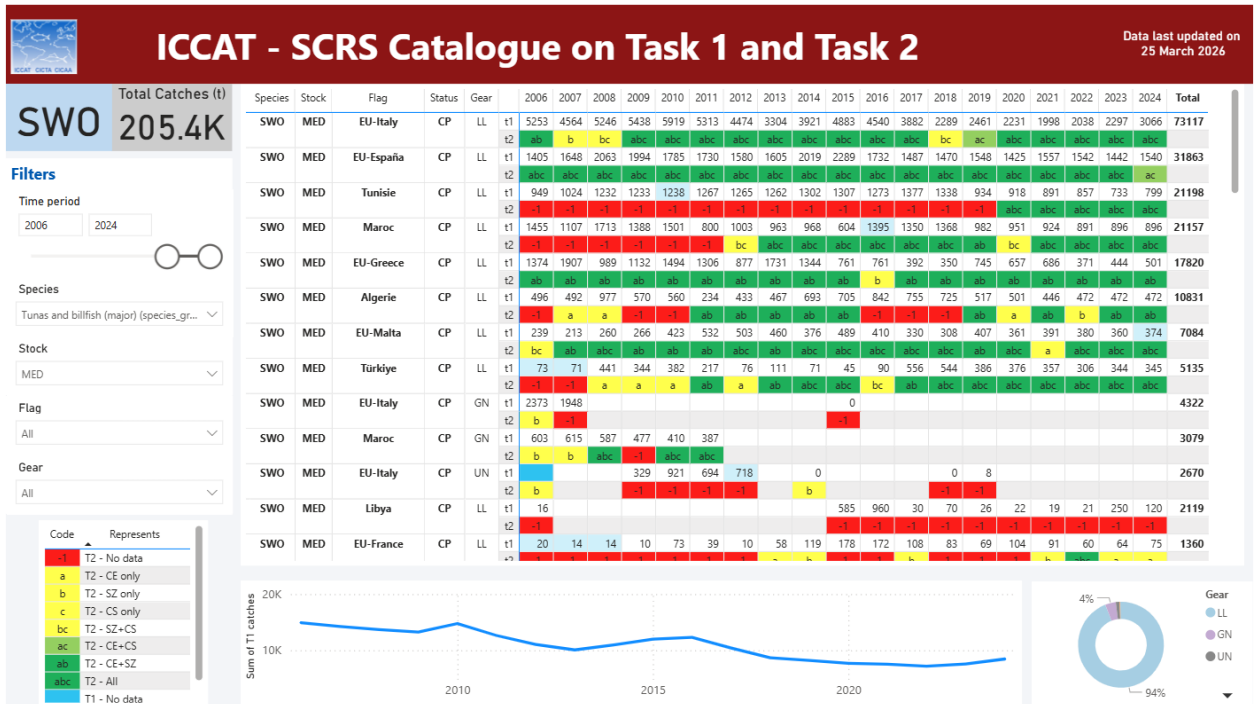


Figure 8. SCRS Catalogue dashboard showing the availability of Task 1 and Task 2 swordfish data for the Mediterranean stock for the period 2006–2024.

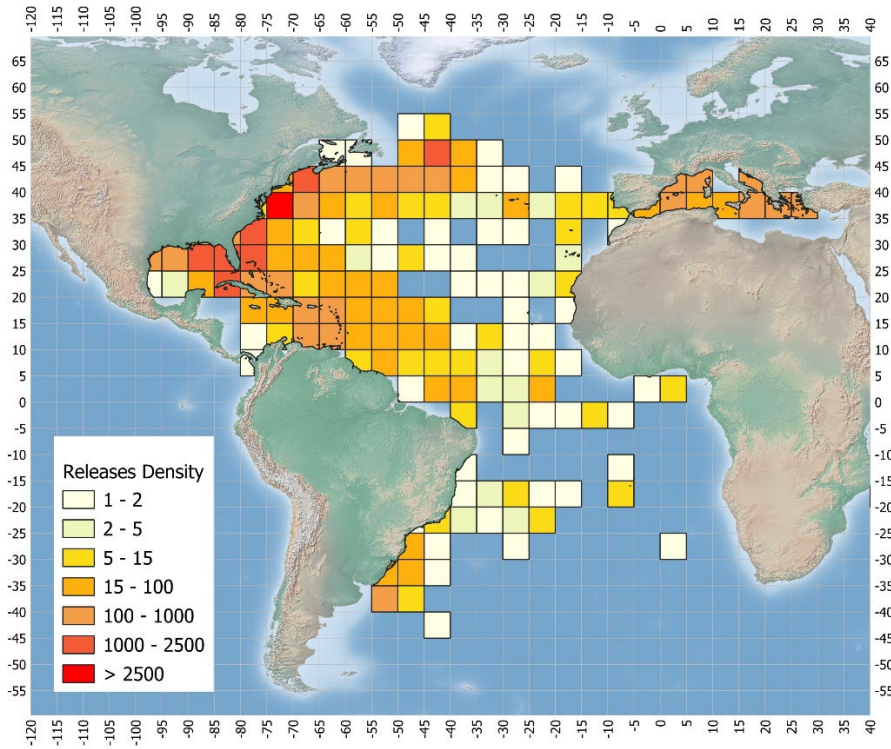


Figure 9. Density of SWO conventional tags released in a 5x5° square grid, in the ICCAT area.

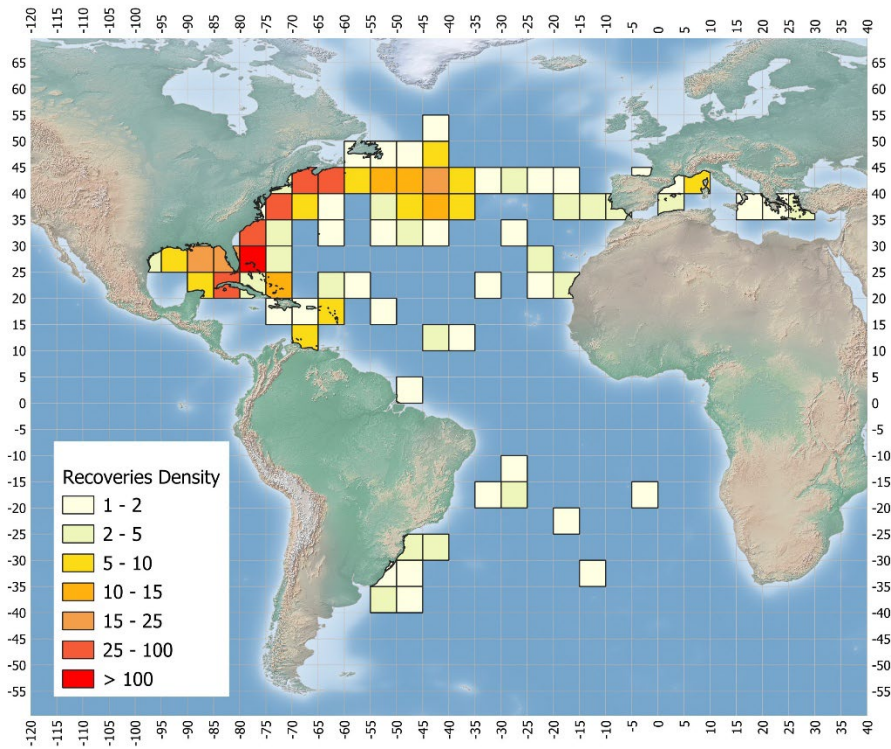


Figure 10. Density of SWO conventional tags recovered in a 5x5° square grid, in the ICCAT area.

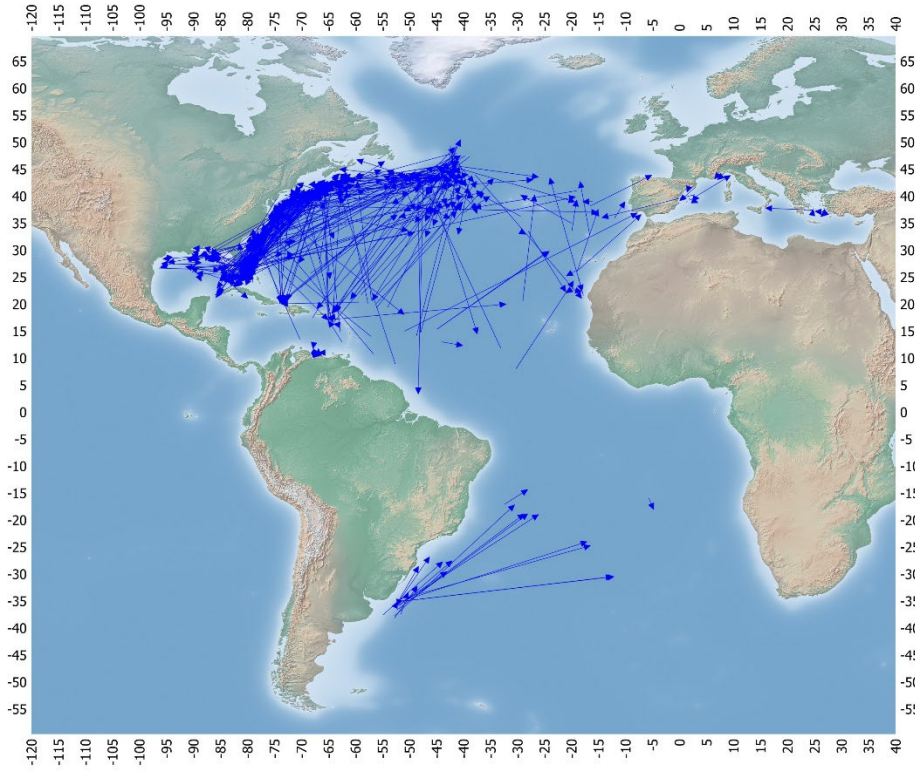


Figure 11. Apparent movement of swordfish based on conventional tagging (arrows: release to recovery location).

Swordfish Data Preparatory Meeting
(Hybrid / Madrid, Spain, 23-27 March 2026)

Objectives

The objective of this meeting is to review data inputs and decide on model specifications for the 2026 Atlantic and Mediterranean swordfish assessments. The meeting will review new biological information, catch and fisheries statistics (including discards), indices of abundance, and auxiliary information for the assessment models. In addition, relevant matters related to new gear types (trap line), discarding estimation, Swordfish Year Program (SWOYP) results, and the North Atlantic swordfish Management Strategy Evaluation (MSE) development will be discussed.

Agenda

1. Opening, adoption of the agenda and meeting arrangements
 - 1.1 Updates from the SCRS and the Commission
2. Review of fishery statistics
 - 2.1 Task 1 catches data and their spatial distribution
 - 2.2 Task 2 catch, effort and size
 - 2.3 Tagging data
 - 2.4 Results from trap line gear studies
 - 2.5 Plan for intersessional work on data improvements
3. Review of new and historical information on biology
 - 3.1 SWOYP updates and new results
 - 3.2 Updates to biological parameters
4. Review of available indices of relative abundance
 - 4.1 Mediterranean stock
 - 4.2 South Atlantic stock
5. Review of potential assessment models, specifications of data inputs, and modeling options
 - 5.1 Mediterranean stock
 - 5.2 South Atlantic stock
 - 5.3 Plan for intersessional work on assessment models
6. Review of discard estimation plans
7. MSE matters
 - 7.1 Robustness testing results
 - 7.2 Minimum size limit results
 - 7.3 Exceptional circumstances
8. Recommendations and workplan
9. Other matters
10. Adoption of the report and closure

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Appendix 3

List of papers and presentations

DocRef	Title	Authors
SCRS/2026/016	The use of traplines in the Portuguese pelagic longline fleet operating in the eastern Atlantic	Coelho R., Lino P., Barbosa C., Rosa D.
SCRS/2026/018	Updated standardized catch rates for South Atlantic stock of swordfish (<i>Xiphias gladius</i>) from the Spanish longline fleet for the period 1989-2024	Fernández-Costa J., Ramos-Cartelle A.
SCRS/2026/029	Standardized catch rates for Mediterranean swordfish (<i>Xiphias gladius Linnaeus, 1758</i>) from the Spanish longline fishery. 1988-2024.	Saber S., Rueda, L., Macías D., García S., Rioja P., Puerto M.A., Ortiz de Urbina J.
SCRS/2026/033	Revision of historical catch statistics of swordfish (<i>Xiphias gladius</i>) caught by the Mexican fishing fleet in the Gulf of Mexico	Ramírez-López K., Rojas-González R.I., Mayor C.
SCRS/2026/034	Spatio-temporal model for CPUE standardization: application to South Atlantic swordfish caught by Japanese tuna longline fishery from 1962 to 2024	Kai M.
SCRS/2026/035	Influences of using ring-shaped branch-line (Meka-Ring) on Atlantic swordfish CPUE in Japanese longline fisheries	Kai M., Tsukahara Y., Sato K., Semba Y.
SCRS/2026/036	Review and preliminary analysis of size samples of South Atlantic and Mediterranean swordfish (<i>Xiphias gladius</i>)	Ortiz M., Taylor N.G., Mayor C., Kimoto A.
SCRS/2026/039	CPUE trends of the Greek surface longline swordfish fishery in the eastern Mediterranean	Tserpes G., Peristeraki P.
SCRS/2026/041	Final report for phase seven of the ICCAT short-term contract for continuation of the swordfish growth, reproduction and genetics studies: biological samples collection and analysis	Rosa D., Stewart N., Gioacchini G., Borrego-Santos R., Andrews A.H., Krusic-Golub K., Carnevali O., Macías D., Hanke A., Gillespie K., Coelho R.
SCRS/2026/042	Updated standardized swordfish catch rates from longline fisheries operating in the Ligurian Sea (Italy, Western Mediterranean) (Period 1990–2024)	Garibaldi F., Bottero F., Lanteri L., Pinto C.
SCRS/2026/043	Multi-fleet longline CPUE standardization for South Atlantic swordfish (<i>Xiphias gladius</i>)	Su N-J., Mourato B.L., West W., Coelho R., Forselledo R., Kai M., Sant'Ana R., Báez J.C., Jagger C.E., Gillespie K., Kimoto A., Cardoso L.G.
SCRS/2026/045	Climate-induced shifts in swordfish spawning habitat in the Western Mediterranean	Tugores M.P., Torres A.P., Reglero P., Martín M., Balbín R., Tintoré J., Alvarez-Berastegui D.
SCRS/2026/046	Swordfish discard estimates in the Spanish Mediterranean longline fleet using the Bycatch Estimator Tool	Rueda L., Moreno J., Ortiz de Urbina J., Puerto M.A., Macías D.
SCRS/2026/047	Preliminary results on the use of traplines in the swordfish longline Spanish fishery in the Mediterranean Sea	Rueda L., Macías D., Moreno J., Borrego-Santos R., Alegría A., Salmerón F., García-Barcelona S., Ortiz de Urbina J., Báez J.C.
SCRS/2026/048	Updated catch rates of swordfish (<i>Xiphias gladius</i>) caught by Moroccan longline fleet in the Mediterranean Sea, 2012–2024	Layachi M., Ikkis A., Abid N., Serghini M., Bensbai J.
SCRS/2026/049	Revision of historical size distributions of swordfish (<i>Xiphias gladius</i>) caught by the Mexican fishing fleet in the Gulf of Mexico	Ramírez-López K., Rojas-González R.I., Mayor C.

SCRS/2026/050	CPUE standardisation of swordfish caught by longline in South African waters	West W.M., da Silva C., Kerwath S.E.
SCRS/2026/051	Development and results of the pilot project on the efficacy of traplines/loops in the Spanish longline fleet in the ICCAT area	Baez J.C., Alegría A., Moreno J., Borrego-Santos R., Salmerón F., García-Barcelona S., Rodríguez E., Carrera M., Rueda L., Puerto M.A., Gómez-Vives M.J., Macías D.
SCRS/2026/052	Standardized catch rates of swordfish from Brazilian and Uruguayan pelagic longline fisheries in the South Atlantic Ocean (1994-2024)	Mourato B., Forselledo R., Jiménez S., Kikuchi E., Mas F., Cardoso L.G., Sant'Ana R.
SCRS/2026/053	Statistique des prises accessoires de l'Espadon (<i>Xiphias gladius</i>) des navires de la pêche industrielle (PI), pêche semi-industrielle (PA) et pêche artisanale (PA) 2010-2025	Soumah M.
SCRS/2026/055	Updated analysis of maturity in swordfish (<i>Xiphias gladius</i>) from western Mediterranean Sea: From 2018 to 2025	Borrego-Santos R., Puerto M.Á., Alegría A., Rueda L., Rodríguez E., Gómez-Vives M.J., Moreno J., Carrera M., Saber S., Poisson F., Macías D.
SCRS/2026/056	Standardization of CPUE for South Atlantic swordfish (<i>Xiphias gladius</i>) caught in the Chinese Taipei tuna longline fishery using Delta approach	Su N-J., Sung Y.F.
SCRS/2026/057	Report of the 2025 ICCAT swordfish tagging campaigns off São Tomé e Príncipe (Gulf of Guinea)	Gillespie K., da-Conceição I.
SCRS/P/2026/018	Direct ageing of South Atlantic swordfish (<i>Xiphias gladius</i>)	Quelle P., Chapela I., Pérez-Casal P., Carroceda A., Jaranay M., Gutiérrez O., García B., Ramos-Cartelle A., Rodríguez-Marín E., Mejuto J.
SCRS/P/2026/021	Age and growth of swordfish using otoliths	Rosa D., Krusic-Golub K., Busawon D., Quelle P., 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., Coelho R.
SCRS/P/2026/023	Summary of available swordfish statistical data	ICCAT Secretariat
SCRS/P/2026/024	Summary of available swordfish tagging data	ICCAT Secretariat
SCRS/P/2026/025	Split the sampling areas in the Mediterranean to replace older T1NC areas	ICCAT Secretariat
SCRS/P/2026/026	Assessment model options and workplan for Mediterranean and South Atlantic swordfish	Gillespie K.
SCRS/P/2026/027	Swordfish discard estimation plans and proposed evaluation criteria	Gillespie K.
SCRS/P/2026/028	North Atlantic swordfish MSE analysis workplan in 2026	Gillespie K.
SCRS/P/2026/029	Genetic structure and diversity of Atlantic and Mediterranean swordfish stocks: A summary from ddRAD and minimum set of SNPs analyses	Gioacchini G., Gillespie K., Rosa D., Busawon D., Bezerra N.A., Travassos P., Hilário T.C., Hazin F.H.V. (in memoriam), Macías D., Gallucci A.M., Poisson F., Garibaldi F., Cardoso L.G., Pappalardo L., Piganlosa P., Su N.-J., Parker D., Tserpes G., Arocha F., Shikongo T., Di Natale A., Addis P., Mariani A., Santos M.N., Coelho R., Hanke A., Carnevali O.

SCRS/P/2026/030	Preliminary analysis of length weight and CPUE of swordfish <i>Xiphias gladius</i> from eastern Mediterranean	Farrag M.
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SCRS documents and presentation abstracts as provided by the authors

SCRS/2026/016 - In response to requests from ICCAT, a pilot project was initiated with the Portuguese pelagic longline fleet to evaluate the new terminal gear modification known as “trapline” or “loops”. Here, we present data collected by the Portuguese fleet operating in the eastern Atlantic Ocean during 2025. Species composition differed markedly between terminal hooks and traplines, with hooks capturing predominantly blue shark (*Prionace glauca*) and swordfish (*Xiphias gladius*), while traplines captured mostly swordfish. Swordfish CPUEs were higher in traplines, while CPUEs of pelagic sharks, including blue shark, shortfin mako (*Isurus oxyrinchus*), and other pelagic shark species, were significantly lower in traplines. These results provide one of the first quantitative evidence that traplines are associated with gear-specific differences in catch composition and CPUEs in pelagic longline fisheries. To date, no recorded catches of marine turtles have been registered in traplines. Continued monitoring and evaluation of this new terminal gear modification is recommended, as additional data become available.

SCRS/2026/018 - Updated standardized catch rates in number and in weight were obtained using Generalized Linear Model (GLM) procedures from trips carried out by the Spanish surface longline fleet targeting swordfish in the South Atlantic stock during the period 1989-2024. The criteria used to define factors were similar to those used in previous papers. The results explained 63% and 69% of CPUE variability in number and in weight, respectively, showing highly stable standardized CPUE and mean weight trends throughout the analyzed time series. The statistical diagnoses were highly satisfactory.

SCRS/2026/029 - Standardized relative abundance indices for swordfish (*Xiphias gladius* Linnaeus, 1758) caught by the Spanish surface longline in the western Mediterranean Sea were estimated for the period 1988-2024. Standardized CPUEs in number were estimated through a General Linear Mixed Modelling (GLMM) approach under a negative binomial (NB) error distribution assumption. Standardized CPUEs in biomass were estimated through a General Linear Mixed Modelling (GLMM) approach under a log-normal error distribution assumption. The main factors in the standardization analysis were fishing area and time of the year (quarter). The standardized indices showed notable annual fluctuations without any definite trend for the period under study.

SCRS/2026/033 - Mexico has maintained statistical records of swordfish catches (*Xiphias gladius*) in the Gulf of Mexico since 1993. In 2010, the Longline Tuna Fishery Information System in the Gulf of Mexico (SIA) was introduced, enabling management and conservation commitments to be met. This system involves collaboration with IMIPAS, PNAAPD, and other stakeholders. An observer program was established in 1993 to monitor fishing efforts and minimize effects on associated species. The updated historical catch series is presented and submitted to ICCAT for consideration.

SCRS/2026/034 - Abundance indices of South Atlantic swordfish caught by the Japanese tuna longline fishery were estimated using logbook data from 1962 to 2024. The nominal CPUE was standardized using a spatio-temporal generalized linear mixed model (GLMM) to describe annual changes in abundance. The analysis focused on capturing spatial and interannual variation in density to account for shifts in fishing locations associated with changes in targeting practices for tuna and tuna-like species. Based on the limited information on gear configuration and interannual changes in mean weight of swordfish, the data was divided into three periods (Early: 1962-1975, Middle: 1976-1990, Late: 1991-2024), and CPUE standardization was conducted separately for each period. The estimated annual CPUEs revealed pronounced fluctuations over the study period, with high values in the early 1960s, a decline through the late 1960s, moderate variability during the 1970s–1980s, and generally lower levels from the 1990s to the 2010s. The estimated CPUE using the spatio-temporal model with a large amount of data collected in the wide area in the South Atlantic Ocean is very useful information about the spatiotemporal changes in the abundance.

SCRS/2026/035 - We evaluated the influence of ring-shaped branch-line (Meka-ring) on swordfish CPUE using Japanese longline fishery data operated in the Atlantic Ocean from 2020 to 2025. In the North Atlantic, Meka-rings were used only once by a single vessel in 2022 that results in the catch of a single swordfish. Consequently, their influence on CPUE during the study period is considered negligible. In the South Atlantic, one vessel used Meka-rings continuously from 2021 to 2024 and achieved measurable swordfish catches over multiple years. Nevertheless, the proportion of operations utilizing Meka-rings remained

considerably small relative to the total effort, and their contribution to standardized CPUE estimates will therefore remain limited. Overall, in both the North and South Atlantic, the actual deployment of Meka-rings by Japanese longline vessels has been limited.

SCRS/2026/036 - Size samples data of South Atlantic and Mediterranean swordfish were reviewed, and preliminary analysis performed for its use within the stock evaluation models. Size data is normally submitted to the Secretariat by CPCs under the Task 2 requirements; optionally CPCs can submit Catch at Size, size samples or both for the major fisheries. The size samples data was revised, standardized and aggregated to size frequencies samples by area, main gear type, year and quarter. Preliminary analyses indicated a minimum number of 30 and 15 fish measured per size frequency sample for the South Atlantic and Mediterranean stocks, respectively. For South Atlantic and Mediterranean, the size sampling proportion among the major fishing gears is consistent with the proportion of the catch since 1970; in general, longline fisheries have been well sampled.

SCRS/2026/039 - Indices of swordfish (*Xiphias gladius*) abundance, expressed as biomass (kg/1000 hooks), were estimated using data from Greek drifting surface longline fisheries targeting swordfish in the eastern Mediterranean during the period 1987–2024. Annual standardized indices were estimated using Generalized Additive Mixed Models (GAMM). The models employed 'Year' and 'Gear type' as fixed effects, along with an 'early-period' covariate to account for the technical improvement of the traditional gear. Additionally, two random-effect components were included: (i) seasonal variation by area, and (ii) fleet-specific changes in catchability over time (technological creep). Differences in Catch per Unit Effort (CPUE) among years were found to be statistically significant, with standardized estimates for the most recent period being among the lowest recorded.

SCRS/2026/041 - In 2018, ICCAT's Swordfish Species Group initiated a biological sampling program in the North and South Atlantic and Mediterranean. The aim of the Swordfish Year Program (SWOYP) was to collect biological data that would support research critical to the assessment and management of this highly migratory and internationally managed species. From Phase 1 through Phase 7, the SWOYP progressively developed sampling protocols, collected biological samples across the Atlantic Ocean and Mediterranean Sea, built and refined databases, and advanced analyses on growth, age, reproduction, maturity, and genetics. Early phases focused on establishing methods and collecting large numbers of samples, while later phases concentrated on processing and analyzing those samples. In this report there is an assessment of where and when additional sampling effort is needed, basic analysis of data collected to date were provided, and next steps for sample collection and analysis are suggested. Particularly, updated results are presented for reproduction and maturity, based on histological staging of gonads; age validation and growth modelling based on otolith readings; and for genetics both on genetic population analysis and epigenetic ageing.

SCRS/2026/042 - Nominal indices of relative abundance for swordfish caught by the Ligurian longline fisheries were updated using data collected over the period 2020–2024. The trend in nominal CPUE for the mesopelagic longline (LLMESO), currently the most widely used gear, shows marked interannual variability over the last ten years, with higher values observed in 2016, 2017, and 2020 and lower values in 2018 and 2021. In the most recent years, the relative abundance index has shown an increasing trend again. The series was then standardized using data up to September 2023, prior to the introduction of the new trapline gear.

SCRS/2026/043 - Operational set-level Catch Per Unit of Effort (CPUE) data for swordfish captured by several longline fleets operating in the South Atlantic Ocean were collected and combined to estimate relative abundance indices time series. The joint-fleet analysis included data from Brazil, Chinese Taipei, Namibia, Portugal, South Africa, Spain and Uruguay, for the years 1978 to 2024. Fleet operations were categorized by clusters representing targeting differences in species compositions, using capture data from tunas, billfishes and other species that are captured by the fleets. The cluster analyses were conducted by each fleet separately and with the whole dataset including the data for all the fleets. Relative abundance indices for swordfish in the South Atlantic Ocean were estimated using generalized linear model (GLM) and delta approaches incorporating spatio-temporal and fishing operations factors. The results presented can be considered as input for the 2026 ICCAT South Atlantic swordfish stock assessment.

SCRS/2026/045 - The purpose of this study is to provide evidence of environmental change in the spawning area of swordfish (SWO) that is affecting the historical suitable reproductive conditions. To this end, we created a habitat model for the SWO yolk-sac larvae (YSL) using TUNIBAL surveys and environmental variables. YSL were found between 18 June and 23 July, with preference up to 7 July. In the western

Mediterranean 1990-2020, temperature and salinity have significantly increased during SWO spawning season, while surface productivity has decreased. Spawning showed strong affinity for warm waters (>24°C) and intermediate salinity values (37.3–37.8), in the waterfront between Atlantic and Mediterranean waters. Environmental and phenological indicators show an increase in the suitability of the reproductive habitat, in intensity and spatial extent, and the advancement of the spawning season (approximately half a day per year). Overall, the observed changes in spawning habitat and phenology, together with the inherent complexity of marine ecosystems, highlight the need to implement adaptive management strategies that can respond to these changes and to the increasing uncertainties introduced in fish stock assessments.

SCRS/2026/046 - This study uses the Bycatch Estimator Tool (BYET) to estimate total catches of discards of swordfish by the Spanish longline fleet in the western Mediterranean, used as a proxy for discards estimation.

SCRS/2026/047 - This study provides an exploratory analysis on the use of traplines by the Spanish Mediterranean longline fishery targeting swordfish using on-board observer data from 2023 to 2025.

SCRS/2026/048 - The relative abundance index of swordfish (*Xiphias gladius*) caught by the Moroccan longline fleet in the Mediterranean Sea was estimated using catch and effort data from 2012 and 2024. A General Linear Mixed Modelling (GLMM) with a lognormal error distribution was applied to standardize the abundance index. This analysis was based on data from 2203 commercial fishing trips. Results from this analysis indicated that the abundance might have declined from 2012 to 2017, followed by a period of relative stability in subsequent years. Both nominal and standardized CPUE showed annual fluctuations, reflecting changes in swordfish abundance and availability. These findings highlight the dynamic nature of swordfish abundance in the Mediterranean and emphasize the importance of continuous monitoring and regular updates of standardized index to support effective stock assessment and sustainable fisheries management.

SCRS/2026/049 - As part of efforts to improve fisheries and biological information within the framework of the SCRS Swordfish (*Xiphias gladius*) Species Group, data collected by the onboard observer program during fishing trips of the Mexican longline fleet in the Gulf of Mexico were analyzed. The dataset included a review of information from 24,522 swordfish records from the Gulf of Mexico for the period 1993–2024. Recorded lengths ranged from less than 50 cm to more than 300 cm LJFL. The annual data allowed for the identification of trends in average size and dominant size classes, contributing to the continuous improvement of ICCAT databases.

SCRS/2026/050 - A standardised CPUE index for swordfish (*Xiphias gladius*) is presented, derived from 16 161 sets recorded by the South African pelagic longline fleet operating along the west coast of South Africa between 2004 and 2024. A delta-lognormal generalised additive mixed model (GAM) was used to account for zero inflation in the catch data. Covariates included year, month, fishing tactic, and a two dimensional spatial smoother representing the spatial distribution of fishing effort, with vessel included as a random effect to account for vessel-specific differences in catchability. Model selection via the corrected Akaike Information Criterion (AICc), with all covariates contributing meaningfully to explaining variation in catch rates. Marginal means were used to derive the standardised year index, isolating the year effect from the influence of operational and spatiotemporal covariates. Residual diagnostics confirmed adequate model fit. The standardised CPUE index a stable trend in relative swordfish abundance in recent years. Swordfish CPUE had a definitive seasonal trend, with catch rates higher in winter (July - October) than in the rest of the year.

SCRS/2026/051 - Recent developments in the Spanish longline fishery have seen the introduction of trap for swordfish (*Xiphias gladius*), replacing or complementing traditional hooks. A pilot study was conducted in 2025 to assess trap performance, catchability, and operational characteristics. Data were collected from 3 long-distance and 37 Mediterranean vessels, using additional logbooks and onboard observers. The long-distance fleet primarily deployed traps on the mainline, while Mediterranean fleets showed diverse deployment patterns on hooks, mainline, or both. Trapline/loop use varied seasonally and among métiers, with increasing adoption toward the end of the year in the Atlantic fleet and relatively stable proportions in the Mediterranean fleet. Results highlight the rapid uptake of traps and their variable configurations, providing baseline information for future standardization and management considerations in swordfish longline fisheries.

SCRS/2026/052 - In this study, catch and effort data from Brazilian and Uruguayan pelagic longline fisheries operating between 1994 and 2024 were analyzed to develop a standardized CPUE index for swordfish in the southwestern Atlantic. CPUE standardization was conducted using Generalized Linear Models under a Delta-lognormal framework, incorporating temporal, spatial, operational, and targeting-related covariates. Two model formulations were evaluated to investigate the effect of vessel-specific differences in catchability: one including vessel identity as a categorical factor and another excluding this variable. Both models produced similar temporal patterns, indicating higher catch rates during the mid-1990s, followed by a decline in the early 2000s, a relatively stable period during the mid-2000s and early 2010s, and a gradual decrease in recent years. The model including vessel effects explained a larger proportion of deviance and reduced unexplained variability. These results suggest that vessel-specific differences contribute to variability in catchability and should be considered when deriving standardized CPUE indices for stock assessment purposes.

SCRS/2026/053 - The Republic of Guinea has a 200-nautical-mile Exclusive Economic Zone (EEZ) extending approximately 370 km along its coastline. This zone is rich in fisheries resources, including demersal fish, cephalopods, and pelagic species such as swordfish, tunas, and shrimp. These resources are exploited by industrial, semi-industrial, and artisanal fishing vessels operating under fishing licenses, contributing significantly to national food security, employment, and economic development. In addition, vessels targeting tunas (small and large species) and other authorized fleets generate substantial bycatch of tunas and associated species. The database of the Centre National des Sciences Halieutiques de Boussoira (CNSHB) contains a long time series of fisheries statistics for industrial, semi-industrial (advanced artisanal), and artisanal fisheries, established since 1995. Analysis of available data indicates that swordfish (*Xiphias gladius*) bycatch has shown an overall increasing trend since 2010, with a marked rise observed after 2020, likely reflecting improvements in data collection systems, particularly in the artisanal sector.

SCRS/2026/055 - Reproduction information about swordfish (*Xiphias gladius*) in the Mediterranean Sea is limited and scarce. This study updated the size at first maturity (L50) and information of spawning season of female swordfish in the western Mediterranean with gonads from Spanish and French longline fisheries between 2018 and 2025. Females reach L50 at 136.5 cm and L90 at 148.2 cm, with spawning activity occurring primarily from June to August. Immature females were mostly in northern Levantine waters, while mature and regenerating individuals were in southern Levantine and north of Corsica, showing spatial segregation. Results highlight methodological effects on L50 and the need for expanded sampling to support sustainable management.

SCRS/2026/056 - Catch and effort data of swordfish (*Xiphias gladius*) were standardized using delta approaches for the Chinese Taipei distant-water tuna longline fishery in the South Atlantic Ocean. The data set was separated into two periods to take into account of the targeting issue. A whole period from 1981-2024 was considered in the analysis, while the late periods 1994-2024 or 1995-2024 considering availability of HBF (i.e. number of hooks between floats) were also included in the analysis for comparison. We also conducted cluster analysis to indicate targeting and operation difference. The standardized catch per unit effort (CPUE) for swordfish showed similar trends among the models considered. The inclusion of HBF in the model produced almost identical patterns. In general, the abundance index for the South Atlantic swordfish dropped to lower level in the late 1990s, and then stabilized until recent years.

SCRS/2026/057 - This document reports the outcomes of the 2025 ICCAT tagging campaigns carried out in the Gulf of Guinea. A first campaign took place between 12 and July 27, 2025, with the operations carried out in the seas surrounding São Tomé Island, São Tomé and Príncipe. The objective was to place electronic tags on swordfish, billfish, and sharks to support ongoing analyses on distribution, diving patterns, and habitat use for these ICCAT managed species. Due to very poor weather and fishing conditions no target species were caught, the contractors further attempted to tag these species later in 2025. An additional campaign was carried out with a view to achieving the initial objectives, which ran from 19 to 23 December in Príncipe Island. Overall, a total of 10 trips were carried out, covering 684 kms of horizontal boat movement over 84 fishing hours during both daytime and nighttime. Trolling and buoy gears were used and two sailfishes and one blue marlin were successfully tagged.

SCRS/P/2026/018 - This presentation revealed the findings derived from the Direct Ageing of South Atlantic Swordfish study. The primary objective of this study is to provide insight into the dynamics of the South Atlantic Ocean stock growth patterns. The sampling covered a wide geographical distribution and occurred in every month of the year. The analysis encompassed a total of 788 anal fins. The study revealed a

correlation between the biometric parameters of the anal fin spine measurements and the fish size. It was observed that there was some variation in the size of the annulus one and the vascularisation, with some internal bands being obscured, in larger specimens. Marginal increment ratio (MIR) and edge type analyses demonstrated the occurrence of annual band formation in the austral winter (July to September), thereby confirming the hypothesis of one annulus formation per year. Growth parameters were calculated using different models. The Gompertz model yielded the most reliable parameters ($L_{\infty} = 341$ cm LJFL, $k = 0.13$ yr⁻¹, $T = 2.83$ yr). The tagging and recapture data provided corroboration for growth estimates of the selected model. The present study furnished indispensable biological parameters for the purpose of stock assessment and fisheries management. These parameters informed both conventional population models and the evaluation of different management strategies.

SCRS/P/2026/021 - An update of age and growth in swordfish is presented based on 927 otolith samples collected across the North Atlantic, South Atlantic, and Mediterranean stocks. Of these, 857 otoliths were prepared for annual ageing and 71 for daily microincrement counts. Fish lengths ranged from 72–175 cm LJFL (Mediterranean), 60–288 cm (North Atlantic), and 76–258 cm (South Atlantic). Estimated zone counts (age) spanned 0–6 years, 0–15 years, and 0–14 years, respectively. For the Atlantic stocks, decimal ages were derived using the Jesstimation method, and growth was modelled using Von Bertalanffy (VB), Gompertz, and Logistic formulations, with sex-specific fits. A Bayesian VB model was also fitted, where L_{INF} priors were based on estimates available in the literature. Due to limited samples, no growth estimates were produced for the Mediterranean stock. The VB model provided the best fit for both Atlantic stocks. Estimated L_{INF} values were among the lowest reported relative to previous studies, while growth coefficients (K) were among the highest. Estimates from the Bayesian models increased L_{INF} estimates, though K remained high when compared to previous studies. Ongoing work includes ageing from spines, with planned comparisons between otolith- and spine-based age estimates and corresponding growth model outputs.

SCRS/P/2026/023 - *SCRS/P/2026/023* provides a comprehensive synthesis of the statistical datasets available for Atlantic and Mediterranean swordfish (*Xiphias gladius*) within the ICCAT data system. It integrates Task 1 nominal catch data, Task 2 catch, effort, and size composition datasets, as well as tagging information and associated catalogue resources. Long-term trends indicate that total nominal catches peaked in the late 1980s and have declined thereafter, with longline fisheries consistently representing the dominant fishing gear, while early harpoon fisheries have diminished in importance. The presentation further evaluates data completeness and quality across fleets and regions using standardized indicators. Significant heterogeneity persists, with gaps in Task 2 reporting, particularly for size and catch-at-size data, and a decline in discard reporting in recent years. Spatial resolution has improved through grid-based systems such as CATDIS, although inconsistencies remain. Overall, the presentation highlights both the breadth of available datasets and key limitations relevant to stock assessment and management procedure development.

SCRS/P/2026/024 - *SCRS/P/2026/024* summarizes the status and characteristics of swordfish tagging data compiled by ICCAT, including both conventional and electronic tagging programs. A substantial number of conventional tag releases have been conducted, with recoveries representing a relatively small proportion, reflecting expected limitations associated with large-scale pelagic tagging studies. Tagging effort is concentrated in specific Atlantic regions, and the resulting recovery patterns indicate broad-scale movement across ocean basins, supporting their use in evaluating stock structure and connectivity. Electronic tagging data provide complementary, high-resolution information on movement behavior and habitat use. These datasets include detailed track reconstructions, transmission metadata, and temporal records of individual fish movements over extended periods. Such information enhances understanding of migration pathways, vertical behavior, and environmental interactions, although data loss and tag performance remain important considerations. The presentation also outlines access to tagging datasets through ICCAT databases, dashboards, and mapping tools. Overall, the integration of conventional and electronic tagging data represents a critical component of the scientific basis for stock assessment, spatial management, and ecosystem-based fisheries management.

SCRS/P/2026/025 - *SCRS/P/2026/025* proposes a revision of ICCAT Task 1 nominal catch spatial stratification in the Mediterranean Sea to address limitations associated with historically coarse and undefined reporting areas. The current system lacks explicit geographical definitions, reducing its effectiveness for spatially explicit analyses and limiting its alignment with biological and management-relevant structures. The proposed framework introduces a subdivision of the Mediterranean

into more refined and ecologically meaningful subregions, including areas such as the Adriatic, Ionian, Ligurian, Tyrrhenian, and Strait of Sicily. Analysis of historical data across these subregions demonstrates that, while the aggregated Mediterranean category dominates reported catches, substantial spatial heterogeneity exists within the basin. The proposal further aligns ICCAT spatial classifications with those used by FAO and the General Fisheries Commission for the Mediterranean, enhancing consistency and interoperability across regional frameworks. A revised codification scheme is presented to operationalize these changes across datasets and species. The proposed restructuring is intended to improve spatial resolution in catch reporting, strengthen the scientific basis for stock assessment, and support more robust spatial analyses within management strategy evaluation frameworks.

SCRS/P/2026/026 - Candidate stock assessment models, specifications, data requirements, and diagnostics are described for the 2026 South Atlantic and Mediterranean swordfish stocks. The initial plan for the Mediterranean involves a4a and JABBA models. In the South Atlantic, a Stock Synthesis and a JABBA model will be developed. Core modelling teams, model assumptions, and model development timelines are described.

SCRS/P/2026/027 - The Commission is increasingly requiring CPCs to describe their methods for estimating discards for select species within their fisheries. For swordfish, the scale of discarding and repercussions for unaccounted mortality is a major source of uncertainty for the three stocks. Discard estimation procedures an important step forward for improving fishing mortality estimated for the stock however the SCRS does not currently have a process for evaluating, revising, or accepting methodologies. This presentation proposes an evaluation process and initial criteria for examining discard estimation plans.

SCRS/P/2026/028 - The North Atlantic Swordfish MSE process has been ongoing since 2018. In 2024 a management procedure was adopted by the Commission. The Recommendation also set out further science tasks for the SCRS for subsequent years. This presentation describes the SCRS's MSE workplan for 2026 which includes additional robustness testing and evaluation of exceptional circumstances. Robustness tests will involve additional testing for climate change pressures and an evaluation of the effectiveness of minimum size limits. The combined index of abundance will undergo a strict data updated which will support EC evaluation.

SCRS/P/2026/029 - A total of 814 swordfish was analyzed, including 764 individuals genotyped using ddRAD sequencing and 50 individuals assigned using a minimum diagnostic SNP panel. The results indicate clear genetic structuring across regions. A distinct genetic clustering was observed between the Mediterranean stock and the two Atlantic stocks, confirming strong differentiation between Mediterranean (MED) and Atlantic (ATL) populations. Analyses of allele frequency distributions further revealed genetic differentiation between North Atlantic (NA) and South Atlantic (SA) stocks, while also indicating evidence of mixing and admixture in the BIL94B area. Within the Mediterranean dataset ($n = 284$), allele frequency analyses identified two main genetic clusters: one associated with swordfish from the Central Mediterranean (Adriatic, Ionian, and Tyrrhenian Seas) and another characteristic of individuals from the Eastern Mediterranean (Greece). Samples from the Western Mediterranean exhibited intermediate allele frequency patterns, suggesting a transition zone and potential admixture between these two Mediterranean genetic groups.

SCRS/P/2026/030 - This is a preliminary investigation of *X. gladius* caught by drifting longliners (Target) and bycatch from the albacore fishing gears during summer 2025, in Damietta landing, Egypt. The exponent of the length weight of 69 specimens was estimated as 2.374 in negative allometric growth. Specimens were ranged from 90 to 290 cm (T.L) with an average of 191.4 ± 58.43 . Lower jaw length ranged from 55.2 to 192.96 cm (LJFL) with an average of 122.71 ± 39.63 cm. Total weight ranged from 4.51 to 49.8 kg and average of 26.72 ± 15.79 kg. condition (kn) ranged from 0.55 to 1.22 with an average of 0.86 ± 0.16 . Length frequency gave majority for group 211-220 to group 251-260 (T.L cm). Catch and CPUE of targeted *X. gladius* from July to November 2025, showed the highest catch in August (38,750 kg: 31.36%) of the total catch, followed by September (31.600 kg; 25.58%). CPUE per hook is the highest in August (4.70 kg). Otherwise, CPUE/day for all allowed boats and for each boat were highest (702.22 and 215.28 kg respectively) during September. This difference between ranks of catch and CPUE is influenced by fishing days. Swordfish by-catch gave the highest catch in July (2700 kg: 29.41%), and CPUE/day for all allowed boats and for each boat/day constituted 135 and 4.50 kg respectively). More data is important for biology and further required stock assessment parameters.