Report of the 2026 Meeting of the Subcommittee on Ecosystems and Bycatch (SC-ECO)
(Spain/Hybrid, 18–22 May 2026)

The results, conclusions and recommendations contained in this Report only reflect the view of the Subcommittee on Ecosystems and Bycatch (SC-ECO). Therefore, these should be considered preliminary until the SCRS adopts them at its annual Plenary meeting and the Commission reviews 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 in Madrid (Spain) in hybrid format from 18 to 22 May 2026. The Co-convenors of the Subcommittee on Ecosystems and Bycatch (the "Subcommittee"), Dr Eider Andonegi (EU-Spain) and Andrés Doming (Uruguay) opened the meeting and welcomed the participants. The ICCAT Executive Secretary also welcomed and thanked the participants. The Co-convenors 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 papers and presentations provided at the meeting is attached as **Appendix 3**. The abstracts of all SCRS documents and presentations provided at the meeting are included in **Appendix 4**. The following served as rapporteurs:

Sections	*Rapporteur*
Item 1	N.G. Taylor
Item 2	B. Haoujar, M.J. Juan-Jordá, E. Andonegi
Item 3	N.G. Taylor
Item4	L. Kell, E. Roebuck
Item 5	N.G. Taylor, E. Andonegi
Item 6.1	N.G. Taylor
Item 6.1.1	J.C. Báez
Item 6.2	J. Bell, H. Wade, H. Matsushita
Item 6.3	M. Grande, L. Ramos, C. Da Silva
Item 6.4	N.G. Taylor, C. Da Silva
Item 7	E. Andonegi, N.G. Taylor, M. Ortiz
Item 8	R. Coelho, H. Matsushita, C. Da Silva
Item 9	G. Díaz
Item 10	M. Grande, C. Da Silva, G. Díaz, A. Domingo, R. Coelho
Item 11	G. Díaz, E. Andonegi, A. Domingo, N.G. Taylor
Item 12	C. Brown, M. Neves dos Santos, E. Andonegi, A. Domingo
Item 13	E. Andonegi, A. Domingo
Item 14	M. Neves dos Santos, R. Coelho, N.G. Taylor
Item 15	N.G. Taylor, E. Andonegi, A. Domingo

Pertaining to ecosystems

2. Review of progress on initiatives developing tools supporting SUBECO ecosystem products: EcoCard and ecosystem fisheries overviews

Document SCRS/2026/100 presented a temperature-driven indicator of early-life habitat suitability for tropical Atlantic bigeye tuna to support the development of climate-informed ecosystem indicators.

The Subcommittee highlighted that while this research contains certain limitations, such as the current focus on sea surface temperature as the primary driver of larval habitat suitability, the document provides highly valuable insights for integrating climate change considerations into ecosystem monitoring and fisheries advice. Uncertainty regarding optimal larval thermal ranges was discussed, noting that available information remains limited and that species may exhibit greater environmental plasticity than currently assumed. Additionally, the Subcommittee indicated this type of indicator could provide useful background information for informing climate-related assumptions in Management Strategy Evaluation (MSE) processes for tropical tunas.

Document SCRS/2026/108 reported on the TunaMed observatory and the use of environmental variability indicators to support climate-informed stock assessment and MSE for Mediterranean bluefin tuna, albacore, and swordfish.

The Subcommittee discussed the potential utility of integrating environmental variability indicators into abundance indices and assessment frameworks for relevant Mediterranean species. The Subcommittee also inquired whether these results had been presented to other ICCAT Species Groups (e.g., BFT, SWO, ALB), noting their clear relevance to stock assessment and MSE processes.

The authors confirmed that the work had indeed been presented to some ICCAT Species Groups, receiving positive feedback. The authors also noted that additional applications for other Species Groups are ongoing or planned.

Document SCRS/2026/107 presented preliminary incidental catch indicators from Namibia's large pelagic fishery and highlighted the need for robust, standardized bycatch monitoring and reporting protocols to support ICCAT ecosystem-based management considerations.

The Subcommittee suggested that the author strengthen collaboration with CPCs and other SCRS Species Groups with experience in bycatch monitoring and indicator development, particularly given that this work represents an early-stage process for Namibia. The Subcommittee emphasized the importance of harmonizing data collection protocols and database structures to facilitate future regional analyses and indicator development. Questions were raised regarding the current observer coverage levels and plans to expand monitoring beyond longline fisheries to include other fleets such as pole-and-line fisheries. The Subcommittee further noted the importance of continuing efforts to finalize Bycatch per Unit Effort (BPUE) indicators and to improve reporting of bycatch of seabirds and other vulnerable taxa.

The author clarified that the incidental catch reporting form has already been prepared for all fleets and is completed by observers. When there is no observer on board, the incidental catch form should be completed by the skipper.

Document SCRS/2026/111 presented updated indicators for retained and assessed ICCAT species proposed for inclusion in the 2026 EcoCard, showing a gradual overall reduction in fishing pressure from overfished conditions while highlighting the stocks currently at greatest risk.

The Subcommittee discussed improvements to the presentation of information included in the EcoCard. These included: the removal of redundant plots, simplification of graphical outputs, and adjustment of visual styles to improve clarity for the Commission.

The Subcommittee also discussed the need to clearly distinguish, within the indicators presented, between years with updated stock assessments and years in which stock status was inferred from previous assessments.

The Subcommittee also noted that long-term trends in B/B_{MSY} indicators may reflect not only changes in stock status, but also methodological changes between assessments.

The Subcommittee suggested that future projects could explore presenting the indicators by ecoregions, which may improve their utility for regional EcoCards and Ecosystem Fisheries Overviews (EFOs).

Furthermore, the Subcommittee noted the importance of considering retained species that are currently not assessed, such as some small tunas, and it was noted there is another component in the EcoCard that covers this.

Finally, the Subcommittee agreed to include only the two previously adopted and updated indicators in the 2026 EcoCard.

Document SCRS/2026/116 evaluated five candidate ICCAT ecoregions as a framework to support ecosystem-based planning, research, and advisory development within ICCAT, demonstrating strong spatial structuring with distinct fleet, catch, and gear compositions and supporting their potential utility as operational spatial units for the implementation of an Ecosystem Approach to Fisheries Management (EAFM).

It was pointed out that the proposed ICCAT ecoregions remain candidate regions in that they have not been adopted by the Subcommittee, and that they require further validation and testing, as noted in the Report of the 2025 Meeting of the Subcommittee on Ecosystems and Bycatch (SC-ECO). It was also noted that an important validation process is already underway through the development of regional EcoCards, regional EFOs, and other ecosystem-based products which may themselves help assess the utility of the proposed ecoregions and inform future refinements.

Additionally, concerns about partitioning the entire Atlantic Ocean into only five ecoregions might be an oversimplification of ecosystem and fisheries dynamics. To address these concerns, the authors noted that each candidate ecoregion is further subdivided into subareas based on the outcomes of the most recent refinement workshop. Regional products at the ecoregion level such as EcoCards and EFOs would also allow relevant subregional patterns and ecosystem characteristics to be highlighted where appropriate. The authors further emphasized that the proposed ecoregions are intended to support regional ecosystem research and development of ecosystem-based products linking fisheries, bycatch, climate, and ecosystem considerations relevant to ICCAT-managed species, rather than representing direct management units.

Presentation SCRS/P/2026/073 presented a Socio-Ecosystem Diagnostic Analysis (SEDA) of the Sargasso Sea integrating ecological, socio-economic, governance, and human-pressure components to support ecosystem-based conservation and management.

The Subcommittee discussed the broader scope of the project, noting that the initiative extends beyond ICCAT and involves multiple institutions, sectors, and regional governance frameworks.

The presenters explained that the detailed SEDA supports and defines a Causal Chain Analysis of Threats, Impacts, and Root Causes, which is a "linear" equivalent to the Drivers – Pressures – State – Impact – Response (DPSIR) framework to identify key ecosystem pressures and interactions, including fishing and other emerging activities such as shipping and deep-sea mining. The authors further clarified that the SEDA represents the first phase prior to the development of a Strategic Action Programme (SAP) for the Sargasso Sea.

Document SCRS/2026/113 updated the economic indicators for the ICCAT EcoCard by incorporating World Bank income classifications and inflation-adjusted tuna prices to provide a more nuanced economic perspective on ICCAT fisheries.

The Subcommittee emphasized the need to determine the importance of establishing the objectives and goals as well as which specific information should be included as EcoCard indicators.

Questions were also raised regarding the practical value of a single ICCAT-level indicator, given the distinct economic variations observed at the individual country level.

The authors agreed that the ICCAT-level indicator approach warrants further discussion, clarifying that this economic indicator is not intended to measure localized fishery impacts, which inherently vary by nation owing to factors including fleet operating costs, national subsidy programmes, and catch value.

Presentation SCRS/P/2026/072 outlined the Marine Beacon Project, which developed evidence-based bycatch mitigation solutions for EU fisheries using a multi-species, multi-objective approach integrating ecological, social, and economic factors to reduce the mortality of protected, endangered, and threatened species.

The Subcommittee emphasized the importance of collaborative approaches and proactive engagement with CPCs to improve data sharing and strengthen species distribution model inputs, particularly for data-poor shark and ray species lacking formal stock assessments. Discussions also highlighted the methodological limitations and uncertainties associated with some of the assumptions of the Ecological Assessment of the Sustainable Impacts by Fisheries (EASI-Fish) framework, particularly regarding susceptibility parameters for the different ICCAT fisheries and fleets.

The presenters noted that the Marine Beacon Project maintains active collaborative processes and is actively engaging with researchers from various CPCs. It was also clarified that ongoing work is focused on refining susceptibility parameters and improving underlying data inputs through collaborative processes with CPC scientists and other researchers, given the importance of these parameters within the EASI-Fish framework.

The Subcommittee noted that previous Ecological Risk Assessments (ERAs), including Productivity-Susceptibility Analyses (PSAs), have already been developed within ICCAT for sharks and seabirds. It was also noted that EASI-Fish is a spatially explicit ERA that allows the cumulative impacts of multiple fisheries to be evaluated and supports estimation of species vulnerability status based on proxies of fisheries reference points.

The Subcommittee also noted that the project contributes directly to ongoing ICCAT efforts to evaluate ecosystem and bycatch impacts associated with tropical tuna fisheries, including work requested under the existing *Recommendation by ICCAT replacing Recommendation 22-01 on a multi-annual conservation and management plan for tropical tunas* (Rec. 24-01).

Document SCRS/2026/099 evaluated the spatiotemporal distribution of mobulid rays in the eastern tropical Atlantic by applying a hierarchical Bayesian Species Distribution Models (SDMs) to observer data from EU purse-seine tropical tuna fleets.

The Subcommittee highlighted the importance of incorporating additional datasets from other fisheries to improve SDM model performance and spatial representativeness. It noted that interactions between mobulids and other fisheries, such as gillnets and pelagic longline fleets may occur in some regions and should be considered in future interactions of the analyses. The importance of incorporating additional fishery-independent datasets, including tagging information and aerial survey observations, was highlighted.

The Subcommittee further noted that ongoing monitoring activities in the Mediterranean, including aerial surveys conducted under the ICCAT Atlantic-Wide Research Programme for Bluefin Tuna (GBYP), may also provide valuable complementary information for future analyses.

The authors indicated that some fishery-dependent data from other longline and gillnet fleets are already being considered for integration through integrated Species Distribution Models (iSDMs) and invited other CPCs to contribute to the study in order to expand the model across the entire Atlantic habitat of *Mobula* species.

Document SCRS/2026/098 introduced "Indicator 3" for the EcoTest framework, an advanced machine-learning tool designed to estimate stock status across a wider range of life histories and fishery types than previous iterations.

The Subcommittee discussed the robustness of the methodology under scenarios of catch uncertainty and potential underreporting. It noted that increases in reported catches may sometimes reflect improvements in reporting practices rather than actual increases in catches or stock abundance.

The authors noted that, while the model relies on actual catch records, testing potential underreporting scenarios is feasible by incorporating a designated percentage of change for underreporting directly into the dataset. Additionally, it was noted that neural network weights can help to clarify the relative contribution of each input variable. Nevertheless, these applications remain highly specific to individual fisheries and species.

Document SCRS/2026/125 presented a study integrating salinity anomalies into Mediterranean albacore Catch per Unit Effort (CPUE) standardization, showing that regional freshening can compress habitat and artificially increase longline catchability, with potential applications for reducing environmental bias in ICCAT stock assessments.

The Subcommittee inquired about the possible bias caused by the use of sea surface salinity in the model, considering that catches come from a deeper layer (from 55 to 500 meters depth). The Subcommittee also asked whether other, more relevant variables had been considered. The authors responded that other variables (such as Sea Surface Temperature (SST) and chlorophyll *a*) had been included in the initial modelling approach, but only salinity and depth showed a significant effect.

Document SCRS/2026/092 presented an Ecopath model designed to describe the trophic structure and energy flows within the pelagic ecosystem of the Western Central Atlantic for the initial year 2000, with emphasis on three small tuna species (*Thunnus atlanticus*, *Acanthocybium solandri,* and *Sarda sarda*).

The Subcommittee inquired about how the spatial limits of the model were defined and whether alternative ecological delimitations were considered during that process. The authors indicated that while ecoregions were initially considered, they opted to use the boundaries of FAO Statistical Area 31 due to practical constraints regarding fishery data availability.

Additionally, the Subcommittee asked why yellowfin tuna was not modelled as a single-species functional group, given its high catch volume in the area. The authors clarified that yellowfin tuna was excluded as a single-species functional group because the model's future application will focus primarily on small tuna species. The authors further noted that the modelled area represents only a small fraction of the spatial distribution for several species and therefore may not adequately represent the broader population dynamics of these highly migratory species.

The Subcommittee also discussed the challenges associated with characterizing bycatch and discards within ecosystem models and noted that these components likely remain important sources of uncertainty. Finally, it noted the potential value of increasing coordination and standardization across ongoing ICCAT ecosystem modelling initiatives to facilitate future comparative analyses across ecoregions and ocean basins.

Document SCRS/2026/103 presented an Ecopath with Ecosim (EwE) model of the Tropical Atlantic Ocean (TAO), calibrated with data from 2003 to 2022 to simulate food-web and fisheries dynamics.

The Subcommittee discussed the potential application of the modelling framework to evaluate ecosystem impacts of different fisheries and fishing practices, including the impacts of purse seine fisheries associated with Fish Aggregating Devices (FADs) on juvenile yellowfin and bigeye tunas, as requested under Rec. 24-01. The Subcommittee noted the potential relevance of this modelling framework to evaluating ecosystem impacts of tropical tuna fisheries. The authors confirmed that this model, after further refinement, could be used to evaluate the impacts mentioned.

The Subcommittee also inquired about the relatively flat biomass trends estimated for some functional groups over time and questioned whether this reflected model limitations or parameterization issues. The authors explained that improvements in parameterization and refinement of key functional group inputs are ongoing in order to better reproduce observed temporal trends. The current configuration of functional groups also allows the simulation of bycatch species removals by fisheries.

Document SCRS/2026/101 presented a bioeconomic framework for Spanish longline and purse-seine fleets targeting tunas and tuna-like species that integrates economic performance, bycatch intensity, and trade-offs between economic efficiency and impacts on vulnerable species.

The Subcommittee noted that the longline fleet showed a higher economic return in relation to its ecological impact when compared with the purse-seine fleet, emphasizing that these results should be interpreted with caution, as other relevant aspects must also be considered. An important limitation was highlighted regarding data availability and standardization; the type of detailed economic, operational, and bycatch information required to construct these bioeconomic indicators is not currently available for ICCAT fisheries. Consequently, the applicability of similar analyses at a broader ICCAT scale remains challenging, and comparisons among fleets or regions may be constrained by differences in data quality, observer coverage, and reporting systems.

Overall, the Subcommittee thanked the authors for their contribution and recognized the relevance and innovative nature of the work as a useful first step toward the development of integrated bioeconomic indicators for ICCAT fisheries.

Document SCRS/2026/124 describes the operation of the marine mammal module of the Gulf of Mexico Longline Tuna Fisheries Information System (SIA) and the progress of its update to contribute to the recording and management of sighting data.

The Subcommittee noted that the information presented was based on opportunistic observations collected by fisheries observers and therefore does not constitute a dedicated marine mammal survey programme. It also highlighted that the presence of marine mammals near fishing vessels does not necessarily imply direct fishery interactions. However, the Subcommittee recognized the value of these long-term observations for fulfilling ICCAT reporting requirements on fishery interactions with associated fauna and noted their future

utility for developing exploratory indicators of marine mammal occurrence, abundance, or distribution trends in the Gulf of Mexico. It was however noted that, changes in the sampling methodology would be required to solve the limitation associated with this opportunistic sampling.

The Subcommittee also asked when the Mexican observer program reached 100% observer coverage. The authors indicated that the Mexico observer programme has had 100% coverage since 1997.

3. Review of work related to incorporating Climate Change impacts into management decisions

Document SCRS/2026/038 applied the Exploratory Climate Test framework to evaluate the robustness of candidate management procedures for western Atlantic skipjack tuna and North Atlantic swordfish under simulated climate-related stress scenarios affecting growth, recruitment, condition factor, and natural mortality.

The Subcommittee discussed the paper and asked how an appropriate robustness threshold should be defined. The author noted that the threshold itself was somewhat arbitrary and that the relative ranking of Management Procedures (MPs) was likely more informative than the threshold value selected.

The Subcommittee also asked whether the analyses considered acute climate shocks or large perturbation events. The author responded that the current analyses focused on progressively increasing stress scenarios and had not yet evaluated acute perturbations, although future work could explore such events using either projected or historical scenarios.

The Subcommittee further discussed whether MPs could explicitly incorporate climate variables. In response, the author noted that climate-related stress testing should occur within the operating model framework and emphasized that the MPs evaluated had already undergone extensive stress testing during the original MSE processes, including recruitment variability and related scenarios.

The Subcommittee also discussed whether empirical observations, such as observed changes in growth rates or productivity, could support the analyses. The author noted that incorporating such information directly would move the framework toward forecasting, which the Climate Test intentionally avoids. However, empirical information could still help identify or exclude non-credible scenarios.

Finally, the Subcommittee discussed how to interpret the robustness scores and whether the framework could identify MPs that were “most robust” to climate impacts. The author clarified that robustness could only be interpreted relative to the scenarios tested and cautioned against extending inference beyond those conditions.

Presentation SCRS/P/2026/060 evaluated the effects of climate change on Atlantic bluefin tuna habitat suitability and predator-prey overlap, projecting poleward habitat shifts, declining suitability in subtropical and spawning areas, and the emergence of potential climate refugia in boreal regions and the north-central Atlantic.

During the discussion, participants focused primarily on methodological clarification and data sources. Questions addressed the fleets included in the analyses, the prior presentation of the work to the Bluefin Species Group, the treatment of potential climate-driven dietary changes, and whether electronic tagging information had been incorporated. The author clarified that the analyses incorporated longline fishery information, derived prey information from literature reviews, did not model ontogenetic or climate-driven diet shifts, and did not include electronic tagging data.

The discussion then shifted to broader implications and modelling challenges. Participants highlighted the difficulty of incorporating prey species into habitat models and emphasized the importance of accounting for spawning areas in future projections.

The Subcommittee also discussed possible implications for tuna farming operations, noting that increasing temperatures could reduce maximum fish size and overall production capacity, and concluded that the framework could support similar climate-impact analyses for other species.

4. Potential effects of mesopelagic fishing on ICCAT fisheries

Presentation SCRS/P/2026/043 identified swordfish as effective sentinel species of mesopelagic ecosystems and highlighted the value of long-term dietary monitoring for understanding ecosystem change, predator-prey dynamics, and potential effects on stock productivity.

The Subcommittee noted that mesopelagic fish and invertebrates are key components of open-ocean food webs, linking lower trophic production to top predators such as tunas, billfishes, and sharks, supporting ICCAT-managed stocks, and contributing to carbon regulation pathways through diel vertical migration. Mesopelagic species are also increasingly being considered as specific targets for a potential fishery. Climate forcing and fisheries can reshape predator reliance on mesopelagic pathways by altering distribution and diet composition, and the Subcommittee considered this a valuable indicator of changing climate upon pelagic ecosystems.

Presentation SCRS/P/2026/046 considered whether mesopelagic fish should be commercially exploited, noting their very large biomass, potential use for fishmeal and aquaculture, and ecological importance as prey for commercially important species and as contributors to carbon sequestration through diel vertical migration.

The authors emphasized that any exploitation would involve substantial trade-offs among provisioning, cultural, food-web, and climate-regulation services, and concluded that the current absence of major fisheries provides an important opportunity to design precautionary, ecosystem-based management before large-scale exploitation develops.

The Subcommittee asked about the economic feasibility of developing mesopelagic fisheries, citing examples from similar trials elsewhere and noting the potential need for substantial investment in vessels, technology, and market development before they are commercially viable. Although these costs were not considered in this study, the Subcommittee agreed they would likely show an additional negative economic factor.

The Subcommittee questioned the relative weight of ecosystem services considered in the study, such as food provisioning and global food security, versus cultural services such as tourism. The Subcommittee noted that not all ecosystem services have equal importance, and there was recognition that multiple ecosystem benefits exist and that management decisions require consideration of trade-offs and societal priorities. The Subcommittee agreed that the social component represented an important element, and future work should incorporate social priorities alongside ecological and economic considerations.

The Subcommittee discussed that several methods had been used to estimate natural mortality, producing a range of values which were lower than those presented in the literature. The Subcommittee noted that uncertainty in recruitment and mortality could create risks of overharvesting the standing biomass before population dynamics are adequately understood.

The Subcommittee noted that, although many mesopelagic fisheries have historically remained unexploited due to a lack of change in fishing practices and market values, the increasing potential market value of some mesopelagic species means that these questions are becoming more relevant. The Subcommittee noted the importance of distinguishing among different mesopelagic ecological groups and size classes, as well as species with species-specific market potential and ecological roles.

5. Update on the Common Oceans project - feedback from the Fourth Joint tRFMO meeting on developing indicators to inform Ecosystem Approach to Fisheries Management (EAFM) processes

Presentation SCRS/P/2026/044 summarized the outcomes of the Common Oceans Tuna Project Workshop on Bycatch and the 2026 Global Tuna RFMO Management Strategy Evaluation (MSE) Workshop, highlighting increasing MSE implementation and harmonization across tuna Regional Fisheries Management Organizations (RFMOs), along with growing attention to climate robustness and uncertainty communication in fisheries governance.

The Subcommittee inquired about which aspects of stock assessment would be addressed. The response was that this had not yet been determined.

Presentation SCRS/P/2026/045 examined how ecosystem indicators could move from descriptive products to operational management tools within tuna RFMOs through integration with EcoCards, the Ecosystem Traits Index, MSE, and harvest strategy frameworks.

The Subcommittee welcomed the presentation and recognized it as a significant contribution to ongoing efforts to operationalize the EAFM across tuna RFMOs, also noting the benefit of this type of practical example.

The Subcommittee expressed particular interest in the Ecosystem Traits Index (ETI), particularly focusing on its usefulness for communicating ecosystem considerations to the Commission. However, the need for further developments was highlighted along with the need for more discussion in subsequent meetings of this Subcommittee to better understand all the information integrated.

It was noted that the EwE model for the Atlantic tropical ecosystem and the associated ETI estimation is nearing completion, and that ETI outputs are expected to be generated automatically from the tool soon.

Pertaining to bycatch

6. Megafauna, threatened and protected species

6.1 Advancing the process of assessing the impact of ICCAT fleets in the Mediterranean on bycatch

6.1.1 Progress toward a coordinated assessment with relevant groups

Document SCRS/2026/117 assessed sea turtle bycatch in Egyptian Mediterranean albacore longline fisheries between 2023 and 2025, documenting variable annual interaction rates dominated by green turtles and highlighting the need for expanded long-term monitoring and observer coverage.

The Subcommittee highlighted the relevance of this contribution, particularly because information from the eastern Mediterranean is still limited despite the known presence of loggerhead, green, and leatherback turtles and their interactions with albacore and swordfish longline fisheries.

Presentation SCRS/P/2026/040 evaluated post-release survival of blue sharks tagged in western Mediterranean longline fisheries, reporting no observed mortality and highlighting the benefits of less invasive tagging methods and circular hooks for improving shark survival.

The Subcommittee discussed the adequacy of the current 30-day survival threshold used in longline fisheries, contrasting it with shorter thresholds applied in purse seine fisheries where mortality is often immediate due to stress or suffocation. Participants also stressed the importance of standardizing tagging metadata for ICCAT reporting and noted the potential long-term value of conventional tags for growth and survival studies, despite concerns regarding invasive methodologies. Overall, the Subcommittee recognized the study as highly valuable given ICCAT's ongoing interest in future Mediterranean blue shark assessments.

6.2 Continue the ongoing review of best practices for mitigation measures to reduce the incidental capture of seabirds

Presentation SCRS/P/2026/050 updated estimates of seabird bycatch in Spanish Mediterranean longline fisheries from 2000–2024, identifying strong spatial and seasonal patterns, elevated risk in bluefin tuna fisheries, and substantial bycatch concentrated among a small number of vessels.

The Subcommittee emphasized that these findings support the need for vessel-specific mitigation measures rather than generalized management approaches, while also underlining the influence of operational factors such as bait type, deployment time, and interactions with other fishing activities.

Document SCRS/2026/109 investigated the effects of fisheries bycatch mortality on wandering albatross populations in South Georgia, linking population declines to high overlap with southern Atlantic fishing activity, including ICCAT fleets.

The Subcommittee noted the Spatially Explicit Fisheries Risk Assessment project (SEFRA) of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) as a related initiative, to which this analysis is complementary. The SEFRA has identified several seabird species, including wandering albatrosses, as groups at risk from bycatch in southern bluefin tuna fisheries in the southern hemisphere.

The Subcommittee noted that the SEFRA is not currently able to distinguish between breeding colonies of the same species, as presented in this document, although this is among potential updates that may be implemented in future. The SEFRA methodology was adopted by the CCSBT at its 2025 meeting, and the Subcommittee noted that decisions on additional seabird management measures in the CCSBT are scheduled for later this year based on these results, which will be reported at the 2027 meeting of the Subcommittee in support of the ongoing review of seabird bycatch mitigation measures in ICCAT. The Subcommittee also recalled that, since the CCSBT has no convention area, ICCAT remains primarily responsible for determining the most appropriate bycatch mitigation measures for use in the Atlantic. The Subcommittee noted that the population declines described in the paper, and attributed to longline fishing activity, have occurred under current ICCAT regulations (*Recommendation by ICCAT on reducing incidental bycatch of seabirds in longline fisheries* (Rec. 07-07) and *Supplemental Recommendation by ICCAT on reducing incidental bycatch of seabirds in ICCAT longline fisheries* (Rec. 11-09)), which emphasizes the importance of concluding the ongoing seabird mitigation measures review to ensure further reductions in seabird bycatch.

Document SCRS/2026/110 presented tagging results for seven tropical seabird species exhibiting facilitated foraging behaviour associated with tunas, describing their Atlantic-wide distributions and overlap with ICCAT fishing activity.

The Subcommittee queried the relevance of the work, since it did not present information on seabird mortality directly driven by fisheries. The authors emphasised that this study aimed to investigate the ecosystem effects of ICCAT fisheries (i.e. reduced foraging success of tropical seabird species) rather than bycatch, which mainly occurs further south.

The Subcommittee noted that tropical seabirds forage near the surface and that it might be more appropriate to correlate their distribution with surface fisheries (e.g., purse seine or bait boats targeting skipjack) rather than longline fisheries. This relationship, however, was not observed in the present study, which found limited evidence of tracked birds foraging within the major purse seine fishing grounds in the Gulf of Guinea, indicating possible regional differences in behaviour.

The Subcommittee also noted that the relationship of “facilitated foraging” is mutualistic, and that fishers have for many years been well-accustomed to using seabird behaviour as an important indicator of potential fishing opportunities. The Subcommittee noted that although “facilitated foraging” may be a complex interaction to characterise, this paper highlights the need to account for these interactions to achieve effective ecosystem-based fisheries management. The Subcommittee was keen to clarify the ICCAT data sources used in the analysis and the authors confirmed that the appropriate datasets (CATDIS and EFFDIS) had been used.

Presentation SCRS/P/2026/047 summarized the ICCAT fisheries operating within the North Atlantic Current and Evlanov Sea (NACES) high seas Marine Protected Area (MPA) designated by the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) and highlighted major gaps in bycatch data and monitoring relevant to seabird conservation.

The Secretariat clarified that it is already engaging in collaboration with OSPAR. When requested, the Secretariat provides available catch and effort data for the NACES MPA region to the best of its ability but noted that these data often differ with external monitoring sources such as Global Fishing Watch. However, the Secretariat and the Subcommittee also noted that sharing operational-level bycatch data remains difficult or impossible due to existing confidentiality rules within individual CPCs.

The Subcommittee discussed whether Memoranda of Understanding (MoUs) would be necessary to integrate fisheries data into planning and monitoring processes. In response, the Secretariat explained that an MoU has already been established with the North-East Atlantic Fisheries Commission (NEAFC) and the Northwest Atlantic Fisheries Organization (NAFO), and for OSPAR, the drafting of a formal MoU is underway and is likely to be presented to the Commission for consideration later in the year.

The Subcommittee highlighted an ongoing collaborative project involving researchers from several countries, including several ICCAT CPCs, under the Common Oceans Programme. This collaboration utilizes the Bycatch Estimation Tool with direct fleet data to analyse bycatch impacts on a larger scale.

The Subcommittee suggested this collaborative approach as a means to help understand and interpret bycatch processes in these expansive areas, rather than relying solely on the distribution of fishing activity within areas of conservation focus. The authors responded that the purpose of presenting the relationship between the NACES MPA and ICCAT fishing activity was to encourage collaboration between OSPAR and ICCAT to ensure evidence-based management of the NACES MPA.

6.3 Advances in Atlantic bycatch studies and mitigation

Presentation SCRS/P/2026/054 presented standardized abundance trends for bycatch species in French tropical tuna purse seine fisheries in the eastern Atlantic, identifying species-specific increases and declines using observer data and delta-GAM modelling frameworks.

During the discussion, the Subcommittee noted that sampling effort across regions and years is variable which can impact the estimates. For instance, hammerhead shark CPUE could be linked to recent changes in fishing effort distribution, particularly due to variability in fishing activity and fishing licenses in areas such as Gabon and Mauritania where this group of species mainly occur. The Subcommittee asked whether these temporal and spatial differences might influence the index. The presenter agreed that timing, location, and fishing strategy can influence CPUE patterns.

The Subcommittee also commented that several species included in the analysis represent very small bycatch components in purse seine fisheries compared to other fishing gears. The presenter confirmed that catches of some vulnerable species were indeed minimal and explained that the intention is to expand the method to other fisheries and collaborate with additional countries, which may provide broader datasets and potentially different results. He emphasized that the current outputs are preliminary. The difficulty of obtaining robust indices for species with low catch rates and a high proportion of zero catches was also emphasized, as well as the complexity created by occasional sets with very high catches. Improving indicators for vulnerable and less common species is identified as a priority for the Subcommittee, hence the emphasis on integrating data from additional fleets and fisheries.

On the modelling framework, the Subcommittee asked whether approaches other than the delta model had been explored. The author confirmed testing Tweedie, zero inflated, and other candidate models, but found the delta model to be the most robust given the available data. The importance of coordinated analyses among different tuna RFMOs was also highlighted to improve assessments of rare or vulnerable species.

Document SCRS/2026/119 presented updated estimates of post-release survival for silky sharks in tuna purse seine fisheries, showing improved survival associated with best handling practices and vessel-adapted bycatch release devices, while highlighting retention time in the bunt as a major source of mortality.

The Subcommittee also noted that, in the Indian Ocean, some vessels used dedicated bycatch release belts to release sharks that fall onto the lower deck, which could contribute to improving post-release survival. The author highlighted that this tagging action is part of a broader set of activities conducted across different vessels and using a variety of release devices, which will allow for the evaluation of the effect of the vessel (i.e. operational procedures), environmental conditions, and biological characteristics on shark survival. These studies will be presented to the Subcommittee in the coming years.

6.4 Bycatch Estimation Tool (BYET)

Document SCRS/2026/097 estimated live and dead discards of shortfin mako shark by the Spanish Atlantic surface longline fleet from 2018-2024 using ICCAT's Bycatch Estimation Tool (BYET), producing lower and more robust estimates than previous approaches based on Data Envelopment Analysis (DEA), while highlighting limitations related to observer coverage and stock aggregation.

The Subcommittee discussed the methodology and results presented. It was noted that BYET estimates consistently fell below totals recorded in skippers' logbooks, likely attributable to logbooks recording discard weight while BYET estimates the number of individuals and then estimates of total biomass were obtained using a mean weight of 123 kg. The Subcommittee also noted that another potential approach would be to estimate the total biomass using the size frequency data. When compared to Spain's previous DEA-based methodology, the differences were smaller for both live- and dead-discard estimates. The author confirmed this discrepancy, noting that skippers are likely poor estimators of discard weight, whereas BYET applies a more standardized approach by number of individuals.

The Subcommittee inquired whether post-release mortality could be estimated. The author acknowledged that while observer data record live/dead status at the point of discard, post-release survival rates are not captured, and that a tagging program would be needed to address this. The Subcommittee noted that post-release mortality estimates have previously been developed and applied in assessments and suggested that these could be incorporated in future analyses.

Questions were raised regarding the minimal level of observer coverage needed to produce reliable estimates, particularly given differences between North and South Atlantic stocks. The author noted that the tool provides information to determine if the observer coverage is appropriate. The author also noted that in practice coverage varied between approximately 5% and slightly more across years.

The Subcommittee suggested that model structure and covariates might require modification, including the potential use of spatial effects as random rather than fixed variables for 5°×5° cells. Concerns were also raised regarding deviations in Quantile-Quantile (QQ) plots at extreme values, which could indicate underestimation of extreme bycatch events. The presenter agreed to explore these refinements in future work.

The Subcommittee suggested testing the method on target species to further validate its performance, which the author acknowledged as a useful recommendation from the tool's user guide. The Subcommittee emphasized that the tool's validity depends on the representativeness and quality of input data and asked whether cross-validation against independent observations had been conducted. The author confirmed that comparisons had been made between models rather than against independent observations.

The issue of size-specific release mortality was raised. The author noted that live makos are prioritized for immediate release and are not brought aboard, complicating size-based mortality estimation.

The Subcommittee noted the importance of presenting this methodology and associated diagnostics to the Working Group on Stock Assessment Methods (WGSAM) for formal evaluation, and the author confirmed that this was the intention.

7. Continue reviewing and refining the ICCAT list of bycatch species

Document SCRS/2026/095 presented a verified checklist of bycatch species observed in Spanish tuna fisheries from 2010–2024, highlighting differences between electronic monitoring systems (EMS) and human observers and emphasizing the need for improved data validation and standardization.

The Subcommittee recognized the value of the checklist as a contribution toward refining the ICCAT bycatch species list, that was described as extensive and in need of systematic review, which was initiated some time ago with the pelagic sharks and rays' review.

The Subcommittee discussed the distinction between species consistently captured across fisheries and those recorded only once or rarely. It was noted that infrequent occurrences, such as a single individual caught on a surface longline hook, raise questions about whether such species should remain on primary bycatch lists, or whether a tiered classification (e.g., frequent, occasional, rare) would be more appropriate.

The Subcommittee noted that some species recorded in ICCAT databases may have been misidentified, may fall outside the Atlantic distribution area, or may reflect reporting errors. It was suggested that the Secretariat contact the relevant CPCs to request confirmation of questionable records rather than unilaterally removing them, as official CPC submissions cannot be deleted.

The Subcommittee highlighted the importance of genetic validation and photographic documentation for species whose identification is uncertain. It noted that taxonomic changes over time further complicate archiving and species code consistency.

The author acknowledged that the list includes some species detected only through EMS and not by human observers, and that certain records may reflect entanglement rather than true bycatch. The presenter agreed that a review process, potentially as part of the Subcommittee's work plan, would be beneficial.

The Subcommittee noted that data collection and reporting remain the responsibility of individual CPCs, while the Secretariat records all reported species. The Subcommittee acknowledged that maintaining large datasets presents significant challenges, particularly given ongoing taxonomic revisions.

The Subcommittee raised the relevance of the BBNJ Treaty, noting that accurate bycatch species records held within ICCAT may become increasingly important for responding to future questions about fisheries impacts on biodiversity and in understanding biodiversity on the high seas.

8. Technical fishing gear modifications and mitigation technologies

Document SCRS/2026/094 presented power analyses to support experimental design of pelagic longline gear studies, estimating the sampling effort and costs required to detect CPUE changes for sharks, tunas, swordfish, and billfishes in ICCAT fisheries.

The Subcommittee asked about the CPUE values presented for the various taxa and fleets, and if those accounted for all catches, including retentions and discards. The author noted that those data were derived from observer programmes and were provided by national scientists specifically for this work, and in principle they should account for all catches, including all discards.

For species like shortfin mako shark, high catch rates do not necessarily imply high retention rates, as many individuals may subsequently be discarded. However, for the purposes of experimental study design, planning, and the comparison of catch rates among gear configurations, total catch rates represent the primary metric of interest, while the distinction between retained and discarded (both dead and alive) catch constitutes an additional consideration.

The Subcommittee commented and agreed that the values presented should be regarded as the minimum effort needed per experimental group when comparing two groups. The Subcommittee further noted that, when three or more groups are compared, additional statistical corrections to the power analysis are required, thereby increasing the overall sampling effort needed.

The Subcommittee asked about the level of observer coverage in those fleets and whether it was sufficient to support the analyses presented. The author explained that the data were derived from observer programs operating in those fleets, which generally have relatively good coverage and operate across broad areas of the Atlantic. Although some fleet and operational combinations have low levels of coverage, the median values presented, which integrate information across fleets and operational combinations, were considered to be relatively robust (for the purposes of experimental design and planning).

Document SCRS/2026/091 presented a preliminary analysis of Meka-ring (traplines) use in Japanese tuna longline fisheries, showing zero observed seabird bycatch and substantially lower sea turtle BPUE than conventional hooks.

The Subcommittee asked about the remaining bycatch as well as target species, as those works should be understood from a multi-species perspective and not only for some taxa. The authors commented that the data collected does account for the remaining species and that those will be presented in future work. Nonetheless, the authors added that the preliminary work done so far shows that the bycatch of other species in the Meka-rings is very low.

The Subcommittee noted that, while general results are promising, it is important to be cautious in interpreting the results at this stage given the preliminary nature of the work. This is especially important when statements are made in terms of it being an effective bycatch mitigation method. The Subcommittee noted that it would be important to maintain the current mitigation measures for seabirds and agreed that those are still needed at this stage.

The Subcommittee asked why the Japanese fleet uses meka-rings in some oceans but not so much in others, for example, in the Atlantic where its use is very limited. The authors responded that this depends on skippers' preferences and whether they are targeting swordfish or not.

The Subcommittee noted that it would be useful to compare how this gear type performs under different environmental conditions, such as stronger currents and adverse weather, as its design may make it more susceptible to certain conditions. Investigating the influence of weather and ocean conditions on gear performance was identified as an interesting area for future research.

The Subcommittee asked if the power analysis previously presented in document SCRS/2026/094 could be applicable here. The answer was that it could be applied, but that many of the Meka-rings (traplines) are currently in the data-collection stage, using onboard observers during regular fishing operations. A later stage could involve the development of experimental at-sea trials, for which prior planning through power analysis would be highly advisable.

The Subcommittee also briefly discussed whether the sizes of the Meka-rings (traplines) recorded by observers should be interpreted as diameters or perimeters. The work presented reported diameters, but the authors clarified they actually record the perimeter from which the diameter is subsequently calculated.

The Subcommittee agreed with this approach, noting that the actual shape of the Meka-rings (traplines) during underwater operations is not currently well understood. As such, the perimeter was considered the cleanest and most directly observable measurement that could be collected by observers. This measurement can then be used to derive additional metrics under various assumptions, as was done in the present work.

The Subcommittee clarified that the number of Meka-rings (traplines) was treated as equivalent to the number of hooks used as a measurement of longline effort following discussion of the capture mechanisms associated with Meka-rings (traplines).

The Subcommittee noted that different seabird species exhibit different diving and feeding behaviours, and observed that, because this gear does not use bait, it would likely be of limited interest to seabirds.

Document SCRS/2026/096 presented information on the differences in bycatch associated with surface and deep longline metiers targeting swordfish using traplines/loops from the Mediterranean Spanish fleet.

The Subcommittee showed some concerns regarding the use of International Union for Conservation of Nature (IUCN) criteria and classifications as the conservation status metric used to categorize the quantities presented in the work. In particular, discussion focussed on the treatment of the data-deficient (DD) category that is currently assigned a level 1 (low), meaning that the conservation status of the species cannot be assessed due to data deficiencies, and may include species facing very high or very low levels of risk.

The authors explained that the purpose of assigning DD a low level was intended to reduce the influence of species lacking a defined conservation status on the overall results. They further noted that the approach allowed comparisons of how different taxonomic groups interact with the gear, and that the use of IUCN categories represents one method for evaluating the ecological impacts of fishing gears.

The Subcommittee also asked about how traplines are specifically used in the Mediterranean Sea. The authors clarified that, for the Spanish Mediterranean fleet, there is a legal maximum of 2,500 hooks per 30 nm of mainline. Under the trapline system, fishers can substitute some (or all) of the hooks for traplines, provided that the final number of hooks + traplines does not exceed the established limit.

The Subcommittee noted that while trapline gear has shown promising results in reducing impacts on commonly encountered bycatch species in tuna fisheries, potential concerns may arise when the gear is deployed near continental shelf areas or close to the seabed, particularly in deeper-set fisheries such as the swordfish "stone-ball" longline (LLPB) metier. The use of traplines in deeper sets may increase interactions with bottom-dwelling shark species, including threatened species such as gulper sharks, some of which have recently been listed under CITES Appendix II and are considered critically endangered. Unlike pelagic sharks, these species may be more difficult to release and could be subject to additional physiological impacts from being hauled up from depth. The Subcommittee noted that further research and data collection are needed to adequately assess the broader ecological implications of this gear type.

The Subcommittee noted that the reduction in bycatch associated with traplines is fundamentally driven by animal behaviour, as most non-target species simply have no interest in interacting with an un-baited loop compared to a traditional baited hook.

9. Research and Data Collection Programme on Bycatch (PIRDCaF): review of progress and future priorities

Document SCRS/2026/122 presented a revised draft for the Research and Data Collection Programme on Bycatch (PIRDCaF).

Initially, the Subcommittee planned to conduct a workshop with the potential participation of other tRFMOs to further discuss and develop the programme prior to the 2026 SCRS plenary meeting. However, after further consideration, the Subcommittee agreed to conduct the workshop after the SCRS plenary and before the end of 2026. In addition, the Subcommittee noted the need to develop and adopt Terms of Reference (ToRs) for the workshop. The results of the workshop would be presented at the 2027 meeting of the Subcommittee.

The Subcommittee congratulated the Co-convenor of the bycatch component for his efforts to improve the original draft based on the numerous comments received from several national scientists.

There was a discussion about developing a research programme for the ecosystem component of the Subcommittee. After the development of such plan, the Subcommittee will consider the feasibility of combining both the ecosystem and the bycatch programmes into one "Ecosystem and Bycatch Research and Data Collection Programme".

The Subcommittee agreed that research programmes are developed to guide the work of the SCRS to support Commission requests. However, that does not preclude the SCRS conducting other lines of research. While the Subcommittee discussed if the programme should focus on research aimed at reducing bycatch and post-release mortality, there was general agreement that such discussions should be delayed until the proposed workshop.

10. Reflections on joint work with other tuna RFMO bycatch groups on different approaches to assessing and mitigating bycatch recommendations (including budget recommendations for 2026–2029)

Presentation SCRS/P/2026/049 provided an overview of the Indian Ocean Tuna Commission (IOTC) programme on bycatch and ecosystems, which has made substantial progress across multiple taxa.

The Subcommittee noted that stock assessments have been conducted for blue shark (BSH) and shortfin mako (SMA) using Stock Synthesis and JABBA models. ERAs have also been carried out for key species such as oceanic whitetip shark, pelagic thresher sharks, and hammerhead sharks. In addition, the conservation status of seabirds, including albatrosses and petrels, has been updated, accompanied by advice on

mitigation strategies. Work has also addressed sea turtles (with more recent updates in 2023) and mobulid rays, which remain an area of ongoing focus. Currently, seven IOTC resolutions include provisions related to these species, with fourteen additional measures incorporated more recently, highlighting the growing regulatory attention to bycatch issues.

The Subcommittee also noted that further efforts have focused on mitigation and management improvements. A comprehensive review of mitigation measures in longline fisheries was completed in 2024, including a comparative analysis of their advantages and disadvantages, as well as consideration of measures implemented in other oceans. Handling practices in gillnet fisheries, which are particularly relevant for cetacean bycatch, have also been reviewed, with studies demonstrating improved effectiveness of mitigation measures by reducing the release time, leading to notable decreases in entanglement and mortality. Upcoming work includes the development of indicators for data-poor species, prioritising hammerhead, silky, and oceanic whitetip sharks in 2026 and thresher sharks in 2027.

Finally, the Subcommittee noted that IOTC also examined modifications to gillnet gear, including changes to sub-surface gillnets aimed at reducing cetacean bycatch. In addition, feasibility analyses on the potential for conducting Close-Kin Mark-Recapture (CKMR) studies on shortfin mako and hammerhead sharks have also been assessed.

The Subcommittee agreed that priorities for RFMOs coordination also include revising mitigation measures for seabirds, cetaceans, and mobulid rays, and advancing in other tools for bycatch management (including CKMR approaches), improving best-practice release guidelines, and better coordinating efforts on rare-event species caught by all tRMFOs but not necessarily assessed.

Presentation SCRS/P/2026/048 provides an overview of the Inter-American Tropical Tuna Commission (IATTC) Strategic Plan for Ecosystem and Bycatch (2026–2030), which began in 2026 and builds on the previous 2019–2025 plan. It introduces more specific objectives supported by defined deliverables and measurable indicators.

The Subcommittee noted that the plan was presented to the Scientific Committee and Commission with minimal changes. The programme, supported by a team of 6–7 scientists, focuses on key functions including assessing and prioritising ecological risks, developing and testing mitigation measures in collaboration with industry, advancing ecosystem science and advice, improving understanding of interactions between the environment and target/non-target species, and promoting capacity building through active dialogue between scientists and the fishing sector. The programme includes dedicated workplans on climate change, Ecosystem-Based Fisheries Management (EBFM), sharks, best practices, and FADs, alongside additional initiatives such as implementation of the BBNJ agreement, Conservation and Management Measure (CMM) evaluations, dolphin research (including CKMR and behavioural studies during sets), and EMS.

The Subcommittee noted that within the shark programme, ten strategic objectives are organised across three main themes: improving data collection (including small-scale fisheries and EMS), advancing stock assessment methods (e.g. CKMR and conventional mark-recapture approaches), and strengthening impact assessment and mitigation across all fishing operations. Work is also underway to operationalise the ecosystem approach through a multi-phase plan aimed at producing practical tools to support decision-making. Climate change activities are progressing through several phases, with a current focus on developing tools to assess, adapt to, and mitigate impacts.

The Subcommittee asked for further explanation as regards advances in CKMR work. The presenter responded that this was initially explored for silky shark to assess feasibility. Early findings highlighted limitations without the inclusion of small-scale fisheries due to sampling constraints. Progress is being made in developing genetic panels and kinship models, supported by an established sampling network across landing sites from Mexico to Peru. If successful, this approach could be extended to other shark species, providing a strong foundation for future assessments.

Presentation SCRS/P/2026/048 also presented the case of CMMs in Pacific tuna RFMOs using sea turtles as an example to illustrate the challenges and opportunities of managing highly migratory species across jurisdictions.

The Subcommittee noted that leatherback turtles were highlighted as a key species helping to address this issue, due to their extensive migrations between nesting and feeding grounds across the entire Pacific Ocean. Sea turtle bycatch mitigation measures in both IATTC and the Western and Central Pacific Fisheries Commission (WCPFC) are broadly similar, specifically regarding the requirement of circle hooks or the use of fish bait in shallow set longline gear, yet limitations still exist for each. In both measures, hook size specifications are not defined, and both are limited to shallow-set gear, despite the fact that the majority of fishing effort fishes deep (>100 m), and thus mitigation measures are not required for the majority of the fishing effort.

The Subcommittee noted that a recent workshop to review WCPFC's sea turtle measure (CMM 2018-04) focused on the potential to expand mitigation measures to deep-set longline fisheries and to improve sea turtle data reporting requirements. Additional efforts include promoting best practices for safe handling and release to improve post-release survival. IATTC also convened recent workshops (in 2022 and 2025) to define a minimum size for a "large" circle hook in IATTC Resolution C-19-04. These efforts were not successful. However, consensus was achieved to update the FAO 2009 guidelines regarding safe release of sea turtles to increase post release survival. Across four tuna RFMOs where sea turtles are considered, all have binding requirements for mitigation measures in shallow-set gear, with the exception of IOTC. These gaps highlight the need for more consistent and comprehensive approaches across regions to effectively reduce sea turtle bycatch and improve conservation outcomes.

Finally, the Subcommittee acknowledged a strong emphasis on the need to enhance collaboration across tuna RFMOs to improve the harmonization of conservation and management measures, particularly for vulnerable species. There is also clear support for science-based decision-making as the foundation for effective fisheries management. Collaboration is presented as essential to maximize existing data, identify gaps, and jointly develop solutions. The overall message encourages leveraging collective expertise to strengthen fisheries management and ensure more coordinated, effective outcomes.

Presentation SCRS/P/2026/057 outlined the evolution of bycatch and ecosystem work within ICCAT. It reviews the historical development of bycatch management since the early 1990s, highlighting key milestones such as the creation of dedicated subcommittees and species groups, the adoption of multiple conservation recommendations for sharks, seabirds, and sea turtles, and the increasing integration of ecosystem considerations into fisheries management. Over time, this work has expanded to include stock assessments, ecological risk assessments, observer programmes, and collaborative scientific initiatives, reflecting a growing recognition of the importance of addressing bycatch within a broader ecosystem framework.

The Subcommittee noted the emphasis on the need for: 1) stronger coordination among tuna RFMOs to improve bycatch assessment and mitigation; 2) key priorities such as enhancing data collection and observer coverage; 3) adopting science-based and precautionary management measures; 4) improving evaluation of mitigation effectiveness; and 5) shifting from single-species to multi-species approaches. The importance of capacity building, harmonization of methods, and collaboration across regions was stressed as essential to addressing data gaps and ensuring effective implementation of measures. Overall, the Subcommittee noted that coordinated action among RFMOs is critical to better understand, reduce, and manage bycatch in global tuna fisheries.

The presenters highlighted that collaborations are currently underway to assess connectivity for different shark species between the Indian and Atlantic Oceans. Identifying these areas of collaboration is important to strengthen joint efforts, to expand knowledge on these species, and to support the development of effective actions to reduce the impacts of fisheries.

The Subcommittee expressed its gratitude for the participation and contributions of scientists from other RFMOs to this section, highlighting the importance of these instances of cooperation and coordination.

Pertaining to ecosystems and bycatch

11. Recommendations

11.1 Recommendations without financial implications

- The Subcommittee recommended establishing a collaborative working framework between SC-ECO and the Tropical Tunas Species Group to use the EwE model developed in the Tropical Atlantic described in document SCRS/2026/103 and Meléndez-Arteaga *et al*. (2025) for responding to the Commission requests related to evaluating ecosystem impacts of tropical tuna fisheries.

- The Subcommittee recommended that ICCAT continue to strengthen collaborative work with other tuna RFMOs on bycatch-related issues, including the exchange of scientific information, harmonization of approaches where appropriate, and coordination on conservation and management challenges.

- The Subcommittee recommended that the Secretariat explore ways to include in ST09D incidental turtle interactions, including events not directly associated with fishing operations.

- The Subcommittee recommended that the modified version of ST09 be sent to the Subcommittee on Statistics for its review.

- To standardize hook size and type for inclusion in the revised ST09 form, the Subcommittee recommended reviewing hook catalogues developed by other tRFMOs and considering the adoption of these catalogues, in their current or a modified version, for ICCAT's use.

- The Subcommittee recommended that national scientists present a list of bycatch species in ICCAT fisheries recorded by their observer programs at future Subcommittee meetings. Such lists will help the Subcommittee to further refine the current SCRS list of bycatch species.

- The Subcommittee recommended coordinating with the Subcommittee on Statistics for improving the fisheries statistics of small-scale/coastal/artisanal fisheries in ICCAT, including gear such as gillnets, hand lines, and others.

11.2 Recommendations with financial implications

Pertaining to ecosystems

The Subcommittee recommended organizing a workshop in 2027 to continue supporting the development of EcoCards, with a particular focus on advancing environmental and climate indicators. The workshop would aim to discuss ongoing work assessing the impacts of environmental and climate variability on relevant ecological processes affecting large pelagic fish populations, and to explore how these indicators could be better linked to support stock assessment, MSE, and other ecosystem-based tools and advisory products within ICCAT.

Date: 1st quarter of 2027

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

SC-Ecosystems & Bycatch	*2027*	*2028*	*2029*	*Explanations*
Workshops/meetings				
Workshop on ECOcard	21,575			Objective is to advance the work on different aspects of the EcoCard in 2027. Funding aims for the attendance of up to 11 experts at the 5-day workshop.
Subtotal	**21,575**	**0**	**0**	

12. Responses to the Commission

The ICCAT Secretariat developed SCRS Responses to the Commission Tracking System, which was presented at previous meetings of the SCRS in 2026. A brief overview of the tool was presented by the Secretariat to the Subcommittee, including role-based access, status tracking, filtering, and exporting.

The Subcommittee thanked the development team and indicated that this tool will be useful to help track requests from the Commission and the status of responses. There were several clarifications that emerged during the discussion linked to process:

- Requests from the Commission have been compiled by the Secretariat, with SCRS Officers validating these entries and potentially including additional requests from intersessional Commission meeting reports. But in the future, SCRS Officers should be responsible for reviewing Recommendations and meeting reports to identify new Commission requests.
- Currently, only SCRS Officers and Commission Panel Chairs can modify some selected entries. The SCRS and Commission can consider whether to expand access.
- Responses should only be entered when adopted by the SCRS, with clarification that the tool should not be used to track the progress of drafted responses.
- The SCRS view of the status of the responses should be input by the SCRS Officers, in line with the adopted responses.

The Subcommittee asked about current plans for access to the tool, including the potential to make this available to members of the public. The Secretariat indicated that the decision on public access should be made by the Commission.

In terms of next steps in the use of the tool, the Subcommittee emphasised the importance of getting feedback from the Commission to understand when Responses were considered complete. The SCRS Chair explained that ICCAT Panel/Working Group Chairs would be asked to review the SCRS responses and the SCRS view of the status of each response and then decide on whether they are content with the response prepared by the SCRS, or if further work was required. It was noted that there will be an option to reflect where the SCRS felt that no response was required.

The Subcommittee then reviewed the active requests from the Commission as well as any previous responses and provided guidance to the Co-convenors on how previous responses might be updated and new responses developed.

Some specifics about the revision of the particular requests corresponding to this Subcommittee are provided below.

The Subcommittee did not receive any additional information from the CPCs, and therefore no changes were proposed to the previous responses, which are listed below.

SCRS to explore potential technical changes to the terminal gear that could reduce bycatch and bycatch mortality (at-vessel and post-release) and design and implement a study(ies) to compare the effects of hook shape and size on catch rates, Rec. 19-05 para 21

Background: *The SCRS shall, in collaboration with CPCs, explore potential technical changes to the terminal gear (such as hook shape, hook size, leader type, etc.) and fishing practices (e.g., timing, soaking time, bait, depths, areas) that could reduce bycatch and bycatch mortality (at-vessel and post-release). As part of this process, the SCRS in collaboration with CPCs shall design and implement a study(ies) to compare the effects of hook shape and size on catch rates (considering both hooking and retention rates), at-haulback mortality, and post-release mortality. The experimental design should account for the influence of leader material types and consider potential operational differences among regions and fleets.*

Based on the results presented by CPCs on their research trials, the SCRS shall advise the Commission on potential sea turtle mitigation measures for these fisheries, Rec. 22-12 para 4

Background: *CPCs with deep-set longline, gillnet, and where appropriate, shallow-set longline fisheries are encouraged to undertake research trials aimed at mitigating bycatch and reducing bycatch mortality, and increasing post release survival of sea turtles. Research should also examine the effects of hook sizes and shapes, fishing depths, fishing areas, and seasons. CPCs shall report the results of this research (including the trade-offs among catch rates of target and bycatch species) to the SCRS. Based on the results of such research, the SCRS shall advise the Commission on potential sea turtle mitigation measures for these fisheries.*

The following responses were addressed by the Subcommittee:

The SCRS should review the appropriateness of the southern boundary of this range and advise the Commission in 2023, Rec. 22-12 para 6

Background:

a) Paragraphs 1-3 shall not apply to vessels operating only north of 55 degrees N or south of 35 degrees S latitude (i.e., primarily outside the geographic range of Atlantic sea turtles).

b) In the Mediterranean Sea,
   i. Paragraph 1 shall not apply at this time.
   ii. Paragraphs 2-3 shall not apply for the period 2023 through 2025.

The SCRS should review the appropriateness of the southern boundary of this range and advise the Commission in 2023.

The Subcommittee considered the response has already been provided and therefore it should be considered as responded.

The SCRS is requested to review periodically the provisions of this measure related to the spatio-temporal ecology of sea turtles, including their interactions and mortality associated with these fisheries, Rec. 22-12 para 7

Background: *In light of the potential impacts of climate change on ICCAT fisheries, including target stocks and bycatch species, the SCRS is requested to review periodically the provisions of this measure related to the spatio-temporal ecology of sea turtles, including their interactions and mortality associated with these fisheries.*

The Subcommittee is conducting collaborative work in both the Atlantic and the Mediterranean Sea to gather additional information on the impact of ICCAT fisheries on sea turtles. Once this work is completed, it could contribute to responding to this request.

SCRS shall assess available information on the use of time-area fishing restrictions and closures in areas where there is a higher risk of interaction with sea turtles and advise the Commission, as appropriate, Rec. 22-12 para 10

Background: *The SCRS shall assess available information on the use of time-area fishing restrictions and closures in areas where there is a higher risk of interaction with sea turtles, and advise the Commission, as appropriate.*

The Subcommittee is working to determine the status of turtles at the time of capture in some ICCAT fisheries in order to link this to their distribution areas. This objective is expected to be achieved by 2027.

SCRS, to the extent possible, develop further best practice guidelines for the safe handling and release of cetaceans, taking into account relevant guidelines already developed by relevant international organizations, Rec. 23-15 para 4

Background: *The Commission requests that the SCRS, to the extent possible, develop further best practice guidelines for the safe handling and release of cetaceans caught in association with ICCAT fisheries, taking into account relevant guidelines already developed by relevant international organizations, and that these guidelines be submitted to the 2025 annual meeting for consideration and adoption by the Commission.*

The Subcommittee included in its work plan for 2027 the development of a guide of good practices for the safe handling and release of cetaceans caught within the framework of ICCAT fisheries.

The SCRS should investigate workable examples of how marine biodiversity can be conserved in a way that is compatible with the conduct of responsible and sustainable fisheries, including other effective area-based conservation measures (OECMs), either as complementary or alternative measures to other area-based approaches, Res. 23-23

Background:

- *The Secretariat should collaborate with the SCRS to evaluate the possibility for the SCRS to provide expertise and advice for the implementation of the instruments, and explore ways in which the workload of the SCRS could accommodate this new task;*

- *The SCRS should investigate workable examples of how marine biodiversity can be conserved in a way that is compatible with the conduct of responsible and sustainable fisheries, including other effective area-based conservation measures (OECMs), either as complementary or alternative measures to other area-based approaches;*

- *CPCs, the SCRS, and the Secretariat should report regularly to the Commission on progress on the above.*

The Subcommittee acknowledged that, given the overall context of this specific request, further clarification from the Commission would be necessary regarding what is specifically being requested the SCRS and the Subcommittee to do.

13. Workplan

a) Finalize the Subcommittee's Bycatch Research and Data Collection Programme for possible approval in 2027.
b) Bycatch affects all Species Groups, so coordination among the Subcommittee and SCRS Species Groups is essential. This collaboration would address the definition of bycatch species and appropriate benchmarks, as well as the inclusion of species in ICCAT databases, among other issues. Accordingly, the Subcommittee recommended that coordination continue between these groups.
c) Continue developing processes that allow progress in assessing the impact of ICCAT fleets in the Atlantic on the bycatch of marine megafauna species (threatened and protected species).
d) Build on the experience and collaborative work on Mediterranean Sea turtles by extending activities to improve the statistics for other taxonomic groups of interest to the Subcommittee, particularly the blue shark, for a possible assessment in 2027-2028.

e) Continue the work of the Subgroup on technical changes to fishing gear. Activities related to bycatch may fall within the objectives of this Subgroup.
f) Continue reviewing and refining the list of bycatch species in the ICCAT databases. The ICCAT databases contain a list of various taxa that should be examined by specialists.
g) Coordinate with other tuna RFMO Ecosystem and Bycatch groups to explore and reflect on different approaches to assessing and mitigating bycatch, to define joint objectives related to bycatch (discuss actions, methodologies for bycatch analysis, mitigation measures, best practice guidelines, training, and identify ways to harmonize measures).
h) Continue the ongoing review of best practices for mitigation measures for seabirds and move towards a review of the recommendations in 2027.
i) Continue the collaborative work on Atlantic and Indian Ocean sea turtles to integrate into the analyses the population structure of turtles affected by ICCAT fisheries and their condition.
j) Collect information and develop a manual of good practices for the release of cetaceans in ICCAT fisheries.

Pertaining to ecosystems

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

*a) Pertaining to **Ecosystems Report Card** Development: Priority 1*

The Subcommittee recognized the need to continue the development of indicators reviewed at the 2025 Meeting of Subcommittee on Ecosystems and Bycatch (Anon., 2025e) recognizing that many would be available for an update of the EcoCard in 2027. It was emphasized that development and/or updates of indicators for some of the other ecosystem components should also be prioritized. The EcoCard components identified for updates or development are described in **Table 1** below. The schedule of updates for ecosystem components for which an indicator was adopted will be discussed at the 2027 meeting while those under development are expected to remain in the workplan until adopted.

It is recommended to host in-person workshops to advance the work on the EcoCard in 2027. The first is required to review indicators developed for select components of the EcoCard, and the second is to review indicators being proposed for the environmental component. The first workshop is planned by the end of November 2026, though the second one is planned for the first quarter of the following year, 2027. Feedback on the main outcomes of the two workshops will be communicated to the Subcommittee in the 2027 meeting.

b) Pertaining to the progress on including climate change considerations to inform scientific advice: Priority 1

b1. The Subcommittee will review the existing work, continuing discussions of the SWGSM meeting in 2026, and try to organize all and develop a road map for future developments.

b2. The Subcommittee will work on further implementing the Climate-test approach as detailed in SCRS/2026/038 and Carruthers (2024), for other ICCAT species.

c) Pertaining to the progress on the implementation of tools for the conservation of biodiversity: Priority 2.

The Subcommittee will closely monitor progress of the implementation of the BBNJ and will be prepared to respond to any request from the Commission.

d) Pertaining to the progress on case studies: Priority 2

The case study groups are making progress towards achieving the objectives identified in the ToRs, in particular the Mediterranean and the Tropical Atlantic Case Studies. Progress made during the intersessional period will be presented in 2027. While there will be no formal review of the progress of the case studies in 2027, they continue to contribute through their support of indicator development for the EcoCard.

Pertaining to ECOtest: Priority 3

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

Table 1. Summary of proposed EcoCard components, development status, objectives and contributors for indicator updates and future work.

Goal/Timing	*EcoCard Component*	*Objective*	*Contributor/s*
No expectation of development in 2026	Retained species: Not assessed	Perform PSA for select retained unassessed species.	
Update for 2027	Retained species: Assessed	Update B_{RATIO} and/or F_{RATIO} values from recent assessments and deal with $F_{0.1}$ and MSE issue.	Alex Hanke/Eider Andonegi
In progress – update	Non-retained sharks (silky shark)	Increase the scope of the data used in the analysis. Include other gear types. Silky shark risk assessment based on SDM or vulnerability index. Hammer?	Rui Coelho/Leire Lopetegui
Develop	Marine turtles	Perform risk assessment for loggerhead and leatherback turtles and indicator development. Check progress of other tRFMO.	Ochi Daisuke /Andrés Domingo
Develop	Seabirds (albatross/petrel)	Create vulnerability indicator based on overlap of species distribution with longline & purse seine fisheries. ICCAT and/or Spatially Explicit Fisheries Risk Assessment (SEFRA) data.	James Bell/Sachiko Tsuji/Sebastián Jiménez /Helen Wade
Develop	Marine mammals	Discuss collaborations with the International Whaling Commission (IWC) and the International Council for the Exploration of the Sea (ICES). Following scoping exercise, develop index from Ecosim model of the tropical Atlantic.	Josu Meléndez/Eider Andonegi
Develop	Trophic structure, community, ecosystem, and diversity indicators	Develop indicators from Ecopath with Ecosim (EwE) to monitor the biomass structure, size structure and trophodynamics of the ecological communities in the tropical Atlantic in response to fishing pressure and environmental drivers. Integrated ecosystem indicators (ETI).	Josu Meléndez/Eider Andonegi/María José Juan-Jordá/Hilario Murua
No expectation of development in 2026	Habitat	Create indicators to monitor climate-induced and fishing-induced habitat changes in ICCAT species.	
Update and develop for 2027	Socio economic	Develop indicators based on socio-economic data. Develop tool to extract the socio-economic data adjusted for inflation and per ton of catch.	Sachiko Tsuji/José Carlos Baez/Diego Álvarez
Develop	Fishing pressure	Develop an indicator based on fishing effort or capacity.	Diego Álvarez/TunaMed
Develop	Environmental pressure	Develop indicators that have a causal relationship with stock life history traits.	Diego Álvarez/María José Juan-Jordá

Goal/Timing	*EcoCard Component*	*Objective*	*Contributor/s*
Develop	Marine debris (abandoned, lost, or otherwise discarded fishing gears (ALDFG))	Quantify annual ALDFG strandings.	Eider Andonegi /Maitane Grande

14. Other matters

14.1 Use of the science funds

The Secretariat provided the Subcommittee with an update on the use of science project funds between 2021-2025. It was noted that the Subcommittee has not fully utilized the available funds in recent years, in contrast to 2023, when approximately 93% of the allocated budget was utilized. In 2026 the Subcommittee has not yet made use of the available funds, since the workshops have been scheduled for the second semester of 2026.

It was recommended that the Subcommittee avoid making major changes to the 2027 funding requests unless such changes were duly justified by achievements made in the interim. Instead, new activities should be discussed within the long-term planning of the activities and funding requests to be considered for the next biennial period (2028-2029).

The Secretariat also highlighted the importance of duly justifying funding requests, particularly by linking them to specific Commission requests. In addition, it was noted that the Subcommittee should report back on the progress achieved and inform the Commission of the expected completion dates for the different studies.

The Subcommittee noted some difficulties making full use of the available funds, namely related to the absence of some invited experts at the workshops, due to conflicts of dates and/or other commitments.

14.2 Revision of form ST09

Presentation SCRS/P/2026/052 described the ongoing revision of form ST09 to comply with *Recommendation by ICCAT on the bycatch of sea turtles caught in association with ICCAT fisheries (combine, streamline, and amend Recommendations 10-09 and 13-11)* (Rec. 22-12), including the proposed creation of a dedicated turtle sub form (ST09D) separate from the optional sampling sub form (ST09C).

Four principal decision points were identified: 1) whether to require a full date field or instead link records to fishing operation identifiers or quarter-based reporting; 2) how to represent FAD types and the appropriate level of detail; 3) whether hook size units should be standardized or linked to reference tables; and, 4) if photographs should be within the existing database structure. The objective is to finalize the revised ST09 structure at the 2026 meeting of the Subcommittee of Statistics, noting that implementation is already substantially delayed.

Discussion focused on practical implementation constraints and standardization challenges across CPCs. The following points of agreement or general support emerged from the discussion:

- Photographs should not be mandatory, but a Boolean field indicating whether a photograph exists should be included.
- Existing ST08 FAD classification codes should be used.
- Mandatory reporting of full dates could create confidentiality constraints for some CPCs, and alternatives such as reporting by month or quarter or linking records to fishing operation identifiers should therefore be considered.
- Standardization of hook size definitions remains difficult across CPCs and manufacturers; development of a reference catalogue like approaches used in other tuna RFMOs was suggested for future exploration.

- The potential inclusion of all turtle interactions, including those not directly associated with fishing events, was discussed, although no formal modification to the reporting structure was proposed at this stage.

14.3 Electronic monitoring systems

Document SCRS/2026/121 presented preliminary results from electronic monitoring trials in the Brazilian pelagic longline tuna fishery, highlighting EMS potential for documenting bycatch, assessing condition at capture, and monitoring compliance with mitigation measures in South Atlantic longline fisheries.

The Subcommittee noted that preliminary results indicated that the EMS system tested was generally effective at identifying turtles and sharks to the species or genus level, and moderately effective for marlins, when specimens were brought on board and discarded. However, identification was often not possible when specimens remained submerged and were not brought on board.

It was also noted that the review of video records is currently done manually but is being optimized through playback acceleration and the development of artificial intelligence tools for automated analysis, already used for Tori-line identification. Further improvements are being made to the system to be aligned with ICCAT EMS minimum video framerate requirements.

15. Adoption of the report and closure

The report was adopted during the meeting and the meeting was closed.

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Appendix 1

Agenda

1. Opening, adoption of the agenda, and meeting arrangements

Pertaining to Ecosystems

2. Review of progress on initiatives developing tools supporting SUBECO ecosystem products: EcoCard and Ecosystem Fisheries Overviews

3. Review of work related to incorporating Climate Change impacts into management decisions

4. Potential effects of mesopelagic fishing on ICCAT fisheries

5. Update on the Common Oceans project - feedback from the Fourth Joint tRFMO meeting on developing indicators to inform Ecosystem Approach to Fisheries Management (EAFM) processes

Pertaining to Bycatch

6. Megafauna, threatened and protected species

    6.1 Advancing the process of assessing the impact of ICCAT fleets in the Mediterranean on bycatch

        6.1.1 Progress toward a coordinated assessment with relevant groups

    6.2 Continue the ongoing review of best practices for mitigation measures to reduce the incidental capture of seabirds

7. Continue reviewing and refining the list of bycatch species

8. Presentation of progress made by the sub-group on technical changes

9. Research and Data Collection Program on Bycatch (PIRDCaF): review of progress and work within the Subcommittee

10. Reflections on joint work with other tuna RFMO bycatch groups on different approaches to assessing and mitigating bycatch

Pertaining to Ecosystems and Bycatch

11. Recommendations (including budget for the period 2026-2029)

    11.1 Recommendations without financial implications

    11.2 Recommendations with financial implications

12. Responses to the Commission

13. Workplan for 2027

14. Other matters

    14.1 Use of the science funds

    14.2 Revision of form ST09

    14.3 Electronic monitoring systems

15. Adoption of the report and closure

Appendix 2

List of participants* [1]

CONTRACTING PARTIES

ALGERIA
Benounnas, Kamel [1] (online)
Researcher, Centre National pour le développement de la Pêche et de l'Aquaculture - CNRDPA, 42000 Tipaza Bou-Ismail

BRAZIL
Brick Peres, Monica
Environment Analyst, Chico Mendes Institute - Ministry of Environment and Climate Change, ICMBio Grandes Unidades Oceânicas, Eqsw 103 104, 70670-350 Distrito Federal, Brasília
Tel: +55 61 981 433 690, E-Mail: monica.peres@icmbio.gov.br

Lezama, Antonio Queiroz
Ministry of Environment and Climate Change, 70068-900 Brasília DF
Tel: +55 619 961 43123, E-Mail: aqlezama@gmail.com; antonio.lezama@mma.gov.br

CANADA
Hanke, Alexander (online)
Research Scientist, Fisheries and Oceans Canada, 531 Brandy Cove Road, St. Andrews, NB E5B 2L9
Tel: +1 506 529 5912, E-Mail: alex.hanke@dfo-mpo.gc.ca

CHINA (P.R.)
Cheng, Xin (online)
Shanghai Ocean University, 999 Hucheng Huan Rd, 201306 Shanghai
Tel: +86 199 170 81606, E-Mail: cx_shhy@163.com

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

EGYPT
Saber, Mahmoud Abdelmola (online)
Researcher, Gear Technology, National Institute of Oceanography and Fisheries - NIOF, 33 A first settlement, PO Box 182 Suez, 11865 New Cairo
Tel: +20 106 158 2353, E-Mail: mahmoudsaber99@yahoo.com; ma.saber@niof.sci.eg

EL SALVADOR
Cortez Cota, Raul Edgardo (online)
Técnico de la División de Ordenación Pesquera y Acuícola, Autoridad Salvadoreña de Economía Azul (ASEA), Final 1ª Avenida Norte, 13 Calle Oriente y Av. Manuel Gallardo, Santa Tecla, La Libertad
Tel: +503 2210 1760, E-Mail: raul.cortez@mag.gob.sv

Orellana González, Jose Abilio (online)
Asistente Técnico de Proyectos, Autoridad Salvadoreña de Economía Azul (ASEA), Final Avenida Manuel Gallardo, Edificio MAG, 1011 Santa Tecla; E-Mail: jose.orellana@mag.gob.sv

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

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

Álvarez Berastegui, Diego (online)
Instituto Español de Oceanografía, Centro Oceanográfico de Baleares, Muelle de Poniente s/n, 07010 Palma de Mallorca, Spain
Tel: +34 971 133 720; +34 626 752 436, E-Mail: diego.alvarez@ieo.csic.es

Andonegi Odriozola, Eider
AZTI, Txatxarramendi ugartea z/g, 48395 Sukarrieta, Bizkaia, Spain
Tel: +34 661 630 221, E-Mail: eandonegi@azti.es

Arrizabalaga, Haritz (online)
Principal Investigator, AZTI Marine Research Basque Research and Technology Alliance (BRTA), Herrera Kaia Portualde z/g, 20110 Pasaia, Gipuzkoa, Spain
Tel: +34 94 657 40 00; +34 667 174 477, Fax: +34 94 300 48 01, E-Mail: harri@azti.es

Báez Barrionuevo, José Carlos
Instituto Español de Oceanografía, Centro Oceanográfico de Málaga, Puerto Pesquero de Fuengirola s/n, 29640, Spain
Tel: +34 669 498 227, E-Mail: josecarlos.baez@ieo.csic.es

Chaguaceda Sarmiento, Mar (online)
Universitat Politècnica de València, Campus de Gandia, 46730 Valencia, Spain
Tel: +34 653 020 910, E-Mail: mar.chaguaceda@gmail.com

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

Cuevas, Nagore (online)
Fundazión AZTI, Txatxarramendi Ugartea s/n, 48395 Bizkaia, Spain
Tel: +34 667 174 470, E-Mail: ncuevas@azti.es

Di Natale, Antonio (online)
Director, Aquastudio Research Institute, Via Trapani 6, 98121 Messina, Italy
Tel: +39 336 333 366, E-Mail: adinatale@costaedutainment.com; adinatale@acquariodigenova.it

Dindart, Thibault
Etudiant, Orthongel, 5 Rue des Sardiniers, 29900, France
Tel: +33 633 773 899, E-Mail: tdindart@orthongel.fr

Erauskin-Extramiana, Maite (online)
AZTI, Herrera Kaia, Portualdea z/g, 20110 Pasaia, Gipuzkoa, Spain
Tel: +34 634 210 341, E-Mail: merauskin@azti.es

Faucheux-Bourlot, Caroline
IRD, UMR MARBEC SETE, Station Ifremer, Avenue Jean Monnet, CS 30171, 34203 Sète Cedex, France
Tel: +33 646 630 620, E-Mail: caroline.faucheux-bourlot@ird.fr

Fernández Corredor, Elena (online)
Passeig Maritim de la Barceloneta, 37-49, 08003 Barcelona, Spain
Tel: +34 615 844 286, E-Mail: elenafc@csic.es

Fernández Costa, Jose Ramón (online)
Instituto Español de Oceanografía, Ministerio de Ciencia e Innovación - CSIC, Centro Costero de A Coruña, Paseo Marítimo Alcalde Francisco Vázquez, 10 - P.O. Box 130, 15001 A Coruña, Spain
Tel: +34 981 218 151, Fax: +34 981 229 077, E-Mail: jose.costa@ieo.csic.es

García Barcelona, Salvador (online)
Instituto Español de Oceanografía, Explanada muelle San Andrés, s/n. Puerto de Málaga, 29001 Málaga, Spain
Tel: +34 660 552 362, E-Mail: salvador.garcia@ieo.csic.es

Garibaldi, Fulvio (online)
University of Genoa - Dept. of Earth, Environmente and Life Sciences, Dipartimento si Scienze della Terra, dell'Ambiente e della Vita (DISTAV), Corso Europa, 26, 16132 Genova, Italy
Tel: +39 335 666 0784; +39 010 353 8576, Fax: +39 010 357 888, E-Mail: fulvio.garibaldi@unige.it; garibaldi.f@libero.it

Grande Mendizabal, Maitane
AZTI - Investigación Marina. Marine Research. Itsas Ikerketa Gestión Pesquera Sostenible. Sustainable Fisheries Management. Arrantza-kudeaketa Jasangarria, Herrera Kaia - Portualdea z/g., 20110 Pasaia, Spain
Tel: +34 667 100 124; +34 667 100 124, E-Mail: mgrande@azti.es

Juan-Jordá, María José
Instituto Español de Oceanografía (IEO), C/ Corazón de María, 8, 28002 Madrid, Spain
Tel: +34 671 072 900, E-Mail: mjuan.jorda@ieo.csic.es; mjuanjorda@gmail.com

Lacambra Andreu, Lola (online)
IEO - CSIC, Calle Corazón de María, 8, 28002 Madrid, Spain
Tel: +34 665 683 134, E-Mail: lola.lacambra@ieo.csic.es

Landreau, Antoine (online)
IFREMER, UMR Marbec, 87 Avenue Jean Monnet, 34200 Sète, France
Tel: +33 749 212 700, E-Mail: antoine.landreau@ifremer.fr

Lerebourg, Clara
IRD, Avenue Jean Monnet CS 30171, 34200 Sète, France
Tel: +33 499 573 200, E-Mail: clara.lerebourg@ird.fr

Lopetegui Eguren, Leire (online)
AZTI, Herrera Kaia. Portualdea z/g, 20110 Pasaia, Gipuzkoa, Spain
Tel: +34 667 126 943, E-Mail: llopetegui@azti.es

Mariño, Gloria (online)
Calle Corazón de María 8, 28002 Madrid, Spain
Tel: +34 613 228 671, E-Mail: gloria.marino@ieo.csic.es

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

Murua, Jefferson (online)
AZTI - Tecnalia/Itsas Ikerketa Saila, Txatxarramendi Ugartea s/n, 48395 Bizkaia Sukarrieta, Spain
Tel: +34 946 574 000; +34 667 174 426, Fax: +34 946 574 000, E-Mail: jmurua@azti.es

Patrocinio Ibarrola, Teodoro (online)
Instituto Español de Oceanografía-CSIC, 15001 A Coruña, Spain
Tel: +34 981 218 151, E-Mail: teo.ibarrola@ieo.csic.es

Poisson, François
IFREMER - Centre de Recherche Halieutique, UMR MARBEC (Marine Biodiversity Exploitation and Conservation), Avenue Jean Monnet, CS 30171, 34203 Sète, France
Tel: +33 499 57 32 45; +33 679 05 73 83, E-Mail: francois.poisson@ifremer.fr

Ramos Alonso, Mª Lourdes
Instituto Español de Oceanografía (IEO), Centro Oceanográfico de Canarias, C/ Farola del Mar, 22 Dársena pesquera, 38180 Santa Cruz de Tenerife, Spain
Tel: +34 922 549400, Fax: +34 922 549 400, E-Mail: mlourdes.ramos@ieo.csic.es

Riesgo Torres, María Dolores
Calle Corazón de María, 8, 28002 Madrid, Spain
Tel: +34 660 141 854, E-Mail: mdolores.riesgo@ieo.csic.es

Rueda Ramírez, Lucía (online)
Instituto Español de Oceanografia IEO CSIC. C.O. de Malaga, Explanada de San Andres Muelle 9, Puerto de Malaga, 29002 Málaga, Spain
Tel: +34 952 197 124, E-Mail: lucia.rueda@ieo.csic.es

Sabarros, Philippe
IRD, UMR MARBEC, Ob7, Avenue Jean Monnet, CS 30171, 34200 Cedex, France
Tel: +33 625 175 106, E-Mail: philippe.sabarros@ird.fr

Tellier, Chloé
IRD, 87 Avenue Jean Monnet, 34200 Sète, France
Tel: +33 646 772 340, E-Mail: chloe.tellier@ird.fr

Thasitis, Ioannis
Fisheries and Marine Research Officer, Ministry of Agriculture, Rural Development and Environment, Department of Fisheries and Marine Research, 101 Vithleem Street, 1416 Nicosia, Cyprus
Tel: +35722807840, Fax: +35722 775 955, E-Mail: ithasitis@dfmr.moa.gov.cy; ithasitis@dfmr.moa.gov.cy

Torreblanca Estrada, Davinia
Centro Oceanográfico de Málaga, Explanada San Andres muelle 9 Puerto Pesquero s/n, 29002 Fuengirola, Málaga, Spain
Tel: +34 655 412 743, E-Mail: davinia.torreblanca@ieo.csic.es

Tugores Ferra, Maria Pilar (online)
ICTS SOCIB - Sistema d'observació y predicció costaner de les Illes Balears, Moll de Ponent, S/N, 07015 Palma de Mallorca, Spain
Tel: +34 971 133 720, E-Mail: pilar.tugores@ieo.csic.es

GRENADA

Paul, Tabia A. (online)
Marine Biologist, Fisheries Division, Melville Street, St. George's
Tel: +1 473 440 3814, E-Mail: tabia.paul@fisheries.gov.gd

GUINEA (REP.)

Barry, Alhassane (online)
Chef section statistiques, Direction Nationale des Pêches Maritimes, Dabompa, Commune Tombolia
Tel: +224 623 244 634, E-Mail: alassb13@gmail.com

JAPAN

Kubota, Hanna
Japan Fisheries Research and Education Agency, Fisheries Resources Institute, Fisheries Stock Assessment Center Highly Migratory Resources Division Bycatch and Data Statistics Group, 2-12-4 Fukuura, Kanazawa-ward, Yokohama, Kanagawa 236-8648
Tel: +81 45 788 7932, E-Mail: kubota_hanna35@fra.go.jp

Ochi, Daisuke
Head of group, Highly Migratory Resources Division, Fisheries Stock Assessment Center, Japan Fisheries Research and Education Agency, 2-12-4 Fukuura, Kanazawa, Yokohama 236-8648
Tel: +81 45 788 7930, Fax: +81 45 788 7101, E-Mail: ochi_daisuke36@fra.go.jp

Okamoto, Kei (online)
Bycatch and Data Statistics Group, Highly Migratory Resources Division, Fisheries Resources Institute, Japan Fisheries Research and Education Agency, 2-12-4 Fukuura, Kanazawa-ku, Yokohama, Kanagawa 236-8648
Tel: +81 45 788 7932, E-Mail: okamoto_kei98@fra.go.jp

Tsuji, Sachiko (online)
Technical Advisor, Highly Migratory Resources Division, Fisheries Stock Assessment Center, Fisheries Resources Institute, Japan Fisheries Research and Education Agency, 2-12-4 Fukuura, Kanazawa-ku, Yokohama, Kanagawa 236-8648
Tel: +81 45 788 7931, Fax: +81 45 788 5004, E-Mail: sachiko27tsuji@gmail.com

Uozumi, Yuji [1] (online)
Advisor, Japan Tuna Fisheries Co-operation Association, Japan Fisheries Research and Education Agency, Tokyo Koutou ku Eitai 135-0034

MEXICO

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

MOROCCO
Haoujar, Bouchra
Cheffe de Service des Espèces Marines Migratrices et des Espaces Protégés, Secrétariat d'Etat chargé de la Pêche Maritime, Nouveau Quartier Administratif, BP 476, 10150 Haut Agdal, Rabat
Tel: +212 253 768 8115, Fax: +212 537 688 089, E-Mail: haoujar@mpm.gov.ma

Hajhouji, Youssef
Institut National de la Recherche Halieutique (INRH)
E-Mail: hajhouji@inrh.ma

Mekyassi, Badreddine (online)
Ingénieur, Institut National de la Recherche Halieutique (INRH)
Tel: +212 666 132 816, E-Mail: mekyassi@inrh.ma

Ouyahya, Hicham
Direction des Pêches Maritimes, Département de la Pêche Maritime
E-Mail: hicham.ouyahya@mpm.gov.ma

Qaidi, Lamyae
Tel: +212 659 158 848 , E-Mail: l.qaidi@mpm.gov.ma

Tai, Imane
Biologiste des pêches, Chargée de la coordination du réseau de Suivi des échouages, Centre régional de l'Institut National de Recherche Halieutique (INRH) à Nador, 13, Bd Zerktouni, BP :493493 Nador
Tel: +212 672 827 416, E-Mail: tai@inrh.ma

NAMIBIA
Jagger, Charmaine
Fisheries Biologist: Large Pelagic Section, Pelagic Resources, Research Management, Ministry of Agriculture, Fisheries, Water and Land Reform, National Marine Information and Research Centre (NatMIRC), P.O. Box 912 Swakopmund, 1 Strand Street
Tel: +264 64 410 1000; +264 81 801 0960, E-Mail: Charmaine.Jagger@mfmr.gov.na; chajagger2014@gmail.com

PANAMA
Molina, Laura (online)
Autoridad de los Recursos Acuáticos de Panamá - ARAP, Dirección General de Investigación y Desarrollo, Edificio Riviera, Ave. Justo Arosemena, Calle 45 Bella Vista, 0819-05850
Tel: +507 511 6036, E-Mail: lmolina@arap.gob.pa

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

MONTENEGRO
Cetkovic, Ilija (online)
Research Associate, Put I Bokeljske brigade 68, 85330 Kotor
Tel: +382 067 343 556, E-Mail: ilija.cetkovic65@gmail.com

SENEGAL
Niang, Magatte (online)
Chef du Bureau des observateurs de la Direction de la Protection et de Ia Surveillance des Pêches (DPSP), Fenêtre Mermoz, Corniche Ouest, BP: 3656 Dakar
Tel: +221 775 854 440, E-Mail: niangmagatte966@gmail.com

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

SOUTH AFRICA
Da Silva Graham, Charlene (online)
Department of Environmental Affairs, Forestry and Fisheries, P/Bag X2, Rogebaai, 7700 Cape Town
Tel: +27 82 923 1063, E-Mail: Cdasilva@dffe.gov.za

TUNISIA
Hajjej, Ghailen
Maître assistant de l'Enseignement Supérieur Agricole, Laboratoire des Sciences Halieutiques, Institut National des Sciences et Technologies de la Mer (INSTM), Port de pêche, 6000 Gabès
Tel: +216 75 220 254; +216 972 77457, Fax: +216 75 220 254, E-Mail: ghailen3@yahoo.fr; ghailen.hajej@instm.rnrt.tn

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND
Bell, James Benjamin
Centre for Environment, Fisheries and Aquaculture Science (CEFAS), Lowestoft Suffolk NR33 0HT
Tel: +44 1 502 521 377, E-Mail: james.bell@cefas.gov.uk

Roebuck, Emily
CEFAS, Pakefield Road, Lowestoft, Suffolk, NR33 0HT
Tel: +44 797 087 7935, E-Mail: emily.roebuck@cefas.gov.uk

Simpson, Tiffany (online)
Conservation Office, ASCN1ZZ Tristan de Cunha Ascension Island, St. Helena
Tel: +44 247 66403, E-Mail: tiffany.simpson@ascension.gov.ac

Warwick-Evans, Victoria (online)
British Antarctic Survey, Cambridge CB3 0ET
E-Mail: vicrwi@bas.ac.uk

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

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

Carlson, John (online)
NOAA Fisheries Service-Sustainable Fisheries Division, 3500 Delwood Beach Road, Florida, Panama City 32408-7403
Tel: +1 850 624 9031, Fax: +1 850 624 3559, E-Mail: john.carlson@noaa.gov

Swimmer, Jana Yonat (online)
NOAA - Pacific Islands Fisheries Science Center, 501 W. Ocean Blvd. 4200, Long Beach California 90802
Tel: +1 310 770 1270, E-Mail: yonat.swimmer@noaa.gov

URUGUAY
Forselledo, Rodrigo * (online)
Dirección Nacional de Recursos Acuáticos - DINARA, Laboratorio de Recursos Pelágicos, Constituyente 1497, CP 11200 Montevideo
Tel: +598 2400 46 89; +598 99 487 401, E-Mail: rforselledo@gmail.com; rforselledo@mgap.gub.uy

Domingo, Andrés
Centro de Investigación y Conservación Marina (CICMAR), Av. Giannattasio Km. 30.4, Canelones
Tel: +598 092 114 545, E-Mail: dimanchester@gmail.com

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

Evaristo, Eucaris del Carmen (online)
Corresponsal Estadístico y Director de Línea de Pesca Industrial, Ministerio del Poder Popular de Pesca y Acuicultura, Corresponsal del Atlántico, Sector "El Salado". Frente a la redoma El Ferry, edificio PESCALBA, Cumaná, Caracas
Tel: +58 416 883 3781, E-Mail: eucarisevaristo@gmail.com

Gómez, David (online)
Analista DGPI, Ministerio del Poder Popular de Pesca y Acuicultura, Avenida Lecuna, Torre este, Piso 17. Parque Central., 1040 Caracas; Tel: +58 212 507 2900, E-Mail: mathias110390@gmail.com

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

Vivas Jiménez, María Daniela (online)
Analista de Asuntos Multilaterales de la Oficina de Integración y Asuntos Internacionales, Ministerio del Poder Popular de Pesca y Acuicultura, Parque Central. Piso 17, 1040 Caracas
Tel: 04242808103, E-Mail: minpescaven@gmail.com

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

BOLIVIA

Cortez Franco, Limbert Ismael (online)
Jefe de Unidad, Unidad Boliviana de Pesca Marítima (UBPM), Calle 20 de Octubre 2502, esq. Pedro Salazar, La Paz
Tel: +591 6 700 9787, Fax: +591 2 291 4069, E-Mail: limbert.cortez@protonmail.ch; limbert.cortez@mindef.gob.bo; licor779704@gmail.com

Alsina Lagos, Hugo Andrés (online)
Asesor Internacional, Unidad Boliviana de Pesca Marítima (UBPM), Ministerio de Defensa, Calle 20 de octubre 2502, esq. Pedro Salazar, La Paz
Tel: +1 832 871 1409; +34 685 733 997, Fax: +507 830 1708, E-Mail: hugo@alsina-et-al.org

Miranda Figueroa, Oscar Limbert (online)
Responsable de Sección, Ministerio de Defensa del Estado Plurinacional de Bolivia, Zona Sopocachi, Calle Pedro Salazar esq. 20 de Octubre, No. 2502, La Paz
Tel: +591 7301 8741, E-Mail: limbertmiranda@gmail.com

Olives García, William Eduardo (online)
Asesor Científico, Unidad Boliviana de Pesca Marítima (UBPM), Calle 20 de Octubre 2502, esq. Pedro Salazar, La Paz
Tel: +593 992 236 798, E-Mail: willian.olives@proton.me

CHINESE TAIPEI

Kuo, Ting-Chun
Associate Professor, Institute of Marine Affairs and Resource Management, National Taiwan Ocean University, No.2, Beining Rd., Zhongzheng Dist., Keelung City, 202301
Tel: +886 2 246 22192 Ext. 5603, E-Mail: tckuo@mail.ntou.edu.tw

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

Sung, Yueh-Feng (online)
Researcher, Department of Environmental Biology and Fisheries Science, National Taiwan Ocean University, No.2, Beining Rd., Zhongzheng Dist., 202301 Keelung City
Tel: +886 2 246 22192, Fax: +886 2 246 33920, E-Mail: yuehfeng85@gmail.com

OBSERVERS FROM INTERGOVERNMENTAL ORGANIZATIONS

INDIAN OCEAN TUNA COMMISSION - IOTC

Nelson, Lauren (online)
Fishery Officer, IOTC, Blend Building (2nd floor), PO BOX 1011, Victoria, Mahe, Seychelles
Tel: +44 795 054 4763, E-Mail: lauren.nelson@fao.org; nelsonlauren@hotmail.com

INTER-AMERICAN CONVENTION FOR THE PROTECTION AND CONSERVATION OF SEA TURTLES - IAC
Prosdocimi, Laura (online)
Museo Argentino de Ciencias Naturales (MACN-CONICET), Av. Ángel Gallardo 470, C1405DJR Caba, Buenos Aires, Argentina
Tel: +54 114 046 3651, E-Mail: lprosdo@yahoo.com.ar

INTER-AMERICAN TROPICAL TUNA COMMISSION - IATTC
Lopez, Jon (online)
Head of Bycatch Mitigation and Gear Technology Group, IATTC, 8901 La Jolla Shores Drive, CA 92037, United States
Tel: +1 858 257 7409, E-Mail: jlopez@iattc.org

SARGASSO SEA COMMISSION
Kell, Laurence (online)
Visiting Professor in Fisheries Management, Centre for Environmental Policy, Imperial College London, Henstead, Suffolk SW7 1NE, United Kingdom
Tel: +44 751 707 1190, E-Mail: laurie@seaplusplus.co.uk; l.kell@imperial.ac.uk; laurie@kell.es

OBSERVERS FROM NON-GOVERNMENTAL ORGANIZATIONS

BIRDLIFE INTERNATIONAL - BI
Wade, Helen
Birdlife International - RSPB, The Lodge, Sandy, Bedfordshire, SG19 2DL, United Kingdom
Tel: +44 7896 758 995, E-Mail: Helen.Wade@rspb.org.uk

FISHERY IMPROVEMENT PROJECT - FIP
Oihenarte Zubiaga, Aintzina (online)
FIP, Bizkaiko Jaurerria, 2 1ºizq, 48370 Bermeo, Bizkaia, España
Tel: +34 944 000 660, E-Mail: departamentotecnico@fipblues.com; aoihenarte@datafishts.com

INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION - ISSF
Murua, Hilario (online)
Senior Scientist, International Seafood Sustainability Foundation (ISSF), 3706 Butler Street, Suite 316, Pittsburgh PA 15201-1802, United States
Tel: +34 667 174 433; +1 703 226 8101, E-Mail: hmurua@iss-foundation.org

PEW CHARITABLE TRUSTS - PEW
Wozniak, Esther (online)
Pew Charitable Trusts, 901 E Street, NW, Washington DC 20004, United States
Tel: +1 202 540 6588, E-Mail: ewozniak@pewtrusts.org

THE OCEAN FOUNDATION
Scott, Rebecca (online)
The Ocean Foundation, 1320 19th St. NW, 5th Floor, Washington 20036, United States
Tel: +1 202 887 8996, E-Mail: rscott@oceanfdn.org

THE SHARK TRUST
Hood, Ali (online)
The Shark Trust, 4 Creykes Court, The Millfields, Plymouth PL1 3JB, United Kingdom
Tel: +44 7855 386083, Fax: +44 1752 672008, E-Mail: ali@sharktrust.org

OTHER PARTICIPANTS

SCRS CHAIR
Brown, Craig A.
SCRS Chairperson, Supervisory Research Fisheries Biologist, Sustainable Fisheries Division, Southeast Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 75 Virginia Beach Drive, Miami, Florida 33149, United States
Tel: +1 305 586 6589, E-Mail: craig.brown@noaa.gov

EXTERNAL EXPERT

Carruthers, Thomas (online)
Blue Matter, 2150 Bridgman Ave, Vancouver Columbia V7P 2T9, Canada
Tel: +1 604 805 6627, E-Mail: tom@bluematterscience.com

*****

ICCAT Secretariat

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

Manel, Camille Jean Pierre
Neves dos Santos, Miguel
Ortiz, Mauricio
Mayor, Carlos
Alemany, Francisco
De Andrés, Marisa (online)
Deprez, Bruno
García, Jesús
Kimoto, Ai
Pagá, Alfonso (online)
Taylor, Nathan
Tensek, Stasa (online)

ICCAT INTERPRETERS

Baena Jiménez, Eva J.
Godfrey, Claire
Hof, Michelle Renée
Liberas, Christine
Linaae, Cristina
Pinzon, Aurélie

Appendix 3

List of papers and presentations

DocRef	*Title*	*Authors*
SCRS/2026/038	Applying the exploratory climate test for western skipjack tuna and North Atlantic swordfish	Carruthers T.
SCRS/2026/063	Informe de las Actividades del componente captura fortuita del Sub-Eco en el mar Mediterráneo	Anonymous
SCRS/2026/076	Programa de investigación y recopilación de datos sobre capturas fortuitas	Domingo A., and Taylor N.G.
SCRS/2026/091	Preliminary analysis of Meka-ring effects on bycatch in Japanese longline fisheries based on scientific observer data	Matsushita H., Ochi D., and Okamoto K.
SCRS/2026/092	Mapping trophic interactions in the western central Atlantic pelagic ecosystem: an ecopath modeling approach	Narváez M., Marín H., Herrera A.T., Evaristo E., Villamizar V., and Arocha F.
SCRS/2026/094	Planning experimental studies on technical fishing gear modifications to detect catch rate changes in ICCAT pelagic longline fleets	Coelho R., Bowlby H., Carlson J., Díaz G.A., Domingo A., Forselledo R., and Su N-J.
SCRS/2026/095	Checklist of bycatch species observed in the Spanish fleet targeting tunas and tuna-like species in the ICCAT area	Baez J.C., Alegría A., Moreno J., Salmerón F., Alonso M.L.R., Pascual P.J., Abascal F.J., Déniz S., García-Barcelona S., Casañas I., de la Rosa J., Torreblanca Estrada D., and Macías D.
SCRS/2026/096	Differences in bycatch associated with surface longline métiers targeting swordfish using traplines/loops from Mediterranean Sea	Macias D.
SCRS/2026/097	Estimates of live and dead discards of shortfin mako sharks in Spanish surface longline fisheries in the Atlantic Ocean using bycatch-estimation tool	Baez J.C., Alegría A., Rueda L., Salmeron F., DeLaRosa J., Torreblanca D., Ramos M.L., and Macias D.
SCRS/2026/098	EcoTest indicator 3: greater indicator generality, higher precision and empirical comparisons	Carruthers T., and Taylor N.G.

DocRef	*Title*	*Authors*
SCRS/2026/099	Modelling spatiotemporal patterns of mobulids in the East Tropical Atlantic Ocean	Riesgo Torres M.D., Pennino M.G., Ramos Alonso M.L., Ruiz Gondra J., Sabarros P.S., Erauskin Extramiana M., and Juan Jordá M.J.
SCRS/2026/100	A temperature-driven early-life habitat suitability indicator for bigeye tuna in the Tropical Atlantic: towards climate-informed ecosystem indicators	Chaguaceda M., Juan-Jordá M.J., and Alvarez D.
SCRS/2026/101	Economic indicators of Spanish fisheries targeting tunas and tuna-like species in the ICCAT area	de-La-Rosa J.
SCRS/2026/103	Preliminary Ecosim model of the tropical Atlantic Ocean: hindcasting food-web and fisheries dynamics	Meléndez-Arteaga J., Andonegi E., Juan Jordá M.J., Zudaire I., Forrestal F., Die D., and Corrales X.
SCRS/2026/107	Incidental catch information from Namibia's large pelagic fishery: preliminary indicators in support of ICCAT ecosystem considerations	Jagger C.E.
SCRS/2026/108	The Role of the TUNAMED Observatory for assessing environmental variability and climate change impacts on large pelagic fish populations in the Mediterranean	Alvarez-Berastegui D., Tugores M.P., Torres A.P., Ottmann D., González N., Aranda I., Alvarez-Ellacuria I., Balbín R., Carreño A., Santandreu M., Juza M., and Reglero P.
SCRS/2026/109	Spatial segregation and bycatch risk as potential drivers of population trends of wandering albatrosses at South Georgia	Warwick-Evans V, Pearmain E., Thorne L., and Phillips R.A.
SCRS/2026/110	Overlap between high seas fishing activity and tropical seabirds that rely on subsurface predators to catch prey	Clark B.L, Shearer L., Simpson T.J.S., Beard A.M., Wright S., Defriez E., Oppel S., Bell J., Reynolds S.J., Phillips R.A., Davies T., Clingham E., Dickey R.C., Henry L., Hughes B.J., Small A., Tuppen S., Wearn C.P., Weber N., Weber S., and Carneiro A.P.B.
SCRS/2026/111	Updated indicators for ICCAT species that are retained and assessed	Hanke A.R., and Andonegi E.
SCRS/2026/113	Update and revision of economic indicator for ICCAT Eco-Card	Tsuji S.
SCRS/2026/116	Evaluating ICCAT candidate ecoregions as a framework to support ecosystem-based advisory products: a comparative analysis of tuna and billfish fisheries and fleets	Casado-Orta H., Mariño G., Murua H., Andonegi E., Idarraga Garces V., and Juan-Jordá M.J.
SCRS/2026/117	Assessment of sea turtle bycatch and fishery interactions along the Egyptian Mediterranean coast	Saber M.A., El Haweet A., and Osman H.

DocRef	*Title*	*Authors*
SCRS/2026/119	Improving post-release survival of silky sharks through best handling practices and bycatch release technologies in tuna purse seiners	Grande M., Mugerza A., Murua J., Cuevas N., Salgado A., Onandia I., Lopetegui-Eguren L., Erauzkin-Extramiana M., Ruiz J., and Arrizabalaga H.
SCRS/2026/121	Electronic Monitoring Systems as a tool to enhance bycatch and discard data collection and compliance with mitigation measures: preliminary results from the Brazilian pelagic longline tuna fishery	Lezama A.Q., Cabanillas-Torpoco M., Canani G., and Peres M.B.
SCRS/2026/122	Bycatch Research and Data Collection Data Program (PIRDCaF)	Anonymous
SCRS/2026/123	Bycatch landed by the Mexican longline fleet in the Gulf of Mexico	Ramírez-López K., Rojas-González R.I., and Wakida-Kusunoki A.T.
SCRS/2026/124	Update of the Marine Mammals Module of the Information System for Tuna of the Gulf of Mexico (SIA)	Ramírez-López K., Rojas López H., Rojas-González R.I., and Wakida-Kusunoki A.T.
SCRS/2026/125	Integrating salinity anomalies into CPUE standardization: a case study of Mediterranean albacore (*Thunnus alalunga*)	Hajjej G., Hanke A., and Sosthene A.
SCRS/P/2026/040	Blue shark tagging for post-release survival studies in Western Mediterranean; protocols and preliminary results	Landreau A, Rouyer T., Kerzerho V., Wendling B., Derridj O., and Tessier E.
SCRS/P/2026/043	Large predatory fishes as sentinels of a changing pelagic realm	Fernández Corredor E., Navarro J., Ramírez F., and Coll M.
SCRS/P/2026/044	Update on Common Oceans Projects	Taylor N.G.
SCRS/P/2026/045	Meeting on the implementation of the ecosystem approach to fisheries management in tuna RFMOs: advancing the development of ecosystem indicators	Murua H.
SCRS/P/2026/046	To fish or not to fish... mesopelagics	Andonegi E. and Prellezo R.
SCRS/P/2026/047	ICCAT fishing in a High Seas MPA in the NE Atlantic: recommendations for collaborative management	Davies T., Mitchell D., Briggs J., Steadman D., Heenan A., Yates O., Crowe O., Carneiro A.P.B., and Wade H.
SCRS/P/2026/048	Pacific tuna RFMOs: efforts to improve and harmonize conservation measures for vulnerable species	Swimmer Y.
SCRS/P/2026/049	IOTC Working party on ecosystems and bycatch data	DaSilva C., Tolotti M., and Nelson L.

DocRef	*Title*	*Authors*
SCRS/P/2026/050	Seabirds incidental catches in Spanish mediterranean longline fisheries: an update for the period 2000–2024 and factors influencing bycatch Risk	García-Barcelona S., Macías López D., Pauly Salinas M., Moreno F.J., Báez J.C., Puerto M.A., Saber S., and Ortiz de Urbina J.M.
SCRS/P/2026/052	Status of ST09 revision process for Recommendation 22-12	ICCAT Secretariat
SCRS/P/2026/054	Abundance trends of French tropical tuna purse seine fisheries bycatch species in the eastern Atlantic Ocean	Lerebourg C., March D., Sabarros P.S., and Kaplan D.M.
SCRS/P/2026/057	Reflexiones para desarrollar un trabajo coordinado entre las Organizaciones Regionales de Pesca atunera, que permita evaluar y mitigar la captura fortuita	Domingo A. and Taylor N.G.
SCRS/P/2026/060	El climático y su impacto en el atún rojo y sus presas principales	Erauskin-Extramiana M.
SCRS/P/2026/072	Marine Beacon Project: high seas case study -co-producing bycatch solutions	Grande M., Erauskin M, Lopetegui L., Riesgo L., Lacambra L., Mariño G., Murua H., and Arrizabalaga H.
SCRS/P/2026/073	A socio-ecosystem diagnostic analysis (SEDA) of the Sargasso Sea	Kell L., Vousden D, and Luckhurst B

Appendix 4

SCRS documents and presentation abstracts as provided by the authors

SCRS/2026/038 - Not provided.

SCRS/2026/063 - This document summarized activities of the Mediterranean bycatch component of the Sub-Committee on Ecosystems and Bycatch, with emphasis on collaborative work to evaluate sea turtle bycatch in ICCAT fisheries. The report reviewed the 2025 workshop held in Olhão, Portugal, and included background from previous workshops in 2023 and 2024. The process was described as a collaborative scientific forum that has improved communication, data sharing and analytical development among scientists from several Mediterranean CPCs, ICCAT and GFCM. The workshop reviewed analyses of loggerhead sea turtle bycatch in Mediterranean and adjacent Atlantic longline fisheries, including GAM-based spatial and temporal modelling, BYET estimation approaches, stranding information, literature reviews and knowledge-gap assessments. The document noted persistent data limitations, including uneven observer coverage, incomplete effort information and limited representation of some fleets and areas. Participants also discussed future work on other bycatch taxa, particularly elasmobranchs and a possible Mediterranean blue shark assessment. The report emphasized the value of continued workshops, improved coordination with the Sharks Group and GFCM, and development of the bycatch data collection and research programme.

SCRS/2026/076 - Not provided.

SCRS/2026/091 - Data collected by Japanese scientific observers aboard tuna longline vessels (2018–2024) across all major ocean areas were used to examine the effects of Meka-ring (trapline) on the catch rates seabirds and sea turtles. Operations in which meka-ring was used at least once were extracted for analysis, and nominal BPUE was compared between meka-ring and conventional hooks. Meka-ring use was concentrated in the northwestern Pacific and accounted for less than 10% of hooks on average in all areas. BPUE on meka-ring was zero for seabirds, and much lower than on conventional hooks for sea turtles. These results support the conclusion that replacing a fraction of conventional hooks with Meka-ring reduces risk for seabirds and sea turtles.

SCRS/2026/092 - An initial Ecopath model was developed to describe the trophic structure and energy flows of the pelagic ecosystem in the western central Atlantic for the reference year 2000. The model integrates available information on biomass, production, consumption, and diet composition across 32 functional groups/species representing nekton, micronekton, plankton, and detritus. Data on fisheries operating in the region were also included. Model diagnostics and descriptions of the mass-balanced model are presented in this document. The results highlight the central role of zooplankton and micronekton pathways in supporting pelagic predators, as well as the importance of crustaceans and cephalopods as key trophic intermediates. The inclusion of gelatinous plankton and separate detrital compartments improves the representation of alternative energy pathways and ecosystem processes. This initial model provides a preliminary baseline that can be refined for future Ecosim simulations to evaluate fishery scenarios and support ecosystem-based fisheries management within the ICCAT Convention area.

SCRS/2026/094 - This paper estimates sampling effort and indicative costs required to conduct gear-comparison experiments in ICCAT Atlantic pelagic longline fisheries. Catch and effort data from five fleets (Canada, EU-Portugal, Chinese Taipei, Uruguay and USA) covering large areas of the Atlantic were used. A power-analysis was carried out to calculate the median number of hooks per experimental group needed to detect relative changes in catch rates (CPUE) of 5%, 10% and 25%. Four species/taxa groups were considered, namely shortfin mako, swordfish, billfishes and tunas. The required effort was mostly driven by species and fleet-specific catch rates. The required effort was converted into fishing sets and assumed days at sea, and the associated costs are provided. We recommend, as a starting point, consider designing experiments capable of detecting a CPUE change of 25% for bycatch species, noting that more effort is needed to detect CPUE differences of 10% or lower. The results presented are intended to support the SCRS and the ICCAT Commission in planning and budgeting experimental research programmes, as requested by several ICCAT Recommendations.

SCRS/2026/095 - In the present study, a verified checklist of species observed as bycatch in fisheries targeting tunas, sharks and tuna-like species within the ICCAT Convention area was developed using data collected from three independent observer programmes: (1) the tropical purse seine observer programme, covering the period 2010–2024; (2) the Mediterranean surface longline observer programme, spanning 2010–2024; and (3) the observer programmes for the Spanish coordinated distant-water longline surface fleet, with data available from 2018 to 2024. A total of 235 taxa were recorded, encompassing eight different taxonomic classes: Actinopterygii (132 taxa), Aves (20), Chondrichthyes (55), Cephalopoda (5), Echinoidea (2), Mammalia (13), Malacostrata (2) and Reptilia (6).

SCRS/2026/096 - This study developed a weighted risk index to compare the impact of loop-based gear and traditional surface longline gear across different metiers of the Spanish longline fleet operating in the western Mediterranean. The index integrates species-specific CPUE values weighted according to International Union for Conservation of Nature conservation categories. Results indicate that loops generally reduce bycatch risk due to their high selectivity for swordfish. However, in LLPB fisheries operating near the continental slope, risk increased, suggesting potentially greater impacts on vulnerable species. Further research and additional data are needed to better assess these effects.

SCRS/2026/097 - Not provided.

SCRS/2026/098 - The EcoTest framework was extended to allow for bespoke indicators specific to the data available for a given stock. Indicator 3 is applicable to a much wider range of life-histories and fishery types than previous EcoTest indicators and provided superior theoretical stock status estimation performance. Unlike earlier EcoTest indicators, Indicator 3 uses a large master simulation dataset encompassing the families Istiophoridae, Scombridae and Carcharhinidae, which can be subsetted to match the data types available for any individual stock. Custom neural networks are then trained on the subsetted data to assess whether those data can, in theory, reliably inform stock status. Polynomial smoothing is used to characterise time-series inputs, allowing networks to accommodate variable time-series lengths within a fixed input layer. When provided with catch, length composition and life-history data, the neural networks correctly identified depleted and healthy stocks in the majority of simulations. When applied to three species of small tunas: Frigate Tuna, Little Tunny and Blackfin tuna, Indicator 3 provided stochastic estimates of stock status for these previously unassessed secondary species.

SCRS/2026/099 - Mobulid rays (family Mobulidae) are highly vulnerable elasmobranchs that frequently interact with tuna and billfish fisheries, yet their spatial ecology remains poorly characterised in the Atlantic Ocean. This study applies hierarchical Bayesian spatiotemporal Species Distribution Models (SDMs) to investigate occurrence patterns of *Mobula mobular*, *Mobula tarapacana*, and the Mobulidae family in the eastern tropical Atlantic, using fishery-dependent observer data from the EU tropical tuna purse seine fleets (2009–2023). Results explicitly address key challenges in modelling rare bycatch species and demonstrate that, in complex data contexts such as fisheries-dependent datasets, the aggregated taxa approach provides a practical framework to overcome limitations when studying rare taxa such as mobulids. Model performance and outputs are therefore interpreted cautiously, with emphasis on data limitations, modelling assumptions, and sources of uncertainty. This work contributes to ongoing efforts within ICCAT to operationalise the Ecosystem Approach to Fisheries Management (EAFM). It supports the development of vulnerability-related indicators for integrating knowledge on the status of non-retained Endangered Threatened and Protected (ETP) species into regional indicator-based Ecosystem Report Cards (EcoCards) and Ecosystem Fisheries Overviews (EFOs) of the Tropical Atlantic ecoregion.

SCRS/2026/100 - Understanding how climate-driven changes in sea surface temperature (SST) influence the thermal suitability of larval habitats can support the development of environmental indicators for ecosystem-based fisheries advice. This study contributes to ongoing efforts within ICCAT to operationalize the Ecosystem Approach to Fisheries Management (EAFM). To assess the effects of SST variability on early life stages of bigeye tuna (*Thunnus obesus*) in the Tropical Atlantic, a Thermal Adequacy Indicator (TA) was developed based on empirically derived larval temperature preferences. The indicator was applied to historical satellite-derived SST data (1982–2022) and to future projections (2081–2100) under three Shared Socioeconomic Pathway (SSP) scenarios, and analysed across contrasting oceanographic regions. Results indicate a consistent basin-scale warming trend and a corresponding increase in TA over the historical period. Future projections show an initial increase in TA across all scenarios, followed by divergence after mid-century, with declining suitability under high-emission conditions. A poleward shift in thermally suitable habitat is projected, with reduced suitability in equatorial regions. The TA provides a spatially explicit and transferable framework to support climate-informed ecosystem reporting within ICCAT.

SCRS/2026/101 - This study develops and applies a bycatch-intensity-based bioeconomic framework to assess the trade-offs between economic performance, bioecological impact, and energy use in the industrial fishery of large pelagic species. The analysis focuses on Spanish fleets operating longlines and purse seines in the Atlantic Ocean, specifically within the ICCAT area. The incidental catch of ecologically sensitive species, such as rays, sharks, and sea turtles, is quantified using bycatch per unit of effort and integrated with economic value and energy-related fishing effort. An individual-based bioeconomic index (BEI) is proposed to link economic returns with ecological impacts and energy use. Complementary indicators, such as economic cost per bycatch per unit of effort ($ECPB$), return on financial risk fund return ($FRFR$), and economic value per unit effort ($EVFD$), are used to characterize economic efficiency and opportunity costs, among other indicators. The results show that longline fishing is more economically efficient per unit of effort, but concentrates greater ecological impacts on fewer individuals, while purse seine fishing has lower impacts at the individual level, but also lower economic returns in relation to energy use.

SCRS/2026/103 - The implementation of Ecosystem Approaches to Fisheries Management (EAFM) within tuna Regional Fisheries Management Organisations increasingly requires integrated ecosystem-based tools capable of accounting for fisheries impacts, trophic interactions and environmental variability. In this study, we present an updated Ecopath with Ecosym (EwE) model of the tropical Atlantic Ocean (TAO) pelagic ecosystem developed to support ecosystem-based advice within ICCAT. Input parameters of the static Ecopath model were refined, and the temporally dynamic Ecosim model was fitted to time series of data from 2003 to 2022. The model was able to reproduce satisfactorily the observed biomass and catch trends for several species and functional groups, although uncertainty remained substantial for some groups. Ecosystem change was driven by fishing pressure, trophic interactions and the environment. Ecological indicators derived from the model suggested that fisheries are exerting higher pressure on high trophic level and vulnerable species, while progressively redirecting removals towards lower trophic level fish. Despite existing uncertainty and data limitations, this work represents an advancement towards the development of an ecosystem modelling framework capable of supporting ecological indicators, ecosystem-based advice and future scenario exploration within ICCAT.

SCRS/2026/107 - This study evaluates preliminary bycatch indicators in Namibia's large pelagic fishery to support ICCAT ecosystem considerations. Operating within the Benguela Current region, the fleet targets sharks and tunas while interacting with non-retention species. Fisheries observer reports, logbooks, and pilot incidental catch forms were analysed from 2024 (two vessels) and 2025 (one vessel). The 2024 pilot study recorded seabird bycatch per unit effort (BPUE) below 1.0 per 1000 hooks. In 2025, 372 incidental catch individuals were documented during June-July, dominated by thresher sharks, which accounted for 91% of all interactions. Interaction rates in July were approximately five times higher than those observed in June. Although no seabird or turtle interactions were recorded in the 2025 pilot forms, observer feedback confirmed occasional encounters, highlighting the importance of integrating multiple data streams to strengthen monitoring accuracy. Most non-retention sharks were released alive, supporting the effectiveness of current safe-release handling practices. These findings support Namibia's ongoing regulatory revisions to mandate bycatch mitigation measures for protected taxa, aligning national policy with ICCAT recommendations and FAO best practices for ecosystem-based fisheries management.

SCRS/2026/108 - TunaMed is a collaborative Mediterranean observatory and scientific coordination initiative focused on understanding how environmental variability and climate change affects tuna and other large pelagic fish populations in the Mediterranean Sea. The initiative integrates oceanographic, ecological, and fisheries-related indicators to support ecosystem-based assessment and management. This document summarizes recent activities developed within TunaMed and their transfer to the Species Working Groups of the ICCAT Standing Committee on Research and Statistics (SCRS). Main activities include the development of environmental indicators linked to Atlantic bluefin tuna abundance indices, the integration of climate variability into larval habitat and catchability analyses for Mediterranean albacore, and the assessment of climate-related shifts in swordfish spawning phenology. TunaMed promotes the incorporation of environmental information into stock assessment, management strategy evaluation, and ecosystem monitoring frameworks, while strengthening scientific cooperation across Mediterranean research institutions.

SCRS/2026/109 - Rates of population decline of the wandering albatross Diomedea exulans vary considerably among breeding sites at South Georgia, with an annual decline of 3% at Bird Island and 1.4% at nearby Prion Island. Populations at Bird and Prion Islands have declined by almost 45% and 25%, respectively, between 1999 and 2018. The overlap between tracked wandering albatrosses and pelagic

longline fisheries in the South Atlantic was up to five times higher for birds from Bird Island than those from Prion Island. Birds from both colonies overlapped with Brazilian, Chinese and Chinese Taiepi pelagic longliners. The clear contrast between the two sites in relative overlap with fisheries is likely to be one of the main drivers of the different rates of decline between these two populations of wandering albatross. We recommend ICCAT update the existing measures outlined in Recs 07-07 and 11-09 to adopt ACAP Best Practice Advice for Reducing the Impact of Pelagic Longline Fisheries on Seabirds and encourage Flag States to increase monitoring of longline fishing operations in the South Atlantic, particularly including compliance with seabird mitigation measures.

SCRS/2026/110 - In support of the Ecosystem Report Card, we investigated the overlap between high seas fishing activity and the movements of tropical seabirds that rely on subsurface predators to drive prey to the surface, where it becomes accessible. We collected new tracking data and collated existing data for breeding seabirds on Ascension Island and St Helena. Use of the high seas beyond Exclusive Economic Zones (EEZs) varied among seabird species, with the highest overlap with fishing activity for Sooty Tern and the endemic and Vulnerable Ascension Frigatebird. Juvenile and non-breeding adults of all tracked seabird species made higher use of the high seas and showed greater overlap with fishing activity but tracking data for these life stages are not available for all species. The areas of greatest overlap were northwest and northeast of the Ascension Island EEZ. Overall, our results illustrate the connectivity between remote oceanic islands, Marine Protected Areas and the oceanic ecosystems beyond national jurisdictions.

SCRS/2026/111 - This document contains an update of indicators presented in the 2018 Ecosystem report card under the component for retained and assessed species.

SCRS/2026/113 - The socio-economic indicator for the ICCAT Eco-Card was initially developed as preliminary basis in 2018 and updated in 2025. The Subcommittee on Ecosystems and Bycatch of 2025 reviewed the proposed indicators and advised further conducting the analysis on the impact of inflation rate to reflect and the disaggregation according to different economic status of countries. Correspondingly, the indicators were disaggregated according to the World Bank Income classes. A comparison between global inflation rate and tuna prices was also made. All indicators were shown by distinguishing ICCAT member status in two ways, one corresponding to the most recent and the other corresponding to the status at the time.

SCRS/2026/116 - The International Commission for the Conservation of Atlantic Tunas (ICCAT) is developing ecosystem-based tools and products for implementing the Ecosystem Approach to Fisheries Management (EAFM). Atlantic fisheries exhibit strong regional heterogeneity, highlighting the need for intermediate regional scales such as ecoregions to support ecosystem-based analyses and advisory processes within ICCAT. This study evaluates whether the five ICCAT candidate ecoregions represent coherent regional socio-ecological fisheries systems. Using ICCAT Task 1 and Task 2, fisheries within each ecoregion were characterised in terms of fleet composition, catch composition, and fishing strategies. Core fleets were classified as regional or across-regions according to spatial fidelity and connectivity. Results revealed strong spatial structuring of fishing activities across the five ecoregions. Regional fleets dominated most ecoregions, whereas highly mobile longline fleets played a greater role in the South Atlantic. Each ecoregion exhibited distinct fleet, gear, and catch compositions reflecting underlying ecological gradients. These patterns remained stable over decades, demonstrating that ICCAT candidate ecoregions function as coherent and operationally meaningful fisheries systems. Overall, the results support the use of ecoregions as a practical spatial framework for ecosystem-based planning, ecosystem analyses, and the development of advisory products within ICCAT.

SCRS/2026/117 - Sea turtle bycatches in Mediterranean fisheries are critical for conservation and biodiversity. Information and data from the eastern Mediterranean remain scarce. This study quantified temporal patterns of sea turtle bycatch in the Egyptian Mediterranean albacore longline fishery from 2023 to 2025 using onboard observer programs and fisher interviews. CPUE was calculated as turtles per 1,000 hooks. A total of 45 sea turtles were recorded, comprising 37 green turtles (*Chelonia mydas*), 82.2% and 8 loggerhead turtles (*Caretta caretta*) 17.8%. Annual CPUE varied considerably, peaking in 2024 0.4441 turtles/1,000 hooks compared to 2023 0.1574 and 2025 0.1646. The overall trend showed a non-significant 4.6% increase ($R^2 = 0.001$, $p > 0.05$). Monthly analysis revealed distinct seasonal peaks in May (0.4444) and September (0.3559), with lowest interactions in June (0.1111). Continued monitoring and expanded observer coverage are recommended to inform evidence-based conservation measures in the region.

SCRS/2026/119 - This study evaluates post-release survival of silky sharks in the Atlantic Ocean tuna purse-seine fishery, focusing on the combined effects of best handling and release practices and the use of on-deck bycatch release devices. A dedicated tagging research action was conducted onboard a purse-seine vessel operating in the Atlantic Ocean during a commercial fishing trip in 2025, during which silky sharks were released following established best practices and using a release ramp installed on deck. Satellite pop-up archival transmitting (SPAT) tags were deployed to directly assess post-release survival. To strengthen survival estimates by vitality state, tagging data from a previous Atlantic Ocean study were integrated into the analysis, increasing the sample size and robustness of the results. Survival rates were assigned to sharks according to their vitality state at release, and these rates were subsequently applied to all sharks caught during the fishing trip to estimate overall trip-level survivorship. Results indicate that post-release survival is strongly linked to vitality at release, with survival reaching 100% for sharks released in excellent condition and exceeding 80% for those released in good or correct condition. By applying vitality-specific survival rates, the estimated overall survival rate for the fishing trip was approximately 50%, exceeding previously reported values for the Atlantic purse-seine fishery.

SCRS/2026/121 - Electronic Monitoring Systems (EMS) are increasingly recognized as vital tools for improving fisheries data collection, however empirical evaluations of their performance in South Atlantic fleets remain scarce. In this study, we evaluated the performance of the first EMS pilot in the Brazilian pelagic longline tuna fishery. The equipment was installed on two commercial vessels operating in the tropical Atlantic and recorded 15 fishing trips and 118 hauling events between July 2022 and March 2024. Preliminary results demonstrate that EMS can effectively record bycatch species, assess the condition of captured individuals, and support monitoring of compliance with bycatch mitigation measures.

SCRS/2026/122 - This document presents the groundwork to establish a Bycatch Research and Data Collection Program within ICCAT, building on previous initiatives such as the Shark Research and Data Collection Programme (SRDCP) (2013). The aim is to improve data collection and scientific advice on non-target species affected by ICCAT fisheries in the Atlantic and Mediterranean, generating research activities. Bycatch refers to unwanted organisms captured, retained and discarded, alive or dead. Although ICCAT lacks a consensus definition, statistical classification criteria were established in 2024. The programme addresses key components: data collection on gear, fleets, effort, and catch; recovery of historical data; observer programmes; and studies on biology, population structure, habitat use, mortality, and tagging. It also proposes assessment tools such as Productivity and Susceptibility Analysis (PSA) and quantitative models for data-poor species. Emphasis is placed on mitigation strategies, strengthening technical capacity, handling measures and good practices) and the need for regional and inter-institutional collaboration. An ecosystem-based approach and coordination with other organizations are essential to optimise conservation and sustainable management outcomes of these species.

SCRS/2026/123 - This study describes the bycatch landed composition of the Mexican surface longline fishery targeting yellowfin tuna (*Thunnus albacares*) and swordfish (*Xiphias gladius*) in the Gulf of Mexico from 1993 to 2024. Data were obtained from an onboard observer program with variable coverage from 1993–1997 and 100% coverage thereafter. Bycatch and target species catch were analyzed in terms of weight and number of individuals, based on standardized logbook and observer records. Over the study period, bycatch represented on average 20.0% of total landings in weight and 30.4% in number of fish. In weight, billfishes (31.5%) and sharks (18.2%) were the most important bycatch components, while in number of individuals other tunas (31.7%) and other fishes (22.4%) were dominant. The results highlight the relevance of pelagic sharks, billfishes, and non-target tunas in the catch composition of this fishery, which is relevant for bycatch monitoring and management in the Atlantic.

SCRS/2026/124 - The updated Marine Mammals Module incorporates two new relational tables containing marine mammal sighting and biological observation data, improving traceability, validation, and reporting capacity for International Commission for the Conservation of Atlantic Tunas (ICCAT) requirements. The Information System for Tuna of the Gulf of Mexico (SIA) has undergone recent improvements and upgrades aimed at optimizing the management and conservation of highly migratory species such as yellowfin tuna (*Thunnus albacares*) and associated bycatch in the Mexican longline fleet operating in the Gulf of Mexico. These improvements include the integration of analysis tools and automation of reports in accordance with the requirements of the ICCAT. With these updates, the SIA adapts more efficiently to national and international regulations and operational needs, ensuring improved compliance with Mexico's commitments regarding conservation and sustainable management of highly migratory species, including the incorporation of marine mammal records into the database. The SIA is consolidated as a key tool for sustainable management of tuna fisheries in the Gulf of Mexico, strengthening standardized ecosystem-related data management.

SCRS/2026/125 - Accurately standardizing CPUE is vital for Mediterranean albacore (*Thunnus alalunga*) assessment. We analyzed 144 artisanal longline operations (2024-2025) in the Gulf of Hammamet using Generalized Additive Models (GAMs). A model including SSS anomalies and fishing depth provided the best fit among the tested formulations, explaining 64.4% of the deviance. Positive albacore catches were mainly associated with deeper fishing areas and local salinity values higher than the regional baseline. These results suggest that SSS anomalies may act as hydrographic proxies for albacore availability and environmentally driven catchability. The SSRI is proposed as an exploratory indicator to identify periods when regional freshening may compress suitable habitat and bias CPUE. Integrating mechanistic proxies like the SSRI into assessments is essential to distinguish environmental catchability shifts from true abundance trends in Mediterranean fisheries management.

SCRS/P/2026/040 - The blue shark is one of the main bycatches of French longline fleets operating in the Gulf of Lion targeting bluefin tuna. Electronic tagging of blue sharks after capture makes it possible to estimate their post-release survival rate. Several protocols exist in the literature and have been tested. A new protocol has been developed to optimise the tagging of these individuals. Preliminary results appear to validate the viability of this protocol and provide important information on the post-release survival of blue sharks.

SCRS/P/2026/043 - Examined the potential role of large pelagic predatory fishes as ecosystem sentinels of changing pelagic ecosystems, with emphasis on trophic ecology, climate change and fisheries effects. The presentation noted that these species are highly migratory, ecologically important and increasingly monitored, and may therefore provide information on otherwise difficult-to-sample open-ocean and mesopelagic communities. Using observer-derived stomach-content and stable-isotope information from the Spanish surface longline fleet, the study evaluated swordfish, blue shark and shortfin mako shark, with particular emphasis on swordfish as a practical sentinel species. Results indicated that swordfish have a generalist and flexible diet, frequently consume mesopelagic fish, cephalopods and gelatinous organisms, and show dietary responses to sea surface temperature, mixed-layer depth, chlorophyll and fishing pressure. The authors suggested that continuous monitoring of swordfish diet could provide a cost-effective indicator of mesopelagic community change. The presentation further identified data gaps for Mediterranean pelagic sharks and highlighted the relevance of trophic information for ecosystem-based fisheries management, spatial management and marine ecosystem modelling, and for evaluating management responses under multiple future environmental and anthropogenic pressure scenarios.

SCRS/P/2026/044 - Provided an overview of recent activities under the Common Oceans Tuna Project, focusing on outcomes from the 2025 Bycatch Workshop and the 2026 tRFMO Management Strategy Evaluation (MSE) Workshop. The presentation reported that proceedings from the bycatch workshop were developed into a Fisheries Research special issue that attracted submissions spanning multiple tuna RFMOs, ocean basins, and subject areas, including bycatch estimation, ecological risk assessment, observer programs, seabird and turtle interactions, FAD impacts, ecosystem-based management, and fisheries monitoring technologies. The presentation also summarized the January 2026 MSE workshop held in Rome, which convened 51 participants from tuna RFMOs, scientific institutions, industry, and partner organizations. Discussions focused on advancing operational MSE implementation, improving science–management dialogue, harmonizing terminology and workflows across RFMOs, and incorporating climate robustness, uncertainty communication, and scalable analytical approaches into future management procedures. The presentation concluded by emphasizing the importance of continued cross-RFMO collaboration and structured capacity building.

SCRS/P/2026/045 - Summarized the March 2026 tuna RFMO workshop on implementing the Ecosystem Approach to Fisheries Management through operational ecosystem indicators. The presentation noted that tuna RFMOs already have many EAFM elements, including bycatch, FAD and ecosystem-related measures, and that substantial indicator science has been developed through Scientific Committees and secretariats. However, ecosystem indicators remain mostly descriptive and are not yet routinely translated into management advice. The workshop therefore focused on identifying practical pathways for moving from dashboards to management-relevant products, including harmonized core indicators, ecoregional approaches, ecocards, risk tables and concise executive summaries. It recommended a small set of robust, interpretable and reproducible indicators, including FAD metrics, bycatch indicators, larval habitat suitability and the Ecosystem Traits Index. The presentation also described the ETI as an integrated ecosystem-context indicator derived from ecosystem models, requiring further validation and plain-language guidance. Priority actions for 2026–2027 include pilot indicators, improved communication

products, strengthened cross-RFMO workflows and a follow-up workshop in 2027. Overall, the workshop provided a practical roadmap for strengthening science-management integration and advancing operational EAFM across tuna RFMOs.

SCRS/P/2026/046 - The mesopelagic or ocean twilight zone (OTZ) in the ocean contains huge numbers of fish in a relatively pristine environment and may therefore attract interest as a commercial fishery. In this study we evaluate in economic terms, the likely trade-offs between the different services provided by the mesopelagic layer in the Bay of Biscay and the societal benefits of its commercial exploitation. Benefits arise mainly from the likely use of this group of species as raw material for producing fishmeal and fish oil. Costs are derived from the loss in climate regulating and cultural services, but also from the loss in the provisioning service of other commercial species. To do so we compare the current non-exploited status with a situation where mesopelagic fishes are harvested at levels capable of producing the Maximum Sustainable Yield. Results suggest that if mesopelagic fishes are harvested, a mean value of 1.2 million Euro loss in a year will be created in the Bay of Biscay, although in a range between 42 million Euro loss and 48 Euro million benefits. This uncertainty comes, mainly, from the limited existing knowledge of the mesopelagic fishes' biomass but also from the uncertainty on the biomass of the rest of the species of the studied ecosystem. The large range indicates that a better understanding of the mesopelagic ecosystem is needed, however, results also show that ecosystem services under no exploitation provided by the OTZ could be more valuable than the fishmeal and fish oil that potentially could be obtained from the fishes harvested in this sea layer.

SCRS/P/2026/047 – It presented recommendations for collaborative management of ICCAT fishing activity within the North Atlantic Current and Evlanov Sea basin Marine Protected Area, a high-seas MPA in the northeast Atlantic designated under OSPAR. The presentation summarized a remote vessel-data framework for monitoring human activities in area-based management tools, including definition of focal, buffer and context areas, establishment of baseline vessel activity, comparison with subsequent years and integration of outputs into management. Results indicated that fishing activity detected within the MPA was attributable to ICCAT fisheries, almost entirely drifting longline activity, and was concentrated in the southern and south-western portions of the area. Fishing occurred mainly from July to September and was associated primarily with Spanish- and Portuguese-flagged vessels, although vessels did not consistently target the MPA each year. The presentation noted that limited observer and bycatch data for the area prevent estimation of impacts on non-target species, including seabirds. Recommendations included improved reporting of non-target species bycatch, greater transparency in ICCAT monitoring, collaboration among OSPAR, ICCAT and relevant national authorities, and continued engagement with BBNJ implementation.

SCRS/P/2026/048 - reviewed ongoing efforts in Pacific tuna RFMOs to improve and harmonize conservation and management measures for sea turtles, with relevance for ICCAT and broader tuna RFMO collaboration. The presentation focused on the Western and Central Pacific Fisheries Commission and the Inter-American Tropical Tuna Commission, noting that sea turtle populations and fisheries interactions occur across ocean basins and management boundaries, creating both challenges and opportunities for harmonized measures. Existing Pacific measures include requirements for sea turtle bycatch mitigation, although current provisions are largely focused on shallow-set longline fisheries and undefined "large" circle hooks. The presentation highlighted recent analyses indicating that, despite lower catch rates per set, deep-set longline fisheries may contribute substantially to sea turtle interactions because they represent most longline effort. It also summarized recent WCPFC and IATTC processes to review sea turtle measures, improve reporting requirements, clarify gear characteristics, consider mitigation for deep-set fisheries, and update best handling and release guidance. The presentation encouraged continued cross-RFMO collaboration, science-based decision-making and harmonized approaches for vulnerable taxa.

SCRS/P/2026/049 - The presentation summarized progress and future directions of the IOTC Working Party on Ecosystems and Bycatch Data in strengthening tuna bycatch management. It reviewed current knowledge on bycatch species, including recent shark assessments and ecological risk analyses, and noted that blue shark was assessed in 2025 as not overfished nor subject to overfishing, while shortfin mako was assessed in 2024 as overfished and subject to overfishing. The presentation also summarized available status information for seabirds, marine turtles, cetaceans and mobulids, and noted that multiple IOTC resolutions address monitoring, data collection, reporting and species-specific bycatch conservation. Recent WPEB work has focused on reducing bycatch mortality through best handling practices, gear modifications, release guidance for mobulids and sharks, longline mitigation measures and sub-surface gillnets to reduce cetacean interactions. The 2026–2027 work programme includes indicator analyses for data-poor shark

species, updating the Shark Research Plan, close-kin mark-recapture data collection and archiving, seabird workplan development, mitigation review, and potential collaboration with other tuna RFMOs on bycatch estimation, CKMR studies and management of species such as porbeagle.

SCRS/P/2026/050 - The presentation updated information on seabird bycatch in Spanish drifting surface longline fisheries operating from the Mediterranean over 2000–2024. The study used data from the IEO onboard observer programme and fleet logbooks to estimate seabird catch rates, total catches by species, and spatial and temporal patterns of interaction across longline métiers targeting swordfish, bluefin tuna, albacore and little tunny. A total of 8,049 sets and more than 16 million hooks were observed from 98 vessels, recording 1,672 seabirds from 13 species. Most captures occurred in the Mediterranean, with limited bycatch in the Spanish South Atlantic region. The most affected taxa were Scopoli's shearwater, yellow-legged gull, Audouin's gull, northern gannet and Balearic shearwater, with Procellariiformes the most affected group. Bycatch rates varied strongly among métiers, with LLHB_BFT showing the highest CPUE, followed by longlines targeting little tunny and albacore. Highest catch rates occurred near the Balearic Islands and southern Catalonia, especially during spring breeding and chick-rearing periods. Estimated total Mediterranean seabird bycatch was 22,177 birds, with high interannual variability and no clear long-term linear trend.

SCRS/P/2026/052 - This presentation summarized the status of the ST09 revision process required to implement the turtle reporting provisions of Recommendation 22-12. The Secretariat noted that Rec. 22-12 introduced mandatory sea turtle interaction reporting requirements that could not be fully accommodated within the existing ST09 structure, and that a separate ST12 draft developed in 2023 had not been formally reviewed by SCRS subcommittees. Following guidance from SC-Statistics, the revision focused on minimum feasible additions, continuity with ICCAT database structures, reuse of existing codes and avoidance of ambiguity between mandatory and optional fields. The main proposal was to create a dedicated ST09D turtle subform, reflecting the mandatory nature of turtle reporting and the likely need for a separate turtle interaction table in Secretariat databases. Feedback from the ad hoc group generally supported this approach, while identifying remaining technical issues on date resolution, FAD type, hook-size standards, photographs and measurement codes. Next steps include resolving these technical decisions through the Sub-Committee and preparing the revised ST09 structure for SC-Statistics review.

SCRS/P/2026/054 - Accurately assessing the abundance trends of bycatch species impacted by tropical tuna fisheries is a major challenge due to limited data and the rarity of many species. This study used observer data collected from French tropical tuna purse seine vessels operating in the East Central Atlantic Ocean between 2013 and 2022 to develop standardised abundance indices and assess temporal trends for 16 major bycatch species, including sharks, rays, billfishes and sea turtles. For each bycatch species, a delta-modeling approach was applied, with a first component modeling bycatch occurrence and a second component to model bycatch abundance conditional on presence. Each model was fitted using a Generalised Additive Mixed Model (GAMM). The results revealed stable or declining trends for most species, while silky sharks, devil rays and olive ridley turtles showed increases. These standardised indices provide to our knowledge the most extensive, concurrent fleet-specific fishery-dependent abundance estimates for multiple tropical Atlantic pelagic bycatch species caught on dFADs, and they represent valuable inputs for future stock assessments, ecological risk assessments, and eventually bycatch mitigation planning.

SCRS/P/2026/057 - Presented reflections on developing coordinated work among tuna RFMOs to evaluate and mitigate bycatch. The presentation reviewed the historical development of ICCAT bycatch work, from early SCRS consideration of incidental catch and establishment of bycatch-related groups in the 1990s, through subsequent shark, seabird, sea turtle, observer programme and ecosystem-related recommendations. It highlighted the evolution from single-taxon initiatives toward broader ecosystem and bycatch coordination, including ecological risk assessments, bycatch data collection, collaborative seabird and sea turtle analyses, and recent measures for sharks, rays, cetaceans, turtles and biodiversity. The presentation also noted increased recent activity within the Sub-Committee, including more documents, CPC participation and total attendance. Examples of inter-ocean connections for taxa such as turtles, blue shark, southern bluefin tuna, porbeagle and seabirds were used to illustrate the rationale for cross-RFMO cooperation. Future collaboration was framed around improving bycatch assessments, mitigation, coordination and capacity building, including prioritized management objectives, science-based measures, observer coverage, multispecies approaches, precautionary management and evaluation of mitigation effectiveness.

SCRS/P/2026/060 - The presentation examined the potential effects of climate change on Atlantic bluefin tuna habitat suitability, prey availability and future overlap with drifting longline fishing effort. The study used biological occurrence data from GBIF, OBIS and ICCAT, Japanese longline catch information and Global Fishing Watch data, together with ensemble habitat models and Earth System Model projections under SSP1-2.6, SSP3-7.0 and SSP5-8.5 scenarios. Habitat suitability was evaluated for Atlantic bluefin tuna and nine principal prey taxa, including squid, sand lance, herring, anchovy, lanternfish, sardine, mackerel and horse mackerel. Results indicated a projected poleward shift in suitable bluefin tuna habitat under all scenarios, with declining suitability in subtropical and spawning regions, including the Gulf of Mexico and Mediterranean Sea. Prey species showed broadly similar northward redistribution, with losses in tropical and semi-enclosed basins and gains in boreal areas. Predator-prey overlap was projected to increase in higher latitudes but decline in traditional spawning and temperate areas. The presentation concluded that climate change should be incorporated into future management strategies to support adaptive and resilient decision-making.

SCRS/P/2026/072 - Presented the Marine Beacon high-seas case study, an EU-funded project focused on co-producing bycatch solutions for protected, endangered and threatened species in European waters and beyond. The case study focuses on ICCAT fisheries, including EU purse seine and longline fleets and other ICCAT fisheries, and on data-poor taxa including silky shark, hammerhead sharks and manta rays. The work aims to improve knowledge of species distributions, catch patterns, vulnerability and mortality reduction options. Species distribution models are being developed and refined using observer data, additional fisheries information and expert input. The presentation also described work to improve bycatch estimation, noting that low observer coverage can produce highly uncertain estimates, particularly for rare or ETP species. Vulnerability analyses are being refined using the EASI-Fish approach, including susceptibility parameters such as overlap, seasonality, encounterability, selectivity and post-capture mortality. The project is also examining post-release survival and mitigation measures, and will co-develop an integrated, multispecies and multi-objective decision-support tool for bycatch management through stakeholder consultation, fisher knowledge and cross-fishery expertise to support practical management advice within ICCAT processes.

SCRS/P/2026/073 – The presentation presented a summary of the Sargasso Sea Stewardship Project's Socio-Ecosystem Diagnostic Analysis, which synthesizes available science to inform a Strategic Action Programme for stewardship of the Sargasso Sea. The document described the Sargasso Sea as a globally significant high-seas ecosystem, structured by the North Atlantic subtropical gyre and supporting important biodiversity, carbon cycling, migratory pathways and life-history functions for numerous species. It noted that governance remains fragmented across sectoral bodies, although the Hamilton Declaration, Sargasso Sea Commission and emerging BBNJ Agreement provide mechanisms for improved cooperative stewardship. The analysis reviewed physical, chemical and biological changes, including warming, stratification, acidification, deoxygenation, altered productivity and changing Sargassum dynamics. It also described deep-sea ecosystems, connectivity, shipping, fisheries, eel fisheries, seabed activities and global pressures such as climate change and pollution. Fisheries were identified as an ecologically significant pressure despite modest catch volumes, particularly through bycatch and food-web interactions. The document emphasized persistent data gaps and the need for sustained monitoring, ecosystem-based management, stakeholder engagement and coordinated international action.