<div align="right">**Appendix 10**</div>

2015-2020 SCRS SCIENCE STRATEGIC PLAN

MISSION

The Standing Committee on Research and Statistics (SCRS), on which each member of the Commission may be represented, is responsible for providing scientific advice to the ICCAT Commission.

The SCRS develops all policy and procedures for the collection, compilation, analysis and dissemination of fishery statistics of tuna and tuna-like species in the Atlantic Ocean and adjacent seas; ensuring that the Commission has the most complete and current statistics available concerning fishing activities in the Convention area as well as biological information on the stocks that are fished. The SCRS also coordinates various national research activities, guides and develops plans for special international cooperative research and capacity building programs, carries out stock assessments, and advises the Commission on the need for specific conservation and management measures in support of the Commission's objective of implementing science-based fishery management. The Committee also advises the Commission on such other scientific matters as may be referred to it.

VISION

A Scientific Committee with broad participation of competent scientists all the CPCs that fish tuna and tuna-like species in the Atlantic Ocean and adjacent seas, working cooperatively in an effective and transparent way, with a solid scientific and technical support of the Secretariat, to provide objective, reliable and robust scientific advice to the Commission in support of the Convention objectives.

SWOT ANALYSIS

Strengths

- Transparency
- Openness
- International collaboration-cooperation
- Welcomes diversity of participation
- Diversity of the analytical approaches
- Secretariat support
- High scientific competence
- Credibility and international recognition
- Open to innovation
- Open to dialogue
- Independence
- Adaptability

Weaknesses

- Low attendance in many cases
- Insufficient technical capacity in some areas
- Heavy workload leading to inefficiencies in organization intra-SCRS and mismatch between the COM requests and the SCRS capacities
- Insufficient financial support
- Insufficient quantity and quality of data in many cases
- Gaps in data collection in many cases
- Lack of "critical mass" especially in view of increasing workload. Insufficient dialogue and channels of communication with the COM
- Limited specific guidance from the COM regarding management goals and risk tolerances
- Limited standardized products to provide information and advice to the COM
- Language barriers

Opportunities

- Scientific collaboration and coordination among CPCs
- Broader participation from G77 countries
- Collaboration with other tRFMOs
- Collaboration with other organizations
- Peer review of stock assessments and science of the SCRS
- Broader external support to the work of the SCRS
- Use of new technologies
- Funding opportunities
- Support from the commission
- Improvement of fishery statistics & methods
- Broader dissemination of scientific results

Threats

- Reduced financial support
- Increase in demands to the SCRS with fewer resources
- Reduced contribution from CPCs in SCRS (participation, research, data collection)
- Low priority/value attached to science (application of science) in some jurisdictions
- Insufficient support for science activities from the Secretariat
- Incidence of regulations in the collection of required data and information
- Lack of scientific interest on the SCRS matters from the scientific community
- Potential lack of expertise in expanded interest areas of the Commission
- Focus efforts on a limited number of stocks
- Undue influence by stakeholders, ideological or political pressure or by economic or financial interests groups

VALUES

I	**INTEGRITY**: The SCRS applies the highest ethical standards to all its scientific work. **INDEPENDENCE**: The SCRS provides advice that is objective and based on the best scientific information available and not unduly influenced by stakeholders, ideological or political pressure groups or by economic or financial interests.
C	**COOPERATION**: The SCRS values and encourages the participation of scientists from all CPCs, acting through scientific collaboration and cooperation to cultivate a diverse set of expertise and to promote best available scientific practices.
C	**COMMITMENT**: We are totally committed to provide the best scientific advice in support of the Commission's objective of implementing science-based fishery management.
A	**ABILITY**: The SCRS strives to ensure the work of the Committee conforms to the highest scientific standards and state of the art methodologies, constantly improving the foundation of knowledge to support the mandate.
T	**TRANSPARENCY**: The SCRS conducts its work in open sessions and encourages the participation of national scientists and external experts; the information, analyses and decision-making process are well-documented and easily accessible to all interested parties.

GOALS, OBJECTIVES AND STRATEGIES

DATA COLLECTION

GOAL 1	**IMPROVE FISHERY DATA COLLECTION AND REPORTING FROM ALL FISHERIES THAT CATCH TUNA, TUNA-LIKE AND OTHER SPECIES UNDER PURVIEW OF THE COMMISSION IN THE AREA OF THE CONVENTION. TO HAVE A REPRESENTATIVE VIEW OF WHAT IS ACTUALLY HAPPENING IN THE FISHERY, SO THAT THE STOCKS CAN BE PROPERLY EVALUATED**

OBJECTIVES

1.1 Strengthen the collection of High Quality Task I and II data and to address data gaps that are identified

   Strategies

   1.1.1   Analysing the effectiveness of existent Recommendations and Resolutions for improving data bases in support of the provision of scientific advice and recommend improvements to enhance effectiveness, as needed.

   1.1.2   Collaborating with other tuna RFMOs and research institutes with tuna interests to assure that best practices are in place.

   1.1.3   Refining protocols for data collection and species identification for target species and bycatch species (commercial and non-commercial) from industrial fishing fleets and non-industrial forms.

   1.1.4   Designing and conduct data evaluation meetings on a regular basis, to review data quality, geographic resolution and misreporting of catches and landings through direct interaction with data providers.

   1.1.5   Investing in capacity building and cooperation to improve both the quantity and quality of the collected data to ensure collection of enough data to have a representative view of what is actually happening in the fishery, so that the stocks can be properly evaluated.

   Measurable targets

   • A 20% reduction in missing or lacking data items in the Secretariat's annual report on statistics.
   • List of specific data elements that are lacking for each stock over a 5-year span.

1.2 Improve resolution and precision of total catch composition and distribution and fishing effort data across CPCs

   Strategies

   1.2.1   Demonstrating through simulation modelling, improvement in precision of estimates of exploitation with different levels of information and cost/benefits of collecting such data.

   1.2.2   Pursuing broad-based application of electronic monitoring systems and other automated data collection methods which provide near real-time data on catch/effort by: i). Monitoring the experiences already in place in tuna fleets, ii). Proposing minimum requirements for electronic monitoring.

   1.2.3   Utilising VMS data for all tuna fisheries for which VMS is required in the Convention Area at the highest temporal resolution possible (1 hour or less) by i). Advocating for adoption by the Commission, collection and recording of VMS data at 1 hour resolution as a minimum, and ii). Obtain access to high resolution VMS data through national scientists or through the Secretariat.

   1.2.4   Compiling comprehensive data on floating object sets (especially on FADs) and on fishing operations by i). Cooperating with the industry for obtaining detailed FAD information (historical and present), under agreed confidentiality rules, ii). Proposing and adopting revisions to confidentiality protocols as needed.

Measurable target

- Fishery catch/effort maps at 1x1° resolution, by month by major gear type by 2020, in support of fine scale (time and space) fishery management advice.

1.3   Improve the fulfilment of the CPC´s data reporting obligations

Strategies

1.3.1   Discouraging provision of low/no quality data by i) Clearly identifying and communicating best practices for data collection and reporting, ii) Strengthen mechanisms to highlight providers of "good" vs "bad" data, iii) As needed, work directly with CPCs to identify methods to address data collection/reporting inadequacies and employ strategic investments to overcome inadequacies, and iv) advocating adoption of recommendations towards "no data, no fish".

1.3.2   Implement quality characterisation methodology with which to inform CPCs of inadequacies in data quality provided to the Secretariat and to inform the Commission on the adequacy of the information available for formulating management advice.

1.3.3   Investing in capacity building and cooperation to improve both the quantity and quality of the collected data to ensure collection of enough data to have a representative view of what is actually happening in the fishery, so that the stocks can be properly evaluated.

Measurable target

- 20% reduction in of non-compliance with CPC reporting obligations according to Secretariat's compilation report within 5 years.

GOAL 2	**INSTITUTE BIOLOGICAL SAMPLING PROGRAMS COMMENSURATE TO THE NEEDS FOR THE ASSESSMENT OF THE DIFFERENT STOCKS UNDER THE CONVENTION**

OBJECTIVES

2.1   Identify the types of biological data that is needed (stock structure, growth, maturity, fecundity, etc.) for the assessment of the different stocks

Strategies

2.1.1   Using approaches such as MSE to determine the relative value of collecting different types of data / information to evaluate stock status and productivity.

2.1.2   Advising the Commission with regards to the types and quality of data that should be required from CPCs. Identify through Ecological Risk Assessments, stocks for which improvements in biological information are necessary for assessing stock status.

2.1.3   Identify through Ecological Risk Assessments, stocks for which improvements in biological information are necessary for assessing stock status.

Measurable target

- Application of MSE to the main ICCAT stocks to evaluate biological data needs by 2018 & Conduct Ecological Risk Assessment (ERAs) for those species for which lack of information prevents quantitative assessments of stock status, by 2020.

2.2   ***Elaborate sampling designs and evaluate the representativeness of samples of length (age) needed for each stock***

Strategies

2.2.1   Demonstrate, through simulation modelling, the sampling required of a stock to achieve sufficient levels of precision in estimates of exploitation.

Measurable target

- Sampling designs for all the main stocks under Commission responsibility elaborated by SCRS by 2020.

2.3   ***Develop coordinated biological sampling programs for ICCAT stocks***

Strategies

2.3.1   Institute regular and representative collections of biological samples as necessary to determine the age and stock structure of the catch to reduce the uncertainties.

2.3.2   Cooperate with National Scientists and CPCs to develop appropriate biological sampling programs for ICCAT stocks.

2.3.3   Dedicate more effort and budget by ICCAT CPCs toward programs for collecting biological information necessary to more fully characterise stock status.

Measurable target

- Increase of 50% in biological sampling programs within a 5-year time frame.

GOAL 3   **DEVELOP PROGRAMS FOR THE COLLECTION AND COMPILATION OF ADDITIONAL DATA NECESSARY TO IMPROVE THE SCIENTIFIC ADVICE TO THE COMMISSION**

OBJECTIVES

3.1   ***Develop a comprehensive bycatch & observer data set***

Strategies

3.1.1   Identifying the extent of the fisheries that catch tuna and tuna-like species for which CPCs should report catch and bycatch data, e.g. specify, shark and other species for which catch, effort, and size (age) data must be reported.

3.1.2   Defining standardised and flexible forms for reporting bycatch with an associated comprehensive electronic form, ensuring the form is consistent with a data base structure that allows CPCs to report bycatch at levels of aggregation in a way that ensures data confidentiality rules are met.

3.1.3   Compiling and maintain meta-data on observer programs and observer data collected by CPCs. Implement mandatory reporting of observer data collected by CPCs.

3.1.4   Enhancing coordination between the CPC's to cover the objectives of observer data collections. Conduct regular reviews of data provided through joint analysis and working group discussions.

3.1.5   Including in the national observer sampling programs the collection of gear and vessel characteristics, and other information, that can be used to standardise CPUE and estimate fishing capacity and changes in effective fishing effort.

3.1.6   Improving estimation of dead and live discards through collection of comprehensive data on total catch composition and disposition through observer (human and/or electronic, as appropriate).

Measurable target

- Representative observer and bycatch data set from 80% of the ICCAT fleets by 2020 and evidence of increase in analyses of CPC observer data through the number of papers submitted to SCRS annually.

3.2   Elucidate data needs for Provision of Ecosystem Based Fishery Management Advice

Strategies

3.2.1   Defining data collection needed for the implementation of EBFM through application of integrated ecosystem models to identify key ecosystem components which need to be monitored in order to more broadly apply EBFM.

3.2.2   Include in the national sampling programs the collection of socio-economic information from the large pelagic fisheries by developing protocols for the collection of socio-economic data for large pelagic fisheries and upgrading ICCAT databases to include data other than biological data.

Measurable target

- Developing protocols for the collection of socio-economic data. Application of Integrated ecosystem models.

DIALOGUE AND COMMUNICATION

GOAL 1   **IMPROVE THE DIALOG WITH THE COMMISSION**

OBJECTIVES

1.1   Elevate science-management dialogue in support of defining critical elements of the decision framework policies of Rec [11-13]: "high probability" and "as short a period as possible"

Strategies

1.1.1   Implementing the Standing Working Group to Enhance Dialogue between Fisheries Scientists and Managers (SWGSM) [Rec. 13-18].

1.1.2   Promoting dialogue of SCRS scientists with their CPCs or Regional Organizations, enabling greater coordination and capacity.

1.1.3   Fully utilising possible GEF-ABNJ funding intended to promote such dialogue.

1.1.4   Focusing on stocks which give cause for concern while management advice is sought for those stocks.

Measurable target

- To provide mechanisms to the Commission so as to be able to adopt probabilities and deadlines for stocks before 2020 (50% percent of cost to be covered by GEF/ABNJ project).

GOAL 2   **PROMOTE OPEN DIALOG WITH THE COMMISSION AND INTERESTED PARTIES**

OBJECTIVES

2.1   Institute periodic meetings with decision makers, SCRS scientists, and stakeholder with more opportunity for free interchange (i.e., not in the usual Commission format)

Strategies

2.1.1   Instituting periodic meetings with Commissioners and stakeholders to discuss how they can tangibly contribute their knowledge of the fishery to the assessment.

2.1.2   Encouraging participation in the meetings by industry, NGOs and other stakeholders.

2.1.3   Taking advantage of the GEF/ABNJ funding offered to ICCAT in support of MSE conduct and in support of conducting dialogue with Commissioners and stakeholders.

Measurable target

- An SCRS-COM stakeholders meeting in the format of the SCRS Working Groups (50% percent of cost to be covered by GEF/ABNJ project).

GOAL 3   **IMPROVE THE DIALOGUE WITHIN THE SCRS**

OBJECTIVES

3.1   Increase interaction between SCRS officers

Strategies

3.1.1   Encouraging participation of SCRS officers in regular and intersessional meetings of the Sub-Committees (Statistics and Ecosystems) and Stock Assessments Methods Working Group.

Measurable targets

- 100% SCRS officers participate in the SCSTAT meetings.
- 100% of SCRS officers participate in the annual coordination meeting.

3.2   Develop better dialog between the working group chair and potential participants

Strategies

3.2.1   Submitting work documents to the Secretariat in advance of the meetings.

3.2.2   Based on the group's response, the Chair will ensure that the appropriate time will be given to the relevant documents within the framework of the meeting agenda.

3.2.3   The documents will be made available before the meeting to registered participants.

3.2.4   Promoting work with all intersessional participants.

3.2.5   Committing the participants in the work to performing the intersessional tasks*.*

Measurable targets

- Broader participation in the working group reports.
- Develop a protocol for the submission of documents prior to meetings.
- 100% of the work plans established (containing deadlines, allocated responsibilities, framed within the strategic plan, subject to financial and technical conditions).

GOAL 4   **IMPROVE THE DIALOG WITH THE SCIENTIFIC COMMUNITY**

OBJECTIVES

4.1   Strengthen linkages and collaboration with other Tuna Regional Fishery Management Organizations (tRFMOs)

Strategies

4.1.1   Increasing the scientific exchange between the SCRS with other RFMOs.

4.1.2   Prioritising the participation of scientists from other tRFMOs as guest experts or as peer reviewers.

4.1.3   Promoting inter-tRFMO meetings on areas of common interest (species, assessment methods, data acquisition, etc.), taking advantage of other fora in which best practices are being discussed. Such as ISSF stock assessment workshops.

4.1.4   Supporting the processes arising from Kobe of the Bycatch and MSE groups.

Measurable targets

- Broader participation in the working group reports.
- External experts or scientists from other tRFMOs will participate in five SCRS meetings up to 2020.
- An inter t-RFMOs meeting on an area of common interest before 2020.

4.2   *Strengthen linkages and collaboration with ICES*

Strategies

4.2.1   Extending the cooperation to all the shared shark species in all areas of mutual interest (e.g. assessment methods).

4.2.2   Encouraging the participation of the Chairs of the ICES and ICCAT shark groups in the assessment meetings of both organisations.

4.2.3   Communicating to the scientists of ICCAT CPCs the ICES agendas for the purposes of encouraging their participation.

Measurable target

- Number of meetings with joint participation of ICES-ICCAT.

4.3   *Collaborate with a peer-reviewed journal to enhance communication of SCRS science products to the scientific community*

Strategies

4.3.1   Seek out a scientific journal that encourages peer-reviewed articles on a variety of topics.

4.3.2   Considering a dedicated tRFMO peer-reviewed journal.

Measurable target

- Partner with at least one peer-reviewed annual publication.

4.4   *Promoting the dialogue and communication between CPCs in order to carry out scientific research on ICCAT fishery resources in a coordinate and efficient way*

Strategies

4.4.1   Use the funding programs to develop capacity, research and cooperation between the CPCs, preferably intra-regionally.

4.4.2   Use the opportunities afforded by the special fund (SCBF) in accordance with Rec. 13-19.

Measurable targets

- Full utilisation of the Scientific Capacity Building Fund (SCBF) throughout the period of the plan.
- 10 collaborative papers on a regional scale to be submitted to the SCRS groups.

GOAL 5   IMPROVE THE DIALOG WITH THE SOCIETY

OBJECTIVES

5.1   *Broad dissemination of the results of the SCRS work to the society as a whole*

Strategies

5.1.1   Defining dissemination procedures.

Measurable target

- A mechanism in place by 2020.

GOAL 6   **IMPROVE THE MECHANISMS OF COMMUNICATION OF THE SCRS**

OBJECTIVES

6.1   Work on the Ontology of the durability of tuna fisheries in the epipelagic ecosystem

   Strategies

   6.1.1   Utilising ontological methods of process analysis to share basic concepts and a clear representation of the SCRS missions among the various groups (scientific, administrative, NGO, fishers' organizations), and for decision-making, specifically employing an MSE approach.

   6.1.2   It is proposed to set up an ad hoc working group, related to the WGSAM, contracting an expert in ontological engineering (i.e. in graphic or textual representations) to analyse and represent the ontologies of the main SCRS missions (diagnosis and uncertainty, selection process of regulatory measure, an ecosystem approach to fisheries).

   6.1.3   Graphical representation (conceptual map, mind map, etc.) of the process of information flows or interconnections, from data collection through to the final objective, could provide clarification. This would then facilitate dialogue and integration of groups from various disciplines (fisheries, ecology, socio-economics) regarding the concepts used, knowledge, responsibility and point of intervention of each of them, as well as time management of the different SCRS tasks from an MSE approach, etc.

   Measurable target

- No measurable target has been identified.

PARTICIPATION AND CAPACITY BUILDING

GOAL 1   **PRESERVE AND PROMOTE THE INDEPENDENCE AND EXCELLENCE OF THE SCRS AND ITS WORKING GROUPS**

OBJECTIVES

1.1   Avoid conflict of interests and ensure the independence of the scientific process

   Strategies

   1.1.1   Adopting, publishing and implementing SCRS rules, including a code of conduct for scientists and for observers.

   Measurable target

- Code of conduct of the SCRS by 2016.

GOAL2   **IMPROVE SCIENCE CAPABILITIES OF THE SCRS OBJECTIVES**

OBJECTIVES

2.1   *Increase the capacity of the CPCs in meeting data-related obligations*

> *Strategies*
>
> 2.1.1   Developing programs to assist CPCs in meeting data-related obligations;
>
> 2.1.2   Continuing training on basic data collection and concept of representative sampling, preferably on site when feasible;
>
> 2.1.3   Increasing financial support to the CPCs monitoring and data collection;
>
> 2.1.4   Developing a strategy of observer's system improvement by training, monitoring and evaluation system.

> *Measurable target*
>
> - 20% reduction in Secretariat's annual report on statistics list of specific data elements that are lacking for each stock over a 5-year span.

2.2   *Increase the ability of the SCRS in the application of methods used in providing management advice on tuna stock management*

> *Strategies*
>
> 2.2.1   Evaluating the use of funds currently available and evaluate the efficacy of the training activities conducted by the Secretariat and the SCRS in the recent years.
>
> 2.2.2   Defining standardised curriculum contents required to increase the abilities of the SCRS according to the needs required.
>
> 2.2.3   Working with CPCs to develop and promote undergraduate and graduate level curricula in quantitative fishery science.
>
> 2.2.4   Organising regular training courses, workshops, webinars and on-line courses.
>
> 2.2.5   Developing audiovisual, multimedia, electronic training material adapted to the curriculum contents defined.
>
> 2.2.6   Evaluate the value of the training programs conducted.
>
> 2.2.7   Bringing experts to meetings when there are clear and identified needs for the improvement in the knowledge/ability amongst participants in order to meet Commission objectives.
>
> 2.2.8   Attending meetings in other fora where contact can be made with experts in areas where the SCRS has deficiencies.
>
> 2.2.9   Developing and enhancing synergies and coordination of capacity-building initiatives.

> *Measurable target*
>
> - 5 courses are conducted and the training materials are openly available on the website.

GOAL 3   **ENHANCE AND IMPROVE PARTICIPATION IN THE SCRS, AND IN PARTICULAR ENHANCING THE ACTIVE INVOLVEMENT OF DEVELOPING ECONOMIES IN THE SCRS ACTIVITIES**

OBJECTIVES

3.1   *Ensure the participation of scientists from those CPCs that harvest significant portions of the stock*

> *Strategies*
>
> 3.1.1   Advocating a mandatory participation for CPCs that catch >10% of the total catch of a given stock.

3.1.2   Note the participation of scientists by CPC in the elaboration of the scientific advice.

Measurable target

- 100% participation of the CPCs that harvest significant portions of the stock.

3.2   *Increase scientific leadership for SCRS by scientists from G77 economies*

Strategies

3.2.1   Emphasizing the need for cross-cultural leadership in the SCRS with Commissioners.

3.2.2   Recruiting aspiring individuals from amongst G77 scientists attending SCRS meetings.

3.2.3   Seeking possible special 'capacity building' funding support for time & travel for G77 scientists to serve in leadership positions.

3.2.4   Establishing mentoring programs specifically targeted at aspiring G77 scientists using vice-Reporter positions where appropriate.

Measurable target

- At least 30% of the SCRS officers belong to G77 countries.

3.3   *Increase scientific participation in SCRS by scientists from G77 economies*

Strategies

3.3.1   Supplementing travel/participation funding of G77 CPC scientists at intersessional and plenary.

3.3.2   Sponsoring long-term training at one or more national laboratories.

3.3.3   Initiating collaborative research projects with G77 scientists leading to SCRS/white journal papers.

Measurable targets

- 33% increase in scientific participation at the SCRS by scientists from G77 economies.
- Supplementing travel/participation funding: 10 participations funded per year.
- Long-term training of at least 6 scientists from G77 economies.
- Initiate 3 collaborative projects with the involvement of scientists from G77 economies.

RESEARCH PRIORITIES

GOAL 1   **QUANTIFY THE MAJOR UNCERTAINTIES AFFECTING STOCK ASSESSMENT AND MANAGEMENT ADVICE**

OBJECTIVES

1.1   *Identify the major uncertainties affecting management advice and the type of research needed to address them*

Strategies

1.1.1   Compile metadatasets about biological and fishery data that will allow characterisation of quality of data as well as identification of knowledge gaps.

1.1.2   Conduct meta-analyses and reviews on the knowledge about biological parameters, fishery data, data processing and assumptions during the assessment process.

1.1.3   Conduct surveys within the SCRS with specific questionnaires to characterise the expert opinion on the main uncertainties.

Measurable targets

- Metadatabase for fishery, biologial and mark recapture data.
- At least one cooperative SCRS or peer reviewed research paper for each main specie identifying the main sources of uncertainty and ranges for different (e.g. biological) parameters.

1.2 *Quantification of the relative importance of the different uncertainties and prioritisation of future research*

Strategies

1.2.1 Developing simulation frameworks (MSE-style approach) for all main species or group of species, that allow the testing of the cost/benefits of different research activities (e.g., How much of the biology do we need?).

1.2.2 Developing (and/or updating) research plans for each specie or group of species, accordingly.

1.2.3 Prioritising according to socio-economic importance and stock status.

Measurable targets

- Simulation approach developed for each main species.
- At least one collaborative SCRS or peer reviewed research paper describing the relative merits of different research actions, for each main species.

GOAL 2 **ACQUIRE THE NECESSARY BIOLOGICAL KNOWLEDGE IN TUNA AND TUNA-LIKE SPECIES, AS WELL AS IN CRITICAL BY-CATCH SPECIES COMMENSURATE TO THE NEEDS FOR THE ASSESSMENT OF THE DIFFERENT STOCKS UNDER THE CONVENTION**

OBJECTIVES

2.1 *Get accurate biological knowledge on stock structure, migrations and life history (growth, maturity, fecundity, maternal effects, etc.)*

Strategies

2.1.1 Identifying biological knowledge gaps within the species working groups.

2.1.2 Promoting joint collaborative analyses of sparse biological datasets.

2.1.3 Designing and execute biological research programs.

2.1.4 Evaluating spatio-temporal patterns in fisheries data.

2.1.5 Summarising the outcome of the research programs by characterising the estimated biological parameters and their variability.

Measurable target

- Development of peer reviewed papers describing new biological findings.

GOAL 3 **IMPROVE THE STANDARDISATION OF THE FISHERY DEPENDENT INFORMATION**

OBJECTIVES

3.1 *Develop measures of fishing capacity and standardized fishing effort for different fleets*

Strategies

3.1.1 Agreeing, within the WGSAM, methodologies to quantify fishing capacity and standardised fishing effort.

3.1.2 Expanding EFFDIS estimates for PS, GN and other fleet/gears.

Measurable targets

- Develop SCRS documents and WGSAM reports on the methodologies to quantify fishing capacity and standardised fishing effort.
- EFFDIS database expanded to PS, GN and other gears, available at the website.

3.2   Further improve standardization of CPUEs for their use as reliable indices of abundance

Strategies

3.2.1   Developing standardised categories for different gear configurations/fishing strategies.

3.2.2   Continuing investigating alternative methods to standardise CPUEs and their relative merits/efficiency under different circumstances (changes in catchability due to changes in gear configuration, environmental influences, etc.).

3.2.3   Developing collaborative efforts to perform standardisations across national fleets.

3.2.4   Developing the quantitative basis for the potential use of floating objects to monitor relative abundance.

Measurable targets

- SCRS or peer reviewed paper on best practices to standardize CPUEs of different nature.
- Peer reviewed paper on the use of floating objects to monitor relative abundance.

GOAL 4   **APPLY APPROACHES WHICH PROVIDE INFORMATION ON POPULATION DYNAMICS INDEPENDENT OF DATA FROM THE COMMERCIAL FISHERY**

OBJECTIVES

4.1   Increase availability of fishery independent information to improve stock assessment and monitor the effect of management regulations

Strategies

4.1.1   Dedicated workshop on fisheries independent information for ICCAT (state of the art, as well as future development).

4.1.2   Fisheries independent indices of abundance (e.g. based on acoustics, aerial observations, egg-larvae surveys, scientific fishing, or other), should be sourced and projects to improve this information should be supported.

4.1.3   Implementing and/or continuing large-scale tuna tagging programs in support of developing fishery management advice (abundance, migration, mortality, etc.).

Measurable targets

- Development of report about dedicated workshop with specific recommendations on how to move forward.
- Increased number of peer reviewed and SCRS papers with the outcomes of fisheries independent research surveys.
- Develop and document experimental designs for mark-recapture surveys of key ICCAT species.

GOAL 5   **BALANCE THE ADEQUACY BETWEEN MODELS USED AND QUALITY OF DATA AND KNOWLEDGE**

OBJECTIVES

5.1   Develop guidelines and robust methodologies that can cope with a range of different situations, including data poor ones

Strategies

    5.1.1   Dedicated workshop or contract to develop general guidelines, based on first principles, on best practices for the range of data qualities observed in ICCAT stocks.

    5.1.2   Development of simulation frameworks to test the effects of alternative modelling approaches for different data qualities.

    5.1.3   Collaborate with other institutions that work with the same goals.

Measurable target

- Identification and/or development of SCRS or peer reviewed papers on best practices and robust methodologies.

GOAL 6 **EVALUATE MANAGEMENT MEASURES AND STRATEGIES IN ACHIEVING THE OBJECTIVES OF THE COMMISSION**

OBJECTIVES

6.1 *Quantify the effects of adopted as well as potential alternative management measures*

Strategies

    6.1.1   Develop MSE and other simulation frameworks for ICCAT tuna stocks that allow to test alternative management measures/strategies.

    6.1.2   Apply such frameworks to quantify the effects of already adopted management measures.

    6.1.3   Apply such frameworks to test candidate management strategies in consultation with the Commission.

Measurable target

- Development of SCRS and peer review papers with the effects of existing and alternative management measures/strategies.

GOAL 7 **COVER RESEARCH NEEDS SO AS TO BE ABLE TO INCLUDE ECOSYSTEM CONSIDERATIONS IN THE PROVISION OF SCIENTIFIC ADVICE**

OBJECTIVES

7.1 *Identify and fill knowledge gaps so as to be able to provide scientific advice including ecosystem considerations (e.g. assessment of bycatch species, mitigation strategies, environmental effects on population dynamics, fishing impacts on the ecosystem, socio economic aspects, etc.)*

Strategies

    7.1.1   Assessing the adequacy of existing ecosystem indicators in other forums and / or development of new indicators.

    7.1.2   Subcommittee on Ecosystems and Bycatch to list the specific research needs and develop prioritised research plans.

    7.1.3   Subcommittee on Ecosystems and Bycatch to organise specific workshops (e.g. on tropical tuna issues including moratorium effects, mitigation aspects, multispecies stock assessments, FAD effects and management plans, etc.).

    7.1.4   Enhancing participation of researchers from different disciplines (oceanography, climate, socioeconomics, etc.) in the SCRS process (especially on the Subcommittee on Ecosystem and Bycatch) by invitation and appointment of specific tasks.

Measurable targets

- Development of WG reports with specific Research Plans.

- Increasing number of people by research discipline participating in the SCRS.

STOCK ASSESSMENTS AND ADVICE

GOAL 1	**PROVIDE OBJECTIVE, RELIABLE AND ROBUST SCIENTIFIC ADVICE TO THE COMMISSION IN SUPPORT OF THE CONVENTION OBJECTIVES (VISION)**

OBJECTIVES

1.1 *Integration of the different forms of uncertainties (e.g. natural variability and or lack of knowledge) in status diagnoses and projections*

Strategies

1.1.1   Develop effective methods to integrate the sources of uncertainties into the stock assessment process and results.

1.1.2   Better utilisation of data preparatory meetings to quantify, prioritise, and integrate uncertainties identified in the previous assessment process.

1.1.3   Providing simple criteria could be used by the different working groups to start scoring the quality of the information used in different stock assessments.

1.1.4   Developing criteria to evaluate the importance of the different data elements depending on the life history and/or assessment model used.

1.1.5   Developing a meta-database with information on the quantity and quality of available fisheries, biological information, and mark-recapture data.

1.1.6   Utilising tables/plots as presented at the 2014 WGSAM, in an effort to be consistent with the resolution 13-15.

Measurable targets

- Development of a more standardised Terms of Reference for the Data Prep Meetings (and Assessment meetings?) that include a more complete analysis of the advice and uncertainty from the previous assessment.
- Further evaluate the quality of the fisheries data and related to the knowledge of the species.

1.2 *Provide scientific advice using methods of analysis that are appropriate for the amount of information available for a given stock*

Strategies

1.2.1   Applying MSEs to determine most parsimonious and robust assessment approaches and control rules to use given current and likely future information levels/data quality.

1.2.2   ICCAT continuing to build staffing levels to support the data needs of more sophisticated stock assessment models.

1.2.3   The SCRS should continue to participate in the ICES SISAM initiative in order to further promote collaborative work in developing assessment methodologies.

1.2.4   Establishing a dialogue with the Commission on the future role of the Secretariat and CPCs in the conducting of future assessments.

1.2.5   Conducting the meetings of the WGSAM next to already established meetings of the same topic in an effort to cultivate outside interactions.

1.2.6   Encouraging CPCs to provide sufficient access to CPUE set-by-set data according to the needs and priorities identified by the different species groups and the subcommittees; use of the existing "cloud" opportunities.

1.2.7   Developing protocols for utilising robust population indicators annually for species which are not necessarily being assessed.

Measurable target

- Conduct a meeting between the Commissions and CPC to discuss the future roles of the CPCs and the Secretariat in future assessments.

1.3 ***Consolidate the stock assessment catalogue to ensure the best use of models that should be fully documented***

Strategies

1.3.1   Update the current stock assessment catalogue to remove outdated software and update the software versions that are currently being used.

1.3.2   Ensure that all software used in the most recent assessments are matched up with the versions in the catalogue.

1.3.3   Ensure that software is well documented and have an accompanying user's manual and code.

Measurable targets

- Reactivate the Working Group of the Stock Assessment Catalogue and review the protocols of inclusion and updating the software used for stock assessments while maintain a historic repository of version control.

1.4 ***Improve Stock Assessments by incorporating improved information on fishery and life history characteristics***

Strategies

1.4.1   Encourages CPCs to provide limited access to CPUE set-by-set data according to the needs and priorities identified by the different species groups and the subcommittees; use of the existing "cloud" opportunities.

1.4.2   Quantification of exactly how much more information constitutes "improved".

1.4.3   Addressing uncertainties in stock assessment by incorporating improved information on life history characteristics: fecundity, age composition of catch, growth, stock structure, and spatial distribution patterns of the stocks of concern.

1.4.4   Expand the aforementioned meta-database to other tRFMOs for comparisons across ocean basins.

Measurable targets

- A written plan of how the data will be collected, stored, shared, and utilised and for exactly what purposes by 2015.
- Use an MSE approach to quantity the sample sizes needed to improve the information.

1.5 ***Strengthen peer review process***

Strategies

1.5.1   Ensuring financial support for the SCRS's plans to implement a peer review system.

1.5.2   Inviting outside experts (e.g., from other RFMOs or from academia) to participate in the SCRS activities, particularly for stock assessments.

1.5.3   Publishing the SCRS scientific findings in the scientific peer-reviewed literature.

Measurable target

- Conduct a peer review of at least one assessment each year.

GOAL 2 **EVALUATE PRECAUTIONARY MANAGEMENT REFERENCE POINTS AND ROBUST HARVEST CONTROL RULES THROUGH MANAGEMENT STRATEGY EVALUATIONS**

OBJECTIVES

2.1 SCRS should continue to evaluate precautionary management reference points and robust harvest control rules through management strategy evaluations

Strategies

2.1.1 Determining and characterising major sources of scientific uncertainty in the assessment of ICCAT's stocks and fisheries.

2.1.2 Developing operating models to examine the impacts of these sources of uncertainty on management advice.

2.1.3 Conducting management strategy evaluations to determine most robust harvest control rules given scientific uncertainty.

2.1.4 Testing precautionary harvest controls rules (e.g. targets and limits) using MSE and make recommendations for use of these measures for ICCAT stocks.

Measurable targets

- Establish a 5 year schedule for the establishment of species specific HCRs which will include a default HCR in the absence of species specific information.
- Produce a review of MSE efforts so far in light of successes, lack of successes and the resources limiting future MSE progress and to collate feedback from managers and stakeholders on the process thus far.

2.2 Provide advice on the setting of precautionary approach and harvest control rules to avoid overfishing and decline of stocks as well as rebuild overfished and depleted stocks.

Strategies

2.2.1 Carrying out directed studies and workshops to discuss and develop harvest control rules with reference points that achieve stated Commission objectives.

2.2.2 Engaging other scientific bodies and RFMOs in the development of HCRs and LRPs.

Measurable targets

- Establish a 5 year schedule for the establishment of species specific HCRs which will include a default HCR in the absence of species specific information.
- Advocate the establishment of a standardised precautionary approach limit to be used as a default in the absence of more specific limits.
- Conduct at least one workshop on the use of MSE to evaluate harvest control rules to be held jointly with other RFMOs.

GOAL 3   ADVANCE ECOSYSTEM BASED FISHERY MANAGEMENT ADVICE

OBJECTIVES

3.1 Focus on the fishery and its role in the ecosystem, including the commercial and non-commercial species as well as the habitat.

Strategies

3.1.1 Through a dialogue with the Commission, determining and making clear the Commission EBFM Goals and Objectives.

3.1.2 Identifying the major ecosystem correlates and drivers of the various ICCAT stocks under consideration.

3.1.3 Creating testable hypotheses relating these ecosystem drivers to various life history parameters (recruitment, growth, migratory patterns, etc.) for incorporation into stock assessments either directly or indirectly.

3.1.4 Creation of a research effort to quantify and monitor in time and space (to the extent possible) the forage base for the various ecosystem functional groups under ICCAT consideration.

Measurable targets

- Create a proposal of possible EBFM goals and objectives to the Commission referring to those currently used by other RFMOs that are further along in this process.
- Support a post-doc or similar position to establish as ecosystem (multi-species, multi-functional group) operating model that can be used to test the afore mentioned hypotheses.

3.2 Enhance the Ecosystem Approach to Fisheries Management (EAFM)

Strategies

3.2.1 Organising workshops to review, evaluate, and develop EAFM plans relevant to the tuna fisheries in the ICCAT Convention area.

3.2.2 Supporting dialogue on Integrated Ecosystem Assessment approaches within and between the RMFOs.

3.2.3 Taking advantage of the GEF/ABNJ funding that ICCAT will receive for this purpose.

3.2.4 Defining data collection needed for the implementation of EBFM through application of Integrated ecosystem models to identify key ecosystem components which need to be monitored in order to more broadly apply EBFM.

Measurable targets

- Host a workshop and invite outside expertise to collaborate with the Sub-Committee of Ecosystems to determine an effective approach to the creation of an ESR.
- In line with other RMFO, compilation of an Ecosystem Status Report that describes the current state and trends in selected ecosystem indicators for communicating this information to participating scientists and managers.

3.3 Develop short term, medium and long-term objective to enhance ecosystem based approaches

Strategies

3.3.1 Determining a list of relevant ecosystem indicators that could be included in ICCAT stock assessments.

3.3.2 Formally and explicitly include these indicators into current stock assessments to the extent they are appropriate and constitute an improvement to the assessment.

3.3.3 Developing management advice that incorporates and considers these critical indicators.

3.3.4 Applying Integrated Ecosystem Based Approaches to the ICCAT Convention Area.

3.3.5 Conducting a meta-analysis of year/area effects on ICCAT species abundance.

Measurable target

- Conduct a metaanalysis of year/area effects on ICCAT species abundance with the goal of determining historic and recent changes in the spatial distribution of these species, possible regime shifts in productivity, and other relevant characterisations.

GOAL 4   BROADEN THE SCIENTIFIC ADVICE TO INCLUDE ECONOMIC AND SOCIAL ASPECTS OF VARIOUS MANAGEMENT MEASURES

OBJECTIVES

4.1   ***Development and testing of bio-economic modeling approaches and Identification of data needs***

Strategies

4.1.1   Clearly understand the Commissions goals and objectives for embarking on bio-socio-economic modelling.

4.1.2   Identifying which modeling platforms are most appropriate to meet these stated objectives.

4.1.3   Identifying the desired outputs of the models so that the appropriate data can be secured.

4.1.4   Including in the national sampling programs the collection of socio-economic information from the large pelagic fisheries by Developing protocols for the collection of socio-economic data for large pelagic fisheries and upgrading ICCAT databases to include other than biological data.

Measurable target

- Protocol to collect bio-socio-economic information.

4.2   ***Development and test bio-economic modeling approaches***

Strategies

4.2.1   Identifying experts in the field that will assist ICCAT in this exercise.

4.2.2   Identifying the resources available for this modeling effort.

4.2.3   Identifying the costs and benefits of bio-economic modeling and measures of success.

4.2.4   Beginning a dialogue with other tRMFOs on successful approaches.

Measurable target

- Creation of a plan to apply bio-socio-economic modelling approaches.

2015-2020 TENTATIVE SCHEDULE OF MEETINGS

	2015	2016	2017	2018	2019	2020
ALB		ALB (N,S,M) Data Prep ALB (N,S,M) SA session				ALB (N,S,M) Data Prep ALB (N,S,M) SA session
BFT	BFT (E,W) Data Prep	BFT (E,W) Data Prep BFT (E,W) SA session		BFT (E,W) Data Prep BFT (E,W) SA session		
YFT-SKJ-BET	BET Data Prep BET SA session	YFT Data Prep YFT SA session	Management of FAD fishing in the EAF context			BET Data Prep BET SA session
SWO			SWO (N,S,M) Data Prep SWO (N,S,M) SA session			
BIL		SAI SA	BUM Data Prep BUM SA session	WHM Data Prep WHM SA session		
SHK	BSH SA session		POR SA (ICCAT-ICES)	Other SHK SA session	SMA SA session	
SMT	SMT Data Prep		SMT Data Prep		SMT Data Prep	SMT SA session
		Workshop on Ecosystem Based Fishery Management				
					Workshop on fishery independent abundance indicators	
Methods	WGSAM					
Ecosystems	SCECO					
Courses	COURSES					
SCRS-COM	WG DIALOGUE SCRS - COM					

This schedule has been prepared for planning purposes and will be adapted according to the different requirements and the progress of the SCRS SSP, especially with the incorporation of MSE approaches in the work of the SCRS.

SCRS SCIENCE STRATEGIC PLAN 2015-2020 ESTIMATED BUDGET

Thematic area	Budget 2015-2020
a. Data Collection	30,000
b. Dialogue and Communication	25,000
c. Participation and Capacity Building	295,000
d. Research Priorities	115,000
e. Stock Assessments and Advice	227,000
Total	**692,000**