2011 MEETING OF THE WORKING GROUP
ON THE ORGANIZATION OF THE SCRS
(Madrid, Spain – March 2 to 4, 2011)

1. Opening, adoption of agenda and meeting arrangements

The Meeting was held at the ICCAT Secretariat in Madrid from Mars 2 to 4, 2011. Mr. Driss Meski, Executive Secretary of ICCAT, opened the meeting and welcomed participants (hereafter referred to as "the Working Group").

Dr. Josu Santiago, SCRS Chair, chaired the meeting. Dr. Santiago also welcomed the meeting participants and proceeded to review the Agenda which was adopted without change (**Appendix 1**).

The List of Participants is included in **Appendix 2**. The List of Documents presented at the meeting is attached as **Appendix 3**. The following participants served as rapporteurs:

P. Pallarés	Items 1, 7, 8 and 10
C. Brown	Items 2 and 6
D. Gaertner	Item 3
G. Scott	Items 4 and 9
R. Duarte	Items 5

2. Review of the Secretariat role/participation in scientific support to the SCRS activities and current human resources at the Secretariat. Staffing and support needs for implementing multidimensional statistical models for preparing management advice

The Working Group reviewed the mandate of the Secretariat and considered how its role (including specific tasks) and staffing has changed over the last five years (**Table 1**, from an update of Doc STF-024/2006). In general, the workload of the Secretariat has been increasing over time since the scheme showed in **Figure 1** was defined. Currently, the lines which identify the Secretariat's role in the assessment process have disappeared and the work of the Secretariat has been expanded to all the processes. The increasing workload is not just for meetings but also for training, data requests, interactions with other RFMOs, FAO, etc. Although **Table 1** shows a substantial increase in staffing from 2005 to 2010 (from 20 to 28 total staff, including special research programs), it was noted that this table does not adequately reflect the overlapping responsibilities that personnel have across multiple categories. The staff level increase has not kept pace with the increased workload, as is demonstrated by the analysis summarized in **Table 2** and **Figure 2**. There is concern that current staffing levels are not sufficient to address current and anticipated future demands.

Several specific areas were identified in which the workload of the Secretariat has substantially increased. For example, tasks associated with the GBYP carry a greater burden for the Secretariat than compensated by the overhead charged to the program. Also, the increased duties related to compliance monitoring outpace even the substantial gain in staff with this primary responsibility (from 1 to 3). In particular, the Secretariat has increased difficulty when CPSs submit data late and/or not in the appropriate electronic format (at present, the requirement is that compliance data be submitted electronically "if possible"; consequently most submissions are not electronic). The reporting situation with respect to Task I and II has been improving, but major problems remain in compliance related reporting proceedings (in particular, formats and reporting media).

Although compliance issues are not normally within the purview of the SCRS, it is clear that the workload associated with compliance monitoring, compounded by the fact that the vast majority of compliance documentation is submitted in paper/pdf rather than in a standard electronic format, has adversely impacted the ability of the Secretariat to fulfill SCRS data processing needs in a timely and complete manner. Given the extraordinary success realized following the requirement that Task I and II data be submitted in specific electronic formats, the Working Group recommends a similar requirement that compliance documentation be submitted in a manageable (non PDF) electronic format like Excel.

With respect to carrying out its responsibilities, the SCRS has historically operated in a manner distinct from many other RFMOs. Historically, the Secretariat functions were limited to support assessment related activities, including collecting data from CPCs, performing initial data processing, and maintaining data bases. Currently,

data analyses and research supporting stock assessments are the joint responsibility of CPC scientists and Secretariat professional staff.

This open process invites participation from scientists with a broad range of expertise and can include scientists from government agencies, universities and non-governmental organizations. The SCRS process also encourages the exploration of alternative assessment models, which can increase flexibility in matching models to the quantity/quality of available data, and in providing management advice and in quantifying uncertainties. Contrasting results from multiple assessment models can also provide greater insight, including into what models assumptions might be violated or the sensitivity of results to the quantity or quality of various data components.

In recent years, there has been increased movement toward the use of more complex assessment models, such as integrated statistical models. In the application of this type of models the uncertainty in the data needs to be explicitly considered, i.e. there is no point in including greater levels of disaggregation, for example by fleet, area or season, if the basic data provided by CPCs are of insufficient quality. More complex models also require greater knowledge about stock, fleet dynamics and, in particular, good understanding of life history characteristics. Unfortunately, investigations into life history characteristics of ICCAT stocks have diminished considerably since the early part of the SCRS history (**Figure 3**). This decline is likely reflective of the reduced level of investment in research toward basic biology of the fishes under exploitation. More detailed information on the advantages and requirements of such models, as well as the implications for increased demands on the Secretariat, are discussed further in section 4.

3. Participation of CPC scientists at SCRS scientific meetings: trends, requirements, scientific participation and scientific capacity building. Additional work needs for implementing multi-dimensional statistical models for preparing management advice

The number of CPCs acceding to the ICCAT agreement has increased rapidly in the last decade. Unfortunately, the level of participation of scientists from CPCs in the work of SCRS has not kept pace (**Figure 4**). Since 2005, ICCAT has been promoting increased participation of CPCs scientists in the work of SCRS (i.e., data collection, contribution to stock assessment, calculation of local fishery indicators, participation at working groups, etc). While the complexity of stock assessment models used by SCRS has increased dramatically in recent years, integrating the local knowledge of CPCs fishery scientists remains a vital component of any stock assessment.

Consequently, different capacity-building activities have been undertaken by ICCAT, focusing on developing coastal States, such as: (1) improvement in data collection (both Task I and Task II), including recovery of historical data, scientific observer programs, and collection of biological information through tagging and other means; (2) travel assistance to increase the participation in inter-sessional scientific meetings and the SCRS Plenary; and (3) training courses encompassing a large panorama of topics from basic tasks (species identification, improvement of collection of statistics and sampling techniques) to statistical tools (e.g., the recent R course). As an example, 12 CPCs received assistance from ICCAT capacity-building activities in 2010.

To fulfill its objective, ICCAT uses different funds provided by some Contracting Parties: Japan Project for the Improvement of Data and Management of Tuna Fisheries (JDMIP), U.S. Fund for Capacity Building, EU Fund for Capacity Building, Data Funds or directly from specific ICCAT Programs: ICCAT Enhanced Research Program for Billfish, ICCAT Bluefin Year Program (BYP), Bluefin Tuna Research Program (GBYP). Furthermore, it was mentioned that other external sources of funding (e.g., capacity-building in developing States managed by FAO) should be explored by CPCs scientists.

A unique funding form will be prepared by the ICCAT Secretariat with the aim of facilitating the SCRS Chair's decision for attributing financial support to CPCs scientists. It was also suggested that the SCRS and Secretariat be more proactive in reaching scientific CPC participation for stock assessments (e.g. recovery of relevant data in Namibia and in South Africa for the stock assessment of southern albacore).

Regarding the efficiency of training courses in developing countries, it was mentioned that one of the possible reasons of the success of such formations in Contracting Parties of Latin America might be due to the regular periodicity of these courses, and continuity of trainees attending, in contrast to the episodic timing so far experienced with African CPCs. The Working Group recommended improving coordination and participation in training activities in the African region. To complement these training courses, the interest of developing instruction manuals and tutorials on statistical methods used during ICCAT stock assessment meetings, or in other RFMO meetings, was highlighted. It was also suggested that modern communication technology in on-ine

internet training courses (e.g., eLearning by WebEx, Zoho, etc.) or a centralized repository for sharing documents before meetings (e.g., Google documents, Zoho Share, etc.) be explored by the ICCAT Secretariat as a way of increasing the participation of CPCs scientists in ICCAT studies.

4. Recommendations from SCRS/Commission to implement Precautionary Approach models for ICCAT species, Management Strategy Evaluation protocols, and incorporation of Ecosystem-based models

Precautionary Approach and Management Strategy Evaluations. The Commission has asked for stock assessment advice to be provided in a manner which provides a framework for informing on risks of failure to achieve its objectives under different management alternatives. This enables the Commission to identify acceptable risk-reward trade-offs within the time-frame it wishes to apply in fishery management. By asking for advice in the Kobe II Strategy Matrix format, the Commission has taken steps that should permit more informed decisions in adopting management measures with tolerable levels of risk-of-failure in achieving the Convention objectives. Taking risk of failure into account in setting management measures can lead to evolving a Precautionary Approach (PA) to management, since a critical component of the PA is to adopt measures that account for uncertainties in stock status evaluations and forecasts. In PA application, it is necessary for SCRS to continue to quantify sources and nature of the uncertainties and provide advice on the potential impact of unquantified uncertainties on estimates of risk of failure, to the degree possible. Quantification of these uncertainties and significant dialogue between the SCRS and Commission are necessary in developing and implementing the PA. Progress on this issue will depend on the understanding that management objectives and tolerable risk levels must be defined by the Commission, but also that a full characterization of scientific uncertainty in stock status is needed to improve estimates of risk. In this regard, the SCRS has advised that:

1) The Commission should establish management measures which result in a low probability of exceeding F_{MSY} (or other proxy), in cases of stocks for which status is consistent with the Convention objective; and
2) For stocks with biomass below the level defined by F_{MSY} (or other proxy), the Commission should establish management measures which result in rebuilding of biomass within a short a time period as biologically feasible and which have a high probability of success.

One important tool for evaluating the efficacy of management options to achieve the Commission's objectives with tolerable risk-of-failure is Management Strategy Evaluation (MSE). This form of evaluation, in support of implementing a PA for management, also requires significant feedback between SCRS and the Commission. The SCRS has consistently recommended application of MSE for the range of stocks ICCAT fisheries impact. The SCRS has also advised that MSE be in line with following the FAO Technical Consultation on the Precautionary Approach to Capture Fisheries (FAO 1996) which recommended the use of decision (or harvest control) rules as one of the elements of the precautionary approach to fishery management. SCRS has noted, however, that while many fishery management bodies have subsequently adopted such decision rules, it does not necessarily follow that they will be precautionary in practice. This is because most decision rules are not evaluated formally to determine the extent to which they achieve the goals for which they were designed, given the uncertainty inherent in the system being managed. MSE has therefore become an important tool to conduct these evaluations. Within an MSE it is also common to include economic evaluations to provide additional advice on the socio-economic as well as biological implications of different management options. In many fishery management organizations this form of evaluation is useful in further guiding selection of preferable options from the suite of suitable options for achieving the Convention Objectives. An example application of a bio-economic MSE for an ICCAT stock is that conducted for Mediterranean swordfish (Tserpes *et.al* 2009). While likely much less complex than such an application for stocks affected by a wider range of CPC fisheries, it provides an example of the added utility of incorporating economic indicators within an MSE.

Appropriately, SCRS continues to work to quantify the sources and nature of uncertainties in stock assessments. Contemporary methods for this involve statistical modeling of the basic data elements used in characterizing fisheries population dynamics so that alternative hypothesis uncertainties are more properly propagated within the stock assessment process. This methodology supports development of management advice that is more responsive to the Commission's desire to implement PA for management. tRFMO scientific committees now apply highly parameterized and data demanding models to address concerns about natural spatial-temporal heterogeneities in the fisheries and stocks that are targeted, to the degree that available data support these models. Frequent use of these modeling frameworks is still developing within the SCRS and to date, the SCRS has been largely unsuccessful in fully using these approaches for quantifying uncertainty in assessments. The main reason for this lack of success is related to the degree of scientific support that is necessary to dedicate to

the full application of such approaches. Application of such models for developing management advice in a way that characterizes risks associated with management options requires increased data management and analytical support at several levels and additional time for conduct of assessments compared to the more traditional SCRS methods. Successful application of these approaches is not readily automated and must involve time-intensive iteration to evaluate alternative, plausible hypotheses about the processes modeled in population dynamics. Because of this, complete application of such methods often require much more time and focus than is possible in a typical 7-10 day assessment workshop meeting and also requires much additional time in assembling and preparing the data streams needed to support these models. SCRS has now instituted the process of conducting a data preparatory meeting in advance of a stock assessment workshops and utilizing electronic communication mechanisms to facilitate intercessional collaboration to attempt to alleviate the difficulty. But, while this increase in meetings, increased intersessional work and advanced preparation time has permitted partial application of these methods, this significantly increased level of activity has not been sufficient to permit complete application of the methods to the satisfaction of the SCRS. It was noted that in cases of tRFMOs which most commonly apply these approaches, the Secretariats have significantly larger stock assessment and database management staff which are used to centralize these functions. The WG concluded that an increase in the scientific support level at the Secretariat and CPCs for these functions is needed in order to ensure consistency across the different species groups attempting these approaches.

Ecosystem Based Fisheries Management Including Bycatch Data. Previously, SCRS advised the Commission, through its Working Group on the Future of ICCAT that:

- The Commission should embark upon identifying a fuller range of goals for the Convention area ecosystem components impacted by the fleets, especially those related to concerns beyond targeted species, and to make these operational.
- The SCRS should then use models which incorporate best knowledge of ecosystem dynamics and account for the identified goals to identify critical data gaps, and ecological processes, and guide research and data collection needed for testing and implementation of EBFM.
- It is apparent that the data demands for fully implementing EBFM are more intense than for single species fishery management approaches, but until the necessary investments are made and research is done, it is not possible to know what the optimal management tools and their data requirements will be for EBFM. However, at a minimum, it is critical to have a full accounting of the catch composition and disposition of the fleets impacting ICCAT species of concern as well ecologically related species. As such, the Commission should take steps designed to intensify and improve scientific observer programs, sampling programs, tagging programs, and research to support these requirements.
- Until a full EBFM approach can be implemented, the Commission should consider, implementing precautionary management as a Best Practice to address, to the degree possible, unaccounted ecosystem concerns.

The Sub-Committee on Ecosystems has coordinated the SCRS work on these activities. Most of the demand for scientific advice in support of Commission requirements over the past decade (or more) has related to the issue of fisheries impacts on bycatch species and methods to mitigate those impacts. Recently, in support of the Commission's desire to more fully embrace EBFM, the Sub-Committee has elevated the priority for pursuing use of ecosystem models to support identification of data gaps and development of scientific advice to the Commission on EBFM approaches over the past few years and some preliminary work on applications are underway. The Working Group discussed organizational structuring within the SCRS which might help to accelerate the pursuit of scientific advice regarding EBFM within ICCAT and suggested that the topic should be further discussed at the upcoming Sub-Committee on Ecosystems intercessional to further analyze the potential for organizational changes to enhance work in this area. It is important to further evaluate organizational structures that could enhance ecosystem considerations within the regular work of the species groups.

4.1 Requirements for scientific support

The Working Group found that increased scientific support is needed to fully apply stock assessment methods to more appropriately quantify uncertainties in stock assessments and expected stock responses to future management approaches and to improve advice on data gaps and research needs to more fully address ecosystem based fishery management concerns. Increases in scientific support for these applications are needed both at the National Scientific level and at the Secretariat.

4.2 Secretariat support and database/capacity requirements

The Working Group noted that while the Secretariat contributed considerable support both at the database management and analytical levels, the level of support lags considerably behind other tRFMOs which regularly institute contemporary statistical modeling approaches for stock assessment. The Working Group concluded additional scientific analytical and database support is needed to meet the growing requirements of the SCRS in utilizing these methods for formulating management advice. It has also become obvious that the pace of increasing demand on just the database management aspects for the Secretariat has occurred at double the rate of addition of staffing at the Secretariat to deal with the increased workload. This is especially true since the mid-2000s with rapid increases in the amount of information the Secretariat is expected to process and rapidly summarize.

The Working Group considers the Secretariat to be well equipped to support the needs for MSE analyses and has, in fact, been collaborating on development of such analyses for several stocks - which are expected to take several years to run to completion.

4.3 Ecosystems and bycatch related database

It was noted with concern that the By-catch Coordinator position, previously recommended by the SCRS, remains unfilled, since the position is a necessary component in permitting the SCRS to more fully address both the EBFM and fishery impacts on by-catch species for which the Commission is seeking scientific advice.

5. Review of the data confidentiality policy and implications for the Secretariat and SCRS scientific task

In 2010, the Commission adopted the *Rules and Procedures for the Protection, Access to, and Dissemination of Data Compiled by ICCAT* (document available in Appendix 10 of the SCRS 2009 Report). These rules differentiate between public domain and non-public domain data and define the conditions for their access and use by different entities and individuals. The Working Group discussed how this confidentiality policy may affect the work of the Secretariat and the SCRS.

5.1 Secretariat requirements to implement the policy

The implementation of the confidentiality policy may have an important impact in the cost and work of the secretariat. As new more detailed information may be provided, additional IT resources or modifications to the present IT systems might be necessary.

However, it was recognised that the data recovery program presently in progress for the Gulf of Guinea is a good example on how the Secretariat is dealing with non-public domain data. This program is collecting and recovering data from the EU and Ghanaian fleet activity in the Gulf of Guinea, including detailed data of individual vessels. A limited number of participants have access to this information and the exchange and storage is performed through a FTP protocol under password admission. This example was recognised and recommended as a way forward.

An additional issue discussed was how to deal with the data provided by the Atlantic Wide Research Programme for Bluefin tuna (GBYP). Under this programme important historical time series are being recovered and the programme provides additional data (e.g. aerial surveys). These data are collected primarily for scientific purposes. For the GBYP programme the data confidentiality is directly dependent and linked to the agreements reached with the data sources. Aerial survey data are publically available as well as historical data.

5.2 SCRS guidelines on confidential data analysis and scientific use

Highly structured and detailed data have an important potential for scientific use. Examples of such data are logbook, observer data and VMS. It was recognised that in certain circumstances and depending on the objectives of the analysis, the confidentiality of the data can be maintained by recoding the identification of individual vessels.

5.3 What the policy means for scientist participating in SCRS

The rules specify that SCRS scientists shall have access to the necessary data to perform all tasks related to stock assessment and management advice. A confidentiality agreement is necessary to be signed and scientists have to maintain the security standards of the Commission.

6. Review and adoption of standard formats for SCRS reports

6.1 Length and structure of Detailed Reports

Detailed reports are prepared for each SCRS inter-sessional meeting, with the objective of providing a detailed record of the discussions, analyses, and conclusions. Guidelines on the structure of these reports were defined in 1995. In spite of this, these reports are often inconsistent in content and level of detail, sometimes redundant in content with other documents and unnecessarily lengthy, may lack clarity/readability, and important information is often difficult to locate or missing. Therefore, the Working Group discussed ways to address this situation, including the adoption of a standard format for SCRS reports which would define what information should be included and how it should be presented.

The Secretariat presented a review of the Detailed Reports of all the SCRS inter-sessional meetings held in 2010. This review outlines the concerns about the current structure of the Detailed Reports, and makes a number of recommendations for improvements. These include (but are not limited to):

- For cases where there are separate data preparatory and assessment meetings, a single assessment report including Parts I and II (therefore avoiding redundancy) should be produced.
- Information should be summarized as much as possible in tables and figures.
- Sections with sub-sections shall include a common introduction as well as a summary text at the end of the section.
- Sections related to the revision of data should be shorter and summary tables must be included.
- Reports of the assessment meetings must include specifics on the data used and general assumptions, a summary table specifying the different scenarios, and a section summarizing the results.
- Where appropriate, more detailed information on methods, analyses, outputs, should be reported in appendices.

The Working Group noted that, while reducing the redundancies and unnecessary details will improve the clarity of the report and reduce the translation workload of the Secretariat, care must be taken to maintain the core purpose of the detailed report. The document must contain the record of the discussions and analyses that the working group used to reach any conclusions and adequate details of the inputs and decisions must be included to permit the repetition of any analyses.

It was further noted that there are areas in the reports which typically contain far more text than necessary. For instance, the descriptions of the fisheries are often quite lengthy and contain details which may appear elsewhere in supporting SCRS documents and/or included tables. Likewise, the discussion of indices often covers in lengthy detail information which may be found elsewhere and which may not be relevant to the decisions of the working group.

It was recommended that sections on descriptions of the fisheries only contain information relevant to trends which may affect analyses or interpretation of results (such as changes on selectivity), or are important considerations for anticipating future changes (such as underlying trends in effort or capacity). More detailed information should be presented in tables or referred to in the supporting documents. Likewise, the section on CPUE indices should reflect the discussion of the working group relative to the presented indices, rather than a repetition of details contained in the supporting documents (tables and figures of the indices should be included in the detailed report). The detailed report text should include decisions by the working group on whether or not particular indices are appropriate for use in the various analyses, and the reasons underlying those decisions. The

Working Group considered that substantial reductions in unnecessary length would be possible if these recommendations are followed.

It was recommended that all inputs to the analyses be properly documented in the detailed report, including biological parameters and the relevant sources. The Working Group also recommended that the Secretariat produce a sample detailed report, to provide initial guidance and to serve as a basis for further discussion. If it is the practice of the working groups to update previous reports, the updates need to be adhering to the new format. It was noted that the current SCRS process has not resulted in the report being thoroughly reviewed during the meeting. Ideally, scientists should dedicate the last two days (of assessment meetings and the like) to discuss final results and write/review the detailed report. Meeting chairs should place a renewed emphasis on ensuring adequate time for the review of analysis results and for the writing of the report.

6.2 Length and structure of Executive Summary reports

There is also a need to make improvements to the structure of the Executive Summary reports, including the reduction of irrelevant detail and to improve approaches highlighting main points. Many of the same general themes for improving detailed reports have application to executive summary reports.

The Working Group considered the possibility that automated report building (or at least standard forms) may be useful. The utility of such an approach would depend to a certain extent on the degree to which there are common denominators across species/groups. In any event, it would require that the inputs to such an automated process (values, tables, figures) be prepared in a standardized fashion (including formatting and location). The Working Group suggested that some summary structures be prepared for the Sub-Committee on Statistics to consider. It is recommended that all tables and figures (= data to create figure) supporting the report be organized in an appropriate electronic format (e.g. Excel)

6.3 Traceability of scientific work at SCRS meetings

It is essential to maintain a thorough record of the scientific work carried out at SCRS meetings, including files containing data, software code, model inputs and outputs, pre- and post-processing spreadsheets, and processed results (including tables and figures). The current practice is for meeting participants to back-up their files onto a shared server before the conclusion of the meeting.

To improve the clarity and utility of this record, each participant should identify all runs, link them to the report text, and give the full path where they are located. Initially, this should be done within a README.txt file within the root directory of that participant's backup. There should be someone, perhaps on the Secretariat staff, tasked to ensure that this is done, and that all files are provided for the meeting backup (including figures and tables necessary for the report).

The Working Group recommended that other options be explored, such as the use of wiki (or specialize software for file sharing) during the meeting. In such a case, one option would be that each participant is responsible to update a central list or table of contents, including links to each relevant directory or file. The Working Group discussed the potential options available for file sharing. These approaches could provide improved structure and guard against loss of data/documents. Some options would offer the ability to collaborate outside of meetings. Some file sharing software options are expensive, others are available free of charge. The Working Group recommended that the Secretariat staff familiar with these software alternatives prepare a paper outlining options, strengths/weaknesses, and potential costs.

7. Collaboration with other t-RFMOs in terms of training and scientific analysis

The first Tuna RFMOs meeting held in Kobe in 2007 was a first step in the collaboration among Tuna RFMOs. Since then there have been a second joint meeting in 2009 and four specific workshops in 2010. In the Kobe meeting a Course of Actions for RFMOs was established which described: (i) key areas and challenges, (ii technical work to cooperate across RFMOs to address the challenges, and (iii) follow-up actions. The compromise with this action plan of the tuna RFMOs has allowed sharing information through a common tuna-org web page (http://www.tuna-org.org/), harmonizing the presentation of stock status and management advice through the so-called Kobe plots and Kobe matrix or creating common forum of discussion on issues as by-catch. In this framework the Working Group considered that the Scientific Committees should continue the cooperation including a wider range of issues as the assessment methods. In this regard, the Working Group recommended to convene specific working groups as well as to promote the participation of experts from one tuna-RFMO in the work of others Scientific Committees as peer reviewers.

8. Other matters

No other matters were discussed by the Working Group.

9. Recommendations

Secretariat support for SCRS

- **Increased scientific analytical support for the conduct of contemporary statistical stock assessment methods is required** to maintain the appropriate data input streams, model configurations, and conduct alternative hypothesis evaluations in order to permit the SCRS to fully consider and evaluate uncertainties in the assessment outcomes and to provide consistency in approach across the species groups. This increase in scientific support for SCRS activities is needed to fully apply methods to more appropriately quantify uncertainties in stock assessments and expected stock responses to future management approaches as well as to improve advice on data gaps and research needs to more fully address ecosystem based fishery management concerns. Increases in scientific support for these applications are needed both at the national scientific level and at the Secretariat. Also, in support of these activities, increased electronic collaboration methodologies need to be instituted by the Secretariat to permit conduct and review of this work over the extended periods needed for successful completion.

- **The By-catch Coordinator position, previously recommended by the SCRS and authorized by the Commission, but which remains unfilled, is a critical component** in permitting the SCRS to more fully address both the EBFM and fishery impacts on bycatch species for which the Commission is seeking scientific advice.

- **Further additions to data management staff at the Secretariat should be made to assure that current and future demands, which are likely to increase further, for rapid processing and summarization of the needed information sets is possible**. The pace of increasing demand on just the database management aspects for the Secretariat has occurred at double the rate of the addition of staffing to deal with the increased workload of the Secretariat. This is especially true since the mid-2000s with rapid increases in the amount of information the Secretariat is expected to process and rapidly summarize.

- **Given the success realized following the requirement that Task I and II data be submitted in specific electronic formats, a similar requirement for compliance information should be implemented.** Although compliance issues are not normally within the purview of the SCRS, it is clear that the workload associated with compliance monitoring, compounded by the fact that the vast majority of compliance documentation is submitted in paper/pdf rather than in a standard electronic format, has adversely impacted the ability of the Secretariat to fulfill SCRS data processing needs in a timely and complete manner.

Research & development (R&D) investments

- **Coordinated and well-funded research programs designed to improve knowledge of life history, such as the GBYP and the recently proposed Atlantic Ocean Tropical Tuna Tagging Program (AOTTT) and the North Atlantic Albacore ICCAT Research Program (NAARP), should be considered critical components of the R&D investment necessary for a PA approach to fishery management.** A basic building block for the provision of fishery management advice is a thorough understanding of life history characteristics, including the influence of exploitation on the potential for change in life histories of the stocks being exploited. A good example of the potential impact of improved knowledge of biological characteristics on management advice is that resulting from the most recent western bluefin tuna assessment. Unfortunately, investigations into life history characteristics of ICCAT stocks have diminished considerably since the early part of the SCRS history. This decline is likely reflective of the reduced level of investment in research toward basic biology of the fishes under exploitation.

Participation of CPC national scientists and capacity building

- **Actions beyond encouraging participation in scientific meetings of CPC scientists and providing short-term training workshops should be further encouraged and supported with capacity building funds to involve developing economy scientists in the work of the SCRS. Actions such as supporting visiting scientist opportunities at national laboratories or the Secretariat could accelerate more participation**

and involvement in the work of SCRS. Broad participation in the SCRS by CPC national scientists is an important element in promoting scientific transparency in the methods, data, and assumptions used in development of scientific advice to the Commission. While capacity building funds have been used to encourage a broader attendance of scientists from developing economies, there is evidence that scientific contributions from all but a few developing economies are not improving to a measurable degree and additional actions are needed for improvement.

Quality assurance and transparency

- **In support of further quality assurance and transparency, a checklist for stock assessment documentation should be developed and implemented to improve the current situation and allow easy location of the model inputs, software, and outputs (including the underlying data supporting tables and figures).** As the complexity of stock assessment workshops has increased, the amount of documentation needed to support the management advice provided to the Commission has increased. There is wide variability in the quality and quantity of documentation, including the basic input data, models applied, and outputs from the assessments. In addition, stricter guidelines streamlining reports (both detailed and executive summaries) need to be implemented in order to improve the quality of the documentation and advice provided.

- **Collaboration between tRFMOs scientific committees should be further enhanced as such collaboration provides a good basis for quality assurance through peer review and exchange of expertise and experience**. In line with the outcomes of the Kobe2 (Barcelona) discussions, benefits from joint, horizontal working groups devoted to cross-cutting issues such as seabird by-catch and data standardizations issues, should be pursued.

10. Adoption of the report and closure

The report was adopted during the meeting.

The Chairman thanked the Secretariat and participants for their hard work.

The meeting was adjourned.

Literature cited

Kell, L.T., Die, D.J., Restrepo, V.R., Fromentin, J-M., Ortiz de Zarate, V., Pallares, P. 2003, An evaluation of management strategies for Atlantic tuna stocks, in: Ulltang, Ø. et al. (2003). Fish stock assessments and predictions: integrating relevant knowledge: SAP Symposium held in Bergen, Norway 4-6 December 2000. Scientia Marina (Barcelona), 67(Suppl. 1): pp. 353-370.

Tserpes, G., Tzanatos, E., Peristeraki, P., Placenti, V. and Kell, L.T., 2009, A bio-economic evaluation of different management measures for the Mediterranean swordfish Fisheries Research Volume 96, Issues 2-3, March 2009, Pages 160-166.

Table 1. Secretariat Dataset Units (STAT and COMP) collected between 2000 and 2010. Dataset Units defined as: any data request (through any of the ICCAT available instruments) that implies a full data management (DB creation, data assimilation, storage and publication) work. This exercise gives an indirect measure of the IT Department workload evolution in time (in relation to data management only).

DsGroup	Form	Information reported	Rec(s)	Yr-Start	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
COMP	CP01-VessLsts	Positive list (>=20 m)	02-22	2002			1	1	1	1	1	1	1	1	1	1
COMP	CP01-VessLsts	BFT fishing/farming → BFT Catching/Other	08-05 09-08	2008									1	1	1	1
COMP	CP01-VessLsts	SWO-MED vessels	09-04	2009										1	1	1
COMP	CP02-VessCATS	Carrier vessels authorized	05-06 06-11	2005						1	1	1	1	1	1	1
COMP	CP03-VessALBN	ALB-N vessels	98-08	1998	1	1	1	1	1	1	1	1	1	1	1	1
COMP	COMP-004-VESS- BFT	Vessels involved in bluefin tuna farming operations	05-04	2005						1	1	1				
COMP	CP05-ChartrCP	Chartering CPC vessels	02-21	2002			1	1	1	1	1	1	1	1	1	1
COMP	CP06-ChartrFS	Chartering by Flag State (NCO)	02-21	2002			1	1	1	1	1	1	1	1	1	1
COMP	CP07-FarmLst	BFT farming facilities list	05-04 06-07	2005						1	1	1	1	1	1	1
COMP	CP08-FarmQtRp	BFT quantities caged / marketed and estimated growth	05-04 06-07	2005						1	1	1	1	1	1	1
COMP	CP09-FarmCgDc	BFT declaration on caging	05-04 06-07	2005						1	1	1	1	1	1	1
COMP	CP10-IntAc20	Internal actions and measures taken pursuant to paragraph 5 of Rec. 09-08	02-22 09-08	2002			1	1	1	1	1	1	1	1	1	1
COMP	CP11-IUULst	IUU Vessel list	02-23 09-10	2002			1	1	1	1	1	1	1	1	1	1
COMP	CP12-TM0613	Trade (Import and landing data, Rec. 06-13)	03-05 06-13	2003				1	1	1	1	1	1	1	1	1
COMP	CP13-COC-Sec	Revised compliance reporting forms for compilation of the Compliance Tables	98-14	1998	1	1	1	1	1	1	1					
COMP	CP14-COC_Orig	Original compliance reporting forms for compilation of the Compliance Tables	98-14	1998	1	1	1	1	1	1	1					
COMP	CP15-SDP_Valid	SDP validation (Seals/signatures of agencies authorized)	94-05 01-21 01-22	2001		1	1	1	1	1	1	1	1	1	1	1
COMP	CP15-SDP_Valid	SDP(BCD's portion) validation (Seals/signatures of agencies authorized)	08-12 09-11	2008									1	1	1	1
COMP	CP16-SDP_BiRp	Bi-annual reports (SDP's, BFT, SWO, BET)	97-04 01-21 01-22	2001	1	1	1	1	1	1	1	1	1	1	1	1
COMP	CP19-TransDec	ICCAT Transhipment declaration	06-11	2006							1	1	1	1	1	1
COMP	CP21-TrapLst	BFT trap list	08-05 10-04	2008									1	1	1	1
COMP	CP22-TrapDec	Declaration of eastern Atlantic and Mediterranean bluefin tuna taken by traps	08-05 10-04	2008									1	1	1	1
COMP	CP24-PortEBFT	BFT ports list (landing, transship)	08-05 10-04	2008									1	1	1	1
COMP	CP25-BFT_McRp	BFT-E Monthy catch reports	08-05 10-04	2008									1	1	1	1
COMP	CP26-BFT_WCRp	BFT-E Weekly catch reports	08-05 10-04	2008									1	1	1	1
COMP	CP27-BFT_TsDc	BFT transhipment declaration	08-05 10-04	2008									1	1	1	1
COMP	CP29-BFT_JFO	Joint Fishing Operations	08-05 10-04	2008									1	1	1	1
COMP	CP30-BCD_Rep	Annual report of ICCAT Catch Document Programme	08-12 09-11	2008									1	1	1	1
COMP	CP31-BCD-Form	Copies of Validated BCDs	09-11	2009										1	1	1
COMP	CP32-FarmCyOv	Annual carry-over declaration from farms	09-11	2009										1	1	1
COMP	CP33-Inpector	List of inspectors with photos and signatures	08-05 10-04	2008									1	1	1	1
COMP	CP34-ObsvBFT	List of E-BFT observers	08-05 10-04	2008									1	1	1	1
COMP	CP35-SWOM_PvYr	Vessels which caught Mediterranean swordfish in the previous year	09-04	2009										1	1	1
COMP	CP36-ChartSum	CPCs which operate chartered vessels	02-21	2002			1	1	1	1	1	1	1	1	1	1
COMP	CP37-TransRep	CPCs which have transhipped at sea or in port	06-11	2006							1	1	1	1	1	1
STAT	ST01-T1FC	Task I Fleet characteristics	Art 4 Conv	2000	1	1	1	1	1	1	1	1	1	1	1	1
STAT	ST02-T1NC	Task I Nominal catch	Art 4 Conv	2000	1	1	1	1	1	1	1	1	1	1	1	1
STAT	ST03-T1CE	Task II Catch & Effort	Art 4 Conv	2000	1	1	1	1	1	1	1	1	1	1	1	1
STAT	ST04-T1SZ	Task II Size frequencies	Art 4 Conv	2000	1	1	1	1	1	1	1	1	1	1	1	1
STAT	ST05-CAS	CAS size composition of the catch	Art 4 Conv	2000	1	1	1	1	1	1	1	1	1	1	1	1
STAT	ST06-T1FM	Task II BFT Farm related (harvest) size measurements	08-05 10-04	2008								1	1	1	1	1
STAT-TG	TG01-CnvTSurv	Conventional tag survey INFO	Art 4 Conv	2000							1	1	1	1	1	1
STAT-TG	TG02-CnvTReRc	Conventional tagging Release/Recovery data	Art 4 Conv	2000	1	1	1	1	1	1	1	1	1	1	1	1
STAT-TG	TG03-ElecTRe	Electronic tag Rel(Rec data	Art 4 Conv	2000							1	1	1	1	1	1
Total COMP (CP)					4	5	11	12	12	17	19	17	28	32	32	32
Total STAT (ST)					6	6	6	6	6	6	8	9	9	9	9	9

Table 2. Relative (scaled to the minimum value) comparison of DMUs (Data management Units: datasets with full data management [DB creation, data validation, assimilation, storage, publication] requirements) and Secretariat Staff (STAT & COMP) involved in the DMU associated workload, between 2000 and 2010. In balanced (optimal) conditions, the ratio DMU/staff, should be kept around 1 (stability between workload and Personal). Currently, workload increases 80% faster than the Staff.

	Staff			*DMU*			*Scaled*		
	ST	*CP*	*tot staff*	*ST*	*CP*	*tot DU*	*Staff*	*DMU*	*ratio DMU/Staff*
2000	4	0	4	6	4	10	1.0	1.0	1.0
2001	4	0	4	6	5	11	1.0	1.1	1.1
2002	4	0	4	6	11	17	1.0	1.7	1.7
2003	6	0	6	6	12	18	1.5	1.8	1.2
2004	6	0	6	6	12	18	1.5	1.8	1.2
2005	5	1	6	6	17	23	1.5	2.3	1.5
2006	5	1	6	8	19	27	1.5	2.7	1.8
2007	5	2	7	9	17	26	1.8	2.6	1.5
2008	7	2	9	9	28	37	2.3	3.7	1.6
2009	7	2	9	9	32	41	2.3	4.1	1.8
2010	6	3	9	9	32	41	2.3	4.1	1.8

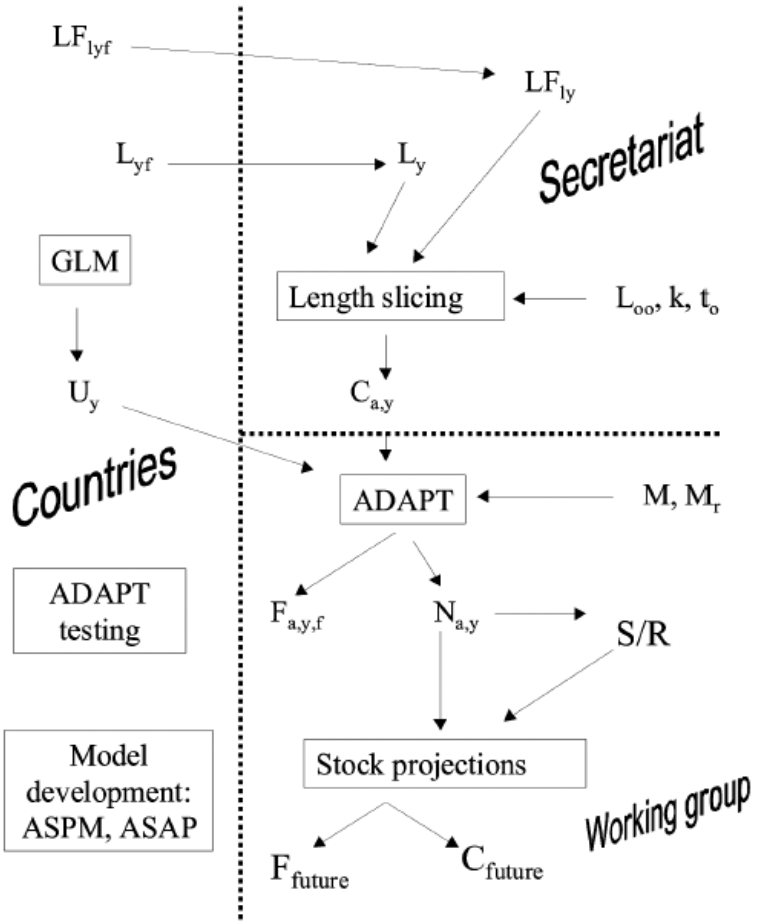
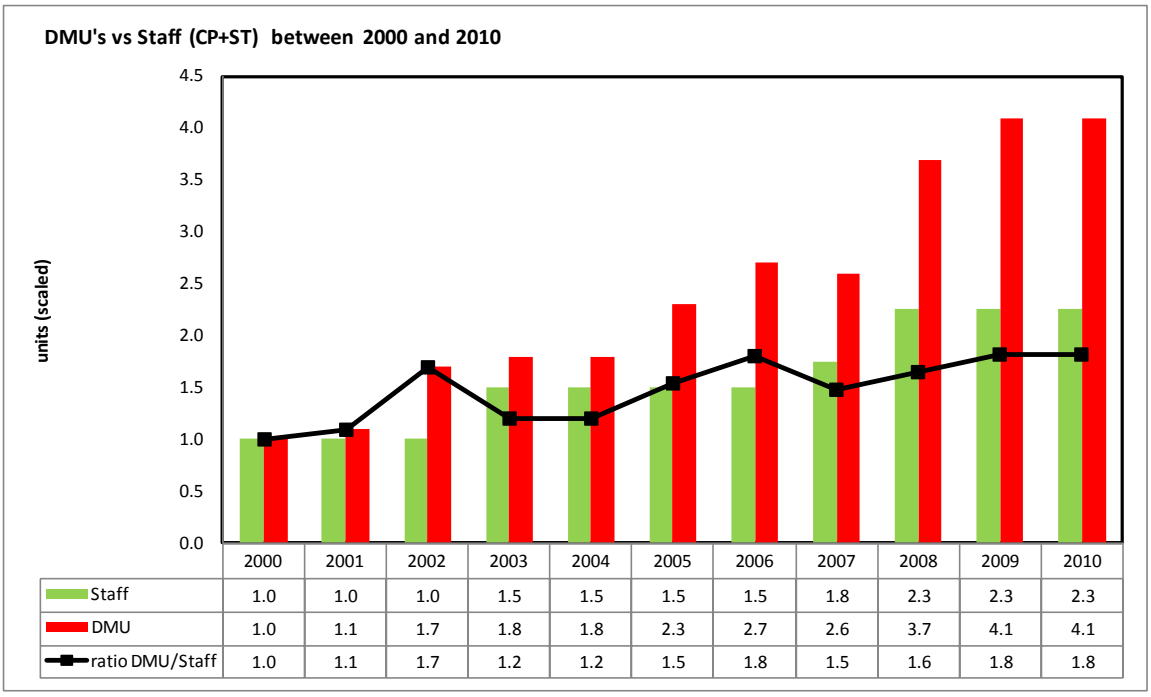


Figure 1. Idealised ICCAT assessment process. L=landings, LF=length frequency samples, U=index of abundance, C=landings by age class, M=natural mortality, L∞, k and to = growth parameters, S=selectivity, N=abundance, F=fishing mortality, S/R=stock-recruitment relationship, Cfuture=constant catch strategy, F_{future} = constant mortality strategy. Subscripts are: l=length, a=age, y=year, f=fleet. Dotted lines separate work done by ICCAT countries from that done by the ICCAT Secretariat and the ICCAT working groups. (From Kell *et al.* 2003).



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Staff	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.8	2.3	2.3	2.3
DMU	1.0	1.1	1.7	1.8	1.8	2.3	2.7	2.6	3.7	4.1	4.1
ratio DMU/Staff	1.0	1.1	1.7	1.2	1.2	1.5	1.8	1.5	1.6	1.8	1.8

Figure 2. Relative (scaled to the minimum in each series) comparison of DMU's (Data management Units: datasets with full data management [DB creation, data validation, assimilation, storage, publication] requirements) and Secretariat Staff (STAT & COMP) involved in the DMU associated workload, between 2000 and 2010. In balanced (optimal) conditions, the ratio DMU/staff, should be kept around 1 (stablility between workload and personnel). Currently, workload increases 80% faster than the staff).

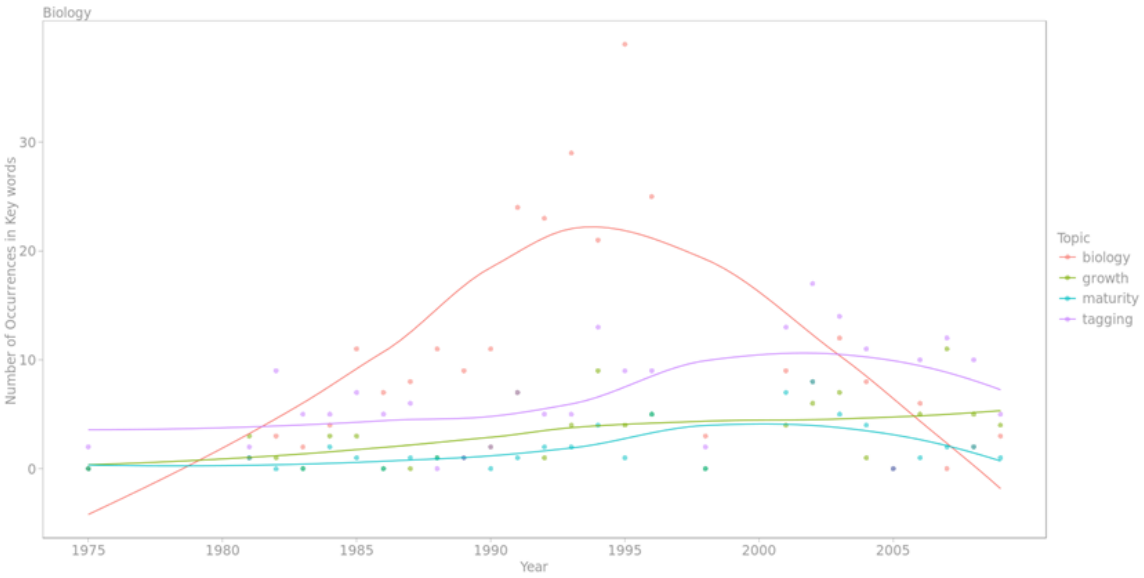


Figure 3. Number of SCRS papers by year on biological studies support stock assessment.

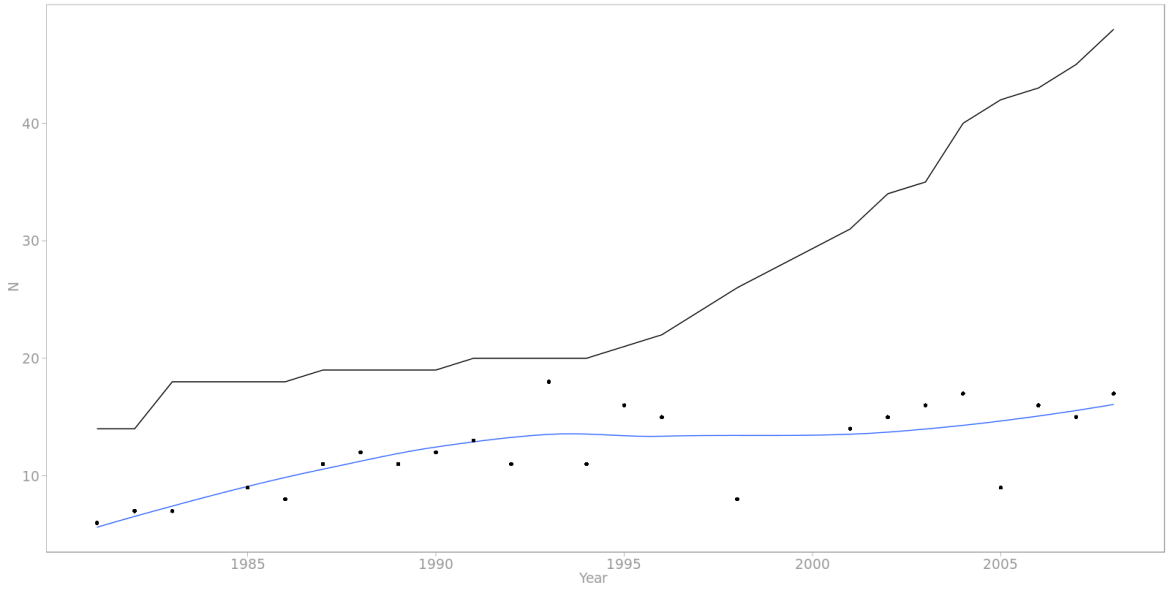


Figure 4. Summary of SCRS papers in ASFA database (dots with lowess smoother) and in Collective Volumes (dots) and Contracting Parties (line) by year.

Appendix 1

Agenda

1. Opening, adoption of agenda and meeting arrangements
2. Review of the Secretariat role/participation in scientific support to the SCRS activities and current human resources at the Secretariat. Staffing and support needs for implementing multidimensional statistical models for preparing management advice.
3. Participation of CPCs scientists on SCRS scientific meetings: trends, requirements, scientific participation and scientific capacity building. Additional work needs for implementing multidimensional statistical models for preparing management advice.
4. Recommendations from SCRS/Commission to implement Precautionary Approach models for ICCAT species, Management Strategy Evaluation protocols, and incorporation of Ecosystem based models.
    4.1. Requirements for scientific support
    4.2. Secretariat support and database/capacity requirements
    4.3. Ecosystems and by-catch related database.
5. Review of the data confidentiality policy and implications for the Secretariat and SCRS scientific tasks
    5.1. Secretariat requirements to implement the policy
    5.2. SCRS guidelines on confidential data analysis and scientific use
    5.3. What the policy means for scientists participating in SCRS
6. Review and adoption of standard formats for SCRS reports
    6.1. Length and structure of detailed reports,
    6.2. Length and structure of executive summary reports
    6.3. Swift documents and traceability of scientific work at SCRS meetings
7. Collaboration with other t-RFMOs in terms of training and scientific analysis.
8. Other matters
9. Recommendations to the Commission and Working Group on the Future of ICCAT
10. Adoption of the report and closure

Appendix 2

List of Participants

CONTRACTING PARTIES

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ICCAT SECRETARIAT

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Kell, Laurie
Ortíz, Mauricio
Palma, Carlos

Appendix 3

List of Documents

SCRS/2011/023 Thirty Five Years of Collective Endeavour, a Review of the SCRS Papers. Kell, L. and Pallarés, P.