Original: English

2013 REPORT OF THE SUB-COMMITTEE ON STATISTICS

(ICCAT Secretariat, 23-24 September, 2013)

1. Opening, adoption of Agenda and meeting arrangements

The Sub-Committee on Statistics met at the ICCAT Secretariat (Madrid, Spain) on September 23-24, 2013. The meeting was chaired by Dr. Gerald Scott while Dr. Alex Hanke and Dr. Paul de Bruyn served as rapporteurs. The Agenda was discussed, accepted and adopted by the Sub-Committee (**Addendum 1 to Appendix 7**).

2. Review of fisheries and biological data (new and historical revisions) submitted during 2013

The Secretariat presented information contained in the 2013 Secretariat Report on Research and Statistics (SCI-008) related to fisheries and biological data submitted for 2012, including revisions to historical data.

2.1 Task I (nominal catches and fleet characteristics)

Overall, a relatively high proportion of Task I catch reports for 2012 were received by the Secretariat by this year's reporting deadlines (representing about 80% for the Task catch data, **Table 2** of the Secretariat Report on Statistics and Coordination on Research in 2013) although a lower proportion of CPCs (about 50%) reported Task 1 fleet characteristics (**Table 1** in SCI-008). Historically the reporting of Task 1 fleet characteristics has always been poor making it of very low utility for analyses.

The Secretariat noted that excessive time is now spent quality controlling data submissions from CPCs so that respective ICCAT databases can be updated. There are increasing difficulties in deciding which of the voluminous statistical datasets received, are properly qualified (well formatted, complete, enough resolution) for acceptance, and those decisions have implications for issues of compliance (SCRS report cards and species catalogues). Noting that there are currently no objective rules about this subject, the Secretariat presented a proposal to the Group for applying "Criteria for acceptance of statistical data received under official formats" (**Appendix 1**). It is based on a two filter (filter I and II) set of simple rules.

This proposed approach will allow the Secretariat to identify submissions that do not fulfil the requirements for inclusion in the ICCAT databases. This is a quality assurance step that is normally the responsibility of CPCs and applies to all statistical and tagging forms. The first (filter I) considers the gross features of the submission (submission on a standard form, proper header information and a completed details section with ICCAT codes). Data will only be accepted for recently defined and accepted sampling areas (i.e., ICCAT stock sampling areas). If complete, the data are accepted, otherwise the data are not accepted and the CPC is asked to properly resubmit. Data that were returned would not be assigned the initial submission date. This filter will enhance the quality of the data submitted and will reduce the Secretariat's work load associated with managing the data.

There has also been a noticeable increase in the frequency of CPC's submitting data to meet compliance deadlines, with the intent of revising it later. The filter described above will not limit CPC's from submitting data in this way and the Secretariat will assume the data was submitted in good faith so future revisions will not affect the compliance date. The filter only addresses the issue of the structural completeness of the submission. All things considered, the Group recommended that filter I was an appropriate measure to implement in 2014 for all data received in response to the ICCAT reporting requirements for statistics.

The second filter (filter II) is a more strict examination of the data submission that has passed filter I as it considers details of the submission such as the completeness and correctness of the data for each field name. The Sub-Committee discussed if the quality control checks for filter II should only include items that are mandatory for reporting (e.g., reporting of size data using stock sampling areas) instead of 'recommended' (e.g., reporting of size data by 5X5 degree squares) so submitted data sets are not needlessly flagged. However, it was recognized that there is a need to define minimum requirements going forward so that data quality can be more fully characterized. Thus, there is a need to distinguish between compliance with what is mandatory and non-accepted data sets for quality assurance reasons. Consequently, for 2014, reporting of the date of acceptance of a data submission will be based on filter I while filter II will be beta tested and used as a diagnostic tool. This should give CPCs time to adjust to the new policy and to evaluate the performance of the criteria proposed for filter II.

2.2 Task II (catch & effort and size samples)

The Secretariat indicated that the volume but not necessarily the quality of Task II data has been increasing (**Appendix 1 of SCI-008**). **Figure 1** is indicative of the tendency of the proportion of CPCs providing Task II size and catch effort data over the recent five years.

Relative to the operation of the filter, the different reporting requirements by species must be recognized so, for example, species with no stock sampling areas are to use billfish areas. In terms of checks on temporal and spatial resolution, the minimum requirements have been identified by the SCRS and shall be applied. As specified above, the Group recommended that filter II be applied to Task II data submissions in order to evaluate its performance.

It was suggested that the filtered data should be available to scientists prior to SCRS and it may be possible to comply with this request provided the CPCs send data in correct formats. The filters may ensure that this is possible in the future. However if the Secretariat continues to carry the burden of processing problematic data, this deadline of data availability will be complicated. It was clarified that the most recent year data for species stocks not undergoing an assessment have never been presented to scientists prior to SCRS, but are always available once the data catalogues (as in the Secretariat Report on Statistics and Coordination on Research in 2013 (SCI-008) are available. Nevertheless, it was considered important that these provisional T2SZ and T2CE data used to build catalogues needs to be made available at the start of the species groups meetings. It was thus agreed, that once the Secretariat Report on Statistics and Coordination on Research in 2013 (SCI-008) has been produced, underlying data can be made available at start of species group meetings.

Document SCRS/2013/179 evaluated the CAS between longline and purse seine size frequency distribution estimates from fleets fishing yellowfin tuna in the Atlantic and Indian Oceans. The document showed that within the Indian Ocean distributions by gear type were similar whereas within the Atlantic Ocean they were very different. There was uncertainty as to whether the differences were real or a reflection of sampling bias for longline, purse seine, or the use of different protocols to estimate CAS or a combination of all these three factors. Sampling in purse seine is more comprehensive than longline and there are geographical differences in the sampling.

It was recommended that sampling designs should be revisited for longline and purse seine and improvements made especially in terms of sample size and its reporting. Longline samples should be increased. Also, we must ensure that the CAS data all conform to the same standard with 1 to 2 cm resolution on fork length and monthly temporal resolution and 5 degree spatial resolution. Lastly, given that pre dorsal lengths (LD1) are easily obtained and have a linear relationship with total length (FL), it is recommended that appropriate conversion factors be developed for this metric. Also, taking note that the LD1-FL relationship presently used to convert LD1 to FL frequencies is based on a small (<2000 yellowfin) and old (1975) sample: this sample needs to be widely reinforced and updated with a new biological sampling done in Abidjan.

The Sub-Committee indicated that in order to proceed with recommending improvements to the sampling designs for size frequency, an analysis of the sampling rates by fleet was needed. It was recommended that the Secretariat provide the information available for future consideration by the Sub-Committee.

2.3 Tagging

A number of issues related to tagging data were identified in the Secretariat Report on Statistics and Coordination on Research in 2013 (SCI-008). Release information is often absent for the recovery data that are reported and fewer species and specimens are being tagged (other than bluefin under the GBYP). Submissions of tagging data from CPCs may include duplicates from previous years requiring additional time spent in quality assurance and control. Also, conventional tag recoveries (and releases) for a number of species are so low that it is difficult to conduct lotteries to reward people for recovering the tags. Also it was noticed that in few countries, in particular in the Caribbean area, it is difficult to make reward payments. The Sub-Committee noted that it is critical to get cooperation from this community as they report the most tag returns.

The Secretariat informed the Sub-Committee on the need of following the administrative rules established for auditors. However, it was also pointed out that it would be possible to consider alternatives (e.g. make the reward payment through intermediate institutions) to facilitate this process.

The Sub-Committee recommended that better guidelines for data transmission, awareness and reward policies etc. need to be agreed and adhered to. It was determined that prizes for reporting returns need to be maintained because of the value associated with the recovery of tagging data. The Sub-Committee also discussed that more strict rules regarding the reporting of tagging of ICCAT related species in ICCAT areas are needed. Resolution on these issues has been deferred to the Working Group on tagging in order to resolve issues and recommend approaches to improve data transmission and exchange. The Working Group on tagging should meet during the 2013 Species Group week and provide their recommendations to the SCRS.

The Sub-Committee noted that there is little that can be done about the diminishing voluntary tagging operations in general. The Sub-Committee also noted that although tagging efforts have declined the tags from fish still at liberty from older tagging efforts are extremely important to recover since they represent fish at large for long time periods and provide important information, especially related to growth and mortality.

Focused scientific tagging efforts that are well designed and adequately funded such as the GBYP tagging and an anticipated Atlantic-wide tropical tuna tagging programme (AOTTP) should result in increasing tag returns in the near future. The Sub-Committee was informed that a Coordinator for the AOTTP Task Force work has been appointed to coordinate and to assist in accomplishing the first steps in the development of the program.

2.4 GBYP data (trade information and others)

Data recovery/data mining is one of the main tasks of ICCAT-GBYP and, within this work, a large amount of data previously not available to the ICCAT bluefin tuna data base have been recovered.

A comparison between the ICCAT bluefin tuna data base and GBYP recovered data was carried out and a few conflicts with the ICCAT Task I data have been noticed. According to the ICCAT data rules, these conflicts must be examined and resolved by the competent CPC and their national scientists participating in bluefin tuna species Working Group, providing the final decision of ICCAT.

The Sub-Committee acknowledged the revision work carried out by the bluefin tuna experts at the Tenerife meeting in May, and recommends that the GBYP recovered Task II (catch and effort, frequencies, etc.) be incorporated into in the ICCAT bluefin tuna data base, according to the existing rules. The GBYP data sets have been presented to the bluefin tuna species group and they have been quality checked to avoid duplications, overlap and conflicts with the data already included in the ICCAT bluefin tuna data base. The same recommendation applies to historical total catch data prior to 1950, which have also been recovered by GBYP.

The Sub-Committee acknowledged that one of the major statistical problems for Task I and II for eastern bluefin tuna right now is with purse seine data and that the currently available statistics may not be sufficient to conduct the scientific tasks required, although there has been significant improvement in the data available. Recommendations of the bluefin tuna species group need to be taken into account after a thorough evaluation has been concluded, focusing in particular on purse seine data recovery (Task I and Task II catch-effort and size).

The analyses of market/auction data recovered by GBYP, which was discussed by SCRS during the bluefin tuna assessment in 2012, by the GBYP Steering Committee in December 2012, and during the Tenerife meeting in May 2013, will be possibly better defined by the GBYP Steering Committee before the next SCRS Plenary.

2.5 Other relevant statistics (sea-turtles data provided by CPCs and by-catch mitigation information, Rec. [10-09]. National observer programmes information, Rec. [12-03], Rec. [10-10].)

The Sub-Committee noted that Table 7a presented in the Secretariat Report on Statistics and Coordination on Research in 2013 (SCI-008) contains only records of data submitted in 2013. It complements the same table (Table 7) presented in the Secretariat Report on Statistics and Coordination on Research in 2012. Full details of the information provided by each CPC (the time-series of information, standardisation of catch rates etc.) are provided in the reports of the 2012 and 2013 meetings of the Sub-Committee on Ecosystems (SC-ECO). The Sub-Committee on Ecosystems did, however, note that calls for data on sea turtles in 2012 and 2013 had a relatively limited response, with fewer than 20 CPCs submitting information on sea turtle interactions. The Sub-Committee on Ecosystems stated that in order to fully address the commission's request, CPCs need to submit data on sea turtle interactions, where available, as the requested assessment had to draw inferences from other oceans as well as make extrapolations based on the few data that were provided, which may provide a distorted picture of what is actually occurring and may bias the provision of advice. The Sub-Committee on Ecosystems expressed concern that areas highlighted as those where turtles are at risk are in fact the only areas for which data are available, whereas data poor regions may not be receiving the attention they require.

The Sub-Committee noted that the response rate to the obligation to report on national observer programs continues to be quite low, considering the number of observer programs that should be in place. The Sub-Committee was made aware of additional responses to the forms circulated by the Secretariat in 2011 to obtain information regarding the data collected by CPC observer programmes as needed for the SCRS to provide a response to the Commission on the issue. The Secretariat only received 14 responses over the past two years to the requests for information circulated to CPCs. Some CPCs provided information on their observer programmes data collection but not in the format specified in Form CP45. The information provided in the Appendix 2 of the Secretariat Report on Statistics and Coordination on Research both this year and in 2012 reflects if the specified information is being collected. It does not imply the data are available to the Secretariat at this stage although several CPCs have sent their actual observer data in the format in which it is captured by their national programmes. During 2013, the Secretariat has updated the forms (presented in 2012 to the Sub- Committee on Ecosystems) for the submission of observer programme data, which are currently being reviewed by the Sub-Committee on Ecosystems). The standard form should facilitate the submission of both aggregated and highly dis-aggregated data to accommodate the needs of individual CPCs. The Sub-Committee recommended this standard form, once adopted by SCRS, be made available to all CPCs to standardise the submission of observer data and facilitate its incorporation into a database to be maintained by the ICCAT Secretariat.

The Sub-Committee was informed that Morocco provided information on their observer program but it was not in an accepted format so their contribution was acknowledged in a footnote to table (Secretariat Report on Statistics and Coordination on Research in 2013, **Appendix 2**).

2.6 ICCAT biometric relationships and other conversion factors, revision and update work plan

The Sub-Committee noted the recommendation for future work on validating LD1-SFL conversion used for yellowfin (see section 2.2 discussion of SCRS/2013/179) and recommends instituting a sampling scheme to allow updating the currently applied conversion factor for estimating SFL for purse-seine caught yellowfin tuna.

The Sub-Committee noted the swordfish Working Group (SWO WG) considered revisions to length weight relationships for Atlantic swordfish and it also noted that the number of different types of weight and length measurements available creates difficulty when generating appropriate catch-at-size; several actions were taken by the swordfish Working Group but were considered interim solutions. Therefore, the swordfish Working Group recognized that the newly-adopted length-weight relationships for swordfish require validation with new field information. National scientists are requested to collect and submit observed values of length (LJFL) and round weight data to the Secretariat to facilitate this task. The Sub-Committee endorsed this course of action.

The tropical tuna species Working Group (TTWG), recognizing the importance in the stock assessment results of the biological parameters and other variables used, such as size distribution, conducted in 2012 (Anon.,2013) a revision of biological parameters of yellowfin, bigeye and skipjack and identified several problems related to the values currently used by the SCRS. In particular tropical tuna species Working Group identified substantial differences among oceans in the biological parameters and other variables such as size frequency distributions, used in the stock assessment. The tropical tuna species Working Group also noticed that some of the original data used to establish relationships used were no longer available and highlighted the importance of revising these basic parameters and made several recommendations regarding the method for revising relationships as well as to ensure that the basic biological data be deposited and stored properly to guarantee their safe conservation and their future access and use by SCRS scientists. The Sub-Committee endorsed the tropical tuna species Working Group course of actions in this regard.

The Sub-Committee noted the GBYP and various national efforts have recovered a considerable amount of historical and recent data for use in bluefin tuna biometric relationships. The L-W relationships for eastern Atlantic and Mediterranean bluefin tuna were updated during the 2013 Bluefin Meeting on Biological Parameters (May, Tenerife). The results of this analysis were considered preliminary as the models developed for the eastern Atlantic and Mediterranean bluefin tuna populations were very similar and perhaps should be combined. Similar work is proceeding with data for the western stock. The Sub-Committee endorsed this course of action by the bluefin Working Group.

2.7 Artisanal Fishery Data Collection

Artisanal fisheries are small-scale fisheries for subsistence or local consumption, sometimes small markets, generally using traditional fishing techniques and small boats. They occur around the world (particularly in

developing nations) and are vital to livelihoods and food security (Jacquet and Pauly, 2008). In the ICCAT Convention Area, artisanal fisheries can harvest substantial amounts of tuna and tuna-like species and in some cases estimated catch represent a relatively large proportion of the total removals of some ICCAT species. Due to their characteristics, artisanal fisheries are more difficult to monitor than industrialized fisheries which generally make use of centralized landing and off-loading facilities. In many developing nations, infrastructure and resources available for research, management, and monitoring of artisanal fisheries are severely limited and strategic investments using ICCAT capacity building, JDMIP, or other funding sources can lead to much improved information sets. Sustaining these efforts to collect the data necessary to describe the impact and management of artisanal fisheries can be challenging.

Over the recent past, ICCAT has made strategic investments in order to enhance data collection for a number of artisanal fisheries which are outlined in some of the case studies below. Additionally, there are several case studies presented that have been implemented through national level funding. Nonetheless, sustaining these data collection activities or enhancing others will require coordination between funding sources as well as sub-regional organizations with common interest in monitoring these fisheries.

Last year the SCRS recommended a research plan for small tunas, which was adopted last year by the Commission. These small tuna species are of great economic value to local communities and thus the Committee should recognize the work being done in Senegal, Côte d'Ivoire and Morocco. These examples showed that with strategic funding, access has been facilitated to important information on some artisanal fisheries in the Convention area that would not otherwise have been possible. These programmes have been successful in improving the data available for scientific assessment and their importance and success need to be acknowledged. Also a number of monitoring systems for artisanal fisheries are also in place and depend upon national financial support. Nonetheless, further improvement in the information obtained could also be obtained in these situations with supplemental strategic investment.

Detailed information on the different data collection systems for artisanal fisheries is collected in **Appendix 2**.

The Sub-Committee was informed that for various reasons and in a general way (some exceptions do exist), African countries, among others, face great difficulties maintaining statistical systems for their complex small-scale artisanal fisheries. Some regional organizations blame this situation on a lack of global evaluation of status and evolution of this important sector for employment and food security. The Economic Community of West African States (ECWAS, www.uemoa.org), an economic regional organization including eight countries of West Africa (Benin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Senegal, Togo, Republic of Guinea-Bissau) decided to set a programme to strengthen these statistical systems and set a regional database. This programme started to focus on a large survey on continental waters and lagoon small scale fishery (2010-2013) and will continue with an identical approach on maritime small scale fisheries (2014-2015). The general purpose of this collaborative programme is to set: i) minimum standards on small scale data collection systems, ii) a regional database with main indicators available and ii) establish a regular financial support of these programmes at the national and regional levels. Liaising with this initiative will help to define where ICCAT strategic investments would be most beneficial.

3. Review of ICCAT-DB (ICCAT relational database system)

3.1 Development status

The Secretariat presented the current status and progress made on the cloud infrastructure (SCI-083 of 2012) which dealt with the development database storage, access and analysis on the ICCAT cloud. The cloud consists of three servers on rackspace in London. Two servers (module I) are devoted to data storage and the documentation framework and a single server (module II) supports calculations using RStudio. The configuration of the servers has been completed but we still need to provide interactive access, produce documentation of the databases and configure the documentation and calculation modules to talk to each other.

The Sub-Committee indicated that we are making acceptable progress on this activity and appear to be on schedule.

3.2 Database documentation framework report

The Secretariat informed the Group that the ICCAT-DB documentation has progressed according to the Phase 1 plan, stipulated under the four year Project (ICCAT-DB documentation framework), adopted in 2012. With the first phase accomplished, the Secretariat has planned a first publication of the documentation in the cloud website (http://tunalab.iccat.int) in the final quarter of 2013. After a period, any comments or suggestions aiming to improve this website (design or structure) are welcome.

3.3 Cloud deployment and its role in the ICCAT-DB documentation

The Secretariat Report on Statistics and Coordination on Research in 2013 (SCI-008) reported that an increasing large number of computer intensive tasks have to be undertaken by the ICCAT Working Groups which can be made more efficient through application of cloud computing. During 2013, some tests were made on the ICCAT cloud-computing servers at the albacore and swordfish intersessional meetings and to write collaborative papers. The cloud platform tests made were considered successful in allowing SCRS scientists to collaborate intersessionally and to conduct many tasks required by stock assessment Working Groups.

The Sub-Committee acknowledged the work by the Secretariat in advancing the use of cloud computing in support of the SCRS activities and anticipates its utility in documenting the ICCAT databases.

4. National and international statistical activities

The Secretariat Report on Statistics and Coordination on Research in 2013 (SCI-008) summarized the activities undertaken by the Secretariat regarding national and international statistical activities. The Sub-Committee encouraged the Secretariat to continue with these efforts.

4.1 International and inter-agency coordination and planning (FAO, CWP, FIRMS)

Following the t-RFMO Kobe recommendations, the Secretariat has been involved in the development and implementation of the Consolidated List of Authorized Vessels (CLAV) project, which comprises the current lists of authorized fishing vessels of each t-RFMO. However, the joint inter-agency initiative to further work on CLAV has not made any substantive progress. It was previously noted that funding is required for experts to work with RFMOs to achieve this which might be obtained from the FAO/GEF ABNJ project which is expected to be approved by the GEF later this year.

The Secretariat Report on Statistics and Coordination on Research in 2013 (SCI-008) indicated that the Secretariat has continued to collaborate with the CWP and has participated in its 24th meeting which was held jointly with the *ad hoc* Working Group on Aquaculture (Rome, February 7-8, 2013). Regarding FIRMS, the Secretariat updated the species identifications sheets for western Atlantic and eastern Atlantic and Mediterranean bluefin tuna stocks, Atlantic white marlin and North and South Atlantic shortfin mako assessed by the SCRS in 2012 for use by FIRMS and participated in the 2013 FIRMS Steering Committee meeting. Since the last SCRS meeting, the Secretariat has also prepared the entries for the ASFA-Proquest database of the documents published in issues 4 and 5 of Vol. 65 of ICCAT's Collective Volume of Scientific Papers.

Additionally, the Secretariat Report on Statistics and Coordination on Research in 2013 (SCI-008) reported upon continued and new collaborations with the International Seafood Sustainability Foundation (ISSF), the Inter-American Convention for the Protection and Conservation of Sea Turtles, and in ongoing projects in the Caribbean area.

The Sub-Committee acknowledged and recommended continuation of these activities.

4.2 National data collection systems and improvements

The Sub-Committee noted there was no new information reporting to the meeting.

5. Report on data improvement activities

5.1 ICCAT-Japan Data and Management Improvement Project

The Coordinator's report on activities of the ICCAT/Japan data and management improvement project (JDMIP) 2013 (SCI-009), dealing with the JDIMP, was introduced briefly prior to presentation in plenary. This is the fourth year of a five year project. This past year the project conducted training courses, sampling programs in South America, the Caribbean and Ghana and provided travel assistance to scientists attending meetings of the SCRS Working Groups.

The Sub-Committee acknowledged the contributions JDMIP has made to capacity building and increasing the availability of data of use for monitoring ICCAT stocks. It was recommended that an accounting of the amount of data added to the ICCAT data bases through JDMIP investments be considered as one metric to gauge the success of the program. The JDMIP Coordinator asked for feedback, suggestions and information on how the project can be continued and how it can be improved and noted that a Steering Committee meeting for JDMIP will be convened during the 2013 SCRS meeting to further discuss program futures.

5.2 Data Funds from [Res. 03-21] and 5.3 Data recovery activities

The Secretariat Report on Statistics and Coordination on Research in 2013 (SCI-008) provided a historical view of 'Data Funds' that have historically been available to improve data collection and strengthen the capacity of the scientists of some developing Parties.

In 2011, the SCRS approved a protocol for the use of data funds & other ICCAT funds. This protocol defines a wide-ranging structure for the use of the funds, which includes the improvement of statistics, training and providing support to the work of the SCRS, including participation in meetings. Likewise, the protocol includes the criteria to be followed for the allocation of funds. In 2013, a total of €127,000 were expended from the "Data Fund" in support of improvements of statistics, training, and providing support to the work of SCRS.

Table 1 summarises the activities financed by these funds in 2013.

The Sub-Committee recognised the benefits of having a protocol for the use of the different ICCAT funds. The Sub-Committee also acknowledged that the various ICCAT funds have significantly improved the SCRS work. However, it was noted that the funds anticipated for 2013 were considerably lower (by €65,000) than anticipated, which limited the work that could be achieved and also required the use of other funds to accomplish the work plans proposed for 2013. The Sub-Committee recommends that CPCs re-invest in these funds. The Sub-Committee also recommended that each of the Species Groups clarify their need for experts in their work plans and provide estimates of approximate costs involved to permit appropriate planning for use of funds.

5.3 BFT-E VMS data

At the bluefin tuna biological parameters meeting in Tenerife, it was recommended that VMS data be provided at the highest temporal resolution possible (one hour or less). Subsequent meetings discussed the use of VMS data with regard to its potential for identifying spawning grounds amongst other things. To maximize the utility of this data, The Sub-Committee endorses the recommendation to link the VMS data to the catch, effort and catch at size data (SCRS/2013/178). The Sub-Committee noted that there is a perception by some that VMS data hasn't been used, but this would appear false as evidenced by the EU using it to affect controls on fishing and catch limits and SCRS's use in determining spawning areas in the Mediterranean. Granted, ICCAT doesn't have the same access to the data as the EU but SCRS could make better use of higher resolution data and it can be used in conjunction with observer data collected and maintained at the Secretariat. Lastly, the Sub-Committee indicated that while the VMS data is useful, it is not a replacement for good Task II data because it does not contain explicit information on tuna catches by species or by size, as in log books data

5.4 BFT-E observer data

Through data collected by MRAG, the Secretariat is investigating ways to link VMS and observer data. Thus the Sub-Committee recommends that we need to estimate detailed C/E files based on the observers that have been deployed since 2010 on 100% of the Mediterranean bluefin tuna PS fleets. SCRS/2013/178 contains the recommendation from the review group. These data have not been neglected from a scientific use standpoint.

5.5 BFT-E weekly catch reports

The Sub-Committee determined that weekly catch reports should be evaluated for their utility in scientific investigations and should be fully available for scientific use.

5.6 Transhipment observer data

Transhipment observer data identifies the species and amount moved from vessel to vessel while at sea and the value of this information for scientific use needs to be investigated.

5.7 Electronic log books

The EU made the use of electronic log books mandatory last year. They can be very useful and provide exact information. The Sub-Committee considered the scientific value of electronic log books and in general endorses their use and development. It was noted however that electronic logbooks were initially developed for bottom trawling and independently by each EU country and require modification to fit the characteristics of the tuna fleets. The Sub-Committee recommended that a standard electronic log book should incorporate the same basic information provided in analogue log books and should be based on the most common format, however support for this data source should not come at the expense of information we currently gain from paper log books. It was noted that not all fisheries and fleets are required to use electronic log books so care must be exercised when advocating for their general use and that we need to take advantage of the information once developed.

6. Review of Secretariat yearly based fishery datasets estimations and dissemination

6.1 CATDIS

The calculation of the distribution of catch requires an improvement in the methodology, however for the current year of data, a normal update was recommended.

6.2 CAS (catch-at-size) and CAA (catch-at-age)

The Secretariat informed the Sub-Committee that updates of bigeye, skipjack and yellowfin mean weight data, from new partial (not all fleets) CAS estimate were available for each of these species. The Secretariat also pointed out that the quality of the CAS estimate for the different ICCAT stocks is still dependent on the method of substitution when sampling data are absent for a given fleet-area-time combination. Thus the Sub-Committee recommends conducting a statistical evaluation of the method of substitution when generating the CAS as well as an evaluation of the use of statistical methods for generating missing size frequency distributions. There is also a requirement for more reliable weight-frequency data to generate the CAA. The development of these tools has been deferred to the Working Group on Stock Assessment Methods.

Finally, the Sub-Committee recommended that recently adopted CAS files by species be available for Species Groups as soon as possible and on a routine basis to facilitate review.

6.3 Others (e.g. EffDIS)

EffDIS provides a spatial representation of the overall long line effort in number of hooks and compared to CATDIS has the greatest requirement for an improvement in the extrapolation methodology. These improvements were addressed by the Methods Working Group on Stock Assessment Methods (SCI-028) which provided recommendations that were reviewed and endorsed by the Sub-Committee. Improvements will largely benefit studies evaluating the impact of ICCAT fisheries on by-catch species. Thus the utility of the recommended work should be evaluated by the Sub-Committee on Ecosystems prior to any action being taken.

7. Review of publications and data dissemination

7.1 Collective Volume of Scientific Papers

The Sub-Committee was informed that the Guidelines for authors of documents destined for the Collective Volume has not been followed in all cases. This imposes an additional burden on the Secretariat that need to reformat the submitted documents. It was proposed and the Sub-Committee agreed that authors must maintain the standards dictated by the Guidelines or the paper will be returned to authors for reformatting or they will be maintained only as SCRS working papers. Working papers will remain in the record of individual meetings, but will not be included in the Collective Volume.

Authors are further encouraged to make use of document templates that are freely available on the ICCAT website.

The Secretariat also informed the Sub-Committee that some SCRS document numbers requested by scientists do correspond to PowerPoint presentations only. For these cases, it was proposed to create a new code number (e.g. SCRS_P_YY_#) and do not assigned an SCRS number to a presentation if not accompanied by a document. The scientific information submitted under this new code number will remain in the record of individual meetings, but will not be included in the Collective Volume.

7.2 Revise the ICCAT-Aquatic Living Resources publication agreement in view of the changes made by ALR towards Ecosystem Approach to Management content.

Consideration was given to the thematic shift of ALR to more ecosystem based content. It was noted that the new theme might be too restrictive for SCRS purposes. The Sub-Committee balanced the results of the ICCAT-ALR agreement and considered it has been positive, although the number of documents published (24 SCRS documents) in ALR since 2007 has been limited. The Sub-Committee recommended that the Secretariat investigate alternative journals rather than developing its own online product but it was not recommended that we give up on ALR this year. The cooperation with ICCES and the other tRFMOs could be also considered.

7.3 Development new or improve existing identification guides for frozen tuna and tuna-like species

In response to the Commission request, the Sub-Committee reviewed the identification guide for frozen tuna and tuna-like species (provided in SCI-072) developed by MRAG to be used in the ICCAT transhipment Observer Program. The Sub-Committee recommended that the Species Groups further review these identification sheets.

7.4 Update of ICCAT web contents

The Secretariat informed on the improvements on the ICCAT web contents (SCI-008).

8. Review of progress made for a revised *ICCAT Manual*

8.1 Development of Chapter 3 on fishing gear descriptions

Good progress has been made (e.g. the longline section is finished) but some gaps remain for non-main gears (e.g. harpoon, trolling). The Sub-Committee expressed the need to complete the work on this Chapter as soon as possible.

8.2 Development of Chapter 2 on species descriptions

It was reported that this chapter is complete, which the Sub-Committee noted.

8.3 Document of "Handling of Sharks in the Purse Seine fisheries"

The Sub-Committee endorsed the recommendation by the Shark Working Group to include the purse seine fishery shark and ray handling document SCRS/2012/151, as an Appendix to the *ICCAT Manual*.

8.4 Proposal from the Secretariat to update and convert the Statistical Data Submission guideline into a dynamic document and make more relevant in the ICCAT Web page.

The proposal was noted and endorsed without comment.

9. Consideration of recommendations from 2013 inter-sessional meetings

The Sub-Committee acknowledged and endorsed recommendations related to statistical and fishery monitoring actions made by the various 2013 intersessional meetings, as noted below:

Albacore

1. The Group recommends increasing efforts to obtain French mid-water trawl and other fisheries historical series of catch, effort, catch at size, geographical distribution and other related fisheries information. The Group also noted that the Chinese Taipei longline size sampling data showed some patterns that might not reflect changes in the population. Thus, the group requested to clarify the reasons behind the patterns in the data to the extent possible. Finally, the Group reiterated the SCRS requirement to report CAS together with the size samples when submitting Task II size information.

2. First estimates of albacore tuna discards in Uruguayan longline fisheries were made available during the data preparatory meeting (SCRS/2013/067). The Group recommended to extend these studies to other longline fisheries to obtain estimates of the amount of albacore tuna being discarded. It was also recommended that CPUE series be constructed using data from both retained and discarded albacore tuna.

3. Several countries with important albacore fisheries were not represented in the data preparatory meeting. This limited the ability of the Group to properly revise the basic fishery data and some standardized CPUEs that were submitted electronically. This resulted in unquantified uncertainties and negatively affected the successfully for achieving the objective of the meeting. To overcome this, the Group recommends that CPCs make additional efforts and be made aware of capacity building funds available for participation in and contributing to working group meetings.

Bluefin tuna

West

1. The historical catch and effort for the West Atlantic data from the Japanese longline fleet should be analyzed by main areas and groups of years that show a consistent effort distribution, rather than considering only catches of bluefin reports. The main areas of interest are the Gulf of Mexico, the waters off Brazil and the Florida-Bahamas areas from 1960 through the 1980s. Special attention should also be given to the South Atlantic, both from an historical and recent perspective.

2. Fishery independent information is needed, either through a large-scale tagging program or by developing fishery independent indices of abundance (e.g., aerial surveys), to better track trends in biomass and fishing mortality rates. Fishery-independent information is furthermore crucial to avoid biases due to management regulations in the models based on catch and CPUE.

3. It is essential to obtain representative samples of otoliths and other tissues from all major fisheries in all areas. Otoliths, spines and vertebrae can be used to provide direct estimates of the age composition of the catch, thus avoiding the biases associated with determining age from size. Moreover, otolith microconstituent data can be very useful to determine stock origin with relatively high accuracy, and thus could be a key factor to improve our ability to conduct mixing analyses.

East

1. The Working Group recommends to check and to validate all farms data as indicated in the report and then to introduce these data in the CAS of the Mediterranean bluefin tuna, so that this considerable source of information can be used in the 2015 stock assessment.

2. The WG recommends continuing the analysis of VMS data to get a better estimates of the spatial and temporal variations in the fishing effort of the main fleets and to obtain an index of abundance of the Mediterranean PS fleet through state-space modeling. For that purpose, the Group also recommends that VMS data be provided at the highest temporal resolution (1 hour or less) possible.

Sharks

1. The Species Group recommends that scientific observers be allowed to collect biological samples (vertebrae, tissues, reproductive tracts, stomachs, skin samples, spiral valves, jaws, whole and skeletonized specimens for taxonomic work and museum collections) from currently prohibited sharks species that are dead at haulback, provided that the samples are part of the research project approved by the SCRS. In order to obtain the approval, a detailed document outlining the purpose of the work, number and type of samples intended to be collected and the spatio-temporal distribution of the sampling work must be included in the proposal. Annual progress of the work and a final report on completion of the project shall be presented to the Sharks Species Group and the SCRS.

2. Cape Verde expressed its desire to obtain assistance to develop a Data Collection Programme, including sampling procedures and a data processing system on the shark species caught by its fleet or landed in Cape Verde. Although sharks are not the target of the local fleet, these are an important component of their catch. The Group recommends that special funds from ICCAT be provided to this important initiative.

3. The Group recommends that in 2014 a small group of SCRS scientist should be in charge of elaborating the biological sampling design for pelagic shark species in the Atlantic and Mediterranean. The expected budget of this action should be evaluated and proposed to SCRS for its approval.

Tropicals

1. In view of the importance of the catches of tropical tunas made in association with FADs, the tropical tuna Working Group seeks the support of Sub-Committee on statistics regarding the importance of reiterating to member countries and cooperating parties the need to provide detailed information on FADs as presented in Rec. 11-01 and proposed by the SCRS in 2012. The tropical working group requests that, in the future, the Sub-Committee on statistics analyzes the progress made on the collection of data on FADs and discusses how this information may be incorporated into the ICCAT database for the purposes of stock assessments of tropical tunas and other species.

2. The tropical tuna working group recommends to the Sub-committee on statistics to develop ways by which the information from VMS of tropical tuna fleets be made available to national and ICCAT scientists at the highest resolution available. The Working Group notes that such information is important for scientific evaluations and assessment. For this purpose, the information is not necessary in real time and could be made available with a delay of one year.

3. The tropical tuna working group recommends that the revised statistics on Ghana landings as developed by the working group after its inter-sessional meeting are considered by the Sub-Committee of Statistics for incorporation in the ICCAT database as accepted revisions.

Ecosystems

1. CPCs should provide sea turtle by-catch data according to Task II standards. If that is not possible, the Sub-Committee recommends CPC's that data concerning sea turtle by-catch be provided by species with spatial and seasonal information (e.g. 5X5) that would allow assignment to the regional management unit (RMU) and quarter.

2. The Sub-Committee recognizes the need to include information on artisanal fisheries that operate within the ICCAT Convention area and encourages CPCs to submit relevant information, especially regarding interactions with sea-turtles, birds, and sharks.

3. The Sub-Committee recommends that supplemental tagging (including electronic and conventional) of sea turtles be conducted and information on those experiments be made available to the Sub-Committee.

Swordfish

Atlantic

1. Catch: All countries catching swordfish (directed or by-catch) should report catch, catch-at-size (by sex) and effort statistics by a small an area as possible, and by month. Recognizing the differential growth and distribution between sexes, collecting catch-at-size information by sex is particularly important. These data must be reported by the ICCAT deadlines, even when no analytical stock assessment is scheduled. Historical data should also be provided.

2. Timely submission of Task I and II data: Considering that a substantial amount of data, (including revisions of many years of historic size information) was received after the deadline and taking into account the time that the Secretariat needs to incorporate, validate and compile to generate the datasets requested, the Group strongly reiterates the need for respecting deadlines and providing the data in the ICCAT standard formats. This recommendation is particularly important as the SCRS moves to incorporate more complex methods than those normally used and for which the request of data is much higher.

3. Unreported Catches: The 2009 stock assessment report noted that the summarized form in which the s.SDS information is currently reported to ICCAT (biannual summaries of direct imports and re-exports) does not give the sufficient detail for improving estimates of potential NEI and volume of Atlantic swordfish in international trade largely due to uncertainty about the year and area of capture for swordfish products in trade, the general lack of product to live weight conversions, and the potential for double counting catches submitted on the re-export certificates. These estimates could be greatly improved if the corresponding individual statistical documents and re-export certificates were made available. These detailed data exist at national levels (with identification numbers) and an effort should be made to recover this important information, if the Commission wishes to improve the utility of the s.SDS for validating Task I data. SCRS has reiterated this advice over the past decade (see General Recommendations to the Commission, on the SCRS Reports of 2000, 2001, 2002, 2003 and 2004), but as of yet none of the detailed swordfish s.SDS information has been received by the Secretariat.

Working Group Stock Assessment Methods

1. The Working Group Stock Assessment Methods recognizes the importance of accounting for changes in fishing operations and characteristics of the main fleets from each CPC operating within the ICCAT area of competence, as these affect the efficiencies of the fleets for catching target and by-catch species. Documentation of these technological and behavioral changes is particularly important to understand the national reports of catch and effort annually submitted (Task II-CE). Taking into consideration also that CPCs are required to report fleet composition data (Task IFC), it is recommended that CPCs present an SCRS document with the details of the fleet composition, sampling, coverage, and statistical methodology to estimate total catch, catch and effort, catch-at-size for each of the main fleet components. This report should also communicate the potential limitations and or restrictions of the data and information provided to be taking into account within any further analysis by the SCRS or the Secretariat.

10. Evaluation of data deficiencies pursuant to [Rec. 05-09]

10.1 Current data catalogues of major species by stock

The Secretariat Report on Statistics and Coordination on Research in 2013 (SCI-008) provides the data catalogues.

10.2 Implications of identified deficiencies in future stock assessments

The albacore Working Group reviewed the data available during its data preparatory and stock assessment meetings. For the North Atlantic stock, the Task II catalogues indicate relatively complete coverage during the last 10 years for the five most important fisheries However, this information was not timely submitted, which created additional work and delayed the overall flow of the work plan. Moreover, some missing Task II datasets were identified for the earlier time periods and for some less important fisheries, which were requested by the Working Group.

The Sub-Committee noted that although the catalogues reflect a relatively positive coverage for main fleets in the last years, the quality of the information is far from optimum in many cases, especially but not limited to that information needed to run statistical models (e.g. MFCL, SS3) with multiple fleets and a long timeframe (1930-2011). Stock assessments using these models are hindered by the following issues:

1. Chinese Taipei size frequencies in the North Atlantic show patterns along the time series that are unlikely to reflect population dynamics. The full time series needs to be revised, and those patterns explained or corrected.
2. French mid-water trawl and other fisheries historical series of catch, effort, catch at size, geographical distribution and other related fisheries information needs to be obtained and reported.
3. Spatial dynamics of important longline fisheries (namely Japanese and Chinese Taipei) needs to be better described and incorporated into the CPUE standardization.
4. The level of by-catch in longline fisheries needs to be characterized, following the Uruguayan example.

In the case of the southern stock, the catalogues again show relatively acceptable coverage for the five most important fleets (except for Namibia that has no T2CE information in years with significant T1 data). This stock was modelled with production models, and thus the stock assessment is mainly hindered by the following issues:

1. Spatial dynamics of longline fisheries (especially Japanese and Chinese Taipei) need to be better characterized and incorporated into the CPUE standardization.
2. The level of by-catch in longline fisheries needs to be characterized, following the Uruguayan example.
3. Main CPCs need to participate in the data preparatory and assessment process for the Group to be able to make informed decisions.

10.3 Proposals for data recovery plans and improvements on data collections systems

The Sub-Committee noted that the Kobe plots/matrix do not necessarily convey the quality of data going into them. It was noted that while data uncertainty should be captured in the estimation process, methods to further characterize unquantified uncertainties are needed. An *ad hoc* Working Group was organized to propose a methodology that could be used to address this issue. The initial proposal from that Group, which met subsequent to the Sub-Committee meeting is provided in **Appendix 3**.

11. Review of existing data submission policy

11.1 Formats (e-FORMS improvements to account with current fishery practices)

Proposed modifications to the e-forms were reviewed including additions and deletions of some fields. Most changes to the task I e-forms were endorsed by the Sub-Committee. The exception was related to the inclusion of a field to identify Faux-Poisson catch and it was debated with no general agreement on how to proceed.

Revised Task II CE forms will reduce the number of files to be submitted by allowing the reporting of multiple years on a single form. The bid to delete school type information from the form was inappropriate for the case of Ghana which still makes use of this field. The Sub-Committee recommended that modifications must not result in a loss of information.

For the size samples and CAS data e-form, the year and species information will be moved from the header section to be fields in the actual table. That way, multiple species and years can be reported in just one form.

The Sub-Committee agreed with the changes proposed to the e-forms by the Secretariat but only for a testing year. The current ones should be kept as the official ones. The results will be evaluated next year.

Following the 2012 SCRS recommendation to study the possibility of making use of the ICCAT Vessel records to complement/improve the Task-I Fleet Characteristics (T1FC), the Secretariat made a short presentation in which similarities and differences among the two types of data were identified.

The Sub-Committee recognized that, despite the ICCAT vessel registry (a Commission's requirement) being nowadays more complete than the SCRS datasets counterpart (T1FC), it only covers a very recent and short time-period.

In this subject, the Secretariat proposed a change in the respective e-Form (ST01-T1FC) which could reduce CPC's data obligations.

While the Sub-Committee appreciated the Secretariat proposal, this is a complex issue that needs to be dealt with intersessionally. Meanwhile, the Sub-Committee recommended the Secretariat continue the data recovery and improvement work (involving CPC scientists) on this dataset.

11.2 Improvements to the ICCAT coding system

Solutions were proposed to deal with the growing list of codes (both active and non-active) used in the ICCAT databases. Many codes are resulting from categorizing catch not elsewhere included (NEI). The Sub-Committee endorsed the changes provided we are able to track the total catches and show the linkages with historical codes. Also, this process should not be interpreted as an attempt to establish alternative official catches for CPCs, but rather the best scientific estimate of removals from the stocks. The Sub-Committee recommended that the Secretariat correspond with CPCs for which this process has an impact as to the nature of the change, describe its intent and acquire the consent of the affected CPC before updating the codes.

The Sub-Committee agreed that codes no longer in use will be maintained in the database but will not be available in future e-forms. Likewise, updates were suggested by certain CPCs where the incorrect code was used and adopted.

11.3 Rules applied to historical data revisions

The Sub-Committee does not recommend change to the rules applied for historical revisions.

11.4 Review of the deadlines for submitting statistics to SCRS intersessional meetings

The Sub-Committee does not recommend change to the rules applied for deadlines for submitting statistics.

11.5 Other related matters

No other matters related to the data submission policy were discussed.

12. Review regional or individual CPC data collection programs, including capacity building programs, for artisanal fisheries and provide a plan to work with relevant regional and sub-regional international organizations and CPCs to expand such programs or implement them in new areas to improve data on billfish catches in these fisheries, Rec.[12-04] paragraph 9.12. Future plans and recommendations.

The case studies presented in section 2.7 show the complexities of collecting artisanal data. While some programmes are very successful, in general, CPCs face difficulties to set in place and maintain monitoring systems. Often data collection is good over short period, but difficult over longer term. The Group was made aware of several other projects, beyond the scope of ICCAT that are also seeking to improve artisanal fishery data collection. This demonstrates that, instituting some successful programmes that have been done within ICCAT, there are complexities and difficulties that need to be overcome, and these can potentially be addressed by coordinating with other external projects and building on work already being conducted. It is important ICCAT liaises with these initiatives and makes the maximum use of the information collecting structures that are already in place.

The Sub-Committee recommended that such interactions with these initiatives be initiated in the intersessional period.

12.1 Review Collection Programs (Rec. 12-04) for billfish artisanal fisheries

Venezuela has two data collection programs to monitor billfish catches by artisanal fisheries, one for artisanal coastal drift-gillnet that targets billfish species and another for artisanal off-shore longline fleets that targets dolphinfish and billfish species. The program for the artisanal coastal drift-gillnet fishery is part of the Enhanced Billfish Research Program that has been recording species-specific catch and effort for the past 20 years. The other program, recently implemented with the support of the JDMIP, is aimed to expand and enhance the species-specific catch and effort data recording in the artisanal off-shore longline fleets.

Other data collection programs that document artisanal billfish catches also exist in the Convention area, including at least some of those noted in case studies presented in Section 2.7.

The Sub-Committee noted one of the main problems with the assessment of white marlin was that Task I catches are incomplete resulting in under-estimates of total removals. This situation results in recreational and artisanal fisheries being poorly sampled, a problem that is exacerbated in the billfish catches coming from the Caribbean Sea. The solution to this persistent problem must start with the SCRS being more involved with the regional management bodies and local government entities that exist in the area.

12.2 Scientific observer programme and ICCAT Moratorium

French and Spanish scientists in charge of observer programs on purse seine wanted to draw the attention of the Sub-Committee to the question of technical interactions between scientific observer programmes and compliance observer programmes. France and Spain set in place an observer programme on purse seiners since 2003 within the Data Collection Framework of the European Union. This program is co-financed by UE and national research institutes (IEO, AZTI and IRD). Following an ICCAT recommendation, it seeks a 10 % coverage with an observing effort equally distributed all over the year. This programme has a clear scientific objective and collects detailed data on fishing strategies, catches, by-catches, discards (species composition, size, sex, biological sample, etc.). This programme is working very well and is tightly coordinated between institutes which have the same data collection protocols, same software, same data quality controls and a common data base structure. Scientists contribute to SCRS on this programme with common analysis.

The setting in place of the ICCAT moratorium on FAD fishing in January and February each year requires that tuna companies to embark observers for compliance if they expect to fish in the moratorium area. In 2013, this operation has been guaranteed by the industry itself with the collaboration of research institutes: this means in fact that the regular scientific programme (seeking 10% coverage) has been extended exceptionally to 100% during this period with observers having the particular duty to verify that FAD fishing or operation does not occur.

For the 2014 moratorium period, the situation will change as a private company will be responsible to run the observer program of the moratorium resulting from the ICCAT call for tenders of the observer programme. As it is not possible to have two observers on board this means that the scientific programme will have to be stopped during the most part of the first quarter (before and after the moratorium as the purse seine trip could start/finish before/after). The Group feel that this situation is regrettable because it will hamper the collection of extremely valuable scientific information for estimation of fisheries impact on stocks and ecosystem due to compliance activities.

The Sub-Committee recommends that measures are taken in order the scientific observer programmes in place are in position to be continued all the year round without any interruption during the moratorium period.

The Sub-Committee was also informed of an experimental observer program (“OCUP”) to be tested on the French purse seine fleet. A summary of the presentation is provided in **Appendix 4**.

13. Evaluate and provide advice on alternative methods to collect by-catch and discard data on artisanal fisheries that are not subject to ICCAT's minimum standards for scientific observer programs [Rec. 11-10]. Since 2012, this information will be included in the Annual Reports.

It was noted that to date very limited information had been provided on this particular topic, possibly due to complications in addressing this issue. Methods discussed in sections 2.7 and 12 above, such as electronic monitoring could be tried and some of the successful case studies such as the Venezuelan system could be put forward as examples of potential ways to solve this problem. The various artisanal data collection systems mentioned above could also be used to address this issue.

As in prior meetings of the Sub-Committee, the experimental use of electronic observation systems was recommended as an approach that could be used to supplement and, in some cases, substitute for human observers in cases where space for on-board observers is limited. However, these methods are not limited to collection of by-catch data since they form a basis for documenting the composition and disposition of the total catch.

14. Other matters

SCRS Strategic Plan

Considering the outcomes of the 2011 Working Group on the Organization of the SCRS, the *Resolution on Best Available Science* [Res. 11-17] and the necessity for provision of appropriate advice to present and future requests from the Commission, the SCRS recommended in 2012 the elaboration of the 2015-2020 SCRS Science Strategic Plan. The result of the first phase of the development of this Plan was presented (SCI-081). It integrates the results of a consultation with the SCRS Officers and the Secretariat as a first attempt to define the main components to be considered: mission, vision, SWOT analysis, values, goals, objectives and strategies. The latter being framed within five thematic areas: data collection, research priorities, participation and capacity building, dialog and communication, and stock assessment and advice.

As established in the roadmap adopted by the SCRS, the outcome of this first phase of the development of the Strategic Plan requires further discussion and elaboration; it was suggested that the plan should be distributed to head scientists at CPCs for comment and review.

Special Issue

A Special Issue of Fisheries Research on "Development, Testing, and Evaluation of Data-Poor Assessment and Management Methods" will be published in 2015. The proposed Special Issue will centre around the primary themes, *i.e.* New methods for data-poor assessment and management, Review of past uses and deficiencies, simulation testing and comparison among approaches and prospects for alternative management and data-collection protocols for data-poor stocks. It is therefore highly relevance to the work of the ICCAT and a potential avenue for publishing work conducted by the SCRS.

14.1 Review progress on prior year recommendations of the Sub-Committee on Statistics

In 2012 it was noted that historically, the Task I fleet statistics reports have been incomplete and, at times, inconsistent, making use of these data of questionable value. While recognising that the vessel registry is the list of licensed vessels and Task I fleet statistics is of active vessels, the Sub-Committee recommended cross checking the available fleet statistics reports with the ICCAT vessel register to identify gaps in reporting and to initiate discussion on methods to improve the quality (or need) of this data set. The Secretariat made good progress on this recommendation and has proposed to work toward homogenizing the data elements recorded in the various vessel lists held by ICCAT to enhance the scientific utility of a database recording vessels permitted to fish for tuna and tuna-like species in the Convention area.

In 2012, a revision of catch statistics from Venezuelan baitboats for year 2000 was presented in SCRS/2012/113. The Sub-Committee endorsed the proposal to incorporate the revision into the data base. This was accomplished in time for the 2013 albacore stock assessment.

In 2012 it was noted that the tropical tuna species group would make recommendations on what additional data should be collected in the call for tenders distributed on 6 September 2012 in response to [Rec.11-01] on requirements for a regional observer program for tropical tuna fisheries. Recommendations received by the Secretariat were incorporated, but due to lack of response from the affected CPCs, it appears the ROP may not function in 2013-2014.

In 2012, the Secretariat generated a list of confidential data sets and their potential utility for scientific evaluations (Table 2 in 2012 Sub-Committee Report). The Sub-Committee recommended that access to the raw level data be provided under the Commission's confidentiality policy guidelines for data sets which are likely valuable sources for scientific estimates in support of stock status evaluations so that their utility can be thoroughly investigated. Thus far, little progress on accessing these potentially scientifically valuable data sets has been made and the Sub-Committee reiterates that Species Groups begin accessing and evaluating these data.

The apparent need for supplementing available resources to support data base management needs of the SCRS (additional manpower) was again raised and recommended. This recommendation has been made for a number of years and while an additional database management support position should have been included in the 2012 and 2013 budgets of the Secretariat, it was not. In fact, the 2013 proposed budget implies a substantial reduction in database management support for SCRS needs. The Sub-Committee recommends against such a reduction in support for its activities and continues to recommend an increase equivalent to one additional person-year to support the increasing demands placed on SCRS to meet the needs of the Commission. In spite of prior recommendations to better coordinate the budget request to address SCRS support needs, no action has been taken to improve this coordination.

In 2012 it was noted that, following the t-RFMO Kobe recommendations, the Secretariat had been involved in the development and implementation of the Consolidated List of Authorized Vessels (CLAV) project, which comprises the current lists of authorized fishing vessels of each t-RFMO. Unfortunately little progress on CLAV has been achieved this year since the IOTC has reduced activity on further development of CLAV. Even though intersessional work on CLAV was limited, it was noted that many vessels have unique vessel identifier numbers issued by Lloyds (IMO numbers) and that the submission of this information to ICCAT has become obligatory, although infrequently reported. In 2012, the Sub-Committee recommended incorporating IMO information provided through an initiative by ISSF into the ICCAT component of CLAV, which, after verification by CPCs has been accomplished. The Sub-Committee recommended that this practice continue.

Following a sharks species group 2011 recommendation, the Secretariat formally requested EUROSTAT and FAO’s databases on shark statistics and this information has been received. In 2012 a need for further discussion with EUROSTAT experts to further elicit understanding of the database and its utility for addressing the sharks Working Group request to derive comparison, was identified. The Sub-Committee was informed that some discussions were held and that discussions indicated that the work required to derive the desired comparison was quite extensive and at the moment could not be completed with the current staffing at the Secretariat.

In 2012, the Sub-Committee recommended that preliminary analysis comparing the transshipment information with the Task I data and to identify additional work that will enable more detailed analysis by SCRS scientists. The 2013 Secretariat Report on Research and Statistics (SCI-008) provided such a comparison which indicated transshipment data in some cases represented only a small fraction of the total landings of tropical tunas and is likely of limited scientific use in some cases. However there can be substantial (30% or more) of the reported landings by certain flags documented in transhipment information indicating the possibility of obtaining significant gains in scientific information for those fleets. Further investigation of these data is recommended.

In 2012, the Sub-Committee recommended that methods should be pursued to recover important data regarding species of interest to ICCAT, including Mediterranean albacore. The Sub-Committee made a recommendation to re-table the data recovery proposal to the Commission and should this not be possible to utilise existing capacity building and data collection funds to recover information. Significant progress on recovering bluefin, billfish, and small tuna data in particular, based on strategic investments by GPYP, the Data and Capacity Building Funds, and Enhanced Research Program for Billfish, in particular. The Sub-Committee recommends continued strategic investments to recover these vital data.

In 2012, it was noted that the *Recommendation by ICCAT on a Multi-Annual Conservation and Management Program for Bigeye and Yellowfin Tunas* [Rec. 11-01] requests the Secretariat to report on the content of the FAD Management Plans to SCRS for review at each Annual meeting. The FAD Management Plan as currently

defined comprises a mandatory component (number of FADs to be deployed per vessel; description of FAD characteristics and FAD markings), and an optional component. SCRS noted that in 2012, six flag States submitted FAD Management Plans and only three of these included the mandatory information, such as the number of FADs to be deployed per vessel. Besides being incomplete, the information received in these Management Plans was not considered useful for stock assessment or for improving the SCRS's ability to advise the Commission.

While it was recommended that the Commission revisit the requirements for FAD monitoring included in [Rec. 11-01] (paragraphs 17-19 and Annexes 1 and 2 of the Recommendation), this was not accomplished at the 2012 Commission Meeting. The Sub-Committee thus recommends that this issue be addressed at the 2013 Commission meeting to come in line with obligations for FAD monitoring already agreed at other tRFMOs.

15. Future plans and recommendations

In addition to the recommendations noted above, the Sub-Committee recommended:

- More focused discussions on artisanal fisheries be conducted intersessionally. Strategic investments in the short term may make improvements, but greater discussion made to avoid duplication and improve utility should be undertaken. Generally, artisanal fisheries do not have by-catch or discards and are usually multi-specific. These discussions should draw on expertise of other sub-regional and regional management bodies and evaluate how best to coordinate with other ongoing initiatives.

- A task group be formulated to identify better ways to characterize uncertainty in unquantified aspects of data utilized in assessments. This should be done in a way that builds upon the SCRS capacity to advise the Commission on how this uncertainty impacts the robustness of scientific advice for fishery management that can be provided.

- The Sub-Committee noted that continuing difficulties are experienced due, in some cases, to Statistical Correspondents lacking adequate knowledge and expertise in providing the full dimension of data within the time-frames that CPCs are obliged to produce. The Sub-Committee recommends that CPCs take steps to assure that Statistical Correspondents are fully versed and equipped to meet data reporting obligations and that those individuals attend the Sub-Committee on Statistics Annual meeting, at a minimum.

16. Adoption of the report and closure

The report was adopted through correspondence, as agreed prior to closure of the meeting.

The Chair thanked the Sub-Committee for continued good work and also the very hard work of the Secretariat and co-Rapporteurs, after which the meeting was closed.

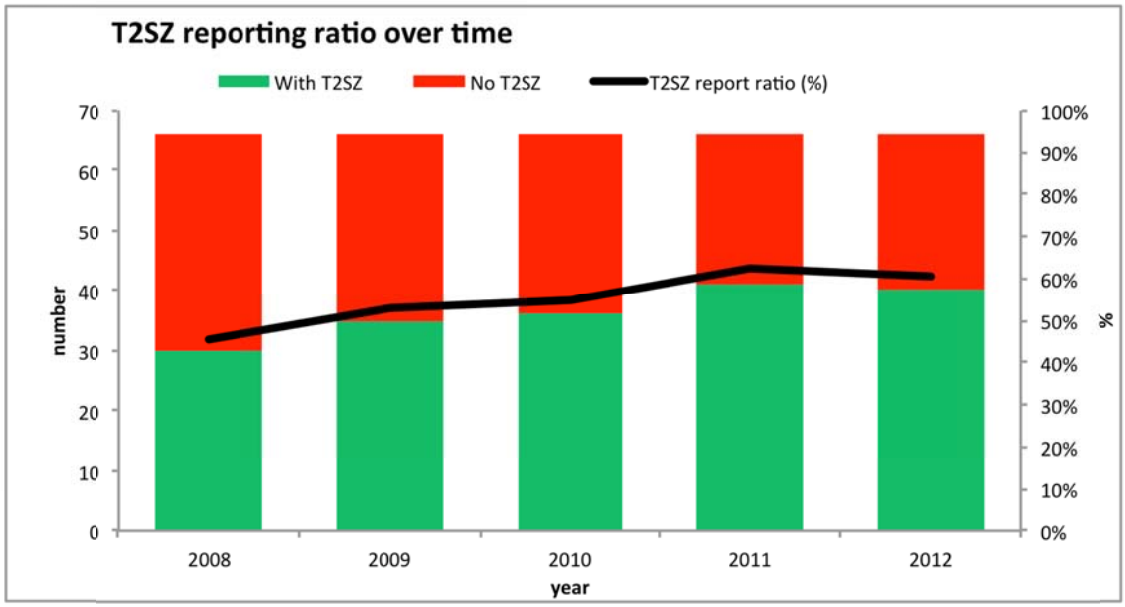
References

Anon, 2013. Report of the 2012 Inter-sessional Meeting of the Tropical Tuna Species Group. ICCAT. Collect. Vol. Sci. Pap. 69 (5). Pp. 1935-1994.

Table 1. Use of Data Funds from [Res. 03-21] and other ICCAT funds in 2013. This table does not include the activities funded by GBYP, EBRP or JDIMP.

Participation at meetings	SCRS meetings	Meetings 11 Countries 13 Scientists 31
Improvement of statistics	Validation and preparation of the 1996-2005 Ghana Task II statistics*	
	Stay of a Ghanaian scientist at the IRD center in Sète to work in the validation and processing of Ghanaian Task II data for the period following 2005*.	
	Small tuna data recovery for Senegal, Côte d'Ivoire and Morocco under the SMTYP	
Support to the work of the SCRS	Participation of two experts to give the training course on the Stock Synthesis Assessment model (SS3)	
	Participation of two experts on large scale tagging programs in the ICCAT intersessional Tropical Tunas Species Group meeting	
	Contract of an expert to coordinate the preparatory work and establish the TOR of a feasibility study on an AOTTT.	
	ALB assessment peer review	
	Short-term contract Sea Turtle Ecological Risk Assessment Expert	
	Participation of the swordfish General Coordinator in the Atlantic swordfish stock assessment, following his retirement	

*These activities were considered in the plan for the improvement of Ghanaian statistics adopted by the SCRS.



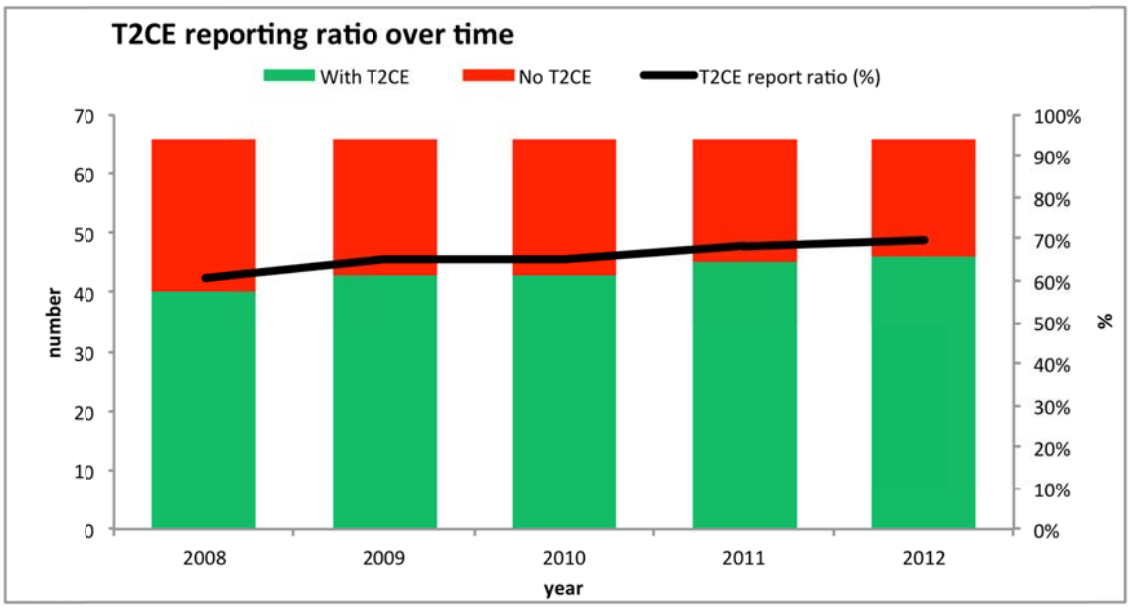


Figure 1. Tendency over time in reporting rates for Task II size (T2SZ) and catch effort (T2SZ). This figure only indicates the proportion of CPCs providing information and does not provide any indication of the quality of the information.

Appendix 1

Criteria for acceptance of statistical data received under official formats

This is a proposal of criteria for acceptance or rejection to be applied to data submission obligations of the CPCs in reference to Statistical Fisheries data Task I, Task II and Tagging. The Secretariat is increasingly receiving data that are not properly qualified, using incorrect codes, incomplete data, incorrect time area resolution, etc. However there is not a guideline or criteria of minimum standards for acceptance, and this greatly increase the work and delay for integrating this data.

The criteria detail below will be in effect in 2014, and introduce two levels of examination of the data, Filter 1 and Filter 2. As recommended, Filter 1 will be applied in 2014, and rejected data submission will be returned to CPCs for corrections. Filter 2 will be applied by the Secretariat, BUT will not cause a rejection. The Secretariat will report to the SCRS on the results of Filters 1 and 2 in 2014 and it will evaluate the benefits/problems. For compliance purposes, only accepted data will be taking into account. This should be clearly communicating in the Annual Circular distributed by the Secretariat.

I. Criteria Filter 1

Applies to statistical and tagging electronic forms approved by the SCRS, including ST01-T1FC, ST02-T1NC, ST03-T2CE, ST04-T2SZ, ST05-CAS, and tagging ST-TAG01, ST-TAG02 and ST-TAG03. It will be applied also to special exchange formats [properly agreed between the Secretariat and a CPC] as long as these complied with the information required in the electronic forms mention above.

a) Data must come in one of the SCRS electronic forms/Exchange formats
b) Header section must be complete
c) Detail section must be filled-in using ICCAT codes
d) Revisions/updates must be indicated in notes: COMPLETE REVISION or PARTIAL REVISION (important: if PARTIAL revision, the data to be substituted, must indicated clearly)

II. Criteria Filter 2

These criteria will be applied to individual forms to review the data provided within each type of information provided and that will comply with the approved data requested.

a) ST01-T1FC (Fleet characteristics):
a) Number of vessels in LOA classes should equals number in GRT classes.
b) ST02-T2NC (Task I nominal catch)
a) For each row, all fields must be filled-in with proper ICCAT codes
b) All quantities: Landings, discards [dead/live] should be in kilograms (live weight)
c) ST03-T2CE (Task II catch & effort)
a) Effort cannot be NULL (rows with NULL effort are discarded)
b) Use effort units by gear approved: LL: Number of hooks; PS: fishing days; etc.
c) Time resolution: month
d) Geographic resolution: LL (5x5 grid); all other surface fleets (1x1 grid)
e) Not mix up in the same data file (by year/fleet/gear combination) different geographic grids (1x1, 5x5)
f) Species catch composition should be as complete as possible (number or weight (kg))
g) Revisions for one or more species should be submitted with all other species from the original data.
d) ST04-T2SZ (Task II Size samples)
a) Time resolution: month

b) Geographic resolution:
   i. Species specific Sampling Areas (http://iccat.int/Forms/CODES_SamplingAreas.xls)
   ii. Spatial grids: 1x1, 5x5, 5x10, or 10x10
c) Each size class frequency must be reported in header section, size intervals for reporting should follow a consistent and complete series (e.g. 2 cm intervals: 20-240 cm]. Size valid ranges will be defined for each species by the Working Groups.
e) ST05-CAS (Catch-At-Size):
a) Only for BET, YFT, SKJ, BFT, SWO (in number) – others series DISCARDED

b) Only the SCRS standard format: 1cm lower limit size class intervals
c) Time resolution: month or trimester
d) Geographic resolution: LL (5x5 grid); all other surface fleets (1x1 grid)
e) Not mix up in the same dataset (by year/fleet/gear combination) different geographic grids (1x1, 5x5)
f) Tagging (all forms)
a) Each specimen tagged (recovered) should have tag number(s) complete (Alfa+number)
b) Dates in international format (YYYY-MM-DD)
c) Latitudes/longitudes in decimal degrees
d) Units of Length (cm)/weight (kg) should indicate its type of measure, and if they were measured or estimated.
e) A recovery should have whenever possible the release INFO associated.

ACTIONS:

If ALL criteria Filter 1 a through d pass, then the file is processed, registered, and stored as valid.

Then the file is checked against Filter 2

If at least one or more of the criteria Filter 1 a through fail, the file is rejected. Then the Secretariat will inform the CPC of the action and the reasons for rejection.

For Compliance purposes, only the date of acceptance will be reported.

Appendix 2

Description of data collection and processing systems for example artisanal fisheries in the ICCAT Convention Area

Venezuela (SCRS/2013/112)

[insert tonnage and # of canoes] At-sea and port sampling to monitor the Venezuelan artisanal off-shore (VAOS) fleet targeting tuna and tuna-like species using pelagic longline gear continued for the second year of a three year project funded by the JDMIP. Sampling continued in the two key fishing communities selected for the period of March to December 2012. At-sea sampling since the beginning of the Project consisted of 52 observed trips by 7 trained Captains, totalling 573 sets. The overall main target species recorded, measured and sexed, include five billfish species (SAI, WHM, SPF, BUM, and SPG), and dolphinfish (DOL). Secondary target species include catches of silky sharks (FAL) and scalloped hammerhead (SPL) sharks. The tuna sample was mostly formed three tunas species (BLF, YFT, and BET). Port sampling activities recorded landings and operational characteristics from 61 vessels during the overall sampling period, in which all billfish and shark species were identified and length measures were recorded, and all shark specimens were sexed.

Senegal (SCRS/2013/176)

Ce rapport est produit dans le cadre du programme de recherche sur les thonidés mineurs lancé en 2013 par l'ICCAT. Le rapport présente les méthodologies de collecte d'estimation, d'identification, de récupération et de validation des données historiques de thonidés mineurs de 1970 à 2012 capturés par les principaux engins de pêche artisanale au Sénégal. Il s'agit des données relatives à la flottille artisanale, aux captures, à l'effort et aux tailles des quatre principales espèces : thonine, bonite à dos rayé, thésard blanc et auxine capturées de façon ciblée ou accessoire par les principaux engins de la pêche artisanale. Les données ont été collectées au niveau des principaux ports de débarquements de la Pêche artisanale par les enquêteurs du Centre de Recherches Océanographiques de Dakar/ Thiaroye (CRODT). Par la suite une analyse synthétique est faite sur les données récupérées.

Cote d'Ivoire (SCRS/2013/175)

Le système de collecte de données en Côte d'Ivoire est jusqu'à présent orienté essentiellement sur un certain nombre d'espèces, notamment les espèces majeurs. Il est surtout concentré depuis plusieurs années sur les sites de débarquement d'Abidjan que sont le port de pêche, le site de Zimbabwé et celui d'Abobodoumé. Le projet de reconstitution des données historiques (1984-2011) sur les thonidés mineurs en Côte d'Ivoire, effectué par le Centre de Recherches Océanologiques, a permis de mettre en évidence la nécessité d'élaborer un plan d'amélioration de la collecte des données statistiques halieutiques. Dans l'ensemble, ce système souffre d'un manque de moyens financiers et matériels qui met en mal les efforts d'amélioration et sa pérennité. Il est évident qu'une contribution nationale est primordiale, notamment à travers une synergie entre le Centre de Recherches Océanologiques et la Direction de l'Aquaculture et des Pêches afin d'optimiser le travail de collecte et de saisie effectué par leur personnel technique. Ceci passe par la définition claire des protocoles d'échantillonnage, la formation et/ou le perfectionnement des connaissances des techniciens, la validation des méthodologies et le développement de méthodes automatisées pour les traitements statistiques. Il faut néanmoins étendre la collecte de données aux sites importants déjà identifiés et évaluer l'importance des nouveaux sites. L'élaboration d'un plan de collecte de données plus performant qui prenne en compte l'ensemble des espèces capturées et des engins de production (y compris la pêche sportive) est nécessaire à l'obtention de données complètes et fiables. Un appui financier annuel et régulier de l'ICCAT contribuerait énormément à la mise en œuvre, au suivi et à la pérennisation de ce système de collecte de données statistiques en Côte d'Ivoire.

Morocco (SCRS/2013/164)

The present study consisted of the recovery of historical catch and effort data for small tunas caught by Moroccan artisanal fleet operating in the Atlantic during the period 1995-2011. Historical catch and effort data were also collected for Atlantic and Mediterranean traps for the period 1984-2011. The quality of these data is in overall satisfactory. Based on the results of this study, a revision of the Task I data is recommended before these data are validated.

Ghana (SCRS/2013/XXX)

A presentation by Ghana highlighted some of the challenges and difficulties in recovering data from artisanal fisheries. Marine and coastal living resources including fish as a source of rich protein has been the backbone of many rural small-scale fisheries. Increased fishery overexploitation and habitat degradation are threatening the coastal and marine fisheries resources. The lack of adequate data and information on the abundance, catch, effort and price of fish species among others has culminated in low quality of information for sound management purposes. It is thus important that efforts to improve fisheries statistics be enhanced to develop further the industry.

Artisanal monitoring of small tuna species are mainly done by collecting data from the field spanning over 308 landing beaches. Sampling stations are involved with a systematic programme monitoring over 120 species (both pelagic and demersals). Some species monitored are the Frigate tuna and Black skipjack tuna among others.

All data are computed via the FAO software “code named”- ARTFISH (Stomatopoulos C. and Jarette T., 2000). The methodology follows after Barerji 1972 where sample based records are used to estimate the total catch. Estimation of Catch Effort, Cpue, Price and Value of all species are done for all coastal districts by gears and pooled to the overall total.

Very little biological sampling of the small tuna species caught by the artisanal fleet are conducted, however, these species are often caught as by-catch from the Purse Seine fleet and observed. There is room for improvement in sampling these species for more information on the dynamics of the fishery for improved fisheries management. A more pragmatic approach at monitoring is needed with adequate resources such as funds, manpower and logistics.

Cape Verde (SCRS/2013/190)

Après plusieurs années de retard dans les données statistiques de l'Institut National pour le Développement des Pêches, en raison de divers problèmes, dont celui lié au programme statistique, les données finales sont disponibles de 2005 à 2012. Sont donnés par rapport à la pêche artisanale, semi-industrielle et industrielle de la flotte Cap-verdienne pour les thons tropicaux et les thons mineurs capturés dans la ZEE du Cap Vert et au-delà. Bien que le nouveau logiciel sera appliquée seulement à partir de 2013, les données définitives mettra à jour les statistiques de l'ICCAT et à partir de maintenant nous pensons fournir à chaque année, les données finales de l'année précédente.

Appendix 3

QUALITY INDICATORS of input information to the Stock Assessment models

Scientists and Commissioners interested by the results of tuna stock assessment done by ICCAT, or by other tuna RFOs, are often questioning on the quality and uncertainties in the inputs used to assess the status of a specific species. Indeed, for ICCAT, Recommendation [05-09] requires SCRS to advise the Commission on the impacts of data deficiencies on the stock assessment advice we can provide. Also, to the degree possible, SCRS quantifies uncertainties in assessments and provides risk-based fishery management advice in the form of a Kobe 2 Decision Matrix, as required by the Commission, and which permits the Commission to apply its risk-based Decision Framework [Rec 11-19]. Never the less, there remain unquantified uncertainties which may be substantial and methods to address these and incorporate them into management advice need further elaboration. This question is fundamental as the quality and uncertainty in the inputs widely justifies the level of sophistication of the stock assessment model and conditions the uncertainties that can be quantified in the diagnosis of the status of all stock assessment results and of all KOBE2 projections.

An *ad hoc* working group (WG) which met subsequently to initiate discussion on one element of the Sub-Committee on Statistics work plan for 2014. Agreed that this pending question should be clarified in the presentation of each stock assessment status summary.

The WG suggested elaborating an *ad hoc* method such as previously used by SCRS to qualitatively communicate uncertainty (see **Figure 1**) should be envisaged in order to better evaluate and show the major, unquantified uncertainties in the inputs used in stock assessment of each stock analysed by ICCAT. This method proposes to give a quality score for the basic fishery data & scientific knowledge concerning each stock. The method would be that a given table (such as **Table 1**) and/or graphic, should be carefully filled by several scientists from each WG (& also preferably by scientists external to the WG).

The WG proposed an approach to consider would be to score the information for each stock for 3 input categories: (1) fishery statistics, (2) biology & (3) auxiliary information. In such an approach, a quality score (ranging between 0 & 10 in this case) should be attributed to each of the 4 or 5 indicators belonging to the input category (see **Table 1**). Each indicator could be weighted accounting for its estimated importance in the stock assessment model (*e.g.,* by a weighting factor chosen by scientists) and receive an averaged quality values for the 3 inputs categories (statistics, biology & auxiliary information), while an average of these 3 values (between 0 & 10) will allow to estimate the global quality and potential influence on uncertainty associated with the stock assessment inputs for the stock.

These indicators of the quality of basic stock assessment inputs should be prepared before & independently of subsequent stock assessment and should help for the choice of an accurate stock assessment model.

The WG recommends that this preliminary proposal should be better studied and finalized by SCRS and by the Methods WG (for instance improving the categories used and their weighting coefficients) and to develop appropriate means for quantifying uncertainty attributed to the different input categories.

Table 1. Example of a proposed method allowing to quantitatively estimate the quality/uncertainty of the basic inputs to each stock assessment (SKJ stock given as an example).

Category	Item	Weighting factor	VALUE Best=10	Score
STATISTICS	Realistic TASK1 for the combined catches?	0,3	8	2,4
STATISTICS	TASK2 C/E: % of fisheries covered by detailed time&area strata of effort & catches	0,3	7	2,1
STATISTICS	Task2 sizes: Realistic size sampling for the main fleets: nb of tuna measured /1000 tons	0,3	8	2,4
STATISTICS	Availability of additional infos used in SA (VMS, observers,environment):	0,1	6	0,6
Total statistics				**7,5**
BIOLOGY	Good Knowledge on growth by sex and max age	0,3	5	1,5
BIOLOGY	Natural mortality at age/size & sex	0,3	3	0,9
BIOLOGY	Size/age at first maturity	0,2	8	1,6
BIOLOGY	Movements, migrations and stock/pop structure in SA	0,2	6	1,2
Total biology				**5,2**
Auxiliary Information	Consistant abundance indices	0,3	2	0,6
Auxiliary Information	Environmental variability & knowledge of its effect on the stock	**0,1**	5	0,5
Auxiliary Information	knowledge & importance of economic drivers	**0,1**	6	0,6
Auxiliary Information	Knowledge & variability of size specific selectivity	**0,2**	7	1,4
Auxiliary Information	Effects & knowledge of cryptic changes in fishing power (by gear)	**0,3**	5	1,5
Total Aux. Indicators				**4,6**
Total Species				**5,8**

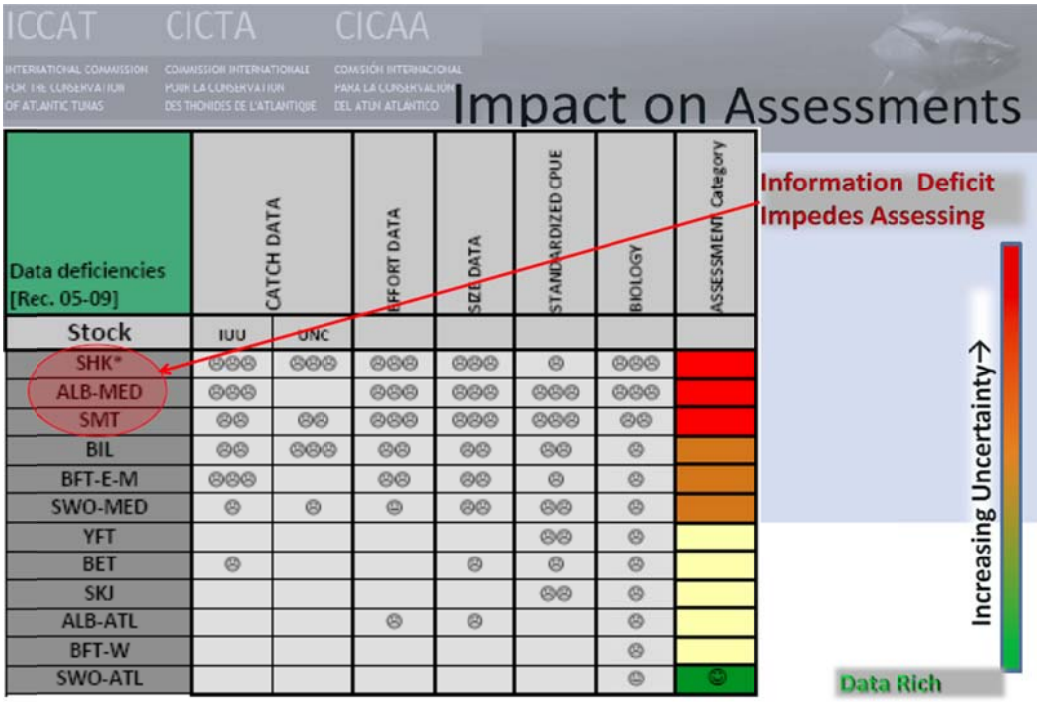


Figure 1. A graphical presentation previously used to communicate to the of the Commission, impact on stock assessment advice resulting from data deficiencies related to different elements considered in stock assessments.

Appendix 4

Program OCUP

The question of the multiplicity of requests for observation onboard fishing vessels in a recurrent problem and a presentation to the Sub Committee has been made by P. Chavance on "OCUP" experimental programme on French purse seine fishery and financed by the industry. This programme started from one year period in July 2013 and has the objective to test the feasibility of setting in place an observer body with a general assignment compounded of four different complementary tasks:

1. scientific observation;
2. control of fishing activities;
3. monitoring of good practices implementation;
4. a certification process.

The programme is conducted by Oceanic Development (a Bureau VERITAS branch) and partnership includes scientific organization, fishing industry, fishery administration, costal countries authorities, European DG Mare, tuna-RFMOs and regional organizations. The plan of operation includes employment of 30 observers with high level of qualification, the majority recruited locally and insuring 60 trips (i.e. almost 50 % coverage of French fleet in Indian Atlantic oceans). The programme includes the organization of working groups with programme partners in both oceans in order to enrich and validate the approach. At the end of the experimental year, we expect: a proof of concept of OCUP programme; a validated content for the mission of OCUP observer and precise list of tasks; a recognized and high level training programme for OCUP observers and a series of tools helping managing the programme and insuring data quality control.

The general aim of the programme is a trial whether scientific programmes can be upgraded with additional tasks and whether these sometime conflicting tasks are compatible or not. It is well noted that there may be potential conflicts of interest between compliance and scientific observer data collection and it will be interesting to see whether these conflicts of interest can be overcome. This experiment could be useful to see whether conflict of interest can be overcome. The project also aims to improve collaboration between observers and what is captured by skippers in e-logbooks.

It was noted that, for example, the EU target 10% observer coverage, but this is difficult to achieve. Reducing coverage will be undesirable from scientific view and will lead to higher uncertainty especially for rare event species. Electronic monitoring has been proposed as an alternative to improve coverage. This form of monitoring is promising and should continue to be evaluated.