**Appendix 4**

**WORK PLANS OF THE SPECIES GROUPS FOR 2014**

**Tropical Tunas Work Plan**

Considering that the last stock assessments (SA) for the eastern and the western stocks of Atlantic skipjack were not updated since 2008 with data until 2006, the tropical species group plans to evaluate these two stocks in 2014 during a nine days inter-sessional meeting. In prevision of this stock assessment meeting, Task I and II should be updated until 2013 and sent to the ICCAT Secretariat at least six weeks before the beginning of the SA meeting. Due to the amount of skipjack catches in many surface fisheries in the Eastern Atlantic, the Group will integrate the estimates by species (commercial tuna catch and *faux poisson*) in the skipjack stock assessment.

Considering the multispecies nature of the tuna tropical fisheries, the interaction between the three species and gears, and the needs to follow the trends in the exploitation rate of the stocks which have not been evaluated the same year (i.e., yellowfin and bigeye), the Group recommended that CPC participants of this stock assessment provide several fishery indicators for the three tropical tuna species. Indices such as CPUEs should be updated until 2013 for the three species and should tentatively be standardized and presented with auxiliary information within the framework defined by the Method Working Group in 2012 (see Chap. 3: *Protocols for the Inclusion or Use of CPUE Series in Assessment* in the Report of the 2012 Meeting of the ICCAT Working Group on Stock Assessment Methods). Likewise, updated CAS should be provided for skipjack, and if possible, for the two other species by the Secretariat.

Due to the importance in catches of the Ghanaian fleets, the Group expressed the need to obtain additional information on catch per vessel and % of fishing days per year of the Ghanaian purse seiners prior to adopting the preliminary Task I estimates presented during the 2013 Species Group, for the 2006-2012 period. Assuming that such a document is made available prior to the 2014 inter-sessional stock assessment meeting, most likely the skipjack stock assessment (at least three months before the stock assessment meeting), the Group recommended that the assumptions used in the corresponding 2013 SCRS document be fully evaluated and that adoption be reconsidered.

In agreement with the concept of best available science, the presence of an external participating expert during the skipjack stock assessment is highly suitable. The terms of reference will be provided by the Working Group and corresponding cost for this participation should be evaluated by the Secretariat.

During the Species Group in September 2014, the efficacy of the time-area closure on FADs [Rec. 11-01], in terms of reduction in mortality of juvenile bigeye and yellowfin tunas will be evaluated in light of the revised and updated statistics and on the best information available. Priority will be given on examining descriptive statistics concerning changes in catch and effort levels and distribution as, with only one year of data available, it is unlikely that a full evaluation of the efficacy of the closure will be possible.

***Atlantic Ocean Tuna Tagging Programme (AOTTP)***

During previous meetings of the SCRS (2010 and 2012), a tagging plan was developed that described a five year Atlantic Ocean Tuna Tagging Program. Last year the Group proposed to update and develop this document to reflect current tagging objectives, priorities and the budget including the voluntary contribution provided by the United States in support of the Tropical Tunas Tagging Program scheduled. The detailed scientific design for the program required to achieve the objectives agreed in the inter-sessional tropical tuna meeting in 2013, was presented in the SCRS 2013 and the Group agreed on the following work plan for the Atlantic Ocean Tuna Tagging Program (see Addendum 1 to Appendix 4 for more information on AOTTP Task force work plan):

﹘ To prepare and submit a project proposal and a funding request for DG Mare to carry out feasibility study for the implementation of the Atlantic Ocean Tropical Tagging Programme.

***Responsibility:*** AOTTP task force/ ICCAT Secretariat.***Deadline:*** before end of 2013 SCRS meeting

﹘ Tolaunch the feasibility study for the implementation of the Atlantic Ocean Tropical Tagging Programme.

***Responsibility:*** ICCAT.***Deadline:*** end of 2013/beginning 2014.

﹘ To provide assistance to those who will carry out the feasibility study for the implementation of the Atlantic Ocean Tropical Tagging Programme and present to the 2014 Skipjack Assessment Meeting. ***Responsibility:*** AOTTP Task Force and the Working Group.***Deadline:*** Skipjack stock assessment meeting.

﹘ Based on the results of the feasibility study to develop a proposal for the AOTTP programme including objectives, plan of work, timeline and budget to be presented during the inter-sessional stock assessment meeting and finalized in 2014 SCRS.

***Responsibility:*** AOTTP Task Force.***Deadline***: First draft for skipjack stock assessment meeting; final version for 2014 SCRS meeting.

﹘ Communicate with possible donors to seek their willingness to fund such a project and identify procedures to mobilize the funds.

***Responsibility***: Consultant + AOTTP Task Force.***Deadline***: First report skipjack stock assessment meeting/final 2014 SCRS meeting.

﹘ To organize a ***peer-review*** meeting with external expertise to review the AOTTP proposal.

***Responsibility***: Tropical Tunas Working Group.***Deadline***: Before 2014 SCRS meeting.

***Addendum 1 to Appendix 4***

**AOTTP Task Force Work Plan**

In 2010, the SCRS recommended the implementation of a large-scale Atlantic Ocean Tuna Tagging Programme (AOTTP) and several delegations endorsed the proposal during the 17th Special Meeting of the Commission and invited all Contracting Parties to contribute financially to its implementation. During its inter-sessional meeting held in March 2013 in Tenerife, Canary Islands (Spain), the Tropical Tuna Species Group revised the list of AOTTP objectives and a Task Force was created to discuss and prepare a comprehensive proposal for the AOTTP.

Today, large uncertainty remains in the stock assessment of tropical tuna stocks in the Atlantic Ocean. A tuna tagging programme at the scale of the tropical Atlantic Ocean would allow ICCAT to acquire the needed missing parameters in order to improve stock assessment analyses and reduce their uncertainty.

Such large-scale programs have been conducted in the Pacific and in the Indian Ocean with great success and today the data resulting from those programs are routinely used in stock assessment analysis and contribute to improve scientific advices for the adoption of management measures by the WCPFC and IOTC.

The Task Force created to undertake the preparatory work of the AOTTP is currently formed by the SCRS Chair, the Tropical Tuna Species Coordinator, the Tropical tuna rapporteurs and a consultant to coordinate its activities and is open to any scientists that would like to participate in the work. Objectives of the task force include:(i)the development of a comprehensive project proposal for the AOTTP built on the lessons learned from the programs in the Pacific and Indian Oceans, and from previous tagging activities in the Atlantic;(ii) the development of Terms of Reference for a Feasibility Study on the implementation of the AOTTP; and (iii) to identify potential donors and contributors to the program. Document SCRS/2013/195 presented a work plan for the Task Force.

***Definition of AOTTP objectives and priorities***

The basis for the development of a program at the scale of the AOTTP is a clear definition of objectives. A list of objectives was proposed by the SCRS in 2010, and was later reviewed by the tropical tuna species group and the Task Force.

The overall objective of the AOTTP is to improve the sustainability of tropical tuna resources by providing the best science available to ICCAT.

Its specific objectives are:

1. To estimate of recent exploitation rates for tropical tunas stocks in the Atlantic Ocean;
2. To integrate tagging information into specialized stock assessment models;
3. To assess the effectiveness of management measures (*e.g*. time are closures, FAD management, *etc.*);
4. To provide training and capacity building to developing Contracting Parties of ICCAT in tagging; data collection and tagging data/stock assessments analysis.

The specific outputs for the project and priorities are:

1. Confirmation of the current stock structure for the three species of tropical tuna, and analysis of their movements across the Atlantic Ocean, *High*
2. Estimation of recent fishing mortality rates independently from CPUE, *High*
3. Estimation of the level of interactions between surface and longline fisheries, *High*
4. Estimation of age-area-sex specific growth rates, *High*
5. Estimation age-specific natural mortality rates, *High*
6. Estimation of tag-shedding and tag reporting rates by gear and flag, *High*
7. Training of scientists from ICCAT developing Contracting Parties to design and implementation of tagging experiments and tagging data analysis, *High*
8. Study the effect of:(i) drifting FADs on the movement patterns and biology of skipjack (at all stages) and of bigeye and yellowfin juveniles;(ii) the associated school fishing technique in some baitboat fisheries; as well as (iii) the residence time of tunas around seamounts, *Medium*
9. Contribute to stock assessment of small tunas, in particular Atlantic bonito and blackfin tuna, *High*
10. Study the link between environmental conditions and distributions and abundance of tropical tunas, *Medium*
11. Habitat and Behaviour: describe the habitat used by tropical tunas, *Medium*
12. Interaction between tropical tunas: is productivity of tropical tunas independent of the productivity of each stock? *Low*
13. Survival rates for released fish: estimate post-tagging mortality, *Low*
14. Spawning: improve knowledge on spawning patterns, *Low*

***Design and implementation of the AOTTP***

The Group recalled that, due to its large-scale, the AOTTP should be carefully designed and planned in order to ensure the best environment to achieve its objectives. Tuna tagging programs in the Pacific and Indian Oceans included a large-scale project and a suite of different small-scale operations to achieve particular objectives. The Group noted that the best structure to be given to the AOTTP should depend on the objectives and level of funding, and noted that the Task Force should study the different possible scenarios. In particular small-scale operations could allow the release of fish where the availability of tuna or bait is too low for a baitboat vessel or where the size class of the fish makes then less available to pole-and-line gear.

The Group noted that during tagging programmes, tag recovery is often underestimated while it is the main contributor to the tagging data collected. For the development of the AOTTP, the Group recommended that special attention is given to the recovery activities in order to ensure that resources allow to maximize the return of good quality data.

In particular, the Group noted that in all tuna tagging programs, reporting rates from longline fleets are very low. In the Atlantic, several of these fleets are well monitored through observer programs and the Group recommended that special attention be given to the fleet, such as:(i) quality of the data should be good;and (ii) based on the returns from these fleets, reporting rates could be inferred for other longline fleets.

The Group recalled that while the aim of the program is to reinforce the management capacity of ICCAT, developing countries in the region will also beneficiaries of the AOTTP. In fact, tuna fisheries are contributing to the economy and the food security of the coastal countries of the Atlantic Ocean, and their sustainable management is of prime interest to maintain these contributions. In addition, the AOTTP will bring capacity building to scientists from coastal countries in the region and contribute to their training regarding design and implementation of tagging project as well as the understanding of the stock assessment process.

The Group noted the different tag types that are used for large-scale tagging programs, and that the AOTTP should use a combination of the different types of tagging (conventional, chemical and electronic) in order to achieve the different objectives of the program. In addition, the Group recommended that genetic and PIT tagging are studied to review the status of the methodology and technology and see whether these types of tagging could be applied to a large-scale program and included in the AOTTP.

The Group recalled the necessity to collect auxiliary information in order to estimate tag shedding and tag reporting rate. Such information is collected by double tagging experiment (for tag shedding), tag seeding operations and/or comparison of return rates with a control group (for tag reporting rate). Regarding estimation of shedding rate, the Group noted that methods should be studied to ensure the independence between the two tags.

Basic biological information for small tuna in the Atlantic is largely unknown, while this species are important for coastal states as they contribute to the local economy and food security of coastal populations. The Group reiterated that the AOTTP will also be a good opportunity to contribute to estimate basic biological parameters for these species, and in particular Atlantic bonito and blackfin tuna, such as growth, stock structure and movements which would contribute to future stock assessment analyses. However, the Group agreed that tagging of such species should not divert the AOTTP from its main target. The Group suggested that a review of the species composition should be made in order to assess if those species could be tag in the same time as the main tropical species, or if their tagging would require dedicated tagging operation under the AOTTP framework.

***Feasibility study***

The Group was informed that the EU could potentially fund a Feasibility Study for the AOTTP in 2013 and recommended that the Task Force develops terms of references and that the ICCAT Secretariat prepare a proposal to the EU and request for the funding of such activity, recognizing that a Feasibility Study would be necessary for the development of the project proposal for the AOTTP.

***Funding***

The Group noted that total financial needs for a project such as the AOTTP should be in the order of magnitude of the programs implemented in the Pacific and Indian Ocean, i.e., €12-15 million, depending on the structure of the project and its objectives.

The Task Force will also be responsible to identify potential donors interested in participating in the funding of the AOTTP, and identify the process to mobilize the funds from the different sources.

The Group noted that only Senegal has sent a letter of interest to the European Union so far, and Cape Verde and Côte d’Ivoire have prepared a letter that should be sent in the near future. However, the Task Force reminded the Group that the submission of these letters is essential to initiate the request for funding to the European Union, as potential contributors to the AOTTP. The Group recommended that all developing coastal countries from the Atlantic send a letter of interest regarding the implementation of a large-scale tuna tagging programme in the Atlantic Ocean to the European Union within the best delays. The Group noted the interest of Brazil to participate in the programme and recommended that the Task Force follows this up.

***Simulation study***

Documents SCRS/2013031 and SCRS/2013/189 presented the results of tagging simulation studies for tropical tunas in the Atlantic. The simulations study the influence of different scenarios on the estimations bias of the key parameters estimated from tagging experiments, *i.e.* natural and fishing mortality.

The Group recognized the interest of such study to use at different levels of the development and implementation of a large-scale tuna tagging program. In fact, such simulations can be used during the design of the program to test the different release and recovery scenarios in terms of numbers of fish released, species composition of the releases and areas of release. The Group noted that the simulation model is using one fishery and two areas (North and South) and recommended that the model is further developed to include several fisheries and an eastern-western stratification, to increase its resolution and its usefulness for the design and implementation of the program. The Group noted that scientists had difficulties to estimate natural mortality from the tagging data of the Indian Ocean and recommended that the authors of the simulation contact them to discuss issues arising from their analyses.

**Albacore Work Plan**

In 2013, the North and South albacore stocks were evaluated and an interim Limit Reference Point was proposed for the northern stock, as well as several alternative HCRs that allow the Commission to choose desired levels of risk and recovery timeframes. Several models were used, including age structured and statistical catch at age models that required substantial data preparatory work by the Secretariat and other members of the Group. In the process, the Group identified several recommendations for future work that will guide the work of the Group during 2014. The main objective will be to prepare the next assessments for these stocks (not scheduled yet), by reducing uncertainty around datasets and parameters on one hand, and developing robust management procedures that cope with the uncertainty that remains. No inter-sessional meetings are envisaged.

The list of actions, responsibilities and deadlines is as follows:

﹘ Revise North Atlantic size data for Chinese Taipei longliners including all the historical period, and explain the patterns.

***Responsibility:*** Chinese Taipei.***Deadline***: September 2014. ***Deliverable:*** SCRS document.

﹘ Describe North and South spatial dynamics of Japanese and Chinese Taipei longline fisheries, their temporal changes and analyze their effect on the standardized CPUE series.

***Responsibility:*** Japan and Chinese Taipei. ***Deadline:*** September 2014. ***Deliverable:*** SCRS document.

﹘ Complete and revise French mid-water trawl historical series of catch, effort, catch at size, geographical distribution and other related information.

***Responsibility:*** EU-France. ***Deadline:*** July 31, 2014. ***Deliverable:*** SCRS document.

﹘ Further elaborate North Atlantic albacore MSE framework to consider a broader range of uncertainties and test alternative management procedures against different indicators. This will allow simplifying the process of updating management advice, as well as enhancing dialogue with the Commission on the most robust HCRs.

***Responsibility:*** EU-Spain, with involvement from the Secretariat and collaboration with the Swordfish Working Group. ***Deadline:*** September 2014. ***Deliverable:*** SCRS document.

﹘ Revise the Albacore Research Program goals, structure and budget, and establish priorities. ***Responsibility:***Albacore Species Group. ***Deadline:*** September 2014.

﹘ Collate Mediterranean albacore biological data that have likely been collected in different data collection programs (e.g. EU/DCR). Also, to the extent possible, extend back in time the available CPUE series. ***Responsibility:*** CPCs. ***Deadline:*** September 2014. Deliverable: SCRS document.

﹘ Development and testing of data poor methods for data poor stocks (i.e., Mediterranean albacore).***Responsibility:***EU-Spain, with involvement from the Secretariat.***Deadline:*** September 2014. ***Deliverable:*** SCRS document.

**Bluefin Tuna Work Plan**

Recommendation [10-04] states “In 2012, and thereafter every three years, the SCRS will conduct a stock assessment for bluefin tuna for the western Atlantic and eastern Atlantic and Mediterranean and provide advice to the Commission on the appropriate management measures, inter alia, on total allowable catch levels for those stocks for future years.”

* The Atlantic-wide Research Program for Bluefin tuna (GBYP) and various National programs have produced, and continue to produce, a great deal of new information on the biology and fisheries for bluefin tuna. In preparation for the planned 2015 assessment, time and resources of the SCRS are thus required to validate these data and to incorporate them in the ICCAT database as well as working on updated biological parameters and new modeling approaches. Therefore, the SCRS planned for several meetings in the 2012 work plan. The first two took place in 2013 and aimed at updating the biological parameters and comparing various modeling platforms. For 2014, the SCRS plans a data preparatory meeting (5-10 May) to incorporate the new catch and effort information in ICCAT databases and continuing working on new modeling platforms.

Recommendation [12-03] for the eastern Atlantic and Mediterranean bluefin tuna states “In 2014 the SCRS will conduct an update of the stock assessment and provide advice to the Commission.../... Furthermore, the SCRS shall work towards the development of new assessment modeling approaches and inputs, in a view to minimize uncertainties, which shall be used in a stock assessment in 2015 and thereafter every three years.”

The Group expressed concern regarding the above Recommendation, mostly because the SCRS may have not the resources to update the assessment of the East Atlantic and Mediterranean bluefin tuna in 2014 while also undertaking the difficult task of preparing for the 2015 assessment. In this regard, the Commission may wish to consider how the limited resources of the SCRS can be most effectively utilized. This dilemma has been debated by the SCRS, which considers that any update of East Atlantic and Mediterranean stock assessment should include updated Task I and II databases. To accommodate priorities to improve the scientific advice by 2015 and last commission request, the SCRS proposes the following workplan for 2014:

1. Conduct an Inter-sessional Preparatory Workshop in early 2014 (6 days) that will focus on the following:

a) Update fishery indicators in accordance Rec. [12-03], paragraph. 50, except for the Spanish bait boat CPUE as their quota has been transferred to Spanish purse seiners since 2012. The Japanese CPUE will have to be split into two periods, before and after TAC implementation due to changes in spatial coverage of the fishery. This will have to be done during the data preparatory meeting. Responsibility: CPCs. Deadline: end of data preparatory meeting. Deliverable: SCRS documents following the standards provided by the WGSAM.

1. Revise Task II by validating and integrating the catch at size statistics with new information from farms and other sources of information.
2. Update the length-weight relationship for both stocks, i.e. Western and Eastern / Mediterranean stocks. Responsibility: CPCs
3. Prepare CAS, CAA, WAA (total and per fleet) using the new length-weight relationship. Responsibility: Secretariat. Deadline: end of preparatory meeting.

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ec) Review tagging past and recent data for bluefin tuna.

fd) Completeoutstanding tasks from the Biological Parameters meeting in Tenerife (age-length relationships, morphometric conversions, natural mortality, reproduction, etc.). Responsibility: CPCs. Deadline: species group in September. Deliverables: SCRS documents.

23. Continue a series of workshops and related activities (to be sponsored by the GBYP and various national programs) in accordance with recommendations from the Biological Parameters Meeting (Tenerife) and the Bluefin Methods meeting (Gloucester) including:

a) Establish a reference collection for otoliths and hard parts and calibrate age estimates among readers.

b) Larval biology workshop.

c) Continue the development of new modeling platforms that can better take into account various sources of uncertainties.

There is thus a considerable amount of work to be done in 2014, i.e., validating and incorporating 10,000s of new files into the current ICCAT databases, calibrating and updating all the size and age conversion methods and continuing the development of new modeling platforms.

Therefore, if the 2014 Bluefin Tuna Species Group is able to incorporate these new sources of information into Task I and II databases and to complete the biological parameters by June May 10 2014 the), the SCRS proposes that an additional inter-sessional meeting be planned in September 2014 to update the eastern Atlantic bluefin tuna stock assessment for the species group meeting in September 2014. This update will consist in updating the data necessary to run the VPA2-BOX assessment using the exact same model specifications that have been performed in 2012. This work will be done before the species group and presented to the group for discussions and agreement. Responsibility: Co-chairs of both stock. Deliverable: a SCRS document presenting the updated assessment (if the data preparatory group is successful). Deadline: end of the species group in September 2014. However, even if the new data are available this stock assessment is unlikely to reduce substantially most of the unquantified uncertainties.

However, if the 2014 bluefin tuna species Group cannot complete these tasks by the end of the workshop (or slightly later), the SCRS proposes postponing the East Atlantic bluefin tuna stock assessment to 2015, as previously planned.

Nonetheless, if the Commission still considers updating the 2014 assessment to be of higher priority, then most of the activities under item (2) and some of item (3) above should be postponed to 2015 and the corresponding 2015 assessment would be postponed until 2016. Note that the eastern Atlantic bluefin tuna stock assessment is postponed to 2016; this will have some implication on the western Atlantic bluefin tuna stock assessment due to mixing issues.

**Billfish Work Plan**

Organize an intersessional meeting for the purpose of analyzing existing billfish data (Task I and Task II); tagging data as well as the diverse range of studies that have been conducted on biology and other aspects of billfish life-history, for use in future evaluations. Identify information gaps and uncertainties in the data. Develop a strategy to obtain the information required for assessment. It is proposed the meeting be held in May, 2014.

Data review of biological and fishery indicators of all billfish. In the case of sailfish the Working Group noted that the last assessment was in 2009 and therefore, such a review could potentially be followed by a sailfish stock assessment meeting in 2015.

The Working Group will conduct an analysis of available biological, catch and effort information, by area and quarter, in order to identify time-areas on which to focus analyses regarding the potential utility of time-area closures.

These analyses will consider, at a minimum: (1) potential billfish catch reduction, by species;(2) impact on targeted catches;(3) the biology and life history of the billfish species, in order to identify areas of specialconcern; and (4) the potential consequences of resulting shifts in effort. This plan will require that the Secretariat provide updated CATDIS and EFFDIS through the most recent years possible in advance of the meeting. CPC scientists should prepare data and documents describing relevant biology, movements and habitat preferences for billfish.

Providing that CPCs report on the methodology used for estimation of dead and live discards of marlins, the Working Group will analyze the information submitted in order to provide a response to the Commission on this matter.

**Swordfish Work Plan**

Assessments for North and South Atlantic swordfish were conducted in 2013. The next assessment is proposed for 2016.

For the Mediterranean stock, the last assessment was conducted in 2010. The next assessment should take place during 2014, using data up to 2013 to allow a preliminary evaluation of the imposed management measures after 2008.

***Proposed work***

*﹘North and South Atlantic*

A list of recommended work has been provided in the Report of the 2013 ICCAT Atlantic Swordfish Stock Assessment Session (SCRS/2013/019). Among those recommendations, the following were identified as high priority areas where continued efforts are required:

*Catch and effort data and reporting deadlines*

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. These data must be reported by the ICCAT deadlines, even when no analytical stock assessment is scheduled. Historical data should also be provided.

*CPUE series*

It is recommended that scientists from Japan, ChineseTaipei, Canada, Spain, Portugal and the United States (North Atlantic) and Japan, ChineseTaipei, Spain, Uruguay and Brazil (South Atlantic), as well as any others CPCs, coordinate their work before the meeting (possibly using videoconference), with the goal of updating the index prior next assessment (or presenting the results as document at 2014 SCRS meeting). Future data preparatory meetings should focus on resolving the conflicting indices to the extent possible prior to the next assessment. Consideration should be given to aggregating the CPUE trends by area (rather than the current method of aggregating by nation). For the South Atlantic in particular, some attempt should be made to use stock assessment methods that can reconcile the contradictory trends in the target and by-catch CPUE series for the south (e.g., age/spatially-structured models).

*Discards*

Information on the number of fish caught, and the numbers discarded (dead and released alive) should be reported in order to quantify discarding in all months and areas so that the effect of discarding and releasing can be fully included in the next stock assessment. These data must be reported by the ICCAT deadlines for submission of Task I and II data.

*Target species*

All fleets should record detailed information on log records to quantify which species or species-group is being targeted. Compilation of detailed gear characteristics and fishing strategy information (including time of set) are very strongly recommended in order to improve CPUE standardization.The Group recommended the investigation of alternative forms of analyses in the South Atlantic, that deal with both the By-catch and Target patterns, such as age- and spatially-structured models. Results should be presented as documents at 2014 SCRS meeting.

*Weight-length relationships*

The Group recognized thatthe 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.

*South Atlantic Swordfish Research Plan*

Given the poor understanding of population dynamics of swordfish in the South Atlantic, the Group should develop a long term plan for an enhanced program of research, focusing on independent estimates of fishing mortality, fraction mature by age, growth by sex and stock, movement and migrations, and improving available indices of abundance. Within the context of the SCRS Strategic Plan, this deficiency could be addressed.

*Environmental effects*

Given the possibility of spatial and environmental effects being partially responsible for the conflicting directions of some of the influential indices of abundance, the Group should further study into this hypothesis during the coming year, use existing PSAT data to compliment this work, and to determine how best to formally including these environmental covariates into the overall assessment process. The United States is willing to take a lead role in this investigation and likely collaborators would include scientist from Canada, Japan, and Spain as their indices were the most appropriate for this work. Moreover, the review of historical size data and fishery data is necessary to decide appropriate modelling structure, which should be conducted by national scientists and the ICCAT Secretariat. Expected deliverables would include quantified reduction in the conflicting indices of abundance from the temperate and tropic regions, which in turn should lead to a more stable assessment. Other products could include an increased understanding of the distribution of Swordfish and perhaps a revisiting of the geographic structure of the data and the assessment. These works should be done before the next stock assessment.

*Informative priors for carrying capacity*

Given the sensitivity of assessment results in general to prior distributions for carrying capacity in situations where the data are uninformative, the group recommends that informative priors for K be developed based upon factors such as habitat area, population density and other life history factors. While borrowing a prior based upon the posterior for K from another assessment, e.g. using the posterior for K from the North for the South may be scientifically justified; the Group recommends that future decisions such as this be based upon scientific analyses similar to the development of a prior for r.

*﹘Mediterranean*

*Past considerations relevant to the 2014 stock assessment*

*Catch and effort*

All countries catching swordfish (directed or by-catch) should report catch, catch-at-size (ideally by sex) and effort statistics by as small an area as possible (2x2 degree rectangles for longline, and 1x1 degree rectangles for other gears), and by month, particularly for the major fleets.

***Responsibility:***All CPCs;***Deadline:***one month prior to the meeting.

*Discards*

It is recommended that at least the order of magnitude of unreported catches and discards be estimated by major fleets.

***Responsibility:***All CPCs;***Deadline:***one month prior to the meeting.

*CPUE indexes*

The Group notes that it is important to collect size data together with the catch and effort data to provide meaningful CPUEs by biomass and age for the major fleets.

***Responsibility:***national scientists;***Timeframe:***15 days prior to the meeting.

*Gear selectivity studies*

Although some work has been already done, further research on gear design and use is encouraged in order to minimize catch of age-0 swordfish and increase yield and spawning biomass per recruit from this fishery.***Responsibility:***national scientists;***Timeframe:***15 days prior to the meeting.

*Stock mixing and management boundaries*

Considering differences in the catch and CPUE patterns between different Mediterranean fisheries, further research, including tagging investigations, in defining temporal variations in the spatial distribution pattern of the stock will help to improve stock assessment and management.

***Responsibility:***national scientists;***Timeframe:***15 days prior to the meeting.

*Other considerations relevant to the Mediterranean stock assessment*

*Alternative Stock Assessment Models*

Results of the previous assessment that was based on XSA were highly dependent on the selection of the plus group. The application of additional methods should be explored based on the trials made during the 2013 assessment of the Atlantic stocks.

***Responsibility:***Secretariat and national scientists;***Timeframe:***during the meeting.

*﹘Participation*

Participation in the Swordfish Species Group has been problematic in recent years. The Group recommends that CPCs that can make valuable contributions to the assessment make the necessary arrangements to ensure the presence of their national scientists at the assessment meeting.

***Responsibility:***CPCs and national scientists;***Timeframe:***15 days prior to the meeting.

**Small Tunas Work Plan**

The following recommendations should be taken into account for improving statistical and biological data as well as the structure of small tuna populations. The improvement in the data would allow conducting assessment in the future in order to provide ICCAT with appropriate management advice for fisheries targeting small tuna.

﹘ All countries should report Task I and Task II data and make effort to improve knowledge on the biology and the stock structure and other relevant aspects of these species;

﹘ National scientists should review their small tuna catches and try to classify them by species, using ICCAT small tunas species identification sheets;

﹘ National scientists should analyse historical data on small tunas collected under the ICCAT Small Tunas Research Program and present the results to the 2014 SCRS: trends in historical catches, effort and CPUE, develop simple indicators of stock sustainability, such as proportion of juveniles within the catch;

﹘ The tasks outlined in the work plan should be conducted by scientists of CPCs in 2014. These improvements to the existing data and information would facilitate an intersessional meeting in 2015 to take inventory of the information as well as allow preliminary analyses of these data.

﹘ Support the extension of the tagging project for tropical tunas to small tunas. The inclusion of small tunas will not significantly increase the budget and will provide an excellent opportunity to improve the current knowledge on the stock structure and biological parameters of small tuna species.

﹘ Encourage studies on stock structure and species distribution;

﹘ Collaborate, as much as possible through joint working groups with RFOs (GFCM, CRFM, and CECAF) to improve and exchange basic fisheries data on small tunas;

**Sharks Work Plan**

Organize an inter-sessional meeting for the purpose of analyzing existing shark data (TI and TII), tagging data as well as the diverse range of studies that have been conducted on biology and other aspects of shark life-history, for use in future evaluations. Identify information gaps and uncertainties in the data. Develop a strategy to obtain the information required for assessment. It would be advantageous to include the participation of other RFBs and RFMOs (e.g. ICES GFCM) to increase the expertise available for this work.

There is also a need to finalize the research plan, especially with regard to economic requirements as well as prioritization of research.

The group will analyse and explore the methodology used in the project which provided advice for the implementation of the EU POA (SCRS/2013/165) to estimate total sharks catches.

It is noted that the last assessment of BSH was in 2008. This meeting should thus be followed by a BSH data preparatory meeting and assessment in 2015.

This activity complements the Research Plan and need for future assessments and responses to requests from the Commission.

**Work Plan for Working Group on Stock Assessment Methods (WGSAM)**

The Working Group discussed the future work plan and retained mainly the following actions:

﹘ WGSAM recommends reviewing the protocols and algorithms for estimating Effort distribution (5x5) for longline (EFFDIS), and extended to purse seine and baitboat gears, currently prepared by the Secretariat. The Working Group should also include estimates of uncertainty on these products. It is suggested that published estimates in the ICCAT Web page, include also detailed description of the estimate assumptions and uncertainty related to these products to make aware the potential users of their limitations.

﹘ The Commission expects risk-based advice on management measures as prescribed in the Kobe II Strategy Matrix and as embedded in its Decision Framework (Rec. 11-13). An important aspect of providing such scientific advice is adequate quantification of uncertainty in stock condition and future prospects under future management option scenarios. With the advent of more commonly applied, highly parameterized stock assessment models, the computational investment in quantifying uncertainty in stock status and future prospects is quite heavy. This is also the experience at other tRFMOs and a number of approximations for quantifying both process and observational uncertainty are being applied to develop risk-based management advice. Guidance on the evolution of and possibility of harmonizing methods to apply for uncertainty characterization across species groups should be provided by WGSAM.

﹘ Including during the agenda items of 2014 some of the Horizontal Themes identified during the process of elaborating the SCRS Strategic Plan in 2013, particularly those related to participation and capacity building and quality control of the stock assessments and management advice.

﹘ WGSAM recognized that there is a trend in recent assessments conducted by the SCRS to use multiple modelling methods to estimate the status of the stock relative to ICCAT conservation benchmarks. While WGSAM agrees the use of multiple approaches is a good practice, situations have arisen where the different methods give results that are not consistent yet equally plausible. Having guidance from the WGSAM on best practices to reconcile or combine such results would be very helpful (see, for example, ICES 2007).

﹘ The evaluation of Limit Reference Points (LRP) and Harvest Control Rules (HCR) through the use of Management Strategy Evaluation (MSE) is increasingly being recognized by global tuna RFMOs as an effective means to advance their fishery management process. The 2013 assessments of albacore and swordfish were used as examples of how an MSE process could possibly be formally included in the management of those stocks.  The WGSAM plans to continue this effort by (1) continuing to refine the methods within the MSE process, (2) introduce MSE more assessments when and where appropriate, and (3) foster lines of communication that keep managers informed of their benefits and weaknesses.

**Sub-Committee on Ecosystems Work Plan**

***﹘ Proposed workplan for the Sub-Committee on Ecosystems in 2014 as pertains to by-catch:***

Continue with the assessment of the impact of ICCAT fisheries on sea turtles as initiated in 2012 to this end, the Group agreed that future work on this matter should be conducted by a coordinated group of scientists from the participating CPCs. It was acknowledged that individual CPCs have access to information/expertise and data which is not available to the Sub-Committee on Ecosystemsfor a variety of reasons. Such a coordinated study with CPC scientists providing information to improve the ERA could address this issue. This work would be coordinated by the Chair of the Sub-Committee on Ecosystemsas well as the by-catch coordinator. Objectives to be achieved include:

1. Review the inputs to the ERA, ensuring we have the best possible information available on:

i) Productivity

ii) Horizontal distribution

iii) Vertical distribution of fishing gear

iv) Vertical distribution of species

v) Post-capture mortality

vi) Selectivity/length frequencies

2. Reviewing the suggestions made in section 9.3 and 9.4 of the 2013 Sub-Committee on Ecosystems Report and incorporating these improvements where possible/relevant.

3. Provide revised advice based on the updated ERA.

4. Review seabird by-catch mitigation measures as described in Rec. 11-09.

***Possible timetable***

1. Contact relevant CPCs - November 2013

2. Deadline for submission of components of ERA (list under point 1) - April 2014

3. Deadline for incorporation into ERA - June 2014

4. Presentation of updated ERA-Sub-Committee on Ecosystems meeting 2014 (preferably in August/September)

***﹘Proposed workplan for the Sub-Committee on Ecosystems in 2014 as pertains to ecosystems:***

The Sub-Committee determined that the following ecosystem related activities would be important to complete in 2014:

*General objectives:*

Develop linkages with other RFMOs that conduct scientific studies, provide management and have developed the tools or are currently developing the tools that will allow them to implement the EBFM approach within ICCATs management area (e.g. tRFMOs, GFCM, NAFO and ICES).

*Specific objectives:*

1. Define the domains within ICCAT for which EBFM frameworks must be developed.

2. Refine the framework (conceptual/operational objectives, indicators, reference levels) that will allow the implementation of the EBFM approach.

3. Assess the importance of the Sargasso Sea ecosystem to ICCAT species as per Resolution 12-12.

4. Populate a list of indicators reflecting stated fishery resource, ecological, economic and social objectives.

5. Determine which indicators of ecosystem status can be used in a traffic light report card.

6. Review the progress that has been made in implementing ecosystem values in enhanced stock assessments or an EBFM.

7. Review conceptual models for EBFM that explore the potential impact of perturbations on the model elements, reveals data gaps, identifies important relationships and identifies thresholds for change within the system.

**Work Plan of the Sub Committee on Statistics**

﹘ A methodology is formulated to identify better ways to characterize uncertainty in unquantifiable aspects of data submissions (related to quality control). This should be done in a way that builds upon the SCRS capacity to advise the Commission on how this uncertainty impacts the scientific advice for fishery management that can be provided. Subsequent to the Sub-Committee meeting, an *ad hoc* Working Group met to initiate work on this topic and made some progress. In order to further this work, an inter-sessional discussion on refining the methodology and evaluating additional methods to characterize this uncertainty will be held. The agenda for this discussion will be developed intersessionally.

﹘ More focused discussions on artisanal fisheries be conducted intersessionally Strategic investments in the short-term may make improvements, but more discussion needs be carried out to avoid duplication and improve utility. Generally these 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 on-going initiatives. The first step in focusing this discussion is to develop an inventory of the recent and on-going initiatives to improve artisanal fishery data collection activities amongst the CPCs. It is recommended that a contract be made to develop such an inventory.