

## EVALUATION OF DATA DEFICIENCIES AND ITS IMPACT ON STOCK EVALUATIONS IN 2014

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### SUMMARY

*This document compiles the reports from the Working Groups rapporteurs that conducted assessments in 2014 and the impact of data deficiencies in their corresponding stock evaluations. These responses are in response to the Commission Rec. 05-09.*

### RÉSUMÉ

*Le présent document regroupe les rapports des rapporteurs des groupes de travail qui ont réalisé des évaluations en 2014 et l'impact de l'insuffisance des données sur leurs évaluations de stocks respectives. Ces réponses ont été apportées aux demandes de la Commission (Rec. 05-09).*

### RESUMEN

*Este documento recopila los informes de los relatores de los Grupos de trabajo que llevaron a cabo las evaluaciones en 2014 y el impacto de las deficiencias en los datos en sus correspondientes evaluaciones de stock. Estas respuestas se presentan en respuesta a la [Rec. 05-09] de la Comisión.*

### KEYWORDS

*Data deficiencies, Ecosystems, Skipjack, Bluefin tuna*

### Introduction

The Sub-Committee on Statistics updated and submits to the SCRS the evaluation of data elements pursuant to the Commission Rec. 05-09 that states “*The Secretariat shall prepare, as part of its annual report on statistics and research, a list of specific data elements that are lacking for each stock. Such listing shall indicate the missing data elements pertaining to catch, by-catch, effort, and/or size composition, by fleet, gear, and fishing area to the extent such fishing operations are presumed to have occurred based on secondary sources.*” In particular the SCRS should report on a) an evaluation of the extent to which missing data have adversely affected the most recent assessment or update, b) an appraisal of the effect on new stock assessments if the data remain unavailable or incomplete, and c) the consequences of the data deficiencies with respect to the formulation of management advice.

The Sub-Committee on Statistics discussed and agreed that these deficiencies should be evaluated by each species group, particularly by those that conducted an assessment this year skipjack, bluefin East and West, Mediterranean swordfish and the Sub-Committee on Ecosystems. In addition, the Secretariat presented the Task I & II catalogues for all main species as approved last year (Appendix 1 to SCI-008) to the Sub-Committee. The Sub-Committee noted that the method applied provided a better view of data gaps that should be addressed by CPCs.

**Annex I** shows the response from the rapporteurs of the Skipjack, bluefin, Mediterranean Swordfish and Sub-Committee of Ecosystems on the impact of data deficiencies on these evaluations.

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## Annex I to the Section 18.7

### 1. Sub-Committee on Ecosystems

*Questionnaire Data deficiencies, impacts, solutions and priorities for stock assessment of ICCAT species.*

1. Species and stocks covered under the data review and preparation work.
  - a) SC-ECO: in each case, we required information by fleet and region.
    - i. *Caretta caretta*
    - ii. *Chelonia mydas*
    - iii. *Eretmochelys imbricata*
    - iv. *Lepidochelys kempii*
    - v. *Lepidochelys olivacea*
    - vi. *Dermochelys coriacea*
2. Please identify a recent data workshop or data preparation task for an assessment evaluation (if applicable). (location, work time schedule, number of scientific participants)
  - a) SC-ECO: Data requests to support an analysis of the impact of ICCAT fisheries on Se turtles were made through the Secretariat in 2012, 2013 and 2014. The 2013 and 2014 SC-ECO meeting considered the available data submissions. These meetings were each about 5 days long and included more than 30 participants. Bycatch information for these species was insufficient because we were forced to rely on CPC submissions from national observer programs, and these submissions were provided at various levels of detail and aggregation. Also, some CPCs did not report, or reported very little information (e.g. short time series). Mandatory bycatch data reporting form should improve the availability of data for bycatch analyses.
3. Please detail the task performed during the data workshop with regard to catch and effort data
  - a) Update and verification of landings, dead discards by? Flag, fishery, area, quarter, semester, etc.
    - i. SC-ECO: Not possible, no comprehensive data base for our species of concern. We did review data submissions from CPC observer programs. These data were not generally provided at the sufficient level of detail to support the recommended impact analysis (e.g. Flag, fishery, area, quarter, fishing mode (deep/shallow sets).
  - b) Update and verification of fishing effort
    - i. SC-ECO: We reviewed data submissions from CPC observer programs. However, we require an update of EFFDIS through 2014, and for all major gears, to properly address the impact of ICCAT fisheries on bycatch species.
  - c) Update and verification of gear/fleets distribution of catches.
    - i. SC-ECO: Not possible, no comprehensive data base for our species of concern. We did review data submissions from CPC observer programs.
  - d) Revision of historical gaps or update of historical series
    - i. SC-ECO We haven't fully considered this need in the context of SC-ECO.
  - e) Others (describe)
4. Other tasks done during the workshop
  - a) CPUE series update

- i. SC-ECO: We did review data submissions from CPC observer programs with regard to bycatch per unit effort, total bycatch, and bycatch mortality.
- b) Size, age conversions of catch data
  - i. SC-ECO: We reviewed size comp from data submissions from CPC observer programs. We did not consider size/age conversions.
- c) Review and update of biological information
  - i. SC-ECO: We reviewed data submissions from CPC observer programs, including various life history parameters (e.g. reproduction, max age)
- d) Others (describe)
  - i. SC-ECO: We also reviewed bycatch mitigation measures and safe-release protocols.
- 5. What were the main problems/difficulties associated with the catch and effort data. Please provide a brief summary if applicable.
  - a) Incomplete series
    - i. SC-ECO: Yes, this is a difficult. No comprehensive ICCAT database, requires CPC submissions. These were provided in a variety of formats, some not particularly useful. Some CPCs that likely intercept bycatch species do not report, or do not have observer programs.
  - b) Lack of information from main flags/fleets for recent years
    - i. SC-ECO: Main flags and fleets provided data for the most recent years. Additional/Improved data by area, season and shallow/deep setting was needed.
  - c) Under-reporting
    - i. SC-ECO: Yes. Underreporting could be a problem. Minor flags and fleets may not have observer programs, and if they do not, they are unable to report data. Also, non-ICCAT fisheries/gears may also have important bycatch levels. This leads to the perception that the major ICCAT fisheries that have observer programs and report data are held responsible for bycatch, when the unknown bycatch rates of nations/gears/fisheries that do not report could be as/more important.
  - d) Others
- 6. What other limitations of data were identified. Please provide a brief summary and their consequences.
  - a) No size data available for important flags/fleets
    - i. SC-ECO: Impact analysis requires size/selectivity information by fleet/quarter/area. This information was not available. As a consequence, we could not accomplish the improvements to the Sea Turtle ERA recommended by SC-ECO in 2013, and we could not agree that there was sufficient data to proceed with the ERA. Thus, the effort was tabled until additional data becomes available.
  - b) No area/ time of year of capture information
    - i. SC-ECO: Impact analysis requires bycatch rates by fleet/quarter/area, and for fishing modes if possible (e.g. deep and shallow sets). This information was not available. As a consequence, we could not accomplish the improvements to the Sea Turtle ERA recommended by SC-ECO in 2013, and we could not agree that there was sufficient data to proceed with the ERA. Thus, the effort was tabled until additional data becomes available.
  - c) Others

7. What were the conclusions/recommendations from the scientific group with regards to the data available and likely assessment analysis to be performed?
  - a) SC-ECO: ERA was tabled due to insufficient information. In 2014, a work plan to conduct future analyses of the impact of ICCAT fisheries on Sea Turtles was defined. We will concentrate on collating information on effort (need EFFDIS update!), bycatch rates, total extrapolated bycatch, and bycatch mortality.
8. For each stock, please choose and describe the recommendations of the scientific group for the assessment analyses
  - a) Incomplete data, the group doesn't recommend any further analysis with it.
    - i. SC-ECO: Rejected use of ERA until improved data becomes available. Until more complete data becomes available, we plan to continue to collate data from CPC observer programs and from the literature.
  - b) Highly deficient data of catch and effort need to restrict analyses to simple aggregated models.
  - c) Sufficient data to carry out age/or group aggregated analysis
  - d) Sufficient data to perform size base evaluations
9. What were the priorities identified by the scientific working group in order to improve data input for future assessment analysis (one per stock, in priority order)
  - a) SC-ECO: Recommended official ICCAT bycatch forms. SC-ECO will present them to SCRS in 2014, if adopted we plan to review their efficacy and improve (if needed) no more than three-years after implementation.
10. Other recommendations to the data collection programs (i.e. individual ICCAT members) or the Secretariat data management group.
  - a) SC-ECO: The complexity of the new observer forms (if adopted) will require a comprehensive training to ensure they are properly filled out. We recommend the Secretariat create a comprehensive web-based or video training.

## 2. Working Group Tropical Tunas: Skipjack Stock Assessment

*Questionnaire Data deficiencies, impacts, solutions and priorities for stock assessment of ICCAT species.*

1. Species and stocks covered under the data review and preparation work.
2. Please identify a recent data workshop or data preparation task for an *assessment evaluation (if applicable)*. (*location, work time schedule, number of scientific participants*) SKJ SA Dakar (Senegal) 8 days (+1 for AOTTP feasibility) about 20 participants
3. Please detail the task performed during the data workshop with regard to catch and effort data
  - a) Update and verification of landings, dead discards by? Flag, fishery, area, quarter, semester, etc. *Yes Ghana, Guinea, Cote d'Ivoire etc Cf 3.1 (Task I), 3.2 (Task II), 3.3 (CATDIS), 3.4(CAS) from SKJ detailed Report*
  - b) Update and verification of fishing effort *No*
  - c) Update and verification of gear/fleets distribution of catches. *Yes Task II Ghana*
  - d) Revision of historical gaps or update of historical series *Yes*
  - e) Others (describe). *Update faux-poissons*

4. Other tasks done during the workshop
  - a) CPUE series update *Yes*
  - b) Size, age conversions of catch data *Yes CAS by stock and sub-stock*
  - c) Review and update of biological information. *Yes (mortality, growth)*
  - d) Others (describe)
  
5. What were the main problems/difficulties associated with the catch and effort data. Please provide a brief summary if applicable.
  - a) Incomplete series *Yes Brasil, Venezuela, Ghana, Curacao, Belize*
  - b) Lack of information from main flags/fleets for recent years *Yes, no data on number of FAD/buoys, supply vessels*
  - c) Under-reporting *may be Ghana, Belize ?, Faux Poisson (landed by different fleets in Senegal and in Ghana)*
  - d) Others
  
6. What other limitations of data were identified. Please provide a brief summary and their consequences.
  - a) No size data available for important flags/fleets *Venezuela?*
  - b) No area/ time of year of capture information
  - c) Others **Additional information for CPUE standardization.** *In order to improve the standardization of the CPUEs of baitboats operating from Dakar, it has been suggested to include information on the vessel characteristics (size, structure, etc.) as well as the dates of the main changes in fishing practice over years (e.g. the beginning and the full use of the associated school fishing method, the implementation of the FADs, etc.). For the Canarian baitboat fishery it was suggested to investigate the years for which the fishery was stopped for commercial reasons to account for this in the standardization procedure.*
  
7. What were the conclusions/recommendations from the scientific group with regards to the data available and likely assessment analysis to be performed? *It was noted by the participants of the meeting that fishing modes of major PS fisheries (e.g. Ghana) are classified with an unknown fishing mode in the CATDIS ICCAT file. Consequently, the WG is recommending that these **unclassified catches should be assigned to FAD or free schools**, based on the scientific knowledge on each fishery and periods.*
  
8. For each stock, please chose and describe the recommendations of the scientific group for the assessment analyses
  - a) Incomplete data, the group doesn't recommend any further analysis with it.
  - b) Highly deficient data of catch and effort need to restrict analyses to simple aggregated models.
  - c) Sufficient data to carry out age/or group aggregated analysis
  - d) Sufficient data to perform size base evaluations
  
9. What were the priorities identified by the scientific working group in order to improve data input for future assessment analysis (one per stock, in priority order) **Supply activities and FAD information:** *According to Rec [2013-01], which stated that CPCs shall ensure that all purse-seiners, baitboats and supply vessels) flying their flag, when fishing in association with fish aggregating devices (FADs), shall collect and report all FAD activities in a FAD-logbook, the Working Group recommended that the information on the number of FADs equipped with beacon deployed vessel and from supply be analyzed and incorporated into the standardization procedure **Faux-poisson** : Considering the volume of catch and size of tropical tunas not included in Task I and II by a number of fleets (e.g. due to landing this catch for the local African markets, as in Abidjan), the Working Group recommended that CPCs establish adequate logbook and sampling programs to ensure the total catch composition and disposition of the catch is fully quantified and reported as part of national statistic reporting obligations. The data collection of logbooks and samplings should be based on a full cooperation between the concerned CPCs and the Cote d'Ivoire scientists in charge of the faux poisson sampling program conducted in Abidjan.*
  
10. Other recommendations to the data collection programs (i.e. individual ICCAT members) or the Secretariat data management group. **Task II by fishing mode** *With the aim of characterizing the fishing effort associated with the two main fishing modes (free school sets and FAD sets) used by the tropical*

*purse seiners and baitboats, the Working Group recommended that the catch and number of sets (total and successful ones) by fishing mode (FAD and school sets) on a 1° square/month basis be submitted by each CPC to ICCAT*

### **3. Working Group Bluefin tuna: West and East bluefin Stock Assessment**

*Questionnaire Data deficiencies, impacts, solutions and priorities for stock assessment of ICCAT species.*

1. Species and stocks covered under the data review and preparation work.  
Atlantic bluefin tuna (*Thunnus thynnus*) – West and East/Mediterranean stock
2. Please identify a recent data workshop or data preparation task for an assessment evaluation (if applicable). (location, work time schedule, number of scientific participants)  
Madrid, May 5-10 2014, 29 participants
3. Please detail the task performed during the data workshop with regard to catch and effort data
  - a) Update and verification of landings, dead discards by? Flag, fishery, area, quarter, semester, etc.  
Presentation of the work to be done to update catch data after the data group meeting and before the species working group meeting
  - b) Update and verification of fishing effort  
Not done
  - c) Update and verification of gear/fleets distribution of catches.  
Presentation of the work to be done to update catch data after the data group meeting and before the species working group meeting
  - d) Revision of historical gaps or update of historical series  
Presentation of the work to be done to update catch data after the data group meeting and before the species working group meeting
  - e) Others (describe)
4. Other tasks done during the workshop
  - a) CPUE series update
    - i. All CPUES series have been updated during the data group and presented as SCRS documents
    - ii. New index of larval catch rates were developed for the Mediterranean
  - b) Size, age conversions of catch data  
Preliminary age-length keys were developed for the east and west
  - c) Review and update of biological information.
    - i. This work has been done during the data group including extensive evaluation of biological conversions such as length weight relationships
  - d) Others (describe).
5. What were the main problems/difficulties associated with the catch and effort data. Please provide a brief summary if applicable.
  - a) Incomplete series
  - b) Lack of information from main flags/fleets for recent years  
late addition of Croatian data for young fish
  - c) Under-reporting

For the East-Med stock, fishing capacity was used in 2010 to estimate under-reporting. However, this method has not been updated. In relation to management measures, under-reporting has been potentially identified in South-Atlantic.

d) Others.

6. What other limitations of data were identified. Please provide a brief summary and their consequences.
  - a) No size data available for important flags/fleets

So far, for the East-/Mediterranean stock, no size composition was available to the group for the purse seiner fishery (all flags; which represents the highest proportion of the catch) since the fish are transferred alive to cages. The ICCAT Secretariat is developing methodology to reconstruct these size compositions from cage data. Moreover, methods are being developed to use stereoscopic cameras to determine the number and the size of the fish caught by this fishery.

- b) No area/ time of year of capture information
  - c) Others
    - ii. Both BFTE and W: Fishery dependent indices strongly affected by changes in catchability, selectivity or availability of fish.
    - iii. BFTE: Decline of small fish in CAA, in the absence of reliable indices of recruitment, substantially reduces the ability to estimate recent recruitments, this leads to severe model instability and highly variable and unreliable estimates of recent recruitment.
7. What were the conclusions/recommendations from the scientific group with regards to the data available and likely assessment analysis to be performed?
- b) The group recommended using the updated CPUE series during the data group. The group asked the Secretariat to provide the group with the catch-at-age data by the end of June 2014 and for the East-Mediterranean stock, the new catch-at-age data (including all new information about historical catch collected by GBYP and new size estimate of purse-seiners catch) by the end of July. Data have been provided on time. The group followed the Commission recommendations to update the stock assessment during the working group meeting and for the East-Mediterranean stock, to perform a “pilot assessment” using the new data available. For this reason there was Insufficient time to fully incorporate new data (New length-weight relationships, new CAA, CAA developed from ALK, Gulf of Lyons aerial survey, etc) into assessments used for advice.
8. For each stock, please chose and describe the recommendations of the scientific group for the assessment analyses
- Need Sufficient data to carry out age/or group aggregated analysis  
Need Sufficient data to perform size base evaluations
9. What were the priorities identified by the scientific working group in order to improve data input for future assessment analysis (one per stock, in priority order)
- The Group notes that for the East-Mediterranean stock, data reconstruction of size composition for purse-seiner fishery will provide a substantial improvement of the catch-at-age, catch-at-size data. Moreover, size estimates from stereoscopic cameras will also be a major improvement when this method will be agreed and validated.
  - Improvement in the quality of CPUES series will be a critical issue as recent management measures have impacted fishery strategy which should be accounted for in future stock assessments.
- a. BFTE
    - i. Fully incorporate GBYP improvements in CAS and CAA into new assessments.
    - ii. Evaluate decisions to split/maintain indices in light of changes in catchability, selectivity or distribution of fish.
    - iii. Re-evaluate the development of the inflated CAA to reflect the actual size composition of removals.
    - iv. Fully operationalize use of year-specific ALK to create improved CAA.
  - b. BFTW
    - v. Evaluate decisions to split/maintain indices in light of changes in catchability, selectivity or distribution of fish.
    - vi. Develop joint indices between CPCs for areas (e.g. Northwestern Atlantic) not currently covered by complete indices
    - vii. Extend assessment back prior to 1970 to fully capture the history of the fishery, this will include evaluating CAS/CAA data prior to 1970 for reliability.
    - viii. Fully operationalize use of year-specific ALK to create improved CAA.

10. Other recommendations to the data collection programs (i.e. individual ICCAT members) or the Secretariat data management group

- i. Increase staff of Secretariat

#### **4. Working Group Swordfish: Mediterranean swordfish Stock Assessment**

Data deficiencies regarding Mediterranean swordfish and impact.

- Lack of historical CPUE series has introduced high uncertainty in production modeling estimates as the available time-series is rather short with limited contrast.
- Tuning of age based assessment was based on age-aggregated CPUE data as CPUE data by age were not available. This affects the reliability of stock estimates and increases uncertainty.