Progress and planning from the ICCAT Sub-group on EMS

ICCAT/SCRS Subgroup on EMS

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ICCAT CICTA CICAA

Background

- In 2019 ICCAT, established Rec 19-05 (parag 20) (pertaining to billfishes – blue and white marlin):

The Permanent Working Group for the Improvement of ICCAT Statistics and Conservation Measures (PWG), in cooperation with the SCRS, shall work to develop recommendations on the following issues for consideration at the 2021 annual meeting of the Commission:

*a) **Minimum standard for an electronic monitoring** system such as:*

(i) the minimum specification of the recording equipment (e.g. resolution. recording time capacity, data storage type, data protection)

(ii) the number of cameras to be installed at which points on board

*b) **What shall be recorded***

*c) **Data analysis standards**, e.g., converting video footage into actionable data by the use of artificial intelligence*

*d) **Data to be analyzed**, e.g., species, length, estimated weight, fishing operation details*

*e) **Reporting format** to the Secretariat*

*In 2020 **CPCs are encouraged to conduct trials** on electronic monitoring and report the results back to the PWG and the SCRS in 2021 for their review.*

Previous work – purse seine fisheries

- Previous recommendations from the SCRS on EMS, specifically with regards to Purse Seine fisheries to be voluntarily implemented and complement human observers:

SCRS Report (2016) - General Recommendations to the Commission:

- *Electronic Monitoring Systems (EMS) are being used by some tropical tuna purse seine vessels. Noting that EMS can complement physical observer programs and also collect other data that would be useful to the SCRS, the Committee considers that it would be useful to ensure that the different systems available conform to harmonized installation, data collection and reporting protocols, so as to ensure compatibility. The Committee recommends that tropical tuna purse seine fleets or CPCs wishing to voluntarily implement EMS follow the guidelines described in document SCRS/2016/180.*

SCRS Report (2017) – Responses to Commissions' request:

- *The SCRS reiterates also its recommendation from 2016 on Electronic Monitoring Systems (EMS) which are already being used by some tropical tuna purse seine vessels. Noting that EMS can complement physical observer programmes and also collect other data that would be useful to the SCRS, the Committee considers that it would be useful to ensure that the different systems available conform to harmonized installation, data collection and reporting protocols, so as to ensure compatibility. The Committee recommends that tropical tuna purse seine fleets or CPCs wishing to voluntarily implement EMS follow the guidelines described in Ruiz et al. 2017. This source of information would help improve current coverage of observer data in tropical tuna fisheries.*

Intersessional work – billfish fisheries

- The work for **longline and other fisheries is more delayed** and to date there are no specific Recommendations from the SCRS on longline or other fisheries.

- In the last Billfishes intersessional meeting (March 2021), the **Billfishes Species Group established a Sub-Group to start addressing this request.**

- **<u>The tasks of that sub-group were defined as:</u>**
  - **Task 1)** Collection and analysis of past studies (e.g. reports and documents) regarding results from comparisons between observers and EMS
  - **Task 2)** Start describing current knowledge
  - **Task 3)** Possible knowledge gaps and needs for additional experimental trials
  - **Task 4)** Review the draft EM guidelines produced by the IMM where needed

Intersessional work

- **Group created as a BIL Sub-Group.**

- Two online meetings organized (13th May 2021, 16th July 2021) and intersessional work carried out

- Subgroup started by compiling a list of **previous works focusing EMS in comparison with human observers (mostly LL fisheries).** Also agreed that **other fisheries (e.g.; gillnets) should need to be addressed at a later stage**;

- Each paper **assigned a "reviewer" to extract information and present/discuss within the group**

Intersessional work – Some preliminary conclusions

After this preliminary round of revisions, the following points have been noted:

- EM systems **hold promise for resolving some problems with data gaps in fisheries monitoring, but it cannot substitute for a human observer.** As such, integrated EM systems are likely to be used as a **complement rather than a replacement** at-sea observer programs at the regional level.

- One principal limitation is that the **cameras record only what is in their field of view and cannot prioritize** among elements in the images they are recording. **Also, its ability to identify species and sizes during the loading of the catch is limited at this time.**

- It is important to also note that **at-sea observers can perform other tasks not covered by EM Systems, such as biological sampling**

Intersessional work – Some preliminary conclusions

- EM systems need to address the **challenges associated with processing and analyzing very large volumes of data that will result**, which are different to the challenges encountered when dealing with human observers and their data
  - It is possible that **improvements in artificial intelligence, machine learning/deep learning algorithms**, hardware and software can mitigate some of the current limitations with data collection and analysis

- Integrated EM systems must be able to **meet both national and international requirements to ensure data collection, continuity, veracity and precision are not compromised** and that scientists have the required data to ensure they can continue to provide accurate scientific advice to managers.

Next steps

- **Assure that participants from other Species Group wishing to participate in the Subgroup are included (reason for this presentation at SC-STATS)**:
  - **Interested participants should send a mail to the Subgroup convener requesting to be included in the Subgroup**. This should be done immediately after the end of the 2021 SCRS meeting (October 2021), taking into account recommendations from other groups such as from Tropicals.

- **Table of what can be recorded with EMS vs At-sea human Observers** (ICCAT form ST-09):
  - The Subgroup convener will **schedule another meeting for later 2021** to start this work, and **also schedule the work for 2022**, according to the participants availability. All Subgroup participants are informed by e-mail.

Next steps (example from ST-09)

FORM ST-09B - Catch					
ST-09B DATA FIELDS			**Collected by human observers?**	**Collected by EMS?**	**Notes**
Catch composition by fishing operation	**Fish. Oper. (FO)**	**FO group ID**	Yes / No / limitations	Yes / No / limitations	Explain if limitations
	Species (attributes)	**Species (cod)**	Yes / No / limitations	Yes / No / limitations	Explain if limitations
		Targeted (Y/N)?			
	Catches (retained)	**Weight (kg)**			
		Product type (cod)			
		Number (catch number)			
	Discards (Number)	**Dead (DD)**			
		Alive (DL)			
		Unknown			
	Sampling (data)	**Nº sampled**			

Next steps

- **Continue the work and present the final recommendations to the SCRS in 2022**:
  - The Subgroup should **continue to work intersessionally in later 2021 and during 2022** to finalize the work.
  - Given that the SCRS is tasked to work with the IMM (ICCAT Integrated Monitoring Measures Group) on this issue, **updates on the status of the work should be provided to the 2022 IMM intersessional meeting**.
  - **The final recommendations from the subgroup should be provided to the SC-STATS and SCRS and various interested Species Groups during 2022**.
  - **Several online (usually 1 day) meetings will be planned and scheduled** by the Subgroup Convener as needed.

Recommendations

- The Subgroup agreed that there is a need for a **separation of scientific vs compliance objectives/data in terms of the EM Systems**, noting that many EM systems to date have been implemented mainly for compliance or mixed purposes

- The Subgroup agreed that for scientific purposes, it is important to **assure that EM systems can record and collect needed scientific data (e.g., species ID, sizes, sex on elasmobranchs, discards, etc) and not only compliance data**.

  - The collection of such type of data seems to be **more difficult at present.**

  - In some cases it may be possible to **place additional cameras in specific locations** of the vessels to collect such data, **and/or there may be software solutions**

Recommendations

- The Subgroup agreed that there **may be the need for more field trials** for CPCs to compare the quality of data obtained with EM Systems vs human observers.
  - Could consider **starting with smaller scale studies and trials** in particular fisheries, and then **scale up as needed and possible**
  - Those trials should **ensure that ICCAT observer data requirements are collected by EM**
  - Field trials could be conducted **immediately after preliminary data standards are adopted, to confirm that the standards address the minimum requirement**, and make adjustments if needed

- The Subgroup agreed that it would be important to **expand the current subgroup** (mainly a BIL sub-group) **to other Species Groups in ICCAT that also relate mostly with longline fisheries** (e.g., SWO, Sharks, ALB, TROP LL component, etc)