Specificiations for MSE Trials for North Atlantic Swordfish

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Introduction

The North Atlantic swordfish fishery, under the management of the International Commission for the Conservation of Atlantic Tuna (ICCAT), is undergoing a management strategy evaluation (MSE) process.

ICCAT describes MSE as:

> a collaborative process between Scientists and decision-makers that involves using computer simulation to compare the relative ability to achieve a set of management objectives using alternative Management Strategies, defined as different combinations of data collection schemes, methods of analysis, harvest control rules and subsequent processes leading to management actions.

There are three main components in an MSE process:

1. **Operating models (OMs)**: a collection of mathematical/statistical models that describe alternative hypotheses of the historical fishery dynamics and specifications for simulating the collection of data and implementation of management measures in the future;
2. **Candidate management procedures (CMPs)**: a set of proposed algorithms that generate management recommendations from fishery data, and will be evaluated in the MSE;
3. **Performance metrics (PMs)**: statistics use the quantitatively evaluate the CMPs against specified management objectives.

The operating models, candidate management procedures, and performance metrics are developed as a collaborative effort between scientists, decision-makers, and other stakeholders in the fishery.

About this document

This document describes the specifications for the OMs, CMPs, and PMs that have been proposed and developed for the North Atlantic swordfish (hereafter swordfish) fishery.

It is a living document and will be continued to be updated so that it reflects the current state of the swordfish MSE process.

Members of the Swordfish Working Group (hereafter the Group) are encouraged to ask questions, provide feedback and comments, and make edits, to any part of this document.

The document is written using the Markdown format and can edited in any text editor. The source document is available on the ICCAT/nswo-mse GitHub repository.

The ICCAT/nswo-mse is currently private and only available to members of the Group. Please contact Adrian or Ai Kimoto if you do not have access.

Group members can make edits to the document either directly in the online repository or by cloning the repository and submitting pull requests with their edits. Alternatively, they can email questions or comments to Adrian. The former approach has the advantage that all comments, questions, and edits are immediately visible to all members of the Group.

Group members can also use the Discussions feature on the Github repository to post questions, comments, or points for discussion related to any aspect of this document or the MSE process in general.

Compiled versions of this document in PDF and HTML format are available at the North Atlantic Swordfish MSE homepage.

Operating Model Conditioning

The swordfish operating models are based on the most recent stock assessment of the swordfish fishery (Anon., 2017) using Stock Synthesis 3 (Methot & Wetzel, 2013).

Data

The

https://s3.us-west-2.amazonaws.com/secure.notion-static.com/9dec0cf5-6efd-43b3-acaa-935af0db476b/SWO_Fleet_Info.txt?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAT73L2G45O3KS52Y5%2F20210326%2Fus-west-2%2Fs3%2Faws4_request&X-Amz-Date=20210326T224503Z&X-Amz-Expires=86400&X-Amz-Signature=ad854b89633452a5fe4ebcab4b44f1abb6083038a3f96686c97ac2efd58c52fb&X-Amz-SignedHeaders=host&response-content-disposition=filename%20%3D%22SWO%2520Fleet%2520Info.txt%22

Changes in catchability

update readme

https://iccat.int/Documents/CVSP/CV075_2018/n_4/CV075040605.pdf

https://www.iccat.int/Documents/Meetings/Docs/2017_ATL_SWO_ASS_REP_ENG.pdf

Assumptions

Table 1: Summary table of the fishing fleets included the 2017 stock assessment of North Atlantic swordfish.

Name	Code	Description	CPUE Period
Spain	SPN_1	Spain longline fleet	1986-2015
US	US_2	US longline observer fleet	1992-2015
Canada - Early	CAN_ERLY_5	Canada longline fleet (early)	1962-1970
Canada - Late	CAN_LATE_4	Canada longline fleet (later)	1979-2016
Japan - Early	JPN_ERLY_5	Japan fleet (early)	1974-1998
Japan - Mid	JPN_MID_6	Japan fleet (middle)	2006-2010
Japan - Late	JPN_LATE_7	Japan fleet (late)	2011-2015
Portugal	PORT_8	Portugal longline fleet	1999-2016
Chinese-Taipai	CHIN-TAI_9	Chinese-Taipai longline fleet	NA
Morocco	MOR_10	Morocco longline fleet	2005-2016
Other	OTH_11	All other swordfish fleets	NA
Age-1 Survey	Age-1	Age-specific CPUE (Spain fleet)	1982-2015
Age-2 Survey	Age-2	Age-specific CPUE (Spain fleet)	1982-2015
Age-3 Survey	Age-3	Age-specific CPUE (Spain fleet)	1982-2015
Age-4 Survey	Age-4	Age-specific CPUE (Spain fleet)	1982-2015
Age-5+ Survey	Age-5+	Age-specific CPUE (Spain fleet)	1982-2015

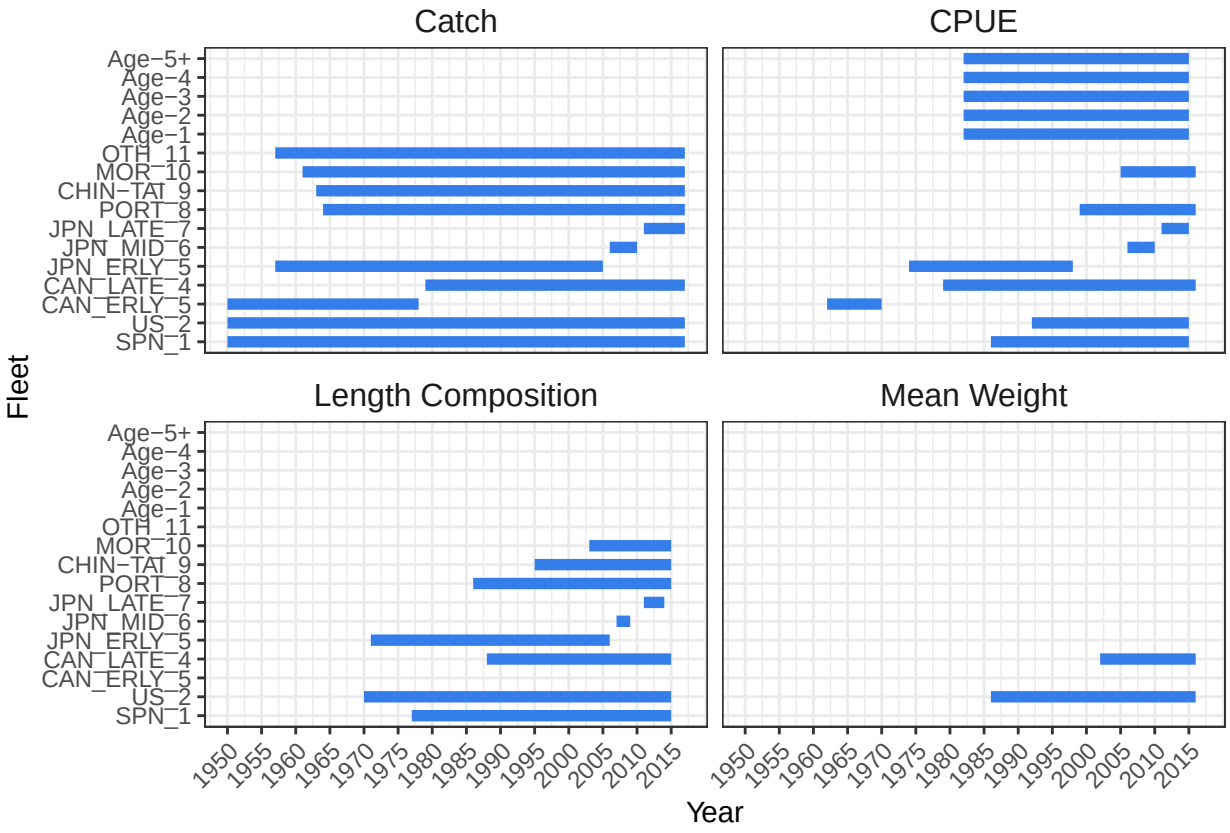

Figure 1: The time periods for the data used in the model

OM Uncertainty Grid

A OM uncertainty

MSE Framework

Key Model Assumptions

Single Stock

Aggregated Fleet

Importing OMs into MSE Framework

Future Catches

Generation of Future Data

Assumptions for Future Conditions

Recruitment

Life-History

Selectivity

Catchability

Candidate Management Procedures

Link to CMP development doc

Performance Metrics

Proposed Performance Metrics

References

Anon. (2017). *Report of the 2017 ICCAT Atlantic Swordfish Stock Assessment Session* (p. 85). ICCAT. https://www.iccat.int/Documents/Meetings/Docs/2017_ATL_SWO_ASS_REP_ENG.pdf

Methot, R. D., & Wetzel, C. R. (2013). Stock synthesis: A biological and statistical framework for fish stock assessment and fishery management. *Fisheries Research*, *142*, 86–99. https://doi.org/10.1016/j.fishres.2012.10.012