

7th MEETING OF THE SCIENTIFIC COMMITTEE

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SC7-JM05

Minutes from the web meeting for stakeholders of the Management Strategy Evaluation (MSE) project

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1. Background

One of the objectives in the [2019 SC Multi-annual workplan](#) requires the SC to

‘commence MSE development to design alternative harvest control rule’.

This activity would in time replace the current rebuilding plan which is used to provide catch advice on Chilean Jack Mackerel (CJM). As the stock has recently rebuilt to the proxy B_{MSY} reference level, alternative harvest control rules would likely focus less on rebuilding and more on long term maximum sustainable exploitation of the CJM stock.

2. Meeting introduction

The group was welcomed, and the agenda adopted for the meeting (Annex 1).

Lessons learned:

During SC2 in 2014 results of evaluating the current rebuilding plan, and alternatives, were discussed and advice prepared to recommend a subset of alternative harvest control rules that were both precautionary and delivered high yield. Presentations were prepared by Chile and the EU. The two approaches were not compatible and as such; one of the major lessons learned was to agree on a set of Operating Models (OMs) to accommodate different members engaging in MSE. Furthermore, the discussions on stock structure and growth over the past years suggest that the SC may want to focus on a wider spectrum of OMs than was used in the 2014 evaluation.

The mandate to engage in MSE has been given by the SPRFMO Commission. However, it is unclear how much interaction is needed with the Commission in designing alternative harvest control rules. What is clear is that the Commission needs to decide on the definition of precise and quantifiable management objectives.

Uncertainty:

The 2014 MSE focussed predominantly on parametric uncertainty. In addition, there is structural and data uncertainty. It was suggested to include the idea of more optimistic and less optimistic productivity regimes in the OM, similar to the two approaches used in the SC to provide catch advice using lower and higher steepness estimates. The assumption on regime does not affect the estimation of historic perception.



Another source of structural uncertainty is the assumption on growth. Chile will present to the SC an update on their growth studies and make suggestions to the MSE stakeholder group on how to reflect alternative growth assumptions in the MSE. The time-frame we are concerned with was suggested to be around 20 years for evaluation purposes, but with a maximum lifespan of the results of 10 years before a review would be triggered. This therefore excludes considering long-term climatic changes as part of the simulation exercise.

In terms of data uncertainty, the weighting of indices in the assessment, ageing error and natural mortality were mentioned and need to be investigated. Further discussion is needed on how to best combine the various sources of uncertainty and will take place over email with the lead stock assessors.

Management procedures:

Two types of management procedures were suggested: model based and model free. Setting catch advice based on simpler methods driven by changes in indices of abundance or influenced by changes on climatic conditions such as El Nino and La Nina (strength of event in the year before the advice year) were mentioned and will be explored. The Commission desires are not yet known, and the SC should seek advice from the Commission on preferences of elements to include in the MSE (e.g. quota transfers between member states and/or between years).

Management objectives and performance indicators

Previous experience from IOTC has shown that an iterative process between scientists and stakeholders (to include the Commission) is most beneficial to derive a set of precise management objectives:

1. a given indicator (e.g. SSB)
2. to be at an agreed level n (e.g. SSB_{MSY})
3. over a given time period (e.g. next 20 years), and
4. with a certain probability (e.g. 60%).

A recommendation from the SC could be formulated to setup a task-group on MSE with Commission members to increase the frequency of communication with the stakeholders. The SPRFMO Secretariat indicated this was possible. A suggestion was made to investigate the possibility to hindcast the stock under different selected management procedures.

Presentation and communication:

No in-depth discussion was held on this topic but IOTC worked on a best-practice document on presenting MSE results that will be used as a template for the SPRFMO MSE.

How to proceed:

It was suggested to work on GitHub and make use of the R-FLR framework. The EU has funding available to do a lot of the practical work, but there is also the major aim to make this a SPRFMO exercise rather than an EU-only exercise. This also relates to the SPRFMO group being involved in making decisions when work needs to be prioritised.

Time-wise, finalizing OMs being endorsed by the SC would have to be achieved by August 2020. As the management procedure prioritization may require several iterations with the Commission, a later date for final MSE results is foreseen (early 2021).



Annex 1: Agenda for web meeting on Chilean jack mackerel MSE

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5th September 2019

Review of past MSE work

A brief overview of the work carried out so far on MSE for the stock, and lessons learned that are relevant for future work

- Documents SC-09-JM-04, SC-09-JM-09

Operating model

Structural uncertainty

Identify important assumptions to be

- (i) included in the operating model grid, or
- (ii) considered as robustness tests for secondary screening of MPs.

- Stock structure
- Growth model parameters
- Stock-recruitment relationship: functional form and parameters

Parameter uncertainty

Discuss methods to quantify it.

- MCMC (ADMB)

Data uncertainty

Consider possible errors and biases in all data sources not captured by model error structure.

Conditioning procedure

Structurally-different models can be combined with or without weighting, based on both prior probabilities and likelihood estimates (When comparable, i.e. equal sample size).

Management Procedures

Identify elements of the MPs that should remain as in current practice, for example:

- Data collection protocols
- Surveys and CPUEs
- Start an initial list of likely candidate HCRs.
- Model-based HCRs
- Model-free HCRs



Management Objectives and Performance Indicators

Specify an initial set of implicit or explicit management objectives, and the performance indicators necessary to monitor their achievement.

- Management objectives
- Performance indicators

Introduce MP tuning as a useful procedure for achieving the desired management objectives

- Tuning of MPs

Presentation and communication.

Explore the range of outputs that both SC and plenary consider necessary to understand the performance of alternative MPs.

- IOTC MSE presentation guidelines as an example document.

MSE development work

- Agreed OMs: base case and robustness scenarios
- Alternative MPs
- Reporting and comparison

Timeline

- Start: September 2019
- End: August 2020

References

- [SC02-JM04](#) Management plan evaluations for Jack mackerel - Evaluating the adopted rebuilding plan (2014)
- [SC02-JM08](#) Evaluating the consequences of different assumptions on population and management structure on the sustainable exploitation of Chilean Jack mackerel (2014)
- [SC02-JM09](#) Harvest control rule for Jack mackerel rebuilding - A preliminary evaluation (2014)
- [Commission 2014 report - Proposed CJM rebuilding plan \(Annex K\)](#)
- [IOTC MSE presentation guidelines](#)
- Miller SM, Anganuzzi A, Butterworth DS, Davies CR, Donovan GP, Nickson A, Rademeyer RA, Restrepo V. 2019. Improving communication: the key to more effective MSE processes. *Canadian Journal of Fisheries and Aquatic Sciences*,76:643-656. <https://doi.org/10.1139/cjfas-2018-0134>.
- IOTC. A glossary of some terms referred to in presentations and discussion at the TCMP02. [IOTC2019–TCMP03–INF02E](#)