Fisheries and Oceans Canada | Pêches et Océans Canada
Science | Sciences

Canadian Science Advisory Secretariat (CSAS)

Proceedings Series 2014/022

Quebec Region

Proceedings of the Regional Peer Review Meeting on the Precautionary Approach Reference Points for the Atlantic Mackerel in Subareas 3 and 4

March 20, 2014
Maurice-Lamontagne Institute

Chairperson : Martin Castonguay
Editor: Sonia Dubé

Maurice-Lamontagne Institute
Fisheries and Oceans Canada
850 Route de la Mer, P.O. Box 1000
Mont-Joli, Quebec G5H 3Z4

September 2014

Canada

Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings may include research recommendations, uncertainties, and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

Published by:

Fisheries and Oceans Canada
Canadian Science Advisory Secretariat
200 Kent Street
Ottawa ON K1A 0E6

http://www.dfo-mpo.gc.ca/csas-sccs/
csas-sccs@dfo-mpo.gc.ca

ISSN 1701-1280

Correct citation for this publication:

DFO. 2014. Proceedings of the Regional Peer Review Meeting on the Precautionary Approach Reference Points for the Atlantic Mackerel in Subareas 3 and 4; March 20, 2014. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2014/022.

Aussi disponible en français :

MPO. 2014. Compte rendu de l'examen régional par des pairs sur les points de référence de l'approche de précaution pour le maquereau bleu des sous-régions 3 et 4 ; le 20 mars 2014. Secr. can. de consult. sci. du MPO, Compte rendu 2014/022.

SUMMARY

This document contains the proceeding from the meeting held within the Quebec Region Science Advisory Process on the Precautionary Approach Reference Points for Atlantic Mackerel in Subareas 3 and 4. This meeting was held on March 20th, 2014 at the Maurice Lamontagne Institute in Mont-Joli, and gathered twelve participants from sciences to management. This proceeding contains the essential parts of the presentations and discussions held and relates the recommendations and conclusions that were presented during the review.

SOMMAIRE

Ce document renferme le compte rendu de la réunion tenue dans le cadre du processus consultatif scientifique de la région du Québec portant sur les points de référence de l’approche de précaution pour le maquereau bleu des sous-régions 3 et 4. Cette rencontre, qui s'est déroulée le 20 mars 2014 à l'Institut Maurice-Lamontagne à Mont-Joli, a réuni une douzaine de participants des sciences et de la gestion. Ce compte rendu contient l'essentiel des présentations et des discussions qui ont eu lieu pendant la réunion et fait état des recommandations et conclusions émises au moment de la revue.

INTRODUCTION

The Precautionary Approach (PA) is a general philosophy for managing threats of serious or irreversible harm when there is scientific uncertainty. Since this situation often arises in fisheries, the PA must be integrated in fisheries management. The first step for developing a PA framework is usually the estimation of limit reference points.

Canada has made commitments at both the national and international level to apply the PA in managing its fisheries. Over the past few years, there have been several initiatives in Canada to define the PA in a fisheries context, to identify benchmarks that would be consistent with the approach and to apply it in fisheries management. The fundamental principles to this approach are presented in two key documents produced by DFO: 1) the Science Advisory Report 2006/023, which identifies the minimum requirements for harvesting strategies to be compliant with the PA, and 2) the 2008 Decision-Making Framework Incorporating the Precautionary Approach, which provides guidelines for the incorporation of PA principles in the management of Canadian fisheries.

To be compliant with the PA, fishery management plans should include harvest strategies that are developed according to a science-based Limit Reference Point, an Upper Stock Reference Point and Removal Reference Point. These points define the limits of stock status zones (i.e. Healthy, Cautious and Critical). It is expected that the management decisions respect the actions each of the stock zones as they are described in DFO Precautionary Approach guidance referenced above.

A regional peer review was held on March 20, 2014 at the Maurice Lamontagne Institute in Mont-Joli in order to define the reference points that comply with the precautionary approach for the Atlantic Mackerel stock in subareas 3 and 4 according to the best scientific information available.

DETAILED DISCUSSIONS

The meeting chairman, Martin Castonguay, thanked the participants attending the meeting. Daniel Duplisea presented a brief history of the mackerel stock, which is in a critical situation as confirmed by the most recent assessment (March 2014). The stock is at the lowest level ever observed, hence the importance of quickly defining a Limit Reference Point (LRP). Moreover, the recreational and bait fisheries are a significant source of uncertainty.

Mr. Duplisea gave a short description of the Precautionary Approach (PA) framework in the context of Canadian fisheries. He defined the LRP concept and mentioned the various methods that can be used to identify this reference point. Within the framework of this meeting, two methods were explored, namely: 1) the empirical approach where the LRP corresponds to B_{rec}, which represents the lowest biomass in the historical series at which a recovery was observed; and 2) the "rule of thumb" applied to the stock-recruitment relationship where the LRP equals the spawning biomass (SSB) that corresponds to 50% of the maximum recruitment.

The LRPs for the stock-recruitment relationship were set using four models (Beverton-Holt, Ricker, "hockey stick", and non-parametric) that take into account, firstly, all the data, and secondly, only low-recruitment years.

Mr. Duplisea presented the results obtained for the two methods under consideration. The LRP values varied between 49,000 and 258,000. Regardless of the method chosen, the stock is clearly below the LRP.

The group then discussed the preferred method for determining the LRP.

- According to Mr. Duplisea, the empirical approach (B_{rec}) could be a good choice because it is accessible and easy to defend.
- However, some participants questioned this choice, mentioning that the current value of B_{rec} depends solely on one exceptional year (1999). This LRP was considered to be very low.
- At this stage in the PA's development, the participants felt more comfortable suggesting a value spread as possible LRP values rather than being limited to a single value.
- Thus, in addition to B_{rec} (empirical approach), the suggestion was made to keep the values obtained through the stock-recruitment relationship. However, there was a question about the relevance of considering either the data in its entirety or only the low-recruitment years. For the moment, it was considered more prudent to keep all the results that were obtained. However, the participants rejected the results of the non-parametric model because they had little confidence in it.
- The idea of considering the environmental factor in making decisions about reference points was also mentioned. Predictions concerning the possible reproduction of exceptional events could eventually be taken into account.
- Finally, several participants thought that the approach taken from a population dynamics model, which sets the LRP at 40% of B_{MSY}, should also be considered. This approach was presented during the last assessment (March 2014).

Mr. Duplisea ended his presentation by emphasizing that the 2014 assessment situated the mackerel stock in subareas 3 and 4 at 8% of the LRP (in the case where this point corresponds to B_{rec}). As explained, the stock is in the critical zone. This situation would also apply to the entire Northwest Atlantic stock.

In conclusion, all the results from the two methods will be kept and presented at the next advisory committee meeting (April 16, 2014). However, the participants agreed to exclude the results from the non-parametric model and to integrate the LRP corresponding to 40% of B_{MSY}. According to the results obtained, the LRP is between 49,000 and 156,000.

This is a preliminary exploration of a Precautionary Approach for the mackerel fishery. Should a PA be applied, additional consideration and refining will be carried out by Science.

APPENDIX

1 – PARTICIPANTS LIST

Name	Affiliation
Bergeron, Mathieu	DFO Fisheries Management
Brassard, Claude	DFO Science
Castonguay, Martin	DFO Science
Cyr, Charley	DFO Science
Dallaire, Jean-Paul	DFO Science
Desgagnés, Mathieu	DFO Science
Dubé, Sonia	DFO Science
Duplisea, Daniel	DFO Science
Grégoire, François	DFO Science
Légaré, Benoît	DFO Science
Sainte-Marie, Bernard	DFO Science
Trottier, Steeve	DFO Science

2 – TERMS OF REFERENCE

Development of reference points for the Precautionary Approach for the stock of Atlantic Mackerel in subareas 3 and 4

Regional Peer Review – Quebec Region

March 20, 2014
Mont-Joli, Quebec

Chairperson: Martin Castonguay

Context

The Precautionary Approach (PA) is a general philosophy to managing threats of serious or irreversible harm when there is scientific uncertainty. That condition often apply in fisheries; therefore PA should be incorporated in fisheries management. The first step in PA framework development is usually estimation of limit reference points.

Canada is committed domestically and internationally to the use of PA in managing its fisheries. Over the last few years, there have been several initiatives in Canada to define the PA in a fisheries context, to identify benchmarks that would be consistent with the approach and to apply it in fisheries management. The fundamental principles guiding this approach have been outlined in two key documents produced by DFO: 1) the Science Advisory Report 2006/023 that identifies the minimal requirements for harvesting strategies to be compliant with the PA and 2) the 2008 Decision-Making Framework Incorporating the Precautionary Approach; a policy document to guide the incorporation of PA principles in the management of Canadian fisheries.

To be compliant with the PA, fishery management plans should include harvest strategies that are developed according to a science-based Limit Reference Point, an Upper Stock Reference Point and Removal Reference points. These points define the limits of stock status zones (i.e., Healthy, Cautious, and Critical). It is expected that the management decisions respect the actions each of the stock zones as they are described in DFO Precautionary Approach guidance referenced above.

Objectives

The key objective of the meeting is to define limit reference points, consistent with the precautionary approach for the stock of Atlantic mackerel in Subarea 3 and 4 based on the best scientific information available. This information includes the results of the egg surveys, catch at age, biological data, and a sequential population analysis.

Specifically, the following objectives have been set:

1. Examine the available data to determine the reference point indicators and provide a rationale for the recommended indicators.
2. Identify and recommend reference points based on indicators.
3. Review the proposed reference points and uncertainties related.

Expected Publications

- Proceedings
- Research Document

Participation

- Fisheries and Oceans Canada (DFO) (Science and Ecosystems and Fisheries Management sectors)