Fisheries and Oceans Canada | Pêches et Océans Canada
Ecosystems and Oceans Science | Sciences des écosystèmes et des océans

Canadian Science Advisory Secretariat (CSAS)

Proceedings Series 2019/013

Quebec Region

Proceedings of the Regional Peer Review of the Stock Assessment of Gulf of St. Lawrence (4RST) Atlantic Halibut

February 18-19, 2019
Mont-Joli, QC

Chairperson: Bernard Sainte-Marie
Editor: Sonia Dubé

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

December 2019

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. 2019. Proceedings of the Regional Peer Review of the Stock Assessment of Gulf of St. Lawrence (4RST) Atlantic Halibut; February 18 -19, 2019. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2019/013.

Aussi disponible en français :

MPO. 2019. Compte rendu de l'examen régional par des pairs sur l'évaluation du stock de flétan atlantique du golfe du Saint-Laurent (4RST); du 18 au 19 février 2019. Secr. can. de consult. sci. du MPO, Compte rendu 2019/013.

SUMMARY

This document contains the proceedings from the regional peer review on the Assessment of the Gulf of St. Lawrence (4RST) Atlantic halibut. This review process was held on February 18-19, 2019 at the Maurice Lamontagne Institute in Mont-Joli. This meeting gathered about fifty participants from sciences, management and industry. These proceedings contain the key points of the presentations and discussions that occurred, and report the recommendations and conclusions that were presented during the review.

INTRODUCTION

The Quebec Region of Fisheries and Oceans Canada (DFO) is responsible for assessing several stocks of fish and invertebrate species harvested in the Estuary and Gulf of St. Lawrence. Most of these stocks are periodically assessed as part of a regional advisory process conducted at the Maurice Lamontagne Institute in Mont-Joli. This document consists of the proceedings of the assessment meeting held on February 18-19, 2019, on the Assessment of the Gulf of St. Lawrence (4RST) Atlantic halibut.

The objective of the review was to determine whether there were any changes in the resource's status and whether adjustments were required to the management plans based on the chosen conservation approach, the ultimate goal being to provide scientific advice on managing the Gulf of St. Lawrence Atlantic Halibut stock (4RST) for the 2019-2020 and 2020-2021 fishing seasons.

These proceedings report on the main points discussed in the presentations and deliberations stemming from the activities of the stock assessment regional committee. The regional review is a process open to all participants who are able to provide a critical outlook on the status of the assessed resources. Accordingly, participants from outside DFO are invited to take part in the committee's activities within the defined terms of reference for this review (Appendices 1 and 2). The proceedings also list the recommendations made by meeting participants.

CONTEXT

Meeting chairperson Bernard Sainte-Marie welcomes the participants. He goes over the objectives of the peer review and how it will proceed and presents the terms of reference and agenda for the meeting. After the participants have introduced themselves, Mathieu Desgagnés presented some data on the biology of Atlantic halibut, including its distribution in the Gulf according to depth and temperature, as well as information on its growth (size structure, weight–length relationship). There is no recent size-at-age relationship. Atlantic halibut is distributed over all of 4RST, in warmer waters (3–5° C), either in coastal areas or in deep channels.

- Some participants mentioned that it would be interesting to examine the information on Atlantic halibut collected during the winter redfish fishery.
- For the weight–length relationship graph, it was suggested that a graph of the observed versus estimated values also be presented, which would provide a better representation of deviations from the average condition.

Charlotte Gauthier briefly presented the results of research on the diet of Atlantic halibut, including a stomach content index based on geographical position and depth, and a portrait of the main prey consumed (invertebrates and fish) based on Atlantic halibut size. The proportion of empty stomachs increases with depth. In addition, Atlantic halibut have shown a tendency to eat more cod and redfish after 2011.

- Questions were asked as to the origin of the cod that has been contributing an increased portion of the halibut diet since 2011. It is most likely from the southern Gulf.
- The possibility of regurgitation was raised to explain the observation of empty stomachs.
- The participants found this study to be very informative. This is the only predator for which the time series of observations has been complete since 1998.

Dominique Robert, Paul Gatti and Christiane Dufresne presented the results of a satellite tagging study conducted in 4RST (2017–2018). The purpose of this study was to examine the

seasonal migrations and spawning areas, environmental associations (to come), nursery areas, and the level of connectivity through otolith chemistry (to come). The model used to reconstruct the migratory route between the tagging and tag releasing was presented, as well as simulations of these routes. There seems to be a segregation between Atlantic halibut from different regions, and each group appears to be fairly loyal to its region. However, in winter, fish are generally found in deep channels, and their ascent into the water column would be associated with reproductive behaviour. Potential winter breeding areas have been identified at depths of more than 300 m in the Gulf channels.

- Concerns were raised about the potential impact of the winter deepwater redfish fishery.
- The possibility of extending the tagging to more sectors, including the Estuary and the Magdalen Islands, was considered.
- With regard to the circulation and drift of eggs and larvae, it was specified that egg laying would take place in very dynamic deep layers.
- It was noted that the results (current and future) of this tagging work will greatly contribute to the assessment of the Atlantic halibut stock.

RESSOURCE ASSESSMENT

LONGLINE SURVEY AND TAGGING

Two years of longline survey and Atlantic Halibut tagging have been completed successfully (2017 and 2018). A total of 125 longline fishing stations were sampled (1 to 30 September) and spaghetti tagging was completed. The results of this collaboration between DFO and industry are expected to contribute to the next assessment of Atlantic Halibut stock status for 2021 winter.

- There is a lower catch in 2018 than in 2017. This year-to-year variation could be related to external factors, such as bad weather.
- It was noted that the tagging work will eventually be used to determine an exploitation rate for Atlantic Halibut.
- Participants question how to improve the return rate of tags. Some of the comments made relate to how to communicate information to fishers, which seems to be improved. It is mentioned that this information is already included in the license conditions.
- The assembly agrees on the importance of maintaining this survey in the coming years

COMMERCIAL FISHERY

The data used for the commercial fishery assessment come from landing statistics (NAFO, Gulf quota reports), zonal interchange format files (ZIFF) (logbooks, purchase slips, dockside verification program), at-sea observers and dockside sampling. Landings of Atlantic Halibut have been increasing since the early 2000s and have reached the highest values since 1960. For the 2017-2018 and 2018-19 management years, preliminary landings are 1,269 t and 1,089 t respectively. There is no reason to believe that the 2018-2019 total allowable catch (TAC) (1,297 t) will not be met. The catch per unit effort (CPUE) for the fishery increased from an average of 100 kg per 1000 hooks in the 2000s to 500 kg per 1000 hooks in 2018.

- For subdivision 4R, a significant gap was noted in the availability of information on landings with catch position and fishing effort. This could be partly explained by the fact that captains

of small vessels (< 35') do not complete a logbook. As a result, a portion of the Gulf is not as well represented. This deficiency greatly affects stock assessment. It was also mentioned that DFO data for the Newfoundland Region are provided later.

- For the historical series of landings, it was decided to consider only the information from 1960 onwards, given the significant uncertainty of data before that date. It was agreed to include a note about this in the Science Advisory Report.
- The landings include all those recorded, including authorized by-catches. It was reiterated that it would be possible to break down the data by fishing gear and target species from 1985 onwards (NAFO data).
- It is specified that the CPUE is calculated only for Atlantic halibut whose size is targeted by the fishery.
- It is stated that standardization does not take into account changes in the behavior of fishermen or their experience.
- As for the information on sizes from the sampling, the participants found that it does not accurately document recruitment.
- Growth is estimated at 8-9 cm per year up to 85 cm.
- Some participants felt that it would be interesting to estimate and present the mean size.

RESEARCH SURVEYS

Other data used for the assessment are from fishery independent surveys (DFO surveys: northern and southern Gulf, mobile sentinel survey: northern and southern Gulf). The abundance of pre-recruit Atlantic halibut (65-85 cm) estimated by bottom trawl research surveys in 2017 and 2018 is among the highest values of the time series. In addition, the size frequency distribution suggests good recruitment to fishing over the next few years. Abundance of commercial size Atlantic halibut (greater than 85 cm) estimated by bottom trawl research surveys in 2017 and 2018 is also among the highest values of the time series.

- It is noted that these surveys do not provide information on fish smaller than 30 cm. The planned work on otolith chemistry will determine where Atlantic halibut spends its first years of life.
- It was suggested that the data from the fixed sentinel survey in the southern Gulf be reviewed as they may provide additional information.
- The participants agreed that these indices are useful. They mentioned their potential in determining reference points for the precautionary approach.

CONVERSION FACTOR

The conversion factor currently used to convert eviscerated weight to round weight is 1.14.

- Industry representatives question this value, which does not seem to fit their observations.
- It is noted that this factor may vary for a variety of reasons, including time of the year, sex and size, and region and depth.
- It is recalled that a conversion value change would require an adjustment of the landings to keep the mortality rate constant.

CHALKY[1] ATLANTIC HALIBUT

With regard to the observations on chalky Atlantic halibut, which have a low market value, it was noted that this condition could be associated with warm water, food quality and the effort made by the fish to free itself from the hook.

- In our situation, there seems to be little applicable information on how to prevent it. It has nothing to do with how the fish is handled or how it is caught.
- This condition has always existed and is apparently also observed in other species.

CONCLUSION

INTERIM YEAR

The participants agreed to assess the status of the Atlantic halibut stock for two years (Science Advisory Report for the 2019 and 2020 fishing seasons). No indices will be reviewed for the interim year. There is little chance of observing major changes quickly given the longevity of the species.

RESEARCH PROJECTS

Some issues for which efforts will be invested are raised:

- Reference points and Precautionary approach;
- Mortality at release;
- Growth curve;
- Size and hook selectivity;
- Bycatch.

It is also noted that work on seasonal migration and spawning areas will be very useful for stock assessment. In the short term, the scientific advice will incorporate the information presented on territory occupancy during winter as well as the breeding season.

HIGHLIGHTS AND ADVICE

The highlights are presented and the participants comment on them.

- In the highlight on preliminary landings, it should be mentioned that there is no reason to believe that the 2017-2018 TAC will not be reached.
- For the two highlights on the indices from the research surveys (pre-recruits and biomass of Atlantic halibut > 85 cm), it would be appropriate to standardize them when it comes to a bottom trawl research survey. After discussing the idea of combining the two highlights into one, the participants decided to keep them separate in order to give each one sufficient importance, given their significance. The participants agreed that the two indices are among the highest values in the historical series.

[1] Chalky Atlantic halibut are characterized by having flesh that has a white opaque color instead of the shiny semi-translucent appearance of normal flesh.

- Potential winter breeding areas were identified at depths of more than 300 m in the Gulf channels. We will continue to use the term "potential."
- With respect to the longline survey highlight, it is suggested to mention that this is a collaboration between DFO and the industry. Information on the source of funding, which will be included in the text of the advice, is removed.
- Participants agreed on the presented outlook indicating that the exploited component of the stock is at its highest historical level and recruitment to the fishery is expected to remain high over the next few years. It is stated that work in progress will eventually be able to document the exploitation rate, which remains unknown for the moment.

Finally, a **conclusion** is made by the participants:

The short and medium term outlook for the Gulf of St. Lawrence Atlantic halibut stock is positive. The exploited component of the stock is at its highest historical level and recruitment to the fishery should remain high in the next years. However, the exploitation rate of this stock still remains unknown.

APPENDIX 1- TERMS OF REFERENCE

Assessment of the Gulf of St. Lawrence (4RST) Atlantic halibut

Regional Peer Review - Quebec Region

February 18-19, 2019
Mont-Joli, Quebec

Chairperson: Bernard Sainte-Marie

Context

The directed Atlantic halibut fishery is mainly carried out by longliners. To protect the population's reproductive potential, this fishery is subject to several management measures including the control of catches by a total allowable catches (TAC). Atlantic halibut represent a by-catch for other fleets, in particular the gillnet Greenland halibut fleet.

At the request of the fisheries management Branch, resource assessment is done every two years. The purpose of the review is to determine whether changes have occurred in the status of the resource that would justify adjustments to the management plan based on the retained conservation approach.

Objectives

Provide scientific advice on Atlantic halibut stock status in NAFO Divisions 4RST. This advice shall include:

- Description of the biology of Atlantic halibut and its distribution;
- A summary of oceanographic conditions in the Gulf;
- Analysis of the commercial fishery data including landing statistics, logbooks and commercial at-sea and dockside sampling program;
- Analysis of data from the DFO annual research trawl survey and sentinel fisheries;
- Analysis of data from the longline survey and tagging project carried out in collaboration with industry;
- Identify a Limit Reference Point for this stock, and report on stock status relative to the LRP.
- The determination of the process to provide advice during the interim years, including a description of conditions that may warrant a full stock assessment earlier than originally planned;
- Provide a perspective on stock status for the 2019-2020 and 2020-2021 seasons based on available indicators;
- Based on the assessment needs, setting research priorities for the next 5 to 10 years

Expected Publications

- Science Advisory Report on the Atlantic halibut in the Gulf of St. Lawrence (4RST)
- Proceedings
- Research Document

Expected Participation

- Fisheries and Oceans Canada (DFO) (Science and Fisheries Management sectors)
- Fishing industry
- Provincial representatives
- Aboriginal communities/organizations
- External experts

APPENDIX 2- LIST OF PARTICIPANTS

Name	Affiliation	Feb 18	Feb 19
Andersen, Christophe	ISMER/UQAR	x	-
Benoit, Hugues	DFO - Science	-	x
Bernier, Denis	DFO - Science	x	-
Boucher, Jean-René	RPPNG/OPFGQ	x	-
Boulanger, Marie-Pier	ISMER/UQAR	x	x
Bourdages, Hugo	DFO - Science	x	x
Brassard, Claude	DFO - Science	x	x
Brzeski, Véronica (tel)	Cape Breton Fish Harvesters Association	x	x
Cerqueira, Andy	MAPAQ	x	x
Chabot, Denis	DFO - Science	x	x
Courchesne, Sandra (tel)	DFO – Fisheries management	x	x
Côté, Jean-François	Association des capitaines propriétaires de la Gaspésie	x	x
Cyr, Charley	DFO - Science	x	x
Dennis, Bill	Fisheries and Land Resources – NL	x	x
Desgagnés, Mathieu	DFO - Science	x	x
Dubé, Sonia	DFO - Science	x	x
Dufresne, Christiane	ISMER/UQAR	x	-
Dufresne, Yvon	DFO - Science	x	x
Duplisea, Daniel	DFO - Science	x	x
Ferguson, Louis	Maritimes Fishermen's Union	x	x
Folliot, Benjamin	Dalhousie University	x	x
Gatti, Paul	Centre for Fisheries Ecosystems Research – Memorial University	x	x
Gaudet, Mario	DFO – Fisheries management	x	x
Gauthier, Charlotte	UQAR	x	x
Gauthier, Johanne	DFO - Science	x	x
Giffin, Melanie	Prince Edward Island Fishermen's Assoc.	x	x
Gosselin, Benjamin	ISMER/UQAR	x	x
Hurtubise, Sylvain	DFO - Science	x	x
Khamassi, Safouane	ISMER/UQAR	x	-
Karbowski, Chelsey	Oceans North Canada	x	x
Larochelle, Mia	DFO – Fisheries management	x	x
Le Bris, Arnaud	Marine Institute, Memorial University	x	x
Lubar, John	DFO – Fisheries management	x	x
MacDonald, Michael	Prince Edward Island Fishermen's Assoc.	x	x
MacEwen, David	PEI Dept Agr. Fish.	x	x
Ouellette-Plante, Jordan	DFO - Science	x	-
Plourde, Stéphane	DFO - Science	x	x
Robert, Dominique	ISMER/UQAR	x	-
Roland, Nicolas	DFO - Science	x	x
Roux, Marie-Julie	DFO - Science	x	-
Sainte-Marie, Bernard	DFO - Science	x	x
Sandt-Duguay, Emmanuel	AGHAMM	x	x
Senay, Caroline	DFO - Science	x	x
Simms, Jason	DFO – Fisheries management	x	x
Spingle, Jason	FFAW/UniFor	x	x
Syvrais, Michel	Ass. des morutiers traditionnels de la Gaspésie	x	x
Syvrais, Pascal	Ass. des morutiers traditionnels de la Gaspésie	x	x
Talbot, Héléna	DFO - Science	x	x
Trottier, Steve	DFO – Fisheries management	x	x