Fisheries and Oceans Canada | Pêches et Océans Canada
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Canadian Science Advisory Secretariat (CSAS)

Proceedings Series 2023/002

Quebec Region

Proceedings of the Regional Peer Review on the Assessment of Whelk Stocks in Quebec's inshore waters (fishing areas 1-9 and 11-15)

April 29, 2022
Virtual meeting

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January 2023

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
ISBN 978-0-660-46541-8 Cat. No. Fs70-4/2023-001E-PDF

Correct citation for this publication:

DFO. 2023. Proceedings of the regional peer review on the assessment of whelk stocks in Quebec's inshore waters (fishing areas 1-9 and 11-15); April 29, 2022. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2023/002.

Aussi disponible en français :

MPO. 2023. Compte rendu de l'examen régional par des pairs sur l'évaluation des stocks de buccin des eaux côtières du Québec (zones 1 à 9 et 11 à 15); 29 avril 2022. Secr. can. des avis sci. du MPO. Compte rendu 2023/002.

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SUMMARY

This document contains the proceedings of the regional peer review meeting on the assessment of whelk stocks in the Quebec's inshore waters. The review, which was conducted on April 29, 2022, via Zoom (virtual meeting), brought together about twenty participants from science, management and industry. These proceedings describe the highlights of the meeting presentations and discussions and outline the recommendations and conclusions resulting from the review.

INTRODUCTION

The Quebec Region of Fisheries and Oceans Canada (DFO) is responsible for assessing a number of fish and invertebrate stocks exploited in the Estuary and Gulf of St. Lawrence. Most of the stocks are periodically assessed as part of a regional peer review process held at the Maurice Lamontagne Institute in Mont-Joli. This document constitutes the proceedings of the Quebec's inshore waters whelk stocks assessment meeting held virtually via Zoom on April 29, 2022.

The purpose of this review was to determine whether changes had occurred in the status of the resource that required adjustments to the management plan based on the conservation approach adopted. The ultimate objective was to provide science advice for the management of Quebec's inshore waters whelk stocks for the 2022 to 2024 fishing seasons.

These proceedings report on the main points discussed in the presentations and deliberations resulting from the activities of the regional stock assessment committee. Regional peer reviews are a process open to any participant who is able to provide a critical outlook on the status of the assessed resources. Consequently, 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 set out the recommendations made by the meeting participants.

RESOURCE ASSESSMENT

Meeting chair Charley Cyr went over the science review process and objectives as well as the role of the participants. The participants were then asked to introduce themselves. Bruno Gianassi, the biologist who conducted the review, highlighted his colleagues' work and gave an outline of his presentation. The last assessment of the whelk fishery in Quebec's inshore waters had been conducted in winter 2018.

Elements of whelk biology (species, distribution, growth, reproductive cycle, parasitism, etc.) were presented. A brief overview of recreational fisheries in Longue-Rive (west of Forestville) on the North Shore was also given. This fishery involves 75 permits, with a limit of 100 whelk per permit and a minimum legal size of 60 mm. In 2021, 12% of whelk captured were under the legal size.

- The importance of implementing a logbook for the next season and adhering to the minimum legal size to ensure stock longevity was acknowledged.
- Some participants remain perplexed by the difference in minimum legal size between the recreational and commercial fisheries.

FISHERY INDICATORS AND RESEARCH SURVEY

The context of commercial whelk fisheries was addressed, including the various management measures and whelk landings from 2017 to 2021. This assessment focuses on areas 1 to 9 (North Shore), 10 (Gaspé / Magdalen Islands), 11 to 14 (Gaspé / Lower St. Lawrence) and 15 (Magdalen Islands). This review of commercial whelk fisheries is based on fisheries statistics (landings, effort, catch per unit effort [CPUE], spatial distribution of the fishery) and biological data from the commercial catch sampling program (size structure). A research survey targeting three sectors (Forestville, Pointe-aux-Outardes, Baie-Comeau) is conducted every two years. It provides information on density and yield as well as size structures. Indicators were presented overall, by region and by fishing area.

In 2021, whelk landings in Québec totalled 909.6 t, a sharp decrease (-32%) compared to 2017 (1,332.0 t). In 2021, 73% of landings came from the North Shore, 18% from the Îles-de-la-Madeleine and 8% from the Gaspé Peninsula–Lower St. Lawrence. Landings had decreased in most fishing areas compared to 2017. The largest decreases were seen in areas 1 (-31%), areas 4-5 (-76%, pooled data), area 6 (-55%), and area 12 (-63%). In contrast, landings in areas 2 (+136%) and 8 (+212%) increased from 2017. The TAC, where applicable, was met only in area 12. For areas managed by a total allowable catch (TAC), it was not reached in areas 1, 12, 13 and 15 and was exceeded by 4.2 t (3.8% of the current TAC) in area 2. The trend in catch per unit effort (CPUE) over the 2018-2021 period is positive in area 8, relatively stable in areas 1 and 2, and declining in areas 3, 4-5, 6, 12, 13, and 15. In 2021, CPUE in areas 3, 4-5, 12, 13, and 15 was between -3% and -49% below their 2002-2018 historical median.

The research survey conducted in 2019 in areas 1 and 2 showed that the density of whelks ≥ 70 mm decreased from 2017 at Foresville, Pointe-aux-Outardes and Baie-Comeau sites. In addition, total whelk density (≥ 20 mm) was significantly lower than the highest value observed historically.

Areas 10 and 14 are not fished, and fishing effort has been sporadic and low in areas 9 and 11. It is therefore impossible to comment on the status of the resource in these areas.

Several general comments were made:

- The high price of fuel could be one reason for the number of inactive licenses, despite the good price of whelk on the market.
- Fishers are also active in other fisheries.
- It seems that active fishers are trying to buy up inactive licenses to reduce the number of active licenses. A fisheries management work plan would address this issue.
- The minimum legal size is now better adjusted to the size at sexual maturity (L50), except in areas 1, 2 and 15, where there have been no adjustments.

The participants gave specific comments for each region, recorded below.

North Shore

- It was hypothesized that the rise in CPUEs in 2016 and 2017 was associated with the 2011 cohort; this could be examined in further detail.
- As in most areas, the legal size was changed in area 3 in 2019 to better reflect the size at sexual maturity.
- It was noted that the increase in landings in the late 1990s and early 2000s was linked to the reorientation of fisheries following the cod moratorium.
- For area 8, a standardized CPUE per sub-area could be proposed.

Gaspé

- Concerns were raised over the fact that six months after the fishery, the 2021 data for area 11 had still not been entered.
- Some participants said that the situation in area 13, where the fishing effort is still high despite a reduction in landings, is very concerning. Could an area closure be recommended? According to some participants, areas 4 and 5 should be closed as well, though area 13 remains the area of greatest concern given the levels of fishing effort. This is

more of a question for management. Science may suggest minimizing harvests or displacing fishing effort.

- It was agreed that there is confusion surrounding the data and reasoning required to accurately assess the status of whelk in the different areas.

Magdalen Islands

- There are very significant boring polychaete infestations in this area. Boring polychaetes weaken whelk shells, making them more vulnerable to predators. We lack detailed data on the impact of this infestation on whelk reproduction and growth. Furthermore, the polychaete species in question has not been identified. This infestation is associated with a particular spatial distribution (more prevalent in the southeastern sectors), which suggests a specific source and/or substrate. Additional work is required to better understand how this infestation is linked to environmental factors and human activities (e.g., aquaculture).
- In parallel, it would also be worthwhile to assess the scope of this issue with scallops in the Magdalen Islands.

UPDATE ON SEXUAL MATURITY

According to a recent assessment, the average size at which 50% of female *Buccinum undatum* are sexually mature (T_{50}) ranges from 62 to 93 mm. To protect reproductive potential, the minimum legal size (MLS) should be adjusted to reflect T_{50}. Such an adjustment would represent an increase in MLS for areas 4, 5, 6, 7, 8, 12 and 13.

- This fishery must be managed carefully due to the lack of a mode of larval dispersal, which makes the population vulnerable to local overfishing.
- The participants proposed the following adjustments to the minimum legal size: The minimum legal size should be increased to at least 80 mm in areas 8, 12 and 13; to at least 90 mm in areas 4 and 5; and to at least 85 mm in areas 6 and 7.
- Monitoring this population is still challenging. Control by minimum legal size therefore remains important, even though some participants think it does not seem very preventive.
- It was noted that little effort had been devoted to monitoring this species. It was determined that the current situation warrants more investments, particularly in cohort tracking. According to the participants, areas 3 to 7 on the North Shore should be prioritized.

CONCLUSION

RESEARCH PRIORITIES

In general, there is little data on whelk populations in Quebec. The following research priorities were identified:

- Continue the research survey on the Upper North Shore (areas 1 and 2).
- Arrange to take new samples to assess sexual maturity in area 8 on the Lower North Shore, a very large area (no samples – La Romaine).
- Continue monitoring boring polychaetes in the Magdalen Islands (i.e., determine the impact on reproduction and growth).

- Assess the relationship between environmental conditions (e.g., water temperature) and whelk abundance (areas 1 and 2 – research survey; area 15 – boring polychaetes) and predator-prey interactions.
- Continue age readings (e.g., growth analysis).
- Assess the biomass, sexual maturity and population structure of whelk in Longue-Rive (area 1; recreational fisheries).

The following priorities were added:

- Improve knowledge of parasitic infestation of whelk gonads and how this infestation impacts reproduction.
- Better understand the ecosystem relationships.
- Examine the environmental factors that influence whelk growth and size at maturity.

SUMMARY AND RECOMMENDATIONS

The key points of the assessment were presented, and some modifications were suggested by the participants.

- For the key point concerning landings by area, it was suggested that the quantities in tonnes be removed to leave only the changes in percentage since 2017.
- The decision was made to remove the key point on sub-legal size whelk landed. This information will be included in the science advisory report.
- The decision was also made to remove the key point on the available indicators as this point was deemed redundant given the key point on CPUEs. The key point on CPUEs was reviewed to ensure it contained information on all areas and was clear and concise.
- The sentence on the parasitic boring polychaete infestation in area 15 was reformulated to highlight the fact that this infestation has been raised as a threat by commercial fish harvesters and to stress the necessity of a follow-up to evaluate the impact on the survival, reproduction, growth and recruitment of affected whelk. After a discussion, it was decided to keep this key point and make it a recommendation.
- The key point on size at maturity (L50) was reviewed and linked to the key point on the proposed adjustment to the minimum legal size with the specification that the aim is to protect reproductive potential. The areas in which the adjustments are proposed (4, 5, 6, 7, 8, 12 and 13) were listed without going into detail.
- A key point was drafted on the more concerning stock status in the Gaspé (areas 12 and 13), the Magdalen Islands (area 15) and the Middle North Shore (areas 3, 4, 5 and 6), with the observation that these stocks do not seem able to sustain the current fishing effort in the long term. It was added that these stocks are vulnerable to overfishing and local depletion.
- Some participants think that it is management's responsibility to capture the scope of Science's concerns and translate these concerns into management measures. Others believe that Science should provide management with better guidance on the actions to take.
- The participants ultimately agreed on this wording: Management measures must be adjusted to better align with L50 and significantly reduce fishing efforts to ensure the sustainability of this resource.

Lastly, the following recommendations were agreed by the participants:

The stock status in some areas of the Gaspé Peninsula (areas 12 and 13), the Middle North Shore (areas 3, 4, 5 and 6) and the Îles-de-la-Madeleine (area 15) is of concern. These stocks do not seem to be able to sustain the current fishing effort over the long term. There are declining trends in CPUE and local declines within some areas. These stocks are therefore vulnerable to overexploitation and local depletion. Consequently, management measures should be adjusted to better align with the T_{50} and lead to a significant decrease in fishing effort to ensure the sustainability of this resource.

Monitoring of the severity of whelk infestation by parasitic polychaete borers in area 15, a threat raised in recent years by commercial fishermen, will need to continue to assess the impact on survival, reproduction, growth and recruitment of affected whelks.

APPENDIX 1 – TERMS OF REFERENCE

Assessment of whelk stocks in the Quebec's inshore waters

Regional Peer Review – Québec Region

April 29, 2022
Virtual meeting

Chairperson: Charley Cyr

Context

The whelk commercial fishery began in the Estuary and Gulf of St. Lawrence in the 1940s. It expanded to the North Shore in the early 1990s and in 2003 in the Îles-de-la-Madeleine. Landings are generally around 1,000 t per year and come mainly from the North Shore. The whelk fishery is practiced using mainly conical traps.

Quebec waters are divided into 15 fishing areas to which access is limited to a restricted number of fishermen. The effort is also controlled by a fishing season, a number of traps and a minimum legal size which varies according to fishing area. In addition, catches are limited by quota in fishing areas 1, 2, 10, 11, 12, 13 and 15.

At the request of the Fisheries Management Branch, resource assessment is done every three years, with some exceptions. The last whelk stock review was done in February 2018. The objective of the review is to determine whether changes that have occurred in the stock status necessitate adjustments to management plans based on the conservation approach used.

Objectives

Provide scientific advice on the management of whelk stocks in Quebec's inshore waters (management units 1 to 15) for fishing seasons 2022 to 2024. This advice shall include:

- Description of the biology of whelk and its distribution in Quebec's coastal waters
- An assessment of size at sexual maturity in different fishing areas
- Description of the fishery including landings, fishing effort and management measures specific to the fishing areas
- Analysis of catch per unit effort from the fishery
- Analysis of data from the commercial sampling program
- Analysis of data gathered during research survey in zone 1 and 2 in Upper North Shore in 2019
- Identification and prioritization of research projects to be considered for the future
- Perspectives for the 2022-2024 fishing seasons in areas 1 to 15 based on available indicators

Expected Publications

- Science Advisory Report on whelk in the Quebec inshore waters.
- CSAS Research Document
- CSAS Proceedings summarizing discussions

Participation

- Fisheries and Oceans Canada (DFO): Ecosystems and Oceans Science, and Ecosystems and Fisheries Management
- Fishing Industry
- Provincial representatives
- Indigenous Communities / Organizations

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