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Proceedings of the regional peer review meeting on the Assessments on Atlantic surf clam stock from the Magdalen Islands

**February 28, 2019
Mont-Joli, Quebec**

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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.

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SUMMARY

This document contains the proceedings from the meeting held within the regional assessment process on Atlantic surf clam stock from the Magdalen Islands following the 2016 to 2018 fishing seasons. This advisory process was carried out on February 28, 2019 at the Maurice-Lamontagne Institute, Mont-Joli, and it gathered about twenty participants from sciences, management and industry. These proceedings contain the essential parts of the presentations and discussions held and relate the main 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 peer review process conducted at the Maurice Lamontagne Institute in Mont-Joli. This document consists of the proceedings of the assessment meeting held on February 28, 2019, on the assessment of the Atlantic surf clam stock from the Magdalen Islands.

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 Magdalen Islands Atlantic surf clam stock for the 2019-2021 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 Charley Cyr goes over the objectives of the peer review and how it will proceed. After the participants have introduced themselves, the biologist in charge of the review, Sylvie Brulotte, highlights the work of her collaborators and presents the Terms of reference. A scientific advice for the management of the Magdalen Islands surf clam stock for the 2019 to 2021 fishing seasons will be formulated following this meeting.

Before going into the details of the resource assessment, a contextualization is carried out. The Atlantic surf clam fishery in the Magdalen Islands is conducted with hydraulic dredges in sub-areas 5A1 and 5B1 or using hand tools, on foot or while diving, in about 10 shellfish sectors located in lagoons or near coasts. Ms. Brulotte exposes the history of this fishery and the current context of exploitation

The Atlantic surf clam distribution is presented, including areas targeted for exploitation, exclusion areas and refuge areas. Some considerations related to global warming are also raised. The main biological characteristics of the species are presented as well as the results of research on growth (FSCP project 2012-2013). The management measures (2016-2018) that apply to the dredges and manual harvest fishery are detailed and the data sources used for the assessment are identified. Landings since 2002 are also illustrated.

Some comments are made by the participants following this presentation.

- Significant stranding of young Atlantic surf clams was observed in November 2018.
- Ms. Brulotte mentioned that the minimum density of mature clams required for successful egg fertilization is unknown, hence the interest in creating high-density refuge areas.
- There is a lack of data on recruitment (importance and origin). The method of assessing recruitment is therefore being questioned, particularly on the basis of the fishery or via sampling (e.g. dredge with small netting, razor clam dredge). Observations (e.g. at low tide or strandings) could provide additional information.

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- Respect of exclusion zones was questioned. Some peer monitoring appears to exist. It was noted that the Vessel Monitoring System (VMS) will be implemented in 2019.
 - It is believed that global warming could affect the distribution of the Atlantic surf clam in the Magdalen Islands, which corresponds to the northern limit of the species' range. A potential expansion of its range is being discussed, although nothing can be predicted at this time.
 - A clarification is made regarding the age at sexual maturity of the surf clam, which is believed to be approximately 4 years (around 75 mm).
 - The hydraulic dredge is very efficient and highly selective for clams of legal size. The capture of associated species is said to be low. However, the impact of the dredge on habitat is considered to be significant in terms of juvenile surf clam settlement on the sea floor. The extent of the damage remains difficult to quantify.
 - Participants wondered about the importance of non-commercial fishing activities (SPS). The official values for 2017 and 2018 are not yet known. Management representatives provided details and the preliminary values are 64 t in 2017 and 73 t in 2018.

RESOURCE ASSESSMENT

HYDRALIC DREDGE FISHERY

Ms. Brulotte continues her presentation by reviewing the indicators associated with the commercial dredge fishery in areas 5A1 and 5B1 and by bed: landings, effort, catches per unit effort (CPUE), size structure, proportion of bed dredged. Three beds were delineated in 5A1 and 5B1. The CGE and East beds are located in 5A1 and the North bed straddles sub-areas 5A1 and 5B1. Since 2009, the fishery has been concentrated on the North bed, whose known area continues to grow.

Since 2013, the total allowable catch (TAC) has been caught in 5A1 (125 t) and 5B1 (113 t) and the fishing effort is stable. CPUE's on the North bed have been high and stable since 2015. The average size of landed surf clam has been greater than 130 mm for several years. The proportion of this bed dredged annually varies from 4.5 to 6.7% since 2010. Since 2002, fishing effort is sporadic and low in sub-areas 5A2 and 5B2; the clam stock status is therefore unknown in these two sub-areas.

Some comments are made by the participants.

- Since 2009, the increase in CPUE's is associated with the exploitation of the North bed. The East bed is an alternative plan according to industry.
- It was mentioned that it would be interesting to examine the possibility of using the annual median of fishing positions per bed to represent the movement of the fishery from one year to the next.
- Confirmation showed that the spacing between the rods for the dredge has remained the same over the years.
- Questions were raised on how to recommend a TAC, including using the proportion of the area dredged annually from known beds as an indicator of the harvesting rate. However, the total area of the bed is unknown.
- Management mentioned that the current need of the industry is not an increase in the TAC, but rather a status quo.

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- An industry representative indicated that the dredging speed varies between 0.2 and 0.6-0.7 kt.

HAND DIGGING

Referring to the various data sources used (logbooks, surveys, inventory, SPS), the biologist reviewed the indicators for manual harvesting, dive fishing and hand digging (landings, effort, CPUE and size structure). Commercial and recreational hand digging by divers and shore harvesters is a very popular, well-developed activity in the Magdalen Islands. However, the extent of recreational hand digging is unknown. Known commercial hand digging landings vary with fishing effort. The averages for the last three years are 160 days and 42 t by divers and 113 days and 9 t for shore harvesters. Unreported harvesting would be approximately 60 t per year for commercial and recreational manual hand harvesting.

For dive fishing, the CPUE in A-12.1, one of the main clam harvesting areas, has been stable since 2016 and is at the 2005-2017 average. The CPUE in A-09.5 has been fluctuating around its average since 2014. Since 2008, the average size of clams landed has generally been around 131 mm in the sampled areas. For hand digging, the CPUE varies from area to area. A-09.5 is quite stable and was close to the 2005-2017 average in 2017 and 2018. The average size of landed surf clams is small compared to other harvesting methods. The average size over the last three years ranges from 111 to 120 mm depending on the area.

- The main point of discussion focused on non-standardized versus standardized CPUE. Ms. Brulotte has more confidence in non-standardized CPUEs, where each activity is given the same weight. The very high value of the 2018 standardized CPUE for dive harvesting appears to be unrealistic (too much weight is believed to have been given to certain more efficient fishermen). Meeting participants seemed to share this view.

CONCLUSION

IDENTIFICATION OF RESEARCH WORK

The work considered priority by participants are:

- Evaluate recruitment on dredged bed. This need is a priority for the next year
- Determine sexual maturity
- Tagging of young surf clams to track individuals (location and growth)
- Determine the source of recruitment in the Grande-Entrée lagoon
- Survey every 2 or 3 years beds exploited manually in collaboration with the population, eg Ilot B (A-09.5) and A-12.1
- Verify the density in the refuge area A-08.4
- Find a mechanism, other than logbooks, to track manual harvesting, eg phone call, e-mail, electronic application (under development)

It is mentioned that the Vessel Monitoring System (VMS) will be put in place in 2019, this should make it possible to better delineate the exploited bed dredged.

MONITORING INDICATORS

No updates will be made between the three-year stock assessments.

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- Some clarifications could be made in the scientific advice to justify the fact that a follow-up during the interim years does not appear necessary.

AJUSTEMENT MODE OF THE TAC - DREDGE

The biologist very briefly recalls the rules of adjustment of the TAC according to a "cautious" approach.

HIGHLIGHTS AND RECOMMENDATIONS

Mrs. Brulotte presents the highlights for dredge fishery and hand digging. Comments are provided by participants and recommendations are made.

Dredge fishery

- In the highlight of the North bed, there is agreement that the known area has been increasing since 2009.
- Regarding the CPUE highlights, it is not necessary to indicate the average of the last three years. In the second sentence, we specify: the proportion "of this bed" (...).
- With respect to the recommendation, there is agreement that current landings can be maintained.
- It should also be mentioned that there is no information on recruitment for all beds, which is an important source of uncertainty.

Thus, the recommendation is formulated as follows:

Yields and size structures of the last years are stable on the North bed and the dredged area is around 6%. According to all information presented, the current landings could be maintained in sub-areas 5A1 and 5B1.

The lack of information on recruitment for all beds is a source of uncertainty to determine the stock status.

Hand digging

- Discussions aim to clarify what is known and unknown about hand digging (reported versus unreported, commercial vs. non-commercial). The highlights are restructured so that the information is clearer.
- Unreported harvest is estimated to be approximately 60 t per year for commercial and recreational manual harvesting.

Thus, the recommendation is formulated as follows:

Based on the information presented, hand harvesting could be maintained at the current level. Any measures that will help better document hand digging are desirable.

APPENDIX 1- TERMS OF REFERENCE

Stock assessment of Atlantic Surf clam of the Magdalen Islands

Regional Peer Review - Quebec Region

February 28, 2019
Mont-Joli, Quebec

Chairperson: Charley Cyr

Context

In Québec, the Atlantic surf clam (*Spisula solidissima*) fishery is practiced exclusively in the Magdalen Islands. The fishery is conducted in two different ways, either by boat with a hydraulic dredge in coastal waters, or manually on foot or while diving in lagoons or near the coast. In addition, hand digging may be recreational or commercial. Dredge fishing Area 5 is divided into four sub-areas while manual commercial fishing is counted by shellfish area. The dredge fishery is regulated by different management measures as a minimum legal size of 90 mm and quotas of landings in sub-areas 5A1, 5A2 and 5B1.

At the request of the Fisheries Management Branch, resource assessment is done every three years. The last Atlantic surf clam stock review was done in 2016. 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.

Objective

Provide scientific advice on the management of Magdalen Islands Atlantic surf clam stocks for the 2019-2021 fishing seasons. This fishing is made by both hydraulic dredge or with manual tools (by diving or by foot). This advice shall include:

- Description of the biology of Atlantic surf clam;
- Description of the fishery including management measures, landings and fishing effort;
- Analysis of catch per unit effort from the commercial fishery;
- Analysis of data from the commercial at-sea and dockside sampling program
- Identification and prioritization of research projects to be considered for the future;
- Identification of indicators to follow the stock status during the years without a formal stock assessment and criteria for the reopening of the advice;
- Perspectives for the 2019-2021 fishing seasons.

Expected Publications

- Science Advisory Report
- Research document
- Proceedings

Participation

- Fisheries and Oceans Canada (DFO) (Science, and Ecosystems and Fisheries Management sectors)
- Fishing industry
- Provincial representatives

APPENDIX 2- LIST OF PARTICIPANTS

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