



## UPDATE OF STOCK STATUS INDICATORS FOR SCALLOP IN SUBAREA 20A IN THE MAGDALEN ISLANDS

### Context

Stock assessment of scallop in Quebec inshore waters is done every three years, with some exceptions, to determine whether recent changes in the status of the resource may justify adjusting the conservation approach and management plan. The last assessment was done in the winter of 2020.

In the case of subarea 20A in the Magdalen Islands, decision rules used to calculate annual authorized fishing effort have been in place since 2010 (Trottier et al. 2017). This effort is calculated using the primary stock status indicator (average catch per unit effort, or CPUE, from commercial fishermen logbooks) and secondary indicators (sea scallop abundance indices from the most recent Fisheries and Oceans Canada research survey). The CPUE was updated after the 2020 fishing season to provide Fisheries Management with information on the fishing effort for the 2021 season according to the precautionary approach guidelines.

This Science Response Report results from the Science Response Process of February 4, 2021 on the Updated indicators status of the scallop stocks in Subarea 20A in Magdalen Islands.

### Background

Two scallop species are fished commercially in the Gulf of St. Lawrence, namely the sea scallop (*Placopecten magellanicus*) and the Iceland scallop (*Chlamys islandica*). These two species are present in the Magdalen Islands and mainly inhabit gravel, shell or rock substrates, generally at depths of between 20 and 60 metres. A Digby dredge is used to harvest scallops near shore and catches are landed mostly as meat (muscle). Given the difficulty in visually distinguishing the meat of the two species, commercial fishing statistics are presented regardless of the species.

Area 20 in the Magdalen Islands is subdivided into five subareas: 20A, 20B, 20C, 20E and 20F (Figure 1). Since 2007, the fishing effort in subarea 20A has been controlled by a total authorized number of days at sea; in subareas 20B, 20C and 20F, it has been controlled by a fishing season. Subarea 20E is closed because it is a sea scallop refuge area. The number of days in subarea 20A can be compiled in half-days ( $\leq 8$  hours) or full days (maximum of 16 hours), two half-days accounting for one day at sea. There are 22 scallop fishing licences in the Magdalen Islands.

In 2010, reference points were determined and guidelines were established to estimate fishing effort based on the primary stock status indicator (CPUE) and its position according to the classification zones (high, average and low CPUE). Decision rules have been established and specify the recommended effort variations according to the results of the secondary indicators.

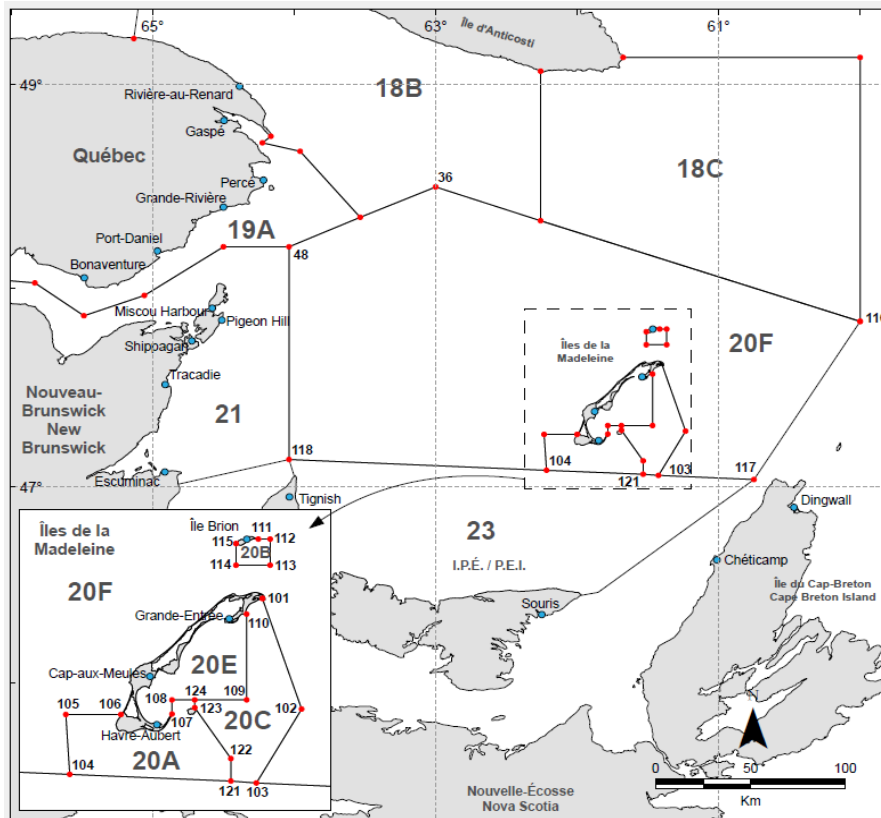


Figure 1. Scallop fishing subareas in the Magdalen Islands (20A, 20B, 20C, 20E and 20F).

The CPUE (kg/hm) for the commercial fishery in subarea 20A is calculated based on information recorded in logbooks (i.e. landings in kg of meat, fishery duration in hours, and dredge width in metres). When CPUE is increasing, the average CPUE for the last two years is used as the primary indicator of the decision rule; when the CPUE is down, the value of the last year is used. Following the adoption of Bill C-68 in 2019, scallop scientific surveys have been changed from biannual to annual on the North Shore and Magdalen Islands. A scientific survey was therefore planned for the summer of 2020, but it was cancelled due to the COVID-19 pandemic. For this reason, the four secondary indicators come from the 2019 research survey conducted in the Magdalen Islands. Those indicators chosen are relative density (number/1000 m<sup>2</sup>) of sea scallop for the <70-mm, 70 to 84-mm, 85 to 99-mm, and ≥100-mm size classes. The reference period for calculation of the 15th, 50th and 85th percentiles of the density is from 1987 to 2008.

For 2020, the maximum recommended fishing effort, calculated from the indicators, was 305.5 days. However, the effort actually authorized was reduced to 299 days after consultation with fishermen.

### Description of the fishery

Landings were 40.1 tons of meat in 2019 and 31.9 tons in 2020 in all of Area 20 (Figure 2), corresponding to a 20.5% decrease in landings between 2020 and 2019. The majority of landings were from subarea 20A with 39.6 t in 2019 and 31.3 t in 2020. The fishing effort was 341 days in 2019 and 302 days in 2020.

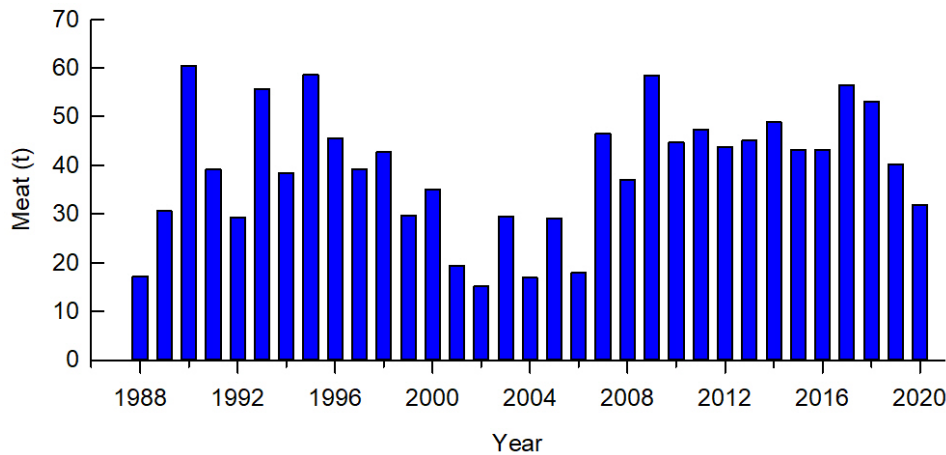


Figure 2. Scallop landings (t of meat) for all of Area 20 in the Magdalen Islands.

### Analysis and Response

#### Indicators of the stock status

The CPUE was 1.11 kg/hm in 2020, down 15.8% from 1.32 kg/hm in 2019 (Figure 3). The 2020 CPUE is between the upper reference level and the limit reference level, i.e. in the "Mean CPUE" classification zone. According to the 2019 research survey, sea scallop abundance was 9.58/1000 m<sup>2</sup> for the ≥100-mm size class, 1.04/1000 m<sup>2</sup> for the 85 to 99-mm class, 1.97/1000 m<sup>2</sup> for the 70 to 84-mm class, and 6.56/1000 m<sup>2</sup> for the <70-mm class. The density for the ≥100-mm size class is above the 85th percentile, those of 70 to 84-mm class and the <70-mm class is between the 50th and 85th percentile while the 85 to 99-mm class is between the 15th and 50th percentile (Figure 4).

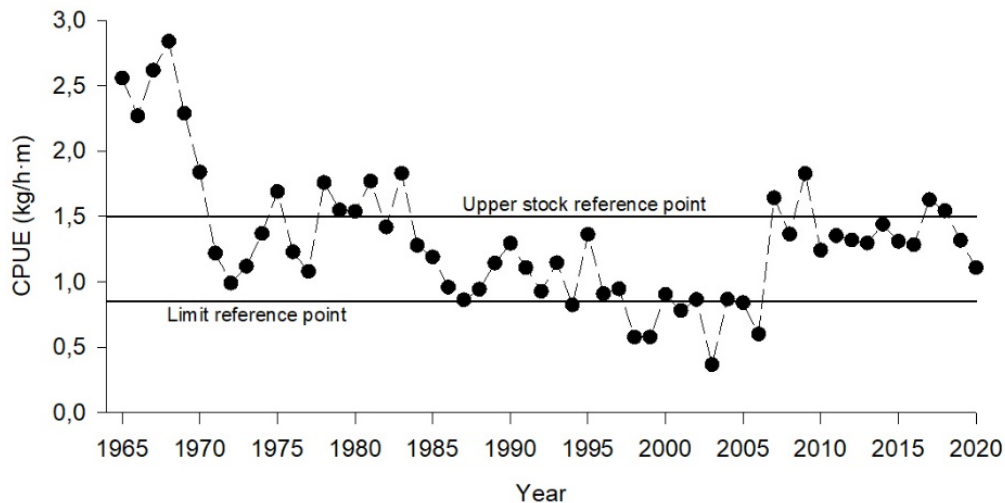


Figure 3. Annual catch per unit effort (CPUE) estimated from logbooks, subarea 20A.

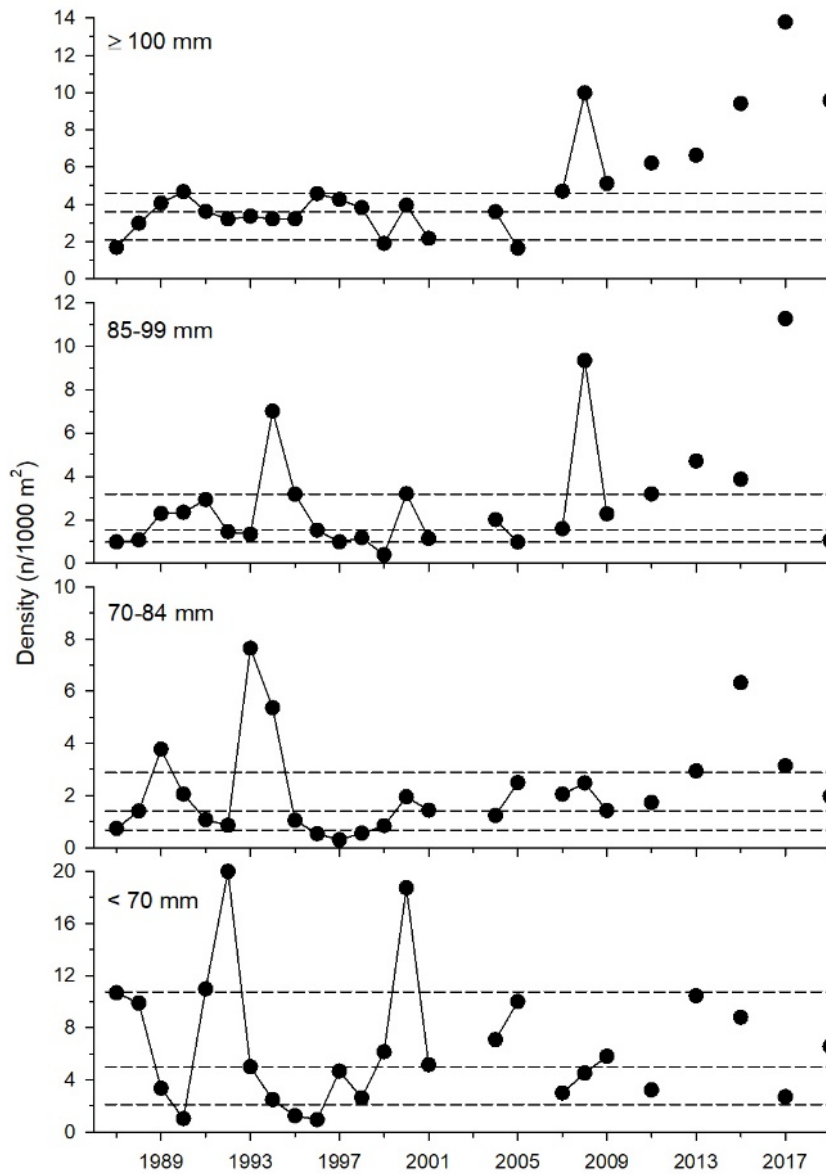


Figure 4. Annual density, by size class, of sea scallops sampled in subarea 20A during research surveys. The dashed horizontal lines represent the 15th, 50th and 85th percentiles of the 1987–2008 series.

## Conclusions

The update of the primary indicator indicates a lower CPUE in 2020 than in 2019. The 2020 CPUE is in the "Mean CPUE" classification zone (Figure 5). Projected fishing effort for 2021 according to the primary indicator is 280 days. The adjustment calculated from the secondary indicators is 0% for the  $\geq 100$ -mm size class, -10% for the 70 to 84-mm and <70-mm size classes and -20% for the 85 to 99-mm size class according to the decision rules. The average adjustment calculated indicates that the maximum fishing effort in Subarea 20A for 2021 would be 252 days at sea [280 days + (0-10-10-20)/4]%. This value is lower than the effort actually exerted in 2020 (302 days) in a context where fishing yield has decreased in 2020 as

anticipated and the research survey suggests that the expected fishing recruitment would be relatively low in the short term. Fisheries Management will determine the 2021 authorized fishing effort.

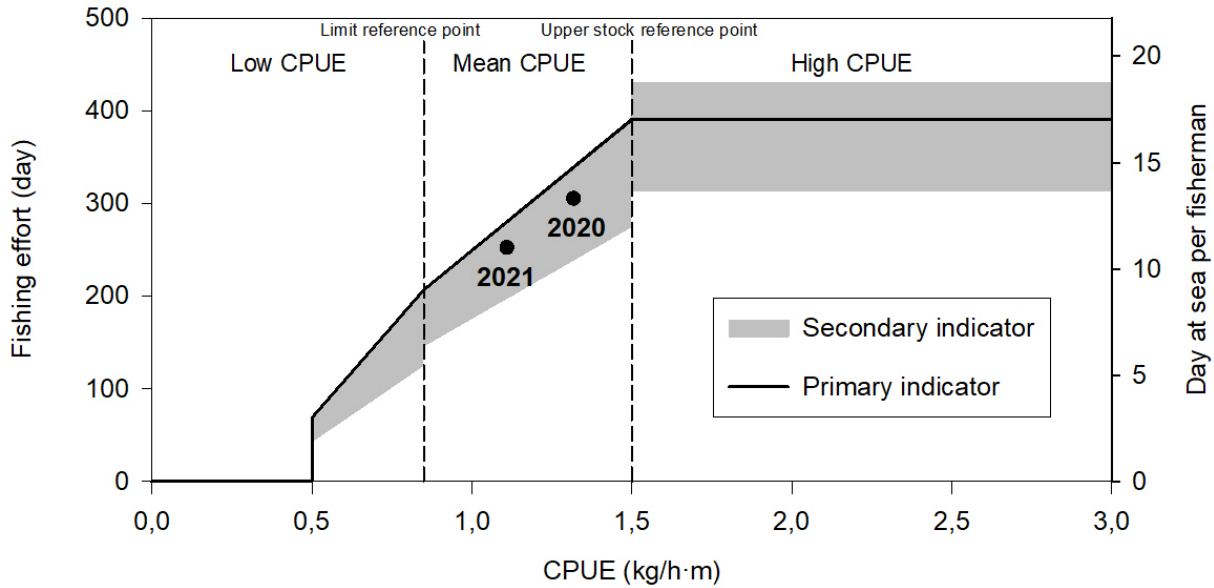


Figure 5. Calculation of fishing effort (days at sea) based on primary (CPUE) and secondary indicators (research survey indices) for subarea 20A.

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Date : February 17, 2021

## Sources of Information

This Science Response Report results from the Science Response Process of February 4, 2021 on the Updated indicators status of the scallop stocks in Subarea 20A in Magdalen Islands.

DFO. 2021. [Scallop stock assessment in Quebec coastal waters in 2019](#). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2020/054.

Trottier, S., Bourdages, H., Goudreau, P. and Brulotte, S. 2017. [Évaluation des stocks de pétoncle des eaux côtières du Québec en 2015 : données de la pêche commerciale, des relevés de recherche et des pêches exploratoires](#). Secr. can. de consult. sci. du MPO. Doc. de rech. 2017/037. xvi + 175 p.

## This Report is Available from the:

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ISSN 1919-3769

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Correct Citation for this Publication:

DFO. 2021. Update of Stock Status Indicators for Scallop in Subarea 20A in the Magdalen Islands. DFO Can. Sci. Advis. Sec. Sci. Resp. 2021/010.

*Aussi disponible en français :*

*MPO. 2021. Mise à jour des indicateurs de l'état du stock de pétoncle de la sous-zone 20A aux Îles-de-la-Madeleine. Secr. can. de consult. sci. du MPO. Rép. des Sci. 2021/010.*