



## 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 2023 (DFO 2023).

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 (annual 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 annual average CPUE was updated after the 2023 fishing season to provide Fisheries Management with information on the fishing effort for the 2024 season according to the precautionary approach guidelines.

This Science Response Report results from the Regional Peer Review of February 20, 2024 on the Updated Indicators Status of the Scallop Stocks in Subarea 20A in Magdalen Islands.

### Background

Two scallop species are fished commercially in the Estuary and 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, but the sea scallop is the most heavily fished species. Scallops 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 and by a fishing season; in subareas 20B, 20C and 20F, it has been controlled by a fishing season only. 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.

**Science Response: Update of Stock Status Indicators  
for Scallop in Subarea 20A in the Magdalen Islands**

**Quebec Region**

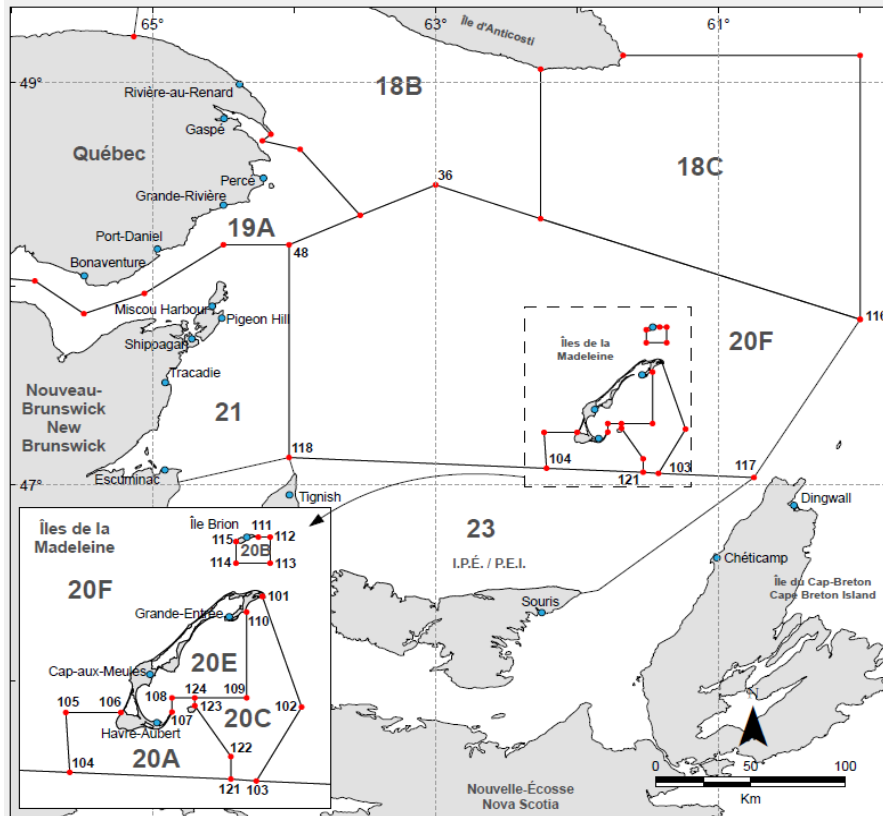


Figure 1. Scallop fishing subareas in the Magdalen Islands (20A, 20B, 20C, 20E and 20F).

The annual average 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. The scientific survey planned for the summer of 2020 was cancelled due to the COVID-19 pandemic. The scientific survey in the summer of 2021 was conducted on a different vessel because the Canadian Coast Guard vessel normally used for the survey was not available. Some modifications to the fishing technique had to be made, which resulted in significant uncertainty in the estimated densities of scallops during the scientific survey. After comparing the 2021 data with the 2022 and 2023 data collected with CCGS *Leim*, it has been determined that the 2021 data are valid and will be used from now on. Data from scientific surveys distinguish between the two species, unlike commercial fishing statistics. Thus, the four secondary indicators used in this document are the 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 2023, the maximum recommended fishing effort, calculated from the indicators, was 430 days. However, the effort authorized by DFO Fisheries Management was 230 days after consultation with the Industry.

**Description of the fishery**

Landings were 46.5 t of meat in 2022 and 59.3 t in 2023 in all of Area 20 (Figure 2), corresponding to a 27.7% increase in landings between 2022 and 2023. The majority of landings were from subarea 20A with 45.8 t in 2022 and 59.2 t in 2023. The fishing effort was 230 days (out of 230 authorized days) in 2022 and 2023.

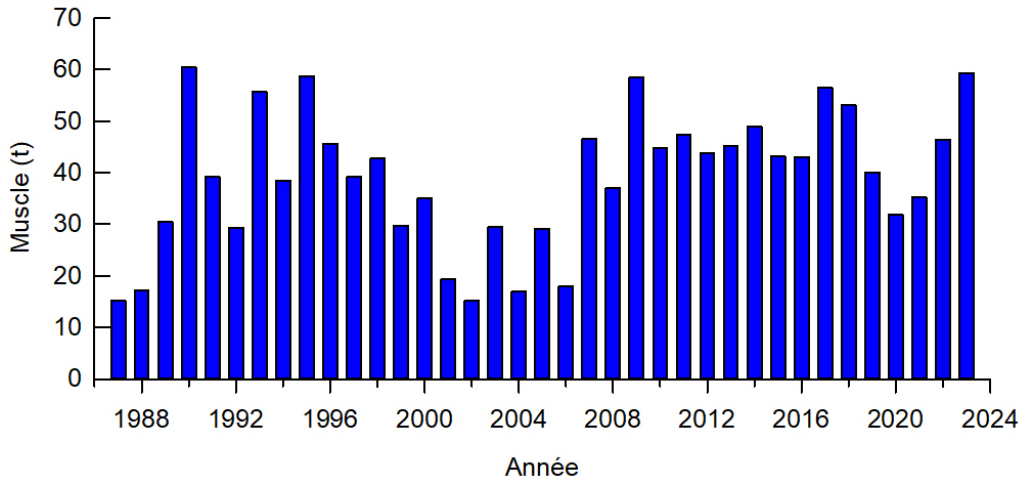


Figure 2. Scallop landings (t of meat) for all of Area 20 in the Magdalen Islands.

**Analysis**

**Indicators of the stock status**

The CPUE was 2.37 kg/hm in 2023, up 22.3% from 1.94 kg/hm in 2022 (Figure 3). The average CPUE for the last two years (2022-2023) is 2.16 kg/hm and is above the upper reference level, i.e. in the "High CPUE" classification zone. According to the 2023 research survey, the observed relative density of sea scallop was 17.82/1000 m<sup>2</sup> for the ≥100-mm size class, 6.64/1000 m<sup>2</sup> for the 85 to 99-mm class, 9.56/1000 m<sup>2</sup> for the 70 to 84-mm class, and 2.84/1000 m<sup>2</sup> for the <70-mm class. The densities for the ≥100-mm size class, 85 to 99-mm class and 70 to 84-mm class are above the 85th percentile, while the density of the <70-mm class is between the 15th and 50th percentile (Figure 4).

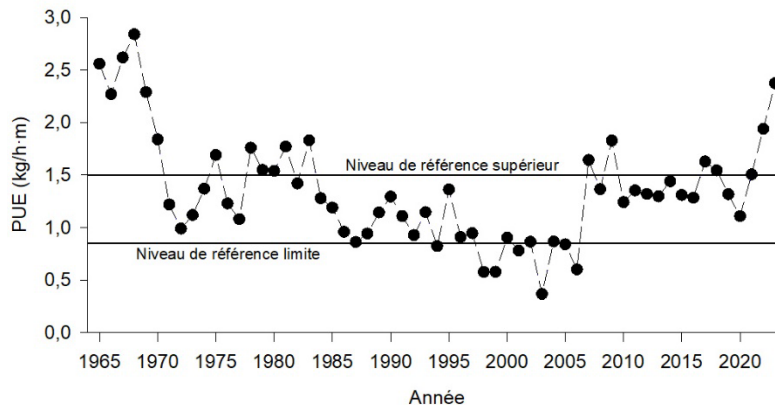


Figure 3. Annual catch per unit effort (CPUE) estimated from logbooks, subarea 20A.

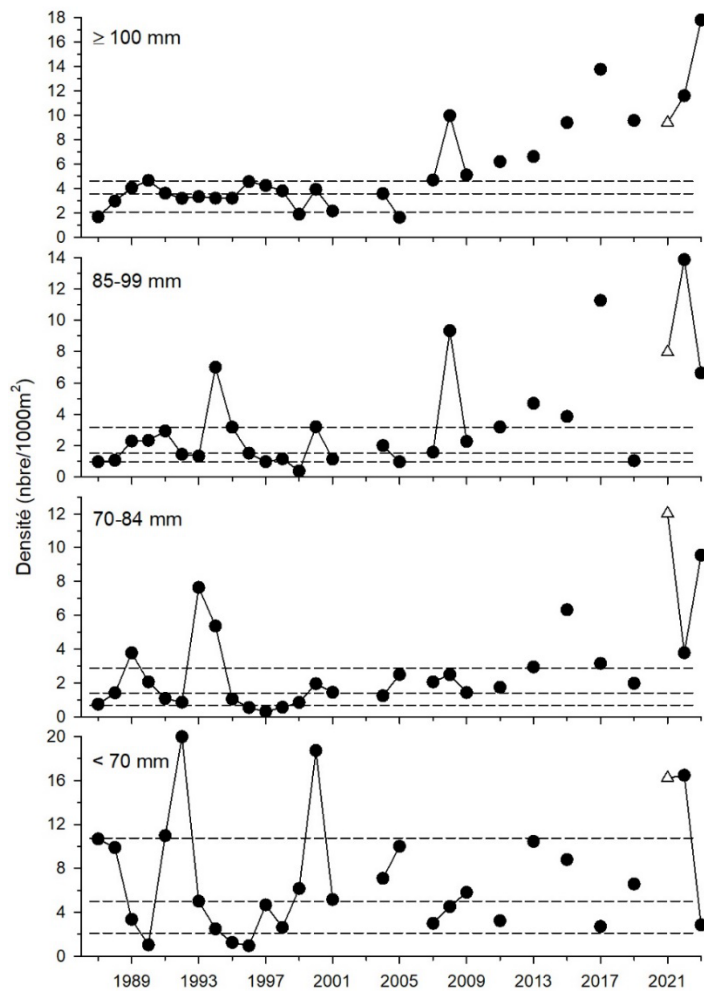


Figure 4. Density of sea scallops, by size class, sampled in the Magdalen Islands during research surveys. The dotted lines indicate the 15th, 50th and 85th percentiles of the 1987- 2008 series. Triangles indicate data collected with a charter boat (*Mytilus*) different from the one normally used. A solid line connects survey points separated by one year.

## Conclusions

The update of the primary indicator indicates a higher CPUE in 2023 than in 2022. The average CPUE of the last two years is in the "High CPUE" classification zone (Figure 5). Projected fishing effort for 2024 according to the primary indicator is 391 days. The adjustment calculated from the secondary indicators is +10% for the ≥100-mm size class, 85 to 99-mm class and 70 to 84-mm class and -10% for the <70-mm class according to the decision rules. The average adjustment calculated indicates that the maximum fishing effort in Subarea 20A for 2024 would be 411 days at sea [391 days + (+10+10+10-10)/4%]. This value is higher than the effort actually exerted in 2023 (230 days) in a context where fishing yield has increased in 2023 as anticipated and the latest research survey shows good estimated densities for all scallops ≥ 70 mm but low estimated densities of small scallops (< 70 mm). Fisheries Management will determine the 2024 authorized fishing effort.

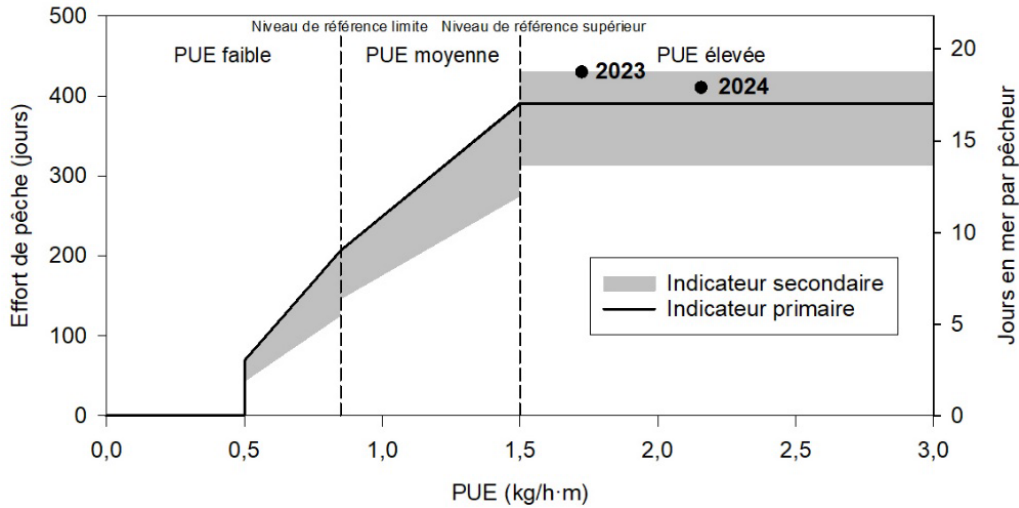


Figure 5. Calculation of fishing effort (days at sea) based on primary (CPUE) and secondary indicators (research survey indices) for subarea 20A in 2023 and 2024.

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### Sources of Information

DFO. 2023. [Scallop stocks assessment in Quebec coastal waters in 2022](#). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2023/034.

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