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 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 2016.

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 logbooks) and secondary indicators (sea scallop abundance indices from the most recent Fisheries and Oceans Canada research survey). The CPUE was updated after the 2017 fishing season to provide Fisheries Management with information on the fishing effort for the 2018 season according to the precautionary approach guidelines.

This Science Response Report results from the Science Response Process of December 13, 2017 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. 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 (≤ 8 hours) or full days (maximum of 16 hours), two half-days accounting for one day at sea. There are 23 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). Subsequently, decision rules specify the authorized effort variations based on the results of the secondary indicators.

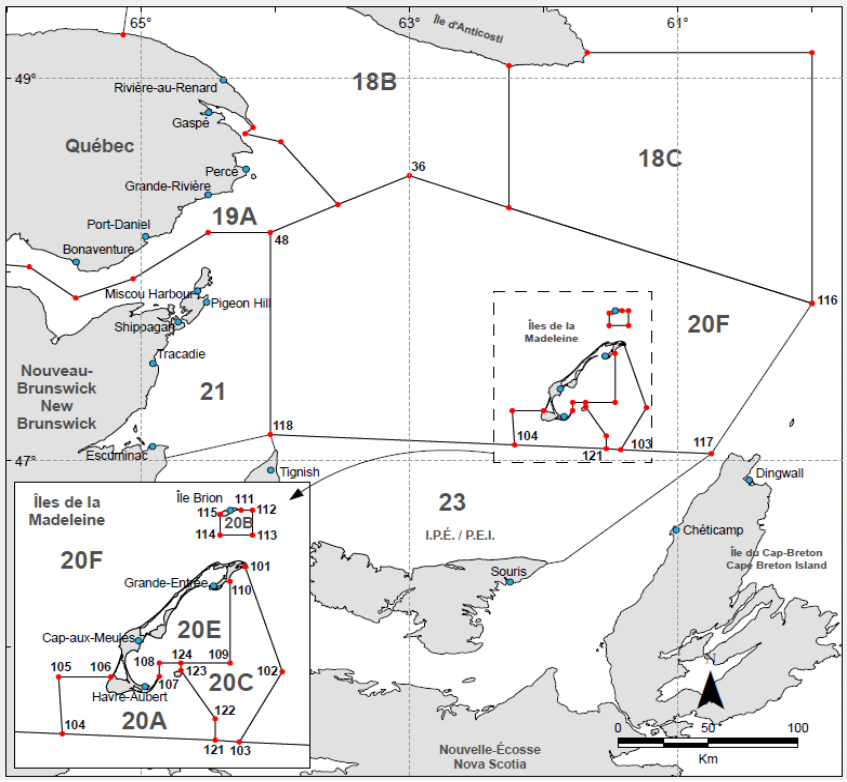

Figure 1. Scallop fishing subareas in the Magdalen Islands (20A, 20B, 20C, 20E and 20F).

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. The four secondary indicators come from the 2017 research survey conducted in the Magdalen Islands. Those indicators chosen are relative density (number/1000 m^2) 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 2017, the fishing effort calculated from the indicators was 322 days. However, the effort actually authorized remained the same (322 days) from 2011 to 2017 after consultation with the fishers.

Description of the Fishery

Landings were 43.1 tonnes of meat in 2016 and 56.5 tonnes in 2017 in all of Area 20 (Figure 2) and the majority of landings were from subarea 20A with 41.8 t in 2016 and 56.3 t in 2017. The fishing effort was 308.5 days in 2016 and 322 days in 2017.

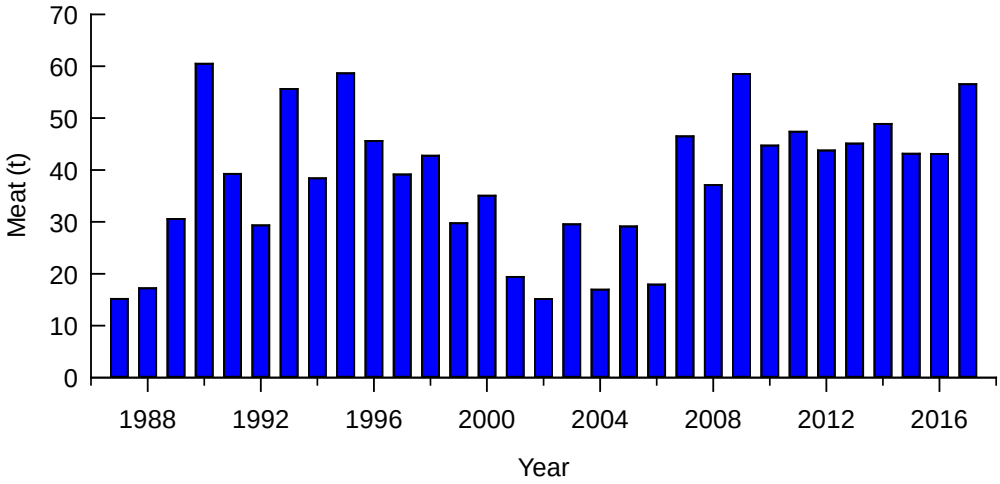

Figure 2. Scallop landings (t of meat) for all of Area 20 in the Magdalen Islands.

Analysis

Stock Status Indicators

The CPUE was 1.28 kg/hm in 2016 and 1.63 kg/hm in 2017(Figure 3). The average CPUE of the last two years is 1.46 kg/hm. This value is below the upper reference level. According to the 2017 research survey, sea scallop abundance was 13.78/1000 m^2 for the ≥100-mm size class, 11.26/1000 m^2 for the 85 to 99-mm class, 3.14/1000 m^2 for the 70 to 84-mm class, and 2.71/1000 $m^2$for the <70-mm class. The relative density of the first three size classes is above their 85th percentile, while the <70-mm class is between the 50th and 15th percentile (Figure 4).

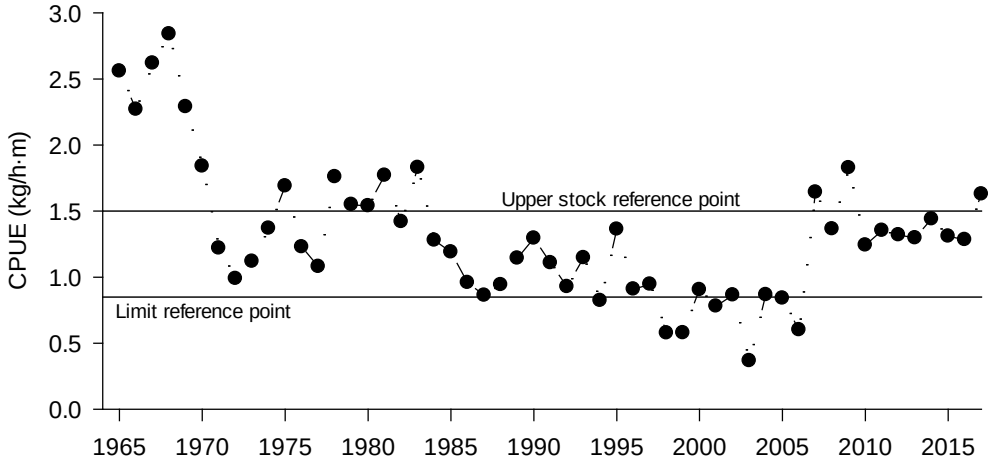

Figure 3. Annual catch per unit effort (CPUE) estimated from logbooks, subarea 20A.

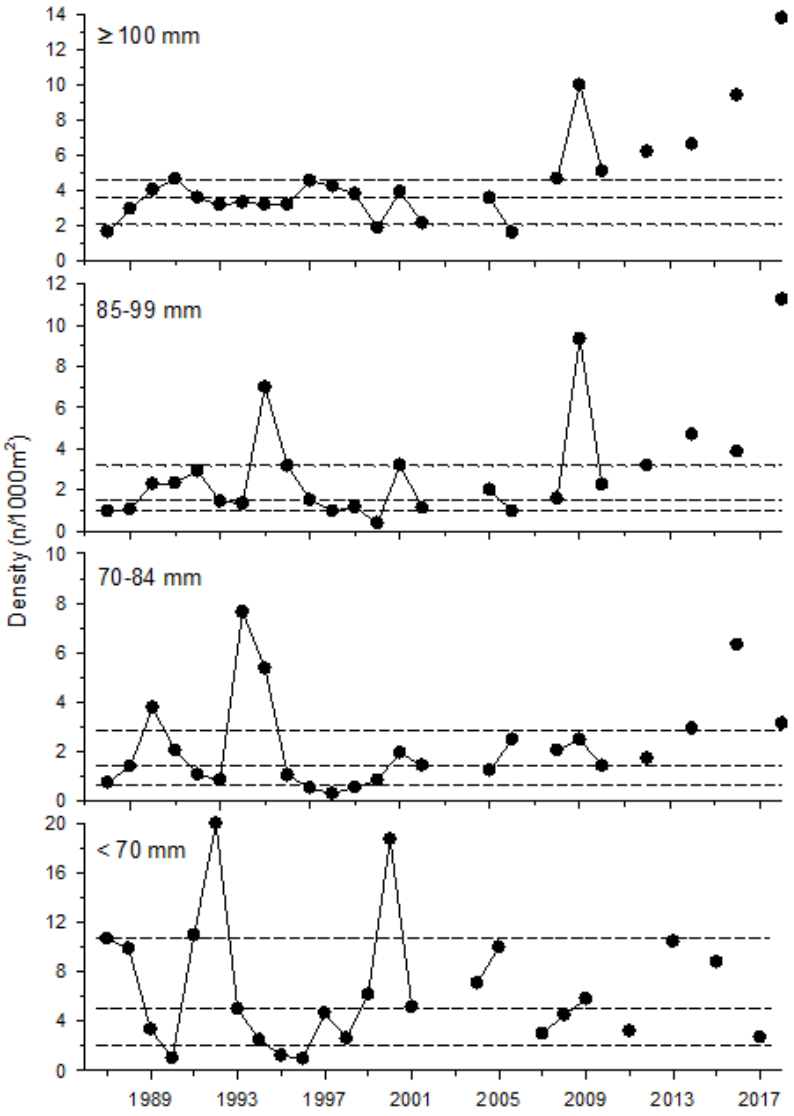

Figure 4. Annual density, by size class, of sea scallops sampled in subarea 20A during research surveys. The vertical lines represent the 15th, 50th and 85th percentiles of the 1987–2008 series.

Conclusions

The update of the primary indicator and landings indicates an increase in available commercial biomass. The average CPUE for 2016 and 2017 is in the "average CPUE" classification zone (Figure 5). Projected fishing effort according to the primary indicator is 379 days. The adjustment calculated from the secondary indicators is 0% for the ≥100-mm, 85 to 99-mm and 70 to 84-mm size classes and -20% for the <70-mm class according to the decision rules. The average adjustment calculated indicates an 11.8% increase in fishing effort. The maximum fishing effort for 2018 would therefore be 360 days at sea in subarea 20A. Fisheries Management will determine the 2018 authorized fishing effort from this value by following the decision rules.

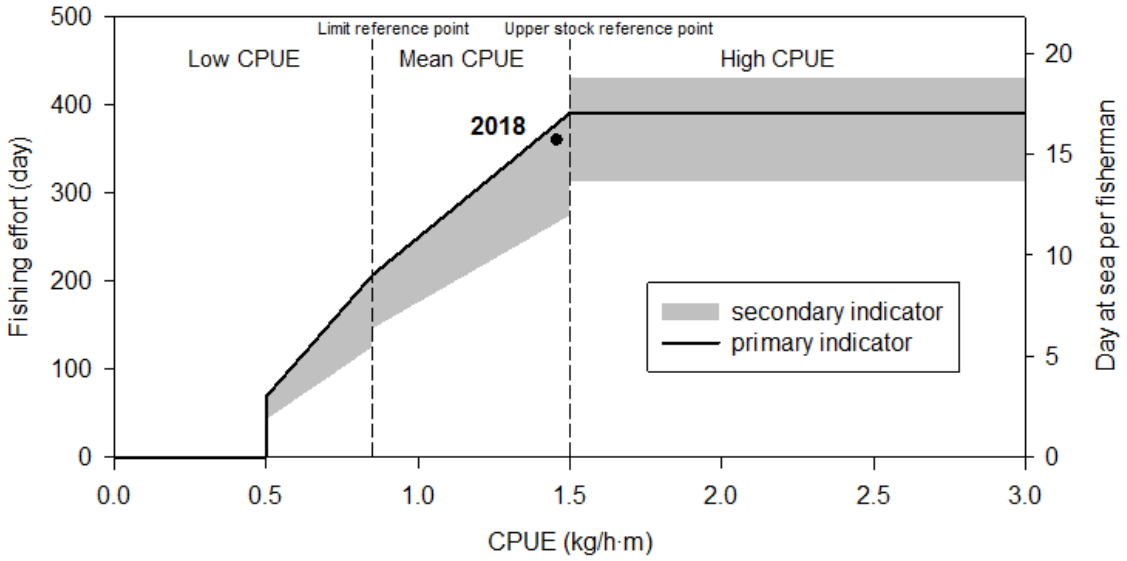

Figure 5. Calculation of fishing effort (days at sea) based on primary (CPUE) and secondary indicators (research survey indices) for subarea 20A.

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Date: January 12, 2018.

Sources of Information

This Science Response Report results from the Science Response Process of December 13, 2017, on Updated indicators status of the scallop stocks in Subarea 20A in Magdalen Islands.

DFO. 2016. 2015 Stock Assessment of Scallop in Quebec Inshore Waters. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2016/027.

Trottier, S., Bourdages, H., Goudreau, P. and Brulotte, S. 2017. Assessment on the Québec inshore waters scallop stocks in 2015: data from commercial fishery, research surveys, and exploratory fishing. DFO Can. Sci. Advis. Sec. Res. Doc. 2017/037. xvi + 175 p.

This report is available from the :

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ISSN 1919-3769

Correct citation for this publication:

DFO. 2018. Update of Stock Status Indicators for Scallop in Subarea 20A in the Magdalen Islands. DFO Can. Sci. Advis. Sec., Sci. Resp. 2018/007.

Aussi disponible en français:

MPO. 2018. Mise à jour des indicateurs de l'état des stocks de pétoncle de la sous-zone 20A aux Îles-de-la-Madeleine. Secr. can. de consult. sci. du MPO. Rép. des Sci. 2018/007.