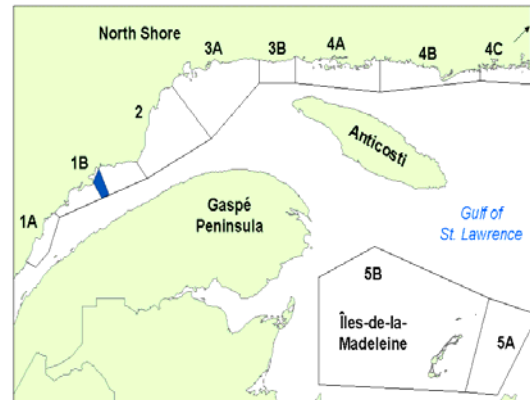


The Stimpson's surfclam in Quebec coastal waters in 2003

Background

Stimpson's surfclam (*Mactromeris polynyma*) is a bivalve mollusc found along the west coast of the Atlantic, from the Baffin Island to Rhode Island. In the Gulf of St. Lawrence, Stimpson's surfclam is found under the low tide line up to a depth of 60 meters. This benthic and sedentary bivalve lives buried mostly in sandy sediment. Surfclam gathers in aggregations called "beds". In the northern Gulf of St. Lawrence, Stimpson's surfclams reach a length of 80 mm after 13 to 15 years. Sexes are separate, and fertilization is external. In the Upper North Shore, the size at sexual maturity of females would be higher than 60 mm. However, size at sexual maturity may vary according to the sex and fishing area.

Stimpson's surfclam fishing is a recent activity in the Gulf of St. Lawrence. Since 1990, many beds of various sizes have been found. These beds are mostly located on Quebec's North Shore as well as in the Îles-de-la-Madeleine area. Stimpson's surfclams are also found in lesser densities in certain areas on the Lower North Shore and the northern coast of Gaspé Peninsula. Stimpson's surfclam fishing is conducted inshore with the use of hydraulic dredges. Quebec waters are divided into ten fishing areas. This fishery is managed mostly by the number of permits issued, a fishing season, and a quota. Exploitation occurs on the North Shore and at the Îles-de-la-Madeleine.



Stimpson's surfclam fishing area in Quebec.

Summary - Quebec

- The Quebec region has ten Stimpson's surfclam fishing areas, eight on the North Shore and two at the Îles-de-la-Madeleine. In 2003, nine permanent licences and ten exploratory licences were issued in Quebec. Furthermore, two New Brunswick fishermen had access to four of these ten fishing areas.
- Landings increased to 862 t in 2003, 69% higher than in 2002 and 125% higher than the average of the last five years. The increase in landings in 2003 can be explained by exploitation development in the Natashquan sector (4B). In 2003, 95% of the landings were from the North Shore.
- In 2003, TACs (Total Allowable Catches) were reached in areas 3A, 3B, 4A, and 4B, but not in the others because of an insufficient fishing effort.
- The average catch rates fluctuated between 104 kg and 700 kg per fishing hour for a tow

of 1 m wide according to an increasing gradient from west to east, which suggests different productivities between areas.

- The average of catches per unit of effort is stable, even slightly lower, in most areas since 1998. However, the variation in catches per unit of effort from one tow to the other is high.
- Since 2000, the mean size of surfclams caught has remained stable on the main exploited beds.
- Every new quota increase will have to be conservative as the weak growth rate and sedentariness of the surfclam would make certain sites vulnerable to overexploitation. In reality, a maximum increase of 10% per five-year period when TAC is reached on a regular basis could be a possible approach, thus allowing sufficient time to observe the effects of such an increase. These increases must take into account the productivity of each area.
- In order to protect the reproductive potential and to optimize the yield per recruit of new cohorts, a minimum size limit of 80 mm on the North Shore is recommended, as in the case of the Îles-de-la-Madeleine.
- In association with Industry, it is recommended to conduct a controlled depletion study on certain limited sites in order to gather data on whether these beds have the capacity to support steady exploitation. The study would also serve to evaluate our fishing development strategy.

Biological context

Stimpson's surfclam (*Mactromeris polynyma*) is a bivalve mollusc found along the west coast of the Atlantic, from the Baffin Island to Rhode Island. It is also found on the Pacific coast, from Alaska to Vancouver. In the Gulf of St. Lawrence, Stimpson's surfclam is found under the low tide line up to a depth of 60 meters. It is a benthic, sedentary, and filter-feeding bivalve which lives buried in sandy sediments. It is found in waters with temperatures below 15°C. Surfclams gather in aggregations called "beds".

In the northern Gulf of St. Lawrence, surfclams reach a length of 80 mm after 13 to 15 years. However, individual growth fluctuates substantially.

Sexes are separate, and fertilization is external. In the Upper North Shore, the size at sexual maturity of females would be higher than 60 mm. However, size at sexual maturity may vary according to the sex and fishing area. After eggs hatching, a pelagic larvae stage extending over a few weeks precedes benthic life. In the Middle North Shore, spawning would occur mostly from the end of June to mid-July. In certain sectors, there could also be a second spawning period later in the fall.

Fishery management

Stimpson's surfclam fishing is a recent activity in the Gulf of St. Lawrence. Since 1990, many beds of various sizes have been found. These beds are mostly located on Quebec's North Shore as well as in the Îles-de-la-Madeleine area. Stimpson's surfclams are also found in lesser densities in certain areas on the Lower St. Lawrence and the northern coast of Gaspé Peninsula (Figure 1). Stimpson's surfclam fishing is conducted inshore with the use of hydraulic dredges. The effectiveness of this type of dredge was estimated at 90% for surfclam size categories that were caught by the

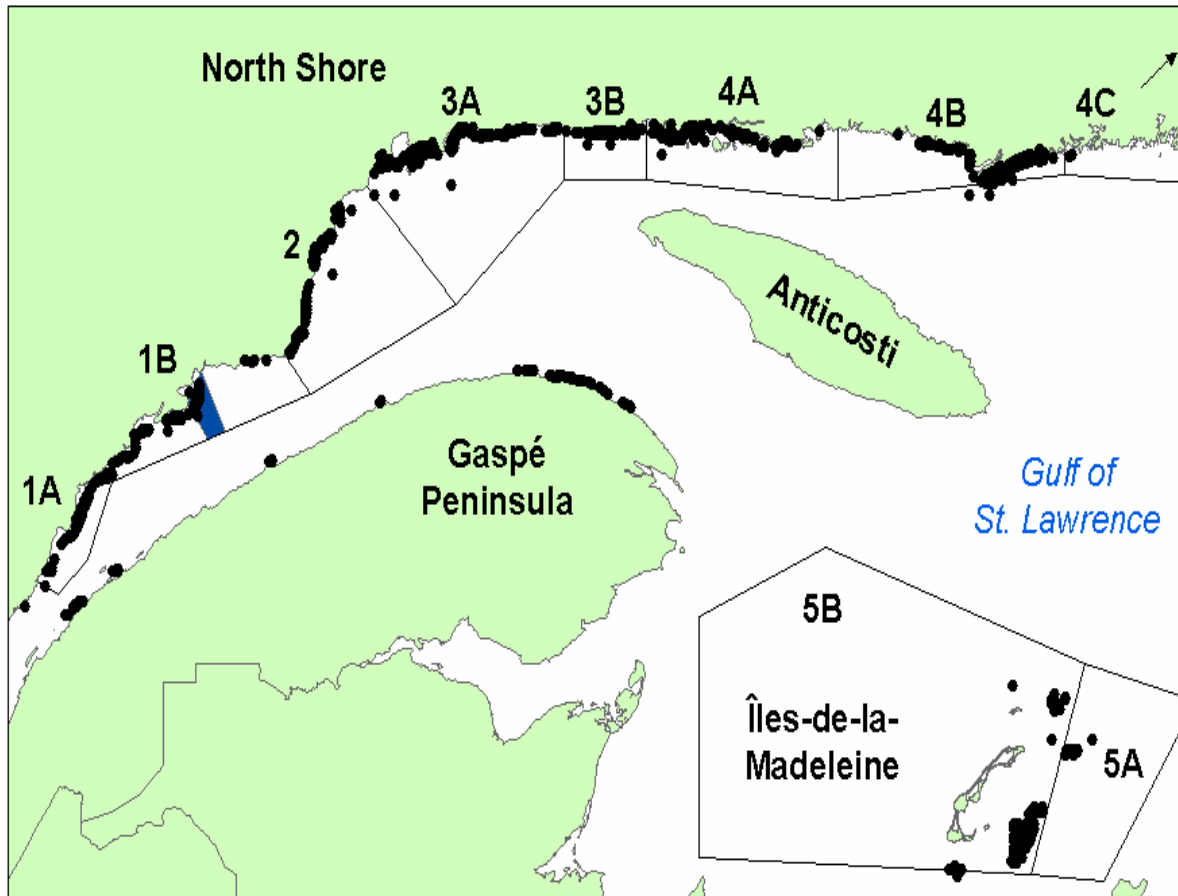


Figure 1. Known distribution sites for Stimpson's surfclam in Quebec (the shadowed section of area 1B corresponds to a fishing exclusion area).

dredge, i.e. those measuring at least 80 mm.

Quebec has ten Stimpson's surfclam fishing areas, eight on the North Shore and two at the Îles-de-la-Madeleine (Figure 1). This fishery is managed by fishing area, the number of permits issued, a fishing season, and a quota (Table 1). Furthermore, the spacing between basket stems on the dredge must be equal to or larger than 3.175 cm. Exploitation occurs on the North Shore and at the Îles-de-la-Madeleine. In 2003, nine permanent licences and ten exploratory licences were issued. Each permanent licence can give access to more than one fishing area. Furthermore, two New Brunswick fishermen had access to

four of the ten fishing areas in Quebec (areas 3A, 3B, 4B, and 5A).

Conservation approach

The weak growth rate and sedentariness of the Stimpson's surfclam make it vulnerable to local overexploitation. The lack of protective measures for spawners on the North Shore increases the overexploitation risks. It would be wise to implement a minimal catch size of 80 mm in this sector. This conservation measure would protect the reproductive potential and ensure the sustainability of each bed. The development of exploitation through the establishment of many fishing areas or sub-areas, is a

conservative approach in line with a conservation strategy.

Stimpson's surfclams spawn in July, and juvenile deposition on the bottom occurs a

fisheries enhance information regarding surfclam beds and the status of the resource.

Stimpson's surfclam landings peaked at

Table 1. Management measures for Stimpson's surfclams in 2003.

Management measures	Fishing areas									
	1A	1B	2	3A	3B	4A	4B	4C	5A	5B
Number of licences (exploratory)	1	1	4	2	2	2	(6)	(3)	3 (1)	3 (1)
Number of N. B. licences				2	2		2		2	
Quota (t)	68.6	68.6	54.9	75.8 ¹	75.8 ¹	149.7	425.0 ²	170	136.0 ³	113
Fishing season	⁴	⁵	←	01/07 to 09/11		→	01/07 to 15/10		01/08 to 30/11	
Stem spacing	←				3.175 cm		→			
Number of dredges (2.134 m)	←			1	→		2	←		1 →
Minimal size									← 80 mm →	

¹ = An additional quota of 14.5 t for New Brunswick (N. B.) fishermen

² = An additional quota of 181.4 t for New Brunswick fishermen

³ = An additional quota of 68.0 t for New Brunswick fishermen

⁴ = 01/04 to 31/05 and 15/07 to 15/10

⁵ = 01/04 to 31/05 and 15/07 to 15/11

few weeks later. Suspending fishing during the reproductive period and during larvae deposition on the bottom can only be beneficial in protecting the reproductive potential.

As the growth level is weak and longevity is high, natural mortality is likely to be low. The optimal exploitation rate will probably have to remain low in order to ensure a sustained yield over time.

Until now, relatively few individuals have been collected from Stimpson's surfclam populations of the Gulf of St. Lawrence, and exploitation levels have remained low.

Status of the resource

The evaluation of the Stimpson's surfclam stock status is mostly based on analysis of data from landings, logbook information recorded by fishermen, and samples of commercial catches collected at sea or at the wharf. Scientific surveys and exploratory

639 t liveweight in 1994. A large number of these landings were made by New Brunswick fishermen. Between 1995 and 2000, landings fluctuated between 210 t and 511 t (Figure 2). Landings reached a new peak of 862 t in 2003, 69% higher than 2002, and 125% higher than the average of the last five years. The increase in landings in 2003 can be explained by exploitation development in the Natashquan sector (4B) (Figure 3). In 2003, 95% of landings were

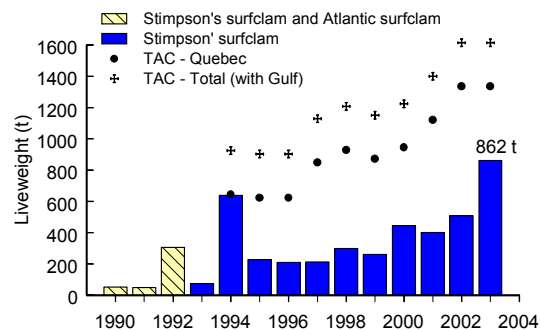


Figure 2. Annual Stimpson's surfclam landings in Quebec and quotas (TAC).

from the North Shore, and mainly from areas 3A, 3B, 4A and 4B, where total admissible catches were reached. In 2003, TACs (Total Allowable Catches) were reached in areas 3A, 3B, 4A and 4B, but not in the others because of an insufficient fishing effort. Since 1995, New Brunswick fishermen have been mostly inactive in Quebec waters. These fishermen didn't document any catches, except for landings of less than 1.5 t, which were declared in 1995 and 1998.

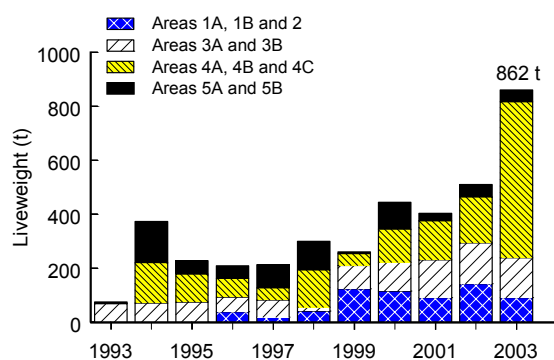


Figure 3. Annual Stimpson's surfclam landings in Quebec per fishing unit area.

The average of catches per unit of effort is stable, even slightly lower, in most areas since 1998 (Table 2). However, the variation in catches per unit of effort from one tow to the other is high. In 2003, catches per unit of effort fluctuated between 104 kg and 711 kg liveweight per fishing hour for a tow of 1 m wide according to areas. There appears to be an increasing gradient from west to east for catches per unit of effort on the North Shore, which suggests different

productivity between areas. The lowest level was recorded in area 1B, and the highest in area 4B.

Since 1998, the average size (antero-posterior length) of surfclams harvested by commercial fishing has remained stable in most of the exploited beds (Table 3). In 2003, the average size was approximately 110 mm in almost every area, except for areas 4B and 5B, in which case it was approximately 100 mm. The number of surfclams measuring less than 60 mm in commercial samples since the beginning of commercial exploitation of this species has been insignificant, probably due to dredge selectivity.

Research surveys and exploratory fisheries conducted mostly by the industry between 1990 and 2001, has helped to define Stimpson's surfclam geographic distribution in Quebec. The industry's contribution in the study has helped us to gather essential data in order to evaluate this resource. These efforts have also helped us to locate many beds of commercial interest (but of various sizes) in each fishing area.

Perspectives

The catches per unit of effort along with the average size of surfclams collected in the main exploited beds have remained stable since the fishery began in the Gulf of St. Lawrence. However, every new quota increase will have to be done in a conservative way as the weak growth rate and sedentariness of the surfclam would

Table 2. Catches per unit of effort (kg of liveweight per fishing hour for a 1 m wide dredge) estimated using logbook information.

	Fishing areas									
	1A	1B	2	3A	3B	4A	4B	4C	5A	5B
1998	165	189		280		498	278			271
1999	269	200	448	321	516	951				179
2000	336	203	501	375	745	802				180
2001	309	208	565	278	560	610				241
2002	280	109	402	368	423	674	519			215
2003	227	104	284	295	430	563	711		182	222

Table 3. Average sizes (mm) of Stimpson's surfclams estimated using commercial fishing samples.

	Fishing areas									
	1A	1B	2	3A	3B	4A	4B	4C	5A	5B
1995		95	110	105	115	115				98
1996		93		103	111	112				95
1997		95		104	111	111				96
1998		102		116		112	117			99
1999		110	106	115	108	111				
2000	113	108	107	118	106	111				100
2001	108	108	102	112	112	111				99
2002	109	107	115	103	104	112				99
2003	108		113	109	114	110	101			102

make certain sites vulnerable to overexploitation. In reality, a maximum increase of 10% per five-year period when TACs are reached on a regular basis could be a possible approach, thus allowing sufficient time to observe the effects of such an increase. These increases must take into account the productivity of each area.

In order to protect the reproductive potential and to optimize the yield per recruit of new cohorts, a minimal catch size of 80 mm is recommended for the North Shore, as in the case of the Îles-de-la-Madeleine.

Furthermore, in association with the industry, it is recommended to conduct a controlled depletion study on certain limited sites in order to gather data on whether these beds have the capacity to support a sustained exploitation. The study would also serve to evaluate our fishing development strategy.

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