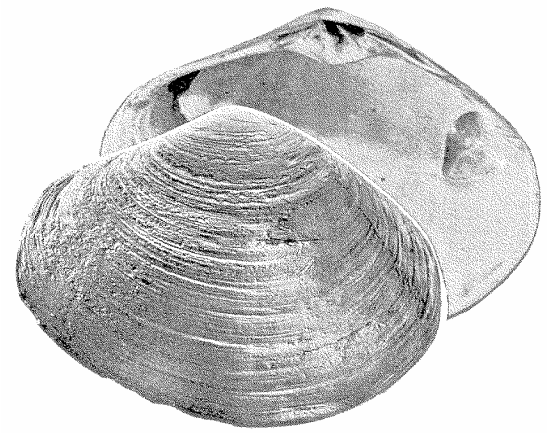
ASSESSMENT OF QUEBEC COASTAL WATERS STIMPSON'S SURFCLAM STOCKS IN 2005



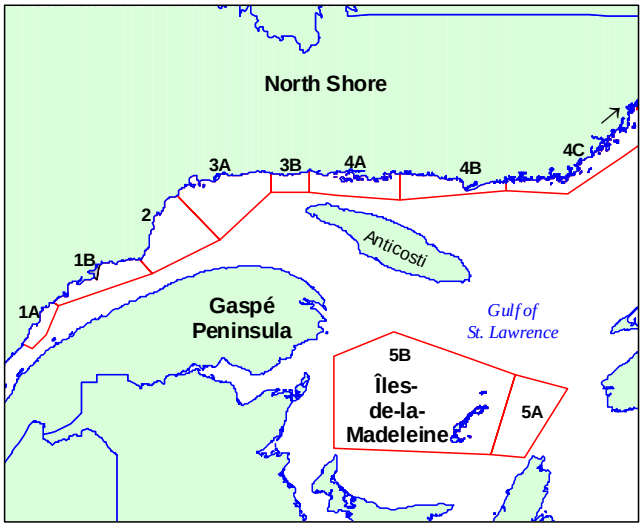


Figure 1: Stimpson's surfclam fishing areas in Quebec.

Context

Stimpson's surfclam (Mactromeris polynyma) fishing is a recent activity in the Gulf of St. Lawrence. The most significant beds are mainly located on the North Shore of Quebec as well as in the Magdalen Islands area. Stimpson's surfclam is also found in low densities in certain areas on the Lower North Shore and the northern coast of the Gaspé Peninsula. Stimpson's surfclam fishing is conducted inshore using hydraulic dredges. Quebec waters are divided into ten fishing areas. This fishery is mostly managed by the number of permits issued, a fishing season, and a quota. Exploitation occurs on the North Shore and in the Magdalen Islands.

Resource assessment is made every two years in order to determine if the changes that have occurred in the status of the resource justify adjustments to the conservation approach and management plan. The main indicators used in this assessment are derived from landing, logbook and commercial capture sampling data.

SUMMARY

- The Quebec region has ten Stimpson's surfclam fishing areas, eight on the North Shore and two in the Magdalen Islands. In 2005, 10 permanent licenses and 8 exploratory licenses were issued in Quebec.

- Landings totaled 882 tons in 2005, 5% up compared to 2004. Ninety-nine percent of these landings were from the North Shore.

- In 2005, quotas were reached in the areas 1A, 1B, and 4A, and were exceeded in area 4B. Areas 4C and 5A were not fished in 2005.

- The average catch rates fluctuated between 162 and 799 kg per fishing hour for a 1 m wide tow according to area. These averages remain variable between the years for most of the areas.

- The average size of captured individuals remains stable on the main beds harvested.

- Any new quota increase must be conservative as the weak growth rate and the sedentariness of this species make certain sites vulnerable to overexploitation. In reality, such an approach could correspond to a maximum increase of 10% in the captures by 5-year period, in as much as quotas are reached on a regular basis. This would allow sufficient time to observe the effects of such an increase.

- Given that quotas have been reached and that commercial indices have been stable since 2001, quotas could be increased by 10% in areas 1A, 3B, and 4A. Status quo is recommended however in the other areas.

INTRODUCTION

Biological context

Stimpson's surfclam, *Mactromeris polynyma*, is a bivalve molluscs found along the west coast of the Atlantic, from Baffin Island to Rhode Island. It is also found on the Pacific coast, from Alaska to Vancouver Island. 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 that 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 (anteroposterior length) after 13 to 15 years, but growth fluctuates substantially from an individual to another.

Sexes are separate, and fertilization is external. In the Middle 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. 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. After eggs hatching, a pelagic larvae stage extending over a few weeks precedes benthic life.

Fishery management

Stimpson's surfclam (*Mactromeris polynyma*) fishing is a recent activity in the Gulf of St. Lawrence. This inshore fishery is conducted inshore using hydraulic dredges, whose spacing between basket stems must be equal or greater than 3.175 cm. The effectiveness of this type of dredge was estimated at more than 90% for the surfclam size categories that were caught by the dredge, i.e. those measuring at least 80 mm.

Quebec has ten Stimpson's surfclam fishing areas, eight on the North Shore and two in the Magdalen Islands (Figure 1). This fishery is managed by fishing area, the number of permits

issued, a fishing season, and quotas (Table 1). In 2005, ten permanent licenses and eight exploratory licenses were issued. Some permanent licenses can give access to more than one fishing area. Furthermore, two New Brunswick fishermen had access to area 5A.

Table 1. Management measures for Stimpson's surfclams in 2005.

Management measures	Fishing areas									
	1A	**1B**	**2**	**3A**	**3B**	**4A**	**4B**	**4C**	**5A**	**5B**
Number of licences (exploratory)	1	1	4	2	2	2	(5)	(3)	4	4
Number of N. B. licences									2	
Quota (t)	68.6	68.6	54.9	75.8	93.986	176.9	425.0[2]	170	136.0[1]	113
Quota management2	Comp.	Comp.	ITQ	ITQ	ITQ	ITQ	Comp.	Comp.	Comp.	Comp.
Fishing season	[3]	[4]	←	01/07 to 09/11		→	[5]	[6]	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 68.0 t for New Brunswick fishermens

[2]= ITQ (individual transferable quota with restriction), Comp. (competitive)

[3] = 01/04 to 31/05 and 15/07 to 15/11

[4] = 01/04 to 31/05 and 15/07 to 30/11

[5] = 15/06 au 15/10

[6] = 01/07 au 15/10

Since 1990, several beds of variable size were discovered. These beds are mainly located on the North Shore of Quebec as well as in the Magdalen Islands area. Stimpson's surfclam is also found in low densities in certain areas on the Lower North Shore and the northern coast of the Gaspé Peninsula (Figure 2).

RESOURCE ASSESSMENT

The assessment 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 in the past at sea on board of fishing vessels and now at dockside. Scientific surveys and exploratory fisheries enhance information regarding surfclam beds and the status of the resource.

Stimpson's surfclam landings peaked at 881 tons liveweight in 2005, increasing by 5% compared to 2004 (Figure 3). Following a 69% increase in landings in 2003, primarily due to the development of harvesting in the Natashquan area (4B), landings remained stable thereafter. In 2005, 99% of landings were from the North Shore (Figure 4). The total allowable catch (TAC) was reached in areas 1A, 1B, and 4A, and was exceeded in area 4B, but not in the others areas due to an insufficient fishing effort. Areas 4C and 5A were not harvested in 2005. Since 1995, New Brunswick fishermen have not been very active in Quebec waters. No capture was reported by these fishermen, except in 1995 and in 1998 where landings of less than 1.5 ton were declared.

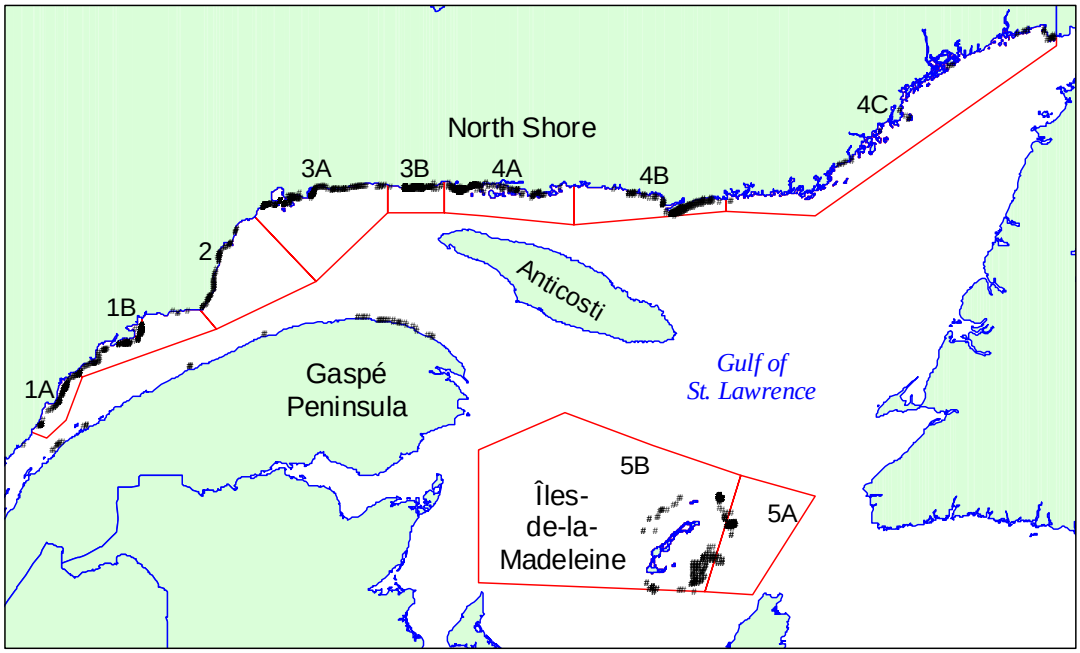


Figure 2. Known distribution sites for Stimpson's surfclam in Quebec.

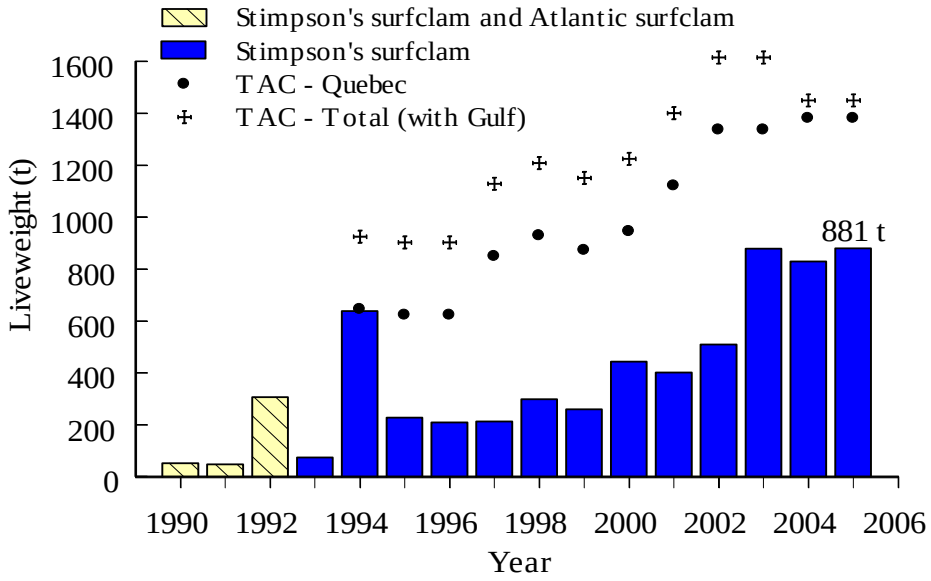


Figure 3. Annual Stimpson's surfclam landings in Quebec and quotas.

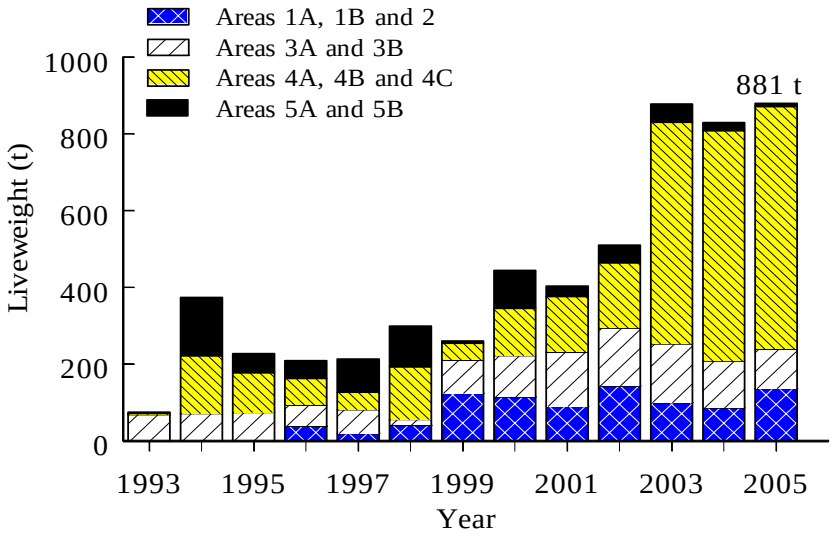


Figure 4. Annual Stimpson's surfclam landings in Quebec per fishing unit area.

The average of catches per unit of effort has fluctuated from year to year in most of the areas since 1998 (Table 2). It should be noted however that variability in catches per unit of effort from one tow to the other is high. Moreover, given the low number of fishermen in each area, variations in annual average catch rates can reflect changes in fishing strategy, for example fishing gear modifications or exploitation of various beds. In 2005, catches per unit of effort fluctuated from 162 to 799 kg liveweight per fishing hour for a 1 m wide tow according to areas, which suggests different productivities or densities between areas.

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

	Fishing areas							
	1A	**1B**	**2**	**3A**	**3B**	**4A**	**4B**	**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	236	97	312	295	433	581	711	214
2004	381	165	371	300	427	741	600	180
2005	432	234	799	209	568	662	407	162

Since 1995, the average size of surfclams harvested by commercial fishing has remained stable in most of the main beds harvested (Table 3). In 2005, the average size was approximately 110 mm in almost every area, except for areas 3B, 4B, and 5B, where it was approximately 103 mm. The percentage of individuals 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.

Table 3. Average sizes (mm) of Stimpson's surfclams estimated using commercial fishery 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	110	114	110	101			102
2004	112	104	114	114	107	108	106			101
2005	112		111	110	105	111	103			101

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.

Sources of uncertainty

This assessment is based only on indices derived using logbook data and commercial capture sampling at dockside. There is no independent source of information available on this fishery. With unknown exploitation rates, using a precautionary approach seems to be the only mean to adjust quotas.

CONCLUSIONS AND ADVICE

Catches per unit of effort along with the average size of surfclams harvested have remained stable in the main beds exploited since the beginning of this fishery in the Gulf of St. Lawrence.

Quota increase must be conservative as the weak growth rate and the sedentariness of this species make certain sites vulnerable to overexploitation. In reality, such an approach could correspond to a maximum increase of 10% in the captures by 5-year period, in as much as TACs are reached on a regular basis. This would allow sufficient time to observe the effects of such increases. Moreover, these increases will have to take account of the productivity of each area.

Given that quotas have been reached on a regular basis for five years in areas 1A, 3B, and 4A, and that commercial indices have been stable since 2001, quotas could be increased by 10% in these areas. Status quo is recommended however in the other areas.

OTHER CONSIDERATIONS

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. In order to protect the spawning potential and to improve yield by recruiting new cohorts, it is recommended to take example on the Magdalen Islands and to prohibit the capture of individuals of less than 80 mm on the North Shore.

Stimpson's surfclams spawn in July, and juvenile deposition on the bottom occurs a 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 harvested from the Stimpson's surfclam populations of the Gulf of St. Lawrence, and the exploitation levels have remained low.

SOURCES OF INFORMATION

Lambert, J. and P. Goudreau. 1997. Biologie et exploitation de la mactre de Stimpson (*Mactromeris polynyma*) sur les côtes du Québec. DFO Can. Sci. Advis. Sec. Sci. Res. Doc. 97/101. 44 p.

FOR MORE INFORMATION

Contact : Hugo Bourdages
Institut Maurice-Lamontagne
850, route de la Mer
C.P. 1000
Mont-Joli, Québec
G5H 3Z4

Tel. : (418) 775-0587
Fax : (418) 775-0740
E-mail : bourdagesh@dfo-mpo.gc.ca

This report is available from the:

Regional Advisory Process (RAP) Office
Quebec Region
Fisheries and Oceans Canada
Maurice Lamontagne Institute
P.O. Box 1000
Mont-Joli
Quebec, Canada
G5H 3Z4

Telephone: (418) 775-0825
Fax: (418) 775-0740
E-Mail: Bras@dfo-mpo.gc.ca
Internet address: www.dfo-mpo.gc.ca/csas

ISSN 1480-4913 (Printed)

La version française est disponible à l'adresse ci-dessus.

CORRECT CITATION FOR THIS PUBLICATION

DFO, 2006. Assessment of Quebec coastal waters Stimpson's surfclam stocks in 2005. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2006/002.