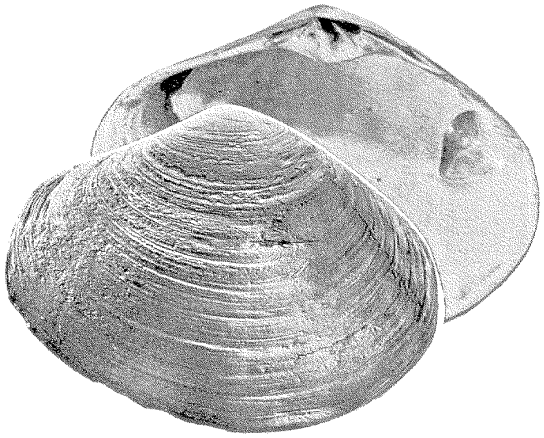

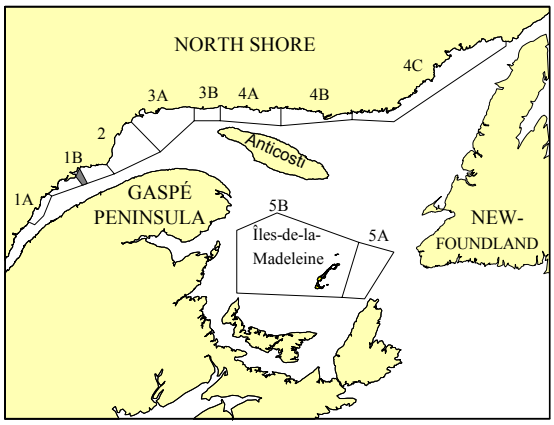

Stimpson's surf clam harvesting areas in Quebec.

Stimpson's surf clam in Quebec inshore waters

Background

Stimpson's surf clams, Mactromeris polynyma*, are sedentary, benthic, bivalve molluscs found along the western Atlantic coast, from Baffin Island to Rhode Island. They inhabit the subtidal zone in the Gulf of St. Lawrence, occurring at depths no greater than 60 metres, and generally live buried in sandy bottoms in aggregations called "beds." It takes more than 15 years for surf clams in the northern Gulf of St. Lawrence to reach a size of 80 mm. Stimpson's surf clams have separate sexes and fertilization takes place externally. Female Stimpson's surf clams on the Upper North Shore reach sexual maturity at around 60 mm, although this size may vary depending on sex and fishing area.*

The Stimpson's surf clam fishery is new in the Gulf of St. Lawrence. A number of beds of various sizes have been discovered since 1990, mainly on Quebec's North Shore and around the Îles-de-la-Madeleine. Stimpson's surf clams also occur at low densities in a few areas in the Lower St. Lawrence and off the southern coast of the Gaspé Peninsula. The Stimpson's surf clam fishery is an inshore fishery conducted with hydraulic dredges. Quebec waters are divided into 10 fishing areas. The fishery is mainly managed by the number of licences issued, a fishing season and quotas. Harvesting takes place on the North Shore and around the Îles-de-la-Madeleine.

Summary – Quebec

- The Quebec Region has 10 fishing areas. In 2001, 8 permanent licences and 10 exploratory licences were issued, and 2 New Brunswick fishers had access to 4 of Quebec's 10 fishing areas.
- Surf clam landings totalled 399 t in 2001, down 10% from 2000, but up 40% compared with the five-year average. In 2001, 93% of landings were from the North Shore.
- Since the fishery in the Gulf of St. Lawrence began, the catch per unit effort and average size of surf clams harvested have remained quite high for the main beds harvested, suggesting that the resource remains abundant.
- Any new increase in quotas must be carefully considered because the surf clam's low growth rate and sedentary nature make certain areas highly vulnerable to overfishing.
- In order to protect the species' reproductive potential and optimize the yield per recruit of new cohorts, it is recommended that a minimum size limit of 80 mm be introduced. It is also recommended that harvesting begin after

the spawning period, i.e. from mid-July on the North Shore and from early August in the Îles-de-la-Madeleine.

Biology

Stimpson's surf clams (*Mactromeris polynyma*) are sedentary, benthic, filter-feeder bivalve molluscs found along the western Atlantic coast, from Baffin Island to Rhode Island. They also occur along the Pacific coast, from Alaska to Vancouver Island. In the Gulf of St. Lawrence, they inhabit the subtidal zone at depths no greater than 60 metres and live buried in sandy bottoms in aggregations called "beds," in waters colder than 15°C.

It takes surf clams in the northern Gulf of St. Lawrence around 15 years to reach a size of 80 mm, but individual growth varies greatly.

Stimpson's surf clams have separate sexes and fertilization takes place externally. Female Stimpson's surf clams on the Upper North Shore reach sexual maturity at around 60 mm, although this size may vary depending on sex and fishing area. After the eggs have hatched, larvae are pelagic for a few weeks before settling in suitable habitat. On the Middle North Shore, spawning generally occurs in late June to mid-July. A second spawning event may also occur in the fall in some areas.

Fishery management

The Stimpson's surf clam fishery is new in the Gulf of St. Lawrence. A number of beds of various sizes have been discovered since 1990, mainly on Quebec's North Shore and around the Îles-de-la-Madeleine. Stimpson's surf clams also occur at low densities in a few areas in the Lower St. Lawrence and off the southern coast of the Gaspé Peninsula (Figure 1). The Stimpson's surf clam fishery is an inshore fishery conducted with hydraulic dredges, whose efficiency for harvesting surf clam size categories bigger than 80 mm has been estimated at more than 90%.

Quebec waters are divided into 10 fishing areas: 8 areas on the North Shore and 2 areas in the Îles-de-la-Madeleine (Figure 1). The fishery is managed by fishing areas, the number of licences issued, a fishing season and quotas (Table 1). Furthermore, the width between dredge bars must be equal to or greater than 3.175 cm. Harvesting takes place on the North Shore and around the Îles-de-la-Madeleine. In 2001, 8 permanent licences and 10 exploratory licences were issued. Fishers holding permanent licences have access to more than one fishing area. In addition, 2 New Brunswick fishers had access to 4 of Quebec's 10 fishing areas (Areas 3A, 3B, 4B and 5A).

Conservation measures

Stimpson's surf clams' slow growth rate and sedentary nature make the species vulnerable to local overfishing. The lack of protective measures for spawners increases the risk of overfishing. As a precaution, a minimum size limit equal to or greater than 80 mm should be introduced to help protect the species' reproductive potential, ensure the survival of beds and increase the yield per recruit. Developing the fishery through the establishment of numerous fishing areas or sub-areas is a precautionary approach consistent with a conservation strategy.

The Stimpson's surf clam spawns in July, and juveniles settle on the seabed a few weeks later. A halt in fishing during the spawning period could only help to protect the species' reproductive potential.

Because Stimpson's surf clams have a low growth rate and live a long time, there is every reason to believe that their natural mortality rate is low. The optimal exploitation rate may need to remain low to ensure sustained harvesting over time.

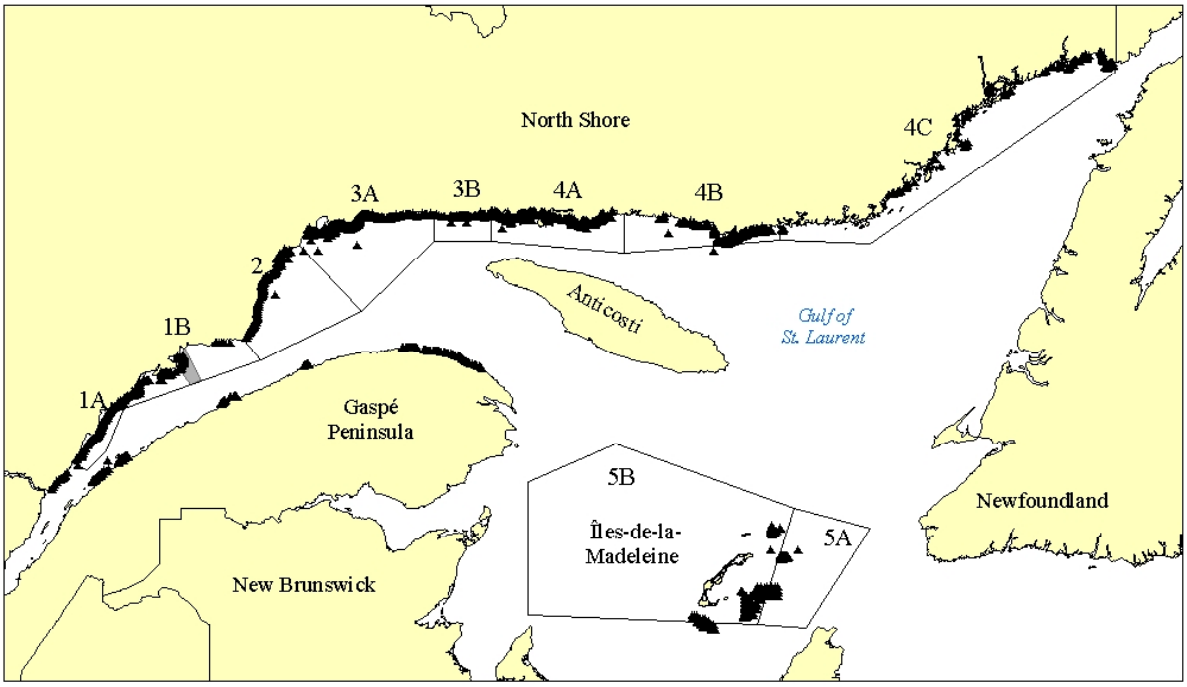

Figure 1. Known Stimpson's surf clam distribution areas in Quebec.

Up until now, relatively few individuals have been harvested from Stimpson's surf clam populations in the Gulf of St. Lawrence, and exploitation rates have remained low.

Resource status

The Stimpson's surf clam stock status assessment is based mainly on the analysis of data from landings, logbooks compiled by fishers and onboard and dockside commercial catch sampling data. Scientific surveys and exploratory fisheries provide additional information on beds and the status of the resource.

Stimpson's surf clam landings totalled 639 t (live weight) in 1994. A large part of these landings was made by New Brunswick fishers. Since 1995, landings have ranged between 210 t and 455 t (Figure 2). Landings totalled 399 t in 2001, down 10% from 2000, but up 40% compared with the five-year average. In 2001, 93% of landings were made on the North Shore, mainly in areas 3A, 3B and 4A, where the total allowable catch was met. New Brunswick fishers have done little fishing in Quebec

Table 1. Stimpson's surf clam management measures in 2001.

Management measures	**Fishing areas**									
	1A	**1B**	**2**	**3A**	**3B**	**4A**	**4B**	**4C**	**5A**	**5B**
Number of licenses	1	1	4	2	2	2	5	3	4	4
Quotas (t)	62.4	62.4	49.9	54.4[1]	54.4[1]	136.1	283.5[2]	170.1	136.1[3]	113.4
Fishing season	←			July 15 to October 31			→		August 01 to December 31	
Width between bars	←					3.175 cm			→	

[1] with quota of 14.5 t for New Brunswick fishers

[2] with quota of 181.4 t for New Brunswick fishers

[3] with quota of 68.0 t for New Brunswick fishers

waters since 1995, registering no catches, except in 1995 and 1998, when their declared landings totalled less than 1.5 t.

Since 1998, the commercial fishery's catch per unit effort has been relatively stable in most fishing areas (Table 2). In 2001, the catch per unit effort ranged between 264 kg and 1003 kg (live weight) per hour of fishing (per metre of dredge width), depending on the area. The lowest value was recorded in area 5B and the highest in area 4A.

Since 1998, the average size (anterior posterior length) of surf clams harvested by the commercial fishery has been stable in every fishing area (Table 3). In 2001, the average size was around 110 mm in nearly all areas, except in areas 2 and 5B, where it was around 100 mm. The percentage of individuals measuring less than 60 mm in commercial samplings has been negligible since the commercial harvesting of this species began, probably because of the dredge's selectivity.

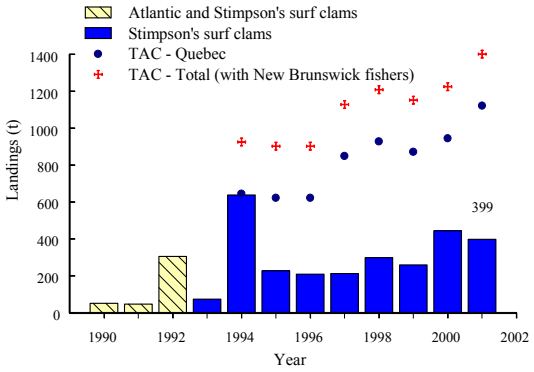

Figure 2. Annual Stimpson's surf clam landings in Quebec and quotas.

Research surveys and exploratory fisheries, which have been conducted in large part by the industry since 1990, have helped to specify the geographic distribution of the Stimpson's surf clam in Quebec. The industry's involvement in exploration has helped us gather data essential for assessing

Table 2. Estimated catch per unit effort (kg of live weight per hour of fishing and metre of dredge width) based on logbooks

	Fishing areas									
	1A	**1B**	**2**	**3A**	**3B**	**4A**	**4B**	**4C**	**5A**	**5B**
1998	193	378		300		863	488			479
1999	639	431	686	401	468	870				174
2000	441	415	632	409	570	792				277
2001	432	426	679	398	575	1003				264

Table 3. Average size (mm) of landed Stimpson's surf clams based on commercial 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

the resource and locate numerous beds of commercial interest in each fishing area. Although the beds vary in size, their average density is similar.

Outlook

The catch per unit effort and average size of harvested surf clams have remained relatively high for the main beds harvested since the fishery was established in the Gulf of St. Lawrence, suggesting that the resource remains abundant. However, any new increase in quotas must be considered carefully because the Stimpson's surf clam's weak growth rate and sedentary nature make certain beds vulnerable to overfishing. In order to protect the species' reproductive potential and optimize the yield per recruit of new cohorts, it is recommended that a minimum legal size be set at 80 mm. It is also recommended that harvesting begin after the spawning period, i.e. in mid-July on the North Shore and in early August in the Îles-de-la-Madeleine.

References

Lambert, J. and P. Goudreau. 1995. Performance de la drague hydraulique de type Nouvelle-Angleterre pour la récolte de la mactre de Stimpson (*Mactromeris polynyma*). Can. Ind. Rep. Fish. Aquat. Sci. 235: vii + 28 p.

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

Lambert, J. and P. Goudreau. 1999. Indices de croissance de la mactre de Stimpson (*Mactromeris polynyma*). Can. Fish Aqut. Sci Tech. Rep. 2269: vii + 39 p.

Landry, T., E. Wade and M. Giguère. 1992. Évaluation de gisements de mactre de Stimpson, *Mactromeris polynyma*, dans le golfe du Saint-Laurent : résultats préliminaires. DFO Can. Atl. Fish. Adv. Comm. Res. Doc. 92/86: 29 p.

Provencher, L., M. Giguère and P. Gagnon. 1997. Caractérisation du substrat entre les isobathes de 10 et 50 mètres autour des Îles-de-la-Madeleine par balayage hydroacoustique et échantillonnages sédimentologiques. Évaluation du système de traitement d'échos USP RoxAnn. Can. Fish. Aquat. Sci. Tech. Rep. 2156: ix + 40 p.

For more information :

Michel Giguère
Maurice Lamontagne Institute
850 route de la Mer
Mont-Joli, Quebec
G5H 3Z4
Tel: (418) 775-0622
Fax (418) 775-0740
Email : giguerem@dfo-mpo.gc.ca

Correct citation for this publication:

DFO, 2002. The Stimpson's surf clam of the inshore waters of Quebec. DFO – Science, Stock Status Report C4-11 (2002).

This report is available from the:

Regional Stock Assessment Office,
Department of Fisheries and Oceans,
Maurice Lamontagne Institute,
P.O. Box. 1000, Mont-Joli,
Quebec, Canada
G5H 3Z4

Email: Stocksrl@dfo-mpo.gc.ca

ISSN 1480-4913

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