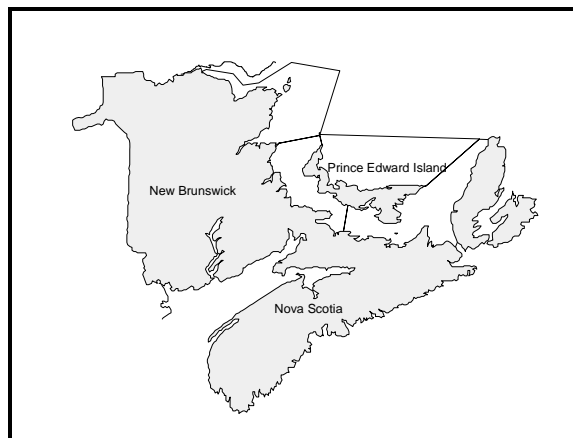




Southern Gulf Soft Shell Clam



Background

Soft shell clams are bivalve molluscs found in mud-silt substrates of intertidal to subtidal zones of protected coastal embayments from Labrador to North Carolina. In the southern Gulf of St.-Lawrence, spawning usually occurs in late June to early July with the annual increase of water temperatures. The sexes are separate with females reaching sexual maturity at lengths > 35-40 mm within the first 4 years (depending on the northern latitude of the population). Fertilization is external with the planktonic larval stage lasting about 4 weeks prior to metamorphosis and spat settlement onto suitable benthic substrates.

The soft shell clam fishery is widespread throughout the area, with commercial beds located in the Tracadie, Miramichi, Richibouctou and Bouctouche areas of NB, and all along the east and south coast of PEI. There are 2924 manual harvesting licenses issued (hand tools: clam hacks, shovels) in the southern Gulf, with over half located in PEI, in addition to a few (5-10) active mechanical (hydraulic) harvesting licenses in PEI. The use of mechanical harvesters in NB (5-10 licenses) remains problematic because of user group conflicts. The fishery consists of both open water, conditionally approved* and closed area commercial components as well as a large recreational fishery. Commercial licenses are currently mandatory (since 1994) and formally separates it from the recreational activity which is also managed with a daily bag limit policy (300 NB and PEI, 100 NS, subject to change through local variation order, total number of any mix of clam species).*

The main conservation measure for the soft shell clam resource is the enforcement of a minimum legal size of 50 mm which now applies throughout the southern Gulf. Prior to 1994, the legal size limit in NB had been 38mm. Current fisheries management does not attempt to control fishing effort through TAC's or with defined fishing seasons.

The Fishery

Management: The soft shell clam fishery is composed of three major components: i) Open water commercial*, ii) Contaminated (and Conditionally approved) Commercial* and iii) Recreational. All adhere to the minimum legal size of 50 mm. The recreational fishery is also controlled by a daily bag limit. These regulations are part of the Maritime Clam Fishery Regulations introduced in 1994. Fishing gear use policies are set along provincial boundaries with PEI licensing a limited entry mechanical harvesting fishery while NB is still dealing with its 10 year old moratorium. In recent years, the harvesting of soft shell clam resources in closed areas (bacterial contamination) has increased considerably in both NB and PEI because of diminishing stocks in open areas and the construction of modern land-based cleansing facilities in both provinces. Statistics are not readily available to quantify recent trends of contaminated product that are relayed from closed areas.

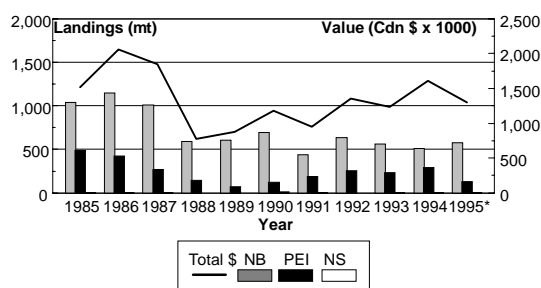
Landings: Soft shell clam landings in the southern Gulf have averaged 766 mt over the past 5 years. This is considerably lower than that observed during 1980s. The present levels would be even lower if access to marginally contaminated areas had not been allowed. The landing statistics however, do not capture any data from the recreational fishery. Also, it is generally accepted that a large proportion of the landings are not reported. Estimations of unreported catch from commercial and recreational activities are practically impossible given the large number of participants and the extensive fishing areas that would need to be covered.

Soft shell clam landings (mt) for the southern Gulf areas of NB, PEI and NS from 1990 to 1995.

Area	85-89	1990	1991	1992	1993	1994	1995*
	Avg						
NB	879	695	438	637	560	508	580*
PEI	278	120	186	256	234	291	131*
NS	1	10	4	-	1	3	0.2*
Total	1158	825	628	893	795	802	711*

* Preliminary Data

Soft shell clam landings (bars) and total landed value (line) for the southern Gulf from 1985-1995.



Resource Status

Although we do not have the data to show that overfishing occurs, there is a consensus among government officials, fishers and the public that the fishing pressure has been increasing over the past few years. With the decline in landings over the past ten years, even though greater access has been given to closed areas, overfishing previously is definitely a possibility. In addition, the overfishing may be more serious because the harvest in closed areas may be impacting the previously protected broodstock.

Manual harvesting accounts for most of the soft shell clam landings in the southern Gulf. Indirect fishing mortality from this technique has been reported to be approximately 17% (Robinson & Rowell 1990, Landry & Ouellette 1993). Indirect fishing mortality associated with recreational harvesting may exceed this due to increased exposure from the time spent searching the clam flat to gather the daily bag limit. The mechanical hydraulic harvesters, on the other hand, have only an indirect mortality of 5% (Landry & Ouellette 1993). These mortality levels do, however, vary greatly with the fishing season and are generally higher during the warm summer months when the clams are in the post-spawning period and in poor physiological condition. Data analysis for field studies showed that this type of fishing gear has an efficiency of approximately 74% compared to

60% for manual methods (clam hacks, etc.) with a corresponding catch rate 3 times greater than that of the manual diggers (Robinson and Rowell 1990; Landry and Ouellette 1993).

Management considerations:

Is it possible to designate commercial and non-commercial beds? Depending on the definition of the minimum daily income of a commercial vs. a non-commercial fisher, it is possible to determine the density of soft shell clams required in an area to meet a pre-set catch. If the minimum catch is set at three pecks (20 kg), and we consider a standard tidal coverage of 80 m², the minimal commercial density could be estimated at 0.25 kg/ m² or approximately 13 clams (>50mm)/ m².

How do beds replenish? The recruitment of soft shell clams is sporadic and difficult to predict. The only conservation measure that is enforced at the present time is the minimum legal size which helps protect the reproductive stock of a clam bed. The replenishing of a bed, however, is highly dependent on the environmental conditions such as the water temperature, salinity and circulation patterns and, therefore, varies considerably from site to site and from year to year.

Data from the rotational fishery research project in PEI will provide some valuable information on the relationship between adult abundance and recruitment levels. Preliminary results from another PEI research project conducted in 1995 suggests that mechanical harvesting activities do not have a negative effect on natural recruitment (T. Landry, unpublished data). In fact, the data tend to suggest that recruitment success is actually improved when harvesting activity is conducted within a couple of weeks (and even a few days) prior to spat settlement, compared to post-settlement harvesting. There are some indications that substrate conditioning (reworking of the surficial layers) caused by the mixing action of the hydraulic jet nozzles of the harvester is associated with the increase in recruitment levels.

Conservation for this fishery based on quota and effort controls does not seem realistic to implement. The only feasible approach would be closed areas that would be controlled at the community level.

For More Information

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****Glossary of Mollusc Fisheries***

Public Relay Fishery: The commercial fishery that usually occurs in the spring of the year with licences issued under the Maritimes Region Contaminated Fishing Regulations where shellfish are harvested from marginally contaminated areas and relayed to clean (open) water leases for cleansing. There are no direct sales for human consumption but all product is cleansed (depurated) and processed through federally registered fish processing facilities under the Canadian Shellfish Sanitation Program (National Shellfish Sanitation Program in the USA).

Leasehold Fishery: The commercial harvesting of shellfish (usually oysters) that occurs only on open water registered leases by lease holders for direct market sales. This activity usually precedes one month before (Sept. 1) the open water commercial fall fishery (Oct. 1).

Contaminated Relay Fishery: The commercial harvesting of shellfish in marginally bacterially contaminated areas (as defined by Environment Canada under the Shellfish Harvesting Area Water Classification Program as part of the Canadian Shellfish Sanitation Program) that allows the product to be moved only to designated clean water areas (leases) or registered depuration facilities for cleansing (depurated) prior to marketing for human consumption.

Open Area (Water) Fishery: The commercial harvesting of shellfish in clean water areas that are not contaminated with bacteria (i.e. clean open water) as defined by Environment Canada under the Shellfish Harvesting Area Water Classification Program as part of the Canadian Shellfish Sanitation Program.

Conditionally Approved Area (Water) Fishery: The commercial harvesting of shellfish in areas that are approved on certain environmental conditions being met for access to the area as defined by Environment

Canada under the Shellfish Harvesting Area Water Classification Program as part of the Canadian Shellfish Sanitation Program. These areas can be closed at certain times of the year because of bacterial contamination brought on by heavy rainfall, spring runoff or the malfunctioning of a sewage pumping control station. A strictly defined overlay water sampling program must be conducted with the results analyzed by a certified laboratory and reviewed by Environment Canada and DFO Inspection to ascertain that clean water conditions have returned to normal before the area can be reopened to commercial fishing activities.

Closed Area (Water) Fishery: The harvesting of shellfish under special licence issued under the Maritimes Region Contaminated Fishing Regulations in areas that are closed to all other commercial fishing year-round because of continual bacterial contamination. Contamination originates from both defined and non-point sources. All shellfish are moved in sealed containers from the harvesting site directly to registered depuration facilities for cleansing and health safety inspection prior to marketing for human consumption.

References

- Landry T. and M. Ouellette. 1993. Suivi de la peche au rateau hydraulique sur des stocks de myes dans la baie de Miramichi, Nouveau-Brunswick - 1992. Rapp. Tech. Can. Sci. Halieut. Aquat. 1921: 14 p.
- Robinson, S.M.C. and T.W. Rowell. 1990. A re-examination of the incidental fishing mortality of the traditional clam hack on the soft shell clam, *Mya arenaria*, Linnaeus 1758. J. Shellfish Res. 9: 283-289.