INTEGRATED MANAGEMENT PLAN
CLAM FISHERY

EASTERN NEW BRUNSWICK AREA
GULF REGION

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GLOSSARY

Approved shellfish area[(1)]: a category of classification applied to a shellfish area that has been approved by the shellfish sanitation monitoring agency for production or harvesting purposes for direct marketing, without depuration. This category assignment is made following a sanitary survey conducted by the shellfish sanitation monitoring agency, in accordance with chapter 2 of the *Canadian Shellfish Program Manual of Operations*. An approved shellfish area may be temporarily closed when a public health emergency has been declared, as, for example, in the event of a hurricane or flood.

Clam: a term denoting a number of species, including the soft-shell clam (*Mya arenaria*), the bar clam (*Spisula solidissima*), the bay quahaug (*Mercenaria mercenaria*) and the razor clam (*Ensis patula*).

Closed shellfish area[(1)]: an area where harvesting is temporarily or permanently prohibited, except to holders of special licences specifying the use to which the harvested shellfish are to be put.

Coastal fisher: means a fisher who is not part of a core enterprise and who holds at least one key commercial non-vessel based licence. Key commercial non-vessel based licences for the Eastern New Brunswick Area are bay quahaug, bar clam, soft-shell clam, eel, gaspereau, oyster and smelt.

Conditionally approved shellfish area[(1)]: a shellfish area that has been conditionally approved by the shellfish sanitation monitoring agency. A conditionally approved shellfish area must meet the same criteria as an approved area during a foreseeable period. That period is subject to conformity to established water quality standards as set forth in a master plan. A conditionally approved shellfish growing area is temporarily closed by the shellfish sanitation monitoring agency if it ceases to meet the criteria required for an approved area.

Core enterprise: means a fishing unit composed of a fisher (head of enterprise), registered vessel(s) and the licences he holds and which has been designated as such in 1996 under the following criteria:

For bonafide fishers: have bonafide status and hold one key licence (snow crab, category A lobster, groundfish other than handline, scallop, tuna or herring).

For non-bonafide fishers: hold either two key licences (shrimp, snow crab, lobster A and groundfish ITQ only) or one key licence and have fished for a full season with

minimum landings of $25 000 from his own licences for two of the years 1993, 1994 and 1995.

Ecosystem: the basic ecological unit consisting of a life environment and the organisms, animals and plants living in it.

Integrated fisheries management plans: are aimed at enhancing the conservation and sustainable use of fishery resources. Plans incorporate conservation, management and scientific requirements for a fishery and also spell out the process and implementation of resource management, conservation and protection measures. The process provides the basis for a more integrated approach between DFO sectors as well as for a more meaningful participation of all stakeholders. Integrated fisheries management plans in effect set the stage for co-management arrangements by ensuring transparency, establishing overall allocations between sectors and fleets, providing relevant contextual information and ensuring that clients and stakeholders are consulted on the overall goals and strategies for the management of each fishery.

Relaying(1): transferring shellfish from a closed area to an approved area for natural biological depuration, using the environment as a depuration system (Houser 1964).

Shellfish area(1): an area in which shellfish grow or which is suitable for shellfish growth.

Watershed: a geographic term designating an area draining into a single body of water, such as a bay (the Caraquet Bay watershed) or a river (the Aboujagane River watershed) and includes ground water, surface water and wetlands.

(1) *Canadian Shellfish Program Manual of Operations*, DFO and Environment Canada.

INTEGRATED MANAGEMENT PLAN
CLAM FISHERY

Eastern New Brunswick Area
2001-2006

INTRODUCTION

This management plan applies to the commercial clam fishery in that part of the Eastern New Brunswick Area contained between statistical districts 63 and 80 (see appendix 1), and covers the years 2001 to 2006 inclusive. It is designed to promote sustainable development, an ecosystemic approach, integrated management and a prudent approach as intended by the *Oceans Act.*

This plan is designed to be applied in conjunction with a yearly update in which specific management measures concerning harvesting, notably fishing areas, seasons and catch limits, may be adjusted in accordance with conservation requirements.

BACKGROUND

The term "clam" denotes various bivalve molluscs found along Canada's Atlantic coast. The main commercial species, in order of abundance and economic importance, are the soft-shell clam (*Mya arenaria*), the bar clam (*Spisula solidissima*) and the bay quahaug (*Mercenaria mercenaria*). The harvesting of these three species, and also the razor clam (*Ensis patula*), is regulated by the *Maritime Provinces Fishery Regulations*.

Based on statistical data from 1994 to 1998, the mean annual value of the commercial clam fishery in the southern Gulf of St. Lawrence is closed to $ 8 million with landings of 5 million metric tons. Soft-shell clams account for 57 per cent of all landings and 60% of landed value, thus the most important species. Bay quahaugs account for 26 per cent of all landings and 29% of landed value. Bar clams account for 17 per cent of all landings and 11% of landed value.

The New Brunswick soft-shell clam fishery is characterized by manual harvesting methods, as a moratorium on the use of mechanical shellfish harvesters has been in force in that province since 1985, shortly after such harvesters had first been introduced. In all, nine mechanical harvesting licences were issued; of these, the only one still active is held by a 45' boat operator who fishes in Northumberland Strait.

Since 1990, the harvesting of clams in contaminated areas has been regulated by the *Management of Contaminated Fisheries Regulations*.

Since 1993, when the *Maritime Provinces Fishery Regulations* were issued, only holders of commercial clam fishing licences are allowed to harvest clams commercially. In January 1994, the Eastern New Brunswick Area held six meetings for public consultations with clam fishers, with a view to soliciting their recommendations concerning licensing and management measures for the soft-shell clam, bar clam, bay quahaug and razor clam fisheries. Up to that time, there had been no clam fishery management plan at all; the only management tool had been the regulations. Harvesting had barely been monitored, the recreational fishery had not been subject to any catch limits, and it was lawful to harvest clams that were considerably under the size limit recommended by biologists. Commercial clam fishing licences, by species, were issued for the first time in 1994. Before the establishment of the Advisory Committee, clams could lawfully be harvested and sold by any registered commercial fisher; clam licences, as such, were not issued.

The meetings referred to above were held in Jacquet River, Bouctouche, Murray Corner, Baie-Ste-Anne, Shippagan and Néguac, and were attended by approximately 1000 fishers. A majority of these expressed the view that there should be no dive fishery for clams, although at the Bouctouche meeting the dive fishers succeeded in obtaining from the persons attending the meeting a recommendation in their favour, while at the Baie-Ste-Anne meeting the group recommended a limited dive fishery in a specific area. At the Shippagan meeting, despite the fact that there were dive fishers in attendance, the participants recommended the prohibition of that fishing method. No dive fishers attended the other meetings, at which similar recommendations were adopted.

The fishers who attended the meetings were also asked to nominate representatives to sit on a new Clam Fishery Advisory Committee. A number of recreational and commercial fishers were appointed to the Committee, which met for the first time on 21 February 1994. The question of a dive fishery gave rise to heated discussion. In the end, the representatives of three areas voted in favour of such a fishery, while those of the other three areas voted against it.

Following that meeting, and after internal consultations within the Area, a decision to ban dive fishing for clams was reached, and an order to that effect was duly issued.

Of the four species of clam, the only one that is not harvested commercially is the razor clam. Very little scientific information about this species is available, and few studies have been devoted to it. DFO's Statistics Division has no records of landings of razor clams.

1. OVERVIEW OF THE FISHERY

1.1 Participants

Approximately 1000 commercial clam fishing licences are issued every year (in 2000, 631 were for soft-shell clams, 352 for bar clams and 111 for bay quahaugs). These licences are held by core fishers and coastal fishers. The profile of licence holders is establised in table 1.

Most of the core fishers participate in the fishery as a complementary fishery. Some coastal fishers depend solely on their clam license while other fishers participate in several coastal fisheries to earn their living.

To sum up, then, in the Eastern New Brunswick Area, 167coastal clam fishers hold only clam licences (soft-shell clams, bar clams or bay quahaugs), while 557 coastal clam fishers hold clam licences in addition to at least one more licence.

Table 1: Numbers of licences by statistical district (2000)

Statistical district	Soft-shell clam		Bar clam		Bay quahaug		Total
	Coastal	Core	Coastal	Core	Coastal	Core	
63	8	3	1	1	0	0	13
64	0	0	0	0	0	0	0
65	3	1	17	5	0	0	26
66	18	10	25	11	0	0	64
67	8	7	36	11	0	0	62
68	15	7	10	7	1	1	41
70	79	8	37	11	13	4	152
71	6	1	3	0	2	2	14
73	137	48	30	21	0	0	236
75	37	49	3	27	0	2	118
76	63	39	13	24	9	10	158
77	60	12	30	21	46	13	182
78	2	2	0	4	1	2	9
80	5	3	3	3	3	2	19
Total	441	190	208	144	75	36	1094

Since restrictions were placed on the issue of new licences in 1996, the number of licences issued yearly has been gradually declining. This trend is making processors uneasy, as was mentioned several times.

Table 2: licences issued, 1994 to 2000

Year	**Soft-shell clams**	**Bar clams**	**Bay quahaug**	**Total**
1994	868	389	163	1420
1995	1063	562	193	1818
1996	809	427	149	1385
1997	703	402	132	1237
1998	686	396	130	1212
1999	678	385	128	1191
2000	631	352	111	1094

The number of recreational fishers is difficult to estimate, since that category includes both residents who have traditionally gathered clams and non-residents who gather

them as a tourist activity. To date, very little information is available about the numbers involved, the profile of the fishers, or quantities landed. A policy is currently being drafted with a view to introducing a licensing system in the recreational fishery. This would yield more satisfactory statistical data, ensure fair public access to the resource, generate greater awareness of species conservation objectives and lead to better management strategies.

Native fisheries:
First nations hold 7 soft-shell clam licences and 5 bar clam licences: 6 soft-shell clam and 4 bar clam licences by Big Cove First Nation, 1 soft-shell clam by Eel River Bar First Nation and 1 bar clam by Bouctouche First Nation. All licences were bought back from commercial fishers.

1.2 Location of the fishery

Clams are harvested in open and in approved contaminated waters along the eastern coast of New Brunswick.

Soft-shell clams are found chiefly in the following regions: Pokemouche Bay as far as the Gully, Miscou harbour, Néguac Bay, including Hay Island, Portage Island and Tabusintac, the Kouchibouguac Park region as far as Cap Lumière, the Trois-Ruisseaux region, and Shemogue harbour. In addition, smaller beds are found at various locations along the coast.

The main bar clam beds are found in the Baie-Verte, Bayfield, Jourimain Island, Spence Cove and Dune de Maisonnette regions.

Lastly, there is a concentration of bay quahaugs in the Cocagne area (Breau Village and around Cocagne Island). In addition, small beds are to be found at Bouctouche, Shemogue, Baie-Ste-Anne and Kouchibouguac Park.

Heron Island

Heron Island had long been regarded as an excellent soft-shell clam gathering site, and, indeed, it was formerly highly productive, but since 1995 the Heron Island beds have been closed because of overharvesting. In 1988, Biorex Atlantique Inc. was commissioned to conduct a study on the area's soft-shell clam population; the study, which was submitted in 1989, concluded that in past years, the population had been characterized by high densities, rapid growth and stable recruitment. There was no sign of overharvesting, and the area seemed exceptionally favourable for spat settlement.

Heron Island, especially its south coast, was the scene of an intensive non-commercial fishery from late April to late September. A commercial fishery using hydraulic rakes (the licences are now under moratorium) operated for several years at the southeastern tip of the island, on the other side of the disused wharf. The northeastern coast was closed to harvesting because of bird contamination, while the beds on the western side were fished during the winter by non-commercial fishers.

In the fall of 1995, a survey of the soft-shell clam population was conducted by SenPaq Consultants with a view to estimating the status of the stock and identifying any changes that had occurred since the 1988 survey, so as to develop a management plan for the resource. In view of the continued harvesting pressure over the years, the consultant firm recommended closure of the fishery. Since then, the Eel River Bar First Nation and the Department of Natural Resources and Energy of New Brunswick have collaborated in the preparation of an ecotourism development project under which they are to manage the resource jointly once conservation concerns have been addressed.

Contaminated areas

In contaminated waters, the clam fishery is restricted to beds where DFO allows the harvesting of soft-shell clams and, since 2000, bar clams. Of the two companies participating in this fishery in 1994, only the one based in the Eastern New Brunswick Area is still operating. In 1994, 285 tonnes of contaminated soft-shell clams were harvested. Licences are issued under the *Management of Contaminated Fisheries Regulations* (see appendix 2). An example of this type of licence will be found in appendix 3.

Not all contaminated areas are suitable for a depuration fishery. First, a decontamination plan must be approved by the shellfish sanitation monitoring agencies. Where an area is too heavily polluted, or where the presence of heavy metals is detected, the harvesting of shellfish is not authorized. No shellfish may be harvested within 150 metres of a wharf.

1.3 Fishing seasons

Fishing seasons are set under the *Maritime Provinces Fishery Regulations*. Changes are made by order as the need arises, after consultation with the members of the Advisory Committee.

In general, the Eastern New Brunswick Area is closed to clam harvesting from 1 January to 31 March. However, beds in the areas listed below have been closed by order:

That part of Chaleur Bay within a line drawn around Heron Island at a distance of 500 metres from the island: closed until the resource has recovered and an agreement has been reached with the Eel River Bar First Nation under a memorandum of understanding to be signed by all parties.

From Johnston Point, Westmorland County, to the boundary between New Brunswick and Nova Scotia: the recreational clam fishery is closed from 1 January to 31 March and 1 June to 1 October. That same area is closed all year to commercial fishing and for any harvesting methods other than by hand and with hand tools. The inland and tidal waters of this part of New Brunswick are closed to bar clam harvesting from 13 July to 31 August.

Dive fishing, for all species of clams, is prohibited from 1 January to 31 December throughout the Eastern New Brunswick Area.

1.4 Fishing methods

Clams are usually harvested with hand tools, in many cases home-made tools, including picks, clam hoes and clam spades. The use of mechanical harvesters is permitted under the regulations, but traditional clam fishers are opposed to this method (see issue 5.8).

However, there is still an active clam harvesting licence issued for a boat under 45 feet in length that is fitted with a hydraulic dredge; the holder of this licence fishes bar clams in the tidal waters of Northumberland Strait adjacent to Kent and Westmorland Counties, except the area lying between Johnson Point and the boundary between New Brunswick and Nova Scotia at Baie-Verte, Westmorland County.

Although mechanical harvesters are currently under a moratorium (with the exception of the active licence just mentioned), their use may be authorized in contaminated waters in the case of certain designated beds.

1.5 Landings, value and market

Statistical data for the past ten years include landings from the commercial fishery as reported from purchase slips. These landings are underestimated and do not necessarily represent the actual situation.

The introduction of a log book in 2001 should yield a better understanding of the size of the commercial fishery. Data on the recreational fishery are difficult to obtain, and a log book can be required only if a recreational licence is issued, which is not yet the case. An example of a log book will be found in appendix 4.

Table 3: Landings and landed value by statistical district – soft-shell clam

Stat. district	MT	$ (000)	MT	$ (000)	MT	$ (000)	MT	$ (000)	MT	$ (000)	MT	$ (000)
	1993	1993	1994	1994	1995	1995	1996	1996	1997	1997	1998	1998
63	27	55	24	47	26	49	18	26	6	10	12	18
64	0	0	6	7	0	0	0	0	0	0	0	0
65	8	16	25	54	8	13	13	22	16	28	13	23
66	21	25	18	29	29	49	16	24	13	23	26	46
67	13	20	5	10	4	8	6	10	19	34	21	37
68	99	75	12	27	28	47	12	20	2	3	11	19
70	123	184	85	158	77	132	48	68	65	103	92	168
71	0	0	0	0	1	2	0	0	0	0	0	0
73	65	100	104	208	141	249	80	144	84	154	548	935
75	62	84	29	53	22	44	12	23	15	24	13	25
76	62	84	72	113	126	224	90	163	70	125	112	194
77	74	105	125	188	129	233	93	156	120	241	134	216
78	2	3	1	2	1	2	1	2	1	2	4	8
80	4	7	2	3	1	1	1	3	3	9	3	7
Total	560	758	508	899	593	1053	390	661	414	756	989	1696

Soft-shell clams:

Landings of soft-shell clams in the southern Gulf have averaged 500 metric tonnes over a five year period (1993-1997), far below the values observed in the 1980s. These landings would be smaller still if harvesting in contaminated areas had not been authorized. However, the statistics do not take recreational harvesting into account. Moreover, it is generally acknowledged that a substantial percentage of all landings is not declared.

Most soft-shell clams are marketed fresh in their shells, although some are shucked and the meat sold fresh, frozen or canned.

Table 4: Landings and landed value by statistical district – Bar clam

Stat. district	MT	$ (000)	MT	$ (000)	MT	$ (000)	MT	$ (000)	MT	$ (000)	MT	$ (000)
	1993	1993	1994	1994	1995	1995	1996	1996	1997	1997	1998	1998
63	0	0	0	0	3	7	0	0	0	0	1	1
64	0	0	0	0	1	3	1	1	0	0	0	0
65	68	136	88	193	20	35	31	31	24	43	33	58
66	0	0	0	0	0	0	0	0	10	18	2	4
67	2	3	0	0	0	0	0	0	1	2	1	1
68	0	0	0	0	1	1	4	4	5	8	0	0
70	27	52	21	35	61	109	19	19	19	34	2	4
71	0	0	0	0	0	0	0	0	0	0	0	0
73	10	17	3	6	2	3	2	2	4	8	40	81
75	21	22	2	3	5	7	4	4	3	6	0	0
76	9	15	15	28	1	2	1	1	1	1	1	2
77	18	23	4	7	52	92	18	18	4	5	17	30
78	2	1	46	52	53	47	46	46	31	34	31	31
80	76	115	8	6	19	31	19	19	10	14	9	16
Total	233	384	187	330	218	337	145	145	112	173	137	228

Bar clam:

The harvesting of bar clams has always been considered supplementary to the spring lobster and crab fisheries. The yield, for the most part, is processed into canned clams and clam chowder for sale on the United States market.

The spring recreational fishery for individual consumption and canning is an important activity in many parts of the region.

Table 5: Landings and landed value by statistical district – bay quahaug

Stat. District	MT	$ (000)	MT	$ (000)	MT	$ (000)	MT	$ (000)	MT	$ (000)	MT	$ (000)
	1993	1993	1994	1994	1995	1995	1996	1996	1997	1997	1998	1998
63	0	0	0	0	0	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0	0	0	0
65	2	3	0	1	0	0	0	0	0	0	0	0
66	5	5	1	1	9	16	3	5	0	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	0	0	0	0
70	3	5	0	0	0	0	0	0	1	1	1	1
71	0	0	0	0	0	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0
75	3	4	1	2	0	0	0	0	0	0	0	0
76	0	0	4	8	0	0	3	8	0	0	0	0
77	170	343	106	211	75	164	57	152	51	141	44	127
78	3	5	6	11	1	1	0	0	0	0	0	0
80	4	8	0	0	0	0	0	0	0	0	0	0
Total	190	373	118	234	85	181	63	165	52	142	45	128

Bar quahaug:

Commercial landings of bay quahaug in the southern Gulf have steadily declined. In 1998, landings have dropped 76% compared to 1993.

Small quahaugs are sold fresh in their shells. The meat of larger specimens tends to be tough, and accordingly it is chopped up and canned for use in chowders.

1.6 Advisory process

The Clam Fishery Advisory Committee is made up of representatives appointed by their peers or by fishers' organizations such as the Maritimes Fishermen's Union. After prior consultation with users, these representatives inform the Committee of the state of the fishery in their respective areas, make recommendations concerning its management, and suggest changes to regulations or to current policy. They inform the Department about any problems or conflicts requiring its intervention. They are the link connecting all fishers and users of the resource, the various watershed management committees, and the federal and provincial governments. Accordingly, recommendations submitted to the Department are adopted by consensus rather than by voting.

In 2001, the Commercial Clam Fishery Advisory Committee for the Eastern New Brunswick Area comprised the following:

- Locals 1 and 10 of the Maritimes Fishermen's Union:
  Clam fishers representing Chaleur Bay (two representatives), the Acadian Peninsula (two representatives), the Néguac/Miramichi Bay area (two representatives), and a staff member of the MFU, locals 1 and 10;
- Local 2 of the Maritimes Fishermen's Union:
  Clam fishers representing the regions of Baie-Ste-Anne (two representatives), Richibouctou/ Bouctouche (two representatives), Cocagne to Cap-Pelé (two representatives), Johnston Point to Port Elgin (two representatives) and a staff member of the MFU, local 2;
- The First Nations and New Brunswick Aboriginal Peoples Council (one representative each)
- Esmond Vautour, Kouchibouguac
- Layne Godin, Lorne
- Kenny Lapointe, Nash Creek
- Jack Reade, Port Elgin
- Myles Dean, Bayfield
- Antoine Sippley, Baie-Ste-Anne
- Camillien Landry, Caraquet
- Kevin Morrison, Oak Point
- Raymond Benoit, Tabusintac
- Bertin Martin, Baie-Ste-Anne
- Donald V. Thibodeau, Bas-Néguac
- Valmond Thibodeau, Rivière-du-Portage

- One representative Mills Seafood Ltd
- One representative of Partenariat pour la gestion intégrée du bassin versant de la Baie de Caraquet ;
- One representative of the Kouchibouguac National Park
- One representative of New Brunswick Fish Packers Association;
- Two representatives from the New Brunswick Department of Agriculture, Fisheries and Aquaculture
- One representative each from Resource Management and Conservation and Protection, Eastern New Brunswick Area
- One shellfish biologist from the Science Branch, Gulf Fisheries Management Region
- Representatives from the Canadian Food Inspection Agency

1.7 Type of management

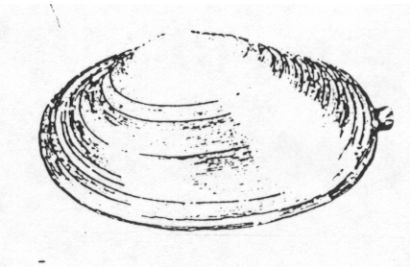
The fishery is managed by the limited number of fishing licences, seasons, catch size and fishing method, as well as the licensing policy for the commercial fishery in the Gulf Region (see annex 5).

The commercial fishery in closed areas is managed in accordance with the *Management of Contaminated Fisheries Regulations* application policy in the Eastern New Brunswick Area. Every licence includes licensing conditions governing fishing gear, management agreements, depuration policy, tagging, fishing areas, relaying and transport, landing sites, the posting of the areas concerned and the keeping of relevant documents.

2. STOCK STATUS REPORT

2.1 Biology, environment and habitat (2, 3, 4)

Soft-shell clam (*Mya arenaria*):



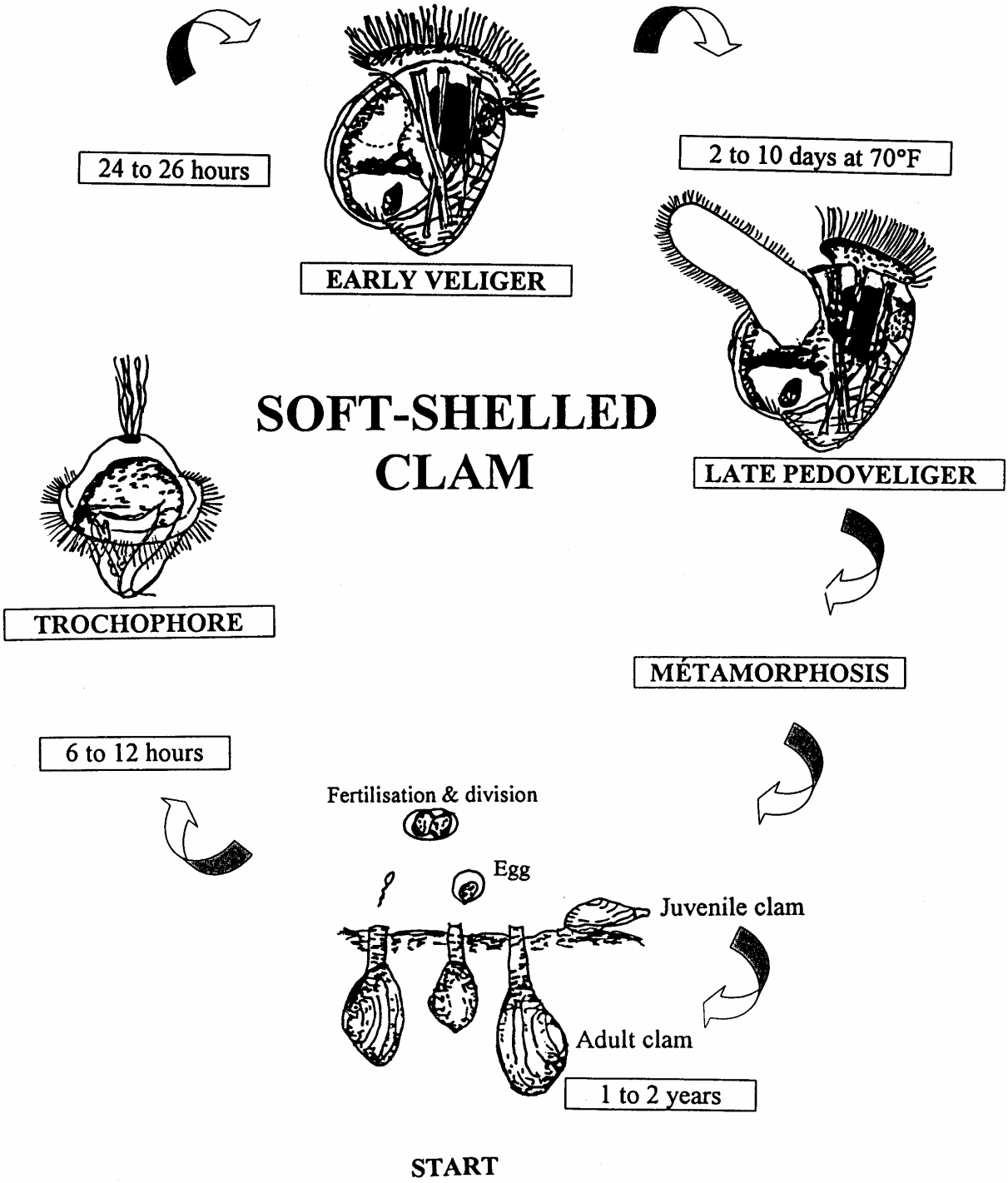
The soft-shell clam is a bivalve mollusc that inhabits mud and clay substrates between the intertidal zone and the subtidal zone in sheltered bays along the coast from Labrador to North Carolina. It has a long, thin, brittle shell that is chalky white in colour. It cannot clamp the two halves of its shell tightly shut because its siphon protrudes.

In the southern Gulf of St. Lawrence, spawning usually occurs between late June and early July, when the water temperature undergoes its yearly rise. The sexes are distinct, and the females reach sexual maturity after they have grown to a length of over 35-40 millimetres in their first four years of life (depending on the northerly latitude of the population). Fertilization is external. The larvae are free-swimming during approximately four weeks before metamorphosis and settlement of the spat on a suitable benthic substrate.

Table 6 (see the following page) illustrates the life cycle of the soft-shell clam.

Although we do not possess data proving that overfishing is occurring, DFO officers, fishers and the general public all maintain that fishing pressure has increased in recent years. The fact that landings have declined over the past ten years, despite greater access to closed areas, indicates that overfishing is a very real possibility. Furthermore, such overfishing is likely to have serious consequences, as harvesting in closed areas might be injurious to stocks that had previously been protected.

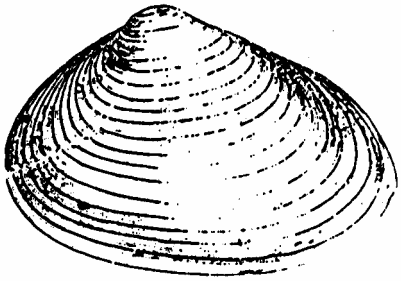
Table 6: Life cycle of the soft-shell clam



Most soft-shell clams landed in the southern Gulf have been harvested by hand methods. Indirect fishing mortality among those clams has been estimated at approximately 17 per cent (Robinson and Rowell 1990, Landry and Ouellette 1993). However, indirect fishing mortality in the recreational clam fishery may be somewhat greater, owing to the fact that the resource is exposed for a longer time while the fisher is grubbing in the clam beds in search of his or her daily limit. When hydraulic harvesters are used, in contrast, indirect mortality is only 55 per cent[1] (Landry and Ouellette 1993). These mortality rates vary greatly from one fishing season to another. They are usually higher in the warm summer months, when the clams have just spawned and are in poor physiological condition. Data obtained from field studies reveal that the efficiency of hydraulic harvesters is approximately 74 per cent, compared to 60 per cent for hand methods (clam spade and the like), and that the yield rate for a hydraulic harvester is three times the yield rate obtained with hand methods (Robinson and Rowell 1990; Landry and Ouellette 1993).

Recruitment of soft-shell clams is sporadic and difficult to estimate. The conservation measure currently in force, setting a minimum legal harvesting size, protects breeding stocks. The recovery of a bed of clams depends to a great extent on environmental conditions such as water temperature, salinity, and circulation patterns; consequently, recovery rates vary substantially from place to place and from year to year.

Bar clam (*Spisula solidissima*):



The bar clam is a bivalve mollusc found in high-energy areas (exposed areas in many instances) of shallow water where the bottom is sandy, from the middle of the intertidal zone out to depths of 25 metres, along the Atlantic coast from Cape Hatteras in the south to the northern limit of its range in the southern Gulf of St. Lawrence. It has a thick, chalk-white shell with a thin olive-brown epidermis.

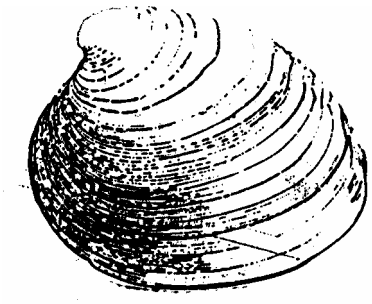
[1] Sic. [Translator]

The sexes are distinct. Sexual maturity occurs at a mean length of over 80 millimetres, when the clam is four years old, according to a study conducted in the waters off Prince Edward Island (Sephton and Bryan 1987, 1990). The ratio of males to females is usually 1/1, and hermaphrodites occur only rarely. Spawning takes place when the gonads are mature and the water temperature is above 12-15˚C, between late July and early October. The eggs are fertilized externally (Sephton 1987). The larvae are free-swimming for a period of four to five weeks, after which metamorphosis and spat settlement occur. Artificial spat collection is not feasible in the case of this species, and consequently little is known about the recruitment of each year's juveniles into local populations (Sephton and Bryan 1985).

As a rule, recruitment to the commercial fishery takes from five to six years (Sephton and Bryan 1990). In the Gulf Region, coastal beds suitable for recreational harvesting are found at locations where there are long, exposed sand dunes.

Unfortunately, there are no data available on which to base an assessment of the state of the resource.

Bay quahaug (*Mercenaria mercenaria*):



The bay quahaug is a bivalve mollusc whose habitat extends from the intertidal zone to the sublittoral zone in sheltered bays and shallow coastal waters from the southern Gulf of St. Lawrence to the Gulf of Mexico. It has a hard, thick, chalk-white shell. It is found only in waters where the temperature is above 20˚C, and consequently the southern Gulf represents the northern limit of its range. It does not occur naturally any further north than the estuary of the Miramichi River. Its distribution area frequently overlaps with that of the Atlantic oyster. Among the quahaug populations in the Gulf of St. Lawrence, recruitment varies from year to year. Sexual maturity occurs at a size of 33 millimetres; however, the bay quahaug is protandrous, i.e. it changes from male to female as it grows older, and the proportion of the two sexes in the population varies with the age distribution. Most quahaugs begin life as males. In view of the fact that females produce fewer gametes than males, it is preferable to keep a larger proportion of females in the breeding stock of a quahaug bed.

Young quahaugs between 50 and 63 millimetres long ("little-necks") command the highest market prices. The danger is that strong demand for little-necks may bring about an increase in fishing effort, with the attendant possibility of heavier fishing mortality that would adversely affect all size categories. As a conservation method, therefore, it might be advisable to consider keeping most of the adult population as breeding stock (Landry *et al*., 1999).

Moreover, it is possible that the effect of overfishing may be even more serious than had been anticipated, because harvesting in areas that had previously been closed may impact formerly protected breeding stocks.

Razor clam (*Siliqua patula*):

The razor clam has a thin, brittle shell that is very long and narrow, so that it resembles an old-fashioned straight razor. The shell is chalky white in colour, and is covered with a thin, shiny brown epidermis. The clam has two white siphons, one protruding from each end of the shell. Razor clams are approximately 6 inches (15 centimetres) long and 2.5 inches (6.5 centimetres) wide.

Razor clams are known as fast burrowers, burying themselves completely in under seven seconds (i.e. at a rate of between 2 and 3 centimetres per second).

2.2 Interaction between species

Direct interaction among the various species of clam is generally very slight in ecological terms. However, they play an important role within the coastal ecosystem both as predators (filter feeders) and as prey. As filter feeders, clams are generating growing interest as a factor in coastal zone management, inasmuch as they play a major role in the areas of food-chain equilibrium and the benthic-pelagic interface, and may even contribute to the remediation of eutrophic coastal ecosystems. The health of each stock of any species of mollusc in itself may have an indirect impact on others in so far as sedimentation, and consequently recruitment success, are affected.

The several species of clam may also interact indirectly as prey. The abundance of any species may have an impact on its predators' abundance and prey selection, and thus a change in the population dynamics of one species of clam may entail consequences for other species.

2.3 Stock assessment

Apart from a few exceptional cases, such as the soft-shell clams of Heron Island or the development of a new fishery (Kouchibouguac), the assessment of shellfish stocks is effectively non-existent in the Eastern New Brunswick Area, and nearly so for Canada's entire east coast. This situation has arisen primarily because assessing a number of small stocks is not a cost-effective exercise, but also because there are so few potential applications of the results of such assessments, given the current management climate in these fisheries.

2.4 Research

The Mollusc Productivity Group at the Regional Office's Science Branch has contributed to the following studies:

- Monitoring of mollusc productivity. Fifth and sixth years of monitoring work at three sites in New Brunswick and four in Prince Edward Island, Nova Scotia and Quebec (1999 and 2000).
- Study on the improvement of quahaug productivity. Assessment of Prince Edward Island quahaug recruitment and breeding biology (1999 and 2000).
- Assessment of quahaug cultivation potential: comparison of natural sources and the *notata* variety (1999 and 2000) and evaluation of natural mortality (2000).
- Evaluation of the impact of the introduction of the green crab on various mollusc stocks
- Interaction between mollusc (mussel) cultivation and the environment
- Assessment of the impact of the nemertean *Cerebratulus lacteus* on soft-shell clam stocks
- Interaction between cultivated and natural mussel stocks

2.5 Prospects for the next five years (2001-2006)

The Gulf Region's Science Branch is aware of the importance of mollusc productivity for the coastal zone, in both socio-economic (fisheries and aquaculture) and ecological terms. For the next five years, the Mollusc Productivity Group will be allocated one additional person-year to work on the assessment of shellfish stocks, mainly scallop stocks. Furthermore, 1.5 person-years will be available to address the issue of cultivated mollusc productivity. This may be expected to yield general information on the biology of the various clam species and their interactions with the coastal environment.

(2) Stock status reports 96/100E, 96/101E and 96/102E, DFO Atlantic Fisheries

(3) Le Monde Sous-Marin, Mollusques et crustacés de l'Atlantique

(4) Le Monde Sous-Marin, La Mye

3. LONG-TERM MANAGEMENT OBJECTIVES

Long-term management objectives for the commercial clam fishery in the Eastern New Brunswick Area are defined as follows:

- in Science
  - advise communities about the effects of various management approaches and methods for stock improvement

- in Statistics
  - gather relevant data on the commercial clam fishing effort by species (numbers of fishers, numbers of fishing days, catch units, and the like)
  - mandatory use of log books in 2001 will provide better information on landings

- in Fisheries Management
  - rationalize fishing effort by optimizing numbers of licences, seasons, and so on
  - document and quantify commercial fishing effort for each of the species involved
  - document and quantify recreational fishing effort for each of the species involved
  - allow all users fair access to the resource

- in Conservation and Protection
  - quantify the activities of fishery officers

- in Habitat Management
  - identify any harmful alteration, disruption or destruction of clam habitat
  - classify and forward to watershed management committees numbers of instances of habitat damage, referred projects, authorizations, and habitat rehabilitation
  - take clam habitat into consideration in assessing referred system projects
  - promote environmental stewardship

- In the Oceans Group
  - promote the development of mechanisms for integrated resource management, i.e. an ongoing, transparent decision-making process established by stakeholders with a view to integrating the planning and implementation of activities and policies affecting Canada's oceans
  - direct and co-ordinate, with the assistance of the groups involved, the implementation of Marine Protection Areas (MPAs), in order to provide particular ecosystems with enhanced protection, for the reasons set forth in the *Oceans Act*

- develop and implement, in consultation with the groups involved, criteria on Marine Environment Quality (MEQ) in estuaries and coastal waters

- In Aboriginal Fisheries
  - continue to provide First Nations groups, at their request, with access to the clam fishery, where warranted, for subsistence, social and ritual purposes, taking into account stock conservation and protection measures
  - promote access by First Nations groups to the commercial clam fishery in the framework of negotiated agreements
  - incorporate into the plan, after consultation with stakeholders, the management measures arising from the Supreme Court decision in the Marshall case

4. MANAGEMENT MEASURES AND CONSERVATION AND HARVESTING PLANS

4.1 Conservation and sustainable fishing

- Promote and ensure the conservation and protection of clams by optimizing the fishing effort.
- Gather timely and accurate data that is essential to stock assessment through mandatory log books.
- Ensure optimal resource use by commercial, recreational and First Nations user groups by maintaining landings statistics.
- Promote the guiding principle of no net loss of habitat production capacity.

4.2 Commercial Fishery

- Ensure the conservation of species by developing appropriate management measures (minimum size, daily limits, seasons and the like).
- Obtain fuller information on actual landings.
- Maintain limited access through licensing.

4.3 Aboriginal fishery

- Provide First Nations groups, at their request, with access to the clam fishery, where warranted, for subsistence, social and ritual purposes, taking into account stock conservation and protection measures.
- Within the framework of the general Departmental strategy, which aims at increasing First Nations participation in commercial fisheries, some commercial clam fishing licences, preferably obtained under a voluntary withdrawal program, are set aside and will be reissued to First Nations groups. Management measures arising from the Supreme Court decision in the Marshall case will be incorporated into the plan, further to consultations with stakeholders.

4.4 Exploratory fishery

- No exploratory fishery is authorized.

4.5 Recreational fishery

- No licence is needed for recreational clam harvesting. However, catch limits, seasons and minimum sizes apply.

4.6 Aquaculture

- There are no commercial clam aquaculture activities in eastern New Brunswick However, several research projets, specifically on bay quahaugs and bar clams and also to a certain extent, soft-shell clams, are presently being pursued. It is expected that by year 2005, the first bay quahaug and bar clam viable commercial aquaculture operations will emerge.

4.7 Clam habitat

- Encourage the development of public beds by maintaining limited access through licensing.
- Encourage preventive and corrective pollution control measures.

5. CURRENT MANAGEMENT PROBLEMS

5.1 Reporting of landings

Issue:
The reporting of all real landings is very important to the Science Branch and managers in order that the fishery can be managed based on actual fishing effort. There still seem to be oversights in landings reports.

Approach:
DFO does not have the resources to monitor landings more adequately. Fishers must ensure that reported landings are accurate in order for the fishery to be satisfactorily managed. Accordingly, log books will be mandatory in the commercial clam fishery in 2001.

5.2 Uniformity in interpretation of the term "diving"

Issue:
While diving for clams—specifically, bar clams and bay quahauogs—is prohibited, there is no single interpretation of the term "diving" for the use of fishery officers. In statistical district 63, fishers wearing diving suits are allowed to float at the surface of the water, whereas at Cape Tourmentine, fishers must have their feet on the bottom at all times.

Approach:
A uniform interpretation should be applied by fishery officers, and fishers should be advised accordingly.

5.3 Licensing policy

Issue:
Concern has been expressed at the fact that, in contrast to their counterparts in the lobster or herring fishery, for example, fisher helpers are not authorized to engage in clam fishing activities unless they hold a commercial clam licence. Similarly, young persons find themselves confronted by restrictions when they try to enter the fishery.

Approach:
Every person engaging in the clam fishery must have a licence authorizing him to harvest the particular species that he is harvesting in order to remain within the law. Participation by unlicensed fishers would increase the fishing effort and might entail charges of fishing without a valid licence.

5.4 Request for closure of bar clam and bay quahaug harvesting with mechanical rakes in Northumberland Strait and in other lobster fishing areas

Issue:
Lobster fishers have expressed concern at the use of mechanical rakes to harvest bar clams and bay quahaugs, as this fishing method disturbs the sea bed. Only one licence has been issued on New Brunswick's east coast, but approximately 15 have been issued to fishers in Prince Edward Island. Sediment stirred up by the pumps tends to silt up lobster traps and cause lobsters to evacuate the area. Fishers have observed that when this form of harvesting is carried on in the vicinity of lobster traps, the lobsters disappear and sometimes do not return for five to eight days, with the result that the traps must be relocated. Accordingly, the fishers are requesting closure for Northumberland Strait and other lobster fishing areas from 1 July to 10 October.

Approach:
This issue concerns only one licence in the Eastern New Brunswick Area, and that licence is valid only for the tidal waters of Northumberland Strait adjacent to Kent and Westmorland counties, except the area lying between Johnston Point and the boundary between New Brunswick and Nova Scotia at Baie-Verte, Westmorland County. The lobster fishers, in contrast, are free to fish anywhere in the Strait. Discussions with the Prince Edward Island Area should be initiated.

5.5 Seeding of the Brantville clam bed

Issue:
The Brantville clam bed, which was formerly very productive, has been overfished. The fishers have formed the Brantville Clam Fishermen's Association and have approached the provincial Department of Agriculture, Fisheries and Aquaculture and also the Science Branch at the Regional Office, with a request for seeding of the bed.

Approach:
If the request is accepted, a scientific protocol will have to be prepared with the assistance of the biologists at the Science Branch. The project will require a control zone, close times, closed areas and scientific monitoring.

5.6 Licence application for soft-shell clam seeding in the Néguac area

Issue:
Since 1997, a firm known as SenPaq Consultants has been working with a mussel culture lease holder and an oyster culture site holder on a soft-shell clam farming project aimed at developing a technique for collecting spat from the natural environment. Promising results have been obtained in the Richibouctou area with a

system of collectors, and in Néguac Bay with a tent technique. Consequently, there is reason to believe that the development of such an approach may be feasible. The clams are subsequently used for seeding purposes in the Néguac region and in the head of the bay in Bouctouche Harbour.

Approach:
In view of this project and the additional applications which it will undoubtedly generate, DFO should develop a policy for the issuance of soft-shell clam spat collecting licences. In addition, DFO should develop management parameters with a view to making spat collection areas available, and should also determine what management measures would be optimal for public beds that have been seeded.

5.7 Closure of the Heron Island fishery

Issue:
Following studies of the Heron Island clam populations, harvesting was prohibited when the proportion of clams of legal size was found to have declined from 28.9 per cent in 1988 to 4 per cent in 1995. For the past five years, the harvesting of soft-shell clams has been prohibited inside a 500-metre line around Heron Island. Most of those who had engaged in the fishery were recreational harvesters, but there had been a few commercial fishers who depended on the Heron Island fishery to qualify for employment insurance. Furthermore, the Eel River Bar First Nation and the Department of Natural Resources and Energy of New Brunswick have collaborated in the preparation of an ecotourism development project under which they are to manage the resource jointly once conservation concerns have been addressed.

Approach:
Commercial clam fishers with historical landings for Heron Island will be consulted and made aware of the management plan to be submitted by natives concerning the clam fishery.

5.8 Moratorium on the use of mechanical harvesters

Issue:
Mechanical harvesters are more efficient than hand tools. A mechanical harvester is a machine, operated by the fisher, which uses a jet of water to force the clams to the surface, where the fisher can then gather them. A prototype and specifications for a mechanical harvester will be found in appendix 6.

There are nine mechanical harvester licences in the Eastern New Brunswick Area. Seven of these, in the Baie-Ste-Anne area, were issued for the last time in 1985. One licence, also under moratorium, is valid for the Charlo region, while the ninth, which

is still active, is valid for the Cap-Pelé region. The moratorium on the issuing of mechanical harvester licences was applied following protests from clam fishers using hand-held tools.

Approach:
Until such time as traditionnal fishers are prepared to tolerate the issuance of mechanical harvester licences, DFO will continue to hold that the status quo should be maintained.

6. DETAILED MANAGEMENT MEASURES FOR 2001

6.1 Soft-shell clam, bar clam, bay quahaug and razor clam seasons

(a) All Eastern New Brunswick waters:
- closed from 1 January to 31 March
- closed to bar clam harvesting from 13 July to 31 August
- closed to dive fishing from 1 January to 31 December

(b) Heron Island (Chaleur Bay):
- closed from 1 January to 31 December in an area lying inside a 500-metre line around the island

(c) From Johnston Point, Westmorland County, to the New Brunswick - Nova Scotia border:
- closed to commercial fishing from 1 January to 31 December
- closed to recreational fishing from 1 January to 31 March and from 1 June to 1 October

6.2 Minimum legal sizes

Soft-shell clam: 50 mm (2 inches)
Bar clam: 102 mm (4 inches)
Bay quahaug: 38 mm (1.5 inches)
Razor clam: no minimum size

6.3 Daily limits, recreational fishery

Soft-shell clam: 100
Bar clam: 100
Bay quahaug: 100
Razor clam: 100
Total of not more than 300 clams daily, all species.

6.4 Daily limits, commercial fishery

Bar clam: 300
Other clam species: no daily limit

6.5 Harvesting of clams in contaminated areas

Upon approval of a decontamination plan, a contaminated clam licence may be issued, and the fisher named therein must hold a commercial clam licence and be registered as a commercial fisher. Harvested clams must be decontaminated in a decontamination facility.

6.6 Harvesting of clams in conditionally approved areas

Where a contaminated clam licence has been issued, the controlled depuration of contaminated clams is subject to the conditions and procedures set forth in the Memorandum of Understanding signed by the licence holder and the Canadian Food Inspection Agency.

7. CONSERVATION AND PROTECTION PROGRAMS AND STRATEGIES FOR 2001

Surveillance of the clam fishery has been maintained for several years now, and no further efforts in that connection are contemplated under the present program.

In view of the new management methods, such as partnerships and co-management arrangements, that are being discussed under the oceans management strategy, and in view of prospective amendments to the *Fisheries Act*, co-operative agreements with users may become the most appropriate tool for the enhanced conservation and protection of clam resources.

8. INDUSTRY RESPONSIBILITIES

Fishers are showing more and more interest in how to manage the clam fishery and are interested in evaluating and proposing new management measures. Fishers' associations should play a greater role in the management of this fishery. The associations should form a group to deal with clam conservation and fisheries management, thus becoming a co-management partner. Consultations would be conducted by this group, meetings would be chaired by the industry and DFO would deal directly with this group on management issues.

Moreover, to support the principles of the *Oceans Act*, the partners involved in such a group should represent the coastal communities, the fishing industry, non-governmental organizations, environmental groups, First Nations, provincial governments, federal departments, universities, in fact, all the potential users of this resource and its habitat.

9. ROLES AND RESPONSIBILITIES OF DFO

● Resource Management
- direct and consolidate consultations with the various divisions of DFO with a view to developing management options
- in charge of consultations with users and the provincial government
- in charge of management before, during and after the season
- in charge of licensing

● Habitat Management
- assess the potential impact of referred projects and major projects on habitat
- assist local groups with river and stream rehabilitation
- assist watershed management committees and the industry with best practices and guidelines for fish habitat protection

● Science
- in charge of scientific advice on stock status
- identify concerns relating to species conservation
- advise on the appropriateness of management options conducive to species conservation
- determine what information is required in order to facilitate recommendations on adjustments during and after seasons

● Science – other
- advise on water quality
- advise on contaminants
- help to determine the causes of fish mortality
- provide opinions when major projects are under assessment
- provide information on the location of essential habitat

● Aboriginal Affairs
- provide follow-up on DFO's relations with First Nations, subsistence, social and ritual fisheries, communal commercial fisheries, consultations, and DFO policies and programs
- has trusteeship responsibility for applying court decisions in treaty matters

● Conservation and Protection
- follow up, monitor and maintain surveillance of regulatory programs requiring the deployment of fishery officers at sea, on land and in the air
- the Division's activities are aimed at enforcement of legislative policies, plans and programs relating to the conservation and protection of Canada's fishery resources

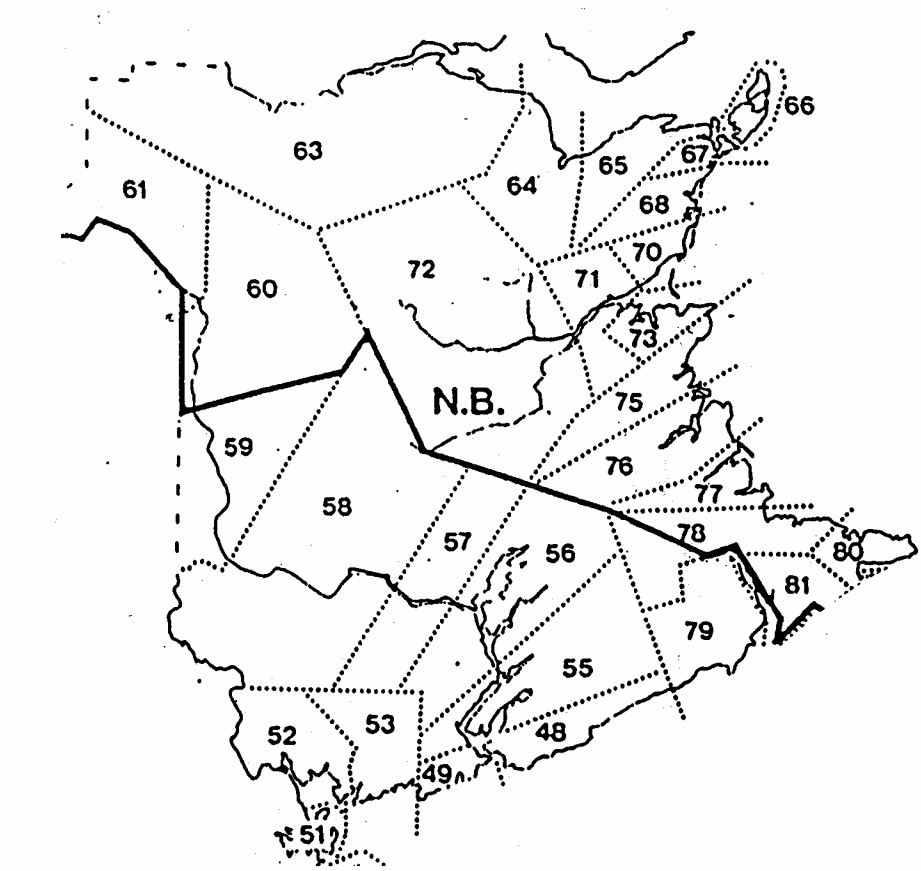
- responsible for initiating requests for amendments to regulations as required in order to support management plans

● Oceans
- encourage the development and implementation of an oceans management strategy that will enable Canada to realize its vision of how estuarine, coastal and marine ecosystems should be managed. This strategy should ensure the health, safety and prosperity of the oceans for the benefit of Canadians today and in the future. It encourages the application of the guidelines of the *Oceans Act*, namely:
- conservation: in accordance with the ecosystemic approach, which is of fundamental importance for safeguarding the biological diversity and productivity of the marine environment
- application of the precautionary principle, i.e., err on the side of caution, in order to protect these resources and preserve the marine environment
- sustainable development: i.e., development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

This strategy will be implemented in co-operation with other federal government departments and agencies, provincial and territorial governments and First Nations organizations, coastal communities and other stakeholders.

● Communications
- provide advice on communication strategies for management plans

APPENDIX 1 - MAP AND DESCRIPTION OF STATISTICAL DISTRICTS



63 – Restigouche County
64 – Restigouche County line to Bass River (incl.)
65 – Bass River (excl.) to Pokesudie Island (incl.)
66 – Lamèque Island and Miscou Island
67 – Shippagan to Pokemouche Gully (incl.)
68 – Pokemouche Gully (excl.) to Northumberland County line
70 – Northumberland County line to Grand Dune Island
71 – from Grand Dune Island to Morrisey Bridge on the north side of the Miramichi River and Morrisey Bridge to Point au Carr (excl.) on the south side
73 – Point au Carr (excl.) to Kent County line
75 – Kent County line to the south side of the St. Louis River (incl.)
76 – south side of St. Louis River (excl.) to Chockpish River
77 – south side of Chockpish River to Westmorland County line
78 – Westmorland County line to Bas Cap Pelé (incl.)
80 – Bas Cap Pelé (excl.) to N.B./N.S. border

APPENDIX 2 – MANAGEMENT OF CONTAMINATED FISHERIES REGULATIONS

Management of Contaminated Fisheries Regulations
SOR/90-351
Registration 14 June, 1990

FISHERIES ACT
Management of Contaminated Fisheries Regulations
(SOR/90-351)
P.C. 1990-1121 14 June, 1990

His Excellency the Governor General in Council, on the recommendation of the Minister of Fisheries and Oceans, pursuant to sections 8 and 43 of the Fisheries Act, is pleased hereby to revoke the Sanitary Control of Shellfish Fisheries Regulations, C.R.C., c. 832, and to make the annexed Regulations respecting the management of contaminated fisheries, in substitution therefor, effective October 1, 1990.

REGULATIONS RESPECTING THE MANAGEMENT OF CONTAMINATED FISHERIES

SHORT TITLE

1. These Regulations may be cited as the *Management of Contaminated Fisheries Regulations*.

INTERPRETATION

2. In these Regulations,
"contaminated", with respect to fish, means fish in or on which bacteria, toxins, chemical compounds or other substances are present to a degree that may constitute a danger to public health; (*contaminé*)
"Regional Director General" means the Director General of the Department of Fisheries and Oceans for the Pacific Region, the Central and Arctic Region, the Quebec Region, the Gulf Region, the Scotia-Fundy Region or the Newfoundland Region. (*directeur général régional*)

PROHIBITION ORDER

3. (1) Where a Regional Director General has reason to believe that fish of any species in any area are contaminated, the Regional Director General may issue an order prohibiting fishing in that area for that species.
(2) Notwithstanding any other regulations made under the *Fisheries Act*, where a Regional Director General issues an order under subsection (1) in respect of an area, no person shall, in that area, fish for or catch and retain any species of fish specified in the order unless
(a) the person is the holder of a licence issued under subsection 4(1) and is carrying that licence; or
(b) the person is named in a licence issued under subsection 4(1) and is carrying a copy of that licence.

LICENCE

4. (1) Subject to subsection (2), on application and payment by a person of the appropriate fee set out in the table to this subsection, the Minister may issue the person a licence authorizing the person and any other person named in the licence to fish in any area in respect of which an order is issued under subsection 3(1), for any species specified in that order.

TABLE

Item	Column I Licence	Column II Fee
1.	Fish for the purpose of scientific investigation	$100
2.	Fish for food purposes	$100, plus $20 for each person named in the licence other than the holder of the licence
3.	Fish for the purpose of obtaining bait	$100

(2) Where a person wishes to obtain a licence to fish for food purposes, the person shall submit to the Minister a decontamination plan that satisfies the Minister that the fish will be decontaminated before being used for human consumption. SOR/94-652, s. 1.

5. No person who catches and retains

(a) fish under a licence to fish for the purpose of scientific investigation shall use the fish for any purpose other than scientific investigation;

(b) fish under a licence to fish for food purposes shall handle the fish except in accordance with the decontamination plan submitted under subsection 4(2) in connection with the licence; or

(c) fish under a licence to fish for the purpose of obtaining bait shall use the fish for any purpose other than bait. SOR/94-652, s. 2.

APPENDIX 3 – CONTAMINATED SOFT-SHELL CLAM FISHING LICENCE

LICENCE NO. MCFR-NB- -_____
issued under the
MANAGEMENT OF CONTAMINATED FISHERIES REGULATIONS
(Licence to harvest contaminated soft-shell clams - *Mya arenaria)*

1. Pursuant to Section 4 of the *Management of Contaminated Fisheries Regulations*, permission is hereby granted to the licence holder to harvest contaminated **soft-shell clams** from the areas described in Schedule I of this licence.

2. The controlled cleansing of these contaminated soft-shell clams are to be subjected to the conditions and procedures established in the **MEMORANDUM OF UNDERSTANDING (MOU)** signed by the licence holder and the **CANADIAN FOOD INSPECTION AGENCY (CFIA).**

3. The persons identified in Schedule II of the present licence may participate in the harvesting activities under the following conditions and requirements.

4. During the period of harvesting, overlay waters from the contaminated areas listed in Schedule I of this licence must have a median faecal coliform count of less than 88 MPN/100 mL, with less than 10% of samples greater than 260 MPN/100 mL for a five tube decimal dilution test.

5. The licence holder will provide the DFO Conservation and Protection Branch Supervisor of the District where harvesting activities are taking place (see attached list), or his designate, a written weekly harvesting plan, at least four (4) days in advance prior to harvesting. This plan will indicate what areas or portions of areas are to be harvested, harvest dates and times, method(s) of harvest, and the names of the harvesters. The Master Harvesters will keep records of the areas or portions of areas harvested, dates and times, name of harvesters and quantities of clams fished by each harvester.

6. DFO reserves the right to restrict the number of areas being harvested and the number of harvesters operating at any one time.

7. The licence holder will provide to DFO a list of harvester representatives ("Master Harvesters"), and harvesters working under each representative per harvesting site. An update of this list must be approved by the appropriate DFO Licencing Service Centre prior to any change of personnel. **ALL HARVESTERS MUST BE LICENSED CLAM FISHERS AND REGISTERED COMMERCIAL FISHERS.**

8. The licence holder will ensure that a Master Harvester is present during all harvesting operations. The site must be no larger than that area which is in view of the Master Harvester at all times.

9. The licence holder will ensure that during harvesting operations each harvester will carry a copy of the licence issued to the depuration facility,to be available for inspection by a DFO Officer.

LICENCE NO. MCFR-ENB- -_____(Continued)

10. The licence holder will ensure that each harvester will during harvest operations, wear a DFO approved, designated coloured arm band, visible to the Master Harvester at all times.

11. The methods of harvesting is by **HAND, HAND HELD TOOLS** and shall conform with existing DFO's policies and regulations, specifically art. 35 (1) of the Fisheries Act which stipulates that "no person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat."

12. Records as described in items 2 and 5 are to be retained for a period of no less than one (1) year from the date of harvest and submitted on demand by a Fishery Officer or by any designated DFO official as per Section 61 of the *Fisheries Act*.

13. Non-compliance with any requirement described in the MOU referred to in item # 2 above may result in the cancellation of this licence. Departmental decisions shall be final.

14. This harvesting will be permitted from _____to_____.

15. The minimal size of contaminated soft-shell clams permitted to be harvested, cleansed or in possession is **the minimum legal size in force.**

16. Re-issuance of this licence is subject to Department of Fisheries and Oceans approval.

17. Failure to comply with any condition of this licence may result in suspension or cancellation of the license and/or court action where applicable.

DECLARATION OF LICENCE HOLDER

This is to certify that I will adhere to the terms and conditions of the Management of Contaminated Fisheries Regulations (July 26, 1990), the Canadian Shellfish Sanitation Program and the attached MOU.

_____

Licencee Date

_____

Departmental Officer Date

MANAGEMENT OF CONTAMINATED FISHERIES REGULATIONS

LICENCE NO. MCFR-ENB- -_____

Licence to Harvest Contaminated Soft-shell Clams (*Mya arenaria*)

S C H E D U L E I

PERMITTED AREAS FOR THE HARVEST OF CONTAMINATED SOFT-SHELL CLAMS UNDER THE AUTHORITY OF THE PRESENT LICENCE

The Department of Fisheries and Oceans (DFO), in consultation with Environment Canada, has designated the following areas from which bivalve molluscs may be harvested for controlled cleansing (See Environment Canada's current **MOLLUSCAN SHELLFISH GROWING WATER CLASSIFICATION INDEX FOR NEW BRUNSWICK** for map references):

NB 1-020

Waters along the coastline between grid reference 9730-2630 (Dalhousie) and grid reference 0400-1884 (Hamilton Point on east side of River Charlo) **EXCEPT** that portion of Eel Bay inside a line drawn from grid reference 9730-2630 at Inch Arran Point to grid reference 9790-2563 at Bonamy Rocks to grid reference 9600-2462 above Miller Brook, and **EXCEPT** that portion of Eel River above Highway No. 11 Bridge. See attached maps and refer to maps Dalhousie 22 B/1, page NB 1-020/1 and map Dalhousie 22B1, 21-0/16, page NB 1-020/2;

That portion of Heron Channel at Heaggs Point inside a line drawn from grid reference 0862-1695 to grid reference 0862-1721 to grid reference 1004-1721 to grid reference 1025-2657. Refer to map Heron Island 21-0/16, page NB 1-020/3;

That portion of Dickie Cove inside a line drawn from grid reference 1482-1497 at Dickie Point to grid reference 1550-1526 at Black Point. Refer to map Heron Island 21-0/16, page NB 1-020/3.

NB 1-030

That portion along the coastline on both side of Nash Creek inside a line drawn form grid reference 1725-1235 to grid reference 1739-1283 to grid reference 1824-1240 to grid reference 1855-1193. Refer to map Jacquet River 21-0/16, page NB 1-030/1;

That portion at the entrance of Jacquet River inside a box formed by a line drawn from grid reference 2141-1195 to grid reference 2135-1245 to grid reference 2214-1255 to grid reference 2245-1218 and back to grid reference 2141-1195. See attached map and refer to map Jacquet River 21-0/16, page NB 1-030/1.

NB 2-010

Millstream Gully and its tributaries located inside a line drawn from grid reference 9909 8537 to grid reference 9919 8522. Refer to map Bathurst 21P/12, page NB 2-010/3, 020/1.

NB 2-020
The entrance of Bathurst Harbour inside a line drawn from grid reference 0280 8180 on Youghall Beach seaward to grid reference 0400 8300, thence to grid reference 0725 8300 and thence shoreward to grid reference 0725 8245 on Belloni Point, and another line drawn from grid reference 0315 8108 to grid reference 0355 8077. Refer to map Bathurst 21P/12, page NB 2-020/2.

NB 4-010:
Waters of Tabusintac River inside a line drawn 50 meters along the shore from Wishart Point at grid reference 5070 4402 to Highway 11 Bridge at grid reference 4895 4402 to grid reference 4810 4387 to grid reference 4895 4315 to grid reference 4938 4285 to grid reference 5030 4328. Refer to map Tabusintac River 21 P/6, 7 page NB 4-010/3 and map Wishart Point 21 P/7, page NB 4-010/2;

Waters of Tabusintac River between Highway 11 Bridge (grid references 4815 4402 and 4810 4387) and Highway 460's Cains River Bridge (grid references 4098 4470 and 4100 4455. Refer to map Tabusintac River 21 P/6, 7 page NB 4-010/3;

Waters of French Cove inside a line drawn from grid reference 4895 4315 and to grid reference 4938 4285. Refer to map Wishart Point 21 P/7, page NB 4-010/2;

Waters along the south shore of Tabusintac River inside a line drawn 50 meters from grid reference 5030 4328 to grid reference 5175 4445. Refer to map Wishart Point 21 P/7, page NB 4-010/2.

NB 4-020:
That portion of Neguac Bay within the lines drawn from grid reference 4320 3475 to grid reference 4330 3470 to grid reference 4345 3494 to grid reference 4335 3500. Refer to map Chatham 21p/3, page NB 4-020/2.

NB 4-030:
That portion of Miramichi Bay at a place known as Point aux Carr from grid reference 3241 1600 to grid reference 3270 1600 to grid reference 3230 1670 within a circumference of 300 meters from grid reference 3255 1635. Refer to map Chatham 21P/3, page NB 4-040/1.

NB 4-040:
That portion of Black River and its tributaries within a line drawn from grid reference 3185 1122 to grid reference 3200 1110 and another line drawn from grid reference 3000 0970 and grid reference 3000 0930. Refer to map Chatham 21P/3 page NB 4-040/1;

Bay du Vin River and its tributaries inside a line drawn from grid reference 3757 1073 to grid reference 3742 1070. Refer to map Chatham 21P/3 page NB 4-040/1;

The foreshore and waters off McInnis Brook within 100m radius of grid reference 3874 1389. Refer to map Chatham 21P/3 page NB 4-040/2;

French River inside a line drawn from grid reference 4725 1600, on French River Point, to grid reference 4730 1568. Refer to map Chatham 21P/3. page NB 4-040/3;

That portion of Eel River and its tributaries comprised within a line drawn from grid reference 4807 1227 to grid reference 4914 1220 on the Eel River, another line on Eel River drawn from grid reference 4720 1140 to grid reference 4725 1130 and a third line, this one on Manuel River drawn from grid reference 4885 1065 to grid reference 4890 1070. Refer to map Chatham 21P/2, page NB 4-040/4.

NB 5-020:
Closed portion of the Kouchibouguacis River inside a straight line drawn from grid reference 5292 8016 and grid reference 5310 7984 Refer to map 21-1/15, 21-1/10, page NB 5-020/2, 030/1.

NB 5-030:
Closed portion of the St. Charles River inside a straight line drawn from grid reference 5335 7520 and grid reference 5355 7515. Refer to map 21-1/15, 21-1/10, page NB 5-020/2, 030/1;

Little Aldouane River inside a straight line drawn from grid reference 5490 7480 and grid reference 5526 7490. Refer to map 21-1/15, 21-1/10, page NB 5-020/2, 030/1;

Mooneys Creek inside a straight line drawn from grid reference 5839 7263 to grid reference 5815 7242. Refer to map 21-1/10, page NB 5-020/3, 030/2;

Closed portions of the Richibucto River and its tributaries inside a straight line drawn from grid reference 5655 6855 to grid reference 5750 6828 to a straight line drawn from grid reference 5590 6703 to grid reference 5507 6590. Refer to map Richibouctou 21-1/10, page NB 5-020/3, 030/2 and map Rexton 21-1/10. page NB 5-030/3;

Closed portion of the Richibucto River including St. Nicholas River inside a straight line drawn from grid reference 5249 6207 and grid reference 5354 6207. Refer to map Big Cove 21-1/10, page NB 5-030/4;

Closed portion of Baie du Village inside a straight line drawn from grid reference 6413 7013 and grid reference 6551 7036. Refer to map Richibouctou-Village 21-1/10, page 5-030/5.

NB 5-030:
That portion of the Richibuctou River between a line drawn from grid reference 5815 7242 at York Point to grid reference 5839 7263 at McGuires Point to grid reference 5956 7218 at Pagan Point and a straight line drawn from grid reference 5655 6855 north of McAlmon Creek to grid reference 5750 6828 on the east bank at Jardineville. Refer to map Richibouctou 21-I/10, page NB 5-020/3, 030/2.

That portion of the Richibuctou River between a straight line drawn from grid reference 5249 6207 to grid reference 5354 6207 at Chapel Point and a straight line drawn from grid reference 5590 6703 to grid reference 5507 6590. Refer to map Richibouctou 21-I/10, page NB 5-030/3.

NB 6-010:
Chockpish River inside a straight line drawn from grid reference 6800 6018 and grid reference 6800 6000. Refer to map Chockpish 21-1/10, page NB 6-010/1.

NB 6-020:
Black River inside a straight line drawn from grid reference 6990 4888 and grid reference 6982 4862. Refer to map Bouctouche 21-1/7, page NB 6-020/2;

Closed portions of the Main Buctouche River inside a straight line drawn from grid reference 6935 4791 and grid reference 6878 4755 and grid reference 6725 4689 and grid reference 6732 4665, and inside a straight line draw from grid reference 6570 4591 and grid reference 6590 4560. Refer to map Bouctouche 21-1/7, page NB 6-020/2;

Closed portion of the Little Buctouche River inside a straight line drawn from grid reference 6894 4407 and grid reference 6894 4373. Refer to map Bouctouche 21-1/7, page NB 6-020/2.

NB 6-020:
That portion of the Bouctouche River, Kent County (known as Bois-Joli), inside a line drawn from grid reference 6725 4689 on the north bank of No 11 Highway Bridge to grid reference 6732 4665 on the south bank and a line drawn from grid reference 6570 4591 on the north bank to the grid reference 6590 4560 on the south bank. Refer to map Bouctouche 21-1/7, pages NB 6-020/2 and NB 6-020/3.

NB 6-030:
The waters of Northumberland Strait at Cormierville inside a line drawn from grid reference 7545 4100 to grid reference 7553 4085 to grid reference 7550 4070. Refer to map Buctouche 21-I/7 page NB6-020/4, 030/1;

The waters of La Passe (Surette Island) Northumberland Strait inside a line from grid reference 7585 3933 to grid reference 7610 3925 to grid reference 7623 3808 to grid reference 7595 3780. Refer to map Buctouche 21-I/7 page NB6-020/4, 030/1);
That portion of Cocagne Harbour on the west side of a line drawn from grid reference 7585 3470 to grid reference 7677 3217 on Jim Longs Cape. Refer to map Buctouche 21 I/7 page NB 6-030/3 .

NB 7-010
Shediac Bay at Grand Digue, north of a line drawn from grid reference 8044 2765 to grid reference 8044 2757. Refer to map Shediac Bridge 21 I/P page NB 7-010/1;

All waters of the Shediac River, Gallants Brooks and Batemans Brook inside a line drawn from grid reference 7895 2612 to grid reference 7940 2535. Refer to map Shediac Bridge 21 I/P page NB 7-010/1.

NB 7-020
The closed portion of the Kouchibouguac River Gully at Robichaud inside a line drawn from grid reference 9320 1968 (wharf at Robichaud) to grid reference 9482 1975 and a

line drawn from grid reference 9445 1855 to grid reference 9462 1859 (bridge, route 15). Refer to map Robichaud 21-I/1, page NB 7-020/1;

The closed portion of the gully at l'Aboiteau, Bas Cap-Pelé inside a line drawn from grid reference 9976 2038 to grid reference 9980 2038. The foreshore and waters of Northumberland Straight at Bas Cap Pelé inside a line drawn seaward from grid reference 0128 2075, to grid reference 0122 2089, thence to grid reference 0149 2106, and thence shoreward to grid reference 0152 2091. Refer to map Robichaud 21-I/1, page NB 7-020/2, 030/1.

NB 7-020, NB 7-030

The foreshore and waters of Northumberland Straight in the vicinity of the Bas Cap Pelé wharf inside a line drawn seaward from grid reference 0244 2083 to grid reference 0266 2107, thence to grid reference 0299 2085 and thence shoreward to grid reference 0300 2070. Refer to map Robichaud 21-I/1, page NB 7-020/2, 030/1.

NB 7-030

The foreshore and waters of Northumberland Straight in the vicinity of Trois Ruisseaux inside a line drawn seaward from grid reference 0573 1878 to grid reference 0584 1885, thence to grid reference 0601 1876 and thence shoreward to grid reference 0596 1866. Refer to map Robichaud 21-I/1, page NB 7-020/2, 030/1;

The foreshore and waters of Northumberland Straight in the vicinity of Trois Ruisseaux inside a line drawn seaward from grid reference 0627 1838 to grid reference 0635 1850, thence to grid reference 0656 1838, and thence shoreward to grid reference 0652 1827. Refer to map Robichaud 21-I/1, page NB 7-020/2, 030/1.

NOTE: When the boundary of an area is expressed in grid references, those grid references are based on the Universal Transverse Mercator Grid System set out on the National Topographic Series Map, Scale 1:50,000 published by the Department of Energy, Mines and Resources. (North American Datum 1927)

During harvesting activities, overlay waters from the above areas must have a median faecal coliform count of less than 88 MPN/100 mL, with less than 10% of samples greater than 260 MPN/100 mL for a five tube decimal dilution test.

MANAGEMENT OF CONTAMINATED FISHERIES REGULATIONS

S C H E D U L E I I

AUTHORIZED PARTICIPANTS IN THE HARVESTING ACTIVITIES AS PER THE CONDITIONS OF THE PRESENT LICENSE

_____ _____ (M.H.)* FIN: _____ _____ DFO Officer

_____ _____ FIN: _____ _____ DFO Officer

_____ _____ FIN: _____ _____ DFO Officer

_____ _____ FIN: _____ _____ DFO Officer

_____ _____ FIN: _____ _____ DFO Officer

_____ _____ FIN: _____ _____ DFO Officer

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_____ _____ FIN: _____ _____ DFO Officer

_____ _____ FIN: _____ _____ DFO Officer

_____ _____ FIN: _____ _____ DFO Officer

_____ _____ FIN: _____ _____ DFO Officer

_____ _____ FIN: _____ _____ DFO Officer

*** Master Harvester**

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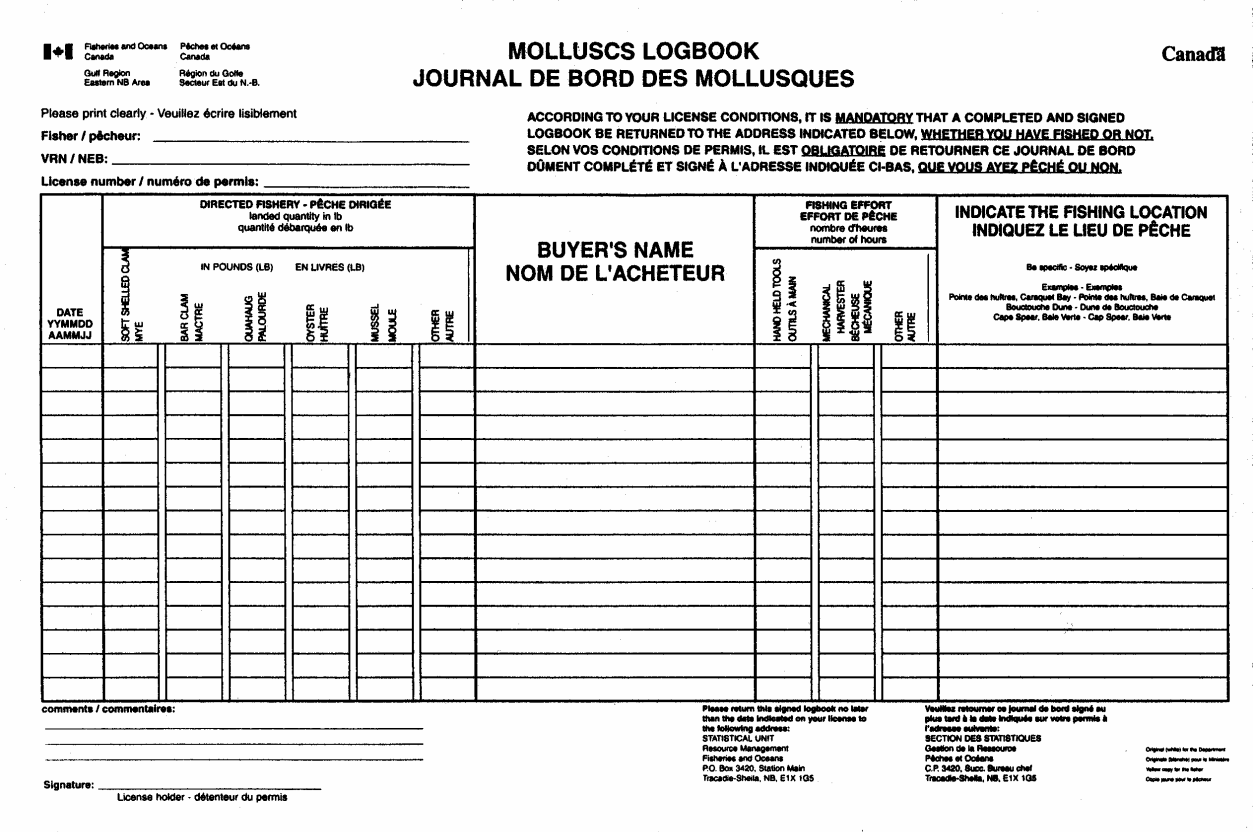
Tel. : 356-2131
Fax : 356-2162

9603 Highway 134
ALDOUANE, NB
E4W 5J2
Tel. : 523-4606
Fax : 523-8274
(*Richibucto)

APPENDIX 4 – LOG BOOK



Fisheries and Oceans Canada / Pêches et Océans Canada
Gulf Region Eastern NB Area / Région du Golfe Secteur Est du N.-B.

MOLLUSCS LOGBOOK
JOURNAL DE BORD DES MOLLUSQUES

Canada

Please print clearly - Veuillez écrire lisiblement

Fisher / pêcheur: _____

VRN / NEB: _____

License number / numéro de permis: _____

ACCORDING TO YOUR LICENSE CONDITIONS, IT IS MANDATORY THAT A COMPLETED AND SIGNED LOGBOOK BE RETURNED TO THE ADDRESS INDICATED BELOW, WHETHER YOU HAVE FISHED OR NOT.
SELON VOS CONDITIONS DE PERMIS, IL EST OBLIGATOIRE DE RETOURNER CE JOURNAL DE BORD DÛMENT COMPLÉTÉ ET SIGNÉ À L'ADRESSE INDIQUÉE CI-BAS, QUE VOUS AYEZ PÊCHÉ OU NON.

DATE YYMMDD AAMMJJ	DIRECTED FISHERY - PÊCHE DIRIGÉE landed quantity in lb / quantité débarquée en lb — IN POUNDS (LB) EN LIVRES (LB): SOFT SHELLED CLAM MYE	BAR CLAM MACTRE	QUAHAUG PALOURDE	OYSTER HUÎTRE	MUSSEL MOULE	OTHER AUTRE	BUYER'S NAME NOM DE L'ACHETEUR	FISHING EFFORT EFFORT DE PÊCHE nombre d'heures number of hours: HAND HELD TOOLS OUTILS À MAIN	MECHANICAL HARVESTER BÊCHEUSE MÉCANIQUE	OTHER AUTRE	INDICATE THE FISHING LOCATION INDIQUEZ LE LIEU DE PÊCHE — Be specific - Soyez spécifique. Examples - Exemples: Pointe des huîtres, Carsquet Bay - Pointe des huîtres, Baie de Carsquet; Boutouche Dune - Dune de Bouctouche; Cape Spear, Bale Verte - Cap Spear, Baie Verte

comments / commentaires:

_____
_____
_____

Signature: _____
License holder - détenteur du permis

Please return this signed logbook no later than the date indicated on your license to the following address:
STATISTICAL UNIT
Resource Management
Fisheries and Oceans
P.O. Box 3420, Station Main
Tracadie-Sheila, NB, E1X 1G5

Veuillez retourner ce journal de bord signé au plus tard à la date indiquée sur votre permis à l'adresse suivante:
SECTION DES STATISTIQUES
Gestion de la Ressource
Pêches et Océans
C.P. 3420, Succ. Bureau chef
Tracadie-Sheila, NB, E1X 1G5

Original (white) for the Department
Originale (blanche) pour le Ministère
Yellow copy for the fisher
Copie jaune pour le pêcheur

APPENDIX 5 - LICENSING POLICY FOR THE COMMERCIAL CLAM FISHERY IN THE EASTERN NEW BRUNSWICK AREA

- No new commercial clam fishing licence may be issued.

- Replacement commercial clam fishing licences may be issued:
  - for transfers from coastal and core fishers to eligible new entrants, and other coastal fishers and core fishers, when licences are replaced);

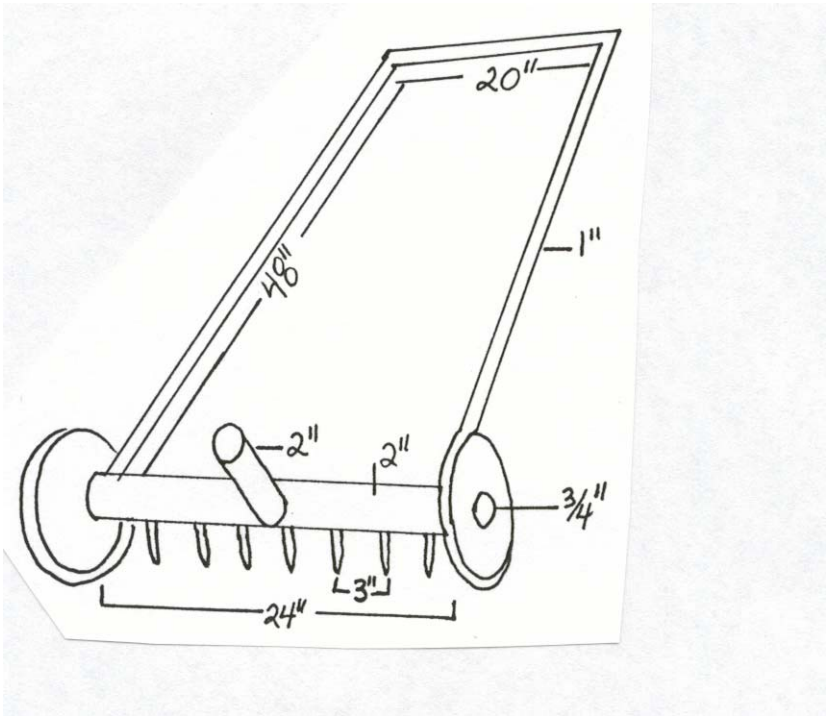
- To qualify as a new entrant and obtain a replacement licence for clam fishing other than a single commercial licence to harvest edible soft-shell clams, it is necessary:
  1- to have fished commercially for at least five weeks in each of the last two years;
  2 - to be registered as a commercial fisher;
  3 - to be recognized as a commercial fisher in his community;

- When a replacement licence is issued, the conditions of the replacement licence are the same as the conditions of the licence replaced.

- A licence holder cannot have a licence validated for waters other than those indicated on the licence.

NB: **Coastal fisher** means a fisher who is not part of a core enterprise and who holds at least one key commercial non-vessel based licence. Key commercial non-vessel based licences for the Eastern New Brunswick Area are clam (soft-shell clam, bar clam, bay quahaug and razor clam), eel, gaspereau, oyster and smelt.

APPENDIX 6 – PROTOTYPE AND SPECIFICATIONS FOR A MECHANICAL HARVESTER



Maximum specifications:

Motor power:	10 HP
Pump capacity:	12 000 gallons per hour
Type of pump:	3 in. x 3 in. Centrifugal
Water feed manifold pressure:	60 PSI
Water feed manifold length:	24 in.
Water feed manifold width:	2 in.
Nozzle clearance:	3 in.
Nozzle size:	½ in x 3 in. (opening can be reduced to ¼ in.)

APPENDIX 7 – REGULATIONS GOVERNING THE COMMERCIAL CLAM FISHERY IN THE EASTERN NEW BRUNSWICK AREA

The following sections are taken from various provincial and federal regulations and are subject to change without notice.

The Department of Fisheries and Oceans assumes no responsibility for the accuracy or reliability of the material reproduced from legislative documents within federal jurisdiction that is appended to this plan. These documents have been prepared for convenience of reference only and have no official sanction. For all purposes of interpreting and applying the law, readers should consult:

(a) the Acts as passed by Parliament, which are published in the "Assented to" Acts version, Part III of the Canada Gazette and the annual Statutes of Canada, and

(b) the regulations, as registered by the Clerk of the Privy Council and published in Part II of the Canada Gazette.

- No person shall fish for or catch and retain any fish unless the following conditions are met: the person is authorized to do so under the authority of a licence issued to that end; the person holds a fisher's registration card; and, where a vessel is used in fishing, a vessel registration card has been issued in respect of that vessel. (Sect. 4(1), *Maritime Provinces Fishery Regulations*)

- Every holder of a licence or fisher's registration card shall carry it at all times when engaged in any activity to which it relates and shall produce it on the demand of a fishery officer or fishery guardian. (Sect. 11, *Fishery (General) Regulations*)

- The operator of a vessel in respect of which a vessel registration card has been issued shall have the vessel registration card and the licence authorizing the use of the vessel on board the vessel whenever the vessel is engaged as a fishing vessel and shall produce them on the demand of a fishery officer or fishery guardian. (Sect. 12, *Fishery (General) Regulations*)

- No person shall operate or cause to be operated a registered vessel on which the vessel registration number is not painted or securely affixed as required. (Sect.. 26, *Fishery (General) Regulations*)

- No person carrying out any activity under the authority of a licence shall contravene or fail to comply with any condition of the licence (Sect. 22 (7), *Fishery (General) Regulations*)

- No person shall, in the [designated] waters during the [designated] close times, fish for bar clams, bay quahaugs, razor clams or soft-shell clams. (Sect. 32, *Maritime Provinces Fishery Regulations*)

- No person who is engaged in recreational fishing for clams by hand or with hand-held tools shall catch and retain more than 300 clams in any day. (Sect. 33, *Maritime Provinces Fishery Regulations*)

- No person shall catch and retain any clam the length of which is less than the minimum length (Sect. 34, *Maritime Provinces Fishery Regulations*)

- No person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat (Sect. 35 (1), *Fisheries Act*)

APPENDIX 8 – SCIENTIFIC AND TECHNICAL PUBLICATIONS

Landry, T., M. Ouellette, N. Brun et P. Cormier. 2000. Étude sur l'abondance, la distribution et la structure de la population d'huîtres du Banc Public de la baie de Caraquet, Nouveau-Brunswick. Rapp. tech. can. sci. halieut. aquat. xxxx :x + x p.

Bourque, D., G. Miron, T. Landry and N. G. MacNair, 1999. Endobenthic predation by the nemertean *Cerebratulus lacteus* in soft-shell clam (*Mya arenaria*) populations in Prince Edward Island. Can. Tech. Rep. Fish. Aquat. Sci. 2288: vii + 19 p.

Bourque, D., G. Miron, T. Landry and N. G. MacNair, 2000. Relationship between the nemertean *Cerebratulus lacteus* and the soft-shell clam, *Mya arenaria* :Predator behaviour and prey selection. Can. Tech. Rep. Fish. Aquat. Sci. xxxx: xx + xx p.

Landry, T., M. Hardy, M. Ouellette, N. G. MacNair and A. Boghen. 1999. Reproductive biology of the northern quahaug, *Mercenaria mercenaria*, in Prince Edward Island. Can. Tech. Rep. Fish. Aquat. Sci. 2287 : v +18p.

Landry, T., M. Hardy, M. Ouellette, N. G. MacNair and A. Boghen. 2000. Monitoring the life cycle of the northern quahaug, *Mercenaria mercenaria*, in Prince Edward Island. Can. Tech. Rep. Fish. Aquat. Sci. xxxx : xxp.

APPENDIX 9 - MANAGEMENT PLAN EVALUATION CRITERIA

The management plan evaluation criteria are:

1. to maintain the level of harvesting
2. to provide all users with fair access to the resource
3. to obtain actual data on commercial fishery landings
4. to satisfy our clientele
5. feedback from the industry
6. promptness in decision-making
7. communication with the industry
8. intergovernmental relations
9. level of acceptance and compliance with management plan

APPENDIX 10 - CONSERVATION AND PROTECTION PLAN EVALUATION CRITERIA

The conservation and protection plan evaluation criteria quantify the activities of fishery officers in the following areas:

1. number of vessel inspections at wharf/landing site
2. number of boardings of vessels at sea
3. number of inspections of fishing gear at sea
4. number of fishing gear inspections at wharf/landing site
5. number of patrols – areas closed to fishing
6. number of monitorings at dockside or on shore
7. number of offences
8. number of warnings
9. number of investigations
10. number of surveillance activities
11. number of patrols by vessel/number of hours at sea
12. number of joint patrols
13. number of hours of intervention by fishery officers
14. cost in wages, overtime, operations and maintenance

APPENDIX 11 – NOTICE TO FISHERS

THE 2001-2006 CLAM FISHERY MANAGEMENT PLAN FOR THE EASTERN NEW BRUNSWICK AREA

TRACADIE-SHEILA – The Department of Fisheries and Oceans announces the publication of an integrated management plan for the clam fishery in the Eastern New Brunswick Area. This is a five-year plan for the harvesting of soft-shell clams, bar clams, bay quahaugs and razor clams in the coastal and inland waters of New Brunswick from 2001 to 2006 inclusive. The plan is to be implemented in conjunction with the yearly clam fishery update, in which various management measures, such as harvesting areas, fishing seasons, daily catch limits and so on, may be adjusted on the basis of conservation standards.

The plan is designed to promote an ecosystemic approach as intended by the *Ocean Act*. It compiles the current management problems. As of 2001, a log book is now mandatory in the clam fishery and will allow for better management of the fishery while better statistical data are gathered.

In the Eastern New Brunswick Area, there are 1 094 fishers who hold commercial clam licences, including 631 for soft-shell clams, 352 for bar clams and 111 for bay quahaugs, and use hand-held tools for harvesting. In 1998, according to reported statistics, these fishers landed nearly 989 metric tons of soft-shell clams, 137 tons of bar clams and 45tons of bay quahaugs, with a landed value of approximately 2 million dollars. .

A Clam Fishery Advisory Committee for the Eastern New Brunswick Area has been established. Its members include clam fishers, their representatives and representatives of other groups. The integrated management plan that is being published today is the outcome of meetings of the Committee devoted to the conservation and long-term viability of this fishery resource.

- 30 -

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(1) *Canadian Shellfish Program Manual of Operations*, DFO and Environment Canada.

(2) Stock status reports 96/100E, 96/101E and 96/102E, DFO Atlantic Fisheries

(3) Le Monde Sous-Marin, Mollusques et crustacés de l'Atlantique

(4) Le Monde Sous-Marin, La Mye

Senpaq Consultants, Survey of Soft-Shell Clam (*Mya arenaria*) Population along the coasts of Heron Island, NB, 1996

Canplan Consultants Limited, A survey of contaminated soft-shelled clam beds in Kent County, NB, 1975

T. Landry et M. Ouellette, Suivi de la pêche au râteau hydraulique sur des stocks de myes dans la baie de Miramichi, Nouveau-Brunswick – 1992, Rapport technique canadien des sciences halieutiques et aquatiques 1921.

Thomas W. Sephton and Clair F. Bryan, A summary of commercial catch rate data for the 1986 Prince Edward Island Bar Clam (*Spisula solidissima*) Fishery, Canadian Atlantic Fisheries Scientific Advisory Committee, CAFSAC Research Document 87/32

Thomas W. Sephton and Clair F. Bryan, A preliminary assessment of the American Bar/Surf clam, *Spisula solidissima*, in Prince Edward Island, 1984, Canadian Atlantic Fisheries Scientific Advisory Committee, CAFSAC Research Document 85/33

ABP Consultants Limited, Report on the preliminary feasibility study for clam depuration plant in Kent County, New Brunswick, 1980

SenPaq consultants, Suivi scientifique de la pêche exploratoire à la palourde dans la région sud du Golfe Saint-Laurent, 1991

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