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Capelin Observers Network

Observer Kit – 2010



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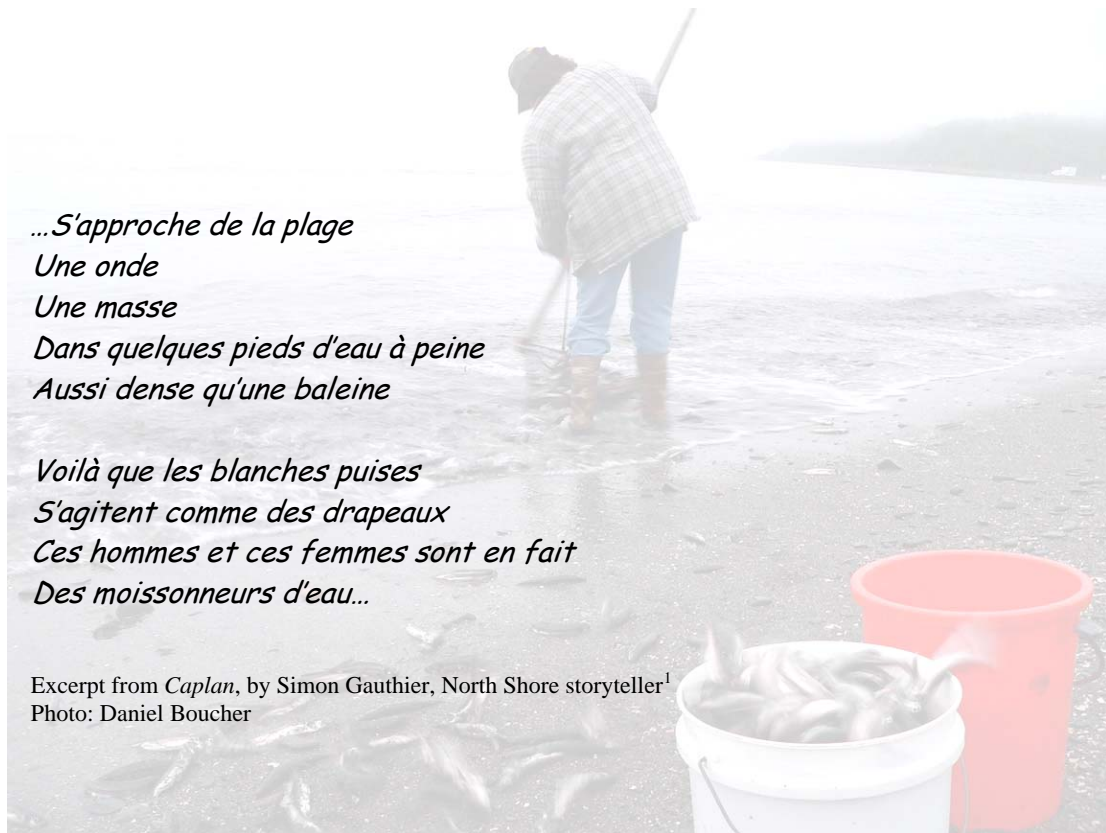
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*...S'approche de la plage
Une onde
Une masse
Dans quelques pieds d'eau à peine
Aussi dense qu'une baleine*

*Voilà que les blanches puises
S'agitent comme des drapeaux
Ces hommes et ces femmes sont en fait
Des moissonneurs d'eau...*

Excerpt from *Caplan*, by Simon Gauthier, North Shore storyteller¹
Photo: Daniel Boucher

Dear Observer,

Where and when will the capelin roll in 2010? Again this year, the Capelin Observers Network (CON) is looking for volunteers to assist in collecting the data that will enable us to establish as accurate a picture as possible of the distribution of capelin spawning grounds along our shores and to monitor changes in capelin spawning habits.

Each of your 2009 observations was invaluable to us and was compiled in the annual report that follows. The current 2010 kit also includes a reminder of the important factors to consider when making your observations as well as maps for indicating the locations of your observations. Please feel free to provide any suggestions you may have for improving this data collection system.

We wish you a good 2010 observation season and thank you for your interest in the Network.

¹ Excerpted from: Une histoire de pêche... La pêche au capelan sur la Côte-Nord, de 1831 à nos jours, racontée par les aînés de la Côte-Nord [collection of stories from North Shore elders]. Gulf North Shore ZIP Committee, 2008.

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Capelin Observers Network (CON)

The Capelin Observers Network was established to promote a better understanding of capelin spawning grounds and spawning habits in the Quebec portion of the Estuary and Gulf of St. Lawrence.

Efforts to monitor capelin spawning began in 2002 on the North Shore. In 2003, Fisheries and Oceans Canada (DFO) and various partners, such as the ZIP (areas of prime concern) committees and coastal committees, developed a network of contacts to collect data on capelin spawning.

Since the establishment of the Network, the number of observers and observations has increased steadily, which has helped clarify the overall picture of the distribution of capelin coastal spawning areas. During the 2009 season, 123 observers reported 351 observations, which represents a 78% increase in the number of observers and a 77% increase in the number of observations over 2008.

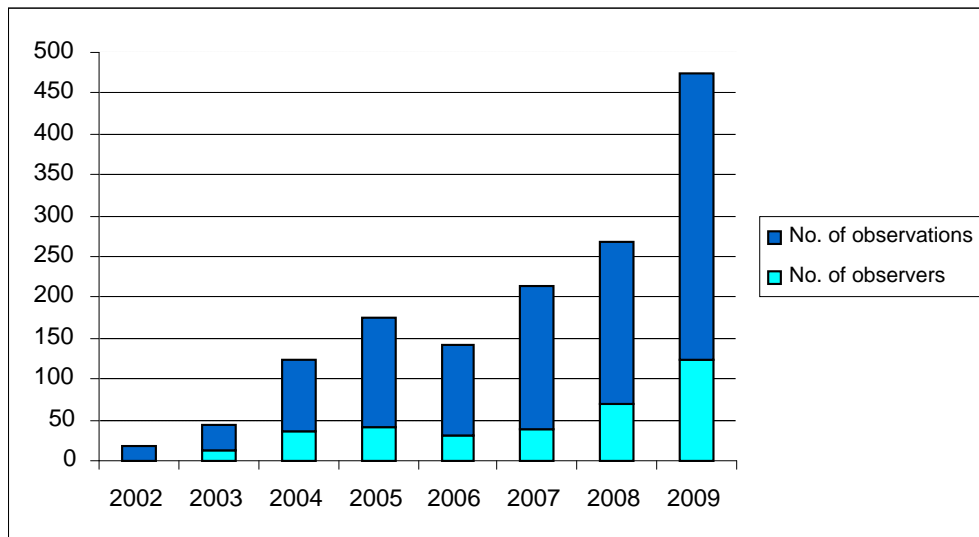
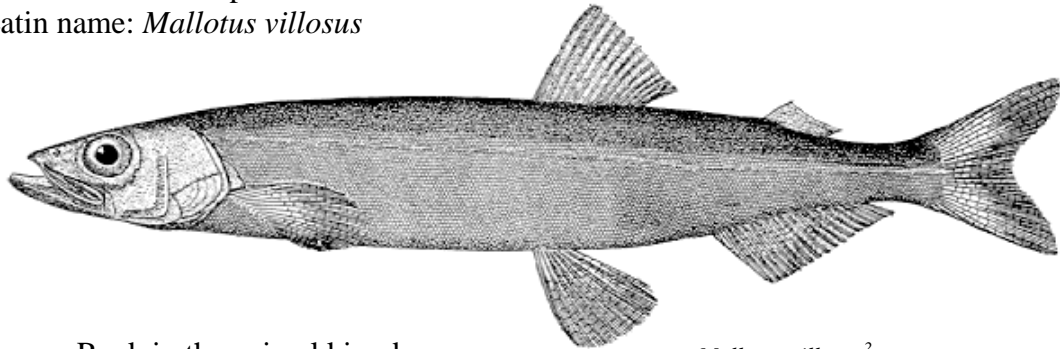


Figure 1: Changes in the number of observers and observations records over time

This growing body of knowledge on the location of capelin spawning grounds and habits will improve our understanding of this important link in the St. Lawrence ecosystem. This information will also help better protect spawning grounds, particularly during the breeding and incubation period, as well as facilitating the formulation of recommendations aimed at mitigating the impacts on habitat when work is carried out near spawning grounds. In addition, the data gathered by the Observer Network may help improve our understanding of the impacts of human activities and climate change, such as shoreline erosion or beach modifications, on the capelin's life cycle.

Species description

Common name: Capelin
Latin name: *Mallotus villosus*



Rank in the animal kingdom:

*Mallotus villosus*²

Phylum: Chordata
Subphylum: Vertebrata
Superclass: Osteichthyes
Class: Actinopterygii
Subclass: Neopterygii
Infraclass: Teleostei
Superorder: Protacanthopterygii
Order: Osmeriformes
Suborder: Osmeroidei
Superfamily: Osmeroidea
Family: Osmeridae
Genus: Mallotus
Species: Villosus

Capelin is a small pelagic fish in the same family as rainbow smelt. It averages 13 to 20 cm in length, but can reach up to 30 cm in some locations. Capelin has a villous band on the lateral line, which separates its olive green back from its silvery sides.

During the spawning period, the female's abdomen is swollen with eggs and the male's pectoral (front) and anal (back) fins lengthen and project out from the body.



M
Male (at top) and female (at bottom) capelin

Photo: Brian Nakashima

² Source: Evermann, B.W., and E.L. Goldsborough. *The Fishes of Alaska*, 1907.

Spawning

As the spawning season approaches, capelin begin an intensive migration to the coast to spawn on beaches or on the seabed, at depths of 30 to 280 m on the Grand Banks of Newfoundland. In Quebec, demersal (seabed) spawning sites are not inventoried. However, in the summer of 2009, a team of divers was able to observe and film capelin spawning at a depth of 9 m near Anse-Pleureuse in the Gaspé Peninsula.³

When capelin spawn on beaches, this is called “rolling” or “landing.” In the estuary and Gulf of St. Lawrence, the capelin “roll” on the shores between the mid-April and July, depending on the area. The males reach the beaches first and await the females. Serge Parent and Pierre Brunel⁴ describe the spawning process as follows:

“[Translation] The spawners are carried by the waves onto the beach all in a jumble; once landed, the males seek out the females. Two males, sometimes one, grasp a partner and corner her between their paired fins and spawning ridges; the trios and couples thus formed advance by wriggling as high as they can and then sweep the ground with rapid tail movements and deposit the eggs and milt; when the wave rolls back in, the spawners separate and head back offshore.



Photo: Louise Proulx

The mating is so brief – lasting not more ten seconds – that each spawner must roll more than once during a season to discharge all their spawn. Furthermore, the chances of survival of each fish are slim: Winters⁵ estimates that only 10 % of males and 30 % of females live to see a second spawning season.”

After spawning, it is not unusual to see large quantities of dead capelin on the beach or in the water. Reddish-coloured egg masses may also be seen, attached to the sand or gravel with a sticky substance. The incubation period, which depends on the ambient temperature, lasts on average 15 days. After hatching, the larvae will feed on animal plankton, comprised on tiny crustaceans (copepods, scuds and krill) and will grow to 2 to 4 cm long before their first winter.

³ The video, produced by Les Productions un Monde à Part Inc., can be viewed on the website of the Réseau des observateurs sous-marins:
http://www.rosm.ca/recherche_espece/fiche_espece.php?recordID=168

⁴ Parent, Serge, and Pierre Brunel. 1976. Aires et périodes de fraye du Capelan (*Mallotus villosus*) dans l'estuaire et golfe du Saint-Laurent.

⁵ Winters, G.H. 1970a. Otolith spawning zones as indicators of post-spawning survival of capelin.

Distribution

Capelin is a small cold-water fish of the Northern Hemisphere. It is found in the Atlantic, Pacific and Arctic oceans, from northern Europe to northern Japan, including Russia. In Canada, it occurs on both the west and east coasts. In the Northwest Atlantic, it is found along the shores of Newfoundland and Labrador, on the Grand Banks and in the Estuary and Gulf of St. Lawrence.

Interestingly, the range of capelin can vary locally from year to year depending on the ocean temperature. Indeed, it is considered an indicator species for temperature. During years when the water is colder, its range extends a little further south, sometimes as far as the Gulf of Maine.

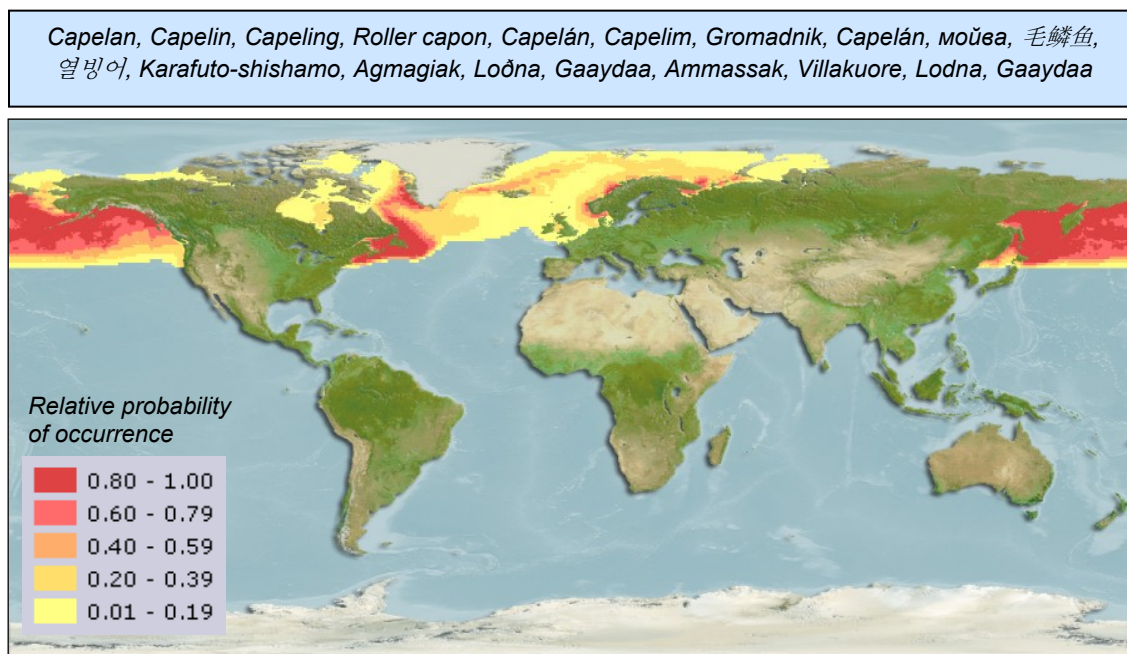


Figure 2: Global distribution of capelin⁶

A recent study⁷ revealed considerable genetic diversity in capelin. The DNA (mitochondrial) analysis of capelin from the three oceans revealed the existence of four distinct major groups, distributed as follows:

- Northwest Atlantic, including Hudson Bay
- From west Greenland to the Barents Sea (northern Norway and Russia)
- Arctic Ocean
- Northeast Pacific.

⁶ Source: Froese, R., and D. Pauly (Eds). 2009. FishBase. World Wide Web electronic publication. www.fishbase.org, Version 10/2009.

⁷ Dodson, J.J., S. Tremblay, F. Colombani, J.E. Carscadden and F. Lecompte. 2007. Trans-Arctic dispersals and the evolution of a circumpolar marine fish species complex, the capelin (*Mallotus villosus*). *Molecular Ecology* 16: 5030–5043.

Ecological significance

Capelin is a key species in the northern Gulf of St. Lawrence ecosystem, since it is the main forage species.⁸ Capelin is the essential prey of cod, but it is also part of the diet of many marine species: halibut, flounder, salmon, whales, belugas, dolphins, porpoises, seals, northern gannets and other seabirds consume large quantities of capelin. When millions of capelin come to spawn on beaches, many predators come to feed on this bountiful food source.



Photo: Louise Proulx

Capelin eggs also constitute an important food for certain fish species, including winter flounder. It is estimated that capelin eggs comprise a large proportion of their diet, particularly for small flounder (14 to 34 cm long), for which capelin eggs represent more than half (59 %) of the weight of food consumed.⁹



Capelin eggs. Photo: Danielle Dorion

Despite its ecological significance, little research has been conducted on Gulf of St. Lawrence capelin. Many important questions regarding abundance estimates, the distribution of the various populations, and the location and quality of coastal and demersal (seabed) spawning grounds remain unanswered.

⁸ Forage species: food for other species.

⁹ Frank, K.T. and W.C. Leggett. 1984. Selective Exploitation of Capelin (*Mallotus villosus*) Eggs by Winter Flounder (*Pseudopleuronectes americanus*): Capelin Egg Mortality Rates, and Contribution of Egg Energy to the Annual Growth of Flounder. *Can. J. Fish. Aquat. Sci.* 41(9): 1294–1302.

Capelin fishery

Traditionally, capelin was fished as cod bait. Since it was an abundant and easily accessible resource, it was often used as a fertilizer for crops. However, this small fish is also fished for human consumption, and is eaten salted and dried or fresh when in season. It has even saved populations from starvation, particularly during the early settlement of the Quebec North Shore.

Today, capelin is still a popular local delicacy, particularly on the North Shore, where a capelin festival is organized during the spawning season. Capelin fishing is a unique traditional activity accessible to everyone. The fish are caught with a dip net or simply with the hands when abundant. Recreational capelin fishing in Quebec is not considered a threat to the species since the quantities harvested are small relative to its abundance.



Photo: Claude Tremblay

In the Gulf of St. Lawrence, commercial capelin fishing takes place primarily along the Newfoundland coast. The main types of fishing gear used are purse seines, traps and weirs. The most lucrative products from this fishery are the mature females, which are sold to the Japanese market along with eggs to accompany sushi. The rest goes to making fishmeal, which is used as feed for farmed fish, and therapeutic oils. Capelin contains two high-quality fatty acids, omega 3 and oleic acid.

In Quebec, the commercial capelin fishery is carried out on the Lower North Shore and to a lesser extent in the St. Lawrence estuary.

Capelin spawning habits

After eight years in existence, the Capelin Observers Network has collected 654 observations of spawning activities and 154 signs of the presence of capelin. The information collected, such as the date and time of the observation, tidal conditions and the type of spawning ground, although not completed for all records compiled, nevertheless enable us to identify certain trends which can help answer some of the following questions: Do capelin spawn more often at night? Do they take advantage of high tide? What type of substrate do they prefer?

Period of the day

As described in the literature, capelins appear to spawn more often in darkness, at least when spawning activity takes place along the shore. In fact, spawning was observed five times more often between 6:00 pm and 6:00 am than during the rest of the day.

Table 1: Percentage of capelin spawning observations by period of the day

Period of the day	Percentage and number of observations
6:00 am to 5:59 pm	16.2 % (70)
6:00 pm to 5:59 am	83.7 % (361)

Number of spawning observations from 2002 to 2009 with information on the time = 431

Tide

Based on spawning observation records for which tidal information is available, we can state that 8 % more observations were made during rising tide than during falling tide, which is a relatively modest trend.

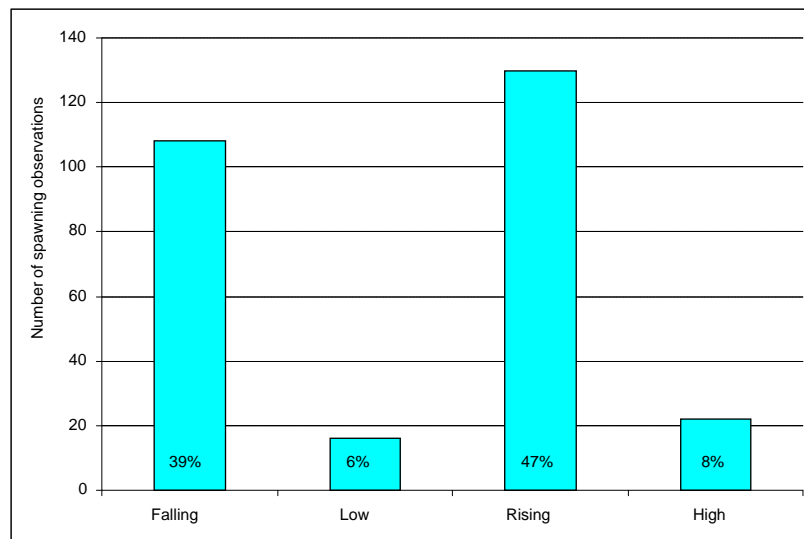


Figure 3: Number of capelin spawning observations by tidal cycle

Number of spawning observations between 2002 and 2009 with tidal information = 276

Type of spawning ground

The vast majority of spawning observations were made on sandy beaches. However, the data collected do not specify the size of the substrate on gravel spawning grounds, which accounted for almost one observation in ten.

Table 2: Percentage of capelin spawning observations by type of substrate

Substrate	Percentage and number of observations
Sand	89.8% (396)
Gravel	9.8% (43)
Pebbles	0.2% (1)
Bedrock	0.2% (1)

Number of spawning observations between 2002 and 2009 with information on substrate = 441



Photo: Louise Proulx

Were there more capelin in 2009?

It is difficult to answer this question since there is no annual monitoring of capelin abundance! However, the following indicators suggest that this may be the case.

According to the Network's database, the majority of observers estimated that the abundance of capelin was high between 2007 and 2009, while they considered it low in 2006.

Table 3: Compilation of estimates of the abundance of spawning capelin

Year	High	Moderate	Low
2006	25	0	75
2007	66	17	17
2008	62	23	15
2009	49	29	22

Capelin abundance in 2009 was also observed by a number of ornithologists in the Gaspé Peninsula and Lower St. Lawrence: "*Capelin appear to be extremely abundant this year. At least in the estuary, where various sources report that the seagulls are not attacking the egg clutches of eider ducks since food is so abundant... And, finally, the proportion of capelin was higher than usual in northern gannet regurgitations analyzed on Bonaventure Island...*"¹⁰

Not everyone was happy to see the capelin arrive in such large numbers, especially lobster fishers: "*With the decline in cod stocks, capelin have no predators. They arrived along our shores on May 16 and are still here. This is unprecedented. Each time the capelin come inshore, we immediately see a negative impact on our catches,*" said Mr. Cloutier, pointing out that lobster eat capelin and therefore show little interest in the fishermen's traps.¹¹

This year, we received many reports of large numbers of dead capelin on the beach or adrift, which was even cause for concern for some observers. Since there was no significant proliferation of toxic phytoplankton¹² in 2009, this significant mortality could be related to a high abundance of capelin, the majority of which apparently died naturally after spawning.

Capelin egg and larvae survival after the spawning season appears to have been good in the Upper Estuary area. During the annual monitoring of rainbow smelt,¹³ biologists from the Quebec Department of Natural Resources and Wildlife (MRNF) collect, identify and count all the fish larvae in their samples. In 2009, they found more than 6,000 capelin larvae per 1,000 m³ of water near Rivière-du-Loup and nearly 4,000 larvae per 1,000 m³ of water at Anse-Saint-Anne. These figures represent by far the highest quantity of capelin larvae recorded since monitoring began in 2002.

¹⁰ Personal communication: Jean-François Rail, Canadian Wildlife Service, July 2009.

¹¹ Gilles Gagné, Homardiens de la Gaspésie: pire saison depuis 1990. *Le Soleil*, July 4, 2009.

¹² Phytoplankton: microscopic algae.

¹³ Personal communication from Guy Verreault (MRNF) to Pierre Nellis (DFO), January 2010.

Observations for the 2009 season by area

In 2009, 351 observations were reported by observers, including 243 spawning observations, 108 signs of the presence of capelin and 2 of the absence of capelin. These observations were made in 61 different sectors and on 84 beaches or beach sections. Ten new sites were inventoried this year. The following is a compilation of these observations in table form, accompanied by maps. This year, for the first time, the results tables distinguish spawning observations from observations of signs of presence of capelin (e.g. presence of diving birds or dead capelin on the beach) using a (‡) symbol next to the date.

For practical reasons, the Estuary and Gulf of St. Lawrence were divided into seven observation areas, the boundaries of which are described below.



Figure 4: Capelin Observers Network observation areas

Upper Estuary

This area covers both shores of the estuary of the St. Lawrence River, from Saint-Joachim to Baie-Sainte-Catherine on the north shore and from Montmagny to Cacouna on the south shore.

Observations - In 2009, five observers reported 47 observations for this area, including 25 spawning observations. From mid-April to mid-May, fishers from Saint-Irénée were the first to observe the presence of capelin. Thereafter, spawning observations extended from May 17 to June 18.

Table 4: Dates of observations of capelin spawning or presence between 2003 and 2009 in the Upper Estuary

Location	2003 to 2007	2008	2009
Saint-Irénée	April, May 2003 May, June 2004, 2006 May, June, July 2005	May 13 to June 18	April 13 [‡] and 14 [‡] , 20 [‡] to 24 [‡] , May 2 [‡] , 10 [‡] to 14 [‡] , 17 to 20, 27 to 30 June 11 to 18, 27 [‡]
La Malbaie (Port-au-Saumon /Anse aux Indiens)	June 2005	---	June 2009
Île-aux-Coudres	June 4 to 6	April to early June	---
Kamouraska	June 2003	---	---
Rivière-du-Loup	---	---	June 17 [‡] to 19 [‡]

Names in parentheses represent sectors of municipalities.

Names in italics designate new observation sites.

‡ Date of observation of the presence of capelin, with no report of spawning.

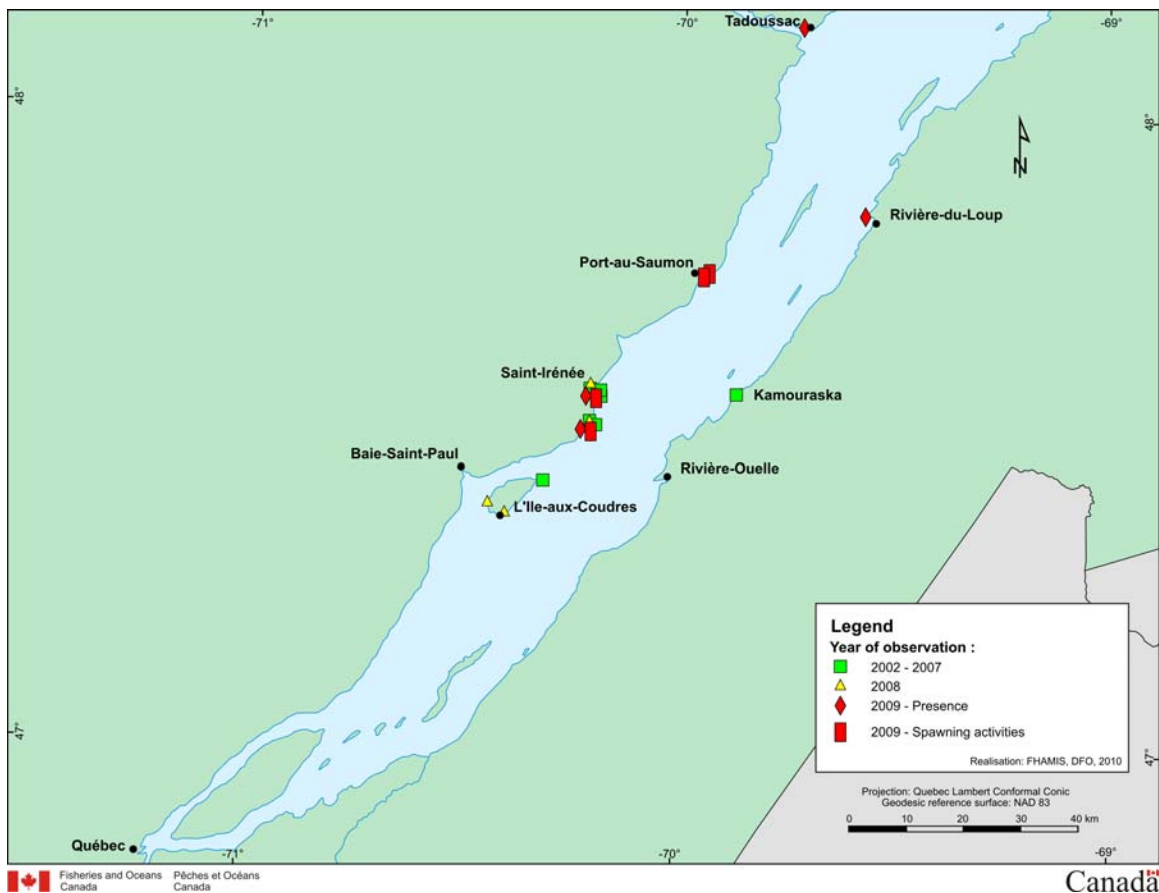


Figure 5: Locations of observations of capelin spawning or presence in the Upper Estuary between 2003 and 2009

Since the establishment of the Network, capelin spawning in the Upper Estuary has been observed primarily in May and June, with the peak in May.

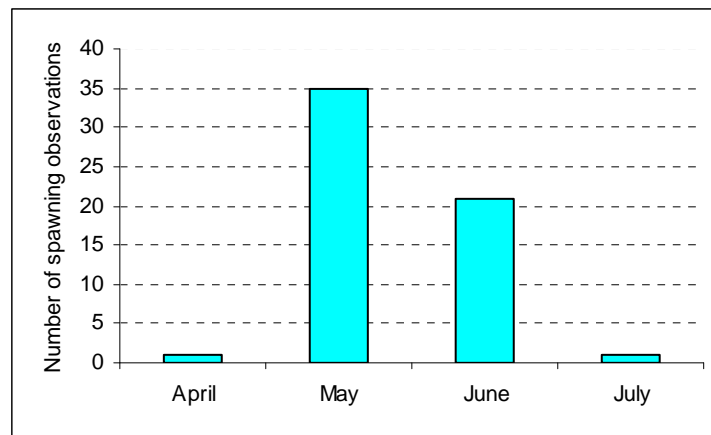


Figure 6: Period of observation of capelin spawning in the Upper Estuary between 2003 and 2009

Number of spawning observations between 2003 and 2009 = 58

Lower Estuary

This area encompasses both shores of the estuary of the St. Lawrence River, from Tadoussac to Baie-Trinité (Pointe-des-Monts sector) on the north shore and from Isle-Verte to Les Méchins on the south shore.

Observations - In 2009, 44 observers reported 81 observations for this area, including 45 spawning observations. The spawning observations extend from April 30 to July 7. On June 3 in Sainte-Luce, approximately 1,000 kg of capelin were caught in a fisher's weir. The 36 observations of the presence of capelin were made between May 25 and July 8, and consisted primarily of reports of dead capelin on the beach, often in large quantities, particularly during the second half of June.

This year, observations of capelin spawning or presence were made at seven new sites in this area.

Table 5: Dates of observations of capelin spawning or presence between 2003 and 2009 in the Lower Estuary

Location	2003 to 2007	2008	2009
NORTH SHORE			
Tadoussac	---	---	June 4, 5 and 10
Les Escoumins	April 2003	---	---
<i>Portneuf-sur-Mer</i>	May 2003, 2007 May, June 2004, 2005, 2006	week of May 5, May 22	May 27 to 31 June 5
<i>Forestville</i>	---	---	June 9
Colombier	May 2005, 2007 June 2005,	May 25	May 17
<i>Baie-Comeau</i>	---	---	June 7 [‡] July 6 [‡]
<i>Godbout</i>	---	---	June 6 July 7
SOUTH SHORE			
Saint-Simon (Saint-Simon-sur-Mer)	June 2003	---	May 23 and 26
Saint-Fabien (Saint-Fabien-sur-Mer)	May, 2006 June 2003, 2004, 2005	June 6 to 23	May 24 June 11, 12 [‡] , 14 [‡] , 16 [‡] and 28 July 1
<i>Rimouski (Cap-à-l'Orignal)</i>	---	---	June 19 [‡]
Rimouski (Rivière Hatée)	June 2007	---	June 23 [‡]
Rimouski (Rimouski)	---	June 9	July 5 [‡]
Rimouski (Pointe-au-Père)	---	May 19 and 20, June 2, 9 and 21	June 28 [‡] , July 6 [‡] and 7 [‡]
Sainte-Luce	June 2003	June 8 and 9	April 30 May 25 [‡] , 26 and 27, 30 June 1 [‡] , 3, 9 to 11, 16, 22 [‡] and 23 [‡] July 4 [‡] and 6 [‡]
Sainte-Flavie	---	June 18	May 25, June 2 [‡] , 11, 22 and 23 July 5 [‡] and 7 [‡]
Métis-sur-Mer	---	June 18	June 23 [‡] , July 7 [‡] and 8 [‡]
Matane	---	July 2	May 27, June, July 5 [‡]
<i>Matane (Petit-Matane)</i>	---	---	June 24 [‡]
Grosses-Roches	---	---	May, June 24 to 26
Les Méchins	June 2004, 2006	---	June

Names in parentheses represent sectors of municipalities.

Names in italics designate new observation sites.

‡ Date of observation of the presence of capelin, with no report of spawning.

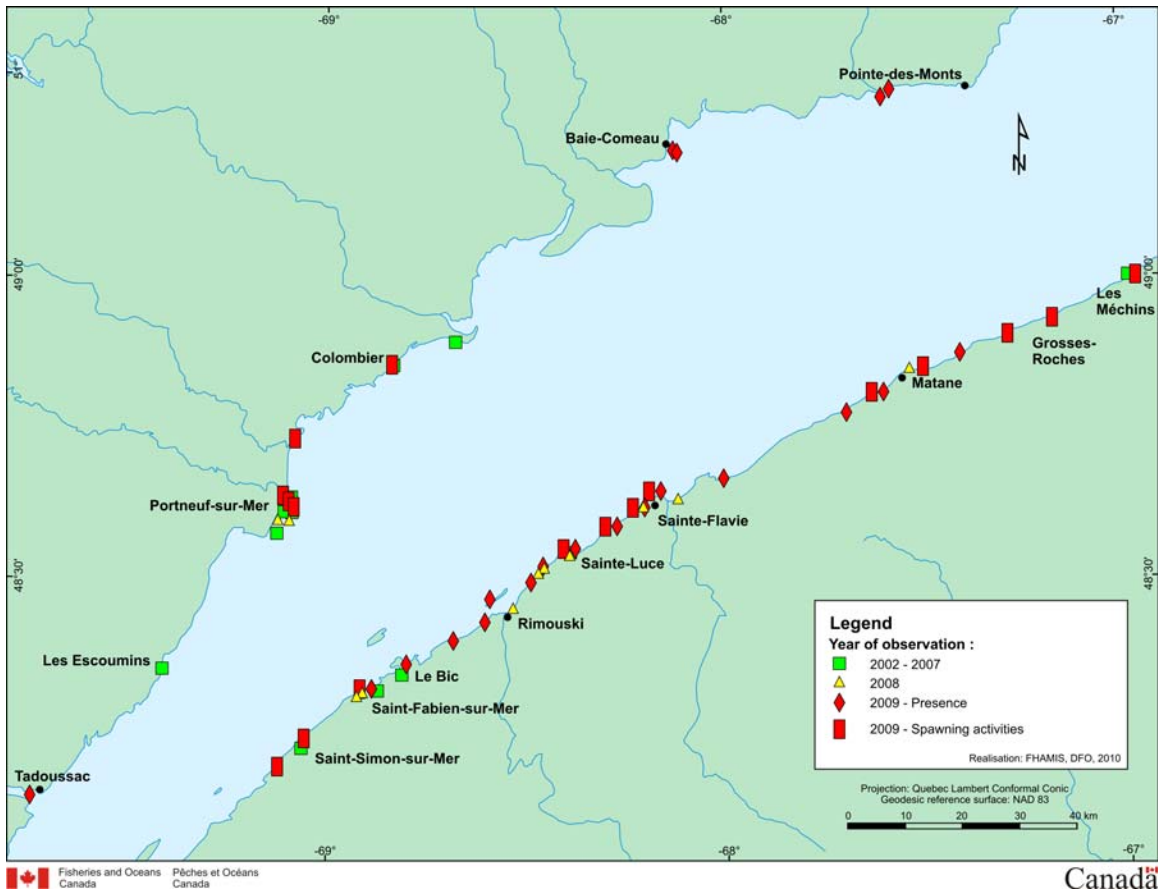


Figure 7: Location of observations of capelin spawning or presence in the Lower Estuary between 2003 and 2009

Since the establishment of the Network, capelin spawning in the Lower Estuary has been observed primarily in May and June, with the peak in June.

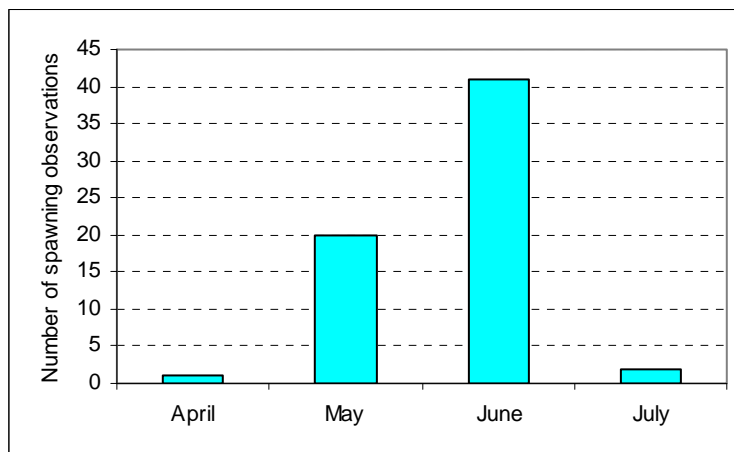


Figure 8: Period of observation of capelin spawning in the Lower Estuary between 2003 and 2009

Number of spawning observations between 2003 and 2009 = 64

Gulf / Middle North Shore

The Middle North Shore stretches from Baie-Trinité (Pointe-des-Monts) eastward to Natashquan (Pointe-Parent), and includes Anticosti Island.

Observations - In 2009, 35 observers reported 108 observations for this area, including 87 spawning reports. The spawning observations were reported between May 12 and July 15. The observations of the presence of capelin were made between May 15 and July 8. This year, there were eight reported sightings of minke whales between May 22 and June 21. An unusual occurrence for this period of the year, a capelin was caught in September in eelgrass, during sampling carried out by the *Réseau Zostère*.

Table 6: Dates of observations of capelin spawning or presence between 2002 and 2009 on the Middle North Shore

Location	2002 to 2007	2008	2009
Baie-Trinité (Îlets-Caribou)	May 2005, 2006 June 2006	---	---
Port-Cartier (Pointe-aux- Anglais)	May 2002, 2004, 2005, 2006, 2007 June 2006, 2007	May 12	May 13 June 3 and 6
Port-Cartier (Rivière-Pentecôte)	May 2004, 2005	May 16 and 17, 28 and 29 June 6, 29	July 8 [‡]
Sept-Îles (Gallix)	May, June 2003, 2005, 2006, 2007 June, July 2004	May 10 to 27 June 5, 13	May 15 [‡] , 17, 19 to 22, 24 to 29, 31 June 2, 3, 5 to 7, 9 and 10, 12 and 13, 16 [‡] , 18 and 19, 21 to 22, 23 [‡]
Sept-Îles (Sept-Îles)	April, May, June 2002, 2007 May, June 2004, 2005 May 2006	May 21 to 30 June 1, 4, 7	May 26 June 1, 5 and 6, 8 July 5 [‡] September 10 [‡]
Sept-Îles (Moisie)	May 2007	May 17	July 6 [‡]
Sept-Îles (Matamec)	---	July 1	June 8
Uashat mak Mani- Utenam (Uashat)	May 2006,	May 27 June 1, 4	May 21 to 23, 27 June 4, 10 and 11
Rivière-au- Tonnerre (Sheldrake)	May 2005	July 10, 16	---
Rivière-au- Tonnerre (Rivière-au- Tonnerre)	May 2005, 2006 June 2004, 2007	May 18 to 27 July 6	May 29 June 1, 4 to 6, 11 to 15, 18
Saint-Jean River (Magpie)	May 2006, 2007 June 2004, 2005, 2006, 2007 July 2006	May 23 to 30 June 3 and 4, 11 and 12	May 24 to 29, 30, [‡] 31 June 12 and 13
Rivière-Saint-Jean (Rivière-Saint- Jean)	---	July 16	---
Longue-Pointe-de- Mingan (Longue-Pointe-de- Mingan)	May 2005, 2006, 2007 June 2002, 2004, 2005 July 2006	May 21 June 5 July 19	May 12 June 8 [‡]

Location	2002 to 2007	2008	2009
Longue-Pointe-de-Mingan (Mingan)	mid-May to mid-June 2006, 2007 June 2002	---	June 4 [‡] to 6 [‡]
Havre-St-Pierre	May 2007 June 2002, 2004 May, June 2005	mid-May to late May	June 13
Aguanish	May 2003 June 2002 May, June 2004, 2005, 2006, 2007	May 24 and 25 June 11 to 25 July 17	June 9, 12, 17
Natashquan	June 2007 June and July 2006	---	---
Anticosti Island	June, July 2004, July 2005 June 2006 2007	June 14	June 26, 29 [‡] July 1 [‡] , 14 and 15

Names in parentheses represent sectors of municipalities.

Names in italics designate new observation sites.

‡ Date of observation of the presence of capelin, with no report of spawning.

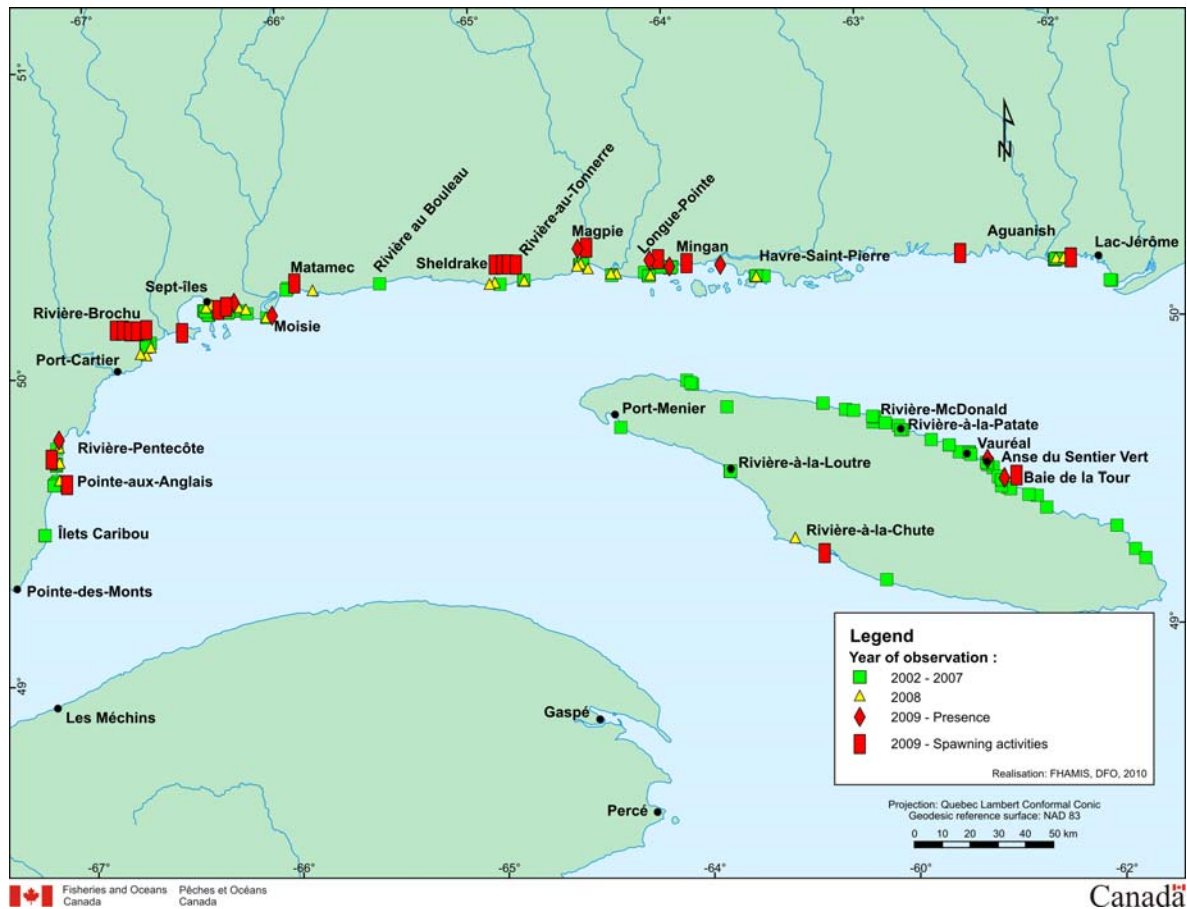


Figure 9: Location of observations of spawning and the presence of capelin on the Middle North Shore between 2002 and 2009

Since 2002, capelin spawning on the Middle North Shore has been observed primarily in May and June, and in some years until mid-July.

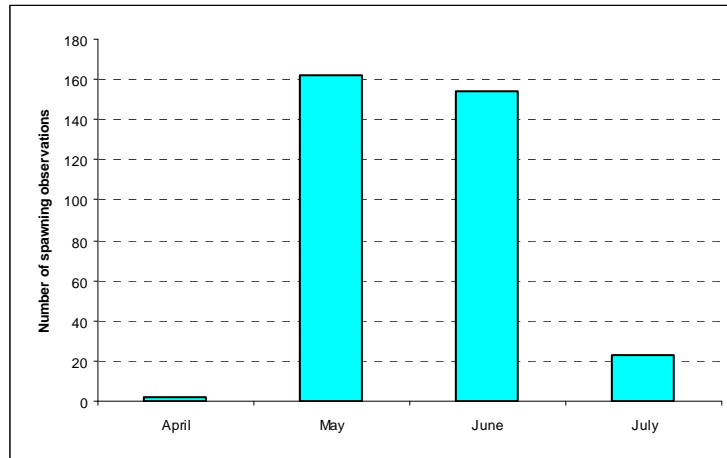


Figure 10: Period of observation of capelin spawning on the Middle North Shore between 2002 and 2009

Number of spawning observations between 2002 and 2009 = 341

Gulf / Lower North Shore

The Lower North Shore stretches from Natashquan (Pointe du Vieux Poste sector) eastward to the Labrador border.

Observations - In 2009, 5 observers reported 9 observations for this area, including 7 spawning reports. The presence of capelin was observed on June 20 and 22 by fishers who caught capelin in their traps. The spawning observations were made between June 23 and July 9.

Table 7: Dates of observations of capelin spawning or presence between 2002 and 2009 on the Lower North Shore

Location	2002 to 2007	2008	2009
Côte-Nord-du-Golfe-du-Saint-Laurent (Kégaska)	---	May 27	---
Côte-Nord-du-Golfe-du-Saint-Laurent (Chevery)	June 2004, 2005 July 2006	June 20	June 20 [‡]
Bonne-Espérance (Vieux-Fort)	June 2002	---	June 29
Blanc-Sablon (Lourdes-de-Blanc-Sablon)	June 2002, 2006, 2007 June, July 2004	June 29	June 23 July 6, 8, 9
Blanc-Sablon (Blanc-Sablon)	June 2006, 2007		June 22 [‡] , 24 June 7, 9
Forteau, Labrador	---	July 1	---

Names in parentheses represent sectors of municipalities.

Names in italics designate new observation sites.

[‡] Date of observation of the presence of capelin, with no report of spawning.

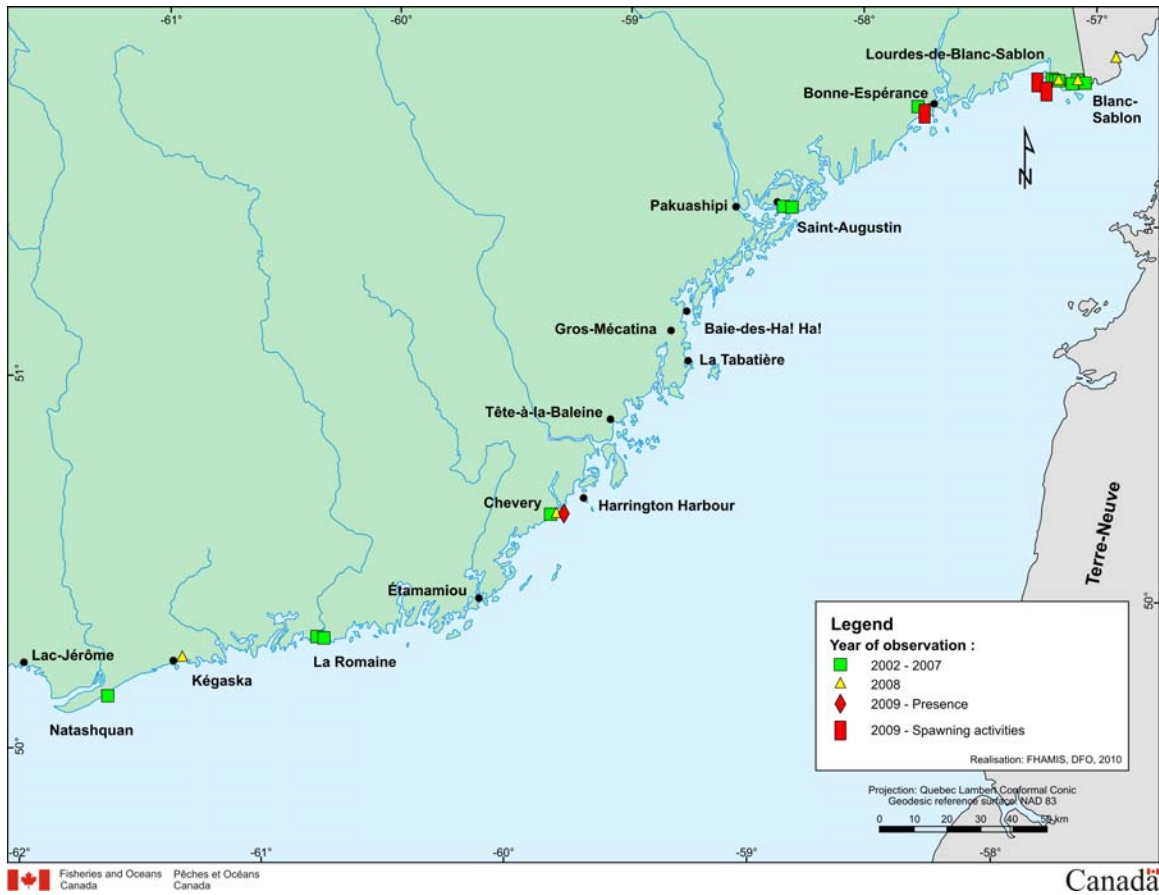


Figure 11: Location of observations of capelin spawning or presence on the Lower North Shore between 2002 and 2009

Since 2002, capelin spawning on the Lower North Shore has been observed primarily in June and early July. A larger number of observers would be desirable for this area in order to gain a better picture of spawning activities.

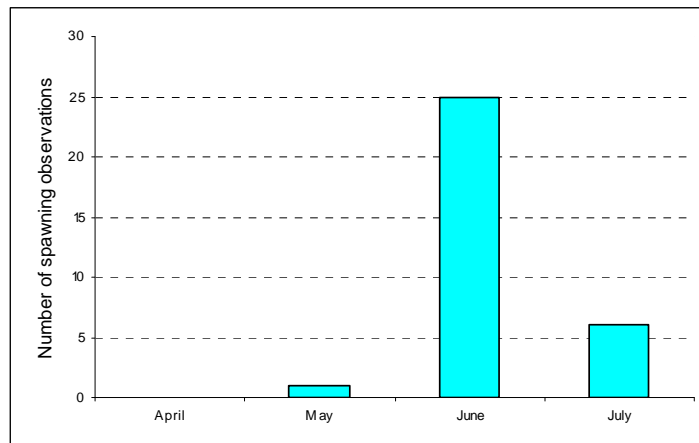


Figure 12: Period of observation of capelin spawning on the Lower North Shore between 2002 and 2009

Number of spawning observations between 2002 and 2009 = 32

Gulf / Gaspé Peninsula

The Gulf / Gaspé Peninsula area covers the north shore and the tip of the Gaspé Peninsula, from Cap-Chat (Capucins sector) to Grande-Rivière.

Observations - In 2009, 27 observers reported 70 observations for this area, including 66 spawning reports. The spawning observations were reported between May 25 and late June (exact date not specified). On June 23, divers filmed a school of capelin spawning on a small sand bar at a depth of 9 m opposite Anse-Pleureuse.¹⁴ On June 23, at Cap-Chat, a long line of dead capelin was observed near the lighthouse.

Table 8: Dates of observations of capelin spawning or presence between 2004 and 2009 in the Gulf / Gaspé Peninsula area

Location	2004 to 2006	2008	2009
Cap-Chat (Capucins)	June 2004	---	---
Cap-Chat (Cap-Chat)	May June 2007 June 2004, 2006	May 27 June 8	May 25 to 28 June 10 and 11, 23
Le Martre	June 2004, 2006, 2007	---	May [†] June 5, 9, 10 and 12
Sainte-Anne-des-Monts	---	May 26	June 10
Marsoui	June 2004	---	---
Rivière-à-Claude	June 2004, 2005, 2006, 2007 July 2004	May 28 to 31 June 1 and 2, 4, 7 to 9, 13	June 11 to 17, 20 to 23
Mont-Saint-Pierre	July 2004	early June	June 16
Saint-Maxime-du-Mont-Louis (Mont-Louis)	June 2005	early June	June
<i>Saint-Maxime-du-Mont-Louis (L'Anse-Pleureuse)</i>	---	---	May 28 [‡] June 18, 23
Sainte-Madeleine-de-la-Rivière- Madeleine (Manche-d'Épée)	June 2004, 2005	---	---
Sainte-Madeleine-de-la-Rivière- Madeleine (Rivière-Madeleine)	June 2004	June	June 10 to 12, 15 to 16
Grande-Vallée	June 2004, 2006, 2007 July 2006 August 2005	June 14, 26 and 27	June 14
Gaspé (Saint-Maurice-de-l'Échourie)	2005, 2006, 2007	---	---
Gaspé (Rivière-au-Renard)	May June 2007 mid-June 2006	---	---
Gaspé (Cap-des-Rosiers)	June 2005, 2006, 2007	June 4, 14, 16	June 3, 7 to 9, 11, 13 to 14, 23 [‡]
Gaspé (Cap-aux-Os)	May June 2007 June 2004	---	---
Gaspé (Cap-Bon-Ami)	May June 2007	---	---

¹⁴ The video, produced by Les Productions un Monde à Part Inc., can be viewed on the website of the Réseau des observateurs sous-marins:
http://www.rosm.ca/recherche_espece/fiche_espece.php?recordID=168

Location	2004 to 2006	2008	2009
Gaspé (Gaspé)	May, June 2007 June 2004, 2005, 2006 July 2004	---	May 28 [‡]
Gaspé (Petit-Cap)	July, August 2005	---	June 9 to 11
Percé (Percé)	June 2005, 2007	---	May 29, June
Percé (Anse-à-Beaufils)	---	June 18	May 31
<i>Percé (Barachois)</i>	---	---	May 30 June 1
Sainte-Thérèse-de-Gaspé	---	May 16	---

Names in parentheses represent sectors of municipalities.

Names in italics designate new observation sites.

‡ Date of observation of the presence of capelin, with no report of spawning.

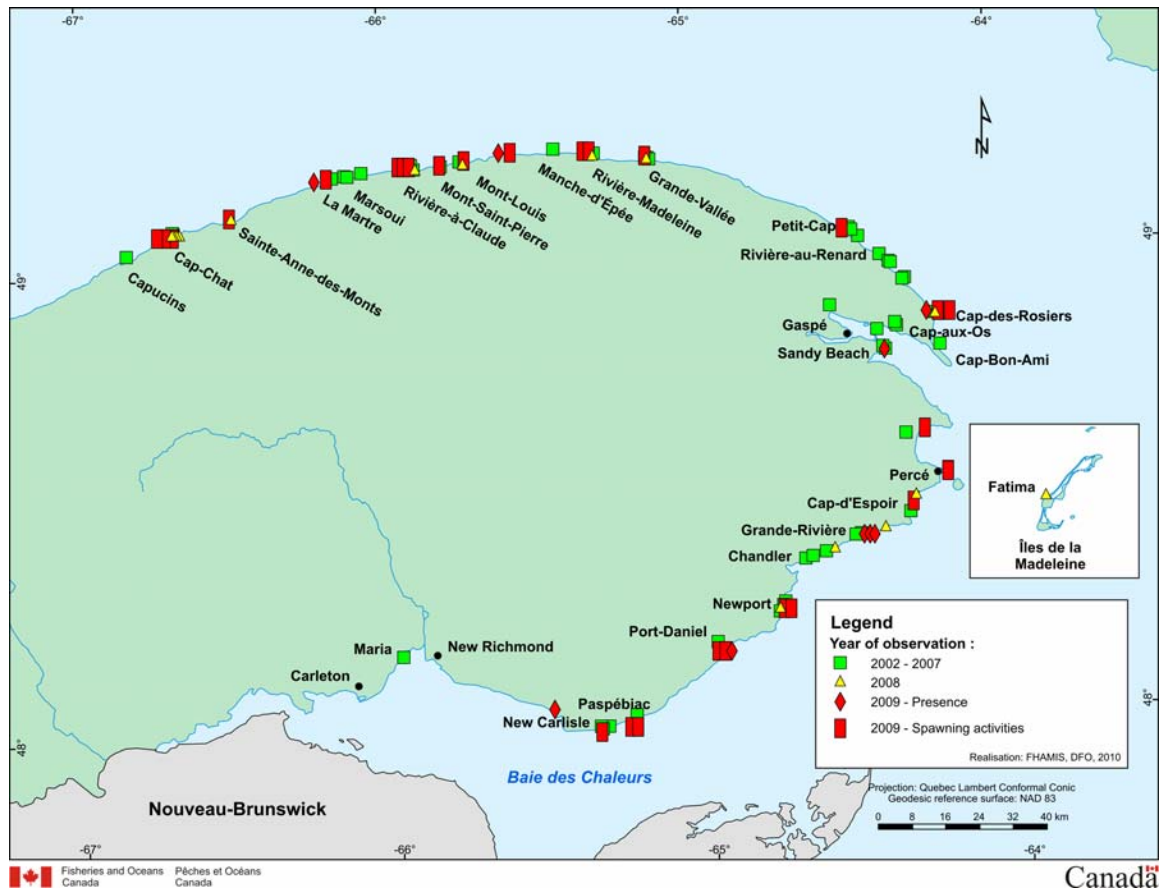


Figure 13: Location of observations of capelin spawning or presence in the Gulf /Gaspé Peninsula and Chaleur Bay areas between 2003 and 2009

Since the establishment of the Network, capelin spawning in the Gulf / Gaspé Peninsula area has been observed beginning in late May, with the peak in June.

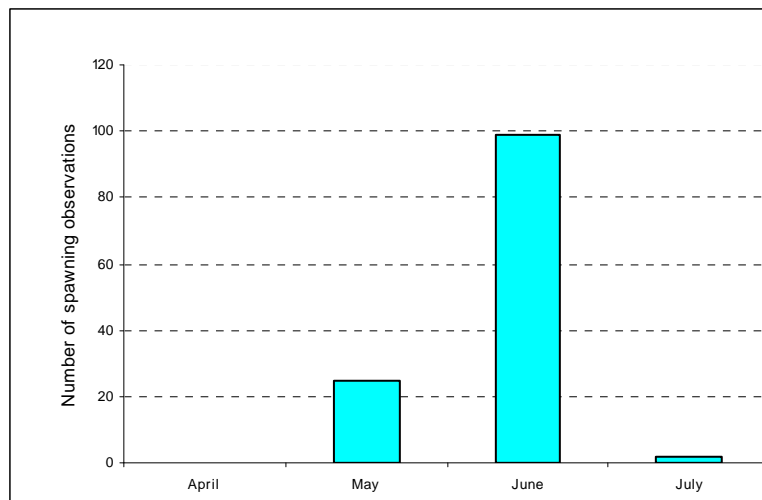


Figure 14: Period of observation of capelin spawning in the Gulf / Gaspé Peninsula area between 2004 and 2009

Number of spawning observations between 2004 and 2009 = 126

Gulf / Chaleur Bay

The Chaleur Bay area encompasses the southern Gaspé Peninsula, from the mouth of the Restigouche River to Grande-Rivière.

Observations - In 2009, 10 observers reported 36 observations for this area, including 13 spawning reports. The first reports of the presence of capelin were made in early May by lobster fishers. Some indicated: “Capelins are in the herring,” meaning that capelins were found in herring nets. As is the case every year, northern gannets, dolphins and minke whales all took advantage of the opportunity to feed on capelin. Spawning observations extended from May 15 to June 5.

Table 9: Dates of observations of capelin spawning or presence between 2003 and 2009 in Chaleur Bay

Location	2002 to 2007	2008	2009
Maria	May 2005	---	---
Bonaventure	---	---	May 10‡
New Carlisle	May 2005, 2006, 2007	---	May 23 and 24
Paspébiac	May 2003, 2004, 2005	---	May 15, 27‡, 30

Location	2002 to 2007	2008	2009
Port-Daniel-Gascon (Port-Daniel)	May, June 2003	---	May 21‡, 25 June 4 and 5
Chandler (Newport)	May 2005, 2006, 2007 June 2006	May 16, 20 June 9	May 26 to 28 June 1 and 2
Chandler (Chandler)	June 2006 in 2007	June	---
Chandler (Pabos)	May 2006	June 18	---
Grande-Rivière	2006	---	May 25‡, 27‡ June 2‡, 7‡, 20‡ to 30‡ July 1‡ to 3‡

Names in parentheses represent sectors of municipalities.

Names in italics designate new observation sites.

‡ Date of observation of the presence of capelin, with no report of spawning.

Since 2003, in Chaleur Bay, capelin spawning has been observed mainly in May, and to a lesser extent in June. An increase in the number of observers would be desirable for this area in order to gain a better picture of spawning activities.

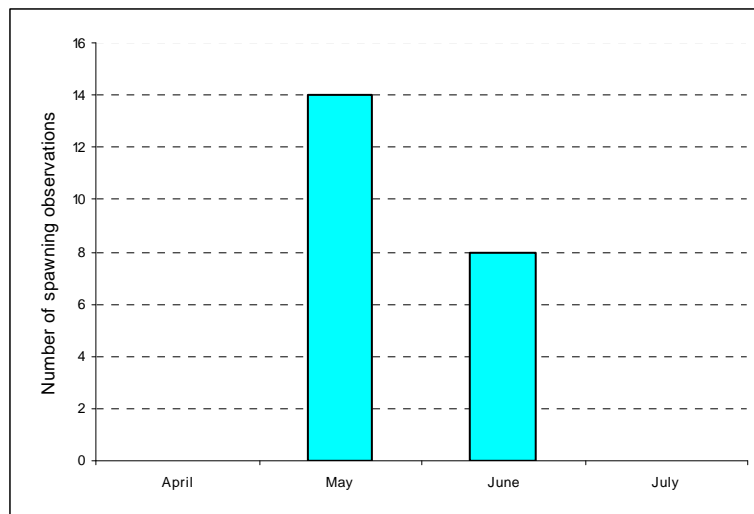


Figure 15: Period of observation of capelin spawning in Chaleur Bay between 2003 and 2009

Number of spawning observations between 2003 and 2009 = 22

Gulf / Magdalen Islands

The Magdalen Islands area encompasses all the islands in the archipelago.

Since the establishment of the Network, only one spawning observation has been reported in this area, in June 2008 at Cap de l'hôpital in Fatima, by lobster and flounder fishers. No observations were reported in 2009.



Photo: Claude Tremblay

Instructions for completing the observer form

This form is designed to enable you to collect all the required information which, after it is submitted to Fisheries and Oceans Canada, will be used to prepare an overview of the situation in 2010 following the end of the season. Capelin spawning can be influenced by various factors; for instance, the type of beach, weather conditions and wave action appear to play an important role in capelin activity. The attached form, which is simple and easy to complete, will make it easier for you to document these factors and other aspects of interest.

The form includes:

A general data page – One sheet per observation must be completed. This sheet includes:

- *Capelin Observers Network observation area* - This information is used during entry of the observation data to quickly assign the municipality to one of the areas in the Fish Habitat Management Information System (FHAMIS).
- *Your contact information* - This information will allow us to send you the proper documentation to support effective Network operations, and to get in touch with you if we have any questions about your data. Rest assured that your contact information will remain confidential and will be used only for the purposes of the Capelin Observers Network.
- *A few questions* - How do you know that this is the capelin spawning period? Have you observed any changes in capelin spawning or the physical characteristics of the beach?
- *Return address* - Although a return envelope is included in the kit, the return address is provided on the data sheet on spawning activity for your information. You can keep any unused data sheets just in case you observe a late spawning. You can also call 1-877-227-6853 to submit your observations during the spawning period.

Data sheets on spawning activity - One sheet must be used for each observation.

- *Name* - We ask that you write your name at the top of each data sheet to facilitate processing.
- *Date and time of spawning activity* – Providing the dates and times enables us to assess the link between spawning activity and any factors associated with those dates and times.
- *Type of observation* - It is important to differentiate between capelin rolling onto beaches (“landing”) to spawn and capelin present without depositing their eggs directly on the beach. “Spawning” represents the moment when the capelin roll onto beaches (land) and “presence” indicates any other sign of the capelin’s presence.
- *Location* – This section contains all the information that allows us to precisely determine the location of your observations, so that we can characterize the

- *Weather and tide conditions* - You can indicate the approximate wind speed in km/h as well as the wind direction. It is also useful to indicate the temperature, whether the tide is rising or falling, as well as the approximate wave height.
- *Spawning evaluation criteria* - This information enables us to characterize the use of a spawning site by capelin from year to year.
- *Comments* - You can include other pertinent information, such as the presence of marine mammals or birds, how long you have observed capelin offshore, or any other observation or comment you would like to share.

Maps:

- A map of the sector where you are likely to see capelin spawning on beaches is included on the back of the form.
- A map has been prepared for each zone considered a likely site for capelin beach spawning. If the map does not cover the entire area of the spawning ground where you usually make your observations, please let us know; we will amend the map accordingly. Furthermore, should you see capelin spawning on other beaches or near other municipalities, we can send you additional maps.
- The map features the most visible landmarks (e.g. houses, streets, wharves, marinas).
- To indicate where you have observed capelin rolling onto beaches, circle the zone on the map, noting where the spawning activity was most intense.
- If you use other terms to name bays, coves or other spawning areas, you can enter them on the maps and we will make the changes for future years.

Thank you for your participation! With your help, we will be able to learn more about capelin. Feel free to contact the Capelin Observers Network by telephone at 1-877-227-6853 or by e-mail at ROC-CON@dfo-mpo.gc.ca if you have any questions regarding the data sheets.

Note: The pages included in the document are provided as examples only; you will find removable sheets in the envelope.



Observer's general data sheet

CON observation area:

Name:

Address:

Telephone number:

E-mail:

Where did you hear about the Network?

How do you know that this is the capelin spawning period?

Have you noticed any changes in capelin spawning in recent years (spawning date, spawning areas, etc.)?

Have you noticed any changes in the physical characteristics of the beach (erosion, alteration)?

Would you like to receive a copy of the 2010 report?

Yes

No

Would you like to receive a 2011 kit?

Yes

No



Data sheet for observations of capelin spawning or presence

Return Address:
 Capelin Observers Network
 OMB - Maurice Lamontagne Institut
 PO Box 1000 Stn Bureau-Chef
 Mont-Joli, QC
 G5H 9Z9

NAME _____

Date of observation (YY/MM/DD) _____

Time _____

Type of observation Spawning Presence Specify _____

Location

Municipality _____

Position (Latitude/Longitude) _____

Name of spawning site
 (e.g.: name of the beach or cove) _____

Describe as precisely as possible the location of the spawning site (e.g.: 1 km east of Brochu River opposite a red house, intersection of Arnaud and Smith streets...)

Type of beach silt sandy gravel pebbles bedrock

Weather and tide conditions

Wind Strength (km/h): _____ Direction (wind coming from): _____

Temperature: _____ °C Clear skies Cloudy Light rain Heavy rain
 (air) or

_____ °F Tide: Falling Low Rising High

Waves: Calm Low Moderate High
 (nil) (-2 feet (2 to 5 feet (+ 5 feet
 -0.6 m) 0.6 to 1.5 m) + 1.5 m)

Evaluation criteria:

Quantity rolling at time of observation Low Moderate High

Length of time (how many days have the capelin been rolling **this season**) _____

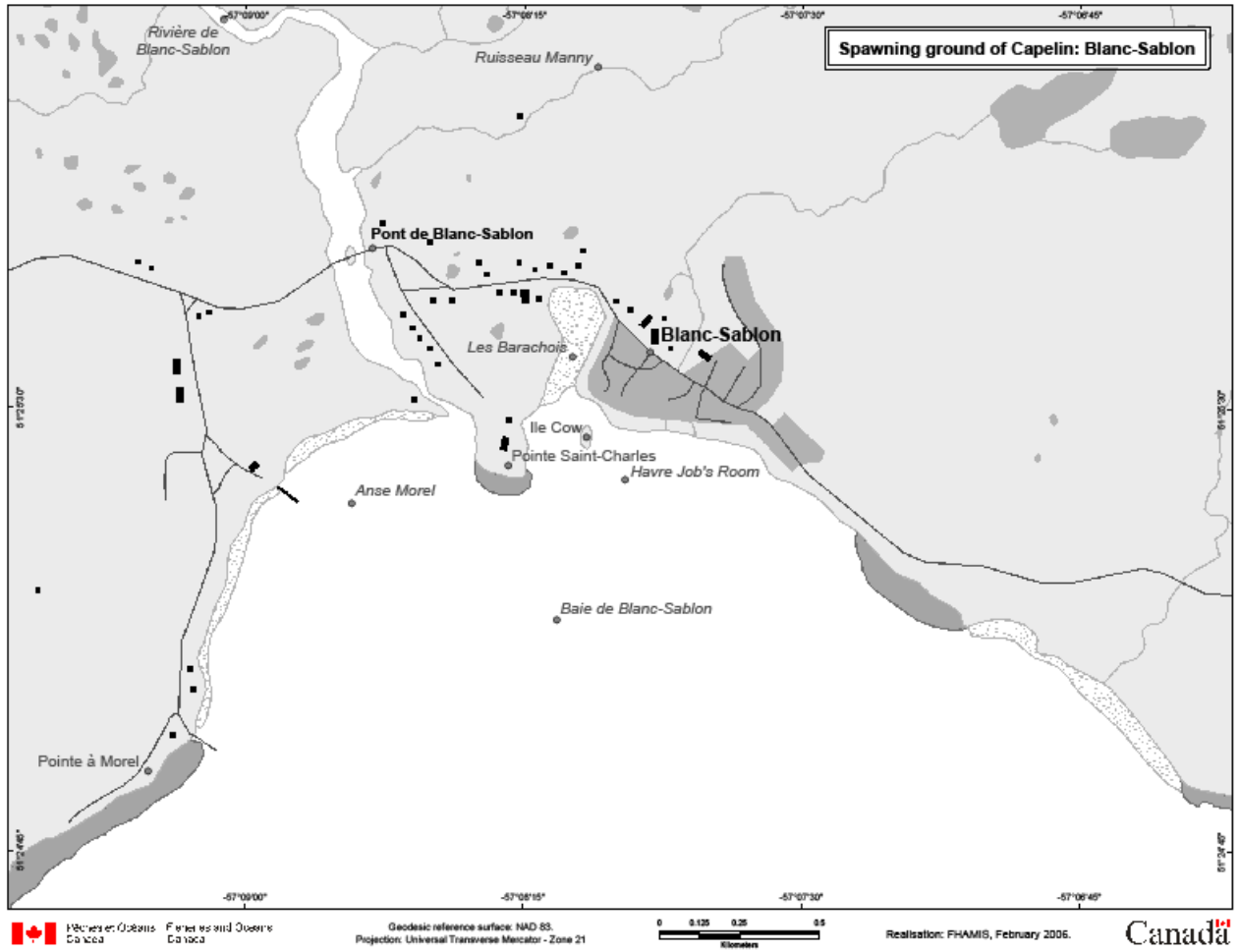
Comparison with previous years **for the entire season** Lower Same Higher

Length of the beach used for spawning (metres or feet) _____

Time required to fish (e.g.: 15 min / 5 gallons or 20 litres) _____

Comments: (discussions with other fishers, unusual behaviour, presence of predators...)

Sample map



To submit your observations during the season, or if you have any questions, you can contact:

Capelin Observers Network (CON)

Telephone: 1-877-227-6853

E-mail: ROC-CON@dfo-mpo.gc.ca

Address:

Capelin Observers Network
OMB - Maurice Lamontagne Institute
PO Box 1000 Stn Bureau-Chef
Mont-Joli, QC
G5H 9Z9

Fisheries and Oceans Canada would like to thank the organizations listed opposite for their support in promoting the Network and its data collection activities. Thanks to these organizations, more people are learning about the Capelin Observers Network, which is essential to its objectives.

Chaleur Bay ZIP Committee
From Matapédia to Forillon



Southern Estuary ZIP Committee
From Berthier-sur-Mer to Les Méchins



Estuary North Shore ZIP Committee
From Tadoussac to Baie-Trinité



Gulf North Shore ZIP Committee
From Baie-Trinité Bay to Blanc-Sablon



Réseau d'observation de mammifères marins (ROMM)



Conseil régional de l'environnement Gaspésie-Îles-de-la-Madeleine (CREGIM)



Le Réseau des observateurs sous-marins (ROSM)

