



Pêches et Océans
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Capelin Observers Network Observer Kit — 2012



Published by:

Oceans Management Division
Fisheries and Oceans Canada
Mont-Joli, Quebec
G5H 3Z4

©Her Majesty the Queen in Right of Canada, 2011
Fs121-9/2012E-PDF
ISSN 1929-2392 (Online)
Cette publication est aussi disponible en français.

The electronic version of the kit is available on the DFO Web site at www.qc.dfo-mpo.gc.ca under *Capelin Spawning Observation* in the “*Something to Report*” section.

Cover photo: Todd Gallant

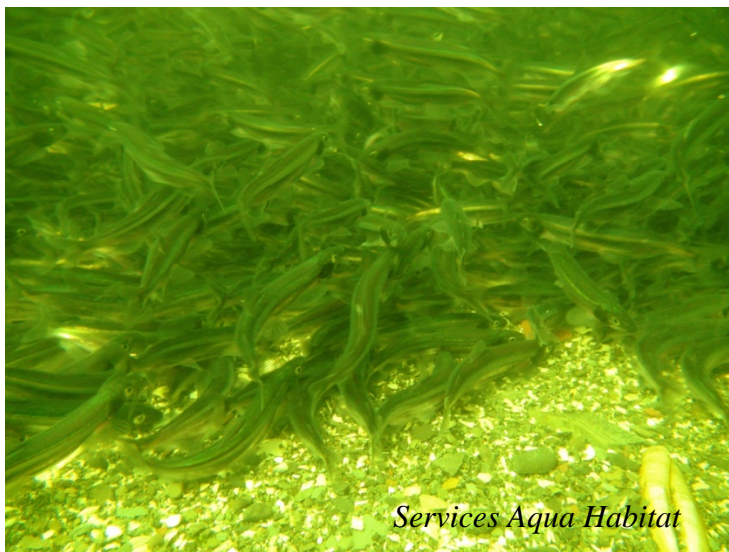
Conception
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“It was the festival of capelin in Marsoui between 21 and 23 of June 2001. Its spawned on the beach but also a lot on the bottom in 5-6 meters of water”

Frédéric Hartog, *Services Aqua Habitat enr.* July 2011



Dear Observer,

Where and when will the capelin roll in 2012? As we begin our **eleven season** collecting data on capelin spawning, we wish to thank you for your efforts and assistance. Thanks to you, we are learning a little more about capelin spawning sites and habits every year.

Once again this year, the Capelin Observers Network (CON) invites you to assist in collecting the data that will allow us to paint as accurate a picture as possible of the distribution of capelin spawning grounds along our shores and to monitor changes in capelin spawning habits.

In 2011, each of your observations was compiled in the summary. The kit provides information on important factors to be considered when making observations and contains practical maps for locating your observations. As always, we welcome your comments and suggestions on how to improve the data collection process.

Submit your observations directly online:

You can monitor changes in capelin spawning observations, submit your observations and obtain information about the Capelin Observers Network online at the following address:

<http://www.qc.dfo-mpo.gc.ca/signaler-report/roc-con/capelan-capelin-eng.asp>

We wish you a good 2012 observation season and thank you for your interest in the Network!

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Capelin Observers Network (CON)

The Capelin Observers Network was established to gather more information about capelin spawning sites and habits in 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), Quebec Region, and various partners, including a number of ZIP (areas of prime concern) committees, developed a network to collect data on capelin reproduction.

From 2002 to 2009, the number of network observers and observations increased steadily, resulting in a clearer general portrait of the distribution of capelin coastal spawning areas. Less information was collected during the 2010 season; during the 2011 season, however, the number of observers and observations increased once again, with 66 observers reporting 184 observations. A new observation zone, Newfoundland and Labrador, was also added in 2011, contributing to the higher number of observations.

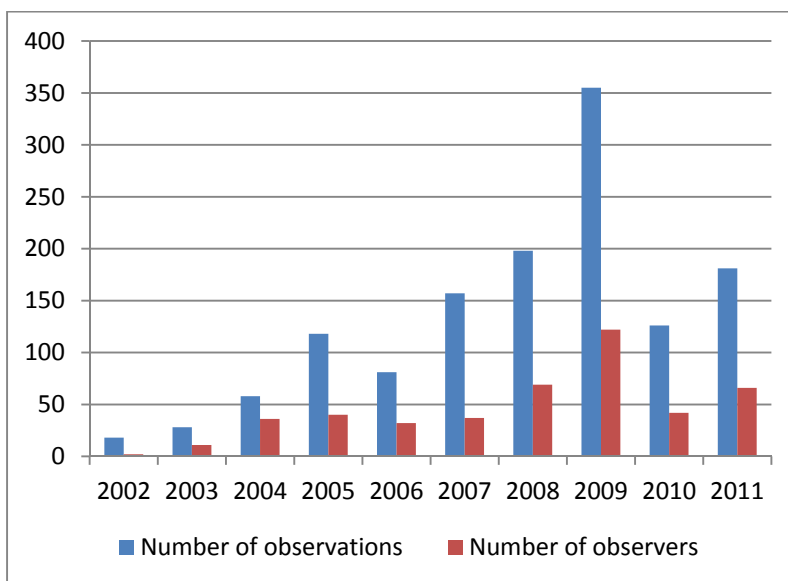


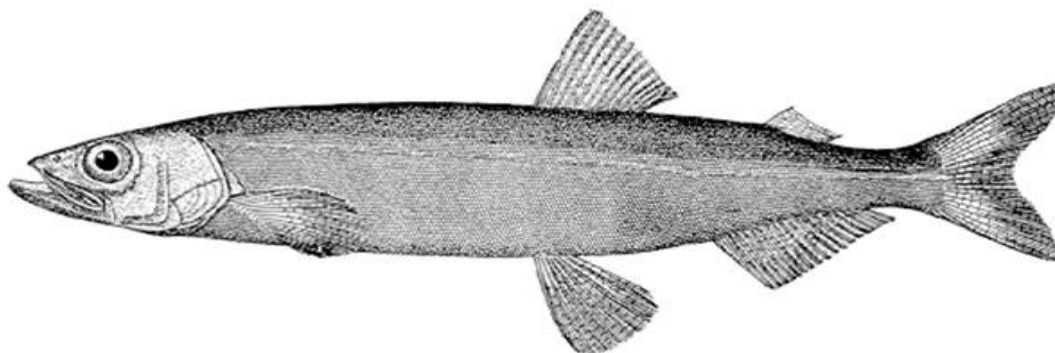
Figure 1: Changes in the number of CON observers and observation reports.

This new knowledge about the spawning site locations and habits of the capelin is enhancing our understanding of this essential link in the St. Lawrence ecosystem. It also helps to improve the protection of spawning sites, particularly during the breeding and incubation period. Measures to mitigate the impacts on habitats can also be recommended when work takes place near spawning sites. The information gathered through the Capelin Observers Network may contribute to greater understanding of the impacts of human activities and climate change, including bank erosion and beach modification, on the capelin's life cycle.

Observers are invited to take part in the Capelin Observers Network by visiting our Internet registry at <http://www.qc.dfo-mpo.gc.ca/signaler-report/roc-con/capelan-capelin-eng.asp> or calling 1-877-227-6853.

Your participation in the Network in 2012 is necessary for monitoring capelin spawning and identifying new trends or confirming those identified in previous years. It is also important to carefully document your observations.

Capelin



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 23 cm in some locations. Capelin has a villous band on the lateral line, which separates its olive green back from its silvery sides, hence its Latin name *Mallotus villosus*, “villosus” meaning villous or hairy, which refers to the hairy appearance of the ridges of elongated scales of the males during spawning.

During the spawning period, the abdomen of the female is swollen with eggs and the pectoral fins of the male lengthen and project out from the body. These distinctive characteristics appear approximately four to five weeks before the start of spawning. For the rest of the year, the differences between the two sexes disappear and it is almost impossible to distinguish between the male and female.



Top to bottom: male and female capelin

Spawning

As the spawning season approaches, capelin begin an intensive migration to the coast to spawn on sandy or fine gravel beaches or on the seabed, at depths of 30 to 280 m.

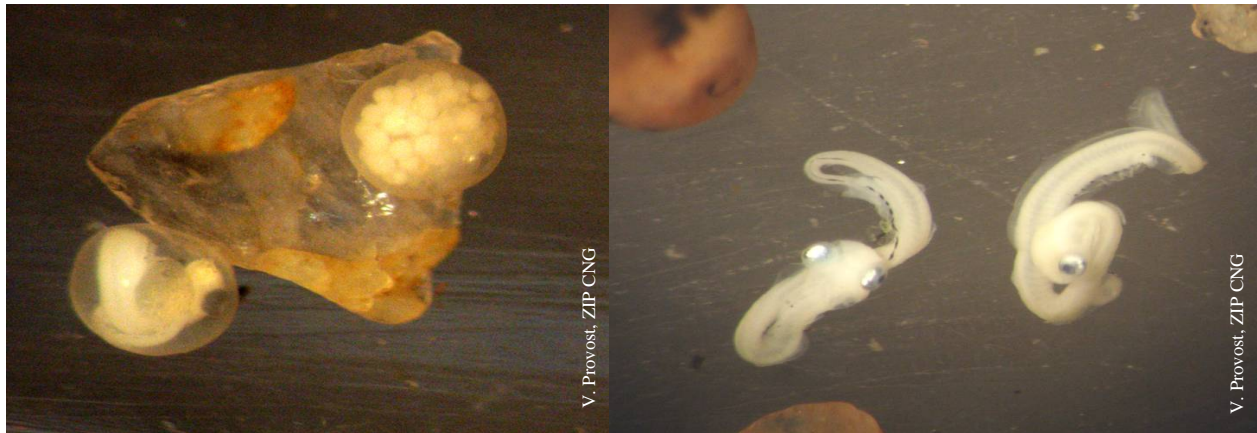
When capelin spawn on beaches, this is called “rolling” or “landing.” In the Estuary and Gulf of St. Lawrence, capelin “roll” on the shores between mid-April and July, depending on the area, when water temperatures are between 6 and 10 °C. Spawning usually occurs at night.



Capelin spawning

At the start of the spawning season, male and female capelin form two separate shoals. The males move inshore first and wait for the females, which stay farther offshore until ready to spawn. When the females arrive, spawning begins. The males push on the sides of the females to expel the eggs. Using sweeping movements with their caudal fin, they deposit the fertilized eggs in the sand or gravel. The eggs are enveloped by a sticky substance, which holds them in place and protects them from tidal action and predation.

After spawning, it is not unusual to see large numbers of dead capelin on the beach or in the water, particularly males that are injured during repeated mating.¹



Embryonic development of capelin (at left: eggs; at right: larvae)

The duration of the incubation period depends on the ambient water temperature. On average, it lasts two weeks. After hatching, the larvae feed on animal plankton, composed of tiny crustaceans. The juveniles will grow to a length of 2 to 4 cm before their first winter.

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 across Russia to northern Japan. In Canada, it occurs on

¹ DFO: 2004. Capelin of the Estuary and Gulf of St. Lawrence (4RST) in 2003. Canadian Science Advisory Secretariat, Stock Status Report 2004/001.

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

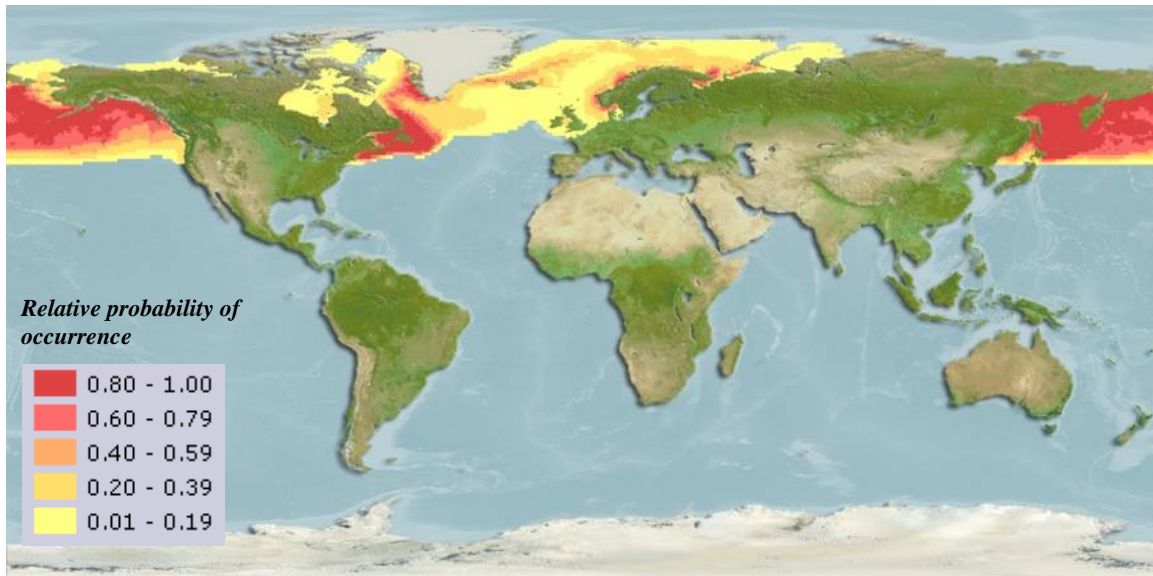


Figure 2: Global distribution of capelin²

A recent study³ has revealed considerable genetic diversity in capelin. Mitochondrial DNA analysis of capelin from three oceans has revealed the existence of four major distinct groups distributed as follows:

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

² Froese, R. and D. Pauly. Editors. 2009. FishBase. World Wide Web electronic publication. www.fishbase.org, version (10/2009).

³ Dodson, J. J. et al. Trans-Arctic dispersals and the evolution of a circumpolar marine fish species complex, the capelin (*Mallotus villosus*). Molecular Ecology 16: 5030-5043.

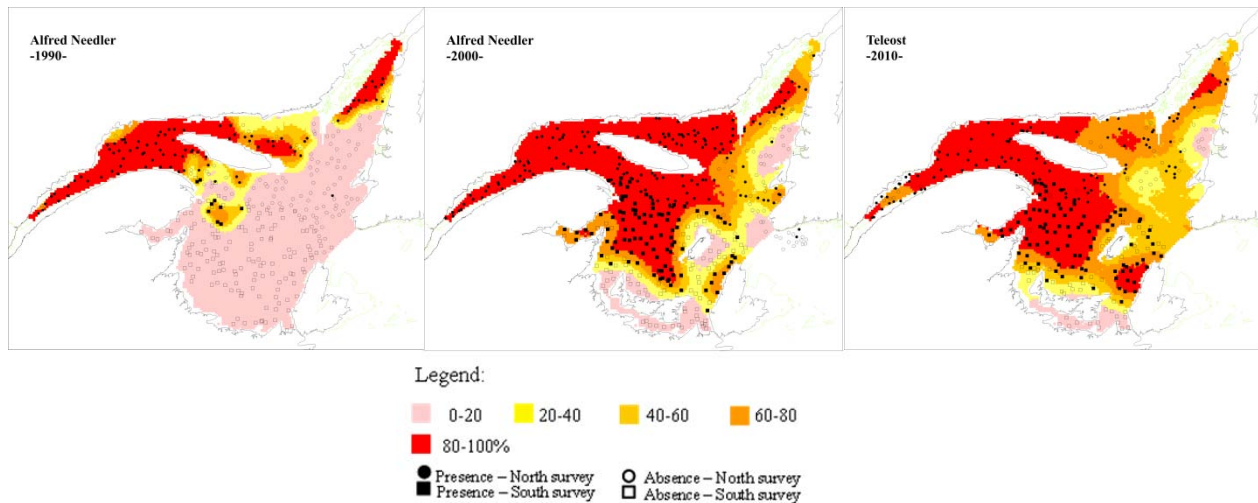


Figure 3 : Probability surfaces (%) of capelin presence for multidisciplinary surveys conducted in the Estuary and northern and southern Gulf of St. Lawrence between 1990 and 2010

Significant changes have been observed in the spatial distribution of capelin in the Estuary and Gulf of St. Lawrence. In the 1990s, the distribution of this species was limited to the estuary, the northern Gulf of St. Lawrence and the Gaspé Peninsula. Between 2000 and 2010, the species' range expanded to cover virtually the entire southern Gulf (Figure 3). The increased presence of capelin in this region of the Gulf may be explained by a change in water temperature regime. The 1990s were characterized by a cooling of the Gulf of St. Lawrence caused by an inflow of cold water from the Strait of Belle-Isle and Cabot Strait. Given that capelin is a cold-water species, the inflow is believed to have expanded the species' range.⁴ The increased presence of capelin in the multidisciplinary surveys of the southern Gulf could also be explained by increased abundance or an increasingly large presence of this species in bottom habitat abandoned by declining groundfish stocks.⁵

Ecological Significance

Capelin is a key species of the northern Gulf of St. Lawrence ecosystem, as it forms the basis of a large number of marine food chains. It is an essential prey species of cod, and a forage species for many marine species, including Greenland halibut (turbot), American plaice, salmon, whales, belugas, dolphins, porpoises, seals, northern gannets and other seabirds. During the spawning period, capelin are a preferred prey item, for they are easy to catch along the shore where they occur in large numbers. Even Atlantic cod follow them close into the shore to feed!

⁴ Grégoire, F. and B. Bruneau. 2011. Capelin (*Mallotus villosus*) of the Estuary and Gulf of St. Lawrence (NAFO Divisions 4RST) in 2010. Canadian Science Advisory Secretariat, Research document. 2011/023.

⁵ McQuinn, I. H. 2009. Pelagic fish outburst or suprabenthic habitat occupation: legacy of the Atlantic cod (*Gadus morhua*) collapse in eastern Canada. Canadian Journal of Fisheries and Aquatic Sciences, 66: 2256-2262.

Capelin eggs are also an important item in the diet of certain fish species and the dominant item in the diet of winter flounder. It is estimated that the proportion of eggs in the diet of smaller flounder (14 to 34 cm long) averages 59% (dry weight).⁶

Despite its significant ecological importance, little research has been conducted on Gulf of St. Lawrence capelin. Little is known about its abundance, the distribution of the various populations, and the location and quality of coastal and demersal (seabed) spawning grounds. This lack of knowledge on the biology and ecology of capelin in the St. Lawrence makes the management of the species a challenge. More data on capelin spawning activity would provide a clearer picture of the situation.



Northern gannets feeding on capelin

⁶ K. T. Frank 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. *Canadian Journal of Fisheries and Aquatic Sciences*, 41: 1294-1302.

Capelin Fishery

Present in large numbers and easy to catch, capelin has been used as bait for cod and furbearing animals. It has also been used as fertilizer for crops.

However, this small fish is a delicacy, both dried and salted and eaten fresh in season. It has even saved populations from starvation, particularly during the early settlement of Quebec's North Shore region.

In the past, residents along the St. Lawrence held feasts during the spawning period. Municipalities with capelin spawning beaches would organize festivals celebrating this small fish. Still today, capelin fishing is a unique traditional activity accessible to everyone. The fish are caught with dip nets or simply by hand 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.



Fishing for capelin with dip nets

There is also a commercial capelin fishery. In the Gulf of St. Lawrence, the fishery occurs primarily on the coasts of Newfoundland. The main types of fishing gear used are purse seines, traps and weirs. The most lucrative products from this fishery are mature females and their eggs, which are sold to the Japanese sushi market. Catches not otherwise sold are used in the production of fishmeal, which is used as feed for fish and livestock, and therapeutic fish oils.

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

Capelin Spawning Habits

The Network has collected 1,469 observations since its founding. Of these, 800 observations involved spawning activity, 287 observations were of signs of capelin presence and 382 other observations did not indicate clearly whether spawning or some other type of activity was taking place. The information gathered, including the date and time of each observation, tidal conditions and the type of spawning site, is helping to reveal trends that can assist in answering questions such as: Do capelin spawn more frequently at night? Do they prefer high tide? What type of substrate do they prefer?

Time of Day

Capelin appear to spawn more frequently when it is dark, at least when this activity takes place in near-shore environments. According to the Network data, spawning is observed five times as often during the night, or between 6:00 p.m. and 6:00 a.m., than at other times of day.

Table 1 : Percentage of capelin spawning observations by time of day.

<i>Time of Day</i>	<i>Number of Observations</i>	<i>Percentage (%)</i>
Day (6:00 a.m. - 5:59 p.m.)	148	20
Night (6:00 p.m. - 5:59 a.m.)	592	80

(Number of spawning observations between 2002 and 2011 with time-of-day information = 740)

Tides

Comparing spawning observations against tidal information reveals that capelin are 12% more likely to spawn during the rising tide than the falling tide.

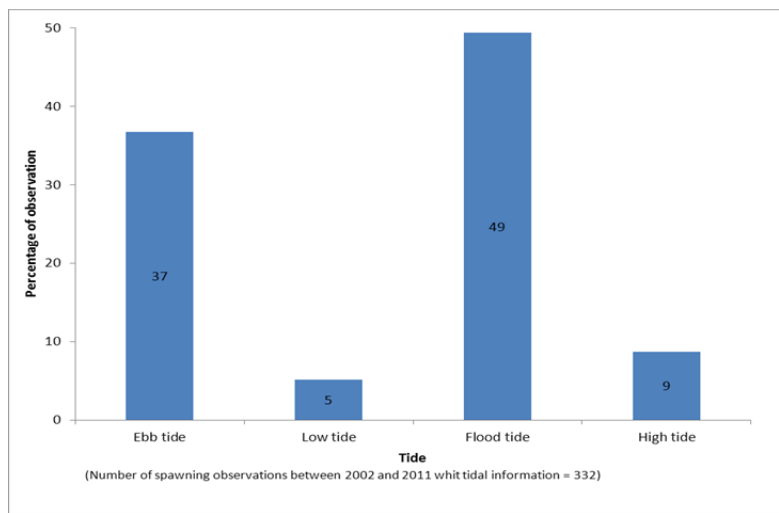


Figure 2: Percentage (%) of capelin spawning observations by tidal cycle.

Spawning Site Type

According to the great majority of observations, spawning occurs on sandy beaches. However, the data collected do not specify the substrate diameter. Spawning also takes place on gravel beaches slightly more than 10% of the time.

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

<i>Substrate</i>	<i>Number of Observations</i>	<i>Percentage (%)</i>
Sand	423	86
Gravel	63	13
Pebbles	7	1
Bedrock	1	0

(Number of spawning observations between 2002 and 2011 with substrate information = 494)

Are there more or fewer capelin in 2011?

This question is difficult to answer because capelin abundance has never been tracked on a year-over-year basis. Based on data collected by the Network between 2006 and 2009, the majority of observers noted that the quantity of capelin spawning was high. This trend was less pronounced in 2010, although it is also to be noted that the numbers of observers and observations dropped between 2009 and 2010. It cannot be concluded from this, however, that fewer capelin were coming in to shore. There were more observers and observations in 2011 than in 2010. One regular observer in Saint-Irénée noted that there appeared to be fewer capelin that year, perhaps because the fish remained further offshore in that particular area.

For most of the observations involving spawning activity, the observers noted that the capelin were present in abundant numbers. In the majority of cases, however, the quantity of capelin spawning was either not specifically evaluated or was unknown.

Table 3 : Compiled evaluations of the quantity of capelin spawning as a percentage.

Year	High	Average	Low
2006	63	12	25
2007	66	17	17
2008	58	21	21
2009	46	29	25
2010	44	30	26
2011	52	30	18

Many factors may influence the quantity of capelin spawning onshore. For example, spawning variations could occur due to a mild preceding winter or changes in ice cover or freshwater levels.

According to some observers, capelin runs took place in 2011 around the same date and in quantities comparable to those in other years in their areas. Others reported that the capelin began running later in 2011.

Observations on the 2011 Season by Zone

A total of 184 observations were reported in 2011. Of these, 94 involved spawning, 85 signs of capelin presence and 5 the absence of capelin. These observations were made in 32 different areas and on 19 beaches or sections of beaches. Seven new sites were surveyed in Quebec: Grand-Ruisseau (Port Cartier), Rivière Brochu (Sept-Îles), Rivière-aux-Graines (Rivière-au-Tonnerre), l'Anse-à-Valleau (Gaspé), l'Anse-aux-Amérindiens (Gaspé), Pointe-aux-Loups (Magdalen Islands) and Étang-du-Nord (Magdalen Islands). The observations were compiled in table form accompanied by maps. This year once again, observations involving spawning or signs of capelin presence (e.g., presence of diving birds or dead capelin on the beach) were highlighted in the results tables by placing a symbol (‡) next to the date.

For practical reasons, the Estuary and Gulf of St. Lawrence were divided into eight observation zones as illustrated on the following page.

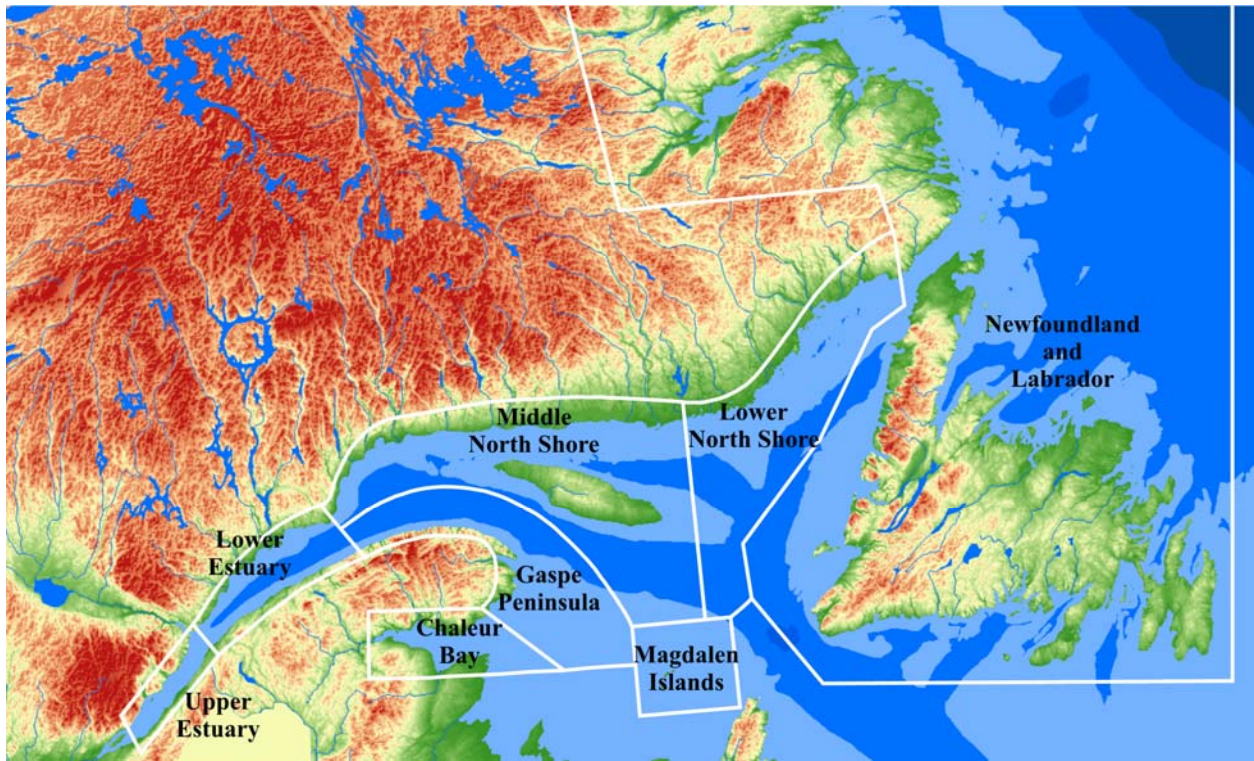


Figure 3: Observation zones of the Capelin Observers Network.

Middle Estuary

This zone extends to both sides of the Middle St. Lawrence Estuary from Saint-Joachim to Baie-Sainte-Catherine on the north shore and from Montmagny to Cacouna on the south shore.

Observations

In 2011, capelin were seen on shores in the Middle Estuary area between April 23 and June 18. A total of 26 observations of capelin presence were reported by two observers. No spawning was observed.

Table 4 : Dates of observation of capelin spawning or presence between 2003 and 2011 in Middle Estuary.

<i>Location</i>	<i>2003 - 2009</i>	<i>2010</i>	<i>2011</i>
	April - May 2003		April: 23 [‡] - 25 [‡]
Saint-Irénée	May - June 2004, 2006, 2008	April: 15 [‡] , 20 [‡] - 23 [‡] , 25 [‡] , 28 [‡] - 30 [‡]	May: 1 [‡] - 4 [‡] , 8 [‡] - 10 [‡] , 15 [‡] , 16 [‡] , 19 [‡] , 24 [‡] - 26 [‡] , 28 [‡] - 30 [‡]
	May - July 2005	May: 1 [‡] , 6 [‡] , 7 [‡]	
	April - June 2009		June: 9 [‡] - 12 [‡]
La Malbaie (Port-au-Saumon / Anse aux Indiens)	June 2005, 2009	---	---
Île-aux-Coudres	June 2007		
	April - early June 2008	May: 28 [‡] - 29 [‡]	April: 23 [‡]
Kamouraska	June 2003	---	---
Rivière-du-Loup	June 2009	May: 29 [‡]	---
Rivière-Ouelle	---	May: 29 [‡]	June: 15 [‡] , 18 [‡]

Names in parentheses denote sections of municipalities. ‡ Denotes date of observation of capelin presence without mention of spawning.

Since 2003, capelin spawning in the Middle Estuary has been observed mainly in May and June and appears to peak in May.

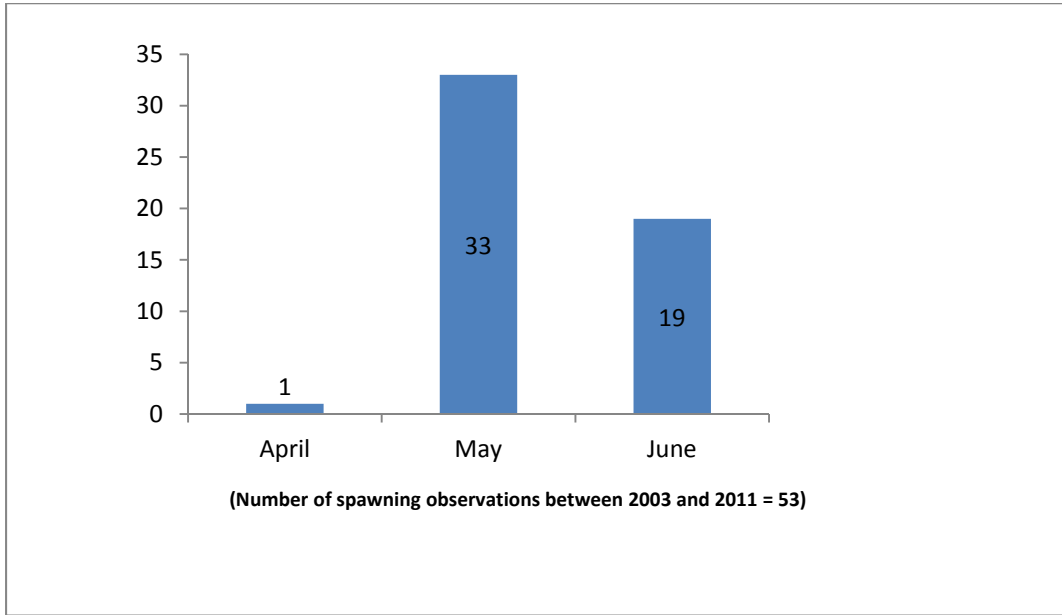


Figure 4 : Period of observation of capelin spawning in Middle Estuary between 2003 and 2011.

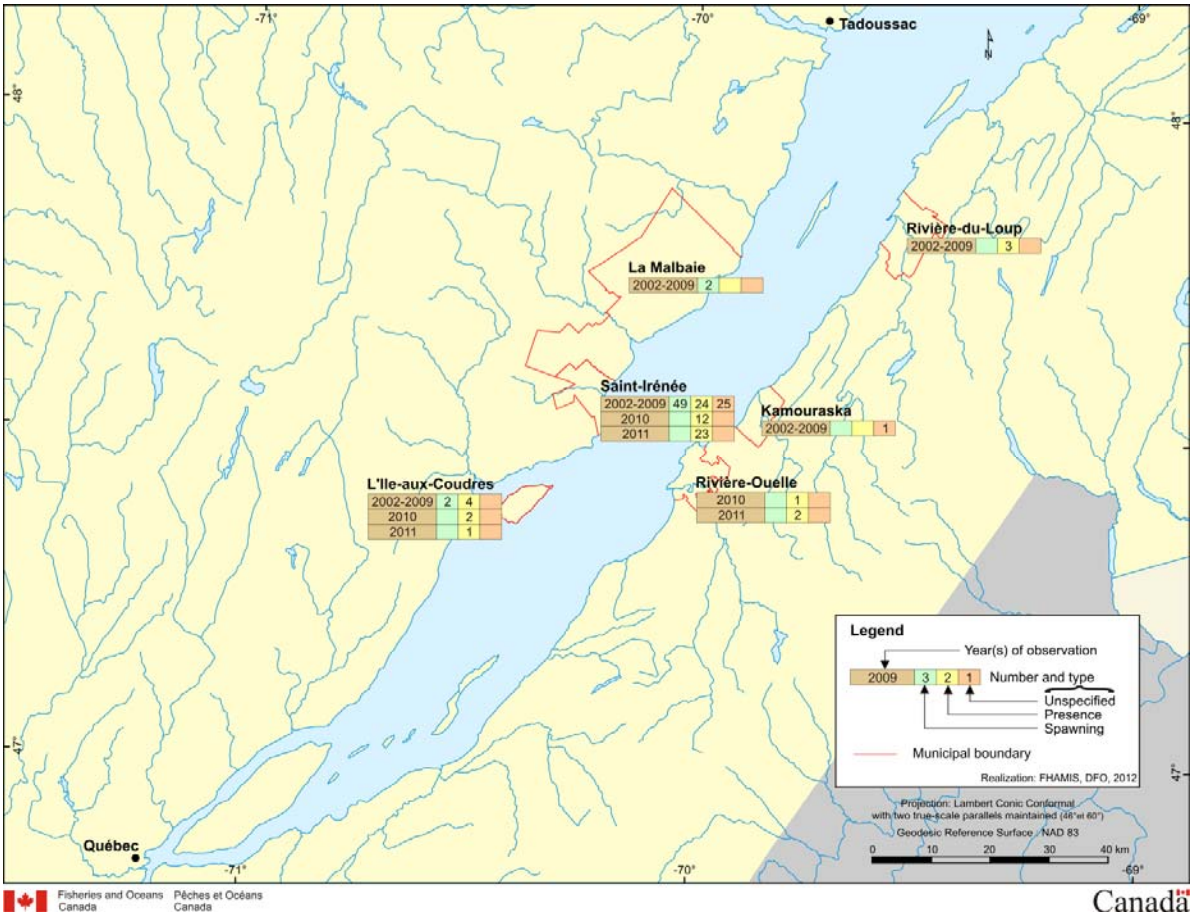


Figure 5 : Locations of observation of capelin spawning and presence in Middle Estuary between 2003 and 2011.

Lower Estuary

This zone covers both shores of the Lower St. Lawrence Estuary from Tadoussac to Baie-Trinité (Pointe-des-Monts) on the north shore and from Isle-Verte to Les Méchins on the south shore.

Observations

In 2011, a total of 13 observations were reported by 12 observers. Of these observations, seven involved spawning. All observations were made between May 25 and July 4.

Table 5 : Dates of observation of capelin spawning or presence between 2003 and 2011 in Lower Estuary.

<i>Location</i>	<i>2003 - 2009</i>	<i>2010</i>	<i>2011</i>
NORTH SHORE			
Tadoussac	June 2009	June: 14 - 20 [‡]	---
Les Escoumins	April 2003	---	---
Portneuf-sur-Mer	May 2003, 2007, 2008 May - June 2004 - 2006, 2009	May: 21, 25 July: 12 [‡]	May: 25
Forestville	June 2009	---	---
Colombier	May 2005, 2007 - 2009, June 2005	---	---
Baie-Comeau	June: 7 [‡] , July: 6 [‡]	---	July: 4 [‡]
Godbout	June: 6, July: 7	---	---
SOUTH SHORE			
Saint-Simon (Saint-Simon-sur-Mer)	June 2003 May 2009	---	---
Saint-Fabien (Saint-Fabien-sur-Mer)	May 2006 June 2003 - 2005, 2008 May - July 2009	---	---
Rimouski (Bic - Anse à Mouille- Cul)	---	July: 11 [‡]	---
Rimouski (Cap-à-l'Orignal)	June: 19 [‡]	---	---
Rimouski (Rivière-Hâtée)	June 2007, 2009	---	---
Rimouski (Rimouski)	June 2008 July 2009	---	---
Rimouski	May - June 2008	---	June: 29 [‡]

<i>Location</i>	<i>2003 - 2009</i>	<i>2010</i>	<i>2011</i>
(Pointe-au-Père)	June - July 2009		
Sainte-Luce	June 2003, 2008 April - July 2009	---	June: 12, 13, 28
Sainte-Flavie	June 2008 May - July 2009	June: 2, 3, 20, 30	June: 24, 28 [‡]
Métis-sur-Mer	June 2008 June - July 2009	---	June: 29
Les Méchins	June 2004, 2006, 2009	---	---

Names in parentheses denote sections of municipalities. ‡ Denotes date of observation of capelin presence without mention of spawning.

Since the Network's founding, capelin spawning in the Lower Estuary has been observed mainly in May and June and appears to peak in June.

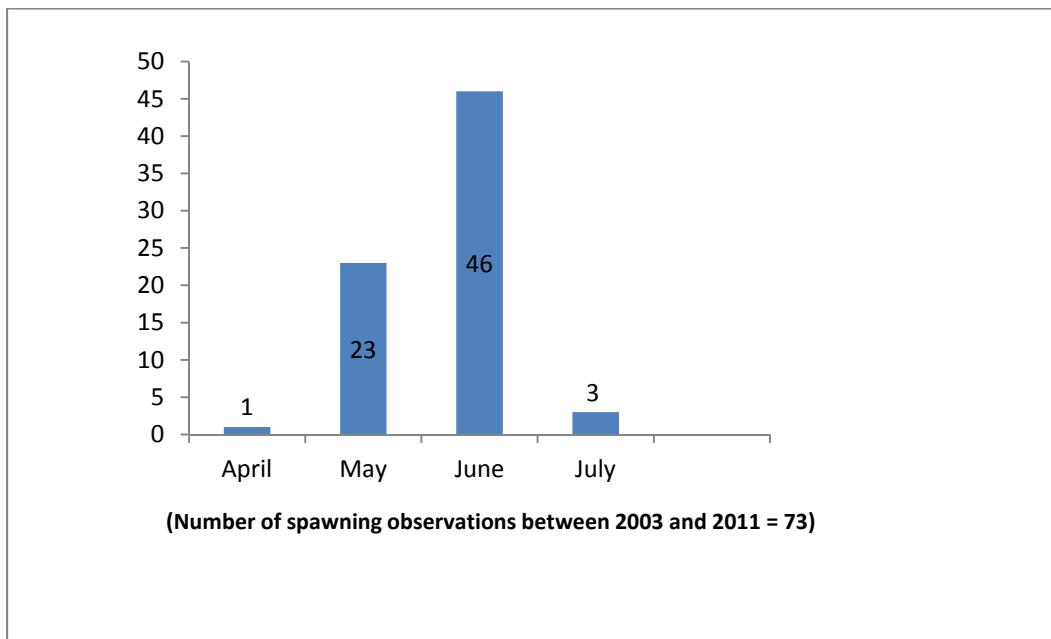


Figure 6: Period of observation of capelin spawning in Lower Estuary between 2003 and 2011.

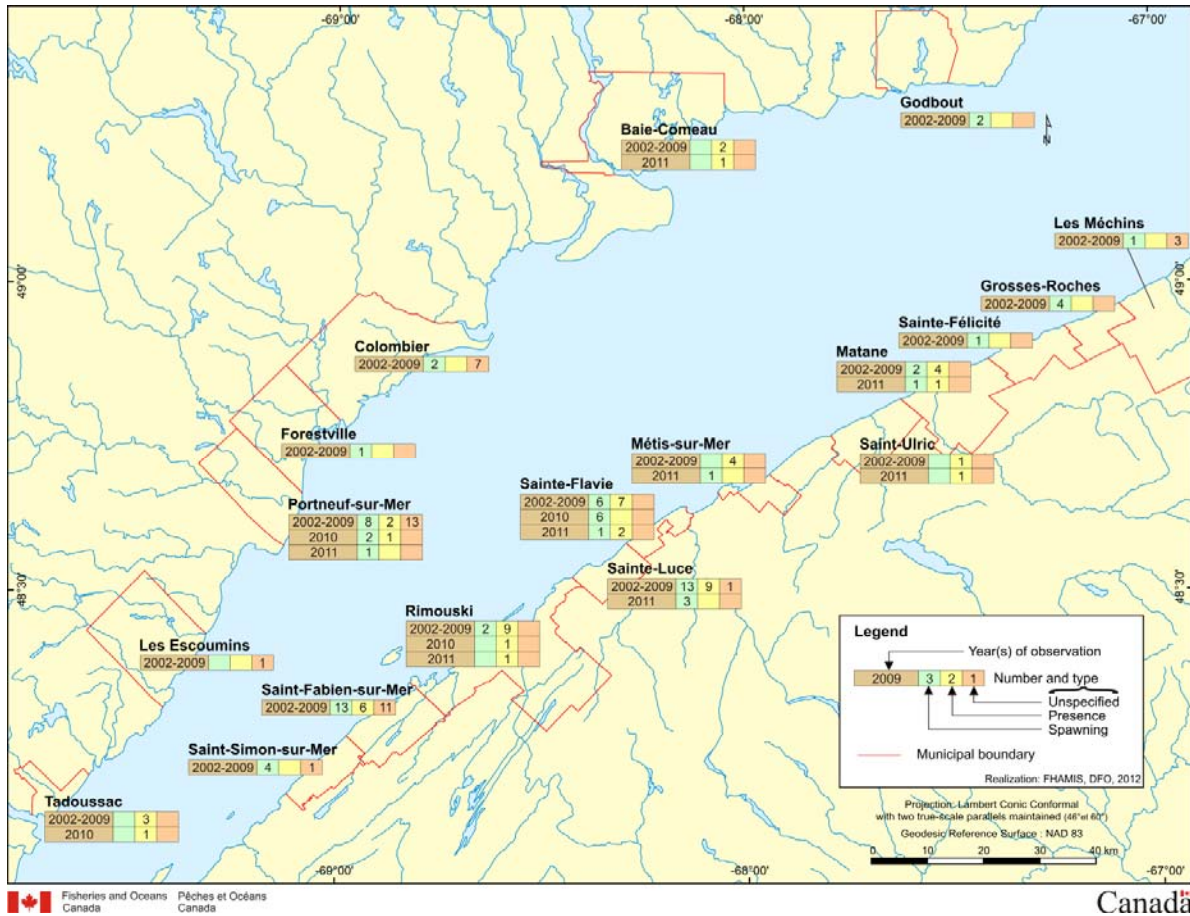


Figure 7 : Locations of observations of capelin spawning and presence in Lower Estuary between 2003 and 2011.

Middle North Shore - Gulf

The Middle North Shore zone extends from Baie-Trinité (Pointe-des-Monts) eastward as far as Natashquan (Pointe-Parent) including Anticosti Island.

Observations

In 2011, the number of observers and observations remained stable in comparison to 2010. A total of 24 observers reported 87 observations in this zone between May 9 and July 2. Of these observations, 57 involved spawning. Observations of capelin presence were reported between May 2 and July 13. Observations were made in three new areas: Port Cartier (Grand-Ruisseau), Sept-Îles (Rivière Brochu) and Rivière-au-Tonnerre (Rivière-aux-Graines).

Table 6 : Dates of observation of capelin spawning or presence between 2003 and 2011 in Middle North Shore.

<i>Location</i>	<i>2002 - 2009</i>	<i>2010</i>	<i>2011</i>
Baie-Trinité (Îlets-Caribou)	May 2005, 2006 June 2006	---	May: 24
Port-Cartier (Pointe-aux-Anglais)	May 2002, 2004 - 2008 June 2006 - 2007 May - June 2009	May: 8, 9, 17	May: 22
Port-Cartier (Rivière-Pentecôte)	May 2004, 2005, 2008 June 2008 July 2009	June: 4, 9	---
Port-Cartier (Grand-Ruisseau)	---	---	May: 9 - 13, 23, 27 June: 2, 4
Sept-Îles (Gallix)	May - June 2003, 2005 - 2009 June - July 2004	May: 12 [‡] , 12, 15, 17 - 23, 28, 29 June: 5, 8, 29 [‡]	Mai : 2 [‡] , 19, 21, 22 [‡] , 25 - 27 June: 3 - 5, 7 - 9, 12 [‡] , 28 [‡] , 29 [‡] July: 1 [‡] , 8 [‡]
Sept-Îles (Sept-Îles)	April - June 2002, 2007 May - June 2004, 2005, 2008 May 2006 May - July, September 2009	---	May: 27 [‡] June: 28
Sept-Îles (Moisie)	May 2007, 2008 July 2009	---	---
Sept-Îles (Matamec)	June 2009 July 2008	---	May: 30, 31 June: 5 July: 1 [‡] , 2
Uashat Mani-Utenam (Uashat)	mak May 2006, 2008 June 2008 May - June 2009	---	---

<i>Location</i>	<i>2002 - 2009</i>	<i>2010</i>	<i>2011</i>
Rivière-au-Tonnerre (Sheldrake)	May 2005 July 2008	June: 3, 4, 8, 11, 12, July: 4	May: 25 June: 5
Rivière-au-Tonnerre (Rivière-au-Tonnerre)	May 2005, 2006, 2008 May - June 2009 June 2004, 2007 July 2008	May: 31 June: 1, 5, 7, 9, 10, 12 - 22, 25, 26, 28	---
Rivière-au-Tonnerre (Rivière-aux-Graines)	---	---	June: 10 July: 7 [‡] - 13 [‡]
Rivière-Saint-Jean (Magpie)	May 2006 - 2009 June 2004 - 2009 July 2006	May: 20	---
Rivière-Saint-Jean (Rivière-Saint-Jean)	July 2008	July: 11 [‡]	May: 27, 31 June: 1, 2 [‡] , 4, 7, 9, 17, 24 - 26
Longue-Pointe-de-Mingan (Longue-Pointe-de-Mingan)	May 2005 - 2009 June 2002, 2004, 2005, 2008, 2009 July 2006, 2008	May: 1 - 5, 20 June: 2, 20 - 31 July: 1, 2, 3, 6	May: 25 - 26 June: 7, 11
Longue-Pointe-de-Mingan (Mingan)	Mid-May - mid-June 2006, 2007 June 2002, 2009	May: 22, 28, 31 June: 1, 2, 3	May: 25, 29
Havre-Saint-Pierre	May 2007, 2008 June 2002, 2004, 2009 May - June 2005	July: 15 [‡]	---
Aguanish	May 2003, 2008 June 2002, 2008, 2009 May - June 2004 - 2007 July 2008	May: 17	June: 4, 11
Natashquan	June 2007 June - July	May: 20	---

<i>Location</i>	<i>2002 - 2009</i>	<i>2010</i>	<i>2011</i>
2006			
Anticosti Island	June - July 2004, 2009 July 2005 June 2006 - August 2008	June: 16, 17 [‡] July: 27 [‡] August: 2 [‡]	June: 20, 21 [‡] , 23 [‡] July: 5 [‡] , 12 [‡]

Names in parentheses denote sections of municipalities. ‡ Denotes date of observation of capelin presence without mention of spawning.

Since 2002, capelin spawning in the Middle North Shore has been observed mainly in May and June as well as, in some years, through mid-July.

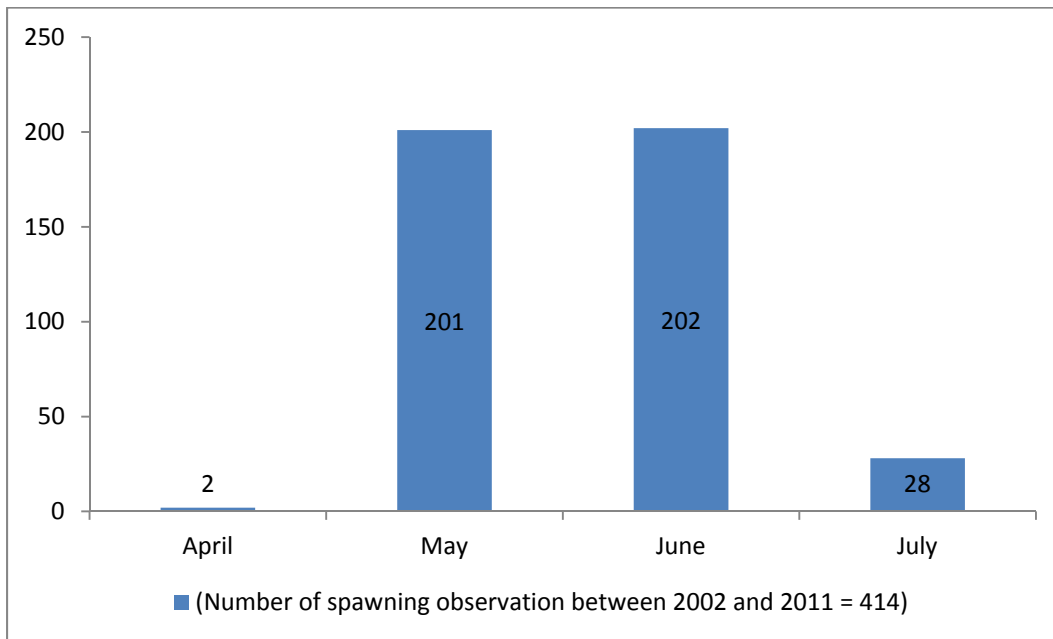


Figure 8: Period of observation of capelin spawning in Middle North Shore between 2002 and 2011.

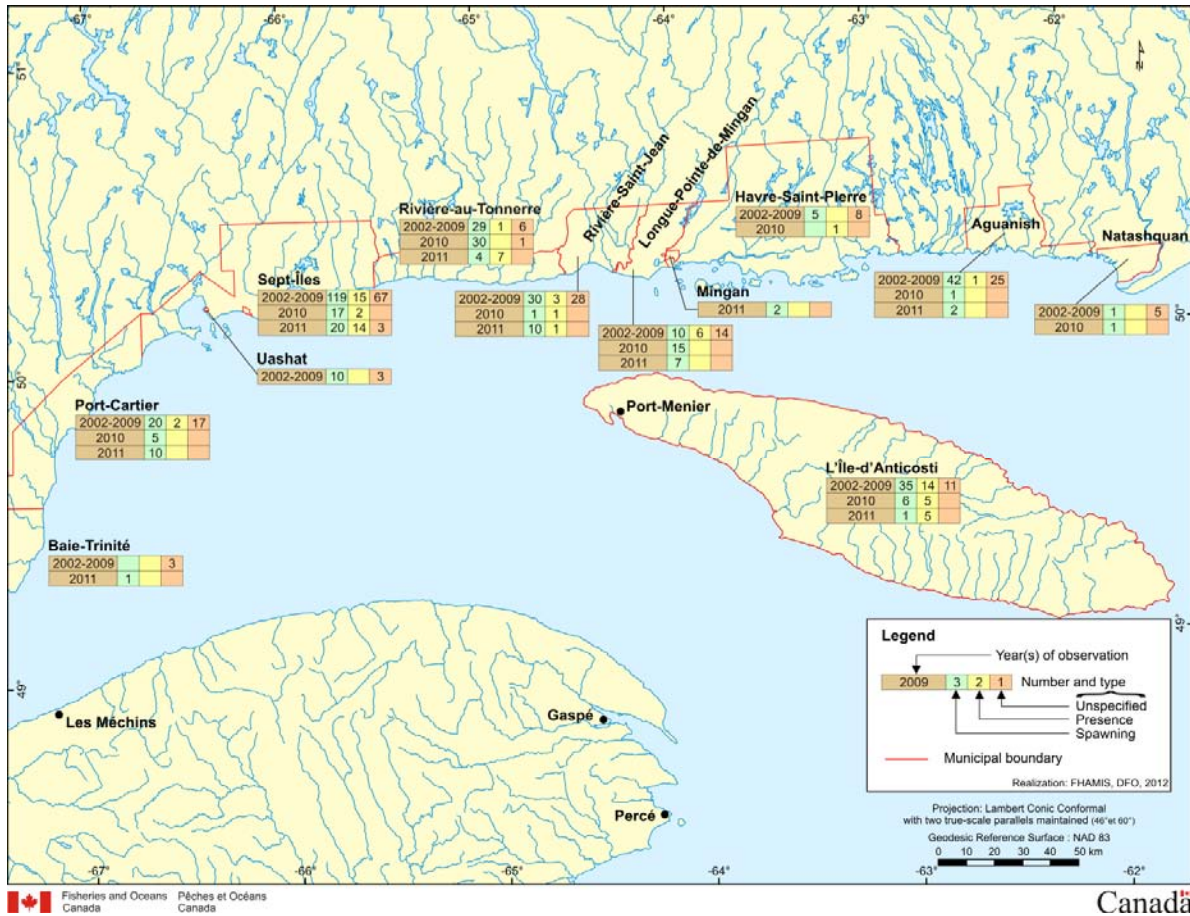


Figure 9 : Locations of observation of Capelin Spawning and Presence in Middle North Shore between 2002 and 2011.

Lower North Shore - Gulf

The Lower North Shore zone extends from Natashquan (Pointe du Vieux Poste area east of the Natashquan River) to the Labrador border.

Observations

In 2011, one observer reported three observations involving spawning and one of capelin presence in this zone.

Table 7 : Dates of observation of capelin spawning or presence between 2002 and 2011 in Lower North Shore.

Location	2002 - 2009	2010	2011
North Shore, Gulf of St. Lawrence (Kégaska)	May 2008	---	---
North Shore, Gulf of St. Lawrence (Chevery)	June 2004, 2005, 2008	---	July: 1, 17 [‡]

<i>Location</i>	<i>2002 - 2009</i>	<i>2010</i>	<i>2011</i>
	July 2006, 2009		
Bonne-Espérance (Vieux-Fort)	June 2002, 2009	June: 20 [‡] July: 20 [‡]	---
Blanc-Sablon (Lourdes-de-Blanc-Sablon)	June 2002, 2006 - 2008 June - July 2004, 2009	---	---
Blanc-Sablon (Blanc-Sablon)	June 2006, 2007, 2009	June: 28 [‡]	---

Names in parentheses denote sections of municipalities. ‡ Denotes date of observation of capelin presence without mention of spawning.

Since 2002, capelin spawning in the Lower North Shore has been observed mainly in June and early July.

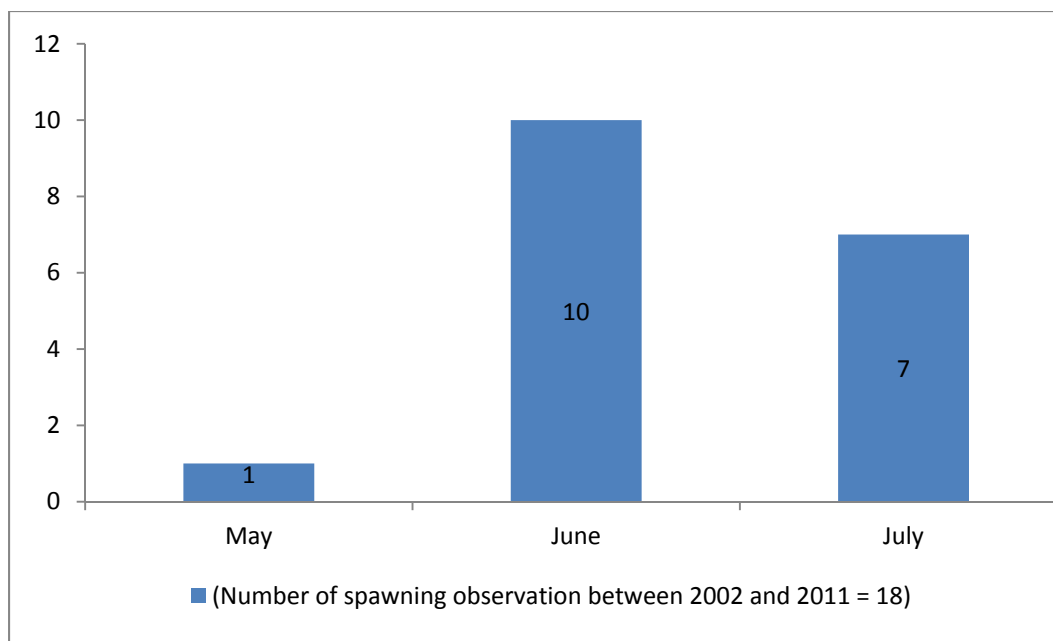


Figure 10: Period of observation of capelin spawning in Lower North Shore between 2002 and 2011.

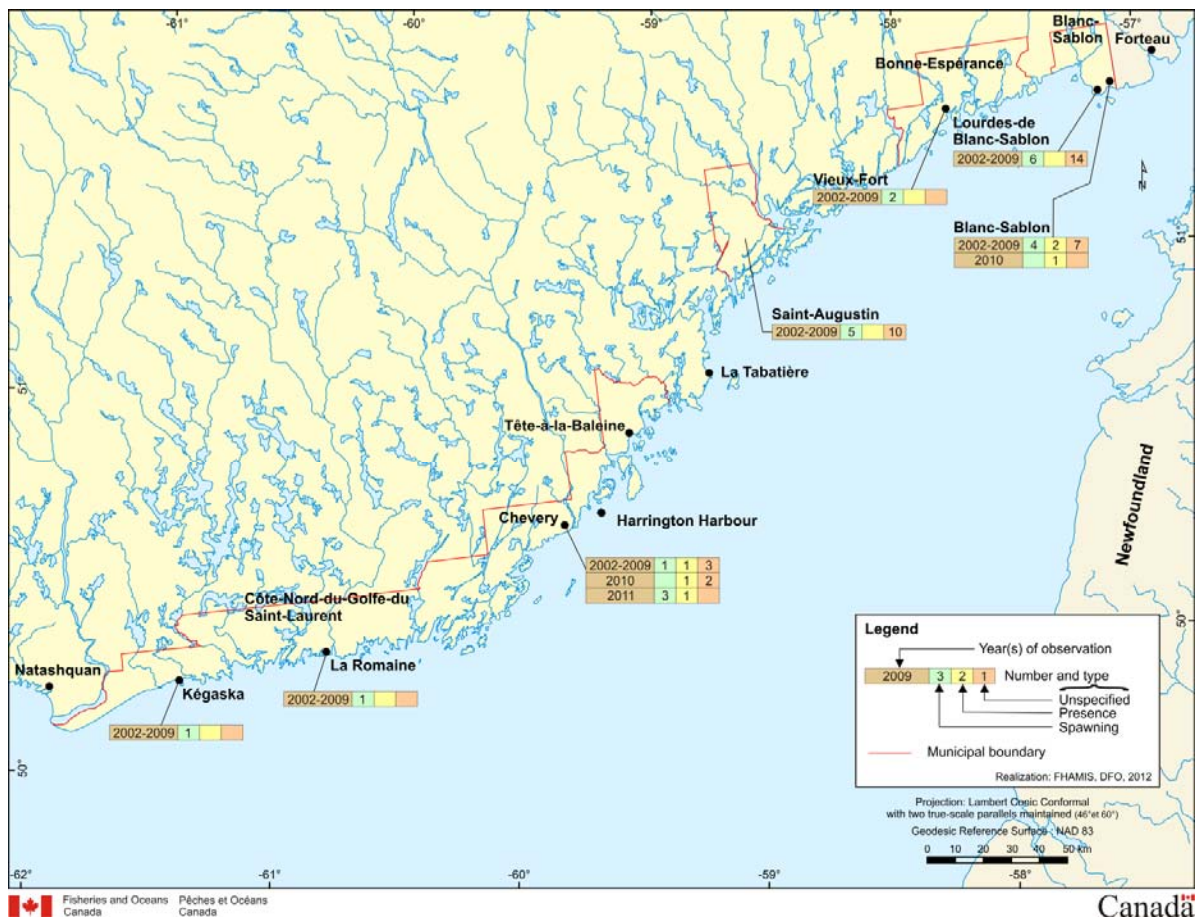


Figure 11 : Location of observations of capelin spawning or presence on the Lower North Shore between 2002 and 2011.

Northern Gaspé Peninsula - Gulf

This zone covers the north shore and tip of the Gaspé Peninsula from Cap-Chat (Capucins area) to Gaspé.

Observations

In 2011, 11 observers reported 13 observations of capelin spawning between June 15 and 24, up from just three in 2010. Observations were made in two new areas: Anse-à-Valleau and Anse-aux-Amérindiens.

Table 8 : Dates of observation of capelin spawning or presence between 2004 and 2011 in Gaspé Peninsula.

<i>Location</i>	<i>2004 - 2009</i>	<i>2010</i>	<i>2011</i>
Cap-Chat (Capucins)	June 2004	---	---
Cap-Chat (Cap-Chat)	May - June 2007, 2008, 2010	---	---
La Martre	June 2004, 2006	---	---

<i>Location</i>	<i>2004 - 2009</i>	<i>2010</i>	<i>2011</i>
	May - June 2009		
Sainte-Anne-des-Monts	May 2008 June 2009	---	---
Marsoui	June 2004	---	June: 21
Rivière-à-Claude	May - June 2008 June 2004 - 2007, 2009 July 2004	July: 7, 9	June: 20, 24
Mont-Saint-Pierre	June 2008, 2009 July 2004	---	---
Saint-Maxime-du-Mont-Louis (Mont-Louis)	June 2005, 2008	June	---
Saint-Maxime-du-Mont-Louis (L'Anse-Pleureuse)	May - June 2009	---	---
Sainte-Madeleine-de-la-Rivière- Madeleine (Manche-d'Épée)	June 2004, 2005	---	---
Sainte-Madeleine-de-la-Rivière- Madeleine (Rivière-Madeleine)	June 2004, 2008, 2009	June: 9	June: 20 - 22
Grande-Vallée	June 2004, 2006 - 2009 July 2006 August 2005	---	June: 14 [‡] - 16 [‡] , 17, 18 [‡] , 19 [‡] , 20, 21
Gaspé (Anse-à-Valleau)	---	---	June: 23
Gaspé (Saint-Maurice-de-l'Échourie)	2005 - 2007	---	---
Gaspé (Petit-Cap)	June 2009 July - August 2005	---	---
Gaspé (Rivière-au-Renard)	May - June 2007 Mid-June 2006	---	---
Gaspé (Cap-des-Rosiers)	June 2005 - 2009	---	June: 15
Gaspé (Anse-aux-Amérindiens)	---	---	June: 21
Gaspé (Cap-Bon-Ami)	May - June 2007	---	---
Gaspé (Cap-aux-Os)	May - June 2007 June 2004	---	---
Gaspé (Gaspé)	May 2009 May - June 2007	---	May: 23 [‡] , 27 [‡] , 29 [‡]

<i>Location</i>	<i>2004 - 2009</i>	<i>2010</i>	<i>2011</i>
	June 2004 - 2006		
	July 2004		

Names in parentheses denote sections of municipalities. ‡ Denotes date of observation of capelin presence without mention of spawning.

According to the Network data, capelin spawning in the northern Gaspé Peninsula begins in late May and is observed mainly in June.

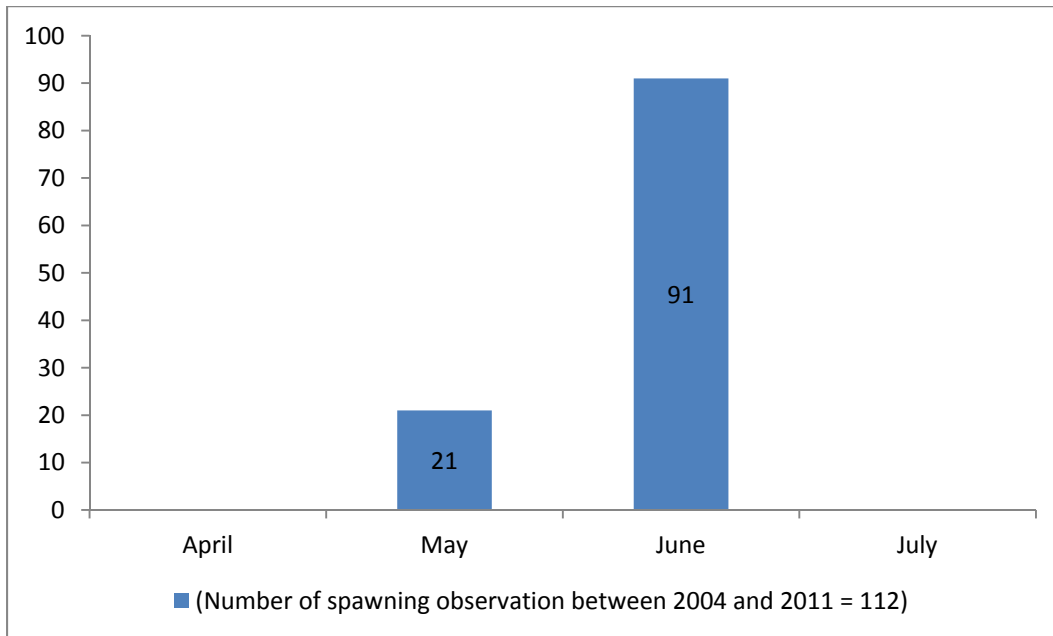


Figure 12 : Period of observation of capelin spawning in Gaspé Peninsula between 2004 and 2011.

Chaleur Bay - Gulf

The Chaleur Bay zone covers the southern Gaspé Peninsula from the mouth of the Restigouche River to Percé (Barachois area).

Observations

In 2011, six observers reported seven observations in this zone, two of which involved spawning.

In early July, residents of Barachois contacted Quebec's Ministère du Développement durable, de l'Environnement et des Parcs complaining about an odour coming off of decomposing capelin. The fish appeared to have been dragged by the tide into the pond area, where they had become trapped.

Table 9: Dates of observation of capelin spawning or presence between 2003 and 2011 in Chaleur Bay.

<i>Location</i>	<i>2002 - 2009</i>	<i>2010</i>	<i>2011</i>
Maria	May 2005	---	---
Bonaventure	May 2009	May: 12 - 15	---
New Carlisle	May 2005 - 2007, 2009	---	May: 28 [‡]
Paspébiac	May 2003 - 2005, 2009	---	---
Port-Daniel-Gascon (Port-Daniel)	May - June 2003, 2009	---	---
Chandler (Newport)	May 2005 - 2009 June 2006, 2008, 2009	May: 13 [‡]	June: 21 [‡]
Chandler (Chandler)	June 2006, 2008 2007	---	June: 6 [‡]
Chandler (Pabos)	May 2006 June 2008	---	---
Grande-Rivière	2006 May - July 2009	April: 29 [‡] May: 13 [‡] , 20 [‡]	---
Sainte-Thérèse-de- Gaspé	May 2008	---	---
Percé (Percé)	May - June 2009 June 2005, 2007	May: 31	June: 29
Percé (Anse-à-Beaufils)	May 2009 June 2008	---	June: 15
Percé (Barachois)	May - June 2009	---	July: 7 [‡]

Names in parentheses denote sections of municipalities. ‡ Denotes date of observation of capelin presence without mention of spawning.

Since 2003 in Chaleur Bay, capelin spawning has been observed mainly in May and, to a lesser extent, June.

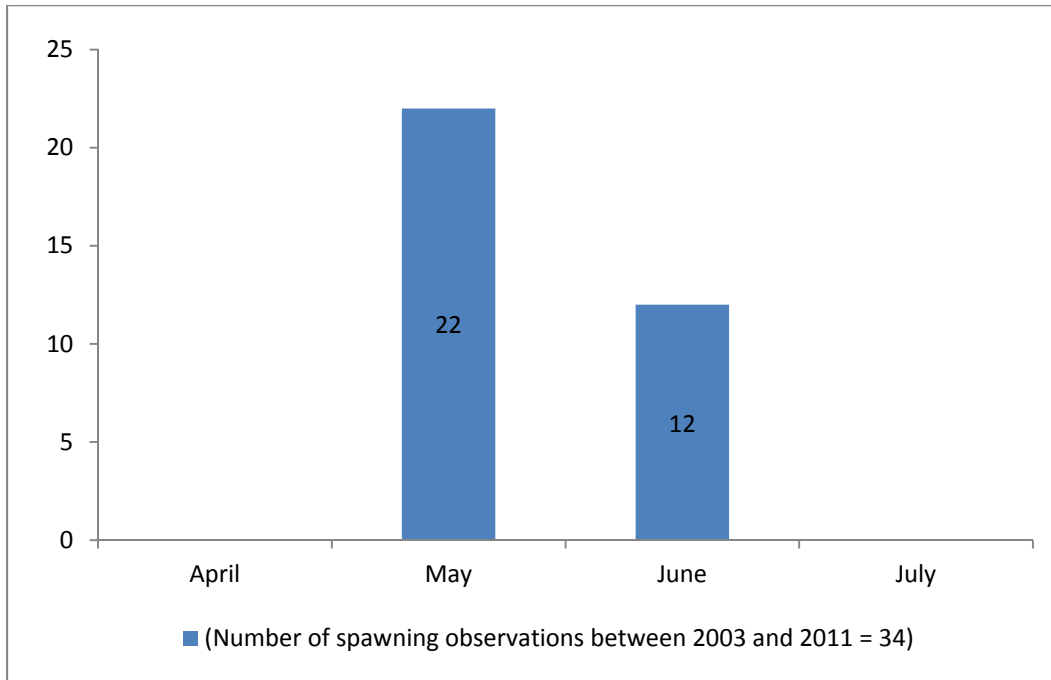


Figure 13 : Period of observation of capelin spawning in Chaleur Bay between 2003 and 2011.

Magdalen Islands - Gulf

The Magdalen Islands zone encompasses all islands in that archipelago.

Observations

The first observation of capelin presence in this zone since the Network's founding was reported in June 2008 at Cap de l'hôpital in Fatima by lobster and flounder fishers. In 2011, two observers made four observations of capelin presence on the beach at Pointe-aux-Loups and at Étang-du-Nord between June 21 and July 1.

Table 10 : Dates of observation of capelin spawning or presence between 2008 and 2011 in Magdalen Islands.

<i>Location</i>	<i>2008 - 2009</i>	<i>2010</i>	<i>2011</i>
Fatima	June 2008	---	---
Étang-du-Nord		---	June: 27 [‡]
Pointe-aux-Loups		---	June: 21 [‡] , 30 [‡] July: 1 [‡]

[‡] Denotes date of observation of capelin presence without mention of spawning.

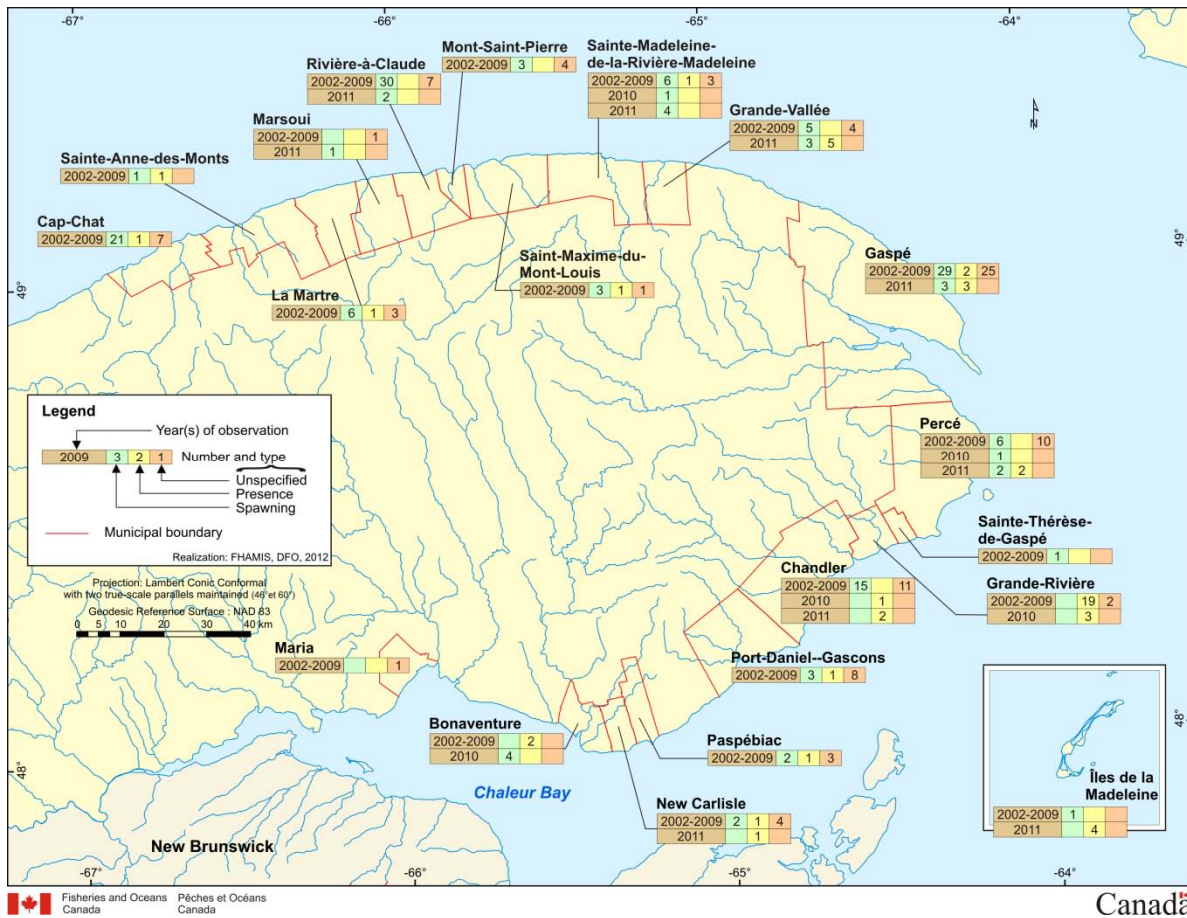


Figure 14: Location of Observations of Capelin Spawning and Presence in Gaspé Peninsula, Chaleur Bay and Magdalen Islands.

Newfoundland and Labrador

The Newfoundland and Labrador zone includes all municipalities throughout that province.

Observations

In 2011, seven observers reported 11 observations involving spawning and six of capelin presence in this zone.

Table 11 : Dates of observation of capelin spawning or presence between 1945 and 2011 in Newfoundland and Labrador.

<i>Location</i>	<i>1945 - 2009</i>	<i>2010</i>	<i>2011</i>
Forteau, Labrador	July 2008	---	---
Sandy Cove Bay	August 1991	---	---
Port au Choix	---	---	June: 27
Port Saunders	---	---	June: 27
River of Pounds	---	June: 29 [‡]	June: 13, 27
Bellburns ⁷	June - July 1945 - 1979	---	---
	May - June 1980 - 1989		
	June - July 1990 - 1999		
	June 2002		
Trout River	---	---	June: 27
Meadows	---	---	June: 18
John's Beach	---	March: 14 [‡]	---
Ship Cove	---	---	June: 28 [‡]
Portugal Cove South	---	---	June: 22, 23
			July: 14 [‡]
Middle Cove	July 2006, 2008	---	June: 27, 29
	June - July 2007		July: 4 [‡] , 7 [‡] , 18
	July - September 2009		
Torbay	August 1998	---	June: 29 [‡]
			July: 4 [‡] , 7 [‡]

Names in parentheses denote sections of municipalities. ‡ Denotes date of observation of capelin presence without mention of spawning.

Since the start of observation in Newfoundland and Labrador, capelin spawning has been observed mainly in June and, to a lesser extent, July.

⁷ Personal records contributed courtesy of a resident of Bellburns

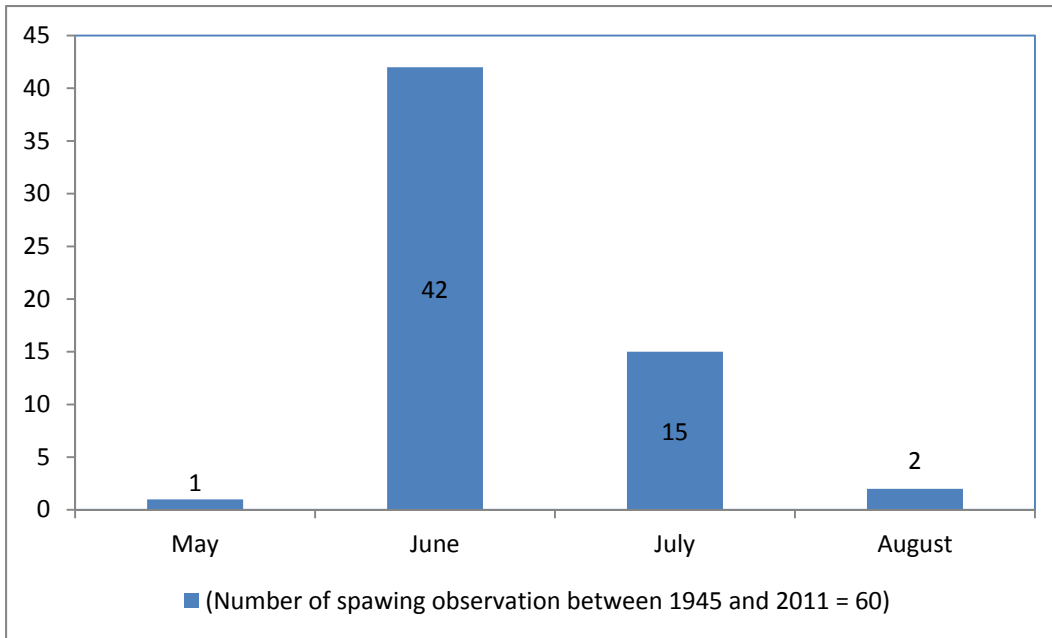


Figure 15 : Period of observation of capelin spawning in Newfoundland and Labrador between 1945 and 2011.

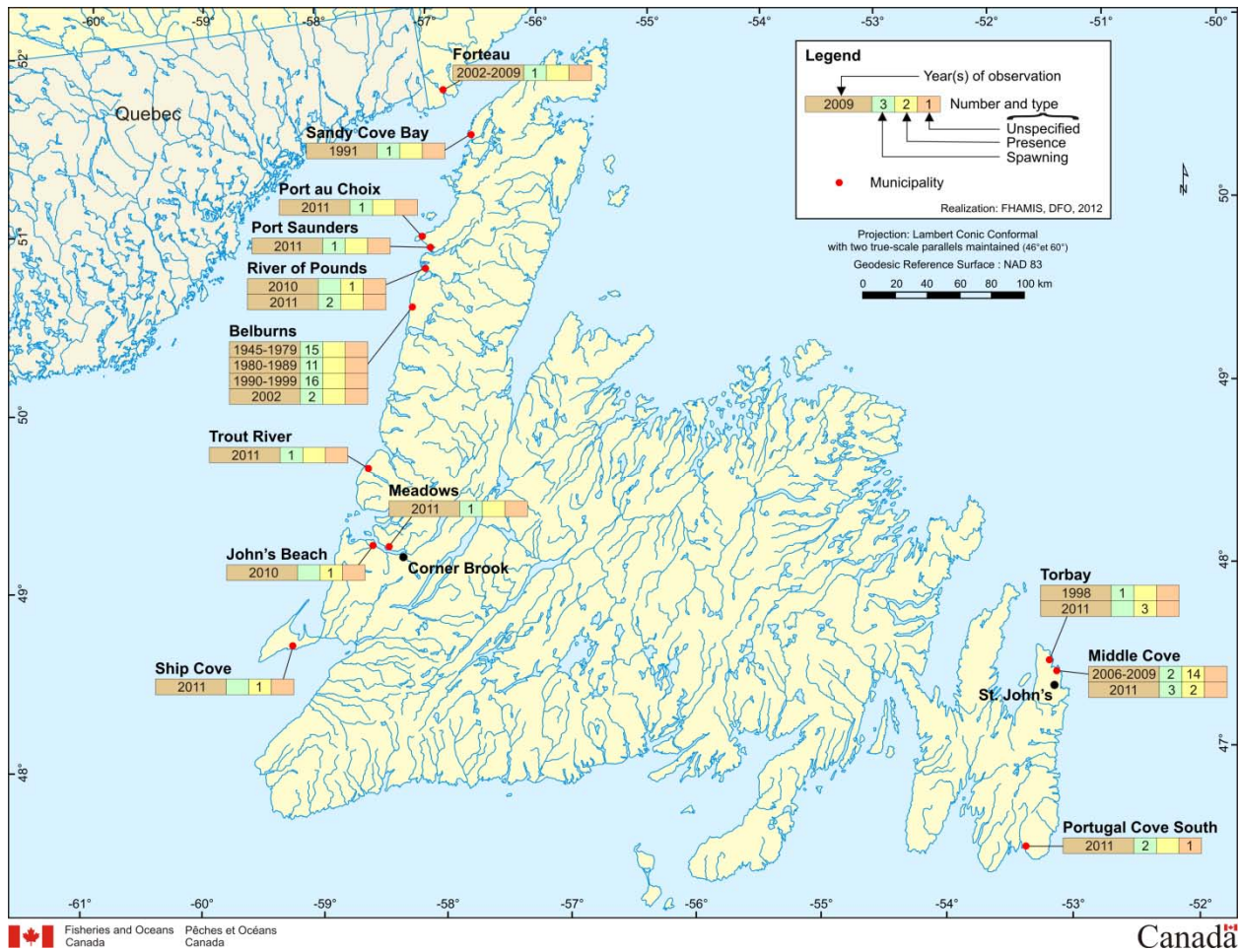


Figure 16 : Location of observation of capelin spawning or presence in Newfoundland and Labrador between 1945 and 2011.

Instructions for completing the observer form

This form is designed to enable you to collect all the required information which, once submitted to Fisheries and Oceans Canada, will be used to prepare an overview of the situation in 2011 at the end of the season. Capelin spawning can be influenced by various factors, such as the type of beach, weather conditions and wave action. 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.

General information sheet

One sheet per observation site must be completed. It 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 geographic information system.
- × ***Your personal contact information***
This information will allow us to send you the necessary documentation and to get in touch with you if we have any questions about your data. This information will remain confidential and will be used only for the purposes of the 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***
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 may keep any unused data sheets just in case you observe a late spawning. You may also call 1-877-227-6853 or use the online registry (<http://www.qc.dfo-mpo.gc.ca/signaler-report/roc-con/capelan-capelin-fra.asp>) to submit your observations during the spawning season.

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 determine whether there is a link between spawning activity and any factors associated with those dates and times.
- × ***Observation type***
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 signs of its 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 beaches where capelin spawn and determine whether capelin are “flexible” in selecting spawning sites. Note that a GPS location is very useful for digitizing data. This may be a single set of coordinates or, even better, coordinates taken at the eastern and western boundaries of the spawning area.

× ***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 Information Sheet

CON observation area: _____

Name _____

Address _____

Telephone _____

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 data, spawning areas, etc.)?

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

If you want a Report or a Kit next year, send us an email at the following address :

ROC-CON@dfo-mpo.gc.ca

or you can apply by calling : 1-877-227-6853.



Data Sheet for Observations of Capelin Spawning or Presence

Return address
 Capelin Observers Network
 OMB - Maurice Lamontagne Institute
 P.O. Box 1000, Station Main
 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 sand gravel cobble bedrock

Weather and tide conditions

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

Temperature: _____^{°C} or _____^{°F} Clear sky Cloudy Light rain Heavy rain

Tide: Ebb tide Low tide Flood tide High tide

Waves: Calm Small Moderate Large
 (none) (< 2 in/0.6 m) (2 to 5 in/0.6 to 1.5 m) (> 5 in/1.5 m)

Evaluation criteria

Quantity rolling at time of observation Small Moderate Large

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

Comparison with previous years for the entire season Fewer Same More

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 fishers, unusual behaviour, presence of predators, etc.)

Network and partner contact information

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



Telephone: 1-877-227-6853

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

Web site: <http://www.qc.dfo-mpo.gc.ca/signaler-report/roc-con/capelan-capelin-eng.asp>

Address: Capelin Observers Network (CON)
OMB - Maurice Lamontagne Institute
P.O. Box 1000, Station Main
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.



Comité ZIP Baie des Chaleurs - Tel. 418-759-5880

Email: zonebdc@globetrotter.net Web site: www.zipbaiedeschaleurs.ca



Comité ZIP du Sud-de-l'Estuaire - Tel. 418-722-8833

Email: zipse@globetrotter.net Web site: www.zipsud.org



Comité ZIP de la rive nord de l'estuaire - Tel. 418-296-0404

Email: zip.rne@zipnord.qc.ca Web site: www.zipnord.qc.ca



Comité ZIP Côte-Nord du Golfe - Tel. 418-968-8798

Email: info@zipcng.org Web site: www.zipcng.org



Réseau d'observation de mammifères marins (ROMM) - Tel. 418-867-8882

Email: info@romm.ca Web site: www.romm.ca



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

Tel. 418-534-4498

Email: cregim@globetrotter.net

Web site: www.cregim.org



Réseau des observateurs sous-marins (ROSM) - Tel: 418-739-4254 or 418-737-4628

Web site: www.rosm.ca



Amphibia-Nature

Tel. 418-782-1808

Email: info@amphibia-nature.org Web site: www.amphibia-nature.org



Gros Morne Beach Watch - Tél. : 709-458-3567

Email : grosmornebeachwatch@gmail.com

Facebook : <http://www.facebook.com/grosmornebeachwatch>