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CAPELIN OBSERVERS NETWORK

OBSERVER KIT - 2011



Canada 

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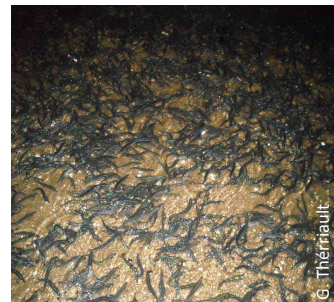
Conception
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Introduction

“There was a 12-year-old boy with us who was getting impatient and wanted to leave. All of a sudden, we saw a capelin at the edge of the water. I told him it was a ‘scout.’ He scooped it up and put it in his bucket. I told him that it wouldn’t be able to inform the others and so he took it out of the bucket and put it back into the water. The capelin began rolling in, forming shoals 7 inches [roughly 18 cm] deep. The young boy went wild, scooping them up with his hands. He told me I was right and that he’d believe me in the future.”



Gérald Thériault, observer since 2005, May 21, 2010

Dear Observer,

Where and when will the capelin roll in 2011? As we begin our **tenth 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 2010, 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 2011 observation season and
thank you for your interest in the Network!**

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Capelin Observers Network (CON)

The Capelin Observers Network (CON) was established to promote a better understanding of capelin spawning grounds 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, such as certain ZIP (area of prime concern) committees and coastal committees, developed a network of contacts to collect data on capelin spawning.

From 2002 to 2009, the number of Network observers and observations has steadily increased, providing an overview of the distribution of the capelin spawning sites in nearshore areas. However, the 2010 season yielded less information. We do not know precisely [exactly] whether this was due to a smaller spawning event or whether fewer observations were reported. In the 2010 season, there were 44 observers and a total of 129 observations.

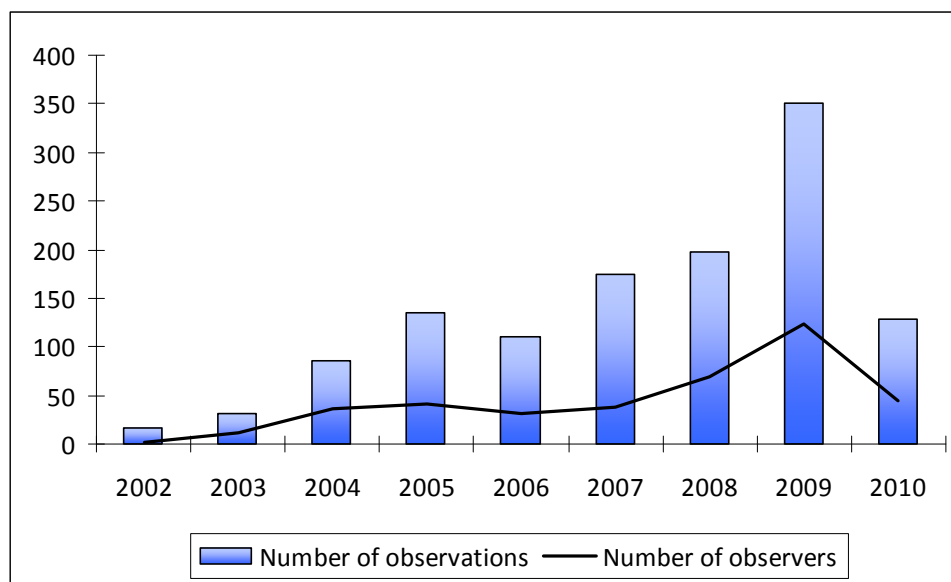
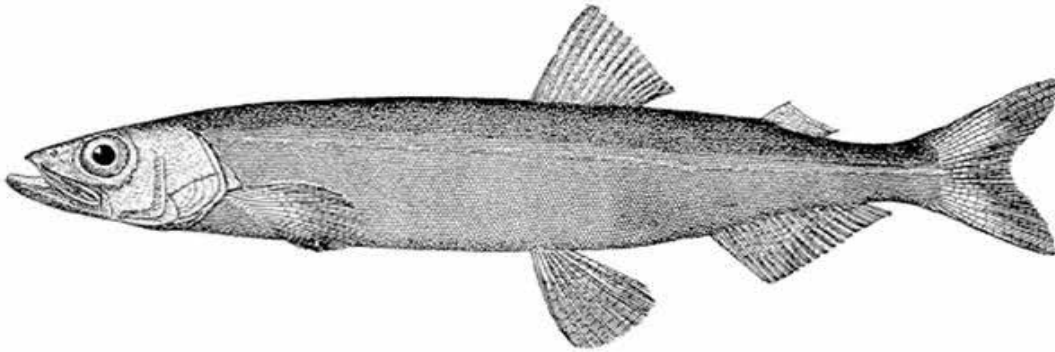


Figure 1: Change in the number of observers and observation records over time

This growing body of knowledge on the location of capelin spawning grounds and habits will improve our understanding of this important component of the St. Lawrence ecosystem. This information will also help to better protect spawning grounds, particularly during the spawning and incubation period, and will lead to the recommendation of measures aimed at mitigating the impacts on capelin habitat of work carried out near spawning grounds. The data gathered by the Observer Network may also 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.

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

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.

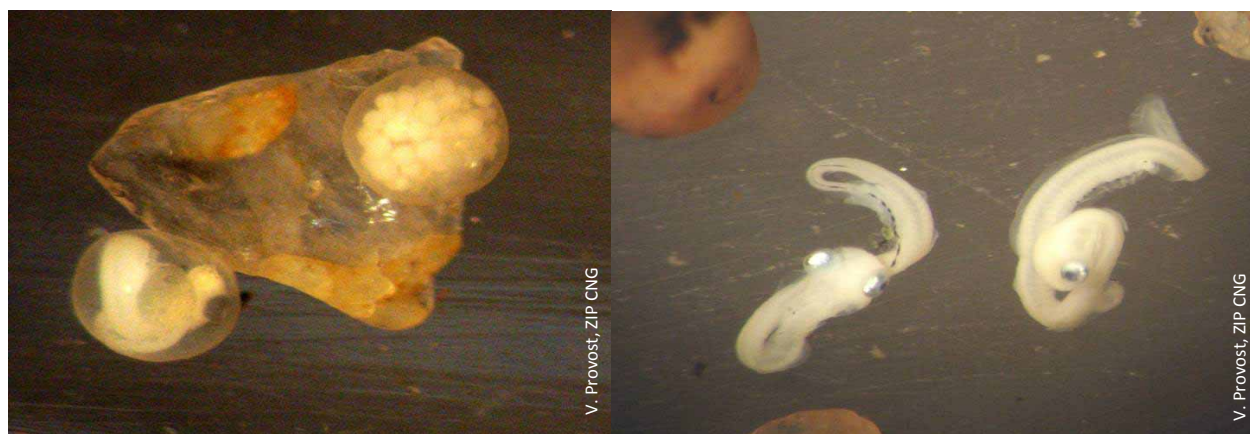
When capelin spawn on beaches, this is called “rolling” or “landing.” In the Estuary and Gulf of St. Lawrence, capelin “roll” on the shores between mid-April and July, depending on the area, when water temperatures are between 6 and 10 °C. Spawning usually occurs at night.



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.

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

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 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.

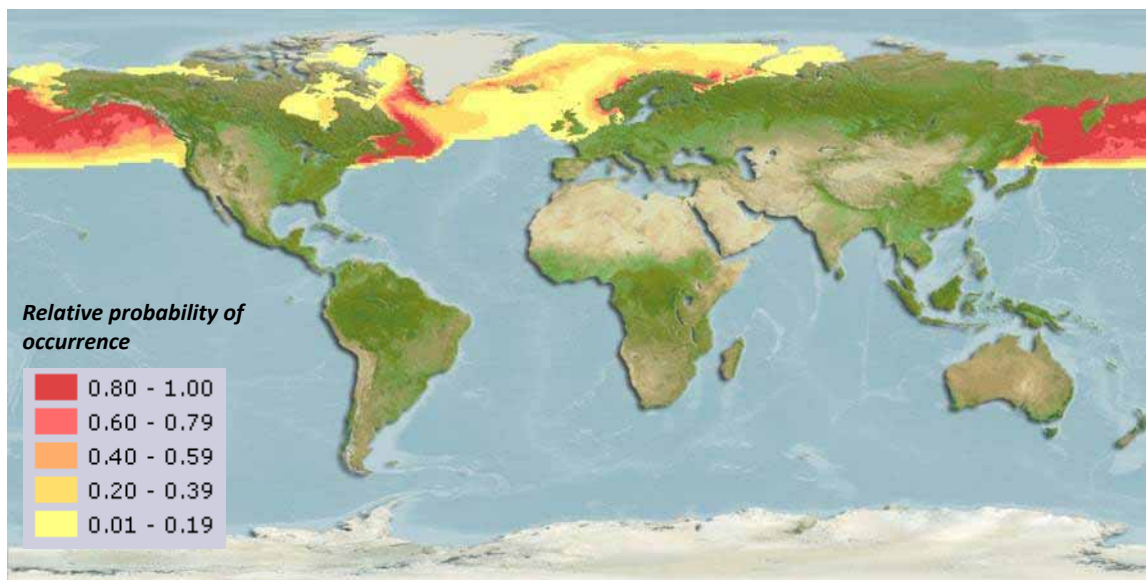


Figure 2: Global distribution of capelin²

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.

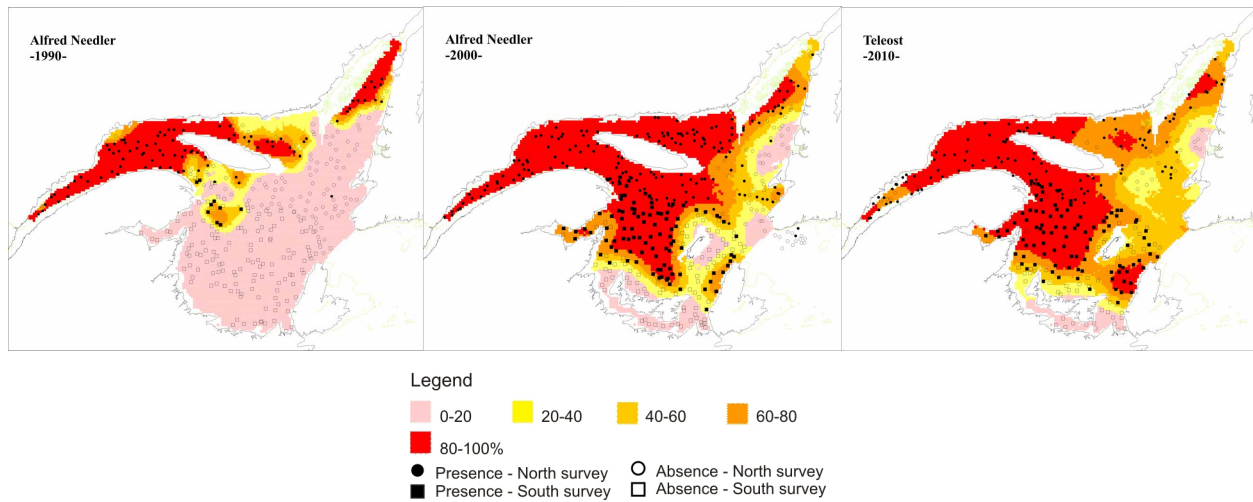


Figure 3: Probability surfaces (%) of capelin presence for multidisciplinary surveys conducted in the Estuary and northern and southern Gulf of St. Lawrence between 1990 and 2010

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

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.

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!

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.

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.



Fishing for capelin with dip nets

Capelin Spawning Habits

Since its creation, the Network has gathered 747 observations of spawning activity and 189 observations of signs of capelin presence. The information collected, such as the date and time of the observation, tidal conditions and type of spawning grounds, is used to identify trends that 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?

Time of Day

Capelin appear to spawn more often in darkness, at least when spawning activity takes place along the shore. Data from the Network show that spawning was observed almost five times more often at night, between 6:00 p.m. and 6:00 a.m., than during the rest of the day.

Table 1: Breakdown (in percentage) of capelin spawning observations by period of the day

<i>Time of day</i>	<i>Number of observations</i>	<i>Percentage (%)</i>
Day (between 6:00 a.m. and 5:59 p.m.)	86	16.4
Night (between 6:00 p.m. and 5:59 a.m.)	437	83.6

(Number of spawning observations from 2002 to 2010 with information on the time = 523)

Tide

A comparison of spawning records with tide data reveals that 11% more capelin spawning occurs during the flood tide than during the ebb tide.

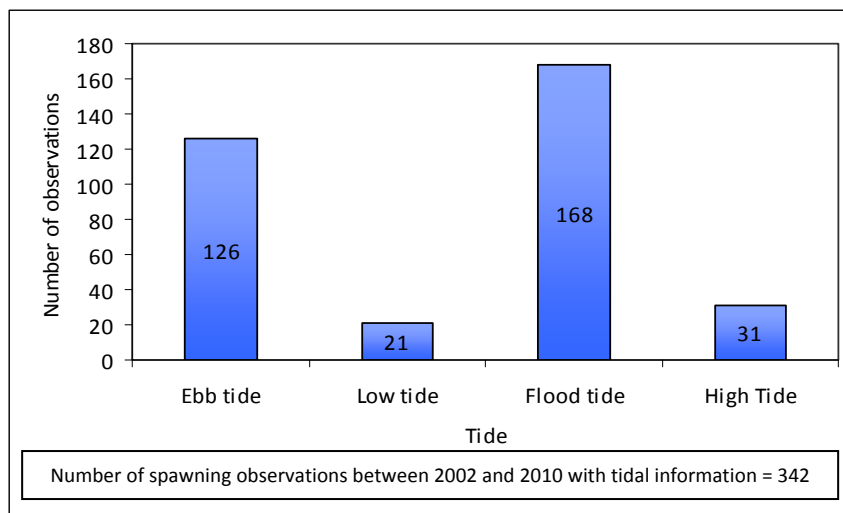


Figure 4: Number of capelin spawning observations by tidal cycle

Type of Spawning Ground

The vast majority of spawning observations are of spawning on sand beaches. However, the data collected do not specify the size of the substrate. One out of ten times, spawning occurs on gravel beaches.

Table 2: Breakdown (in percentage) of capelin spawning observations by type of substrate

<i>Substrate</i>	<i>Number of observations</i>	<i>Percentage (%)</i>
Sand	479	87
Gravel	52	10
Cobble	13	2
Bedrock	3	1

(Number of spawning observations between 2002 and 2010 with information on substrate = 547)



Capelin on various spawning substrate types (clockwise: sand, gravel, bedrock and cobble)

Were there more capelin in 2010?

This question is difficult to answer because annual monitoring of capelin abundance is not carried out. The data collected by the Network from 2007 to 2009 show that most observers estimated that the number of spawning capelin was high. That was not the case in 2010. Over the past year, the number of spawning capelin was described equally as high, moderate and low. It should be noted that the number of observers and observations generally fell between 2009 and 2010. As a result, we are unable to say whether there were actually fewer capelin on the shore.

Table 3: Compilation of estimates of numbers of spawning capelin

<i>Year</i>	<i>High</i>	<i>Average</i>	<i>Low</i>
2006	25	0	75
2007	66	17	17
2008	62	23	15
2009	49	29	22
2010	43	33	24

The number of spawning capelin is influenced by a number of factors. For example, a milder winter, a change in ice cover or a change in freshwater inflows can all have an effect on variations in spawning.

According to some observers, capelin rolled on the same date and in comparable numbers as in previous years in their location. Others reported a change in beach and the formation of a sand bank several metres from the shore. Capelin are said to have rolled at this location rather than moving in to the beach.

Your participation in the 2011 Network is needed in order to monitor capelin spawning and identify new trends. It is also important that your observations be well documented.

Observations for the 2010 season by area

In 2010, 129 observations were reported, as follows: 93 spawning observations, 32 observations of signs of capelin presence, and one observation of the absence of capelin. There were three other observations that did not indicate whether they were spawning observations or another type of observation. The observations were made in 31 different sectors and on 32 beaches or beach sections. A new site was included this year, namely the sector of Anse à Mouille-Cul, at Bic (Rimouski). The observations were compiled in the form of tables accompanied by maps. Once again this year, the tables distinguish spawning observations from observations of signs of capelin presence (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.

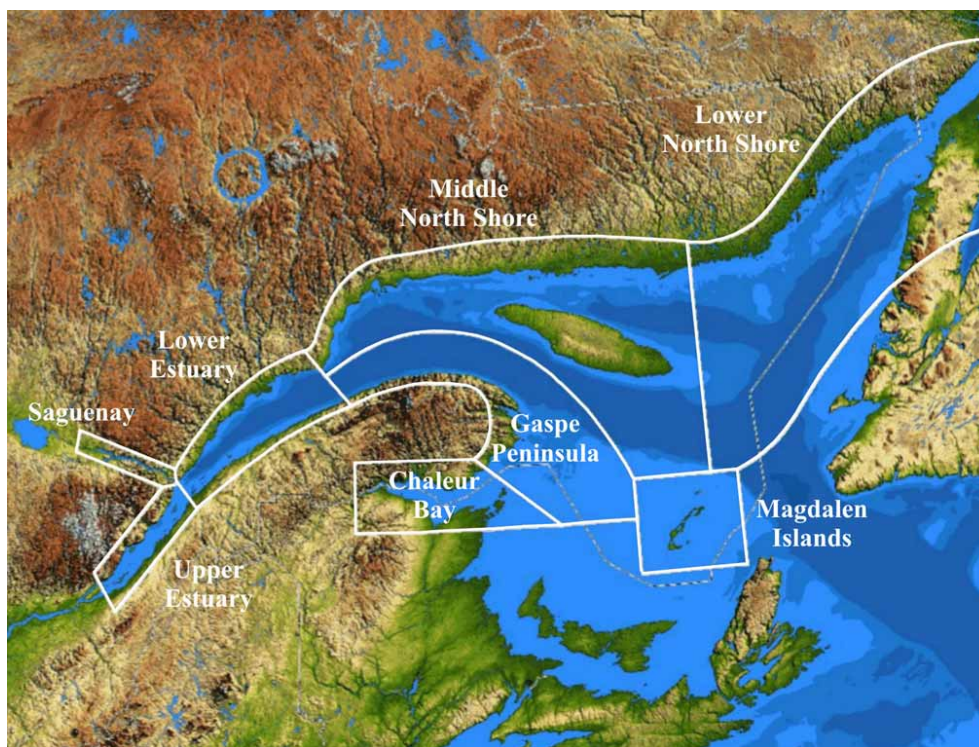


Figure 5: Capelin Observers Network observation areas

Middle Estuary

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

Observations

In 2010, capelin were observed on the shores of the Middle Estuary between April 15 and May 29. Fifteen observations of capelin presence were reported by four observers. No spawning activity was observed in 2010.

Table 4: Dates of observations of capelin spawning or presence between 2003 and 2010 in the Middle Estuary

Location	2003 to 2008	2009	2010
Saint-Irénée	April and May 2003 May and June 2004, 2006 and 2008 May, June and July 2005	April 13 [‡] and 14 [‡] , 20 [‡] to 24 [‡] May 2 [‡] , 10 [‡] to 14 [‡] , 17 to 20, 27 to 30 June 11 to 18, 27 [‡]	April: 15 [‡] , 20 [‡] to 23 [‡] , 25 [‡] , 28 [‡] to 30 [‡] May 1, 6, 7
La Malbaie (Port-au-Saumon /Anse aux Indiens)	June 2005	June 2009	---
Île-aux-Coudres	June 2007 April to early June 2008	---	May 28 [‡] and 29 [‡]
Kamouraska	June 2003	---	---
Rivière-du-Loup	---	June 17 [‡] to 19 [‡]	May 29 [‡]

Names in parentheses represent sectors of municipalities.

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

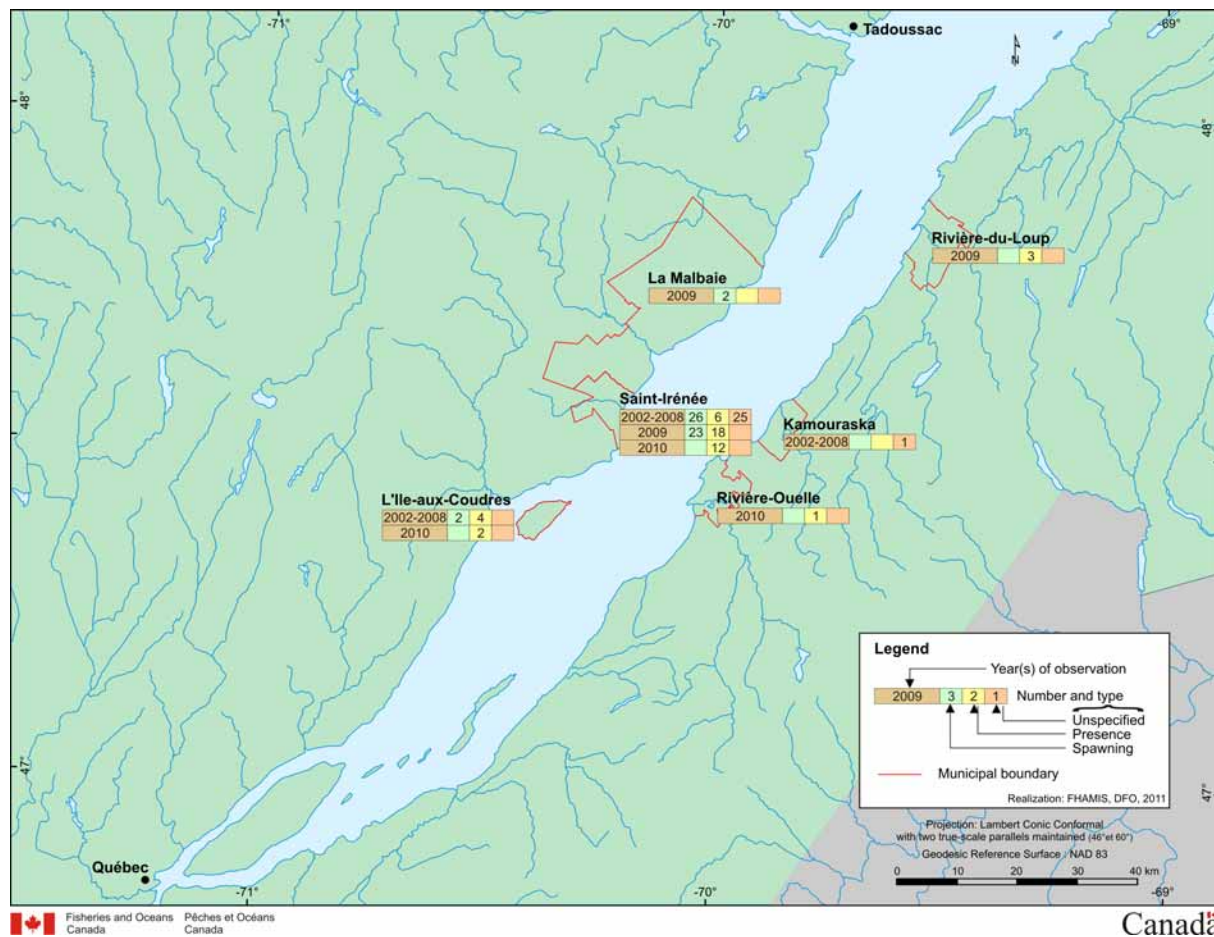


Figure 6: Locations of observations of capelin spawning or presence in the Middle Estuary between 2003 and 2010

Since 2003, capelin spawning in the Middle Estuary is observed primarily in May and June, peaking in May.

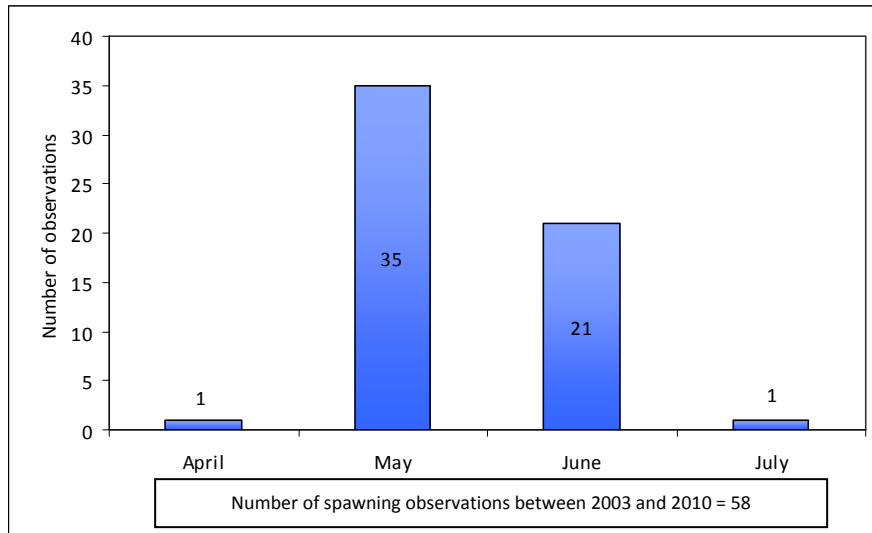


Figure 7: Timing of capelin spawning observations in the Middle Estuary between 2003 and 2010

Lower Estuary

This area encompasses both shores of the estuary of the St. Lawrence River, 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 2010, there was a clear reduction in the number of observers and observations compared to 2009. In this sector, the number of observers fell from 44 to 8 and the number of observations from 81 to 11. Of the 11 observations, 8 were spawning observations. They occurred from May 21 to June 3 and from June 29 to July 1. Unusually, an observation of an egg mass on the beach was reported on July 1 and 2 at Sainte-Flavie.

One observer reported recently dead capelin downstream from dam PN-1 on the Portneuf River at Portneuf-sur-Mer on July 12.

This year, the presence of capelin was reported for the first time in the sector of Anse à Mouille-Cul, at Bic.

Table 5: Dates of observations of capelin spawning or presence between 2003 and 2010 in the Lower Estuary

<i>Location</i>	<i>2003 to 2008</i>	<i>2009</i>	<i>2010</i>
NORTH SHORE			
Tadoussac	---	June 4, 5 and 10	June 14 to 20 [†]
Les Escoumins	April 2003	---	---
Portneuf-sur-Mer	May 2003, 2007 and 2008 May and June 2004 to 2006	May 27 to 31 June 5	May 21, 25 July 12 [†]
Forestville	---	June 9	---
Colombier	May 2005, 2007 and 2008 June 2005	May 17	---
Baie-Comeau	---	June 7 [†] July 6 [†]	---
Godbout	---	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 to 2005, 2008	May 24 June 11, 12 [†] , 14 [†] , 16 [†] and 28 July 1	---
<i>Rimouski</i> (<i>Bic – Anse à Mouille-Cul</i>)	---	---	July 11 [†]
Rimouski (Cap-à-l'Orignal)	---	June 19 [†]	---
Rimouski (Rivière-Hâtée)	June 2007	June 23 [†]	---
Rimouski (Rimouski)	June 2008	July 5 [†]	---
Rimouski (Pointe-au-Père)	May and June 2008	June 28 [†] July 6 [†] and 7 [†]	---
Sainte-Luce	June 2003 and 2008	April 30 May 25 [†] , 26 and 27, 30 June 1 [†] , 3, 9 to 11, 16, 22 [†] , 23 [†] July 4 [†] and 6 [†]	---
Sainte-Flavie	June 2008	May 25 June 2 [†] , 11, 22 and 23 July 5 [†] and 7 [†]	June 2, 3, 20, 30
Métis-sur-Mer	Jun. 2008	June 23 July 7 [†] and 8 [†]	---
Les Méchins	June 2004 and 2006	June	---
Matane	July 2008	May 27 June July 5 [†]	---

<i>Location</i>	2003 to 2008	2009	2010
Matane (Petit-Matane)	---	June 24 [†]	---
Grosses-Roches	---	May June 24 to 26	---

Names in parentheses represent sectors of municipalities.

Names in italics designate new observation sites.

[†]*Date of observation of capelin presence, with no report of spawning.*

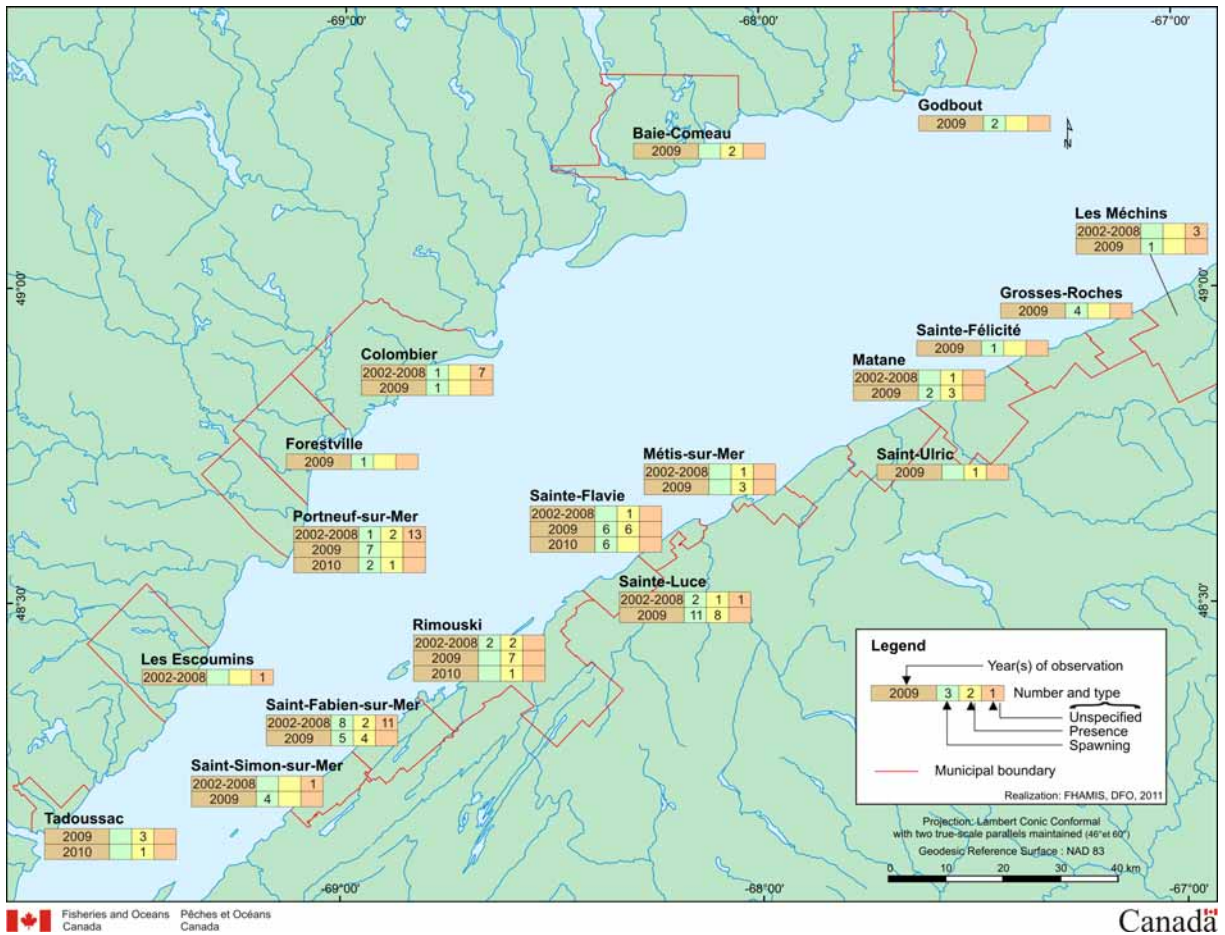


Figure 8: Location of observations of capelin spawning or presence in the Lower Estuary between 2003 and 2010

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.

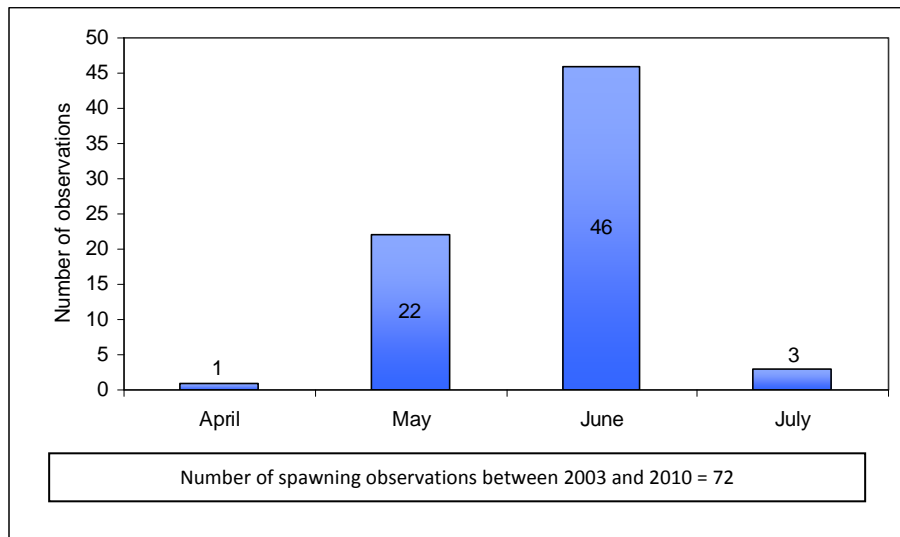


Figure 9: Timing of capelin spawning observations in the Lower Estuary between 2003 and 2010

Middle North Shore - Gulf

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

Observations

The Middle North Shore is the sector which saw the smallest decline in the number of observations between 2009 and 2010. In 2010, 23 observers reported 86 observations for this area, including 76 spawning observations between May 8 and July 6. Observations of capelin presence were made between May 12 and July 2.

Table 6: Dates of observations of capelin spawning or presence between 2002 and 2010 on the Middle North Shore

Location	2002 to 2008	2009	2010
Baie-Trinité (Îlets Caribou)	May 2005 and 2006 June 2006	---	---
Port-Cartier (Pointe-aux-Anglais)	May 2002, 2004 to 2008 June 2006 and 2007	May 13 June 3 and 6	May 8, 9 and 17
Port-Cartier (Rivière-Pentecôte)	May 2004, 2005 and 2008 June 2008	July 8 [†]	June 4 and 9
Sept-Îles (Gallix)	May and June 2003, 2005 to 2008 June and July 2004	May 15 [‡] , 17, 19 to 22, 24 to 29, 31 June 2, 3, 5 to 7, 9, 10, 12, 13, 16 [‡] , 18, 19, 21, 22, 23 [‡]	May 12 [‡] , 12, 15, 17 to 23, 28, 29 June 5, 8 and 29 [‡]

<i>Location</i>	<i>2002 to 2008</i>	<i>2009</i>	<i>2010</i>
Sept-Îles (Sept-Îles)	April to June 2002 and 2007 May and June 2004, 2005 and 2008 May 2006	May 26 June 1, 5, 6, 8 July 5 [‡] September 10 [‡]	---
Sept-Îles (Moisie)	May 2007 and 2008	July 6	---
Sept-Îles (Matamec)	July 2008	June 8	---
Uashat mak Mani- Utenam (Uashat)	May 2006 and 2008 June 2008	May 21 to 23, 27 June 4, 10, 11	---
Rivière-au-Tonnerre (Sheldrake)	May 2005 July 2008	---	June 3, 4, 8, 11, 12 July 4
Rivière-au-Tonnerre (Rivière-au-Tonnerre)	May 2005, 2006 and 2008 June 2004 and 2007 July 2008	May 29 June 1, 4 to 6, 11 to 15, 18	May 31 June 1, 5, 7, 9, 10, 12 to 22, 25, 26 and 28
Rivière Saint-Jean (Magpie)	May 2006 to 2008 June 2004 to 2008 July 2006	May 24 to 29, 30 [‡] 31 June 12 and 13	May 20
Rivière Saint-Jean (Rivière Saint-Jean)	July 2008	---	July 11 [‡]
Longue-Pointe-de- Mingan (Longue-Pointe-de- Mingan)	May 2005 to 2008 June 2002, 2004, 2005, 2008 July 2006 and 2008	May 12 June 8 [‡]	May 1 to 5 and 20 June 2 and 20 to 31 July 1, 2, 3 and 6
Longue-Pointe-de- Mingan (Mingan)	Mid-May to mid-June 2006 and 2007 June 2002	June 4 [‡] to 6 [‡]	May: 22, 28 and 31 June 1, 2 and 3
Havre-Saint-Pierre	May 2007 and 2008 June 2002 and 2004 May and June 2005	June 13	July 15 [‡]
Aguanish	May 2003 and 2008 June 2002 and 2008 May and June 2004 to 2007 July 2008	June 9, 12, 17	May 17
Natashquan	June 2007 June and July 2006	---	May 20
Anticosti Island	June and July 2004 July 2005 June 2006 to 2008	June 26, 29 [‡] July 1 [‡] , 14 and 15	June 16 to 20 and 17 [‡] July 27 August 2 [‡]

Names in parentheses represent sectors of municipalities.

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

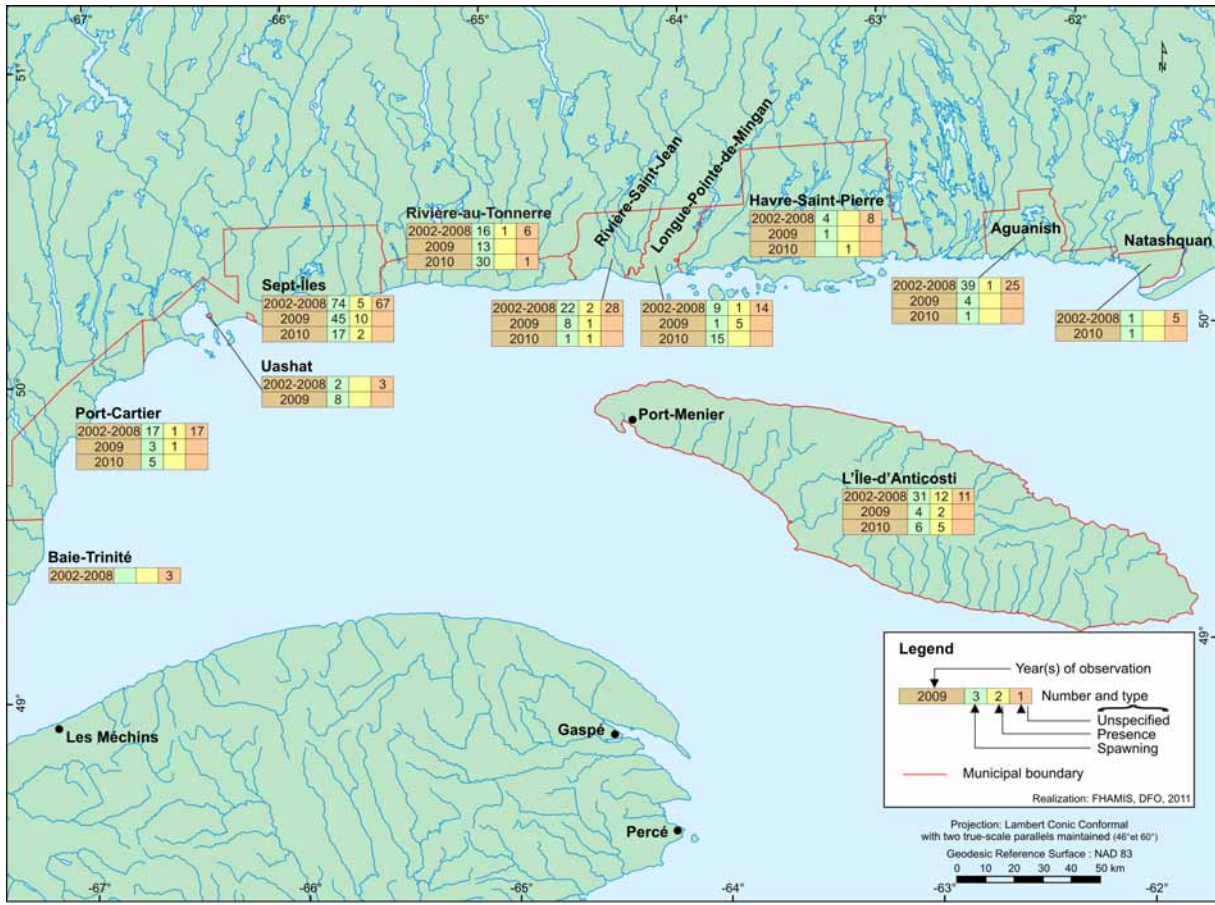


Figure 10: Location of observations of capelin spawning or presence on the Middle North Shore between 2002 and 2010

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

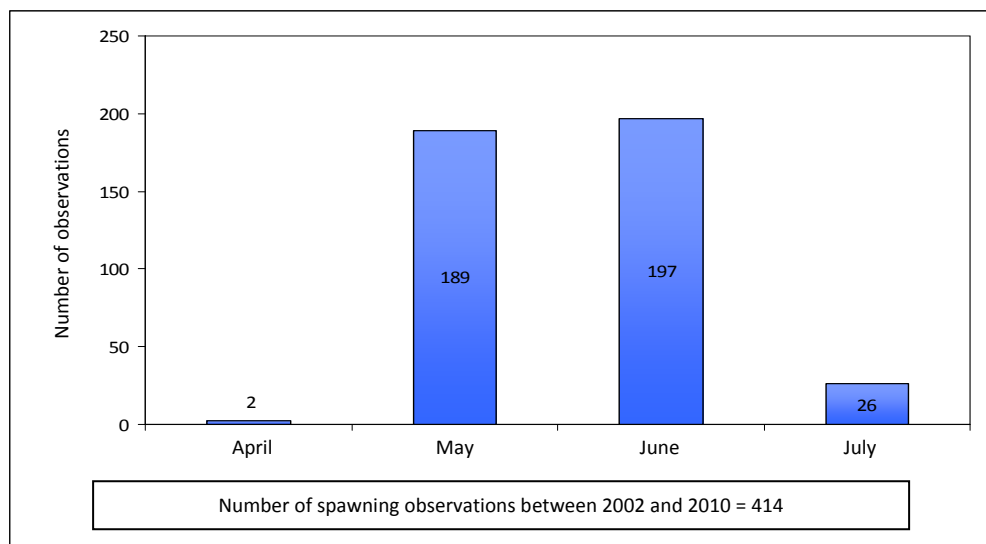


Figure 11: Timing of capelin spawning observations on the Middle North Shore between 2002 and 2010

Lower North Shore - Gulf

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

Observations

In 2010, two observers reported three observations of capelin presence in this area, but no spawning activity was reported. On June 28, the presence of capelin was observed by fishers who caught them in their capelin traps.

Table 7: Dates of observations of capelin spawning or presence between 2002 and 2010 on the Lower North Shore

<i>Location</i>	<i>2002 to 2008</i>	<i>2009</i>	<i>2010</i>
Côte-Nord-du-Golfe-du-Saint-Laurent (Kégaska)	May 2008	---	---
Côte-Nord-du-Golfe-du-Saint-Laurent (Chevery)	June 2004, 2005 and 2008 July 2006	June 20 [‡]	---
Bonne-Espérance (Vieux-Fort)	June 2002	June 29	June 20 [‡] July 20 [‡]
Blanc-Sablon (Lourdes-de-Blanc-Sablon)	June 2002, 2006, 2007 and 2008 June and July 2004	June 23 July 6, 8 and 9	---
Blanc-Sablon (Blanc-Sablon)	June 2006 and 2007	June 7, 9, 22 [‡] and 24	June 28 [‡]
Forteau, Labrador	July 2008	---	---

Names in parentheses represent sectors of municipalities.

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

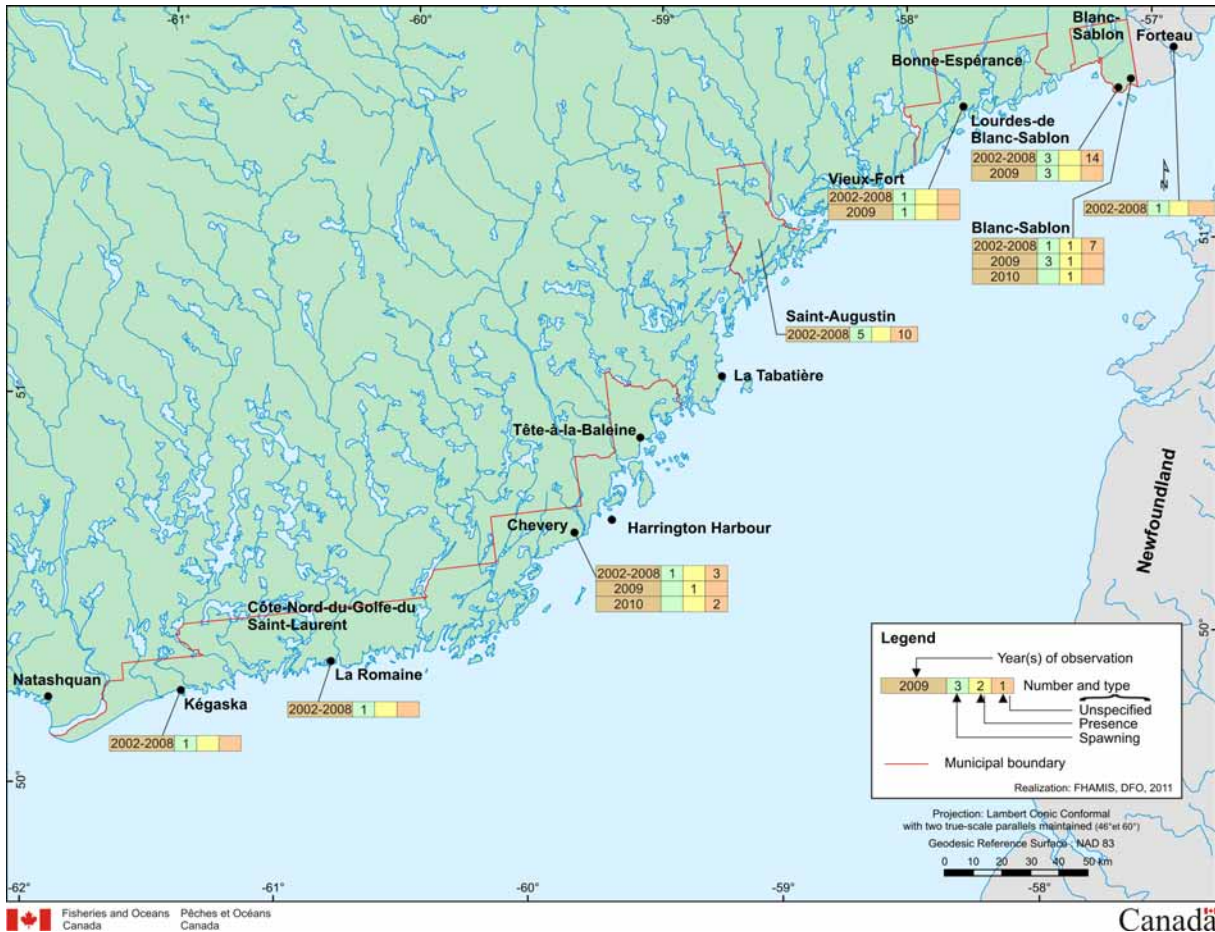


Figure 12: Location of observations of capelin spawning or presence on the Lower North Shore between 2002 and 2010

Since 2002, capelin spawning on the Lower North Shore has been observed primarily in June and early July. No observations were reported in 2010.

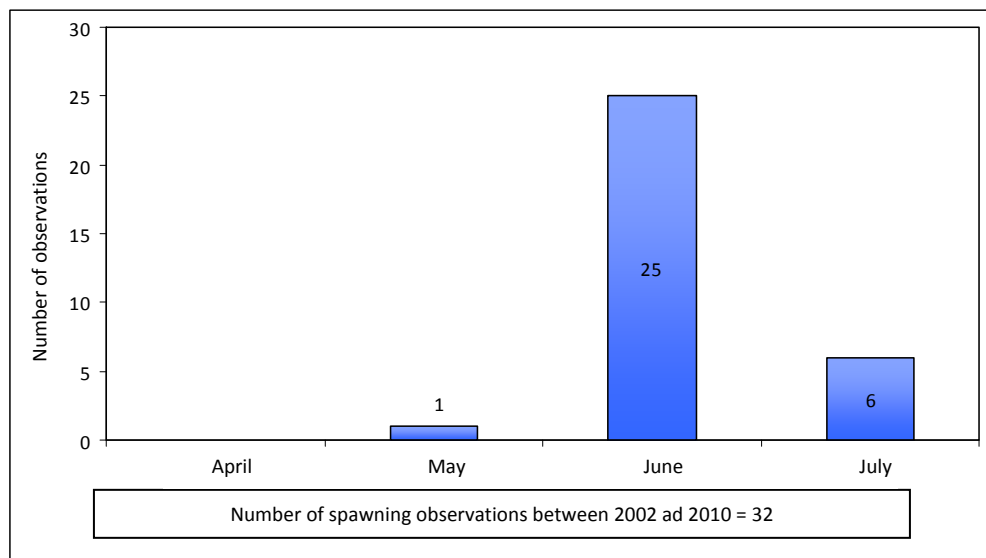


Figure 13: Timing of capelin spawning observations on the Lower North Shore between 2002 and 2010

Gaspé Peninsula - Gulf

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

Observations

In 2010, three observers reported five observations of capelin spawning between late May and mid-June and in early July.

Table 8: Dates of observations of capelin spawning or presence between 2004 and 2010 on the Gaspé Peninsula

<i>Location</i>	<i>2004 to 2008</i>	<i>2009</i>	<i>2010</i>
Cap-Chat (Capucins)	June 2004	---	---
Cap-Chat (Cap-Chat)	May and June 2007, 2008 June 2004 and 2006	May 25 to 28 June 10, 11 and 23	---
La Martre	June 2004, 2006 and 2007	May [‡] June 5, 9, 10 and 12	---
Sainte-Anne-des-Monts	May 2008	June 10	---
Marsoui	June 2004	---	---
Rivière-à-Claude	May and June 2008 June 2004, 2005, 2006 and 2007 July 2004	June 11 to 17 and 20 to 23	July 7 and 9
Mont-Saint-Pierre	June 2008 July 2004	June 16	---
Saint-Maxime-du-Mont-Louis (Mont-Louis)	June 2005, 2008	June	---
Saint-Maxime-du-Mont-Louis (L'Anse-Pleureuse)	---	May 28 [‡] June 18 and 23	---
Sainte-Madeleine-de-la-Rivière-Madeleine (Manche-d'Épée)	June 2004 and 2005	---	---
Sainte-Madeleine-de-la-Rivière-Madeleine (Rivière-Madeleine)	June 2004 and 2008	June 10 to 12, 15, 16	June 9
Grande-Vallée	June 2004, 2006, 2007 and 2008 July 2006 August 2005	June 14	---
Gaspé (Saint-Maurice-de-l'Échourie)	2005, 2006 and 2007	---	---
Gaspé (Rivière-au-Renard)	May and June 2007 Mid-June 2006	---	---
Gaspé (Cap-des-Rosiers)	June 2005, 2006, 2007 and 2008	June 3, 7 to 9, 11, 13, 14 and 23 [‡]	---
Gaspé (Cap-aux-Os)	May and June 2007 June 2004	---	---
Gaspé (Cap-Bon-Ami)	May and June 2007	---	---
Gaspé (Gaspé)	May and June 2007 June 2004, 2005 and 2006 July 2004	May 28 [‡]	---
Gaspé (Petit-Cap)	July and August 2005	June 9 to 11	---

Names in parentheses represent sectors of municipalities.

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

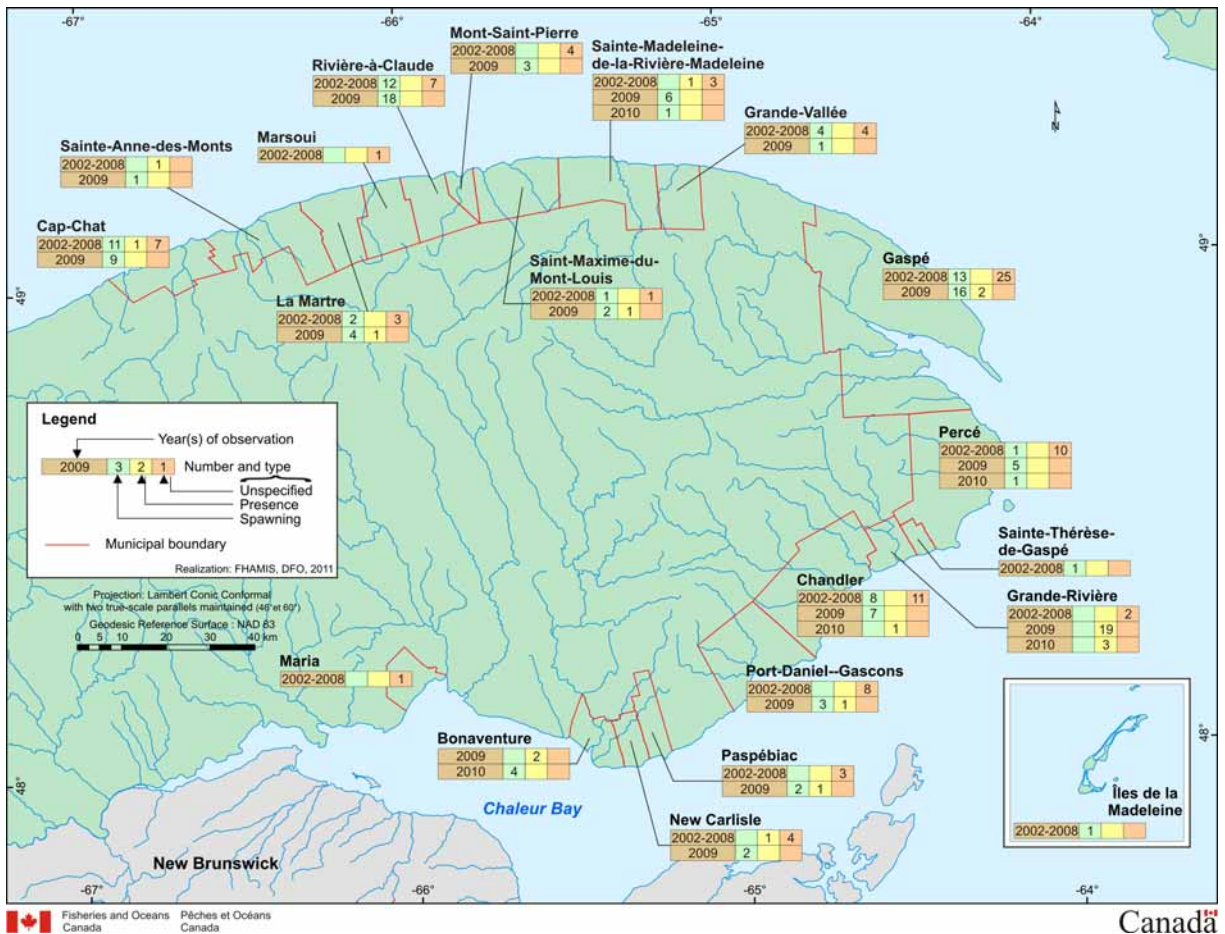


Figure 14: Location of observations of capelin spawning or presence in the Gaspé Peninsula and Chaleur Bay between 2003 and 2010

Data from the Network indicate that capelin spawning in the Gaspé Peninsula begins in late May and is observed primarily in June.

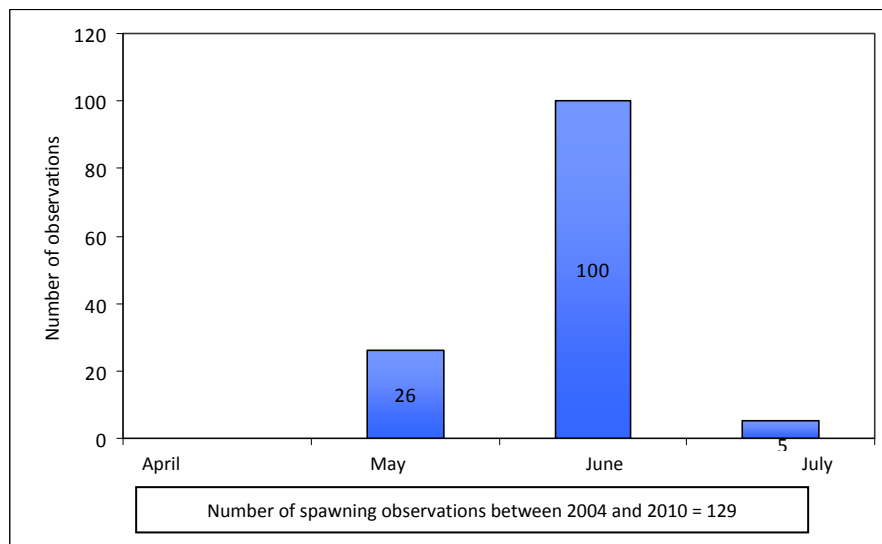


Figure 15: Period of capelin spawning observations in the Gaspé Peninsula between 2004 and 2010

Chaleur Bay - Gulf

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

Observations

In 2010, 3 observers reported 8 observations for this area, including 4 spawning observations. Northern gannets were also observed in foraging flight during the same period. This year, the first observation was in April, which has almost never been seen in this sector since the Network was created. In contrast to previous years, capelin spawning was not observed in the municipalities of New-Carlisle or Paspébiac. Spawning observations were reported at Bonaventure (neighbouring municipality).

Table 9: Dates of observations of capelin spawning or presence between 2003 and 2010 in Chaleur Bay

<i>Location</i>	<i>2002 to 2008</i>	<i>2009</i>	<i>2010</i>
Maria	May 2005	---	---
Bonaventure	---	May 10 [†]	May 12 to 15
New Carlisle	May 2005 to 2007	May 23 and 24	---
Paspébiac	May 2003 to 2005	May 15, 27 [†] , 30	---
Port-Daniel-Gascon (Port-Daniel)	May and June 2003	May 21 [†] , 25 June 4 and 5	---
Chandler (Newport)	May 2005 to 2008 June 2006 and 2008	May 26 to 28 June 1 and 2	May 13 [†]
Chandler (Chandler)	June 2006 and 2008 2007	---	---
Chandler (Pabos)	May 2006 June 2008	---	---
Grande-Rivière	2006	May 25 [†] and 27 [†] June 2 [†] , 7 [†] , 20 [†] to 30 [†] July 1 [†] to 3 [†]	April 29 [†] May 13 [†] and 20 [†]

Names in parentheses represent sectors of municipalities.

[†]Date of observation of capelin presence, 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.

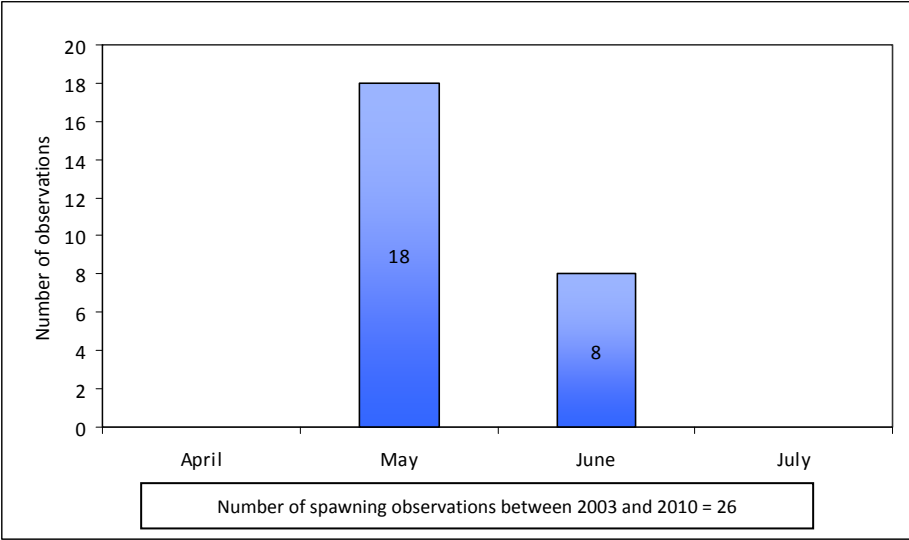


Figure 16: Timing of capelin spawning observations in Chaleur Bay between 2003 and 2010

Magdalen Islands - Gulf

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

Observations

Since the establishment of the Network, only one spawning observation has been reported in this area; it was made in June 2008 at Cap de l'Hôpital in Fatima by lobster and flounder fishers. No observations have been reported since then.

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)?

Would you like to receive a 2011 summary Yes No

Would you like to receive a 2012 kit Yes No



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.)

Sample map



Zones de fraie du Capelan: Sept-Îles



Realization: SIG-AP, Février 2005.

Surface de référence géodésique: NAD 83.
Projection Universelle Transverse de Mercator - Zone 19

Pêches et Océans
Canada
Fisheries and Oceans
Canada

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.gc.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 - From Matapédia to Forillon

Tel. 418-759-5880

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



Comité ZIP du Sud-de-l'Estuaire - From Berthier-sur-Mer to Les Méchins

Tel. 418-722-8833

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



Comité ZIP de la rive nord de l'estuaire - From Tadoussac to Baie-Trinité

Tel. 418-296-0404

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



Comité ZIP Côte-Nord du Golfe - From Baie-Trinité to Blanc-Sablon

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