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Capelin Observers Network – Summary 2015



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Dear observer,

*In the midst of the Capelin Observers Network's thirteenth **season** of capelin spawning data gathering, we would like to thank you for your involvement in 2015. It is thanks to your efforts and your support that, year after year, we are able to learn more about capelin habits and their spawning sites. The observation of the presence of capelin in Prince Edward Island in 2014 and mentioned this year led to the creation of the new area.*

*Since 2014, we have merged **two usually distinct publications, the review and the kit, into a single document**. Therefore, the 2015 report is a continuation of the 2013-2014 report which brings together important facts to be considered during your observations as well as practical maps for location finding. It also includes your observations usually compiled in the annual report. This way a single document holds all the available information on the presence of capelin in the St. Lawrence. Some of the previous sections were removed from the paper document and are now available on the St. Lawrence Global Observatory's website.*

The Crowdsourcing webtool to share your observations is available at the following link:

<http://slgo.ca/roc/login/auth?lang=en>

You can also have access to the network's documentation, as well as to the capelin spawning observation data archives here:

<http://slgo.ca/en/biodiversity/fish/dfo-capelin/network.html>

Where and when will capelin roll in 2016? *Once again, the Capelin Observers Network is already inviting you to participate in a new year of data gathering. Your sustained commitment helps us provide the most accurate possible picture of the distribution of capelin spawning along our coasts and also enables us to better track the evolution of its spawning habits.*

We hope to keep your interest and generate new collaboration by the increased visibility of the Capelin Observers Network. We wish you a good reading and a great season of observations for the coming year. We also thank you for your continued interest in the Capelin Observers Network!

Acknowledgements

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.



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1.0 Capelin Observers Network (CON)

The Capelin Observers Network's (CON) objective is to better understand capelin spawning and spawning patterns within the Estuary and Gulf of St. Lawrence. Efforts to monitor capelin spawning began in 2002 on the North Shore. In 2003, the Department of Fisheries and Oceans Canada (DFO), (Quebec Region,) along with different partners such as certain Committees from the Priority Intervention Zones organisation, known in French as (ZIP), developed a formal network in order to collect capelin reproduction data.

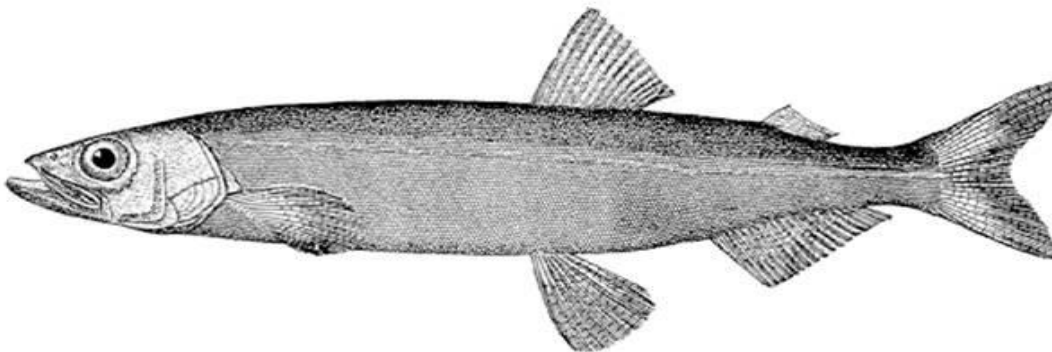
Observers are invited to participate in the Capelin Observers Network by visiting the Internet registry at: <http://slgo.ca/en/biodiversity/fish/dfo-capelin/observation.html>

Your participation in the Network in 2016 is more than necessary to help track capelin spawning and identify new trends, as well as help confirm trends of recent years. It is also important that your observations be as documented as possible, (see Appendix 1. User Guide for WEB entries).

2.0 Capelin Biology

2.1 GENERAL

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.





Capelin male (top) and female (bottom)

2.2 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.

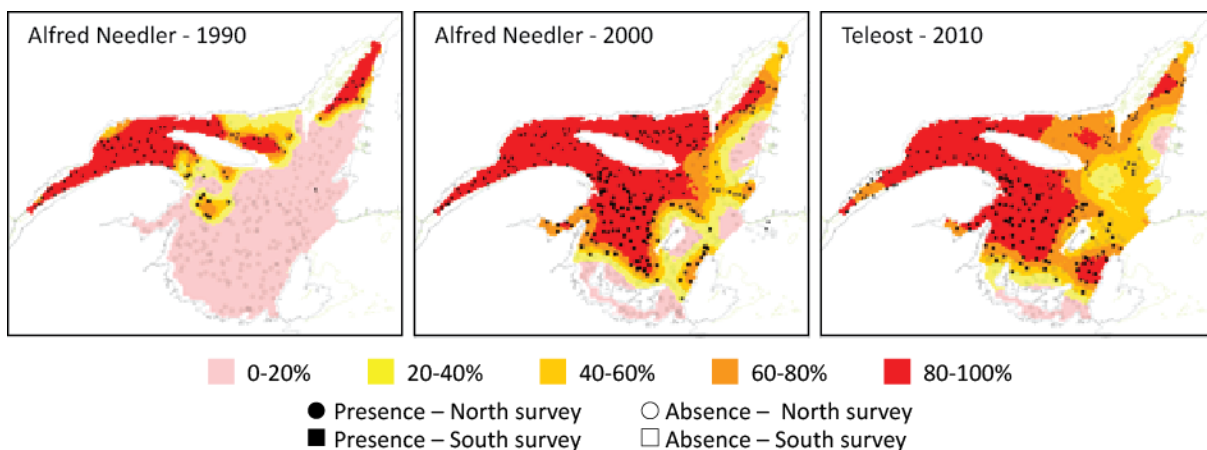


Figure 1: Probability surfaces (%) of capelin presence for multidisciplinary surveys conducted in the Estuary and northern and southern Gulf of St. Lawrence between 1990 and 2010.

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 1). 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.¹ 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.²

3.0 Observations for the 2015 Season by Zone

In 2015, 25 observations were reported, including 17 spawning observations and 4 signs of capelin presence in 4 of the Network's zones. These observations were made in 14 different sectors. One new spawning site was reported in 2015 at Raleigh, Newfoundland. Also, a new site was mentioned for the observation of capelin in 2014, in Park Corner, Prince Edward Island for which no zone existed. Therefore, a new zone has been created. Although this observation occurred in 2014, it was reported in 2015 only and has been integrated in the balance sheet only this year.

These observations were compiled in table formats accompanied by maps. This year again, the tables help distinguish spawning observations from signs of capelin presence (e.g. presence of diving birds or dead capelin on the beach) with a symbol (‡) provided alongside each date entry. For practical reasons, the St. Lawrence Estuary and Gulf were divided into eight observation zones (Figure 2). Note below that the boundaries have been illustrated and are properly described by virtue of each of their result entries.

¹ 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.

² 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.

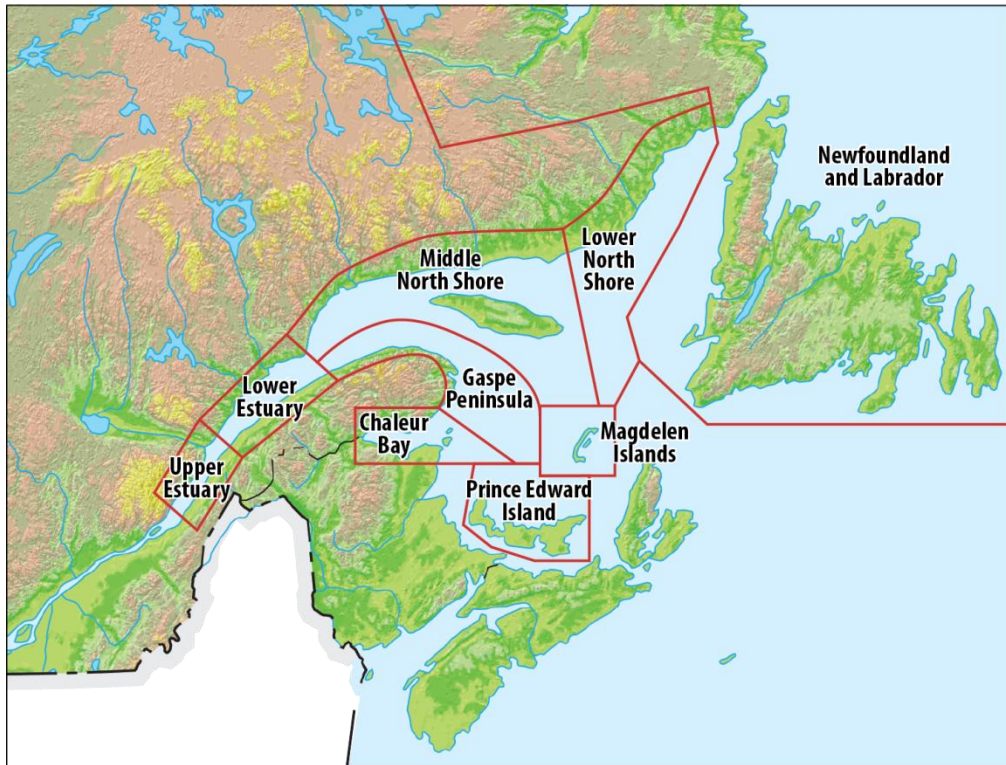


Figure 2: Observation zones of the Capelin Observers Network.

3.1 UPPER 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 2013, capelin was sighted on the shores of the Upper Estuary between March 17 and June 24 (Table 1). Three observers reported 50 sightings of capelin and 3 observations of spawning. During 2014, there were 4 sightings of capelin presence in the zone though no mention of spawning. Only one observer reported 1 sighting in May during the 2015 season into Upper Estuary.

Table 1: Dates of observation of capelin spawning or presence between 2003 and 2015 in Upper Estuary.

<i>Localisation</i>	<i>2003 to 2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>
Saint-Irénée	April and May 2003, 2010	April: 23 [†] to	April: 8 [†] to 13 [†] , 16 [†] to	March: 17 April: 28 [†]		
	May and June 2004, 2006, and 2008	25 [†] May: 1 [†] to 4 [†] , 8 [†]	21 [†] , 26 [†] to 30 [†] May: 1 [†] to	May: 1 to 2 [†] , 5 [†] , 9 [†] , 10 [†] to 11 [†] ,	---	May: 21 [†]

Localisation	2003 to 2010	2011	2012	2013	2014	2015
	May, June, and July 2005 April, May, and June 2009	to 10 [‡] , 15 [‡] , 16 [‡] , 19 [‡] , 24 [‡] to 26 [‡] , 28 [‡] to 30 [‡] June: 9 [‡] to 12 [‡]	16 [‡] , 18 [‡] to 21 [‡] , 24 [‡] to 27 [‡]	13 [‡] to 15 [‡] , 16, 18, 20 [‡] to 23 [‡] , 25 [‡] to 31 [‡] June: 1 [‡] to 8 [‡] , 10 [‡] to 24 [‡]		
La Malbaie (Port-au- Saumon /Anse aux Indiens)	June 2005 and 2009	---	---	---	May: 29 June: 02, 03, 04	---
Île-aux- Coudres	June 2007 April to early June 2008 May 2010	April: 23 [‡]	---	---	---	---
Kamouraska	June 2003	---	---	---	---	---
Rivière-du- Loup	May 2010 [‡] June 2009	---	---	---	---	---
Rivière- Ouelle	May 2010 [‡]	June: 15 [‡] et 18 [‡]	---	---	---	---

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

Since 2003, capelin spawning in the Upper Estuary has been observed from May to June, with a peak in May (Figure 3). However, in 2013, a spawning sighting was reported in March. The locations of spawning observations or presence of capelin in the zone have been mapped for the years 2002 to 2015 (Figure 4).

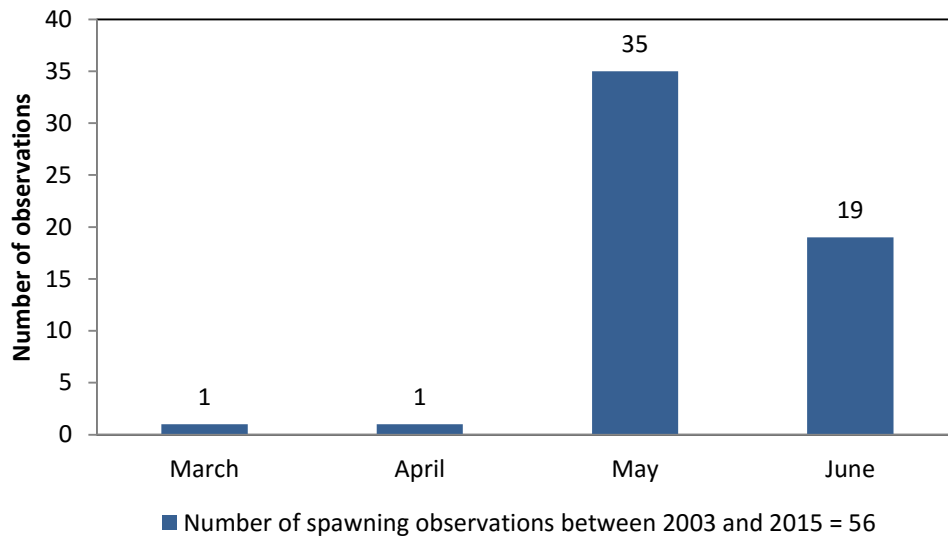


Figure 3: Period of observation of capelin spawning in Upper Estuary between 2003 and 2015.

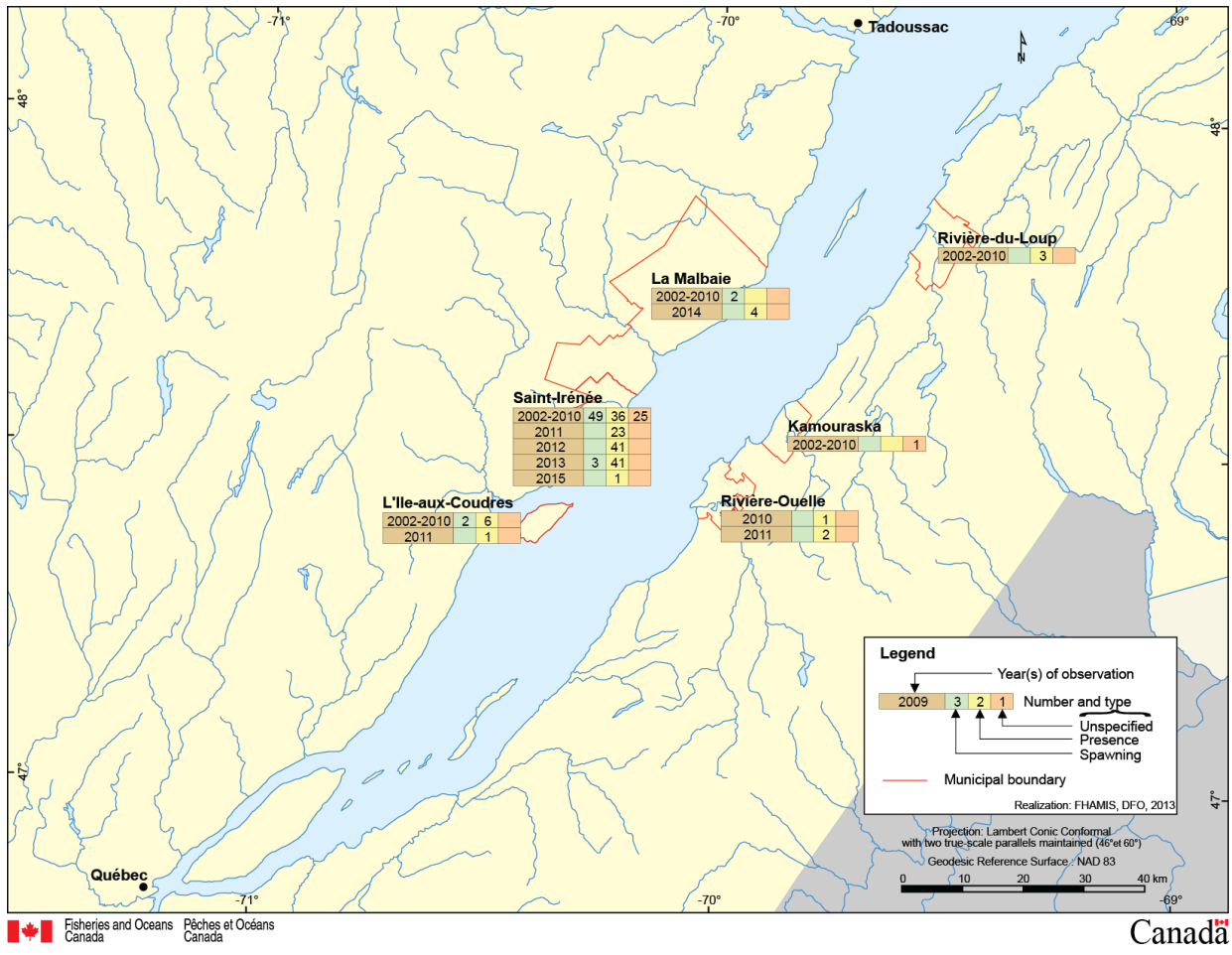


Figure 4: Locations of observation of capelin spawning and presence in Upper Estuary between 2002 and 2014.

3.2 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 2013, 2 observers reported 6 sightings of which 4 were spawning cases. These observations were made between May 17 and June 1st (Table 2). Also, in 2014, 2 observers reported capelin spawning between May 14th and 20th. In 2015, six observers have reported 7 observations, 5 of which were spawning in municipalities already known for capelin, those are Portneuf-sur-Mer , Baie-des-Sables , St. Ulric , Matane and Grosse Roche. However, the most recent observations reported for these municipalities dated back to 2009 and 2011.

Table 2: Dates of observation of capelin spawning or presence between 2003 and 2015 in Lower Estuary.

Localisation	2003 to 2010	2011	2012	2013	2014	2015
NORTH SHORE						
Tadoussac	June 2009, 2010	---	---	---	---	---
Les Escoumins	April 2003	---	---	---	---	---
Portneuf-sur-Mer	May 2003, 2007, 2008 May and June 2004 to 2006 and 2009 May and July 2010	May: 25	May: 19 and 21	May: 17	May: 14 [‡]	May : 9
Forestville	June 2009	---	---	---	---	---
Colombier	May 2005, 2007 to 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 to 2005 and 2008	---	June: 7	May: 24 to 25, 30,	May: 20 [‡]	---

Localisation	2003 to 2010	2011	2012	2013	2014	2015
	May, June and July 2009			31 [‡] June: 1 [‡]		
Rimouski (Bic – Anse à Mouille-Cul)	July: 11 [‡]	---	---	---	---	---
Rimouski (Cap-à- l'Original)	June: 19 [‡]	---	---	---	---	---
Rimouski (Rivière- Hâtée)	June 2007 and 2009	---	---	---	---	---
Rimouski (Rimouski)	June 2008 July 2009	---	---	---	---	---
Rimouski (Pointe-au- Père)	May and July 2008 June and July 2009	June: 29 [‡]	---	---	---	---
Sainte-Luce	June 2003 and 2008 April, May, June, and July 2009	June: 12, 13, 28	June: 5 [‡]	---	---	---
Sainte-Flavie	June 2008, 2010 May, June, and July 2009	June: 24, 28 [‡]	---	---	---	---
Métis-sur-Mer	June 2008 June and July 2009	June: 29	---	---	---	---
Baie-des-Sables		June : 28	---	---	---	May : 31 [‡]
Saint-Ulric		June : 27 [‡]	---	---	---	May : 28 [‡]
Matane		June : 24, 28 [‡]	---	---	---	May : 15, 16, 24
Grosse-Roche	May et June 2009		---	---	---	June : 28
Les Méchins	June 2004 and 2006 and 2009	---	---	---	---	---

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

The data collected by the network supports findings that capelin spawning occurs primarily during May and June, peaking in June (Figure 5). The observations of spawning locations or presence of capelin in the zone were mapped for the years 2002 to 2015 (Figure 6).

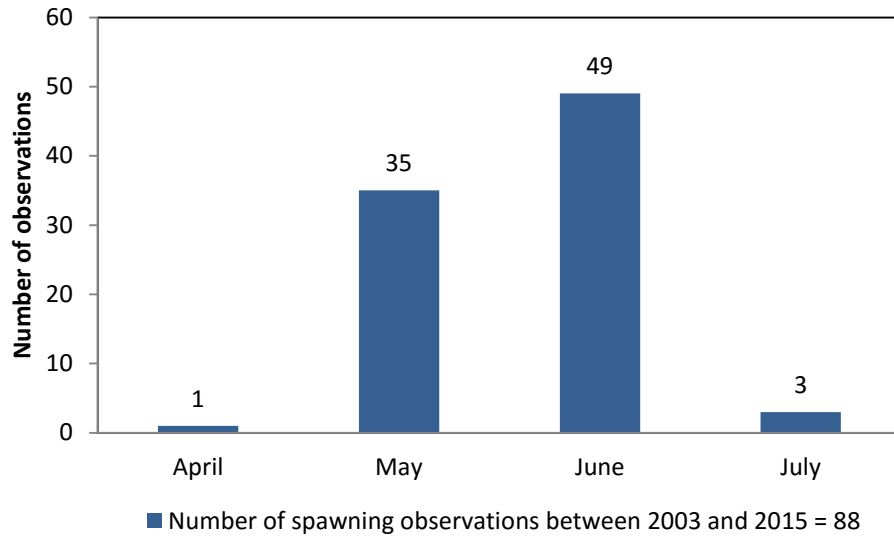


Figure 5 : Period of observation of capelin spawning in Lower Estuary between 2003 and 2015.

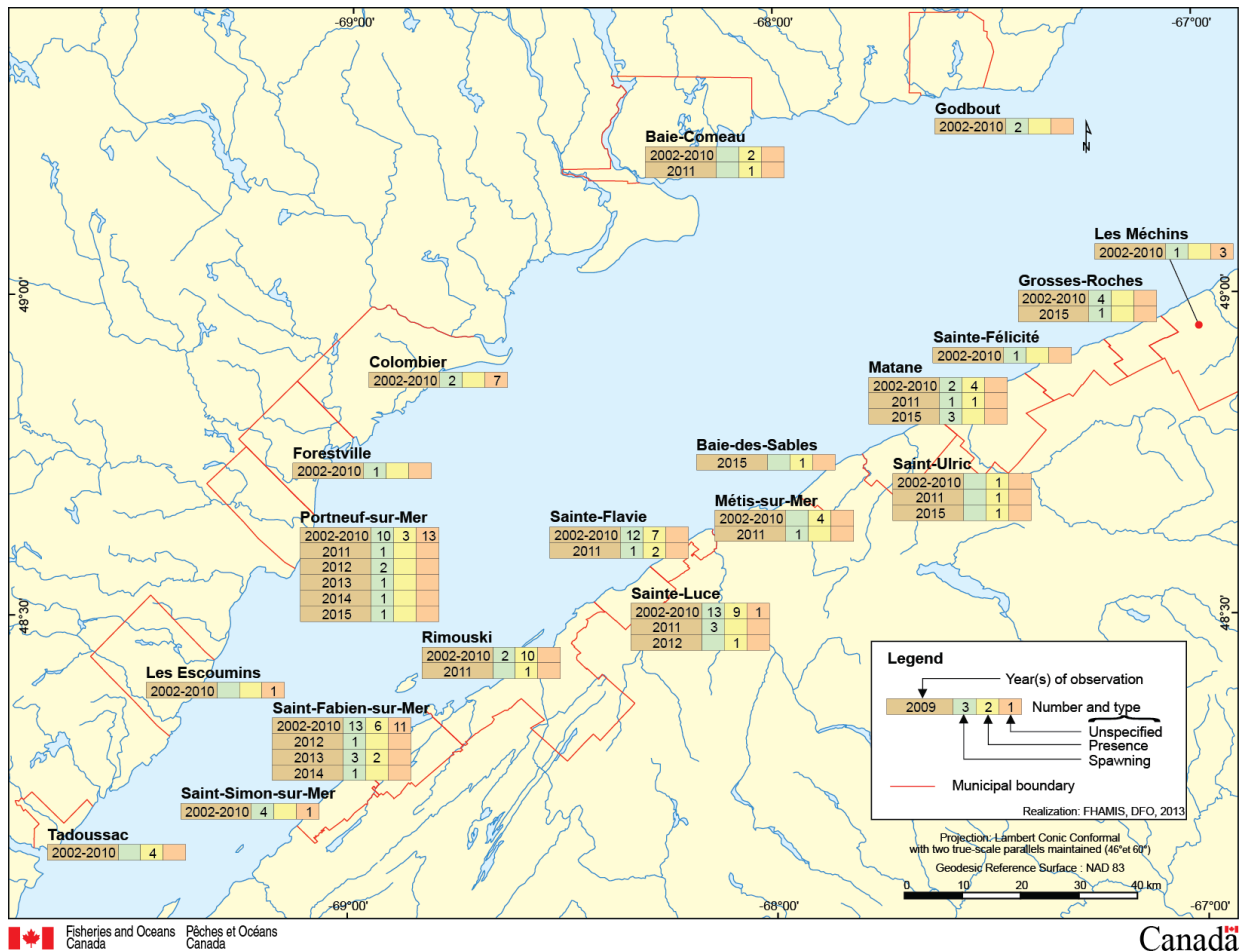


Figure 6: Locations of observations of capelin spawning and presence in Lower Estuary between 2002 and 2015.

3.3 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

Much like 2012 with respect to previous years, the number of observations in 2013 also declined with only 6 observers in the zone for a total of 18 observations. As in 2012, all 6 cases reported for 2013 observed capelin spawning exclusively in May, between the 14th and 30th. These observations were reported by 3 observers. As during the previous two years, spawning in the zone in 2014 was also observed in May, totalizing 6 spawning observations between the 14th and the 30th of the month. Two signs of capelin presence and one permanent presence were also reported. Two observers recorded their observations on the online data entry tool, but it is also possible that these observations were reported by more than two observers. In 2015, 16 observations were reported by 9 observers. Spawning was reported 11 times out of 16 observations, other observations being to report presence between May 11th and June 30th..

Table 3: Dates of observation of capelin spawning or presence between 2002 and 2015 in Middle North Shore.

Localisation	2002 to 2010	2011	2012	2013	2014	2015
Baie-Trinité (Îlets-Caribou)	May 2005 to 2006 June 2006	May: 24	---	---	---	---
Port-Cartier (Pointe-aux-Anglais)	May 2002, 2004 to 2008, 2010 June 2006 to 2007 May and June 2009	May: 22	May: 15 [‡]	---	---	---
Port-Cartier (Rivière-Pentecôte)	May 2004, 2005 and 2008 June 2008, 2010 July 2009	---	---	---	May: 14	---
Port-Cartier (Grand-Ruisseau)	---	May: 9 to 13, 23 and 27 June: 2 and 4	---	---	---	---
Sept-Îles (Gallix)	May and June 2003, 2005 to 2010	May: 2 [‡] , 19, 21, 22 [‡] , 25 to 27	May: 18 [‡]	---	---	May : 11, 16, 17, 23 [‡] ,

<i>Localisation</i>	<i>2002 to 2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>
	June and July 2004	June: 3 to 5, 7 to 9, 12 [†] , 28 [†] and 29 [†] July: 1 [†] and 8 [†]				June : 30 [†]
Sept-Îles (Sept-Îles)	April to June 2002 and 2007 May and June 2004, 2005 and 2008 May 2006 May, June, July and September 2009	May: 27 [†] June: 28	May: 18 to 23, 26	May: 14, 19, 24, 27, 30	May: 15, 17 [†] , 24 [†] , 25 [†] , 28, 29 [†] , 30 [†]	Mai : 23, 26, 27, 29
Sept-Îles (Moisie)	May 2007 and 2008 July 2009	---	---	---	---	---
Sept-Îles (Matamec)	June 2009 July 2008	May: 30, 31 June: 5 July: 1 [†] and 2	---	---	May 21	May : 31---
Uashat mak Mani- Utenam (Uashat)	May 2006 and 2008 June 2008 May and June 2009	---	May: 15 [†]	---	---	---
Rivière-au- Tonnerre (Sheldrake)	May 2005 June and July 2010 July 2008	May: 25 June: 5	---	---	---	---
Rivière-au- Tonnerre (Rivière-au- Tonnerre)	May 2005, 2006 and 2008 May and June 2009, 2010 June 2004 and 2007 July 2008	---	---	---	---	---
Rivière-au- Tonnerre (Rivière- aux- Graines)	---	June: 10 July: 7 [†] to 13 [†]	---	---	---	---
Rivière- Saint-Jean	May 2006 to 2010	---	---	---	---	---

Localisation	2002 to 2010	2011	2012	2013	2014	2015
(Magpie)	June 2004 to 2009 July 2006					
Rivière- Saint-Jean (Rivière- Saint-Jean)	July 2008, 2010	May: 27, 31 June: 1, 2 [‡] , 4, 7, 9, 17 and 24 to 26	---	---	---	---
Longue- Pointe-de- Mingan (Longue- Pointe-de- Mingan)	May 2005 to 2010 June 2002, 2004, 2005, 2008 to 2010 July 2006, 2008 and 2010	May: 25 and 26 June: 7 and 11	---	---	---	Mai : 26, 29 [‡] Juin : 3, Mai : 5 [‡]
Longue- Pointe-de- Mingan (Mingan)	Mid-May to mid-June 2006 and 2007, 2010 June 2002 and 2009	May: 25 and 29	May: 20	---	---	---
Havre- Saint-Pierre	May 2007 and 2008 June 2002, 2004 and 2009 May and June 2005	July: 15 [‡]	---	---	---	Mai : 05 [‡] Juin : 12
Aguanish	May 2003 and 2008 June 2002, 2008 and 2009 May and June 2004 to 2007, 2010 July 2008	June: 4 and 11	---	---	---	---
Natashquan	June 2007 June and July 2006	May: 20	---	---	---	---
Île d'Anticosti	June and July 2004 and 2009 July 2005 June 2006 to 2008 June, July and August 2010	June: 20, 21 [‡] and 23 [‡] July: 5 [‡] and 12 [‡]	June: 7 and 28 July: 04 [‡]	---	---	---

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 mainly observed in May and June, though some years until mid-July (Figure 7). The locations of spawning observations or presence of capelin for the area were mapped for the years 2002 to 2015 (Figure 8).

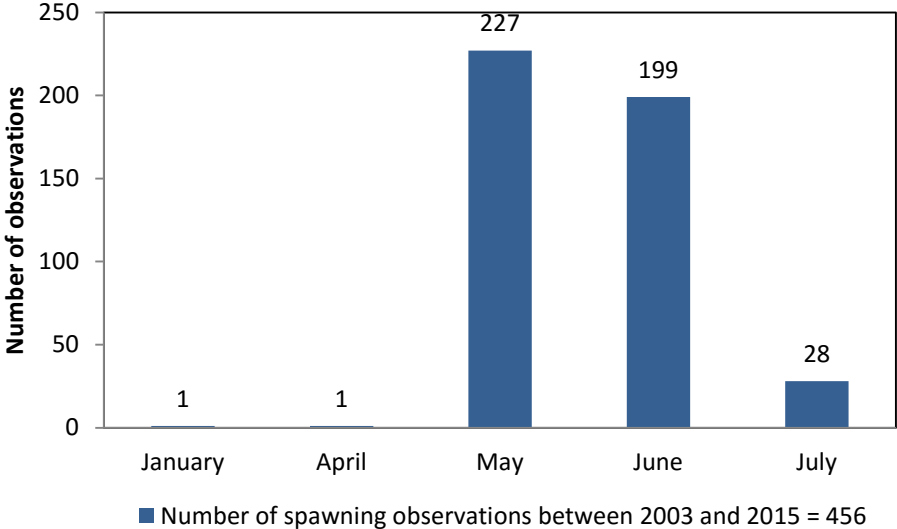


Figure 7: Period of observation of capelin spawning in Middle North Shore between 2002 and 2015.

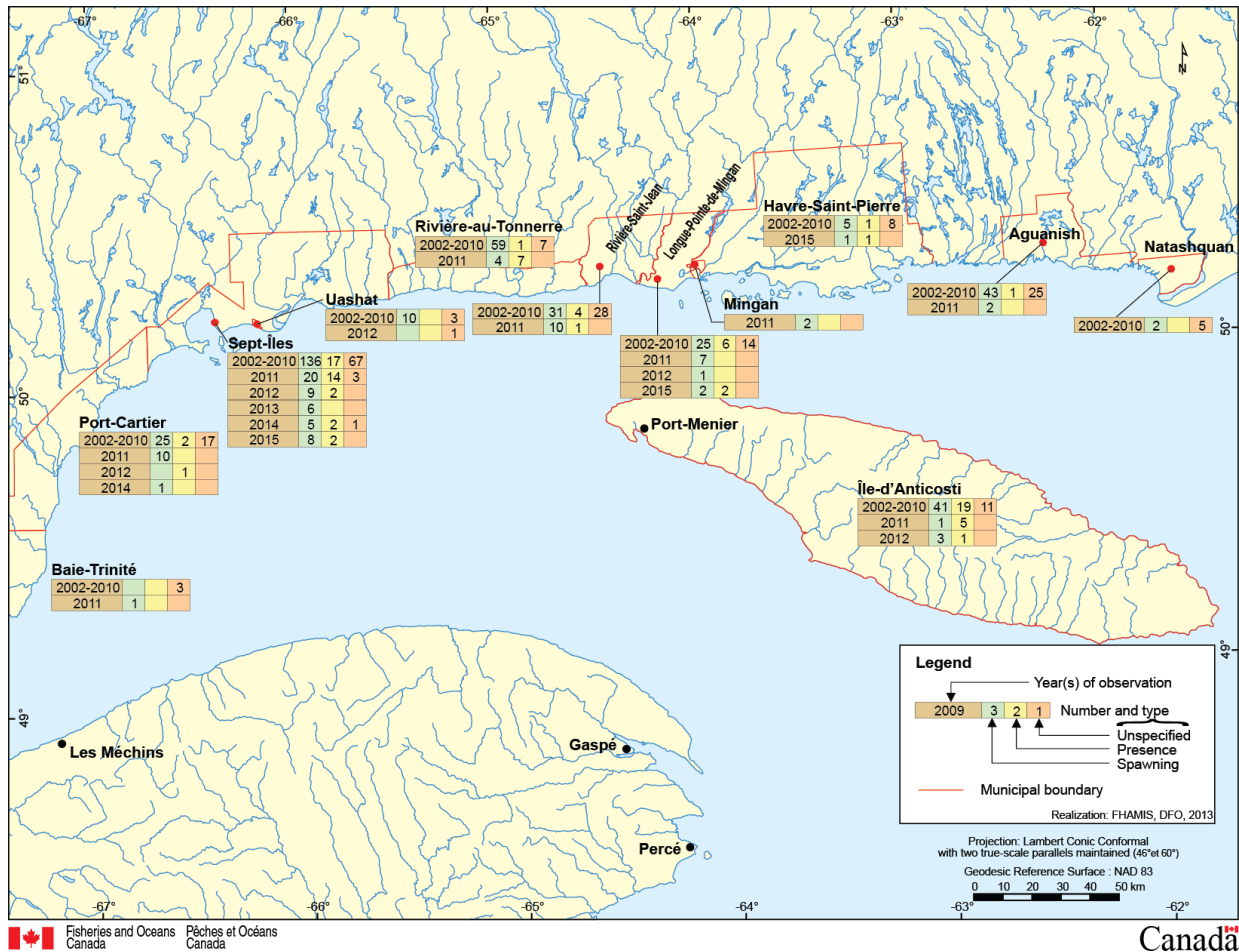


Figure 8: Locations of observation of Capelin Spawning and Presence in Middle North Shore between 2002 and 2015.

3.4 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

No observations of the presence of capelin or capelin spawning were reported regarding this zone during 2013, 2014 and 2015. (Table 4).

Table 4: Dates of observation of capelin spawning or presence between 2002 and 2015 in Lower North Shore.

Localisation	2002 to 2010	2011	2012	2013	2014	---
St. Lawrence North Shore (Kégaska)	May 2008	---	---	---	---	---

Localisation	2002 to 2010	2011	2012	2013	2014	---
St. Lawrence North Shore (Chevery)	June 2004, 2005 and 2008 July 2006 and 2009	July: 1 et 17 [‡]	---	---	---	---
Bonne-Espérance (Vieux-Fort)	June 2002, 2009 and 2010 July 2010	---	---	---	---	---
Blanc-Sablon (Lourdes-de-Blanc-Sablon)	June 2002, 2006 to 2008 June and July 2004 and 2009	---	---	---	---	---
Blanc-Sablon (Blanc-Sablon)	June 2006, 2007, 2009 and 2010	---	June: 30	---	---	---

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 was observed mainly in June and in early July (Figure 9). The locations of spawning observations or the presence of capelin in the zone were mapped for the years 2002 to 2015 (Figure 10).

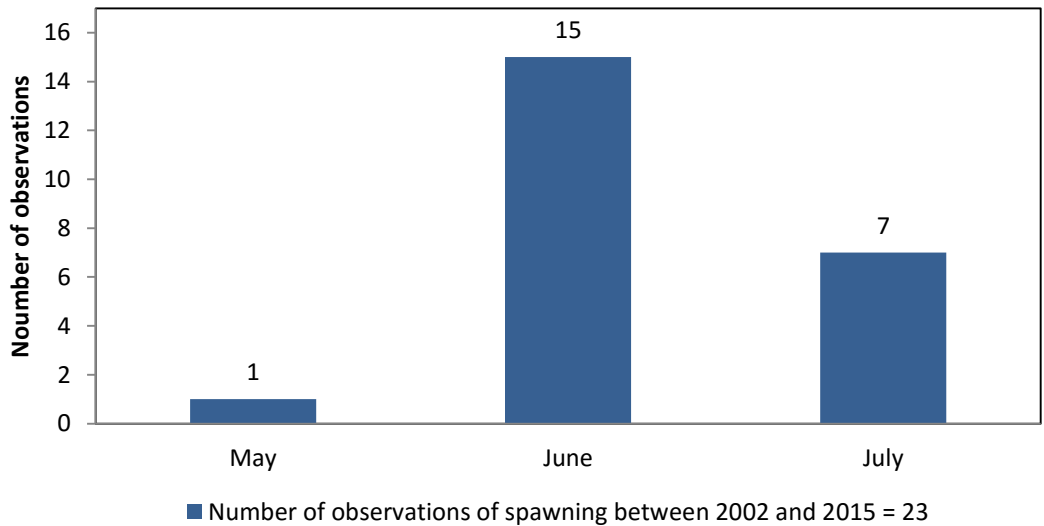


Figure 9: Period of observation of capelin spawning in Lower North Shore between 2002 and 2015.

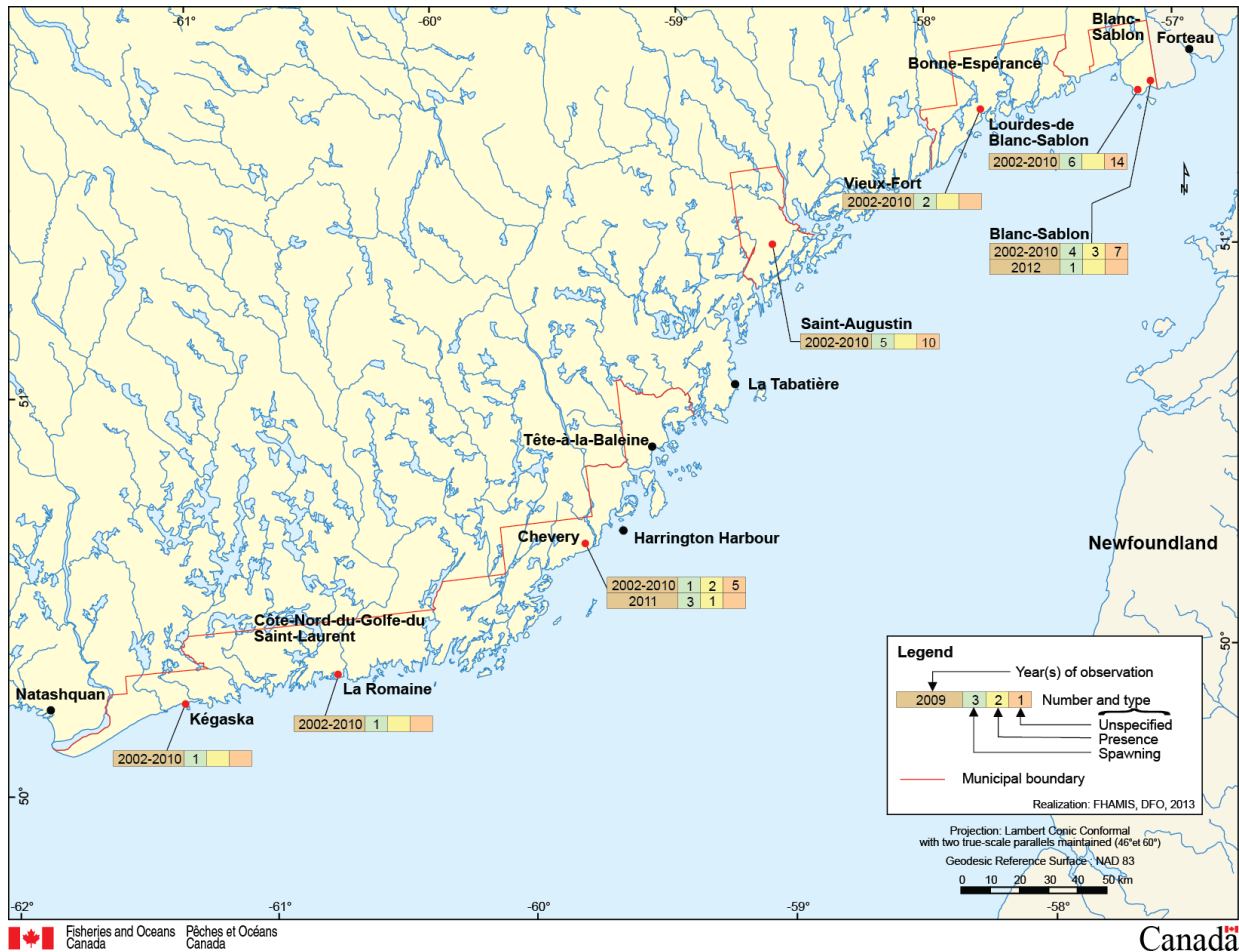


Figure 10: Period of observation of capelin spawning in Lower North Shore between 2002 and 2015.

3.5 NORTHERN GASPÉ PENINSULA – GULF

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

Observations

During 2013, 2014 and 2015, no observations were reported regarding this zone (Table 5).

Table 5: Dates of observation of capelin spawning or presence between 2004 and 2015 in Northern Gaspé Peninsula.

Localisation	2004 to 2010	2011	2012	2013	2014
Cap-Chat (Capucins)	June 2004	---	---	---	---
Cap-Chat (Cap-Chat)	May and June 2007, 2008 and 2009 June 2004 and 2006	---	---	---	---
La Martre	June 2004, 2006 and 2007 May and June 2009	---	June: 17 [†]	---	---
Sainte-Anne-des-Monts	May 2008 June 2009	---	---	---	---
Marsoui	June 2004	June: 21	June: 4 [†] , 12 [†] , 15 [†] , 16, 17, 18 [†] , 19 [†]	---	---
Rivière-à-Claude	May and June 2008 June 2004 to 2007 and 2009 July 2004, 2010	June: 20 and 24	---	---	---
Mont-Saint-Pierre	June 2008 and 2009 July 2004	---	---	---	---
Saint-Maxime-du-Mont-Louis (Mont-Louis)	June 2005, 2008 and 2009	---	---	---	---
Saint-Maxime-du-Mont-Louis (L'Anse-Pleureuse)	May and June 2009	---	---	---	---
Sainte-Madeleine-de-la-Rivière-Madeleine (Manche-d'Épée)	June 2004 and 2005	---	---	---	---
Sainte-Madeleine-de-la-Rivière-Madeleine (Rivière-Madeleine)	June 2004, 2008, 2009 and 2010	June: 20 to 22	June: 14	---	---
Grande-Vallée	June 2004, 2006 to 2009 July 2006 August 2005	June: 14 [†] to 16 [†] , 17, 18 [†] , 19 [†] , 20 and 21	---	---	---
Gaspé (Anse-à-Valleau)	---	June: 23	---	---	---
Gaspé (Saint-Maurice-de-l'Échourie)	2005, 2006 and 2007	---	---	---	---

Localisation	2004 to 2010	2011	2012	2013	2014
Gaspé (Petit-Cap)	June 2009				---
	July and August 2005	---	---	---	---
Gaspé (Rivière-au-Renard)	May and June 2007	---	---	---	---
	Mid-June 2006				
Gaspé (Cap-des-Rosiers)	June 2005 to 2009	June: 15	---	---	---
Gaspé (Anse-aux-Amérindiens)	---	June: 21	---	---	---
Gaspé (Cap-Bon-Ami)	May and June 2007	---	---	---	---
Gaspé (Cap-aux-Os)	May and June 2007	---	July: 29	---	---
	June 2004				
Gaspé (Gaspé)	May 2009				---
	May and June 2007	May: 23 [‡] , 27 [‡] and 29 [‡]	---	---	---
	June 2004 to 2006				
	July 2004				

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

The data from the Capelin Observers Network indicate that capelin spawning in the Northern Gaspé Peninsula begins in late May though it was mainly observed in June (Figure 11). The locations of spawning observations or presence of capelin in this zone were mapped covering the sectors of Chaleur Bay and Magdalen Islands for the years 2002 to 2015 (Figure 13).

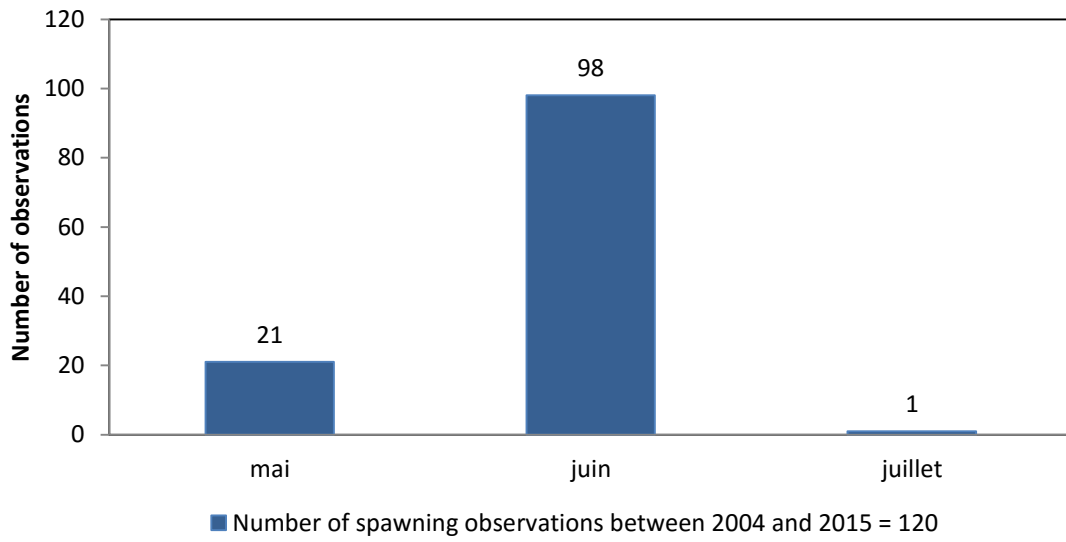


Figure 11: Period of observation of capelin spawning in Gaspé Peninsula between 2004 and 2015.

3.6 CHALEUR BAY – GULF

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

Observations

In 2013, two observers reported 3 cases, including 1 case of spawning in this zone (Table 6). These observations were made between May 15 and 29. No data were reported regarding this zone in 2014 and 20215.

Table 6: Dates of observation of capelin spawning or presence between 2003 and 2015 in Chaleur Bay.

Localisation	2003 to 2010	2011	2012	2013	2014	2015
Maria	May 2005	---	---	---	---	---
Bonaventure	May 2009, 2010	---	---	---	---	---
New Carlisle	May 2005 to 2007 and 2009	---	May: 28 [‡]	---	---	---
Paspébiac	May 2003 to 2005 and 2009	---	May: 25	---	---	---
Port-Daniel-Gascon (Port-Daniel)	May and June 2003 and 2009	---	---	---	---	---
Chandler (Newport)	May 2005 to 2010 June 2006, 2008 and 2009	June: 21 [‡]	---	---	---	---
Chandler (Chandler)	June 2006 and 2008 2007	June: 6 [‡]	---	May: 15 [‡]	---	---
Chandler (Pabos)	May 2006 June 2008	---	---	---	---	---
Grande-Rivière	2006 May, June and July 2009	April: 29 [‡] May: 13 [‡] and 20 [‡]	June: 3 [‡] , 6 [‡] , 8, 16 [‡]	May: 16 [‡] , 29	---	---
Sainte-Thérèse-de-Gaspé	May 2008	---	---	---	---	---
Percé (Percé)	May 2009, 2010 June 2005, 2007 and 2009	June: 29	June: 2, 3 and 19 [‡]	---	---	---
Percé (Anse-	May 2009	June: 15	---	---	---	---

Localisation	2003 to 2010	2011	2012	2013	2014	2015
à-Beaufils)	June 2008					
Percé (Barachois)	May and 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 the Chaleur Bay region, capelin spawning was observed mainly in May, and to a lesser extent, in June (Figure 12). The locations of the observations of spawning or presence of capelin for this zone were mapped covering the Gaspé Peninsula sectors and the Magdalen Islands for the years 2003 to 2015 (Figure 13).

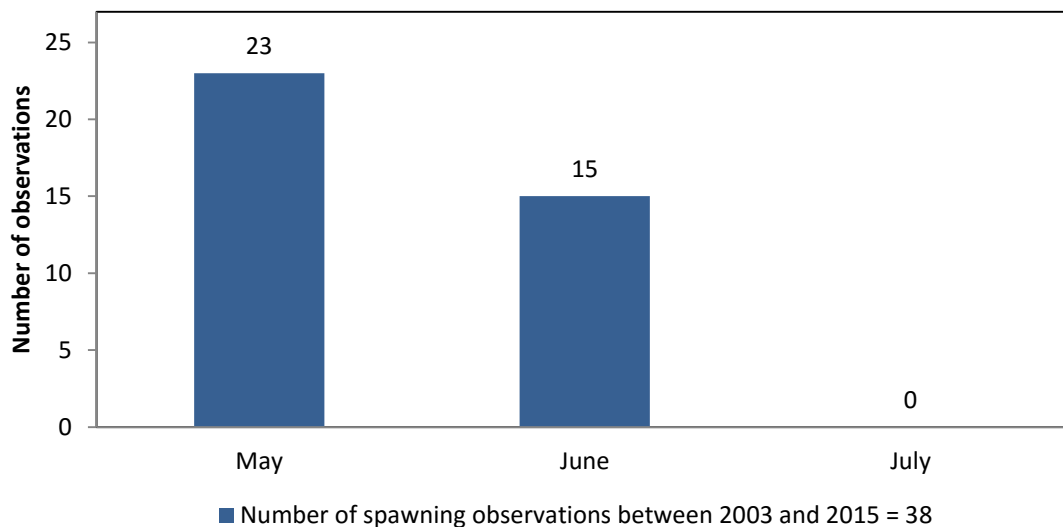


Figure 12: Period of observation of capelin spawning in Chaleur Bay between 2003 and 2015.

3.7 MAGDALEN ISLANDS

The Magdalen Islands zone encompasses all islands in that archipelago.

Observations

The first observation of capelin presence, since the network's establishment, was reported by lobster and flounder fishermen in June 2008, at Cap de l'Hôpital, in Fatima (Table 7). In 2011, two observers made 4 observations of capelin presences between June 21st and July 1st at Étang-du-Nord and Pointe-aux-Loups beach. No sightings were reported for either: 2012, 2013, 2014 or 2015. However, local fishermen have reported sighting in abundance along the coast as well as floating dead on the northwestern side of the archipelago during the season the last season. The

locations of the observations of spawning or presence of capelin for this zone were mapped covering the Gaspé Peninsula sectors and the Chaleur Bay for the years 2002 to 2014 (Figure 13).

Table 7: Dates of observation of capelin spawning or presence between 2008 and 2015 in Magdalen Islands.

Localisation	2008 to 2010	2011	2012	2013	2014	2015
Fatima	June 2008	---	---	---	---	---
Étang-du-Nord	---	June: 27 [‡]	---	---	---	---
Pointe-aux-Loups	---	June: 21 [‡] and 30 [‡] July: 1 [‡]	---	---	---	---

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

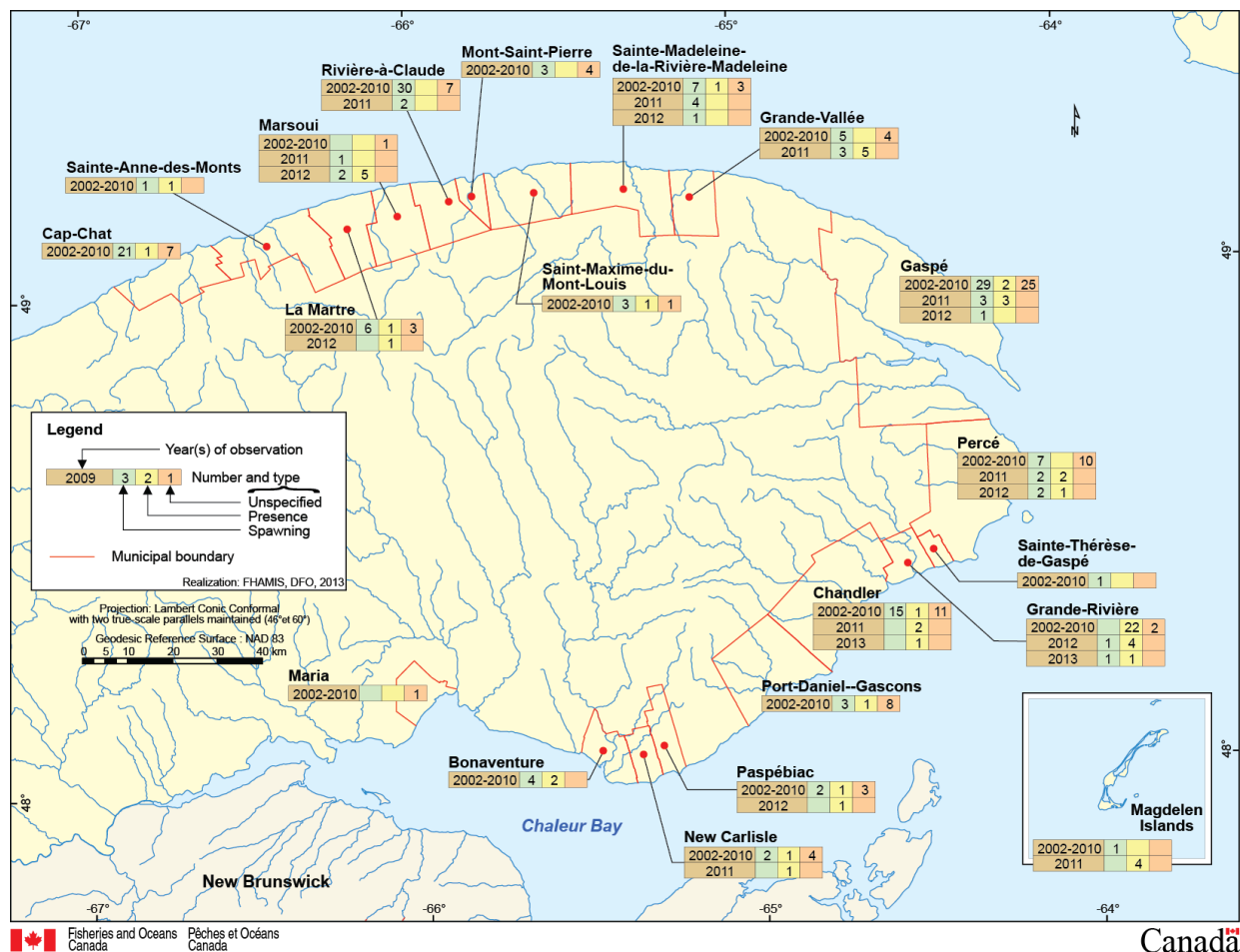


Figure 13: Location of observations of capelin spawning and Presence in Gaspé Peninsula, Chaleur Bay and Magdalen Islands between 2002 and 2015.

3.8 NEWFOUNDLAND AND LABRADOR

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

Observations

In 2011, 7 observers reported 11 observations of capelin spawning and 6 presences of capelin in the zone (Table 8). Nothing was reported in 2012 and in 2013. Several observations were reported in the zone in 2014. September spawning observations were reported in this zone, including, for the first time, at Drook Cove and Trepassey. In 2015, one new spawning site was mentioned at Raleigh.

Table 8: Dates of observation of capelin spawning or presence between 1945 and 2015 in Newfoundland and Labrador.

Localisation	1945 to 2011	2011	2012	2013	2014	2015
Forteau Labrador	July 2008	---	---	---	---	---
Sandy Cove Bay	August 1991	---	---	---	---	---
Port au Choix	---	June: 27	---	---	---	---
Raleigh	---	---	---	---	---	July : 28
Port Saunders	---	June: 27	---	---	---	---
River of Pounds	June: 29 [†]	June: 13 and 27	---	---	---	---
Belburns	June and July 1945 to 1979 May and June 1980 to 1989 June and July 1990 to 1999 June 2002	---	---	---	---	---
Trout River	---	June: 27	---	---	---	---
Meadows	---	June: 18	---	---	---	---
John's Beach	March 2010	---	---	---	---	---
Ship Cove	---	June: 28 [†]	---	---	---	---
Portugal Cove South	---	June: 22 and 23 July: 14 [†]	---	---	June: 24 [†] July: 14 [†] , 19 [†] , 21 [†]	---
Drook Cove *	---	---	---	---	July: 7 [†]	---

Localisation	1945 to 2011	2011	2012	2013	2014	2015
Middle Cove	July 2006 and 2008 June and July 2007 July, August and September 2009	June: 27 and 29 July: 4 [‡] , 7 [‡] and 18	---	---	---	---
Torbay	August 1998	June: 29 [‡] July: 4 [‡] and 7 [‡]	---	---	---	---
Trepassey					June: 25 [‡] July: 21 [‡]	---

*Names in parentheses denote sections of municipalities. ‡ Denotes date of observation of capelin presence without mention of spawning. * 1st spawning report in this zone.*

Since the beginning of observations in Newfoundland and Labrador, capelin spawning seems to have occurred mainly in June, and to a lesser extent, in July (Figure 14).

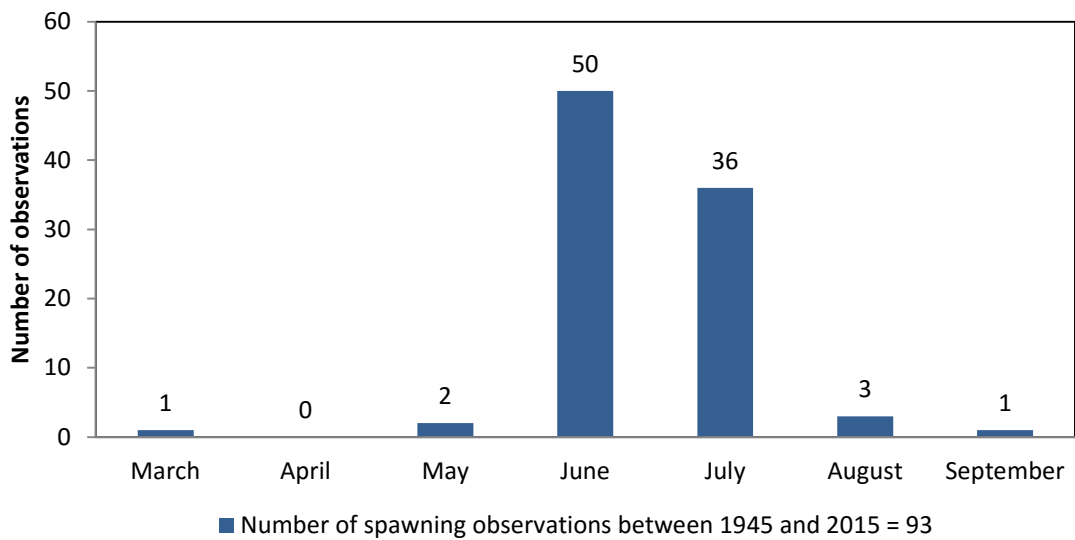


Figure 14: Period of observation of capelin spawning in Newfoundland and Labrador between 1945 and 2015.

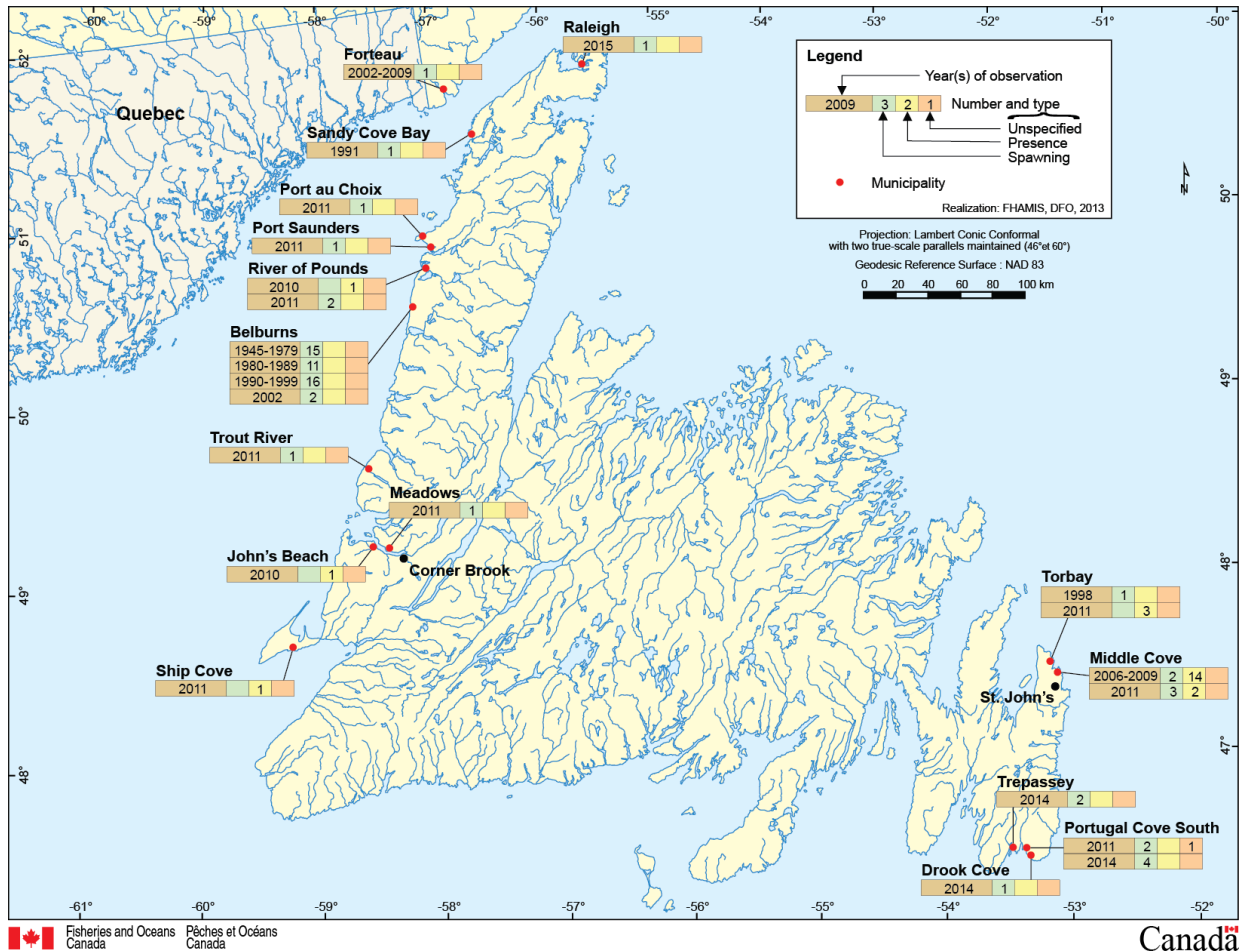


Figure 15: Location of observation of capelin spawning or presence in Newfoundland and Labrador between 1945 and 2015.

3.9 PRINCE EDWARD ISLAND

The Prince Edward Island CON Zone includes all the municipalities of the island.

Observations

Since the establishment of the network, the first observation of the presence of capelin in Prince Edward Island was reported in 2015, although observed in May 2014 in Park Corner.

Table 9: Dates of observation of capelin spawning or presence between 2008 and 2015 Prince Edward Island.

Localisation	2008 to 2010	2011	2012	2013	2014	2015
Park Corner *		---	---	---	---	May 6 [‡]

[‡] Denotes date of observation of capelin presence without mention of spawning. * 1st spawning report in this zone.

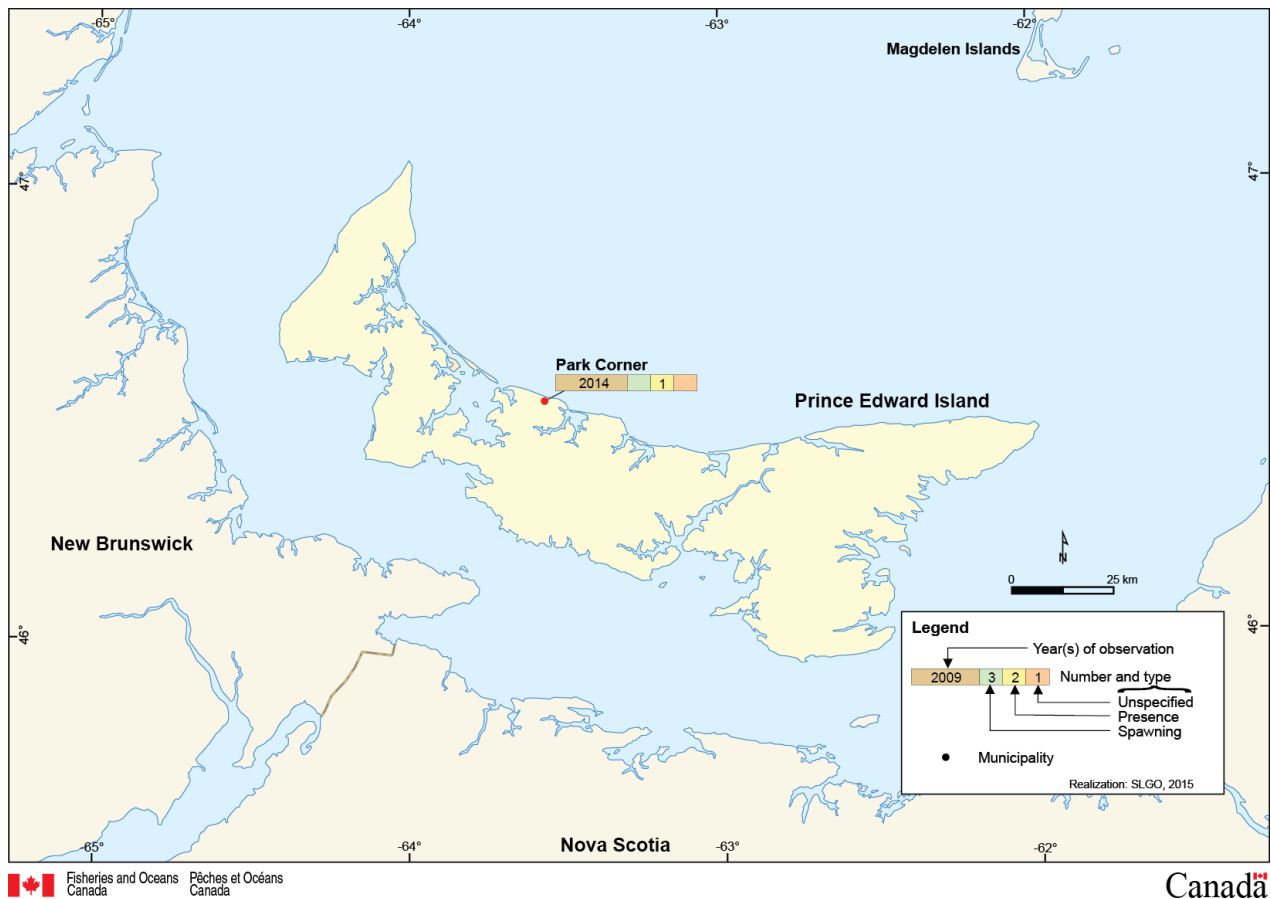


Figure 16: Dates of observation of capelin spawning or presence between 2008 and 2015 in Prince Edward Island

4.0 Estimation of the seasonal abundance of capelin

Are there more or less capelin? Because there isn't any annual monitoring of capelin abundance, this question is difficult to answer. However, the data collected by the network between 2006 and 2009 show that a majority of observers estimated that the amount of spawning capelin was high (Table 9). Though this trend was less marked in 2010, it should be noted that the number of observers and observations dropped in 2009 and 2010. That being said, we are unable to conclude that there were less capelin on the beaches. We can safely say that there were more observers and observations in 2011 than during the previous year. 2012 shows a marked decrease in observers and in gathered assessments. Because of the method used for data collection, it is unsure whether these decreases were due to a lower abundance of capelin or to fewer active observers. 2013 and 2014 followed the same trend as in 2012: a decrease in the number of observations, dropping from 93 in 2012, to 66 in 2013, and to only 23 in 2014. For each of these three years, the number of observers also dropped from 19 to 11, to 7. In 2015, a small increase was noted for the number of capelin observation reported, that is 25 observations reported by 16 observers, representing more than twice the observers compared to 2014. It

around twice time of observers compared with 2014. Raleigh was also determined as a new capelin spawning site.

For a majority of the observations regarding the presence and/or the spawning of capelin, observers have estimated that the abundance of capelin was just as high in 2013, 2014 and 2015 as it has been every year since 2006 (Table 9). However, the abundance of capelin has not been systematically reported. During 2013, in 59 out of 93 observations, the capelin abundance was either unassessed or unknown. In 2014, in 5 out of 23 reports, the capelin abundance was also unknown. In 2015, the capelin abundance was noted for only 5 observations out of 25.

Table 10: Estimation of the percentage of spawning capelins or presence observation.

<i>Year</i>	<i>High</i>	<i>Mean</i>	<i>Low</i>
2006	63	12	25
2007	66	17	17
2008	58	21	21
2009	46	29	25
2010	44	30	26
2011	52	30	18
2012	50	25	25
2013	72	14	14
2014	50	39	11
2015	40	30	30

Several factors can influence the amount of capelin spawning on beaches. For example, a previous warmer winter, variations of ice cover or changes in freshwater runoffs may all be taken into account to explain variations in spawning.

5.0 Conclusion

Since 2011, the number of capelin sightings has considerably declined, going from 184 entries to 93 in 2012, to 66 in 2013, to 24 in 2014 with a slightly increase in 2015 with 25 reported observations. The question is now whether there is a genuine cause for concern regarding the species or rather if attracting potential observers along the coast is a growing necessity? In that regard, it may also be important to remind coastal populations that observation data can only be considered if it holds the minimum mandatory information, including: date, location (network zone and municipality), the type of observation as well as capelin density. Other data, such as: time, types of substrate, shoreline length, tide, temperature, waves, etc., although of great

interest for maximizing information regarding capelin spawning habits, it is important to understand that these data should not be limited solely to the disclosure of capelin presence on our shores. In order to encourage the promotion of the ROC WEB site to give information about capelin observations, it may be appropriate to put forth the most favorable periods and zones historically relevant to coastal populations through increased promotion by the project partners.

To encourage sharing capelin observations, it may be appropriate to further promote the CON Crowdsourcing web tool and the importance of capelin on the St. Lawrence ecosystem, prior to spawning periods.

Once again, we wish to convey our gratitude to the all observers, whose observations and data gatherings helped muster the information relative to capelin spawning for the last years, including the addition of two new observations localities, one to become the first in Prince Edward Island, a new CON zone.

Appendix 1. User Guide for WEB entries

User Guide

Capelin Observers Network (CON)'s Data Capture Tool

SING-IN

On the login page (figure 1), click **Register as new user** to create your user account.

Fill in the required fields (those marked with an asterisk (*) are required), then click on **Create your account**. An email is automatically sent, which invites you to click **Activate my account** to complete your registering process. No need to enter your information's again, you will be redirected to the home page (figure 2).

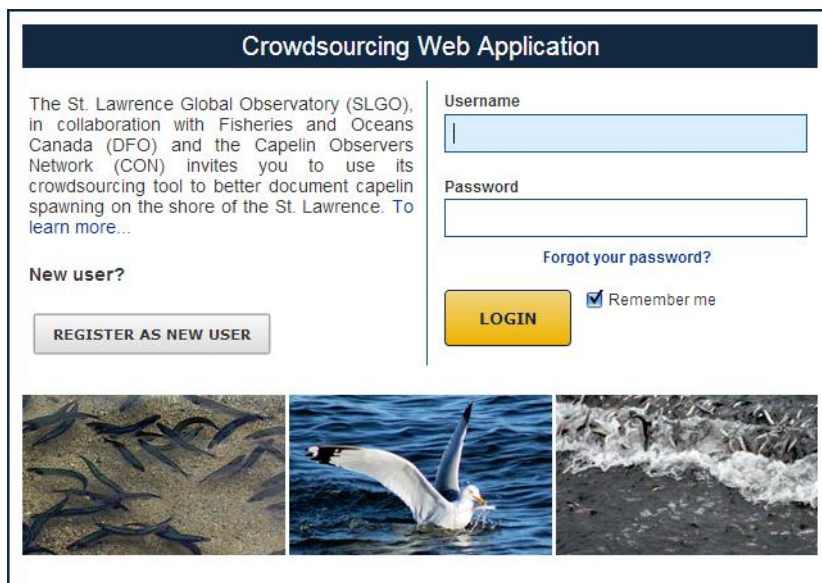


Figure 1

LOGIN

To login to your account once you are registered, enter your username and password to access the data capture tool (figure 1).

Once you are done with the capture tool, logging out is recommended. To do so, click **Logout** at the top-right corner of the home page (figure 2).

DATA CAPTURE

For all users

After logging in, CON's home page (figure 2) displays. You can look for observations searching by user (All users or just your own observations), by observation type and by year. The total number of observations from all users is displayed by default above the map on the right.

To enter a new capelin observation, click **Add a new observation**, top-left of the page (figure 2). Capture page then displays (figure 3).

Then you have to simply fill in the fields. Note that for «1. Required Fields» tab, latitude and longitude values must be entered with a «.», not with a «,». You can also localize your position by double-clicking on the map; then you will have to zoom in until you can add your marker. While on the field, you can also use the **Use my current GPS position** link, which localizes automatically your position. Don't forget to check the position entered and to rectify it on the map if needed. Data capture for tabs 2 to 4 is not mandatory. However, it is important to check the **Publish on SLGO** box in the tab «4. Other» if you wish your observations to be viewed by all users. Finally, make sure you click the **Create** button on the bottom-left corner of the page to save your data.

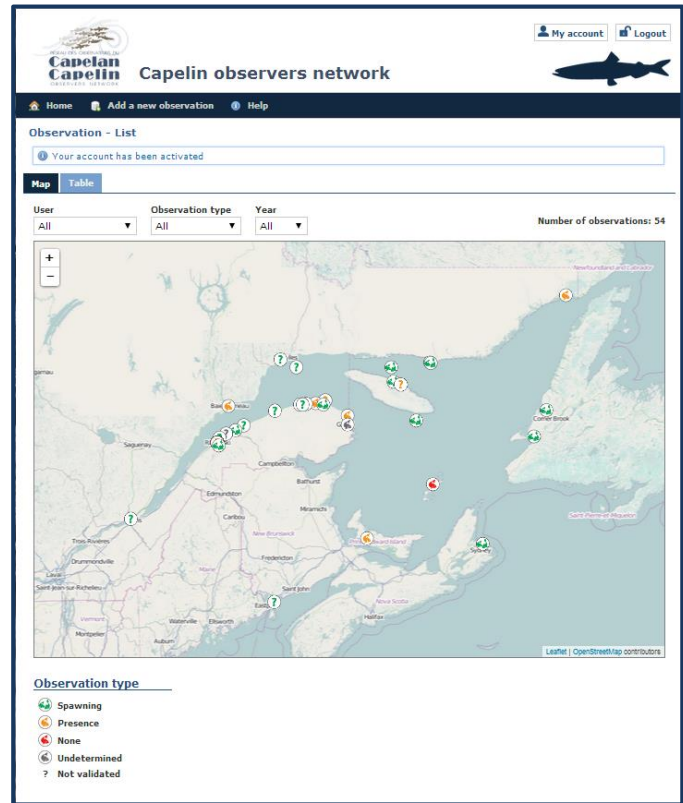


Figure 2

Once the observation is created, the capture tool allows adding pictures from a browser. Click **Select a file** (figure 4) and add your comments, then click **Create** to save your picture. If you don't have any picture for this observation, simply click **Back to observation**.

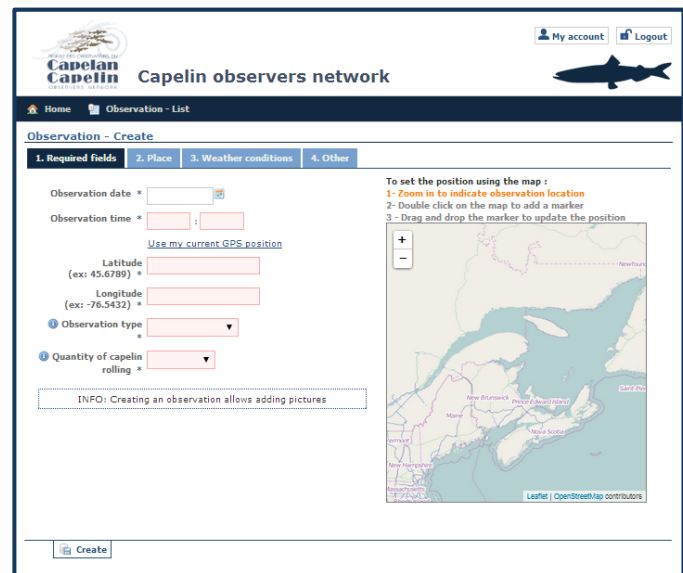


Figure 3

Once your picture is entered, you can edit or delete it, using the buttons on the bottom-left corner of the page (figure 5). You can also add another picture by clicking [Add a new picture](#). The [Picture – List](#) button allows viewing all of the pictures related to the observation. The [Back to observation](#) button brings you to the observation’s summary page (figure 6).



Figure 4

Once your picture is entered, you can edit or delete it, using the buttons on the bottom-left corner of the page (figure 5). You can also add another picture by clicking [Add a new picture](#). The [Picture – List](#) button allows viewing all of the pictures related to the observation. The [Back to observation](#) button brings you to the observation’s summary page (figure 6).



Figure 5

On this page, you can see the list of your observations (by clicking [Observation – List](#)) or you can add new observations, by clicking [Add a new observation](#). To add a picture at this stage, click the [Pictures](#) blue link, then select [Add a new picture](#) on the page displays. At all times, you can view your observations by clicking [Home](#).

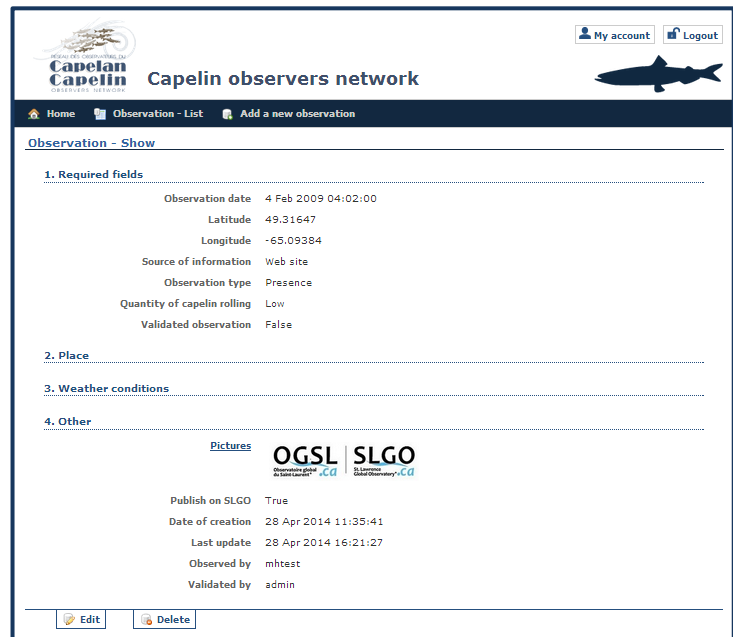


Figure 6

You may have noticed that the home page displays your observations with question marks of the same colour as the observation type (figure 7). The question marks mean that the observations remain non-validated by the capture tool's administrators, namely the CON's professionals. You will receive an email to confirm validation or to explain the reasons why the observation has not been validated, if there is any doubt from the administrator.

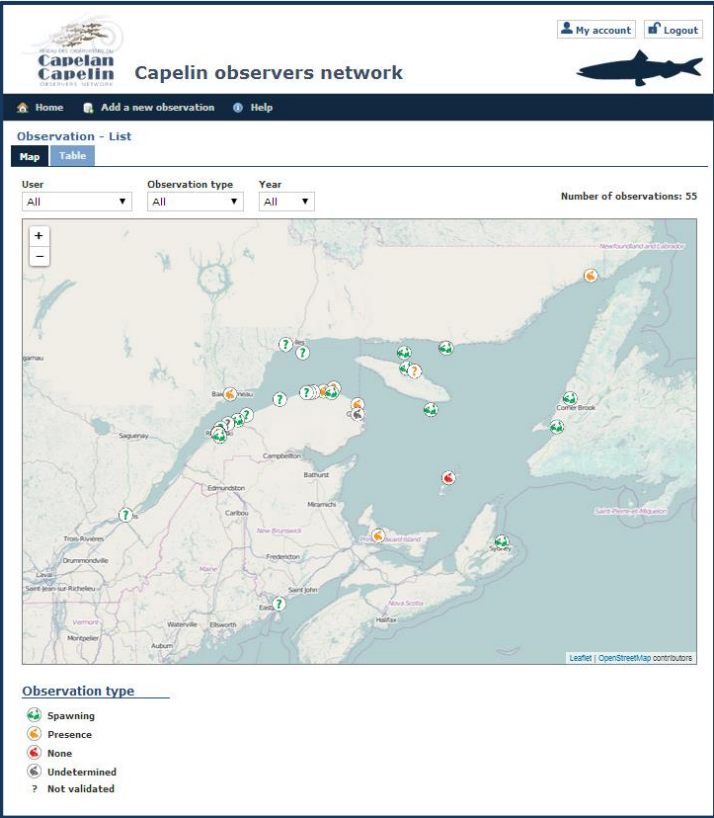


Figure 7

Appendix 2. Network and partner contact information

To submit your observations during the season go to the following address:



Web Site: <http://slgo.ca/en/biodiversity/fish/dfo-capelin/observation.html>

Email: info@ogsl.ca

Telephone: 1-877-227-6853

Address: St. Lawrence Global Observatory (SLGO)
Capelin Observers Network (CON)
310, allée des Ursulines
Rimouski (QC) Canada
G5L 3A1