ASSESSMENT OF CAPELIN IN SA2 + DIV. 3KL IN 2013

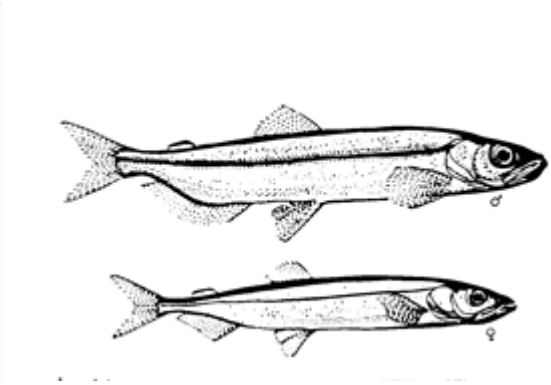

Image adapted from a drawing in C. E. Hollingsworth. 2002. Preface. ICES J. Mar. Sci. 59, p. 861

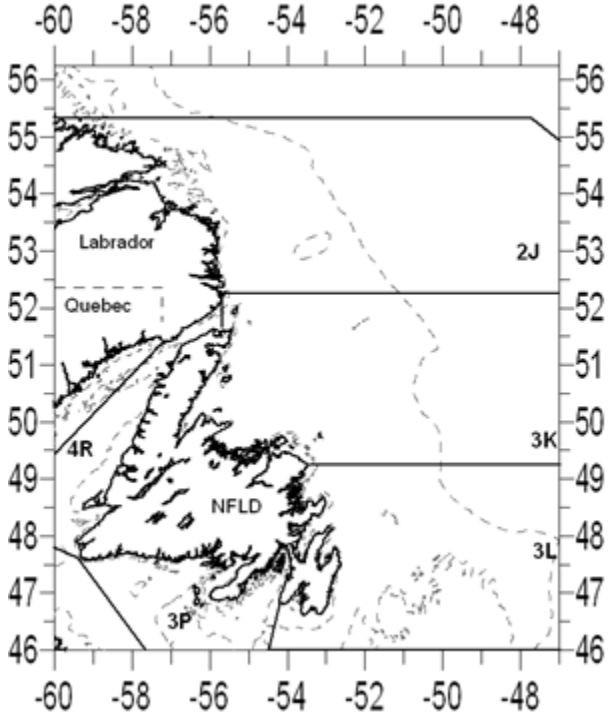

Figure 1: Capelin stock area with 100 m and 500 m contours.

Context:

Capelin (Mallotus villosus) is a small pelagic schooling species with major populations occurring in the Northwest Atlantic, in waters around Iceland, in the Barents Sea, and in the northern Pacific.

Prior to 1992, Capelin in Northwest Atlantic Fisheries Organization (NAFO) Subarea (SA) 2 + Division (Div.) 3K and in Div. 3L were treated as two separate stocks; however, as a result of accumulated evidence, scientists recommended in 1992 that Capelin in these areas be considered one stock complex. Four other recognized Capelin stocks occurring in Canadian waters are the Southeast Shoal (Div. 3NO), St. Pierre Bank (Subdiv. 3Ps), Gulf of St. Lawrence (Div. 4RST), and the Scotian Shelf (Div.4W).

Historical catches of Capelin for food, fertilizer, and bait in Newfoundland have not exceeded 25,000 t. An offshore foreign fishery for Capelin occurred in the 1970s with a peak catch of 250,000 t in 1976. The offshore fishery was closed in Div. 3L in 1979 and in Div. 2J3K in 1992. An inshore fishery started in Div. 3KL in the late 1970s with peak landings of about 80,000 t from 1988-1990. Recent landings have been closer to 20,000 t.

Capelin are eaten by many predators including seals, whales, cod, Greenland halibut, salmon and seabirds and are considered a key forage species. Because of its prominent position in the ecosystem a conservative approach to their management has been adopted. Since 1979 a conservative exploitation rate not to exceed 10% of the projected spawning biomass was advised for Capelin stocks in the Northwest Atlantic. This advice has not been implemented since 2000 due to the inability to predict stock biomass.

The previous assessment for this stock was in 2010 (DFO 2011). Until 2001, stock status had been assessed and a stock status report produced on an annual basis. The fishery for Capelin in SA2+Div 3KL has been managed with three-year Capelin management plans from 1999 to 2008. From 2009 to 2011 the fishery has been managed with single year management plans. Since 2012 the fishery is being managed by an evergreen management plan.

The present review is the result of a request for science advice from the Fisheries Management (FM) Branch, Newfoundland Region prior to the formulation of the Fisheries Management Plan for Capelin in 2013.

A meeting of the Regional Advisory Process (RAP) was held on January 29-30, 2013 in St. John's, NL, to address the above request. Participants included researchers and resource managers from the Fisheries and Oceans Canada (DFO), representatives from the Newfoundland and Labrador provincial government and the Fish, Food and Allied Workers Union, fish harvesters, and faculty and graduate students from Memorial University.

SUMMARY

- Preliminary landings in 2011 and 2012 were 20,104 t and 22,298 t, respectively, against a Total Allowable Catch (TAC) in Div. 3KL of 22,579 t.
- Fish harvesters report normal distribution and abundance in areas fished in recent years.
- Fall Capelin distribution contracted southerly in the early 1990s. In 2011-2012 there was an expansion northward into Div. 2J.
- In spring 2011-2012 Capelin were widely distributed. In 2012 the DFO spring acoustic survey, an independent acoustic study, and the spring multi-species survey reported that Capelin have shifted from the shelf break onto the shelf, along the coast, and further south, a pattern typical of the 1980s.
- Capelin vertical distribution continues to exhibit less diurnal migration, remaining closer to the bottom than in the 1980s; however, Capelin inhabited more shallow depths in 2011-2012.
- The mean lengths and ages of Capelin sampled during the commercial fishery in 2010 and 2011 increased from a low in 2009 but remained smaller and younger than estimates in the 1980s.
- The proportion of age 2's maturing in recent years (37-79%) has been higher than in the 1980s (less than 5%).
- Since the 1990s spawning times have been delayed by as much as four weeks. Peak spawning at Bryants Cove and Bellevue Beach from 2010 to 2012 was in early to mid-July almost three weeks later than in the 1980s.
- Larval densities from the Trinity Bay September 0-group index since 2003 have been lower than during the mid-1980s, and the mean length of larvae has been smaller.
- Recruitment based on the spring acoustic survey has remained low since the 1980s. Five recruitment indices covering the year classes since 2003 have generally been coherent and indicate that the 2010 and 2011 year classes are comparable to the relatively large 2007 year class. There is uncertainty concerning the relative size of the 2012 year class.
- The 2011 and 2012 estimates of abundance from the spring acoustic survey in Div. 3L are higher than the 2010 estimate and similar to those of 2007-2009, an order of magnitude below estimates of the 1980s.

- Zooplankton abundance has been above average in recent years and favorable for Capelin growth, distribution and spawning.
- The current impact of predators on Capelin is not well understood. However, the biomass of piscivores since 2005 has been generally higher during than the previous decade but remains lower than the 1980s. Harp Seal abundance has been increasing since a low in the 1970s and has been relatively stable over the recent decade.

INTRODUCTION

Species Biology

Adult fish range in size from about 12 to 23 cm with males being larger than females. Historically, the spawning populations were composed of mainly three and four year old fish. Since the early 1990s, spawning populations have consisted predominantly of two and three year old fish. The short life span and variable recruitment offer the potential for frequent and dramatic changes in the mature biomass.

Juvenile Capelin of the SA2 + Div. 3KL stock can be found both in major bays and in offshore waters although the northern Grand Bank and Northeast Newfoundland Shelf are thought to be major nursery areas. At maturity, during June and July, schools of adults migrate inshore to spawn on Newfoundland beaches and on demersal sites. Since 1991 spawning has been delayed up to four weeks with spawning taking place in July and August. After the eggs have hatched, the larvae exit the gravel and most are carried out of the bays by surface currents. The average size of mature Capelin continues to be smaller than observed during the 1980s.

In summary, Capelin biology and behaviour continue to reflect the patterns observed during the 1990s. The dramatic shifts, first observed in the early 1990s, appeared to be linked with below normal seawater temperatures; however, the changes continue to persist despite higher seawater temperatures since the mid-1990s. Recent analyses suggest that changes in prey quality and availability in offshore feeding areas may be involved.

Fishery

Historically, Capelin were fished domestically on spawning beaches for food, bait, and fertilizer (annual harvest estimated at about 25,000 t). A directed foreign offshore fishery began in the early 1970s and was closed in Div. 3L in 1979 and in Div. 2J3K in 1992. The peak offshore catch of 250,000 t occurred in 1976.

During the late 1970s, an inshore fishery for roe-bearing female Capelin began. Throughout the 1980s, the inshore fishery usually started by mid-June in the south and finished about mid-July in the north. Since the early 1990s the inshore fishery has operated mainly in July and at times, especially in Div. 3K, in early August. Peak inshore landings of approximately 80,000 t occurred in 1988-1990. The TAC was close to being caught in 2011-2012 (Fig. 2).

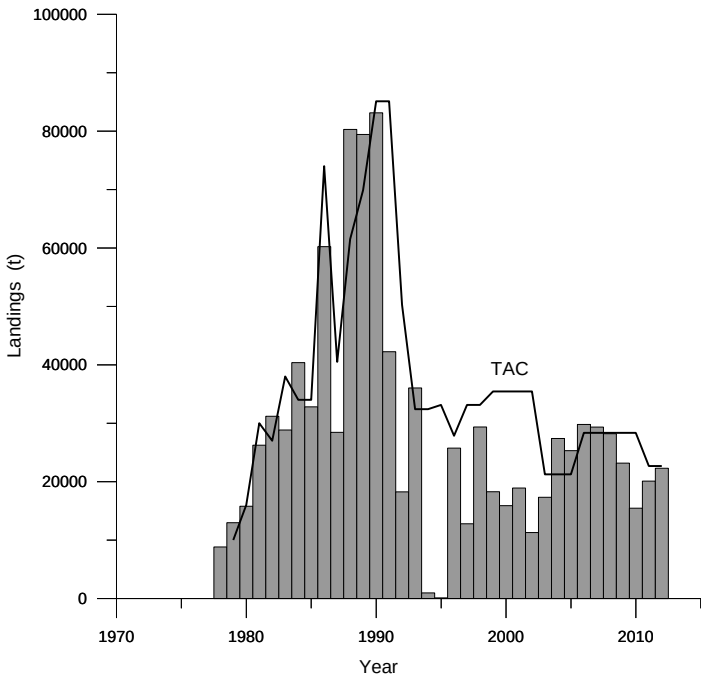

Figure 2: Inshore landings (bars) and TAC (line) for Div. 3KL in 1978-2012.

The inshore fishery has been prosecuted by Capelin traps, purse seines, and, to a lesser extent, beach seines. Since 1998, modified beach seines, called “tuck seines”, have been deployed because Capelin stayed in deep water and were unavailable to Capelin traps and beach seines. The use of tuck seines or Capelin traps has varied from location to location. The majority of the inshore landings in recent years comes from purse seines and tuck seines.

The primary market for frozen roe-bearing female Capelin in Japan is limited and the demand for quality is high. Inshore TACs have been tied to market constraints until the late 1990s. Discarding at sea and dumping of Capelin, predominantly males which are unsuitable for the Japanese market, were major concerns in the 1980s. In recent years, several management measures and access to other markets have mitigated these concerns. Monitoring Capelin quality prior to opening the fishery and relatively short fisheries (two to three days) have significantly reduced at-sea discarding. A condition of provincial processing licenses requiring full utilization of Capelin has been in effect since 2006. This requirement along with new markets for male Capelin have increased the utilization of male Capelin.

In 1994 and 1995, the average size of female Capelin in most areas was too small to meet a conservation criterion of 50 count /kg (sea run) in the Capelin management plan. As a result, the fishery either did not open or opened for only a short time and catches were low. In 1996, this size criterion was removed.

Landings from 1996-2003 were less than the TAC as a result of reduced fishing effort due to low prices, small females, and lack of interest by processors. Interest in the Capelin fishery has steadily increased since 2004 coincident with a closure of the Barents Sea Capelin fishery. The Barents Sea fishery reopened in 2009.

In the Capelin Integrated Fisheries Management Plan (IFMP) for 2003-2005, there was a 40% reduction in TACs attributed to uncertainty around the status of Capelin at the time and its role in cod recovery. In the Capelin IFMP for 2006-2008, TACs were increased by 33%; at the time

there were indications that Capelin status was improving based on observations of Capelin in northern portions of the stock area, an increase in the size of spawners, and indications of more and earlier beach spawning. TACs were lowered by 20% for 2011 and 2012.

Capelin landings in Notre Dame Bay and White Bay for 2012 have returned to levels prior to 2010; however, landings in Conception Bay remain at relatively low levels. Capelin landings in St. Mary's Bay and along the Southern Shore have been negligible since the 1990s. A sustained reduction in the spawning area of the stock may mean recruitment is becoming more dependent on spawning sites located in a smaller portion of the stock area.

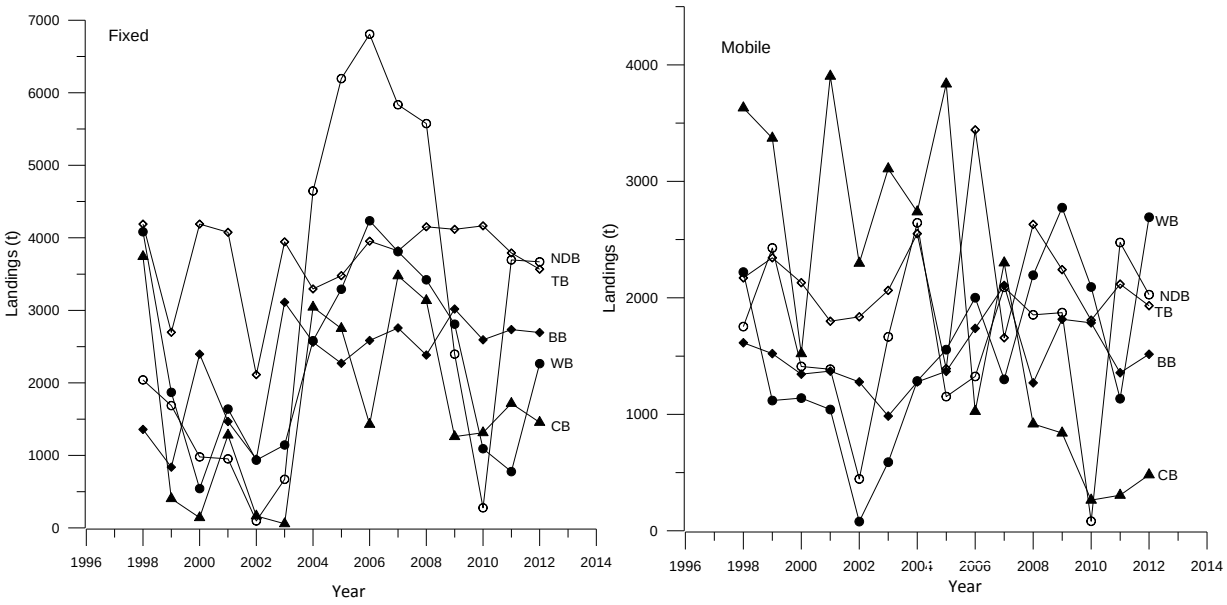

Figure 3: Trends in fixed and mobile gear landings (t) in Conception Bay (CB; closed triangle),Trinity Bay (TB; open diamond), Bonavista Bay (BB; closed diamond), Notre Dame Bay (NDB; open circle), and White Bay (WB; closed circle) for 1998-2012.

ASSESSMENT

There are no reliable estimates of current spawning biomass for the entire stock although an index of abundance is available from the spring acoustic survey which covers about one third of the potential area of distribution. The assessment is therefore based on trends in indices and distribution, behavioural changes, and biological descriptors.

The sources of data for consideration are as follows:

1) abundance estimates, and biological samples from spring offshore acoustic surveys predominantly in Div. 3L during 1984-1992, 1996, 1999-2005, 2007-2012;

2) distribution from spring offshore acoustic surveys and spring and fall multi-species research vessel bottom trawl surveys in Div 2J3KL (1985-2012) and a spring CFER (Centre for Fisheries Ecosystem Research, Memorial University) acoustic study in Div. 3KL and Subdiv. 3Ps (2012);

3) larval emergence (1990-1996, 1998-2012) and larval surface tow (2003-2012) indices from Bellevue Beach in Trinity Bay;

4) 0-group surveys of larval Capelin in Trinity Bay (1982-1986 and 2003-2012);

5) spawning times from Bryants Cove in Conception Bay and Bellevue Beach 1978-2012;

6) biological samples collected from the commercial inshore fishery 1981-2011;

7) spring offshore feeding (1999-2012); and

8) environmental/ecosystem considerations.

Trends

Spring Acoustic Survey

Information from spring acoustic surveys was available for 1988-1992, 1996, 1999-2005, and 2007-2012. Estimates of Capelin numbers, including 95% confidence limits, were calculated using a simulation technique that incorporated variability over time associated with advances in hydro-acoustic technology and calibration, changes in spatial and vertical distribution patterns, and changes in the size of Capelin. Acoustic survey data from 1984 to 1987 were not available to be processed in the same way, hence the survey series could not be extended further back in time. Abundance at age 3 was strongly correlated with abundance at age 2 indicating that the survey does consistently track stock size. Survey abundance remains well below that observed in the late 1980s. Following a period of very low abundance in the 1990s and early 2000s the abundance of Capelin increased slightly from 2007–2009, dipped briefly in 2010, increasing again in 2011-2012 to levels approaching those in 2007-2009 (Fig. 4). The spring survey covers a part of the stock area and as such these are considered to be minimum abundance estimates.

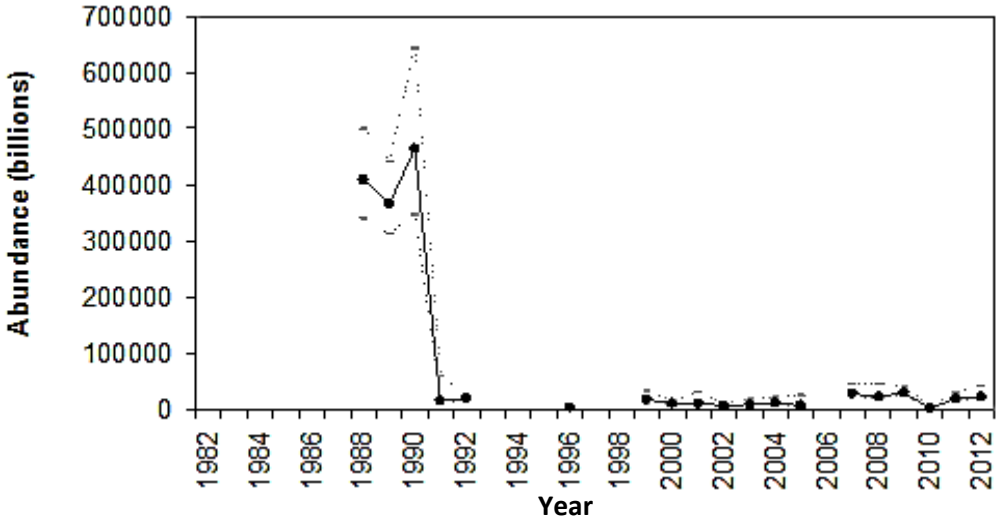

Figure 4: Simulated spring offshore abundance estimates (line) with 95% confidence intervals (broken lines) for an index area (mostly NAFO Div.3L).

Larval Studies

Annual estimates of larval Capelin emerging from beach gravel at Bellevue Beach were available from 1990 to 2012 except for 1997. Larvae were enumerated from plankton tows over the intertidal zone at every high tide[1]. Larval release from beaches has been shown to be related to recruitment (Carscadden el al. 2000). The 2010-2012 year classes are believed to be relatively strong. The 2011 year class, one of the largest in the series, would be relatively strong as age 2 in 2013 and the 2010 year class which was smaller than the 2011 year class would be three-year olds in 2013 (Fig. 5).

From 2003-2012 larval Capelin within Trinity Bay have been surveyed each September with double oblique 333 µm mesh bongo nets towed at each of 19 fixed stations[1]. The methodology employed was consistent with that used by Dalley et al. (2002) from 1982-1986. Comparison of results from the two time periods revealed that Capelin larvae in the 2000s were smaller and less abundant than in the previous period. Larval estimates since 2003 from Bellevue Beach (surface tows and emergent larvae) and Trinity Bay 0-group surveys and the ages 1 and 2 acoustic indices were generally coherent and indicated that the 2010 year class is about average and the 2011 year class is similar in size to the relatively large 2007 year class (Fig 6). The size of the 2012 year class is uncertain.

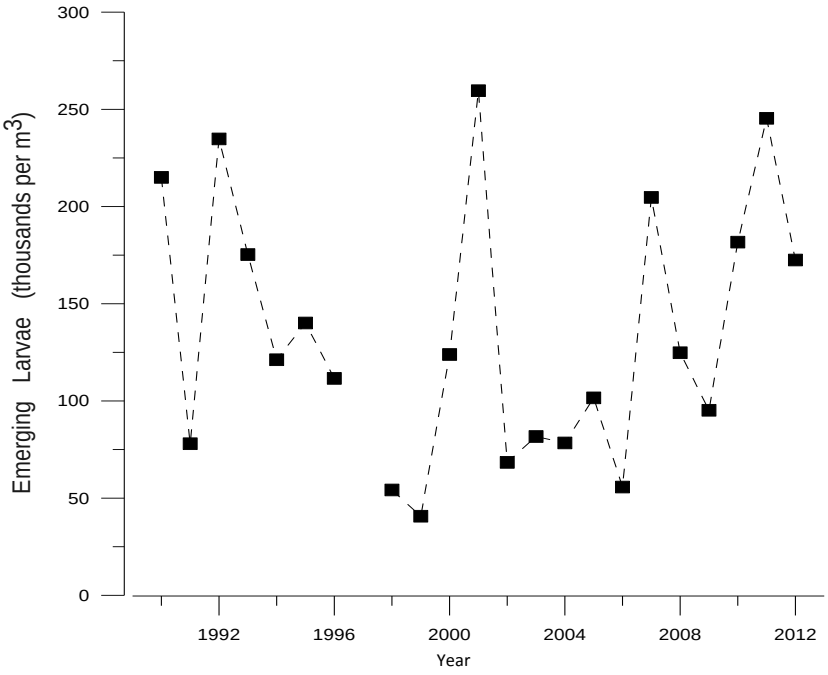

Figure 5: Larval emergence (squares) from 1990-1996 and 1998-2012 for Bellevue Beach, Trinity Bay.

[1] Nakashima, B.S. and Mowbray, F.K. Unpublished Data. Capelin (*Mallotus villosus*) recruitment indices in NAFO Div. 3KL.

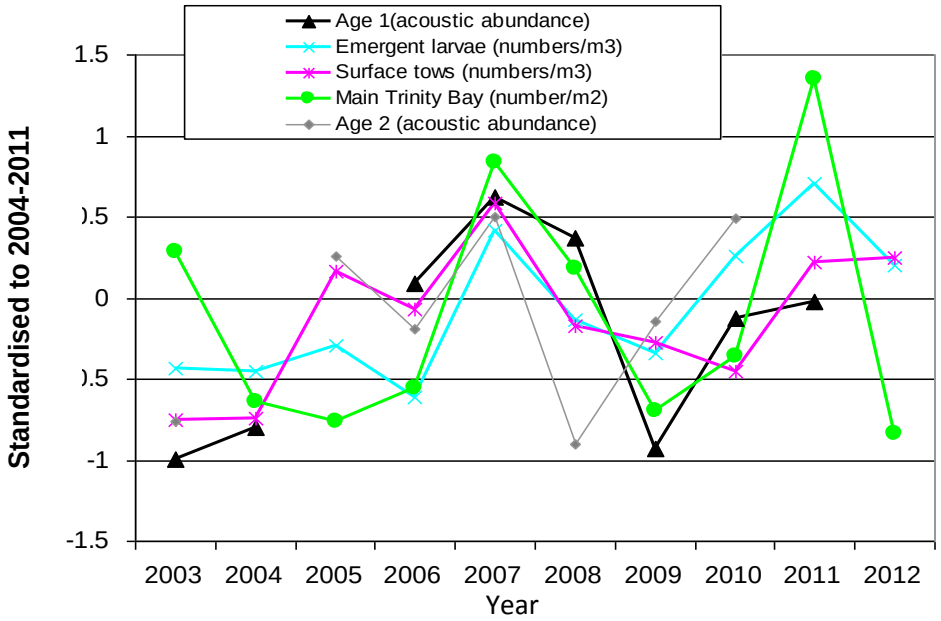

Figure 6: Standardized recruitment indices for Bellevue emergent larvae (teal x) and surface tow larvae (mauve x), Trinity Bay 0-group (green), and spring age 1 (black triangles) and age 2 (grey diamonds) acoustic abundance estimates for the 2003-2012 year classes.

Behavioural Information

Horizontal Distribution

Distribution of Capelin during the spring acoustic survey has changed over time. Prior to 1991 high densities of Capelin were spread throughout the survey area with the highest densities near- to mid-shore on the northern Grand Bank. Since 1999 Capelin densities have been low across the entire bank with the highest densities in a deep water stratum (>200 m) off Bonavista and along the shelf break. In 2010 Capelin densities were extremely low in all strata, although in the deepest shelf break stratum (300-500 m) and the only inshore stratum (Trinity Bay) the declines were less marked. In 2011 and 2012 Capelin distribution was widespread. The spring acoustic survey, CFER acoustic study, and the spring multi-species bottom trawl survey concur Capelin were distributed near the coast, on the shelf, and further south in 2012. This distribution is more similar to observations in the 1980s.

In autumn both immature and maturing Capelin are distributed offshore in Div. 2J3KL. Bottom trawl survey data indicate that densities in Div. 2J decreased sharply in 1990, with some short term increases in the northerly distribution in 1998-1999 and 2007-2008. In 2011-2012, higher densities of Capelin were again observed in Div. 2J.

Vertical Distribution

Vertical distribution, as measured from the spring acoustic surveys, shows that, since 1991, Capelin in Div. 3L have been found deeper in the water column and not undergoing diurnal migrations as observed in the 1980s (Fig. 7). However, in 2011-2012 Capelin were observed in areas of shallower bottom depths.

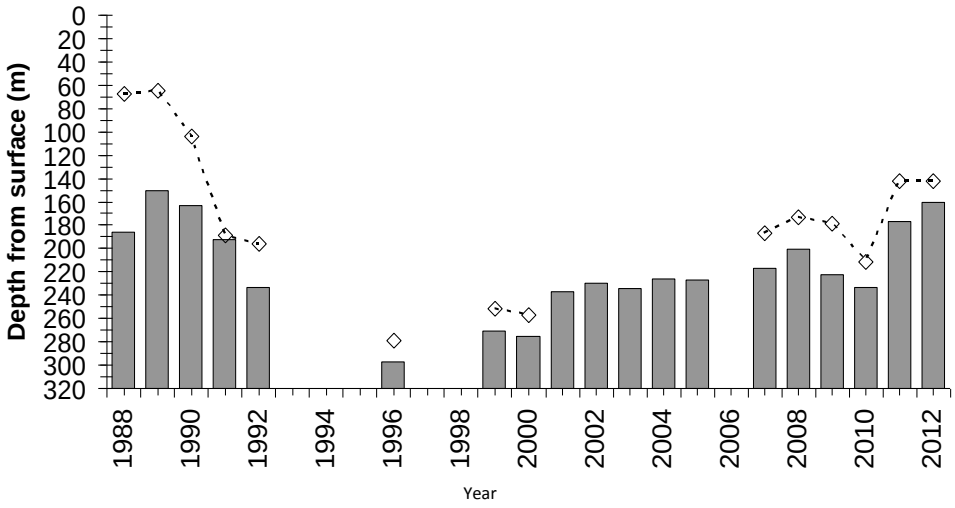

Figure 7: Mean weighted depth of Capelin (diamonds) and mean bottom depth where Capelin were found (bars) in the survey area in the spring, 1988-2012.

Spawning Time

A time series of the annual date of peak spawning was available for two beaches (Fig. 8). The data from Bryants Cove, Conception Bay (Div. 3L), were from 1978 to 2012 and is the only location where peak spawning has been documented before 1990. The data from Bellevue Beach, Trinity Bay, is the only location where peak spawning has been documented continuously from 1990 to 2010. Observations from 1991 to 2012 from four other spawning beaches in White Bay, Notre Dame Bay, Bonavista Bay, and Conception Bay mirrored the trend of peak spawning reported for Bryants Cove and Bellevue Beach. Capelin beach spawning continues to be about three weeks later than observed during the 1980s. Harvesters reported relatively early spawning on some beaches in Bonavista Bay in 2012.

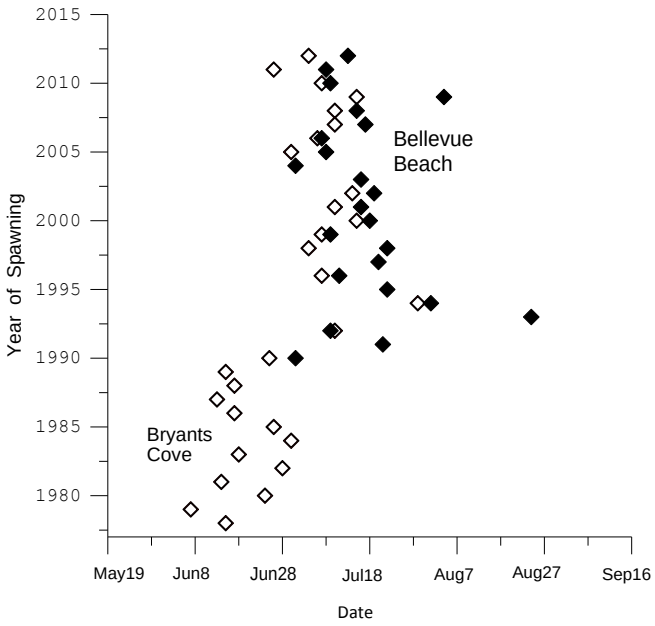

Figure 8: Peak spawning times at Bryants Cove, Conception Bay (open diamond), and Bellevue Beach, Trinity Bay (closed diamond).

Biological Information

Biological samples from the commercial inshore Capelin fishery have been collected and processed since the early 1980s. Results were available to 2011 for this assessment. Mean total lengths of males and females in both Div. 3L and Div. 3K describe similar trends (Fig. 9). Mean lengths since 1992 have been, on average, 15 to 18 mm smaller than those measured prior to 1992. Mean lengths in 2010 and 2011 were larger than in 2009.

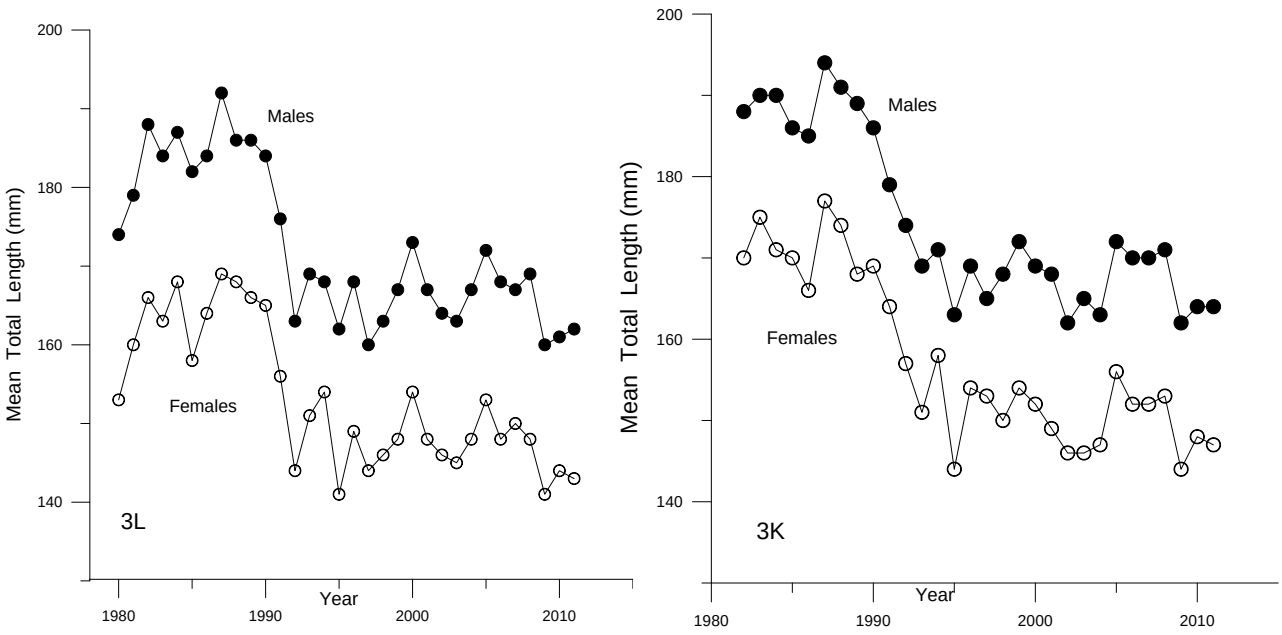

Figure 9: Mean total lengths of males (closed circles) and females (open circles) in Div. 3L and 3K.

The mean age of Capelin sampled from the inshore commercial fishery has been younger since 1992 compared to the 1980s (Fig. 10). From 1980 to 1991 the spawning biomass was comprised predominantly of three and four year-old fish. Since 1992 the spawning biomass has been dominated by two and three year old fish. The mean spawning age in 2010 and in 2011 has increased above the low estimate in 2009 and is consistent with the majority of the estimates since 1994.

Biological samples collected during the spring acoustic survey in recent years feature a higher proportion of mature two-year olds (Fig. 11) than in previous years. In the 1980s two year old Capelin in the offshore were predominantly immature. These observations are consistent with the increase in the proportion of mature two year olds observed in the commercial inshore fishery since the mid-1990s.

Capelin condition was lower in the 1990s than in the 1980s (Carscadden and Frank 2002). The body condition and gonad development of Capelin sampled during the spring acoustic survey have tended to vary together since at-sea measurements became available in 1996. Small gonads in May are indicative of delayed development and spawning. Capelin condition was highest and gonad development was most advanced in 2005 (Fig. 12). Condition in 2009 was the lowest in the series but has returned to average levels in 2010-2012. Gonad development in 2011-2012 was relatively advanced.

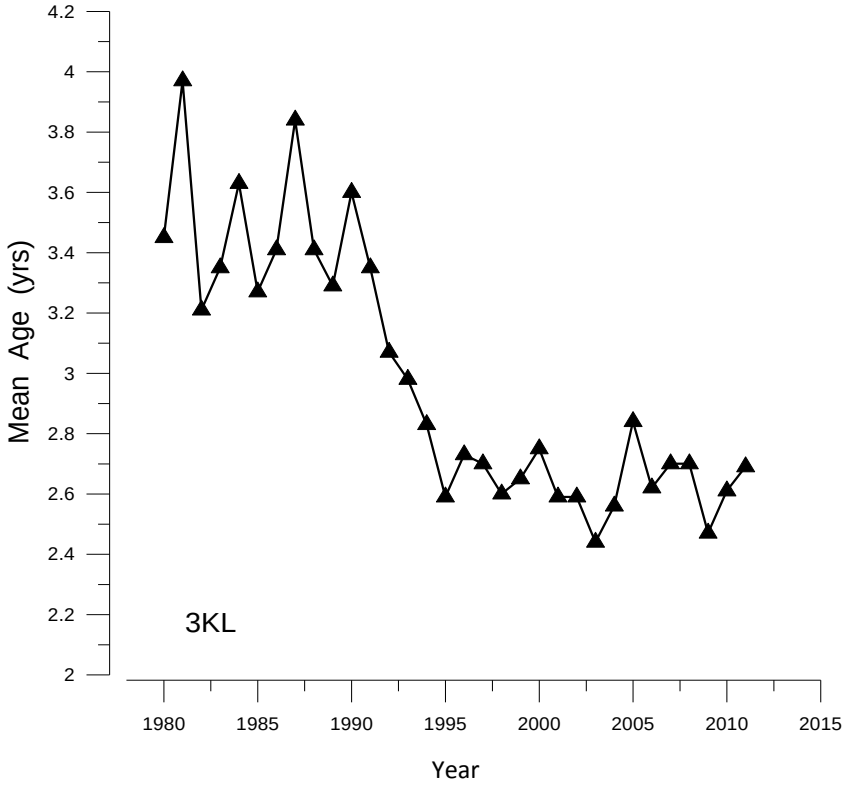

Figure 10: Mean age of mature Capelin (sexes combined) in Div. 3KL.

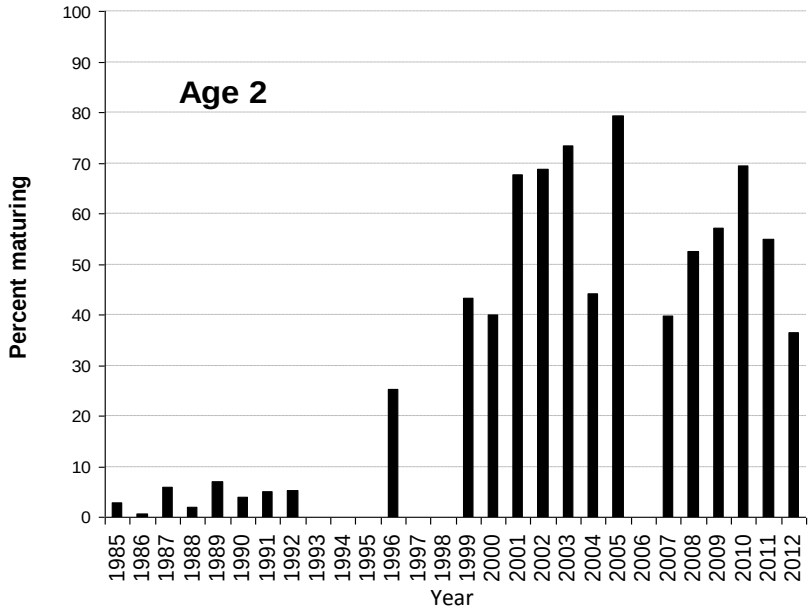

Figure 11: Proportion of two year old Capelin maturing in the spring.

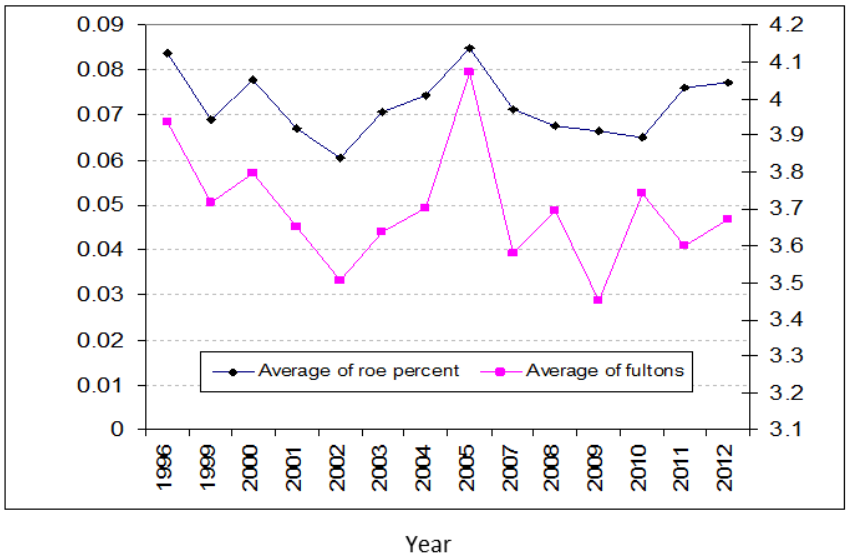

Figure 12: Fulton's condition index (squares) and roe percentage (diamonds) of female Capelin sampled during the spring offshore acoustic survey.

Environmental/Ecosystem Considerations

The extent of the Cold Intermediate Layer (CIL, <0°C) is generally regarded as a robust index of ocean climate conditions off the eastern Canadian continental shelf. The cross sectional area of this cold water mass along standard sections off eastern Newfoundland (Bonavista) and off southern Labrador (Seal Island) has been below the long term (1981-2010) mean during the past three years, reaching record low values off Bonavista in 2011. Above normal extents of the CIL were pervasive throughout the 1980s and early 1990s and may be associated with the shift to later spawning and smaller sizes of Capelin (Nakashima 1996).

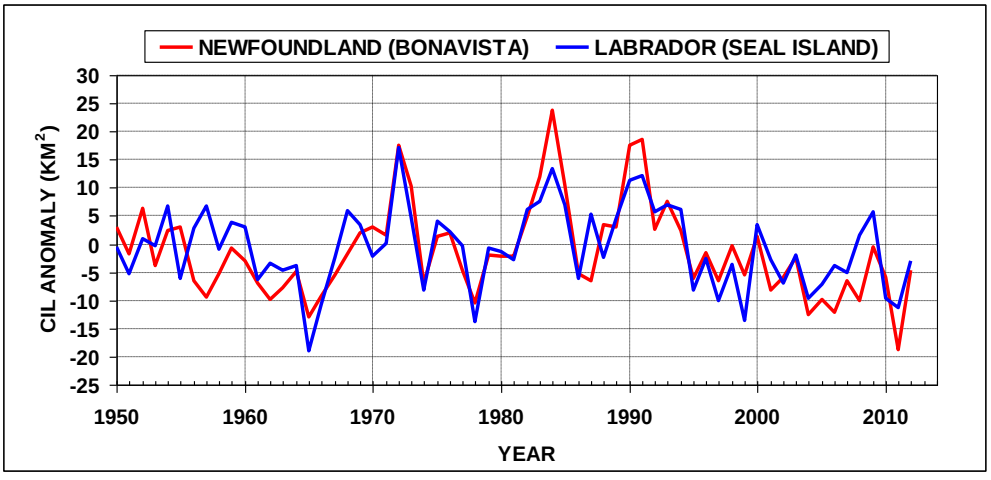

Figure 13: The cross-sectional area of the Cold Intermediate Layer (CIL) off eastern Newfoundland (red) and southern Labrador (blue), 1950-2012.

An abundance index of calanoid copepods, the primary prey group for Capelin, is available from the Atlantic Zonal Monitoring program since 1999. The abundance of calanoid copepods is above average in recent years.

Biomass indices for fish functional groups and commercial invertebrates (shrimp and crab) are available from DFO spring and fall multi-species bottom trawl surveys. According to these surveys, overall fish biomass increased from 2003 to 2007, and has been relatively stable since. Current overall fish biomass is higher than in the mid-1990s but still well below during pre-collapse levels (Fig. 14). The biomass of piscivores since 2005 is generally higher than the previous decade but remains lower than in the 1980s. The biomass of shrimp, which had been at record high levels in the late 1990s and 2000s, has declined since 2007 and is currently at the level of the late 1990s.

Based on data from the Div. 2J3KL fall survey, shrimp replaced Capelin as the single most important prey item for Atlantic Cod (*Gadus morhua*) in the early 1990s. Since 2009 the importance of Capelin in the diet of both Atlantic cod and Greenland Halibut (*Reinhardtius hippoglossoides*) has been increasing, particularly in Div. 2J, where Capelin was the dominant prey of American plaice (*Hippoglossoides platessoides*) in 2011. The increasing importance of Capelin in the diets is associated with a decrease of shrimp. Both Capelin and shrimp remain important forage species on the Southern Labrador and Northern Newfoundland shelves (Div. 2J3KL).

Marine mammals are also important predators of Capelin. Significant amounts of Capelin are consumed by Harp Seals (*Pagophilus groenlandicus*) in Div. 2J3KL (Stenson 2013). The abundance of seals has been increasing since a low in the1970s and has been relatively stable for the last 10 years (Hammill et al. 2012).

Given the population increases in Capelin predators, and the decline in alternate prey items such as shrimp, predation pressure on Capelin has most likely increased in recent years.

Sources of Uncertainty

There are no estimates of current stock size for Capelin in SA2+Div.3KL. As a result the impact of current catches on spawning biomass cannot be evaluated.

Beginning in 1991 and continuing throughout the 1990s, acoustic densities of Capelin offshore have been substantially lower than densities recorded during the 1980s. At the same time, other indicators of abundance, most notably those based on inshore areas during the spawning season, did not decline to the degree that would have been predicted from the acoustic estimates. The abrupt decline in offshore acoustic densities between 1990 and 1991, the continuing low offshore acoustic densities, and the discrepancies between the acoustic indices and other indices have never been explained.

The loss of the egg deposition and emerging larvae indices from Bellevue Beach that has been monitored since 1990 may increase uncertainty.

Associated with climate change is an increase in the magnitude and frequency of anomalies in environmental parameters. Capelin can respond rapidly to such environmental changes. Accordingly environmental variability may increase uncertainty with regard to Capelin stock dynamics.

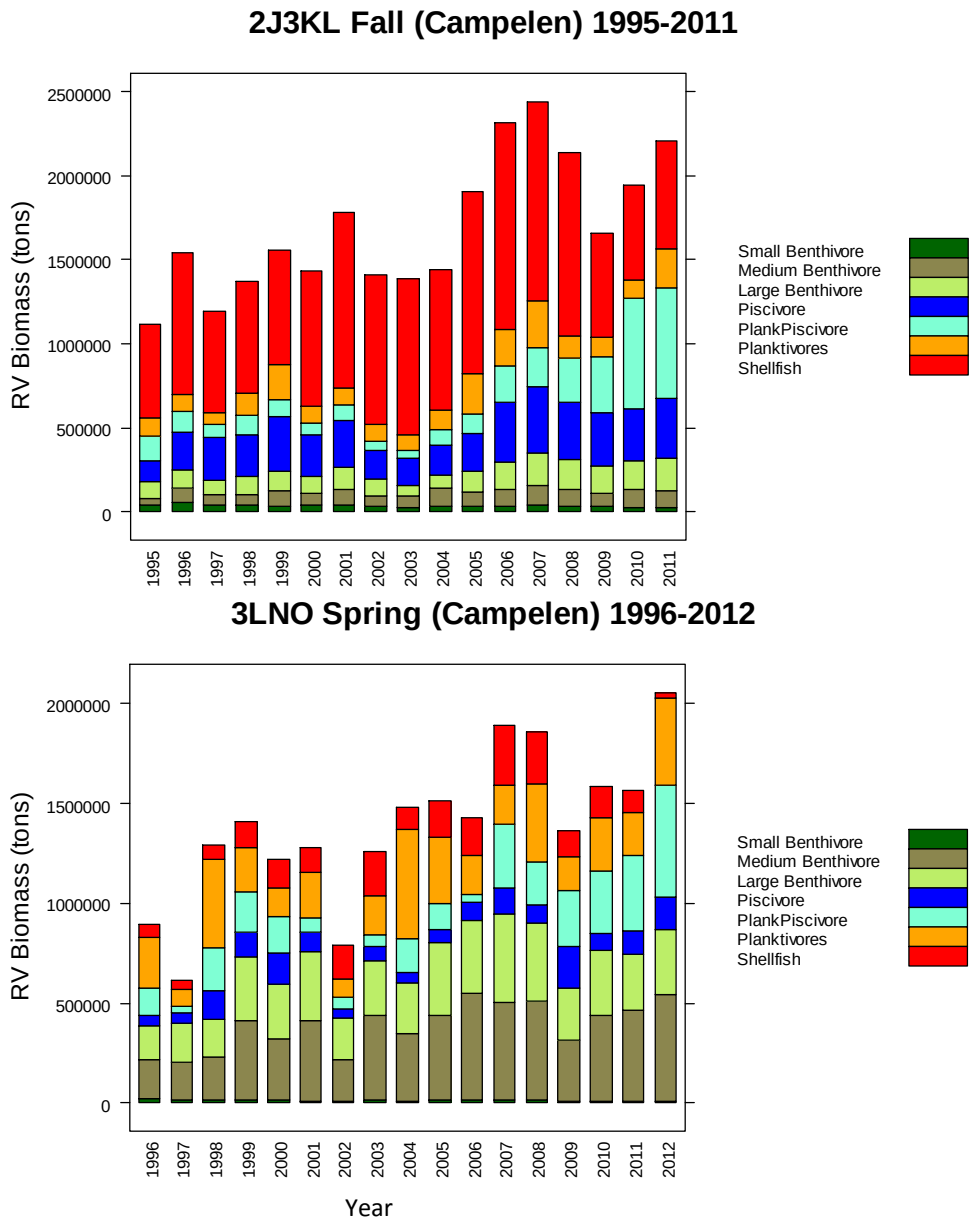

Figure 14: Relative biomass indices (RV Biomass in tons) of fish and commercial invertebrates from core strata in the DFO multi-species bottom trawl surveys using Campelen trawl. Above: Southern Labrador and Northern Newfoundland Shelves (Div. 2J3KL) during fall 1995-2011; Below: Grand Bank (Div. 3LNO) in the spring 1996-2012.The shellfish index primarily reflects Northern Shrimp biomass.

ADDITIONAL STAKEHOLDER PERSPECTIVES

During the 2012 season, harvesters have observed an abundance of Capelin that is comparable to the mid-1990s. However, some traditional areas of the 1980s, such as St. Mary's Bay and Placentia Bay, have seen little or no fisheries. This appears to be due to the fish moving north to other areas like Conception, Trinity, Bonavista, Notre Dame, and White bays. This northerly shift is even more prevalent in the extreme northern areas such Notre Dame and

White bays with even good reports of Capelin on the Labrador coast. All of these northern areas have shown an excellent abundance of Capelin.

Lack of landings in some areas can be attributed to better economic opportunities in other fisheries within that area. Other conditions such as poor market conditions combined with an inability to sell Capelin have the potential to negatively impact Capelin landings in all areas.

In recent years, Capelin have spawned 3-4 weeks later than seasons of the 1980s. However, during the 2011 and 2012 seasons harvesters have noticed that the Capelin have returned to the bays and began spawning earlier. Harvesters consider this to be a positive return to the more traditional spawning cycles of Capelin.

Capelin in 2012 appear to be of larger size, especially by weight. Even though the Capelin are shorter than fish landed in the 1980s, the Capelin appear to be larger in size or girth than the early 2000s which was a period of small Capelin.

Harvesters are very concerned with the predation of seals on Capelin. They feel that the mortality on Capelin due to the fishery is insignificant compared to predation mortality, especially by seals. If left unchecked, harvesters feel that seal predation on Capelin will be detrimental to all fish stocks including Capelin in the Div. 2J3KL areas in the future.

Capelin is very important to the harvesters that are involved in the NL fishery as it is an integral part of the viability of their enterprises and in many cases promotes a more diversified fishery.

CONCLUSIONS AND ADVICE

Abundance in 2010 was the lowest in the series. The 2011 and 2012 estimates of abundance from the spring acoustic survey in Div. 3L are higher than in 2010 and similar to those of 2007-2009, an order of magnitude below estimates in the 1980s. Recruitment based on the spring acoustic survey has remained low since the 1980s. Five recruitment indices covering the year classes since 2003 are generally coherent and indicate that the 2010 and 2011 year classes are comparable to the relatively large 2007 year class. There is uncertainty concerning the relative size of the 2012 year class.

The new biological and behavioural information indicate that Capelin continue to be small, continue to mature at a young age, are in poor condition, are late spawning, and remain close to the bottom. Some of these characteristics appear to be shifting slightly toward those of the 1980s, for example, Capelin distribution expanded in 2011 and 2012.

This assessment indicates that the acoustic abundance index has increased only slightly above the lows of the 1991-2005 period.

Prospects for recruitment to the 2013 spawning biomass are positive relative to previous years. Recruitment for 2014 is uncertain. Because there is no overall abundance estimate for this stock, exploitation levels cannot be estimated. Considering the above indicators, the unknown level of exploitation on this stock, the importance of Capelin as a key forage species, and the recent decline of shrimp (another important forage species) that may result in higher predation pressure on Capelin, caution is advised.

SOURCES OF INFORMATION

This Science Advisory Report is from the Regional Advisory Process of January 29-30, 2013 on the Assessment of Capelin in SA2 + Div. 3KL in 2013. Additional publications from this process will be posted as they become available on the DFO Science Advisory Schedule.

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