

Update on Selected Scallop Production Areas in the Bay of Fundy in 1999

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Background

The most recent assessments of the status of the Bay of Fundy scallop stocks were conducted in April 1998 for Scallop Production Areas (SPA) 1,2,3,5,6, and 7 and in September 1998 for SPA 4. These assessments are summarized in Stock Status Reports C3-56, and C3-22 (1998), respectively.

This report provides a brief update on fishery and survey data for SPA 1, 3 and 6 for 1998. A complete review of all the SPA's in the Bay of Fundy is planned for November 1999.

Summary**SPA Bottom Line**

- 1**
- 1998 landings have increased by 80% over 1997.
 - Catch rates of the Full Bay and Mid Bay fleets have similar trends over time and are currently the lowest in the time series.
 - The surveys on both sides of the Bay also show similar trends and indicate that abundance is at a low level.
 - Recruitment continues to be low.
 - There should be no increase in exploitation in 1999.

- 3**
- The 1999 TAC has already been set at 200 t for SPA 3 and 7, which have been combined in 1999 for fisheries management purposes.
 - Catch rates in 1998 were at a low level.
 - There was minimal port sampling data in 1998.
 - The survey indicated an increase in abundance of scallop >80 mm in the Brier Island area but little change in the Lurcher area.
 - There were some signs of recruitment in both areas, mainly along the western edge.
 - There was no estimate of exploitation rate for this fishery.
 - Based on population size structure estimated from the survey, there is no reason to change the TAC for 1999.

- 6**
- The 1999 recommended catch level has already been set at 150 t.
 - The higher commercial catch rates in 1998 were due to the higher biomass in the inside zone. These scallops have been heavily fished.
 - Survey abundance in 1998 was below the 1996 survey.
 - The survey catch rate in the inside (SPA 6B) zone has decreased for scallops > 80 mm and is the lowest in the three year survey series.

SPA 1 - Inner/Upper Bay of Fundy***The Fishery***

Landings in SPA 1 reached a peak in 1989, with the large recruitment pulse seen throughout the Bay, and have steadily declined since then.

Landings(t)

Year	Avg. 1990–94	1995	1996	1997	1998*
Total	1110	414	202	130	231

*preliminary

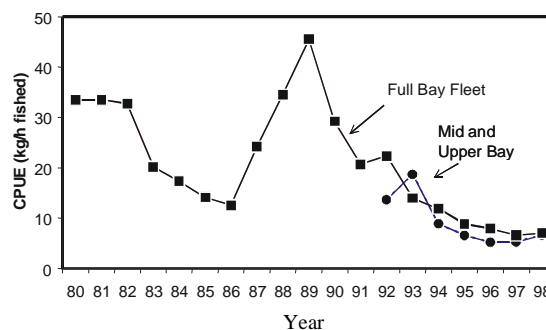
The Mid Bay vessels were not required to keep logbooks up until 1996, and so their earlier catches cannot be broken down by SPA. Landings by Statistical Districts 24, 40, 43, 44, 48 and 79, were used to estimate Mid Bay landings from SPA 1 prior to 1997.

The Mid Bay vessels are now required to keep logbooks and so catch and effort can be broken down by SPA.

The 1998 quota for Full Bay licence holders was kept at 240 t, the same as in 1997. The Mid and Upper Bay fishers had opted for effort restrictions.

The 1998 landings increased by 80% over 1997 levels but still did not reach their allowable catches. The 1998 landings were 188 t for the Full Bay licence holders, 31.1 t for the Mid Bay and 12.1 t for the Upper Bay fishers. **Catch per unit effort** for both the Full Bay and combined Mid and Upper Bay fleets has declined from the highs of the late 1980's, and has leveled off at the lowest catch rates seen in the time series.

Catch per unit effort



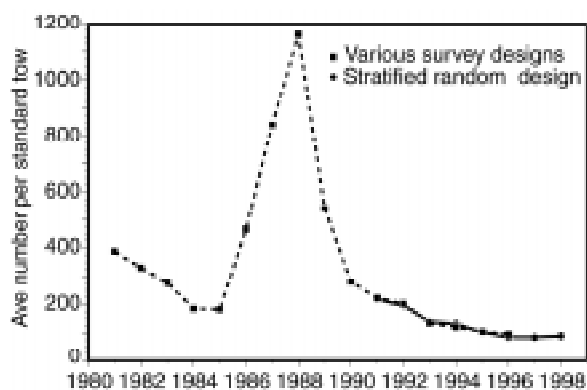
Port sampling indicates a decline in the size range of meats being caught, with fewer large and small scallops showing up in the samples.

SPA1 was closed to the Full Bay fleet from September 21 to November 18, while SPA 4 was open. SPA 4 was being fished at a lower meat count than SPA 1 and this closure was put in place to avoid problems with misreporting.

Resource Status

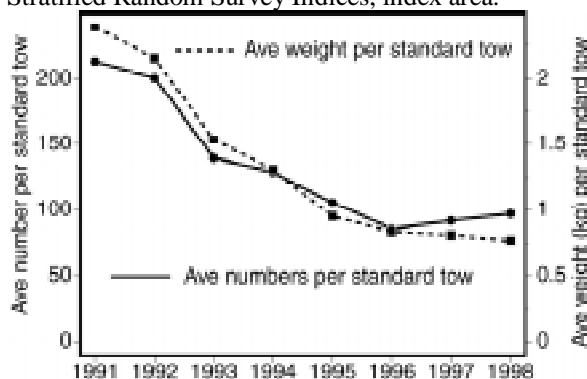
Resource surveys have been conducted annually in the Digby area since 1978. These surveys cover the highly productive grounds of SPA 4, and that portion of SPA 1 that surrounds it. The portion of SPA 1, covered by this survey series extends from 8 to 16 miles from shore, from Sandy Cove to Hampton on the Nova Scotia side of the Bay. This area can be used as an index area to look at trends in abundance. Although of different designs, the survey series can be used to look at long term trends in this section of SPA 1. This series shows the peak in abundance seen in 1988, and the decline to the current historically low.

Survey indices, index area

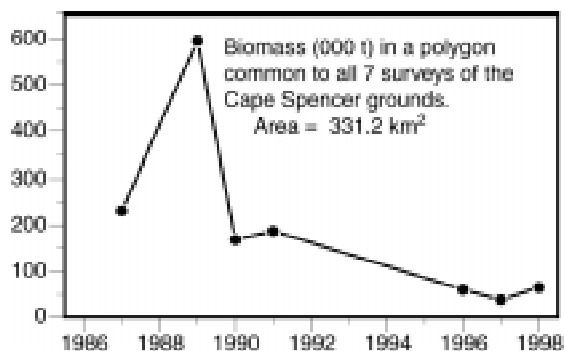


The recent stratified random surveys of the index area show the decline in the mean catch per standard tow in both numbers and weight.

Stratified Random Survey Indices, index area.

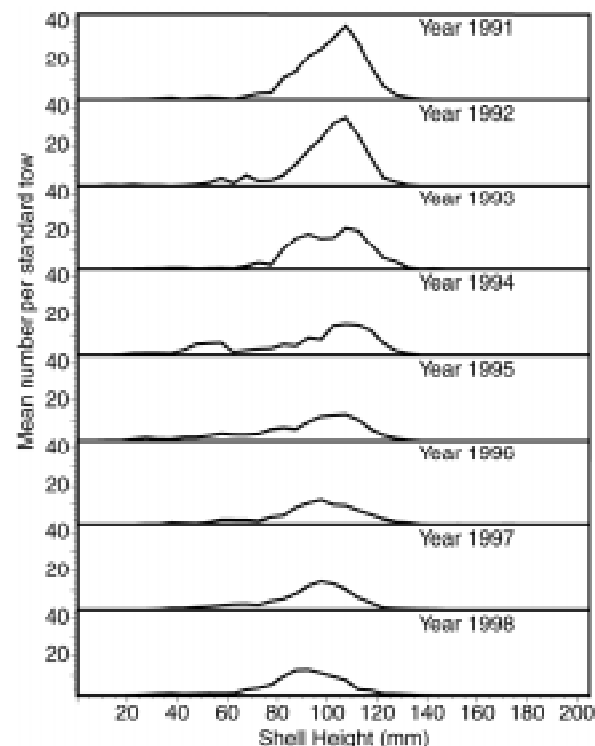


The same decline to low levels is seen when comparing the recent surveys of the Cape Spencer grounds (from index area to Cape Spencer, NB) to historic survey data.



The size frequency distribution from the index area surveys shows a decline in the number of larger scallops. Recruitment continues to be low.

Shell height frequency from index area



Outlook

The present level of removals from this stock appears to be offset by a low level of recruitment and growth of the biomass. The fishery appears to be stable at the moment, but the low population abundance is still a concern. There should be no increase in exploitation in 1999.

Management Considerations

With few small scallops, changes in meat weight regulations will have little effect until a large year class enters the fishery.

SPA 3 - Lurcher Shoal/Brier Island***The Fishery***

Landings in SPA 3 increased each year from 1990 to 1994, and have steadily declined since. There are two main beds in SPA 3, the beds around Lurcher Shoal and the beds below Brier Island, although scallops can be found throughout most of the area. The Full Bay fleet (with 99 licences) is the only fleet eligible to fish SPA 3. The 1998 quota for this fleet was 150 t. Landings in 1998 exceeded the quota by 12 t.

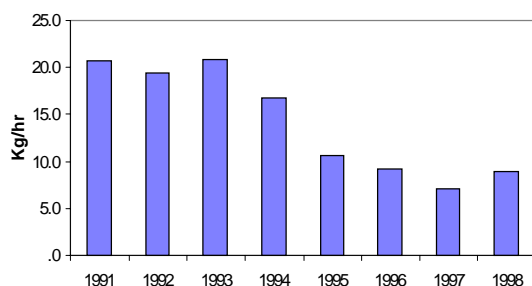
Landings (t)

Year	Avg. 1990-94	1995	1996	1997	1998*
Total	730	767	200	190	162

*preliminary

Fleet activity is monitored through logbooks and port sampling information. Logbook compliance has been poor (13%) in the recent past (1990), but was at 87% in 1994, 77% in 1995 and 100% in 1996 to 1998. **Catch per unit effort (CPUE)** exhibited a small increase in 1998 over that observed in 1997, which was the lowest on record for this SPA since 1991.

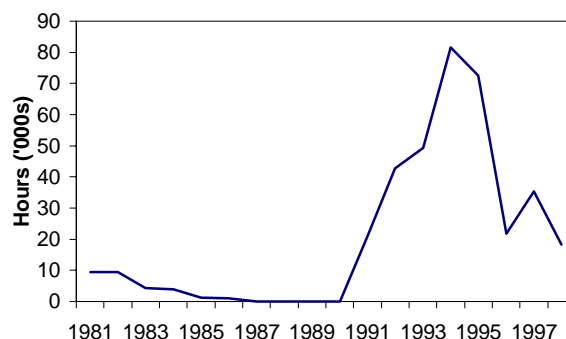
Catch per unit effort



Effort increased steadily from 1990 to 1994 as the fleet moved away from the Digby beds to this area. Effort fell in 1995 with the decline in stock numbers, showed a modest

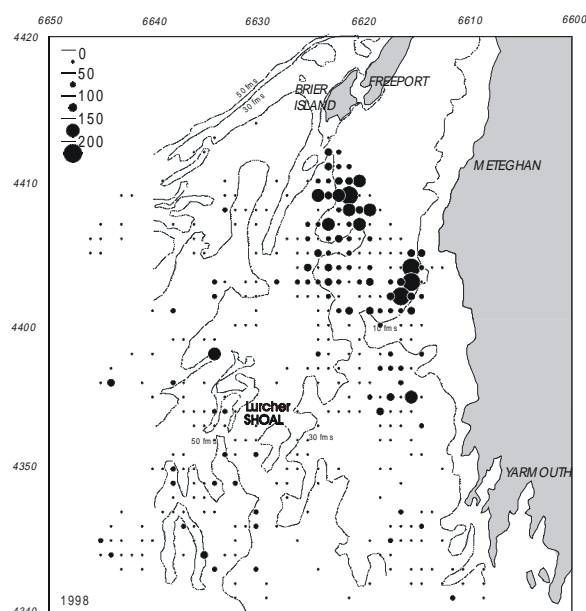
increase in 1997 and then declined again in 1998.

Effort



Unlike the previous year, in which the fishing effort was concentrated in the western portion of Lurcher, fishing effort in 1998 was mainly located in the northeast corner of the Brier Island subarea along the boundary with SPA 7 (St. Mary's Bay). Consequently, the largest portion of the catch came from this same area, however the associated catch rates tended to be in the lower end of the range observed. Given that this area is shallow and scallops caught here exhibit high meat yield, it appears that the fleet was targetting larger scallops for the higher prices being paid for them despite the lower catch rate.

Spatial distribution of effort (hours) in 1998.



Commercial sampling has been poor in SPA 3 and estimates from these samples of the size composition of the landings were not considered to be reliable.

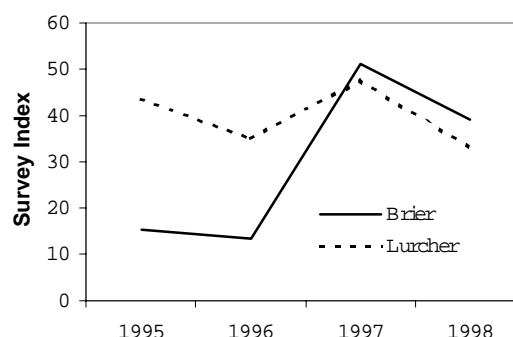
Resource Status

Data from research vessel **surveys** were also used to assess these scallop stocks. Annual stock assessment surveys have been conducted in August since 1991, using the government research vessel, *J. L. Hart*. In terms of coverage and design, only the results from the 1995 to 1998 surveys are comparable. The 1998 survey was of a random design and was planned to include the inshore portion of the grounds east of longitude 66°15'. 120 stations were randomly assigned within SPA 3 but only 100 were completed due to vessel malfunction problems. Many of the missed stations were in the eastern end of the fishing grounds.

The **average number of scallops per standard tow** (survey index) for scallops with shell height less than 80 mm declined

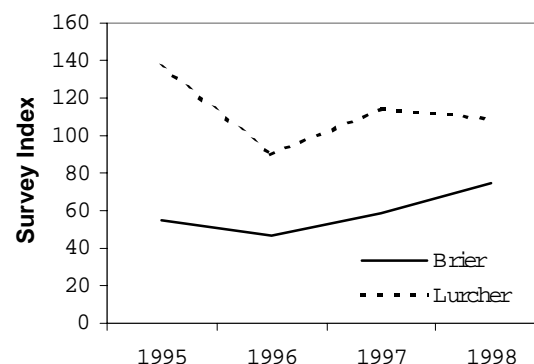
in both the Lurcher and Brier Island areas in 1998 over that observed for 1997. However, the 1998 indices were still higher than observed for 1995 and 1996.

Survey index (mean number per tow) for shell height < 80mm



For the Brier Island beds, the survey index in 1998 for scallops with shell heights greater than 80 mm increased slightly over 1997. There was little change in the survey index for the Lurcher shoal in 1998.

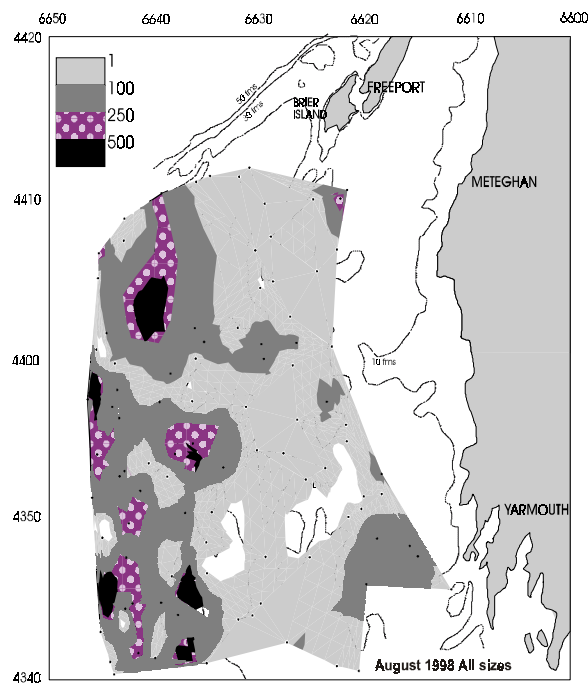
Survey index (mean number per tow) for shell height > 80mm



In 1998, the largest concentration of scallops less than 80 mm (recruitment) were mainly found in the western side of SPA 3. This differed from the 1997 survey where the recruitment was observed in the shallower waters of the east region of SPA 3. The largest concentrations (> 500 per standard tow) of fishable scallops continues to be in

the deeper water off of Lurcher Shoal but is also distributed along the deeper edge of the Brier Island subarea. The lack of survey coverage in the inshore areas due to vessel problems limits our knowledge of the distribution and abundance of scallops in those areas.

1998 Spatial Distribution of Scallops in SPA 3.
Number of Scallops/Std. Tow.



Analyses of the shell height, meat weight and age data from 1996 indicated that there was a great deal more spatial variability in the growth of scallops than previously recognized. As a result, age composition could not be reliably estimated for all years. Without age composition, **exploitation rates** cannot be calculated. Estimates of the biomass of meat weights in the population are also unavailable until a thorough analysis of the spatial patterns in the growth data is completed.

Overall abundance of scallops (>80 mm) as indicated by the 1998 survey, has increased in numbers in the Brier Island subarea and decreased by a small amount in Lurcher

Shoal. Indices for scallops <80 mm show a slight decline in 1998. A large portion of the scallop abundance appears to be concentrated in the western portion of SPA 3 where meat yields are low. Interpretation of the full spatial distribution of the scallops was limited by the lack of survey coverage in the shoal water area near the mouth of St. Mary's Bay where the commercial fishing effort was the highest. Attempts will be made again in 1999 to extend the survey coverage to the eastern nearshore areas of SPA 3.

Outlook

A combined interim TAC of 200 t has been set for SPA 3 and SPA 7 for 1999. In 1998, these areas had separate TAC's of 150 t and 50 t, respectively but these SPAs have been combined in 1999 for fishery management purposes. Assuming that the limit for SPA 3 in 1999 will be 150 t, there is no reason to change the TAC in 1999.

SPA 6 – Grand Manan and Southwest New Brunswick***The Fishery***

Grand Manan and southwest New Brunswick are designated SPA 6. This area is further divided into SPA 6A for the outside zone and SPA 6B for the inside zone around Grand Manan Island.

Landings (tonnes of meat)

Year	1997	1998*
Total	128	179

*Preliminary

Landings from SPA 6 comprise approximately 25% of the total from the Bay of Fundy. Landings from SPA 6 in 1998 increased 40% from 1997 and exceeded the biological advice by 49 t.

In 1998, almost 75% of landings took place in the first quarter of the year. This is largely due to the seasonal fishery that takes place in SPA 6B (inside zone) from the second Tuesday of January to March 31.

There are 99 Full Bay licenses and approximately 207 Mid Bay licenses. In 1998, 33 Full Bay licenses and approximately 117 Mid Bay licenses actively fished SPA 6.

The Full Bay license holders fish under an IQ system. The 1998 SPA 6 quota for the Full Bay fleet was 50 t with a maximum of 30 t from the Grand Manan inside zone (SPA 6B). The blended meat count was 40/500g and the minimum shell height regulation was 100 mm. Preliminary Full Bay fleet landings for SPA 6 in 1998 were 37 t; 19 t from SPA 6A and 18 t from SPA 6B.

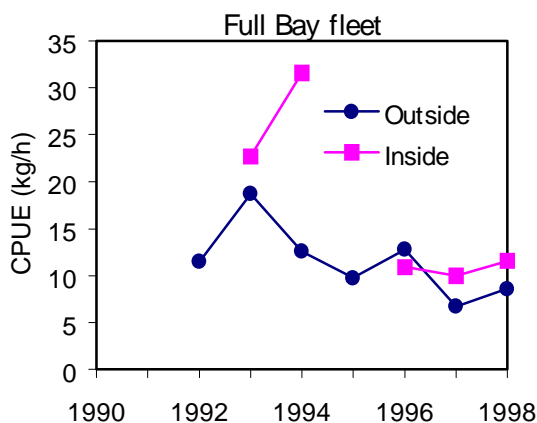
Mid Bay license holders are governed by an effort control management plan. The recommended catch level for 1998 was 80 t, with a maximum of 50 t from the Grand Manan Island inside zone. With the implementation of an industry-sponsored port sampling program, the blended meat count was 45/500g and the minimum shell height regulation was 95 mm. Preliminary landings for the Mid Bay fleet for SPA 6 are 142 t; 60 t from SPA 6A and 82 t from SPA 6B.

In 1999, the recommended catch level for SPA 6 is set at 150 t. The Full Bay fleet TAC is 50 t with a maximum of 30 t from the inside zones. The Mid Bay fleet has a 100 t catch level with a maximum 80 t from the inside zones. In 1999, the inside zones include Grand Manan Island and New Brunswick mainland zones.

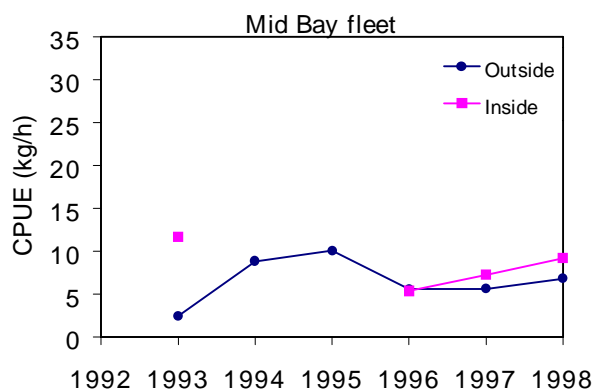
Resource Status

Dockside Monitoring documents have replaced the logbook system and are used to provide catch and effort information to calculate catch rates (CPUE). Both the Full Bay and the Mid Bay fleets have been required to submit completed monitoring documents of their daily fishing activities since 1997.

Preliminary **CPUE** for SPA 6 are available from the Full Bay fleet. In 1998, the catch rate for the both the outside and inside zones increased from 1997.



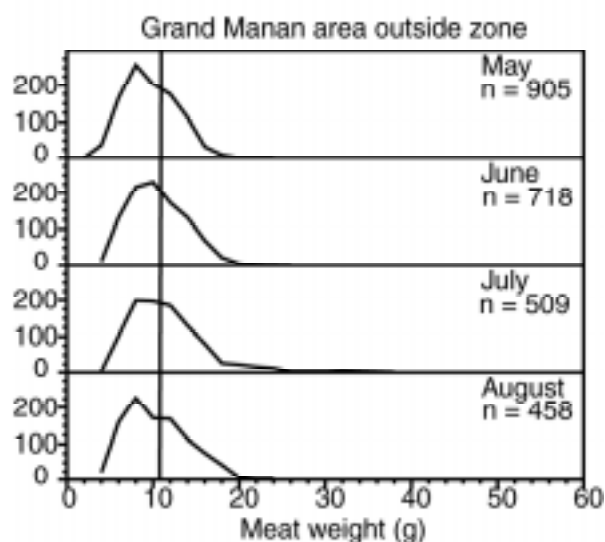
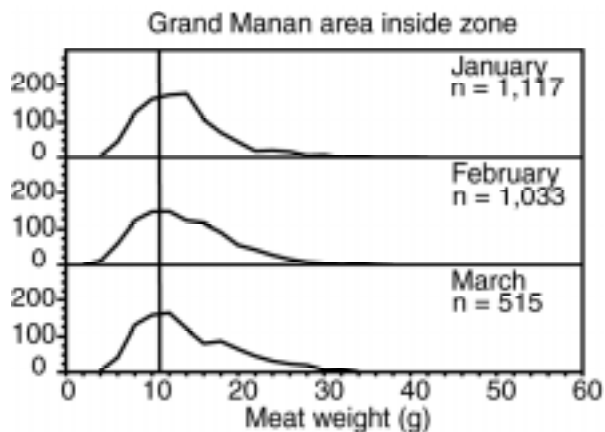
Preliminary catch rates for SPA 6 are available from the Mid Bay fleet. In 1998, the catch rate for the inside and outside zones increased from 1997. Generally, Mid Bay fleet catch rates tend to be lower than those from the Full Bay fleet.



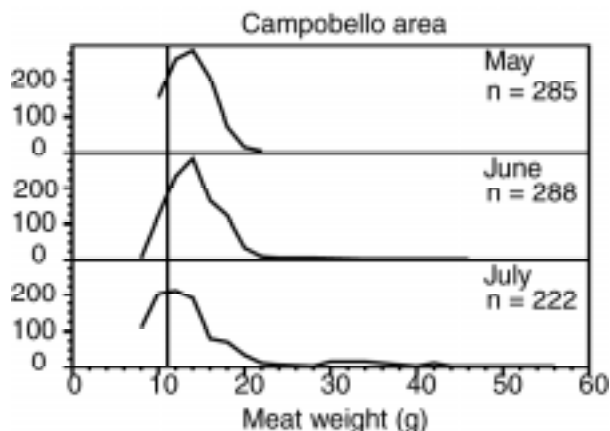
In January 1998, the Grand Manan Fisherman's Association initiated an industry-sponsored **port sampling program** for the Grand Manan Island fishing area. The Campobello Fisherman's Association joined the port sampling program in April. This provides information on catch composition.

In general, meat weights from the Grand Manan area were higher in the inside zone. Meat weights were lower in the outside zone due to the larger numbers of meats less than 11g in the catch. A line marks the 11g meat

weight which corresponds to the meat weight for a straight 45/500g meat count.

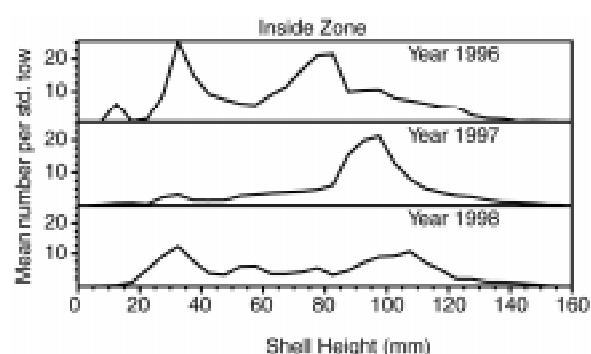


Port samples from the Campobello area had larger meats with few less than 11g.

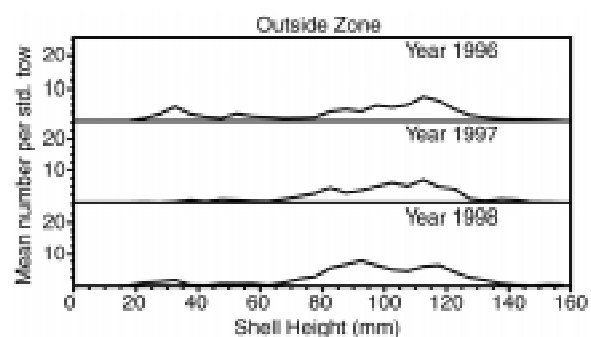


Research surveys of the Grand Manan area were conducted annually from 1979 to 1991, using the government research vessel, *J. L. Hart*. The survey resumed in 1996. The 1998 research survey repeated the 1997 survey stations with stations added based on current fishing activities.

The survey indicated a decrease of 40% in mean number of scallops >80 mm in the inside zone from 1997. In 1998, the mean number of scallops <80 mm doubled over that observed in 1997.



There was a minimal increase in scallops >80 mm in the outside zone from 1997. There was a slight increase in mean numbers of scallops <80 mm concentrated in the 20–35 mm range.



The inside zone (SPA 6B) survey mean weight per tow in 1998 decreased by 35% for scallops > 80 mm and remained the same for scallops < 80 mm as in 1997.

Survey mean weight (kg) per tow, inside zone

Year	Shell Height (mm)	
	<80	>80
1996	0.42	1.18
1997	0.12	1.46
1998	0.13	0.95

The survey mean weight per tow for the outside zone (SPA 6A) indicated no change scallops <80 mm and little change for scallops >80 mm.

Survey mean weight (kg) per tow, outside zone

Year	Shell Height (mm)	
	<80	>80
1996	0.03	0.65
1997	0.02	0.63
1998	0.02	0.61

Outlook

The overall increase in mean numbers of scallops <80 mm from 1997 is positive. The higher commercial catch rates in 1998 were a result of increased fishable biomass found in the inside zone. These scallops were heavily fished in the 1998 fishery and the 1998 survey mean numbers are below those of the 1996 survey. The survey mean weight per tow in the inside (SPA 6B) zone has decreased for scallops >80 mm and is the lowest for this survey series.

References

- Butler, M.A.E. 1999. Scallop stock update for SPA 6, Grand Manan and Southwest New Brunswick - 1998. DFO *Can. Stock Assess. Secret. Res. Doc.* 99/60.
- Lundy, M.J. and S.J. Smith. 1999. Scallop production Area 3: Stock status update for 1998. DFO *Can. Stock Assess. Secret. Res. Doc.* 99/61.

Roddick, D., M. Lundy, M. Butler and S.J. Smith. 1999. Assessment of the scallop stock in scallop production Area 1, Bay of Fundy for 1998. DFO *Can. Stock Assess. Secret. Res. Doc.* 99/62.

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