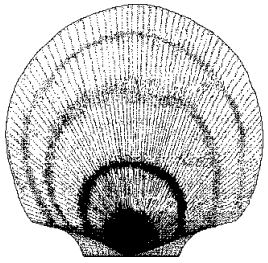


Scallop Production Areas in the Bay of Fundy

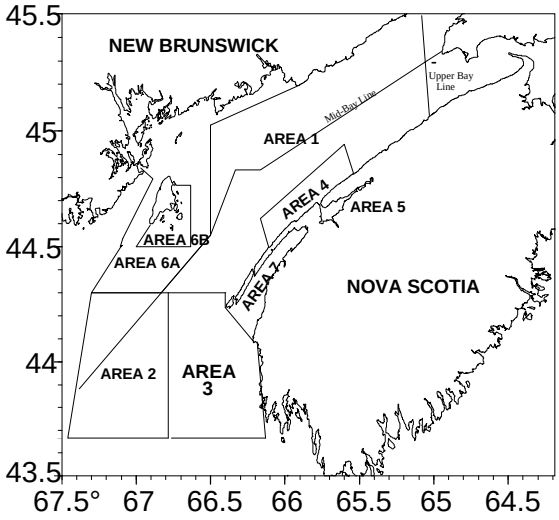
Background

The sea scallop Placopecten magellanicus occurs only in the northwest Atlantic Ocean from Virginia north to Labrador. Within this area, scallops are concentrated in persistent, geographically discrete aggregates or "beds", many of which support valuable commercial fisheries. The larger beds are found offshore and in the Bay of Fundy along the Nova Scotian coast. Scallops in different beds, and in different areas of large beds, show different growth rates and meat yields.

Unlike many commercial scallop species, the sea scallop has separate sexes. Male scallops develop a white gonad in the summer months, while female gonads are bright red. Eggs and sperm are released into the water and fertilization takes place in the sea. Spawning begins in late August to early September, and the larvae drift in the water for almost a month before settling to the bottom in October.

The Bay of Fundy area is fished by the Full Bay and the Mid-Bay licensed fleets. Full Bay vessels are 45' to 65' and Mid-Bay vessels are generally between 30' to 45'. Full Bay licensed vessels are permitted to fish all the Bay of Fundy. The Mid-Bay license holders have access to the New Brunswick side of the Bay of Fundy to the Mid-bay line and SPA 2. There are also 16 Upper Bay Licences restricted to the upper reaches of the Bay. There is a gear limit of 5.5 m with ring size of less than 82 mm inside diameter. Seasonal closures, quotas, meat counts, minimum shell height and limited entry are used to manage the fishery.

This industry became a quota fishery in 1997, with limited entry, TAC, gear size, seasonal closures, minimum shell height and meat count restrictions.



Summary

SPA	Bottom Line
1	• Population is aging and unchanged over past 5 years. • No signs of recruitment. • A lower meat count will not increase yield.
2	• Area of poor growth and yield. • Population is not self sustaining .
3	• The survey results suggest that the level of the 1997 TAC resulted in a reduced exploitation rate for the area. • The strength of the 1995 year-class appears to be above that of the 1993 and 1994 year-classes. • A straight meat count of 45/500g would optimize the yield from the 1995 year-class, which is distributed in shallow areas of good growth, but would restrict fishing to ages 7 and older. • A blended meat count of 40/500g would also improve yield.

4
- The status of this stock will be reviewed in July 1998, after the spring survey.
- Because of very rapid growth, the yield from a fall fishery is 40% greater than a summer fishery.

5
- This area has good growth.
- Yield would be optimized at a meat count of 30/500g.

6
- Good recruitment seen in the 1996 survey was not present during the 1997 survey.
- Exploitation is high and fishing effort should be reduced.
- A cautious harvesting strategy is recommended.

7
- This area has good growth.
- Yield would be optimized at meat counts lower than 40/500g.

Overview

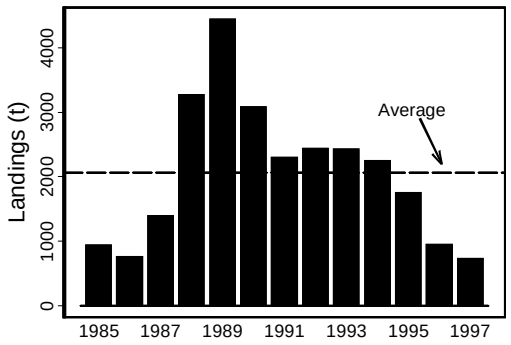
Landings in the whole of the Bay of Fundy by all fleet sectors have declined from 1996 by 23.3% in 1997, including catches of 92.8t from SFA 29 outside of the regulation fishing area. The landed value of the catch was approximately $13.662 million.

Landings (t)

Year	Avg. 85–89	Avg. 90–93	94	95	96	97*
Total	2165	2565	2429	2254	1754	727

*preliminary

Bay of Fundy Scallop Landings (t) (dash line: average over time series)



Landings and Catch Limits (t) by SPA in 1997.

SPA	Landings (t)	Catch Limits (t)**
1	130	290
2	30	–
3	190	237
4	116	100
5	5	10
6	128	170
7	36	50
Total	634*	

* Excluding landings from SFA 29.
** Area 4 catch limit set by analytical assessment, all other limits are harvest caps only to control exploitation.

Area 1: Inner/Upper Bay of Fundy

The Fishery

Landings in Area 1 reached a peak of over 4,000 t in 1989, with the large recruitment pulse seen throughout the Bay, and have steadily declined since then.

The Mid-Bay vessels were not required to keep logbooks up until 1996, and so their earlier catches cannot be broken down by fishing area. Landings by Statistical District for the districts for Districts 24, 40, 43, 44, 48 and 79, were used to estimate Mid-Bay landings from Area 1.

Landings (t)

Year	Avg. 85–89	Avg. 90–93	94	95	96	97*
Total	1978	1309	316	414	202	130

*preliminary

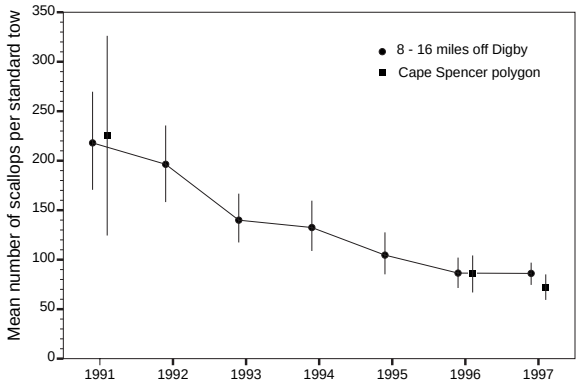
The Mid-Bay vessels are now required to keep logbooks and so catch and effort can be broken down by fishing area.

The 1997 quota for Full Bay licence holders was set at 240 t. Mid and Upper Bay fishers opted for effort restrictions rather than a quota but their total catch was not to exceed 50 t.

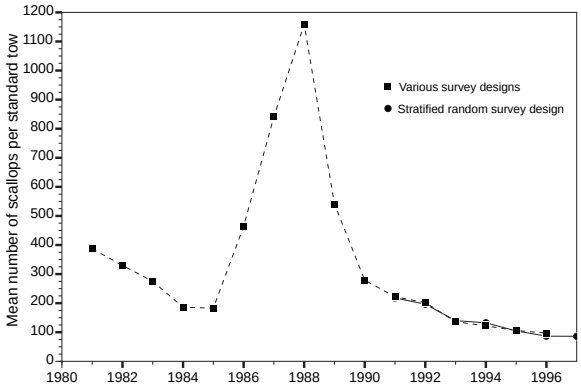
The 1997 landings did not reach the allowable catch for either fleet sector. The Full Bay license holders landed 106.3 t while the Mid and Upper Bay license holders landed 23.2 t. Effort was reduced in SPA 1 in 1997 for several reasons. The first reason was that the number of active Full Bay licences was lower than in previous years. In addition, there was a 2 month closure for the northern side of the Mid-Bay Line and Upper Bay areas, and finally, effort from most of the full Bay Fleet was diverted to Area 29 for one month while it was open. An additional factor was that for enforcement purposes, while the inside zone off Digby (Area 4) was open (from October to December), the meat count was changed to 33/500 g and the minimum shell height was 110 mm for scallop fishing zone 28A, that area on the Nova Scotia side of the Mid-Bay line west of the Upper Bay line.

Resource Status

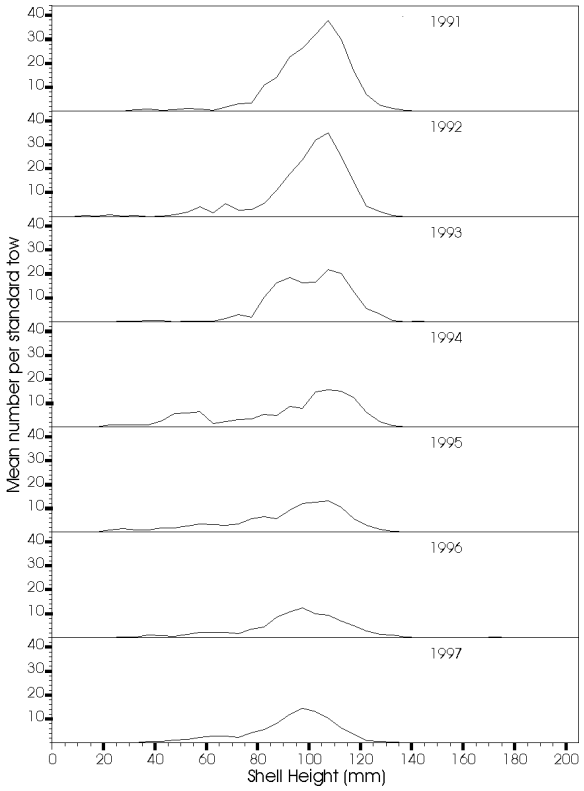
Resource surveys have been conducted annually in the Digby area since 1978. These surveys cover the highly productive grounds of Area 4, and that portion of Area 1 that surrounds it. Since 1991 the zone from 8–16 miles has shown a decline in catch per standard tow for scallops greater than 80 mm shell height, while the numbers of recruiting scallops, those less than or equal to 80 mm shell height, have remained at low levels.



A similar decline was seen in the Cape Spencer bed where estimates of abundance within an area covered by the six surveys showed a peak abundance during the 1988 survey, followed by a decline to the low levels seen in the early 1980's.



Recruitment (<80 mm) has remained at low levels since the large year-classes that produced the high landings in the late 1980's.



Outlook

There is no sign of strong year-classes entering the fishery in the next few years. The present level of removals from this stock appear to be offset by a low level of recruitment and growth of the biomass.

Management Considerations

The meat count is being reduced to 40/500 g in 1998.

Even if the source of recruitment for most of Area 1 is from elsewhere in the Bay of Fundy, population levels are low throughout most of the Bay. Areas that are thought to be self-sustaining such as the Digby grounds and perhaps Cape Spencer, may need additional protection for the spawning stock biomass. This could mean further reductions in the TAC and/or closures.

Area 2 - Southwest Bank

The Fishery

Prior to 1997, the scallop beds in Area 2 had not been heavily exploited (annual log book landings less than 1 t from 1991 to 1994, and 3 t in 1995). This area was opened to fishing, subject to special license conditions in 1996 and 1997**.** Due to poor growth and yield, there were no size controls in this fishery in 1997. A portion of this area within the Mid-Bay Line is open to fishing by the Mid-Bay fleet. The entire area is open to fishing by the Full Bay Fleet**.** In 1997, 29.7 t were landed from this area, 9.6 t and 20.1 t by the Full Bay and Mid-Bay fleets respectively.

Resource Status and Outlook

There are no new surveys for this area. The scallops in Area 2 exhibit very poor growth and meat yield. The scallop population on Southwest Bank does not appear to be self-sustaining.

Management Considerations

As a result of the biological data presented in 1997, management and industry have decided to fish this area subject to license conditions without size controls.

Area 3 - Lurcher Shoal/Brier Island

The Fishery

Landings in Area 3 increased each year from 1990 through to 1994, declining in 1995, 1996 and 1997. There are two main beds in Area 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 Area

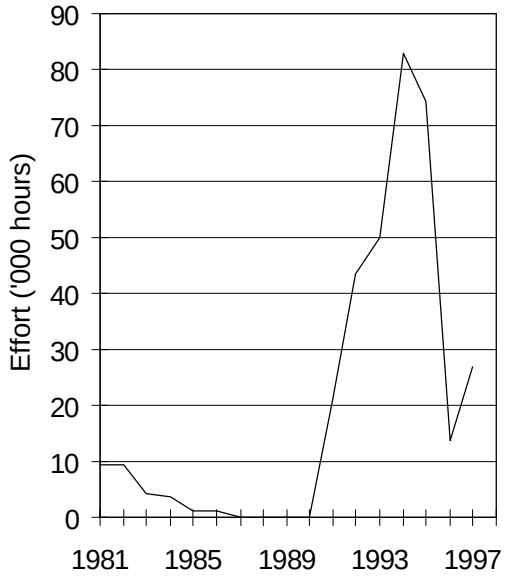
3. The 1997 quota for this fleet was 237 t.

Landings (t)

Year	Avg. 88–89	Avg. 90–93	94	95	96	97*
Total	0	568	1380	920	200	190

*preliminary

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 but shows a modest increase in 1997.



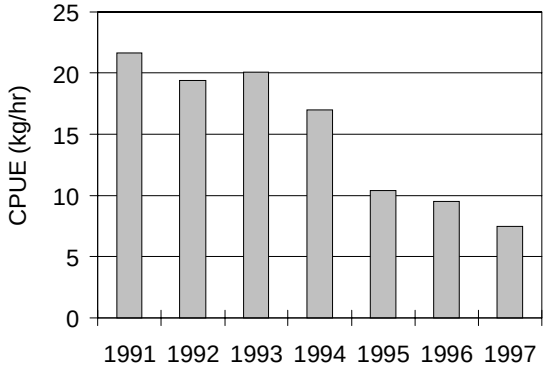
Historically, the scallop beds in the lower Bay of Fundy have not supported an extensive, stable fishery, as have the beds off Digby, N.S. The scallop beds between Brier Island and 43°40' N (Area 3), were heavily exploited in the 1950s and 1960s. In the 1970s, scallop fishing on these grounds was both minimal and sporadic, and the stocks were considered to have been depleted by the earlier over-fishing.

However, at the end of the decade, catches increased as both the offshore and Bay of Fundy fleets fished these beds. Most of this effort was incidental to concentrated effort expended on nearby German Bank (NAFO 4Xq) and beds south of Lurcher Shoal. Fishing continued in this fashion through to the end of 1986. Since 1990, the Area 3 beds have been annually exploited by the Full Bay fleet. Of the 99 licence holders, 70 were active in 1997, a decrease of 29% from 1996.

Commercial sampling has been poor and estimates of the catch-at-age were not considered reliable, although improvements in the data were seen in 1997 with 339 samples collected from 50 vessels with only 29% of the data coming solely from four vessels. These data show a similar size pattern to 1995 in that the majority of the catches are made up of meats approximately 10 g. This weight corresponds to a 6 year old animal on the Brier Island grounds above 44°N and a 7 year old animal on the Lurcher Shoals.

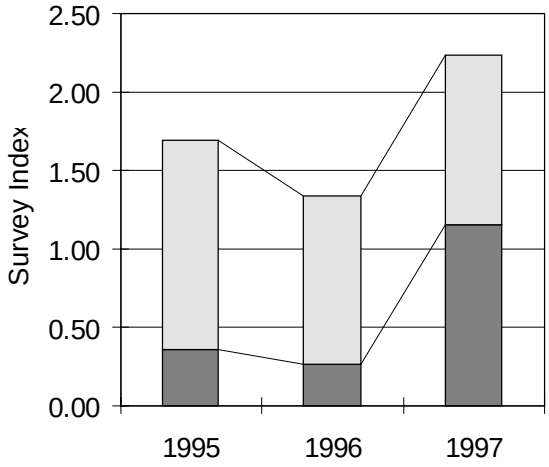
Resource Status

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, 100% in 1996 and 100% in 1997. **Catch per unit effort** was the lowest on record for this Area in 1997, falling below the low level reported in 1996.



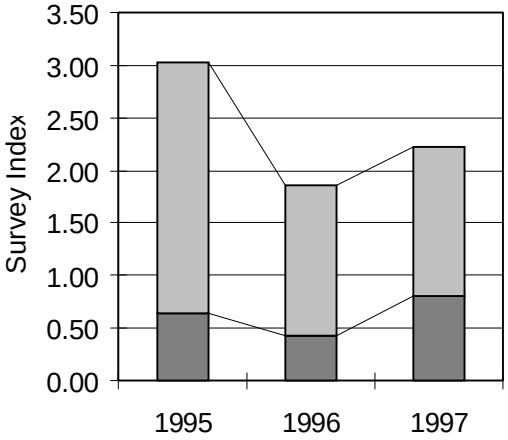
Data from research vessel **surveys** were also used to assess these scallop stocks. Annual stock assessment surveys have been conducted in August since 1991, using the government research vessel, *J. L. Hart*. The 1997 survey was of a random design and excluded the inshore portion of the grounds east of longitude 66°15'. 120 stations were randomly assigned within Area 3.

Survey Relative Number of Scallops (Dark Shades: Prerecruit Scallops < 4; Lighter Shades: 4+ Scallops): Brier Island Portion of Scallop Production Area 3.



The total **average number of scallops per standard tow** caught during the survey has declined dramatically since 1992 and 1993 and remains low in 1997 after a sharp decline in 1995. However, there has been an increase in the average number of scallops per tow (total) in 1997 over 1996 due to the presence of prerecruit scallops (<4 yrs) on both grounds but especially on the Brier Island beds. On both beds, the dominant age-class is the 2 year old scallops. This 1995 year-class is much stronger than the 1993 and 1994 year-classes at the same age. The average tow captures more animals on the Lurcher grounds below 44°N than on the Brier Island grounds for all age combinations except the age 2 animals.

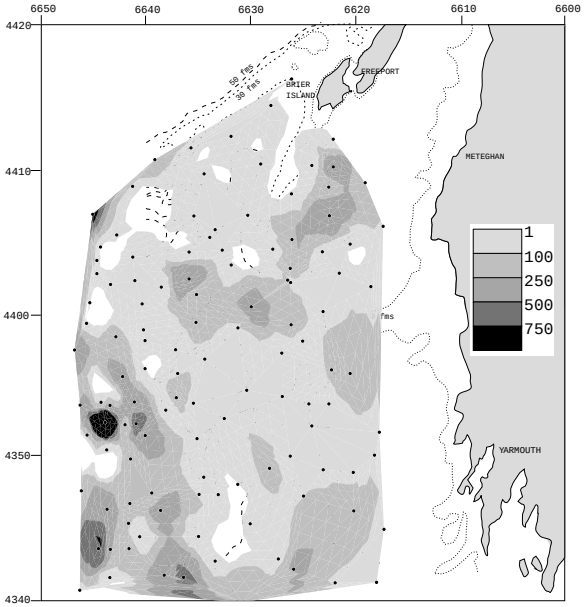
Survey Relative Number of Scallops (Dark Shades: Prerecruit Scallops < 4; Lighter Shades: 4+ Scallops): Lurcher Shoal Portion of Scallop Production Area 3.



The largest concentrations of fishable scallops (>500 per standard tow) are in the deeper water off Lurcher Shoal. The pre-recruit scallops are found in shallower water at concentrations of >250 animals per standard tow. They occur in patches throughout the area with the exception of the deep water in the northwest and southwest portions of Area 3. The shallow water above 44°N is a good growth area and the yield from these pre-recruits will be important for the revitalization of this area.

The incidence of **clappers** (paired empty shells) increased in the surveys from lows of less than 2.5% from 1991 to 1993 to 16% in 1994 and 10.2% in 1996. In 1997, the percentage of clappers dropped to 5.2%. The number of clappers may reflect both natural mortality and incidental fishing mortalities.

1997 Spatial Distribution of Scallops in Area 3.
Number of Scallops/Std. Tow.



Exploitation rates declined from 22.6% in 1996 to 21.1% in 1997 in Brier and from 48.7% to 28.9% in Lurcher.

Outlook

Research vessel abundance indices show little change in the average number of scallops per standard tow in the recruited age-classes (4+), but an increase in the total average number due to the presence of a strong 1995 year-class. This year-class is distributed in the shallow water areas throughout Area 3. This year-class will be vulnerable to growth overfishing given that yield per recruit analysis recommends fishing at age 7 in this area.

If the 1998 landings were equal to the 1997 landings of 190 t, then the exploitation rate would likely increase over the 1996 level. The population is not expected to increase as the prerecruits are not expected to be a large part of the catch in 1998.

Management Considerations

An important consideration in the 1998 fishery will be to protect the 1995 year-class from growth overfishing. The wide distribution of the animals is not amenable to a partial closure of the area, and as three year olds, they will be captured by the gear.

Area 3. Mean Weight at Age (g).

Age	**2**	**3**	**4**	**5**	**6**
Brier	1.0	2.8	5.7	8.2	10.2
Lurcher	1.1	2.9	4.7	6.6	8.3
Age	**7**	**8**	**9**	**10**	
Brier	12.0	13.6	14.7	19.1	
Lurcher	9.5	10.6	11.9	15.5	

Area 3. Straight Meat Count at Age (Number/500g).

Age	**2**	**3**	**4**	**5**	**6**
Brier	515	179	87	61	49
Lurcher	472	173	108	75	60
Age	**7**	**8**	**9**	**10**	
Brier	42	37	34	26	
Lurcher	52	47	42	32	

The recommended meat count to optimize yield for Area 3 is a straight count of 45/500g based on generalized models of yield and growth for this area. The 1998 Interim Plan calls for a blended meat count of 40/500 g. This latter count will offer a greater degree of protection for the small scallops than a higher count.

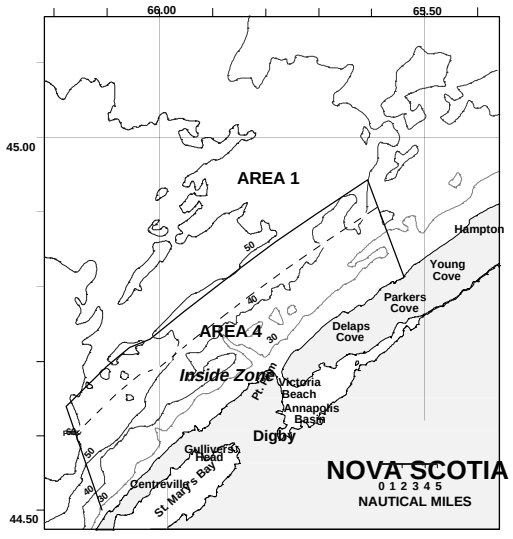
Area 4 - Digby

The Fishery

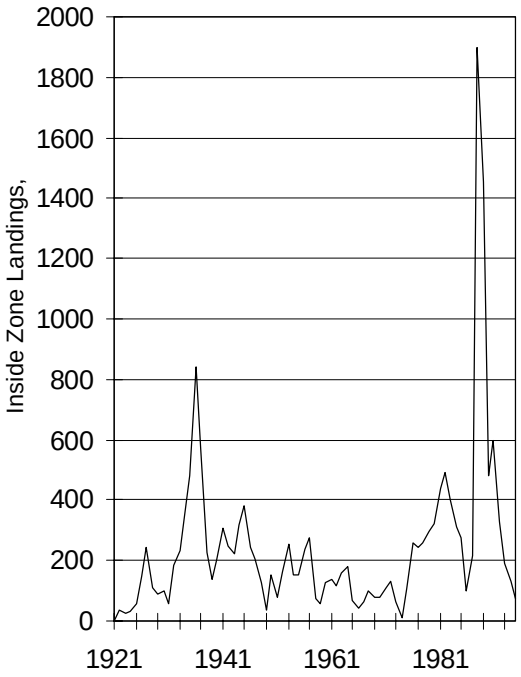
The Digby scallop beds were fished according to seasonal zones from 1986 to 1996. The Inside Fishing Zone encompasses an area within 6 miles of shore, from Parker's Cove to Centreville, and was closed by regulation from May 1 to September 30. The rest of the beds were seasonally unrestricted and are referred to as the

Outside Zone. In 1987, the Inside Fishing Zone was extended to 8 nautical miles from shore (to protect small scallops), to the equivalent of the present Area 4. In 1992, the Inside Zone returned to the 6 mile distance from shore. In 1995, the Inside Zone regulation closure area was extended from Parkers Cove to Port Lorne beginning August 12, 1995, and neither area was opened in October. This was done to protect broodstock and the pre-recruit scallops. The part of Area 4 which was the former Inside Zone was not fished in 1996 except for a limited fishery in a portion of the Area from the Digby Gut to Port Lorne which was fished under a dockside monitoring condition from November 15 to December 15, 1996. The meat count for this area was 40/500 g. Fishing also occurred from 6 to 8 miles from shore until the establishment of the 8 mile SPA 4 on January 1, 1997. The quota for SPA 4 was 100 t in 1997 with a meat count of 33/500 g.

Place Names in Area 4



Scallop landings off Digby, N.S. have been variable over the last decade. A strong recruitment pulse, first observed in 1986 and 1987 as 2 year old animals, contributed to unprecedented high landings in 1988 through to 1991. Although scallop abundance increased in many parts of the Bay due to these year-classes, the greatest concentration of scallops was centered on the Inside Fishing Zone. From 1993 to 1996, the beds have been fished down and closures were necessary. Historical **landings** for the former Inside Zone (0 to 6 mile portion of Area 4) are available from 1921 to 1995.



Landings from SPA 4 are only available for 1991 to 1997.

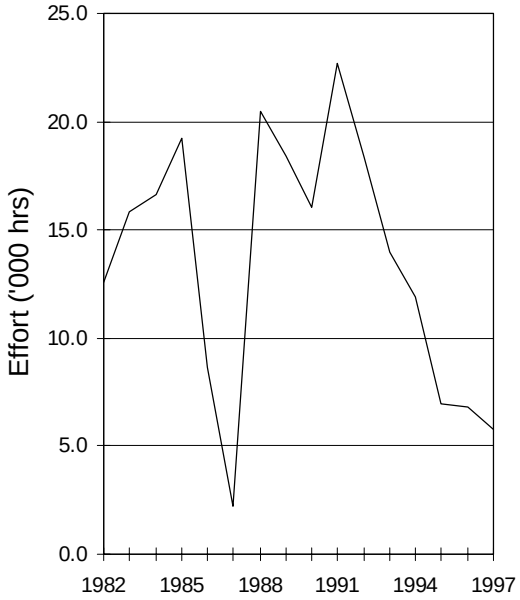
Landings (t)

Year	Avg. 91–93	94	95	96	97
Total	414	163	95	71*	116

* including landings from 6-8 miles of 9.1 t

Landings in Area 4 declined steadily from 1991 to 1995 as the large year-classes (1984, 1985) were fished down. Portions of Area 4 were closed in 1995 and 1996 (see below). The 1997 fishery in the Area 4 portion of the Bay of Fundy landed 116.1 t according to dockside monitoring statistics.

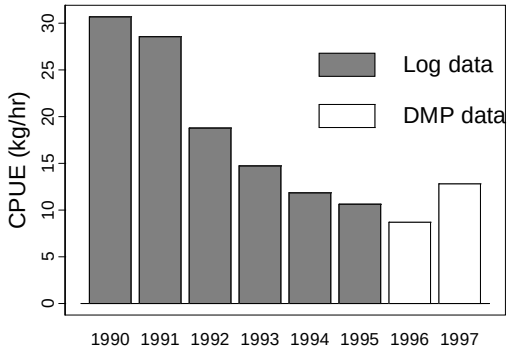
Total **effort** (hrs) in the Inside Zone was low in 1995, 1996 and 1997 due to the closure of the fishery for portions of each year.



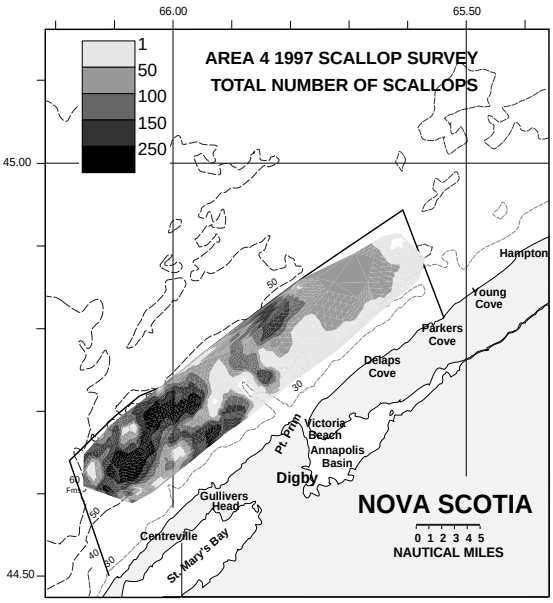
Fleet activity in 1996 was monitored for the first time through a dockside monitoring program which continued in 1997. There were also logbook and port sampling information. Of the 99 Full Bay vessels entitled to fish in this area, 75 were active in 1997.

Resource Status and Outlook

The 1997 log **catch per unit effort** (CPUE) was 12.81 kg/hour with a minimum of 4.03 kg/hour and a maximum of 23.15 kg/hour. CPUE for 1990 to 1995 was obtained from log data for the old "Inside Zone". The data from 1996 and 1997 was from the dockside monitoring program. Due to the differences in sources and area covered, the 1995 CPUE cannot be compared with the 1996 and 1997 CPUE. The 1997 CPUE was calculated based upon 65.5 t of catch. This was an increase in the CPUE over 1996 despite the lower meat count in 1997.



Spatial Distribution of Scallops in Area 4. Numbers of scallops/std. tow



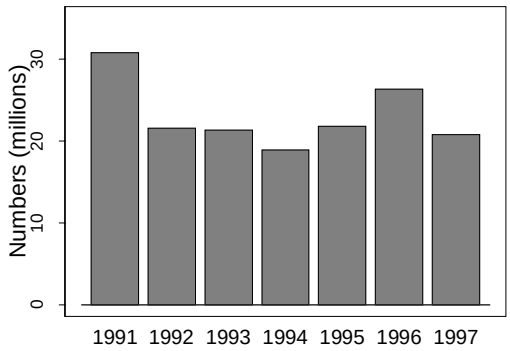
Data from **research vessel surveys** were used to assess scallop stocks. Comparable area stratified random surveys have been conducted in June since 1991. Previous to this date, surveys were stratified by commercial catch.

In 1997, 100 stratified-random tows were made in Area 4 using the government research vessel, *J. L.. Hart*.

The greatest concentration of scallops in Area 4 is in the area off Centreville and Gullivers Head. In 1995, the dominant age group was Age 2 (1993 year-class). These scallops were located in the portion of Area 4 which was closed to fishing, that is off Gullivers Head and Centreville, but extended to Delaps Cove in the fished area. These scallops were still present in the 1997 survey, with the age 4 and 5 animals being the largest age group.

The percentage of **clappers** (dead paired shells) was low at 4.3%, a decline from 1996 and similar to levels observed in 1986 and 1987. Of these, 72% were larger scallops over 100 mm shell height and located primarily in the area between Digby and Delaps Cove where the concentrated fishing activity took place in late 1996. The numbers of clappers may reflect both natural mortality and incidental fishing mortality.

Survey Index, Population numbers for Area 4.



Population meat weight estimates were calculated from the June 1997 survey data with a catchability factor. The meat weight of scallops age 5 and over for the entire Area 4 increased from 1996 (due to growth) and was estimated as 736 t (95% confidence interval 655 t, 819 t). The meat weight of scallops age 5 and over in the area west of Pt. Prim (which was opened to fishing after the survey) was estimated as 229 t.

Area 4 Exploitation Rate (%) for Ages 5+

1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997
31.5	13.3	28.2	24.7	12.4	-

Exploitation rate, assuming a natural mortality of 0.1, was calculated from the surveys on the animals ages 5 + in the whole of Area 4. The low levels in 1995 and 1996 reflect the closure of a large portion of Area 4 through these years. Exploitation was very low in 1996 and the rate could not be reliably calculated.

The status of the Area 4 stock will be reviewed after the completion of the 1998 research survey in June.

Management Considerations

Any discussion of changes in the fishing season must consider the fact that the yield from a fall fishery is 40% greater than from a summer fishery because of the rapid growth experienced by the scallops after spawning.

Area 5 - Annapolis Basin

The Fishery

In 1997, a limited fishery (9 days) was conducted in Area 5 under a dockside monitoring protocol. A total of 5.1 t were removed.

Preliminary analysis of the 1997 Class 1 (complete) log data from the dockside monitoring program shows **catch per unit effort** (CPUE) was 6.55 kg/hour with a minimum of 2.6 kg/hour and a maximum of 13.4 kg/hour. The Class 1 log records

totaled 100 "days" fished. The Class 1 log catch was 9700 lb. or 4400 kg. The total number of days fished was 125 over a 9 calendar day period. A strong **prerecruit** year-class was reported by fishers in the 1997 fishing season.

Resource Status and Outlook

There is no new survey information. Logbook information for the 1998 fishery is still being processed.

Area 5 appears to be a self-sustaining stock. Growth is very good in this area and the meat yield from the scallops is high for a given size. The prerecruit year-classes in Area 5 appear to be strong. Landings in Area 5 are expected to increase in 1998 and 1999 as these incoming year-classes enter the fishery.

Management Considerations

Yield per recruit models indicate that the optimum age-at-first-capture for this area is age 8 to 10+. To fish at the optimum yield target would mean fishing at below a 15 count. Fishing at a straight count of 30/500g results in a 30 to 40% loss of potential longterm yield. The fast growth rate in this area results in the scallops growing from a 45 to a 30/500g count in less than one year. A 40/500g meat count appears to be too high for this area. There is no biological basis for the TAC.

Area 6 - Southwest New Brunswick

The Fishery

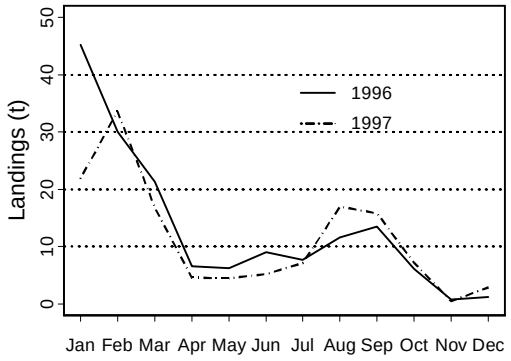
Southwest New Brunswick, that is, Grand Manan and the surrounding area is designated as SPA 6. This area is further divided into SPA 6A for the offshore area and SPA 6B approximates the inshore conservation zone around Grand Manan Island.

Landings (t)

Year	Avg. 88–89	Avg. 90–93	94	95	96	97*
Total**	323	379	254	239	159	137

*preliminary
** Total for district 50–53

Since the early 1990s **landings** from all fleets in the Bay of Fundy have steadily declined. For historical comparison, landings for Statistical Districts 50 to 53 most closely approximate catches from the new SPA 6. Landings in these districts in 1997 decreased 14% from those of 1996.



In 1997, 53% of the landings took place in the first quarter of the year. This was largely due to the seasonal fishery that takes place in SPA 6B (which approximates the inshore conservation zone), from the second Tuesday of January to March 31. This was a decrease from 1996 which reported 61% of the landings occurring in the first quarter of the year. The first quarter landings of 1997 were the lowest since 1994.

There are 99 Full Bay licenses and 209 Mid-Bay licenses. In 1997, 31 Full Bay licenses

and approximately 120 Mid-Bay licenses actively fished SPA 6.

1997 was the first year the Full Bay license holders fished under a ITQ system. The 1997 SPA quota for Full Bay licence holders was 70 t with a maximum of 50 t from the regulated inshore conservation zone (SPA 6B). Preliminary Full Bay fleet landings for SPA 6 for 1997 were 33 t; with 12 t from SPA 6A and 21 t from SPA 6B.

Mid-Bay license holders are governed by an effort control management plan. The quota for SPA 6 was 100 t in 1997 with a maximum of 80 t from the regulated inshore conservation zone (SPA 6B). In 1997, preliminary landings for the Mid-Bay fleet for SPA 6 were 95 t; with 35 t from SPA 6A and 60 t from SPA 6B.

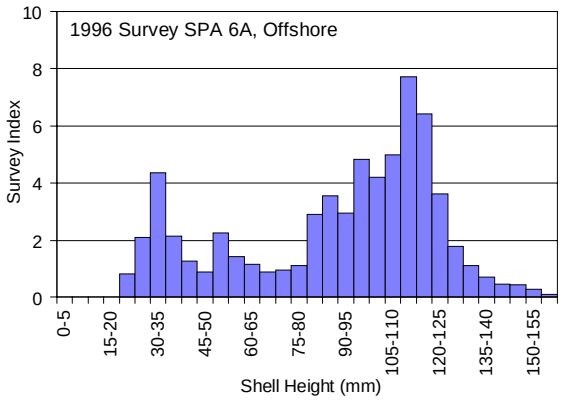
Port samples were not available from either fleet for SPA 6 in 1997.

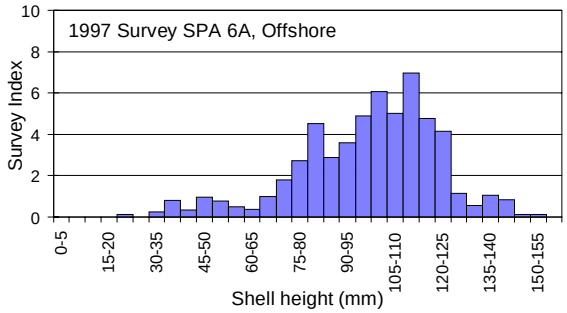
Resource Status

Preliminary **catch rates** for SPA 6 are available from the Full Bay Fleet only. In 1997, the average CPUE for SPA 6A was 7.1 kg/h, a decrease of 46% from 13.1 kg/h in 1996. The average CPUE for SPA 6B in 1997 was 9.5 kg/h, a decrease of 30 % from the 1996 CPUE of 13.5 kg/h. 1996 and 1997 catch rates are not available for the Mid-Bay fleet.

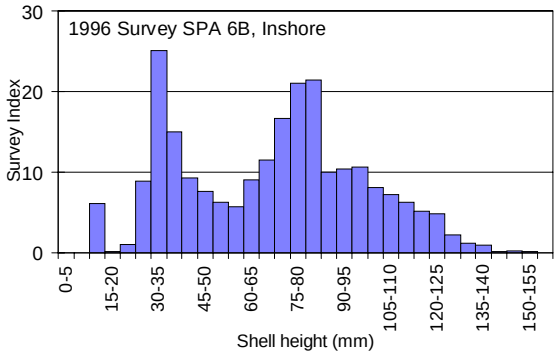
Surveys were conducted annually from 1979 until 1991. They resumed in 1996. The 1997 survey repeated the 1996 survey stations with additional random stations based on historical fishing activities.

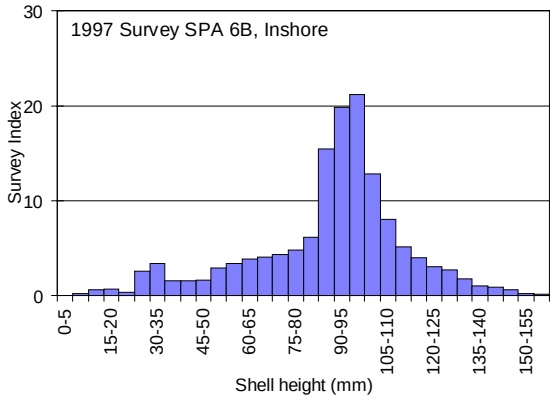
Overall, the 1997 survey indicated a decrease of 70% in the precruits (<80 mm) and a modest increase of 13% in the recruited sizes (>80 mm) from the 1996 survey. Numbers are generally lower for the offshore area, SPA 6A than the inshore conservation zone, SPA 6B. The highest concentrations were found in Duck Island Sound (SPA 6B).





The average number of commercial size scallops (>80 mm) per standard tow for the 1997 survey area of SPA 6A or offshore had a minimal increase of 1% from 1996. The 1997 average number of prerecruits (<80 mm) decreased 50% from 1996.





The 1997 survey of the inshore or SPA 6B indicated the average number of commercial size scallops increased 14% from 1996 survey. The 1997 survey average number of prerecruits decreased 75% from 1996.

The relative biomass index per standard tow (shell height >80 mm) remained the same for SPA 6A, offshore, from 1996 to 1997. However, the index for the inshore area, SPA 6B, increased by 20%.

The large numbers of prerecruits found in the 1996 survey were not observed in the 1997 survey. This may be attributed to the patchiness of the beds. In SPA 6B, 55% of the 30-35 mm scallops were found at two stations. In SPA 6A, 82 % of the 30-35 mm scallops came from one station.

Outlook and Management Considerations

Landings have been decreasing since the exceptionally good recruitment pulse in the Bay of Fundy that was heavily targeted in the late 1980s and early 1990s. The survey area concentrates on the traditional fishing areas around Grand Manan Island. SPA 6B continues to be more productive than the offshore area, SPA 6A, and should be protected against overfishing.

Given the low numbers and apparent extreme patchiness of the prerecruits found in the 1997 survey, pressure will be on the current commercial size scallops to sustain the fishery. The modest increase shown in the research abundance indices for recruited size-classes may not be enough to maintain fishing effort at current levels. A cautious approach in harvesting strategies is recommended.

Area 7 - St. Mary's Bay

The Fishery

The St. Mary's Bay scallop stocks are closely associated with Area 3. The fishing history of this area is similar to that of Area 5 (Annapolis Basin) and annual landings from complete log data in 1994 and 1995 were less than 100 t, however there was an increase in landings from 1994 (61 t) to 1995 (94.5 t). Landings decreased to 35.7 t in 1997 under a 50 t quota.

Resource Status and Outlook

Area 7 appears to be a self-sustaining stock, which sometimes receives recruitment from Area 3. Growth is very good in this area and the meat yield from the scallops is high for a given size.

Management Considerations

Data are not available from this area to determine optimum meat weight/shell height targets, however the growth rate is expected to be very similar to Area 5 and the same targets (i.e., 30/500g) are likely to apply to Area 7. A blended meat count of 40/500g appears to be too high for a fast growing stock such as this stock.

References

Kenchington, E., M.J. Lundy and S.J. Smith. 1997. Bay of Fundy Scallop Stock Assessment: Areas 2,3,4,5,7. *DFO Can. Stock Assessment Res. Doc* 97/63.

Kenchington, E. and S.J. Smith. 1997. 1997-98 Bay of Fundy scallop stock assessment: Analysis of the Area 4 survey. *DFO Can. Stock Assessment Res. Doc*. 97/89, 33 p.

Kenchington, E. and M.J. Lundy. 1998. Area 3 scallop stock survey (Brier Island and Lurcher Shoal). DFO *Can. Stock Assessment Secret. Res. Doc*. 98/79, 26 p.

Roddick, D., M. Lundy, M. Butler and S.J. Smith. 1998. Assessment of the scallop stock in scallop production Area 1, Bay of Fundy. DFO *Can. Stock Assessment Secret. Res. Doc*. 98/10.

For more Information on Scallop Production Area 1

Contact: Mr. Dale Roddick
Invertebrate Fisheries Division
Department of Fisheries and Oceans
Bedford Institute of Oceanography
P.O. Box 1006
Darmouth, NS B2Y 4A2

Tel: (902) 426-6643
Fax: (902) 426-1862
E-Mail: RoddickD@mar.dfo-mpo.gc.ca

For more Information on Scallop Production Areas 2, 3, 4, 5, 7

Contact: Dr. E. Kenchington
Mr. M.J. Lundy
Invertebrate Fisheries Division
Department of Fisheries and Oceans
Bedford Institute of Oceanography
P.O. Box 1006
Darmouth, NS B2Y 4A2

Tel: (902) 426-2030/3733
Fax: (902) 426-1862
E-Mail: KenchingtonE@mar.dfo-mpo.gc.ca

For more Information on Scallop Production Area 6

Contact: Ms. Maureen Butler
Invertebrate Fisheries Division
Department of Fisheries and Oceans
Bedford Institute of Oceanography
P.O. Box 1006
Darmouth, NS B2Y 4A2

Tel: (902) 426-5342
Fax: (902) 426-1862
E-Mail: ButlerM@mar.dfo-mpo.gc.ca

This report is available from the:

Maritimes Regional Advisory Process
Department of Fisheries and Oceans
P.O. Box 1006, Stn. B105
Dartmouth, Nova Scotia
Canada B2Y 4A2
Phone number: 902-426-7070
e-mail address: MyraV@mar.dfo-mpo.gc.ca

Internet address: http://www.dfo-mpo.gc.ca/csas

ISSN: 1480-4913

La version française est disponible à l'adresse ci-dessus.

Correct citation for this publication

DFO 1998. Scallop Production Areas in the Bay of Fundy. DFO Sci. Stock Status Rep. C3-56 (1998).