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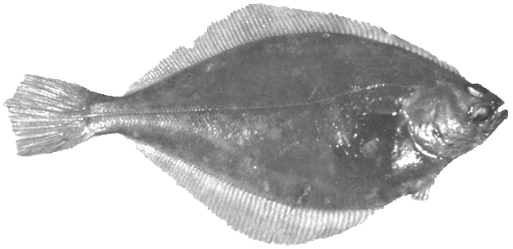
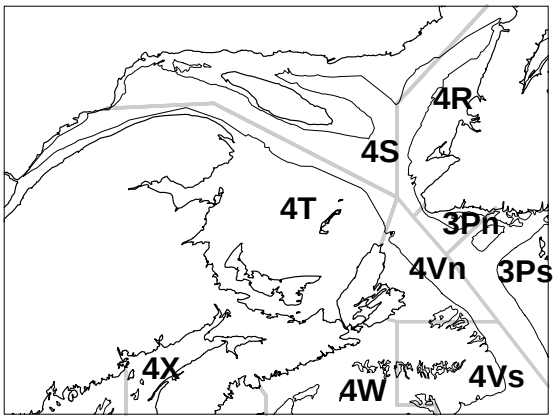


American Plaice in the Southern Gulf of St. Lawrence (Div. 4T)



Background

American plaice are widely distributed throughout the Northwest Atlantic, from West Greenland to the Gulf of Maine. Throughout their range, they are associated with intermediate depths (about 80-250 m) and cold waters (below 0°C to 1.5°C). Male and female plaice differ in their life-history traits: females grow faster and attain larger sizes than males; male plaice have shorter lives than females. Sexual maturity is reached at 7-15 years of age for females and between 5 and 7 years of age for males. Spawning occurs from early spring to summer with each female releasing hundreds of thousands of eggs. The fertilized eggs float near the water surface for several days. After hatching, plaice are pelagic until they reach a minimum length of 18 mm, when metamorphosis occurs and they become benthic. Plaice consume a wide range of organisms throughout their life cycle: young plaice consume bottom organisms such as mysid shrimp, amphipods, polychaetes, echinoderms and molluscs; older plaice consume other small fish species and invertebrates.

In the southern Gulf of St. Lawrence (NAFO Division 4T), American plaice has been under quota management since 1977. The resource was exploited mainly by longlines in the 1930s, but by the 1960s most landings were made by seines and otter trawls. Plaice are now caught by a diverse fishery of fixed and mobile gear, with the dominant sector being seines operated by vessels less than 45 feet. With the growth of mobile gear sectors during the 1960s, a large component of plaice catches in 4T (30-40% by weight) was commercially-undersized and discarded at sea. Recent measures, including increased mesh sizes and mandatory landing of all catches, have likely reduced discarding.

The most recent full assessment of this stock was conducted in February 2001 (Morin et al, 2001; SSR A3-26 (2001)). This report updates fishery and survey data on this stock up to 2004.

Summary

- Landings of American plaice are at their lowest level in the 1965-2004 period, reaching 390 t in 2003 and 401 t in 2004. The fishing industry attributes this decline to a reduction in effort because of poor market conditions in recent years.
- The index of abundance from the research vessel survey has not been updated since 2002. The scheduled survey vessel, the CCGS *Alfred Needler,* was disabled shortly before the September 2003 survey and was replaced by the CCGS *Wilfred Templeman* in 2003 and the CCGS *Teleost* in 2004. The relative fishing efficiency of these vessels is unknown, but comparative fishing experiments are planned for 2005.
- The survey abundance index declined steadily from the early 1990's to 2002. The decline has been principally in western 4T.
- Recruitment has been below the long-term average for several years, based on data up to 2002.

Canada

The Fishery

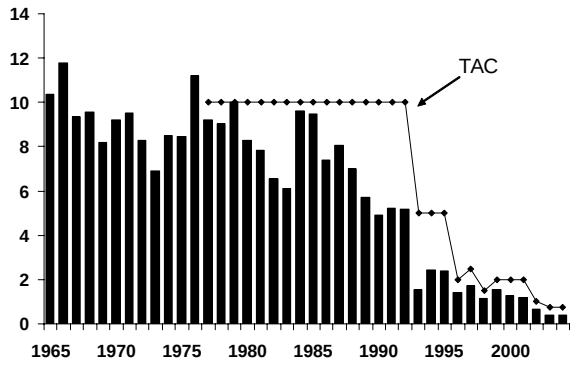
Landings and TAC (thousands of tonnes)

Year	Average 1981-90	Average 1991-95	Average 1996-00	2001	2002	2003	2004*
TAC**	10.0	7.0	2.0	2.0	1.0	0.75	0.75
Landings	7.3	3.4	1.4	1.2	0.7	0.39	0.40

* Preliminary statistics
** TAC in 2000-2004 for May 15 to May 14 of following year

The total allowable catch (TAC) for 4T American plaice was reduced to 750 tonnes following the 2002-2003 fishing season from a 1,000-tonne TAC that was in effect for the three previous years. Landings declined to 390 t in 2003, the lowest level on record, and 401 t in 2004. With the re-opening of the cod fishery in the late 1990s, there was a redirection of fishing effort, contributing to a reduction in plaice landings. In 2003 and 2004, groundfish fisheries were closed from April 1 to June 15 to protect spawning cod. The loss of market demand and a reduction in market price paid to harvesters, has also contributed to reduced effort in the fishery.

Landings and TAC's (thousands of tonnes)



The plaice fishery is mainly conducted by seiners (over 60% of total landings in recent years) and by other mobile gears, such as otter trawls and pair trawls. The fishery has concentrated in the eastern part of 4T since the early 1990s.

Resource Status

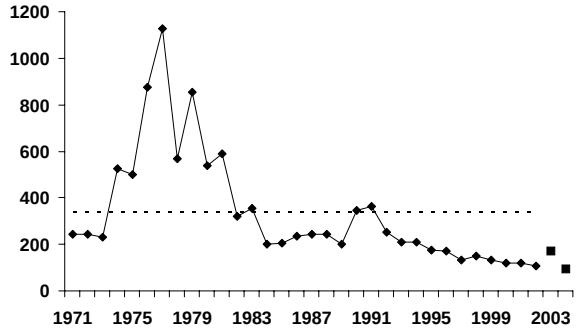
In January 2005, 23 plaice fishers responded to a **telephone survey**. Only fishers who had landed plaice in the 2004 fishery were contacted. The dominant view expressed by fishers was that the plaice resource was at the same level of abundance as the previous year. However, almost the same number felt that plaice abundance was higher in 2004 than in 2003. Similar views were expressed when the respondents were asked to compare the abundance of plaice in 2004 to the previous five years and to all the years of their fishing experience. In both of these comparisons, the most frequent response was that plaice abundance in 2004 was similar to the past. Twenty plaice fishers responded to a question asking them to rate plaice abundance from "very low" to "very high". Ten responded that plaice abundance was "average"; seven responded that it was low or very low; only three felt that it was high or very high.

Research vessel (RV) surveys have been conducted yearly in 4T since 1971. Until 2003, two vessel changes had occurred and on both occasions, the vessel and its replacement were fished side-by-side to compare and 'calibrate' the fishing efficiency of the two vessels. In 2003, the *Alfred Needler* (the vessel used in the 4T survey since 1992) was disabled and replaced by the *Wilfred Templeman*. The *Alfred Needler* was replaced by the *Teleost* in 2004. It has not been possible to compare the fishing efficiency of the *Wilfred Templeman*, nor the *Teleost*, to the *Alfred Needler*. In 2003, the *Wilfred Templeman* was unable to complete all of the strata normally covered in the 4T survey. Due to the incomplete coverage of the 2003 survey and the uncalibrated catch rates of the research vessels used in the 2003 and 2004 surveys, the time series of the abundance index is considered broken. Abundance data from 2003 and 2004 may not be compared to previous years. The relative fishing efficiency of these vessels is unknown, but comparative fishing experiments are planned for 2005.

Research survey data indicate that the abundance of plaice has been in decline since 1991. In 2002, the last year that the *Alfred Needler* was used, the abundance index declined to 105 plaice per tow (biomass index at 12.9 kg per tow). In the

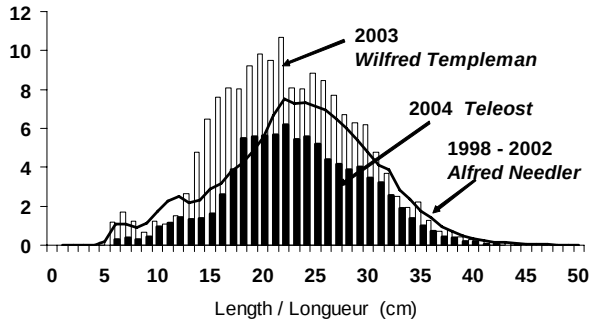
2003 survey, conducted on the *Wilfred Templeman*, the mean catch per tow was 169 plaice per tow (including estimated mean catches in strata not sampled). Catches in 2004 with the *Teleost* dropped to their lowest level on record at 92 plaice per tow (11.4 kg per tow).

Survey abundance index (mean number per tow), showing average catch 1971-2002 (horizontal line)



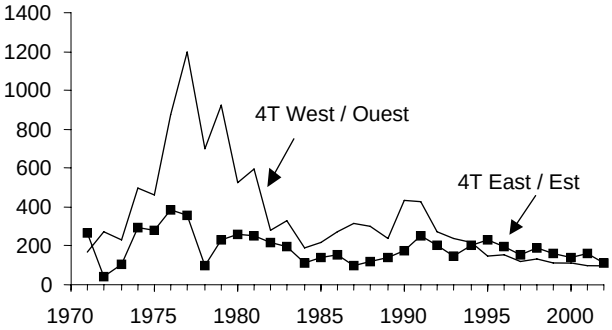
The higher mean catch of plaice in 2003, with the *Wilfred* Templeman, was due to stronger catches of plaice at sizes less than 25 cm. The size composition of plaice in 2003 was unlike that of previous surveys. Plaice catches in 2004 with the *Teleost* were weak at sizes between 20 and 30 cm. It is not clear whether the size composition of plaice observed in 2004 is due to size-dependent differences in fishing efficiency of the *Teleost* or to population changes. This pattern underlines the importance of conducting experiments to compare and calibrate the fishing efficiency of the *Teleost* relative to the *Alfred Needler.*

Length frequency (number per tow) in 2003 and 2004, compared to previous 5-year average, indicating research vessels used in surveys

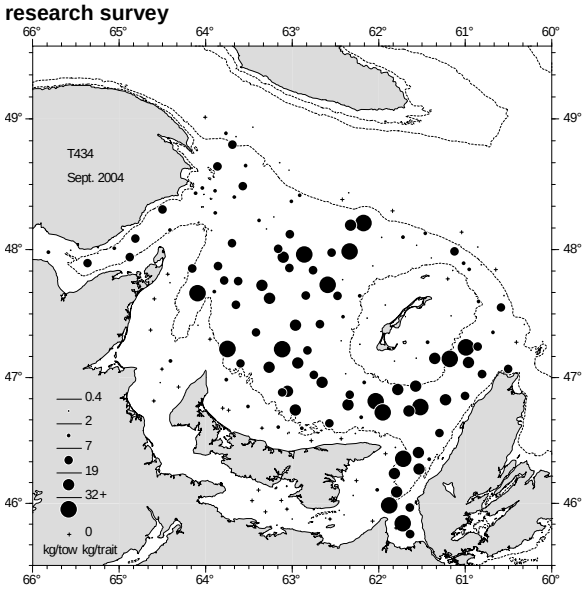


The pattern of decline in abundance of plaice has differed between regions of the southern Gulf. RV survey catch rates have declined in the western half of 4T, but have remained fairly stable in the east. Since 1994, the RV survey biomass index in the east has been equal to or greater than that in the west. This analysis could not be continued to 2003 and 2004. However, the distribution of plaice in recent surveys continues to show stronger catches in eastern parts of 4T. Plaice catches in 2004 were greatest off the western coast of Cape Breton and remain low in Chaleur Bay and along the Gaspé coast.

Research survey mean number per tow, 1971-2002



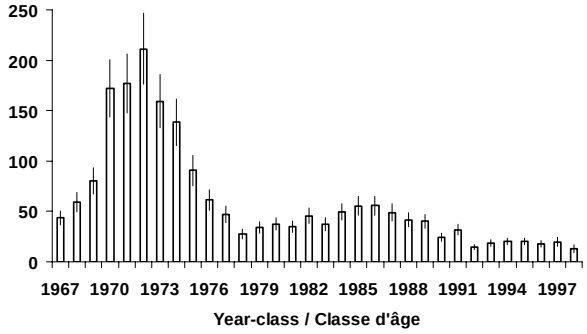
Catches of plaice (kg) in standard tows of the 2004 research survey



Recruitment has been well below the long-term average for this stock. Plaice do not appear in commercial catches in significant numbers before 6-years-of-age and they become fully recruited to commercial fishing gear between 8 and 10-years-of-age. Year-class strength is evaluated by their

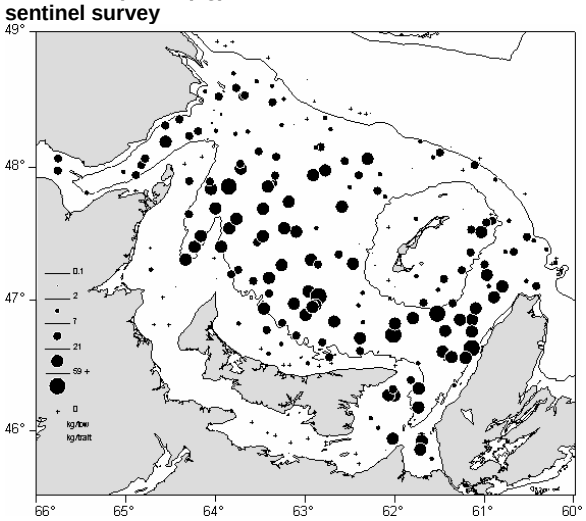
abundance in the RV survey at ages that are not fully recruited to the commercial fishery (ages 4-7). These analyses are sensitive to changes in the RV surveys, including changes in catch rates and size selectivity. For this reason, it was not possible to update the recruitment index with results from the 2003 and 2004 RV surveys.

Research survey mean number per tow at age-5



A synoptic survey of 4T by four commercial trawlers is conducted as part of the **sentinel program**. Since 2003, this survey adopts a similar sampling approach to the RV survey. The distribution of catches in the sentinel program was similar to the plaice distribution in the RV survey, with catches mainly off Cape Breton and in the eastern part of the Magdalen Shallows. Plaice abundance, adjusted for the relative fishing efficiency of the vessels used in this survey, averaged 64 per standard tow in the 2003 sentinel survey and 77 per tow in 2004. The sentinel program may provide reliable indicators of plaice abundance with sufficient time.

Catches of plaice (kg) in standard tows of the 2004 sentinel survey



Sources of Uncertainty

The annual RV survey provides indices of stock abundance and biomass. The continuity of this data series over three decades also enables us to identify trends in growth, mortality and year-class strength. The unplanned changes of the research vessel in 2003 and 2004 have resulted in a break in the survey index and the temporary loss of several indicators of stock status. This has introduced uncertainty in the assessment of the status of the 4T plaice resource.

Discarding of commercially undersized plaice prior to the mid-1990s caused uncertainty in the exploitation level for this resource. This discarding has limited the effectiveness of stock assessment and management, making it difficult to interpret trends in fishing mortality and to develop biological reference points.

Plaice has been observed in the grey seal diets, but no estimates of the amount consumed are currently available. Fishers believe that seal predation on plaice is substantial.

Outlook

The abundance index for all of 4T from the RV survey for 2002 was the lowest on record. Given the slow growth rate of 4T plaice, low

stock abundance and poor recruitment, the prospects of a rapid recovery of this stock are poor. Without increased recruitment, despite low catch levels in recent years, no improvement can be anticipated in the short to medium term.

For More Information

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