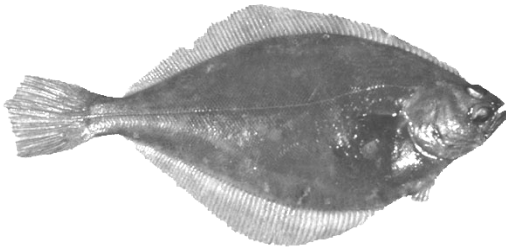




Gulf Region

Stock Status Report 2004/004

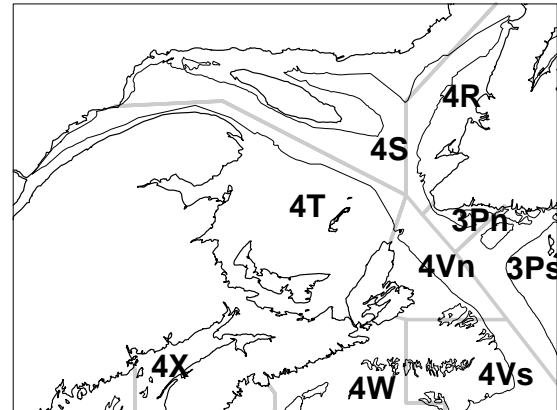


American Plaice in the Southern Gulf of St. Lawrence (Div. 4T)

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 2003.

Summary

- Landings of American plaice in 2003 declined to 389 t, the lowest level in the 1965-2003 period. This is due in part to a reduction in the quota, from 1000 to 750 t, and to reductions in effort and poor market conditions since 2000.
- The index of abundance from the research vessel survey could not be updated in 2003. The scheduled survey vessel, the CCGS *Alfred Needler*, was disabled shortly before the September 2003 survey and was replaced by the CCGS *Wilfred Templeman*. The relative fishing efficiency of the two vessels is unknown. The *Wilfred Templeman* was unable to complete all of the areas normally surveyed each year in 4T.
- The survey abundance index has been declining since the early 1990's without any improvement.
- Recruitment has been below the long-term average for several years.

The Fishery

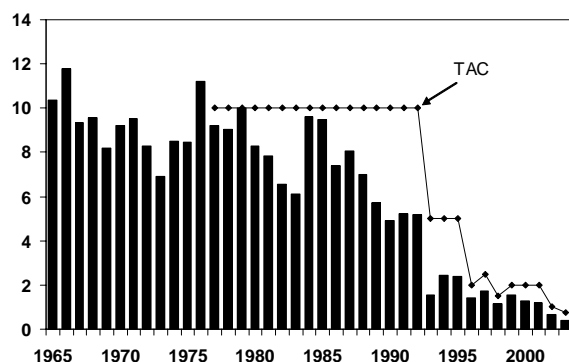
Landings and TAC (thousands of tonnes)

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

* Preliminary statistics

The total allowable catch (TAC) for 4T American plaice was reduced to 750 tonnes for the 2003-2004 fishing season from 1,000 tonnes in the previous season. Landings declined to 389 t, the lowest level on record. 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, groundfish fisheries were closed from April 1 to June 15 to protect spawning cod. Activity in the plaice fishery was further reduced by closures off western Cape Breton due to concentrations of cod. Other factors, such as the loss of market demand and a reduction in market price paid to harvesters, also contributed to reduced effort in the fishery.

Landings and TAC's (thousands of tonnes)



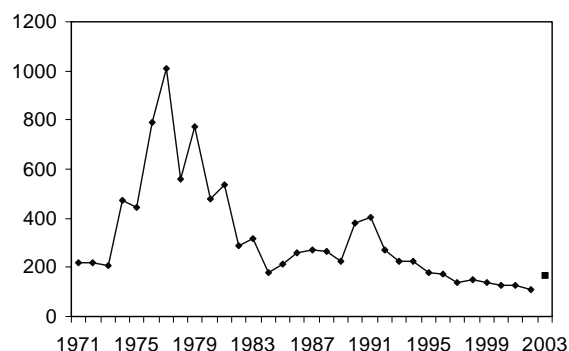
Resource Status

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*. It was not possible in 2003 to compare the fishing efficiency of the two vessels. 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 two research vessels, the time series of the abundance index is considered broken. Abundance data from 2003 may not be compared to previous years.

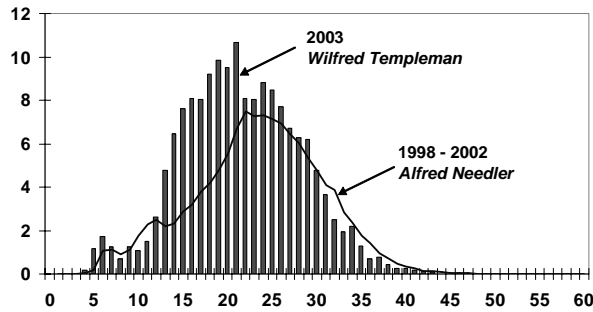
In strata that were sampled in all years, the abundance of plaice has been in decline since 1991. The abundance index reached its lowest point in 2002, at 112 plaice per tow (biomass index at 13.5 kg per tow). In the 2003 survey, conducted on the *Wilfred Templeman*, the mean catch per tow was 165 plaice per tow (19.0 kg per tow).

Survey abundance index (mean number per tow)



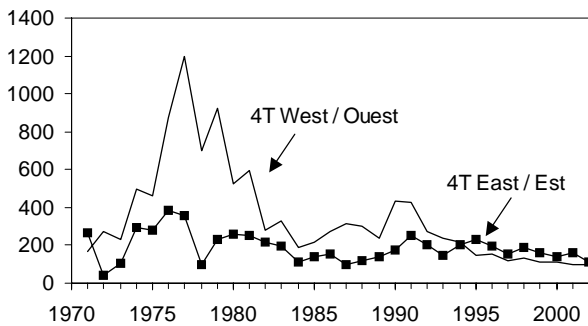
The higher mean catch of plaice in 2003 was due to stronger catches of plaice at sizes less than 25 cm with the *Wilfred Templeman*. The size composition of plaice observed in 2003 has not been observed in recent surveys.

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

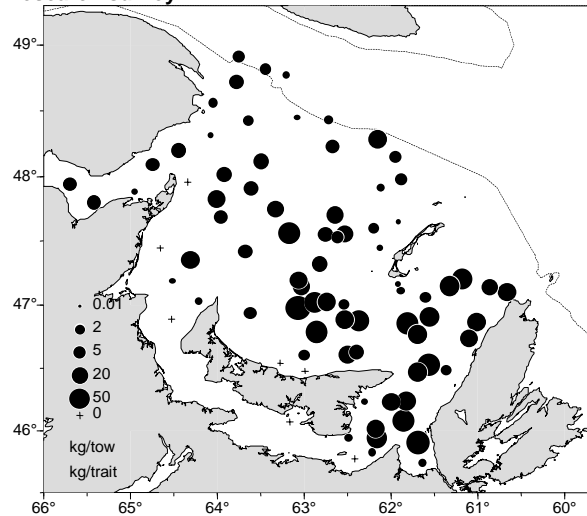


The pattern of decline in abundance of plaice has differed between regions of the southern Gulf. RV survey catch rates have declined in the western half of 4T, but have remained fairly stable in the east. Since 1994, the RV survey biomass index in the east has been equal to or greater than that in the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

Research Survey mean number per tow, 1971-2002

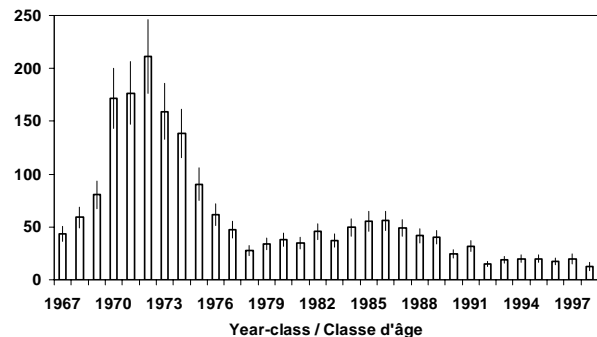


Catches of plaice (kg) in standard tows of the 2003 research survey



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 RV survey.

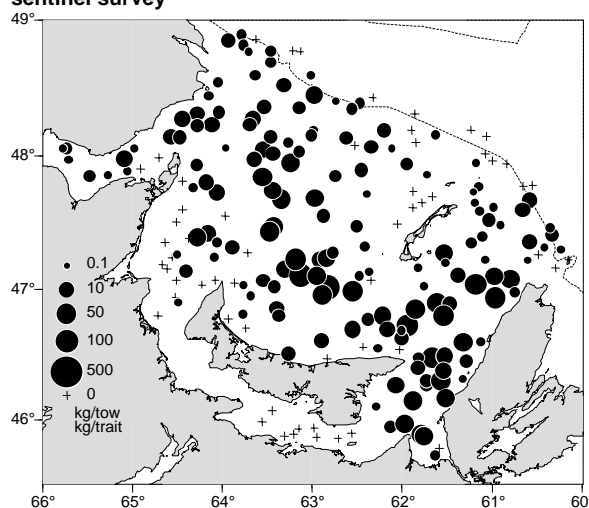
Research survey mean number per tow at age-5



A synoptic survey of 4T by four commercial trawlers was initiated in 2003 as part of the **sentinel program**. 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 Magdalen Shallows. Plaice abundance averaged 60 per standard tow in the 2003 sentinel survey. The sentinel program may provide reliable indicators of plaice abundance with sufficient time.

Catches of plaice (kg) in standard tows of the 2003 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 change of research vessels in 2003 has 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.

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References

- DFO, 2001. American plaice (Div. 4T). DFO Science Stock Status Rep. A3-26 (2001).
- DFO, 2003. American plaice (Div. 4T). DFO Science Stock Status Rep. A3-26 (2003).
- Hammill, M.O., and G.B. Stenson. 2002. Estimated consumption of Atlantic cod (*Gadus morhua*) and some other prey by grey seals (*Halichoerus grypus*) and harp seals (*Phoca groenlandica*), in the southern Gulf of St. Lawrence (NAFO Division 4T). DFO Can. Sci. Adv. Sec. Res. Doc. 2002/054.
- Morin, R., I. Forest, and G.A. Poirier. 2001. Status of NAFO Division 4T American plaice, February 2001 / État de la plie canadienne de la division 4T de l'OPANO, février 2001. DFO Can. Sci. Adv. Sec. Res. Doc. 2001/23.

Poirier, G.A., and L. Currie. 2004. Results from the August 2003 sentinel mobile survey of the southern Gulf of St. Lawrence. DFO Sci. Adv. Sec. Res. Doc. 2004/014.

Poirier, G.A., T. Hurlbut, D.P. Swain, G.A. Chouinard, H. Benoît, C. LeBlanc and L. Currie. 2003. Preliminary results from the September 2003 bottom-trawl survey of the southern Gulf of St. Lawrence. DFO Can. Sci. Adv. Sec. Res. Doc. 2003/112.

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