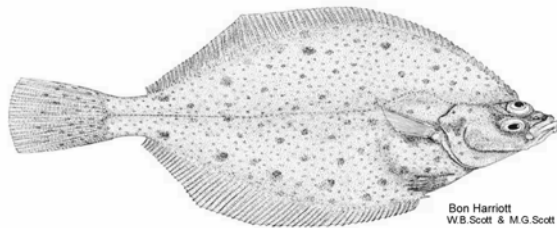




Gulf Region



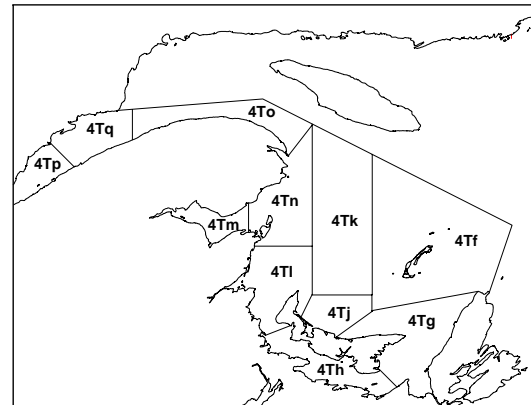
## Yellowtail Flounder in the Southern Gulf of St. Lawrence

### Background

Yellowtail range from Labrador to Chesapeake Bay. In the southern Gulf of St. Lawrence (NAFO Division 4T), yellowtail flounder are most prevalent around the Magdalen Islands, and in the southern parts of 4T, including Chaleur Bay, the Shediac Valley-Miramichi area, Northumberland Strait, and St. George's Bay. They are associated with sand or sand and mud bottoms usually at depths of 37-91 m and temperatures between two and six degrees Celsius. Throughout their range, they migrate seasonally into shallower waters in the spring and back to deeper waters in the winter. Spawning occurs on or near the bottom in spring or early summer. Female yellowtail deposit large numbers of small eggs that float to the surface once fertilized. Growth rates vary widely between regions, and there is little information on the biology of yellowtail flounder in 4T. The small mouth of yellowtail flounder restricts its choice of food to polychaete worms, amphipods, and other small crustaceans such as shrimp. They feed in lesser quantities on fish such as sand lance.

The 4T yellowtail flounder resource supports localized bait fisheries. Yellowtail is also a bycatch in fisheries for cod, white hake, American plaice and winter flounder. The fishery in 4T is prosecuted mainly by mobile gear operated by vessels less than 45 feet around the Magdalen Islands, off the northeast coast of New Brunswick, and the north coast of Prince Edward Island.

A quota was imposed on yellowtail flounder in the Magdalen Islands for the first time in 1998.



The most recent full assessment of this resource was conducted in February, 2002 (Poirier and Morin, 2002; SSR A3-16 (2002)). This report updates fishery and survey data on this stock up to 2004.

### Summary

- Landings in 2004 were approximately 190 tonnes.
- 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 mean number per tow for all of 4T in the DFO research vessel survey was relatively stable from 1985 to 2002. In the strata surrounding the Magdalen Islands, the mean number per tow increased from 1985 to 1993 and remained relatively stable until 2002.
- Following the 800 tonne catch of yellowtail in 1997, the modal (most common) length in the research vessel survey decreased from 28 cm to 21 cm.

It increased and remained at 24 cm from 2000 to 2002, and was 23 cm in 2004. There continues to be a large proportion of small yellowtail in the surveys.

- Harvest levels near 800 tonnes may cause the stock to decline, but the stock appears able to support current harvest levels.

## The Fishery

A TAC of 300 tonnes has been imposed on yellowtail flounder landed in the Magdalen Islands since 1998. Yellowtail in the rest of 4T is not under quota management. Mesh sizes have increased considerably since the 1960s. In 2000, the minimum mesh size for mobile gears in most areas of 4T in the winter flounder-yellowtail directed fisheries was increased from 130 mm to 140 mm square, and in 2003 the minimum mesh size was 145 mm square. For all years, restrictions were imposed on the minimum size of yellowtail flounder; fisheries were to be closed when the number of yellowtail less than 25 cm in length exceeded 15% of the total yellowtail flounder catch.

### Landings (thousands of tonnes):

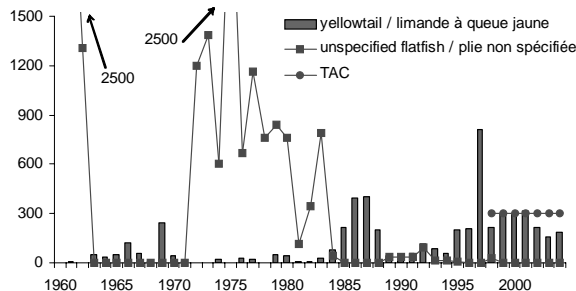
Year	Avg 1991-95	Avg 1996-2000 <sup>1</sup>	2001	2002	2003	2004 <sup>2</sup>
TAC (Magdalen Islands)		0.30	0.30	0.30	0.30	0.30
Magdalen Island Landings	0.06	0.35	0.29	0.19	0.13	0.17
Total Landings	0.14	0.14	0.32	0.22	0.16	0.19

<sup>1</sup> First TAC was established in 1998

(TAC in 2000-2004 for May 15 to May 14 of following year)

<sup>2</sup> Preliminary statistics

### Landings (t)

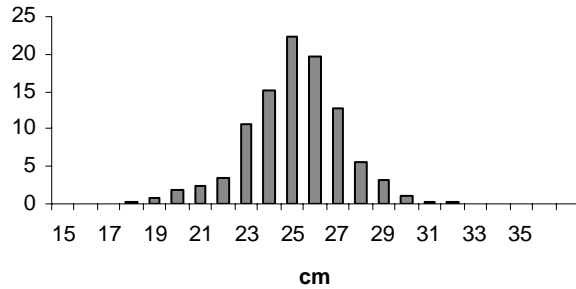


Reported **landings** of yellowtail flounder have varied widely since 1960, ranging from below 10 tonnes in the 1960s and 1970s to a high of about 400 tonnes in the mid-1980s, and over 800 tonnes in 1997. Some of the fluctuations appear to be caused by inconsistent reporting of yellowtail catches. There have been years of large unspecified flatfish catches, some of which may have been yellowtail. Between 1998 and 2002, annual landings were between approximately 200 and 300 tonnes. Landings were 160 tonnes in 2003 and 190 tonnes in 2004, due in part to poor market conditions.

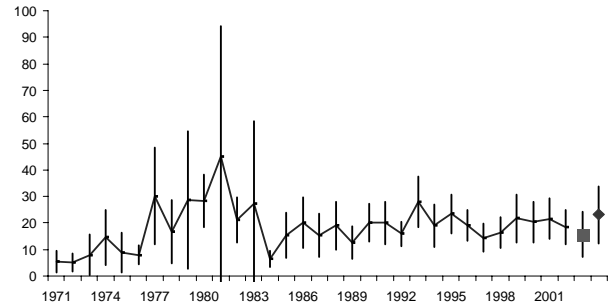
Seines and otter trawls continue to be the dominant gears in the 4T fishery, which is prosecuted largely in the spring and summer months close to the Magdalen Islands, off the northeast coast of New Brunswick, and off the northwest coast of Prince Edward Island. Since 1996, more than 80% of the landings have originated from areas around the Magdalen Islands.

**Port samples** of 4T commercial yellowtail catches for length composition are available for some years since 1985, but annually since 1995. In addition, catches at sea have been sampled in the Observer Programme since 1995, and in the Sentinel Surveys for 1996 and 1997. From 1992 to 2003, the modal length of the commercial catches was between 26 cm and 29 cm but was 25 cm in 2004. The proportion of small (<25 cm) yellowtail in the landings was fairly steady at 6%-7% from 1995 to 1997, was about 20% in 2000 and 2001, and has been greater than 30% since 2002. Apparent annual changes in length frequency distributions may be due, in part, to the paucity of length frequency samples.

Percent of landings by length (cm)



4T DFO survey abundance (mean number/tow ±2SE)



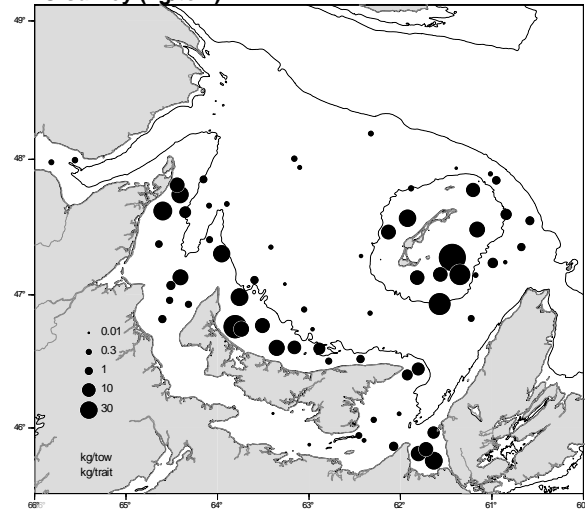
**Resource Status**

DFO Research Vessel (RV) surveys have been conducted in 4T every September since 1971. The mean number per standard tow shows low abundance (fewer than 10 yellowtail/tow) in the early 1970s, increasing to greater than 25 yellowtail/tow in the early 1980s, and decreasing to about 19 yellowtail/tow since 1985.

The indices of stock status from the research vessel survey cannot be updated after 2002. In 2003, the regular survey vessel, the CCGS *Alfred Needler*, was disabled shortly before the September survey and was replaced by the CCGS *Wilfred Templeman*. The relative fishing efficiency of the two vessels is unknown. Furthermore, portions of the survey area were either unsampled or under-sampled in 2003. In 2004, the CCGS *Teleost* completed the survey, but the CCGS *Alfred Needler* fished only 52 sets. As a result, the relative fishing efficiency of these two vessels is unknown, and the 2004 results cannot be put into historical context. The mean numbers of yellowtail per tow in 2004 were 23 and 84, for all of 4T and the Magdalen Islands, respectively.

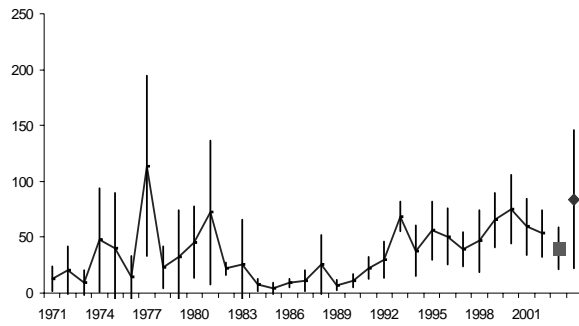
In September, yellowtail are concentrated around the Magdalen Islands, along the northeast coast of New Brunswick, along the north coast of Prince Edward Island and in St. Georges Bay, with lesser concentrations off the east coast of P.E.I.

DFO survey (kg/tow)



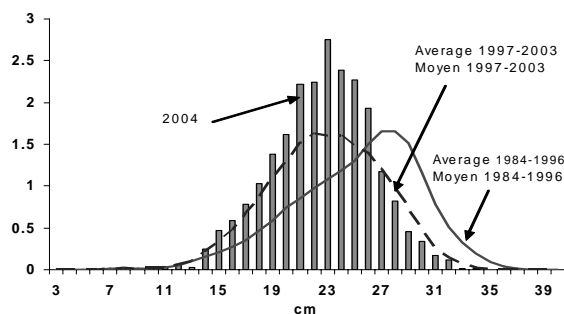
A separate index of abundance was calculated for the strata surrounding the Magdalen Islands. The abundance trend for this area is not the same as for 4T as a whole. The abundance peaked in the late 1970s and early 1980s in the Magdalen Islands and after a sharp decline to a low in the mid-1980s, increased to the early 1990s and has been fairly stable from 1993 to 2002.

Magdalen Island DFO survey abundance (mean number/tow  $\pm 2SE$ )



From 1984 to 1989, the **modal length** of yellowtail in the RV surveys varied between 27 cm and 29 cm. From 1990 to 1996, it was generally between 25 cm and 28 cm. Following the 800 tonne catch in 1997, the modal length was 21 cm, and has increased since then to 24 cm in 2000. The length frequency of yellowtail in the 2002 research vessel catches was bimodal, with modes at 20 cm and 24 cm. The mode was 21 cm in 2003 and 23 in 2004, but it is unclear whether this is due to the changes in research vessels, or reflects changes in the population. The proportion of small (less than 25 cm) yellowtail in the catches was generally less than 50% before 1997, but since then has been greater. The proportion of small fish in 2004 was 69%.

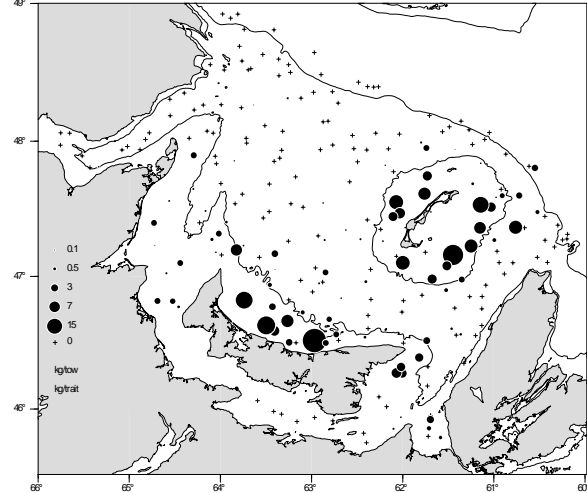
Length frequency (number/tow)



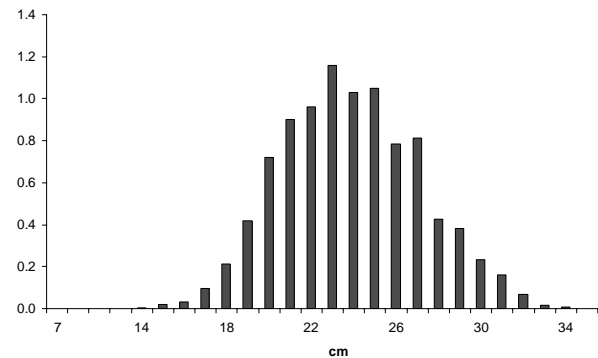
Since 2003, a stratified random survey of 4T has been conducted by four bottom trawlers in August as part of the sentinel programme. The protocol is patterned on the September RV survey protocol. In this survey, the mean number per tow of yellowtail was 10.7 and 9.5 for 2003 and 2004, respectively, in all of the strata, and 36.7 and 30.5 in 2003 and 2004,

respectively, in the strata surrounding the Magdalen Islands. Yellowtail were found in the same areas in the August and September surveys. The modal length in the sentinel survey was 23 cm, and 58% of the yellowtail were less than 25 cm in length.

Sentinel mobile survey (kg/tow)



Length frequency (number/tow) in Sentinel mobile survey



### Sources of Uncertainty

The uncalibrated vessel changes in the September RV survey in 2003 and 2004 are major sources of uncertainty. Because of these changes, it is not possible to determine whether the status of this resource has changed since 2002.

DFO RV surveys, although in all probability covering the majority of distribution of adult yellowtail flounder, may miss large portions of small fish inhabiting very shallow water.

The stock structure of yellowtail in 4T is not known. Distribution maps of RV catches indicate the possibility of separate stocks.

### **Outlook**

The abundance of 4T yellowtail was fairly stable with landings of approximately 200 tonnes in the mid 1990s. The increased effort and harvest of over 800 tonnes from the area surrounding the Magdalen Islands in 1997 coincided with a lower mean number per tow and a smaller modal length in the 4T groundfish RV survey in 1997. In addition, the length frequency distributions of yellowtail caught in the surveys since 1997 show a smaller modal length and a larger proportion of fish less than commercial size (<25 cm).

The annual RV abundance was relatively stable for both 4T in its entirety, and the area surrounding the Magdalen Islands until 2002, the last year in the abundance index time series.

There do not appear to be signs of major change in the 4T yellowtail stock; indicators show relatively stable conditions, with a large proportion of small fish in both the commercial and RV catches.

Harvest levels near 800 tonnes may cause the stock to decline, but the stock appears able to support current harvest levels.

### **For more Information**

Contact:

Gloria Poirier  
Fisheries and Oceans Canada  
Gulf Fisheries Centre  
P.O. Box 5030  
Moncton, N.B. E1C 9B6

Tel: (506) 851-2035  
Fax: (506) 851-2620  
E-Mail: PoirierG@dfo-mpo.gc.ca.

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Department of Fisheries and Oceans  
P.O. Box 1006, Stn. B203  
Dartmouth, Nova Scotia  
Canada B2Y 4A2  
Phone number: 902-426-7070  
e-mail address: [myrav@mar.dfo-mpo.gc.ca](mailto:myrav@mar.dfo-mpo.gc.ca)

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