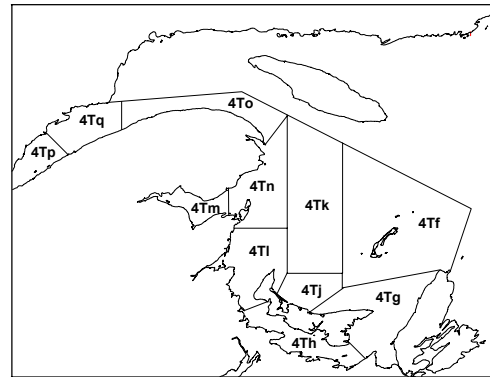


## Yellowtail Flounder in the Southern Gulf of St. Lawrence



### 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 4T for the first time in 1998.

### Summary

- Since 1999, annual landings have been approximately 300 tonnes.
- Catch rates of commercial and Sentinel Survey vessels show no major change from 1997 to 2001.
- The mean numbers per tow for all of 4T in the DFO research vessel survey remained relatively stable from 1985 to 2001. In the strata surrounding the Magdalen Islands, the mean numbers per tow increased from 1985 to 1993 and has remained relatively stable since then.
- Following the 800 tonne catch of yellowtail in 1997, the modal (most common) length in the research vessel survey decreased to a very small length, but has been increasing since then to 2001. There continues to be a large proportion of small yellowtail in the surveys.
- Relative fishing mortalities at length for 1997 were much higher than during 1995-1996 and 1998-2001.
- Harvest levels near 800 tonnes may cause the stock to decline, but the stock appears able to support harvest levels closer to 300 tonnes.

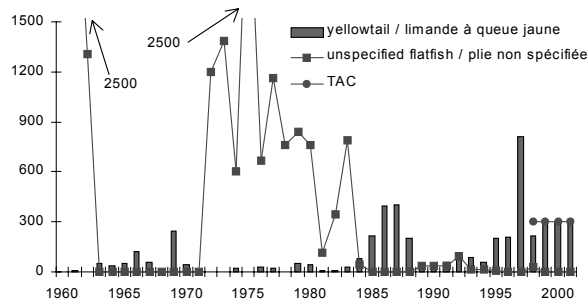
### The Fishery

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. 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	1990-94 Avg	1995-97 Avg	1998	1999	2000	2001
TAC (Magdalen Islands)			0.3	0.3	0.3	0.3
Total	0.1	0.4	0.2	0.3	0.3	0.3

#### Landings(t)

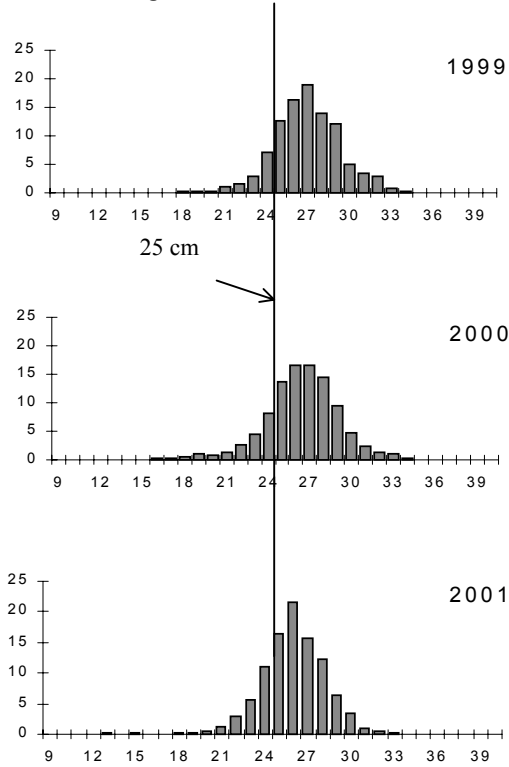


Reported **landings** of yellowtail flounder have varied widely since 1960, ranging from below 10 tonnes in the 1960s and 1970s to a high of about 400 tonnes in the mid-1980s, and over 800 tonnes in 1997. Some of the fluctuations appear to be caused by inconsistent reporting of yellowtail catches. There have been years of large unspecified flatfish catches, some of which may have been yellowtail. Since 1999, annual landings have been approximately 300 tonnes.

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 originate from areas around the Magdalen Islands.

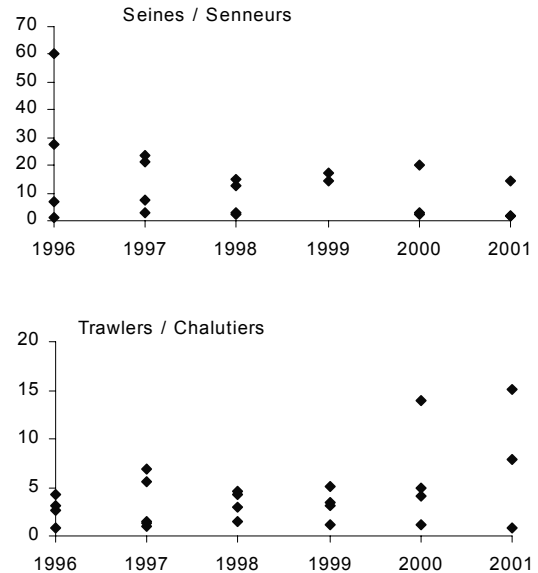
**Port samples** of 4T commercial yellowtail catches for length composition are available for some years since 1985, but annually since 1995. In addition, catches at sea have been sampled in the Observer Programme since 1995, and in the Sentinel Surveys for 1996 and 1997. Since 1992, the modal length of the commercial catches has been between 26 cm and 29 cm. In 2001, the length frequency distribution appears very restricted, with a high proportion of landings between 24 cm and 28 cm. The proportion of small (<25 cm) yellowtail in the landings was fairly steady at 6%-7% from 1995 to 1997, but has been about 20% on 2000 and 2001. Apparent annual changes in length frequency distributions may be due, in part, to the paucity of length frequency samples.

Percent of Landings



**Catch rates** were calculated for seven seiners and eleven trawlers in the Sentinel Surveys from 1996 to 2001. Catch rates of both seiners and trawlers have varied little for most vessels since 1996.

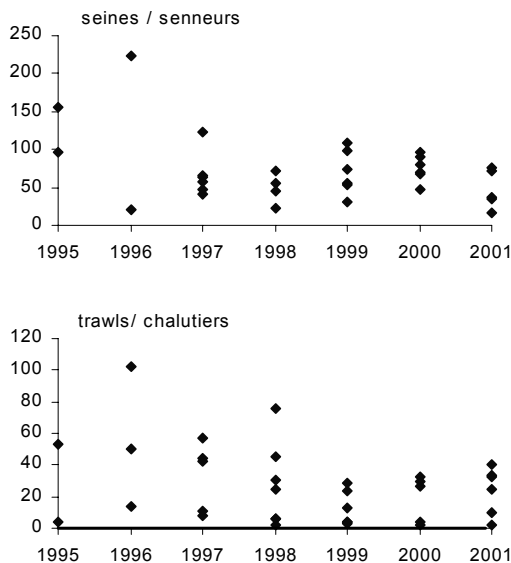
Sentinel Survey Catch Rate (kg/hr)



Resource Status

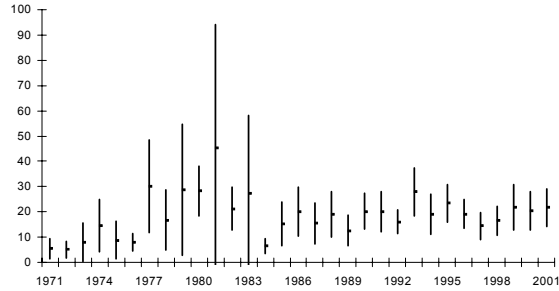
Commercial **catch rates** were calculated for a group of six seiners and seven trawlers that actively fished yellowtail from 1995 to 2001. The trends for both seiner and trawler catch rates indicate little change since 1997.

Commercial Catch Rate (kg/hr)

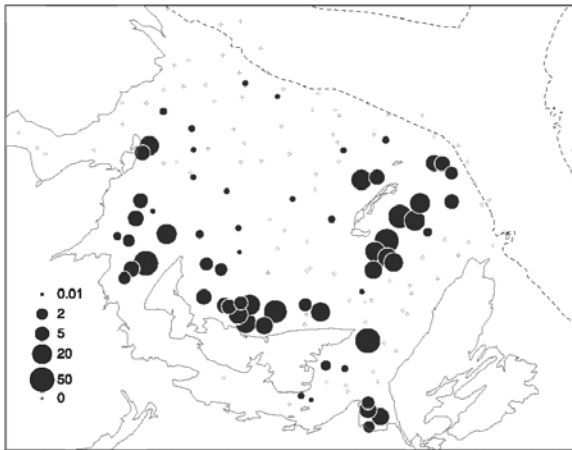


DFO **research vessel (RV) surveys** have been conducted in 4T every September since 1971. The **mean number per standard tow** shows low abundance (fewer than 10 yellowtail/tow) in the early 1970s, increasing to greater than 25 yellowtail/tow in the early 1980s, and decreasing to about 19 yellowtail/tow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

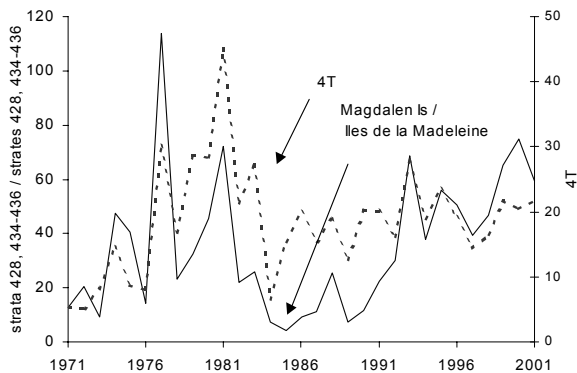


DFO Survey (kg/tow)



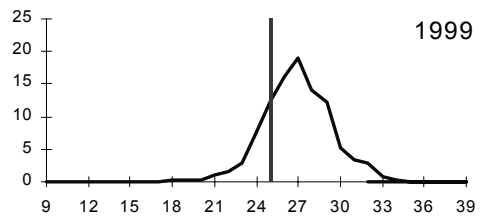
A separate index of abundance was calculated for the strata surrounding the Magdalen Islands. The abundance trend for this area is not the same as for 4T as a whole. The abundance peaked in the late 1970s and early 1980s in the Magdalen Islands and after a sharp decline to a low in the mid-1980s, increased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

DFO Survey Abundance (mean number/tow)

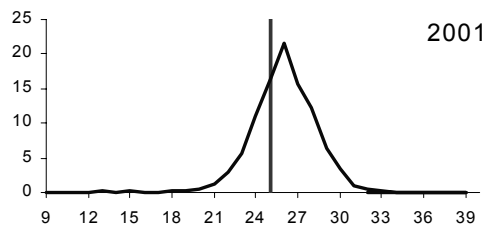
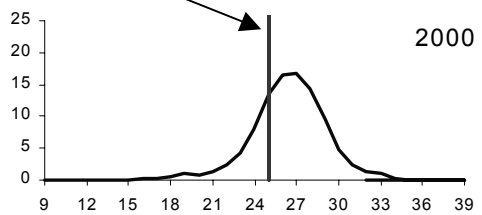


From 1984 to 1989, the **modal length** of yellowtail in the RV surveys varied between 27 cm and 29 cm. From 1990 to 1996, the modal length was generally between 25 cm and 28 cm. In 1997, the modal length was 21 cm, and has increased since then to 24 cm for both 2000 and 2001. The proportion of small (less than 25 cm) yellowtail in the catches was generally less than 50% before 1997. The proportion of small fish in 1997 was 65%, increased to 70% in 1998, and then decreased to 54% in 2001.

Length Frequency (number/tow)



25 cm

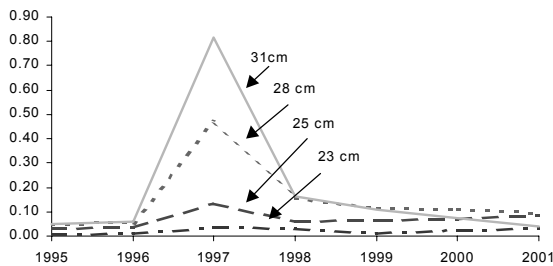


An **inshore trawl survey** has been conducted yearly since 1999 in waters surrounding the Magdalen Islands. The main purpose of this survey is to provide an index of yellowtail abundance and biomass in nearshore waters. Modifications to the gear were made in 2000, making comparisons between the first two years of the survey

difficult. Estimation of yellowtail abundance and biomass indicates a decline from 2000 to 2001.

**Relative fishing mortality** at length for 1995 to 2001 was estimated from the ratio of the landings at length to the RV abundance index at length. Relative fishing mortality for all lengths was higher for 1997 than for all other years.

**Relative Fishing Mortality**



### **Sources of Uncertainty**

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, but, to date, analyses of length frequencies do not indicate the existence of separate stocks.

### **Outlook**

Until 1996, 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 less than commercial size fish (<25 cm).

Catch rates of commercial and Sentinel Survey seiners and trawlers show no major change from 1997 to 2001. The annual RV abundance is relatively stable for both 4T in its entirety, and the area surrounding the Magdalen Islands. The index from the inshore Magdalen Island survey decreased from 2000 to 2001.

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

Harvest levels near 800 tonnes may cause the stock to decline, but the stock appears able to support harvest levels closer to 300 tonnes.

### **For more Information**

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ISSN: 1480-4913

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***Correct citation for this publication:***

DFO, 2002. Yellowtail Flounder in the Southern Gulf of St. Lawrence. DFO Science Stock Status Report A3-16(2002).