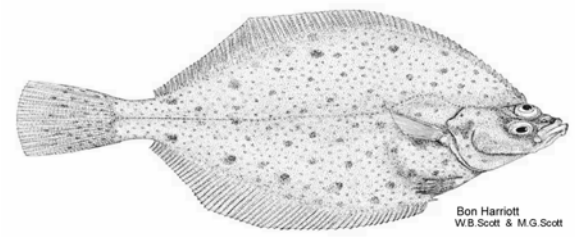


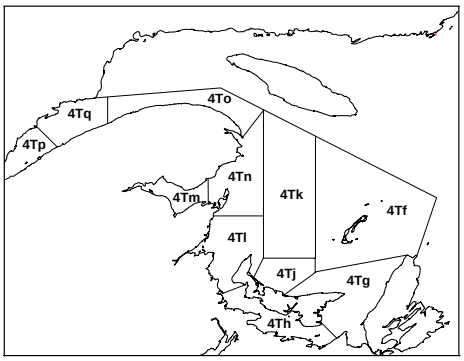
Yellowtail Flounder in the Southern Gulf Of St. Lawrence

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 2003.

Summary

- Landings in 2003 were approximately 160 tonnes, the lowest since 1994.
- The indices of stock status from the research vessel survey cannot be updated 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.
- 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 to a very small length.

It increased and remained at 24 cm from 2000 to 2002, and decreased in 2003 to 21 cm. 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 harvest levels closer to 300 tonnes.

The Fishery

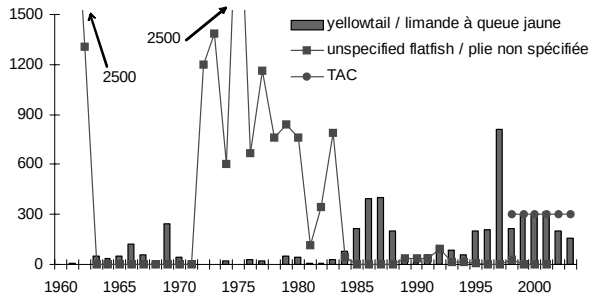
A TAC of 300 tonnes has been imposed on yellowtail flounder landed in the Magdalen Islands since 1998. Yellowtail in the rest of 4T is not under quota management. Mesh sizes have increased considerably since the 1960s. In 2000, the minimum mesh size for mobile gears in most areas of 4T in the winter flounder-yellowtail directed fisheries was increased from 130 mm to 140 mm square, 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 1986-90	Avg 1991-95	Avg 1996-2000[1]	2001	2002	2003
TAC (Magdalen Islands)			0.30	0.30	0.30	0.30
Magdalen Island Landings	0.10	0.06	0.35	0.29	0.19	0.13
Total Landings	0.21	0.11	0.37	0.32	0.22	0.16

[1] First TAC was established in 1998

Landings (t)

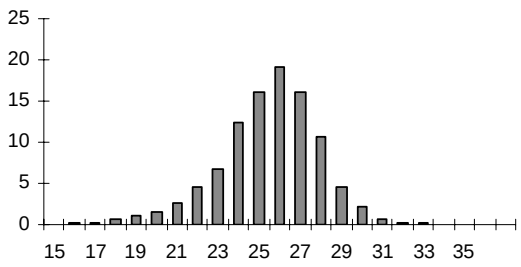


Reported **landings** of yellowtail flounder have varied widely since 1960, ranging from below 10 tonnes in the 1960s and 1970s to a high of about 400 tonnes in the mid-1980s, and over 800 tonnes in 1997. Some of the fluctuations appear to be caused by inconsistent reporting of yellowtail catches. There have been years of large unspecified flatfish catches, some of which may have been yellowtail. Since 1998 annual landings have been between approximately 200 and 300 tonnes. However, in 2003 the landings were approximately 160 tonnes, the lowest since 1994, due to an early closure of the fishery.

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. Since 1992, the modal length of the commercial catches has been between 26 cm and 29 cm. 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,was 37% in 2002, and 30% in 2003. 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)

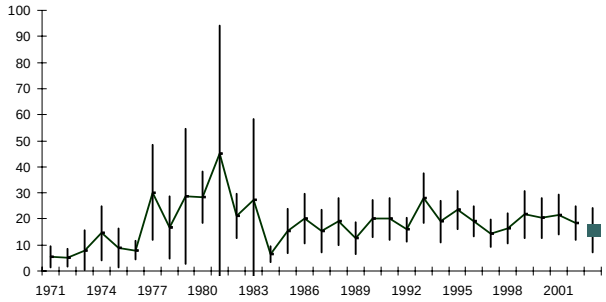


Resource Status

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.

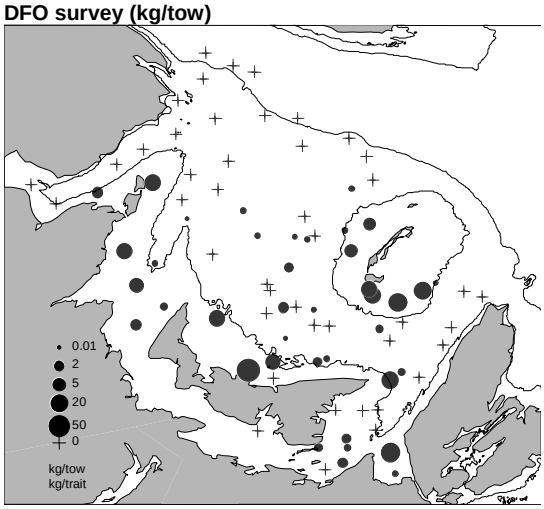
The indices of stock status from the research vessel survey cannot be updated in 2003. The regular survey vessel, the CCGS *Alfred Needler,* was disabled shortly before the September survey and was replaced by the CCGS *Wilfred Templeman*. The relative fishing efficiency of the two vessels is unknown. Furthermore, portions of the survey area were either unsampled or under-sampled in 2003. The mean numbers of yellowtail per tow in 2003 were 16 and 40, for all of 4T and the Magdalen Islands, respectively.

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



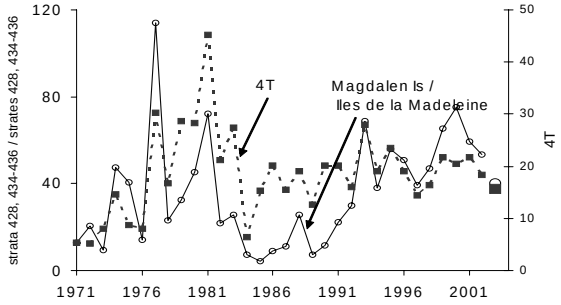
In September, yellowtail are concentrated around the Magdalen Islands, along the northeast coast of New Brunswick, along the north coast of Prince Edward Island and in St. Georges Bay, with lesser concentrations off the east coast of P.E.I.

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 since 1993.

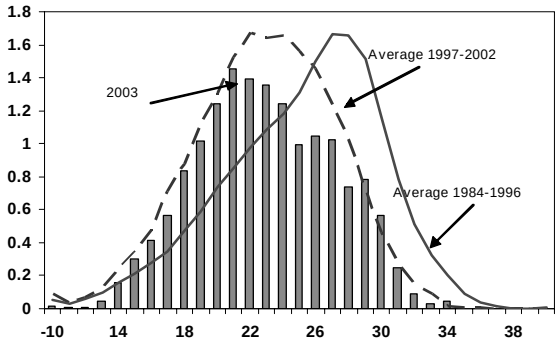
DFO survey abundance (mean number/tow)



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. 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. In 2003, the mode decreased to 21 cm, but it is unclear whether this is due to the change in research vessels, or reflects a change in the

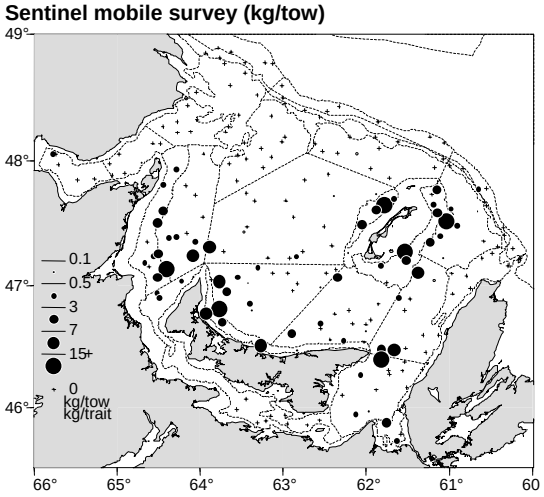
population. The proportion of small (less than 25 cm) yellowtail in the catches was generally less than 50% before 1997, but since then has been greater. The proportion of small fish in 2003 was 64%.

Length frequency (number/tow)



In August, 2003, there was a stratified random survey of 4T conducted by four bottom trawlers in the sentinel programme. The protocol was patterned on the September RV survey protocol. In this survey, the mean number per tow of yellowtail was 10.7 in all of the strata, and 36.7 in the strata surrounding the Magdalen Islands. Yellowtail were found in the same areas in the August and September surveys.

Sentinel mobile survey (kg/tow)



Sources of Uncertainty

The research vessel abundance time series has been broken due to a change in vessel in 2003, precluding calculation of stock status indices. Lack of abundance and biomass indices for 2003 is a major source 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.

Outlook

Since the mid 1980s, 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 harvest levels closer to 300 tonnes.

For More Information

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References

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

Poirier, G.A., and L. Currie. 2004. Results from the August 2003 Sentinel Mobile Survey of the Southern Gulf of St. Lawrence. DFO Canadian Stock Assesment Secretariat Res. Doc. 2004/014.

Poirier, G A., T. Hurlbut, D.P. Swain, G.A. Chouinard, H.P. Benoît, C. LeBlanc, and L. Currie. 2003. Preliminary Results from the September 2003 Bottom-trawl Survey of the Southern Gulf of St. Lawrence. DFO Canadian Stock Assesment Secretariat Res. Doc. 2003/112.

Poirier, G., and R. Morin. 2002. The status of yellowtail flounder in NAFO Division 4T in 2002. DFO Can. Sci. Adv. Sec. Res. Doc. 2002/034.

Scott W.B., and M.G. Scott. 1988. Atlantic Fishes of Canada. Can. Bull. Fish. Aquat. Sci. 219:731 p.

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