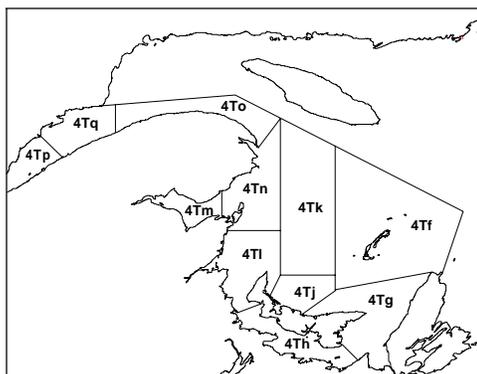


## Yellowtail Flounder In The Southern Gulf Of St. Lawrence



### 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

- Catch rates of commercial vessels show little change from 1994 to 1998.
- The mean weight/tow for all of 4T in the DFO research vessel survey remained relatively stable from 1985 to 1996, then decreased to the two lowest points since 1984.
- Research vessel survey data show relatively small modal (most common) lengths and small proportions of large fish throughout 4T in both 1997 and 1998.
- Relative fishing mortalities at length for 1997 are much higher than for 1995-1996 and 1998.

**The Fishery**

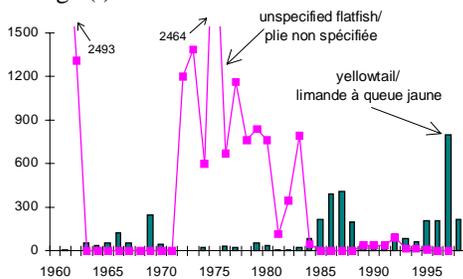
In 1998, for the first time in 4T, a 300 t TAC was imposed on yellowtail flounder harvested around the Magdalen Islands. In the Northumberland Strait and around the Magdalen Islands, the approved minimum mesh size for mobile gear in yellowtail-directed fisheries was 130 mm square mesh while in Chaleur Bay and Miscou Bank, it was 135 mm square. In the rest of 4T, mobile gears were restricted to a minimum mesh size of 155 mm square. Gillnets in all of 4T were required to have a minimum mesh size of 5.5 inches (140 mm). Fishers indicated use of larger mesh sizes than the required minimum. Restrictions were also imposed on the minimum size of yellowtail flounder. Fisheries were closed when yellowtail less than 25 cm in length exceeded 15% by number of the total yellowtail flounder catch.

**Landings (tonnes):**

Year	1970-79 Avg	1980-89 Avg	1990-94 Avg	1995	1996	1997	1998
TAC							300*
Total	18	142	67	204	210	819	213

\* for yellowtail landed on the Magdalen Islands

Landings (t)



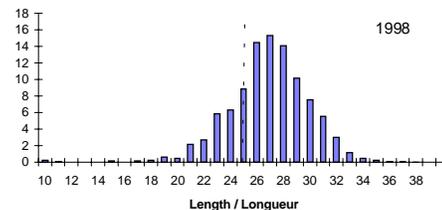
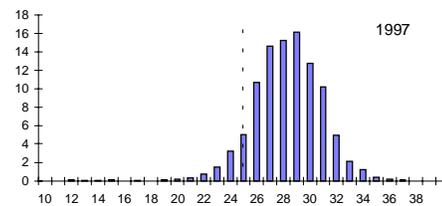
Landings of yellowtail flounder in 4T totalled 819 t in 1997, the highest recorded catch. In 1998, 213 t were landed, about the same as in 1995 and 1996. Reported landings have varied widely since 1960, ranging from below 10 tonnes in the 1960s and 1970s to a high of over 400 tonnes in 1987, and over

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.

Seines and otter trawls continue to be the dominant gears in the 4T fishery which is prosecuted largely in the summer and fall months close to the Magdalen Islands, off the northeast coast of New Brunswick, and off the northwest coast of Prince Edward Island.

Port samples of 4T commercial yellowtail catches for length composition are available for some years since 1985, but annually since 1995. Also since 1995, samples of catches at sea from the Observer Programme, and for 1996 and 1997, for the Sentinel Survey Programme are available. The most common (modal) length of yellowtail in the 4T landings appears to have declined since 1991, but this may be an artifact of sampling intensity. The modal length was smaller in 1998, and there was a larger proportion of smaller fish, than in the length frequency for 1997.

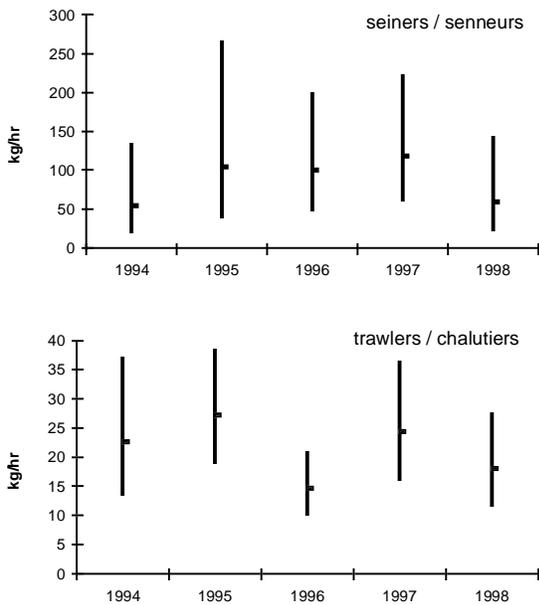
Percent of landings



**Resource Status**

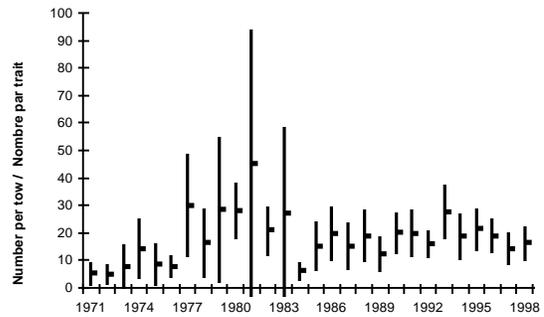
Commercial **catch rates** were calculated for a group of six seiners and seven trawlers that actively fished yellowtail from 1994 to 1998. Catch rates for both trawlers and seiners were stable throughout this period with small decreases in 1998.

**Catch Rate**

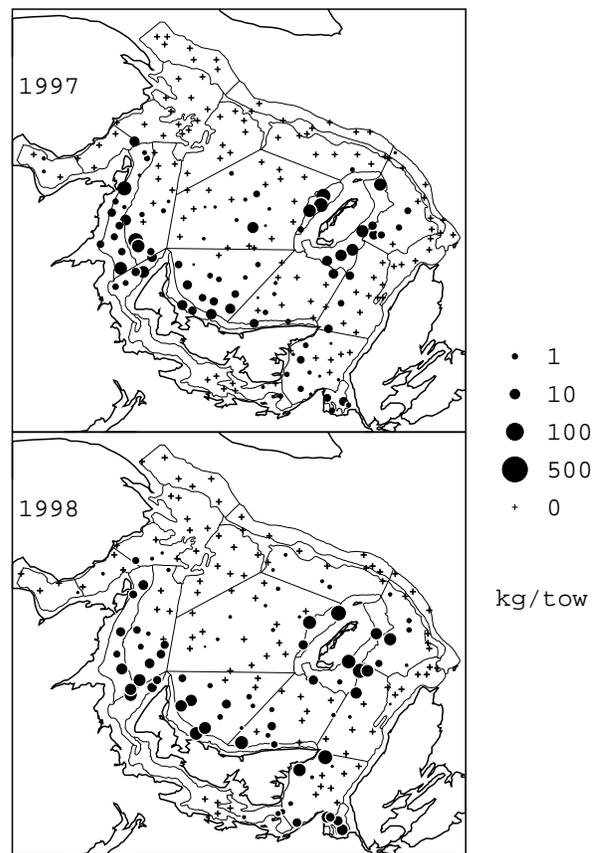


DFO **research surveys** have been conducted in 4T every September since 1971. The **mean number per standard tow** shows low abundance (fewer than 10 yellowtail/tow) in the early 1970s, increasing to values greater than 25 yellowtail/tow in the early 1980s, and decreasing to a stable level at about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

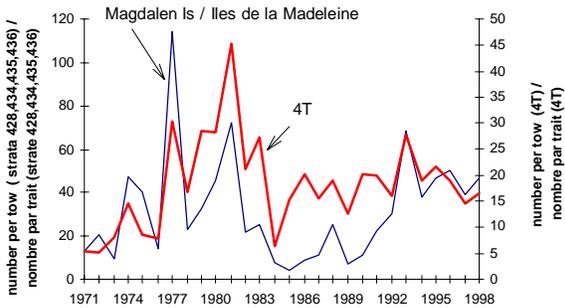


**DFO survey**



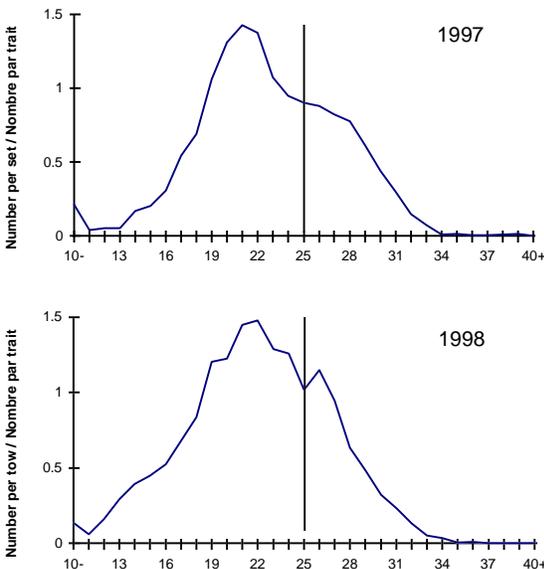
A separate index of abundance was calculated for the strata surrounding the Magdalen Islands, because of the apparent separation of yellowtail in this area from the remainder of 4T. Abundance trends for this area does not provide the same picture as for 4T as a whole. The abundance peaked in the late 1970s and early 1980s in the Magdalen Islands and after a sharp decline to a low in

the mid-1980s, generally increased to the early 1990s. The abundance in all of 4T peaked in the early 1980s, and following a decrease, has remained fairly stable since 1985. For 4T, the mean weight/tow in 1997 and 1998 are the lowest values since 1984.



Length frequencies of yellowtail in the survey tend to track year-classes from one year to the next. The modal (most abundant) length has varied between 26 cm and 29 cm for most years, but was 21 cm in 1997 and 22 cm in 1998. In these two years, the proportion of fish of legal size ( $\geq 25$  cm) was small compared to the previous 3 years.

Length frequency

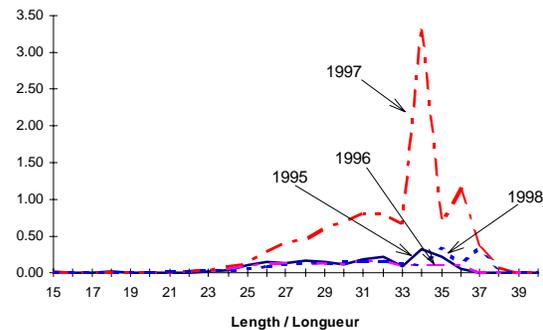


Yellowtail flounder caught in lobster

research surveys conducted near the Magdalen Islands by DFO staff from Institut Maurice-Lamontagne were measured in both 1996 and 1997. Yellowtail were extremely prevalent and a large number of small yellowtail ( $<16$  cm) were caught in both years. The survey area is close to the eastern shores of the Magdalen Islands - outside of the groundfish survey boundaries. This indicates a potential for large numbers of small yellowtail in very shallow waters.

Relative fishing mortality at length for 1995 to 1998 was estimated from the ratio of the landings at length divided by the research vessel abundance index at length. Relative fishing mortality for all lengths was higher for 1997 than for the other 3 years.

Relative fishing mortality



*Sources of Uncertainty*

DFO research 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 research vessel catches indicate the possibility of separate stocks, but, to date, analyses of length frequencies do not indicate the existence of separate stocks.

Industry expressed concerns regarding the conversion factor for day and night catches in the research vessel surveys, and what this might mean for the gear configuration.

### ***Outlook***

From 1985 to 1996, abundance of 4T yellowtail was stable with landings of up to 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 coincides with a lower mean number per tow in the 4T groundfish research survey. In addition, the length frequency distribution of yellowtail caught in the survey shows a smaller modal length and a smaller proportion of commercial size fish ( $\geq 25$  cm). The abundance index did increase somewhat in 1998. Relative fishing mortalities at length for 1997 were higher than for 1995 and 1996 and 1998. This indicates that harvest levels near 800 tonnes could cause the stock to decline.

### ***For more Information***

Contact: Gloria Poirier  
 Department of Fisheries and Oceans  
 Science Branch, Maritimes Region  
 Gulf Fisheries Centre  
 P.O. Box 5030  
 Moncton, N.B. E1C 9B6

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

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- Scott WB, and MG Scott. 1988. Atlantic Fishes of Canada. Can. Bull. Fish. Aquat. Sci. 219:731 p.
- Poirier, G., R. Morin 1999. The status of yellowtail flounder in NAFO Division 4T in 1998. DFO Canadian Stock Assessment Secretariat Res. Doc. 99/46.

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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

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