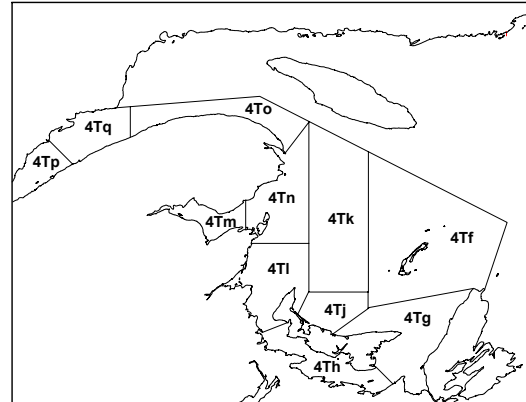


Winter Flounder in the Southern Gulf of St. Lawrence (Div. 4T)



Background

Winter flounder is a coastal flatfish distributed in the west Atlantic from southern Labrador to Georgia. In the southern Gulf of St. Lawrence (NAFO Division 4T), winter flounder are limited to the Magdalen Islands and to southern parts of 4T: Chaleur Bay, the Shediac Valley-Miramichi area, Northumberland Strait, and St. George's Bay. They are associated with soft or moderately hard bottoms and depths less than 40 m. They occupy a range of water temperatures and are capable of inhabiting sub-zero water conditions. Throughout their range, they migrate seasonally from the coast and in the southern Gulf they overwinter in estuaries. Spawning occurs in late winter or early spring. Female winter flounder release several hundreds of thousands of eggs that settle to the bottom, adhering to rocks and vegetation. The larvae drift in surface waters for 2-3 months before metamorphosis. Growth rates vary widely between regions, with female winter flounder reaching sexual maturity by about 25 cm and with males maturing by approximately 20 cm. Winter flounder feed opportunistically on a variety of benthic organisms, mainly molluscs and small crustaceans. They also feed on the eggs of other aggregations of spawning fish, in particular capelin and herring. In some areas of the southern Gulf, modified gillnets (tangle nets) are set on the spring and fall spawning beds of herring to capture winter flounder.

Winter flounder in 4T came under quota management in 1996. With the closure of the Atlantic cod fishery in 1993, concern was expressed that species without quota restrictions, such as winter flounder, would become subject to increased directed effort. The first assessment of the stock status was made in 1994.

The 4T winter flounder resource supports localized fisheries for lobster bait and limited food markets. Winter flounder was also a by-catch in fisheries for cod, white hake and American plaice; however, since closure of the cod fishery, winter flounder has become a mainly directed fishery. The fishery in 4T is prosecuted mainly by mobile gear operated by vessels less than 45 feet. The flesh of winter flounder is of good quality and in certain parts of their range, as in northeastern US, winter flounder are commercially valued in sport and commercial fisheries.

The most recent in depth assessment for this stock was conducted in February 2002 and is summarised in Stock Status Report A3-22(2002). This report updates fishery and survey data on this stock for 2002.

Summary

- Landings of winter flounder were about 400t in 2002, compared with approximately 600t annually from 1998-2001. Directed effort on winter flounder has declined in the 1990s.
- Abundance of winter flounder in the research vessel survey has varied about a constant level for over a decade. The abundance index is near average for the series, while the biomass index is below average.
- Winter flounder in 4T probably comprise several stock units. The survey abundance index shows regional differences in abundance trends.
- The average size of winter flounder in the survey has declined, but appears to have levelled in recent years.

The Fishery

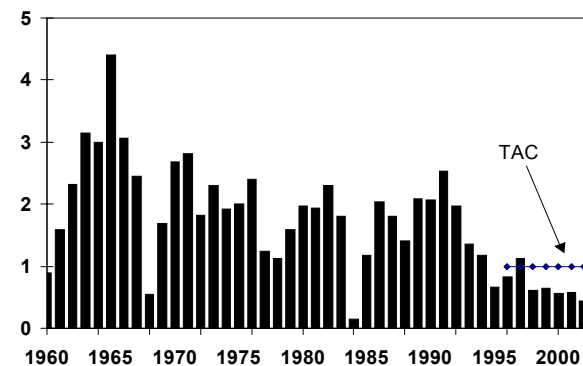
Landings and TAC's (thousands of tonnes)

Year	Average 1980-89	Average 1990-95	Average 1996-99	2000	2001	2002*
TAC			1.0	1.0	1.0	1.0
Landings	1.7	1.6	0.8	0.6	0.6	0.4

* Preliminary statistics

Winter flounder **landings**, which had remained close to 600t from 1997 to 2001, declined to about 400t in 2002. The average since 1965 has been 1729t. Otter trawls have been the dominant gear, landing winter flounder over the past four decades; however, gillnets have contributed at least one quarter of landings in most years since 1986.

Landings and TAC (thousands of tonnes)



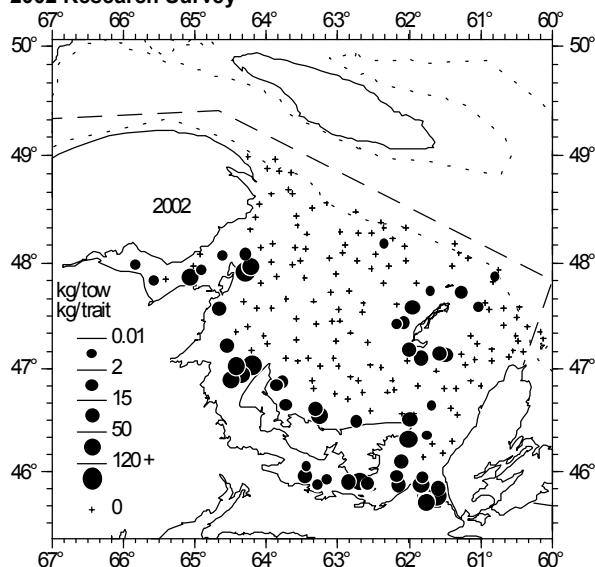
Winter flounder landings have varied widely from year to year due to a number of factors. Directed effort on winter flounder declined in the 1990s. This species has been used widely as bait in 4T, often reported as unspecified flounder or misreported as other species. Mesh sizes have increased considerably since the 1960s. In 2000, the minimum mesh size for mobile gears in most areas of 4T with directed fisheries for winter flounder was increased from 130 to 140mm square. Several improvements were made to

landing statistics in the 1990s, such as better identification of the species caught, dockside monitoring, and the introduction of fixed gear logbooks.

Resource Status

Winter flounder has a coastal distribution in the southern Gulf of St. Lawrence.

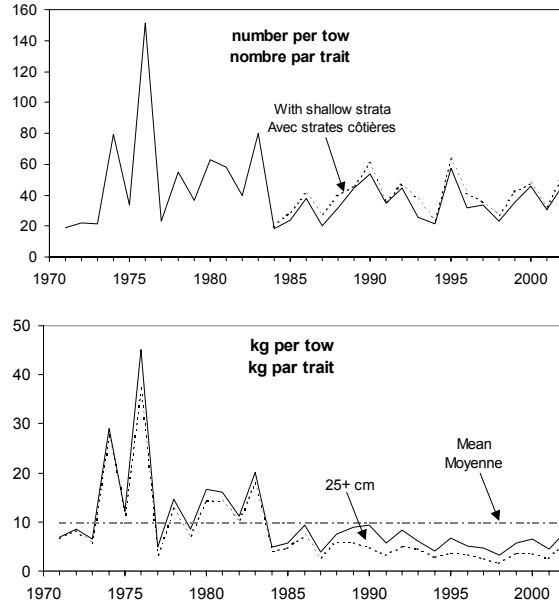
Catches of Winter Flounder (kg) in Standard Tows of the 2002 Research Survey



The **annual research vessel survey** in 2002 averaged 46 winter flounder per tow, slightly more than the average of 42 per tow for strata sampled since 1971. Three inshore strata were added to the survey in 1984. Including these strata, the survey averaged 52 winter flounder per tow in 2002. Both abundance indices (with and without inshore strata) have varied about the long-term average for over a decade. The biomass indices from the survey, for all winter flounder and for commercial-sizes only, have also fluctuated about a constant level for the past decade, but continue to be below the average for the series. It should be noted however, that this survey does not extend to depths less

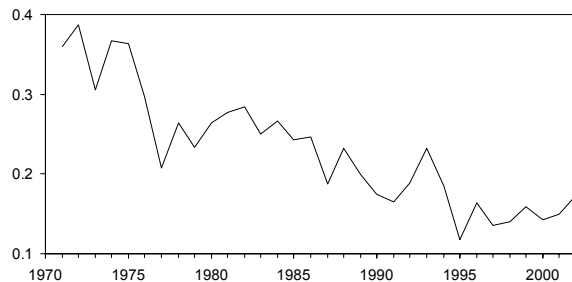
than 20m, consequently much winter flounder habitat, particularly that of younger fish, may not be sampled.

Survey Abundance and Biomass Indices



The average size and weight of winter flounder captured in the RV survey have declined since 1971, although this trend appears to have levelled since 1995. A similar decline in winter flounder size has not been observed in samples of commercial catches since 1983.

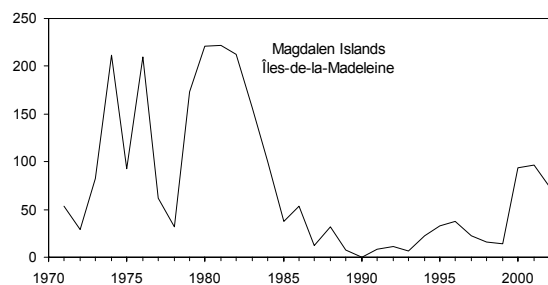
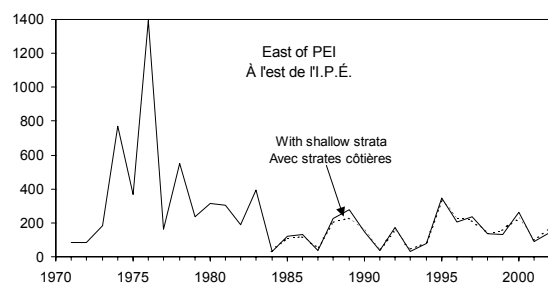
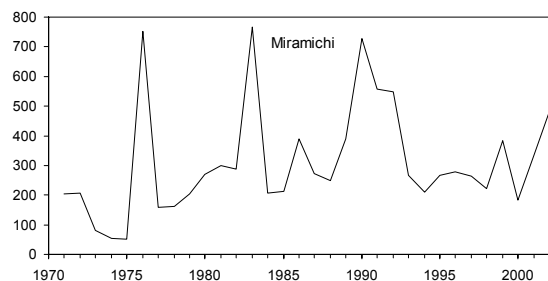
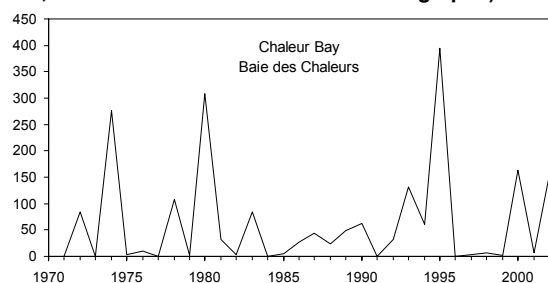
Mean Weight (kg) of Winter Flounder in Research Surveys



Winter flounder are believed to overwinter in estuaries of the southern Gulf. Migration studies conducted elsewhere indicate that they make limited seasonal movements, suggesting that several stock units may occur in 4T.

Patterns of abundance in the RV survey have varied among areas of 4T, supporting this hypothesis. In Chaleur Bay, RV catches have varied widely without any discernible trend since 1971, possibly reflecting the small number of stations sampled there. In the Miramichi area, RV catch rates were relatively low in the early 1970s, with exceptional catches in 1976, 1983, and during 1990-1992. RV catch rates in 2002 were above average. In the area east of PEI, catch rates were highest in the mid-1970s, but have fluctuated at relatively low levels since then. In the Magdalen Islands area, winter flounder catches were strong throughout most of the 1970s and early 1980s, but have remained at a low level for most of the period since then. In 2000 to 2002, catches in that area have risen, ranging from 74 to over 90 winter flounder per tow.

Survey Abundance by Area of 4T (mean number per tow; note different abundance scales on graphs)



Sources of Uncertainty

Recent improvements have been made to landing statistics for this resource. Data on landings up to the mid-1990s may be incomplete. Logbook data are available for mobile gear since 1991, but mostly for one area (4Tg).

The annual RV survey of 4T does not sample the full distribution of winter flounder. Small, young winter flounder

are found further inshore than the area sampled by the survey. Length-frequencies of winter flounder from the research survey do not signal incoming recruitment, nor do they track size modes that indicate year-class strength.

Although there is uncertainty concerning the diet composition of seals in the southern Gulf of St. Lawrence, some analyses suggest that predation by seals on winter flounder in 4T may be considerable.

Outlook

Survey data indicate that the index of winter flounder abundance for the whole of 4T has fluctuated about the long-term average in the past decade. The survey indicates that there has been a declining trend in the average size of winter flounder over the past thirty-two years, but this trend appears to have levelled since 1995.

For More Information

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