

STOCK STATUS REPORT

LAURENTIAN REGION

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DFO, Atlantic Fisheries, Stock Status Report 96/58

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GREENLAND HALIBUT IN GULF OF ST. LAWRENCE (4RST)



Landings (thousands of tonnes)

Year	77-91 av	1992 ¹	1993 ¹	1994 ¹	1995 ¹	1996
TAC	-	10.5	4	4	4	2
Fixed	3.3	2.5	2.5	3.5	2.3	
Mobile	1.5	0.9	0.2	0	0	
Total	4.2	3.4	2.8	3.6	2.3	

¹ Provisional figures

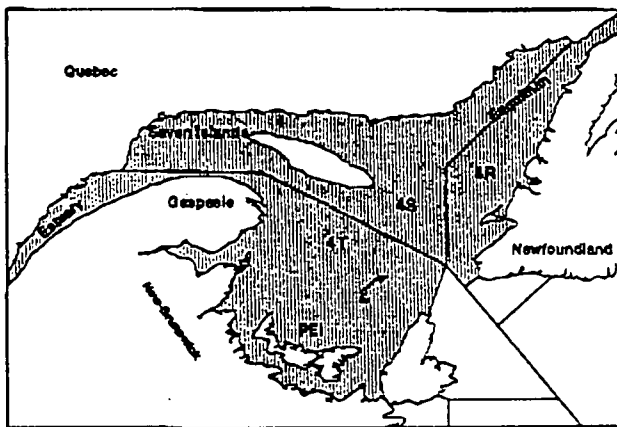


Figure 1. Map of the Gulf of St. Lawrence with the NAFO Divisions.

INTRODUCTION

Greenland halibut (black turbot, commonly called turbot by fishermen) is a flatfish found at depths of up to 1,500 m (830 fathoms) in the North Atlantic. In the Gulf of St. Lawrence, it is found at shallower depths of between 200 and 500 m (110-280 fathoms). The main concentrations of Greenland halibut during the summer are found west of Anticosti Island and, to a lesser extent, north of the island and near the west coast of Newfoundland in the Esquiman Channel (Figure 2). In 1995, it appears that large quantities of Greenland halibut were found south of Anticosti Island, further

east than in past years. A study on parasites showed that it was impossible to distinguish Greenland halibut caught in the Gulf in the summer from those caught in Cabot Strait in the winter. It is thus probable that the concentrations observed during the winter in the Strait and extending outside the limits of Divisions 4RST originate from the Gulf.



Figure 2. Summer distribution of Greenland Halibut as observed on the summer research survey in 1995. The grey area represents the deep water (100 fathoms and more). The size of the round symbol is proportionnal to the importance of the catch.

The growth of males and females is basically the same up to the age of six (Figure 3). At this age, the males reach sexual maturity and begin to grow more slowly than the females. The weight of fish in relation to their length condition decreased in the late 1980s, but has stabilized since 1990 and increased slightly in 1995 for fish bigger than 40 cm (Figure 4). This increase is indicative of a slight improvement in fish condition. The decrease in the condition at the end of the 1980s occurred at the same time as the temperature near the bottom decreased

by 1°C, but it is impossible to confirm that there is a relation between these two observations or whether other factors may have affected fish condition during this period..

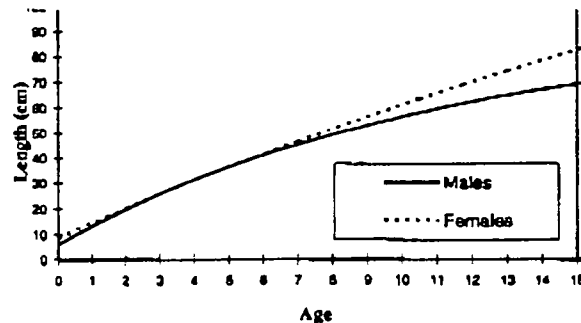


Figure 3. Growth rate of Greenland Halibut in 1995.

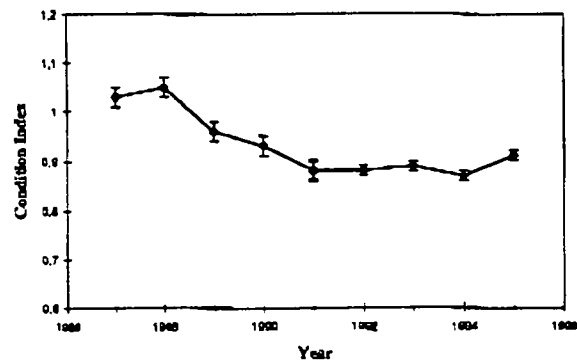


Figure 4. Weight at length (condition) of Greenland Halibut of 40 cm or more.

In 1995, we found that the length at which 50% of females reach sexual maturity was below that observed in previous years. It was estimated at 49 cm compared to previous values of 55 to 58 cm (Figure 5). The reasons for this decrease are not known, but may be related to the presence of new year-classes that have reached maturity more quickly. Another year of observations will be necessary to determine whether

this decrease is real or due to a sampling bias.

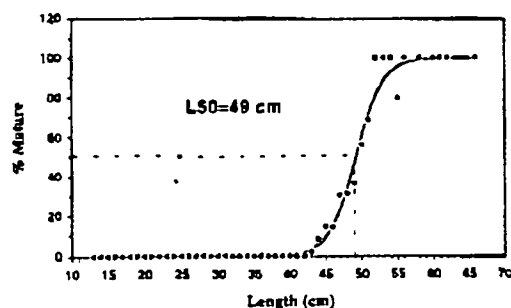


Figure 5. Proportion at length of mature females for Greenland Halibut in 1995. The length where 50 % of the females are mature is shown.

The Greenland halibut generally spawns between January and April and groups of Greenland halibut were observed spawning in the deep waters of the Laurentian Channel during winter trawl surveys. Recruitment success has been fairly low over the past 15 years. However, two periods can be identified when more abundant year-classes were produced: 1979-80 and 1988-90. These periods correspond to two peaks in the abundance of the stocks, indicating a possible relation between stock abundance and recruitment.

DESCRIPTION OF THE FISHERY

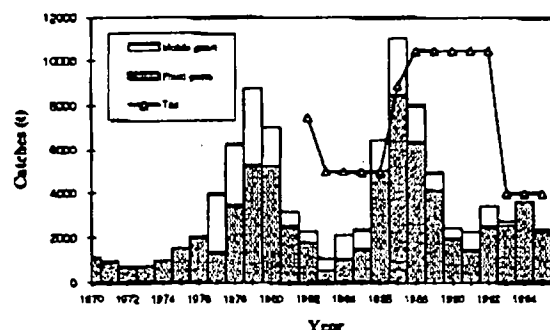


Figure 6. Historical commercial landings of Greenland Halibut in the Gulf of St. Lawrence (TAC: Total allowable catch).

Until the mid-1970s, Greenland halibut landings in 4RST consisted primarily of by-catches from other fisheries. Later, a directed fishery using gillnets and bottom trawls developed. This fishery is now largely dominated by vessels fishing with gillnets whose home ports are in Quebec and on the west coast of Newfoundland. The data series on catches for all provinces (Figure 6) shows two peaks: the first in 1979 (8,800 t) and the second in 1987 (11,000 t). In 1988, catches began a steep downturn, falling as low as 2,300 t in 1991, and since then have fluctuated around 3,000 t. In 1995, preliminary landings were 2,300 t. Catches of Greenland halibut from the shrimp fishery fell from 700 t to 10 t between 1992 and 1994, mainly due to the introduction of the Nordmore grate in the fishery. The total allowable catch (TAC) was set at 4,000 t in 1993; it was reduced to 2,000 t in 1996. The 1995 Greenland halibut fishery was shorter

(May-August) than in previous years. The directed fishery was closed during the summer because the fixed gear quota was reached. The quota had been reduced by 30% before the fishery opened, so the actual quota was well below the TAC of 4,000 t. In 1995, landings from the northern Gaspé Peninsula increased, whereas those in the St. Lawrence estuary declined.

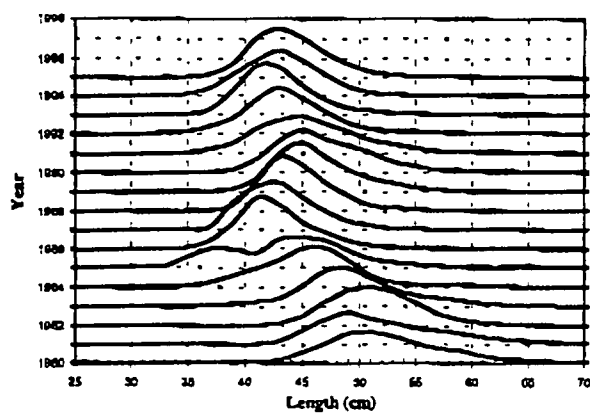


Figure 7. Length frequencies of Greenland Halibut caught by gillnets between 1980 and 1995.

The size frequencies of fish caught in gillnets showed a significant decrease in the average size of Greenland halibut landed from 1980 to 1985 (Figure 7). In 1986, the stronger 1979-80 year-classes began to recruit to the fishery, and so the average length of fish caught rose gradually as these cohorts grew. By 1990, the cohorts had been completely harvested; the fishery then began to target new year-classes that were recruiting to the population, causing the average length to again decrease. The fishery has depended heavily on annual recruitment since then. In 1995, the largest proportion (65%) of Greenland halibut caught with gillnets measured

40-45 cm with a mode of 43 cm and were mainly fish born in 1988 and 1989. The proportion of females in catches rose from 40% in 1990 to 70% in 1993 and 1994; it seems to have fallen to 60% in 1995. In 1994-95, the average size of fish caught off the northern Gaspé Peninsula was slightly higher than in the St. Lawrence estuary. An analysis of length frequencies of monthly gillnet catches between 1986 and 1995 in Divisions 4ST has shown that Greenland halibut caught in the spring were generally bigger and that the size decreased over the fishing season.

FISHERY MANAGEMENT

In 1995, several measures were proposed to follow FRCC recommendations aimed at reducing the amount of immature fish caught: increasing mesh size from 140 mm (5 inches) to 152 mm (6 inches) for 30% of nets, reducing fixed gear quotas by 30% (3,000 t to 2,100 t) and reducing fishing effort by decreasing the number of nets by 20%. The information gathered on the various mesh sizes used in 1995 was not sufficient to establish a mesh size that would decrease the proportion of immature fish. Following the FRCC's latest recommendations in the fall of 1995, the 1996 management plan included more measures aimed at conserving and reducing catches of immature fish:

1. a small fish protocol;
2. a mesh size of 6 inches (152 mm) or more;
3. dockside monitoring.

ABUNDANCE INDICES

Index Fishermen Program

The Index Fishermen Program for Greenland halibut was begun in 1991 to obtain first-hand information from the gillnet fleet. The program has yielded catch and effort data for Greenland halibut on the four main fishing grounds: the St. Lawrence estuary, the northern Gaspé Peninsula, the Sept Îles area and the Esquiman Channel near the west coast of Newfoundland.

Catches per unit of effort (CPUEs) generally increased between 1991 and 1994, rising from 1.5 to 2.5 kg/day/100 m of gillnet. In 1995, participation in the program was low due to difficulties in the fishery in the summer, so it is difficult to compare 1995 CPUEs with those from previous years. Nevertheless, a joint analysis of data from index fishermen and observers show that CPUEs did not change or declined in the St. Lawrence estuary in 1995 compared to 1994, but increased in the northern Gaspé Peninsula.

A groundfish trawl survey has been carried out in the summer in the northern Gulf and the St. Lawrence estuary since 1984. The average weights (kg/set) recorded during the summer survey have remained relatively low since 1990. It appears that good year-classes were produced between 1988 and 1990 (Figure 8). However, the numbers at age two over the past three years are smaller than those in 1990-1992 (Figure 9).

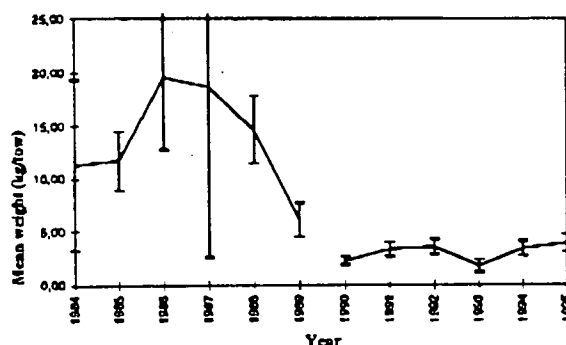


Figure 8. Abundance index of Greenland Halibut on the summer research survey in the Gulf of St. Lawrence. The survey vessel was changed in 1990 and the two series are not directly comparable.

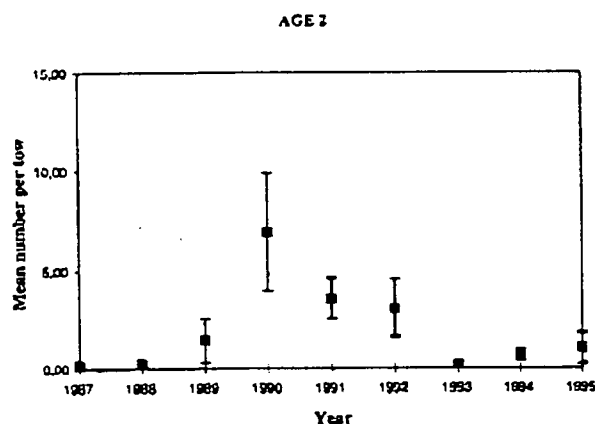


Figure 9. Abundance index of juveniles (age 2) on the summer research survey in the Gulf of St. Lawrence.

A groundfish survey was carried out in the Cabot Strait area in January 1995 and 1996. The distribution of catches in 1995 shows that there are Greenland halibut in the deep waters of the Laurentian Channel in winter. The largest catches were made west of Port aux Basques, Newfoundland. Another concentration appeared south of Burgeo Bank. The distribution of Greenland halibut in 1996 was similar on the whole to the 1995 distribution.

Greenland halibut size frequencies recorded during 1995 surveys have a mode around 40 cm; the mode was approximately 42 cm in the January 1996 survey. Although the number of juveniles (fish under 20 cm) observed in the surveys was very low, the size structure of fish over 30 cm is similar to that found in the Gulf in summer.

Sentinel Fisheries

Four surveys under the Sentinel Fisheries program for 4RSPn cod have been carried out by small trawlers since December 1994. The surveys used the same sampling pattern as trawl surveys made by DFO fishing cruises and provide information on other groundfish species.

The last two surveys (August and October/November 1995) covered a larger distribution area of the Greenland halibut in the Gulf. The distribution of catches and size structures from the two surveys were similar to those observed during the DFO summer trawl surveys (Figure 10).

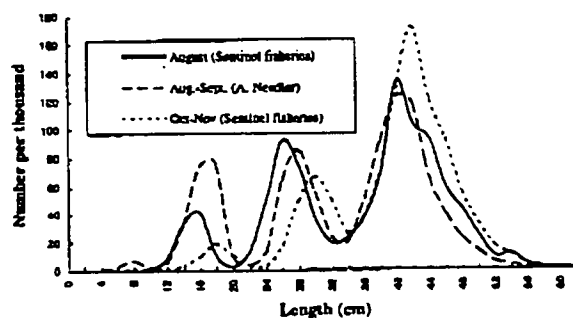


Figure 10. Length frequencies of Greenland Halibut from the summer research survey (A. Needler) and the Sentinel fisheries.

THE INDUSTRY'S POINT OF VIEW

During meetings with Greenland halibut fishermen over the past year, several points were raised regarding the state of the Greenland halibut resource and fishery. To begin, changes in the distribution from 1994 to 1995 were mentioned frequently by the fishermen. The most notable change was the greater number of Greenland halibut northeast of the Gaspé Peninsula. This change is consistent with the observations made during the summer research survey. Secondly, some fishermen reported that the size of the fish caught had increased in 1995 and that there were more brooding females in their catches. Finally, some fishermen have the impression that the stock is more abundant in 1995 than in previous years.

PROGNOSIS

Abundance indices have shown a slight increase in Greenland halibut since 1990. The abundance of commercial-size Greenland halibut (more than 40 cm) has also increased since 1994 due to the presence of good year-classes. However, large Greenland halibut (more than 50 cm) are still not common in the population. The number of juveniles observed in the summer research survey was below average from 1993 to 1995, which suggests a decrease in recruitment to the population. The low abundance of large Greenland halibut suggests that the resource has been heavily harvested. Tighter control of the fishery over the past few years has probably decreased the rate. Nevertheless, harvesting should

remain limited as long as the number of adult Greenland halibut does not increase significantly.

It is highly likely that the Greenland halibut concentrated in the Cabot Strait area in winter come from the Gulf of St. Lawrence. The uncontrolled harvest of these concentrations would not favour conservation of the Gulf population.

In the fall of 1995, the Fisheries Resource Conservation Council (FRCC) repeated the recommendation it made in 1994 to decrease catches of immature fish. The management measures implemented in 1996 are a substantial step towards achieving this objective. Target size of fishes caught and other conservation-oriented measures will be reviewed with DFO management and the Industry in the fall of 1996, following the fishing season and the next summer trawl survey.

For more information:

Morin, B., B. Bernier, R. Arthur, G. Chouinard and A. Fréchet. 1996. Évaluation et biologie du flétan du Groenland (*Reinhardtius hippoglossoides*) du golfe du Saint-Laurent (4RST) en 1995. DFO Atl. Fis. Res. Doc. 96/53.

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