

Atlantic Halibut of the Gulf of St. Lawrence (4RST) – in 2004

Background

This document presents an assessment of available data for this stock in 2004. It is a supplement to the A4-02 Stock Status Report published in 2000 following a full assessment of Atlantic halibut in the Gulf of St. Lawrence.

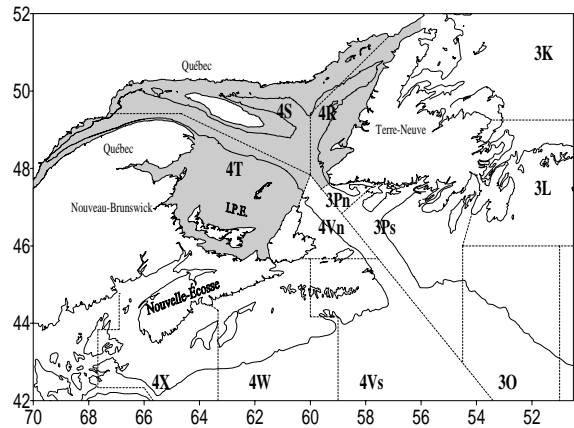


Figure 1. Map of the Gulf of St. Lawrence and neighbouring regions showing NAFO divisions 4RST.

Summary

- As of December 31, 2004, the recorded landings of Atlantic halibut from the Gulf of St. Lawrence stock (NAFO Divisions 4RST) totalled 393.5 t, a 26% increase compared with those of the 2003-2004 season. These landings account for the second highest value since the introduction of a TAC in 1988.
- The abundance index of halibut caught during the mobile gear sentinel fisheries survey of July 2004 in the northern Gulf was among the highest observed values in the historical series. The mean weight per tow recorded in 2004 was comparable to those in the 2000s. Catches are still made up primarily of halibut under 81 cm.
- Since 1997, year in which a minimum allowable catch size of 81 cm was implemented, landings have mostly been made up of individuals measuring between 81 cm and 115 cm. The mode was consistent and close to the minimum catch size. In 2004, the results of at-sea sampling indicate that pre-recruits were still well represented, with a mode of 71 cm, more or less the same size as the two previous years. In 2004,

the size structure of fixed gear halibut catches is still as wide (32 to 272 cm).

- Even though stock abundance is unknown, a comparison of recent landings (315 t) with those recorded before the 1970s (more than 500 t) indicates that the exploitable portion of the stock is still at a low level. There is however an upward trend in the abundance of smaller size individuals according to scientific surveys, as well as in the commercial catches sampled at sea. This could well indicate that recruitment has increased during the 1990s.
- At the end of 2004, the preliminary catches recorded exceeded the 12% TAC (350 t). It is recommended that commercial catches and the TAC be maintained at 350 t until there has been a replenishment of spawner stock, shown by the consistent presence of individuals greater than 120 cm.

Species biology

Atlantic halibut of Divisions 4RST can be found throughout the Estuary and Gulf of St. Lawrence. In the northern Gulf, the species is more abundant in the Esquiman, Laurentian and Anticosti channels, at depths of 200 m and over. In the southern Gulf, the greatest concentrations occur in shallower waters (at depths less than 100 m), near the Miscou Bank, north of

Prince Edward Island, northwest of Cape Breton and around the Magdalen Islands (Figure 1).

Atlantic halibut grows fast and in a continuous manner. The annual average growth rate in the Gulf was evaluated to 7.5-8.5 cm per year (Archambault and Grégoire, 1996). Male and female growth rates are comparable. However, it was observed that females reach a larger maximum size than males. This could be due to the fact that Atlantic halibut females reach sexual maturity at a larger size than males, as observed for Atlantic halibut in Canadian Atlantic waters. Based on observations made during scientific trawl surveys conducted in January and May, Gulf halibut is able to spawn during these periods.

The current Atlantic halibut management unit for the Gulf, which corresponds to Divisions 4RST, was established in 1987 based on the findings of tagging–recapture studies and by taking into account additional biological data such as size and growth rate.

Fishery description

The significant landings (average of 1,500 t) of Atlantic halibut harvested in the Gulf of St. Lawrence during the first half of the 20th century indicate that this stock was once very abundant and that it was subjected to an intense fishing pressure

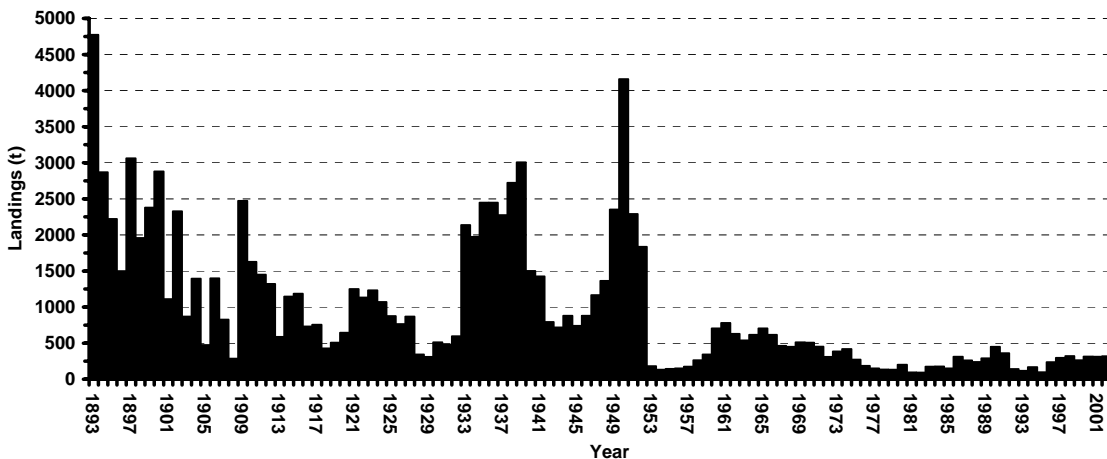


Figure 2. Historical series of commercial annual landings of Gulf Atlantic halibut, 1893-2004.

(Figure 2). Halibut landings, which were around 650 t in the early 1960s, hit a record low in 1982 at 91 t. Until 1995, they seldom exceeded the threshold of 300 t, which is equivalent to the precautionary TAC established in 1988. Since then, halibut landings grew up slightly, which would be mainly due to an increased fishing effort by the fixed-gear fleet, in particular longliners.

Following a recommendation of the Fisheries Resource Conservation Council (FRCC, 1999), the TAC for the 1999 fishing season (January 1 to December 31) was increased to 350 t. Due to the application of the new groundfish management period extending the 1999 fishing year until May 14, 2000, an additional TAC of 100 t was granted by management to cover this period. Since 2000, the fishing season and the authorized TAC refer to the period from May 15 of the current year to May 14 of the following year.

As of December 31, 2004, landings for the 2004 fishing year totalled 393,5 t, exceeding by 12% the authorized TAC of 350 t (Table 1). However, the magnitude of quota exceeding is definitely more significant (up to 300%) if one considers the quotas granted per period to the <65 feet fixed-gear float. As in previous years, most of the catch was taken with fixed gears, primarily longliners. In 2004, the majority of fishing activities took place between May and August. Total landings for the 2003 fishing season were 313.4 t, or 89.5% of the

authorized TAC of 350 t. Although the landing average for the last five years totalled 315 t, it is below the 500 t and more commonly recorded in the 1960s (Figure 2). It seems even more insignificant when considering the thousands of tons that were landed regularly in the first half of the 20th century.

Resource status

Data on the abundance of Atlantic halibut in the Gulf were provided by four scientific trawl surveys: two by the Department and two by the mobile-gear sentinel fishery program in the northern Gulf. There is considerable variability in abundance estimates, however, owing to the low susceptibility of Atlantic halibut to bottom trawls.

Halibut catches made during surveys are distributed throughout the Estuary and Gulf of St. Lawrence. In the northern part of the Gulf, the species is abundant in the Esquiman, Laurentian and Anticosti channels, at depths of 200 m and over. In the southern part of the Gulf, the greatest concentrations occur in peripheral areas, in shallower waters (at depths less than 100 m) than in northern Gulf, around the Magdalen Islands and on the southern edge of the Laurentian Channel.

Halibut abundance has generally been found to be low in the different surveys (fewer than 1 halibut per 3 tows), although an upward trend has been observed since the late 1990s (Figure 3). Parallel to this increase in abundance is an increase in mean capture weight per tow, but it is less consistent.

Survey and commercial fishery data also provides information on the size of the fish caught and on the presence of pre-recruits (individuals smaller than 81 cm). The average size of halibut measured during surveys seldom exceeded 80 cm. The smallest average sizes are observed in the southern part of the Gulf. Since 2000, a sustained downward trend in average size

Table 1. Atlantic halibut landings in the Gulf of St. Lawrence (t)

Division	Year						
	1988-1998 ¹	1999 ²	2000 ³	2001	2002	2003	2004 ⁴
TAC	300	450	350	350	350	350	350
4R	85	105	58	93	82	144	157
4S	73	115	156	110	104	87	113
4T	91	120	72	99	95	83	124
Total	249	340	285	301	282	313	393

¹ Average

² Fishing year, landings and TAC for the period between January 1, 1999 and May 14 of the following year

³ As of 2000, the fishing season, landings and TAC for the period between May 15 of the current year and May 14 of the following year to May 14th of the following year

⁴ Preliminary data as of December 31, 2004

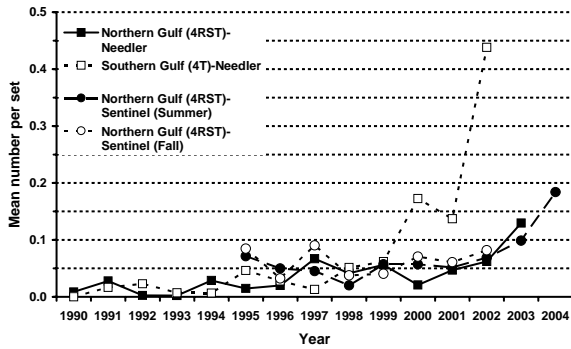


Figure 3. Abundance index of Atlantic halibut captured during the groundfish stock assessment scientific surveys conducted between 1990 and 2004.

has been observed. In 2004, it was about 50 cm, as in 2003.

In 2004, the average size of Atlantic halibuts landed by the fixed-gear fleet increased by about ten centimetres compared to 2003, reaching 101 cm, a value comparable with the average sizes observed between 1999 and 2002 (Table 2). However, in 2004, the modal size dropped to 84 cm, that is a little more than the minimum legal size of 81 cm. Commercial catches sampled at dockside between 2002 and 2004 were mostly made up of individuals measuring between 81 cm (minimum legal size) and 115 cm.

According to the samples measured by observers at sea (that is before individuals of less than 81 cm are returned to water), the range of sizes in Atlantic halibut captured by fixed gears remained rather large in 2004 (minimal size: 32 cm; maximum size: 272 cm) (Figure 4). Moreover, these samples indicate the continuous presence of pre-recruits in catches between 1999 and 2004. This group of individuals was particularly abundant in 2004, its modal size being around 71 cm. All these elements corroborate the comments fishermen provided over the last years, namely the sustained presence in their captures of a large number of Atlantic halibut of less than 81 cm.

Table 2. Statistics on the sizes (cm) of Atlantic halibut captured by fixed gears and measured at dockside, 1997-2004.

Parameter	YEAR							
	1997	1998	1999	2000	2001	2002	2003	2004
Minimum	38	59	56	75	48	64	38	66
Quartile 25%	72	80	87	87	87	84	82	83
Median	84	89	97	97	100	94	90	92
Quartile 75%	102	104	117	111	120	115	102	112
Maximum	242	240	209	201	174	210	208	207
Mode	72	79	82	83	85	84	92	84
Mean	89.98	95.91	105.49	103.73	106.45	101.31	89.50	101.03
SD ¹	25.47	23.84	26.55	22.98	25.01	24.42	28.12	25.72
N ²	23268	22378	13355	17877	16372	19157	24686	20878

¹: standard deviation

²: estimated number for fished halibut

Tagging program

The purpose of the Gulf Atlantic halibut tagging program is to study the movements of Atlantic halibut in and out of the Gulf, and to examine potential links between Atlantic halibut of 3Pn and the adjacent stocks of 4RST and 4VWX3NOPs. The tagging program consists in affixing tags on individuals of less than 81 cm, which must be obligatorily returned to water by commercial fishermen.

The program was in its seventh year in 2004. So far, a total of 2,685 tags were affixed in three traditional fishing sectors of the Gulf and in subdivision 3Pn by voluntary commercial fishermen and fishermen of the Sentinel Fishery Program. The details of tagging activities carried out in each one of these areas are presented in Table 3. The size of individuals tagged during these seven years ranged from 35 cm to 81 cm.

By the end of 2004, 174 tag returns had been declared, for a recapture rate of 6.5%. Based on information provided on positions,

Table 3. Summary of tagging activities, 1998-2004.

Year	Sector				3Pn, 4RST
	West Coast Newfoundland	3Pn	Anticosti Island	Southwestern Gulf	
1998	89	-	-	-	89
1999	200	-	56	50	306
2000	206	-	45	59	310
2001	359	2	-	91	452
2002	279	43	-	115	437
2003	371	2	-	90	463
2004	360	90	-	178	628
1998-2004	1864	137	101	583	2685

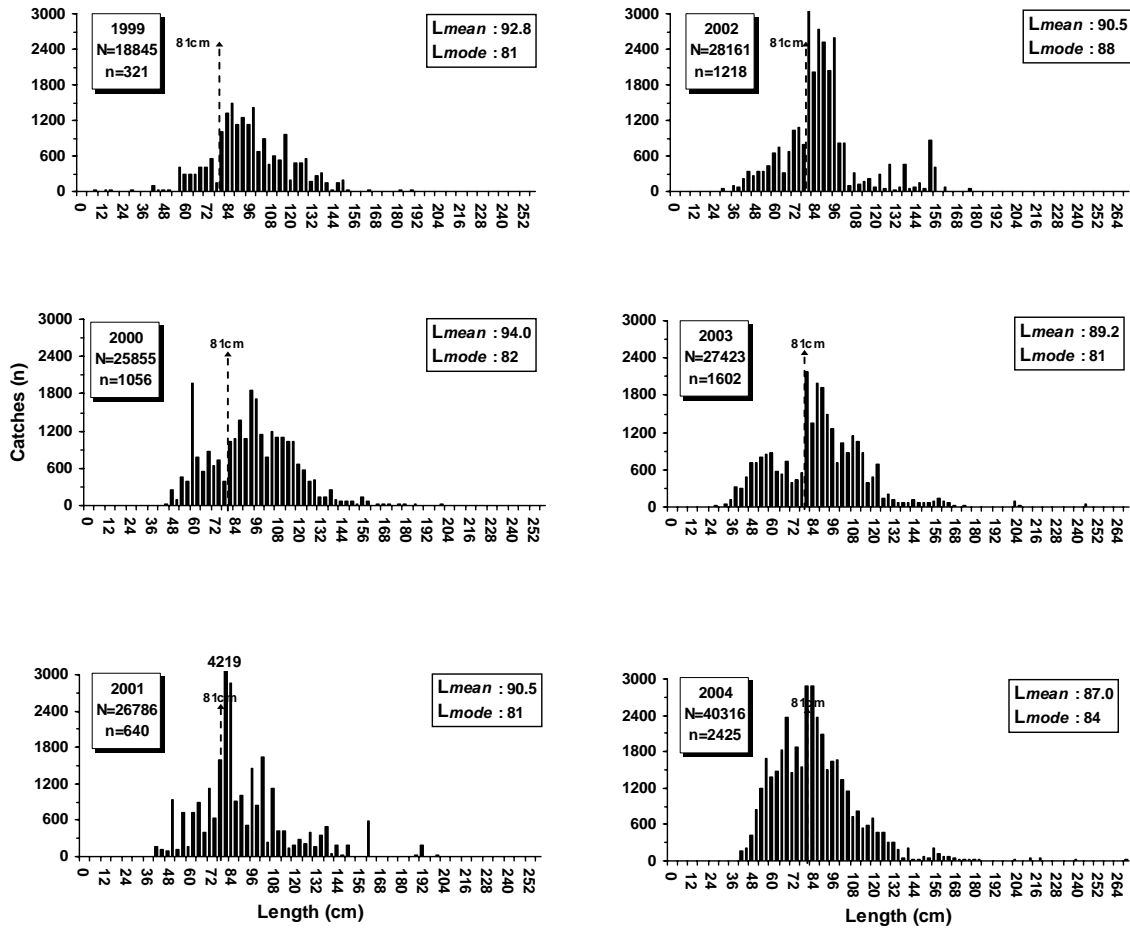


Figure 4. Size frequency distribution of Atlantic halibut measured at sea in commercial catches using fixed gears, 1999-2004 (N: estimated total number of Atlantic halibut found in catches; n: total number of Atlantic halibut measured in samples; Lmoy: mean length (cm); Lmode: modal length (cm)).

14 Atlantic halibut had been recaptured in 3Pn, 1 in 3Ps, and 159 other in traditional fishing sectors, i.e. 26 in the southwestern part of the Gulf, 7 south of Anticosti Island, 10 in the northern part of 4S, and 116 on the west coast of Newfoundland. The time elapsed between tagging and recapture dates vary from less than one month to almost five years. Although the maximum distance between the tagging and recapture sites for one individual was 640 km, more than 90% of the distances recorded do not exceed 200 km (Figure 5). According to the results of the Gulf Atlantic halibut tagging program, tagged individuals are mainly recaptured in the fishing division in which tagging took place. Only one of the individuals tagged in 3Pn (137 Atlantic

halibut) was recaptured out of the subdivision (in 4R). The few Atlantic halibut tagged in 4R and found out of this division (11%) were it in the northern part of division 4S (9 individuals) and in the subdivision 3Pn (2 individuals). All the Atlantic halibut tagged in 4S and recaptured later on were in 4S. Finally, only 3 Atlantic halibut tagged in 4T were recaptured out of this division, that is one by subdivision or division (3Pn, 3Ps and 4S). The statistical analysis of the data did not reveal any significant relationship between the length of time separating tagging and recapture, the distance separating tagging and recapture sites, nor between the size of fish at tagging and the distance separating tagging and recapture sites.

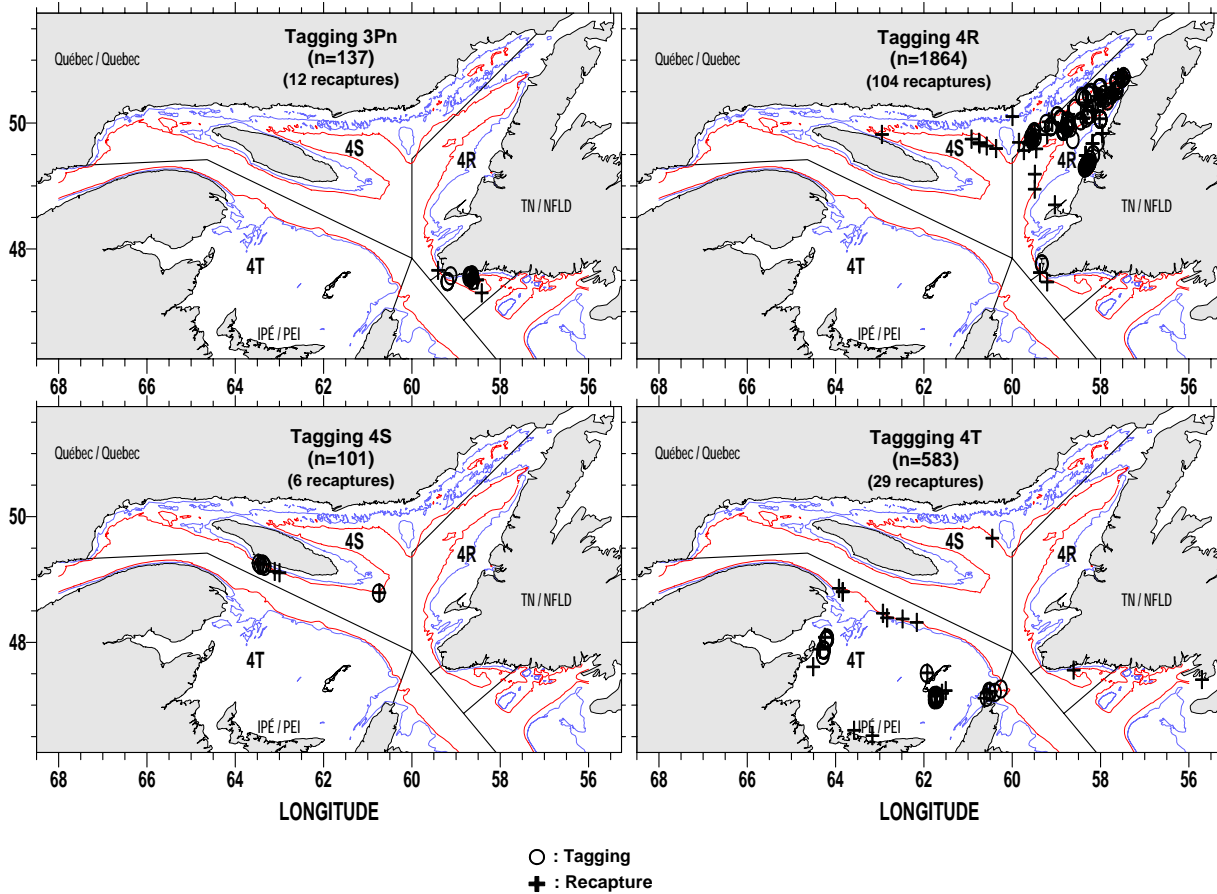


Figure 5. Taggings and recaptures (known sites) of Atlantic halibut carried out in the Gulf of St. Lawrence and subdivision 3Pn since 1998.

Uncertainties

Determining size at sexual maturity in the Atlantic Atlantic halibut of the Gulf is still an issue of concern. According to information available on the Atlantic halibut stock of the Canadian Atlantic waters (divisions 4VWX3NOPs), 50% of females reach sexual maturity at a size of 115 cm and 50% of males at a size of 75 cm (DFO, 2002). If sexual maturity follows the same pattern for Gulf halibut, this would mean that the present minimum legal size of 81 cm is insufficient to protect spawning potential, especially since the majority of commercial catches consist of intermediate sizes (81 to 115 cm). It is thus imperative to complete the examination of the Atlantic halibut gonads collected over the last years within the scope of a collaboration project with the

fishing industry as well as with the assistance of commercial landings samplers.

The Atlantic halibut fishery in subdivision 3Pn does not have a TAC because it is not taken into account in the two management units established in 1987 for both Atlantic halibut stocks found in Canadian waters. However, in 2002, the FRCC recommended that a cap of 40 t be set for subdivision 3Pn as a provisional measure until the stock's structure was better defined (FRCC, 2002). This recommendation is all the more justified owing to the fact that the absence of restrictions on Atlantic halibut catches in this subdivision could jeopardize the conservation of the Atlantic halibut stock in the Gulf, if the fish of 3Pn belong to the same biological population as that of the Gulf of St. Lawrence. Declared landings

made in 3Pn in the last five years averaged 31 t.

Outlook

Overall, the conclusions that can be drawn about stock status in 2004 are much the same as for last year. The stock remains at a very low level. Although total landings in 2004 represent the second highest value recorded since the introduction of a TAC in 1988, and exceed by 12% the authorized TAC for the 2004-2005 fishing season (350 t), the average of the landings of the last five years (315 t) remains well below the landings of 650 t recorded at the beginning of the 1960s.

Commercial fishery focuses on individuals measuring between 81 cm and 115 cm, sizes that are just above the minimum legal size of 81 cm. This situation could result from a directed fishing on Atlantic halibut of smaller sizes for which better prices are offered on the market, or a significant reduction in the abundance of Atlantic halibut of large size and/or an increase in the number of Atlantic halibut recruited just above the minimal legal size of 81 cm.

However, according to available data, it appears that the abundance of Atlantic halibut of small size has increased. The greater abundance of small halibut found in scientific surveys in recent years, which is corroborated by at-sea sampling of commercial catches and by fishermen comments, would be due to the nearly complete cessation of trawling activities as a result of the moratoria on cod and redfish, as well as to shrimpers' use of the Nordmore grate. Currently, Atlantic halibut born after the implementation of these measures would start to recruit to the fishery.

The fact remains that the exploitable fraction of the stock is still at a low level based on the order of magnitude of landings carried out for the last 20 years, compared to those carried out before the 1970s, or to the thousand tons and more frequently

recorded in the first half of the 20th century. It is thus recommended to maintain commercial catches and the TAC at 350 t as long as a rebuilding of the spawning stock will not be observed, with a significant and sustained presence of individuals of size larger than 120 cm within the size structures.

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