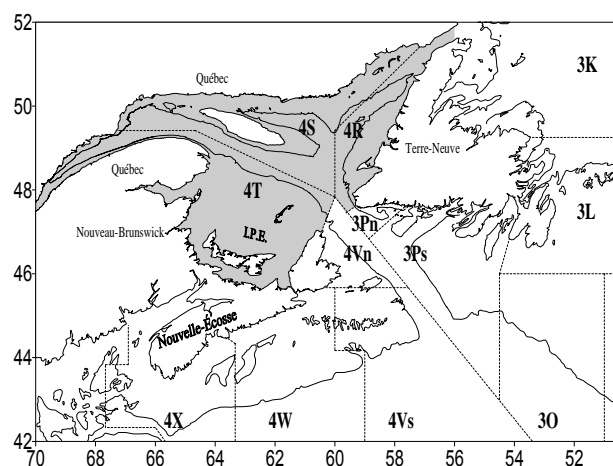
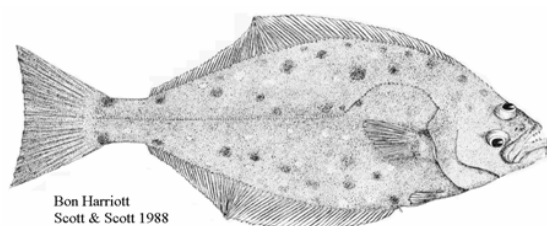




STOCK ASSESSMENT OF ATLANTIC HALIBUT OF THE GULF OF ST. LAWRENCE (NAFO DIVISIONS 4RST) IN 2006



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

Context

The Atlantic halibut commercial fishery in the Estuary and Gulf of St. Lawrence began at the end of the 19th century. During the first half of the 20th century, this resource was exploited by American and Canadian fleets. It was quite common to see annual landings totalling thousands of tons. Beginning in the second half of the 20th century, exploitation was almost exclusively carried out by the Canadian fleet, the four Atlantic Provinces as well as Quebec. From over 600 t during the 1960s, landings have steadily decreased until the early 80s, totalling 90 t in 1982. Landings increased again in the late 90s and now exceed 400 t.

The current Atlantic halibut stock management unit in the Gulf, Divisions 4RST, was defined in 1987. In 1988, Management introduced the first TAC set at 300 t. This TAC was increased to 350 t in 1999 following the recommendation from the FRCC. The same year, the fishing season was amended. A minimum catch size set at 81 cm was added to the halibut exploitation conditions in 1997. Directed fishing for Atlantic halibut is practiced on a competitive basis and is almost exclusively carried out by longliners. Directed fishing for halibut, which is mostly practiced from May to August, has undergone a significant drop in the number of fishing days over the last 3 years without seeing the volume of catches drop, and the TAC were even exceeded by 15%.

Although it is the largest flatfish and a prized species on the market, knowledge pertaining to its biology and halibut stock status in the Gulf is limited. The only available information on stock abundance stems from estimates done during scientific trawl surveys. Size at sexual maturity still need to be established as well as commercial catch rates.

Even though it was succinct, a resource assessment has been conducted on an annual basis until 2005. Beginning in 2007, a detailed examination is scheduled for every three years. The current assessment puts into perspective the available information on the biological characteristics of the Gulf halibut and its commercial exploitation in 2005 and 2006 compared with 2004. It also attempts to respond to certain concerns which were raised by fishery management and industry as to the current management practices regarding the release back into the water of halibut caught accidentally and the eventual opening of a fishery sector on the Miscou Bank.

SUMMARY

- Preliminary landings declared for the May 15 to December 31, 2006 period totalled 349 tons, which represents all or substantially all the TAC of 350 tons.
- Since the beginning of the 2000s, the abundance index of Atlantic halibuts captured in the summer scientific trawl surveys have increased significantly in the northern Gulf to reach a peak in 2006. Catches mainly consisted of Atlantic halibuts of less than 81 cm, with a mean size of about 60 cm.
- Since 1997, which is the year where the minimum legal size of 81 cm was implemented, landings have been mainly made up of individuals between 81 cm and 120 cm. The mode observed remained around the minimum legal size.
- The scientific surveys indicate a significant increase in recruitment, and the results of the commercial fishery show that the catch rates probably increased. The stock could likely support an increase in catch levels.
- The minimum legal size (81 cm) is however by far lower than the size at sexual maturity for females, which is estimated at 115 cm.
- In such conditions, the Atlantic halibut catches could be increased by about 25% compared to the average landings (380 tons) observed during the last three years, i.e. 475 tons.
- On the other hand, this increase in catch levels must be accompanied by an increase in the minimum legal size (around 100 cm) by 2010. This increase could be made gradually through an annual size increase of 5 cm.
- Lastly, the application of management measures supporting or requiring the release of fish of commercial size accidentally caught by fisheries that are not directed to Atlantic halibut is not recommended, as the chances of survival are probably reduced for larger individuals due to the difficulty of handling them without causing lethal wounds.

INTRODUCTION

Species Biology

Atlantic halibut (*Hippoglossus hippoglossus*) 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.

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 the other Atlantic halibut stock found in Canadian Atlantic waters (DFO, 2006). Based on observations made during scientific trawl surveys conducted between January and May, Gulf halibut is able to spawn during this period.

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 (Neilson *et al.*, 1987).

Fishery

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 1). 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 (Total Allowable Catches) established in 1988. Since then, halibut landings grew slightly, which would be mainly due to an increased fishing effort by the fixed-gear fleet, in particular longliners (Table 1).

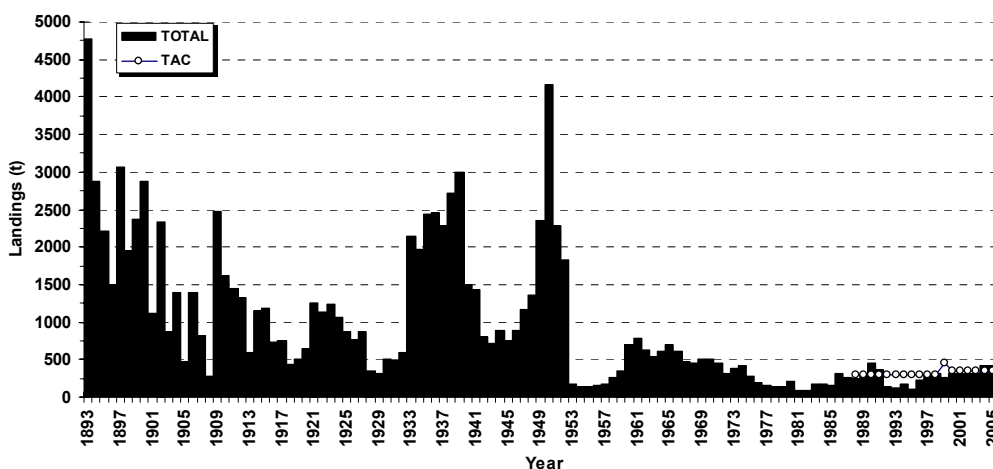


Figure 1. Atlantic halibut annual landings (t) and Total Allowable Catches (TAC) for NAFO divisions 4RST. The 2006 data is preliminary.

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. Another management measure, associated with a minimum allowable catch size of 81 cm, was added to the fishery conditions as of 1997. This size was the estimate for the halibut stock from unit 3NOPS4VWX and was determined using a model for evaluating the yield per recruit and value per recruit, while considering the incidence of fishing mortality and natural mortality (Neilson and Bowering, 1989).

Table 1. Commercial Atlantic halibut landings (t) per gear in NAFO divisions 4RST. The 2006 data is preliminary.

YEAR	FIXED GEARS						%	MOBILE GEARS						UNKNOWN		TOTAL (4RST) (Jan1 st -Dec31 st)	TAC (4RST)
	Gillnet	Handline	Longline	Trap	Other	TOTAL		Bottom trawl (fish)	Bottom trawl (shrimp)	Pelagic trawl	Danish seine	Other	TOTAL	%	TOTAL	%	
1979	17	50	19	0	0	86	65.2	33	8	0	2	0	43	32.6	3	2.3	132
1980	12	2	11	0	0	25	12.4	97	14	0	0	0	111	55.0	66	32.7	202
1981	9	0	16	0	0	25	26.3	9	7	0	0	0	16	16.8	54	56.8	95
1982	3	1	16	0	0	20	22.0	25	17	0	4	0	46	50.5	25	27.5	91
1983	15	0	90	0	0	105	60.3	42	8	0	0	0	50	28.7	19	10.9	174
1984	11	14	51	0	0	76	43.2	93	7	0	0	0	100	56.8	0	0.0	176
1985	7	34	63	0	0	104	68.9	43	4	0	0	0	47	31.1	0	0.0	151
1986	100	25	134	0	0	259	82.7	39	12	0	3	0	54	17.3	0	0.0	313
1987	44	31	114	0	0	189	73.0	46	24	0	0	0	70	27.0	0	0.0	259
1988	33	17	137	0	0	187	78.6	23	23	5	0	0	51	21.4	0	0.0	238
1989	73	18	135	0	0	226	77.7	50	15	0	0	0	65	22.3	0	0.0	291
1990	69	34	238	0	0	341	75.6	94	13	0	0	0	107	23.7	3	0.7	451
1991	43	7	263	0	0	313	86.5	32	13	0	0	0	45	12.4	4	1.1	362
1992	11	3	86	0	0	100	70.4	11	23	0	7	0	41	28.9	1	0.7	142
1993	19	4	96	0	0	119	93.0	1	8	0	0	0	9	7.0	0	0.0	128
1994	20	0	91	1	0	112	63.3	4	2	0	2	0	8	4.5	57	32.2	177
1995	23	0	35	7	0	65	65.7	3	0	0	0	0	3	3.0	31	31.3	99
1996 ¹	14.2	26.0	154.0	4.2	0	198.4	84.5	10.3	0.8	0	0.4	2.4	13.9	5.9	22.4	9.5	234.7
1997 ¹	32.5	0.6	230.2	0.1	0	263.4	89.0	7.1	2.4	0	5.5	8.2	23.2	7.8	9.5	3.2	296.1
1998 ¹	20.6	0.1	272.9	0	0.5	294.1	91.8	10.0	0.6	0	0.3	1.6	12.5	3.9	13.6	4.2	320.2
1999 ¹	29.5	0.3	218.7	0	0	248.5	94.1	11.5	1.1	0	0.7	2.3	15.6	5.9	0	0.0	264.1
2000 ¹	27.3	0.8	271.0	0	0	299.1	95.3	13.2	0.6	0.2	0.2	0.5	14.7	4.7	0	0.0	313.8
2001 ¹	25.7	0.4	274.8	0	0	300.9	96.0	7.6	1.8	0	0.7	2.3	12.4	4.0	0	0.0	313.3
2002 ¹	16.7	0.9	287.4	0	0	305.0	95.8	7.6	1.9	0	0.8	1.7	12.0	3.8	1.5	0.5	318.5
2003 ¹	24.3	0	270.9	0	0	295.2	96.1	7.9	2.0	0	0.1	1.9	11.9	3.9	0	0.0	307.1
2004 ¹	20.7	0.6	384.6	0	0	405.9	97.6	3.5	2.8	0	2.7	1.1	10.1	2.4	0	0.0	416.0
2005 ¹	29.1	0.9	367.2	0	0	397.2	96.0	5.1	2.0	0.1	5.1	4.4	16.7	4.0	0	0.0	413.9
2006 ²	47.3	1.6	289.3	0	0	338.2	97.0	4.5	1.3	0.1	2.0	1.6	9.5	2.7	1.1	0.3	348.8
1988-2006	30.47	6.06	215.89	0.65	0.03	253.10	88.49	16.12	6.02	0.28	1.45	1.47	25.34	8.86	7.58	2.65	286.03
2002-2006	27.62	0.80	319.88	0	0	348.30	96.52	5.72	2.00	0.04	2.14	2.14	12.04	3.34	0.52	0.14	360.86

¹: data obtained from ZIF.²: data obtained from preliminary ZIF.

As of December 31, 2006, reported preliminary landings totalled 349 t, almost the entire authorized TAC of 350 t (Table 2). However, a more detailed examination of catches for the <65 feet fixed-gear fleet reveals excesses of over 30% of the fishing quota for a given fishing period. As in previous years, more than 95% of catches were taken with fixed gears, primarily longliners. Over 80% of catches were recorded between May and July. Thus, in 2006, the number of directed fishing days permitted for halibut by fixed gears was only 13 days, compared with 124 days in 2004 and 29 days in 2005.

Totalling 415 t, the reported landings for the 2004 and 2005 fishing seasons were the second highest values since the introduction of a TAC in 1988, the highest being 451 t in 1991 (Table 1). These significant catches cause the average landings over the last five years to equal the 350 t TAC authorized since 2000. Even though this shows a clear increase, these landings are still under the 500+ t reported during the 60s and appear even more insignificant compared with the thousands of tons regularly reported during the first half of the 20th century (Figure 1).

Table 2. Atlantic halibut landings (t) for divisions 4RST.

Division	Year						
	1988- 2000 ¹	2001 ²	2002	2003	2004	2005	2006 ³
TAC	300-350	350	350	350	350	350	350
4R	84	92	89	138	140	155	157
4S	80	124	128	87	141	81	90
4T	92	98	101	82	135	177	102
Total	256	314	318	307	416	413	349

¹ Average² 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 year³ Preliminary data as of December 31, 2006

ASSESSMENT

Abundance and biomass

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

Halibut catches made during surveys are distributed throughout the Gulf of St. Lawrence (Figure 2). In the northern part of the Gulf, the species is abundant in the Esquiman, Laurentian and Anticosti channels, at depths of 200+ m. 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.

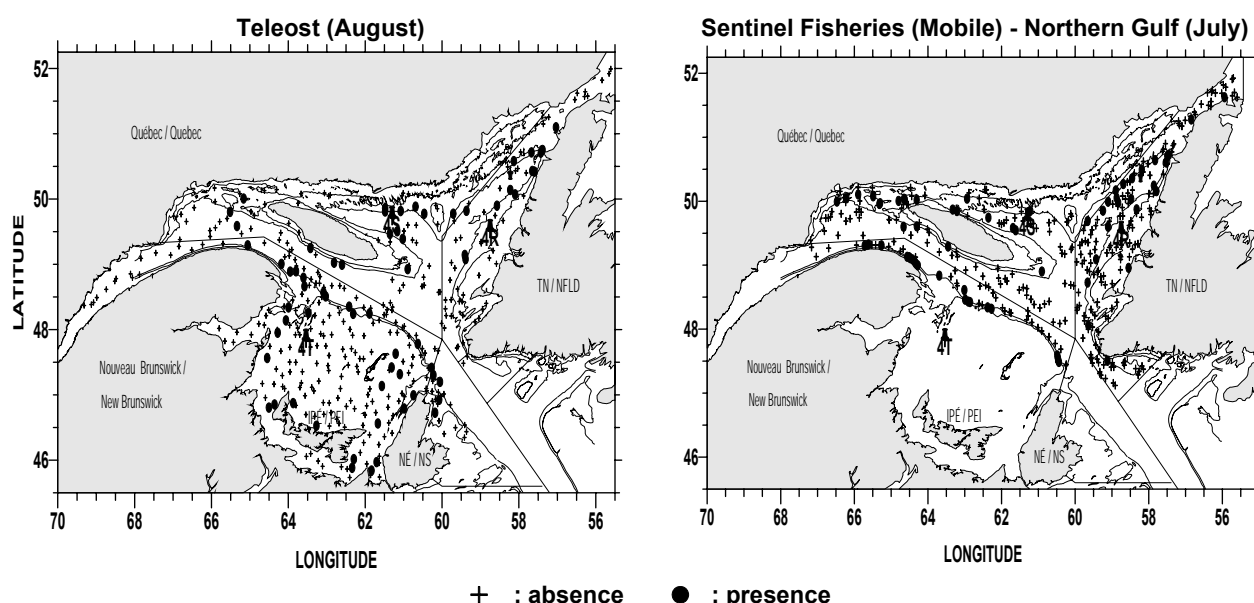


Figure 2. Location of Atlantic halibut catches made during the scientific trawl surveys conducted in the summer of 2006.

Since the early 2000s, abundance and biomass indices for halibut caught in the scientific surveys show a considerable increase in the northern Gulf, culminating in 2006 (Figure 3). During this period, the mean number of individuals per tow has more than quadrupled. Parallel to this increase in abundance is an equally significant increase in mean capture weight per tow.

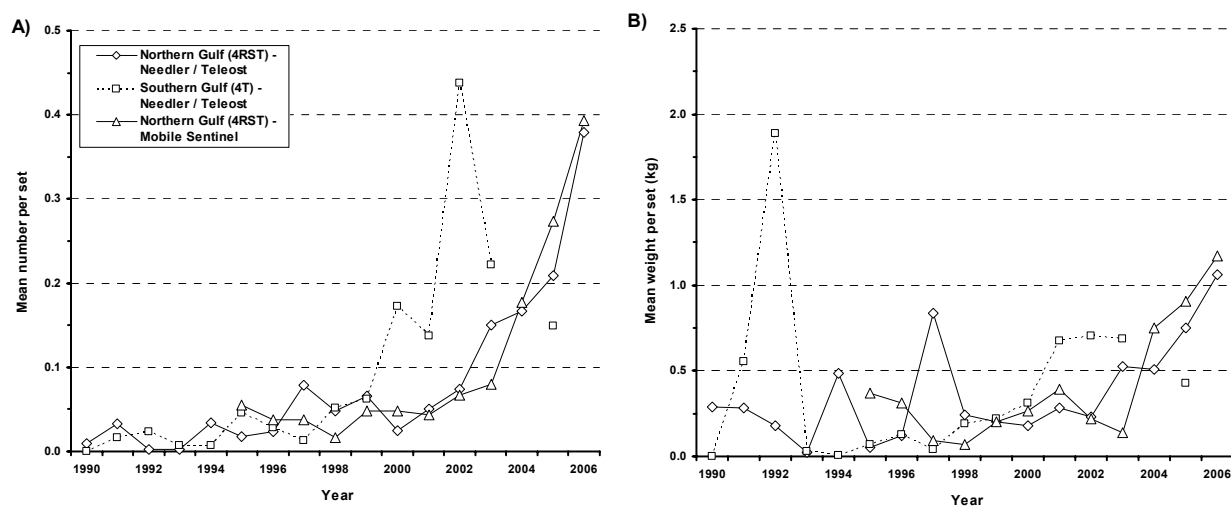


Figure 3. Abundance indices (A) and biomass (B) of Atlantic halibut captured during the summer scientific trawl surveys, between 1990 and 2006.

Size and Recruitment

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 ranges between 20 and 120 cm (Figure 4). Landings are mostly made up of halibut of less than 81 cm. Since 2000, the average size is around 60 cm in the northern Gulf, and only 50 cm in the southern Gulf. Individuals over 140 cm are not well represented on account of a lower trawl catchability for large size halibut able to avoid the trawl.

Since 2004, the average size of Atlantic halibuts landed by the fixed-gear fleet is around 96 cm and remains under the 100+ cm range observed in the early 2000s (Table 3). Except for 2003 and 2005, the modal size was around the minimum legal size of 81 cm. The structure of commercial catches sampled at dockside between 2004 and 2006 were mostly made up of individuals measuring between 81 cm and 120 cm (Figure 5).

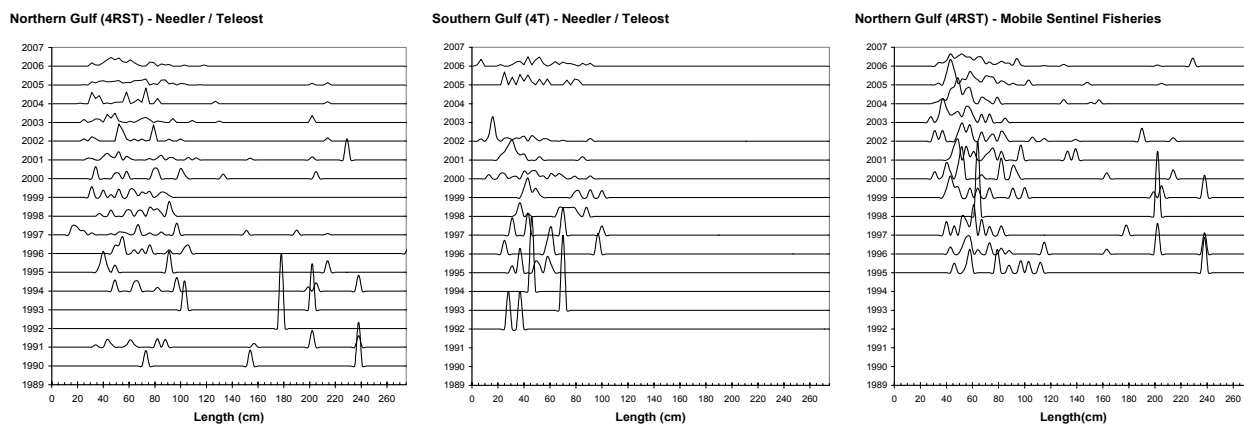
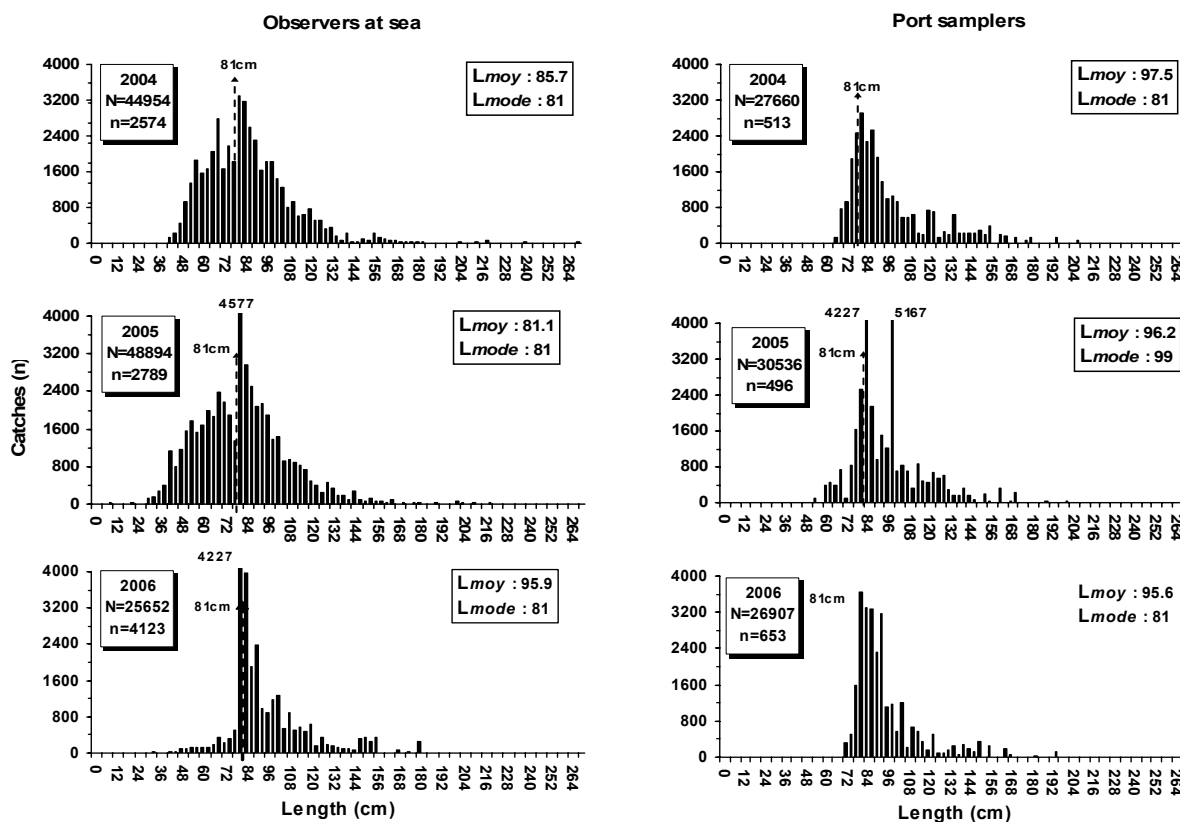


Figure 4. Size composition (%) of Atlantic halibut captured during the summer scientific trawl surveys, between 1990 and 2006.

Table 3. Statistics on the sizes (cm) of Atlantic halibut captured by fixed gears and measured at dockside.

Parameters	Year						
	2000	2001	2002	2003	2004	2005	2006
Minimum	75	48	64	38	66	56	73
Quartile 25%	87	87	84	82	81	84	84
Median	97	100	94	90	87	93	90
Quartile 75%	111	120	115	102	108	102	99
Maximum	201	174	210	208	207	203	197
Mode	83	85	84	92	81	99	81
Mean	103.73	106.45	101.31	89.50	97.52	96.22	95.58
SD ¹	22.98	25.01	24.42	28.12	25.38	20.55	19.67
N ²	17877	16372	19157	24686	27693	32008	27652

¹ : standard deviation² : nombre estimé d'individus capturésFigure 5. Size frequency distribution of Atlantic halibut measured at sea and dockside in commercial catches using fixed gears, (N: estimated total number of Atlantic halibut found in catches; n: total number of Atlantic halibut measured in samples; L_{moy}: mean length (cm); L_{mode}: modal length (cm)).

According to the samples measured by observers at sea (that is before individuals of less than 81 cm are returned to water) over the last three years, the range of sizes in Atlantic halibut captured remained rather large, from about 30 to over 270 cm (Figure 5). Except for 2006, the abundance of pre-recruits is still significant in the samples; the modal size for the category of individuals under 81 cm was around 70 cm. Their low representation in 2006 is likely due to a reduction of the sampled area for some of the activities at sea, stemming from logistics

problems in dispatching observers. Based on comments fishermen provided over recent years and observations made during scientific trawl surveys, the category of halibut of less than 81 cm has remained significant in the catches.

Examining the Incidence of Releasing Atlantic Halibut

At the beginning of June 2006, Fisheries Management issued a new measure requiring the release back into the water of any halibut caught accidentally by longlines during the cod fishery. Furthermore, a request made by the main fisherman association on the west coast of Newfoundland, the FFAW, wanted to know the eventual impact of releasing all halibut of 120+ cm, considering that these individuals could contribute to the reproductive stock and corresponded to a less lucrative size category for industries.

The analysis of halibut caught by longliners reveals that the sub-legal category accounts for less than 15% of landings in weight (Table 4A). Nevertheless, their numbers can represent up to 40% of the abundance of halibut landed. When considering the non-directed halibut longline fishery (Table 4B), the proportions of halibut under 81 cm, in weight and in numbers, are clearly higher in 2003. In 2004 and 2005, these proportions dropped by at least half and are comparable to those observed for catches made during the same years with longliners directed on halibut.

Table 4. Significance of Atlantic halibut size categories in the landings according to the nature of the fishing activity.

A) Longlines (Directed fishery)		Proportion (%) of landings					
		Sublegal size (<81cm)		Commercial size (≥81cm)		Large fish (≥120cm)	
		Weight	Number	Weight	Number	Weight	Number
Year	Landings (t) (Jan 1st to Dec 31st)						
2003	207.8	6.67	30.81	93.33	69.19	35.60	10.02
2004	295.3	13.42	41.54	86.58	58.46	35.81	8.87
2005	271.8	14.44	45.51	85.56	54.49	29.78	6.94
2006	289.3	2.49	9.09	97.51	90.91	41.44	13.77

B) Longlines (Non directed fishery)		Proportion (%) of landings					
		Sublegal size (<81cm)		Commercial size (≥81cm)		Large fish (≥120cm)	
		Weight	Number	Weight	Number	Weight	Number
Year	Landings (t) (Jan 1st to Dec 31st)						
2003	63.1	39.68	82.57	60.32	17.43	17.78	2.83
2004	89.3	8.76	33.28	91.24	66.72	49.22	20.55
2005	95.4	15.28	44.75	84.72	55.25	27.02	6.04

The proportion of commercial size halibut (≥ 81 cm) represents a significant portion of landings in weight, making up 85%, saving exceptions. In numbers, their contribution in landings appears more inconsistent, with values varying between 55% and 90%. Finally, the category of large individuals (≥ 120 cm) only represents a quarter of the landings in weight while in terms of numbers the proportion rarely exceeds 15%.

There is no current available estimate as to the survival or mortality of Atlantic halibut in the Gulf following their release back into the water. It is therefore difficult to assess the impacts on the stock when implementing new management measures requiring the release back into the water of all accidental halibut catches during fisheries directed on other groundfish species, especially when these releases are not counted. The current tagging program on halibut on individuals of less than 81 cm indicates an average return rate of 7%. This program's main objective was not to measure the survival or mortality rate for halibut in the Gulf. To do so, the procedures would have to be amended in order to, among other things, measure the loss rate of tags, the survival of individuals after tagging, the number of tags returned compared with the number of fish actually caught.

Sources of Uncertainty

Size at sexual maturity

Determining size at sexual maturity in the 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 (unit 3NOPs4VWX), 50% of females reach sexual maturity at a size of 115 cm and males at 75 cm (DFO, 2006). 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 120 cm), directed or non-directed fisheries. Gonad samples collected over the last five years, which are being studied, should answer this question.

Release back into the water of Atlantic halibut

Although there has been no specific study conducted in the Gulf of St. Lawrence on the survival of Atlantic halibut after their release back into the water, there has been much information gathered for the other Canadian stock of Atlantic halibut found outside the Gulf as well as for Pacific halibut (*Hippoglossus stenolepis*), which is closely related to Atlantic halibut (Trumble *et al.*, 1993). Neilson *et al.* (1989) showed during studies conducted on Atlantic halibut from unit 3NOPs4VWX that, in conditions reflecting a commercial longline fishery, the survival rate for halibut of less than 81 cm was 77% after 48 hours. These rate estimates took into account the parameters associated to fishing practices (i.e. manoeuvring time, catch weight, fishing depth) and to the fish (i.e. length, condition). Furthermore, using the recapture rates of tagged halibut, Trumble *et al.* (2000) estimated the survival and mortality rates associated with the release back into the water of accidental catches of different size Pacific halibut in the longline fishery on the Canadian west coast. Estimated survival rates varied according to the nature of the injuries, the occurrence and significance of bleeding, the infestation of the fish by parasites. This same study also considered the characteristics of the hook used as well as the procedure used to remove it from the fish, as these factors could affect the severity of the injuries. Thus, considering a number of criteria, the authors established four estimated survival rate categories (excellent, moderate, low, nil), which dropped by a third between categories. Therefore, the survival rate for

a halibut losing an eye or whose jaw had been broken on account of the hook would drop from 96.5 to 63.7%. This rate would drop to 35% if part of the head had been torn by the hook or gaff. If there was an indication that sand fleas had penetrated the eyes, fins or anus, the estimated survival rate was considered nil.

In light of these works, the survival rate could therefore be quite high (96%) in the case of accidental halibut catches from the cod longline fishery in the Gulf, which, as in 2005, reported almost 100 t of landed halibut (Table 4B), a quarter of the total landings by longliners that year. Nevertheless, this survival rate could be greatly reduced or even drop to 0%, for large size individuals (100+ cm) that, according to fishermen, are very hard to handle without inflicting injuries to the fish. In fact, the gaff is the current method used by fishermen to haul halibut on board ships.

CONCLUSIONS AND ADVICE

Even though there has been a considerable increase, the stock is still at a low level compared with past recorded levels. Although the average total landings over the last five years corresponds to the authorized TAC of 350 t, and that the declared catches of 415 t of 2004 and 2005 were the second highest values since the introduction of the TAC in 1988, the numbers remain nevertheless well under the thousands of tons reported during the first half of the 20th century.

The commercial fishery lands mainly individuals measuring between 81 and 120 cm, the few cohorts that have just been recruited into the fishery. This situation is no doubt encouraged by the fact that market prices are better for intermediate size halibut.

According to the data collected in recent years by scientific surveys and by observers at sea, and by fishermen comments, the abundance of pre-recruits has increased significantly. This fact is undoubtedly 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. Atlantic halibut born after the implementation of these measures would have begun to recruit to the fishery over the last few years.

However, the rebuilding of the reproductive stock remains at a low level with the current management measures. The minimum catch size of 81 cm appears to be somewhat inadequate considering the suggested size of females at sexual maturity of 115 cm.

The mandatory release back into the water of larger individuals caught accidentally in the cod longline fishery should be rethought. Should such a measure be applied, measures could be encouraged for observers at sea to collect information in order to record the number of halibut released back into the water, their length, their chance of survival with respect to the nature and severity of their injuries. This data would enable a better assessment of the impacts on the stock, especially knowing that it is difficult to handle the fish without injuring it. Effective management should in fact prevent any loss to resources for which a low chance of survival is considered (or a high mortality rate).

Considering the positive signs of recruitment of the 2000s and the large numbers in commercial catches over recent years, the Atlantic halibut Gulf stock is able to support a catch increase of

25%, based on the average landings observed over the last three years (380 t) which would provide an acceptable catch level of 475 t.

However, this catch increase must include an increase of the minimum catch size to 100 cm by 2010. This increase in catch size could be done gradually by increasing the minimum catch size every year by 5 cm. Following the assessment of the results collected from the study on the size of females at sexual maturity, the minimum catch size value could then be adjusted in order to better protect this portion of the reproductive stock.

Finally, management measures encouraging the release back into the water of commercial size fish with low chances of survival should be kept to a minimum, at least not without accounting for the disposal and not without being able to assess the consequences on the resource.

OTHER CONSIDERATIONS

Miscou Bank

Following a request by Management from the southern Gulf sector who wanted to gather information with an experimental project, a portion of the Miscou Bank (Figure 6), which had historically prohibited directed fishing on Atlantic halibut, was open to longliners for this species between July 12 and 14.

Observations, both for the non directed fishery (2004 and 2005) and the directed fishery (2006) indicated that halibut catches of sub-legal size were marginal over the last two years (Table 5). Landings were almost exclusively made up of commercial size fish. The large size individuals (≥ 120 cm) category on its own accounted for about 25% in weight while in numbers this proportion was limited to 11% of total halibut landings.

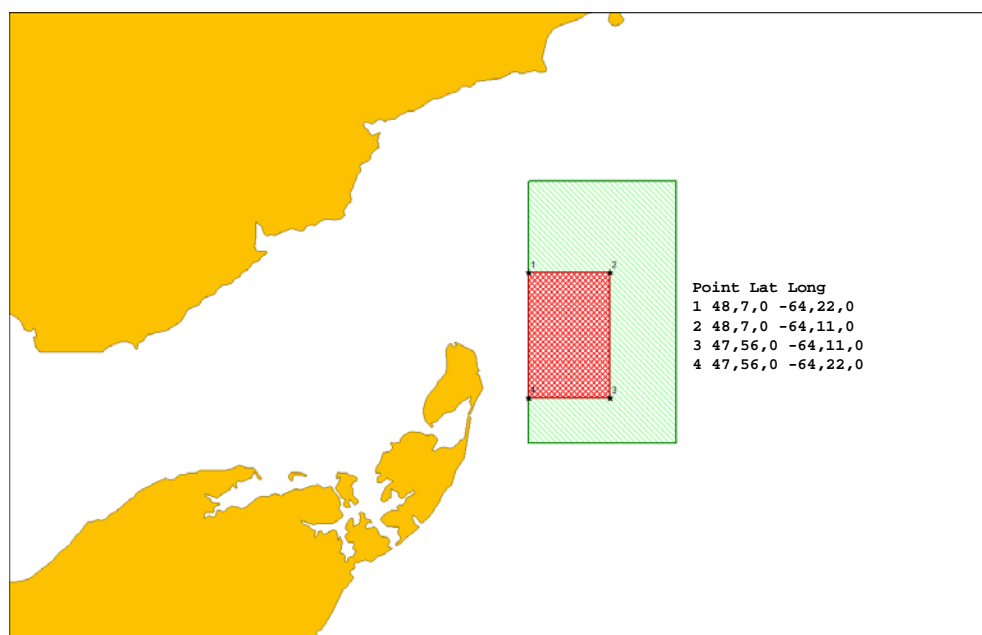


Figure 6. Authorized longline fishing area for Atlantic halibut on the Miscou Bank (black shaded area), for the period of July 12 to the 14, 2006.

Table 5. Significance of Atlantic halibut size categories in the landings from the open area on the Miscou Bank in 2006.

Longlines		Proportions (%) of landings					
Year	Landings (t) (Jan 1st to Dec 31st)	Sublegal size (<81cm)		Commercial size (≥81cm)		Large fish (≥120cm)	
		Weight	Number	Weight	Number	Weight	Number
2004 ¹	8.6	7.90	41.33	92.10	58.67	1.10	20.81
2005 ¹	19.3	0.33	1.06	99.67	98.94	23.77	11.11
2006 ²	8.0	1.10	3.02	98.90	96.98	28.84	11.61

¹ : non directed fishery² : directed fishery

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FOR MORE INFORMATION

Contact: Diane Archambault
Maurice Lamontagne Institute
850, route de la Mer
P.O. Box 1000
Mont-Joli (Quebec)
G5H 3Z4

Tel: (418) 775-0705
Fax: (418) 775-0679
E-Mail: ArchambaultD@dfo-mpo.gc.ca

This report is available from the:

Center for Science Advice (CSA)
Quebec Region
Fisheries and Oceans Canada
Maurice Lamontagne Institute
P.O. Box 1000, Mont-Joli
Quebec (Canada)
G5H 3Z4

Telephone: (418) 775-0825
Fax: (418) 775-0679
E-Mail: Bras@dfo-mpo.gc.ca
Internet address: www.dfo-mpo.gc.ca/csas

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