



Preliminary Report on the October 2002 Mobile Survey For Groundfish Sentinel Program In the Northern Gulf of St. Lawrence (3Pn, 4RS)

October 2002

Groundfish Sentinel Program

Biologists from Fisheries and Oceans Canada conduct annual assessment of the status of fish and invertebrate stocks. To perform these assessments, scientists use data provided by mobile gear sentinel fishers. Once analysed, the collected data will be used to derive an abundance index that will be used to estimate the status of various stocks. The Groundfish Sentinel program must cover the entire northern Gulf of St. Lawrence.

The sentinel survey requires a great deal of precision and involves collecting a variety of data. Sentinel fishers must sort fish by species, weight and measure some individual fish. Otoliths are collected from cod for analysis by DFO Science. Moreover, frozen fish samples is carried out (herring, capelin and sampling for species at risk and biodiversity). Fishers are also required to collect water temperature data. These data will yield valuable information on the stock abundance, size, growth, condition and water temperature.

Catches not used for scientific purposes are sold to processing plants and the profits from such sales are used, in part, to finance the Groundfish Sentinel Program. Fisheries and Oceans has main responsibility for the administration of the program. The implementation of the program is the responsibility of the Capitaines-Propriétaires de la Gaspésie (ACPG), for mobile gear fisheries in 4S, 4T and the Fish, Food and Allied Workers (FFAW) of Newfoundland in 3Pn, 4R.

The Sentinel Fishery follows a depth-stratified random sampling plan. The Northern Gulf is divided into depth zones because depth is known to have an influence the distribution of cod. The following strata have been defined: 20-50 fathoms, 50-100 fathoms, 100-150 fathoms, 150-200 fathoms and over 200 fathoms. Fishers have 3 or more random sampling stations established within these strata. Trawlers perform a 30-minute standard tow at a speed of 2,5 knots for each of their assigned sampling stations. This type of tow is used to evaluate abundance.

Two mobile surveys of approximately two weeks each are carried out annually. These operations are conducted in July and October. In all, nine fishing vessels about 300 tows per survey in 3Pn, 4RS and 4T. Each year, in August, Fisheries and Oceans Canada carries out a similar survey in the northern Gulf of St. Lawrence, aboard the CCGS Alfred Needler research vessel.

October 2002 Survey

The 8th annual October sentinel survey was conducted in the northern Gulf of St. Lawrence between September 27 and October 13, 2002. A total of 252 sentinel fishing stations were surveyed (Figure 1). Of those 252 standard tows, 249 were successfully carried out, i.e., 35 in 3Pn, 115 in 4R, 63 in 4S and 36 in 4T. The 249 stations represent 88.9% of the sampling target.

- ? From September 27 to October 7, four Quebec trawlers covering 4ST completed 99 out of a planned 130 stations (Figure 1). On the west coast of Newfoundland (4R 3Pn), from October 1 to October 13, four trawlers performed the 150 stations that were targeted (Figure 1).
- ? The 36 tows in 4T are conducted to complement the assessment of the redfish of Unit 1 and Greenland halibut (turbot) stocks for the management unit 4RST. **The cod captured in 4T is not used to estimate abundance of cod in 3Pn, 4RS.**
- ? The sentinel survey of 3Pn, 4RS and 4T was completed in 17 days, this represents the third shortest duration for the October survey. Since 1995, the October surveys were completed on average in 24 days. Moreover, the October 2002 sentinel survey is also the survey where less tows were carried out (Table 1). On average, in the October survey of the previous years, 291 standard tows are carried out.
- ? The total catches of stratified random survey for cod, redfish and Greenland halibut (turbot) for the July surveys are presented in Table 1. Catches of the redfish as doubled in 2002 essentially due of the good catches in 3Pn (belonged to unit 2 at this time)
- ? A good part of the decline in the estimate of the index of minimal trawlable biomass of the redfish and Greenland halibut can be due to the fact that six strata were not used in the calculation of the estimate for the index of 4S because only one station per strata was carried out. During last years, these strata proved to be significant for the redfish and Greenland halibut since it contributed respectively for 18.6% to 27.3% and 12.5% to 35.9% of the index of minimal trawlable biomass of 4S of each species.

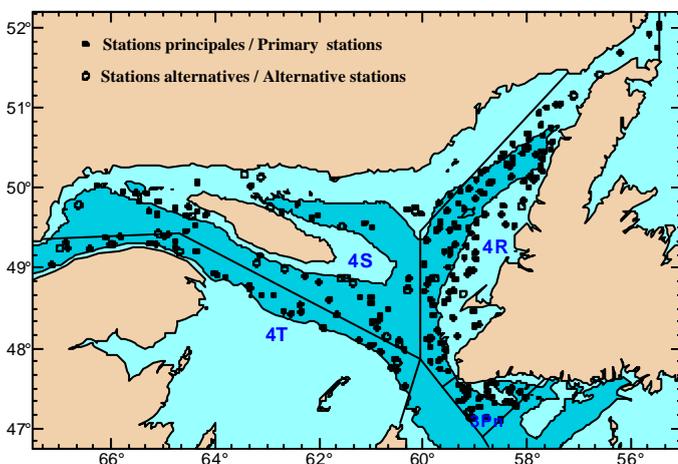


Figure 1: Map showing the distribution of stratified random tows done during the October 2002 survey.

Table 1: Total catches of stratified random tows for the October 1995-2002 survey for 3Pn, 4RST.

Year	Number of tows	Catch (kg)		
		Cod	Redfish	Greenland halibut
1995	327	4,211.0	3,562.4	1,763.1
1996	279	6,261.8	2,424.3	1,373.0
1997	290	5,566.6	2,937.8	1,527.2
1998	289	4,824.8	1,449.8	2,277.0
1999	297	5,618.8	2,019.3	1,583.8
2000	298	8,522.9	3,184.5	2,165.7
2001	283	4,899.7	1,551.0	1,799.1
2002	252	4,271.7	3,213.7	1,443.7

1. Biomass and Distribution of Groundfish.

Cod

Compared to 2001, the preliminary data show a drop in the index of the minimal trawlable biomass estimates of about 11% for 3Pn, 4RS reaching a total of 31,054 tons (Figure 2). The estimate for the index of the minimal trawlable biomass is the second lowest in the 8 year time series. The lowest value was observed in 1995 (Figure 2). During the time series, 4R contributes on average for nearly 90% of the total cod minimal trawlable biomass of the northern Gulf (3Pn, 4RS).

The decline was most pronounced in the western shore of Newfoundland 4R. In 4R, the minimal trawlable biomass estimates recorded a dropped about 14% from 31,771 tons in October 2001 to 27,425 tons in 2002. This decline results in an estimate of 4R that is the second weaker observed after 1995. In 2002, the estimate for the index of the minimal trawlable biomass of 4S was also the second low value observed after 1996. For 3Pn, the actual value in 2002 is highest of the series. During the 8 years time series, only the estimate for the index of minimal trawlable biomass of year 2000 with 57,406 tons is higher by 42% than the 7 other years which average is 33,509 tons. As in the past, the cod concentrations remain very low in divisions 4S at more than 150 fathoms (Figure 3). Moreover, the quantities of cod as determined by the Groundfish sentinel program are much lower in 4S and 3Pn compared to 4R. The catch distribution of cod is located primarily in Division 4R along the west coast of Newfoundland (Figure 3) at depth less than 200 fathoms.

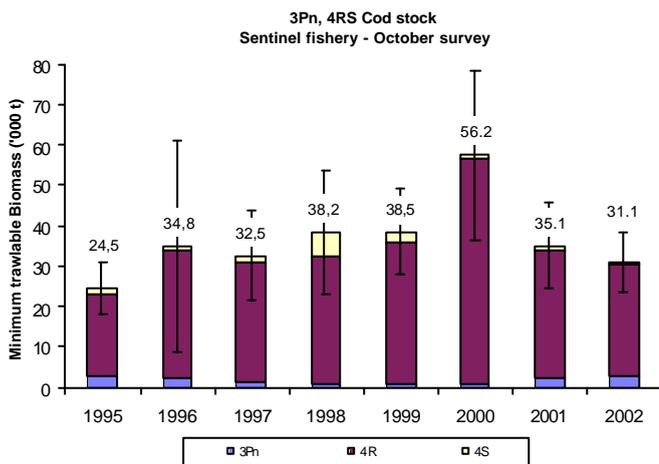


Figure 2: Index of the minimum trawlable biomass estimates for cod from October stratified random tows in 3Pn, 4RS (1995-2002).

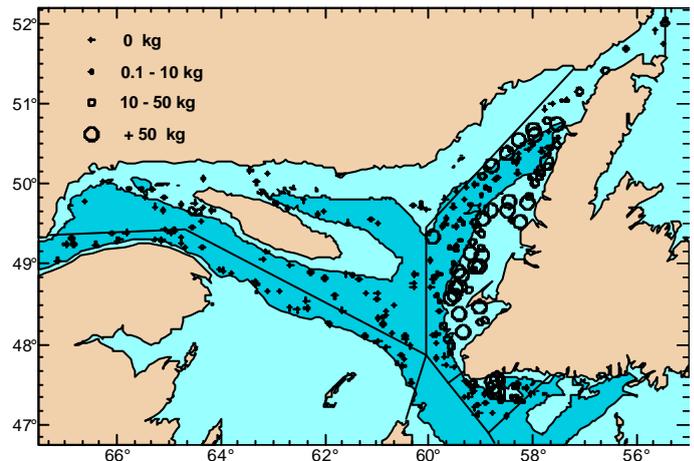


Figure 3: Map showing the observed catch distribution of cod from stratified random survey in 3Pn, 4RST for October 2002.

Redfish

The preliminary data show a decline of the estimate of the index of the minimal trawlable biomass of the redfish in 4RST with 7,857 tons for the October 2002 survey (Figure 4). In 4S, the redfish was at its lowest level since 1995, whereas for 4R, the preliminary data show a stability in the estimate of the index of minimal trawlable biomass. In 4T, the increase of the biomass index compared to the last year brings back for us the years 1995 to 2000 values. This fall in the index of the minimal trawlable biomass of the redfish stock of unit 1 (4RST) has decline by 11% compared to 2001. The estimate of 2002 is weakest of the series.

As in earlier years, the redfish was concentrated for the most part in the channels of the Northern region of the Gulf (Figure 5). In October, good concentrations of redfish were found in the 3Pn, in spite of the fact that this area is not a part of the stock of management Unit 1 of 4RST.

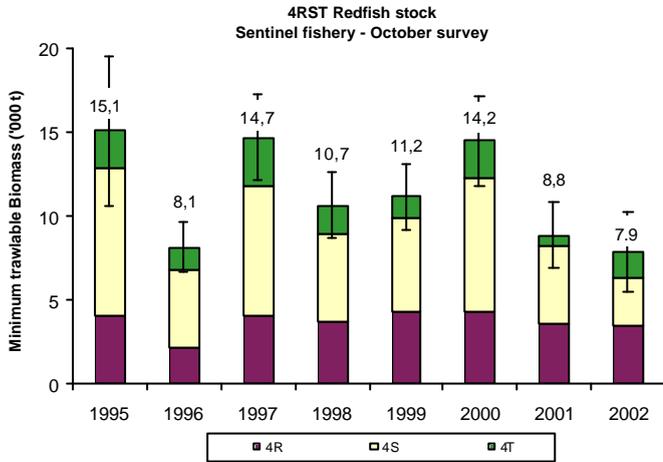


Figure 4: Index of the minimum trawlable biomass estimates for redfish from October stratified random tows in 3Pn, 4RS (1995-2002).

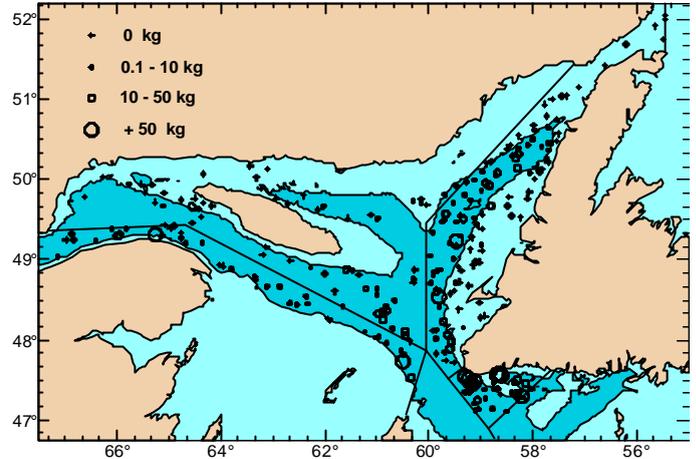


Figure 5: Map showing the observed catch distribution of redfish from stratified random survey in area 3Pn, 4RST during the October 2002 survey.

Greenland Halibut (turbot)

The preliminary data show a drop of 38% of the estimate of minimal trawlable biomass index of the Greenland Halibut in area 4RST with 12,708 tons for the October 2002 survey (Figure 6). One can observe an annual increase in the minimal trawlable biomass estimate of 38% for the period of 1995 to 1998 and on decrease of 92% for the period of 2000 to 2002. Divisions 4R and 4T are stable whereas the 4S shows a strong decrease in 2002 of 62% of the estimate for the index of minimal trawlable biomass. As for the redfish in 4S, the Greenland Halibut has one of lowest levels in the estimate for the index since 1995.

The Greenland halibut was normally concentrated mostly in the Estuary, in the Laurentian Channel, around Anticosti Island and in the Northern portion of the Esquiman Channel (Figure 7). At the time of the October 2002 survey, the distribution of the Greenland halibut is different than in the past, only one concentration in the Esquiman channel was observed. The Groundfish Sentinel program mobile survey does not sample the upstream part of the Estuary where Greenland halibut is found in abundance in the August DFO's annual scientific survey.

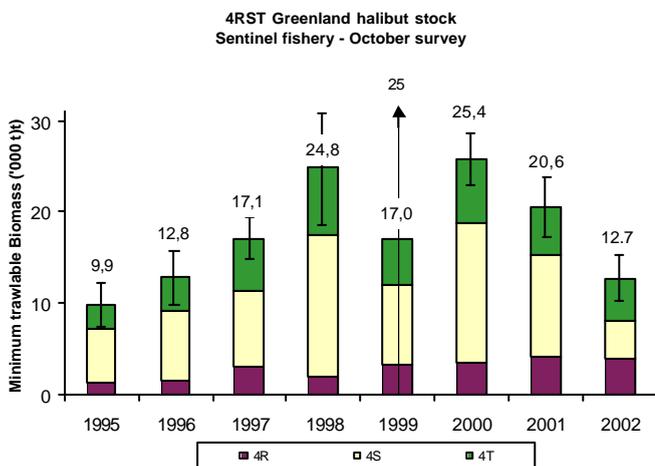


Figure 6: Index of the minimum trawlable biomass estimate for Greenland halibut from October stratified random tows in 4RST (1995-2002).

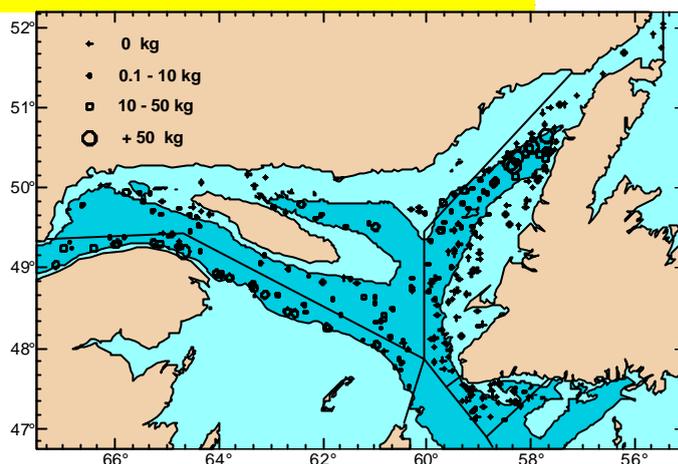


Figure 7: Map showing the observed catch distribution of Greenland halibut from stratified random survey in area 3Pn, 4RST during the October 2002 survey.

2. Sampling and Analysis

The standard sampling procedures (length, sex and weight) were used for cod, redfish, greenland halibut, witch flounder and atlantic halibut. For each species, the data were recorded on separate forms for each tow.

Otoliths

Otoliths were taken from cod in area 3Pn, 4RS. The age of individual cod specimens will be determined from the otoliths before the next assessment in February, 2003.

Biodiversity and species at risk

The main objective of this sampling is to obtain abundance data and biological measurements for the species which will be evaluated soon by the committee on the status of endangered wildlife in Canada (COSEWIC <http://www.cosewic.gc.ca>). When species from the priority list (31 species for the biodiversity and species at risk program) were captured, the length, the sex and the total weight were collected. When identification was dubious, the individuals were frozen and brought back to the Maurice-Lamontagne Institute to be identified.

Witch Flounder

Witch flounder are typically found in deeper waters of the North Atlantic. The assessment of the resource relies on analyses based on length. The length frequencies per sex as well as the weight per length were collected for the assessment of the witch flounder. Douglas Swain of the Gulf Fisheries Center in Moncton (MPO) is the assessment biologist responsible for the stock assessment on the witch flounder in the Gulf.

Herring and Capelin

The October 2002 sentinel survey allowed the harvest of whole specimens of herring and capelin. These frozen samples were brought back to the Maurice-Lamontagne Institut for analyses which will be completed soon by the team of François Gregoire, assessment biologist responsible at Mont-Joli for the stock assessment on these species in the Gulf.

Acknowledgements

We wish to acknowledge the work of the many fishers, observers and coordinators. Without their contributions, the objectives of the 8th annual October sentinel survey could not have been achieved.

Table 2: The following fishers and observer contributed to the October 2002 sentinel survey:

4R, 3Pn			4S		
Skipper	Crew	Observer	Skipper	Crew	Observer
Winsor Hedderson (<i>Northern Tip</i>)	Howard Pittman Dereck Pittman Chad Hedderson Everett Pittman	James Marsden Necholas Gale	Jean-Pierre Élément (<i>Rémy Martin</i>)	François Dionne Martin Élément	Guylain Dupuis
Dereck Coles (<i>Catalina Venture</i>)	Bob Campbell Gorvin Williams Mike Williams Randy Coles Gorvin Stevens	A.J. Felix	Albert English (<i>Annie Annick</i>)	Robert Dumarais Marcel Côté	Gabriel Violette
Murray Lavers (<i>Sylvia Lyn II</i>)	Floyd Biggin Ian A. House Barry Ryan Barry Plowman Jonathan Lavers	James Marsden	Marcel Roy (<i>Sextan</i>)	René Plourde Dino Côté	André Rioux
Dan Genge (<i>Nfid Storm</i>)	Albert White Kevin Genge Claude Genge Maurice Way	Paul Osmond	Réjean Bernatchez (<i>Chlorydon</i>)	Jean Guy Côté Gilles Côté	Mylène Lefebvre

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Fréchet, A. 1996. Intercalibration of eight otter-trawlers participating in the sentinel fisheries in the Northern Gulf of St. Lawrence (3Pn, 4RS) in 1995 through the use of SCANMAR sensors. DFO Atlant. Fish. Res. Doc. 96/67 15p.

Fréchet, A. 1997. Standardization of otter trawlers participating in the sentinel fisheries in the Northern Gulf of St. Lawrence in 1996. DFO Atlant. Fish. Res. Doc. 97/72 10p.

Fréchet, A. 2000. Multiple otter-trawl calibration for sentinel surveys in the northern Gulf of St. Lawrence. In : Demersal resources in the Mediterranean, IFREMER. Actes de colloques 26: (37-45).

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NEW

Bérubé, M. and A. Fréchet. 2001. Summary of the northern Gulf sentinel tagging program with emphasis on recaptures from adjacent management units. CSAS, Res. Doc. 2001/002. 24p.

http://www.dfo-mpo.gc.ca/csas/csas/DocREC/2001/RES2001_002b.pdf

NEW

Smedbol, R.K., P.A. Shelton, D.P. Swain, A. Fréchet et G.A. Chouinard. 2002. Review of population structure, distribution and abundance of cod (*Gadus morhua*) in Atlantic Canada in a species at-risk context. CSAS, Res. Doc. 2002/082. 134p.

http://www.dfo-mpo.gc.ca/csas/csas/DocREC/2002/RES2002_082e.pdf

NEW

Fréchet, A., J. Gauthier, P. Schwab, G. Moreault, L. Pageau, J. Spingle et F. Collier. 2002. The status of cod in the Northern Gulf of St. Lawrence (3Pn, 4RS) in 2001. CSAS, Res. Doc. 2002/083. 55p.

http://www.dfo-mpo.gc.ca/csas/csas/DocREC/2002/RES2002_083b.pdf

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This report is available at our internet site

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ATTENTION !

The Quebec Region's Sentinel Fisheries Program are pleased to announce the opening soon of the mobile gear Internet site for the northern Gulf of St. Lawrence sentinel fisheries.

<http://www.osl.gc.ca>



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