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

August 2002

Sentinel Fisheries

Biologists from Fisheries and Oceans Canada are conduct annual assessment of the status of fish and invertebrate stocks. To perform this assessment, 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. Sentinel fisheries 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 species of fish. Otoliths are collected from cod for analysis by DFO Science. Moreover, the harvest of 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 size, growth, condition and diet of various species, as well as stock abundance 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 Sentinel Survey Program. Fisheries and Oceans has primary responsibility for the administration of the program. The implementation of the program is the responsibility of the Capitaines-Propriétaires de la Gaspésie inc. (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.

July 2002 Survey

The 8th annual July sentinel survey was conducted in the northern Gulf of St. Lawrence between June 29 and July 14, 2002. A total of 264 sentinel fishing stations were surveyed (Figure 1). Of those 264 standard tows, 261 were successfully carried out, i.e., 19 in 3Pn, 131 in 4R, 78 in 4S and 33 in 4T. The 261 stations represent 93.2% of the sampling target.

- From June 29 to July 9, four Quebec trawlers covering 4ST completed 111 out of a planned 130 stations (Figure 1). On the west coast of Newfoundland (4R 3Pn), from July 3 to July 14, five trawlers performed the 150 stations that were targeted (Figure 1).
- The 33 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 15 days, this represents the shortest duration for the July survey. The July 2002 sentinel survey is also the survey where less tows were carried out (Table 1). Since 1995, the July surveys were completed on average in 20 days.
- The total catches of stratified random survey for cod, redfish and Greenland halibut (turbot) for the July surveys are presented in Table 1.

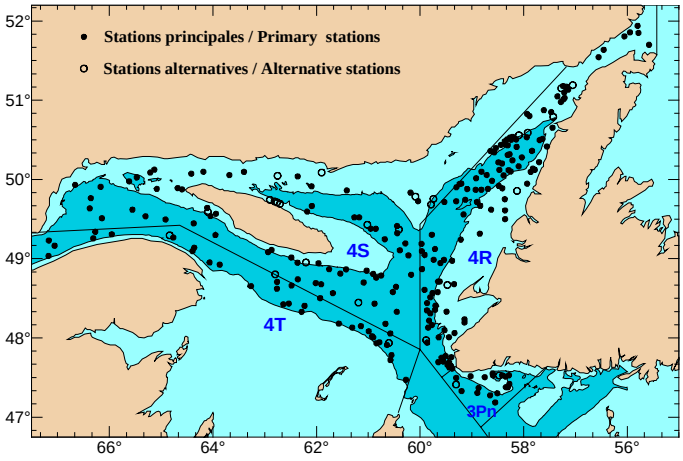

Figure 1: Map showing the distribution of stratified random tows done during the July 2002 survey.

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

Year	Nomber of tows	Catch (kg)		
		Cod	Redfish	Greenland halibut
1995	326	6597.7	11766.9	675.2
1996	280	7254.2	16941.5	1304.0
1997	293	8762.4	12345.7	1193.7
1998	293	8158.7	16060.2	1498.0
1999	296	5290.2	12596.1	1705.7
2000	296	7872.7	7573.2	1582.6
2001	283	10251.9	7569.4	1400.3
2002	264	7731.1	8220.7	1486.9

1. Biomass and Distribution of Groundfish.

Cod

Compared to 2001, the preliminary data show a decline in the index of the minimal trawlable biomass estimates of about 27% for 3Pn, 4RS reaching a total of 58,649 tons (Figure 2).

The decline was most pronounced in the Northern part of 4R, along the western shore of Newfoundland. In 4R, the minimal trawlable biomass estimates recorded a dropped from 75 813 tons in July 2001 to 50 749 tons in 2002. In 2002, 3Pn and 4S recorded a slight increase in the minimal trawlable biomass estimate compared to year 2001. For 3Pn, the actual value in 2002 is the highest of the series. For 4S, the minimal trawlable biomass estimate almost doubles since last year. 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 mobile sentinel surveys 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).

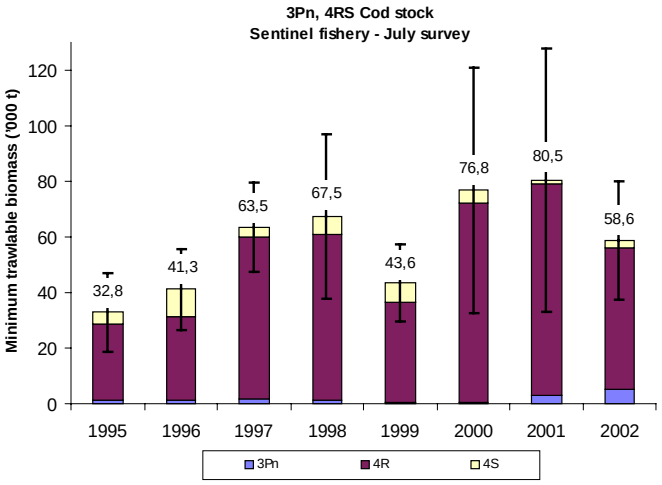

Figure 2: Index of the minimum trawlable biomass estimates for cod from July stratified random tows in 3Pn, 4RS (1995-2002).

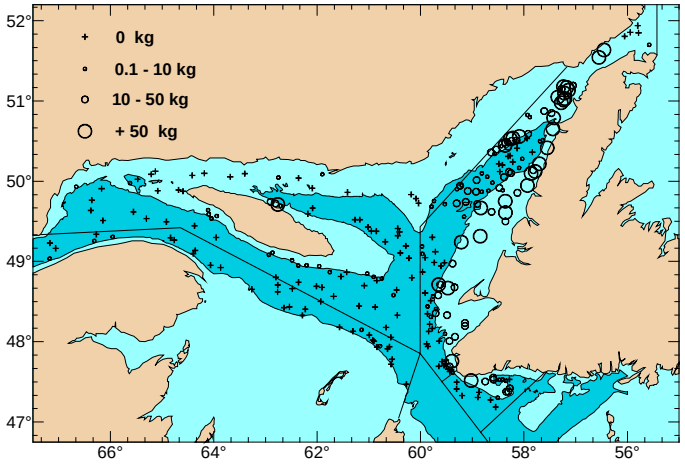

Figure 3: Map showing the observed catch distribution of cod from stratified random survey in 3Pn, 4RST for July 2002.

Redfish

The preliminary data show a stability of the minimal trawlable biomass estimate of the redfish in 4RST with 52,706 tons for the July 2002 survey (Figure 4). In 4S, the redfish was at its lowest level since 1995, whereas for 4R and 4T, the redfish recorded an increase in the minimal trawlable biomass estimate compared to last year. This increase in the minimal trawlable biomass estimate of 4R and 4T compensates for the decrease observed in 4S, so that the redfish stock of unit 1 of 4RST shows a stability for 2002.

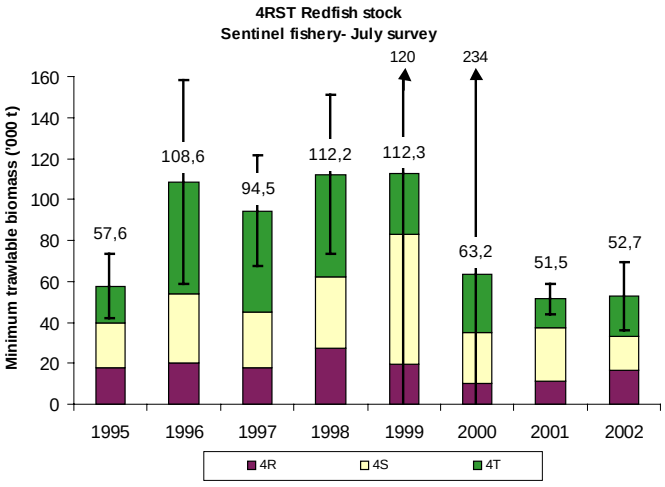

Figure 4: Index of the minimum trawlable biomass estimates for redfish from July stratified random tows in 3Pn, 4RS (1995-2002).

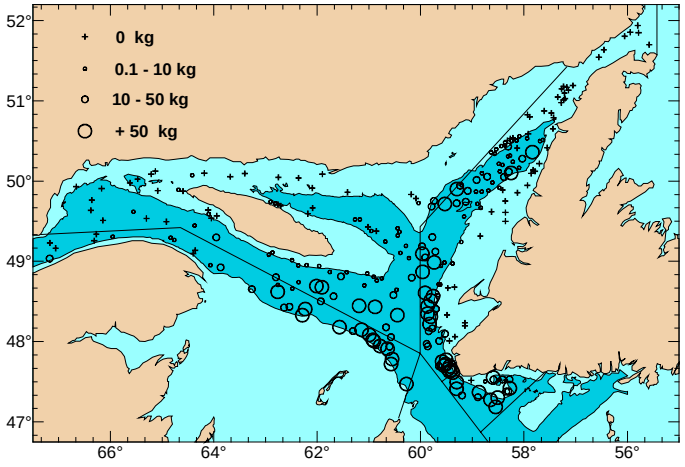

Figure 5: Map showing the observed catch distribution of redfish from stratified random survey in area 3Pn, 4RST during the July 2002 survey.

One can thus observe a 13% annual increase in the minimal trawlable biomass estimate for the period of 1995 to 1999 and a decrease of 25% for the period of 1999 to 2002. 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 July, 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.

Greenland Halibut (turbot)

The preliminary data show a stability of the estimate of minimal trawlable biomass index of the Greenland Halibut in area 4RST with 17,241 tons for the July 2002 survey (Figure 6). One can observe an annual increase in the minimal trawlable biomass estimate of 12% for the period of 1995 to 2002. Divisions 4R and 4T recorded a slight increase whereas the 4S for its part recorded small decrease of the minimal trawlable biomass estimate. In 4R, the Greenland Halibut reaches one of highest levels since 1995, whereas for 4S, the decrease of the minimal trawlable biomass estimate approaches the values of the years 1997 and 1998.

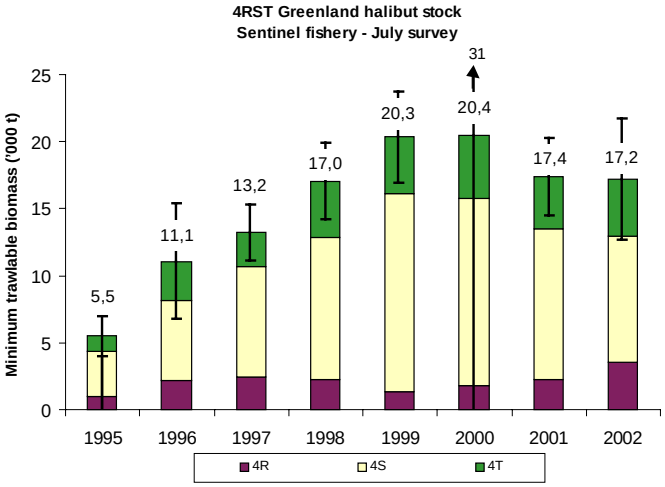

Figure 6: Index of the minimum trawlable biomass estimate for Greenland halibut from July stratified random tows in 4RST (1995-2002).

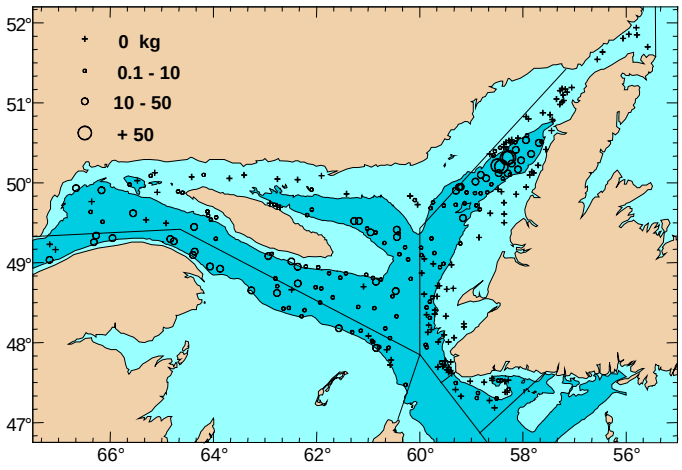

Figure 7: Map showing the observed catch distribution of Greenland halibut from stratified random survey in area 3Pn, 4RST during the July 2002 survey.

The turbot was concentrated mostly in the Estuary and in the Laurentian Channel, around Anticosti Island and in the Northern portion of the Esquiman Channel (Figure 7). The distribution of turbot is overall similar to those of earlier years. The mobile sentinel survey does not sample the upstream part of the Estuary where turbot is found in abundance in the August DFO's annual scientific 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. 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 scientist responsible for the stock assessment on the witch flounder in the Gulf.

Herring and Capelin

The July 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, scientist 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 July sentinel survey could not have been achieved.

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

4R, 3Pn			4S		
Skipper	Crew	Observer	Skipper	Crew	Observer
Winsor Hedderson (*Northern Tip*)	Howard Pittman Dereck Pittman Chad Hedderson Dwayne Decker	Bob O'Quinn	Jean-Pierre Élément (*Rémy Martin*)	François Dionne Martin Élément	Guylain Dupuis
Garield Warren (*885-77*)	Leonard Warren Kayward Warren Jamie Warren Enis Gaulton	A.J. Felix	Albert English (*Annie Annick*)	Robert Cloutier Dave Jalbert	Mélanie Gaumond
Dereck Coles (*Catalina Venture*)	Bob Campbell Ashley Coles Gorvin Williams Randy Coles Abe Coles	Derek Poole	Marcel Roy (*Sextan*)	René Plourde Dino Côté	André Rioux
Murray Lavers (*Sylvia Lyn II*)	Floyd Biggin Warren House Barry Ryan Rod Cornick	James Poole	Réjean Bernatchez (*Chlorydon*)	Jean Guy Côté Gilles Côté	Louise Faulkner
Dan Genge (*Nfld Storm*)	Albert White Kevin Genge Claude Genge	Paul Osmond			

References :

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 fiseries 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 ressources in the Mediterranean, IFREMER. Actes de colloques 26: (37-45).

MPO, 2002. Northern Gulf of St. Lawrence Cod (3Pn, 4RS) in 2001. DFO, Atlant. Fish. Stock Status Report A4-01 (2002). 11p. http://www.dfo-mpo.gc.ca/csas/Csas/status/2002/SSR2002_A4-01E.pdf

NEW Bérubé, M. and A. Frechet. 2001. Summaryof 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-rick 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

For more information contact

MPO/DFO
Alain Frechet,
Cod Biologist (418) 775-0628
Johanne Gauthier,
Sentinel fisheries Biologist (418) 775-0871
Philippe Schwab,
Cod Techician (418) 775-0626

ACPG inc.
Sylvain Samuel,
Executive Director (418) 269-7701
Guy Moreault,
Scientific coordinator (418) 775-0724
Louis Pageau,
Scientific coordinator (418) 775-0723

F.F.A.W.
David Decker,
Director (709) 634-7382
Jason Spingle,
Scientific coordinator (709) 634-7382

This report is available at our internet site

Prepared by:

Guy Moreault, ACPG inc.
Scientific coordinator
Tel. (418) 775-0724
Fax. (418) 775-0679
E-mail moreaultg@dfo-mpo.gc.ca

ATTENTION !

The Quebec Region's Sentinel Fisheries Program are pleased to announce the opennig soon of the mobile gear Internet site for the northern Gulf of St. Lawrence sentinel fisheries.
http://www.osl.gc.ca

L'ASSOCIATION DES CAPITAINES-PROPRIÉTAIRES DE LA GASPÉSIE ACPG

Pêches et Océans Canada Sciences | Fisheries and Oceans Canada Science

FFAW CAW FISH, FOOD AND ALLIED WORKERS