



## Preliminary Report on the July 2004 Mobile Sentinel Survey In the Northern Gulf of St. Lawrence (3Pn, 4RS)

June 2005

### *Sentinel Fisheries Project*

Each year, biologists from Fisheries and Oceans Canada must, as part of their mandate, assess the status of fish and invertebrate stocks. In order to perform this evaluation, scientists use data provided, in part, by mobile gear sentinel fishers (trawlers). The fishing vessels cover almost the entire northern Gulf of St. Lawrence. Once analysed, the collected data is used to calculate an abundance index that is used to estimate the status of various stocks.

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 on the distribution of cod. The following strata have been defined: 20-50, 50-100, 100-150, 150-200 and over 200 fathoms. Fishers have 3 or more random sampling stations to sample within these strata. Trawlers perform a 30-minute standard tow at a speed of 2,5 knots for each of their assigned sampling stations.

The sentinel surveys require a great deal of precision and involve collecting a variety of data. First, sentinel fishers must sort each catch by species and weigh it. Then the length, weight and sex of a number of fish for each species are recorded. Some samples (otoliths, liver, gonads, etc.) may also be taken on some fish. Moreover, the freezing of fish samples is carried out (herring, capelin and sampling for species at risk and biodiversity). Finally, fishers are also required to collect water temperature data using a temperature sensor. These data 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 and 4T, and of the Fish, Food and Allied Workers (FFAW) of Newfoundland in 3Pn and 4R.

Between 1995 and 2002, two mobile surveys were carried out annually. These fishing activities, each lasting about two weeks, were conducted in July and October. However, since 2003, only the July survey is

done every year. The sentinel surveys are carried out by nine fishing vessels that conduct about 300 tows in 3Pn, 4RS and 4T.

### July 2004 Survey

The 10<sup>th</sup> annual July sentinel survey was conducted in the northern Gulf of St. Lawrence between July 1 and July 12, 2004. A total of 294 sentinel fishing stations were surveyed (Figure 1). Of those 294 standard tows, 280 were successfully carried out, i.e. 21 in 3Pn, 117 in 4R, 102 in 4S, 30 in 4T and 10 in the three new coastal strata of 4R. The 280 stations represent 95% of the sampling target.

- From July 1 to July 12, four Quebec trawlers covering 4ST completed 132 out of a planned 144 stations (Figure 1). On the west coast of Newfoundland (3Pn, 4R), from July 1 to July 3, five trawlers carried out 148 stations out of a planned 150 stations (Figure 1).
- The 30 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 cod captured in the 10 tows carried out in the three new coastal strata in 4R (10 - 20 fathoms) were used to calculate an index of minimum trawlable biomass for cod. However, those strata having been surveyed only in the last two years (2003 and 2004), the results can not be used in the cod stock assessment.
- The total catches of cod (3Pn, 4RST) for the stratified random survey of July 2004 are presented in Table 1.

Table 1: Total catches of cod for the stratified random surveys of July 1995-2004 for 3Pn, 4RST.

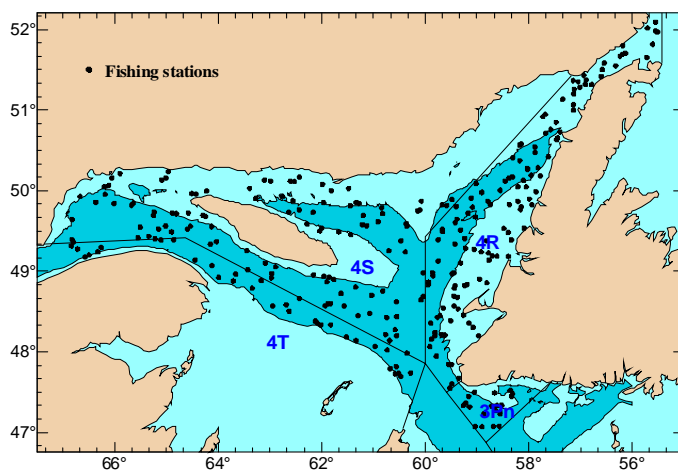


Figure 1: Map showing the distribution of stratified random tows done during the July 2004 survey.

Year	Number of tows	Catch of cod (kg)
1995	326	6 597,7
1996	280	7 254,2
1997	293	8 762,4
1998	293	8 158,7
1999	296	5 290,2
2000	296	7 872,7
2001	283	10 251,9
2002	264	7 731,1
2003	305	13 723,0
2004	294	14 144,0

## 1. Biomass and Distribution of Cod

Compared to 2003, the preliminary data show an increase of 31% in the index of the minimal trawlable biomass estimates for 3Pn and 4RS, reaching a total of 86,319 tons (Figure 2a). This value is comparable with that of 2001.

In 4R, the minimal trawlable biomass estimate increased from 61,900 tons for July 2003 survey to 83,143 tons in 2004. A slight increase of the estimate was also recorded in 3Pn, passing from 933 tons in 2003 to 1,107 tons in 2004. On the other hand, a considerable decrease was observed in 4S. The 2004 minimal trawlable biomass estimate for 4S is the second lowest of the series (2,069 tons), the lowest estimate being 1,463 tons in 2001.

Minimal trawlable biomass estimates were also calculated by including the three new strata 10-20 fathoms (Figure 2b). Those results indicate that there are no significant differences in the overall biomass between 2003 and 2004 but the <20 fathoms biomass is lower in 2004. However, these strata having been surveyed only in the last two years, estimates calculated this way were not used in the cod stock assessment.

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).

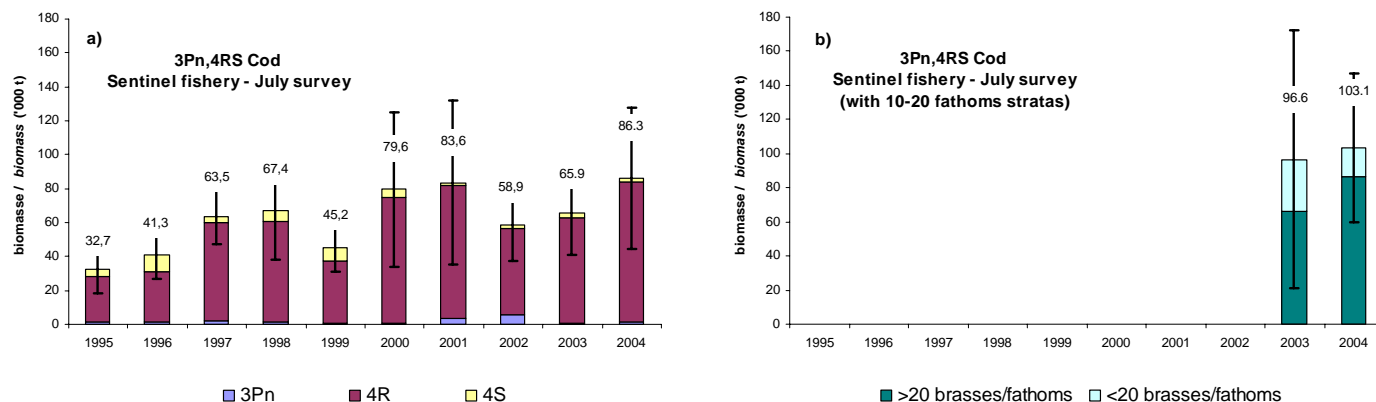


Figure 2 : Minimal trawlable biomass estimates for cod, based on the stratified random tows of the sentinel fisheries in 3Pn and 4RS in July (1995-2004). a) for the strata in more than 20 fathoms b) including the three new strata in 10-20 fathoms

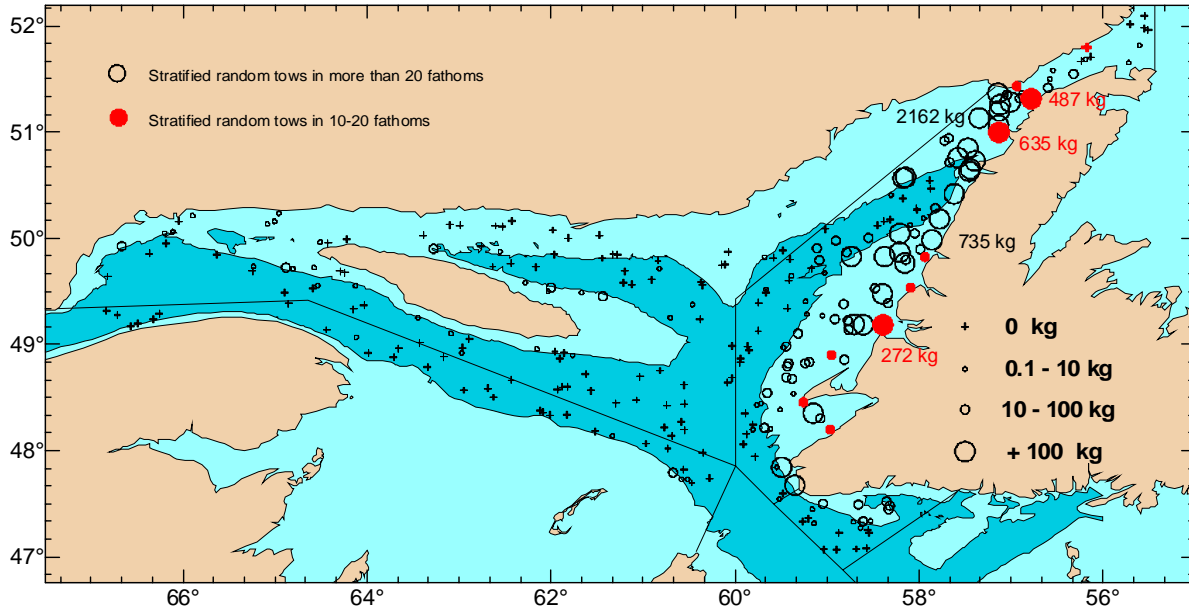


Figure 3 : Map showing the observed catch distribution of cod from July 2004 stratified random survey in 3Pn and 4RST.

## **2. Sampling and Analysis**

The standard sampling procedures (length, sex and weight) were used for cod, redfish, Greenland halibut and Atlantic halibut. The data were recorded on separate forms for each tow.

### ***Otoliths***

Otoliths were taken from cod in area 3Pn, 4RS. The otoliths were used to determine the age of individual cod specimens and these data were included in the cod stock assessment.

### ***Biodiversity and species at risk***

The main objective of this sampling is to obtain abundance data and biological measurements for the species which could be evaluated by the committee on the status of endangered wildlife in Canada (COSEWIC <http://www.cosewic.gc.ca>). When species from the priority list (92 species for the biodiversity and species at risk program) were captured, the length, the sex and the total weight were collected. When identification was doubtful, 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 2004 sentinel survey allowed the harvest of whole specimens of herring and capelin. These frozen samples were brought back to the Maurice-Lamontagne Institute for analyses which are completed by the team of François Grégoire, the scientist in charge of the stock assessment for these species in the Gulf.

### ***Addition of new fishing strata for the July mobile survey***

The three new strata between 10 and 20 fathoms, situated on the West coast of Newfoundland, were surveyed for a second year. The purpose of these new strata was to look at the presence of cod outside the zone normally sampled by trawlers in the July mobile gear sentinel survey. The three new strata were created in 4R; one in the strait of Belle Isle, one north of the 49<sup>th</sup> parallel and another south of the 49<sup>th</sup> parallel. A total of 10 tows were done by four trawlers during the July 2004 survey (Figure 3). The cod catches varied between 0 and 635 kg for a 30-minutes standard tow. More than half of the tows (6) reached the 30 minutes duration. The other 4 tows lasted less than 30 minutes either because of bad bottom (trawl hooked at the bottom) or because of the presence of fixed gears.

### **Acknowledgements**

We wish to acknowledge the work of all the fishermen, observers and coordinators who contributed in reaching the objectives of the 10<sup>th</sup> annual July sentinel survey.

The following fishermen and observers contributed to the July 2004 sentinel survey:

4R, 3Pn			4S		
Skipper	Crew	Observers	Skipper	Crew	Observers
Winsor Hedderson ( <i>Northern Tip</i> )	Dereck Pittman Chad Hedderson Dwayne Decker	James Marsden	Jean-Pierre Élément ( <i>Rémy Martin</i> )	Rémy Élément Martin Élément	Guylain Dupuis
Gariel Warren ( <i>885-77</i> )	Leonard Ubren Lou Pittman Enos Gaultos	A.J. Felix	Albert English ( <i>Annie Annick</i> )	Richard Philibert Steeve Chouinard	Yves Johnson
Dereck Coles ( <i>Catalina Venture</i> )	Robert Campbell Gorvin Williams Ashley Coles Randy Coles	Bob O'Quinn	Marcel Roy ( <i>Sextan</i> )	Gildas Cotton Jean-Guy Côté	André Rioux
Murray Lavers ( <i>Sylvia Lyn II</i> )	Floyd Biggin Warren House Barry Plowman	Derek Poole	Réjean Bernatchez ( <i>Chlorydon</i> )	Paul-René Côté Gilles Côté	Marie-Hélène Baril
Dan Genge Jr. ( <i>Nfld Storm</i> )	Albert White Kevin Genge Claude Genge Jr.	Levi Harvey			

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