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The 1985 4T Herring Gillnet Questionnaire

by

Gloria Nielsen
Marine Fisheries Division
Gulf Fisheries Center
Department of Fisheries and Oceans
P.O. Box 5030
Moncton, New Brunswick E1C 9B6
Canada

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ABSTRACT

An in-person interview survey was carried out on the southern Gulf of St. Lawrence (NAFO Division 4T) herring gillnet fishers. The main objective was to verify and update the historic effort series used to calculate the Catch Per Unit Effort from 1983 to 1985. In the event that a new effort series is required, questions were asked that would provide a more realistic indicator of the effort expended to catch herring in 4T. The results were not comparable to the historic series, and modifications of the results to compare with the series indicate very large inconsistencies. If information from gillnetters is to be used in the future to calculate effort values, serious thought should be given to the data required and the calculations to be used .

RESUME

On a procédé à une enquête par entrevues personnelles auprès des pêcheurs de hareng au filet maillant de la zone sud du golfe du Saint-Laurent (division 4T de l'OPANO). L'enquête avait pour principal objectif de vérifier et mettre à jour les séries de données historiques sur l'effort de pêche utilisées pour calculer les prises par unité d'effort de 1983 à 1985. Au cas où il faudrait établir une nouvelle série de données, nous avons posé des questions afin d'obtenir une indication plus réaliste de l'effort consacré à la pêche du hareng dans 4T. Les résultats obtenus n'étaient pas comparables aux séries historiques, et les modifications apportées aux résultats pour permettre cette comparaison ont révélé d'importantes anomalies. Si l'on compte utiliser à l'avenir l'information recueillie des pêcheurs au filet maillant pour calculer l'effort de pêche, il faudrait examiner sérieusement les données requises et les calculs à utiliser.

INTRODUCTION

Intensive surveys of southern Gulf gillnet herring fishers have been carried out in 1979 and 1982. A less intensive survey was done in 1983, and there was no survey in 1984. (O'Boyle and Cleary, 1981; Cleary, MS 1983; Ahrens and Nielsen, MS 1984). A major objective of these surveys was to estimate a gillnet effort index to be used in calculating a Catch Per Unit Effort index (CPUE). The number of nets per trip is an integral part of the historic CPUE indices, and there has been no change in the estimated number of nets per trip since the 1982 fishing season (Ahrens and Nielsen MS 1984, Ahrens MS 1985). The very high reported catch rates in the fall of 1984 and again in 1985 suggest however that there has indeed been a change in the availability of herring. In addition, the gillnetters have reported that their effort has changed since 1982. At a meeting of the Small Pelagics Advisory Committee on October 15, 1985, it was decided to design and carry out an in-person interview of herring gillnetters to determine if the assumption of no change in effort from 1983 to 1984 was valid. A secondary objective of the survey was to collect information about the mesh size of gillnets used to fish herring in the southern Gulf. This information is necessary to calculate partial recruitment. An estimate of the amount of herring not sold to processors, and therefore not included in the landings, was also of interest.

METHODOLOGY

An attempt was made to survey a representative sample of herring gillnetters in the Southern Gulf of St. Lawrence (NAFO division 4T). Statistical comparisons between fishing areas require extremely large sample sizes and knowledge of how many (and which) gillnetters were fishing in each area and season. Because that information was not available, the Gulf region was divided into 8 fishing areas (Table 1, Figure 1) and systematic random samples were drawn from lists of active licensed herring gillnetters living in those areas. The constraints imposed on the survey were: that it was to be held by in-person interviews; that it must be completed by October 26 in New Brunswick and shortly after that in the rest of the Gulf; and that all areas were to be sampled. These constraints did not allow sufficient sampling for statistical comparisons, therefore it was decided to attempt complete areal coverage rather than select certain areas for detailed statistical analysis and comparison.

A small pre-test was used to test the clarity and understanding of the interview form with the gillnetters. This test was too limited to uncover all the problems with the questionnaire. The interviews were carried out in French and English between Oct 24 and Nov 7 using the questionnaires in Appendix B.

District and area DFO personnel organized the interviews in each of the 8 major fishing areas. They set up interview times with the gillnetters in approximately 15 locations, and supplied personnel to conduct the interviews. Moncton Research Branch staff were present to answer questions from the interviewers and fishers and to ensure consistency. Some fishers who could not attend the in-person interviews were interviewed by telephone using the same questionnaire. The Magdalen Islands were surveyed entirely by telephone due to the time restrictions; and in Escuminac, the initial response was so low that subsequently complete coverage was attempted, but not achieved, by telephone.

THE QUESTIONNAIRE (Appendix B)

The interview was divided into 4 sections:

1. The first set of questions 'located' the respondents in the fishery. The status of the fishers was verified - that they were active herring gillnetters in 1985; the number of nets owned was asked (so there is no confusion with how many were used as opposed to owned - one of the industry's complaints about the 1983 survey); and the seasons fished for herring from 1983 to 1985 recorded.
2. The second set of questions covered details to calculate an index of gillnet effort for each fishing area. For each year and season fished since 1983 the following questions were asked:
 - the fishing location
 - the total number of days fished and the number of days fished in the peak
 - the number of nets used during the peak as well as during the rest of the season
 - the number of times the nets were hauled during the peak.
3. For 1985 only, but separately for each season, the mesh sizes and numbers of nets for each mesh size used were determined.
4. For 1985 only, but separately for each season, the percent of the respondent's catch that was kept for bait, dumped, or sold to processors was determined.

The interviews lasted from 10 to 30 minutes, depending on how much information the fisher had to impart as well as the difficulty with remembering details up to 3 years old. At the end of the interviews, the respondent had an opportunity to ask questions or make comments about the herring fishery and its management. (Appendix A contains summaries of these comments). Address labels were filled out for those respondents wishing a copy of the questionnaire report.

RESULTS AND DISCUSSION

In total, 306 herring gillnetters were interviewed, most in person, but 20-30 interviews were held by telephone. There appeared to be no difference in the quality of the answers by the two different methods - the questionnaire was the same in both cases. The area-by-area breakdown of the responses (Table 3.) shows that, although the number of responses was not sufficient to allow statistical comparisons, the areal coverage was good. From the responses it was evident that the areal division of the southern Gulf by address of gillnetter was also the division by area fished. The only significant mixing in 1984 and 1985 of gillnetters from different areas was in east P.E.I. and Nova Scotia and in Gaspe and Acadian Peninsula where the gillnetters fished in the same area during the fall. In all areas the gillnetters landed their catches near their homeport, except in the fall of 1985 when some Nova Scotia gillnetters landed some of their catches in P.E.I.

Although the lists used to select the systematic random sample from each area were thought to consist of only currently active licenced herring gillnetters, the responses indicated that in some cases (notably south east N.B. and west P.E.I.) this may not have been true (Table 3). The total number of herring gillnetters fishing in each area (Table 4) was calculated using the number of respondents fishing in the area divided by the sample proportion corrected for the number of people on the list that weren't active in 1984 or 1985.

Although questions were asked and answered for three years of herring fishing, it was the opinion of the Research Branch staff present at the interviews that recall difficulty for 1983 was extremely significant, and that even the 1984 information suffers from recall error. Consequently, 1983 data were omitted from the following analysis. As a result of the pre-test, questions about summer fishing as well as spring and fall fishing were included in the questionnaire. But because only 14 respondents replied that they fished during what could be considered a 'summer fishery' it was decided to exclude summer fishing information from the analysis.

Effort Calculations

There are some important differences among the areas surveyed that affect the use of the number of gillnets fished as a measure of effort:

First, drift nets are used by some gillnetters, set nets are used by others and in Northern N.B. many gillnetters use a modification of drift nets, where one end of the net is anchored and the other is attached to the boat. The amount of effort involved in active fishing is different from the amount involved in passive fishing.

Second, in the Caraquet fishery (Acadian Peninsula), nets are set, hauled, and reset more than once between trips to the processors. In Escuminac, the nets are set and left overnight, except during the peak of the season, when the nets are hauled and reset more than once a day, but only once between trips to the processing plant. This means that purchase slips in Escuminac are filled out for only part of a day's fishing and for one haul of some of the nets, while purchase slips in Caraquet are filled out for an entire day, which may include multiple net-hauls.

Third, the Escuminac spring fishery is on the spawning grounds. In contrast, the gillnetters in southeast New Brunswick fish a migrating stock; they set a large number of nets but catch herring in only a few of them each day.

Fourth, in P.E.I. and Nova Scotia, many gillnetters do not distinguish between a peak and non-peak period. Especially in eastern P.E.I. and Nova Scotia, they fish with the same number of nets throughout the season often emptying partially full nets more than once a day.

Other problems with creating a single CPUE index for all of the herring in division 4T became evident from the responses to the questionnaire. Many gillnetters fish for bait only - keeping what they need for themselves and giving or selling the rest to friends. In some areas, processors have placed restrictions on the sale of herring, thereby affecting the amount and timing of effort by gillnetters. Some gillnetters have geared up for fishing only to be told that the quota had been caught and the season closed.

The summaries of the questions used to calculate an effort index show extreme differences among the means of the areas and seasons within years, but not within an area and season between 1984 and 1985 (Tables 5-8). The standard errors of the means are, however, extremely large, thus no differences between the area and seasons are statistically significant. The number of days fished, both during the peak and during the non-peak of the seasons varies greatly among the areas for each season. The number of nets used varies more in the spring than in the fall. The most number of nets used per respondent was generally in Escuminac and south east New Brunswick; the fewest was in the Acadian Peninsula, East P.E.I., and Nova Scotia. In general, more nets were used in the spring than in the fall. Most of the gillnetters responded that they hauled their nets only once a day, but there was a difference between the spring and the fall fisheries, with the fall having a larger mean number of net-hauls per gillnetter per day. The P.E.I. and Nova Scotia fall fisheries differ from other areas in that many gillnetters haul the same partially full nets more than once a day .

The majority of the respondents from P.E.I. and Nova Scotia made no distinction between the peak and non-peak number of nets used and number of days fished, but some of them did make the

distinction. Therefore it was decided to combine the peak and non-peak information in calculating effort indices for the areas involved.

Several effort indices were calculated:

1. The average number of net-hauls/gillnetter.
2. The average number of net-hauls/trip.
3. The total number of net-hauls.

$$1. \text{NHF}_i = \frac{1}{n_i} \sum (dp_j * np_j * h_j + dnp_j * nnp_j)$$

where n_i = number of responses in area-season i
 dp_j = number of days in the peak for resp. j in area-season i
 np_j = number of nets in the peak for resp. j in area-season i
 h_j = number of hauls/day in the peak for resp. j in area-season i
 dnp_j = number of days in the non-peak for resp. j in area-season i
 nnp_j = number of nets in the non-peak for resp. j in area-season i
 # hauls/day in the non-peak is assumed to be 1

The N.S., P.E.I. modification :

$$\text{NHF}_i = \frac{1}{n_i} \sum (dp_j * np_j + dnp_j * nnp_j) * h_j$$

$$2. \text{NHT}_i = \frac{1}{n_i} \sum \frac{(dp_j * np_j * h_j + dnp_j * nnp_j)}{(dp_j + dnp_j)}$$

The N.S., P.E.I. modification :

$$\text{NHT}_i = \frac{1}{n_i} \sum \frac{(dp_j * np_j + dnp_j * nnp_j) * h_j}{(dp_j + dnp_j)}$$

The Escuminac modification :

$$\text{NHT}_i = \frac{1}{n_i} \sum \frac{(dp_j * np_j + dnp_j * nnp_j) * 1}{(dp_j + dnp_j)}$$

$$3. \text{NNH}_i = \text{NHF}_i * N_i$$

where N_i = number of responses in area-season i times the sampling proportion adjusted for the null responses (Tables 3,4)

Overall indices for 4T were calculated by weighting the area averages by the landed catch (Table 2). This was done because the individual sample sizes were chosen for areal coverage only, and bear no relationship to the relative importance of the major fishing areas to the southern Gulf gillnet herring fishery. Because the 1985 data for Quebec landings were not available, the overall indices do not include data from Quebec or the Magdalen Islands.

From 1984 to 1985, the number of net-hauls per gillnetter increases slightly in the spring and decreases in the fall (Table 9, Figure 2). The average number of net-hauls per trip shows an increase in the spring and a decrease in the fall from 1984 to 1985 (Table 10, Figure 3). The total number of net-hauls per area shows a decrease in both the spring and fall in the total effort expended by herring gillnetters from 1984 to 1985 (Table 11, Figure 4).

The effort index used in the past was the average number of nets per trip, assuming one set per trip and one trip per day. The overall spring Gulf averages were determined by weighting the Acadian Peninsula and a combination of the Escuminac, southeastern New Brunswick, and partial western P.E.I. averages by the number of gillnetters fishing in those areas (O'Boyle and Cleary, 1981). The overall fall averages were set equal to the Acadian Peninsula averages. The data here are not comparable to the historic data - the questions in the surveys were not the same. If the data are modified to combine the number of nets used in the peak and non-peak periods, and if the data are grouped as in the past and weighted by the number of gillnetters in the areas, then the revised number of nets per trip calculated from the 1985 survey are : spring 1984 - 14.3 ; spring 1985 - 13.7 ; fall 1984 - 5.3 ; fall 1985 - 5.2. Table 12 contains the entire updated historic effort index.

Gillnet Mesh Sizes

The distributions of the gillnet mesh sizes used in the spring and fall in 1985 are given in Tables 13 and 14. Gillnetters used fewer sizes of mesh in the fall than in the spring, and the nets in the fall are concentrated for the most part in one or two size classes while a more uniform distribution of net sizes is evident for the spring. The most common mesh size in the Spring fishery was 2.25, and in the Fall fishery was 2.75. This represents no change from the findings of previous surveys.

Percentage Use Of The Catch

The summaries of the percentage use of the catch in 1985 is shown in Tables 15 and 16. There are large differences in the use of the catch between areas and seasons from total sale to processors to total use as bait. The percentages in the table do not necessarily add up to one hundred percent in all areas for a season because the individual responses did not in all cases add to 100%. In general, the areas with extreme percentage kept for bait did not have large gillnet landings (Table 2).

Concluding Remarks

The questionnaire elicits detailed information about peak and non-peak gillnet fishing activity. This allows a more 'exact' calculation of fishing effort as measured by number of nets or net-hauls. This calculation is, however, incompatible with the historical indices based on the number of nets per trip. Further information, such as the percent of drift nets, set nets, and modified drift nets, as well as soak time for nets, and accurate information about the number of gillnetters fishing in each location may be desirable to include in effort calculations. Use of effort indices do not currently take into consideration such factors as restrictions on fishing activity imposed by processors, area quotas, or differences in the fisheries (fishing on spawning grounds or migrating stocks).

No questions to check the validity of the responses were included as part of the survey. Further examination of useful information for effort index calculation is indicated.

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Table 1. Statistical Districts making up the geographic divisions for the 8 fishing areas of the Southern Gulf of St. Lawrence.

AREA	Statistical Districts
Magdalen Is.	26, 27, 28
Quebec	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Acadian Pen.	63, 64, 65, 66, 67, 68, 70
Escuminac	71, 73, 75, 76
Southeast N.B.	77, 78, 80
Nova Scotia	45, 46, 1, 2, 3, 10, 11, 12, 13, 14
East P.E.I.	85, 86, 87, 88
West P.E.I.	82, 83, 92, 93, 95, 96

Table 2. Gillnet Herring Landings in tonnes by seasonal fishery for the 8 fishing areas of the Southern Gulf of St. Lawrence.

AREA	1984		1985	
	Spring	Fall	Spring	Fall
Magdalen Is.	10.0	-	*	*
Quebec	518.0	1073.0	*	*
Acadian Pen.	623.4	7098.1	638.3	8496.1
Escuminac	2135.8	22.5	2914.2	1.0
Southeast N.B.	290.7	431.0	1051.3	-
Nova Scotia	184.1	2435.0	192.0	4124.8
East P.E.I.	90.5	4267.8	-	1302.7
West P.E.I.	281.7	652.5	328.7	920.6

Note: - denotes no landings
 * denotes information not available

Table 3. Response Coverage by major herring fishing areas

AREA	Active Fishers	Resp	Non-fishing Resps	
			1984	1985
Magdalen Is.	10	5	0	0
Quebec	118	36	1	0
Acadian Pen.	227	69	0	0
Escuminac	46	25	1	2
Southeast N.B.	49	16	6	7
Nova Scotia	117	50	7	0
East P.E.I.	105	36	2	0
West P.E.I.	185	73	15	14

Table 4. Number of responses and total number calculated for each area.

AREA	1984				1985			
	Spring		Fall		Spring		Fall	
	Resp	Tot	Resp	Tot	Resp	Tot	Resp	Tot
Magdalen Is.	5	10	0	0	5	10	0	0
Quebec	30	98	27	89	29	95	20	66
Acadian Penn.	46	151	52	171	49	161	65	214
Escuminac	21	39	6	11	22	40	2	4
South East N.B.	9	28	2	6	9	28	0	0
Nova Scotia	25	59	43	101	20	47	50	117
East P.E.I.	9	26	34	99	11	32	36	105
West P.E.I.	54	137	23	58	54	137	19	48

Table 5. Summary of 1984 Spring gillnet fishery effort index parameters (net hauls)

AREA	# days		# Nets		# Hauls in peak
	peak	non-peak	peak	non-peak	
Magdalen Is.	11.5±11.5	20.3±8.1	12.9±5.5	10.8±7.3	1.0±0.0
Quebec	9.1±8.4	37.4±22.1	10.7±10.1	14.1±11.3	1.0±0.0
Acadian Pen.	11.5±11.7	16.7±13.2	5.9±5.8	7.6±7.1	1.2±0.0
Escuminac	8.4±6.3	14.8±15.9	21.4±13.4	23.6±14.6	1.0±0.2
Southeast N.B.	4.0±3.3	12.1±12.1	15.4±15.9	22.1±20.3	1.0±0.0
Nova Scotia	4.1±10.1	26.3±15.2	1.1±3.6	2.6±1.5	1.0±0.0
East P.E.I.	0.0±0.0	35.7±17.7	2.4±1.5	3.4±1.1	1.0±0.0
West P.E.I.	13.6±11.4	17.1±13.4	25.3±17.2	27.1±16.6	1.0±0.2

Table 6. Summary of 1984 Fall gillnet fishery effort index parameters (net hauls)

AREA	# days		# Nets		# Hauls in peak
	peak	non-peak	peak	non-peak	
Quebec	10.8±8.0	31.2±24.9	10.2±7.9	10.4±8.3	1.2±0.5
Acadian Pen.	8.8±6.4	7.5±7.7	5.0±2.6	5.5±2.9	1.8±1.0
Escuminac	5.6±4.5	4.5±5.1	11.5±4.6	10.5±7.1	1.8±1.0
Southeast N.B.	1.0±0.0	0.5±0.7	9.0±4.2	9.0±4.2	1.0±0.0
Nova Scotia	7.0±5.2	14.9±13.1	7.5±4.0	8.7±4.1	1.3±0.7
East P.E.I.	12.7±6.6	16.2±10.5	8.8±3.0	11.4±3.9	1.3±0.5
West P.E.I.	19.1±16.3	21.5±20.9	11.3±9.8	11.8±9.3	1.2±0.7

Table 7. Summary of 1985 Spring gillnet fishery effort index parameters (net hauls)

AREA	# days		# Nets		# Hauls in peak
	peak	non-peak	peak	non-peak	
Magdalen Is.	9.8±12.8	22.0±8.5	12.4±6.4	10.9±7.1	1.0±0.0
Quebec	15.1±8.4	32.1±22.1	10.1±10.1	12.6±11.3	1.0±0.0
Acadian Pen.	10.7±12.1	19.1±12.9	6.1±6.4	8.2±7.5	1.2±0.5
Escuminac	7.8±6.1	12.3±13.2	22.4±12.5	25.4±12.8	1.1±0.3
Southeast N.B.	5.2±4.1	12.7±8.1	22.1±18.1	29.7±14.9	1.0±0.0
Nova Scotia	2.6±7.7	26.3±14.0	1.3±2.4	3.3±3.3	1.0±0.0
East P.E.I.	0.0±0.0	37.0±16.3	2.0±1.7	3.9±2.2	1.0±0.0
West P.E.I.	13.9±9.4	17.0±13.2	24.1±16.4	25.4±16.4	1.0±0.2

Table 8. Summary of 1985 Fall gillnet fishery effort index parameters (net hauls)

AREA	# days		# Nets		# Hauls in peak
	peak	non-peak	peak	non-peak	
Quebec	13.9±10.6	28.1±19.6	7.2±6.7	9.4±7.8	1.1±0.4
Acadian Pen.	8.6±3.9	2.4±8.0	4.3±3.4	5.3±4.4	1.5±0.8
Escuminac	7.0±4.2	5.5±7.8	13.0±9.9	13.0±9.9	1.0±0.0
Nova Scotia	8.5±5.4	11.6±8.6	6.5±3.5	8.2±3.4	1.5±0.7
East P.E.I.	10.3±3.0	11.9±7.5	8.0±2.0	10.6±3.7	1.3±0.6
West P.E.I.	19.7±17.6	22.3±21.6	10.1±8.9	11.0±8.3	1.3±0.6

Table 9. Average number of net-hauls per gillnetter

AREA	1984		1985	
	Spring	Fall	Spring	Fall
Magdalen Is.	318.1	-	316.3	-
Quebec	609.2	560.7	565.8	455.5
Acadian Pen.	259.8	162.3	307.3	92.7
Escuminac	486.3	182.2	440.3	103.0
Southeast N.B.	415.9	12.0	516.4	-
Nova Scotia	113.9	244.9	99.2	224.5
East P.E.I.	122.3	409.6	139.0	303.7
West P.E.I.	823.2	543.4	808.7	547.8
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TOTAL GULF*	450.1	258.9	450.2	176.1

* Excludes Quebec

Table 10. Average number of net-hauls per trip

AREA	1984		1985	
	Spring	Fall	Spring	Fall
Magdalen Is.	11.6	-	11.6	-
Quebec	12.9	11.6	12.0	8.9
Acadian Pen.	7.9	8.5	8.7	7.1
Escuminac	21.7	12.0	23.1	13.0
Southeast N.B.	22.1	9.0	28.1	-
Nova Scotia	3.7	10.8	3.3	10.9
East P.E.I.	3.4	13.3	3.9	12.9
West P.E.I.	29.1	15.8	27.3	15.2
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TOTAL GULF*	18.9	10.6	21.9	9.2

* Excludes Quebec

Table 11. Total number of net-hauls.

AREA	1984		1985	
	Spring	Fall	Spring	Fall
Magdalen Is.	3181.0	-	3163.0	-
Quebec	59701.6	40902.3	53751.0	30063.0
Acadian Pen.	39229.8	27753.3	49475.3	19837.8
Escuminac	18965.7	2004.2	17162.0	412.0
Southeast N.B.	11645.2	72.0	14459.2	0.0
Nova Scotia	6720.1	24734.9	4662.4	10776.0
East P.E.I.	3179.8	40550.4	4448.0	31888.5
West P.E.I.	112778.4	31517.2	110791.9	26294.4
TOTAL GULF*	28813.8	30250.3	26425.7	18776.6

* Excludes Quebec

Table 12. Gillnet catch rate series modified from Ahrens (MS 1984)

YEAR	SPRING	FALL
	Nets/Trip	Nets/Trip
1973	26.5	7.1
1974	24.7	7.6
1975	29.2	7.2
1976	29.6	8.9
1977	28.8	9.3
1978	30.9	11.4
1979	37.0	11.4
1980	32.3	11.0
1981	34.0	11.0
1982	33.0	11.0
1983	33.0	11.0
1984	14.3	5.3
1985	13.7	5.2

Table 13. Percentage of each mesh size used in the 4T Spring gillnet fishery

AREA	NET SIZE											
	$1\frac{5}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{5}{16}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$2\frac{7}{8}$	3	$3\frac{1}{4}$
Magdalen Is.		4.2		25.4		29.9	33.7		6.7			
Quebec		7.8	5.8	48.9		6.0	9.5	11.0	6.3	1.0	0.6	2.9
Acadian Pen.	3.3			14.7		40.6	26.5	13.7	1.2			
Escuminac			0.6	72.1		17.5	9.8					
Southeast N.B.				89.3		6.9	3.7					
Nova Scotia		2.6		5.1		21.7	48.0	22.6				
East P.E.I.				15.2		46.2	21.7	7.1	4.9	3.9	1.0	
West P.E.I.		0.3		55.2	4.2	23.4	10.1	1.1	4.0	1.0	0.5	

Table 14. Percentage of each mesh size used in the 4T Fall gillnet fishery

AREA	NET SIZE											
	$1\frac{5}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{5}{16}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$2\frac{7}{8}$	3	$3\frac{1}{4}$
Magdalen Is.												
Quebec		10.4	6.0	0.5		5.1	18.8	18.5	27.3	5.1	8.1	
Acadian Pen.							1.0	79.7	16.6	2.5	0.3	
Escuminac									100.0			
Southeast N.B.												
Nova Scotia						2.5	3.7	93.8				
East P.E.I.								98.6	1.4			
West P.E.I.				3.3	0.9	3.7	2.7	40.1	30.1	19.2		

Table 15. Responses to the disposition of the 1985 catch

AREA	SPRING			FALL		
	Pers.use 100%	dumped some	sold 100%	Pers.use 100%	dumped some	sold 100%
Magdelan Is.	1	1	1	-	-	-
Quebec	6	9	7	3	5	13
Acadian Pen.	28	4	3	2	6	59
Escuminac	2	9	3	1	0	0
Southeast N.B.	1	2	3	-	-	-
Nova Scotia	18	1	0	0	1	49
East P.E.I.	11	0	0	0	0	35
West P.E.I.	16	16	2	10	4	5

Table 16. Percentage use of the 1985 catch.

AREA	SPRING			FALL		
	bait	dumped	sold to processors	bait	dumped	sold to processors
Magdelan Is.	57.0	0.0	22.0	-	-	-
Quebec	41.6	6.6	51.7	19.5	4.8	76.0
Acadian Pen.	77.6	0.0	21.2	3.1	0.6	87.7
Escuminac	25.3	6.9	53.1	100.0	0.0	0.0
Southeast N.B.	20.7	6.1	68.2	-	-	-
Nova Scotia	94.0	0.5	2.5	0.0	0.0	100.0
East P.E.I.	100.0	0.0	0.2	0.1	0.0	99.0
West P.E.I.	60.8	10.5	26.6	67.6	6.1	26.3

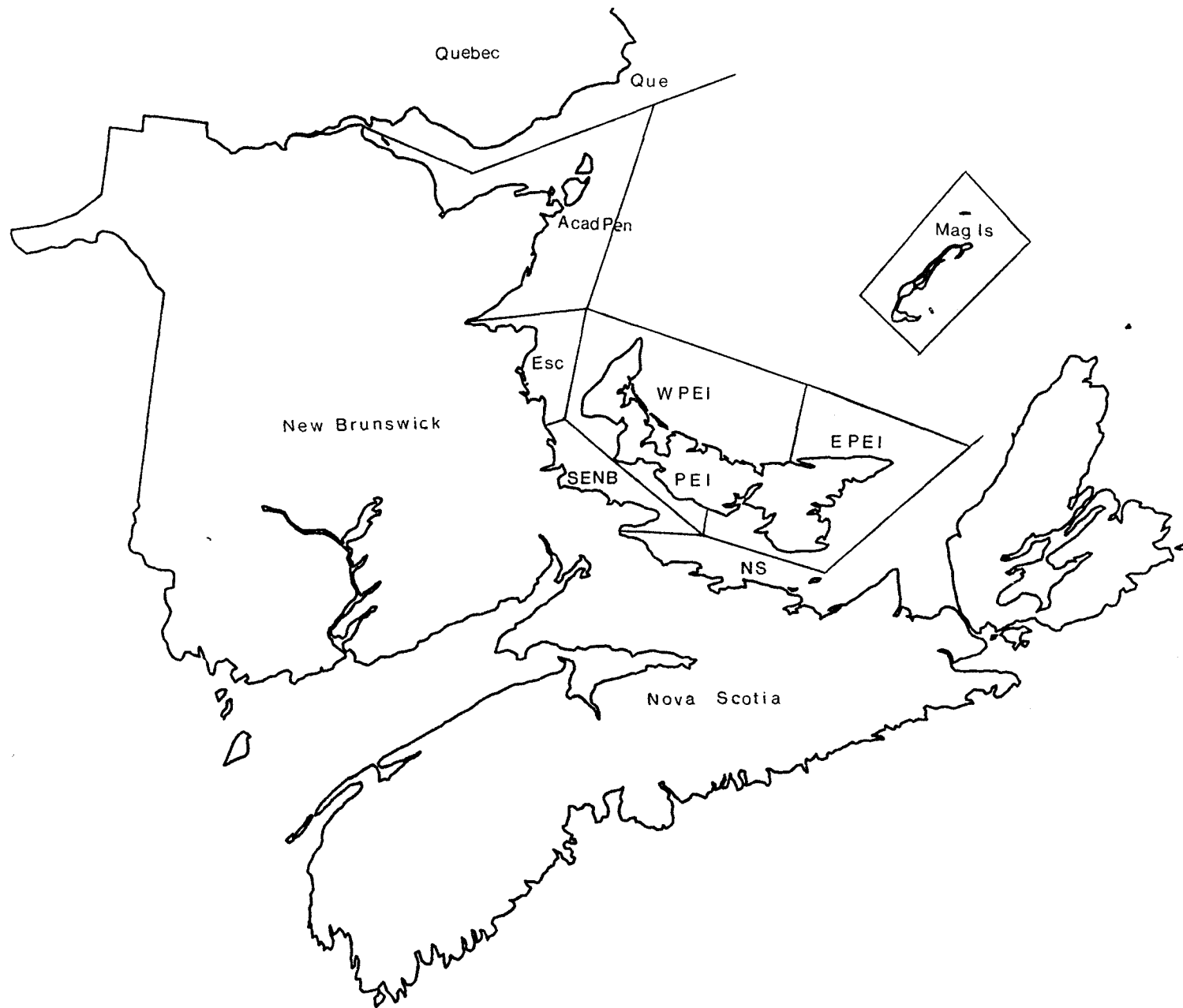


Figure 1. Geographic division of the southern Gulf of St. Lawrence used in the 1985 herring gillnet survey

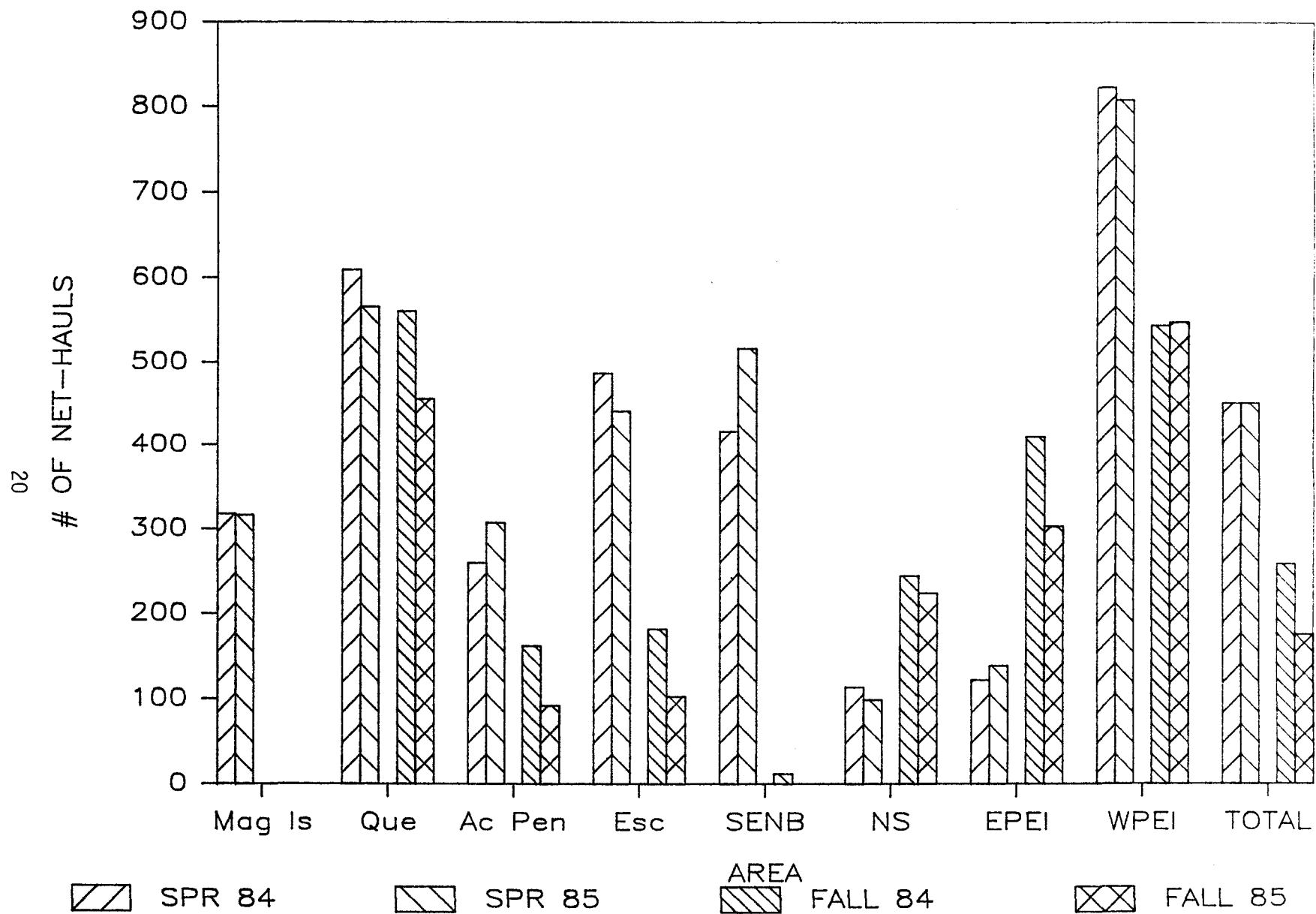


Figure 2. Average Number of Net-Hauls per Gillnetter in the Southern Gulf of St. Lawrence Overall total excludes Quebec and Magdalen Islands

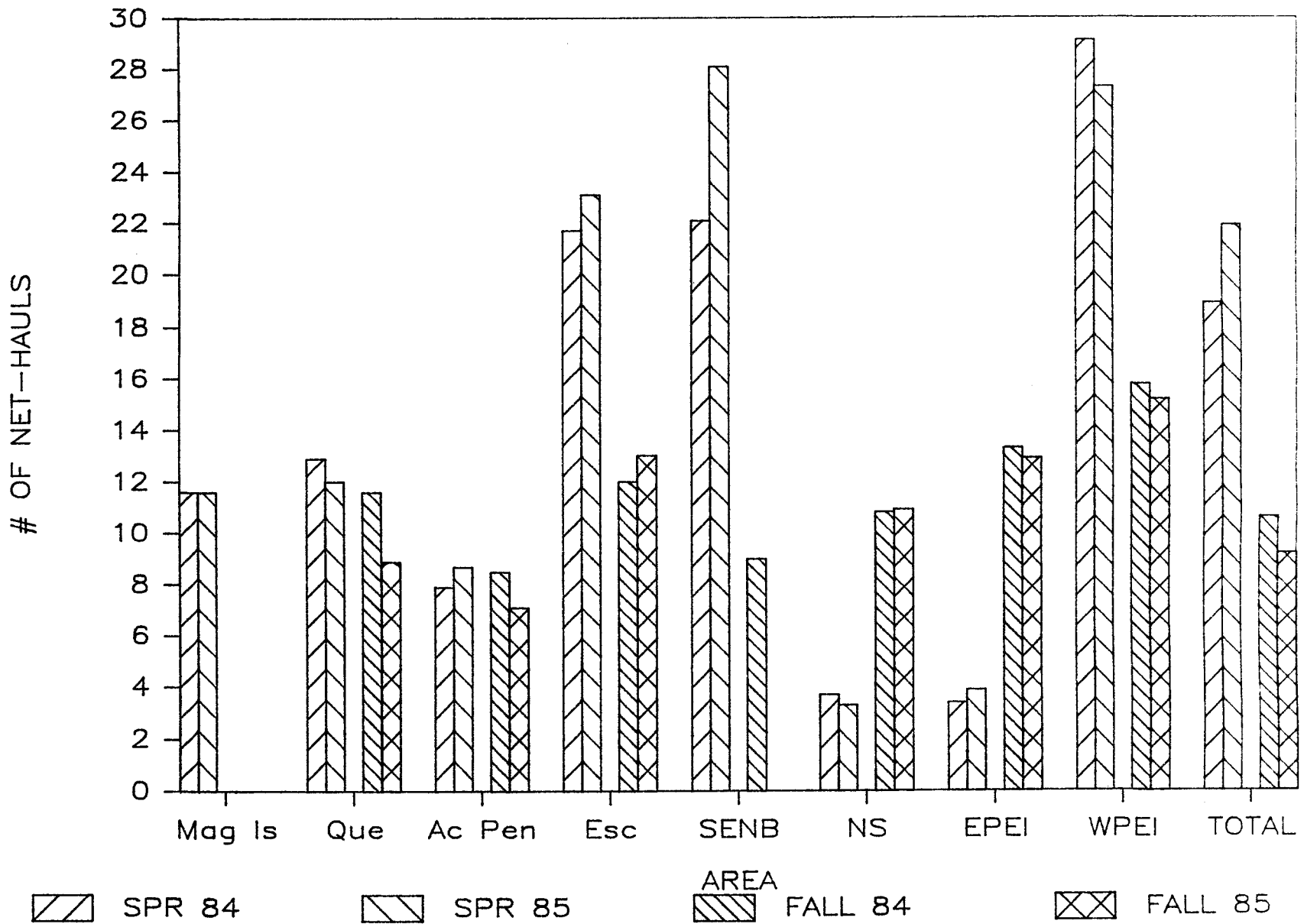


Figure 3. Average Number of Net-Hauls per Trip in the Southern Gulf of St. Lawrence
Overall total excludes Quebec and Magdalen Islands

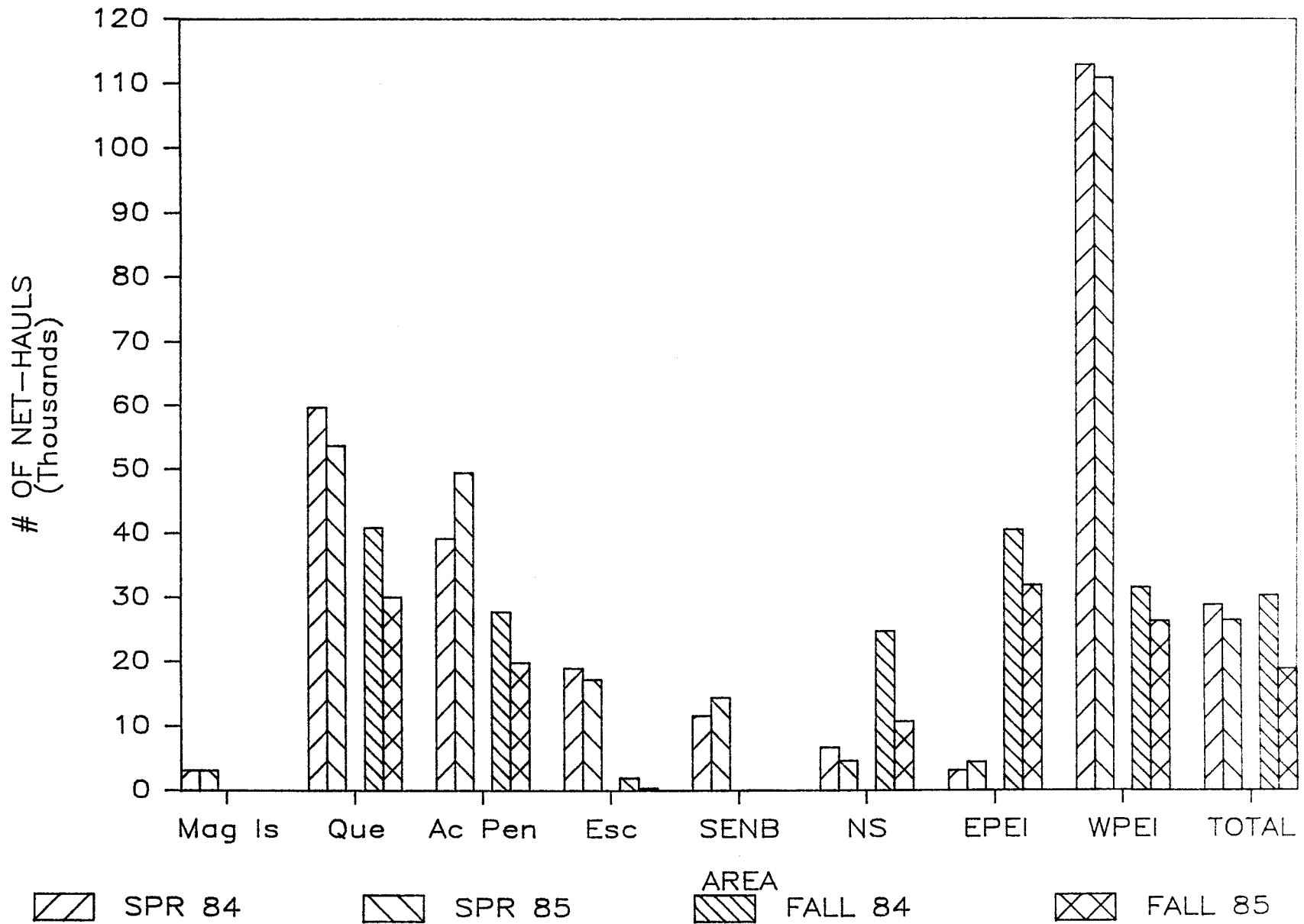


Figure 4. Average Total Number of Net-Hauls in the southern Gulf of St. Lawrence
Overall total excludes Quebec and Magdalen Islands

APPENDIX A.

Comments of the respondents regarding the fishing management, fishing seasons, and abundance of herring.

Quebec responses

Work is needed to develop the market.

The gillnetters should be able to sell their catch in N.B.

The processors are buying herring from outside the Quebec area, so the fishers have difficulty selling their herring.

There are a lot more herring now than there used to be; this was the best season in a long time.

Quebec gillnetters were kept out of the Miscou area, so could not fill their quota.

Boat quotas should be used.

The seiners should be stopped altogether.

Quebec should be allowed to fish until its quota is filled.

There should be more efficient management to control herring numbers.

Processors imposed limits on the sale of herring.

The present system is satisfactory.

The results of the spawning bed surveys are not believed.

Acadian Peninsula

The season should be later.

The season should be earlier.

Rather than a quota, a fixed season should be set.

If fixed seasons are not initiated, larger quotas are needed to support the fishery.

The Baie des Chaleurs needs its own season or quota.

Boat quotas should be used.

The seiners are the problem for the herring - gillnetters can't destroy the resource.

The fishery can support a large number of people if it is managed properly.

There are a lot more herring than there were in the past.

The whole fish should be utilised.

Escuminac

A lot of herring caught in the summer and fall in this area is caught as a by-catch of the mackerel fishery .

The seiners are hurting the fishery.

There are more herring the last couple of years than before.

The number of nets being used now is fewer than in the past, and the catch is as large or larger.

There should be better co-operation between the Department of Fisheries and processors for management of the resource; more control is required.

The roe fishery could destroy the resource.

There should be a net limit.

There should be a limit on the number of meshes deep allowed for nets.

The fishery in 1985 should not have been closed then reopened - that hurt rather than helped the gillnetters.

The Canso Causeway has caused a decrease in the abundance of fish in the area.

Southeast New Brunswick

The seiners shouldn't get 20% of the quota.

Much of the herring caught in the summer and fall is caught as a by-catch of the mackerel fishery.

By the time the fish got to this area the quota was filled.

The quotas should be allocated in a more equitable manner by area.

There were large catches on either side of this area, but not here.

Better markets should be developed.

There should be a net limit.

The licensing for different fisheries is not handled fairly.

The biologists do not understand the fisheries.

West Prince Edward Island

There is a lot of herring - much more than in the past.

Better markets and prices and higher quotas are needed.

Boat quotas should be used.

Net limits should be used.

Mesh size regulations to allow spawners to escape should be used.

Zone quotas should be used.

The present quota is satisfactory.

Markets should be developed for the whole fish - not just the roe.

The gillnetters should be able to sell to the foreign factory ships.

The fish should be handled better to produce a better quality product.

The seiners should be kept out of the Gulf.

East Prince Edward Island

A boat quota system (daily, weekly, seasonal, or a combination) should be used.

The overall quota should be higher.

The season should be later.

There should be an East P.E.I. quota and a West P.E.I. quota.

The quota should be based on the number of boats in an area.

There should be no quota or season - as long as the processors can handle the fish, and the fish are there, the gillnetters should be allowed to fish.

The 1985 season was too short.

There were lots of herring in the area this year - they arrived late and stayed a long time.

The price was too low and better markets should be developed.

When the quota was filled, there were still lots of herring left.

It was unfair that the Nova Scotia gillnetters could fish when the Island gillnetters couldn't.

A net limit should be used.

Mesh size regulations should be used.

The biologists' reports about the herring are not believed - more spring survey work should be done.

The seiners should be kept out of the Gulf.

Some herring is caught for tuna bait - some with mackerel nets.

Nova Scotia

Boat quotas (daily, weekly, or seasonal) should be used.

The quota should be higher.

The quota is satisfactory.

There shouldn't be quotas - the market can govern the fishery.

Fisherman's Bank is overcrowded.

Markets should be developed for the whole fish - not just the roe.

There should be more incentive for higher quality fish.

There should be better unloading facilities.

The seiners should be eliminated.

DFO should get better information about the herring stocks.

There are now lots of herring.

HERRING QUESTIONNAIRE 1985

=====

Interviewer: _____

Date: _____

Hello, I'm _____ with DFO. We're helping the Moncton Research office with a survey of the Gulf herring fishery. We're collecting data to update the effort that is used to catch herring - that is gear type, days fishing, etc.

The information will be used for biological research only, and will be kept strictly confidential. Individual responses will not be identified at a later date.

In order to make this survey as useful as possible, please answer the questions as precisely as you can. If you can't remember some of the answers, that's okay, just tell us.

- 1. Just to be sure - have you fished herring with gillnets since 1983? That could be drift nets or set nets and for personal use as well as commercial.

NO

YES

- 2. How many gillnets do you own? _____

- 3. When did you fish herring?

	This year 1985	Last year 1984	Two years ago 1983
Spring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Summer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The next few questions will deal only with the Spring fishery

This Year
1985

Last Year
1984

Two Years Ago
1983

4. Where did you fish in the Spring of:

5. Approximately how many days did you fish in:

6. How many days did you fish during the peak of the season (that is, when the catch was really good) in:

7. During the peak, how many nets did you fish per day in:

8. Did you empty the same net more than once a day during the peak in:

NO:

How many times per day

YES:

9. How many nets did you fish during the rest of the Spring season in:

27

The following questions pertain to just this last Spring season (1985)

10. What were the mesh sizes and the number of nets of each size that you used this Spring?
 (# of nets for each size)
- 2" _____
- 2 1/4" _____
- 2 1/2" _____
- 2 3/4" _____
- 3" _____
- Other (specify) _____

11. What is the average size of a single gillnet?
- Length (fathoms): _____
- Depth (mesh): _____

12. Did you keep any of your catch this Spring for bait or personal use?
- NO:
- YES: _____ %

13. Were you forced to dump some of your herring this Spring?
- NO:
- YES: _____ %

14. What percentage of your catch was sold to processing plants this Spring?
- _____ %

28

The next few questions will deal only with the Fall fishery

This Year
1985

Last Year
1984

Two Years Ago
1983

15. Where did you fish in the Fall of:

16. Approximately how many days did you fish in:

17. How many days did you fish during the peak of the season (that is, when the catch was really good) in:

18. During the peak, how many nets did you fish per day?

19. Did you empty the same net more than once a day during the peak in:

NO:

How many times per day?

YES:

20. How many nets did you fish during the rest of the Fall in:

29

The following questions pertain just to the last Fall season (1985)

21. What were the mesh sizes and the number of nets of each size that you used this fall?
- 2" _____
- 2 1/4" _____
- 2 1/2" _____
- 2 3/4" _____
- 3" _____
- Other (specify) _____
- _____

22. What is the average size of a single gillnet?
- Length (fathoms): _____
- Depth (mesh): _____

23. Did you keep any of your catch this fall for bait or personal use?
- NO:
- YES: _____ %

24. Were you forced to dump some of your herring this fall?
- NO:
- YES: _____ %

25. What percentage of your catch was sold to processing plants this Fall?
- _____ %

30

This Year
1985

Last Year
1984

Two Years Ago
1983

The next few questions will deal only with the Summer fishery

26. Where did you fish in the Summer of:

27. Approximately how many days did you fish in:

28. How many days did you fish during the peak of the season (that is, when the catch was really good) in:

29. During the peak, how many nets did you fish per day?

30. Did you empty the same net more than once a day during the peak in:

NO:

How many times per day?

YES:

31. How many nets did you fish during the rest of the Summer in:

The following questions pertain just to the last Summer season (1985)

32. What were the mesh sizes and the number of nets of each size that you used this Summer?

2" _____

2 1/4" _____

2 1/2" _____

2 3/4" _____

3" _____

Other (specify) _____

33. What is the average size of a single gillnet?

32

Length (fathoms): _____

Depth (mesh): _____

34. Did you keep any of your catch this Summer for bait or personal use?

NO:

YES:

_____ %

35. Were you forced to dump some of your herring this Summer?

NO:

YES:

_____ %

36. What percentage of your catch was sold to processing plants this Summer?

_____ %

This concludes our questionnaire, and we thank you very much for your time and assistance. We will be preparing a report of this survey, would you be interested in receiving a copy?

NO: _____

_____ Could you give us your mailing address please.

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Notes:

Questionnaire - Hareng 1985

=====

Interviewer: _____

Date: _____

Bonjour, je suis _____ du Ministère des Pêches et des Océans, et j'assiste le personnel de la direction de la recherche (Moncton) à mener un sondage sur la pêche au hareng. Nous recueillons de l'information pour mettre à jour l'effort utilisé pour pêcher le hareng c.-à-d. le genre d'équipement utilisé, le nombre de jours pêchés, etc...

L'information obtenue par ce sondage sera seulement utilisée pour la recherche et sera gardée confidentielle. Aucune réponse individuelle ne sera identifiable plus tard.

Pour que ce sondage nous soit profitable, veuillez, S.V.P., répondre aux questions le plus précisément possible, et si vous êtes incapable de vous rappeler de certains détails, veuillez me l'indiquer.

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1. Juste pour vérifier, est-ce que vous avez pêché le hareng depuis 1983 à l'aide de filets maillants. (Ceci peut être à l'aide de filets dérivants (drift net) ou ancrés (set nets); aussi que votre pêche soit pour des fins personnelles ou commerciales:

Non:

Oui:

2. Combien de filets maillants possédez-vous? _____

3. Pendant quelle saison avez-vous pêché le hareng au cours de

	Cette année 1985	L'an passé 1984	2 ans passés 1985
printemps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
automne	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
été	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Les questions suivantes porteront seulement sur la pêche du **printemps**

cette année
1985

l'an passé

2 ans passés

4. Où avez-vous pêché durant le printemps de:

5. Environ combien de jours avez-vous pêché:

6. Combien de jours avez-vous pêché durant la période de capture forte:

7. Durant la période de capture forte combien de filets par jour avez-vous pêchés en:

8. Est-ce que vous avez relevé vos filets plus d'une fois par journée durant la période de capture forte du printemps en:

Non:

Non:

Non:

Combien de fois par jour?

Oui: _____

Oui: _____

Oui: _____

9. Combien de filets par jour pêchiez-vous durant le reste de la saison de pêche du printemps de:

Les questions suivantes porteront seulement sur le printemps de cette année.

10. Quelle est la grandeur de mailles des filets que vous avez utilisé:
(# de filets pour chaque grandeur)
- 2" _____
- 2 1/4" _____
- 2 1/2" _____
- 2 3/4" _____
- 3" _____
- Autre (spécifiez) _____
- _____

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11. En moyenne, quelles sont les dimensions d'un filet individuel:
- Longueur (brasse): _____
- Profondeur (maille): _____
12. Est-ce que vous avez gardé une partie de votre prise pour des fins personnels ou de la boette, durant le printemps de 1985?
- Non:
- Pouvez-vous nous donner un pourcentage? Oui: _____ %
13. Durant le printemps de 1985 est-ce que vous avez dû jeter une partie de vos prises?
- Non:
- Oui: _____ %
14. Quel pourcentage de votre prise du printemps de 1985 a été acheté par des usines de transformation? _____ %

Les questions suivantes porteront seulement sur la pêche d' **Automne**.

	cette année 1985	L'an passé 1984	2 ans passés 1983
15. Où avez-vous pêché durant l'automne de:	_____	_____	_____
16. Environ combien de <u>jours</u> avez-vous pêché:	_____	_____	_____
17. Combien de <u>jours</u> avez-vous pêché durant la période de capture forte:	_____	_____	_____
18. Durant la période de capture forte combien de filets par jour avez-vous pêché en:	_____	_____	_____
37 19. Est-ce que vous avez relevé vos filet plus d'une fois par journée durant la période de capture forte de l'automne en: Combien de fois par jour?	Non: <input type="text"/>	Non: <input type="text"/>	Non: <input type="text"/>
	Oui: _____	Oui: _____	Oui: _____
20. Combien de filet par jour pêchiez-vous durant le reste de la saison d'automne de:	_____	_____	_____

Les questions suivantes porteront seulement sur l'automne de cette année.

21. Quelle est la grandeur de mailles de filets que vous avez utilisés:
(# de filets pour chaque grandeur)
- 2" _____
- 2 1/4" _____
- 2 1/2" _____
- 2 3/4" _____
- 3" _____
- Autre Autre (spécifiez) _____
- _____

22. En moyenne, quelles sont les dimensions d'un filet individuel:
- Longueur (brasse): _____
- Profondeur (maille): _____

23. Est-ce que vous avez gardé une partie de votre prise pour des fins personnels ou de la boette durant l'automne de 1985? Non:
- Pouvez-vous nous donner un pourcentage? Oui: _____ %

24. Durant l'automne de 1985 est-ce que vous avez dû jeter une partie de vos prises: Non:
- Oui: _____ %

25. Quel pourcentage de votre prise d'automne de 1985 a été acheté par des usines de transformation: % _____ %

Les questions suivantes porteront seulement sur la pêche d' Eté.

	cette année 1985	L'an passé 1984	2 ans passés 1983
26. Où avez-vous pêché durant l'été de:	_____	_____	_____
27. Environ combien de <u>jours</u> avez-vous pêché:	_____	_____	_____
28. Combien de <u>jours</u> avez-vous pêché durant la période de capture forte:	_____	_____	_____
29. Durant la période de capture forte combien de filets par jour avez-vous pêché en:	_____	_____	_____
30. Est-ce que vous avez relevé vos filet plus d'une fois par journée durant la période de capture forte de l'automne en: Combien de fois par jour?	Non: <input type="text"/>	Non: <input type="text"/>	Non: <input type="text"/>
	Oui: _____	Oui: _____	Oui: _____
31. Combien de filet par jour pêchiez-vous durant le reste de la saison d'automne de:	_____	_____	_____

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Les questions suivantes porteront seulement sur l'été de cette année.

32. Quelle est la grandeur de mailles de filets que vous avez utilisés: 2" _____
(# de filets pour chaque grandeur) 2 1/4" _____
2 1/2" _____
2 3/4" _____
3" _____

Autre Autre (spécifiez) _____

33. En moyenne, quelles sont les dimensions d'un filet individuel: Longueur (brasse): _____
Profondeur (maille): _____

34. Est-ce que vous avez gardé une partie de votre prise pour des fins personnels ou de la boette Non:
durant l'automne de 1985? Oui: _____ %
Pouvez-vous nous donner un pourcentage? Oui: _____ %

35. Durant l'automne de 1985 est-ce que vous avez dû jeter une partie de vos prises: Non:
Oui: _____ %

36. Quel pourcentage de votre prise d'automne de 1985 a été acheté par des usines de transformation: _____ %

C'est la fin du questionnaire et nous vous remercions de votre temps et assistance. Nous allons préparer un rapport du sondage, seriez-vous intéressé à recevoir une copie?

Non: _____

Si oui: _____ S.V.P. nous donner votre adresse postale.

Notes: _____
