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The 1987 4T Herring Gillnet Questionnaire

by

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ABSTRACT

A telephone survey was conducted to collect information from herring gillnetters about their 1987 fishery in the southern Gulf of St. Lawrence (NAFO Division 4T). The survey gathered data on the fishing effort for abundance estimates, on mesh size distribution for determination of partial recruitment, and on disposition of the catch for validation of purchase slip information. In addition, the gillnetters were asked their opinion on the abundance of herring in 1987. Analysis of the survey indicates differences in the effort parameters from 1984 to 1987. The average number of nets fished per trip (used in the historical effort index) dropped slightly in 1987 from the previous few years. The pattern of mesh size distribution was the same in 1987 as in 1986. In the spring fishery, some areas sold more of their catch to processors than in 1986, while others sold less. In the fall fishery, generally more was sold to the processors than in 1986. Gillnetters fishing in the fall felt that herring abundance was better than average, while gillnetters fishing in the spring felt that abundance in 1987 was slightly better than average.

RESUME

Un sondage téléphonique a été réalisé auprès des pêcheurs de hareng au filet maillant afin d'obtenir des renseignements sur la pêche de 1987 dans la partie sud du golfe du Saint-Laurent (division 4T et l'OPANO). Ce sondage avait pour but de recueillir des données sur l'effort de pêche, servant à établir des estimations de l'abondance des données sur la répartition des diverses longueurs de maille, pour déterminer le recrutement partiel, ainsi que des données sur l'écoulement des prises, qui permettent de valider les renseignements contenus sur les fiches de débarquements. De plus, on demandait aussi aux pêcheurs leur opinion sur l'abondance du hareng en 1987. L'analyse des résultats révèle des différences dans l'effort de pêche entre 1984 et 1987. Le nombre moyen de filets employés par voyage (utilisé pour calculer l'indice d'effort chronologique) a légèrement diminué en 1987 par rapport aux quelques années antérieures. La répartition des diverses longueurs de maille est demeurée la même qu'en 1986. Certains secteurs ont vendu une plus grande partie des prises de la pêche de printemps aux transformateurs qu'en 1986, tandis que d'autres en ont vendu moins. Pour ce qui est de la pêche d'automne, on a généralement vendu plus de hareng aux transformateurs qu'en 1986. Les pêcheurs au filet maillant qui ont pratiqué la pêche d'automne estimaient que l'abondance de hareng était supérieure à la moyenne et ceux qui ont pratiqué la pêche de printemps signalaient une abondance légèrement supérieure à la moyenne.

INTRODUCTION

Since 1985, herring gillnetters in the Gulf of St. Lawrence have been interviewed annually to obtain information about the distribution and intensity of fishing effort, the sizes and distribution of meshes fished, and the disposition of the catch. The objective of the survey essentially has not changed, but each year some changes are made. This year the changes were:

1. abundance indices were estimated,
2. more areas were included, and
3. soak time was estimated.

METHODS AND ANALYSIS

Sample Selection

The southern Gulf of St. Lawrence coastline was divided into eight areas of major herring gillnet fishing activity (Table 1, Figure 1). The Magdalen Islands was included in the survey (as in 1985), whereas in 1986 it was excluded. A further difference from previous surveys was the inclusion of gillnetters from Cape Breton with those from Gulf Nova Scotia. For the Maritime Provinces, lists of licenced gillnetters were compared to purchase slip records to obtain a list of active gillnetters for 1987. A systematic random sample was drawn from this list to obtain a sample with numbers in each area proportional to the number of active gillnetters. For Quebec and the Magdalen Islands, purchase slips were not available, so random samples were chosen from the lists of licenced gillnetters. Table 2 summarizes gillnet statistics for 1987.

The interviews were conducted by telephone in the official language of the gillnetters' choice, during December 1987 and January 1988. Each respondent was given up to three telephone calls to be contacted.

The Questionnaire

The interview was divided into five sections (detailed in appendix A):

1. The first set of questions 'located' the respondents in the fishery. The status of the respondents was verified - that they were active herring gillnetters in 1987; the number of nets owned was asked (to prevent confusion over how many were used as opposed to owned); and the seasons fished were recorded.
2. The second set of questions dealt with fishing effort. For each season fished respondents were asked:
 - their 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 non-peak

- the length of time the nets rested in the water before being hauled (soak time) during the peak as well as during the non-peak
- the number of times a day the nets were hauled.

Two indices of effort for each area-season combination were calculated and compared to those from previous surveys:

- i. The average number of net-hauls per gillnetter (NHF).
- ii. The average number of net-hauls per trip (NHT).

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

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

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

h_j = number of hauls/day for resp. j in area-season i

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

Overall indices for 4T were calculated by weighting the area averages by the landed catch (Table 2). In previous surveys, the total number of net-hauls per area also was calculated. But this calculation is based on an estimate of the number of active gillnetters in each area, and because this estimate is not comparable for the Maritime Provinces and the Quebec areas (the sample frames are different), the calculation was not made this year.

3. For each season fished, the types of gillnets fished, average length of a net, and mesh sizes and numbers of nets for each mesh size fished were determined.

4. For each season fished, the catch and percent of the catch that was kept for bait, dumped, or sold to processors were recorded.

5. The respondents were asked the number of years they had fished with gillnets in the Gulf of St. Lawrence. In addition, they were asked two questions about how they felt about the abundance of herring. The first question asked gillnetters to rate the abundance of herring in 1987 on a scale of 1 to 10, assuming that 5 is average abundance. The second question asked respondents to compare herring abundance in 1987 versus 1986. On a scale of 1 to 10, compared with 1986, the responses mean:

- 0 = abundance was much less in 1987 than 1986
- $2\frac{1}{2}$ = abundance was somewhat less in 1987 than in 1986
- 5 = abundance was the same in 1987 as in 1986
- $7\frac{1}{2}$ = abundance was somewhat more in 1987 than in 1986
- 10 = abundance was much more in 1987 than in 1986

RESULTS AND DISCUSSION

In total, 338 herring gillnetters were interviewed. The area-by-area breakdown of the responses (Tables 3 and 4) shows that all areas and both seasons were well covered. There appeared to be more movement between area of home port and area of fishing than in previous years, with several gillnetters fishing in more than one area in a season. This happened mostly between Quebec and the Acadian Peninsula in the fall, and between southeastern N.B. and western P.E.I. in the spring.

Effort Index Parameters

The responses to the questions concerning the intensity of effort show large differences among areas and seasons (Tables 5 and 6). Comparisons of the fishing effort for 1984-1987 are shown in Figures 2 and 3.

The number of nets fished per respondent in the spring fishery increased from 1986 in all but one area (Escuminac) in the peak season, and decreased in all but two (Quebec and Nova Scotia) in the non-peak. Escuminac and south east New Brunswick continued to use the greatest number of nets per respondent in the spring.

In the fall fishery, the number of nets fished per respondent in the peak increased from 1986 in only Nova Scotia and western P.E.I.; in the non-peak, the number of nets decreased or remained unchanged in all areas. Quebec and the Acadian Peninsula used the fewest nets in the fall.

The number of days fished per respondent during the peak of the season increased in both the spring and fall fisheries from 1986; the number of days in the non-peak decreased. The total days fished per respondent increased from 1986 in the spring in Quebec, Acadian Peninsula, and Nova Scotia, and in the fall, in the Acadian Peninsula and Nova Scotia.

There seems to be no consistent difference between soak time during the peak versus during the non-peak for the spring fishery (Figure 4, Table 7). In the spring, soak time is generally close to 24 hours, except in the Acadian Peninsula and Nova Scotia. In the fall, soak time is much less than in the spring, and is generally more during the non-peak than in the peak.

The fall fishery is more variable than the spring fishery with respect to the average number of hauls of the nets per day per respondent. In general more than one haul/day is made in the fall, while close to one/day in the spring is more the norm. Where there is a difference from 1986 for both the spring and the fall, more hauls/day/respondent were made in 1987 (Figure 5).

The effort indices for 1984 to 1987 calculated from survey results are shown in Figures 6 and 7. In the spring fishery, the two indices are consistent for the four year period for Quebec,

south east N.B., and Nova Scotia. Within the remaining areas, the indices do not show similar trends. In the fall fishery, Nova Scotia and eastern P.E.I. are the only areas with internal consistency for the two effort indices. When the area indices are weighted by landings to produce an overall Gulf index, the results show a clear trend for neither the spring nor the fall fisheries.

Abundance Indices

The effort index used in the assessment of 4T herring stocks is the average number of nets fished per trip, assuming one haul of the nets per trip and one trip per day. The overall spring Gulf averages are determined by weighting the Acadian Peninsula and a combination of the Escuminac, southeastern New Brunswick, and partial western P.E.I. averages by the landings in those areas (O'Boyle and Cleary 1981, Cleary 1983, and Chadwick and Cairns 1988). The overall fall averages are set equal to the Acadian Peninsula averages. The historic abundance index shown in Figure 8 shows a slight decrease for the spring and a more noticeable decrease for the fall from 1986.

The responses to the questions about relative abundance of herring in 1988 are shown in Figure 8. For the spring fishery, all areas except Magdalen Islands and Quebec felt that 1987 was at least a slightly better than average year (ranges from 5.5 to 6.7). As well, compared to 1986, the abundance of herring in 1987 was judged to be somewhat better (ranges 5.2 to 8.6). The gillnetters fishing in the fall are more optimistic about the abundance of herring. On a scale of 1 to 10, the overall abundance is ranked between 6 and 7.3 for all areas except the Magdalen Islands, and compared to 1986, the abundance ranges from 6.8 to 9.6, with Quebec, the Acadian Peninsula, and Escuminac viewing 1987 abundance more positively than the remaining areas.

Gillnet Mesh Size Distribution

Table 8 summarizes the mesh size composition of the fisheries for 1986 and 1987. There appears to be little change from 1986. Most nets used in the spring continue to be between 2.25 and 2.5 inch mesh, but there was a fairly wide distribution of net sizes used. In the fall, fewer mesh sizes were used, and they were generally larger than in the spring, with most of the nets being between 2.5 and 2.75 inch mesh.

The average length of net fished varied from area to area and between seasons within area (Table 9). Nova Scotia and all of P.E.I. tended to use shorter nets in the fall than in the spring, while the Acadian Peninsula and Escuminac used longer nets.

Almost all of the gillnets fished in the spring were set nets (both ends anchored to the ground) but a large percentage of those used in the fall, except in the Magdalen Islands and eastern P.E.I., were drift nets (one end attached to the boat, the other drifting free) or modified nets (one end anchored to

the ground, one end to the boat) (Table 10).

Use Of The Catch

Questions about the percent of the catch kept for personal use, sold to processors, or dumped, revealed differences from 1986. In the spring, higher proportions of the catch in the Acadian Peninsula and Nova Scotia were sold to processors. Escuminac gillnetters dumped 37% of the catch. In the fall, much more of the catch was sold than in the spring, but there was a large 'kept' percentage in the Magdalen Islands (Tables 11 and 12).

Concluding Remarks

The questionnaire elicits information about peak and non-peak gillnet fishing activity on an area-by-area basis, allowing detailed calculations of fishing effort based on the number of nets or net-hauls. Indices of abundance based on these calculations are, however, not comparable with the historical index based on the average number of nets per trip with its assumptions of one trip/day and one net-haul/trip and exclusion of some areas from the index. Calculation of effort does 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).

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

Area	Statistical Districts
Magdalen Islands	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. Herring gillnet statistics for the southern Gulf of St. Lawrence in 1987.

Area	Landings (Tonnes)		Number of Licences	Number of Boats (CFVN's)
	Spring	Fall		
Magdalen Is.	106	1	292	—
Quebec	452	3200	561	—
Acadian Pen.	3599	28668	615	315
Escuminac	3181	904	332	191
Southeast N.B.	2987	2	263	145
Nova Scotia	145	8971	343	229
East P.E.I.	24	9166	378	181
West P.E.I.	602	1052	482	144
TOTAL	11096	51964	3266	1205

Table 3. Response to the questionnaire by home area of gillnetter.

Area	Number Sampled	Number of Reports	Number of Phone, Address Problems	Number not Contacted	Number Unavailable or Uncooperative	Number not Fishing
Magdalen Is.	33	25	0	4	0	4
Quebec	50	25	0	9	3	13
Acadian Pen.	103	88	4	11	0	0
Escuminac	65	50	3	8	3	1
Southeast N.B.	39	22	2	10	3	2
Nova Scotia	81	60	5	12	3	1
East P.E.I.	48	37	3	7	0	1
West P.E.I.	44	31	3	7	1	2
Total	463	338	20	68	13	24

Table 4. Number of respondents fishing in each area in 1987.

Area	Fishing in the Spring	Fishing in the Fall
Magdalen Is.	25	2
Quebec	23	26
Acadian Pen.	62	89
Escuminac	51	4
Southeast N.B.	29	0
Nova Scotia	30	53
East P.E.I.	11	37
West P.E.I.	21	15
Total	252	226

Table 5. Effort parameters for the 1987 spring gillnet fishery (Mean \pm 1 standard deviation of the mean)

Area	No. of Days Fished			No. of Nets Fished	
	total	peak	non-peak	peak	non-peak
Magdalen Is.	19.5 \pm 2.3	3.4 \pm 2.2	16.1 \pm 2.3	4.3 \pm 0.3	-
Quebec	34.5 \pm 4.9	13.8 \pm 4.8	19.3 \pm 5.3	6.3 \pm 1.7	5.2 \pm 0.9
Acadian Pen.	18.2 \pm 1.0	14.2 \pm 1.3	3.9 \pm 1.1	6.9 \pm 1.1	5.2 \pm 1.0
Escuminac	18.3 \pm 1.7	15.8 \pm 1.8	2.5 \pm 2.7	19.0 \pm 1.4	21.4 \pm 3.4
Southeast N.B.	19.2 \pm 1.1	16.6 \pm 1.6	2.7 \pm 1.2	31.2 \pm 1.1	30.6 \pm 1.1
Nova Scotia	27.0 \pm 2.4	14.4 \pm 3.0	12.6 \pm 2.4	3.5 \pm 0.4	3.2 \pm 0.6
East P.E.I.	21.2 \pm 4.8	9.0 \pm 3.5	12.2 \pm 5.7	12.6 \pm 6.0	2.7 \pm 0.3
West P.E.I.	19.2 \pm 2.7	10.0 \pm 2.5	9.2 \pm 2.3	25.3 \pm 2.4	21.4 \pm 4.7

Table 6. Effort parameters for the 1987 fall gillnet fishery (Mean \pm 1 standard deviation of the mean)

Area	No. of Days Fished			No. of Nets Fished	
	total	peak	non-peak	peak	non-peak
Magdalen Is	5.5 \pm 4.5	0.0 \pm 0.0	5.5 \pm 4.5	0.0 \pm 0.0	7.0 \pm 5.0
Quebec	10.8 \pm 1.8	6.8 \pm 1.4	3.6 \pm 1.4	3.7 \pm 0.3	4.7 \pm 1.3
Acadian Pen.	20.1 \pm 1.0	16.8 \pm 0.8	3.5 \pm 0.8	4.6 \pm 0.1	5.4 \pm 0.6
Escuminac	8.5 \pm 3.0	8.5 \pm 3.0	0.0 \pm 0.0	9.0 \pm 1.0	0.0 \pm 0.0
Southeast N.B.	-	-	-	-	-
Nova Scotia	17.6 \pm 1.0	10.7 \pm 1.2	6.9 \pm 1.2	6.4 \pm 0.3	7.2 \pm 0.4
East P.E.I.	21.4 \pm 1.0	19.4 \pm 1.4	2.0 \pm 1.1	7.3 \pm 0.3	8.0 \pm 1.0
West P.E.I.	12.7 \pm 3.9	12.7 \pm 3.7	4.1 \pm 2.6	7.2 \pm 0.7	5.3 \pm 1.5

Table 7. Soak time (hours) in the 1987 gillnet fishery (Mean \pm 1 standard deviation of the mean)

Area	Spring		Fall	
	peak	non-peak	peak	non-peak
Magdalen Is.	20.0 \pm 4.0	24.0 \pm 0.0	-	-
Quebec	24.0 \pm 0.0	22.3 \pm 1.2	1.9 \pm 0.6	10.9 \pm 3.6
Acadian Pen.	17.1 \pm 1.0	14.8 \pm 1.6	2.2 \pm 0.3	4.3 \pm 1.3
Escuminac	20.8 \pm 0.9	22.3 \pm 1.7	1.8 \pm 1.2	-
Southeast N.B.	23.3 \pm 0.7	24.0 \pm 0.0	-	-
Nova Scotia	19.7 \pm 1.6	18.3 \pm 1.9	2.0 \pm 0.3	3.2 \pm 0.6
East P.E.I.	24.0 \pm 0.0	22.0 \pm 2.0	1.4 \pm 0.1	1.3 \pm 0.4
West P.E.I.	20.8 \pm 1.6	22.8 \pm 1.2	7.3 \pm 2.8	13.0 \pm 6.1

Table 8. Percentage of each mesh size used (inches)
in the 4T herring gillnet fishery

1986 SPRING											
Area	<2"	2.13	2.19	2.25	2.31	2.38	2.5	2.63	2.75	2.88	>3
Mag Is											
Que		4		25		2.6	21	36.8	9.2		1.3
Ac Pen				10	1.8	33.8	37	12	2.7	2.7	
Esc	3	0.8		77.8	4.9	5.7	3.6	2.3	2		
SeNB		1	3.3	85.8		7			3		
NS				10		28	32	30			
E PEI				66.7		4.2	4.2	16.7		8.3	
W PEI	5.9	6.2	2.7	50.2	4.2	17.5		3.9	1.2	8.	0.2
1987 SPRING											
Area	<2"	2.13	2.19	2.25	2.31	2.38	2.5	2.63	2.75	2.88	>3
Mag Is				19		20.3	27.5	22.2	10.5	0.7	
Que	7.5	1.7		35.3		5.9	8.4	21	16.8		3.4
Ac Pen	2.2	1.1		15.4		47.1	21.8	8.5	3.3	0.6	
Esc	4.5	0.8		82.2	0.7	6.9			1.9	2.9	
SeNB		1.5		95.8		2.7					
NS				11.7		6.8	15.5	61.2	4.9		
E PEI				70.9		10.1	7.6	7.6		3.8	
W PEI		6.6		61.7	9.8	16.5	0.4	2.3		2.7	
1986 FALL											
Area	<2"	2.13	2.19	2.25	2.31	2.38	2.5	2.63	2.75	2.88	>3
Mag Is											
Que				3.6		3.6	27.3	65.5			
Ac Pen	0.4					1		73.4	13.7	8.2	3.3
Esc								85.7	7.1	7.1	
SeNB											
NS						3.6	8.9	83.5	3.2	0.8	
E PEI	13.2						1.9	85.1			
W PEI						4	43	40		13	
1987 FALL											
Area	<2"	2.13	2.19	2.25	2.31	2.38	2.5	2.63	2.75	2.88	>3
Mag Is							92.9		7.1		
Que	4.1	1.4		1.4			6.9	84.1	2.1		
Ac Pen								94.5	2.3	3.2	
Esc							8.3	91.7			
SeNB											
NS				0.3				84.2	13.4	2.1	
E PEI	3.1							96.9			
W PEI						2.7		85.6	1.8	9.9	

Table 9. Length of gillnets used in the 1987 herring fishery (Fathoms).

Area	Spring	Fall
Magdalen Is.	17.3	17.0
Quebec	21.4	22.0
Acadian Pen.	16.1	20.6
Escuminac	18.1	25.0
Southeast N.B.	21.8	—
Nova Scotia	26.4	22.3
East P.E.I.	19.1	16.8
West P.E.I.	17.8	15.5

Table 10. Percent distribution of gillnet types used in the 1987 herring fishery.

Area	Spring		Fall	
	Set	Drift+Modified	Set	Drift+Modified
Magdalen Is.	100	0	100	0
Quebec	100	0	72	28
Acadian Pen.	99	1	40	60
Escuminac	100	0	0	100
Southeast N.B.	100	0	—	—
Nova Scotia	81	20	89	11
East P.E.I.	100	0	100	0
West P.E.I.	100	0	52	48

Table 11. Percentage use of the 1986 and 1987 herring spring gillnet catch.

Area	1986			Spring			1987		
	Kept	Dumped	Sold to processors	Kept	Dumped	Sold to processors	Kept	Dumped	Sold to processors
Magdalen Is.	—	—	—	100.0	0.0	0.0	100.0	0.0	0.0
Quebec	30.6	0.9	68.4	68.1	0.0	31.9	68.1	0.0	31.9
Acadian Pen.	45.7	6.7	47.3	21.2	0.0	78.8	21.2	0.0	78.8
Escuminac	4.8	20.9	74.7	7.7	36.9	55.4	7.7	36.9	55.4
Southeast N.B.	5.4	4.5	86.1	13.0	1.0	86.0	13.0	1.0	86.0
Nova Scotia	83.9	0.0	16.1	60.0	0.0	40.0	60.0	0.0	40.0
East P.E.I.	100.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0
West P.E.I.	57.3	3.8	38.9	57.9	4.0	38.2	57.9	4.0	38.2

Table 12. Percentage use of the 1986 and 1987 herring fall gillnet catch.

Area	1986			Fall			1987		
	Kept	Dumped	Sold to processors	Kept	Dumped	Sold to processors	Kept	Dumped	Sold to processors
Magdalen Is.	—	—	—	95.7	0.0	4.3	95.7	0.0	4.3
Quebec	19.5	4.8	76.0	0.5	0.2	99.3	0.5	0.2	99.3
Acadian Pen	3.1	0.6	87.7	0.0	0.1	99.9	0.0	0.1	99.9
Escuminc	100.0	0.0	0.0	3.0	0.0	97.0	3.0	0.0	97.0
Southeast N.B.	—	—	—	—	—	—	—	—	—
Nova Scotia	0.0	0.0	100.0	0.0	0.4	99.7	0.0	0.4	99.7
East P.E.I.	0.1	0.0	99.0	2.2	0.2	97.6	2.2	0.2	97.6
West P.E.I.	67.6	6.1	26.3	9.5	0.0	90.5	9.5	0.0	90.5

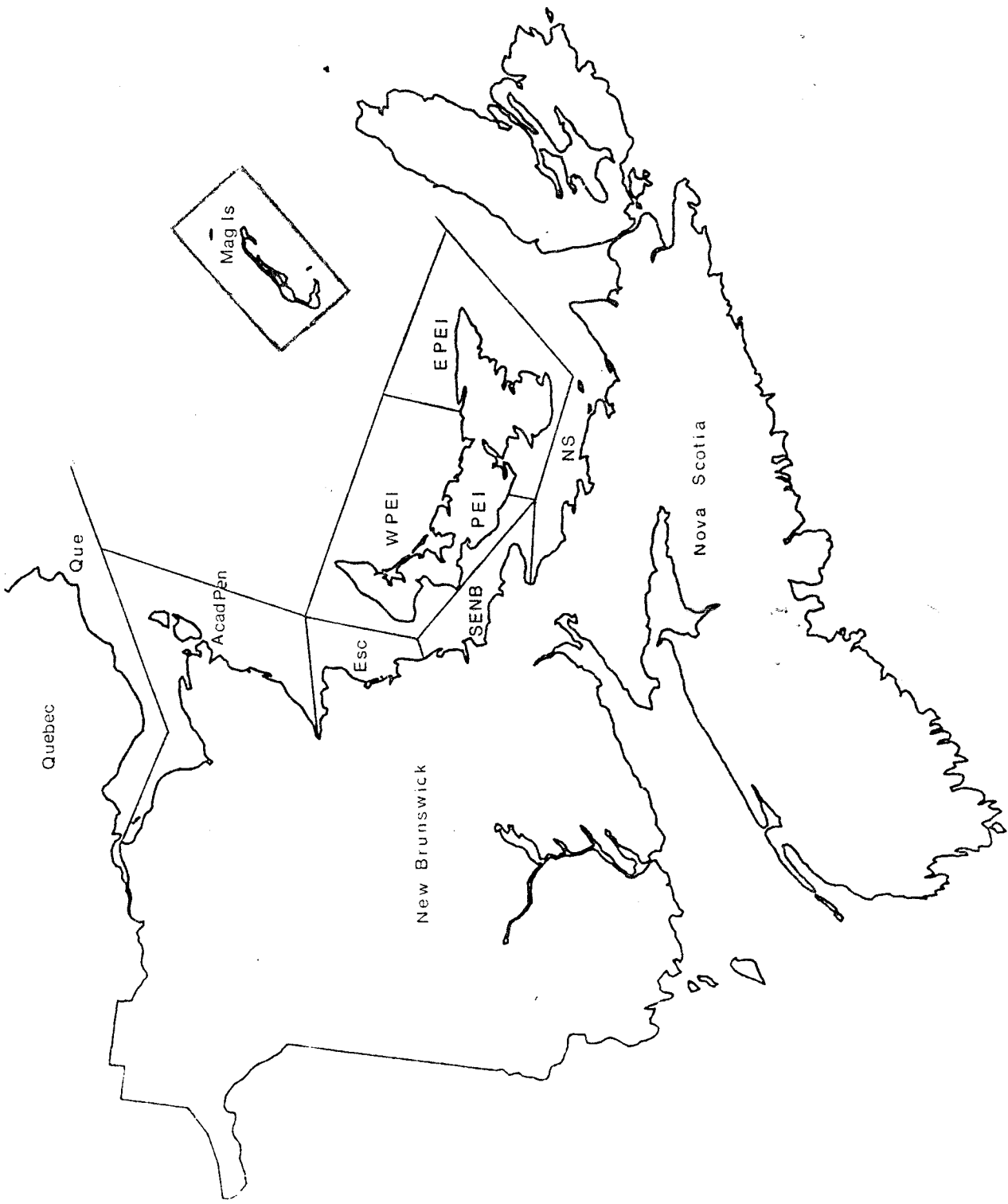
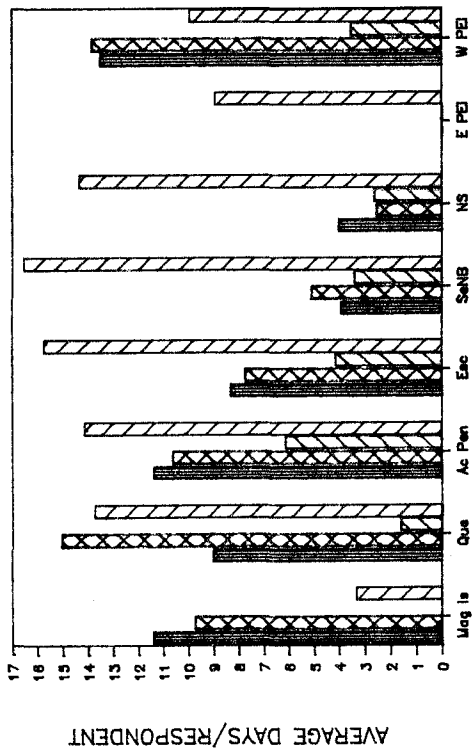
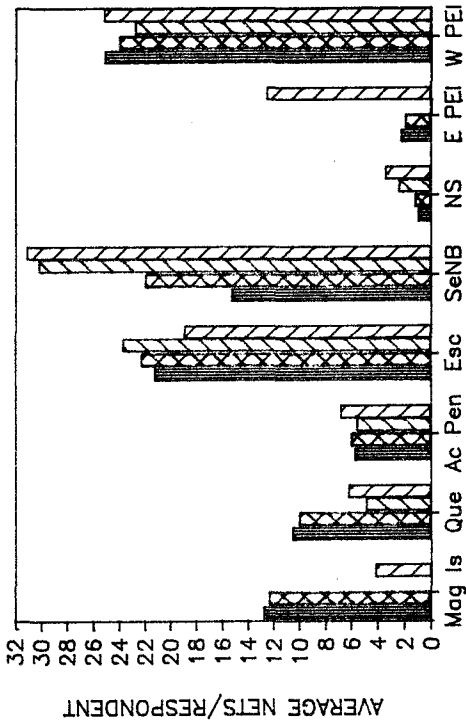


Figure 1. Geographic division of the southern Gulf of St. Lawrence used in the 1987 herring gillnet survey

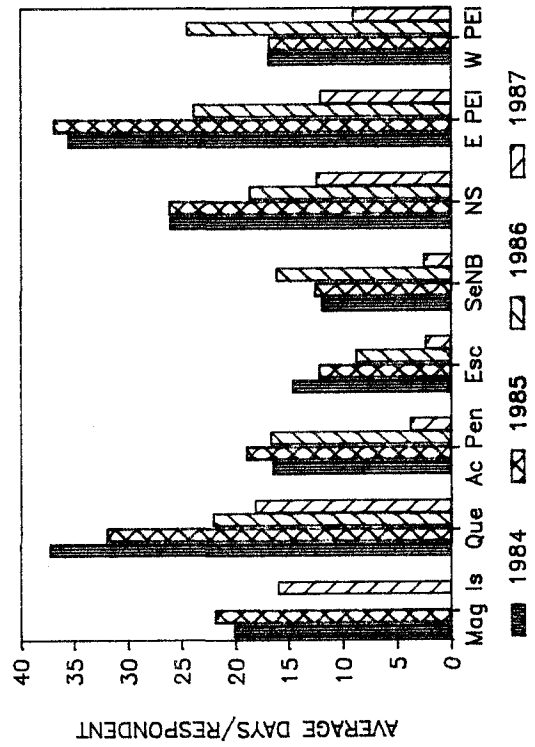
DAYS FISHING DURING THE PEAK PERIOD



NETS FISHED DURING THE PEAK PERIOD



DAYS FISHING DURING THE NON-PEAK PERIOD



NETS FISHED DURING THE NON-PEAK PERIOD

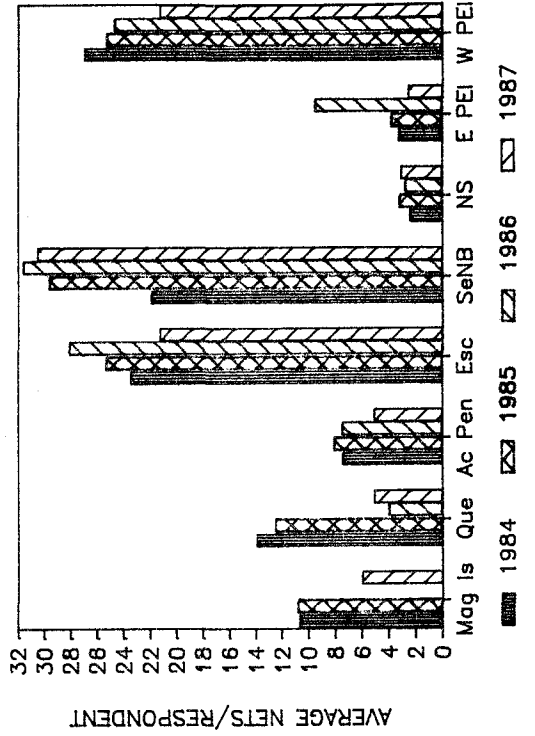
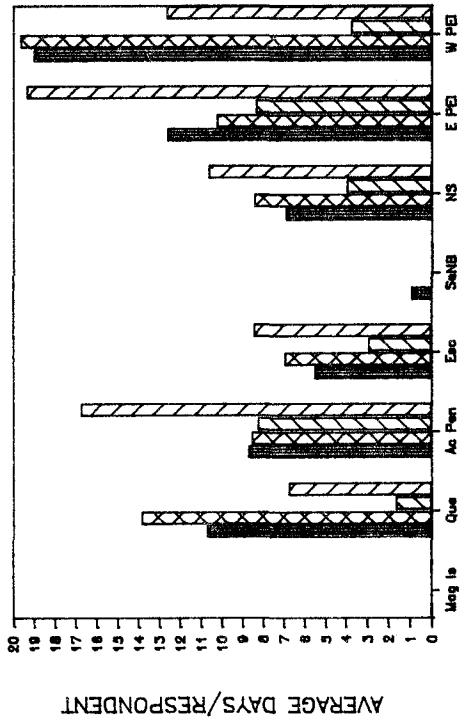
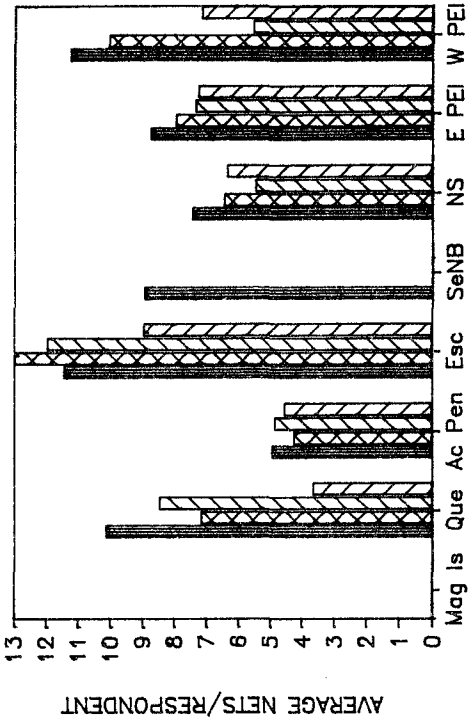


Figure 2. Effort parameters for 4T Spring fishery

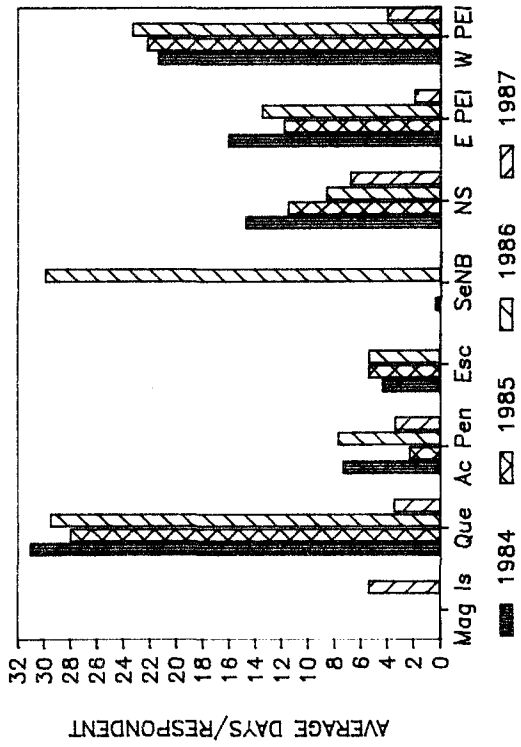
DAYS FISHING DURING THE PEAK PERIOD



NETS FISHED DURING THE PEAK PERIOD



DAYS FISHING DURING THE NON-PEAK PERIOD



NETS FISHED DURING THE NON-PEAK PERIOD

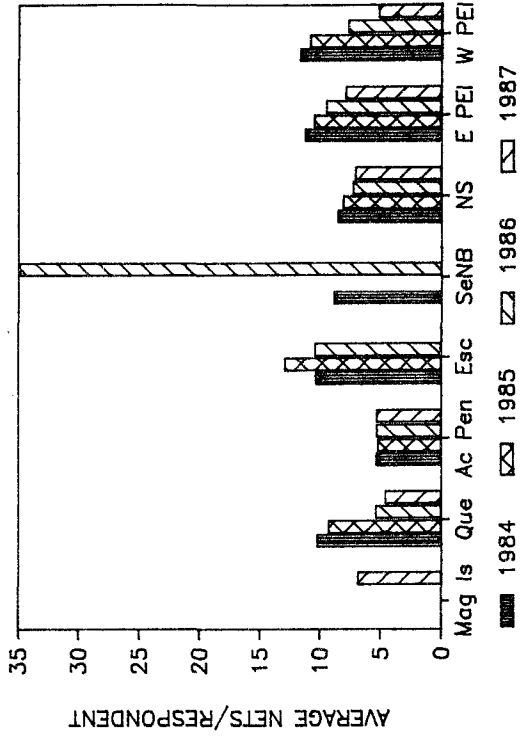
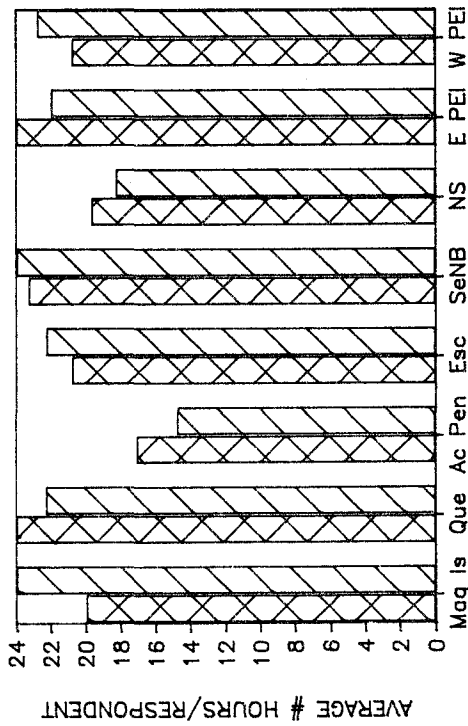
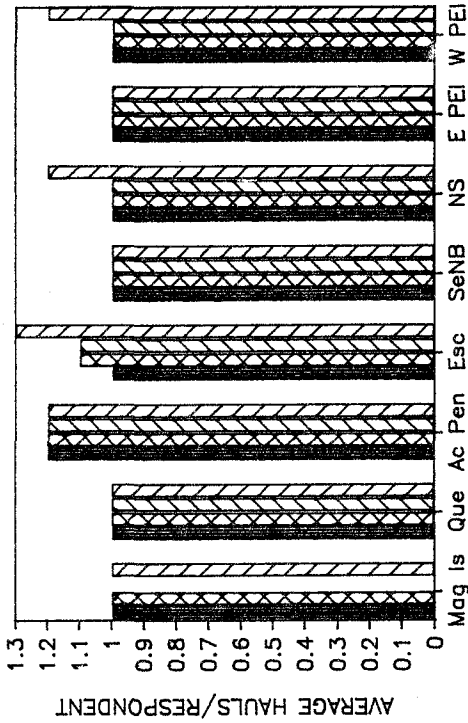


Figure 3. Effort parameters for 4T Fall fishery

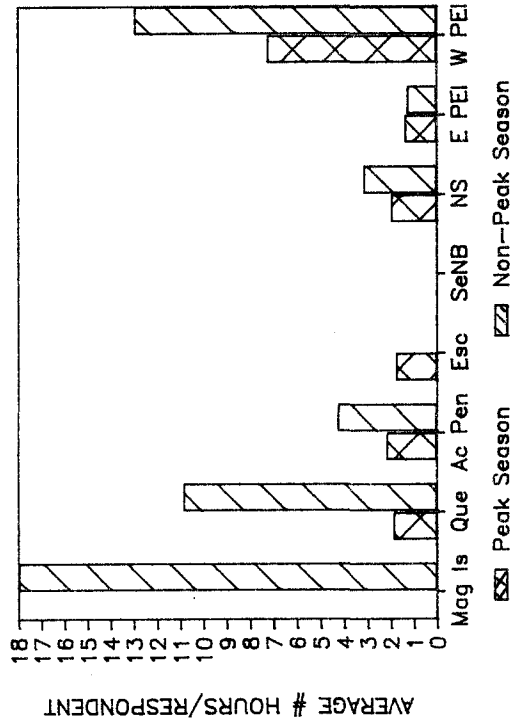
NET SOAK TIME IN THE SPRING FISHERY



HAULS/DAY DURING THE SPRING FISHERY



NET SOAK TIME IN THE FALL FISHERY



HAULS/DAY DURING THE FALL FISHERY

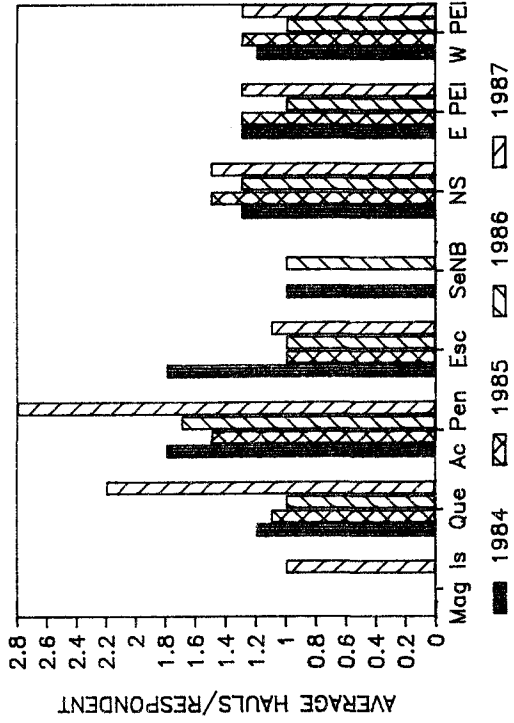
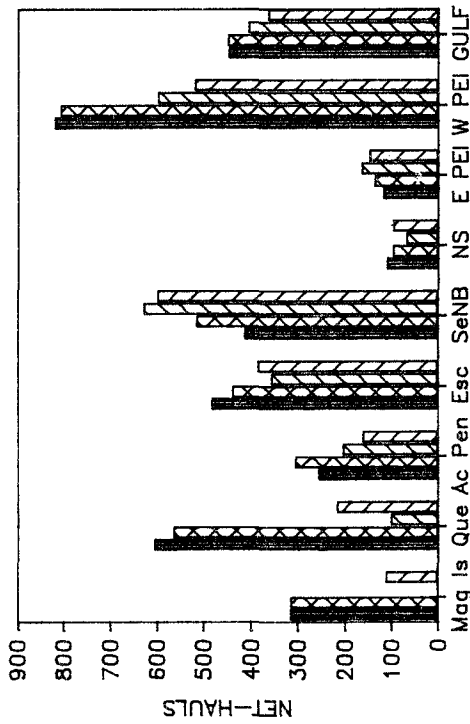


Figure 4 . Soak time (Hrs) in 1987

Figure 5 . Number of hauls/day

NET-HAULS/GILLNETTER



NET-HAULS/TRIP

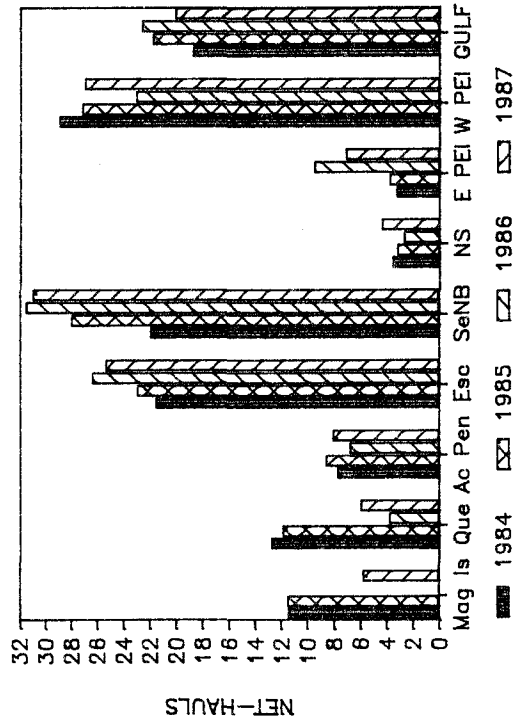
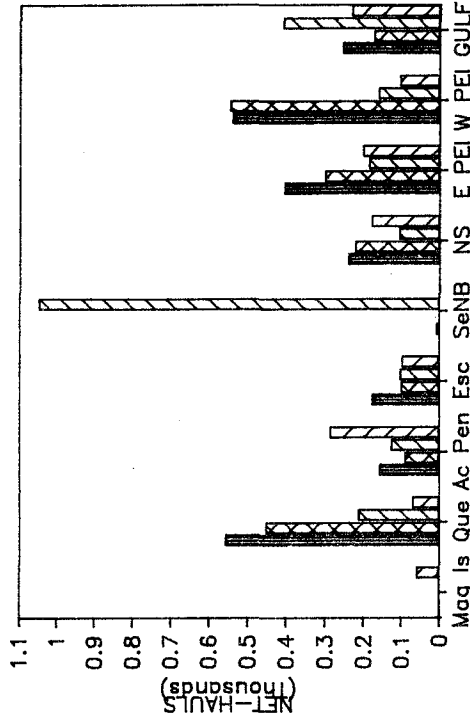


Figure 6 . Effort expended in the Spring Season

NET-HAULS/GILLNETTER



NET-HAULS/TRIP

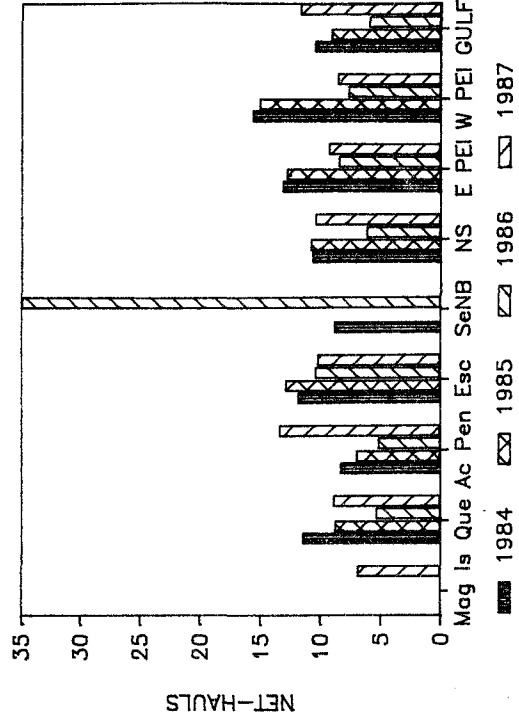
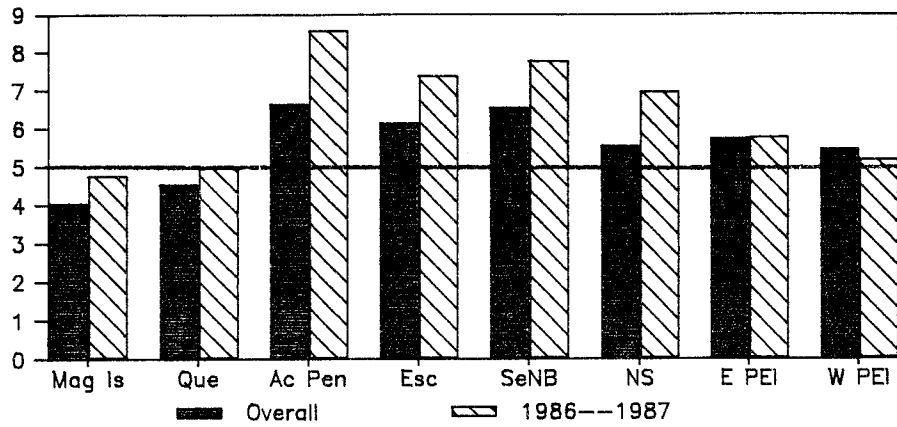
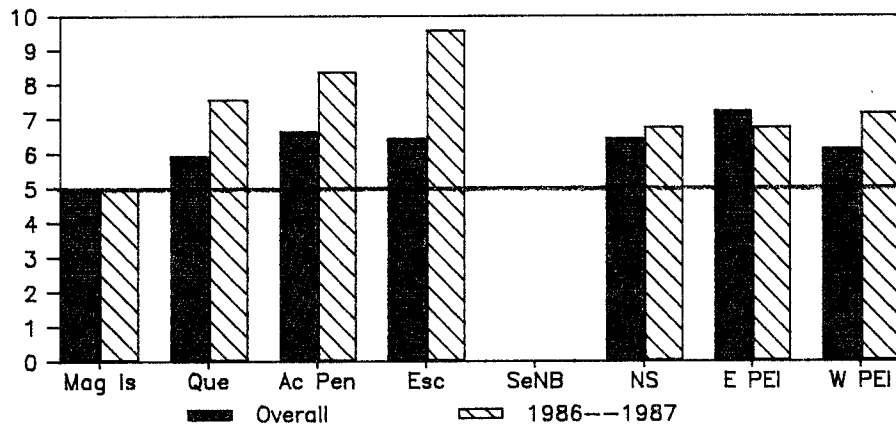


Figure 7. Effort expended in the Fall Season

Gillnetters' Indices of Abundance Spring



Gillnetters' Indices of Abundance Fall



**Historical Index of Abundance
Number of Nets/Trip**

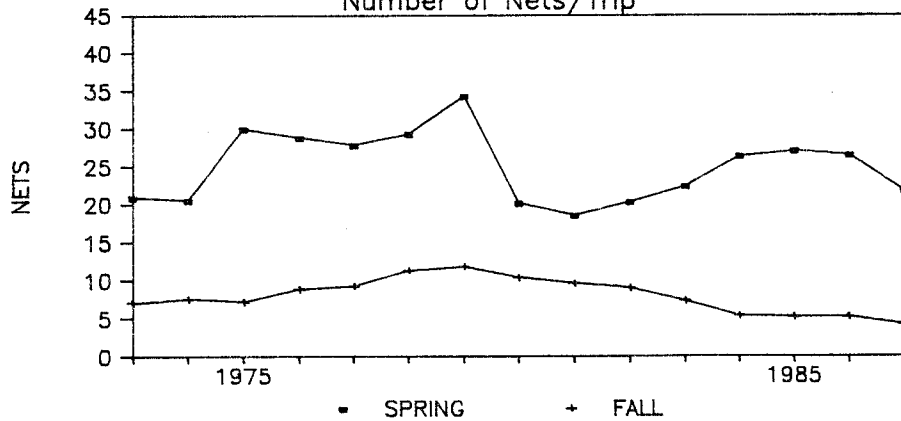


Figure 8. Abundance Indices in the 4T herring Fishery

APPENDIX A

HERRING GILLNET QUESTIONNAIRE 1987

Interviewer _____

Home Stat Dist _____

Date _____

Resp I.D. _____

Record # 1

1. Did you fish herring with gillnets in 1987? YES _____
NO _____ (If NO, then end of the questionnaire)

2. How many gillnets do you own? _____

=====

3. Did you fish herring in the spring in 1987? YES _____ (S)
NO _____ (If NO, then go to question 22)

(location 1)

(location 2)

4. Where did you fish herring in the spring? _____ () _____ ()

5. How many days did you fish in (each location)? _____

6. Would you say there was a 'peak' in the season (ie. a time when the catches were really good)? YES _____ NO _____ YES _____ NO _____

=====

IF A 'PEAK' WAS IDENTIFIED:

7. About how many days did you fish during the peak? _____

8. How many nets did you fish per day during the peak? _____

9. On average, how many hours did your nets stay in the water during the peak period before you hauled them? _____

10. How many nets did you fish per day in the non-peak? _____

11. On average, how many hours did your nets stay in the water during the non-peak period before you hauled them? _____

=====

IF A 'PEAK' WAS NOT IDENTIFIED:

12. How many nets did you fish per day? _____

13. On average, how many hours did your nets stay in the water during the peak period before you hauled them? _____

=====

HERRING GILLNET QUESTIONNAIRE 1987

Interviewer _____

Home Stat Dist _____

Date _____

Resp I.D. _____

Record # 2

=====

22. Did you fish herring in the fall in 1987? YES ___ (F)
NO ___ (If NO, then end of the questionnaire)

(location 1)

(location 2)

23. Where did you fish herring in the fall? _____ () _____ ()

24. How many days did you fish in (each location)? _____

25. Would you say there was a 'peak' in the season (ie. a time when the catches were really good)? YES ___ NO ___

=====

IF A 'PEAK' WAS IDENTIFIED:

26. About how many days did you fish during the peak? _____

27. How many nets did you fish per day during the peak? _____

28. On average, how many hours did your nets stay in the water during the peak period before you hauled them? _____

29. How many nets did you fish per day in the non-peak? _____

30. On average, how many hours did your nets stay in the water during the non-peak period before you hauled them? _____

=====

IF A 'PEAK' WAS NOT IDENTIFIED:

31. How many nets did you fish per day? _____

32. On average, how many hours did your nets stay in the water during the non-peak period before you hauled them? _____

=====

33. How many times each day did you empty your nets? _____

34. What is the average length of a single gillnet that you used? _____ fathoms _____ fathoms

35. What are the numbers and sizes of nets that you used in the fall?	mesh (in)	# nets	type (set/drift) modified	mesh (in)	# nets	type (set/drift) modified
	_____	_____	_____	_____	_____	_____
(A set net is one that is anchored to the ground at both ends)	_____	_____	_____	_____	_____	_____
(A drift net is one that is anchored to the boat at one end)	_____	_____	_____	_____	_____	_____
(A modified net is one that is anchored one end to ground, and one end to the boat)	_____	_____	_____	_____	_____	_____

36. How many barrels of herring did you catch during the fall season? _____ barrels = _____ lbs _____ barrels = _____ lbs

37. Approximately how much of your herring catch

-did you keep for personal use or bait?	_____ lbs = _____ %	_____ lbs = _____ %
-did you sell to processors?	_____ lbs = _____ %	_____ lbs = _____ %
-were you forced to dump?	_____ lbs = _____ %	_____ lbs = _____ %

38. The Department of Fisheries and Oceans is interested in whether gillnetters think that herring are becoming more abundant or less abundant. First of all, how long have you been fishing herring in your area in the fall? _____ yrs.

=====

IF FISHING FOR TWO OR MORE YEARS:

39. We would like you to compare the abundance of herring in this year's fall fishery with abundance in last year's fall fishery.

Would you say that herring this year are: more abundant _____ -> much more _____
 little more _____
 about the same _____
 less abundant _____ -> much less _____
 little less _____ ()

=====

40. On a scale of 1 to 10, considering 5 as an average year, how would you rate this year's abundance of herring?

B:\>

QUESTIONNAIRE - HARENG 1987

Interviewer _____

Home Stat Dist _____

Date _____

Resp I.D. _____

Record # 1

1. Avez-vous peche le hareng en 1987 a l'aide de filets maillants? OUI _____
NON _____ (Si NON, c'est le fin de questionnaire)

2. Combien de filets maillants possédez-vous? _____

3. Avez-vous peche le hareng durant le printemps en 1987? OUI _____
NON _____ (Si NON, question 22)

(location 1)

(location 2)

4. Ou avez-vous peche durant le printemps? _____ () _____ ()

5. Combien de jours avez-vous peche (chaque endroit)? _____

6. D'apres vous est-ce qu'il y a eu une periode de capture forte (ie. une periode lorsque les prises etaient bonnes)? OUI _____ NON _____

SI UNE PERIODE DE CAPTURE FORTE A ETE IDENTIFIE:

7. Combien de jours avez-vous peche durant la periode de capture forte? _____

8. Combien de filets par jour avez-vous peches durant la periode de capture forte? _____

9. Durant la periode de capture forte, pendant combien d'heures par moyenne est-ce que vos filets ont reste dans l'eau avant qu'ils soient retires? _____

10. Combien de filets par jour avez-vous peches durant le reste de la saison? _____

11. Durant le reste de la saison, pendant combien d'heures par moyenne est-ce que vos filets ont reste dans l'eau avant qu'ils soient retires? _____

SI UNE PERIODE DE CAPTURE FORTE N'A PAS ETE IDENTIFIE:

12. Combien de filets par jour avez-vous peches? _____

13. Par moyenne, pendant combien d'heures est-ce que vos filets ont reste dans l'eau avant qu'ils soient retires? _____

14. Combien de fois par journee avez-vous releve vos filets? _____

15. Quelle etait la longueur moyenne d'un filet maillant que vous utilisiez? _____ brasses _____ brasses

16. Quelle est la grandeur de mailles des filets et le nombre de filets ce chaque grandeur que vous avez utilisee?

	maille (po)	# filets	type (ancre/derivant modifie)	maille (po)	# filets	type (ancre/derivant modifie)
	_____	_____	_____	_____	_____	_____
(Un filet ancre en est un qui est ancre au fond a chaque bout)	_____	_____	_____	_____	_____	_____
(Un filet derivant est un qui est attache au bateau a un bout)	_____	_____	_____	_____	_____	_____
(Un filet modifie en est un qui est ancre au fond a un bout, et attache au bateau a l'autre)	_____	_____	_____	_____	_____	_____

17. Combien de hareng avez-vous pris? _____ barils = _____ poids _____ barils = _____ poids

18. Quel pourcentage de votre prise de hareng

- avez-vous garde pour des fins personnels _____ poids = _____ % _____ poids = _____ %
ou de la boette?
- avez-vous vendu aux usines de transformation? _____ poids = _____ % _____ poids = _____ %
- avez-vous du jeter? _____ poids = _____ % _____ poids = _____ %

19. Le Ministere de Peches et Oceans veut savoir si les pecheurs a filet maillant considerent que le hareng devient plus abondant ou moins abondant. Tout d'abord, depuis combien de temps avez-vous peche du hareng dans votre region durant l'automne? _____ ans.

=====

SI LE REpondant A PEche LE HARENG DEPUIS DEUX ANS OU PLUS:

20. Pourriez-vous faire une comparaison de l'abondance du hareng dans la peche de ce printemps avec l'abondance du hareng dans la peche du printemps dernier.

Est-ce que vous diriez que l'hareng ce printemps est plus abondant _____ -> beaucoup plus abondant _____
un peu plus abondant _____

a peu pres la meme _____

moins abondant _____ -> beaucoup moins abondant _____
un peu moins abondant _____ ()

=====

21. Sur une echelle de 1 a dix, avec 5 comme annee moyenne, sur quel point de l'echelle est-ce que vous placeriez l'abondance du hareng cette annee? _____

QUESTIONNAIRE - HARENG 1987

Interviewer _____

Home Stat Dist _____

Date _____

Resp I.D. _____

Record # 2

22. Avez-vous peche le hareng durant l'automne en 1987? OUI _____
 NON _____ (Si NON, c'est la fin de la questionnaire)

(location 1)

(location 2)

23. Ou avez-vous peche durant l'automne? _____ () _____ ()

24. Combien de jours avez-vous peche (chaque endroit)? _____

25. D'apres vous est-ce-qu'il y a eu une periode de capture forte (ie. une periode lorsque les prises etaient bonnes)?
 OUI _____ OUI _____
 NON _____ NON _____

=====

SI UNE PERIODE DE CAPTURE FORTE A ETE IDENTIFIE:

26. Combien de jours avez-vous peche durant la periode de capture forte? _____

27. Combien de filets par jour avez-vous peches durant la periode de capture forte? _____

28. Durant la periode de capture forte, pendant combien d'heures par moyenne est-ce que vos filets ont reste dans l'eau avant qu'ils soient retires? _____

29. Combien de filets par jour avez-vous peches durant le reste de la saison? _____

30. Durant le reste de la saison, pendant combien d'heures par moyenne est-ce que vos filets ont reste dans l'eau avant qu'ils soient retires? _____

=====

SI UNE PERIODE DE CAPTURE FORTE N'A PAS ETE IDENTIFIE:

31. Combien de filets par jour avez-vous peches? _____

32. Par moyenne, pendant combien d'heures est-ce que vos filets ont reste dans l'eau avant qu'ils soient retires? _____

=====

33. Combien de fois par journee avez-vous releve vos filets? _____

34. Quelle etait la longueur moyenne d'un filet maillant que vous utilisiez? _____ brasses _____ brasses

35. Quelle est la grandeur de mailles des filets et le nombre de filets ce chaque grandeur que vous avez utilisee?	maille (po)	# filets	type (ancre/derivant modifie)	maille (po)	# filets	type (ancre/derivant modifie)
(Un filet ancre en est un qui est ancre au fond a chaque bout)	_____	_____	_____	_____	_____	_____
(Un filet derivant est un qui est attache au bateau a un bout)	_____	_____	_____	_____	_____	_____
(Un filet modifie en est un qui est ancre au fond a un bout, et attache au bateau a l'autre)	_____	_____	_____	_____	_____	_____

36. Combien de hareng avez-vous pris? _____ barils = _____ poids _____ barils = _____ poids

37. Quel pourcentage de votre prise de hareng

- avez-vous garde pour des fins personnels _____ poids = _____ % _____ poids = _____ %
ou de la boette?
- avez-vous vendu aux usines de transformation? _____ poids = _____ % _____ poids = _____ %
- avez-vous du jeter? _____ poids = _____ % _____ poids = _____ %

38. Le Ministere de Peches et Oceans veut savoir si les pecheurs a filet maillant considerent que le hareng devient plus abondant ou moins abondant. Tout d'abord, depuis combien de temps avez-vous peche du hareng dans votre region durant l'automne? _____ ans.

=====

SI LE REpondant A PEche LE HARENG DEPUIS DEUX ANS OU PLUS:

39. Pourriez-vous faire une comparaison de l'abondance du hareng dans la peche de cet automne avec l'abondance du hareng dans la peche de l'automne dernier.

Est-ce que vous diriez que l'hareng cet automne est plus abondant _____ -> beaucoup plus abondant _____
un peu plus abondant _____

a peu pres la meme _____

moins abondant _____ -> beaucoup moins abondant _____
un peu moins abondant _____ ()

=====

40. Sur une echelle de 1 a dix, avec 5 comme annee moyenne, sur quel point de l'echelle est-ce que vous placeriez l'abondance du hareng cette annee? _____