

Not to be cited without
permission of the authors¹

Canadian Atlantic Fisheries
Scientific Advisory Committee

CAFSAC Research Document 90/91

Ne pas citer sans
autorisation des auteurs¹

Comité scientifique consultatif des
pêches canadiennes dans l'Atlantique

CSCPCA Document de recherche 90/91

The 1989 4T Herring Gillnet Questionnaire

by

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

¹This series documents the scientific basis for fisheries management advice in Atlantic Canada. As such, it addresses the issues of the day in the time frames required and the Research Documents it contains are not intended as definitive statements on the subjects addressed but rather as progress reports on ongoing investigations.

Research Documents are produced in the official language in which they are provided to the Secretariat by the author.

¹Cette série documente les bases scientifiques des conseils de gestion des pêches sur la côte atlantique du Canada. Comme telle, elle couvre les problèmes actuels selon les échéanciers voulus et les Documents de recherche qu'elle contient ne doivent pas être considérés comme des énoncés finals sur les sujets traités mais plutôt comme des rapports d'étape sur les études en cours.

Les Documents de recherche sont publiés dans la langue officielle utilisée par les auteurs dans le manuscrit envoyé au secrétariat.

ABSTRACT

A telephone survey was conducted to collect information from herring gillnetters about their 1989 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 1989. The average number of nets fished per trip (used in the historical effort index) increased in the spring from 1988, but did not change in the fall. The pattern of mesh size distribution has not changed since 1984. In the spring fishery, a large proportion of the catch continued to be kept for personal use. The fall catch is generally all sold to processors. Gillnetters felt that the spring abundance of herring was about the same as in 1988 in all areas except the Magdalen Islands (lower) and southeast N.B. (higher). The fall abundance was seen to be at least as good as 1988 in all areas except east P.E.I. The spring abundance was seen to be about average while the fall abundance was seen to be a little higher than average.

RÉSUMÉ

On a effectué un sondage par téléphone pour recueillir des données sur la pêche du hareng dans le sud du golfe du Saint-Laurent (division 4T de l'OPANO) en 1989 auprès des pêcheurs au filet maillant. On a pu ainsi obtenir des renseignements sur l'effort de pêche, sur la répartition des diverses grosseurs de maille et sur le sort des prises, servant respectivement à établir des estimations de l'abondance, à déterminer le recrutement partiel et à contre-vérifier les données figurant sur les récépissés d'achat. De plus, on a sollicité l'opinion des pêcheurs au filet maillant sur l'abondance du hareng en 1989. Comparativement à 1988, le nombre moyen de filets mouillés par voyage (servant à établir l'indice d'effort historique) a augmenté au printemps, mais n'a pas changé en automne. La répartition des diverses grosseurs de maille n'a pas changé depuis 1984. Par ailleurs, une forte proportion des prises de la pêche de printemps reste réservée à l'usage personnel. Les prises d'automne sont généralement toutes vendues aux transformateurs. D'après les pêcheurs au filet maillant, l'abondance du hareng au printemps était comparable à celle de 1988 dans tous les secteurs, sauf aux îles-de-la-Madeleine (inférieure) et au sud-est du Nouveau-Brunswick (supérieure). Les pêcheurs ont également estimé que durant la pêche d'automne le hareng était au moins aussi abondant qu'à la même période de 1988 dans tous les secteurs, sauf à l'île-du-Prince-Édouard. Selon eux, l'abondance était à peu près moyenne dans la pêche du printemps et légèrement supérieure à la moyenne dans la pêche d'hiver.

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 information is used to calculate the annual index of effort for the assessment of 4T herring, as well as to understand the dynamics of the fishery. This report summarizes the results of the 1989 survey, and presents comparisons with results from previous surveys.

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). For the Maritime Provinces, lists of licenced gillnetters were compared to purchase slip records to obtain a list of active gillnetters for 1989. 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. As in previous years, purchase slips were not available for Quebec and the Magdalen Islands, so random samples were chosen from the lists of licenced gillnetters. Table 2 summarizes gillnet statistics for 1989.

The interviews were conducted by telephone in the official language of the gillnetters' choice, during January and February 1990. Each respondent was given up to three telephone calls to be contacted.

The Questionnaire

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

1. The first set of questions situated the respondents in the fishery. The status of the respondents was verified (were they active herring gillnetters in 1989?). Other questions included the number of nets owned and the season(s) fished.
2. The second set of questions dealt with fishing effort. For each season, respondents who had been active in the fishery were asked:
 - their fishing location
 - the total number of days fished and the number of days fished in the peak of the season, where the peak is defined as the part of the season (if any) when the fishing is really good
 - the number of nets used during the peak as well as during the non-peak of the season
 - the length of time the nets were immersed 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 gillnetter per day (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).

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, and 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 respondents to compare herring abundance in 1989 versus 1988. On a scale of 0 to 10, the responses mean:

- 0 = abundance was much less in 1989 than 1988
- 2½ = abundance was somewhat less in 1989 than in 1988
- 5 = abundance was the same in 1989 as in 1988
- 7½ = abundance was somewhat more in 1989 than in 1988
- 10 = abundance was much more in 1989 than in 1988

The second question asked gillnetters to rate the abundance of herring in 1989 on a scale of 1 to 10, assuming that 5 is average abundance.

RESULTS AND DISCUSSION

In total, 352 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. The total number of gillnetters fishing in the spring and fishing in the fall is greater than 352, indicating a number fishing in both seasons and/or in more than one area in a season. In general, the area of fishing is the same as the area of home port. However, there was some mixing in both the fall and the spring between gillnetters from the Acadian Peninsula and Quebec, in the spring between west P.E.I. and southeast N.B., and in the fall between Nova Scotia, Escuminac and P.E.I.

Effort 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 1984-1989 are shown in Figures 2 to 5.

Spring

The total number of days fished in the spring fishery changed greatly from 1988 only in Quebec and west P.E.I. (decreased in both areas), but the breakdown of peak vs non-peak days varies between areas. Southeast N. B. and Nova Scotia are the only areas with more peak fishing time in 1989 than in 1988.

From 1988, there were increases in Quebec and west P.E.I. and a decrease in the Magdalen Islands in the number of nets fished in the peak of the spring season. During the non-peak, there were decreases for the Acadian Peninsula, Escuminac and west P.E.I. Escuminac and southeast New Brunswick continued to use the greatest number of nets per respondent in the spring.

Fall

The total number of days fished in the fall decreased markedly in Quebec and Southeast N.B. from 1988, but the number of days fished in the peak changed only slightly in all except west P.E.I. (decreased).

For most areas, the number of nets fished in the fall season (both during the peak and during the non-peak) did not greatly change from 1988. In all areas where both a peak and a non-peak fishery existed, the number of nets fished in each was similar. This is in contrast to the spring fishery, where gillnetters may fish a different number of nets in the peak from in the non-peak. The apparent large changes in Southeast N.B. are a result of the extremely small number of gillnetters fishing there in the fall (either 0 or 1 since 1985).

Net soak and net haul parameters

Information relating to the number of hours that the nets are left in the water (soak time) and the number of times each day that the nets are emptied (hailed) are shown in Figure 6. As in the past, the net soak time in the 1989 spring fishery was very close to 24 hours (both peak and non-peak). But in the fall, except in west P.E.I., the net soak time was less than 4 hours during the peak and less than 12 hours during the non-peak. There was little change from 1988 in the spring, and change only in west P.E.I. in the fall.

The average number of hauls of the nets per day per respondent is more variable in the fall fishery than in the spring fishery. The number of hauls/day in the spring decreased from 1988 for Escuminac, Nova Scotia and east P.E.I. gillnetters. In the fall, there were decreases from 1988 in the number of hauls/day in Nova Scotia and west P.E.I.

Effort Indices

The effort indices calculated from survey results are shown in Figures 7 and 8. In both the spring and the fall fisheries, the two indices show the same general trends from 1984 to 1989. As could be expected, the trend of number of net-hauls/day follows closely the trend of number of nets fished in the spring fishery. This is not true of the fall fishery, in which the number of net-hauls/day is more variable.

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 spring Gulf index is determined by weighting the Acadian Peninsula and a combination of the Escuminac, southeast New Brunswick, and

partial west P.E.I. averages by the landings in those areas (O'Boyle and Cleary 1981, Cleary 1983, and Chadwick and Cairns 1988). The fall index is set equal to the Acadian Peninsula value. The index includes data only for gillnetters who sell at least 50% of their catch to processors. The historic effort index shown in Figure 9 indicates an increase in 1989 from 1988 in the spring to the 1986 level, but no change in the fall. The increase in the spring value may be explained in part by the fact that in 1988, the landings in the Acadian Peninsula equalled those of the rest of the index area, while in other years they have been less than 1/2 of the remaining area.

Abundance Indices

The responses to the questions about relative abundance of herring in 1989 are shown in Figures 10 and 11. The Magdalen Islands and Quebec rated the 1989 spring fishery worse than 1988 (ratings less than 4), while Escuminac, southeast N.B., and west P.E.I. rated it better (ratings greater than 6). On a scale of 1 to 10, the spring values ranged from 3.5 to 6.7 and were less than the 1988 values only for the Magdalen Islands, Quebec, and the Acadian Peninsula. All areas rated fall 1989 at least as good as 1988 except east P.E.I., which rated 1989 somewhat worse (3.9). On a scale of 1 to 10, the fall values ranged from (3.0 to 6.5) and were less than the 1987 values only for southeast N.B., and east and west P.E.I.

Gillnet Mesh Size Distribution

Figures 12 and 13 illustrate the percent of the gillnet mesh sizes used from 1985 to 1989 that were the predominant mesh size. The distribution of mesh sizes has been quite wide in the spring, but most nets used have been between 2.25 and 2.5 inch mesh. The fall distribution is much narrower, and most nets have been 2.625 inch mesh. The distribution has been fairly constant over time - particularly in the areas with the largest catches (the Acadian Peninsula, Escuminac, and southeast N.B. in the spring, and the Acadian Peninsula, Nova Scotia, and east P.E.I. in the fall).

The average length of net fished varied from area to area (Table 7), but not within an area between seasons except for southeast N.B. and west P.E.I. In 1989, the length of nets used ranged from 15 to 21.5 fathoms in the spring, and from 10 to 21.3 fathoms in the fall.

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 were modified nets (one end attached to the boat) (Table 8). Only Nova Scotia and east and west P.E.I. used more set nets than modified nets in the fall. The use of set nets corresponds to soak times of approximately 24 hours and one haul per day, while modified nets soak for less time and are hauled on average more than once a day (Figure 6). The exception is in east P.E.I. in the fall, where set nets are used and the soak time is less than 3 hours.

Use Of The Catch

Questions about the percent of the catch in 1989 kept for personal use, sold to processors, or dumped, revealed few differences from 1988. In the spring, a higher proportion of the catch in Quebec and lower proportions in Nova Scotia and east P.E.I. were sold to processors. In the fall, the catch continued to be primarily sold to processors except for west P.E.I. The amount of catch dumped remains low in all areas for both seasons. Figure 14 shows the trends in percent sold to processors from 1986 to 1989.

Concluding Remarks

The historical effort index was devised in the late 1970's (O'Boyle and Cleary) as the best information available at the time. The annual catch is divided by the annual effort to obtain an index of abundance - catch per unit of effort (cpue). Yearly detailed questioning of the gillnetters is an attempt to arrive at a more accurate reflection of the actual effort expended on the 4T herring. The questionnaire elicits information about peak and non-peak gillnet fishing activity on an area-by-area basis, allowing calculations of fishing effort based on the number of nets or net-hauls. Calculation of effort does not currently take into consideration such factors as restrictions on fishing activity imposed by markets, quotas, weekend closures, or differences in the fisheries (fishing on spawning grounds or migrating stocks).

ACKNOWLEDGEMENTS

Thanks to Stella Langis who interviewed the gillnetters and to Martina Poirier who entered and validated the data. Thanks to Ghislain Chouinard and H el ene Dupuis for helpful suggestions regarding the report. Special thanks to all the gillnetters who took the time to participate in the survey.

REFERENCES

- Chadwick, E.M.P., and D.K. Cairns. 1988. Assessment of Atlantic herring in NAFO Division 4T, 1987. CAFSAC Res. Doc. 88/38.
- Cleary, L. 1983. An assessment of the southern Gulf of St. Lawrence herring stock complex. CAFSAC Res. Doc. 83/69.
- Nielsen, G. 1989. The 1988 4T herring gillnet questionnaire. CAFSAC Res. Doc. 89/26.
- O'Boyle, R., and L. Cleary. 1981. The herring (Clupea harengus) gillnet fishery in the southern Gulf of St. Lawrence, 1970-79. Can. Tech. Rep. Fish. Aquat. Sci. no. 1065. 90pp.

Table 1. Statistical Districts making up the geographic areas 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 1989.

Area	Landings (Tonnes)*		Number of Licences	Number of Boats (CFVN's)
	Spring	Fall		
Magdalen Is.	74	0	310	-
Quebec	1380	1261	543	-
Acadian Pen.	2776	23362	621	329
Escuminac	1585	1021	332	120
Southeast N.B.	4030	261	258	104
Nova Scotia	461	3049	428	150
East P.E.I.	27	2752	380	112
West P.E.I.	794	414	484	189
TOTAL	11127	32120	3356	1004

* preliminary

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.	31	23	0	4	0	4
Quebec	54	39	3	1	1	10
Acadian Pen.	119	98	4	16	1	0
Escuminac	46	33	2	8	1	1
Southeast N.B.	40	30	2	7	0	1
Nova Scotia	55	44	2	7	0	2
East P.E.I.	40	34	3	2	1	0
West P.E.I.	65	51	1	6	3	4
Total	450	352	18	51	7	22

Table 4. Number of respondents fishing in each area in 1989.

Area	Fishing in the Spring	Fishing in the Fall
Magdalen Is.	23	0
Quebec	40	21
Acadian Pen.	82	82
Escuminac	30	9
Southeast N.B.	36	1
Nova Scotia	21	37
East P.E.I.	8	28
West P.E.I.	46	20
Total	286	198

Table 5. Effort parameters for the 1989 spring gillnet fishery
(Mean \pm 1 standard deviation)

Area	No. of Days Fished			No. of Nets Fished	
	total	peak	non-peak	peak	non-peak
Magdalen Is.	20.6 \pm 14.7	0.1 \pm 0.5	20.5 \pm 14.9	1.0 \pm 0.0	7.3 \pm 5.1
Quebec	22.3 \pm 16.2	15.9 \pm 18.8	6.4 \pm 10.9	14.7 \pm 16.7	5.6 \pm 5.4
Acadian Pen.	25.8 \pm 15.3	12.9 \pm 15.4	12.9 \pm 17.5	10.4 \pm 14.1	9.5 \pm 9.1
Escuminac	18.2 \pm 12.6	13.5 \pm 12.9	5.0 \pm 10.2	17.8 \pm 9.6	21.3 \pm 14.2
Southeast N.B.	20.7 \pm 10.4	19.1 \pm 11.5	1.5 \pm 6.0	30.4 \pm 4.5	30.0 \pm 0.0
Nova Scotia	35.1 \pm 14.1	22.5 \pm 21.4	12.6 \pm 18.3	4.2 \pm 5.0	4.6 \pm 1.4
East P.E.I.	19.7 \pm 7.9	8.5 \pm 13.5	11.2 \pm 10.4	4.0 \pm 2.8	6.2 \pm 3.1
West P.E.I.	20.5 \pm 9.5	13.1 \pm 12.4	7.4 \pm 11.6	25.6 \pm 11.4	12.9 \pm 7.2

Table 6. Effort parameters for the 1989 fall gillnet fishery
(Mean \pm 1 standard deviation)

Area	No. of Days Fished			No. of Nets Fished	
	total	peak	non-peak	peak	non-peak
Magdalen Is	-	-	-	-	-
Quebec	12.4 \pm 12.0	7.4 \pm 12.2	5.0 \pm 8.5	4.7 \pm 2.0	8.0 \pm 6.9
Acadian Pen.	17.6 \pm 13.9	11.6 \pm 10.6	5.7 \pm 11.1	5.1 \pm 1.8	6.7 \pm 4.5
Escuminac	15.1 \pm 4.1	13.1 \pm 6.2	2.0 \pm 4.7	9.1 \pm 2.1	8.0 \pm 2.8
Southeast N.B.	4.0 \pm 0.0	4.0 \pm 0.0	-	3.0 \pm 0.0	-
Nova Scotia	8.5 \pm 6.9	7.6 \pm 7.5	0.9 \pm 2.4	5.8 \pm 2.3	5.0 \pm 2.5
East P.E.I.	10.1 \pm 5.1	7.0 \pm 6.5	3.2 \pm 5.3	6.6 \pm 2.0	7.7 \pm 1.4
West P.E.I.	19.0 \pm 20.5	12.4 \pm 19.0	6.6 \pm 15.5	6.8 \pm 4.8	4.8 \pm 3.2

Table 7. Length of gillnets used in the 1989 herring fishery (Fathoms).

Area	Spring	Fall
Magdalen Is.	21.5	-
Quebec	20.4	20.2
Acadian Pen.	15.5	17.5
Escuminac	16.8	16.1
Southeast N.B.	15.0	10.0
Nova Scotia	17.9	18.2
East P.E.I.	18.2	19.0
West P.E.I.	16.7	21.3

Table 8. Percent distribution of gillnet types used in the 1989 herring fishery.

Area	Spring		Fall	
	Set	Modified	Set	Modified
Magdalen Is.	100	0	-	-
Quebec	100	0	27	73
Acadian Pen.	100	0	11	89
Escuminac	100	0	30	70
Southeast N.B.	100	0	0	100
Nova Scotia	100	0	70	30
East P.E.I.	100	0	100	0
West P.E.I.	97	3	84	16

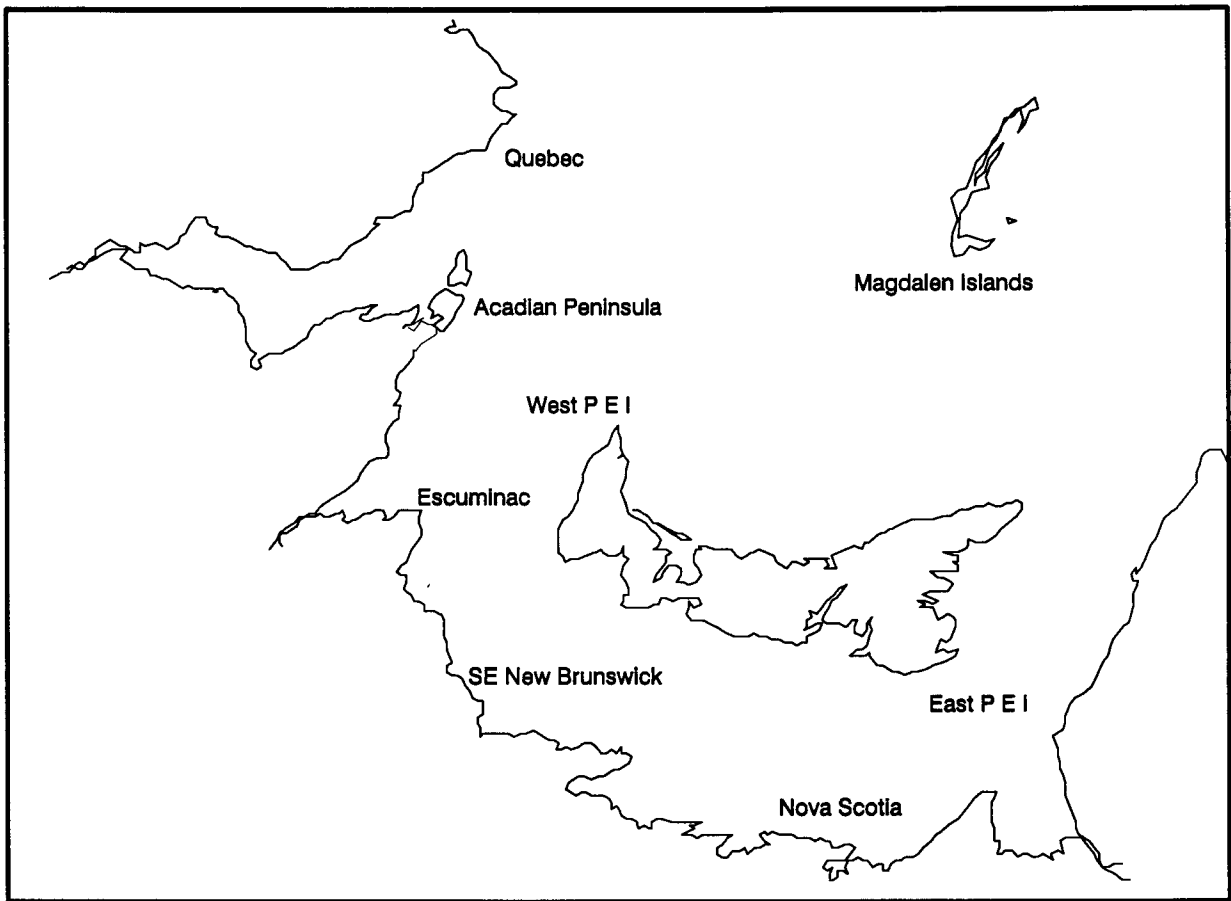


Fig 1. Geographic areas in the southern Gulf of St. Lawrence used in the 1989 herring gillnet survey.

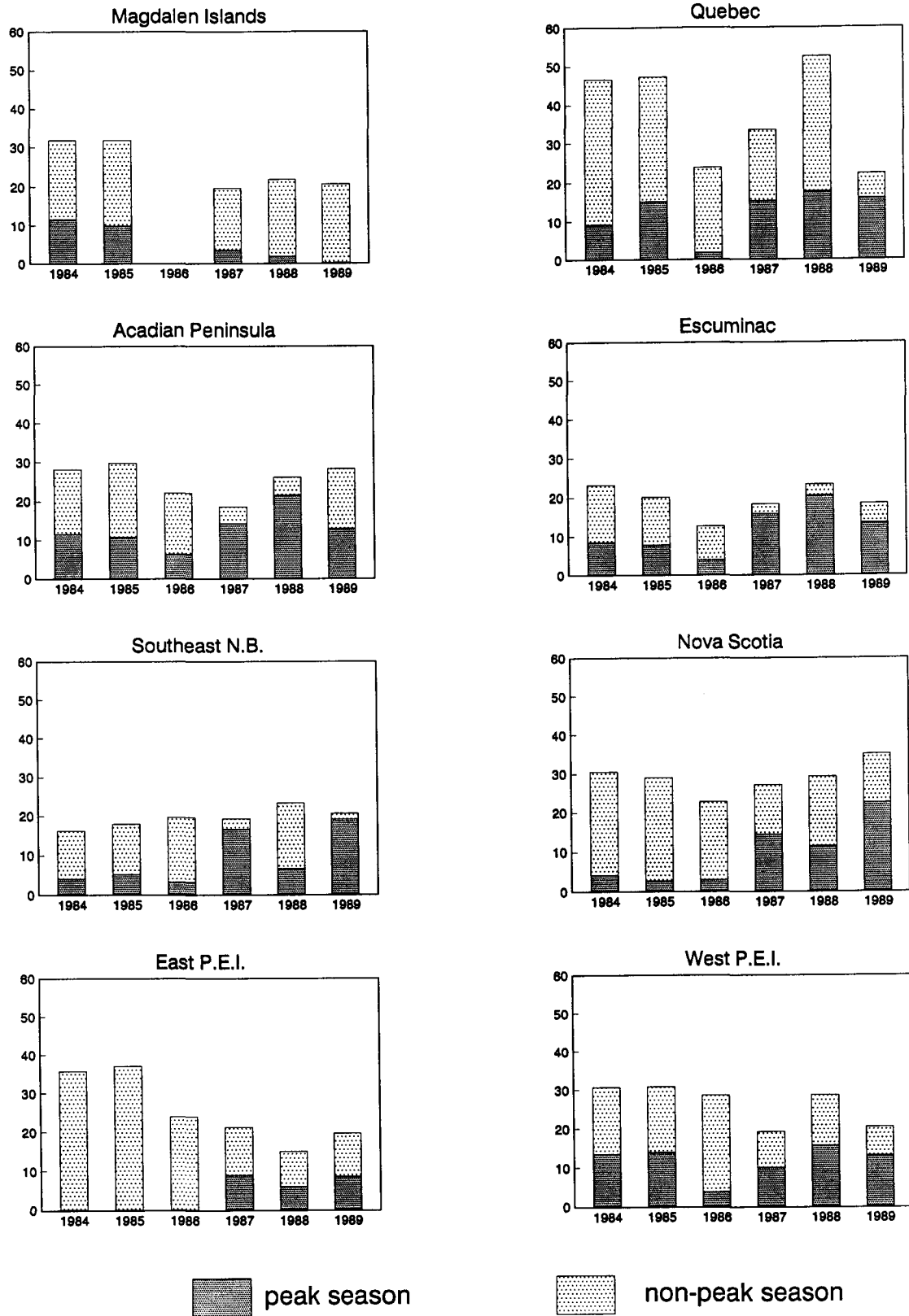
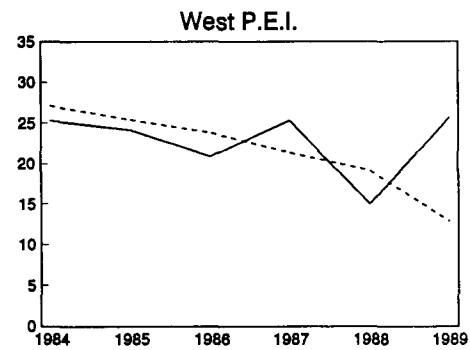
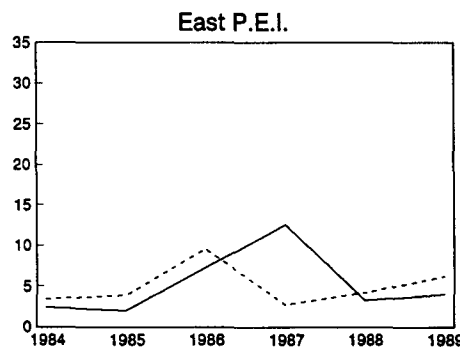
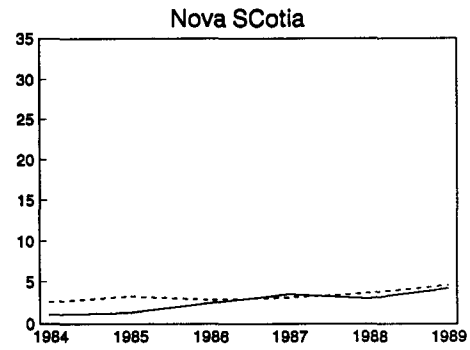
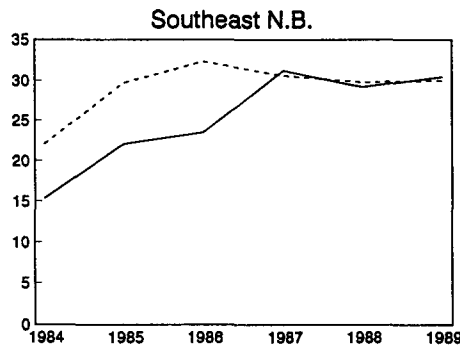
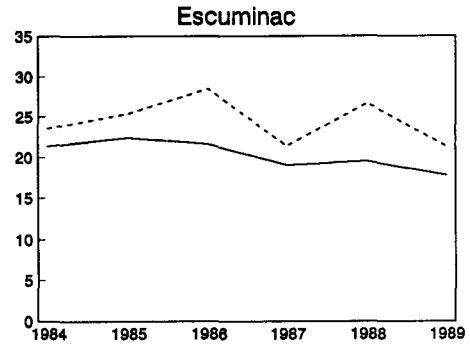
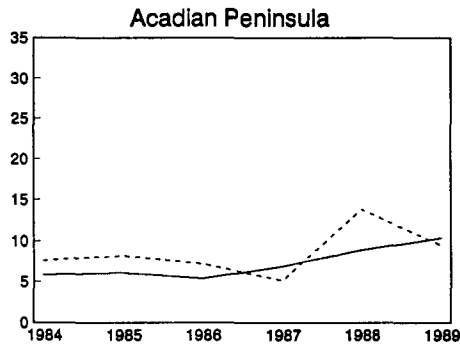
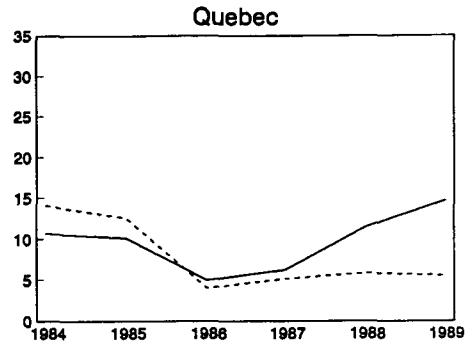
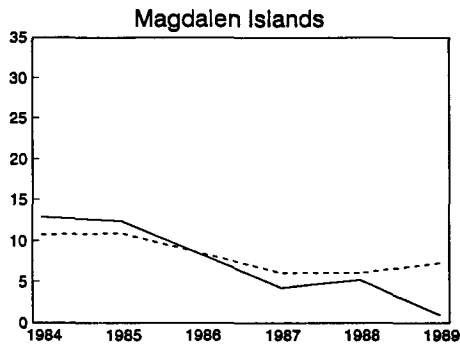


Figure 2. Number of days fished in the 4T spring fishery



————— peak season - - - - - non-peak season

Figure 3. Number of nets fished in the 4T spring fishery

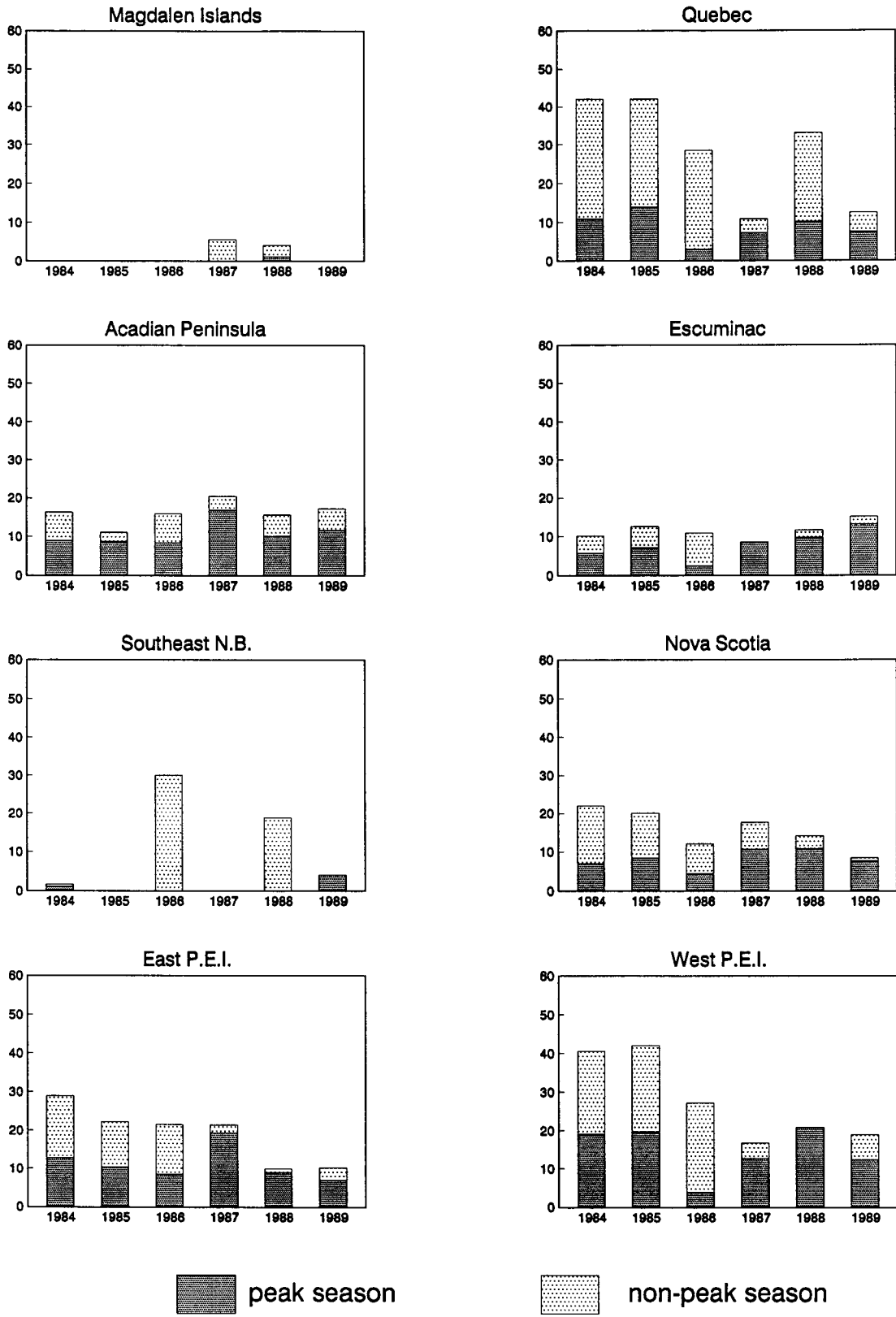


Figure 4. Number of days fished in the 4T fall fishery

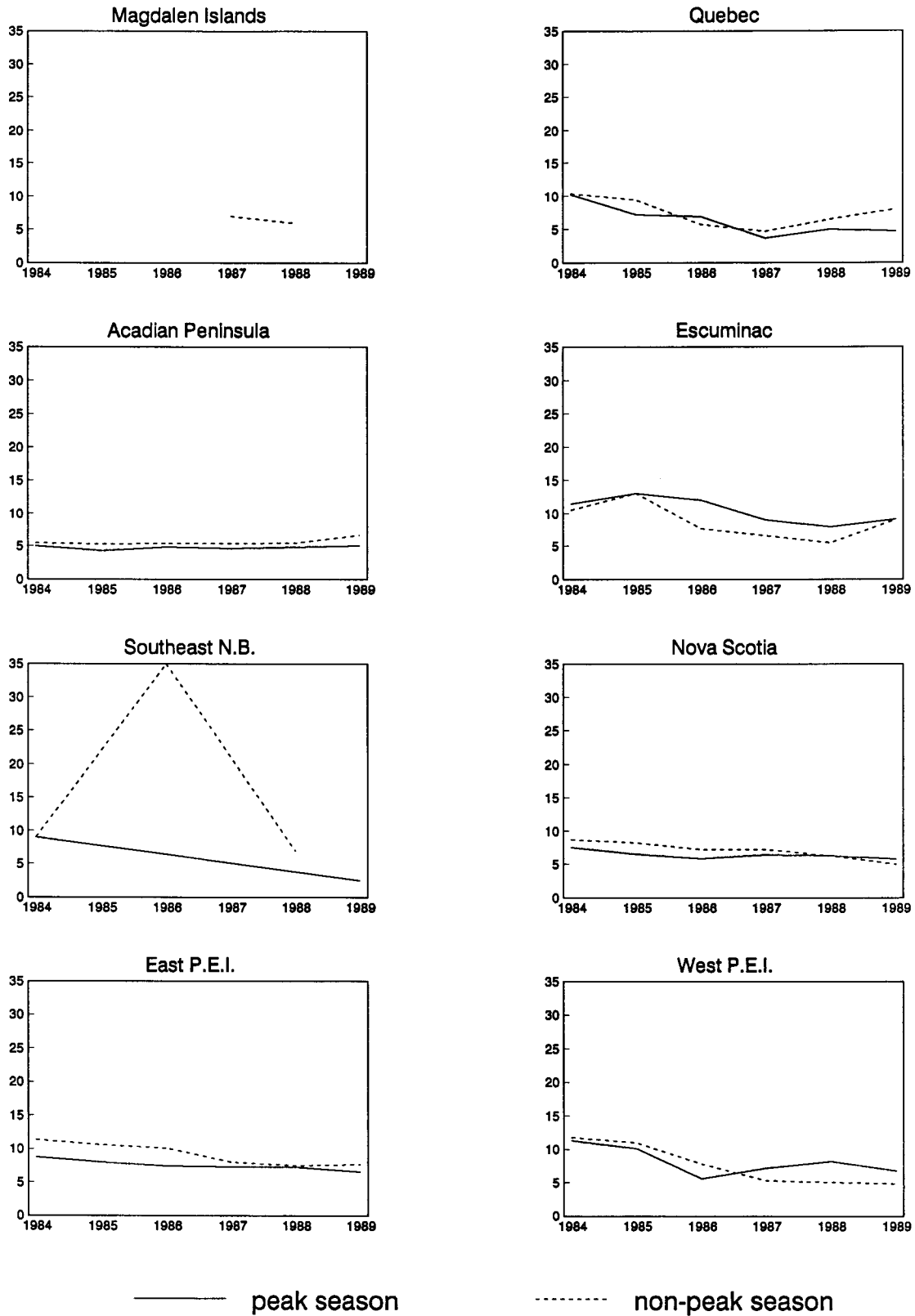


Figure 5. Number of nets fished in the 4T fall fishery

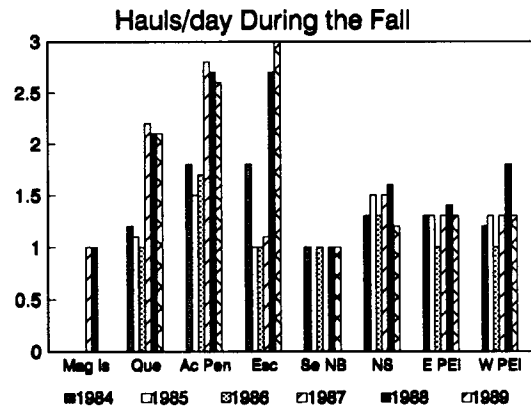
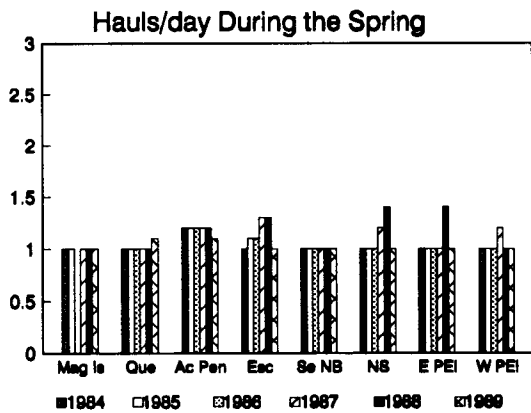
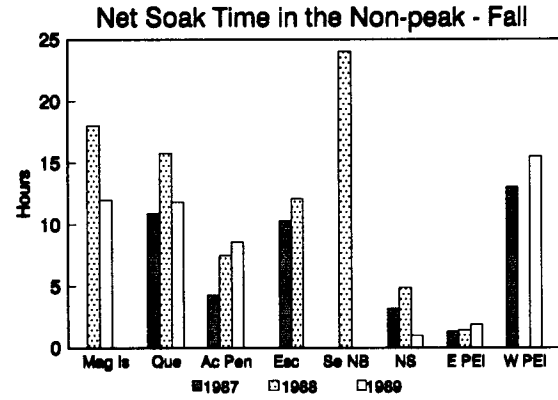
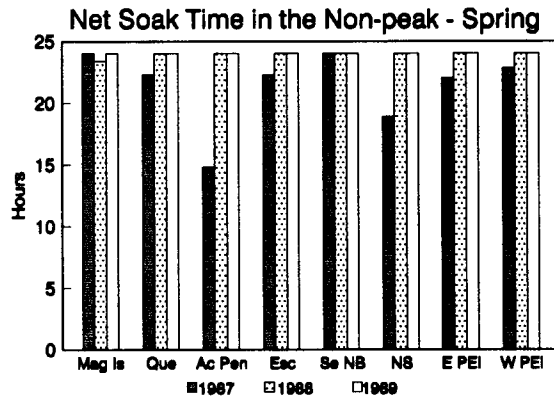
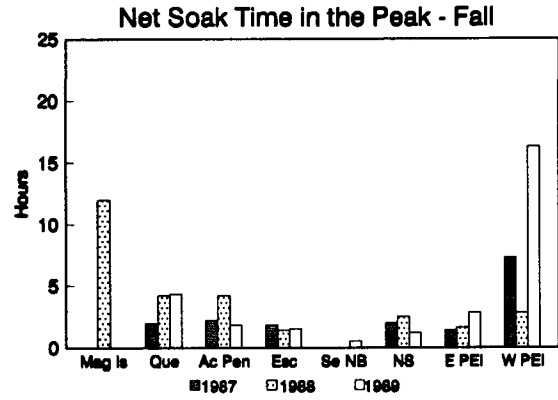
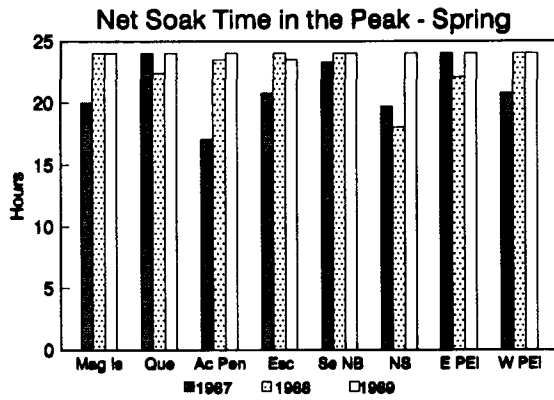


Figure 6. Net soak parameters for the 4T fishery

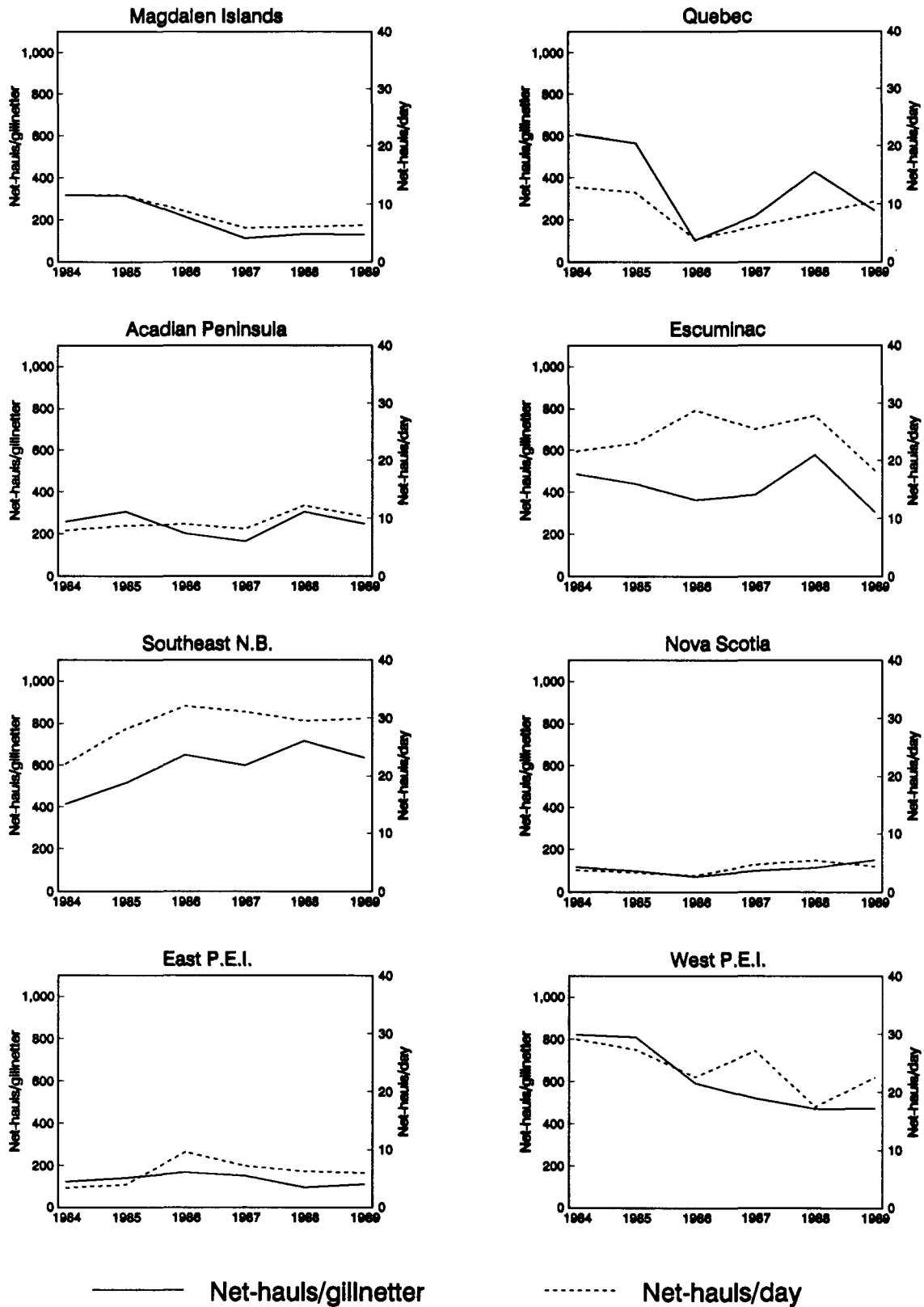


Figure 7. Effort expended in the 4T spring fishery

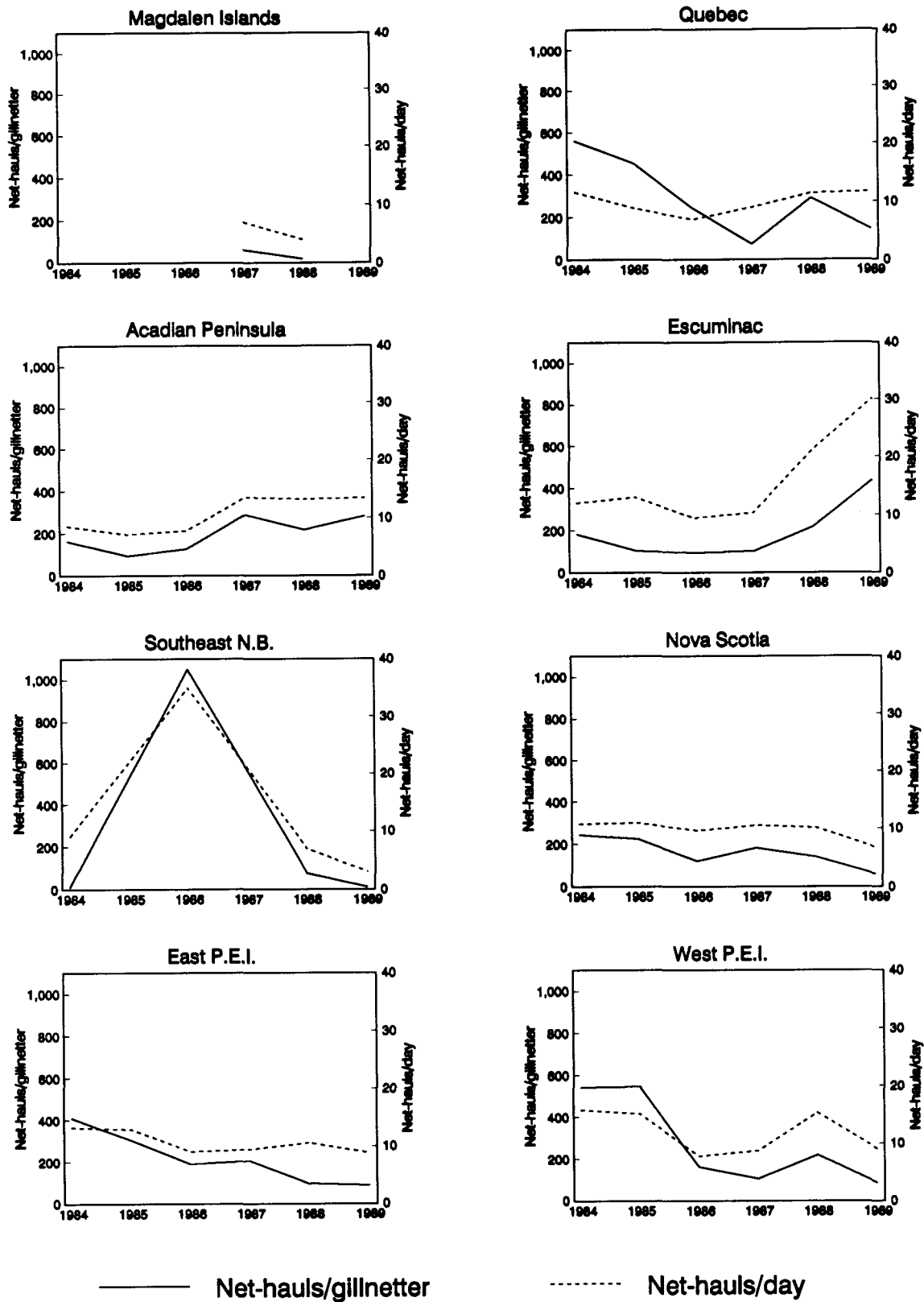


Figure 8. Effort expended in the 4T fall fishery

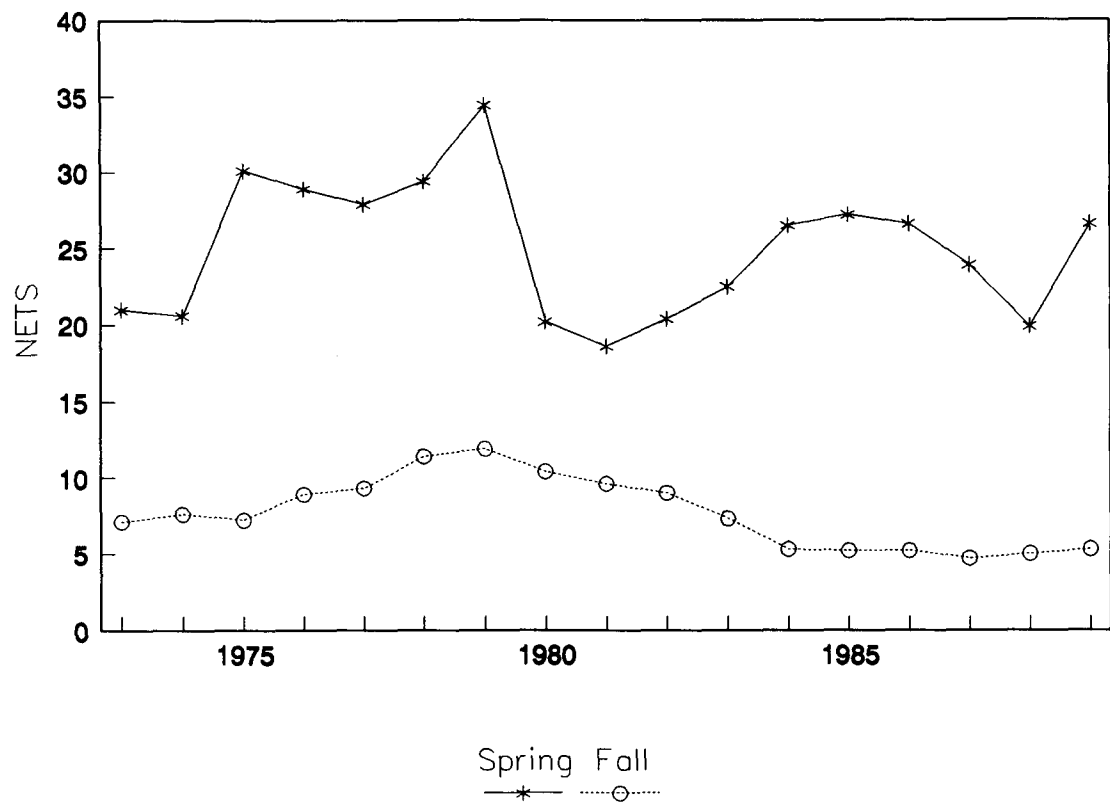


Figure 9. Historical effort index - number of nets fished/trip

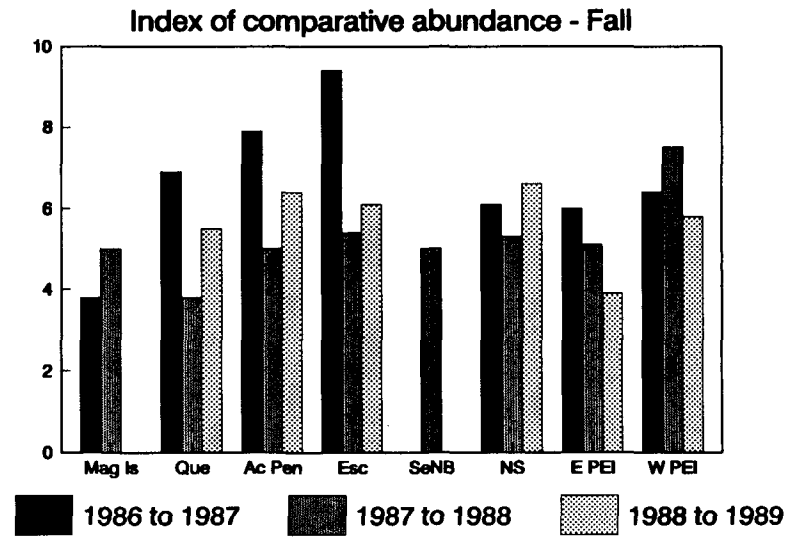
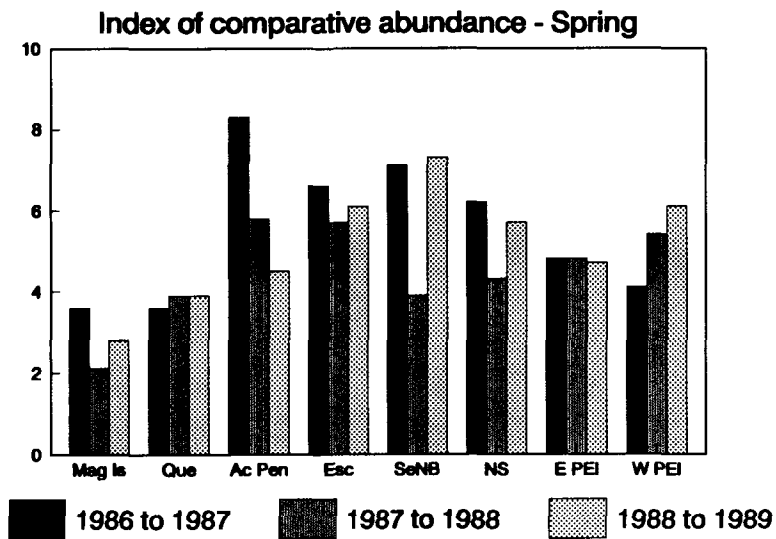
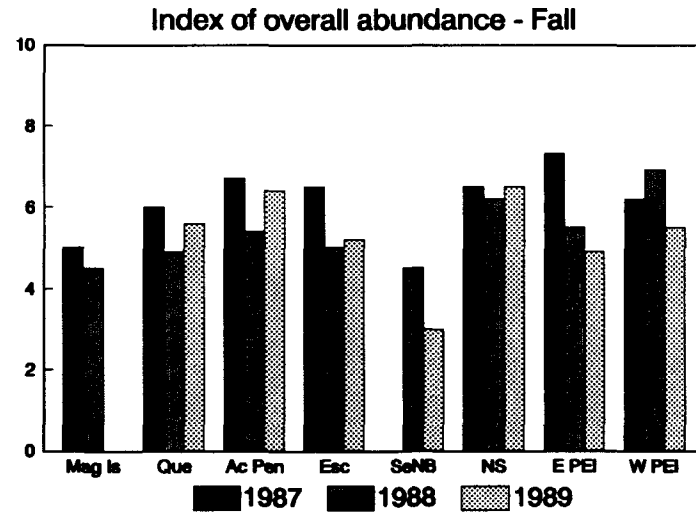
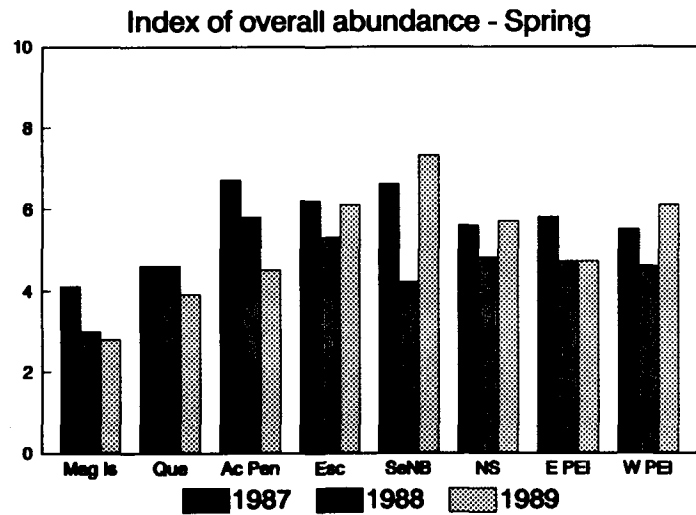


Figure 10. Spring indices of abundance

Figure 11. Fall indices of abundance

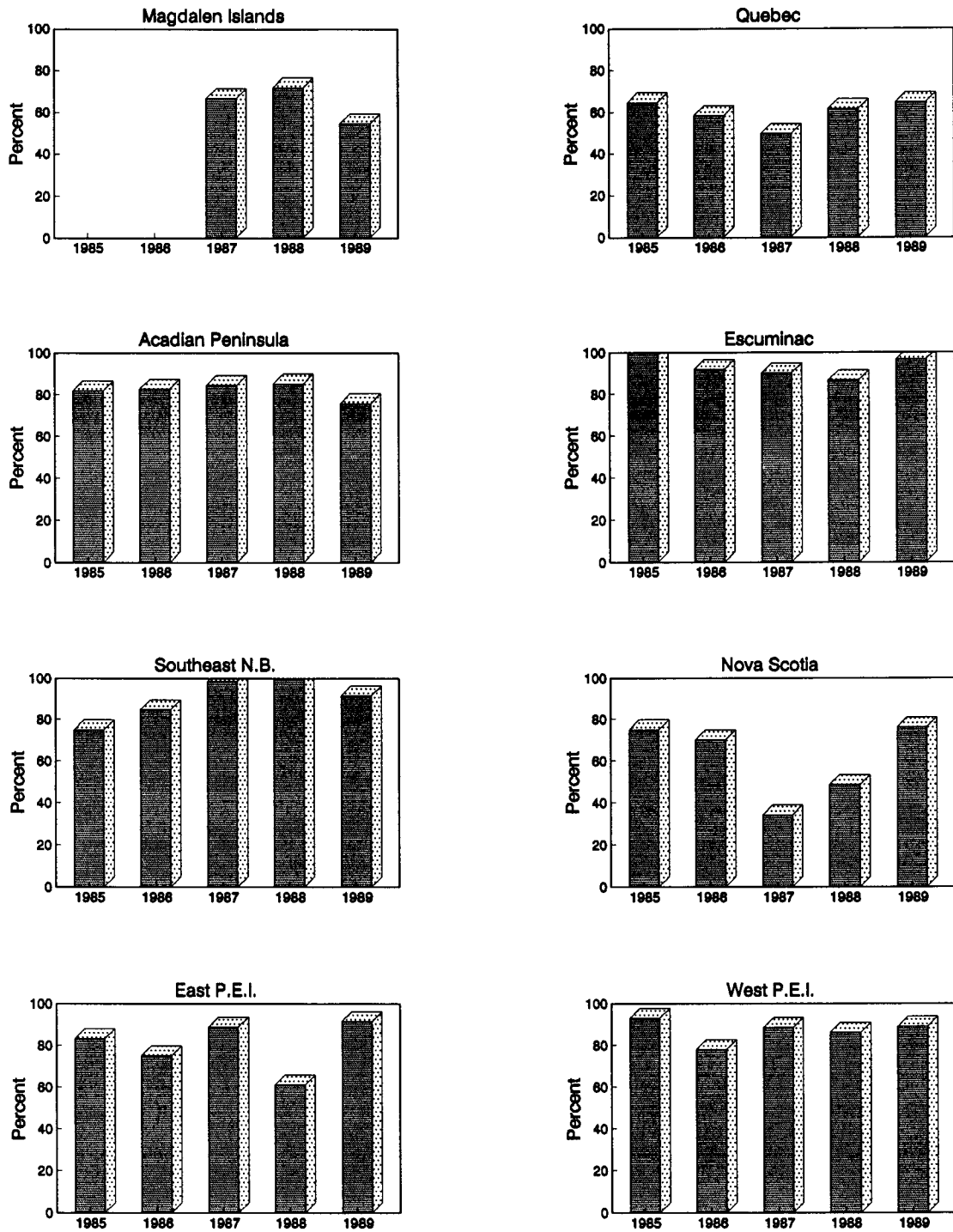


Figure 12. Percent of nets fished that are between 2 1/4" and 2 1/2" mesh in the 4T spring fishery.

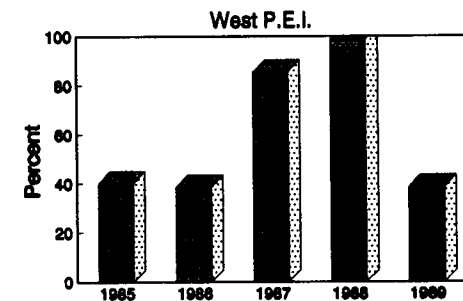
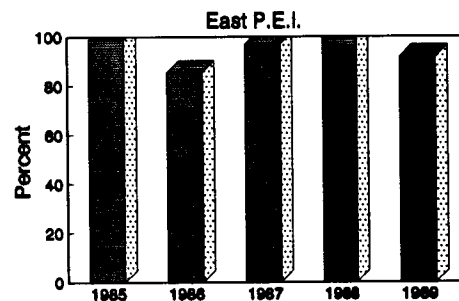
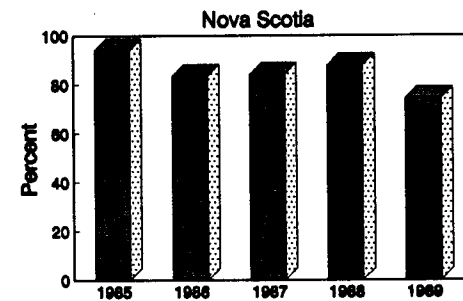
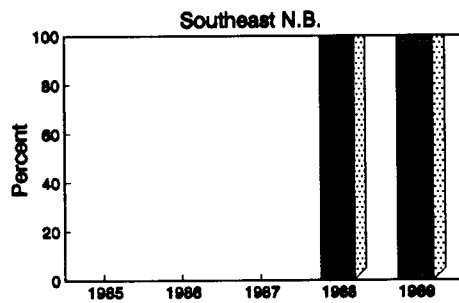
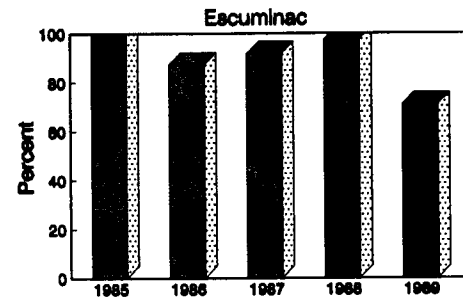
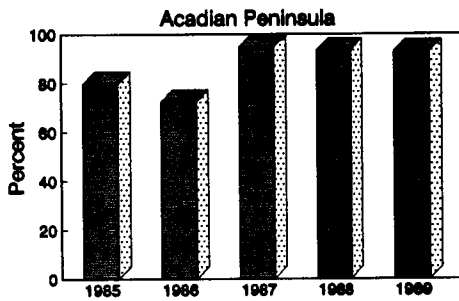
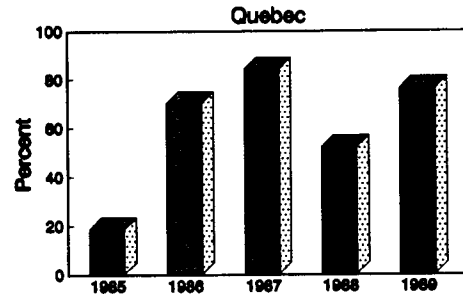
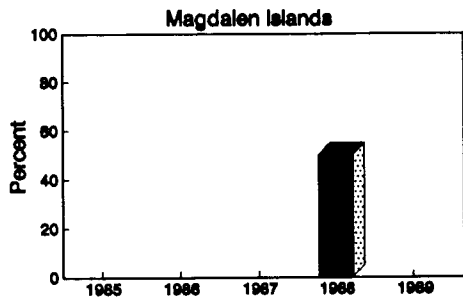


Figure 13. Percent of nets fished that are 2 5/8" mesh in the 4T fall fishery.

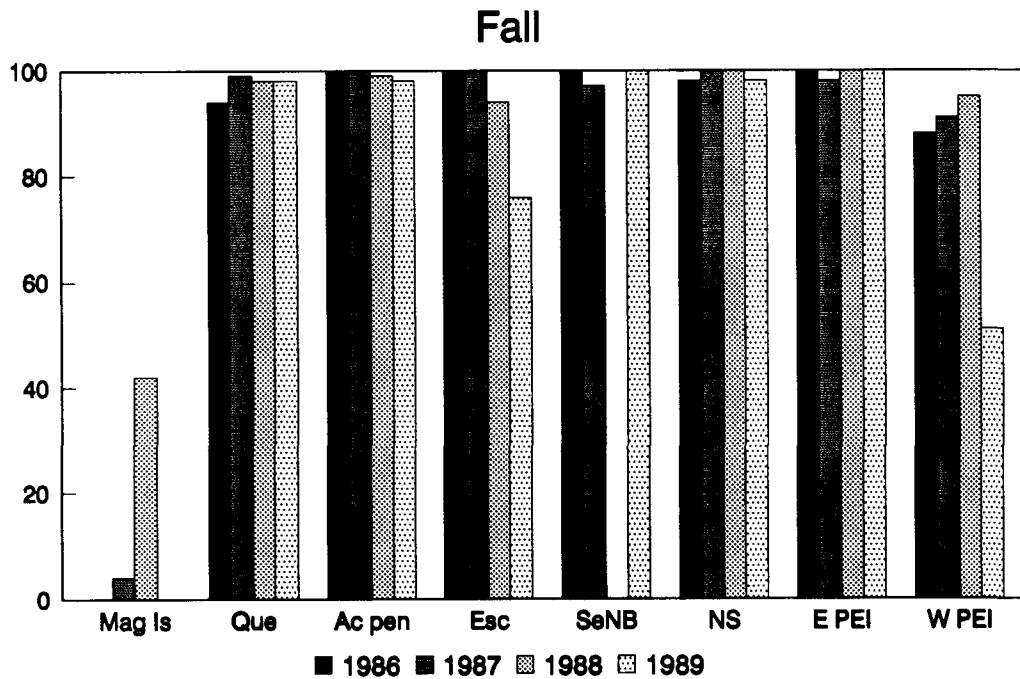
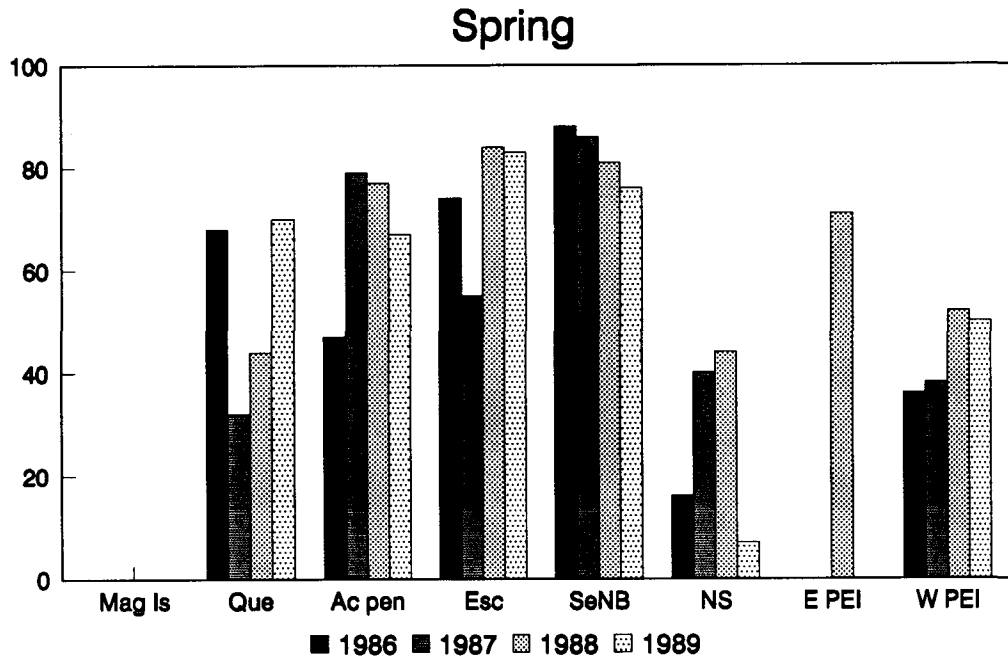


Figure 14. Percent of 4T catch sold to processors

APPENDIX
HERRING GILLNET QUESTIONNAIRE 1989

Interviewer _____

Home Stat Dist _____

Date _____

Resp I.D. _____

Record # 1

1. Did you fish herring with gillnets in 1989? 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 1989? 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 _____

=====

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? _____

=====

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

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

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

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

18. 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 = _____ %

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

=====

IF FISHING FOR TWO OR MORE YEARS:

20. 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 _____ ()

=====

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

HERRING GILLNET QUESTIONNAIRE 1989

Interviewer _____

Home Stat Dist _____

Date _____

Resp I.D. _____

Record # 2

1. Did you fish herring with gillnets in 1989? YES ___
NO ___ (If NO, then end of the questionnaire)

2. How many gillnets do you own? _____

22. Did you fish herring in the fall in 1989? 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/modified)	mesh (in)	# nets	type (set/modified)
	_____	_____	_____	_____	_____	_____
(A set net is one that is anchored to the ground at both ends)	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
(A modified net is one that is anchored to the boat at one end)	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____

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

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?

QUESTIONNAIRE - HARENG 1989

Interviewer _____

Home Stat Dist _____

Date _____

Resp I.D. _____

Record # 1

1. Avez-vous peche le hareng en 1989 a l'aide de filets maillants? OUI _____
NON _____ (Si NON, c'est le fin du questionnaire)

2. Combien de filets maillants possédez-vous? _____

3. Avez-vous peche le hareng durant le printemps en 1989? 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 IDENTIFIEE:

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 sont restes 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 sont restes dans l'eau avant qu'ils soient retires? _____

=====

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

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

13. Par moyenne, pendant combien d'heures est-ce que vos filets sont restes 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/modifie) | maille (po) | # filets | type (ancre/modifie) |
|--|-------------|----------|----------------------|-------------|----------|----------------------|
| | _____ | _____ | _____ | _____ | _____ | _____ |
| (Un filet ancre en est un qui est ancre au fond a chaque bout) | _____ | _____ | _____ | _____ | _____ | _____ |
| (Un filet modifie est un qui est attache au bateau a un bout) | _____ | _____ | _____ | _____ | _____ | _____ |
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 le printemps? _____ 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 le 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 1989

Interviewer _____

Home Stat Dist _____

Date _____

Resp I.D. _____

Record # 2

1. Avez-vous peche le hareng en 1989 a l'aide de filets maillants? OUI _____
NON _____ (Si NON, c'est le fin du questionnaire)

2. Combien de filets maillants possédez-vous? _____

22. Avez-vous peche le hareng durant l'automne en 1989? 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'après vous est-ce qu'il y a eu une période de capture forte (ie. une période lorsque les prises étaient bonnes)? OUI _____
NON _____

OUI _____
NON _____

=====

SI UNE PERIODE DE CAPTURE FORTE A ETE IDENTIFIEE:

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

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

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

=====

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

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

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

=====

33. Combien de fois par journée 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/modifie)	maille (po)	# filets	type (ancre/modifie)
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

(Un filet ancre en est un qui est ancre au fond a chaque bout)

(Un filet modifie est un qui est attache au bateau a un bout)

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 le 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? _____