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**THE 1990 4T HERRING GILLNET QUESTIONNAIRE**

by

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## ABSTRACT

A telephone survey obtained information from 396 herring gillnetters about their 1990 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 1990. The average number of nets fished per trip (used in the historical effort index) did not change in either the spring or the fall fisheries. 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 1989 in all areas except west P.E.I. (higher) and Quebec and Acadian peninsula (lower). The fall abundance was seen to be at least as good as 1989 in all areas except Escuminac. On a scale of 1 to 10, the 1990 spring abundance was seen to be about average in all areas except Quebec and Acadian peninsula (lower) while the 1990 fall abundance was seen to be overall a little higher than average except for Escuminac (lower).

## RÉSUMÉ

On a effectué un sondage téléphonique auprès de 396 pêcheurs de hareng au filet maillant afin de recueillir des renseignements sur la pêche de 1990 dans le sud du golfe du Saint-Laurent (division 4T de l'OPANO). On a ainsi obtenu des données sur l'effort de pêche, permettant d'établir des estimations d'abondance, des données sur la répartition des maillages, servant à déterminer le recrutement partiel et des données sur le sort des prises, qui permettent de confirmer les renseignements contenus sur les bordereaux d'achat. De plus, on a sollicité l'opinion de ces pêcheurs au sujet de l'abondance du hareng en 1990. Le nombre moyen de filets utilisés par voyage (chiffre servant à établir l'indice d'effort historique) n'a changé ni dans la pêche de printemps, ni dans celle d'automne. La répartition des maillages est restée la même depuis 1984. Comme à l'accoutumée, une bonne partie des prises de la pêche de printemps était destinée à l'usage personnel. Les prises d'automne sont en général entièrement vendues aux transformateurs. Les participants à la pêche du hareng au filet maillant ont estimé que l'abondance était à peu près la même qu'en 1989 dans toutes les zones, sauf à l'ouest de l'Î.-P.-É. (où elle était plus élevée) ainsi qu'au large du Québec et de la péninsule acadienne (où elle était plus basse). À leur avis, l'abondance dans la pêche d'automne était au moins aussi bonne qu'en 1989 dans toutes les zones, sauf à Escuminac. Ils ont estimé que, selon une échelle de 1 à 10, l'abondance du hareng de printemps correspondait environ à la moyenne dans toutes les zones, sauf au Québec et dans la péninsule acadienne (où elle était plus basse) et que l'abondance du hareng d'automne était dans l'ensemble légèrement supérieure à la moyenne, sauf à Escuminac (où elle était plus basse).

## 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 1990 survey, and presents comparisons with results from previous surveys (Nielsen 1986-1990).

## 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 1990. 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 1990.

The interviews were conducted by telephone in the official language of the gillnetters' choice, during January and February 1991. Each respondent was given up to three telephone calls to be contacted.

### The Questionnaire

The interview was divided into six 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 1990?). 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 numbers of set and modified 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.

6. Because of a concern for the number of harbour porpoises caught in fishing nets, the respondents were asked if they caught any marine mammals, what they were, and where and when they were caught.

## RESULTS AND DISCUSSION

In total, 396 herring gillnetters were interviewed. The area-by-area breakdown of the responses (Tables 3 and 4) shows that all areas and both seasons were covered. The total number (by area) of gillnetters fishing in the spring and fishing in the fall is greater than 396, due to 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 but there was some travelling to other areas, especially in the fall with Acadian peninsula gillnetters fishing close to Quebec. Table 5 summarizes the number fishing in each area by location of home port.

## Effort Parameters

The responses to the questions concerning the intensity of effort show large differences among areas and seasons (Tables 6 and 7). Comparisons of the fishing effort for 1984-1990 are shown in Figures 2 to 5.

### Spring

Since 1987, the total number of days fishing has remained about the same in the Magdalen Islands, Acadian peninsula, Escuminac, southeast New Brunswick, and Nova Scotia. In the remaining areas, the number has fluctuated but shows no obvious trends. The proportion of days identified as peak fishing, however, varies over time in all areas, with Escuminac and southeast N.B. having the highest proportion in recent years. In the Acadian peninsula, the proportion of days identified as peak has decreased over the last three years.

Since 1984, there has been considerable year to year variation in the number of nets fished both in the peak and in the non-peak season. There do not appear to be any trends, however, either within an area or within a year. From 1989, the number of nets fished is up in some areas, and down in others. Nova Scotia and east P.E.I. continue to use the fewest nets, while southeast N.B. and Escuminac use the most.

### Fall

From 1989, the total number of days fished in the fall increased or remained the same in all areas except Escuminac, which is also the only area with a large proportion of the days fished identified as non-peak in 1990. In 1990, no respondents reported fishing in either of the Magdalen Islands or southeast N.B.

For most areas, the number of nets fished in the fall season (both during the peak and during the non-peak) has not changed greatly since 1984. In all areas where both a peak and a non-peak fishery existed, the number of nets fished in each is 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 (hauled) is shown in Figure 6. As in the past, the net soak time in the 1990 spring fishery was very close to 24 hours (both peak and non-peak). In the fall, for all areas except west P.E.I., the net soak time was less than 4 hours during the peak and 12 hours during the non-peak. There was little change in the fall peak soak time, except for a decrease in west P.E.I., but for the non-peak, there were decreases in Quebec, the Acadian peninsula and east P.E.I., and increases in Nova Scotia and west P.E.I. from 1989.

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 was one for all areas in 1990. In the fall, all areas reported more than one haul/day; Quebec, the Acadian peninsula and Escuminac all reported more than 2 hauls/day.

## 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 1990. As 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. Both the Acadian peninsula and Escuminac have shown an increasing trend in the number of net-hauls in the fall since at least 1986.

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 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 basically no change in either the spring or the fall from 1989.

## Abundance Indices

The responses to the questions about relative abundance of herring in 1990 are shown in Figures 10 and 11. Spring abundance in 1990 was rated between 4 and 6 (average) both overall and compared to 1989 except for Quebec (3.5 overall, 2.8 compared to 1989), Acadian peninsula (3.9 overall, 3.3 compared to 1989), and west P.E.I. (6.6 compared to 1989). In general, since 1988, the spring abundance has been rated lower in the Acadian peninsula, but higher in the Magdalen Islands and west P.E.I. Fall abundance, both overall and compared to 1989 was rated greater than 6 in Nova Scotia, east P.E.I., and west P.E.I., but less than 4 in Escuminac; other areas were average.

## Gillnet Mesh Size Distribution

Figures 12 and 13 illustrate the percentage of the gillnet mesh sizes used from 1985 to 1990 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 8), but not within an area between seasons. In 1990, the length of nets used ranged from 14.7 to 21.4 fathoms in the spring, and from 15.3 to 21.2 fathoms in the fall. Quebec used the longest nets in both the spring and the fall; west P.E.I. used the shortest.

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 9). In 1990, as in 1989, only Nova Scotia, east P.E.I., 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 exceptions are Nova Scotia and east P.E.I. in the fall, where set nets are used and the soak time is less than 5 hours.

### Use Of The Catch

Questions about the percentage of the catch kept for personal use, sold to processors, or dumped, revealed some variability over time - especially in the spring fishery. In the spring, less catch was sold in 1990 than in 1989 in all areas except southeast N.B. and the Magdalen Islands. In the fall, the catch continued to be primarily sold to processors in all areas. The amount of catch dumped remains low in all areas for both seasons except west P.E.I. in which 15% of the catch was dumped in the spring. Figure 14 shows the trends in percent sold to processors from 1986 to 1990.

### Marine Mammals

Table 10 lists the marine mammals caught by respondents in 1990. In total, 4 harbour seals, 4 grey seals, 11 dolphins, several whales, and 16 to 19 harbour porpoises were reported taken in a variety of nets. The harbour porpoises were all caught by east P.E.I. respondents between June and July. Because herring gillnets do not appear to be the only, or even the predominant, fishing gear catching marine mammals, these questions will not be included in future herring gillnetter questionnaires.

### 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 total annual catch is divided by the total 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

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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 1990.

Area	Landings (Tonnes)*		Number of Licences	Number of Boats (CFVN's)
	Spring	Fall		
Magdalen Is.	167	2	319	-
Quebec	916	4540	557	-
Acadian Pen.	5801	29381	615	395
Escuminac	4172	1743	340	125
Southeast N.B.	3514	1588	250	111
Nova Scotia	5576	19761	424	193
East P.E.I.	534	13185	378	183
West P.E.I.	2432	4568	477	185
TOTAL	23112	74768	3360	1192

\* preliminary

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

Area	Number Selected	Number of Completed Questionnaires	Number of Phone, Address Problems	Number not Contacted	Number Unavailable	Number not Fishing
Magdalen Is.	47	37	0	7	1	2
Quebec	50	27	4	3	3	13
Acadian Pen.	128	117	3	6	2	0
Escuminac	36	32	1	2	0	1
Southeast N.B.	36	32	0	4	0	0
Nova Scotia	60	49	1	8	1	1
East P.E.I.	57	49	2	5	0	1
West P.E.I.	57	53	0	2	2	0
Total	471	396	11	37	9	19

Table 4. Number of respondents fishing in each area in 1990.

Area	Fishing in the Spring	Fishing in the Fall
Magdalen Is.	30	0
Quebec	23	32
Acadian Pen.	96	107
Escuminac	31	6
Southeast N.B.	35	0
Nova Scotia	31	48
East P.E.I.	19	47
West P.E.I.	49	32
Total	314	272

Table 5. Number of respondents fishing in each area in 1990  
by area of home port

Home port Area	Fishing Area - Spring							
	Mag Is	Que	Ac Pen	Esc	Se NB	NS	E PEI	W PEI
Magdalen Is.	30							
Quebec		22						
Acadian Pen.		1	94		1			
Escuminac			2	30				
Southeast N.B.					32			
Nova Scotia						30		
East P.E.I.						1	19	
West P.E.I.				1	2			49

Home port Area	Fishing Area - Fall							
	Mag Is	Que	Ac Pen	Esc	Se NB	NS	E PEI	W PEI
Magdalen Is.								
Quebec		9	3					
Acadian Pen.		23	102					
Escuminac			1	6				4
Southeast N.B.			1					
Nova Scotia						44		
East P.E.I.						4	45	1
West P.E.I.							2	27

Table 6. Effort parameters for the 1990 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.	21.0 $\pm$ 15.5	10.5 $\pm$ 16.4	10.5 $\pm$ 13.9	8.6 $\pm$ 5.8	5.6 $\pm$ 3.1
Quebec	35.2 $\pm$ 24.0	13.4 $\pm$ 24.4	21.8 $\pm$ 24.2	9.3 $\pm$ 7.4	9.6 $\pm$ 9.0
Acadian Pen.	26.2 $\pm$ 15.5	7.9 $\pm$ 17.6	18.3 $\pm$ 15.0	7.0 $\pm$ 4.8	9.1 $\pm$ 9.5
Escuminac	21.5 $\pm$ 13.8	18.4 $\pm$ 15.0	3.2 $\pm$ 7.7	20.0 $\pm$ 10.8	22.6 $\pm$ 8.4
Southeast N.B.	24.0 $\pm$ 15.2	16.7 $\pm$ 16.8	7.3 $\pm$ 11.8	28.0 $\pm$ 9.7	25.8 $\pm$ 12.6
Nova Scotia	33.3 $\pm$ 18.5	16.2 $\pm$ 26.5	17.2 $\pm$ 22.3	4.3 $\pm$ 3.5	4.0 $\pm$ 5.5
East P.E.I.	22.5 $\pm$ 17.9	6.9 $\pm$ 15.2	15.6 $\pm$ 17.8	3.2 $\pm$ 1.8	3.7 $\pm$ 2.7
West P.E.I.	26.1 $\pm$ 14.1	20.3 $\pm$ 18.6	5.9 $\pm$ 9.7	15.8 $\pm$ 9.5	19.3 $\pm$ 9.8

Table 7. Effort parameters for the 1990 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	12.6 $\pm$ 13.9	8.7 $\pm$ 12.0	4.0 $\pm$ 11.0	4.8 $\pm$ 1.7	5.9 $\pm$ 2.6
Acadian Pen.	18.0 $\pm$ 8.3	15.2 $\pm$ 10.8	2.8 $\pm$ 6.8	5.2 $\pm$ 2.1	4.9 $\pm$ 2.6
Escuminac	8.0 $\pm$ 4.9	0.0 $\pm$ 0.0	8.0 $\pm$ 4.9	-	12.3 $\pm$ 14.1
Southeast N.B.	-	-	-	-	-
Nova Scotia	13.8 $\pm$ 4.2	12.3 $\pm$ 6.0	1.5 $\pm$ 4.3	5.8 $\pm$ 1.5	6.1 $\pm$ 2.3
East P.E.I.	16.8 $\pm$ 5.4	16.4 $\pm$ 6.1	0.4 $\pm$ 2.2	7.1 $\pm$ 1.6	7.5 $\pm$ 2.1
West P.E.I.	27.1 $\pm$ 18.6	21.9 $\pm$ 19.1	5.2 $\pm$ 14.8	8.2 $\pm$ 3.5	5.8 $\pm$ 2.4

Table 8. Length of gillnets used in the 1990 herring fishery (Fathoms).

Area	Spring	Fall
Magdalen Is.	16.6	-
Quebec	21.4	21.2
Acadian Pen.	16.5	17.3
Escuminac	15.4	17.6
Southeast N.B.	17.5	-
Nova Scotia	16.9	17.3
East P.E.I.	16.4	19.2
West P.E.I.	14.7	15.3

Table 9. Percent distribution of gillnet types used in the 1990 herring fishery.

Area	Spring		Fall	
	Set	Modified	Set	Modified
Magdalen Is.	85	15	-	-
Quebec	78	12	16	84
Acadian Pen.	100	0	5	95
Escuminac	100	0	31	69
Southeast N.B.	100	0	-	-
Nova Scotia	95	5	96	4
East P.E.I.	79	11	100	0
West P.E.I.	100	0	71	29

Table 10. Marine mammals caught in nets of the respondents to the herring gillnet questionnaire during the 1990 fishing season.

AREA	DATE	MAMMAL	SIZE	QUANTITY	TYPE OF GEAR
Que	May	harbour seal	60 lb	1	lobster cage
	May	dolphin	4.5 ft	1	herring net
	June	grey seal	little	3	cod net
	May	harbour seal	adult	1	herring net
	May	grey seal	5 ft	1	herring net
Mag Is	June	whale	6-7 ft	several	mackerel net
Ac pen	Sept	whale	20 ft	1	
	end of July	dolphin	80 lb	2	cod net
Se NB	June	dolphin	150 lb	2	
E PEI	July	dolphin		1	cod net
	Aug	harbour porpoise	80-100 lb	6-8	cod net
	June-July	harbour porpoise	3-4 ft	5	herring net/cod net
	Aug	harbour porpoise	200 lb	4-5	cod net
W PEI	June 10	dolphin	200 lb	1	
	June 10	dolphin	350 lb	1	
	May	harbour seal	60-70 lb	2	herring net
	Sept	dolphin	45-50 lb	2	cod net
	June	dolphin		1	mackerel net

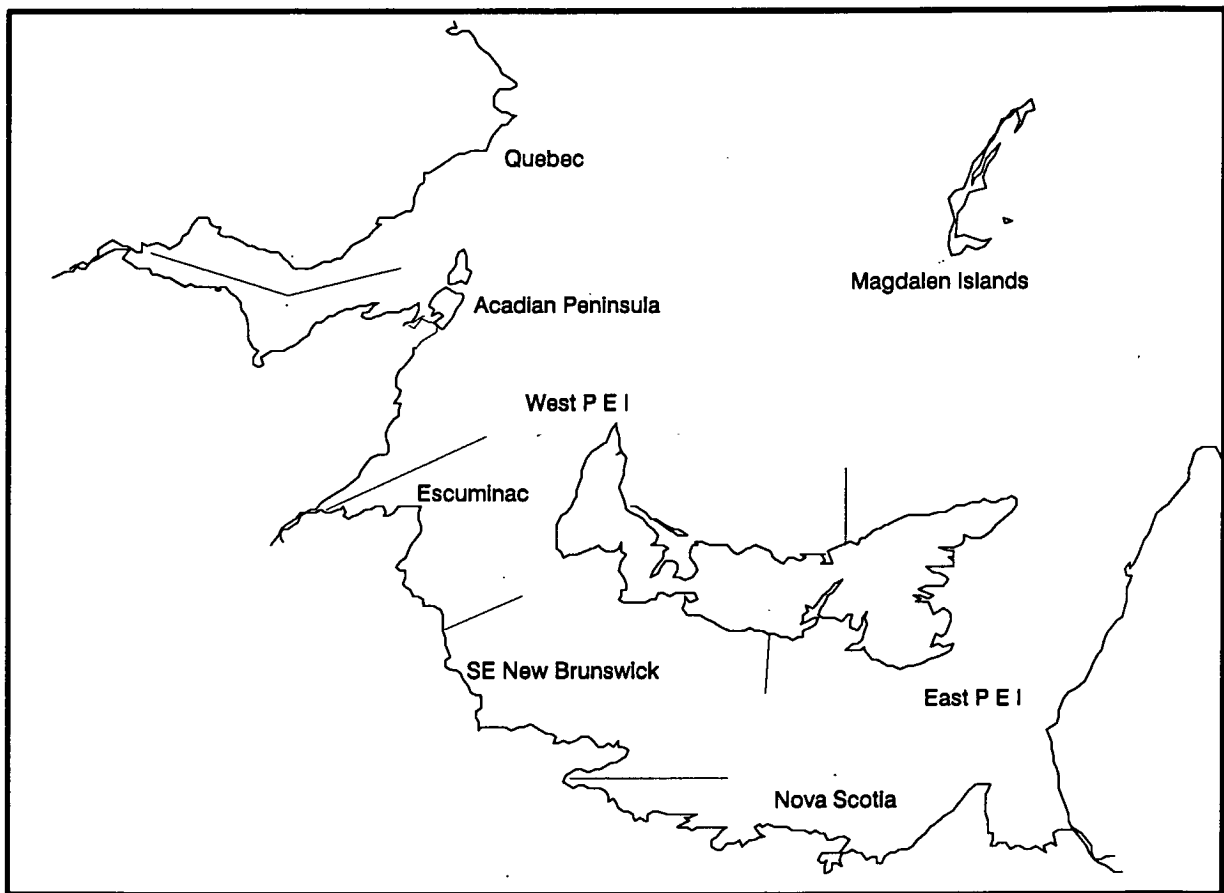


Fig 1. Geographic areas in the southern Gulf of St. Lawrence used in the 1990 herring gillnet survey.

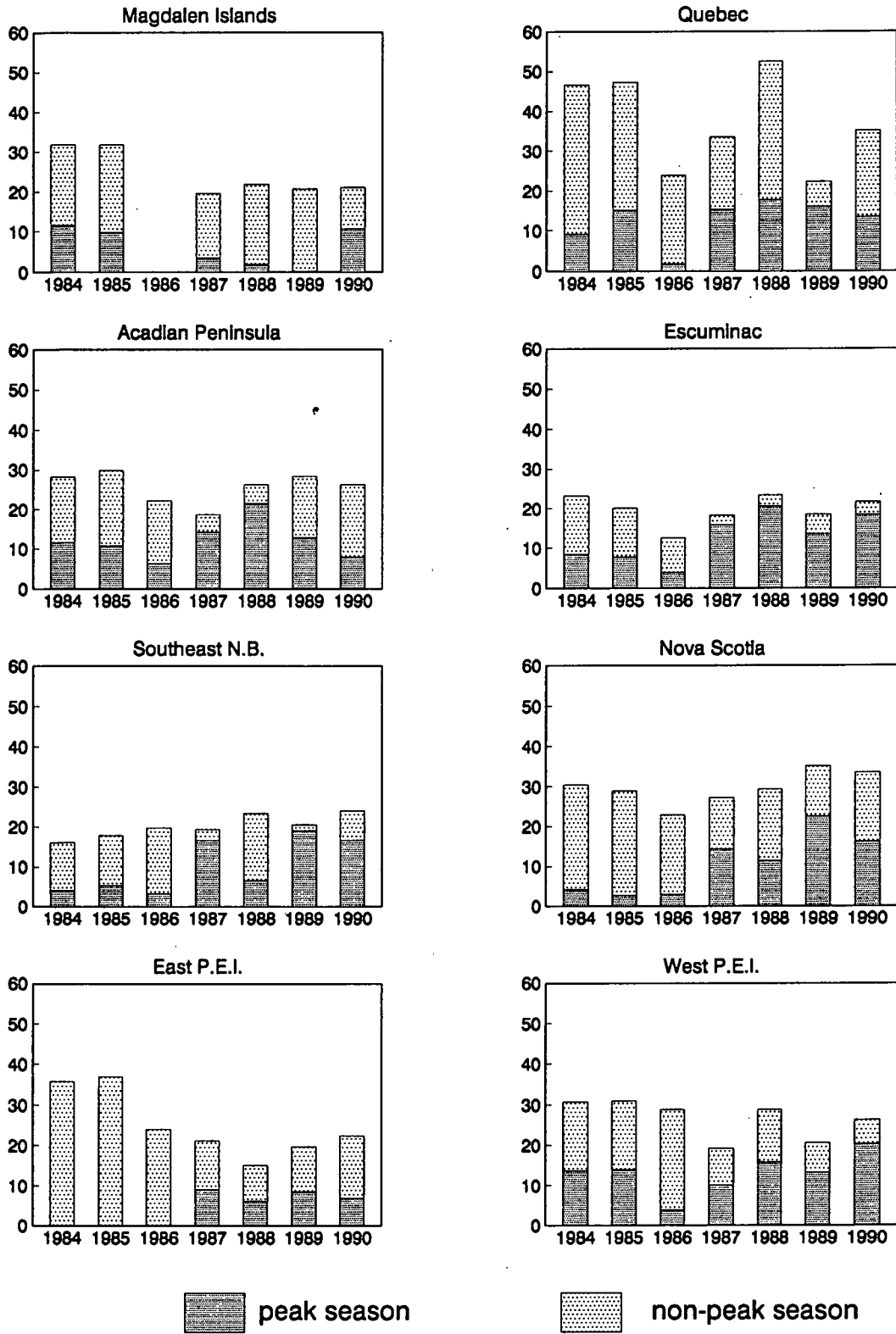


Figure 2. Number of days fished in the 4T spring fishery

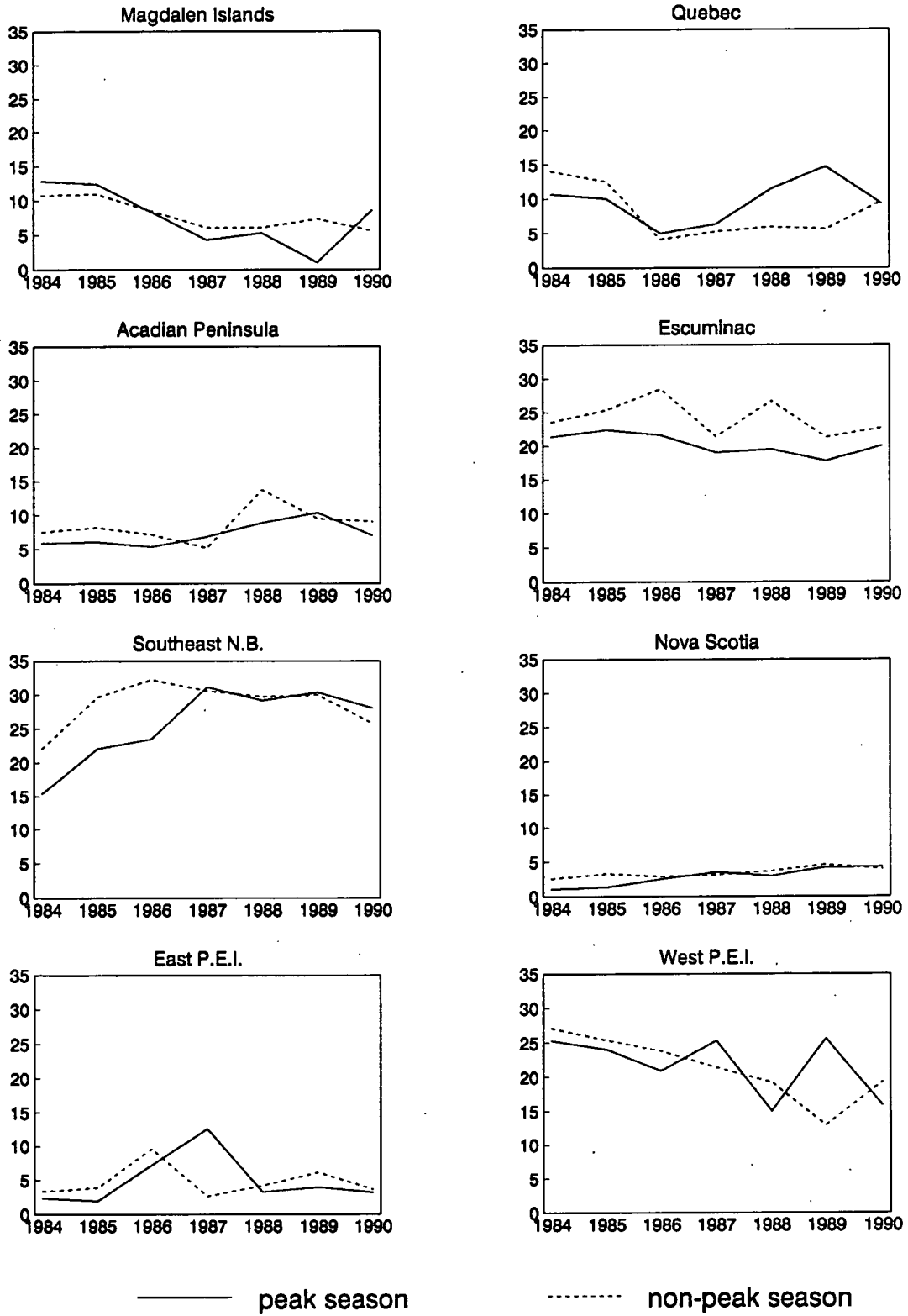


Figure 3. Number of nets fished in the 4T spring fishery

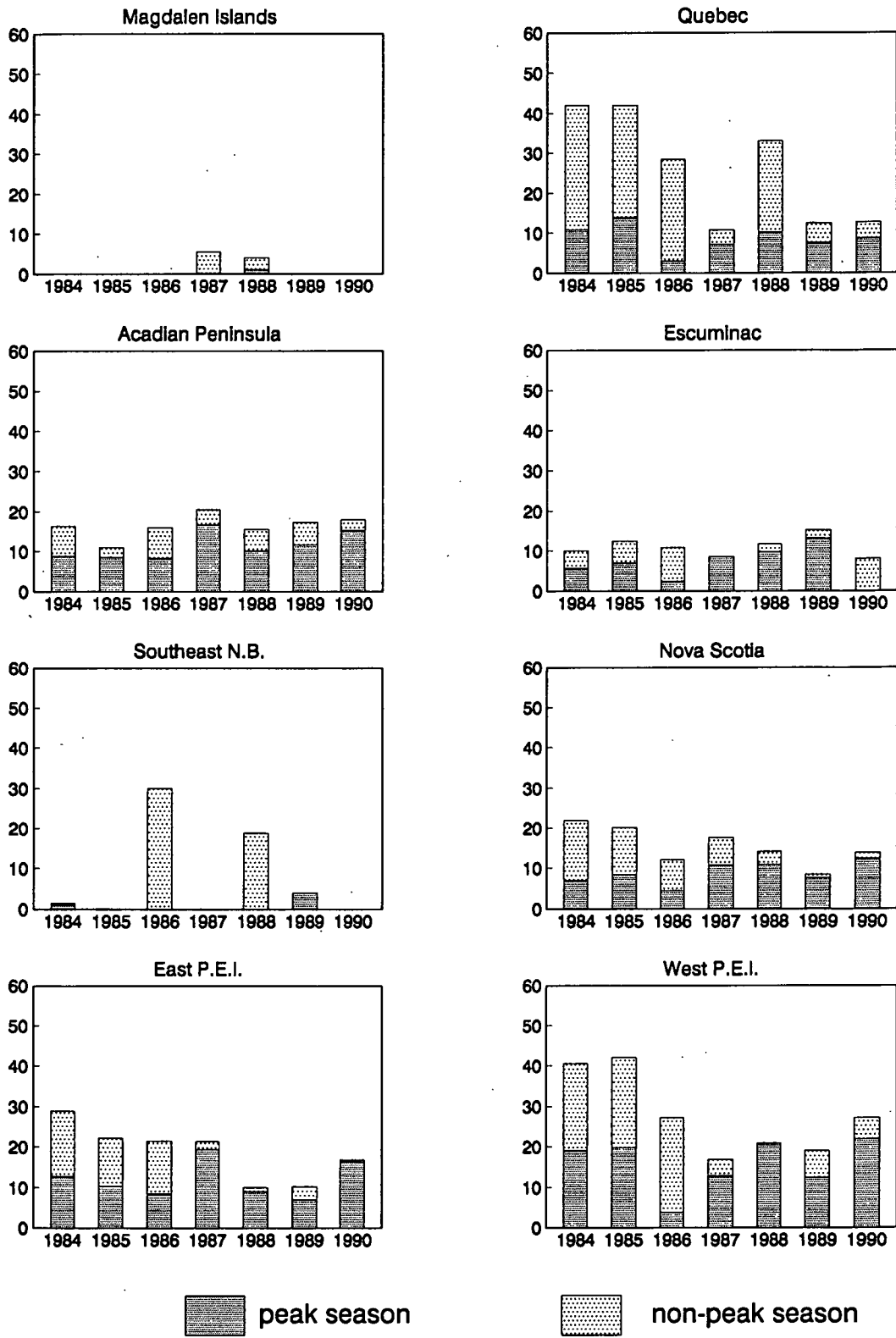


Figure 4. Number of days fished in the 4T fall fishery



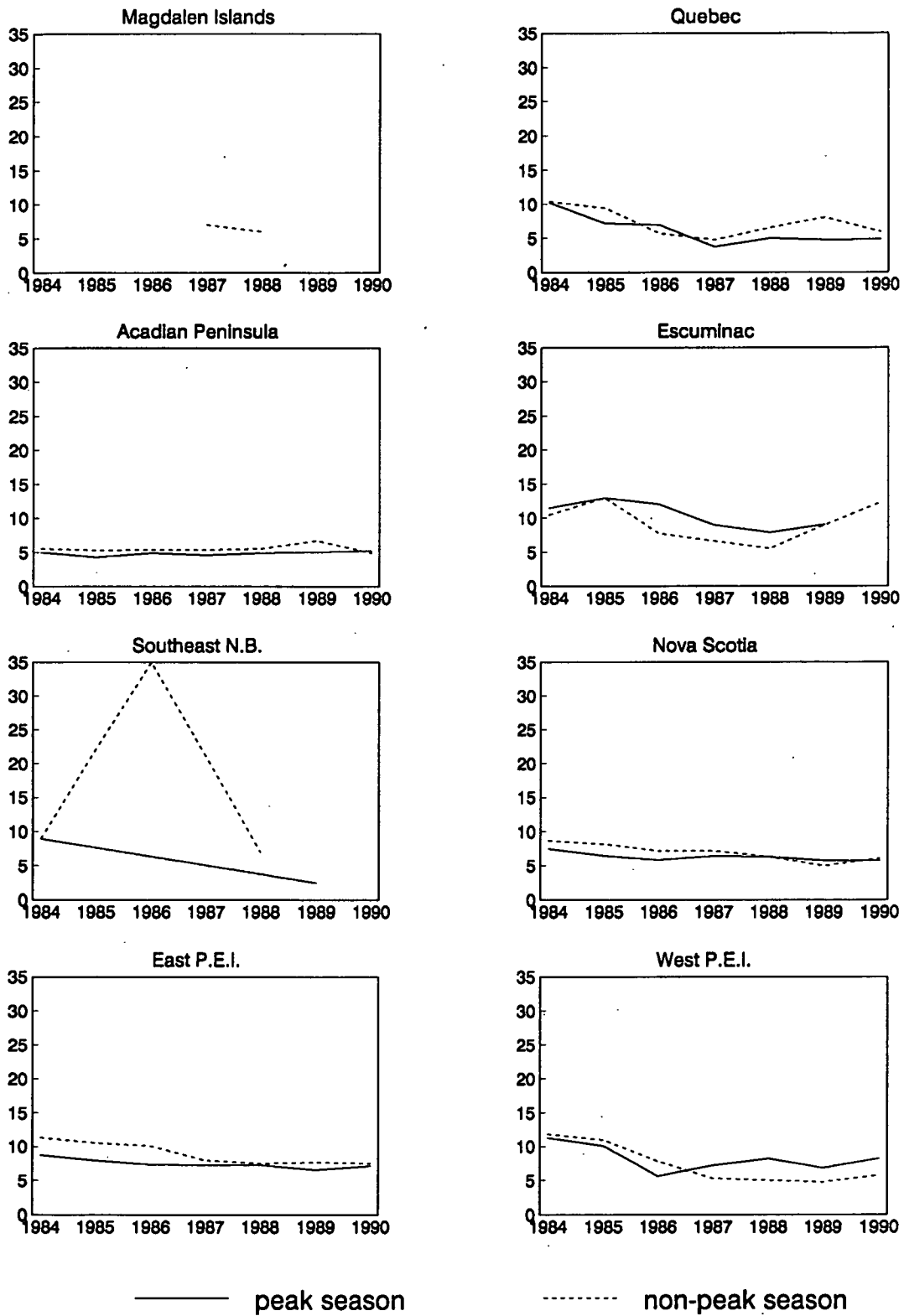


Figure 5. Number of nets fished in the 4T fall fishery

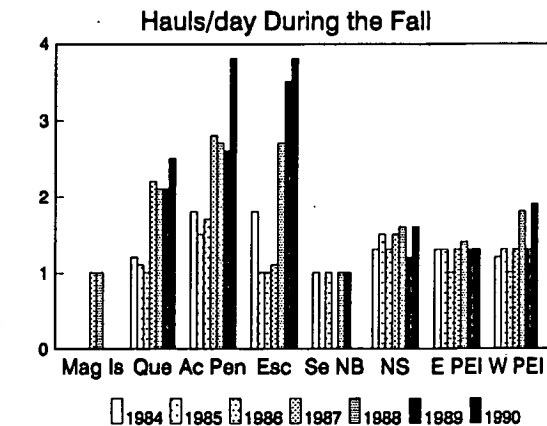
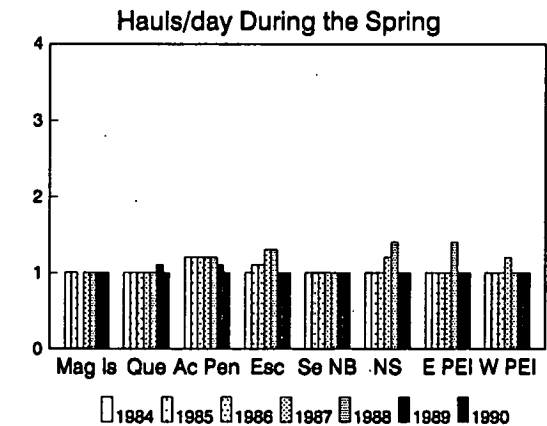
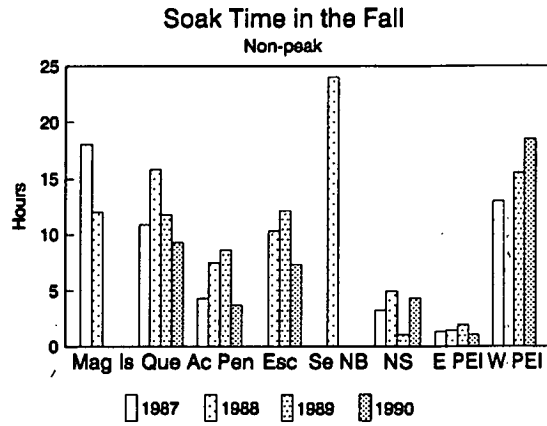
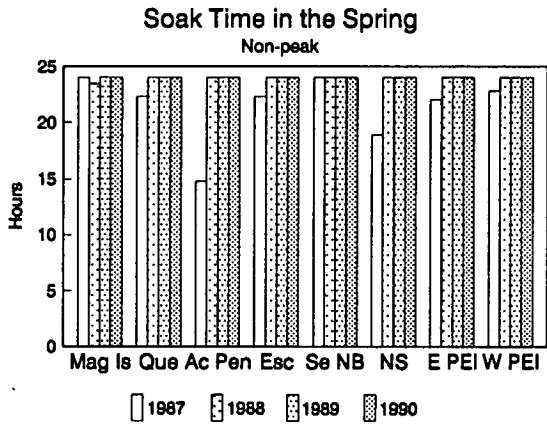
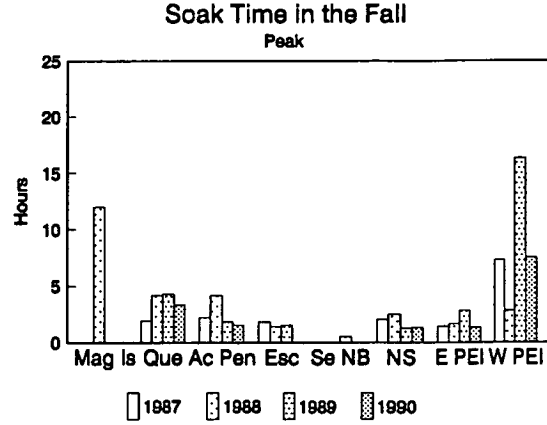
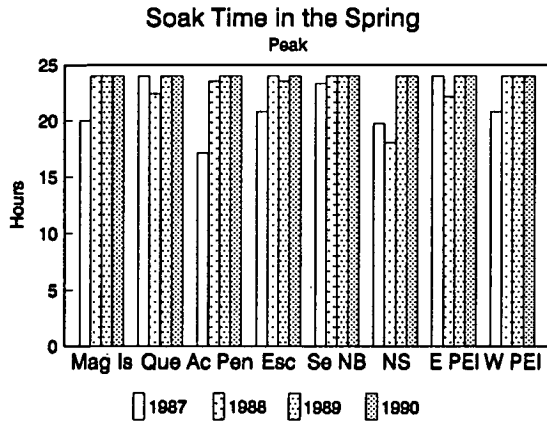


Figure 6. Net soak parameters for the 4T fishery

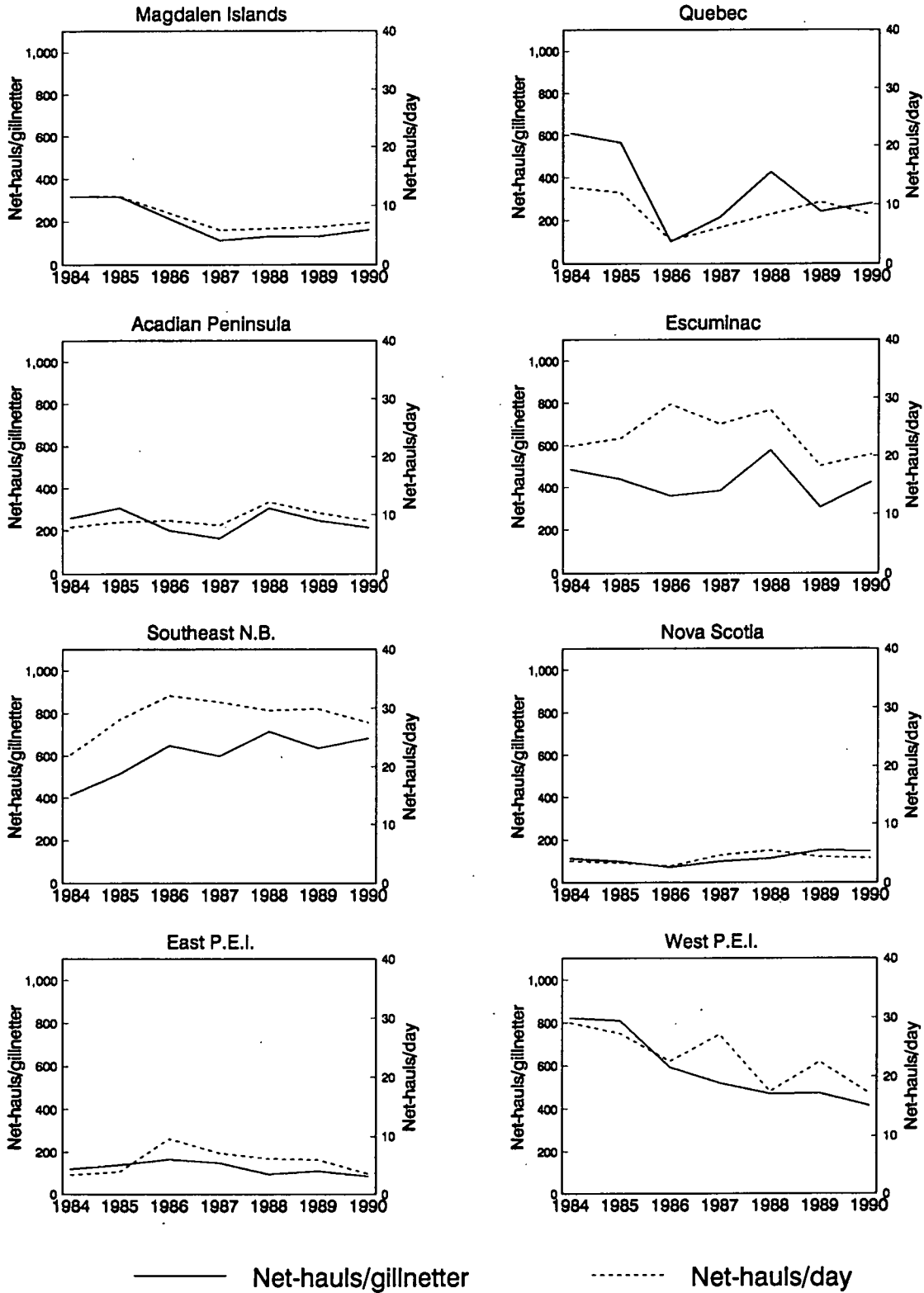


Figure 7. Effort expended in the 4T spring fishery

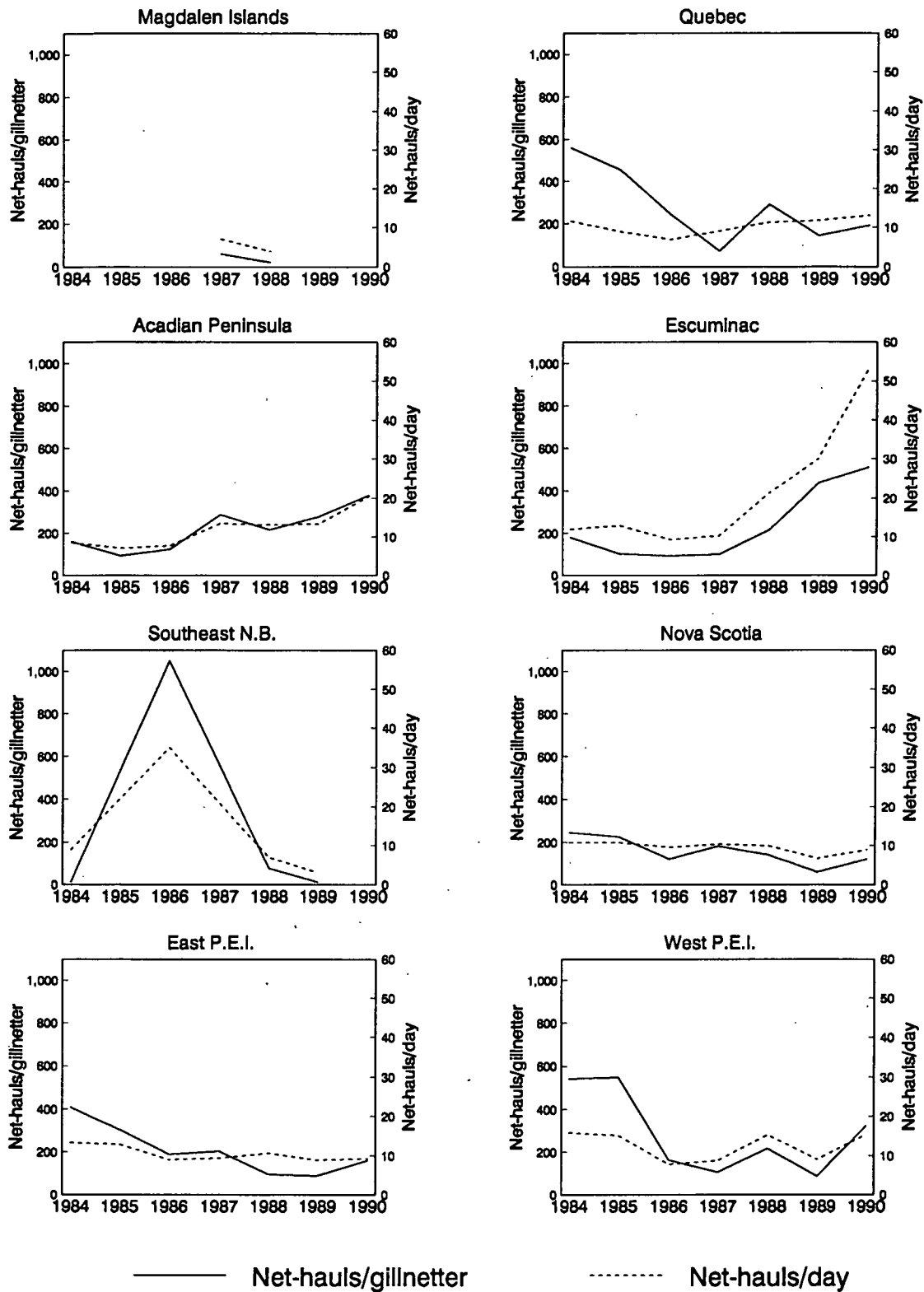


Figure 8. Effort expended in the 4T fall fishery

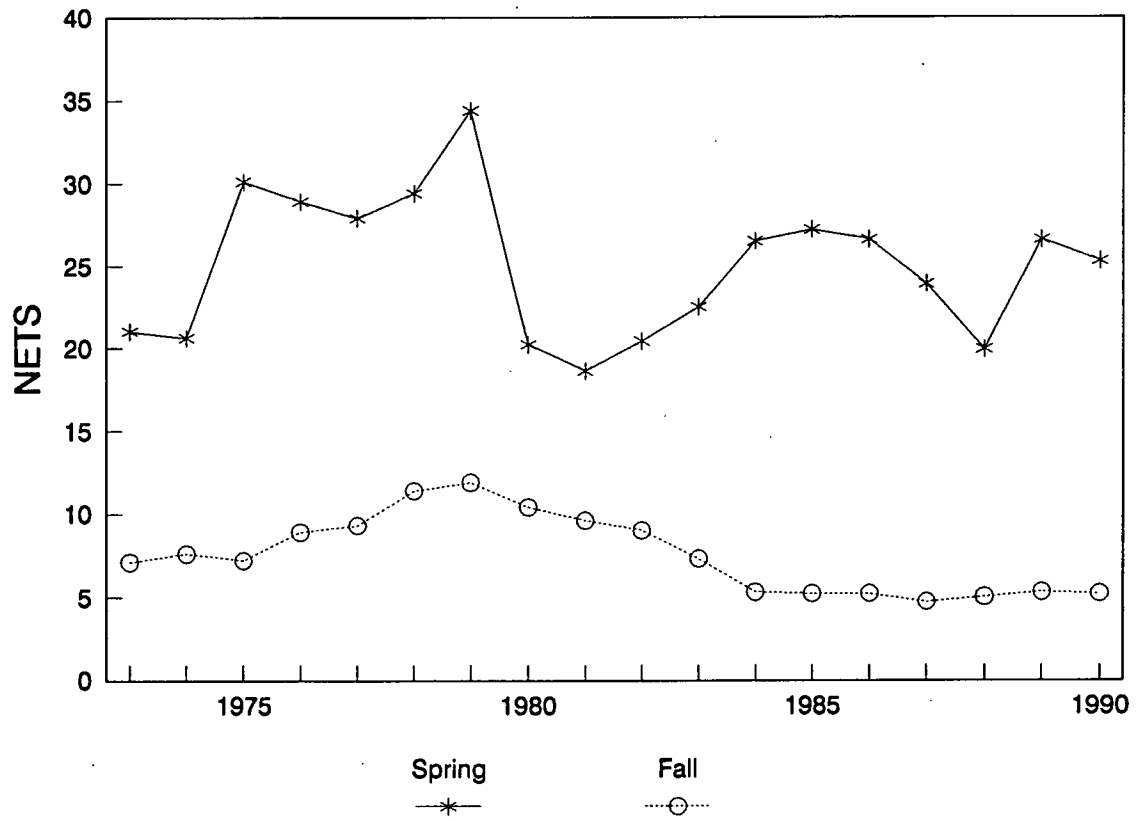


Figure 9. Historical effort index - number of nets fished/trip.

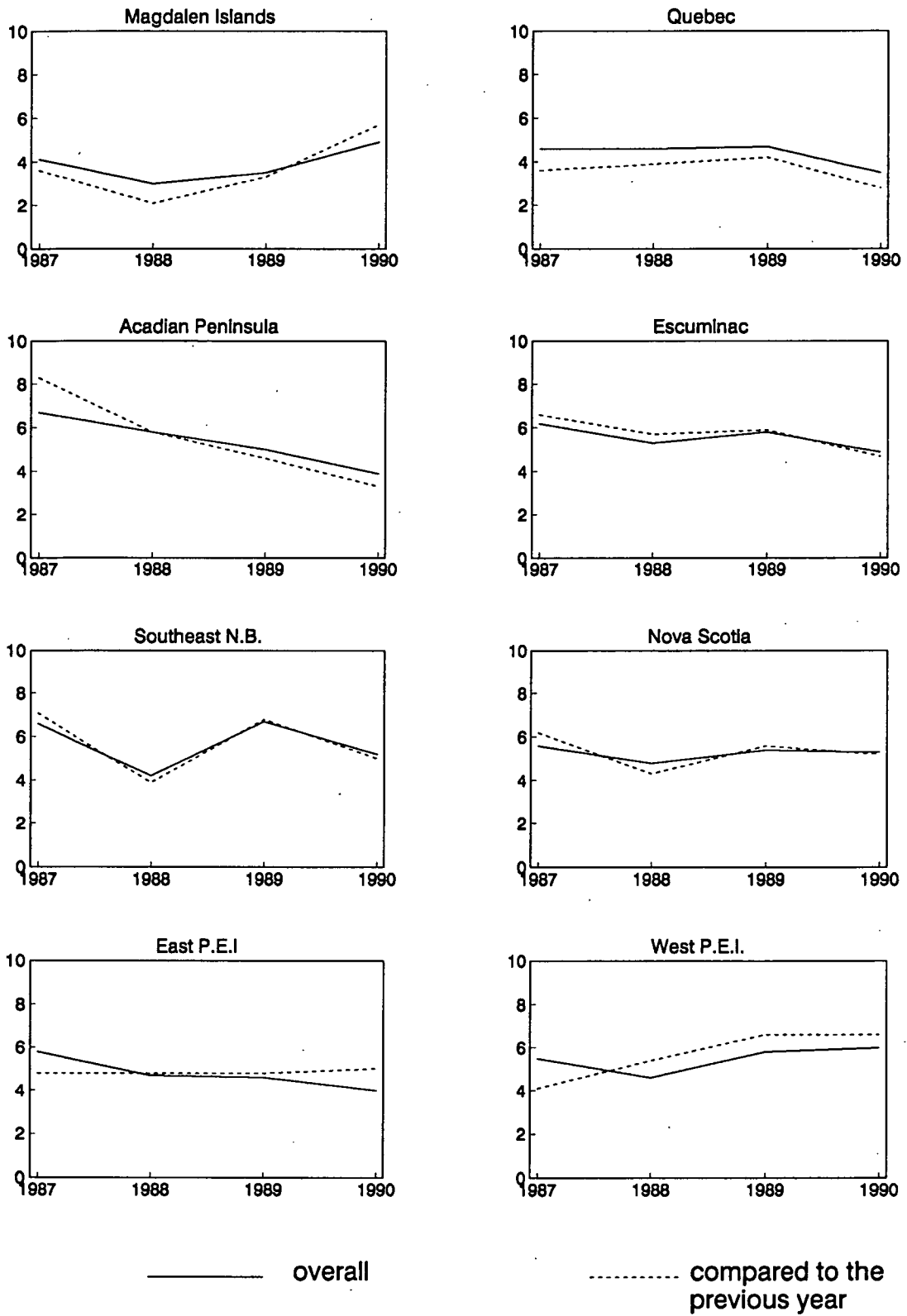


Figure 10. Spring Indices of abundance

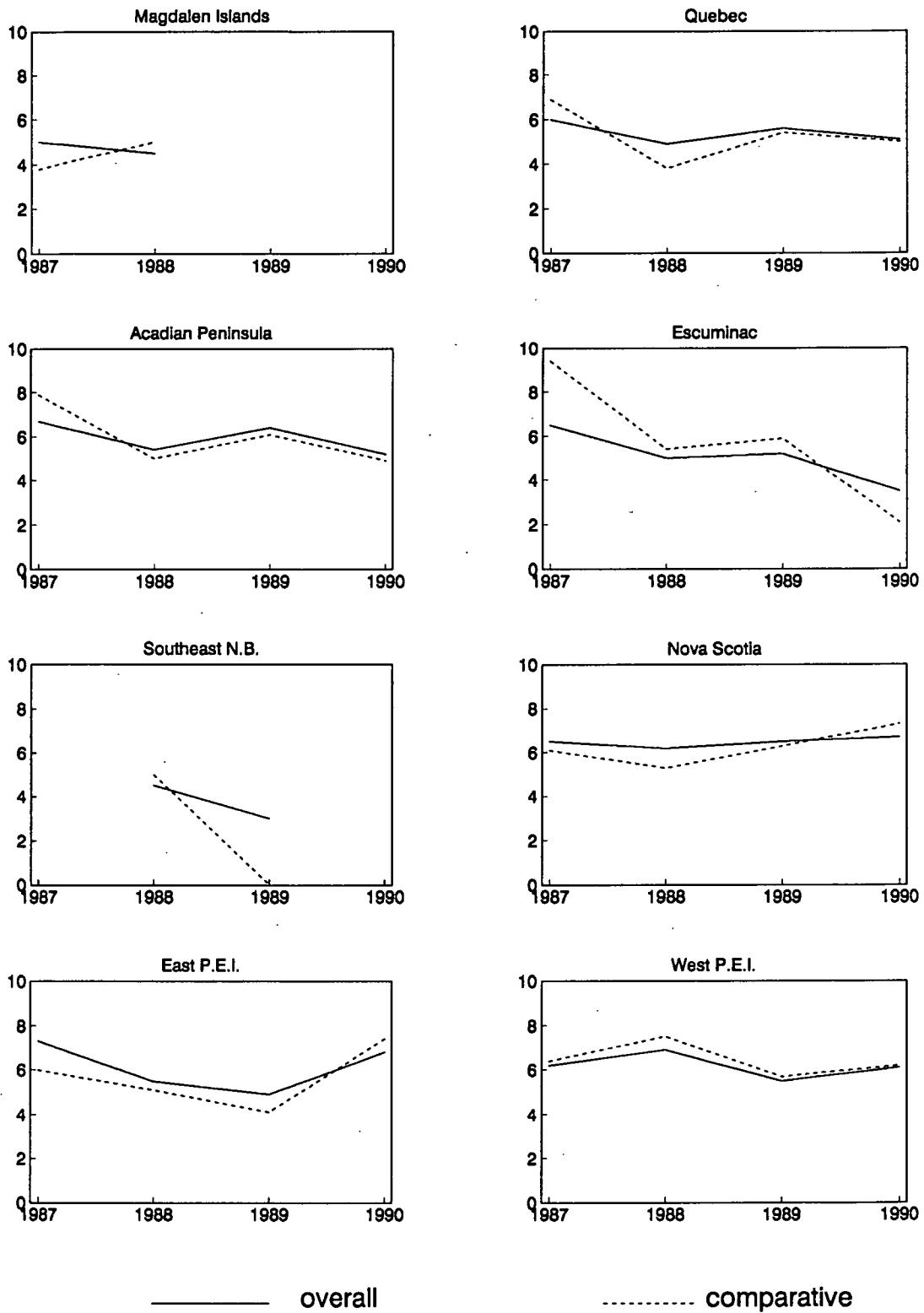


Figure 11. Fall Indices of abundance

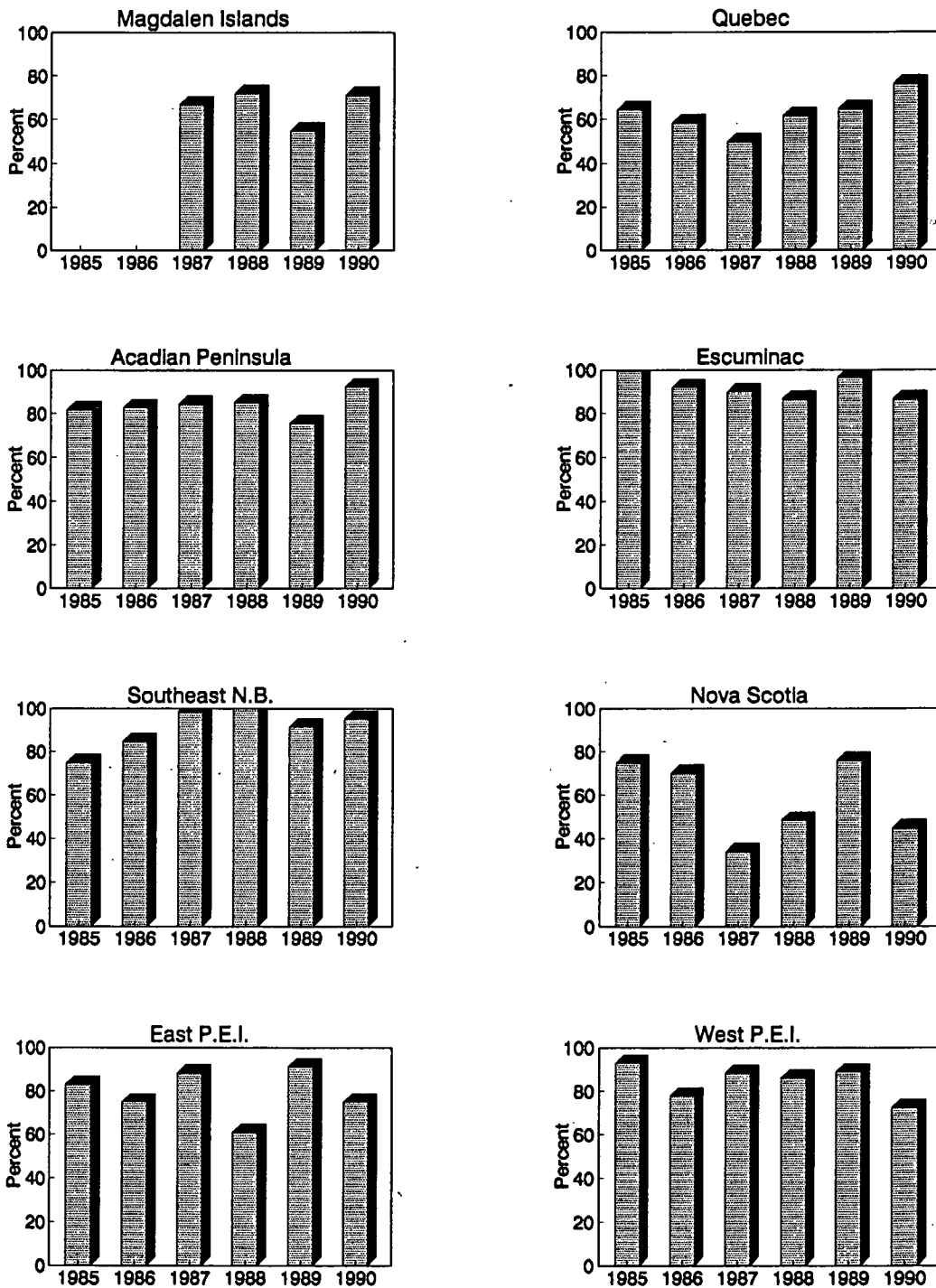


Figure 12. Percent of nets fished that are between 2 1/4 and 2 1/2 mesh in the 4T spring fishery.



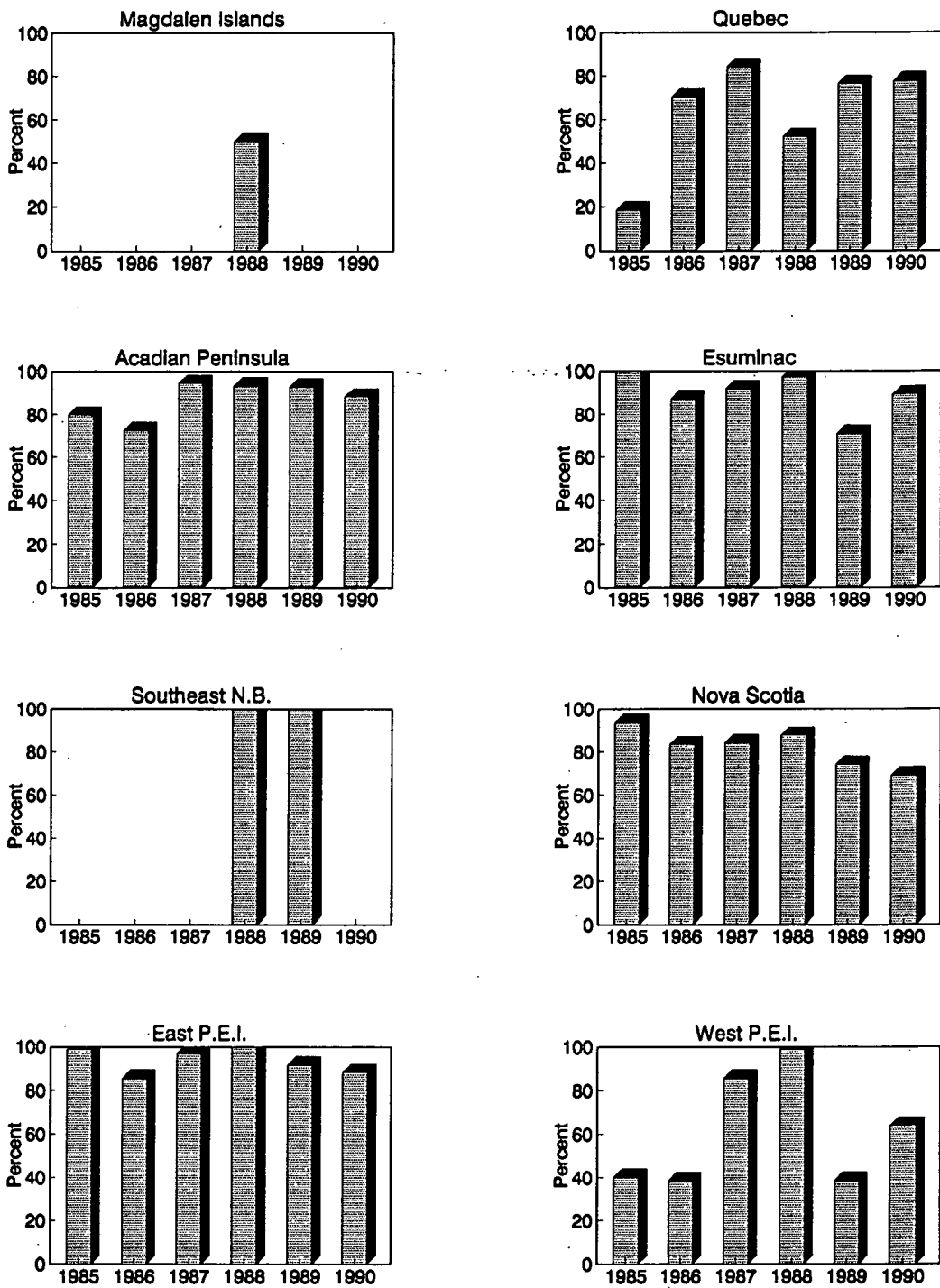


Figure 13. Percent of nets fished that are 2 5/8" mesh in the 4T fall fishery.

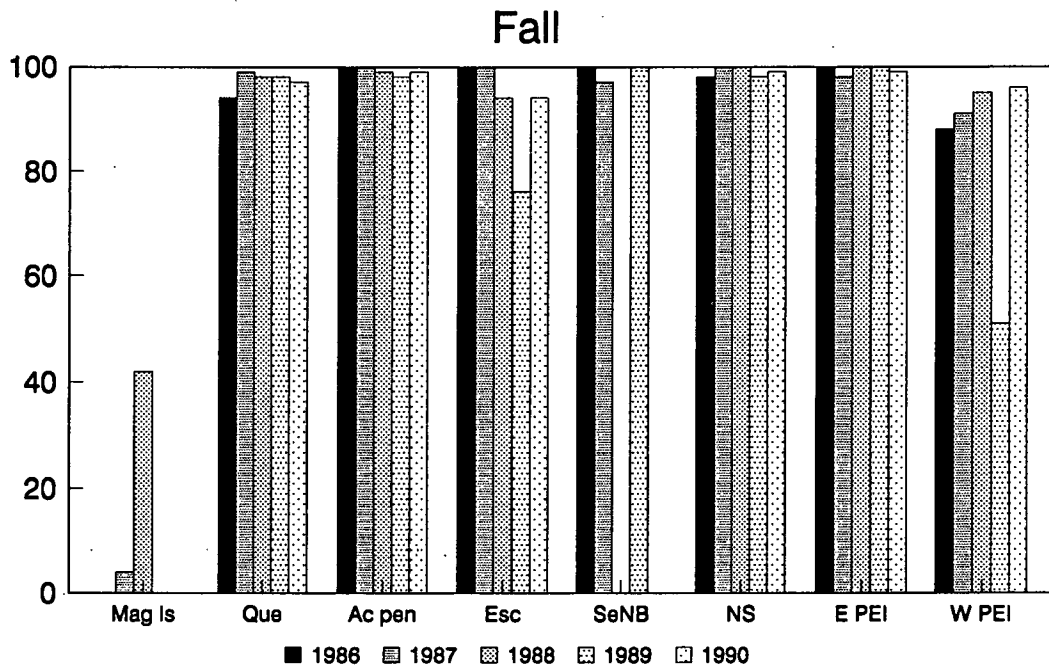
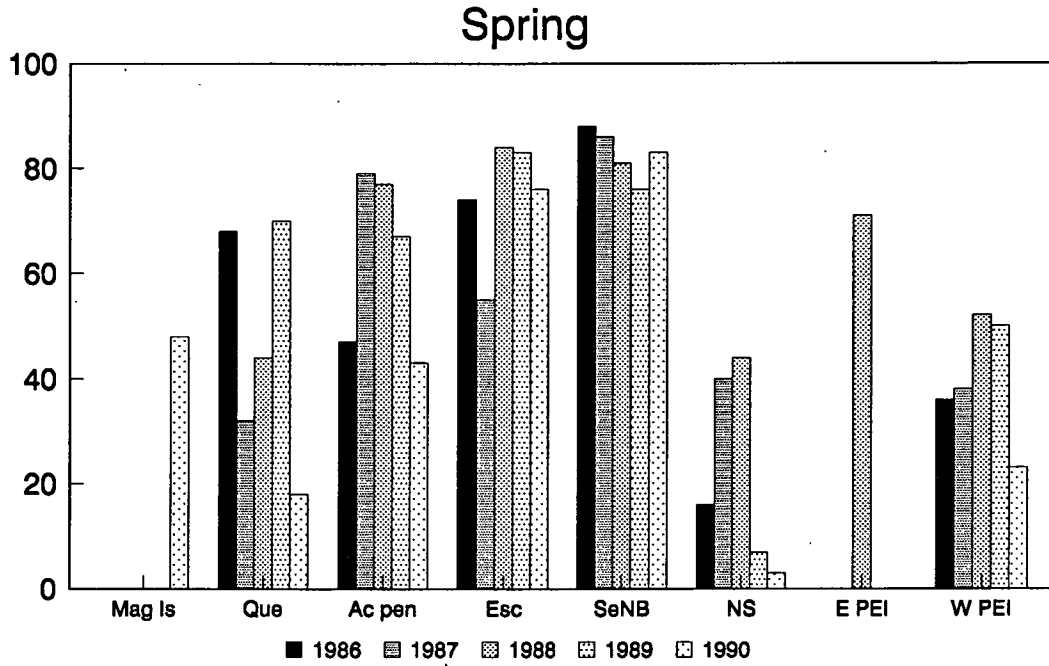


Figure 14. Percent of 4T catch sold to processors

APPENDIX

HERRING GILLNET QUESTIONNAIRE 1990

Interviewer \_\_\_\_\_

Home Stat Dist \_\_\_\_\_

Date \_\_\_\_\_

Resp I.D. \_\_\_\_\_

Record # 1

1. Did you fish herring with gillnets in 1990? 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 1990? 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 \_\_\_\_\_ 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 \_\_\_\_\_ 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?

21a. Did any marine mammals become trapped in any of your fishing gear in 1990? YES \_\_\_\_\_  
NO \_\_\_\_\_

(If YES, then ask the following questions):

21b. What kind, and how many of each were trapped? Grey seal \_\_\_\_\_  
Harbour seal \_\_\_\_\_  
Harbour porpoise \_\_\_\_\_  
Dolphin \_\_\_\_\_  
Whale \_\_\_\_\_

21c. In what kind of fishing gear were they trapped?

21d. About what date were they trapped?

HERRING GILLNET QUESTIONNAIRE 1990

Interviewer \_\_\_\_\_

Home Stat Dist \_\_\_\_\_

Date \_\_\_\_\_

Resp I.D. \_\_\_\_\_

Record # 2

1. Did you fish herring with gillnets in 1990? 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 1990? 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?  
 \_\_\_\_\_

41a. Did any marine mammals become trapped in any of your fishing gear in 1990? YES \_\_\_\_\_  
NO \_\_\_\_\_

(If YES, then ask the following questions):

41b. What kind, and how many of each were trapped? Grey seal \_\_\_\_\_  
Harbour seal \_\_\_\_\_  
Harbour porpoise \_\_\_\_\_  
Dolphin \_\_\_\_\_  
Whale \_\_\_\_\_

41c. In what kind of fishing gear were they trapped?

41d. About what date were they trapped?



QUESTIONNAIRE - HARENG 1990

Interviewer \_\_\_\_\_

Home Stat Dist \_\_\_\_\_

Date \_\_\_\_\_

Resp I.D. \_\_\_\_\_

Record # 1

1. Avez-vous peche le hareng en 1990 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 1990? 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/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 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? \_\_\_\_\_

21a. Est-ce que vos engins de peche ont attrape des mammiferes marins durant 1990? OUI \_\_\_\_\_  
NON \_\_\_\_\_

(Si OUI, demandez les questions suivantes):

21b. Quelles especes et combien de mammiferes etaient attrapees? Phoque gris \_\_\_\_\_  
Phoque commun \_\_\_\_\_  
Marsouin \_\_\_\_\_  
Dauphin \_\_\_\_\_  
Baleine \_\_\_\_\_

21c. Ces animaux etaient attrapes dans quel sorte d'engin?

21d. Ils etaient attrapes vers quelle date?

QUESTIONNAIRE - HARENG 1990

Interviewer \_\_\_\_\_

Home Stat Dist \_\_\_\_\_

Date \_\_\_\_\_

Resp I.D. \_\_\_\_\_

Record # 2

1. Avez-vous peche le hareng en 1990 a l'aide de filets maillants? OUI \_\_\_\_\_  
NON \_\_\_\_\_ (Si NON, c'est le fin de questionnaire)

2. Combien de filets maillants possédez-vous? \_\_\_\_\_

22. Avez-vous peche le hareng durant l'automne en 1990? 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 \_\_\_\_\_ 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 (ancree/modifie)	maille (po)	# filets	type (ancree/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 = \_\_\_\_\_%  
ou de la boette?

\_\_\_\_\_ poids = \_\_\_\_\_%

-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? \_\_\_\_\_

41a. Est-ce que vos engins de peche ont attrape des mammiferes marins durant 1990? OUI \_\_\_\_\_  
NON \_\_\_\_\_

(Si OUI, demandez les questions suivantes):

41b. Quelles especes et combien de mammiferes etaient attrapees? Phoque gris \_\_\_\_\_  
Phoque commun \_\_\_\_\_  
Marsouin \_\_\_\_\_  
Dauphin \_\_\_\_\_  
Baleine \_\_\_\_\_

41c. Ces animaux etaient attrapes dans quel sorte d'engin?

41d. Ils etaient attrapes vers quelle date?