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## **The 1993 4T Herring Gillnet Questionnaire**

by

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Research documents are produced in the official language in which they are provided to the secretariat.

<sup>1</sup>La présente série documente les bases scientifiques des évaluations des ressources halieutiques sur la côte Atlantique du Canada. Elle traite des problèmes courants selon les échéanciers dictés. Les documents qu'elle contient ne doivent pas être considérés comme des énoncés définitifs 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 dans le manuscrit envoyé au secrétariat

### ABSTRACT

A telephone survey obtained information from 320 herring gillnetters about their 1993 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 1993. The average number of nets fished per trip (used in the historical effort index) rose slightly in fall fishery (5.0 to 5.4), but increased from 22.7 in 1992 to 24.0 in 1993 in the spring fishery. The pattern of mesh size distribution has not changed much since 1984, although we see a tendency for larger mesh sizes in certain areas in the fall. In the spring fishery, a large proportion of the catch continued to be kept for personal use (usually bait). The fall catch is generally all sold to processors. Gillnetters felt that the spring abundance of herring was lower than in 1992 in all areas except Nova Scotia and east P.E.I. The fall abundance was seen to be at least as good as in 1992 in all areas except the Acadian peninsula and Quebec. On a scale of 1 to 10, the 1993 spring abundance was seen to be about average in all areas except for Nova Scotia (higher) while the 1993 fall abundance was seen to be overall about average except for Magdalen Islands and Escuminac which were rated higher.

### RESUME

Un sondage téléphonique fut effectué auprès de 320 pêcheurs pour recueillir des données sur la pêche du hareng au filet maillant dans le sud du golfe du Saint-Laurent (division 4T de l'OPANO) en 1993. Des renseignements furent obtenus sur l'effort de pêche, sur la répartition des divers maillages et sur l'utilisation des prises, servant respectivement à établir des estimés d'abondance, à déterminer le recrutement partiel, et à contre-vérifier les données obtenues sur les bordereaux d'achat. De plus, on a sollicité l'opinion des pêcheurs au filet maillant sur l'abondance du hareng en 1993. Le nombre moyen de filets pêchés par sortie (servant à établir un indice d'effort historique), a augmenté légèrement dans la pêche d'automne (de 5.0 à 5.4), et de 22.7 à 24.0 au printemps. La répartition des différentes grandeurs de mailles n'a pas changé beaucoup depuis 1984, mais l'on aperçoit une tendance vers du maillage plus grand dans certaines régions à l'automne. Dans la pêche printannière, une forte proportion des prises est gardée pour utilisation personnelle (surtout comme appât), tandis que la pêche d'automne est majoritairement vendue aux transformateurs. Les pêcheurs ont indiqué que l'abondance du hareng au printemps était inférieure à celle de 1992 dans toutes les régions, sauf la Nouvelle-Ecosse et l'est de l'Île-du-Prince-Édouard. L'abondance de hareng à l'automne fut jugée comparable à celle de 1992, sauf pour la Péninsule Acadienne et le Québec où elle fut jugée inférieure. Selon une échelle de 1 à 10, l'abondance du hareng au printemps était jugée moyenne dans toutes les régions, sauf pour la Nouvelle-Ecosse (supérieure à la moyenne). À l'automne, l'abondance fut aussi jugée moyenne, sauf pour les Îles-de-la-Madeleine et Escuminac où elle fut jugée 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 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 1993 survey, and presents comparisons with results from previous surveys (Nielsen 1986-1993).

## 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 licensed gillnetters were compared to purchase slip records to obtain a list of active gillnetters for 1993. 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 licensed gillnetters. Table 2 summarizes gillnet statistics for 1993.

The interviews were conducted by telephone in the official language of the gillnetters' choice, during January and February, 1994. 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 1993?). 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 part of the season (if any) when the fishing is really good (peak of the season)
  - 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).

$$i) NHF_i = \frac{1}{n_i} \sum_j (dp_j \times np_j + dnp_j \times nnp_j) \times h_j$$

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  $i$

$$ii) NHT_i = \frac{1}{n_i} \sum_j \frac{(dp_j \times np_j + dnp_j \times nnp_j) \times h_j}{dp_j + dnp_j}$$

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.

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 1993 versus 1992. On a scale of 0 to 10, the responses mean:
  - 0 = abundance was much less in 1993 than 1992
  - 2½ = abundance was somewhat less in 1993 than in 1992
  - 5 = abundance was the same in 1993 as in 1992
  - 7½ = abundance was somewhat more in 1993 than in 1992
  - 10 = abundance was much more in 1993 than in 1992

The second question asked gillnetters to rate the abundance of herring in 1993 on a scale of 1 to 10, assuming that 5 is average abundance.

## RESULTS AND DISCUSSION

In total, 320 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 320, due to some gillnetters 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 and gillnetters from west P.E.I. fishing close to New Brunswick. Table 4 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. Comparisons of the fishing effort for 1984-1993 are shown in Figures 2 to 5.

#### Spring

There have been large fluctuations since 1984 in the total number of days fishing by Quebec gillnetters, and a slight increase from 1992 to 1993 in all other areas except Escuminac (Fig. 2). The proportion of days identified as peak fishing varies over time in all areas, with Escuminac, southeast N.B., Nova Scotia, and west P.E.I. having the highest proportion in recent years. Quebec, Acadian peninsula and East P.E.I. have the lowest proportion of days identified as peak in the time series.

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 (Fig. 3). There appears to be general downward trends in west P.E.I., and perhaps Escuminac and the Magdalen Islands. Compared to 1992, the number of nets fished in 1993 is equal or up in all areas except Escuminac, Nova Scotia and west P.E.I. in the non-peak. Magdalen Islands, Nova Scotia and east P.E.I. continue to use the fewest nets, while southeast N.B., Escuminac, and west P.E.I. use the most.

#### Fall

From 1992, the total number of days fished in the fall noticeably increased in Quebec, Escuminac, southeast N.B. and Nova Scotia, slightly decreased in the Acadian peninsula and P.E.I. (Fig. 4). The Magdalen Island, Escuminac, southeast N.B. and Nova Scotia gillnetters identified only peak days in 1993. For the third year in a row, all areas reported fishing activity.

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 (Fig. 5). The exceptions are southeast N.B., which has few gillnetters in some years and none in others, and Escuminac, whose gillnetters used fewer nets in the non-peak in 1991 compared to previous years, and declared only peak days in the fall of 1992 and 1993. Magdalen Islands, southeast N.B. and Nova Scotia also declared only peak days in 1993.

### 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 1993 spring fishery was very close to 24 hours (both peak and non-peak). In the fall, only the Magdalen Islands, Escuminac, and Nova Scotia had a decrease in net soak time in 1993; all other areas increased. During the non-peak, the net soak time in 1993 was less in the four areas that fished during the non-peak; Quebec, Acadian peninsula, east P.E.I., and west P.E.I.

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 1.0 to 1.2 for all areas except southeast N.B. (1.3) in 1993. In the fall, the Acadian peninsula and Escuminac continue to report the most hauls/day (more than 3), Quebec decreased and south east N.B. increased in the range of 2-2.5 hauls/day, while the remaining areas reported 1.2-1.5 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 1993, except for Quebec in the fall, where the number of net-hauls/gillnetter appears to have declined since 1984, but the number of net-hauls/day has remained stable. As expected, the trend of number of net-hauls/day follows closely the trend of number of nets fished in the spring fishery (Fig. 7). This is not true of the fall fishery, in which the number of net-hauls/day is more variable (Fig. 8). From 1992, the number of both indices increased or remained about the same in all areas and both seasons, except in Nova Scotia in the spring, and southeast N.B. and P.E.I. in the fall.

The historic effort index shown in Figure 9 indicates some variability in the spring since 1985, but little change in the fall. The spring index increased in 1993 from 1992 (22.7 to 24.0), while the fall index rose slightly from 5.0 to 5.4.

### Abundance Indices

The responses to the questions about relative abundance of herring in 1993 are shown in Figures 10 and 11. Spring abundance in 1993 was rated lower than in 1992 except for Nova Scotia and east P.E.I., where there was an increase (Fig. 10). Overall, the abundance was considered average except in southeast N.B. and Nova Scotia (greater than average). Since 1987, the spring abundance has been decreasing in the Acadian peninsula, with a slight increase in 1992, and increasing in the Magdalen Islands and Nova Scotia, while remaining more or less stable with some fluctuation in the other areas.

Fall abundance compared to 1992 was rated greater than 6 in the Magdalen Islands, and Escuminac, but less than 4 in Quebec, the Acadian peninsula, and southeast N.B. (Fig. 11). Overall, fall abundance was reported to be average except in Magdalen Islands (9.0) and Escuminac (8.2).

### Gillnet Mesh Size Distribution

Figures 12 and 13 illustrate the percentage of the gillnet mesh sizes used from 1985 to 1993 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 5), but not within an area between seasons, except for east P.E.I. and Nova Scotia, for which there were only 3 respondents in the spring and 6 respondents in the fall, respectively. The length of nets used in 1993 ranged from 14.9 to 21.8 fathoms in the spring, and from 14.9 to 20.6 fathoms in the fall. Quebec used the longest nets in both the spring and the fall.

In previous years, 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). In 1993, only Quebec and east P.E.I. spring gillnetters used less than 90% set nets (Table 6). Only Quebec and Acadian peninsula fall gillnetters used more than 50 percent modified nets. The use of set nets in the spring corresponds to soak times of approximately 24 hours and one haul per day, while in the fall, generally more than one haul is made per day whether or not modified nets or set nets are used (Figure 6).

### Use of The Catch

Figure 14 shows the trends in disposition of the catch from 1988 to 1993. 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, only Escuminac, southeast N.B. and west P.E.I. gillnetters sold more than 50% of their catch to processors in 1993. All other areas keep over 50% of their catch for personal use; it is mainly used or resold for bait. The percentage dumped was low in 1993.

In the fall, the catch continued to be primarily sold to processors in all areas. South east N.B. has the highest percentage of catch kept for personal use. The amount of catch dumped in the fall remained low or nil in all areas.

### 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). It also gives an idea of how the gillnetters perceive the abundance of herring in their area. This area-by-area portrait of the fishery provides valuable information on the patterns and trends of the fishery over time.

### 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 Peninsula	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, 95, 96

**Table 2. Herring gillnet statistics for the southern Gulf of St. Lawrence in 1993.**

Area	Landings		Number of	
	Spring	Fall	Licences	Boats
Magdalen Islands	.	.	327	.
Quebec	.	.	531	.
Acadian Peninsula	1348	12038	608	238
Escuminac	4382	2806	343	170
Southeast N.B.	3930	131	246	113
Nova Scotia	289	728	425	52
East P.E.I.	99	1410	376	72
West P.E.I.	1547	549	482	213

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

Area	Number Selected	Number of completed surveys	Number of phone problems	Number not contacted	Number not fishing	Number not cooperating
Magdalen Islands	41	28	1	9	3	0
Quebec	67	47	1	6	12	1
Acadian Peninsula	86	72	1	8	3	2
Escuminac	62	54	2	2	0	4
Southeast N.B.	42	35	5	0	2	0
Nova Scotia	15	12	0	2	1	0
East P.E.I.	27	22	1	3	1	0
West P.E.I.	68	50	0	12	5	1
Total	408	320	11	42	27	8

\* Examples of phone problems: no number, disconnected



**Table 4. Number of respondents fishing in each area in 1993 by area of home port.****Fishing Area - Spring**

Home Port	Mag Is	Que	Ac Pen	Esc	Se N.B.	N.S.	E P.E.I.	W P.E.I.	Total
Mag Is	28	.	.	.	.	.	.	.	28
Que	.	30	3	.	.	.	.	1	34
Ac Pen	.	.	60	.	.	.	.	.	60
Esc	.	.	.	46	3	.	.	.	49
Se N.B.	.	.	.	.	35	.	.	1	36
N.S.	.	.	.	.	.	8	.	.	8
E P.E.I.	.	.	.	.	.	.	3	.	3
W P.E.I.	.	.	.	4	2	1	.	47	54
Total	28	30	63	50	40	9	3	49	272

**Fishing Area - Fall**

Home Port	Mag Is	Que	Ac Pen	Esc	Se N.B.	N.S.	E P.E.I.	W P.E.I.	Total
Mag Is	4	.	.	.	.	.	.	.	4
Que	.	8	.	.	.	.	.	.	8
Ac Pen	.	11	60	.	.	.	.	.	71
Esc	.	.	.	16	.	.	.	1	17
Se N.B.	.	.	.	.	6	.	.	.	6
N.S.	.	.	.	.	.	4	2	.	6
E P.E.I.	.	.	.	.	.	.	22	.	22
W P.E.I.	.	.	.	.	.	.	1	15	16
Total	4	19	60	16	6	4	25	16	150

**Table 5. Length of gillnets used in the 1993 herring fishery (fathoms).**

Area	Spring	Fall
Magdalen Islands	16.9	17.5
Quebec	21.8	20.6
Acadian Peninsula	14.9	16.4
Escuminac	16.2	17.4
Southeast N.B.	15.8	16.0
Nova Scotia	21.3	15.2
East P.E.I.	14.7	18.0
West P.E.I.	15.9	14.9

**Table 6. Percent distribution of gillnet types used in the 1993 herring fishery.**

Area	Spring		Fall	
	Set	Modified	Set	Modified
Magdalen Islands	92.8	7.2	78.9	21.1
Quebec	86.4	13.6	40.3	59.7
Acadian Peninsula	99.6	0.4	14.0	86.0
Escuminac	100.0	.	89.2	10.8
Southeast N.B.	100.0	.	87.5	12.5
Nova Scotia	100.0	.	70.0	30.0
East P.E.I.	83.3	16.7	100.0	.
West P.E.I.	96.7	3.3	93.1	6.9

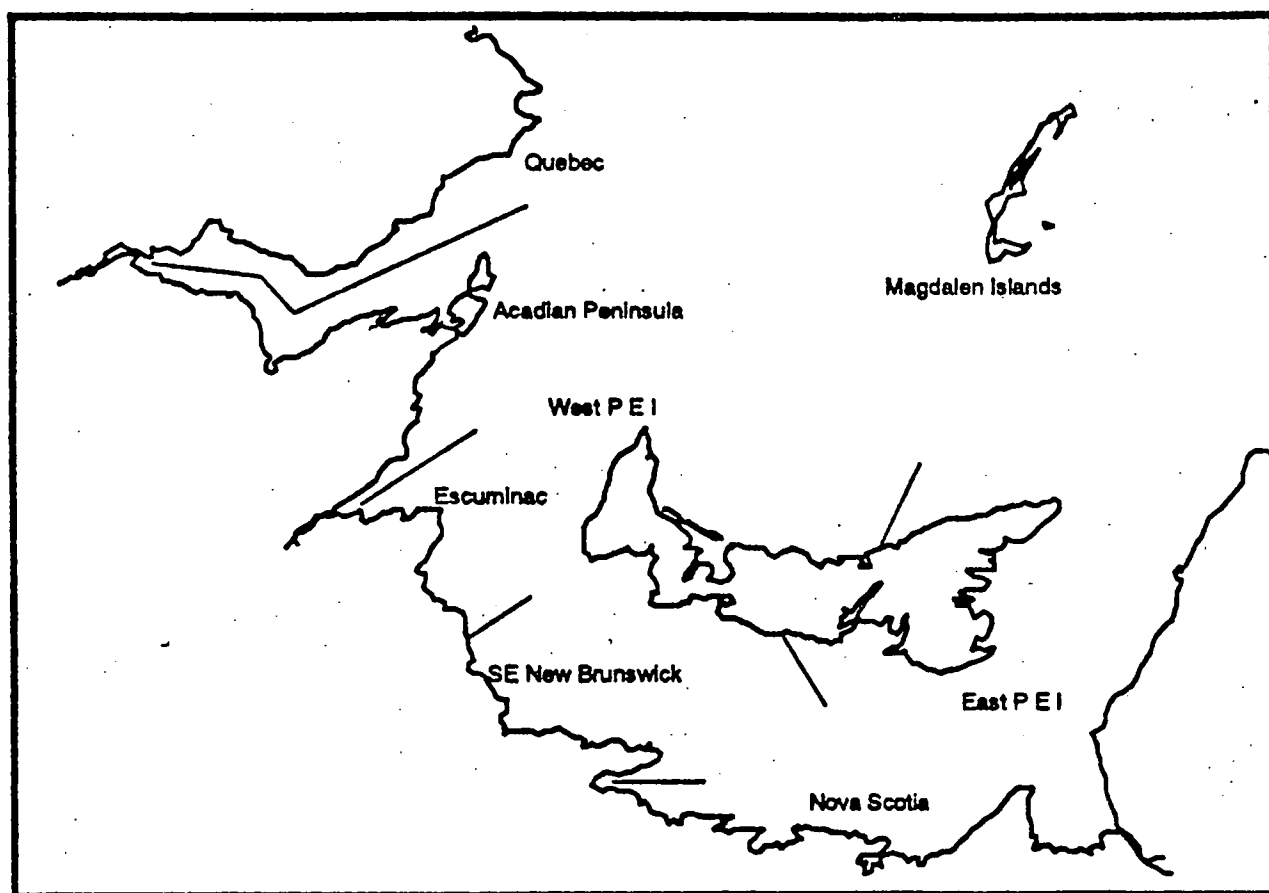


Fig 1. Geographic areas in the southern Gulf of St. Lawrence used in the 1993 herring gillnet survey.

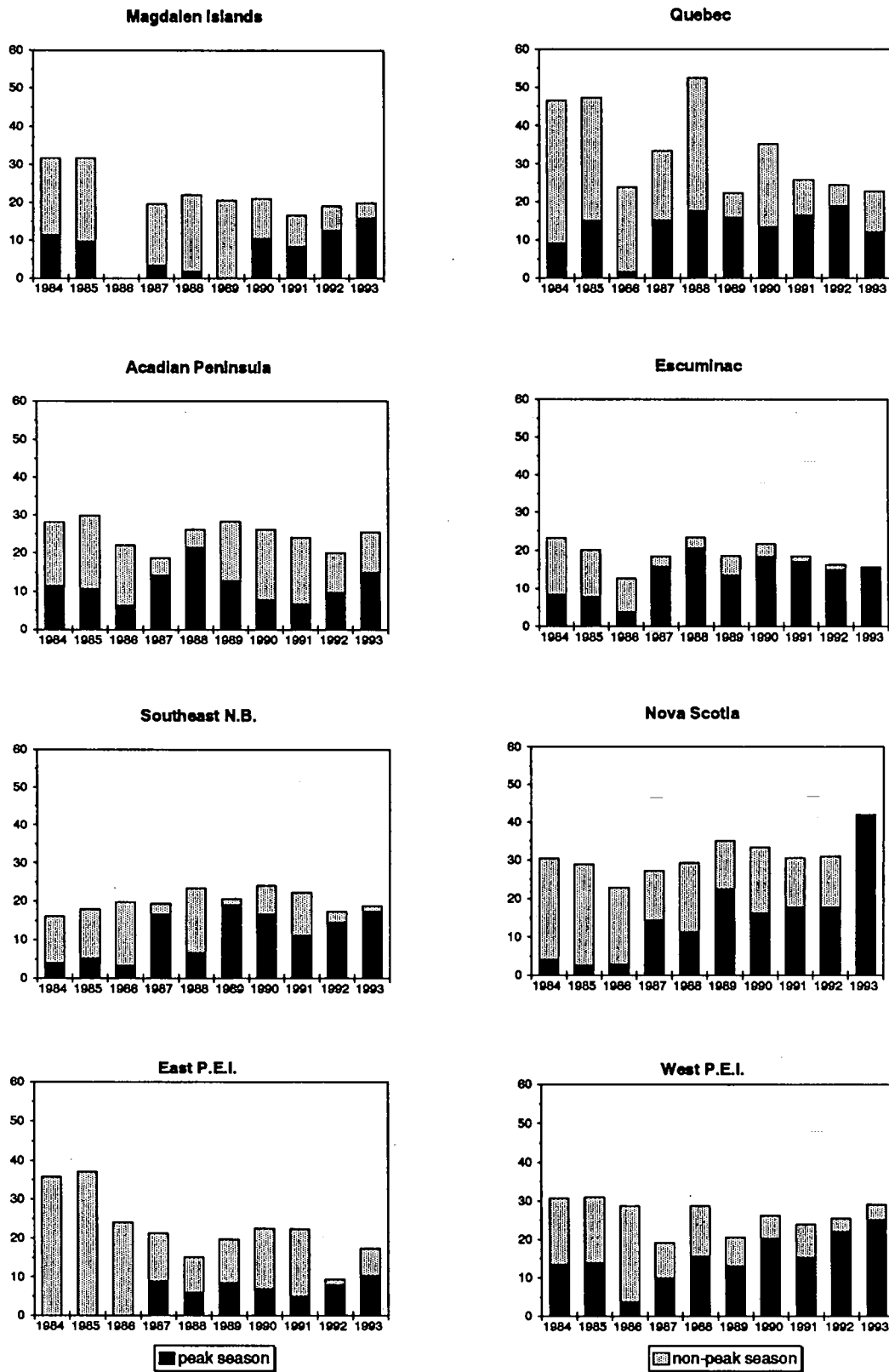


Figure 2. Number of days fished/gillnetter in the 4T spring fishery

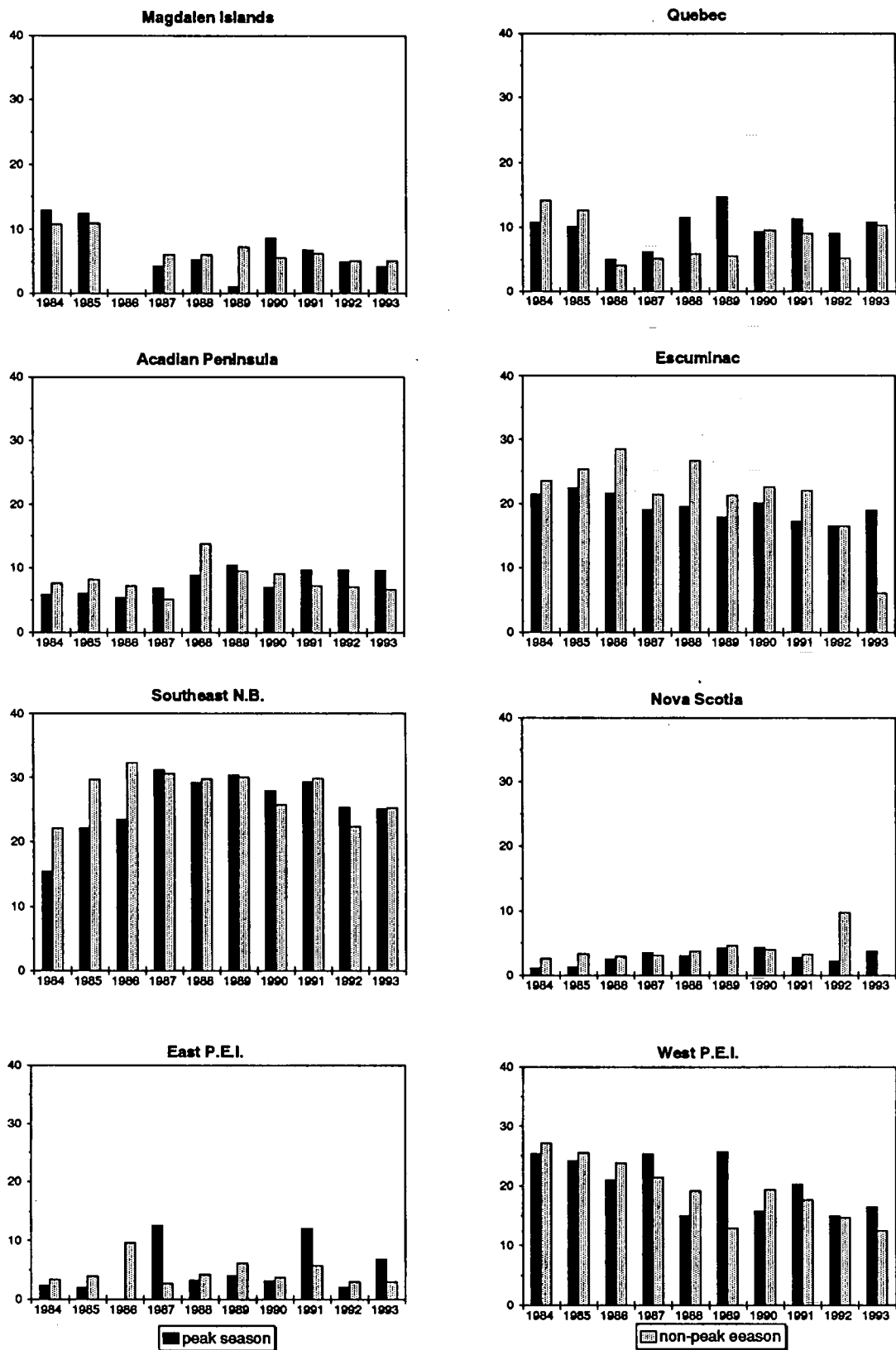


Figure 3. Number of nets fished/gillnetter in the 4T spring fishery

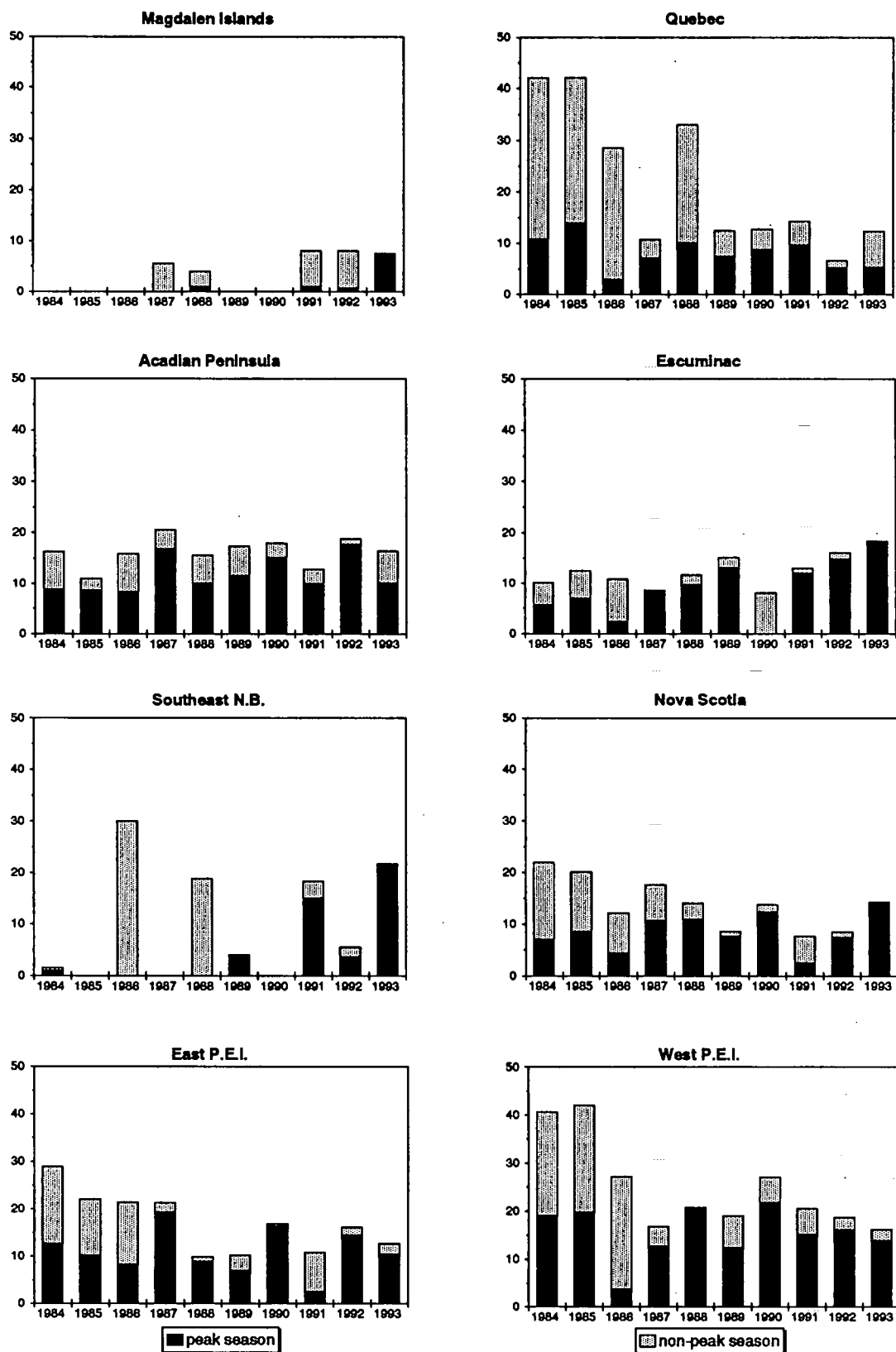


Figure 4. Number of days/gillnetter fished in the 4T fall fishery

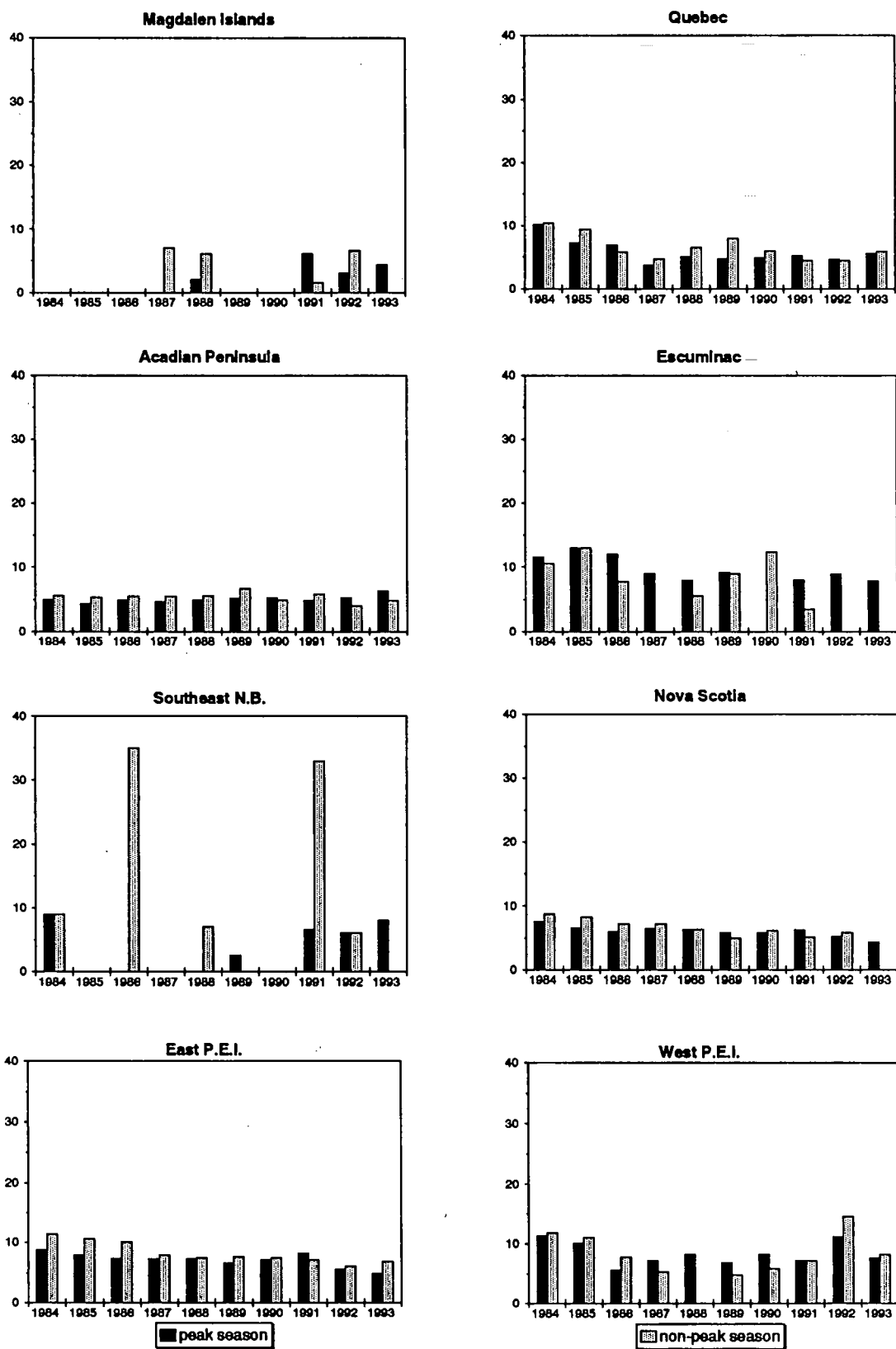
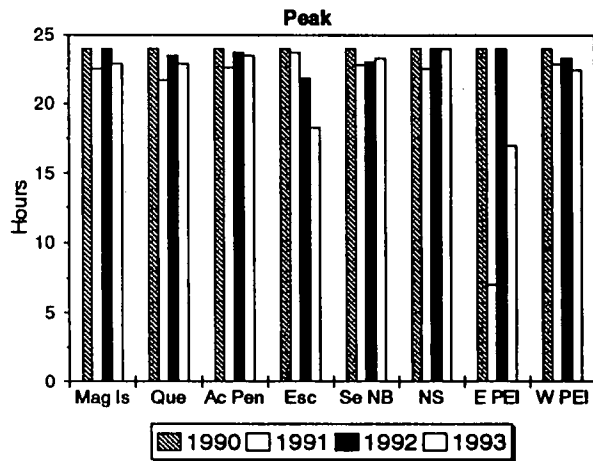
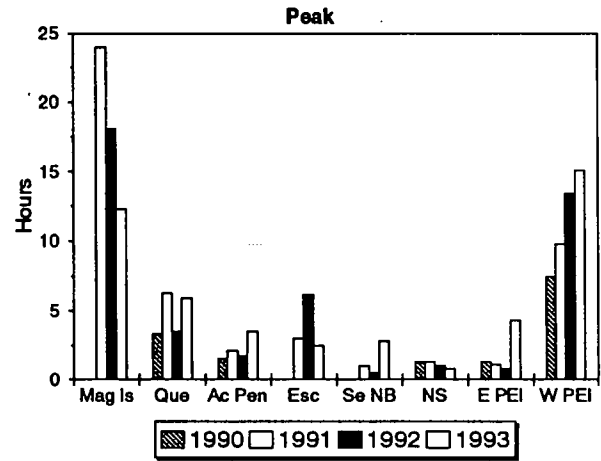


Figure 5. Number of nets fished/gillnetter in the 4T fall fishery

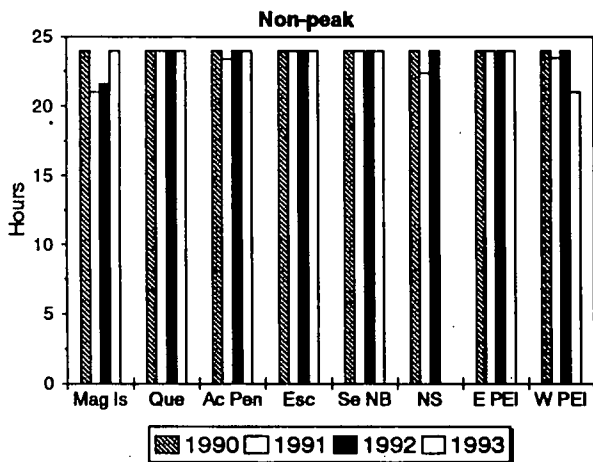
## Soak Time In The Spring



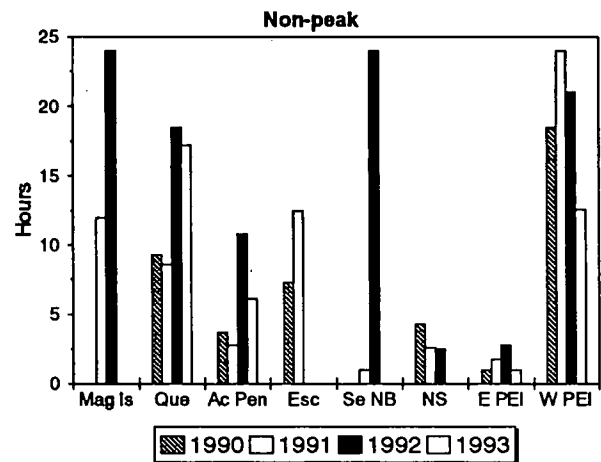
## Soak Time In The Fall



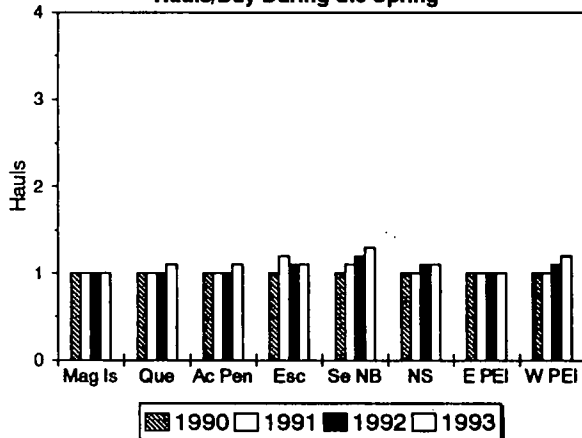
## Soak Time In The Spring



## Soak Time In The Fall



## Hauls/Day During the Spring



## Hauls/Day During the Fall

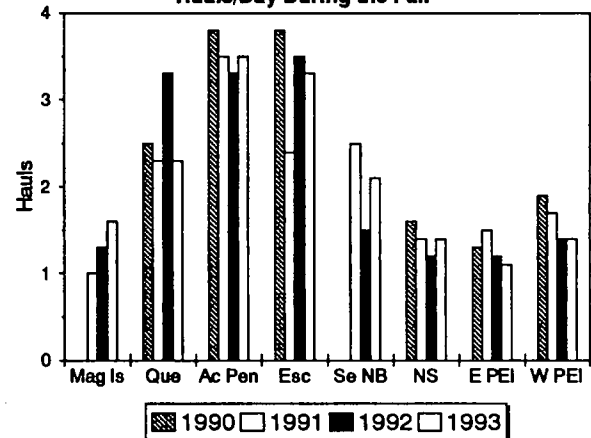


Figure 6. Net soak parameters for the 4T fishery



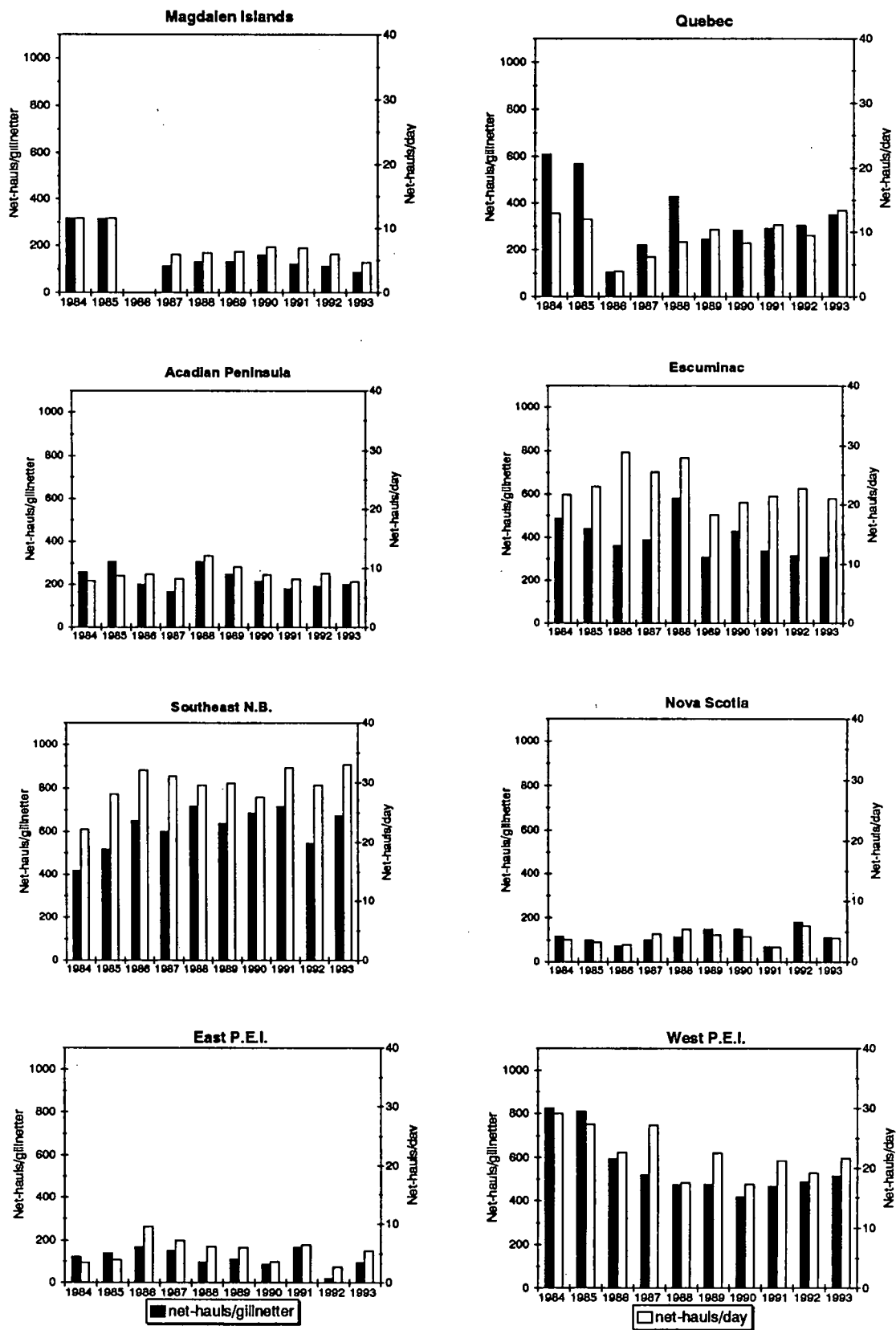


Figure 7. Effort expended in the 4T spring herring fishery

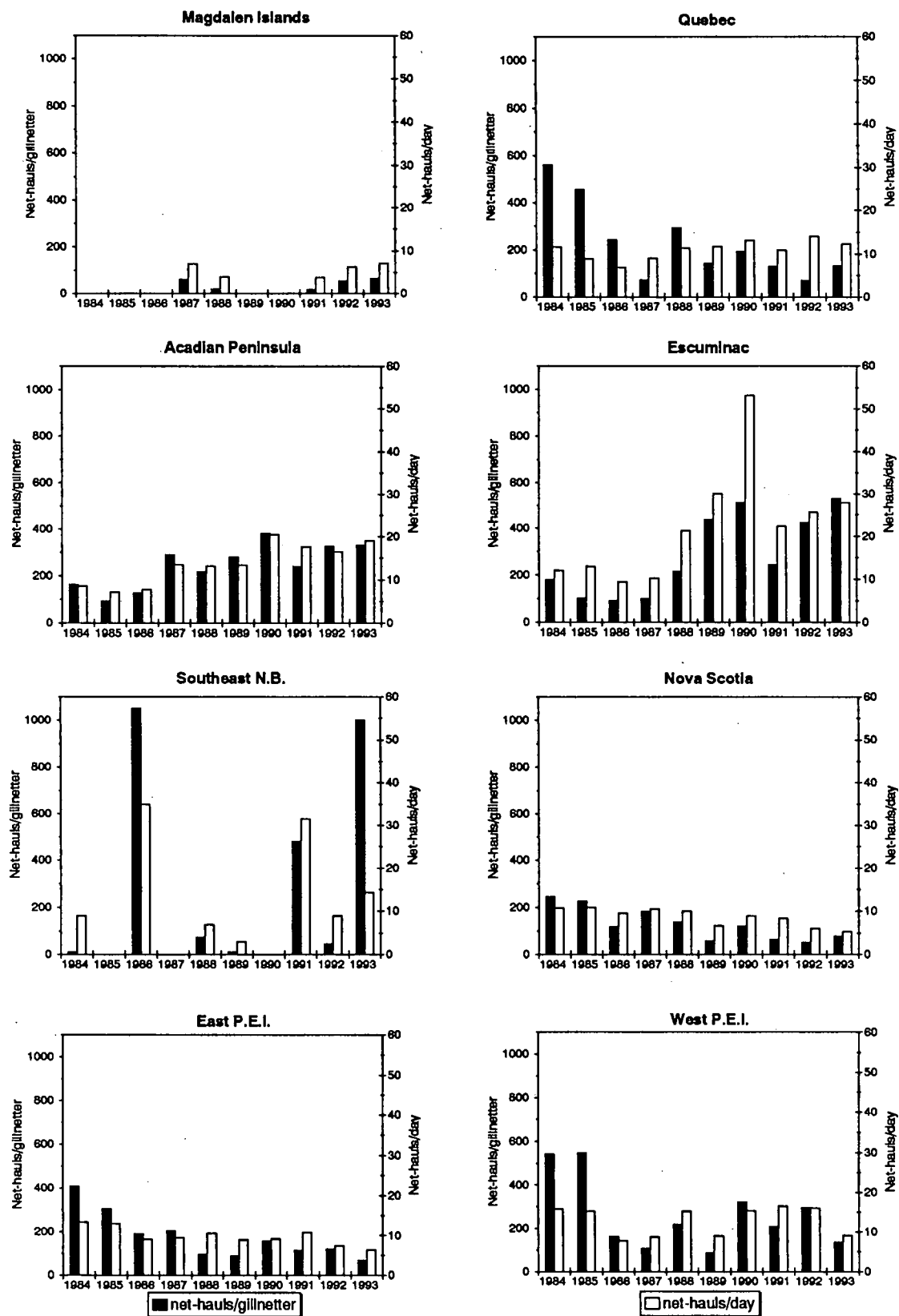


Figure 8. Effort expended in the 4T fall herring fishery

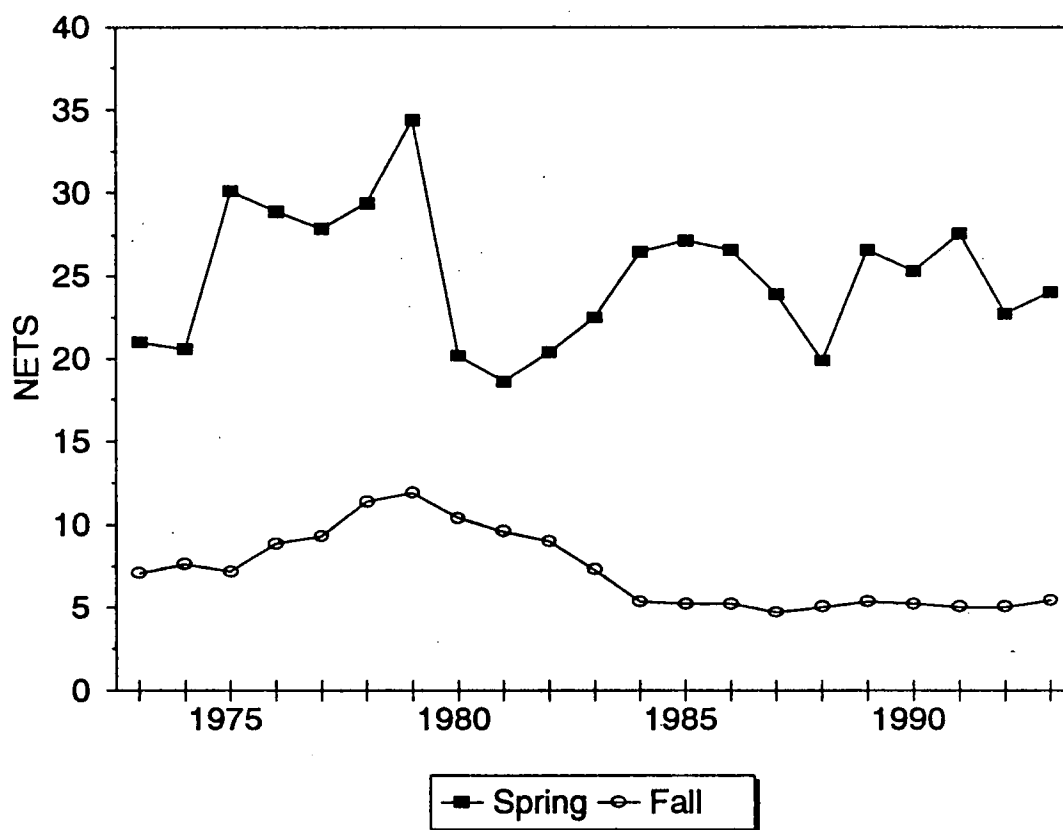


Figure 9. Historical effort index - number of nets fished/trip

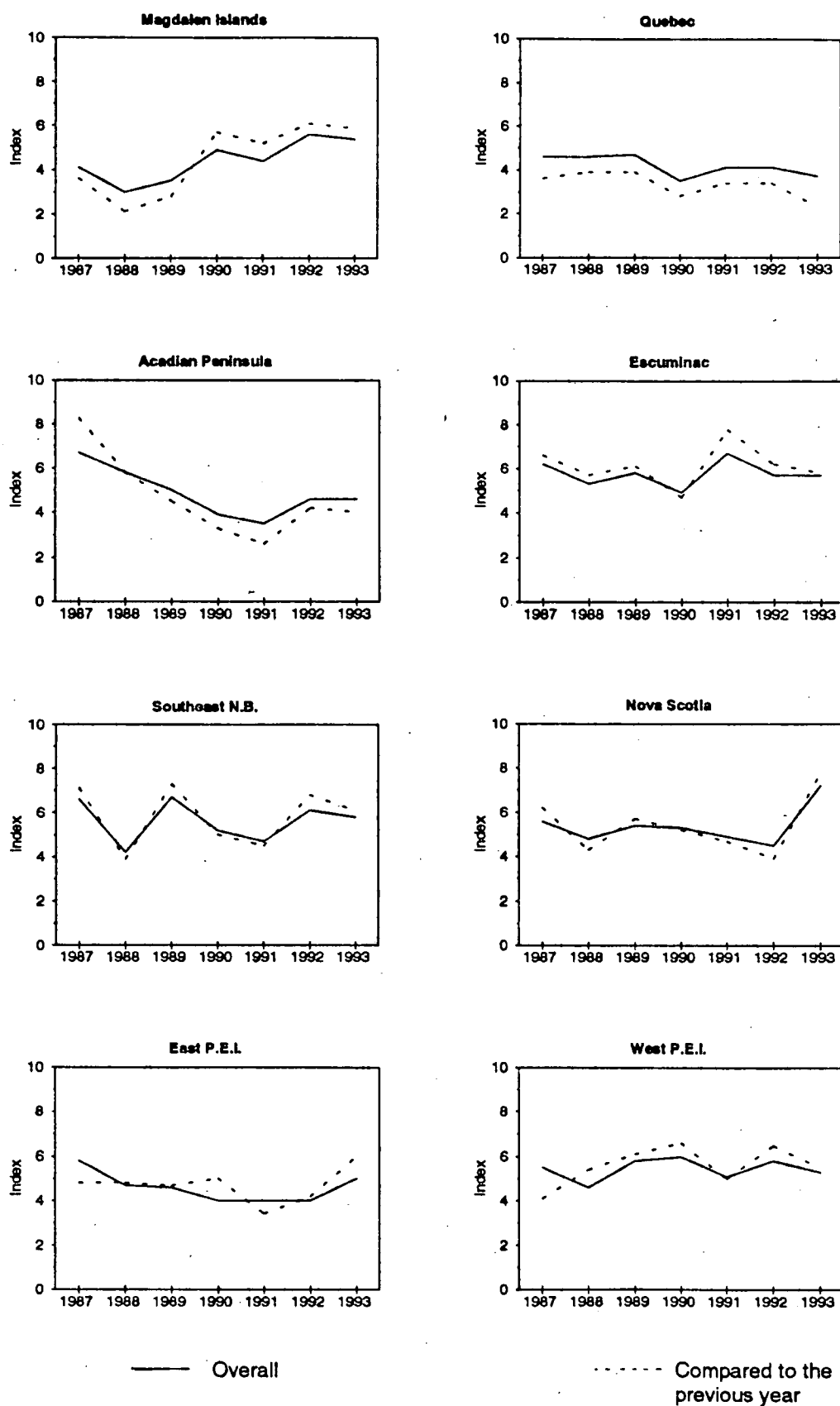


Figure 10. Spring indices of abundance

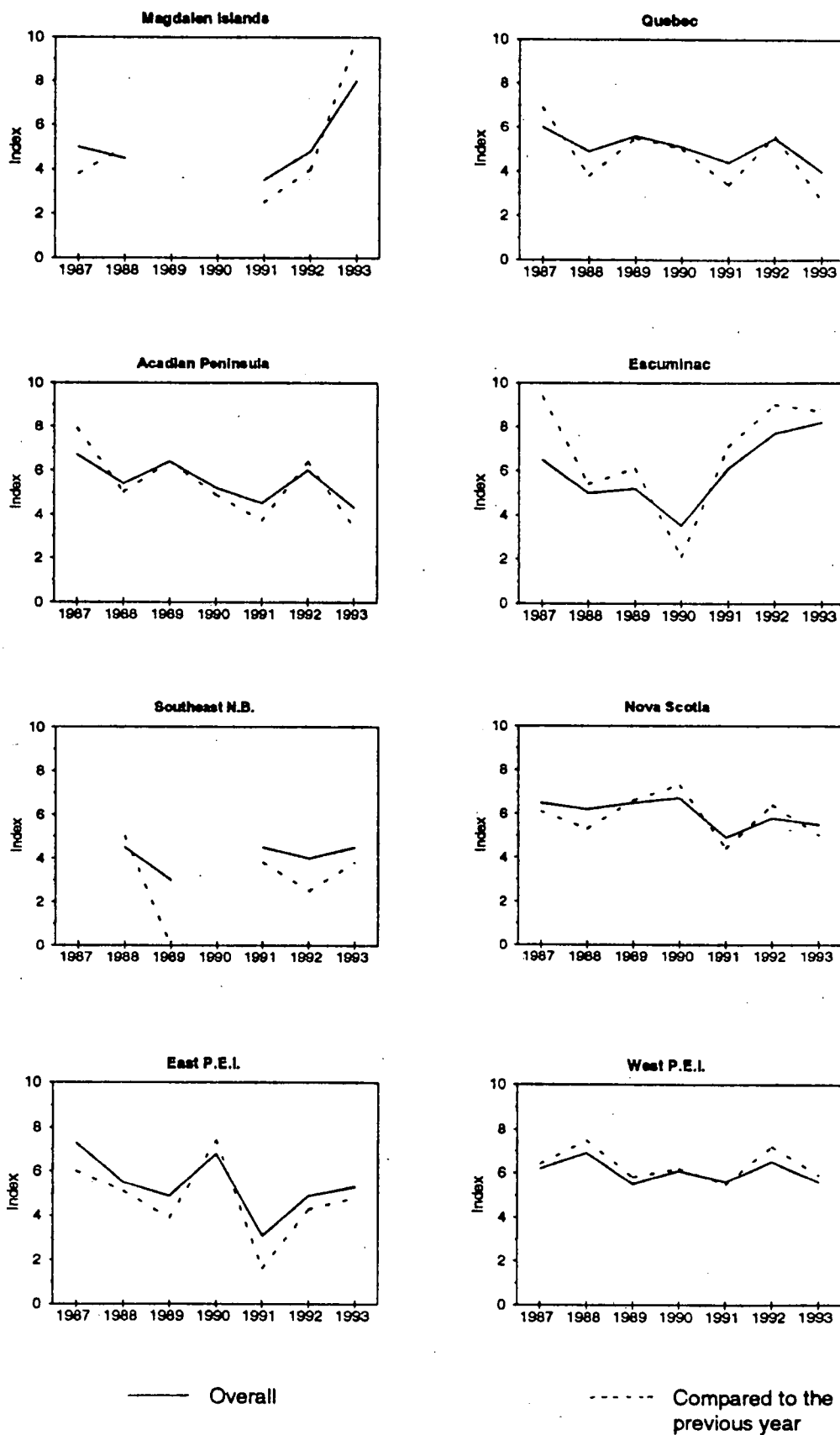
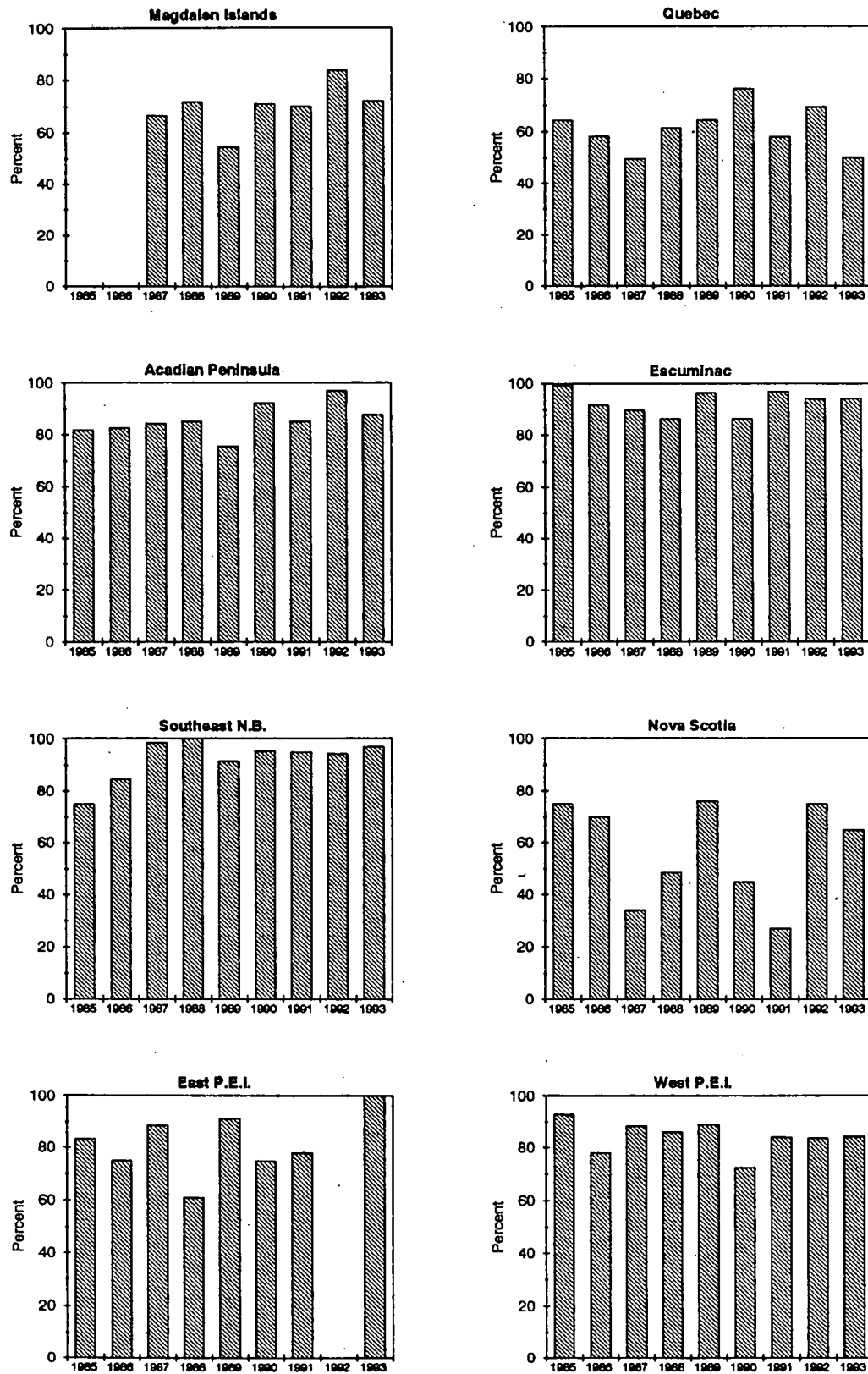


Figure 11. Fall indices of abundance



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

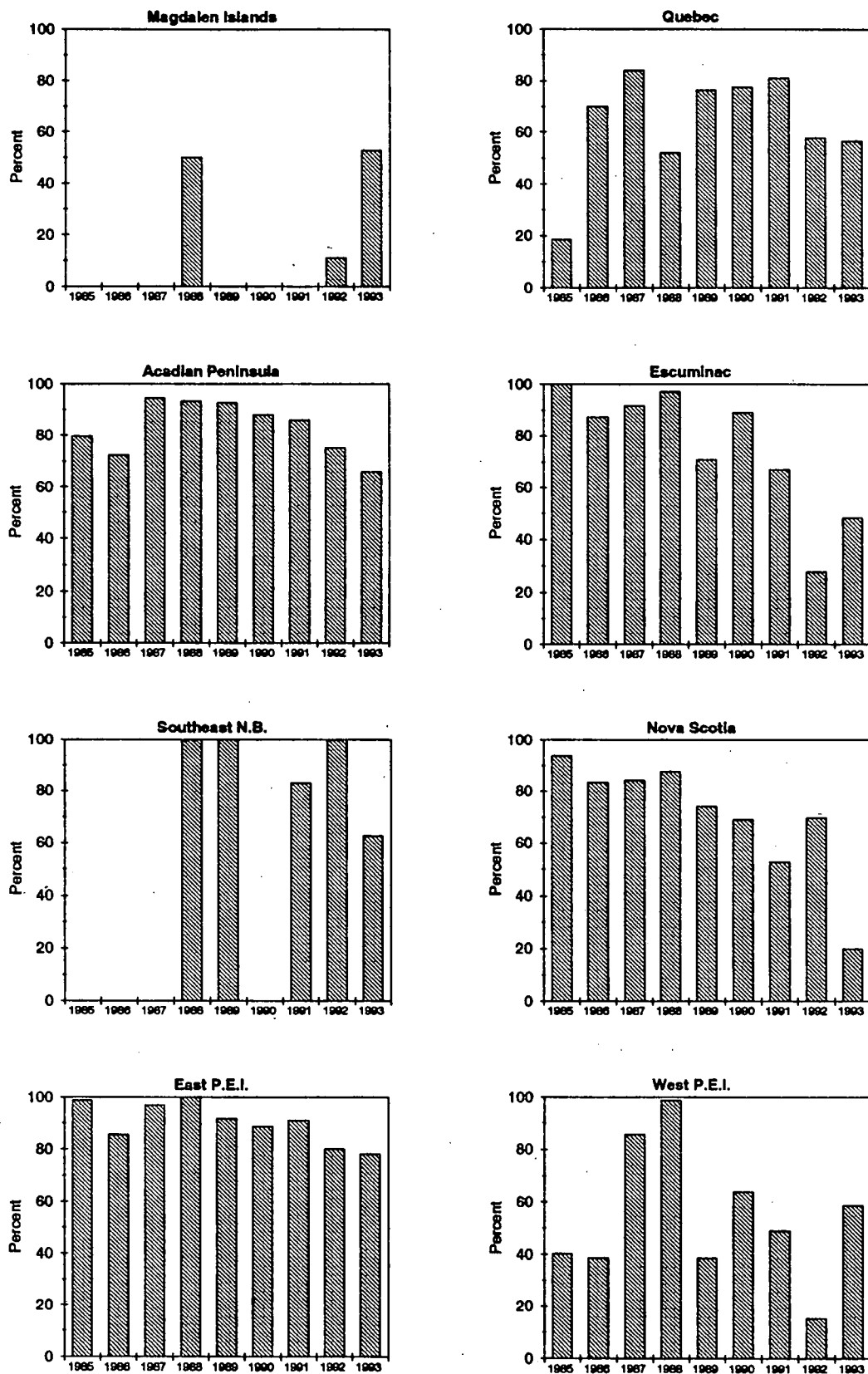


Figure 13. Percent of nets fished that are 2 5/8" mesh in the 4T fall fishery

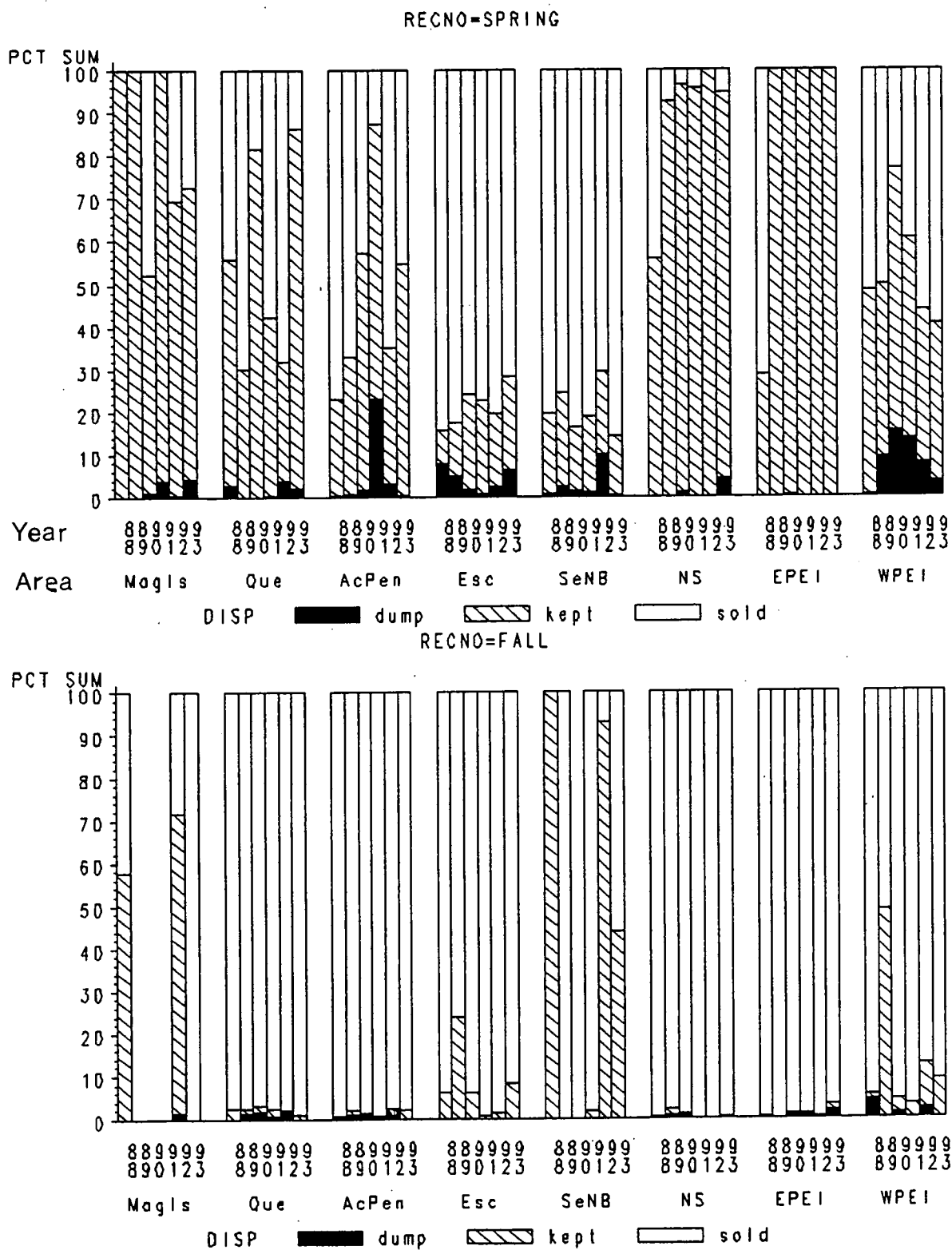


Figure 14. Disposition of the 4T herring catch



# Appendix

## HERRING GILLNET QUESTIONNAIRE 1993

Interviewer \_\_\_\_\_

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

Date \_\_\_\_\_

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

Record # 1

1. Did you fish herring with gillnets in 1993? 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 1993? 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 YES \_\_\_\_\_  
 (ie. a time when the catches were really good)? 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? \_\_\_\_\_

=====

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 mesh # type mesh # type  
nets that you used in the spring? (in) nets (set/modified) (in) nets (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?

## HERRING GILLNET QUESTIONNAIRE 1993

Interviewer \_\_\_\_\_

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

Date \_\_\_\_\_

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

Record # 2

1. Did you fish herring with gillnets in 1993? 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 1993? 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 YES \_\_\_\_\_  
 (ie. a time when the catches were really good)? NO \_\_\_\_\_

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 mesh # type mesh # type  
nets that you used in the fall? (in) nets (set/modified) (in) nets (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 = \_\_\_\_\_ 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?

\_\_\_\_\_

## QUESTIONNAIRE - HARENG 1993

Interviewer \_\_\_\_\_

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

Date \_\_\_\_\_

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

Record # 1

1. Avez-vous peche le hareng en 1993 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 1993? 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 \_\_\_\_\_

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 (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)

_____	_____	_____	_____	_____	_____	_____
-------	-------	-------	-------	-------	-------	-------

_____	_____	_____	_____	_____	_____	_____
-------	-------	-------	-------	-------	-------	-------

_____	_____	_____	_____	_____	_____	_____
-------	-------	-------	-------	-------	-------	-------

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 1993

Interviewer \_\_\_\_\_

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

Date \_\_\_\_\_

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

Record # 2

1. Avez-vous peche le hareng en 1993 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 1993? 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)

_____	_____	_____	_____	_____	_____	_____
-------	-------	-------	-------	-------	-------	-------

_____	_____	_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____	_____	_____
-------	-------	-------	-------	-------	-------	-------

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? \_\_\_\_\_