

2367



Scientific Excellence • Resource Protection & Conservation • Benefits for Canadians  
Excellence scientifique • Protection et conservation des ressources • Bénéfices aux Canadiens

DFO - Library / MPO - Bibliothèque



12022774

# Effort, harvest, and expenditures of trout and salmon anglers on Prince Edward Island in 1994, from a mail-out survey

David K. Cairns

Prince Edward Island Department of Environmental Resources  
Box 2000  
Charlottetown  
Prince Edward Island C1A 7N8

and

Science Branch\*  
Department of Fisheries and Oceans  
Box 1236  
Charlottetown  
Prince Edward Island C1A 7M8



\*Present address

September 1996

Canadian Manuscript Report of Fisheries and Aquatic Sciences No. 2367

SH  
223  
F55  
#2367  
2.1



Fisheries and Oceans

Pêches et Océans

Canada

## **Canadian Manuscript Report of Fisheries and Aquatic Sciences**

Manuscript reports contain scientific and technical information that contributes to existing knowledge but which deals with national or regional problems. Distribution is restricted to institutions or individuals located in particular regions of Canada. However, no restriction is placed on subject matter, and the series reflects the broad interests and policies of the Department of Fisheries and Oceans, namely, fisheries and aquatic sciences.

Manuscript reports may be cited as full publications. The correct citation appears above the abstract of each report. Each report is abstracted in *Aquatic Sciences and Fisheries Abstracts* and indexed in the Department's annual index to scientific and technical publications.

Numbers 1-900 in this series were issued as Manuscript Reports (Biological Series) of the Biological Board of Canada, and subsequent to 1937 when the name of the Board was changed by Act of Parliament, as Manuscript Reports (Biological Series) of the Fisheries Research Board of Canada. Numbers 901-1425 were issued as Manuscript Reports of the Fisheries Research Board of Canada. Numbers 1426-1550 were issued as Department of Fisheries and the Environment, Fisheries and Marine Service Manuscript Reports. The current series name was changed with report number 1551.

Manuscript reports are produced regionally but are numbered nationally. Requests for individual reports will be filled by the issuing establishment listed on the front cover and title page. Out-of-stock reports will be supplied for a fee by commercial agents.

## **Rapport manuscrit canadien des sciences halieutiques et aquatiques**

Les rapports manuscrits contiennent des renseignements scientifiques et techniques qui constituent une contribution aux connaissances actuelles, mais qui traitent de problèmes nationaux ou régionaux. La distribution en est limitée aux organismes et aux personnes de régions particulières du Canada. Il n'y a aucune restriction quant au sujet; de fait, la série reflète la vaste gamme des intérêts et des politiques du ministère des Pêches et des Océans, c'est-à-dire les sciences halieutiques et aquatiques.

Les rapports manuscrits peuvent être cités comme des publications complètes. Le titre exact paraît au-dessus du résumé de chaque rapport. Les rapports manuscrits sont résumés dans la revue *Résumés des sciences aquatiques et halieutiques*, et ils sont classés dans l'index annuel des publications scientifiques et techniques du Ministère.

Les numéros 1 à 900 de cette série ont été publiés à titre de manuscrits (série biologique) de l'Office de biologie du Canada, et après le changement de la désignation de cet organisme par décret du Parlement, en 1937, ont été classés comme manuscrits (série biologique) de l'Office des recherches sur les pêcheries du Canada. Les numéros 901 à 1425 ont été publiés à titre de rapports manuscrits de l'Office des recherches sur les pêcheries du Canada. Les numéros 1426 à 1550 sont parus à titre de rapports manuscrits du Service des pêches et de la mer, ministère des Pêches et de l'Environnement. Le nom actuel de la série a été établi lors de la parution du numéro 1551.

Les rapports manuscrits sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre. Les rapports épuisés seront fournis contre rétribution par des agents commerciaux.

Canadian Manuscript Report of Fisheries and Aquatic Sciences No. 2367

September 1996

Effort, harvest, and expenditures  
of trout and salmon anglers on Prince Edward Island in 1994,  
from a mail-out survey

David K. Cairns

Prince Edward Island Department of Environmental Resources  
Box 2000  
Charlottetown  
Prince Edward Island C1A 7N8

and

Science Branch\*  
Department of Fisheries and Oceans  
Box 1236  
Charlottetown  
Prince Edward Island C1A 7M8

\*Present address

© Minister of the Department of Fisheries and Oceans 1996

Cat. No. Fs 97 - 4 / 2367      ISSN 0706-6473

Correct citation for this publication is:

Cairns, D.K. 1996. Effort, harvest, and expenditures of trout and salmon anglers on Prince Edward Island in 1994, from a mail-out survey. Can. Ms. Rep. Fish. Aquat. Sci. No. 2367:v+45 pp.

## Contents

List of Tables .....	iii
List of Figures .....	iii
List of Appendices .....	iv
Abstract .....	v
Résumé .....	v
Introduction .....	1
Methods .....	1
Results .....	2
Return rates .....	2
Trout fishing and harvest for PEI .....	2
Fishing effort and harvest by region and habitat .....	2
Salmon fishing effort and harvest for PEI .....	2
Salmon fishing by river .....	3
Angler spending .....	3
Angler contributions to conservation .....	3
Angler experience and methods .....	4
Angler opinions on management measures .....	4
Origin of non-resident anglers and quality of their fishing experiences .....	4
Discussion .....	4
Questionnaire return rates .....	4
Angler numbers .....	5
Questionnaire reliability .....	5
Angler effort and catch .....	5
Angler spending .....	6
Angler commitment to conservation .....	6
Acknowledgments .....	7
Literature cited .....	7
Tables .....	8
Figures .....	29
Appendices .....	36

### List of Tables

Table 1 - Return rates and samples sizes of the Prince Edward Island angler questionnaire, by licence category .....	8
Table 2 - Days spent per angler fishing for trout and salmon on Prince Edward Island in 1994 .....	9
Table 3 - Number of trout and salmon caught per angler .....	10
Table 4 - Proportion of trout and grilse salmon released .....	11
Table 5 - Estimated catch and effort of anglers .....	11
Table 6 - Fishing effort and harvest in six regions of PEI .....	12
Table 7 - Salmon fishing effort and harvest on six PEI rivers .....	17
Table 8 - Effort and catch of respondents who reported salmon fishing in six PEI rivers .....	18
Table 9 - Major purchases and direct expenditures of anglers .....	19
Table 10 - Conservation group membership and volunteer activities of resident anglers .....	20
Table 11 - Willingness of anglers to contribute funds to support wildlife and fisheries enhancement .....	20
Table 12 - Angler ratings of experience fishing for	

trout and salmon .....

Table 13 - Methods used by anglers to fish trout and salmon .....	21
Table 14 - Opinion of anglers on opening and closing dates for the trout fishery .....	22
Table 15 - Opinion of anglers on daily bag limits for trout .....	23
Table 16 - Opinions of anglers on maximum and minimum size limits for trout and on the number of large trout kept per day .....	24
Table 17 - Opinion of anglers on impoundments and stream enhancement .....	25
Table 18 - Place of residence and fishing locations of non-resident anglers .....	26
Table 19 - Opinion of non-resident anglers on the fishing experience on PEI and importance of fishing in the choice of PEI as a place to visit .....	26
Table 20 - Number of angling licences issued on PEI, 1948-1994 .....	27
Table 21 - Sample sizes, fishing effort, harvest, and expenditures from post-season trout angling surveys, 1973-1994 .....	28
Table 22 - Sample sizes, fishing effort, harvest, and expenditures from post-season surveys of salmon anglers on PEI, 1980-1994 .....	28

### List of Figures

Fig. 1 - Prince Edward Island, showing the principal angling streams and the regions used in the angler questionnaire .....	29
Fig. 2 - Frequency distributions of days spent fishing by trout and salmon anglers .....	30
Fig. 3 - Frequency distributions of number of trout and salmon caught by anglers .....	31
Fig. 4 - Percent frequency distribution of number of days salmon fishing by resident salmon licencees, from three different questions in the angler mail-out questionnaire .....	32
Fig. 5 - Frequency distribution of the difference within individual resident salmon licencees of the number of salmon fishing days they reported in the province-wide numeric question and the number of salmon fishing days they reported in the river-based numeric question .....	33
Fig. 6 - Number of angling licences issued on Prince Edward Island, 1948-1994 .....	33
Fig. 7 - Estimated number of days fished by licenced anglers on Prince Edward Island in 1973, 1975, 1980, 1985, 1990, and 1994 .....	34
Fig. 8 - Estimated number of trout caught per fishing day by licenced anglers on Prince Edward Island in 1973, 1980, 1990, and 1994 .....	34
Fig. 9 - Estimated number of brook and "sea" trout caught by licenced anglers on Prince Edward Island in 1973, 1980, 1985, 1990,	

and 1994 .....	34
Fig. 10 - Estimated number of rainbow trout caught by licenced anglers on Prince Edward Island in 1973, 1980, 1985, 1990, and 1994 .....	34
Fig. 11 - Estimated number of all trout caught by licenced anglers on Prince Edward Island in 1973, 1975, 1980, 1985, 1990, and 1994 .....	35
Fig. 12 - Estimated number of days fished for salmon on Prince Edward Island in 1988, 1991, 1992, and 1994 .....	35
Fig. 13 - Estimate number of salmon caught per salmon fishing day on Prince Edward Island in 1988, 1991, 1992, and 1994 .....	35
Fig. 14 - Estimated total of major purchases and direct expenditures attributable to angling on Prince Edward Island in 1975, 1980, 1985, 1990, and 1994 .....	35

#### **List of Appendixes**

Appendix 1 - Questionnaire mailed to resident trout and courtesy trout licencees.....	36
Appendix 2 - Questionnaire mailed to resident salmon licencees .....	40
Appendix 3 - Questions in the non-resident questionnaires which did not appear in the resident questionnaires .....	45
Appendix 4 - Note accompanying the second mail-out of angler questionnaires.....	45

## Abstract

Biological and economic aspects of the Prince Edward Island recreational fishery were investigated through a questionnaire mailed to 1130 anglers licenced to fish for trout or salmon in 1994. Four hundred and fifty-eight responses were received, for a return rate of 40.5%. Based on survey results, licenced anglers spent 211,215 days fishing trout on Prince Edward Island in 1994. Trout catch per angler varied from 153.9 per year for resident salmon licencees to 18.2 per year for courtesy (over age 65) trout licencees. Licenced anglers caught an estimated 508,955 trout, of which 226,976 were retained. About half of the total fishing effort was expended in non-tidal streams, with the remainder split between ponds and tidal waters.

Anglers were estimated to have spent 11,802 days fishing salmon. Total estimated catch was 147 large salmon caught and released, 597 grilse caught and released, and 122 grilse caught and retained. Estimated salmon catch on the Morell River was 99 large salmon caught and released, 111 grilse caught and released, and 89 grilse caught and retained.

Licenced anglers spent an estimated \$7 million on Prince Edward Island in 1994 on purchases and expenditures related to sport fishing. \$4.6 million of this was directly attributable to sport fishing.

Most respondents indicated a willingness to contribute funds additional to their present licence fees to wildlife and fisheries enhancement. A levy of the mean amount respondents indicated they were willing to contribute would raise \$220,806, based on the number of licences issued in 1994. Respondents generally supported current trout fishing regulations. Those that disagreed tended to favour more restrictive rules.

The absence of licence-exempt farmers, commercial fishermen, and youth under 16 from this survey's sample base downwardly biases estimates of total trout catch and effort. This exemption bias is opposed by the greater tendency of avid anglers to respond to questionnaires, which upwardly biases results. In addition, survey reliability is constrained by sampling error, especially in non-resident and regional estimates.

Comparisons with previous mail-out surveys reveal that number of fishing days, number of trout caught per fishing day, and total trout catch have declined since the 1970s. These changes parallel declining trends in the number of trout licences issued. A decrease in salmon catch rate and harvest in 1994 may be related to lower stocking levels. Total inflated-adjusted spending attributed to angling has remained constant since the 1970s, but the amount spent by non-resident anglers has declined sharply.

## Résumé

Les aspects biologiques et économiques de la pêche récréative de l'Île du Prince Édouard étaient examinés à l'aide d'un questionnaire envoyé aux 1130 pêcheurs ayant droit de pêcher la truite et le saumon en 1994. On a reçu 458 réponses, pour un taux de retour de 40.5%. Les résultats indiquent que les pêcheurs ont consacré 211,215 journées à la pêche à l'IPE en 1994. La prise des truites par pêcheur a varié de 153.9 chez les détenteurs de permis de saumon à 18.2 par les détenteurs de permis de courtoisie (âge d'or). On estime que les détenteurs de permis ont capturé 508,955 truites, dont 226,976 étaient retenues. La moitié de l'effort de la pêche s'effectuait dans les ruisseaux non-influencés par la marée; le restant était divisé entre les étangs et les eaux influencées par la marée.

On estime que les pêcheurs ont passé 11,802 journées à la pêche au saumon. La prise totale fut estimée à 147 grands saumons pris et relâchés, 597 petits saumons pris et relâchés, et 122 petits saumons pris et retenus. La prise estimée sur la Morell était 99 grands saumons pris et relâchés, 111 petits saumons pris et relâchés, et 89 petits saumons pris et retenus.

Les pêcheurs détenteurs de permis ont dépensé \$7 millions à l'Île du Prince Édouard en 1994 sur le matériel et les services ayant lien à la pêche. On estime que \$4.6 millions de cette somme était directement attribuable à la pêche.

La plupart des pêcheurs qui ont répondu au questionnaire se sont dits prêt à faire une contribution financière additionnelle à la mise-en-valeur de la faune et de la pêche. Une cotisation des montants moyens indiqués dans les réponses au questionnaire récolterait \$220,806, basé sur le nombre de permis émis en 1994. En général, les pêcheurs qui ont répondu au questionnaire appuyaient les régulations actuelles qui gouvernent la pêche à la truite. Ceux qui n'étaient pas d'accord avaient tendance à favoriser les régulations plus sévères.

L'absence des fermiers, des pêcheurs commerciaux, et les jeunes en bas de 16 ans, qui ont droit de pêcher sans permis, a l'effet de réduire les estimés des prises et l'effort de la pêche à la truite. Par contre, des pêcheurs avides de leur sport auraient une plus grande tendance de répondre au questionnaire, qui ferait un biais dans le sens opposé. En plus, la fiabilité du relevé est limitée par l'erreur d'échantillonnage, surtout en ce qui concerne les non-résidents et les calculs régionaux.

Les comparaisons avec les relevés ultérieurs démontrent que le nombre de journées pêchées, le nombre de truite pris par journée de pêche, et la prise totale de la truite diminuent depuis les années 1970s. Ces changements sont parallèles aux réductions dans le nombre de permis émis. Une diminution du taux de prise et de la récolte des saumons en 1994 sont possiblement dus à une réduction dans le stockage. Les dépenses attribuées à la pêche ont resté constantes depuis les années 1970s en dollars ajustés pour l'inflation, mais les dépenses effectuées par les pêcheurs non-résidents ont diminué de façon marquée.

## Introduction

Recreational fishing is one of Canada's chief leisure activities. This sport has significant implications for conservation, because fishing affects an important natural resource, and for the economy, because anglers spend substantial sums of money to pursue their hobby.

Questionnaires mailed to anglers are one of the main methods of obtaining information on the biological and economic aspects of sport fishing. On Prince Edward Island, mail-out angler surveys began in 1973 (Thomson 1975), and continued in 1975 with subsequent surveys carried out every five years (Anon. 1978, Smith and Brickley 1985, Anon. 1988, Anon. 1994). In addition, special surveys for salmon licence-holders were undertaken in 1988, 1991, and 1992 (Anon. 1990, MacFarlane and Guignon 1992 and 1993).

This report presents results of an angler mail-out survey which was sponsored by the Prince Edward Island Wildlife Federation with support from the Watershed Improvement/Recreational Fisheries Development Program and the Department of Fisheries and Oceans. The survey covered anglers licenced to fish trout and salmon on Prince Edward Island in 1994. Part of the questionnaire solicited opinions and recommendations on sport fishing on Prince Edward Island. The responses given by respondents to this invitation are presented in a separate report (Cairns 1996).

## Methods

Questionnaires mailed to resident angling licence-holders are reproduced in Appendices 1-2. Additional questions posed to non-resident anglers are presented in Appendix 3. The questionnaires were developed in fall 1994 with the aid of the Prince Edward Island Wildlife Federation and federal and provincial biologists. Questions in the questionnaire were also designed to be compatible with previous mail-out surveys.

Fishing effort and harvest were investigated through province-wide questions and through questions that asked respondents to break down their effort and harvest by six regions that correspond to the northern and southern portions of PEI's three counties (Fig. 1). In addition, salmon licencees were asked to report their effort and harvest in PEI's six principal salmon rivers. The province-wide questions were posed in two formats: a category format, in which respondents chose between categories such as 1-2, 3-9 etc., and a numeric format which respondents answered with a number.

The basic trout licence for anglers living on Prince Edward Island in 1994 was a resident trout licence, which sold for \$10. Residents over 65 could fish trout under a courtesy trout licence, available free. Residents who were under age 16, were of native descent, or who were farmers or commercial fishermen were exempt from licencing requirements (a free licence was introduced for farmers and commercial fishermen in 1995). Non-residents needed a non-resident trout licence, which sold for \$20, to fish trout on Prince Edward Island.

To fish Atlantic salmon on Prince Edward Island, anglers required the appropriate authorization to fish trout, and a salmon licence, which cost \$10.

The questionnaire was prepared in four versions. The resident trout questionnaire was mailed to holders of resident trout and courtesy trout licences who did not also hold salmon licences, and the non-resident trout questionnaire was mailed to holders of non-resident trout licences who did not also hold salmon licences. The resident trout and salmon questionnaire was mailed to holders of salmon licences who had PEI addresses, and the non-resident trout and salmon questionnaire was mailed to holders of salmon licences who had non-PEI addresses.

Questionnaire recipients were selected as follows. For resident and non-resident trout questionnaires, numbers were randomly drawn between 1 and the total number of trout licences printed of each category (resident, courtesy, and non-resident). Names and addresses of licencees whose sequential position in the licence books corresponded to these numbers were keypunched. The keypunched names and addresses were then compared with an alphabetized printout of salmon licence holders. Licencees who also held salmon licences were deleted from the keypunched list. Additional names were drawn by the same procedure until the needed number of subjects was obtained.

To select questionnaire recipients for the resident and non-resident trout and salmon surveys, all salmon licences were keypunched and the list was sorted according to residence (PEI or non-PEI). Resident and non-resident licence-holders were drawn by randomly selecting numbers between 1 and the number of licences issued.

The first round of questionnaires was mailed on 30 January - 2 February 1995. All packages included a Canada Post business reply envelope for postage-free return of the questionnaire. No provision was made for free return of questionnaires from the U.S. The logo of the Prince Edward Island Wildlife Federation was printed on the outside envelope, reflecting that organization's sponsorship of the survey. Questionnaires were mailed to 600 resident trout licencees, 100 courtesy trout licencees, 150 non-resident trout licencees, 250 resident salmon licencees, and 30 non-resident salmon licencees (Table 1). The percent of the sampling pool covered by the mail-out ranged from 7.3% (resident and courtesy trout) to 53.6% (non-resident salmon). Overall, 1130 questionnaires were mailed to 10.2% of the 11069 individuals who held angling licences on PEI in 1994.

On 5 April 1995, a second round of questionnaires was mailed to survey subjects who had not returned their questionnaires from the first mailing. This mail-out included the same questionnaire sent in the first mail-out, a business reply envelope, and a brief note requesting completion and return of the questionnaire (Appendix 4).

## Results

### *Return rates*

Of the 1130 questionnaires mailed in the first round, 286 (25.3%) were completed and returned (Table 1). Another 69 (6.1%) were returned by the Post Office as undeliverable. In the second round, 172 of 794 questionnaires were completed and returned, for a return rate of 21.7%. Combined returns from both rounds totaled 458, 40.5% of the original mail-out. In all, questionnaires were received from 4.1% of the 11069 individuals who held PEI angling licences in 1994.

Resident salmon licencees returned their questionnaires at a higher rate (50.0%) than residents who held trout licences only (32.0-33.5%) (Table 1). Non-residents showed higher return rates (54.0-63.3%) than residents (32.0-50.0%), despite the fact that non-residents living in the U.S. had to pay their own return postage.

### *Trout fishing effort and harvest for PEI*

In general, 80% or more of respondents answered province-wide category questions (Tables 2-4). Response rates to numeric questions were much lower, with most questions receiving answers from fewer than 65% of respondents (Tables 2-4). The higher response to category questions is likely related to their position in the questionnaire. Category questions were listed first, and some respondents may have been reluctant to answer numeric questions after they had supplied the information in category form.

Days spent fishing per angler and number of fish caught per angler did not differ significantly between respondents to the first mail-out and second-round respondents ( $P > .05$ , two-tailed t-tests, Tables 2 and 3). Therefore first and second round respondents were pooled for all subsequent analyses.

Resident anglers reported higher fishing effort and catch than did non-residents (e.g. a mean of 51.0 trout in 21.7 days for resident trout licencees vs. a mean of 22.4 trout in 7.6 days for non-resident trout licencees, Tables 2 and 3, Figs. 2 and 3). Resident salmon licencees were more avid (36.3 vs. 21.7 days) and successful (153.9 vs. 51.0 trout) than anglers who held only the resident trout licence.

The proportion of active anglers, defined as the percent of respondents who fished at least one day, was calculated by combining the number of respondents who said they did not fish in PEI in 1994 (Question 1, Appendices 1 and 2) and the number of respondents who reported fishing 0 days in the province-wide category question. The proportion of active anglers was highest for resident salmon licencees, 96.8% of whom reported fishing trout (Table 2). Participation was above 90% for all other licence types except courtesy trout, where the rate was only 71%. The lower proportion of courtesy licencees who fished in 1994 reflects the fact that the courtesy licence is free.

The total number of active anglers holding each licence type was estimated by applying the percent of

respondents who were active anglers to the number of licence-holders. This procedure yields an estimate of 10,044 active trout anglers in PEI in 1994 (Table 5).

Total number of days fishing trout was estimated from answers to the province-wide numeric question as 211,215 (Table 5). Fishing effort was also estimated from the region-based question, which did not distinguish between trout and salmon fishing. The estimate derived from this question was 236,040 fishing days (Table 6).

Mean trout catch per angler, calculated from province-wide numeric questions, was highest among resident salmon licencees (153.9 per year) and lowest among courtesy licencees (18.2 per year) (Table 3).

Respondents holding salmon licences reported releasing a higher portion of trout (69.1-88.7%) than those who held trout licences only (33.8-63.2%) (Table 4). Within both trout-only licencees and salmon licencees, non-residents released a higher proportion of their trout than residents.

Estimates of total trout catch, derived from province-wide numeric questions, are presented in Table 5. Anglers caught an estimated 508,955 trout, of which 226,976 were retained. Total trout catch can also be estimated from the region-based question. A summation of regional responses indicated total catches of 486,599 brook trout and 59,291 rainbow trout, of which 172,221 brook trout and 21,112 rainbow trout were kept (Table 6). The sum for both species is 544,890 trout caught and 193,333 trout kept.

### *Fishing effort and harvest by region and habitat*

Fishing effort, estimated from reports of days fished per angler, proportion utilizing the region, and the total number of active anglers, was greatest in Region 5 (southern Queens County), where anglers fished an estimated 60,913 days (Table 6, Fig. 1). Estimated fishing effort in other regions ranged from 29,626 to 44,088 days. Estimated retained catches per region varied from 19,002 to 41,848 for brook trout and from 2,003 to 6,546 for rainbow trout.

The region-based question also asked respondents to classify their responses by habitat. Anglers spent an estimated 113,158 days (48%) fishing in running fresh water (non-tidal stream and rivers), 68,458 days (29%) fishing in freshwater ponds, lakes, and impoundments, and 54,424 days (23%) fishing in tidal waters of rivers and estuaries (Table 6).

### *Salmon fishing effort and harvest for PEI*

An estimated 528 anglers fished salmon on PEI in 1994 (Table 5). The mean number of days resident licencees fished for salmon was calculated as 14.6 days from the province-wide numeric question and 21.4 days from the river-based numeric question (Table 3, Fig 4). There are two possible explanations to this discrepancy: i) that a different subset of respondents, with differing effort profiles, answered the two questions, and ii) that individual respondents were inconsistent in their responses. Fig. 4 compares the frequency distribution of

responses to the province-wide category question, the province-wide numeric question, and the river-based numeric question. This plot shows that respondents who answered the river-based question reported high ( $\geq 30$  days) fishing effort more frequently than those who answered the province-wide numeric question. Such reports of high effort have a powerful effect on the mean, and are therefore responsible for the greater mean effort calculated from the river-based question.

Thirty-seven resident salmon licencees responded to both the province-wide numeric question and the river-based numeric question. Eleven (30%) of these respondents gave differing numbers of salmon fishing days in the province-wide and the river-based questions. The mean of these residuals was close to 0 and their frequency distribution was symmetrical about the mean (Fig. 5).

These comparisons indicate that inconsistent answers by individual respondents cannot explain the differing mean efforts calculated from the two questions. Hence the discrepancy between the estimates reflects the differing subsets of respondents who answered the two questions.

Which of these estimates is more reliable? Answers to the province-wide category question do not resolve this issue, because the frequency distribution of answers to this question does not more closely resemble the distribution of the province-wide numeric question than it does the distribution of the river-based numeric question (Fig. 4). Because the river-based question attracted a much higher response rate than the province-wide numeric question (113 responses, 78%, vs. 58 responses, 40%), the river-based question is likely the best estimator of salmon fishing effort. Total effort estimated from the river-based question was 11,802 salmon fishing days (Table 7).

Salmon catch rates are estimated from the river-based question because, unlike the province-wide questions and the region-based question, this question asked respondents to indicate salmon fishing effort and to break down catches into grilse and large salmon (Appendix 2).

The weighted mean catch rate from the river-based question was 0.34 large salmon caught and released per season, 0.83 grilse caught per season, and 0.25 grilse kept per season (Table 7).

Total salmon harvest is estimated from the region-based question because of that question's high response rate (90.4% resident, 100% non-resident; Table 6). Total estimated catch was 147 large salmon caught and released, 597 grilse caught and released, and 122 grilse caught and kept (Table 6).

#### *Salmon fishing by river*

Responses to the question on salmon effort and harvest by river are summarized in Table 7. Of the 113 respondents to this question, 108 (95.7%) reported fishing in one or more of the six rivers (Table 7). The most heavily fished river was the Morell, which was

fished by 86 respondents (75.5%). The mean number of days fished per angler ranged from 5.8 in the Mill and Trout Rivers to 22.5 in the Montague/Valleyfield Rivers. Estimated fishing effort for salmon totaled 5,946 days for the Morell, which was greater than the summed effort expended on all other rivers.

To provide firm minimum values of salmon harvest, actual catches as reported by respondents are listed in Table 8. Respondents reported personal catches of 34 large salmon and 81 grilse, of which 24 grilse were kept. Catches by respondents on the Morell were 16 large salmon and 32 grilse, of which 14 grilse were released. One respondent reported catching and releasing 18 grilse on the Mill River (Table 8). The highest reported catch on the Morell was eight large salmon and two grilse, of which one was released.

Total catches on the Morell were estimated as 99 large salmon and 200 grilse, of which 89 grilse were retained (Table 7). The next most productive river was the Mill, where anglers caught an estimated 0 large salmon and 115 grilse, of which 11 grilse were retained. This high estimate is chiefly due to one respondent who reported catching and releasing 18 grilse on the Mill (Table 8).

#### *Angler spending*

Spending by anglers was investigated by asking respondents how much they spent on PEI in 1994 on major purchases and direct expenditures related to angling. For each category of spending, the respondent was asked to give the percent of the expenditure that was attributable to angling. In the present analysis, expenses reported by anglers who did not indicate a percent attributable to angling were assumed to be 100% attributable to angling.

Respondents reported spending a mean of \$282 on major purchases and \$180 in direct expenditures attributable to angling on PEI in 1994, for a total of \$462. The biggest spenders were resident salmon licencees, who spent a mean of \$1,064 in expenses attributable to angling on PEI in 1994.

In PEI as a whole, anglers spent an estimated \$7,021,438 in purchases and expenditures due in whole or in part to fishing. Anglers spent \$2,764,388 in major purchases and \$1,858,445 in direct expenditures attributable to fishing, for a total of \$4,622,833. An estimated \$563,286 (12%) of this was spent by salmon licencees. Non-resident anglers accounted for \$334,548 (7%) of total estimated spending.

#### *Angler contributions to conservation*

The resident questionnaires asked respondents if they were members of a PEI-based angling, wildlife, or conservation group in 1994. The highest participation was reported by salmon licencees, 50% of whom indicated membership (Table 10). Among respondents holding only trout licences, 11.3% of resident licencees and 7.1% of courtesy licencees reported membership.

Salmon licencees also reported the highest participation rate in volunteer activities in support of PEI's recreational fishery (31.1%) (Table 10). Participation rates of resident trout and courtesy trout licencees were much lower (16.3% and 3.4%, respectively). Numerical responses to the question on volunteer time indicated mean volunteer contributions of 9.3, 3.9, and 0 days for the salmon, resident trout, and courtesy licence categories, respectively.

Table 11 reports the willingness of anglers to annually contribute additional funds to wildlife and recreational fisheries enhancement. Resident salmon licencees indicated the highest willingness to contribute (mean \$31.92). Respondents holding only resident trout licences reported willingness to contribute a mean of \$17.43. Two respondents proved their willingness to contribute by enclosing cheques with their questionnaires for \$25 and \$50, respectively.

If a levy were applied equal to the mean willingness to contribute indicated for each licence type, and if the number of licences issued is the same as in 1994, a total of \$220,806 would be raised (Table 11).

#### *Angling experience and methods*

Most respondents (209 of 415) felt that trout fishing on PEI in 1994 was good or fair (Table 12). Nevertheless, the majority (200 of 342) reported that trout fishing had declined since 1989. A majority of salmon licencees (79 of 119) believed that salmon fishing was poor on PEI in 1994. Most salmon anglers (64 of 98) also reported that salmon angling had declined in comparison with 1989.

The survey indicated that the most popular method of fishing trout is by bait (Table 13). Sixty-nine percent of respondents fished trout with bait most or all of the time. Overall, 34.6% of respondents reported that they used artificial flies for most or all of their trout fishing. Salmon licencees favoured flies much more than other respondents; 84% of these anglers did most or all of their trout fishing with flies. Only 6.8% of respondents fished trout with lures most or all of the time.

Most (56.8%) respondents never used barbless hooks to fish trout, and only 8.4% always used them (Table 13).

#### *Angler opinions on management measures*

Most (294 of 412, 71%) respondents advocated a continuation of 15 April as the opening date of trout fishing, although a minority (67 of 412, 16%) favoured delaying the opening to the end of April or the beginning of May (Table 14). A slim majority (216 of 410, 53%) agreed with the present closing date of 15 September, but significant minorities advocated closing dates near the beginning of September or at the end of September.

Respondents advocated a retention of the present daily trout bag limit of 10 by a small majority (219 of 425, 52%) (Table 15). Forty percent wanted a smaller limit and 9% wanted a larger limit. The mean limit advocated by respondents was 8.6 trout per day.

Table 16 presents respondents' opinions on size limits for trout. With the exception of resident salmon anglers, only a minority favoured a maximum size limit for trout. Of those that wanted a limit, the most common recommended cutoff was in the 14-22 inch (35.6-55.6 cm) range. One half or more respondents in all licence categories advocated a minimum size limit for trout. Most respondents believed this limit should be in the 4-10 inch (10.2-25.4 cm) range (fish aged 1+ and 2+, Johnston et al. 1993).

With the exception of courtesy trout licence-holders, majorities within each licence category advocated a limit on the number of large kept per day (Table 16). Respondents gave a wide variety of recommended threshold sizes and numbers permitted to be kept above this threshold. The most common response was for a threshold set between 15 and 20 inches (38.1 - 50.8 cm), and numbers to be kept of one to three.

A majority (317 of 397, 80%) of respondents felt that trout fishing on PEI would be best served by maintaining or increasing the number of impoundments (Table 17). Only 20% of respondents believed that reducing the number of impoundments would serve the interest of trout fishing.

Most respondents (312 of 404, 77%) believed that stream enhancement by community groups has helped trout and trout angling.

#### *Origin of non-resident anglers and quality of their fishing experiences*

Of 100 non-resident respondents, 70 were of Canadian origin and 30 were of US origin (Table 18). Most non-resident Canadian anglers came from Nova Scotia, New Brunswick, and Ontario, while the majority of US anglers came from New England. In general, fishing locations for these non-resident anglers corresponded to their provinces or states of origin.

Non-resident respondents were asked to compare their fishing experience on PEI to the province/state where the respondent does most of his/her fishing. The modal response to this question was that fishing was about the same (Table 19). However, a substantial minority (35 of 89, 39%) thought that fishing on PEI was poorer.

Most (68%) non-resident anglers reported that freshwater fishing was the main or a secondary reason for choosing PEI as a place to visit.

## **Discussion**

### *Questionnaire return rates*

The overall return rate of questionnaires in this survey was 40.5%, of which 25.3% came from the first mail-out and 15.2% came from the second (Table 1). This rate is lower than that obtained in previous angling surveys on Prince Edward Island (1973: 61%, Thomson 1975; 1975: 52.5%, Anon. 1978; 1980: 44%, Smith and Brickley 1985; 1985: 52%, Anon. 1988) but it is superior to the 24% rate obtained from a survey of winter anglers in 1994 (Anon. 1995a).

The return rate for salmon licencees in this survey was 51.4% (Table 1). This rate is lower than the 68.9% obtained in the 1988 salmon survey (Anon. 1990), but it exceeds the 9.4% and 37.8% rates from the 1991 and 1992 salmon surveys (MacFarlane and Guignon 1992 and 1993).

#### *Angler numbers*

The number of anglers licenced to fish on Prince Edward climbed from 3,851 in 1948 to peak at 16,584 in 1979 (Table 20, Fig. 6). Since 1979 the number of angling licencees has declined. In 1994 11,069 individuals held angling licences on PEI, a decrease of 33% from the 1979 peak. For non-resident trout licencees, the decline in numbers began earlier and was more severe. In 1994 non-resident trout licencees numbered about 1/3 of their level in the early 1970s. Numbers of courtesy trout licences have declined since 1991 and numbers of salmon licences have declined since 1993. The drop in courtesy numbers appears to part of a consistent trend, but the decrease in salmon licence sales may be a short-term fluctuation.

This survey is based on reports from licenced anglers only, and therefore does not consider angling by unlicenced youth under 16, farmers, commercial fishermen, and native people. In addition, spouses and dependents of non-resident trout licencees are permitted to fish trout without individual licences for two weeks following the issue date of the non-resident licence.

A survey conducted in Prince Edward Island schools in 1973 estimated that 14,000 school children fished 129,000 days (Thomson 1974). No update to this survey is available, but it is clear that unlicenced youth could add substantially to current angling effort on PEI.

The 1973 school survey also queried children on fishing activities of their parents. Based on their answers, the 1973 angling population was estimated to include 2,600 farmers and 1,730 commercial fishermen who were exempt from licence requirements. In 1994, farmers and commercial fishermen were required for the first time to acquire licences to hunt small game on Prince Edward Island. This licence was issued to 1027 individuals, which increased the total number of hunting licences issued by 28%. If farmers and commercial fishermen participate in angling at the same rate as they did in 1973, or if they angle at the same rate as they hunt, these unlicenced sectors must be a substantial part of the total current angling population.

The Prince Edward Island Native Council requires people under its jurisdiction to record their angling activities on cards which are to be submitted at the end of the season. Four cards were returned in 1994 (Cairns et al. 1995). It is not known how many other natives under Native Council jurisdiction angled but did not return cards, or how many natives under the jurisdiction of other councils angled in 1994.

#### *Questionnaire reliability*

Results of this survey are subject to both positive and negative biases. The absence from the survey of licence-exempt youth under 16 and farmers and commercial fishermen tends to depress estimates of total effort and harvest. This exemption bias applies only to the resident trout fishery, because all non-residents and all salmon anglers are required to hold licences. The only resident adult salmon harvesters who are licence-exempt are natives. Fishing effort and harvest by this group is not known, but it appears to be small.

The depressing effect of the exemption bias is opposed by the "response bias," which refers to the greater tendency of active and avid participants in any activity to respond to surveys about that activity. The effect of the response bias is to inflate estimates of catch and effort. Unlike the exemption bias, the response bias applies to all respondent groups.

In addition to these biases, survey results are subject to sampling error. This is particularly acute in licence categories with low sample sizes, where 95% confidence limits are very broad (Tables 2 and 3). Low sample sizes are especially evident in non-resident responses and where effort and catch are estimated by region (Tables 6 and 7).

In view of the above, estimates derived from this survey must be considered as rough approximations of true values. Because there is no objective means of measuring the exemption and response biases, overall confidence limits cannot be calculated. The best use of survey results may perhaps be as indices showing trends, rather than as indicators of exact values.

#### *Angler effort and catch*

Table 21 and Figs. 7-11 compare estimated angler effort, trout catch rates, and trout harvest on Prince Edward Island from six mail-out surveys of licenced anglers between 1973 and 1994.

The total number of days fished estimated by these surveys rose sharply in the 1970s, only to fall in the 1980s and 1990s (Table 21, Fig. 7). These changes follow the trend of number of licences issued (Fig. 6). Estimates of non-resident days fished have declined in every survey since 1973 (except for 1990). The 1994 estimate of non-resident days fished is only 51% of estimates from surveys conducted in the 1970s (Table 21).

Trout catch per day also declined over the surveyed period, from 3.5 in 1973 to 2.3 in 1994 (Table 21, Fig. 8). Estimated brook trout catches declined from 839,800 in 1980 to 453,574 in 1994 (Table 21, Fig. 9). Earlier surveys included the category "sea trout," which is presumed to be brook trout. In contrast to brook trout, estimates of rainbow trout catch have risen and the 1994 estimate of 55,381 is near the highest of the series (Table 21, Fig. 10). Estimates of total trout catch follow the pattern of brook trout, the species which dominates the harvest (Table 21, Fig. 11).

The 1994 survey estimated that 11,802 days were spent fishing for salmon on Prince Edward Island (Table 22, Fig. 12). This estimate exceeds that obtained from the 1988 survey, but is lower than the estimates for 1991-1992. Salmon fishing effort on the Morell River, estimated in this survey as 5946 days (Table 7), was independently estimated by a creel survey (Cairns et al. 1995). The creel survey estimate of 4,911 days was based on exits from the river by anglers reporting that they were targeting salmon, or targeting both trout and salmon.

The overall salmon catch rate estimated for 1994 (0.073 per day, Table 22) is about one half the rates estimated for 1991 and 1992 (Table 22, Fig. 13).

The inter-year comparisons presented above must be viewed in the context of two factors which made 1994 atypical as a fishing year. Both of these factors would tend to depress fishing effort and harvest below normal levels.

First, 1994 was a dry year on Prince Edward Island, and summer water levels in rivers were low. The 1985 angler survey indicated that 45% of fishing effort between April and September occurred during July, August, and September (Anon. 1988). Thus the low water levels experienced in 1994 could have affected fishing during a significant portion of the season. The parameters that low water levels could have depressed include number of licences issued (particularly salmon and non-resident trout), number of days fishing for trout and for salmon, trout and salmon caught per day, and total trout and salmon caught.

Second, a high proportion of salmon caught on Prince Edward Island are stocked fish, and the majority of salmon caught in a given year were released in the previous year as 2+ smolts. In 1993, the number of 2+ smolts fell because of a die-off in a rearing pond in 1992. The low salmon catch rates in 1994 are likely related to this decrease in stocking level (Cairns et al. 1995).

#### *Angler spending*

The 1994 survey estimated that anglers spent \$7.0 million on Prince Edward Island in purchases and expenditures related to recreational fishing, of which \$4.6 million was attributable to fishing on PEI (Tables 9 and 21). The difference between these values is due to purchases (e.g. vehicles, camping equipment) whose use is shared between fishing and non-fishing purposes. These estimates are for spending on PEI only. It is not known how much resident and non-resident anglers spend outside PEI on goods and services related to angling on PEI.

The estimate for spending attributable to fishing is virtually unchanged from inflation-adjusted estimates from previous surveys dating to 1975 (Fig. 14). However, estimates of non-resident spending attributed to angling have declined sharply. In 1975, non-residents were estimated to spend \$452,039 (\$1,336,603 in 1994 dollars). The corresponding estimate for 1994 is \$334,548, a decrease of 75%. The decline in non-

resident spending parallels the decreasing number of non-residents who purchase angling licences on Prince Edward Island. The sharp drop in non-resident spending estimates after 1975 may also be related to the collapse of the bluefin tuna charter industry, which was a major tourism draw in the 1970s. The 1975 questionnaire was mailed only to holders of trout licences, but some tuna anglers who visited PEI in the 1970s also fished trout (Thomson 1975). Because tuna fishing is a costly sport, questionnaires returned by such anglers would have inflated the non-resident spending estimate for 1975.

As noted in the previous section, water levels and availability of stocked salmon were aberrant in 1994. These factors may have decreased angler effort, and therefore angler spending, below normal levels.

#### *Angler commitment to conservation*

The commitment of anglers to fish and watercourse conservation can be inferred from their membership in conservation groups, their willingness to pay for enhancement work, and their support for restrictive management measures. The response rate to a survey such as this is also a reflection of commitment to conservation. Because those who returned survey questionnaires are likely to care more about fish conservation than those who don't, the sample of respondents is intrinsically biased. Therefore the level of commitment by anglers as a whole is likely to be lower than that suggested by the numbers in this report.

Overall, 43% of questionnaires which were not returned by the Post Office were completed and returned by licencees (Table 1). Return rates were higher from salmon licencees and from non-residents, which suggests that these groups are more committed to fish and fish conservation than residents who hold trout licences only.

One half of resident salmon licencees reported membership in conservation groups, a rate much higher than that of holders of trout licences only (Table 10). In both groups, the majority of respondents reported spending no time in 1994 in volunteer work in support of PEI's recreational fishery. However the mean number of days worked by salmon licencees was much higher than that of trout-only licencees. This difference was apparently due to a few salmon licencees who worked a great many days (Table 10).

Overall, 78% of respondents said they were willing to contribute funds additional to present licence fees to support conservation (Table 11). Salmon licencees and non-residents stated higher contribution levels than resident trout-only licence-holders. If levies are imposed at the mean levels indicated by respondents in each licence category, and if numbers of licencees remain at 1994 levels, then \$220,806 would be raised annually. However, this projection must be tempered by two considerations: i) opposition to increased fees is likely to be more frequent in the angling population as a whole than in the sample which responded to the questionnaire, and ii) increased fees would likely lead to a decrease in

licence sales which would offset some of the revenue gain.

Fly-fishing is linked with conservation because fish caught with a fly are easier to release uninjured than fish taken on a baited hook or lure. Salmon licencees used flies more often to fish trout than did holders of trout licences only (Table 13). Barbless hooks also make it easier to release fish. Only a small portion of respondents used barbless hooks all the time, and the most frequent response in all licence groups was that the respondent never used barbless hooks (Table 13). Despite the relatively low usage of barbless hooks, respondents released the majority of both trout and salmon that they caught (Table 5).

In general, respondents supported the current management regime for trout angling. The respondents who disagreed with current regulations showed a slight tendency to favour rules which are more restrictive. Most respondents favored the present opening day for trout angling of 15 April, but the majority of dissenters advocated a delay in opening until about 30 April (Table 14). Most also favored the status quo of 15 September for a closing date. Those who wanted a change preferred a later, rather than an earlier, close date by a small majority.

Most anglers advocated a retention of the present daily bag limit of 10 trout, but most of those wanting a change recommended a smaller limit (Table 15). Support for size limits for trout was mixed. Most respondents supported imposition of a lower size limit for trout, but opposed an upper size limit (Table 16). However, majority support for a limit on the number of large trout was found in all licence groups except courtesy trout. In 1995, a daily limit of one trout 40.6 cm (16 inches) or larger was imposed.

#### Acknowledgments

This study was funded by a grant from the Recreational Fisheries/Watershed Improvement Development Program, a unit of the Canada-Prince Edward Island Cooperative Agreement on Sustainable Economic Development, to the Prince Edward Island Wildlife Federation. The author and the Wildlife Federation thank Randy Angus, Keith Brickley, Art Smith, Bruce Smith, Carl Brydon, Steve Cheverie, Ross Claytor, Kevin Davidson, Todd Dupuis, George Ferguson, Dawna Gillis, Daryl Guignon, Jim Jenkins, Kevin MacAdam, Blair MacKinnon, Allie MacLennan, Shane O'Neil, and Darren Riggs for their help in devising this survey, Elayne Long, Krista MacKay, Dwaine Oakley, and Kim Radanovich for keypunching and clerical assistance, and Gérald Chaput and Andrea Locke for editorial comments. Most of all, we extend our grateful appreciation to the 458 anglers who completed the questionnaire upon which this study is based.

#### Literature cited

- Anon. 1978. Survey of sportfishing in Prince Edward Island in 1975. Prince Edward Island Department of the Environment, Charlottetown, and Fisheries and Environment Canada, Ottawa. 20 pp.
- Anon. 1988. Sport fishing in Prince Edward Island, 1985. Prince Edward Island Department of Community and Cultural Affairs, Charlottetown, and Department of Fisheries and Oceans, Ottawa. 12 pp.
- Anon. 1990. 1988 survey of Atlantic salmon anglers in Canada. Economic and Commercial Analysis Report no. 63. Department of Fisheries and Oceans, Ottawa. 106 pp.
- Anon. 1994. 1990 survey of recreational fishing in Canada. Economic and Commercial Analysis Report no. 148. Department of Fisheries and Oceans, Ottawa. 146 pp.
- Anon. 1995a. Winter angling in Prince Edward Island: a report on the winter angling season. Pamphlet, Prince Edward Island Department of Environmental Resources. 2 pp.
- Anon. 1995b. The Consumer Price Index 74:(5). Statistics Canada, Ottawa.
- Cairns, D.K. 1996. Comments on the Prince Edward Island sport fishery by respondents to mail-out surveys, 1994 and 1995. Submitted to Technical Reports of Prince Edward Island Environmental Science.
- Cairns, D.K., K. Davidson, and R. Angus. 1995. Status of Atlantic salmon in the Morell, Mill, Dunk, West, and Valleyfield Rivers, Prince Edward Island, in 1994. DFO Atlantic Fisheries Research Document 95/100.
- Johnston, C.E., J. MacMillan, G. Blatch, K. Bustard, and T.D. Dupuis. 1993. Analysis of the West (Eliot) River sport fishery during the 1990 angling season during a stratified creel census. Univ. Prince Edward Island Biol. Dept. Tech. Rep. No. 2.
- MacFarlane, R., and D.L. Guignon. 1992. 1991 survey of resident Atlantic salmon anglers on Prince Edward Island. Morell River Management Cooperative Ltd. 15 pp.
- MacFarlane, R., and D.L. Guignon. 1993. Survey of Atlantic salmon anglers on Prince Edward Island 1992. Morell River Management Cooperative Ltd. 36 pp.
- Smith, A., and K.W. Brickley. 1985. 1980 survey of sportfishing in Prince Edward Island. Prince Edward Island Department of Community and Cultural Affairs, Charlottetown, and Department of Fisheries and Oceans, Ottawa. 48 pp.
- Thomson, I.D. 1974. Prince Edward Island school survey of anglers. Environment Canada, Ottawa. 32 pp.
- Thomson, I.D. 1975. Sportfishing in Prince Edward Island: a survey of anglers. Prince Edward Island Department of the Environment, Charlottetown, and Department of the Environment, Ottawa. 70 pp.
- Anon. 1978. Survey of sportfishing in Prince Edward Island in 1975. Prince Edward Island Department of

Table 1

Return rates and sample sizes of the Prince Edward Island angler questionnaire, by licence category.

	Trout licence				Salmon licence			Total
	Resident	Courtesy	Non-resident	Total	Resident	Non-resident	Total	
No. licences issued	8652	1450	967	11069	531	56	587	11656
Sampling pool*	8197	1374	911	10482	531	56	587	11069
<u>First mail-out</u>								
No. questionnaires mailed	600	100	150	850	250	30	280	1130
Mail-out as a % of sampling pool	7.3	7.3	16.5	8.1	47.1	53.6	47.7	10.2
No. completed and returned	119	12	48	179	93	14	107	286
Percent completed and returned	19.8	12.0	32.0	21.1	37.2	46.7	38.2	25.3
No. returned by Post Office	49	1	8	58	11	0	11	69
Percent returned by Post Office	8.2	1.0	5.3	6.8	4.4	0.0	3.9	6.1
<u>Second mail-out</u>								
No. questionnaires mailed	441	87	95	623	154	17	171	794
No. completed and returned	82	20	33	135	32	5	37	172
Percent completed and returned	18.6	23.0	34.7	21.7	20.8	29.4	21.6	21.7
<u>Totals</u>								
No. completed and returned	201	32	81	314	125	19	144	458
Completed and returned questionnaires as a percent of first mail-out	33.5	32.0	54.0	36.9	50.0	63.3	51.4	40.5
Completed and returned questionnaires as a percent of sampling pool	2.5	2.3	8.9	3.0	23.5	33.9	24.5	4.1

\*For trout licencees, the sampling pool excludes those who also purchased a salmon licence. The ratio of resident and courtesy trout licences among salmon licence-holders is assumed to be similar to that of trout licence-holders as a whole.

Table 2

Days spent per angler fishing for trout and Atlantic salmon on Prince Edward Island in 1994, from province-wide category and numeric questions.

	Number of days fishing for trout					Number of days fishing for salmon	
	Trout licence only		Salmon licence			Salmon licence	
	Resident	Courtesy	Non-resident	Resident	Non-resident	Resident	Non-resident
<b>Category responses</b>							
0 days	13	9	2	4	1	12	1
1-2 days	15	6	29	5	4	11	6
3-9 days	55	8	35	10	9	30	8
10-29 days	70	4	11	35	2	46	2
30-99 days	44	3	2	58	2	10	0
>=100 days	4	1	0	13	1	6	0
Percent fishing 1 or more days (active anglers)	93.5	71.0	97.5	96.8	94.7	89.6	94.1
Questionnaires with responses	201	31	79	125	19	115	17
Percent with responses	100	96.9	97.5	100.0	100.0	92.0	89.5
<b>Numeric responses</b>							
First mail-out							
Mean number of days	19.2	35.4	9.8	37.7	11.9	15.9	5.1
SD number of days	17.6	46.1	16.3	26.9	16.4	19.2	6.4
Questionnaires with responses	54	5	34	34	10	34	9
Percent with responses	45.4	41.7	70.8	36.6	71.4	36.6	64.3
Second mail-out							
Mean number of days	25.3	9.6	4.2	32.5	7.7	11.0	2.3
SD number of days	21.7	11.0	3.2	26.5	0.6	7.6	1.5
Questionnaires with responses	38	8	22	12	3	12	3
Percent with responses	46.3	40.0	66.7	37.5	60.0	37.5	60.0
P, first vs. second mail-out (2-tailed t-test)	0.22	0.17	0.11	0.75	0.57	0.42	0.48
All responses							
Mean number of days	21.7	19.5	7.6	36.3	10.9	14.6	4.4
SD number of days	19.5	30.8	13.0	26.6	14.3	17.0	5.6
SE number of days	2.0	8.5	1.7	3.9	4.0	2.5	1.6
Upper 95% confidence limit	17.7	0.9	4.2	28.6	2.6	9.7	1.0
Lower 95% confidence limit	25.7	38.1	11.0	44.0	19.3	19.5	7.8
Questionnaires with responses	92	13	56	46	13	46	12
Percent with responses	45.8	40.6	69.1	36.8	68.4	36.8	63.2

Table 3

Number of trout and Atlantic salmon caught per angler on Prince Edward Island in 1994, from province-wide category and numeric questions. Number of fish caught include those released.

	Number of trout caught				Number of salmon caught		
	Trout licence only		Salmon licence		Salmon licence		
	Resident	Courtesy	Non-resident	Resident	Non-resident	Resident	Non-resident
<b>Category responses</b>							
0 fish	10	6	13	1	1	65	13
1-2 fish	12	2	7	1	2	23	3
3-9 fish	35	6	22	7	6	12	1
10-29 fish	46	4	18	21	5	0	0
30-99 fish	59	5	13	42	2	0	0
100-299 fish	22	0	4	30	0	0	0
300-999 fish	4	0	0	16	2	0	0
>=1000 fish	0	0	0	2	0	0	0
Questionnaires with responses	188	23	77	120	18	100	17
Percent with responses	93.5	71.9	95.1	96.0	94.7	80.0	89.5
<b>Numeric responses</b>							
First mail-out							
Mean number of fish	57.4	29.3	26.9	123.3	46.6	1.09	0.10
SD number of fish	85.2	33.8	43.5	144.2	115.8	1.99	0.32
Questionnaires with responses	61	7	31	44	10	46	10
Percent with responses	51.3	58.3	64.6	47.3	71.4	49.46	71.43
Second mail-out							
Mean number of fish	41.5	10.5	15.8	228.6	41.3	0.83	0.33
SD number of fish	54.3	11.2	13.2	376.4	33.8	1.25	0.58
Questionnaires with responses	41	10	21	18	3	18	3
Percent with responses	50.0	50.0	63.6	56.3	60.0	56.25	60.00
P, first vs. second mail-out (2-tailed t-test)	0.31	0.10	0.10	0.06	0.86	0.81	0.45
All responses							
Mean number of fish	51.0	18.2	22.4	153.9	45.4	1.02	0.15
SD number of fish	74.4	24.3	34.8	237.6	101.3	1.80	0.38
SE number of days	7.4	5.9	4.8	30.2	28.1	0.23	0.10
Upper 95% confidence limit	36.5	5.7	13.0	94.7	-13.6	0.57	-0.06
Lower 95% confidence limit	65.4	30.7	31.9	213.0	104.4	1.46	0.37
Questionnaires with responses	102	17	52	62	13	64	13
Percent with responses	50.7	53.1	64.2	49.6	68.4	51.2	68.4

Table 4

Proportion of trout and grilse salmon released by anglers on Prince Edward Island in 1994, from province-wide category and numeric questions.

	Proportion of trout released					Proportion of grilse salmon released*	
	Trout licence only			Salmon licence		Salmon licence	
	Resident	Courtesy	Non-resident	Resident	Non-resident	Resident	Non-resident
<b>Category responses</b>							
None released	30	11	16	7	3	12	2
Some (up to 1/2) released	77	9	20	33	2	2	0
Most (> 1/2) released	54	3	18	58	5	3	0
All released	17	0	14	15	8	15	2
Questionnaires with responses	178	23	68	113	18	32	4
Percent with responses	88.6	71.9	84.0	90.4	94.7	25.6	21.1
<b>Numeric responses</b>							
Mean percent released	53.0	33.8	63.2	69.1	88.7	56.4	0.0
SD percent released	31.3	30.5	33.3	27.8	22.5	48.1	0.0
Questionnaires with responses	128	12	45	88	12	26	2
Percent with responses	63.7	37.5	55.6	70.4	63.2	20.8	10.5

\*Based solely on respondents who reported catching salmon

Table 5

Estimated catch and effort of anglers licenced to fish on PEI in 1994. Numbers of licence-holders and active anglers are based on Tables 1 and 2. Total days spent fishing are calculated from the province-wide numeric question for trout (Table 2) and the river-based numeric question for salmon (Table 8). Numbers of trout caught, released, and kept are calculated from the province-wide numeric questions of catch per angler (Table 3) and retention rate (Table 4). Numbers of salmon caught, released, and kept are from the region-based numeric question (Table 6).

	Trout fishing						Atlantic salmon fishing		
	Trout licence only			Salmon licence		Total	Salmon licence		
	Resident	Courtesy	Non-resident	Resident	Non-resident		Resident	Non-resident	Total
Number of licence-holders	8,197	1,374	911	531	56	11,069	531	56	587
Number of active anglers	7,667	975	835	514	53	10,044	476	53	528
Total days spent fishing	166,592	19,049	6,323	18,672	579	211,215	11,375	427	11,802
Total number caught	390,944	17,778	18,725	79,099	2,408	508,955	846	20	866
Number caught and released	207,323	6,005	11,830	54,686	2,135	281,979	732	11	744
Number caught and kept	183,622	11,774	6,895	24,413	273	226,976	114	8	122

Table 6  
Fishing effort and harvest in six regions of PEI in 1994, by licence type and habitat type. Fishing effort includes both trout fishing and salmon fishing.

	Trout licence only												Salmon licence								All licences, weighted mean* (or total)			
	Resident				Courtesy				Non-resident				Resident				Non-resident				Run- ing fresh water	Ponds, lakes, & estu- aries	Tidal rivers & estu- aries	Total
	Run- ing fresh water	Ponds, lakes, & estu- aries	Tidal rivers & estu- aries	Total	Run- ing fresh water	Ponds, lakes, & estu- aries	Tidal rivers & estu- aries	Total	Run- ing fresh water	Ponds, lakes, & estu- aries	Tidal rivers & estu- aries	Total	Run- ing fresh water	Ponds, lakes, & estu- aries	Tidal rivers & estu- aries	Total	Run- ing fresh water	Ponds, lakes, & estu- aries	Tidal rivers & estu- aries	Total				
Questionnaires with responses				177				22				74				113				19				(405)
Percent with responses				88.1				68.8				91.4				90.4				100.0				86.1
<b>Region 1</b>																								
Number of respondents who fished	16	19	12	36	3	1	0	3	16	6	4	21	13	6	12	22	2	0	0	2	(50)	(32)	(28)	(84)
Percent of respondents who fished in Region 1				20.3				13.6				28.4				19.5				10.5				20.1
Days fished per angler, based on anglers who fished in this habitat or region	12.3	11.5	17.1	17.3	4.3	2.0	5.0	7.4	6.3	6.8	8.7	14.2	10.8	12.0	17.9	2.0	2.0	2.0	11.0	9.8	13.8	15.0		
Fish caught or kept per angler, based on anglers who fished in this habitat or region																								
Brook trout																								
Number caught per angler per season	32.8	11.8	14.8	25.8	10.7	6.0	12.7	16.8	6.3	4.5	15.5	65.2	19.5	16.0	52.5	6.0	6.0	6.0	30.2	11.0	12.1	24.5		
Number kept per angler per season	15.6	5.2	9.0	12.7	3.7	4.0	5.0	1.7	0.7	4.0	2.2	19.2	2.7	11.3	18.2	0.5	0.5	0.5	13.1	4.5	7.5	11.1		
Number caught per angler per day	2.7	1.0	0.9	1.5	2.5	3.0	2.5	2.3	1.0	0.7	1.8	4.6	1.8	1.3	2.9	3.0	3.0	3.0	2.7	1.3	0.8	1.7		
Number kept per angler per day	1.3	0.5	0.5	0.7	0.8	2.0	1.0	0.2	0.1	0.6	0.3	1.4	0.2	0.9	1.0	0.3	0.3	1.1	0.6	0.5	0.7			
Rainbow trout																								
Number caught per angler per season	0.5	0.0	5.0	1.9	1.3	0.0	1.3	0.2	2.0	0.0	0.7	7.8	0.0	0.0	4.6	0.0	0.0	0.0	0.9	0.2	3.7	1.8		
Number kept per angler per season	0.3	0.0	3.3	1.2	0.0	0.0	0.0	0.1	0.7	0.0	0.2	5.8	0.0	0.0	3.4	0.0	0.0	0.0	0.5	0.1	2.5	1.1		
Number caught per angler per day	0.0	0.0	0.3	0.1	0.3	0.0	0.3	0.0	0.3	0.0	0.1	0.6	0.0	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.2	0.1		
Number kept per angler per day	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1		
Large salmon																								
Number caught and released per season													0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grilse salmon																								
Number caught per angler per season													1.6	0.0	0.0	1.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Number kept per angler per season													0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total number of fishing days	8533	9486	8880	26900	576	89	665	1332	429	305	2065	837	296	655	1788	11	11	11	(11289)	(10299)	(9840)	(31428)		
Total of fish caught or kept																								
Brook trout																								
Number caught	22741	9746	7667	40155	1418	266	1684	3036	429	203	3668	3853	532	873	5258	34	34	34	(31081)	(10973)	(8744)	(50798)		
Number kept	10829	4288	4678	19796	487	177	665	305	45	181	530	1133	73	614	1819	3	3	3	(12757)	(4584)	(5473)	(22813)		
Rainbow trout																								
Number caught	347	0	2599	2946	177	0	177	34	135	0	169	464	0	0	464	0	0	0	(1022)	(135)	(2599)	(3756)		
Number kept	173	0	1733	1906	0	0	0	11	45	0	56	341	0	0	341	0	0	0	(526)	(45)	(1733)	(2304)		
Large salmon																								
Number caught and released													0	0	0	0	0	0	0	(0)	(0)	(0)	(0)	
Grilse salmon																								
Number caught													96	0	0	96	0	0	0	(96)	(0)	(0)	(96)	
Number kept													0	0	0	0	0	0	0	(0)	(0)	(0)	(0)	
<b>Region 2</b>																								
Number of respondents who fished	25	28	22	49	3	4	0	6	12	5	3	16	13	14	12	27	0	1	0	1	(59)	(52)	(37)	(99)
Percent of respondents who fished in Region 2				27.7				27.3				21.6				23.9				5.3				26.8
Days fished per angler, based on anglers who fished in this habitat or region	9.7	8.4	9.8	14.1	11.7	9.0	11.8	3.1	2.6	3.0	3.7	7.1	6.9	5.8	9.6	2.0	2.0	2.0	9.2	7.9	7.8	12.7		
Fish caught or kept per angler, based on anglers who fished in this habitat or region																								
Brook trout																								
Number caught per angler per season	20.5	28.4	8.7	30.6	14.3	10.0	13.8	5.2	0.8	0.0	4.1	27.1	19.6	5.8	25.7	0.0	0.0	0.0	18.7	23.3	6.7	25.9		
Number kept per angler per season	8.4	9.9	4.8	12.1	4.7	1.8	3.5	2.3	0.0	0.0	1.8	4.9	7.6	5.7	8.8	4.0	4.0	4.0	7.3	8.0	3.8	10.0		
Number caught per angler per day	2.1	2.5	0.5	1.8	1.2	5.0	2.8	1.7	0.1	0.0	0.5	3.8	1.8	0.5	1.4	0.0	0.0	0.0	2.0	2.5	0.4	1.8		
Number kept per angler per day	0.9	0.9	0.3	0.7	0.4	0.9	0.7	0.8	0.0	0.0	0.2	0.7	0.7	0.5	0.5	2.0	2.0	2.0	0.8	0.8	0.2	0.7		
Rainbow trout																								
Number caught per angler per season	1.4	1.0	0.5	1.5	0.0	0.0	0.0	0.0	1.2	0.0	0.4	1.2	2.3	2.2	2.7	4.0	4.0	4.0	1.1	0.9	0.5	1.3		
Number kept per angler per season	0.9	0.6	0.5	1.0	2.0	0.0	1.0	0.0	1.2	0.0	0.4	0.3	0.6	0.3	0.6	4.0	4.0	4.0	0.9	0.6	0.4	0.9		
Number caught per angler per day	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.2	0.2	0.2	2.0	2.0	2.0	0.1	0.1	0.0	0.1		
Number kept per angler per day	0.1	0.0	0.0	0.1	0.2	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	2.0	2.0	2.0	0.1	0.1	0.0	0.1		
Large salmon																								
Number caught and released per season													0.6	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grilse salmon																								
Number caught per angler per season													0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number kept per angler per season													0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0





Table 6 (continued)

	Trout licence only												Salmon licence								All licences, weighted mean* (or total)			
	Resident				Courtesy				Non-resident				Resident				Non-resident							
	Run- ing fresh water	Ponds, lakes, impound- ments	Tidal rivers & estu- aries	Total	Run- ing fresh water	Ponds, lakes, impound- ments	Tidal rivers & estu- aries	Total	Run- ing fresh water	Ponds, lakes, impound- ments	Tidal rivers & estu- aries	Total	Run- ing fresh water	Ponds, lakes, impound- ments	Tidal rivers & estu- aries	Total	Run- ing fresh water	Ponds, lakes, impound- ments	Tidal rivers & estu- aries	Total	Run- ing fresh water	Ponds, lakes, impound- ments	Tidal rivers & estu- aries	Total
Total number of fishing days	25514	10916	7970	44400	3811	4387	665	8863	643	34	14	691	2525	1910	2443	6878	70	11	81	(32562)	(17247)	(11103)	(60913)	
Total of fish caught or kept in region																								
Brook trout																								
Number caught	52370	15421	9226	77017	4432	4432	1329	10193	2110	79	248	2438	7155	2638	3193	12987	483	0	483	(66550)	(22570)	(13997)	(103117)	
Number kept	23608	7580	5328	36516	44	44	665	753	1083	23	203	1309	1301	964	823	3089	181	0	181	(26218)	(8612)	(7019)	(41848)	
Rainbow trout																								
Number caught	3812	5328	260	9400	177	266	0	443	124	474	113	711	318	1901	332	2552	0	11	11	(4432)	(7969)	(716)	(13117)	
Number kept	2599	2686	87	5371	0	0	0	0	56	316	23	395	77	614	77	769	0	11	11	(2733)	(3616)	(198)	(6546)	
Large salmon																								
Number caught and released													23	0	5	27	6	0	6	(28)	(0)	(5)	(33)	
Grilse salmon																								
Number caught													82	0	14	96	3	0	3	(85)	(0)	(14)	(98)	
Number kept													9	0	0	9	3	0	3	(12)	(0)	(0)	(12)	
<b>Region 6</b>																								
Number of respondents who fished	26	17	14	37	1	1	3	5	4	4	3	8	20	14	14	29	1	0	1	1	(52)	(36)	(35)	(80)
Percent of respondents who fished in Region 6				20.9				22.7				10.8				25.7				5.3			20.4	
Days fished per angler, based on anglers who fished in this habitat or region	11.5	13.5	11.6	18.7	8.0	2.0	4.0	4.4	3.8	2.8	4.7	5.0	19.9	14.4	14.0	27.4	7.0	7.0	14.0	10.8	11.1	10.2	16.2	
Fish caught or kept per angler, based on anglers who fished in this habitat or region																								
Brook trout																								
Number caught per angler per season	39.0	45.3	18.9	55.4	45.0	7.0	6.0	14.0	22.5	10.0	17.0	22.6	91.0	24.4	21.4	84.9	0.0	0.0	0.0	40.7	36.4	17.1	48.7	
Number kept per angler per season	9.5	15.6	6.9	16.5	36.0	7.0	6.0	12.2	18.8	3.8	8.7	14.5	16.1	6.3	7.9	17.9	0.0	0.0	0.0	13.8	13.1	7.0	15.8	
Number caught per angler per day	3.4	3.4	1.6	3.0	5.6	3.5	1.5	3.2	6.0	3.6	3.6	4.5	4.6	1.7	1.5	3.1	0.0	0.0	0.0	3.9	3.3	1.8	3.1	
Number kept per angler per day	0.8	1.2	0.6	0.9	4.5	3.5	1.5	2.8	5.0	1.4	1.9	2.9	0.8	0.4	0.6	0.7	0.0	0.0	0.0	1.6	1.4	0.8	1.3	
Rainbow trout																								
Number caught per angler per season	4.7	2.2	1.1	4.7	3.0	3.0	0.0	38.3	0.8	1.8	0.0	1.3	1.4	7.3	8.6	8.6	3.0	0.0	3.0	4.0	2.5	1.3	8.8	
Number kept per angler per season	0.8	0.5	0.1	0.8	3.0	3.0	0.0	1.2	0.5	0.0	0.0	0.3	0.8	1.1	3.6	2.8	1.0	0.0	1.0	1.1	0.8	0.2	0.9	
Number caught per angler per day	0.4	0.2	0.1	0.3	0.4	1.5	0.0	8.7	0.2	0.6	0.0	0.3	0.1	0.5	0.6	0.3	0.4	0.0	0.2	0.4	0.4	0.1	1.3	
Number kept per angler per day	0.1	0.0	0.0	0.0	0.4	1.5	0.0	0.3	0.1	0.0	0.0	0.1	0.0	0.1	0.3	0.1	0.1	0.0	0.1	0.1	0.2	0.0	0.1	
Large salmon																								
Number caught and released per season													0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Grilse salmon																								
Number caught per angler per season													1.3	0.2	0.1	1.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	
Number kept per angler per season													0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total number of fishing days	12995	9920	7017	29932	355	89	532	975	169	124	158	451	1810	919	892	3621	20	20	39	(15349)	(11051)	(8618)	(35018)	
Total of fish caught or kept in region																								
Brook trout																								
Number caught	43923	33354	11436	88713	1994	310	798	3102	1016	451	576	2043	8279	1556	1360	11194	0	0	0	(55212)	(35671)	(14169)	(105052)	
Number kept	10699	11522	4202	26423	1595	310	798	2703	846	169	293	1309	1465	400	500	2365	0	0	0	(14606)	(12402)	(5793)	(32801)	
Rainbow trout																								
Number caught	5241	1646	693	7580	133	133	0	8494	34	79	0	113	127	464	546	1137	8	0	8	(5544)	(2322)	(1239)	(17333)	
Number kept	953	347	43	1343	133	133	0	266	23	0	0	23	73	68	227	368	3	0	3	(1184)	(548)	(271)	(2003)	
Large salmon																								
Number caught and released													9	0	0	9	0	0	0	(9)	(0)	(0)	(9)	
Grilse salmon																								
Number caught													114	14	5	132	0	0	0	(114)	(14)	(5)	(132)	
Number kept													14	0	5	18	0	0	0	(14)	(0)	(5)	(18)	



Table 7

Salmon fishing effort and harvest on six PEI rivers, by residency status.

	Resident							Non-resident							Weighted mean* (or total)								
	Mill	Trout	Dunk	West	Morell	Montague/ Valleyfield	Total	Mill	Trout	Dunk	West	Morell	Montague/ Valleyfield	Total	Mill	Trout	Dunk	West	Morell	Montague/ Valleyfield	Total		
Questionnaires with responses							97															16	
Percent with responses							77.6																84.2
Number of respondents who fished in river	10	10	16	39	72	11	93	0	0	0	2	14	1	15	(10)	(10)	(16)	(41)	(86)	(12)	(108)		
Percent of respondents who fished in river	10.3	10.3	16.5	40.2	74.2	11.3	95.9	0.0	0.0	0.0	12.5	87.5	6.3	93.8	9.3	9.3	14.9	37.6	75.5	10.9	95.7		
Days fished per angler, based on anglers who fished in this river	5.8	5.8	15.1	11.3	14.2	23.4	22.3				3.0	7.3	14.0	8.1	5.8	5.8	15.1	10.5	13.5	22.5	21.0		
Fish caught or kept per angler, based on anglers who fished in this river																							
Large salmon																							
Number caught and released per season	0.00	0.00	0.06	0.36	0.25	0.09	0.37				1.00	0.00	0.00	0.13	0.00	0.00	0.06	0.42	0.23	0.08	0.34		
Number caught and released per day	0.000	0.000	0.004	0.032	0.018	0.004	0.016				0.333	0.000	0.000	0.016	0.000	0.000	0.004	0.060	0.016	0.004	0.016		
Grilse salmon																							
Number caught per angler per season	2.10	0.20	0.56	0.26	0.47	0.55	0.88				0.50	0.29	0.00	0.33	2.10	0.20	0.56	0.28	0.45	0.49	0.83		
Number kept per angler per season	0.20	0.10	0.13	0.08	0.21	0.09	0.26				0.50	0.14	0.00	0.20	0.20	0.10	0.13	0.12	0.20	0.08	0.25		
Number caught per angler per day	0.362	0.034	0.037	0.023	0.033	0.023	0.039				0.167	0.039	0.000	0.041	0.362	0.034	0.037	0.036	0.034	0.021	0.040		
Number kept per angler per day	0.034	0.017	0.008	0.007	0.015	0.004	0.012				0.167	0.020	0.000	0.025	0.034	0.017	0.008	0.022	0.015	0.004	0.013		
Total number of fishing days in river	318	318	1325	2420	5589	1407	11375				21	357	49	427	(318)	(318)	(1325)	(2441)	(5946)	(1456)	(11802)		
Total of fish caught or kept in river																							
Large salmon																							
Number caught and released	0	0	5	77	99	5	186				7	0	0	7	(0)	(0)	(5)	(84)	(99)	(5)	(193)		
Grilse salmon																							
Number caught	115	11	49	55	186	33	449				4	14	0	18	(115)	(11)	(49)	(58)	(200)	(33)	(466)		
Number kept	11	5	11	16	82	5	131				4	7	0	11	(11)	(5)	(11)	(20)	(89)	(5)	(142)		

\*Means are weighted by the proportion of licence types in the sampling pool (Table 1).

Table 8

Effort and catch of respondents who reported salmon fishing effort in six PEI rivers. Each line gives the catch reported by one respondent. Blanks indicate that the respondent did not give the number of fish caught or kept.

Mill River (N=9)				West River (N=40)				Morell River (N=82)				Morell River (continued)				Montague/Valleyfield Rivers (N=12)			
Number of days fishing for salmon in river	Large salmon caught and released	Grilse Caught	Grilse Kept	Number of days fishing for salmon in river	Large salmon caught and released	Grilse Caught	Grilse Kept	Number of days fishing for salmon in river	Large salmon caught and released	Grilse Caught	Grilse Kept	Number of days fishing for salmon in river	Large salmon caught and released	Grilse Caught	Grilse Kept	Number of days fishing for salmon in river	Large salmon caught and released	Grilse Caught	Grilse Kept
1		0		1		1	1	1	0	0		5	0	1	1	2			
2				1	0	0	0	1	0	0	0	6				5	0	0	0
2	0	0	0	2				1	0	0	0	6	0	0		5	0	0	0
2	0	0	0	2	0			1	0	0	0	6	3			10			
5	0	1	0	2	0	0		1	0	0	0	7		2	0	10	0	0	0
5	0	1	1	2	0	0	0	1	0	0	0	9	0	0	0	14	0	0	0
6				2	0	0	0	2				9	0	0	0	20	0	0	0
15		1	1	2	0	0	0	2		0	0	10				20	0	0	0
20	0	18	0	3				2		1	1	10		0		25		3	
Total	0	21	2	3			0	2		2	0	10	0			30	0	0	0
				3		1	1	2	0	0		10	0	0		30	1	0	0
				3	0	0	0	2	0	0	0	10	0	0		100		3	1
				3	2			2	0	0	0	10	0	0		Total	1	6	1
				4				2	0	0	0	10	0	0	0				
				4	0	0	0	2	0	0	0	15	0	0	0				
				4	2	1	1	2	0	0	0	15	0	0	0	Total, all rivers (N=168)			
				5				2	0	0	0	19	8	1	1		34	81	24
				5	0	0	0	2	0	0	0	20	0	0	0				
				5	0	0	0	2	0	0	0	20	0	0	0				
				5	0	0	0	3				20	0	0	0				
				5	1	0		3	0	0	0	20	0	0	0				
				5	2	0	0	3		1	1	20	0	0	0				
				6	0	0		3	0	0		20	0	0	0				
				6	0	0	0	3	0	0	0	20	0	0	0				
				7	0	0	0	3	0	0	0	20	0	0	0				
				7	0	0	0	3	0	0	0	20	0	0	0				
				8		1	0	3	0	0	0	20	0	4	2				
				8	1	3	0	4				20	0	5	0				
				10	0	0	0	4	0	0		20	0	2	2				
				10	1	0	0	4	0	0	0	25	2	2	0				
				10	1	0	0	4	0	0	0	28							
				12				4	0	0	0	30	0	0	0				
				15				4	0	0	0	30	0	0	0				
				15				4	0	0	0	30	0	0	0				
				15		0	0	5				32	0	1	1				
				15	0	0		5				40							
				20	0	0	0	5			0	40		2	0				
				20	0	0	0	5	0	0		50	0	3	0				
				25		1	1	5	0	0		58	0	1	1				
				30	0	0	0	5	0	0	0	65	0	0	0				
				30	0	0	0	5	0	0	0	100	0	1	1				
				120	6	3		5	0	0	0	100	1	2	2				
Total	1	9	2	Total	16	11	4	5	0	0	0	Total	16	32	14				
								5	0	1	1								

Table 9

Major purchases and direct expenditures of anglers on PEI in 1994, in Canadian dollars, by licence type. Amounts refer to purchases and expenditures that took place on PEI.

	Trout licence only						Salmon licence				All licences, weighted mean* or (total)	
	Resident		Courtesy		Non-resident		Resident		Non-resident		Total	Attributable to fishing
	Total	Attributable to fishing	Total	Attributable to fishing	Total	Attributable to fishing	Total	Attributable to fishing	Total	Attributable to fishing		
Major purchases per angler												
Fishing equipment	61	57	23	23	15	12	198	192	44	43	58.70	55.16
Boating equipment	121	65	0	0	5	2	220	172	1	1	100.61	56.29
Camping equipment	21	19	0	0	70	38	47	29	11	11	23.50	18.79
Special vehicles	155	63	1000	500	3	0	770	165	1	0	276.38	116.54
Land, buildings	3	2	0	0	163	74	2	2	17	17	15.50	7.80
Other equipment	36	30	5	4	16	12	95	79	18	18	33.37	27.37
Total	397	235	1028	527	272	138	1332	638	92	90	508.07	281.95
Direct expenditures per angler												
Accommodation during fishing	8	8	1	1	42	27	15	15	62	50	10.71	9.34
Food during fishing	51	46	4	2	108	69	93	88	80	59	51.89	44.89
Travel costs during fishing trips	81	74	22	21	84	61	201	193	85	65	79.50	72.31
Boat operating costs	13	10	0	0	51	48	31	30	1	1	15.22	13.12
Fishing supplies	34	32	13	13	22	18	89	81	14	12	32.69	30.54
Licence fees	10	10	0	0	20	20	19	19	30	30	10.09	10.09
Total	196	181	40	38	326	243	447	426	272	217	200.10	180.30
Total purchases and expenditures per angler	593	416	1069	565	598	381	1779	1064	363	307	708.17	462.25
Total of major purchases for PEI	3040887	1802332	1002512	513957	241158	122532	684806	328110	4857	4752	(4974219)	(2771682)
Total of direct expenditures for PEI	1506057	1388279	39269	36696	289422	215897	229632	218911	14421	11513	(2078800)	(1871296)
Total of purchases and expenditures for PEI	4546944	3190611	1041780	550653	530580	338428	914438	547021	19279	16265	(7053020)	(4642978)
Questionnaires with responses	170		18		59		115		18		(380)	
Percent with responses	84.6		56.3		72.8		92.0		94.7		83.0	

\*Weighted by proportion of licence types in the sampling pool (Table 1).

Table 10

Conservation group membership and volunteer activities of resident anglers in 1994, by licence type.

	Trout licence only		Resident salmon licence
	Resident	Courtesy	
<b>Membership in a PEI-based angling, wildlife or conservation group in 1994</b>			
Members (percent)	22 (11.3%)	2 (7.1%)	60 (50%)
Non-members (percent)	173 (88.7%)	26 (92.9%)	60 (50%)
Questionnaires with responses	195	28	120
Percent with responses	97.0	93.3	96.0
<b>Volunteer time in support of PEI's recreational fishery</b>			
<u>Category responses</u>			
0 days	164	28	84
1-2 days	12	1	15
3-9 days	10	0	7
10-29 days	9	0	10
30-99 days	1	0	2
>= 100 days	0	0	4
Questionnaires with responses	196	29	122
Percent with responses	97.5	96.7	97.6
<u>Numeric responses</u>			
Mean number of days	3.9	0	9.3
SD number of days	7.6	0	23.2
Questionnaires with responses	39	7	24
Percent with responses	19.4	23.3	19.2

Table 11

Willingness of anglers to contribute funds, over and above present licence fees, to support wildlife and recreational fisheries enhancement.

	Trout licence only			Salmon licence		All licences		
	Resident	Courtesy	Non- resident	Resident	Non- resident	Total	Weighted mean %*	Weighted total*
<u>Category responses</u>								
None	35	6	34	10	4	89	22.3	
\$5 per year	45	3	13	11	2	74	22.1	
\$10 per year	51	6	18	37	7	119	28.3	
\$20 per year	38	2	7	25	1	73	18.5	
\$30 per year	13	2	3	15	2	35	7.6	
\$50 per year	1	0	1	12	1	15	1.1	
\$75 per year	0	0	0	1	0	1	0.0	
\$100 or more per year	0	0	0	2	0	2	0.1	
Questionnaires with responses	183	19	76	113	17	408		
Percent with responses	91.0	59.4	93.8	90.4	89.5	89.1		
<u>Numeric responses</u>								
Mean additional contribution	17.43	16.88	27.93	31.92	28.75			18.97
SD additional contribution	8.08	12.80	7.50	24.76	16.42			9.46
Questionnaires with responses	94	8	29	53	8	192		
Percent with responses	46.8	25.0	35.8	42.4	42.1	41.9		
<u>Potential revenue</u>								
Annual revenue from a levy equal to the mean additional contribution**	150,766	24,469	27,009	16,952	1,610	220,806		

\*Weighted by proportion of licence types in the sampling pool (Table 1).

\*\*Based on the number of licences issued in 1994.

Table 12

Angler ratings of experience fishing for trout and Atlantic salmon on PEI in 1994, by licence category.

	Trout fishing					Total	Salmon fishing		
	Trout licence only			Salmon licence			Salmon licence		Total
	Resident	Courtesy	Non-resident	Resident	Non-resident		Resident	Non-resident	
<b>Rating of fishing experience on PEI in 1994</b>									
Excellent	17	2	8	11	7	45	1	1	2
Very good	28	3	19	26	3	79	2	1	3
Good	57	2	10	37	1	107	11	3	14
Fair	48	4	21	26	3	102	18	3	21
Poor	35	10	17	16	4	82	71	8	79
Questionnaires with responses	185	21	75	116	18	415	103	16	119
Percent with responses	92.0	70.0	92.6	92.8	75.0	90.6	82.4	66.7	82.6
<b>Rating of fishing in 1994 compared to 1989</b>									
Improved	24	0	2	17	0	43	15	1	16
Remained the same	46	5	16	29	3	99	16	2	18
Declined	86	16	25	65	8	200	57	7	64
Questionnaires with responses	156	21	43	111	11	342	88	10	98
Percent with responses	77.6	70	53.1	88.8	45.8	74.7	70.4	41.7	68.1

Table 13

Methods used by anglers to fish trout and salmon in Prince Edward Island in 1994, by licence type.

	Trout licence only			Salmon licence		All licences	
	Resident	Courtesy	Non-resident	Resident	Non-resident	Total number	Weighted mean %*
<b>Use of bait when fishing trout</b>							
Never used bait	11	2	8	22	7	50	8.0
Used bait some of the time	36	6	13	64	4	123	22.9
Used bait most of the time	61	2	19	11	1	94	28.9
Always used bait	76	12	18	3	1	110	40.1
Questionnaires with responses	184	22	58	100	13	377	
Percent with responses	91.5	73.3	71.6	80.0	54.2	82.3	
<b>Use of artificial flies when fishing trout</b>							
Never used artificial flies	21	3	10	0	0	34	19.0
Used artificial flies some of the time	60	3	12	21	1	97	46.5
Used artificial flies most of the time	16	3	6	56	3	84	17.3
Always used artificial flies	13	3	19	42	14	91	17.3
Questionnaires with responses	110	12	47	119	18	306	
Percent with responses	54.7	40	58	95.2	75	66.8	
<b>Use of lures (hardware) when fishing trout</b>							
Never used lures	28	5	9	36	9	87	29.3
Used lures some of the time	75	5	20	42	1	143	63.8
Used lures most of the time	4	0	5	1	0	10	3.8
Always used lures	1	1	6	0	0	8	3.0
Questionnaires with responses	108	11	40	79	10	248	
Percent with responses	53.7	36.7	49.5	63.2	41.7	54.1	
<b>Use of hooks with barbs removed or flattened (barbless hooks) when fishing trout</b>							
Never used barbless hooks	104	14	45	57	12	232	56.8
Used barbless hooks some of the time	49	2	16	42	3	112	24.0
Used barbless hooks most of the time	22	1	8	15	1	47	10.8
Always used barbless hooks	12	4	9	6	2	33	8.4
Questionnaires with responses	187	21	78	120	18	424	
Percent with responses	93	70	96.3	96	75	92.6	
<b>Use of hooks with barbs removed or flattened (barbless hooks) when fishing salmon</b>							
Never used barbless hooks				66	10	76	67.9
Used barbless hooks some of the time				19	2	21	19.0
Used barbless hooks most of the time				9	0	9	8.4
Always used barbless hooks				3	3	6	4.7
Questionnaires with responses				97	15	112	
Percent with responses				77.6	62.5	24.5	

\*Percentage weighted by proportion of licence types in the sampling pool (Table 1).

Table 14

Opinion of anglers on opening and closing dates for the trout fishery, by licence type.

	Trout licence only			Salmon licence		Total
	Resident	Courtesy	Non-resident	Resident	Non-resident	
Anglers favoring an opening date of						
1 January	2				1	3
1 March	1					1
15 March	1					1
1 April	6		6	13	1	26
5-10 April	3			1		4
15 April	139	18	54	71	12	294
20-26 April	5		3			8
30 April - 1 May	27	5	4	29	2	67
10-15 May			2	4		6
15 June	2					2
Questionnaires with response	186	23	69	118	16	412
Percent with responses	92.5	71.9	85.2	94.4	84.2	90.0
Anglers favoring a closing date of						
1 July	1					1
1 August	1					1
15 - 25 August	4					4
30 August - 1 September	23	2	4	21	2	52
4 - 10 September	1			2		3
15 September	90	18	48	53	7	216
25 September	3					3
30 September - 1 October	43	2	12	27	5	89
15 October	7	1	2	8		18
30 October - 1 November	7		3	5		15
10-15 November	2			1		3
30 November	0			1		1
15 December	1					1
31 December	2				1	3
Questionnaires with response	185	23	69	118	15	410
Percent with responses	92.0	71.9	85.2	94.4	78.9	89.5

Table 15

Opinion of anglers on daily bag limits for trout, by licence category.

	Trout licence only			Salmon licence		Total
	Resident	Courtesy	Non-resident	Resident	Non-resident	
Anglers favoring a daily bag limit of						
1	1	0	0	0	1	2
2	0	0	0	1	3	4
3	2	0	1	1	0	4
4	1	0	2	3	3	9
5	25	0	13	33	2	73
6	12	0	8	21	0	41
7	7	1	1	1	0	10
8	10	3	2	10	0	25
9	0	0	0	0	0	0
10	103	18	43	47	8	219
11	0	0	0	0	0	0
12	15	2	4	1	1	23
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	6	0	1	1	0	8
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18	1	0	0	0	0	1
19	0	0	0	0	0	0
20	3	0	3	0	0	6
Mean	9.2	9.8	9.0	7.5	6.7	8.6
SD	2.9	1.1	3.3	2.5	3.8	
Questionnaires with responses	186	24	78	119	18	425
Percent with responses	92.5	80	96.3	95.2	75	93.4

Table 16

Opinions of anglers on maximum and minimum size limits for trout and on the number of large trout kept per day, by licence type.

	Trout licence only			Salmon licence	
	Resident	Courtesy	Non-resident	Resident	Non-resident
<b>Opinion on maximum size limits for trout</b>					
Number favoring a maximum limit	56	7	21	56	7
Percent favoring a maximum limit	31.5	38.9	27.6	52.3	46.7
Recommended maximum limit in inches (cm)					
4-5.9 (10.2-15.0)	1	0	1	0	0
6-7.9 (15.2-20.1)	3	0	1	0	0
8-9.9 (20.3-25.1)	2	1	0	0	0
10-11.9 (25.4-30.2)	3	0	0	1	0
12-13.9 (30.5-35.3)	6	1	1	3	0
14-15.9 (35.6-40.4)	10	2	1	10	0
16-17.9 (40.6-45.5)	5	0	3	13	2
18-19.9 (45.7-50.5)	5	2	3	12	2
20-21.9 (50.8-55.6)	6	1	2	5	0
22-23.9 (55.9-60.7)	1	0	0	3	0
24-25.9 (61.0-65.8)	4	0	1	7	3
26-27.9 (66.0-70.9)	0	0	0	0	0
28-29.9 (71.1-75.9)	0	0	0	0	0
30-31.9 (76.2-81.0)	1	0	0	0	0
<b>Opinion on minimum size limits for trout</b>					
Number favoring a minimum limit	147	16	53	88	13
Percent favoring a minimum limit	73.1	50.0	65.4	70.4	68.4
Recommended minimum limit in inches (cm)					
2-3.9 (5.1-9.9)	1	0	0	0	0
4-5.9 (10.2-15.0)	22	4	4	3	0
6-7.9 (15.2-20.1)	69	10	21	32	4
8-9.9 (20.3-25.1)	35	1	18	32	2
10-11.9 (25.4-30.2)	5	1	5	18	3
12-13.9 (30.5-35.3)	2	0	2	1	2
14-15.9 (35.6-40.4)	0	0	0	0	1
<b>Opinion on limits to the number of large trout kept per day</b>					
Number favoring a limit	96	11	43	90	12
Percent favoring a limit	50.8	44.0	54.4	73.2	70.6
Threshold size for large trout 6-9.9 inches					
Number favoring a limit at this threshold	11	1	5	3	
Number of fish to be permitted above threshold	Mean	4.8	1.0	6.6	2.5
	SD	2.5		3.4	2.5
Threshold size for large trout 10-14.9 inches					
Number favoring a limit at this threshold	26	3	19	24	4
Number of fish to be permitted above threshold	Mean	2.5	3.0	3.7	2.0
	SD	1.3	2.7	2.0	1.6
Threshold size for large trout 15-19.9 inches					
Number favoring a limit at this threshold	42	4	10	47	7
Number of fish to be permitted above threshold	Mean	2.5	2.5	1.8	1.1
	SD	1.6	2.4	1.0	0.8
Threshold size for large trout 20-25 inches					
Number favoring a limit at this threshold	11		2	9	1
Number of fish to be permitted above threshold	Mean	1.5		4.5	1.9
	SD	0.9		0.7	1.3
Questionnaires with responses	178	18	76	107	15
Percent with responses	88.6	56.3	93.8	85.6	78.9

Table 17  
Opinion of anglers on impoundments and stream enhancement in relation to trout and trout fishing,  
by licence type.

	Trout licence only			Salmon licence		Total
	Resident	Courtesy	Non- resident	Resident	Non- resident	
<b>Anglers believing that trout fishing on PEI would be best served by</b>						
Building more impoundments	68	12	24	29	6	139
Keeping the same number of impoundments	75	7	42	49	5	178
Reducing the number of impoundments	36	3	4	34	3	80
Questionnaires with responses	179	22	70	112	14	397
Percent with responses	89.1	73.3	86.4	89.6	58.3	87.3
<b>Anglers believing that stream enhancement by community groups has</b>						
Harmed trout and trout angling	17	4	4	17	0	42
Had no effect on trout and trout angling	22	3	11	7	2	45
Helped trout and trout angling	145	14	51	92	10	312
Questionnaires with responses	184	21	66	116	17	404
Percent with responses	91.5	70	81.5	92.8	70.8	88.8

Table 18

Place of residence and fishing locations of non-resident trout and salmon anglers, by licence type.

Location	Angler's residence		Fishing location other than PEI	
	Trout licence	Salmon licence	Trout licence	Salmon licence
Canada				
Nova Scotia	19	5	19	4
New Brunswick	16	2	13	2
Quebec	5	3	7	4
Ontario	17	1	16	1
Northwest Territories	1		1	
Alberta	1		1	
Total	59	11	57	11
United States				
New England				
Maine	5	1	5	1
New Hampshire	3	1	1	1
Vermont	2		2	
Connecticut	1	1	1	1
Massachusetts	4	1	2	1
Total	15	4	11	4
Non-New England				
New York	1	2	2	2
Pennsylvania	2		2	
Maryland	1		1	
South Carolina	1		1	
Michigan	1		1	
Louisiana	1		1	
Montana			1	
New Jersey		1		
California		1		1
Total	7	4	8	3
Total US	22	8	19	7
Germany			1	
Total*	81	19	77	18
Questionnaires with responses			70	17
Percent with responses			86.4	89.5

\*Totals exceed number of questionnaires with responses because some respondents listed more than one fishing location.

Table 19

Opinion of non-resident anglers on the fishing experience on PEI and importance of fishing in the choice of PEI as a place to visit, by licence type.

	Licence	
	Trout only	Salmon
Opinion of the fishing experience on PEI compared to the province or state where the respondent does most of his/her recreational fishing		
Fishing on PEI in 1994 was		
Much better	8	4
Better	6	3
About the same	28	5
Poorer	20	3
Much poorer	9	3
Questionnaires with responses	71	18
Percent with responses	87.7	94.7
Importance of freshwater fishing opportunities in the choice of PEI as a place to visit		
Fishing was the main reason to visit PEI	15	5
Fishing was a secondary reason to visit PEI	36	10
Fishing had no influence on the choice of PEI	27	4
Questionnaires with responses	78	19
Percent with responses	96.3	100.0

Table 20

Number of angling licences issued on Prince Edward Island, 1948-1994.

Year	Trout				Total	Atlantic salmon
	Resident	Courtesy	Non-resident	Winter		
1948	3068		783		3851	
1949	3552		907		4459	
1950	3746		1165		4911	
1951	4251		1086		5337	
1952	4952		1158		6110	
1953	5467		1159		6626	
1954	5222		1209		6431	
1955	5291		1238		6529	
1956	5298		1371		6669	
1957	4989		1596		6585	
1958	6884		1941		8825	
1959	7265		1965		9230	
1960	6987		1705		8692	
1961	6370		1704		8074	
1962	7681		1834		9515	
1963	6882		1953		8835	
1964	7127		1912		9039	
1965	7738		1927		9665	
1966	8374		2063		10437	
1967	7046		2079		9125	
1968	8607		2592		11199	
1969	9195		2733		11928	
1970	9067		2917		11984	
1971	9368		2919		12287	
1972	8518		2793		11311	
1973	9911	1286	2777		13974	
1974	9777	1170	3069		14016	
1975	10860	1446	2169		14475	
1976	11887	1442	2155		15484	
1977	11205	1401	1994		14600	
1978	11168	1391	1899		14458	
1979	12951	1559	2074		16584	
1980	11641	1675	1538		14854	
1981	11722	1629	1517		14868	
1982	11929	1718	1619		15266	
1983	12164	1761	1505		15430	321
1984	11103	1648	1372		14123	68
1985	10740	1649	1341		13730	117
1986	10619	1642	1547		13808	279
1987	9674	1638	1272		12584	461
1988	9177	1667	1410		12254	719
1989	9804	1650	1427		12881	646
1990	9726	1582	1361		12669	793
1991	9648	1665	1154		12467	716
1992	8524	1026	1016	195	10566	928
1993	8438	1499	988	233	10925	829
1994	8652	1450	967	233	11069	587

Table 21

Sample sizes, fishing effort, harvest, and expenditures from post-season trout angling surveys on PEI, 1973-1994.

Fishing year	Number of questionnaires returned			Number of days fished*			Trout caught per fishing day	Trout harvest						Major purchases and direct expenditures attributable to recreational fishing			Source
	Resident	Non-resident	Total	Resident	Non-resident	Total		Brook and "sea" trout		Rainbow trout		All trout		Resident	Non-resident	Total	
								Caught	Kept	Caught	Kept	Caught	Kept				
1973	351	245	596	192960	14700	207660	3.5	713000		16000		729000	319547 **	341300 **	660847 **	Thompson 1975	
1975			631	271289	14697	285986						568457	1247357	452039	1699396	Anon. 1978	
1980			878	303900	10100	314000	2.8	839800	641600	46600	24800	886400	666400	2098200	290900	2389100	Smith and Brickley 1985
1985			691	280766	8952	289718			444466		30342		474808	3271337	454021	3725358	Anon. 1988
1990	460	343	803	259132	9959	269091	2.5	616409	375662	55430	30982	671839	406644	3435522	594685	4030207	Anon. 1994
1994	358	100	458	215688	7329	223017	2.3	453574	202190 ***	55381	24786 ***	508955	226976	4288285	334548	4622833	This study

\*Includes days fishing for salmon

\*\*Does not include major purchases

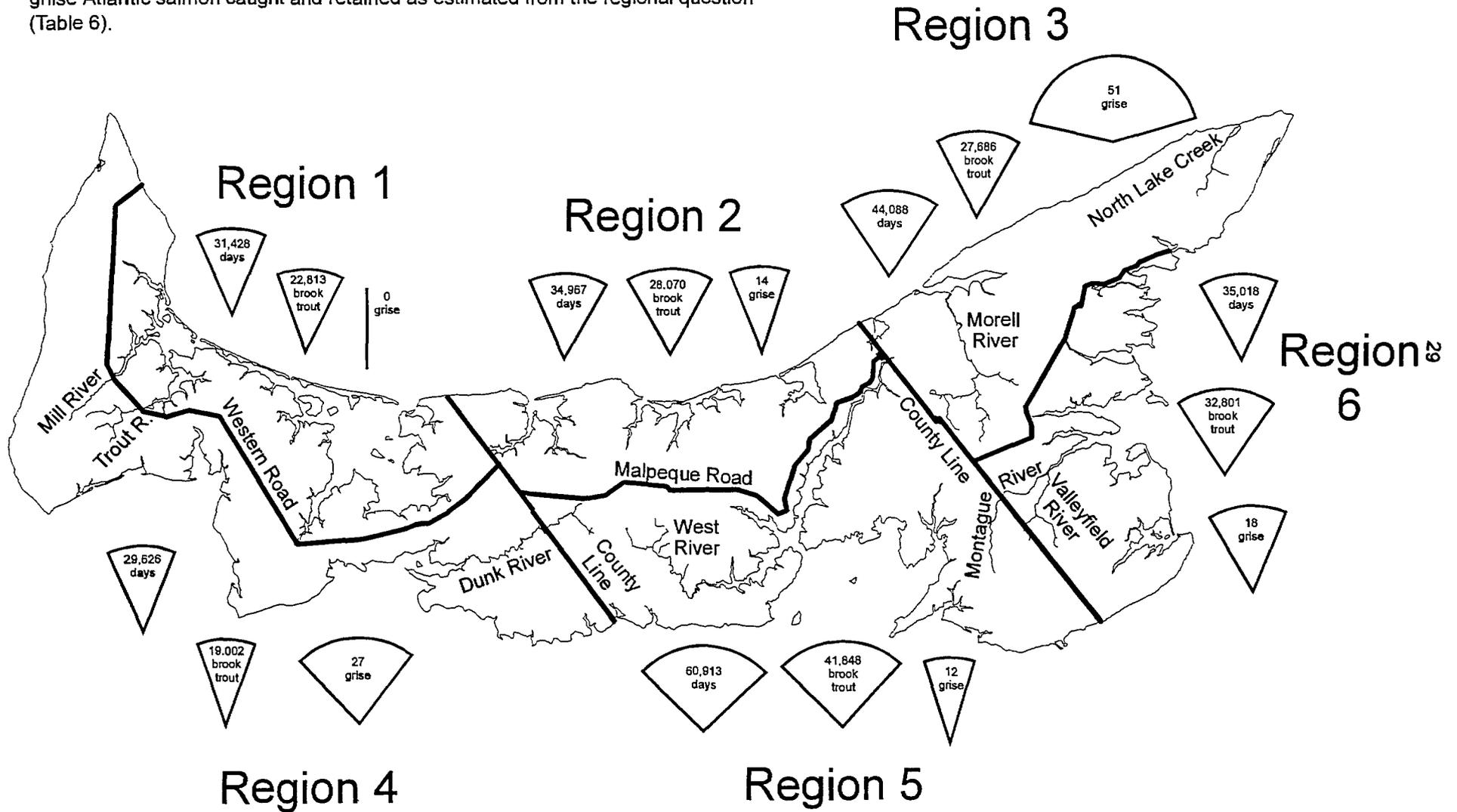
\*\*\*Calculated from total trout harvest given in Table 5 and brook trout:rainbow trout ratios from Table 6

Table 22

Sample sizes, fishing effort, harvest, and expenditures from post-season surveys of salmon anglers on PEI, 1980-1994.

Fishing year	Number of questionnaires returned by salmon licence-holders			Number of days fished for salmon			Salmon caught per fishing day	Small salmon		Large salmon released	All salmon		Major purchases and direct expenditures of salmon licence-holders attributable to fishing on PEI			Source
	Resident	Non-resident	Total	Resident	Non-resident	Total		Caught	Kept		Caught	Kept	Resident	Non-resident	Total	
1980											700	300				Anon. 1978
1985												67				Smith and Brickley 1985
1988			491	6972	213	7185	0.237	1445	678	256	1701	678	332987	34401	367388	Anon. 1990
1990											1697	631				Anon. 1994
1991	54	0	54	13639		13639	0.144	1772	669	187	1697	631				MacFarlane and Guignion 1992
1992			325			15458	0.135		839		2089	839				MacFarlane and Guignion 1993
1994	125	19	144	11375	427	11802	0.073	719	122	147	866	122	547021	16265	563286	This study

Fig. 1  
 Prince Edward Island, showing the principal angling streams and the regions used in the angler questionnaire. Also shown are fishing days, brook trout caught and retained, and grilse Atlantic salmon caught and retained as estimated from the regional question (Table 6).



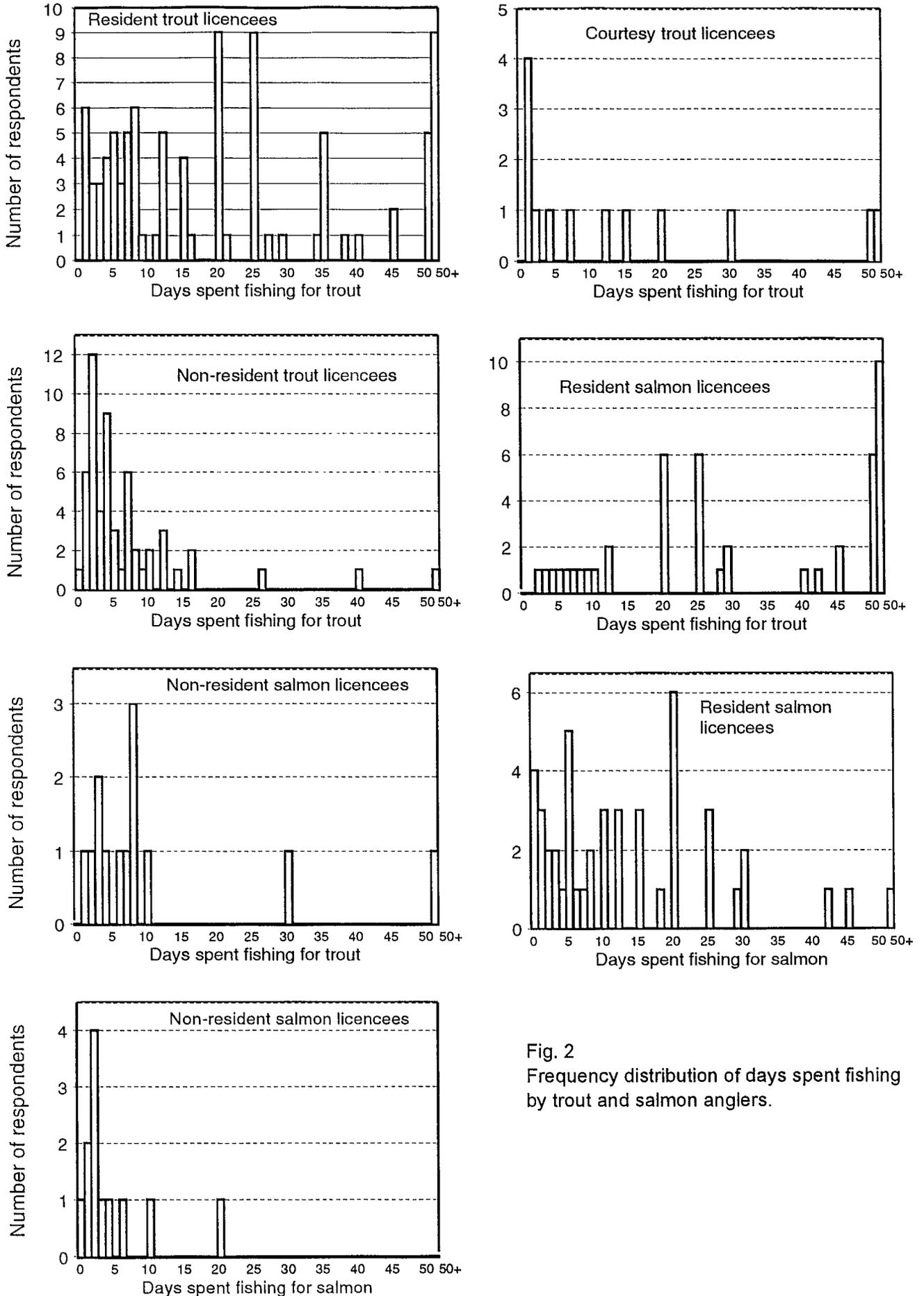


Fig. 2  
Frequency distribution of days spent fishing by trout and salmon anglers.

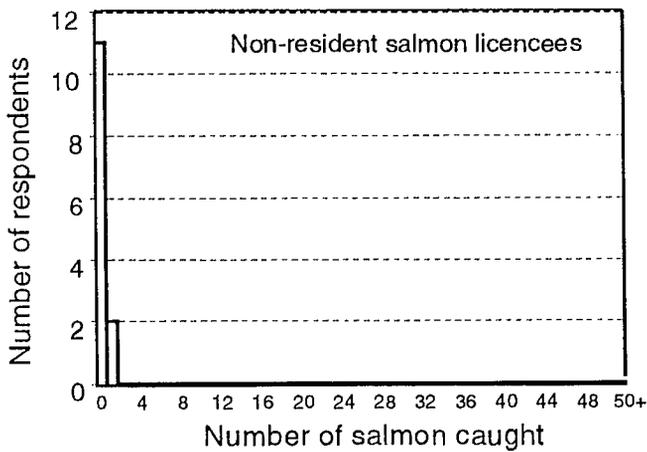
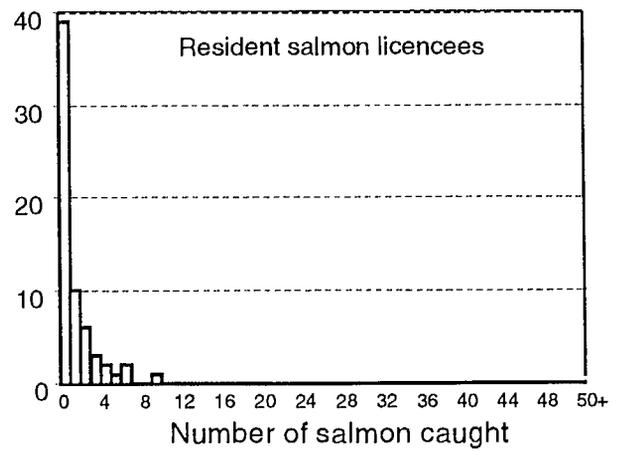
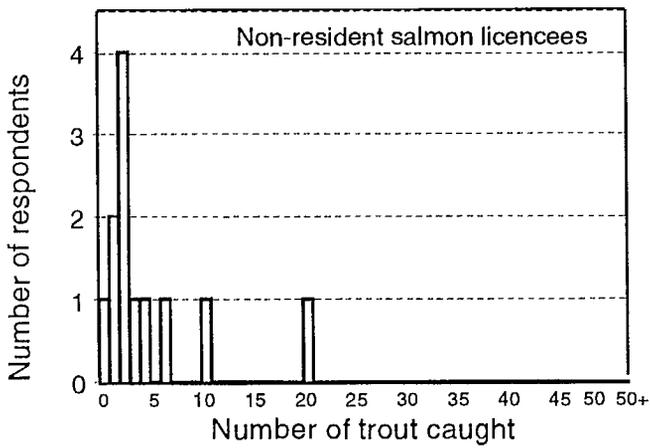
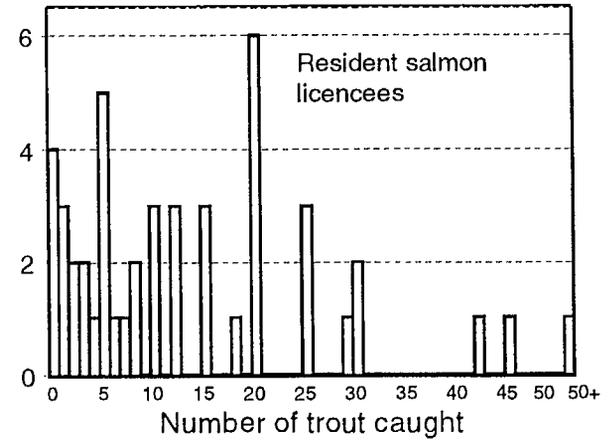
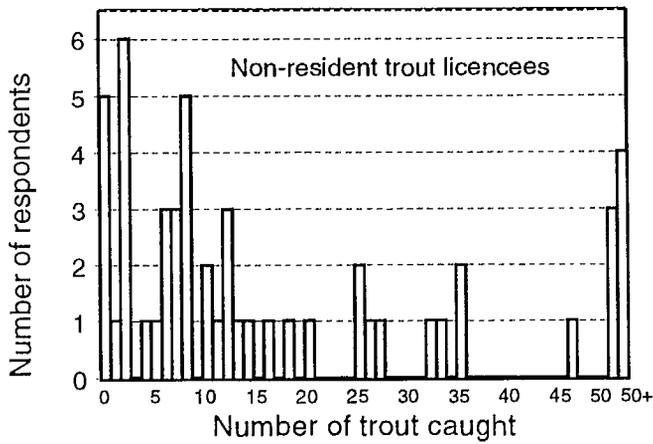
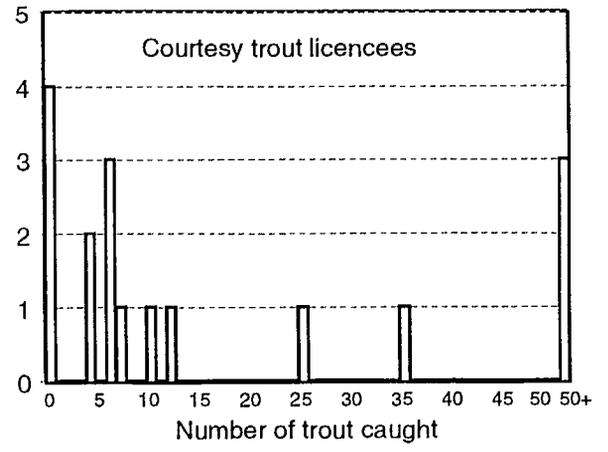
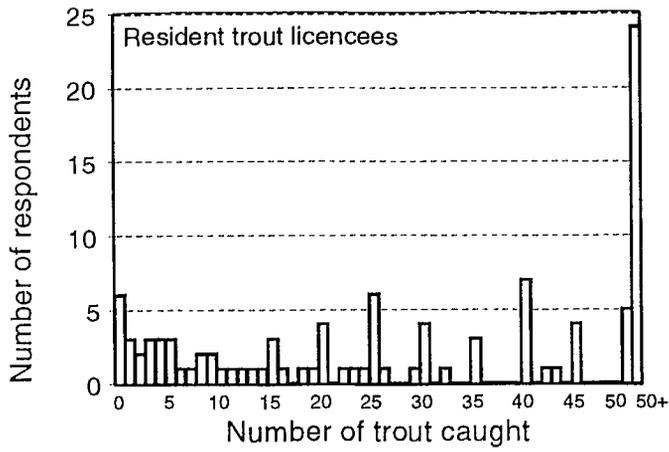


Fig. 3  
 Frequency distributions of number of trout and salmon caught by anglers. Fish caught include those released.

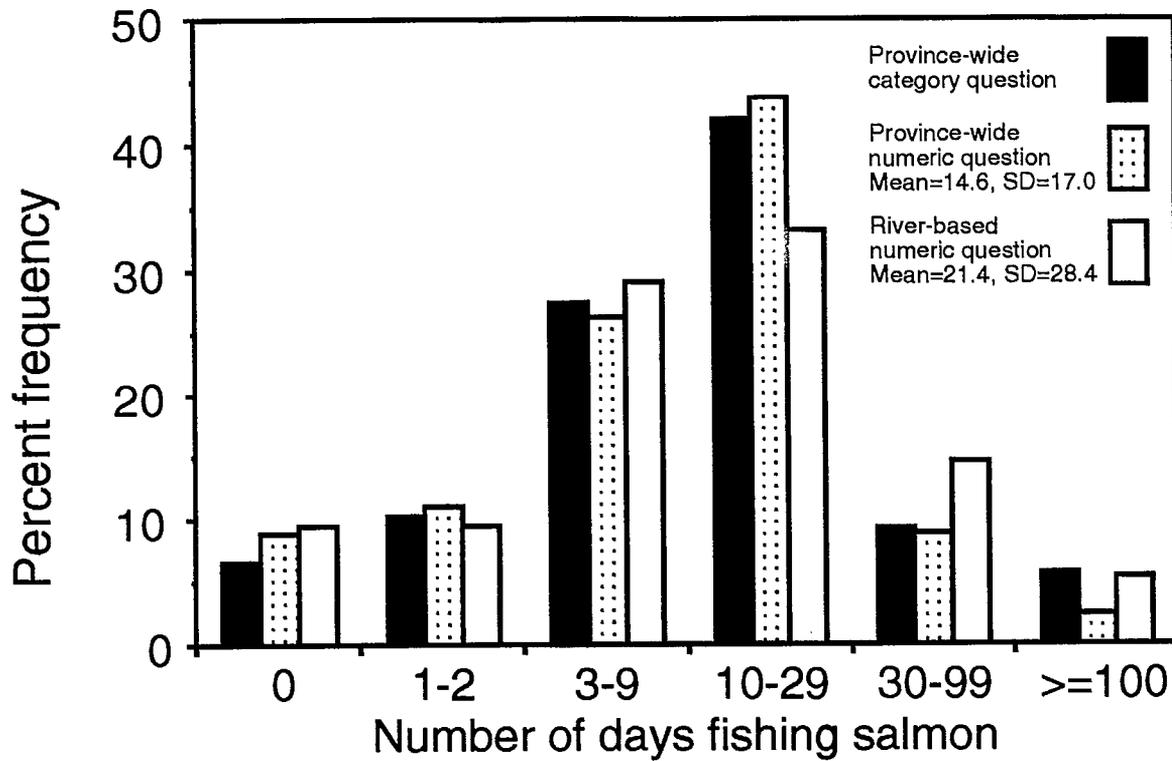


Fig. 4  
Percent frequency distribution of number of days salmon fishing by resident salmon licencees, from three different questions in the angler mail-out questionnaire.

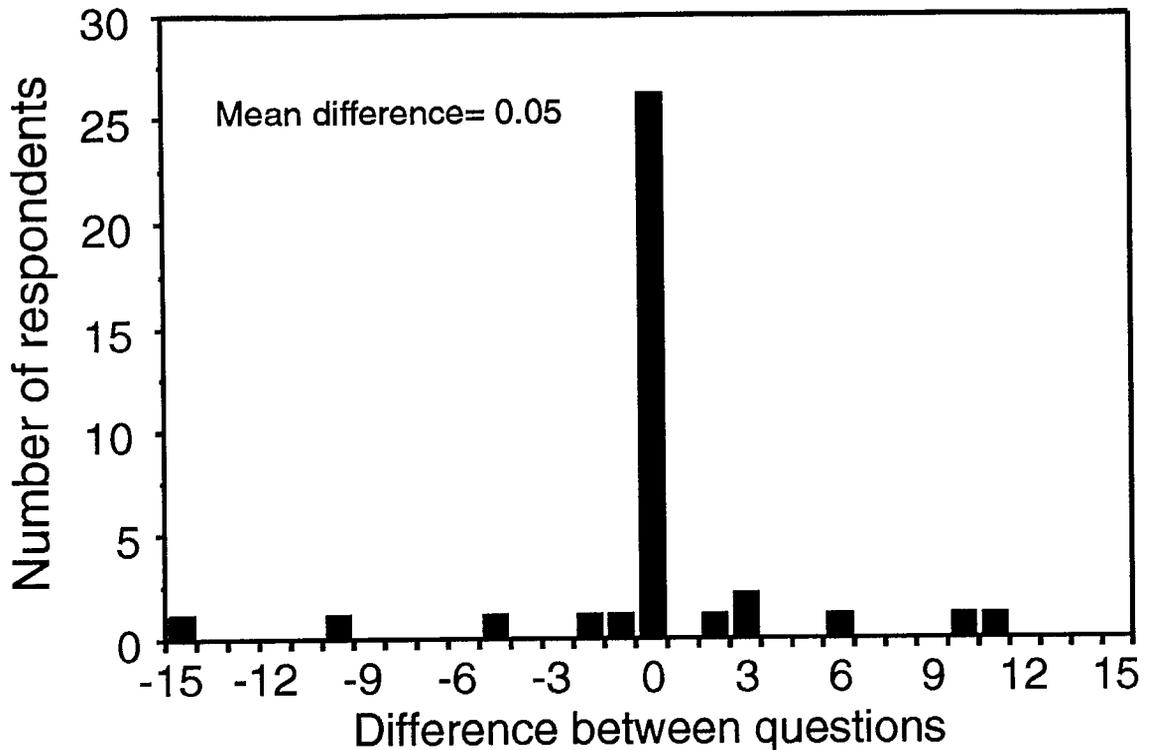


Fig. 5  
Frequency distribution of the difference within individual resident salmon licencees of the number of salmon fishing days they reported in the province-wide numeric question and the number of salmon-fishing days they reported in the river-based numeric question.

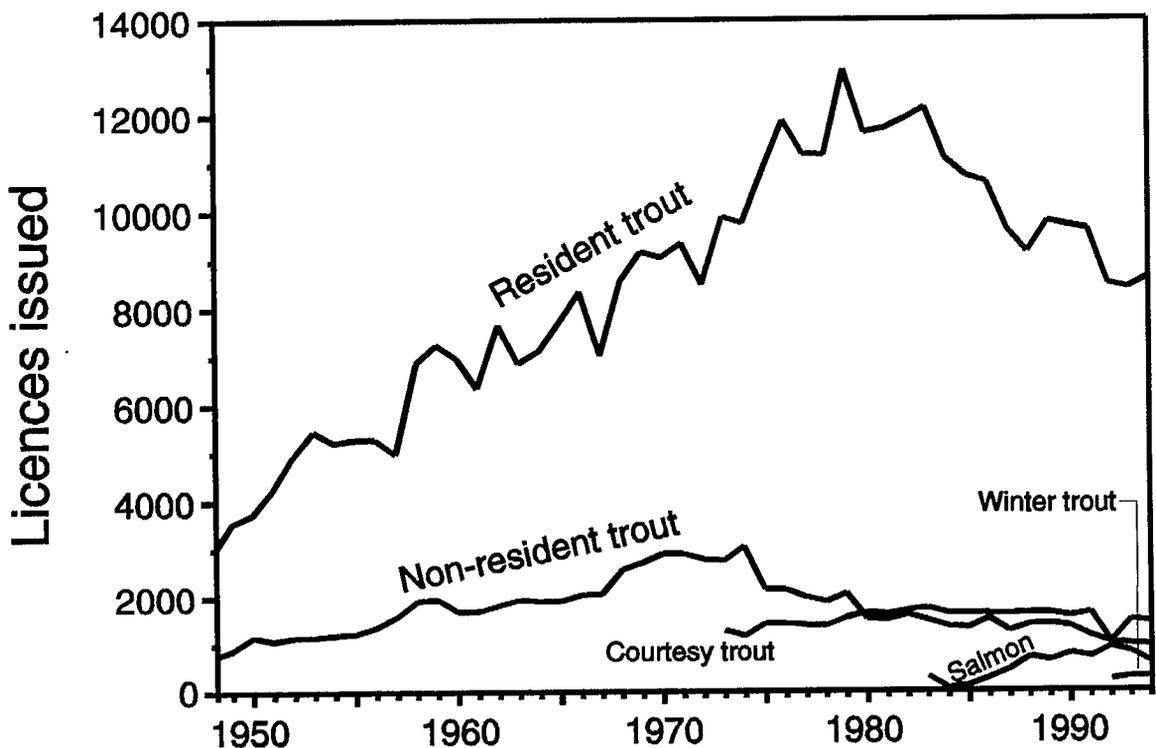


Fig. 6  
Number of angling licences issued on Prince Edward Island, 1948-1994.

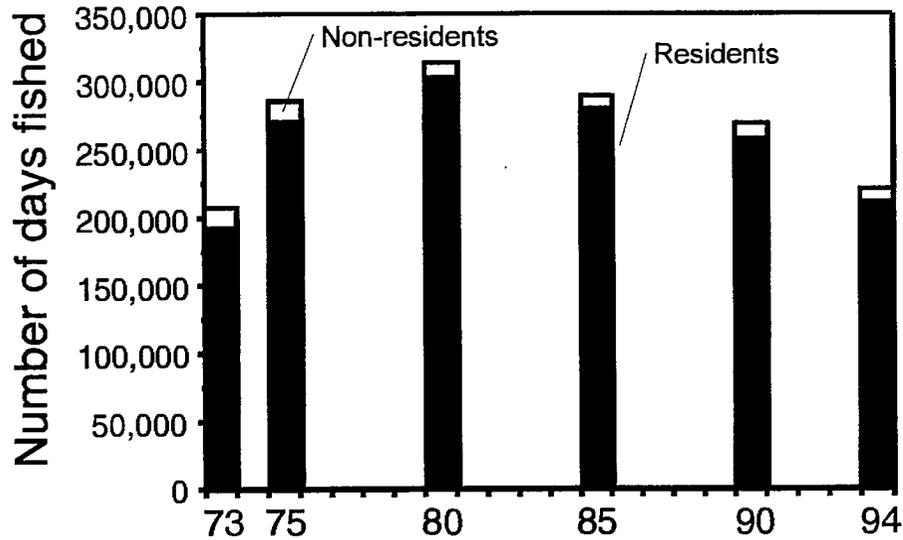


Fig. 7  
Estimated number of days fished by licenced anglers on Prince Edward Island in 1973, 1975, 1980, 1985, 1990, and 1994.

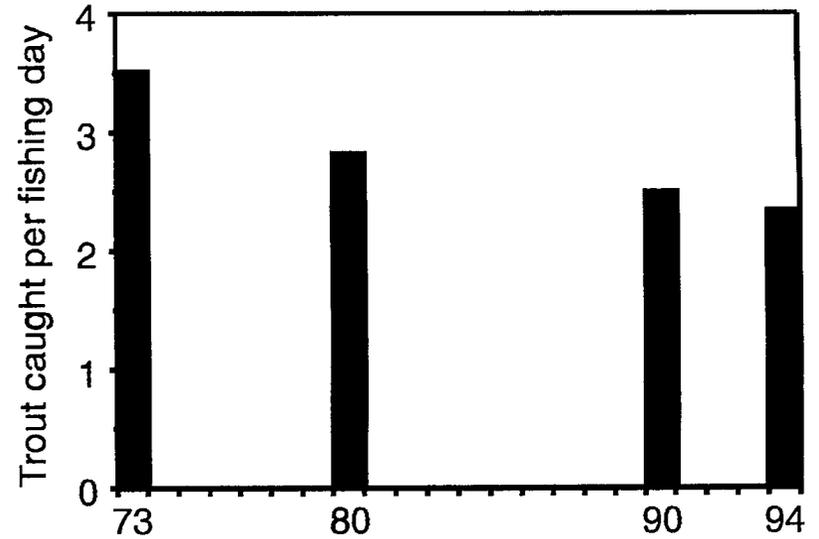


Fig. 8  
Estimated number of trout caught per fishing day by licenced anglers on Prince Edward Island in 1973, 1980, 1990, and 1994.

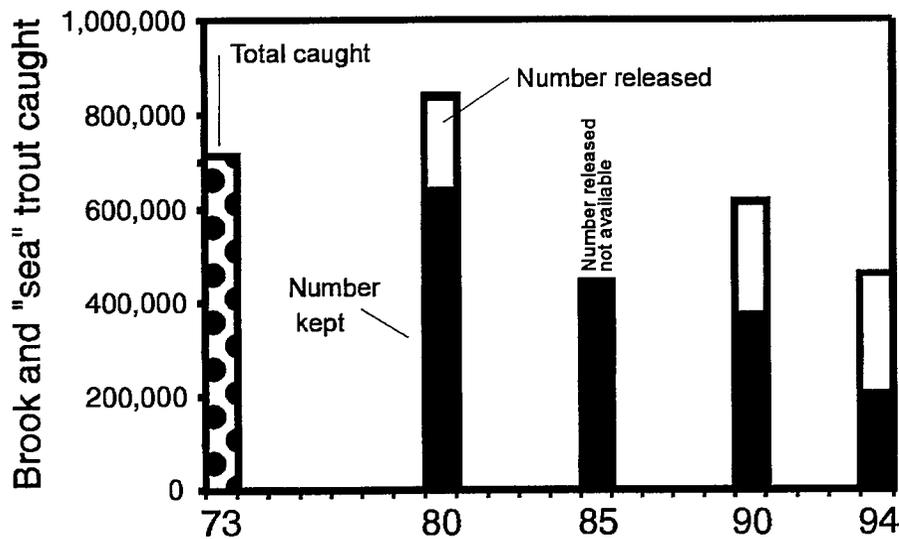


Fig. 9  
Estimated number brook and "sea" trout caught by licenced anglers on Prince Edward Island in 1973, 1980, 1985, 1990, and 1994.

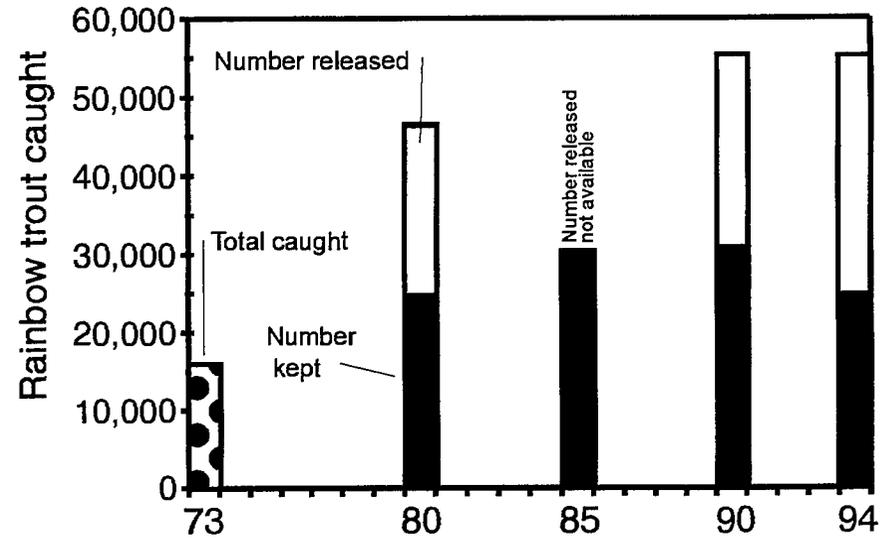


Fig. 10  
Estimated number of rainbow trout caught by licenced anglers on Prince Edward Island in 1973, 1980, 1985, 1990, and 1994.

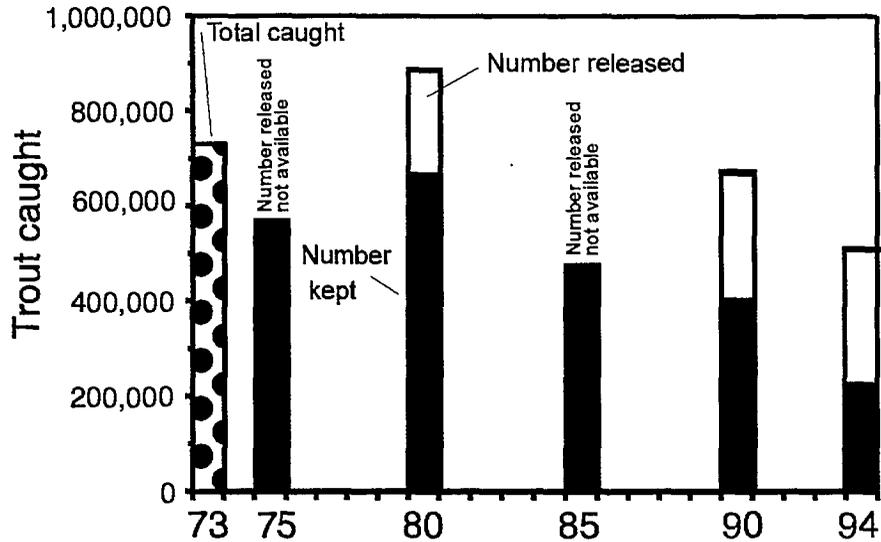


Fig. 11  
Estimated number of all trout caught by licenced anglers on Prince Edward Island in 1973, 1975, 1980, 1985, 1990, and 1995.

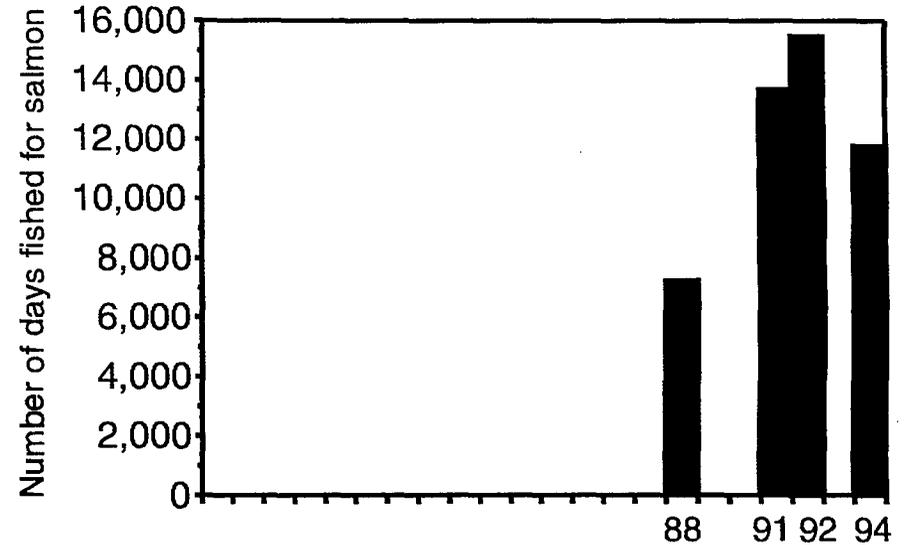


Fig. 12  
Estimated number of days fished for salmon on Prince Edward Island in 1988, 1991, 1992, and 1994.

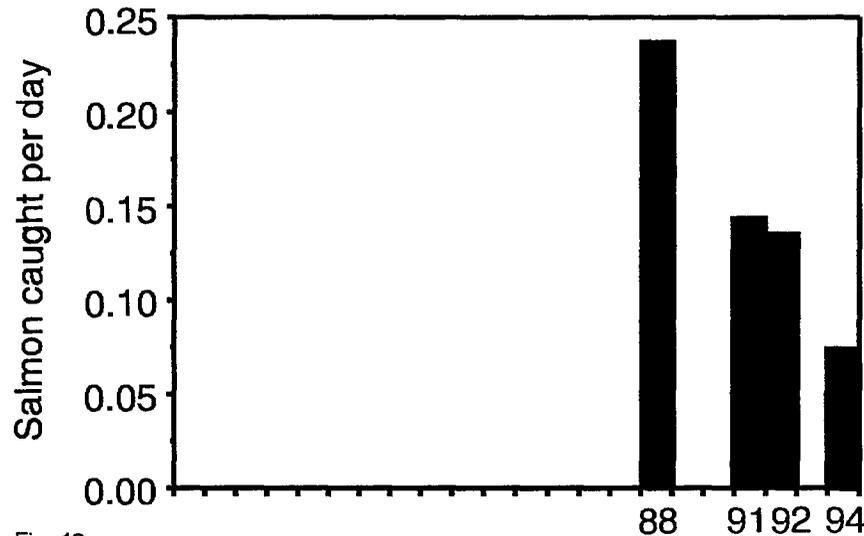


Fig. 13  
Estimated number of salmon caught per salmon fishing day on Prince Edward Island in 1988, 1991, 1992, and 1994.

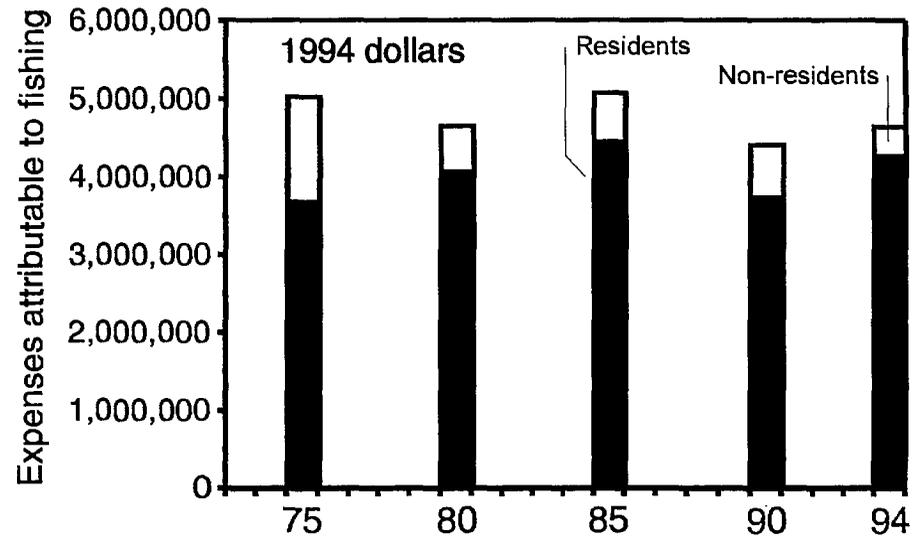


Fig. 14  
Estimated total of major purchases and direct expenditures attributable to trout and salmon angling on Prince Edward Island in 1975, 1980, 1985, 1990, and 1994. Amounts are adjusted to 1994 dollars by Statistics Canada's Consumer Price Index (Anon. 1995b).



## Survey of trout fishing on Prince Edward Island in 1994 - For residents of PEI -



Sponsored by  
The Prince Edward Island Wildlife Federation  
with support from the

Watershed Improvement/Recreational Fisheries Development Program

Since 1906, the PEI Wildlife Federation has worked to strengthen the fish and wildlife resources of Prince Edward Island. Much of this work has been in partnership with other community groups and with federal and provincial agencies. To better accomplish our task, we need to know the present state of recreational fishing in this province. In this questionnaire, we ask you, the trout angler, to tell us where you are fishing, how much you are catching, and what you think should be done to improve trout production and trout angling opportunities on Prince Edward Island.

We hope that you will take a few minutes to complete this questionnaire, and return it in the pre-paid envelope. Since it's often hard to remember actual numbers, we have given you the choice of ranges in many questions. Please check the box beside the range that fits you best. If you can recall or estimate the actual number, please give it as well. The questionnaire is confidential once completed.

1. Did you fish for trout in Prince Edward Island in 1994?

- Yes  ⇒ please continue the questionnaire  
No  ⇒ please answer questions 7-8 and 13-19 only

2. How many days did you spend fishing for trout in Prince Edward Island in 1994? (A "day" is all or any part of a day fished).

- None . . . . .       1 or 2 days . . . . .   
3 to 9 days . . . . .       10 to 29 days . . . . .   
30 to 99 days . . . . .       100 or more days

Number of days you fished for trout on PEI in 1994 .....

3. How many trout did you catch in Prince Edward Island in 1994? Include fish you caught and released.

- None . . . . .       1 or 2 trout . . . . .   
3 to 9 trout . . . . .       10 to 29 trout . . . . .   
30 to 99 trout . . . . .       100 to 299 trout   
300 to 999 trout       1000 or more trout

Number of trout you caught on PEI in 1994 .....

4. Of the trout you caught in Prince Edward Island in 1994, how many did you release back into the water?

- None . . . . .   
Some (up to one-half of what I caught) . . . . .   
Most (more than one-half of what I caught) . . . . .   
All the trout I caught . . . . .

Percentage that you released ..... %

5. How often did you use the following methods to fish trout in PEI in 1994?

	Never	Some of the time	Most of the time	Always
Bait	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Artificial fly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lure (hardware)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Did you use hooks with the barbs removed or flattened when fishing trout in PEI in 1994?

- Never . . . . .       Some of the time   
Most of the time       Always . . . . .

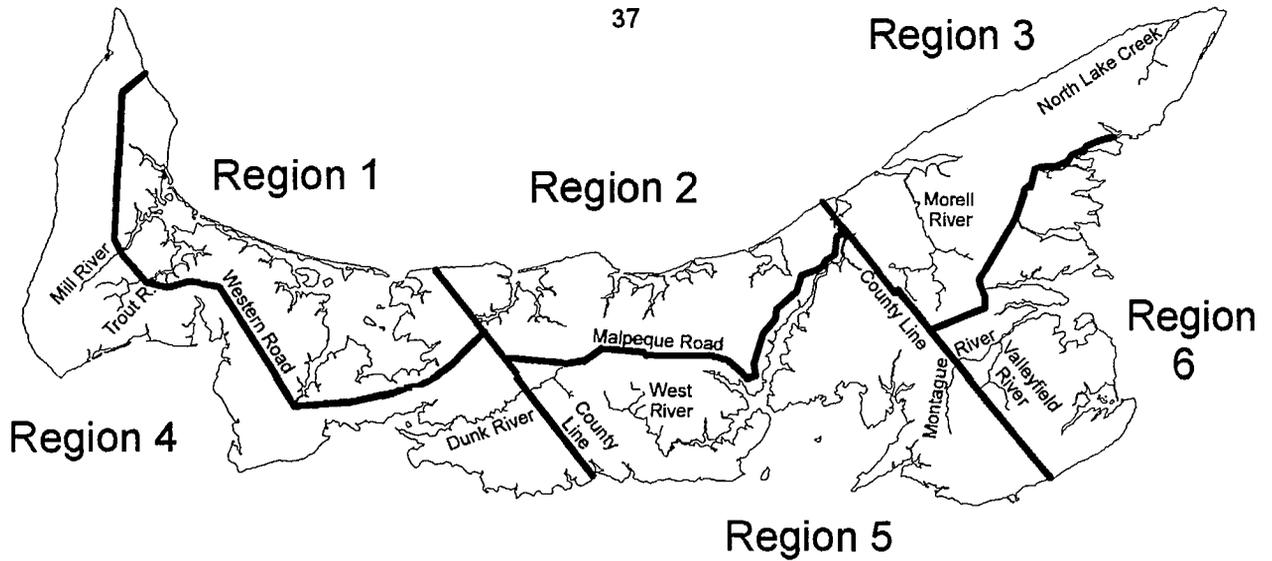
7. Were you a member of a PEI-based angling, wildlife, or conservation group in 1994?

- Yes       No

8. How much personal time did you give to volunteer work in support of Prince Edward Island's recreational fishery (e.g. habitat clean-up, constructing fishways, etc.) in 1994? (A day is all or any part of a day worked).

- None . . . . .       1 or 2 days . . . . .   
3 to 9 days . . . . .       10 to 29 days . . . . .   
30 to 99 days       100 or more days

Number of days of volunteer work .....



9. For each of the six regions of PEI shown above, please indicate the number of days you fished and the number of trout you caught and kept in 1994. In determining the number of days fished in each water type, consider only the water type where you spent the most time on a given day.

<b>Region 1</b>		In running fresh water (non-tidal streams and rivers)	In freshwater ponds, lakes, and impoundments	In tidal waters of rivers and estuaries
Number of days fished		.....	.....	.....
Brook trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....
Rainbow trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....

<b>Region 2</b>		In running fresh water (non-tidal streams and rivers)	In freshwater ponds, lakes, and impoundments	In tidal waters of rivers and estuaries
Number of days fished		.....	.....	.....
Brook trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....
Rainbow trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....

<b>Region 3</b>		In running fresh water (non-tidal streams and rivers)	In freshwater ponds, lakes, and impoundments	In tidal waters of rivers and estuaries
Number of days fished		.....	.....	.....
Brook trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....
Rainbow trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....

<b>Region 4</b>		In running fresh water (non-tidal streams and rivers)	In freshwater ponds, lakes, and impoundments	In tidal waters of rivers and estuaries
Number of days fished		.....	.....	.....
Brook trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....
Rainbow trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....

**Region 5**

		In running fresh water (non-tidal streams and rivers)	In freshwater ponds, lakes, and impoundments	In tidal waters of rivers and estuaries
Number of days fished		.....	.....	.....
Brook trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....
Rainbow trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....

**Region 6**

		In running fresh water (non-tidal streams and rivers)	In freshwater ponds, lakes, and impoundments	In tidal waters of rivers and estuaries
Number of days fished		.....	.....	.....
Brook trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....
Rainbow trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....

10. How much did you spend on PEI in 1994 on trout fishing? For each category, please estimate the percentage of your total expenditure which you consider was directly attributable to trout fishing on PEI.

Category	Amount you spent	Percent attributable to trout fishing
Fishing equipment (rods, reels, fish finders etc.)	\$.....	.....%
Boating equipment (boats, motors, trailers, etc.)	\$.....	.....%
Camping equipment (tents, camper trailers etc.)	\$.....	.....%
Special vehicles (4x4's, camper truck, ATV's etc.)	\$.....	.....%
Land, buildings (cabins, cottages, land etc.)	\$.....	.....%
Other equipment (special clothing, waders, etc.)	\$.....	.....%
Accommodation during fishing trips (motels, campsite fees etc.)	\$.....	.....%
Food during fishing trips (groceries, restaurant meals, alcoholic beverages)	\$.....	.....%
Travel costs during fishing trips (gas, vehicle repairs, rentals etc.)	\$.....	.....%
Boat operating costs (gas, repairs, insurance, etc.)	\$.....	.....%
Fishing supplies (bait, line, tackle, etc.)	\$.....	.....%
Trout licence fee	\$.....	100%

11. How would you rate your trout fishing experience in Prince Edward Island in 1994?

- Excellent  Fair   
 Very good  Poor   
 Good

Please answer Question 12 if you have fished for trout for the last five years on Prince Edward Island.

12. How would you rate trout fishing in 1994 compared to 1989?

- Improved .....   
 Remained the same .   
 Declined .....

13. Impoundments are artificial ponds formed by dams. Do you think that trout fishing on PEI would be best served by

- building more impoundments .....   
 keeping the same number of impoundments   
 reducing the number of impoundments ....

14. In the past several years many community groups have been involved in enhancing streams for trout habitat and for trout angling. Do you think this work has

- harmed trout and trout angling .....   
 had no effect on trout and trout angling .   
 helped trout and trout angling .....

15. The bag limit for trout is presently 10 trout per day. What do you think the limit should be?

Number of trout per day \_\_\_\_\_

16. The trout season presently opens on April 15 and closes on September 15. What do you think the opening and closing dates should be?

Opening date \_\_\_\_\_

Closing date \_\_\_\_\_



Questionnaire mailed to resident salmon licencees.

# Survey of trout and salmon fishing on Prince Edward Island in 1994

- For residents of PEI -

Sponsored by

The Prince Edward Island Wildlife Federation

with support from the

Watershed Improvement/Recreational Fisheries Development Program



Since 1906, the PEI Wildlife Federation has worked to strengthen the fish and wildlife resources of Prince Edward Island. Much of this work has been in partnership with other community groups and with federal and provincial agencies. To better accomplish our task, we need to know the present state of recreational fishing in this province. In this questionnaire, we ask you, the angler, to tell us where you are fishing, how much you are catching, and what you think should be done to improve trout and salmon angling opportunities on Prince Edward Island.

We hope that you will take a few minutes to complete this questionnaire, and return it in the pre-paid envelope. Since it's often hard to remember actual numbers, we have given you the choice of ranges in many questions. Please check the box beside the range that fits you best. If you can recall or estimate the actual number, please give it as well. The questionnaire is confidential once completed.

1. Did you fish for trout or salmon in Prince Edward Island in 1994?

Yes  ⇒ please continue the questionnaire

No  ⇒ please answer questions 6-7 and 14-20 only

2. How many days did you spend fishing for trout or salmon in Prince Edward Island in 1994? (A "day" is all or any part of a day fished).

	Trout	Salmon
None . . . . .	<input type="checkbox"/>	<input type="checkbox"/>
1 or 2 days . . . .	<input type="checkbox"/>	<input type="checkbox"/>
3 to 9 days . . . .	<input type="checkbox"/>	<input type="checkbox"/>
10 to 29 days . .	<input type="checkbox"/>	<input type="checkbox"/>
30 to 99 days . .	<input type="checkbox"/>	<input type="checkbox"/>
100 or more days	<input type="checkbox"/>	<input type="checkbox"/>

Number of days you spent fishing trout on PEI in 1994 . . . . .

Number of days you spent fishing salmon on PEI in 1994 . . . . .

3. Of the trout and grilse salmon you caught in Prince Edward Island in 1994, how many did you release back into the water?

	Trout	Grilse salmon
None . . . . .	<input type="checkbox"/>	<input type="checkbox"/>
Some (up to one-half of what I caught) . . . . .	<input type="checkbox"/>	<input type="checkbox"/>
Most (more than one-half of what I caught) . . . . .	<input type="checkbox"/>	<input type="checkbox"/>
All the fish I caught . . . . .	<input type="checkbox"/>	<input type="checkbox"/>

Percentage of trout that you released . . . . . %

Percentage of grilse salmon that you released. . . . . %

4. How many trout and salmon did you catch in Prince Edward Island in 1994? Include fish you caught and released.

	Trout	Salmon
None . . . . .	<input type="checkbox"/>	<input type="checkbox"/>
1 or 2 fish . . . . .	<input type="checkbox"/>	<input type="checkbox"/>
3 to 9 fish . . . . .	<input type="checkbox"/>	<input type="checkbox"/>
10 to 29 fish . . .	<input type="checkbox"/>	<input type="checkbox"/>
30 to 99 fish . . .	<input type="checkbox"/>	<input type="checkbox"/>
100 to 299 fish . .	<input type="checkbox"/>	<input type="checkbox"/>
300 to 999 fish . .	<input type="checkbox"/>	<input type="checkbox"/>
1000 or more fish	<input type="checkbox"/>	<input type="checkbox"/>

Number of trout you caught in PEI in 1994 . . . . .

Number of salmon you caught in PEI in 1994 . . . . .

5. How often did you use the following methods to fish trout in PEI in 1994?

	Never	Some of the time	Most of the time	Always
Bait	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Artificial fly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lure (hardware)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Were you a member of a PEI-based angling, wildlife, or conservation group in 1994?

Yes  No

[mailing label]

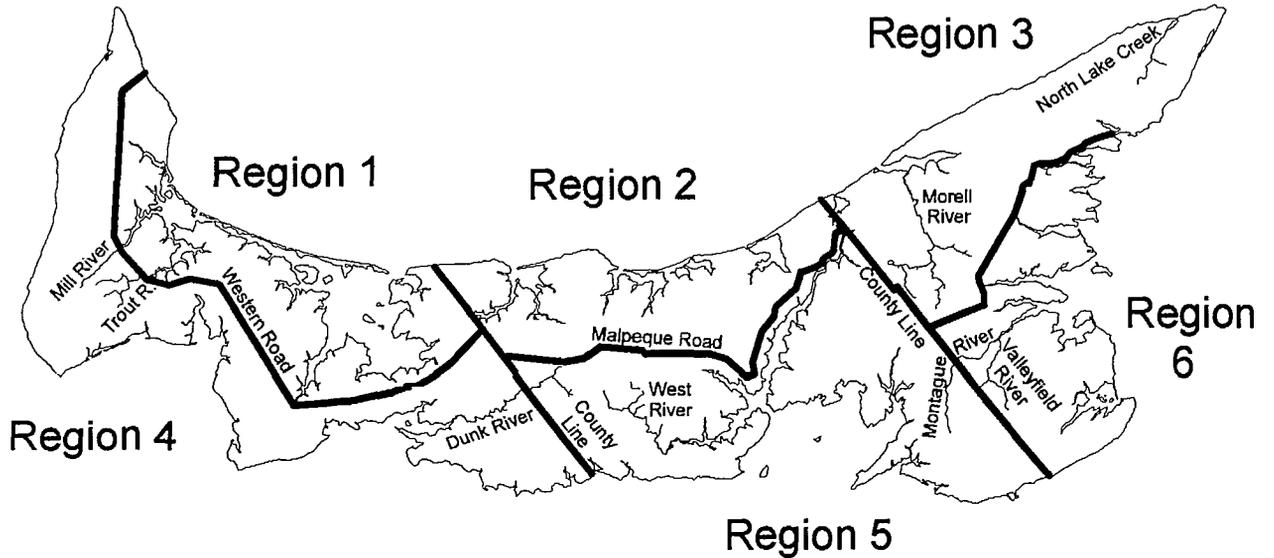
7. How much personal time did you give to volunteer work in support of Prince Edward Island's recreational fishery (e.g. habitat clean-up, constructing fishways, etc.) in 1994? (A day is all or any part of a day worked).

- None .....       1 or 2 days ....   
 3 to 9 days ..       10 to 29 days ..   
 30 to 99 days       100 or more days

Number of days of volunteer work .....

8. Did you use hooks with the barbs removed or flattened when fishing for trout and salmon in PEI in 1994?

- |                      |                          |                          |
|----------------------|--------------------------|--------------------------|
|                      | Trout                    | Salmon                   |
| Never .....          | <input type="checkbox"/> | <input type="checkbox"/> |
| Some of the time ... | <input type="checkbox"/> | <input type="checkbox"/> |
| Most of the time ... | <input type="checkbox"/> | <input type="checkbox"/> |
| Always .....         | <input type="checkbox"/> | <input type="checkbox"/> |



9. For each of the six regions of PEI shown above, please indicate the number of days you fished and the number of brook trout, rainbow trout, and Atlantic salmon you caught and kept in 1994. In determining the number of days fished in each water type consider only the water type where you spent the most time on a given day.

Region 1		In running fresh water (non-tidal streams and rivers)	In freshwater ponds, lakes, and impoundments	In tidal waters of rivers and estuaries
Number of days fished		.....	.....	.....
Brook trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....
Rainbow trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....
Large salmon	Number caught and released	.....	.....	.....
Grilse salmon	Number caught	.....	.....	.....
	Number kept	.....	.....	.....

Region 2		In running fresh water (non-tidal streams and rivers)	In freshwater ponds, lakes, and impoundments	In tidal waters of rivers and estuaries
Number of days fished		.....	.....	.....
Brook trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....
Rainbow trout	Number caught	.....	.....	.....
	Number kept	.....	.....	.....
Large salmon	Number caught and released	.....	.....	.....
Grilse salmon	Number caught	.....	.....	.....
	Number kept	.....	.....	.....



11. How much did you spend on PEI in 1994 on trout and salmon fishing? For each category, please estimate the percentage of your total expenditure which you consider was directly attributable to trout and salmon fishing on PEI.

Category	Amount you spent	Percent attributable to trout and salmon fishing
Fishing equipment (rods, reels, fish finders etc.)	\$.....	.....%
Boating equipment (boats, motors, trailers, etc.)	\$.....	.....%
Camping equipment (tents, camper trailers etc.)	\$.....	.....%
Special vehicles (4x4's, camper truck, ATV's etc.)	\$.....	.....%
Land, buildings (cabins, cottages, land etc.)	\$.....	.....%
Other equipment (special clothing, waders, etc.)	\$.....	.....%
Accommodation during fishing trips (motels, campsite fees etc.)	\$.....	.....%
Food during fishing trips (groceries, restaurant meals, alcoholic beverages)	\$.....	.....%
Travel costs during fishing trips (gas, vehicle repairs, rentals etc.)	\$.....	.....%
Boat operating costs (gas, repairs, insurance, etc.)	\$.....	.....%
Fishing supplies (bait, line, tackle, etc.)	\$.....	.....%
Trout and salmon licence fees	\$.....	100%

12. How would you rate your recreational fishing experience in Prince Edward Island in 1994?

	Fishing for trout	Fishing for salmon
Excellent . . .	<input type="checkbox"/>	<input type="checkbox"/>
Very good . .	<input type="checkbox"/>	<input type="checkbox"/>
Good . . . . .	<input type="checkbox"/>	<input type="checkbox"/>
Fair . . . . .	<input type="checkbox"/>	<input type="checkbox"/>
Poor . . . . .	<input type="checkbox"/>	<input type="checkbox"/>

Please answer Question 13 if you have fished for trout or salmon for the last five years on Prince Edward Island.

13. How would you rate fishing in 1994 compared to 1989?

	Fishing for trout	Fishing for salmon
Improved . . . . .	<input type="checkbox"/>	<input type="checkbox"/>
Remained the same	<input type="checkbox"/>	<input type="checkbox"/>
Declined . . . . .	<input type="checkbox"/>	<input type="checkbox"/>

14. The bag limit for trout is presently 10 trout per day. What do you think the limit should be?

Number of trout per day \_\_\_\_\_

15. The trout season presently opens on April 15 and closes on September 15. What do you think the opening and closing dates should be?

Opening date \_\_\_\_\_

Closing date \_\_\_\_\_

16. There are presently no size limits for trout on PEI. What is your view on size limits?

There should be no size limits for trout. . . . .

There should be a maximum size limit for trout . . . , and anglers should be required to release all fish that are over \_\_\_\_\_ inches long.

There should be a minimum size limit for trout . . . , and anglers should be required to release all fish that are under \_\_\_\_\_ inches long.

There should be a limit on the number of large trout kept per day . . . . .  and anglers should be allowed to keep only \_\_\_\_\_ large fish, over \_\_\_\_\_ inches long, per day.

17. Impoundments are artificial ponds formed by dams. Do you think that trout and salmon fishing on PEI would be best served by

building more impoundments . . . . .

keeping the same number of impoundments

reducing the number of impoundments . . . .

18. In the past several years many community groups have been involved in enhancing streams for trout and salmon. Do you think this work has

harmed fish populations and angling . . . . .

had no effect on on fish populations and angling. .

helped fish populations and angling . . . . .

greatly helped fish populations and angling . . . .



Appendix 3

Questions in the non-resident questionnaires which did not appear in the resident questionnaires.

11. In what state or province other than PEI do you do most of your recreational fishing?

\_\_\_\_\_

12. In comparison with the province or state where you do most of your recreational fishing, the fishing experience on PEI in 1994 was

- |                   |                          |        |                          |
|-------------------|--------------------------|--------|--------------------------|
| Much better . . . | <input type="checkbox"/> | Better | <input type="checkbox"/> |
| About the same    | <input type="checkbox"/> | Poorer | <input type="checkbox"/> |
| Much poorer . . . | <input type="checkbox"/> |        |                          |

13 How important were trout fishing opportunities in your choice of PEI as a place to visit?

- |  |                          |
|--|--------------------------|
| Trout fishing was the main reason to visit PEI           | <input type="checkbox"/> |
| Trout fishing was a secondary reason to visit PEI .      | <input type="checkbox"/> |
| Trout fishing had no influence on my choice to visit PEI | <input type="checkbox"/> |

Appendix 4

Note accompanying the second mail-out of angler questionnaires.

**The Prince Edward Island Wildlife Federation**



Dear Angler:

In early February 1995, the PEI Wildlife Federation sent questionnaires to over 1000 holders of PEI sport fishing licences. We have received valuable information and useful suggestions from many anglers, but we have not yet received your response. Your views are important to us, and we'd be grateful if you could take a few minutes to complete the enclosed questionnaire.

You may be assured that the questionnaire you submit will be treated as confidential; the inside mailing label is used only to check off respondents who do not need reminder letters.

Yours in conservation,

Steve Cheverie, President

