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Status of Atlantic Salmon (*Salmo salar* L.) Stocks of Insular Newfoundland (SFAs 3-14A), 2004

État des stocks de saumon atlantique (*Salmo salar* L.) à l'île de Terre-Neuve (ZPS 3-14A) en 2004

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Abstract

The commercial Atlantic salmon fishery moratorium, implemented in insular Newfoundland in 1992, entered its 13th year in 2004. Returns of small salmon in 2004 improved over 2003 for most monitored rivers. Returns of small salmon also increased relative to the moratorium means in most cases, but this was not as pronounced for large salmon. The proportion of large salmon in total returns in 2004 decreased from 2003 for rivers on the northeast and east coasts and in Bay St. George, while the reverse was true for southern rivers (particularly Rocky River) and those on the northwest coast. The same pattern held more or less in relation to the moratorium means. Conservation egg requirements were met or exceeded in 15 out of 24 rivers or sections of rivers in 2004. Most rivers (73%) in insular Newfoundland were closed to angling for varying periods in July and/or August in 2004, due to low water levels and high water temperatures. Sea survival in 2004 increased (Conne River; Northeast Brook, Trepassey; Campbellton River) or remained similar (Western Arm Brook; Rocky River) relative to 2003; increases were most pronounced for the two southern systems, Conne River and Northeast Brook, Trepassey. Smolt production in 2004 increased over 2003 in four out of five rivers, the exception being Campbellton River. When smolt production increases, returns of small salmon are expected to be higher in the following year, unless correspondingly there are decreases in marine survival that offset increased numbers of smolts. The converse holds when there are decreases in smolt production.

Résumé

Entré en vigueur à l'île de Terre-Neuve en 1992, le moratoire sur la pêche commerciale du saumon atlantique en était donc à sa treizième année en 2004. Les remontes de petits saumons ont été supérieures en 2004 à celles de 2003 dans la plupart des cours d'eau surveillés. Elles ont aussi augmenté par rapport aux moyennes du moratoire dans la plupart des cas, mais la hausse n'était pas aussi prononcée que pour les gros saumons. La proportion de gros saumons dans l'ensemble des remontes de 2004 a diminué par rapport à celle de 2003 pour les cours d'eau des côtes nord-est et est et dans la baie St. George, tandis que l'inverse était vrai pour les cours d'eau de la partie sud (surtout la rivière Rocky) et de la côte nord-ouest. La tendance est plus ou moins la même par rapport à la moyenne du moraoitre. Les objectifs de ponte établis pour satisfaire aux besoins de la conservation ont été atteints ou dépassés dans 15 des 24 cours d'eau ou sections de cours d'eau en 2004. La pêche à la ligne a été interdite dans la plupart des cours d'eau (73 %) de l'île de Terre-Neuve à divers moments, en juillet et en août 2004, en raison des faibles niveaux d'eau et des températures élevées de l'eau. La survie en mer en 2004 a augmenté (rivière Conne; ruisseau Northeast, Trepassey; rivière Campbellton) ou est demeurée la même (ruisseau Western Arm; rivière Rocky) par rapport à 2003; les hausses les plus prononcées étaient celles des deux réseaux du sud, la rivière Conne et le ruisseau Northeast, Trepassey. La production de saumoneaux en 2004 était en hausse comparativement à 2003 dans quatre des cinq cours d'eau, la rivière Campbellton faisant exception. Lorsque la production de saumoneaux augmente, les remontes de petits saumons devraient être plus élevées l'année suivante, à moins qu'une baisse correspondante de la survie en mer ne vienne la neutraliser. L'inverse est aussi vrai quand il y a une baisse de la production de saumoneaux.

Introduction

This paper presents the general status of Atlantic salmon stocks in Salmon Fishing Areas (SFAs) 3-14A of the Newfoundland Region (Fig. 1) in 2004. Catch and effort data from the recreational fishery, counts and total returns at fishways and counting fences, and egg depositions in relation to conservation requirements are examined in relation to historical data and management measures in effect in 2004.

Management measures, past and present

The moratorium on the commercial Atlantic salmon fishery in insular Newfoundland continued in 2004. The implementation of the moratorium in 1992 was accompanied by a commercial license retirement program and followed a major management plan introduced in 1984 (O'Connell *et al.* 1992a; May 1993; Mullins and Caines MS 1994), elements of which were continued into the quota years of 1990 and 1991 (O'Connell *et al.* MS 1992b) and the moratorium years (1992-2002). These regulations continue a long-standing history of management programs designed to prevent stock declines and to allow populations to rebuild (May 1993).

A quota on the number of small salmon (< 63 cm in fork length) that could be retained in the Atlantic salmon recreational fishery was introduced in each SFA in 1992 and 1993. The quota was assigned for each SFA as a whole as opposed to individual river quotas. Only hook-and-release fishing was permitted after the quota was caught in each SFA. Quotas were eliminated in 1994. The seasonal bag limit for the retention of small salmon was lowered from eight to six fish in 1994, three to be caught prior to July 31 and three after that date. Hook-and-release fishing only was permitted after the bag limit of three was reached in each time period. These measures remained in effect in 1995-1997. Returns of small salmon to many rivers in insular Newfoundland in 1997 were substantially lower than expected (Dempson *et al.* MS 1998; O'Connell *et al.* MS 1998). As a result of this and uncertainties regarding levels of future returns, the management plan for 1998 was much more conservative than for previous years. The seasonal bag limit for the retention of small salmon in insular Newfoundland was reduced to one, pending the results of an in-season review. As a result of the findings of the in-season review, anglers were allowed to additionally retain three small salmon from July 4 until the end of the angling season. Beginning on July 8, 1998 only the use of barbless hooks was permitted. As in previous years, the retention of large salmon (≥ 63 cm in fork length) was not permitted in insular Newfoundland in 2002.

A three-year management plan was implemented in 1999, a significant component of which was the introduction of a River Classification System for insular Newfoundland, used to develop retention levels based on the health of individual stocks, without jeopardising conservation goals. This was a major departure from previous years when stocks were managed on a more regional or SFA basis. Details of the three-year plan and a description of the River Classification System are provided in Anon. (1999). A five-year management plan was introduced in 2002 (Anon. 2002), wherein the River Classification System, though variously modified, was retained.

Special management measures were in effect for several rivers in 2004 and a number of rivers were closed for the season, details of which are provided in Anon. (2004). More details on openings and closures throughout the season on a river-specific basis, including times when rivers were closed due to high water temperatures and low water levels, are presented in Table 1. During the 2004 angling season, 116 out of 158 scheduled rivers (or tributaries of major rivers) in insular Newfoundland (73%) were closed for varying periods of time for environmental reasons. Most affected areas were SFAs 7, 8, 9, and 14A where 30-43% of the potential fishing days available were closed. In total for all SFAs, 20% of all fishing days were closed, the second highest since 1987 when 37% were unavailable. This is in contrast to 2003 when 93 rivers were closed with 16% of angling days affected.

As was the case for the period 1995-2003, there were fall hook-and-release fisheries (September 8-October 7) in Gander River (SFA 4) and in Humber River (SFA 13) in 2004. A fall fishery was also introduced for Exploits River (SFA 4) in 2002, which continued in 2004 with the same opening and closure dates as for Gander and Humber rivers.

For the five-year period immediately preceding the commercial salmon fishery moratorium, the average number of recreational fishery licenses sold in Newfoundland and Labrador was 24493. Maximum license sales prior to the moratorium were recorded in 1988 (26445). By comparison, sales during the moratorium years were as follows:

Year	**Licenses sold**
1992	25718
1993	26508
1994	22596
1995	21489
1996	25553
1997	21403
1998	18490
1999	17927
2000	17244
2001	17876
2002	15937
2003	17146
2004 (preliminary)	15200

There has been a significant overall decline ($P = 0.0000$) in the numbers of licenses sold since 1992 ($y = 1E+303x^{-90.533}$; $r^2 = 0.868$).

Methods

Fishway, counting fence, swim-through survey (five rivers in Bay St. George), and egg deposition data were added to that presented in O'Connell *et al.* (MS 2003). Recreational fishery data are provided for the period 1994-2003 and were derived from the License Stub Return System. The information for 2004 is preliminary at this stage. Recreational fishing effort was presented as rod days, defined as any day or part of a day on which an angler fishes.

Recreational fishery catch and effort data in 2004 were compared to means for 1994-2003. Counts, total returns (which typically are counts at counting facilities or from swim-through surveys plus angling removals below counting facilities or before swim-through surveys plus an adjustment for hook-and-release mortality), and percent of conservation egg requirement achieved in 2004 were compared to the pre-salmon moratorium mean 1984-1991. This mean involves the years 1984-1989 in which there were major management changes in the commercial fishery in the Newfoundland Region (O'Connell *et al.* 1992a) and includes 1990 and 1991 when quotas were in effect in each SFA in insular Newfoundland (O'Connell *et al.* MS 1992b). The mix of management measures in effect during 1984-1989 on the one hand and the imposition of commercial quotas in 1990 and 1991 on the other, should be kept in mind when making evaluations involving the pre-moratorium mean. Two means were used for the moratorium years, 1992-1996 and 1997-1992. The first corresponds to the period when fish otherwise caught in the commercial fishery escaped to rivers thereby increasing spawning escapements in many rivers, while the second is the period during which the progeny of the increased spawners were to return (see also below).

In addition to examining trends of individual stocks from counts at fishways or fish counting fences, salmon abundance can also be tracked in a collective manner where information on salmon returns to all rivers is combined to derive a composite index of abundance. Composite indices can be derived for specific regions as well as an index for insular Newfoundland as a whole. This approach complements individual assessments by providing an overall perspective of changes in salmon abundance. Details of the methodology used are summarized in Dempson et al. (2004). Index values for the pre-moratorium period 1984 to 1991 were adjusted to account for marine exploitation. In all cases, exploitation rates used were the average of the median values obtained from nine rivers as described in Dempson et al. (2001) and were 45.3% for small salmon and 74.2% for large salmon

References for river-specific methodologies used for the calculation of total river returns of small and large salmon and percent of conservation egg requirement achieved can be found in DFO (2001, 2002a, 2002b, 2003, 2004). **Since recreational fishery data were not finalized for 2004, total returns and percent of conservation egg requirement achieved values are still preliminary where appropriate.**

Means and 95% confidence intervals for ratios were calculated according to Cochran (1977).

Results and Discussion

Smolt-to-adult (small salmon) survival

Smolt-to-adult survival (repeat spawners included) for Campbellton River in 2004 (adult year) increased over 2003 and was the second highest on record (Table 2). Survival for Northeast Brook, Trepassey (SFA 9) increased relative to 2003, while that of Rocky River (also in SFA 9) showed a slight decline. Conne River (SFA 11) showed a marked improvement over the record low of 2003. There were no smolt counts for Highlands River since 2001 and hence survival cannot be determined. Survival for Western Arm Brook (SFA 14A) in 2004 was similar to that of 2003.

Fig. 2 shows graphically trends in sea survival for the rivers mentioned above. Survival adjusted for marine exploitation (from Dempson *et al*. MS 1998) is also shown for Conne River, Northeast Brook, Trepassey, and Western Arm Brook. During the moratorium years, estimates of sea survival from smolts to adult small salmon are assumed to represent natural survival rates. Pre-moratorium adjusted (for commercial harvest) survival rates approaching 15% were achieved in Conne River and Northeast Brook, Trepassey. Ocean survival for both of these stocks fell throughout the late 1980s and early 1990s. Despite major changes to fisheries and corresponding reductions in marine exploitation, sea survival rates for Conne River and Northeast Brook, Trepassey remain low, as highlighted by the adjusted sea survival rates. The same statement holds for Western Arm Brook, if several years prior to 1985 (the earliest year shown in Fig. 2) presented in Table 2 were adjusted for marine exploitation.

Smolt production

Smolt production in 2004 increased over 2003 at Northeast Brook, Trepassey (48%), Rocky River (194%), Conne River (11%), and Western Arm Brook (43%) but decreased slightly at Campbellton River (7%).

Recreational fishery, counts, and total returns

Recreational catches of small and large salmon for insular Newfoundland (SFAs 3-14A combined) are presented in Appendix 1a. Data for insular Newfoundland were also rolled into four subdivisions, Northern Peninsula East and Eastern (SFAs 3-8), South (SFAs 9-11), Southwest (SFAs 12-13), and Northern Peninsula West (SFA 14A) and are shown in Appendix 1b-e. Data for each individual SFA are shown in Appendix 1f-q. Calculation of catch per unit of effort (CPUE) is in terms of small and large retained and released fish combined. Counts of small and large salmon and associated pre-moratorium and moratorium means are presented in Tables 3 and 4.

Entire Insular Newfoundland (SFAs 3-14A)

Recreational fishery

The total catch of small salmon (retained + released fish) and retained catch of small salmon in 2004 were the lowest of the time series (Fig. 3). The number of large salmon released decreased from 2003 and remained well below the 1994-2003 mean. Effort expenditure was also the lowest on record and below average. Catch per unit of effort (CPUE) decreased from 2003 and was slightly below average.

Indices

Fig. 4 illustrates the collective index of small and large salmon for all of insular Newfoundland. When adjusted for marine exploitation, the highest abundances of small salmon occurred during pre-moratorium years (1984-1991). Since then, overall abundance has declined and only in recent years has it begun to approach levels estimated prior to the commercial fishery closure. Average index values for the period 1997-2003 were somewhat lower than for 1992-1996. Thus the paradox is that while numbers of small salmon returning to some rivers have improved, the total stock size is still less than that estimated prior to the moratorium. Abundance of Newfoundland large salmon also declined substantially reaching its lowest values in the early 1990s. Since then, the abundance of large salmon has improved such that total stock size is somewhat similar to that which occurred prior to the closure of the commercial salmon fishery.

Northern Peninsula East and Eastern (SFAs 3-8)

Recreational fishery

Total and retained catches of small salmon in 2004 decreased from 2003 and were similar to 2002 and were below the 1994-2003 means (Fig. 5). The number of large salmon released increased over the low of 2003 but remained below average. Effort expenditure was the lowest recorded. CPUE decreased from 2003 and was slightly below average.

Total returns – northeast coast

SFA 3: The counting fence in Northwest Branch tributary of Main River (Sop's Arm) has not operated since 1999.

SFA 4: Information on total returns of small (Table 5 and Fig. 6) and large (Table 6 and Fig. 5) salmon is available for Exploits River (Bishop's Falls), Gander River, and Campbellton River. Returns of small salmon to Exploits River in 2004 decreased slightly from 2003 but remained above all means (Table 7). Returns of large salmon decreased from 2003 and the 1997-2003 mean, increased over the 1984-1991 mean, and were similar to the 1992-1996 mean (Table 8). Returns of small salmon to Campbellton River increased over 2003 and the 1997-2003 mean but decreased from the mean for 1992-1996. Returns

of large salmon increased slightly over 2003 but remained below the means. Returns of small salmon to Gander River increased over 2003 and the 1984-1991 and 1997-2003 means but decreased relative to the 1992-1996 mean. Returns of large salmon increased over 2003 and all means (only slightly in the case of the 1997-2003 mean).

The proportion of large salmon in total returns to Exploits River in 2004 increased relative the 1984-1991 mean but decreased from 2003 and the remaining means (Table 9 and Fig. 7). The proportion for Campbellton River decreased from 2003 (slightly) and the means. For Gander River, the proportion increased over 2003 (slightly) and the 1984-1991 and 1992-1996 means but decreased from the 1997-2003 mean.

Total returns – east coast

SFA 5: Information on total returns of small (Table 5 and Fig. 8) and large (Table 6 and Fig. 8) salmon is available for Middle Brook, the lower Terra Nova River, and Northwest River, Terra Nova National Park. Returns of small (Table 7) and large (Table 8) salmon to Middle Brook in 2004 increased over 2003 and the 1984-1991 means but decreased from the 1992-1996 and 1997-2003 means. Returns of small salmon to Terra Nova River increased over 2003 and all means while large salmon increased over 2003 and the 1984-1991 and 1997-2003 means but decreased slightly from the 1992-1996 mean. Returns of small salmon to Northwest River increased over 2003 and the means; large salmon returns were similar to 2003 and above the means.

The proportion of large salmon in total returns to Middle Brook in 2004 (Table 9, Fig. 9) decreased slightly from 2003; the proportion was below the mean for 1984-1991 and similar to the 1992-1996 mean but below that of 1997-2003. The same pattern applied to Terra Nova with the exception that the proportion was also below the 1992-1996 mean. The proportion for Northwest River decreased from 2003 and the means.

Indices – northeast and east coasts

The abundance index of small salmon returns for all rivers combined in SFAs 3 to 8 illustrate an improvement in runs during the past two years (Fig. 10). However, over the long term, salmon abundance has declined with the highest abundances, adjusted for marine exploitation, occurring during the mid-1980s. Average total stock abundance decreased from pre-moratorium levels during the initial five years of the salmon fishery moratorium (1992-1996) and again during the period 1997-2003. Abundance of large salmon continued to decline from the mid-1980s to mid-1990s before increasing substantially by 1996. High abundances persisted for several years before falling to relatively lower values in 2000-2002 with some improvement during the past two years, but at levels that are still below those attained from 1996 to 1999.

South (SFAs 9-11)

Recreational fishery

Total and retained catches of small salmon and the number of large salmon released in 2004 increased somewhat over 2003 but all remained below the means (Fig. 11). Effort expenditure was the lowest recorded while CPUE was the highest of the time series.

Total returns

SFA 9: Information on total returns of small (Table 5 and Fig. 12) and large (Table 6 and Fig. 12) salmon is available for Northeast Brook, Trepassey and Rocky River. Total returns of small salmon to Northeast Brook in 2004 decreased from 2003 and the means (Table 7). Returns of large salmon were similar to 2003 and the mean for 1997-2002, but decreased from the means for 1984-1991 and 1992-1996 (Table 8). Returns of small salmon to Rocky River decreased from 2003 and the means while the opposite was true for large salmon to a large extent.

The proportion of large salmon in total returns to Northeast Brook in 2004 increased over 2003 and the 1997-2003 mean but remained below the 1984-1991 and 1992-1996 means (Table 9 and Fig. 13). The proportion for Rocky River increased markedly over 2003 and the means.

SFA 11: Information on total returns of small (Table 5 and Fig. 12) and large (Table 6 and Fig. 12) salmon is available for Conne River and Little River. Returns of small salmon to Little River in 2004 increased over 2003 and the means. Returns of large salmon increased over 2003 and the 1984-1991 mean but decreased from the 1992-1996 and 1997-2003 means. Small salmon showed an increase over 2003 and the 1992-1996 and 1997-2003 means but decreased relative to the 1984-1991 mean for Conne River. A similar pattern applied to large salmon except for the 1997-2003 mean (slight decline

The proportions of large salmon in total returns to Little River in 2004 increased over 2003 but remained below the means (Table 9 and Fig. 13). A similar pattern applied to Conne River with the exception there was only a minor change from the 1992-1996 mean.

Indices

The index of small salmon returns for all south coast rivers combined clearly illustrates that salmon abundance fell dramatically during the commercial fishery moratorium and has remained at relatively low levels with little sign of improvement (Fig. 14). A similar situation applies to large salmon, although there was some increase from 1998-2000 before declining again.

Southwest (SFAs 12-13)

Recreational fishery

Total catch of small salmon in 2004 decreased from 2003 and the mean while the number of small salmon retained was average (Fig. 15). The number of large salmon released decreased from 2003 and the mean. Effort expenditure increased over 2002 and was about average while CPUE on the other hand was one of the lowest on record.

Total returns

SFA 13: Information on total returns of small (Table 5 and Fig. 16) and large (Table 6 and Fig. 16) salmon is available for Highlands River, Crabbes River, Middle Barachois River, Robinsons River, Fischells River, Flat Bay Brook, and Harry's River. All rivers had increases in returns of small salmon in 2004 relative to 2003 and the means (Table 7). Returns of large salmon to Highlands River and Harry's River increased over 2003 and the means (Table 8). Returns to the remaining rivers were more or less similar to 2003, and while Crabbes River and Fischells River increased relative to the mean, Middle Barachois River, Robinsons River, and Flat Bay Brook decreased (Table 8).

Proportions of large salmon in total returns in 2004 decreased (to varying degrees) from 2003 and the means for all rivers except Harry's River which was similar to 2003 and above the means (Table 9 and Fig. 17).

Indices

Insufficient data exists to derive a composite index of abundance for the 1984-1991 pre-moratorium period. However, with respect to the 1992 to 2001 period, abundance has fluctuated but has also been followed by a substantive increase in recent years to the highest values recorded (Fig. 18). In contrast with the abundance of small salmon, abundance of large salmon has shown a consistent increase over time with the highest values recorded occurring during 2003 and 2004.

Northern Peninsula West (SFA 14A)

Recreational fishery

Total and retained catches of small salmon and the number of large salmon released in 2004 decreased from 2003 and the means (Fig. 19). Effort expenditure was the second lowest on record while CPUE increased over 2003 and was average.

Total returns

Information on total returns of small (Table 5 and Fig. 20) and large (Table 6 and Fig. 20) salmon is available for Lomond River, Torrent River, and Western Arm Brook. Returns of small salmon to Lomond River in 2004 were similar to 2003, above the 1984-

1991 mean, and below the 1992-1996 and 1997-2003 means (Table 7). Returns of large salmon increased over 2003 and the means (Table 8). Returns of small and large salmon to Torrent River increased over 2003 and the means, slightly in some cases. The number of small salmon for Western Arm Brook decreased from 2003, increased over the 1984-1991 and 1992-1996 means, and was similar to the 1997-2002 mean. Returns of large salmon increased over 2003 and the means.

The proportion of large salmon in total returns to Lomond River and Western Arm Brook in 2004 increased over 2003 and the means (Table 9 and Fig. 21). The same was true for Torrent River except there was a decline relative to the 1997-2003 mean.

Indices

When the abundance of small salmon returning to northern peninsula west rivers (Lomond River, Torrent River and Western Arm Brook) are examined together, there has been no appreciable change over time when data for the 1984-1991 pre-moratorium period are adjusted for marine exploitation (Fig. 22). Indeed, while there have been appreciable improvements in numbers of salmon returning to these rivers, total stock size when adjusted for past marine exploitation, shows that abundance has remained flat with no increased production resulting from the higher spawning escapements that have occurred. In contrast with small salmon, abundance of large salmon has shown an increase over time but with considerable annual variability both among and within rivers.

Net marks

The incidence (%) of net-marked fish has been determined at counting facilities for a number of rivers throughout insular Newfoundland since 1994. The results for small and large salmon combined are presented below:

River	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Gander River	15.9	8.9	12.2	15.9	2.9	5.2	3.9	3.7	3.0	4.6	3.1
Campbellton River	6.2	5.0	4.3	4.3	5.8	4.1	11.4	4.9	3.7	7.5	3.7
Middle Brook				15.8	11.6	4.5	7.7	3.0	7.0	4.2	3.2
Terra Nova River				2.9	1.2	3.1		4.8	4.1	3.0	1.3
Northeast R., Plac.							7.5				
Conne River	18.6	7.1	6.2	7.2	3.7	4.0	3.3	8.0	2.6	6.1	3.9
Harry's River			0.6	9.3	1.8	0.1	2.6				
Humber River		1.4	2.6	7.6	4.1	2.4					

The incidence of marked fish in 2004 decreased from 2003 for Campbellton River. It should be noted that, unlike the other rivers, marks recorded for Campbellton River include all marks (e.g. resulting from encounters with predators, etc.) and not just net marks. Fish were counted with a video system in this river and it is not possible to

accurately distinguish the various markings. It was possible to determine the incidence of net marks for the remaining rivers. After 1999, values for Gander River were determined at the fishway in Salmon Brook tributary and at the counting fence in other years; the incidence for 2004 decreased from 2003. For Middle Brook and Terra Nova River, there was a decrease relative to 2003, being most pronounced for Terra Nova River. Conne River showed a decrease from 2003. Net marks were likely the result of encounters with both legally set gear for other species and illegal gear in the marine environment and with illegal gear in freshwater. It is not possible to estimate the extent of such removals, therefore, total returns considered in the context of being equivalent to total production during the moratorium, have to be regarded as minimum values.

Percent of conservation egg requirement achieved

Northern Peninsula East and Eastern (SFAs 3-8)

Northeast coast, SFA 4

The Exploits River as a whole achieved half of its conservation egg requirement in 2004 while the lower Exploits segment exceeded requirement (Table 10 and Fig. 18); the middle and upper Exploits remained well below requirement, being most pronounced for the latter. Percent achieved in 2004 decreased from 2003 for the whole Exploits and for all segments separately. Egg depositions exceeded the means in all cases except the upper Exploits. It should be noted that values included in the pre-moratorium mean (1984-1991) for the upper Exploits were the result of artificial stocking of this segment while egg deposition in subsequent years resulted from natural spawning of adults ascending the Red Indian Lake fish passage. The Exploits River was the site of major Atlantic salmon enhancement programs beginning in the late 1950s and extending to the early 1990s (O'Connell *et al*. 1983; O'Connell and Bourgeois 1987; Bourgeois *et al*. MS 2001).

Egg deposition in Campbellton River exceeded conservation requirement in all years. The percent met in 2004 increased over 2003 and was similar to the mean for 1997-2003, but below the 1992-1996 mean.

In 2004, Gander River attained conservation requirement for the first time since 1999. The percent achieved in 2004 increased over 2003 and all means.

East coast, SFA 5

Middle Brook achieved conservation egg requirement in all years of the moratorium. The percent achieved in 2004 increased over 2003 and the pre-moratorium mean, but remained below the moratorium means.

Terra Nova River has yet to attain egg requirement. It should be noted however that accessible habitat for anadromous Atlantic salmon in this river more than doubled with the establishment of a fish passage at Mollyguajeck Falls in 1985, as part of an enhancement initiative that started in that year (O'Connell *et al*. MS 2000). Initial

enhancement activity started in 1952 with the construction of a fishway around impassable falls in the upper river (O'Connell *et al*. MS 2000; Mullins *et al*. 2003). The level of attainment of egg requirement in 2004 was the highest on record.

The percent of egg requirement reached in Northwest River in 2004 was the highest on record. In 1948, the area above Northwest Falls was made accessible to anadromous salmon with the blasting of a fish passage (Cote *et al*. 2001). Prior to 1948 only the first 3.2 km of the river were accessible.

Data for Indian Bay Brook are only available for 1997-1999 and conservation egg requirement was achieved in all years.

South (SFAs 9-11)

SFA 9

There is no information available for Biscay Bay River since 1996. Northeast Brook, Trepassey has reached egg requirement in all years of record. The level achieved in 2004 decreased from 2003 and the means.

Rocky River was the recipient of Atlantic salmon enhancement initiatives during the period 1984-1996 which included an operational fishway around an impassable waterfall at the mouth (Bourgeois 1998; Mullins *et al*. 2003). This river achieved half of its egg requirement in 2004, which was the same as in 2003 and was an increase over the means.

SFA 10

There was no information available for Northeast River, Placentia since 2002. This river exceeded egg requirement in all years.

SFA 11

Little River attained egg requirement in 2004 surpassing 2003 and the means. This system was stocked with swim-up fry in the 1980s and 1990s (Bourgeois *et al*. MS 1997).

The level of egg requirement met in Conne River in 2004 doubled that of 2003, increased over the 1992-1996 and 1997-2003 means, but decreased relative to the 1984-1991 mean.

Southwest (SFAs 12-13)

SFA 13

Of the seven rivers with data available for 2004, five achieved egg requirement (99% in the case of Fischells River). The exceptions were Middle Barachois and Harry's River. All rivers surpassed the means.

There is no information available for Pinchgut Brook, a tributary of Harry's River, since 2002 or for Humber River since 1999.

Northern Peninsula West (SFA 14A)

Lomond River achieved egg requirement in 2004. Compared to 2003 and the pre-moratorium mean there was an increase but in relation to the moratorium means there were decreases.

Torrent River likewise achieved egg requirement in 2004, increasing over 2003 and the 1984-1991 and 1997-2003 means but decreasing from the 1992-1996 mean. An enhancement program was carried out in this river in 1965-1976, which included the construction of a fishway around an impassable waterfall located 2 km from the mouth (Mullins *et al*. 2003).

Egg requirement was achieved in Western Arm Brook in 2004; there was a decrease compared to 2003 but an increase in relation to the means.

Summary and Conclusions

Returns of small and large salmon in 2004 improved over 2003 for most rivers. Returns of small salmon also increased over the moratorium means in most cases, but this was less pronounced for large salmon. The proportion of large salmon in total returns decreased from 2003 for rivers on the northeast and east coasts and in Bay St. George but increased for southern (particularly Rocky River) and northwest coast rivers. The same pattern held more or less in relation to the moratorium means. Greatly increased spawning escapements in most rivers on the northeast, northwest, and east coasts in 1992-1996, immediate benefits of the moratorium, should have resulted in corresponding increases in small salmon recruitment beginning in 1997 and 1998 (depending on smolt age composition). This has not occurred and in fact, except for Western Arm Brook, average returns in 1997-2003 were lower than or similar to those of 1992-1996. Some rivers in southern Newfoundland did not receive the same immediate benefits from the closure of the commercial fishery as was evident in northern areas and indeed returns of small salmon were lower during moratorium years than prior to the moratorium in Northeast Brook, Trepassey and Conne River. With respect to large salmon, with only a few exceptions (Northwest River, Northeast Brook, Trepassey, and Conne River), returns during the

moratorium years showed an overall increase relative to pre-moratorium years, and for most, average returns in 1997-2003 were higher than in 1992-1996. Prior to the closure of the commercial salmon fishery, marine exploitation rates for the period 1984-1991 averaged 45.3% on small salmon and 74.2% on large salmon (Dempson *et al*. 2001). In spite of the closures and restrictions placed on fisheries since 1992, overall abundance continues to be low.

Conservation egg requirements were met or exceeded in 15 out of 24 rivers or sections of rivers in 2004 compared to ten rivers in 2003. It should be noted that rivers that have undergone enhancement activities in the past 10-20 years (Exploits, Terra Nova, and Rocky), resulting in the opening up of vast amounts of habitat, are still in the developmental stage and are not expected to achieve conservation requirements in the near future.

Most rivers in insular Newfoundland were closed to angling for varying periods in July and/or August in 2004, due to low water levels and high water temperatures. This most likely affected angling effort and catches to some extent (historically, most angling activity and the bulk of catches occur in June-July). For insular Newfoundland overall (Fig. 3), catches of small and large salmon and effort in 2004 were below average while catch rate was around average.

Sea survival in 2004 increased (Conne River; Northeast Brook, Trepassey; Campbellton River) or remained similar (Western Arm Brook; Rocky River) relative to 2003; increases were most pronounced for the two southern systems, Conne River and Northeast Brook, Trepassey. Smolt production in 2004 increased over 2003 in four out of five monitored rivers, the exception being Campbellton River. When smolt production increases, returns of small salmon are expected to be higher in the following year, unless correspondingly there are decreases in marine survival that offset increased numbers of smolts. The converse holds when there are decreases in smolt production.

References

Anon. 1999. Integrated management plan for Newfoundland and Labrador Atlantic salmon. Fisheries Management Branch, Newfoundland Region. St. John's, NL.

Anon. 2002. 2002-2006 Atlantic salmon integrated management plan – Newfoundland and Labrador. Fisheries Management Branch, Newfoundland Region. St. John's NL.

Anon. 2004. Anglers Guide 2004. Communications Branch, Department of Fisheries and Oceans, Newfoundland Region, St. John's, NF.

Bourgeois, C. E. 1998. Assessment of the introduction of Atlantic salmon, *Salmo salar*, into Rocky River. p. 225-233. *In*: Cowx, I. G. [ed.] Stocking and introduction of fish. Fishing News Books. 456 pp.

Bourgeois, C. E., J. P. Davis, J. Murray, and V. Mercer. MS 1997. Status of three enhanced Atlantic salmon (*Salmo salar* L.) stocks of the Newfoundland Region. DFO, CSAS Res. Doc. 97/33.

Bourgeois, C. E., J. Murray, and V. Mercer. MS 2001. Status of the Exploits River stock of Atlantic salmon (*Salmo salar* L.) in 2000. DFO, CSAS Res. Doc. 2001/026.

Cochran, W. G. 1977. Sampling techniques. John Wiley & Sons, Inc. 428 pp.

Cote, D., R. Wissink, and M. Simpson. 2001. Northwest River: a discussion paper of management options available to Terra Nova National Park. Eco. Sci. Review Rep. 15: 40 pp.

Dempson, J. B., M. F. O'Connell, and C. J. Schwarz. 2004. Spatial and temporal trends in abundance of Atlantic salmon, *Salmo salar*, in Newfoundland with emphasis on impacts of the 1992 closure of the commercial fishery. Fisheries Management and Ecology 11: 387-402.

Dempson, J. B., D. G. Reddin, M. F. O'Connell, J. Helbig, C. E. Bourgeois, C. C. Mullins, T. R. Porter, G. Lilly, J. Carscadden, G. B. Stenson, D. Kulka, and R. Knoechel. MS 1998. Spatial and temporal variation in Atlantic salmon abundance in the Newfoundland-Labrador region with emphasis on factors that may have contributed to low returns in 1997. DFO, CSAS Res. Doc. 98/114.

Dempson, J. B., C. J. Schwarz, D. G. Reddin, M. F. O'Connell, C. C. Mullins, and C. E. Bourgeois. 2001. Estimation of marine survival rates on Atlantic salmon (*Salmo salar* L.) stocks in Newfoundland, Canada. ICES J. Mar. Sci. 58: 331-341.

DFO, 2001. Newfoundland & Labrador Atlantic salmon stock status for 2000. DFO Science Stock Status Report D2-01 (2001).

DFO, 2002a. Newfoundland & Labrador Atlantic salmon stock status for 2001. DFO Science Stock Status Report D2-01 (2002).

DFO, 2002b. Newfoundland & Labrador Atlantic salmon 2002 stock status update. DFO Science Stock Status Update D2-01 (2002).

DFO, 2003. Newfoundland & Labrador Atlantic salmon 2003 stock status update. DFO Science Stock Status Report 2003/048.

DFO, 2004. Newfoundland & Labrador Atlantic salmon 2004 stock status update. DFO Science Stock Status Report 2004/040.

May, A. W. 1993. A review of management and allocation of the Atlantic salmon resource in Atlantic Canada. p. 220-232. *In*: Mills, D. [ed.] Salmon in the sea and new enhancement strategies. Fishing News Books. 424 pp.

Mullins, C. C., C. E. Bourgeois, and T. R. Porter. 2003. Opening up new habitat: Atlantic salmon (*Salmo salar* L.) enhancement in Newfoundland. p. 200-221. *In*: Mills, D. [ed.] Salmon at the edge. Fishing News Books. 307 pp.

Mullins, C. C., and D. Caines. MS 1994. The status of Atlantic salmon stocks in the Gulf of St. Lawrence, western Newfoundland and southern Labrador, 1993. DFO Atlantic Fisheries Res. Doc. 94/83.

O'Connell, M. F., and C. E. Bourgeois. 1987. Atlantic salmon enhancement in the Exploits River, Newfoundland, 1957-1984. North American Journal of Fisheries Management 7: 207-214.

O'Connell, M. F., J. P. Davis, and D. C. Scott. 1983. An assessment of the stocking of Atlantic salmon (*Salmo salar* L.) fry in the tributaries of the Middle Exploits River, Newfoundland. Can. Tech. Rep. Fish. Aquat. Sci. 1225: v + 142 p.

O'Connell, M. F., J. B. Dempson, C. C. Mullins, D. G. Reddin, N. M. Cochrane, and D. Caines. MS 1998. Status of Atlantic salmon (*Salmo salar*, L.) stocks of insular Newfoundland (SFAs 3-14A), 1997. DFO, CSAS Res. Doc. 98/107.

O'Connell, M. F., J. B. Dempson, C. C. Mullins, D. G. Reddin, C. E. Bourgeois, T. R. Porter, N. M. Cochrane, and D. Caines. MS 2003. Status of Atlantic salmon (*Salmo salar*, L.) stocks of the Newfoundland Region, 2003. DFO, CSAS Res. Doc. 2003/105.

O'Connell, M. F., J. B. Dempson, T. R. Porter, D. G. Reddin, E.G.M. Ash, and N. M. Cochrane. MS 1992b. Status of Atlantic salmon (*Salmo salar* L.) stocks of the Newfoundland Region, 1991. CAFSAC Res. Doc. 92/22.

O'Connell, M. F., J. B. Dempson, and D. G. Reddin. 1992a. Evaluation of the impacts of major management changes in the Atlantic salmon (*Salmo salar* L.) fisheries of Newfoundland and Labrador, Canada, 1984-1988. ICES J. Mar. Sci. 49: 69-87.

O'Connell, M. F., A. Walsh, and N. M. Cochrane. 2000. Status of Atlantic salmon (*Salmo salar* L.) in Indian Bay Brook, Middle Brook, and Terra Nova River (SFA 5), Northeast Brook, Trepassey (SFA 9), and Northeast River, Placentia (SFA 10), Newfoundland, in 1999. DFO, CSAS Res. Doc. 2000/041.

Table 1. Opening and closure dates of the Atlantic salmon recreational fishery for each SFA, and variations by river, 2004.

River	Class	Close dates	Reason for closure
SFA 3 June 15 - September 7			
Western Brook (Hare Bay)	III	July 21-Aug. 22	Low water levels & high water temperatures
Salmon River (Hare Bay)	II	July 29-Aug. 22	"
Easter Brook	III	July 21-Aug. 22	"
Northeast Brook	III	July 21-Aug. 22	"
Western Brook (Beaver Brook)	III	July 21-Aug. 22	"
Northwest Brook	III	July 21-Aug. 22	"
Cloud River	III	July 23-Aug. 22	"
Coney Arm River	III	August 2-22	"
Main River (Sops Arm)	II	August 2-22	"
Hampden River	III	August 2-22	"
Wild Cove Brook	III	August 2-22	"
Western Arm Brook	III	August 2-22	"
Middle Arm Brook	III	August 2-22	"
Southern Arm Brook	III	August 2-22	"
Baie Verte River	III	August 2-22	"
Woodstock Brook	III	August 2-22	"
SFA 4 June 15 - September 7			
Burlington River	III	August 2-22	Low water levels & high water temperatures
Indian River	II	August 2-22	"
West River	III	August 2-22	"
South Brook	III	August 2-22	"
Tommy's Arm River	III	August 2-22	"
Northwest Arm Brook	III	August 2-22	"
Western Arm Brook	III	August 2-22	"
Leamington River	III	August 2-22	"
Charles Brook	III	August 2-22	"
Northern Arm River	III	August 2-22	"
Peters River	III	August 2-22	"
Exploits River (tributaries)	III	August 2-22	"
Rattling Brook downstream from the powerhouse)	III	August 2-22	"
Gander River (tributaries)	II	August 2-22	"
SFA 5 June 15 - September 7			
Northwest River (Port Blandford) remains closed for the season			
Northwest Brook (Indian Bay)	III	Aug. 11-22	Low water levels & high water temperatures
Indian Bay River	II	Aug. 11-22	"
Northwest River (Trinity)	III	Aug. 11-22	"
Traverse Brook	II	Aug. 11-22	"
Middle Brook	II	Aug. 11-22	"
Gambo River	II	Aug. 11-22	"
Northwest Brook (Alexander Bay)	III	Aug. 11-22	"
Terra Nova River	III	Aug. 11-22	"
Salmon Brook	IV	Aug. 11-25	"
Southwest Brook (Port Blandford River)	IV	Aug. 11-25	"
SFA 6 June 15 - September 7			
Samon Cove River	III	Aug. 11-22	Low water levels & high water temperatures
Trouty River	III	Aug. 11-22	"
Pope's Harbour River	III	Aug. 11-22	"
Shoal Harbour River	III	Aug. 11-22	"
Deer Harbour River	III	Aug. 11-22	"
Bellevue River	III	July 7 - 20, Aug. 6 - Sept. 7	"
SFA 7 June 15 - September 7			
Salmon Cover River	III	July 7 - 20, Aug. 6 - Sept. 7	Low water levels & high water temperatures
North River	III	July 7 - 20, Aug. 6 - Sept. 7	"
South River	III	July 7 - 20, Aug. 6 - Sept. 7	"
North Arm River Holyrood	IV	July 7 - 25, Aug. 6 - Sept. 7	"
SFA 8 June 15 - September 7			
Renews River	III	July 7-25, Aug. 6-18	Low water levels & high water temperatures

Table 1 cont'd

River	Class	Close dates	Reason for closure
SFA 9 June 6 - September 7			
Biscay Bay River	III	July 8-20, Aug. 6-18	Low water levels & high water temperatures
Northwest River (Trepassey)	III	July 8-20, Aug. 6-18	"
Peters River	III	July 8-20, Aug. 6-18	"
Salmonier River	III	July 8-20, July 24-25, Aug. 6-23	"
Colinet River	III	July 8-25, Aug. 6-23	"
Rocky River	III	July 8-25, Aug. 6-23	"
North Harbour River	IV	July 8-25, Aug. 6-23	"
Little Salmonier River	III	July 8-25, Aug. 6-23	"
Big Barachois Brook	III	July 8-25, Aug. 6-23	"
Branch River	III	July 8-20, Aug. 6-23	"
SFA 10 June 6 - September 7			
Great Barasway River	III	July 8-25, Aug. 6-23	Low water levels & high water temperatures
Southeast Rive (Placentia)	III	July 8-25, Aug. 6-23	"
Northeast River (Placentia)	III	July 8-25, Aug. 6-23	"
Come by Chance River	III	Aug. 6-22	"
Watson's Brook	III	Aug. 6-22	"
North Harbour River	III	Aug. 6-22	"
Black River	III	Aug. 6-22	"
Pipers Hole River	III	Aug. 6-22	"
Cape Roger River	III	July 7-19, Aug. 11-22	"
Nonsuch Brook	IV	July 7-19, Aug. 11-22	"
Bay De L'Eau River	III	July 7-19, Aug. 11-22	"
Red Harbour River	III	July 7-19, Aug. 11-22	"
West Brook	III	July 7-19, Aug. 11-22	"
Tides Brook	III	July 7-19, Aug. 11-22	"
Salmonier River (Burin)	III	July 7-19, Aug. 11-22	"
Little St. Lawrence River	III	July 7-19, Aug. 11-22	"
Lawn River	III	July 7-19, Aug. 11-22	"
Taylors Bay River	III	July 7-19, Aug. 11-22	"
Salmonier River (Lamaline)	III	July 7-19, Aug. 11-22	"
Piercey's Brook	III	July 7-19, Aug. 11-22	"
Rushoon River (non scheduled)		Aug. 11-22	"
SFA 11 June 6 - September 7			
Conne River - opens June 21	III	July 5-8, July 30-Aug. 8, Aug. 13-Sept. 7	Inseason Review, environmental conditions
Grand Bank Brook	III	July 7-19, Aug. 11-22	Low water levels & high water temperatures
Long Reach Brook	III	Aug. 13-23	"
Allen's Cove Brook	III	Aug. 13-23	"
Bottom Brook	III	Aug. 13-23	"
Hare Bay River	III	Aug. 13-23	"
Garnish River	III	July 7-19, Aug. 11-22	"
Devils Brook (non-scheduled)		Aug. 11 - 22	"
SFA 12 June 6 - September 7			
SFA 13 June 1 - September 7			
Bear Cove River	III	Aug. 5-22	Low water levels & high water temperatures
Little Codroy River	III	Aug. 5-22	"
Great Codroy River	II	Aug. 5-22	"
Crabbes River	IV	Aug. 5-22	"
Barachois River	III	Aug. 5-22	"
Robinsons River	III	Aug. 5-22	"
Little Barachois River	III	Aug. 5-22	"
Southwest & Bottom Brooks	III	Aug. 5-22	"
Fox Island River	III	Aug. 5-22	"
Hughes Brook	IV	Aug. 5-22	"
Goose Arm River	III	Aug. 5-22	"
Humber River (All Tributaries)	I	Aug. 5-22	"
SFA 14A June 15 - September 7			
Lomond River	II	Aug. 5-22	Low water levels & high water temperatures
Parsons Pond River	II	Aug. 5-22	"
Portland Creek	II	Aug. 5-22	"
Torrent River	II	Aug. 5-22	"
Big East River	III	Aug. 5-22	"
Castors River	II	July 23-Aug 22	"
St. Genevieve River	II	July 23-Aug 22	"
East River (St. Barbe)	III	July 21-Aug. 22	"
Big Brook	III	July 21 - Sept. 7	"
Watson's Brook	III	July 21 - Sept. 7	"
Parkers Brook	III	July 21 - Sept. 7	"
Bartlett's Brook	III	July 21 - Sept. 7	"
Upper Brook	III	July 21 - Sept. 7	"
East River	III	July 21 - Sept. 7	"
Pincents Brook	III	July 21 - Sept. 7	"
SFA 14B June 15 - September 15			
SFA 1 June 15 - September 15			
SFA 2 June 15 - September 15			

Table 2. Atlantic salmon smolt-to-adult suvival (back to the river) for Campbellton River (SFA 4), Northeast Brook, Trepassey, and Rocky River (SFA 9), Conne River (SFA 11), Highlands River (SFA 13), and Western Arm Brook (SFA 14A). Repeat spawners are included in counts. Adjusted smolt counts for Rocky River are bold.

	Campbellton River			Northeast Brook			Rocky River			Conne River[1]			Highlands River			Western Arm Brook		
Year	Smolts	Sm. sal.	%	Smolts	Sm. sal.	%	Smolts	Sm. sal.	%	Smolts	Sm. sal.	%	Smolts	Sm. sal.	%	Smolts	Sm. sal.	%
(i)	year i	year i + 1	Surv.	year i	year i + 1	Surv.	year i	year i + 1	Surv.	year i	year i + 1	Surv.	year i	year i + 1	Surv.	year i	year i + 1	Surv.
1971																5735	406	7.1
1972																11905	797	6.7
1973																8484	506	6.0
1974																11854	639	5.4
1975																9600	552	5.8
1976																6232	373	6.0
1977																9899	315	3.2
1978																13071	1578	12.1
1979																8349	465	5.6
1980													15028	127	0.8	15665	492	3.1
1981													15839	100	0.6	13981	467	3.3
1982																12477	1141	9.1
1983																10552	235	2.2
1984																20653	467	2.3
1985																13417	527	3.9
1986				1117	91	8.1										17719	437	2.5
1987				1404	97	6.9				74585	7627	10.2				17029	422	2.5
1988				1692	62	3.7				65692	4968	7.6				15321	455	3.0
1989				1708	71	4.2				73724	5368	7.3				11407	444	3.9
1990				1902	99	5.2	8287	211	2.5	56943	2411	4.2				10563	233	2.2
1991				1911	49	2.6	7732	237	3.1	74645	2523	3.4				13453	480	3.6
1992				1674	79	4.7	7813	292	3.7	68208	2703	4.0				15405	947	6.1
1993	31577	2857	9.0	1849	99	5.4	5115	158	3.1	55765	1533	2.7	9986	145	1.5	13435	954	7.1
1994	41663	3035	7.3	944	80	8.5	9781	385	3.9	60762	3502	5.8	10503	172	1.6	9283	823	8.9
1995	39715	3208	8.1	792	73	9.2	7577	356	4.7	57733 *	4154	7.2	12160	199	1.6	15144	1230	8.1
1996	58369	1975	3.4	1749	50	2.9	**14261**	435	3.1	94088	3200	3.4	12383	398	3.2	14502	509	3.5
1997	62050	3275	5.3	1829	91	5.0	**16900**	423	2.5	100983	2931	2.9	6776	96	1.4	23845	1718	7.2
1998	50441	3076	6.1	1727	95	5.5	**12163**	327	2.7	69841	2358	3.4	5922	146	2.5	17139	1046	6.1
1999	47256	1798	3.8	1419	83	5.8	**8625**	277	3.2	63658	5177	8.1	9634	58	0.6	13500	1492	11.1
2000	35596	2151	6.0	1740	56	3.2	**7616**	233	3.1	60777	1503	2.5	13120	75	0.6	12706	563	4.4
2001	37170	1974	5.3	916	65	7.1	**9392**	276	2.9	86898	2573	3.0				16013	1465	9.1
2002	32630	2219	6.8	2076	115	5.5	**10144**	402	4.0	81806	1953	2.4				14999	1406	9.4
2003	35089	2726	7.8	1064	70	6.6	**4440**	169	3.8	71479	3818	5.3				12086	1151	9.5
2004	32780			1571			13047			79667						17323		

[1]Includes Native food fishery.

* 57733 excludes 5016 removed to Roti Bay.

4154 small salmon for Conne River 1996 excludes 286 fish from the wild smolt aquaculture experiment.

Table 3. Counts of small salmon to rivers in insular Newfoundland 1974-2004 by Salmon Fishing Area (SFA). Also shown are means, 95% confidence intervals, and percentage change for 2004 in relation to 2003, and the 1984-1991, 1992-1996, and 1997-2003 means. Partial counts are in parentheses and are not included in statistical calculations. Adjusted counts are bold.

	SFA 4			SFA 5			SFA 9		SFA 10	SFA 11		SFA 13								SFA 14A		
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1974	2538		857	(770)					223											41	38	382
1975	9218			(1119)					(186)											1	191	631
1976	3991								294											132	341	520
1977	6148																			192	789	362
1978	3790		755	1403	810				390											117	971	293
1979	6715		(404)	(1350)	569				454											195	1984	1578
1980			997	1712	843				433			82								301	792	435
1981	(8114)		2459	2414	1115				334			127								110	2101	451
1982	(7605)		1425	1281	963				86			100								275	2112	394
1983			978	1195	1210				233											220	2007	1141
1984	17219		1081	1379	1233		89		419											440	1805	120
1985	16652		1663	904	1557		124		384											190	1553	**416**
1986	9697		1064	1036	1051		158		725		7515									354	2815	**525**
1987	9014		493	914	974		91	80	325	64	9687									355	2505	378
1988	8974		1562	772	1737		97	313	543	65	7118									437	2075	**251**
1989	7192		596	496	1138		62	168	706	102	4469										1369	**455**
1990	6629		**345**	745	1149		71	401	551	158	4321										2296	**444**
1991	5245		245	562	873		99	211	353	55	2086										1441	233
1992	12538		1168	1182	1443		49	237	921	104	1973							222		435	2347	480
1993	21319	4001	1560	1959	(2713)		79	292	847	169	2355	137						576		526	4009	947
1994	16168	2857	968	1513	1571		99	158	677	73	1533	145						562		701	3592	954
1995	15691	3035	1600	1139	2258	442	80	385	663	118	3498	172						753		1003	5800	823
1996	29726	3208	946	1751	2005	593	73	356	1225	674	4436	199	844	805	768		1051	601		601	6923	1230
1997	13552	1975	465	1221	1577	(408)	50	435	641	399	2678	398	1121	1044	1017	599	1282	613		783	3659	509
1998	26333	3275	1295	2405	1780	540	91	423	756	264	2931	96	482			194		593		542	4999	1718
1999	28252	3076	1105	1802	1836	314	95	327	336	307	2357	146	709	560	1399	1264	2237	608		829	4008	1046
2000	11817	1798	742	1660		272	83	277	520	564	4708	58	1024	1142	1293	1800	2134	441		658	3763	1486
2001	18978	2151	663	1188	2151	102	56	233	**265**	125	1359	75	683	934	1776	214	952	200		333	2216	559
2002	15147	1974	714	823	1374	441	65	276	414	487	2352	169	614	515	758	399	1373	593		522	3909	1465
2003	28626	2219	722	1105	2225	999	115	402		322	1867	294	1098	733	1066	1046	1425	351	2334	589	3297	1406
2004	26678	2726	983	1370	2945	1157	70	169		656	3641	507	2128	1078	1811	1254	1919	292	2720	551	4343	1151
$\bar{X}$ 1984-1991	10078		881	851	1214		99	235	501	89	5866									355	1982	353
95% CI	3743		455	234	245		25	155	130	53	2875									85	442	115
N	8		8	8	8		8	5	8	5	6									8	8	8
$\bar{X}$ 1992-1996	19088	3275	1248	1509	1819	518	76	286	867	228	2759	163						543		653	4534	887
95% CI	8354	803	391	441	602	959	22	114	284	313	1474	45						242		271	2260	337
N	5	4	5	5	4	2	5	5	5	5	5	4						5		5	5	5
$\bar{X}$ 1997-2003	20386	2353	815	1458	1824	445	79	339	489	353	2607	177	819	821	1218	788	1567	486		608	3693	1170
95% CI	6698	537	263	494	343	325	22	75	196	135	981	116	238	239	327	558	469	149		156	773	442
N	7	7	7	7	6	6	7	7	6	7	7	7	7	7	7	7	7	7		7	7	7
% change 2004 vs.																						
2003	-7	23	36	24	32	16	-39	-58		104	95	72	94	47	70	20	35	-17	17	-6	32	-18
1984-1991 mean	165		12	61	143		-29	-28		639	-38									55	119	226
1992-1996 mean	40	-17	-21	-9	62	124	-8	-41		188	32	211						-46		-16	-4	30
1997-2003 mean	31	16	21	-6	61	160	-12	-50		86	40	187	160	31	49	59	22	-40		-9	18	-2

1. Exploits River (Bishop's Falls)
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21. Torrent River
22. Western Arm Brook

Table 4. Counts of large salmon to rivers in insular Newfoundland 1974-2004 by Salmon Fishing Area (SFA). Also shown are means, 95% confidence intervals, and percentage change for 2004 in relation to 2003, and the 1984-1991, 1992-1996, and 1997-2003 means. Partial counts are in parentheses and are not included in statistical calculations. Adjusted counts are bold.

	SFA 4			SFA 5			SFA 9		SFA 10	SFA 11		SFA 13								SFA 14A		
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1974	411		9	(77)					9											33	3	4
1975	1439			(9)					(36)											0	25	1
1976	460								56											11	47	0
1977	581																			11	33	3
1978	303		52	16	20				32											12	21	1
1979	277		(6)	(54)	170				37											1	39	0
1980			15	91	39				34			55								19	63	3
1981	(1695)		33	39	90				62			29								50	97	1
1982	(181)		18	20	19				36			56								16	523	3
1983			12	75	57				22											7	442	4
1984	529		38	57	107		33		44											47	288	0
1985	183		26	27	112		41		0											14	30	1
1986	355		12	15	140		30		39		397									32	92	0
1987	310		9	19	56		30	1	16	3	498									11	68	1
1988	147		24	14	206		19	6	11	3	418									21	44	1
1989	89		24	19	142		18	9	15	5	319										60	0
1990	122		8	13	144		9	17	25	15	361										82	0
1991	99		2	14	114		13	16	8	6	87										71	1
1992	314		101	43	270		10	46	46	21	154							5		80	169	8
1993	627	145	87	87	(470)		17	72	65	11	98	78						43		34	222	8
1994	916	191	83	90	242		15	19	70	11	100	148						47		50	331	31
1995	941	218	125	168	634	135	12	39	74	17	107	120						28		95	611	33
1996	2053	560	112	161	464	203	15	45	123	127	179	142	239	36	120		112	38		93	507	50
1997	886	321	119	262	527	(115)	9	89	185	79	182	157	346	182	172	73	167	68		72	666	55
1998	1953	402	141	196	390	104	11	130	287	49	294	117	234			72		63		126	757	128
1999	2235	493	138	130	343	93	18	77	167	49	241	82	263	66	200	246	231	63		113	399	22
2000	683	208	61	189		106	14	104	258	52	216	67	152	155	316	276	466	15		81	587	120
2001	1346	119	93	62	330	50	8	60	**65**	35	140	65	176	141	219	44	173	3		72	437	28
2002	889	123	95	69	271	113	2	78	40	41	167	87	129	160	198	42	195	23		62	421	48
2003	1335	152	139	74	329	273	11	73		13	51	166	260	101	173	180	187	20	422	77	330	23
2004	948	161	72	88	397	253	11	235		31	175	252	268	96	159	190	183	15	483	96	536	74
$\bar{X}$ 1984-1991	229		18	22	128		24	10	20	6	347									25	92	1
95% CI	130		10	12	36		9	8	13	6	148									12	68	0
N	8		8	8	8		8	5	8	5	6									8	8	8
$\bar{X}$ 1992-1996	970	279	102	110	403	169	14	44	76	37	128	122						32		70	368	26
95% CI	815	302	22	66	291	432	3	24	35	62	46	50						21		34	233	22
N	5	4	5	5	4	2	5	5	5	5	5	4						5		5	5	5
$\bar{X}$ 1997-2003	1332	260	112	140	365	123	10	87	167	45	184	106	223	134	213	133	237	36		86	514	61
95% CI	536	137	28	72	92	81	5	22	104	18	72	39	70	40	49	92	106	25		22	146	42
N	7	7	7	7	6	6	7	7	6	7	7	7	7	7	7	7	7	7		7	7	7
% change 2004 vs.																						
2003	-29	6	-48	19	21	-7	0	222		138	243	52	3	-5	-8	6	-2	-25	14	25	62	222
1984-1991 mean	314		303	296	211		-54	2298		384	-50									284	483	14700
1992-1996 mean	-2	-42	-29	-20	-1	50	-20	432		-17	37	107						-53		36	46	185
1997-2003 mean	-29	-38	-36	-37	9	105	5	169		-32	-5	138	20	-28	-25	43	-23	-59		11	4	22

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Table 5. Total returns of small salmon to rivers in insular Newfoundland 1984-2004 by Salmon Fishing Area (SFA). Also shown are means and 95% confidence intervals for 1984-1991, 1992-1996, and 1997-2003.

	SFA 4			SFA 5			SFA 9		SFA 10	SFA 11		SFA 13							SFA 14A		
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1984	19028			1675	1534		89		459										986	1805	235
1985	17555			1283	2012		124		519										393	1621	470
1986	10343			1547	1459		158		879		8302								725	3155	528
1987	9481			1053	1404		91	80	350	64	10155								652	2647	437
1988	9496			1337	2114		97	313	637	65	7627								841	2388	422
1989	7577		7743	626	1377		62	168	809	102	4968								652	1510	455
1990	6995		7740	1070	1518		71	401	699	158	5368								777	2518	444
1991	5659		6745	763	1127		99	211	368	55	2411								731	1590	233
1992	13508		18179	1563	1780		49	237	956	104	2523							888	794	2829	480
1993	22253	4001	26205	2247	3050		79	292	980	169	2703	137						1808	816	4215	947
1994	17603	2857	18494	1751	1809		99	158	737	73	1533	145						1791	1292	3737	954
1995	16226	3035	22432	1390	2515	498	80	385	811	118	3502	172						2213	1529	6346	823
1996	30425	3208	24191	2044	2251	593	73	356	1532	674	4440	199	870	818	882		1233	1798	1242	7475	1230
1997	15263	1975	10637	1352	1732	466	50	435	749	399	3200	398	1168	1056	1107	863	1320	1747	1468	4158	509
1998	27093	3275	19060	2625	1868	540	91	423	1075	264	2931	96	494			205		1659	787	5388	1718
1999	28802	3076	18742	1948	1892	314	95	327	401	307	2358	146	717	563	1452	1264	2276	1713	1212	4857	1046
2000	12063	1798	14074	1749	1629	272	83	277	622	564	5177	58	1027	1142	1501	1800	2397	1271	1072	4154	1492
2001	19370	2151	12517	1525	2261	102	56	233	313	125	1503	75	688	937	1909	248	1150	1028	572	2637	563
2002	15589	1974	13444	916	1435	443	65	276	534	487	2573	169	630	548	998	414	1560	1640	895	4750	1465
2003	29070	2219	13657	1182	2279	1012	115	402		322	1953	294	1107	735	1260	1071	1641	2334	921	3875	1406
2004	26998	2726	18521	1504	2999	1207	70	169		656	3818	507	2135	1082	1993	1254	2122	2828	803	5061	1151
$\bar{X}$ 1984-1991	10767		7409	1169	1568		99	235	590	89	6472								720	2154	403
95% CI	4100		1429	304	277		25	155	166	53	2902								143	507	91
N	8		3	8	8		8	5	8	5	6								8	8	8
$\bar{X}$ 1992-1996	20003	3275	21900	1799	2281	546	76	286	1003	228	2940	163						1700	1135	4920	887
95% CI	8232	803	4368	433	657	604	22	114	388	313	1356	45						606	397	2390	337
N	5	4	5	5	5	2	5	5	5	5	5	4						5	5	5	5
$\bar{X}$ 1997-2003	21036	2353	14590	1614	1870	450	79	339	616	353	2814	177	832	835	1363	838	1715	1627	967	4287	1171
95% CI	6625	537	2915	521	288	266	22	75	287	135	1099	116	243	229	306	546	471	379	280	821	442
N	7	7	7	7	7	7	7	7	6	7	7	7	7	7	7	7	7	7	7	7	7

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Table 6. Total returns of large salmon to rivers in insular Newfoundland 1984-2004 by Salmon Fishing Area (SFA). Also shown are means and 95% confidence intervals for 1984-1991, 1992-1996, and 1997-2003.

	SFA 4			SFA 5			SFA 9		SFA 10	SFA 11		SFA 13							SFA 14A		
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1984	529			57	107		33		44										75	288	0
1985	183			27	112		41		0										14	30	1
1986	355			15	140		30		39		412								37	93	0
1987	310			19	56		30	1	16	3	516								12	68	1
1988	147			14	206		19	6	11	3	420								24	44	1
1989	89		473	19	142		18	9	15	5	320								22	60	0
1990	122		508	13	144		9	17	25	15	372								19	82	0
1991	99		670	14	114		13	16	8	6	89								21	71	1
1992	314		4162	43	270		10	46	46	21	159							16	86	170	8
1993	627	145	1734	88	472		17	72	65	11	100	78						115	38	224	8
1994	916	191	1072	91	243		15	19	70	11	100	148						128	64	334	31
1995	945	218	1121	169	637	135	12	39	74	17	110	120						80	103	617	33
1996	2057	560	1753	161	467	203	15	45	123	127	179	142	249	38	138		132	126	101	517	50
1997	881	321	1883	262	528	182	9	89	185	79	185	157	361	189	195	89	174	201	78	676	55
1998	1959	402	3649	196	394	104	11	130	287	49	294	117	239			72		191	128	761	128
1999	2236	493	4815	130	344	93	18	77	167	49	241	82	265	66	204	246	235	176	120	421	22
2000	684	208	1942	190	232	106	14	104	258	52	216	67	156	155	320	276	494	49	90	596	120
2001	1347	119	1682	62	330	50	8	60	65	36	140	65	180	142	232	45	176	132	75	443	28
2002	890	123	1898	69	271	114	2	78	40	41	167	87	136	165	206	42	202	285	66	433	48
2003	1336	152	1853	74	330	273	11	73		13	51	166	264	101	182	180	200	422	82	341	23
2004	949	161	2668	88	397	265	11	235		31	175	252	272	98	167	190	192	498	99	546	74
$\bar{X}$ 1984-1991	229		550	22	128		24	10	20	6	355								28	92	1
95% CI	130		261	12	36		9	8	13	6	153								17	68	0
N	8		3	8	8		8	5	8	5	6								8	8	8
$\bar{X}$ 1992-1996	972	279	1968	110	418	169	14	44	76	37	130	122						93	78	372	26
95% CI	817	302	1575	66	202	432	3	24	35	62	46	50						59	34	237	22
N	5	4	5	5	5	2	5	5	5	5	5	4						5	5	5	5
$\bar{X}$ 1997-2003	1333	260	2532	140	347	132	10	87	167	46	185	106	229	137	222	136	244	208	91	524	61
95% CI	538	137	1121	72	88	68	5	22	104	18	72	39	73	41	47	90	115	110	22	143	42
N	7	7	7	7	7	7	7	7	6	7	7	7	7	7	7	7	7	7	7	7	7

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Table 7. Percentage change in total returns of small salmon in 2004 in relation to 2003, the 1984-1991, 1992-1996 and 1997-2003 means.

Counting Facility	Total Returns Small Salmon 2004*	Percent Change from 2003	1984-1991 mean	1992-1996 mean	1997-2003 mean
SFA 4					
Exploits River	26998	-7	151	35	28
Campbellton River	2726	23		-17	16
Gander River	18521	36	150	-15	27
SFA 5					
Middle Brook	1504	27	29	-16	-7
Terra Nova River (Lower)	2999	32	91	31	60
Northwest River (TNNP)	1207	19		121	168
SFA 9					
Northeast Bk. (Trep.)	70	-39	-29	-8	-12
Rocky River	169	-58	-28	-41	-50
SFA 11					
Little River	656	104	639	188	86
Conne River	3818	95	-41	30	36
SFA 13					
Highlands River	507	72		211	187
Crabbes River	2135	93			157
M. Barachois River	1082	46			30
Robinsons River	1993	64			46
Fischells River	1254	17			50
Flat Bay Brook	2122	38			24
Harry's River	2828	21		66	74
SFA 14A					
Lomond River	803	-4	12	-29	-17
Torrent River	5061	28	135	3	18
Western Arm Brook	1151	-18	186	30	-2

*preliminary

Table 8. Percentage change in total returns of large salmon in 2004 in relation to 2003, the 1984-1991, 1992-1996 and 1997-2003 means.

Counting Facility	Total Returns Large Salmon 2004*	Percent Change from			
		2003	1984-1991 mean	1992-1996 mean	1997-2003 mean
SFA 4					
Exploits River	949	-29	314	-2	-29
Campbellton River	161	6		-42	-38
Gander River	2668	44	385	36	5
SFA 5					
Middle Brook	88	19	296	-20	-37
Terra Nova River (Lower)	397	20	211	-5	14
Northwest River (TNNP)	265	-3		57	101
SFA 9					
Northeast Bk. (Trep.)	11	0	-54	-20	5
Rocky River	235	222	2298	432	169
SFA 11					
Little River	31	138	384	-17	-32
Conne River	175	243	-51	35	-5
SFA 13					
Highlands River	252	52		107	138
Crabbes River	272	3			19
M. Barachois River	98	-6			-28
Robinsons River	167	-8			-25
Fischells River	190	6			40
Flat Bay Brook	192	2			-21
Harry's River	498	18		435	139
SFA 14A					
Lomond River	99	19	254	26	8
Torrent River	546	60	493	47	4
Western Arm Brook	74	222	14700	185	22

*preliminary

Table 9. Proportions of large salmon in total returns to rivers in insular Newfoundland during 1992-2004 and mean proportions for 1984-1991, 1992-1996, and 1997-2003.

	Proportion of large salmon															
River Name	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	1984-1991 mean	1992-1996 mean	1997-2003 mean
SFA 4																
Explotis River (Bishop's Falls)	0.023	0.027	0.049	0.055	0.063	0.055	0.067	0.072	0.054	0.065	0.054	0.044	0.034	0.021	0.046	0.060
Campbellton River		0.035	0.063	0.067	0.149	0.140	0.109	0.138	0.104	0.052	0.059	0.064	0.056		0.078	0.099
Gander River	0.186	0.062	0.055	0.048	0.068	0.150	0.161	0.204	0.121	0.118	0.124	0.119	0.126	0.069	0.082	0.152
SFA 5																
Middle Brook	0.027	0.038	0.049	0.108	0.073	0.162	0.069	0.063	0.098	0.039	0.070	0.059	0.055	0.019	0.058	0.080
Terra Nova River	0.132	0.134	0.118	0.202	0.172	0.234	0.174	0.154	0.125	0.127	0.159	0.126	0.117	0.075	0.155	0.157
Northwest River (Port Blandford)				0.213	0.255	0.281	0.161	0.229	0.280	0.329	0.205	0.212	0.180		0.237	0.226
SFA 9																
Northeast Brook (Trepassey)	0.169	0.177	0.132	0.130	0.170	0.153	0.108	0.159	0.144	0.125	0.030	0.087	0.136	0.196	0.154	0.116
Rocky River	0.163	0.198	0.107	0.092	0.112	0.170	0.235	0.191	0.273	0.205	0.220	0.154	0.582	0.040	0.134	0.205
SFA 10																
Northeast River (Placentia)	0.046	0.062	0.087	0.084	0.074	0.198	0.211	0.294	0.293	0.172	0.070			0.032	0.070	0.213
SFA 11																
Little River	0.168	0.061	0.131	0.126	0.159	0.165	0.157	0.138	0.084	0.224	0.078	0.039	0.045	0.067	0.141	0.114
Conne River	0.059	0.036	0.061	0.030	0.039	0.055	0.091	0.093	0.040	0.085	0.061	0.025	0.044	0.052	0.042	0.062
SFA 13																
Highlands River		0.363	0.505	0.411	0.416	0.283	0.549	0.360	0.536	0.464	0.340	0.361	0.332		0.428	0.375
Crabbes River					0.223	0.236	0.326	0.270	0.132	0.207	0.178	0.193	0.113			0.215
M. Barachois River					0.044	0.152		0.105	0.120	0.132	0.231	0.121	0.083			0.141
Robinsons River					0.135	0.150		0.123	0.176	0.108	0.171	0.126	0.077			0.140
Fischells River						0.093	0.260	0.163	0.133	0.154	0.092	0.144	0.132			0.139
Flat Bay Brook					0.097	0.116		0.094	0.171	0.133	0.115	0.109	0.083			0.125
Harry's River	0.018	0.059	0.066	0.034	0.065	0.103	0.103	0.093	0.037	0.114	0.148	0.153	0.150		0.052	0.113
SFA 14A																
Lomond River	0.098	0.044	0.047	0.063	0.075	0.050	0.140	0.090	0.077	0.116	0.069	0.082	0.110	0.037	0.065	0.086
Torrent River	0.057	0.050	0.082	0.089	0.065	0.140	0.124	0.080	0.125	0.144	0.084	0.081	0.097	0.041	0.070	0.109
Western Arm Brook	0.016	0.008	0.031	0.039	0.039	0.098	0.069	0.021	0.074	0.047	0.032	0.016	0.060	0.001	0.028	0.049

Table 10. Summary of the conservation egg requirement achieved for various rivers for years prior to the commercial salmon fishing moratorium (1984-1991) and years during the moratorium (1992-2003) in insular Newfoundland. Also shown are the means for 1984-1991,1992-1996, and 1997-2003.

		Percentage conservation level met																							
SFA	River	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Mean 1984-1991	Mean 1992-1996	Mean 1997-2003
4	Exploits River	39	37	32	33	37	36	26	16	31	43	31	39	69	24	47	44	21	34	27	54	49	32.0	42.6	35.9
	Lower	123	100	66	62	59	46	45	34	101	157	103	121	210	72	134	116	56	91	64	156	142	66.9	138.4	98.4
	Middle	20	17	8	9	12	14	12	16	20	23	18	24	43	15	35	35	16	27	23	39	37	13.5	25.6	27.1
	Upper	29	53	72	97	125	119	88	0	2	6	7	12	26	10	6	7	2	5	3	7	2	72.9	10.6	5.7
	Campbellton River										311	216	264	316	180	315	312	152	148	138	193	208		276.8	205.4
	Gander River						44	38	36	118	128	84	89	115	61	110	121	86	84	91	96	114	39.3	106.8	92.7
5	Indian Bay Brook														113	183	161								152.3
	Middle Brook	131	84	89	90	55	49	74	51	148	238	176	116	258	193	301	222	217	132	101	134	164	77.9	187.2	185.7
	Terra Nova River	18	23	17	14	28	19	19	15	28	53	25	44	35	31	33	33	27	36	28	42	55	19.1	37.0	32.9
	Northwest River (TNNP)												37	55	46	42	28	27	11	37	81	92		46.0	38.9
9	Biscay Bay River	156	126	230	119	117	87	122	38	141	97	143	77	117									124.4	115.0	
	Northeast Brook (Trepassey)	229	312	368	227	213	173	156	249	126	193	239	194	196	135	256	248	216	157	156	303	167	240.9	189.6	210.1
	Rocky River	64	29	59	22	30	17	40	22	28	34	25	56	34	56	54	39	34	33	40	50	51	35.4	35.4	43.7
10	Northeast River (Placentia)	204	152	352	166	247	302	269	175	555	527	430	412	766	482	489	276	449	168	243			233.4	538.0	351.2
11	Little River				29	30	60	106	47	44	80	37	56	288	200	231	38	263	69	224	144	295	54.4	101.0	167.0
	Conne River - Conservation			262	394	285	185	201	93	87	110	72	147	204	125	150	122	210	67	113	81	160	236.7	124.0	124.0
	Management			146	219	159	103	112	51	48	61	40	82	114	70	84	68	117	37	63	45	89	131.7	69.0	69.1
13	Highlands River										46	77	67	79	105	59	49	34	34.8	53	99	155		67.3	62.0
	Crabbes River									34	13	41		68	95	53	66	63	53	43	81	123		39.0	64.9
	Middle Barachois Brook									53	48	74		52	95		43	95	80	61	61	79		56.8	72.5
	Robinsons River									57	23	65		67	91		118	135	142	82	94	132		53.0	110.3
	Fischells River									14	24	71			44	23	110	142	18	28	86	99		36.3	64.4
	Flat Bay Brook									18	14	19	45	85	89		149	167	71	97	99	126		36.2	112.0
	Harry's River									13	41	51	53	46	50	49	49	29	33	60	82	89		40.8	50.3
	Pinchgut Brook									36	117	145	150	130	140	136	138	82	36	116				115.6	108.0
	Humber River							60	27	117	96	40	128	186	115	120	201						43.5	113.4	145.3
14A	Trout River																		25	25					25.0
	Lomond River	74	31	59	56	70	61	62	64	121	118	142	187	143	161	151	181	140	88	112	129	134	59.6	142.2	137.4
	Torrent River	270	161	360	199	266	225	221	178	313	538	530	1033	1279	797	924	680	657	400	597	496	685	235.0	738.6	650.1
	Western Arm Brook	30	80	156	103	67	142	157	68	151	288	292	286	415	200	625	370	567	193	510	466	425	100.4	286.4	418.7

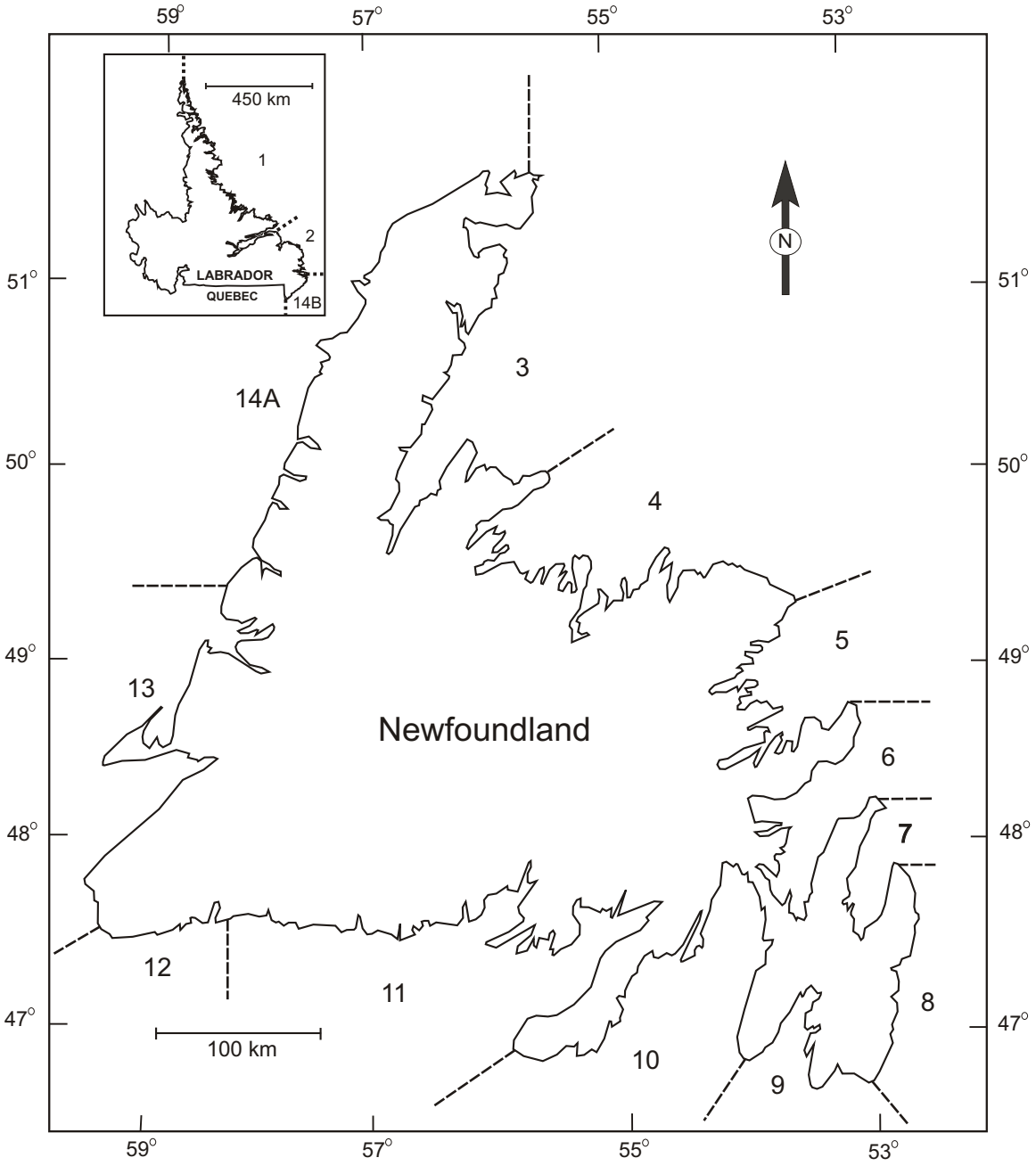


Fig. 1. Map showing the 14 Salmon Fishing Areas of the Newfoundland Region.

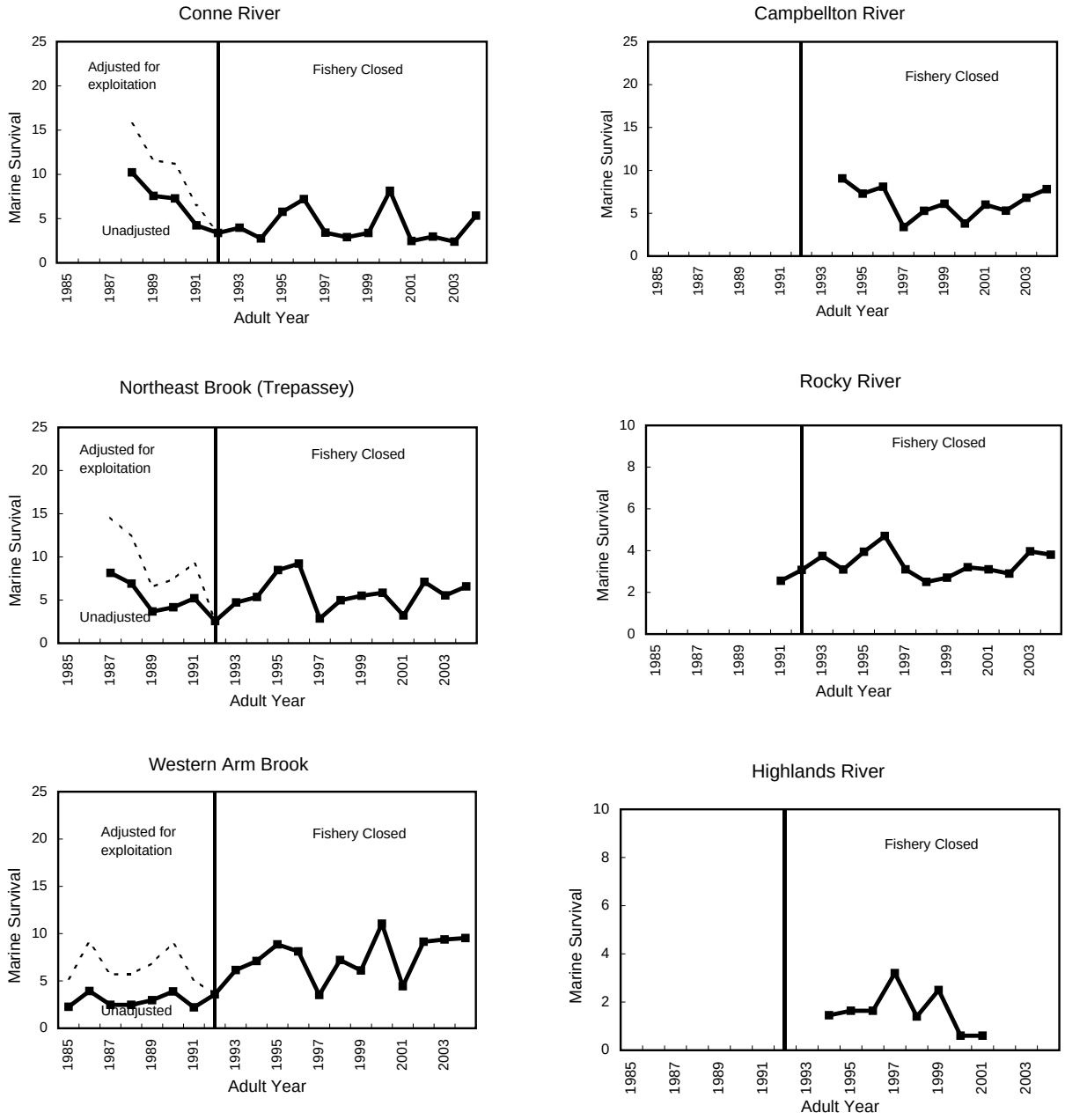


Fig. 2. Estimates of marine survival from smolts in year i to adult small salmon in year i+1. Dashed line represents marine survival adjusted for average marine exploitation rate (from Dempson et al. MS 1998).

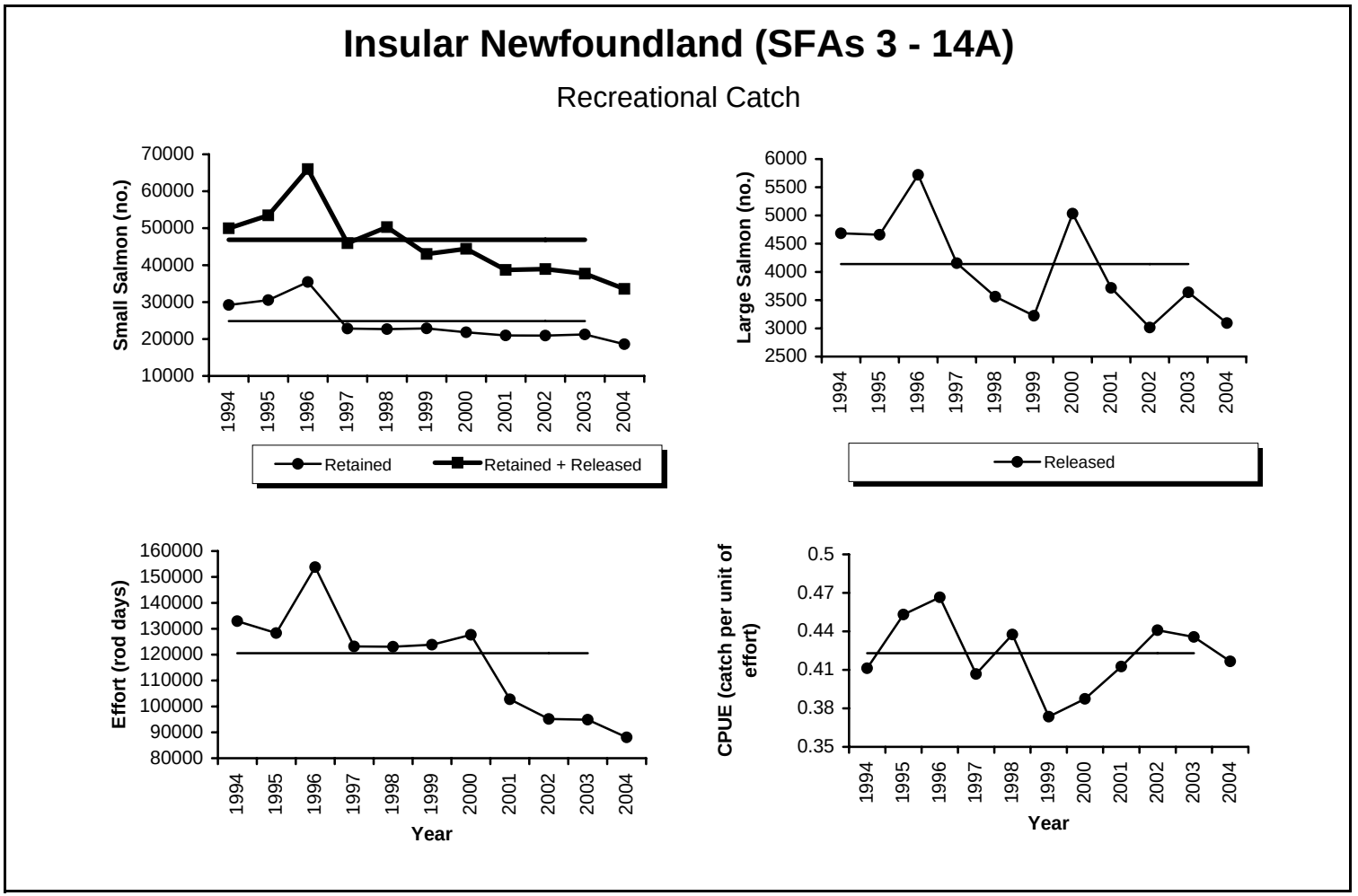


Fig. 3. Recreational catch of small salmon (retained and retained plus released), large salmon released, effort, and CPUE, 1994-2004, for Insular Newfoundland (SFAs 3-14A). The thin horizontal line represents the 1994-2003 mean for small salmon retained, large released, effort and CPUE, and the thick horizontal line the 1994-2003 mean for retained and released small salmon combined.

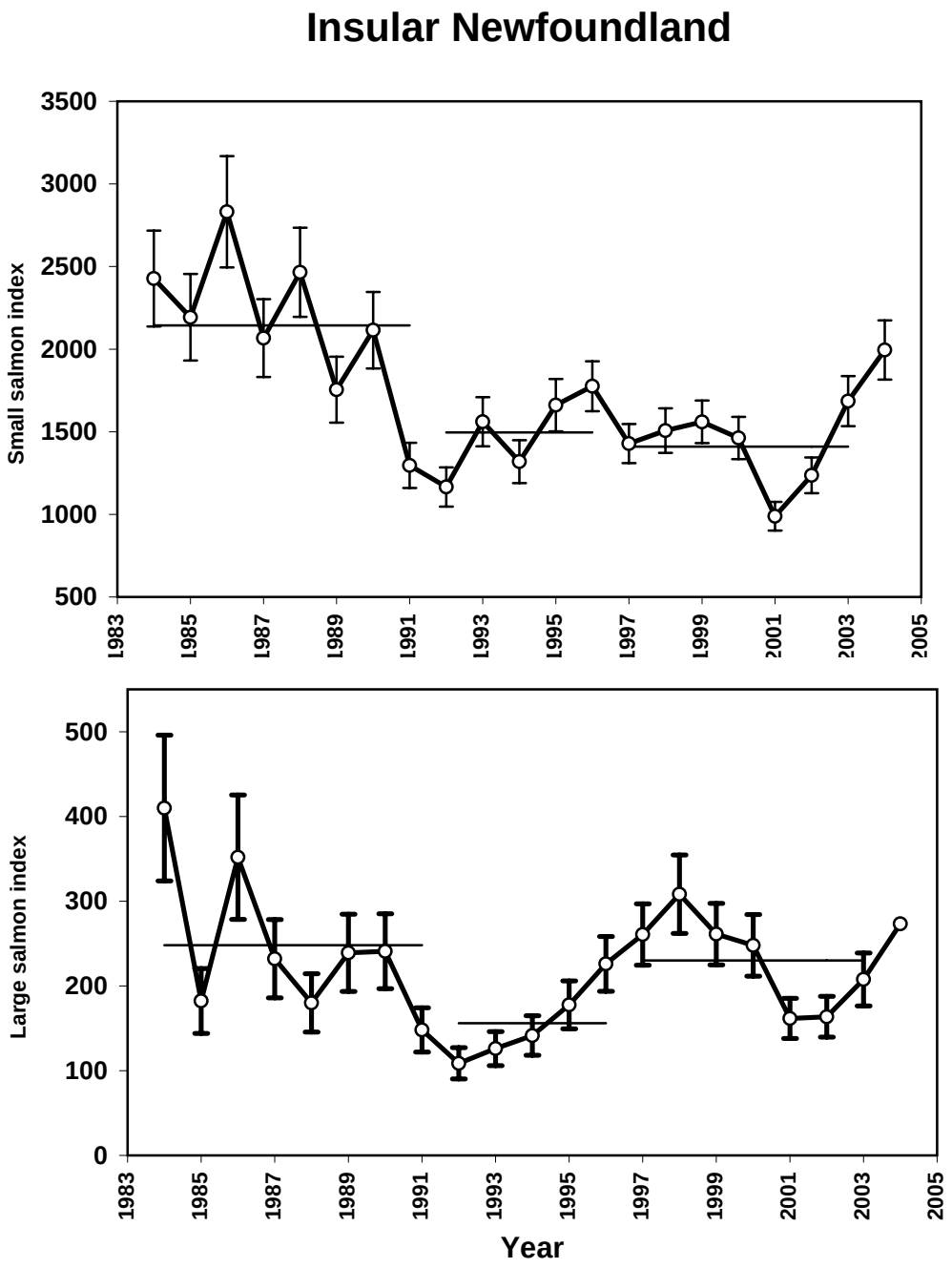


Figure 4. Trends in abundance of small (upper) and large (lower) salmon for insular Newfoundland, SFAs 3 -14A, all rivers combined, 1984 to 2004. Vertical lines represent ± 1 standard error. Horizontal lines illustrate the mean abundance index for the periods 1984-1991, 1992-1996, and 1997-2003.

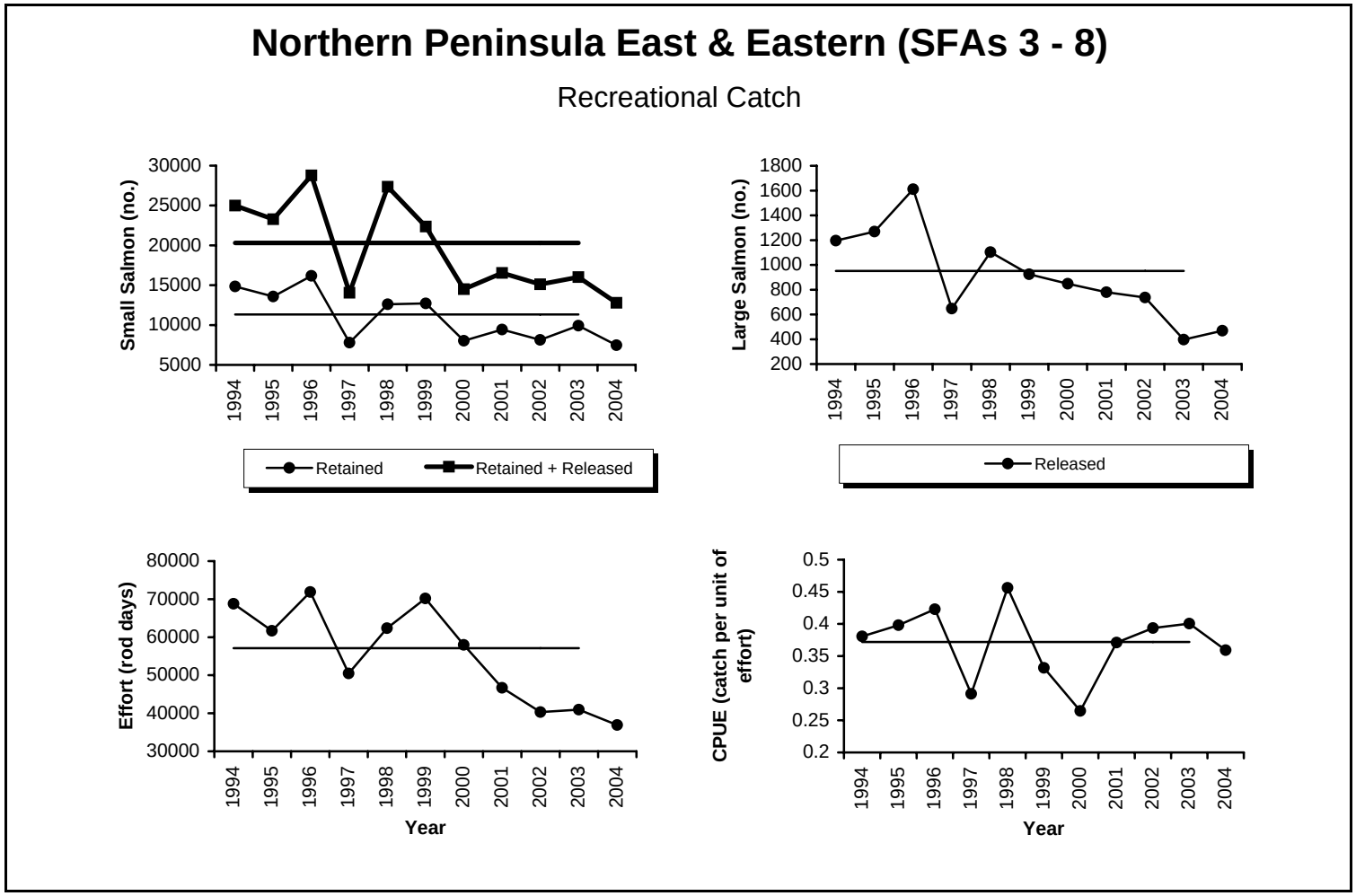


Fig. 5. Recreational catch of small salmon (retained and retained plus released), large salmon released, effort, and CPUE, 1994-2004, for Northern Peninsula East & Eastern (SFAs 3-8). The thin horizontal line represents the 1994-2003 mean for small salmon retained, large released, effort and CPUE, and the thick horizontal line the 1994-2003 mean for retained and released small salmon combined.

NORTHEAST COAST

Total Returns

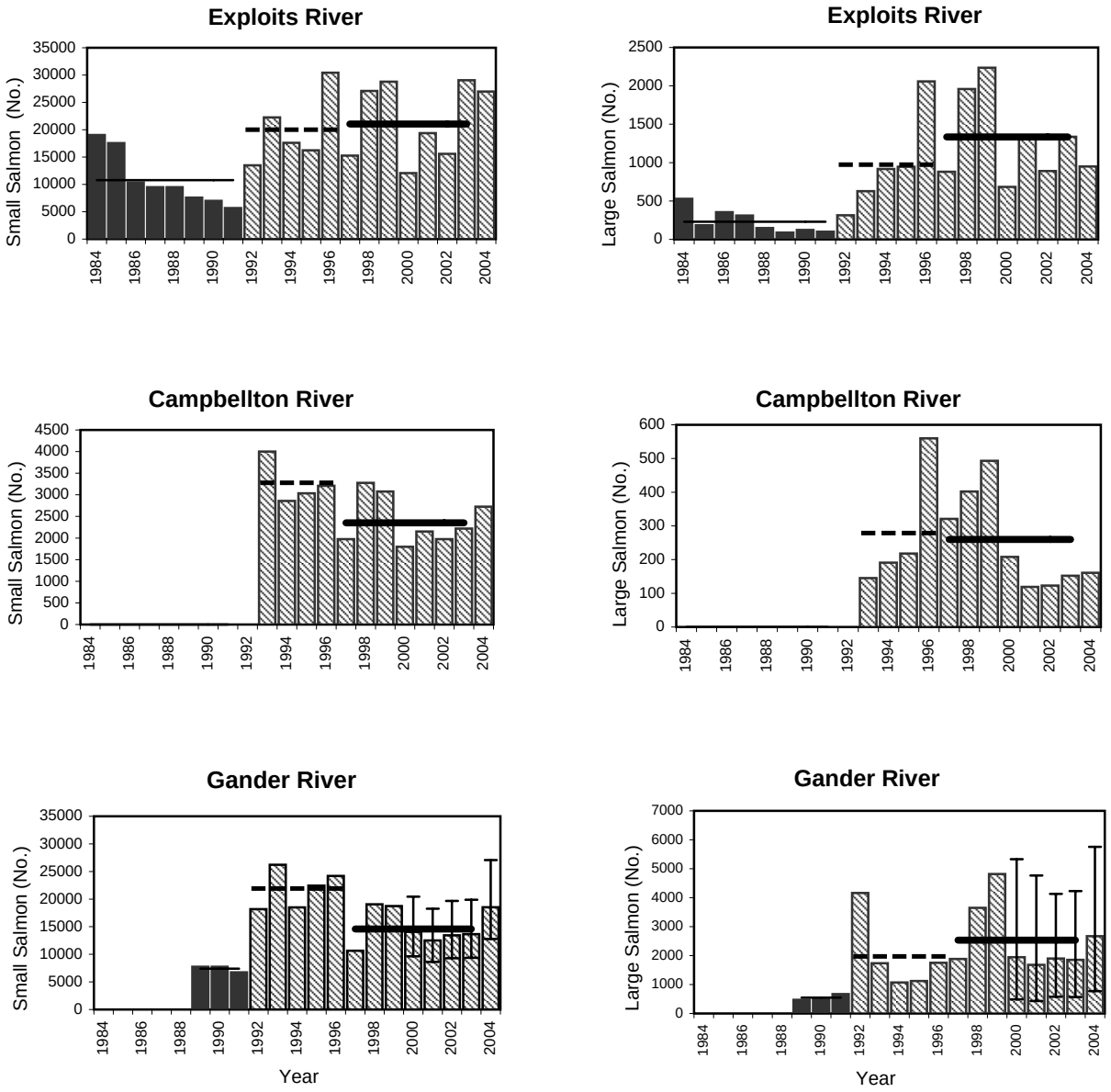


Fig. 6. Total returns of small and large salmon to Exploits River, Campbellton River and Gander River (northeast coast), 1984-2004. The thin solid horizontal line represents the 1984-1991 mean, the broken line the 1992-1996 mean, and the thick solid line the 1997-2003 mean. The dark gray bars represent the pre-moratorium years and the cross-hatched bars the moratorium years. Vertical lines are estimates of the 5th to 95th percentiles.

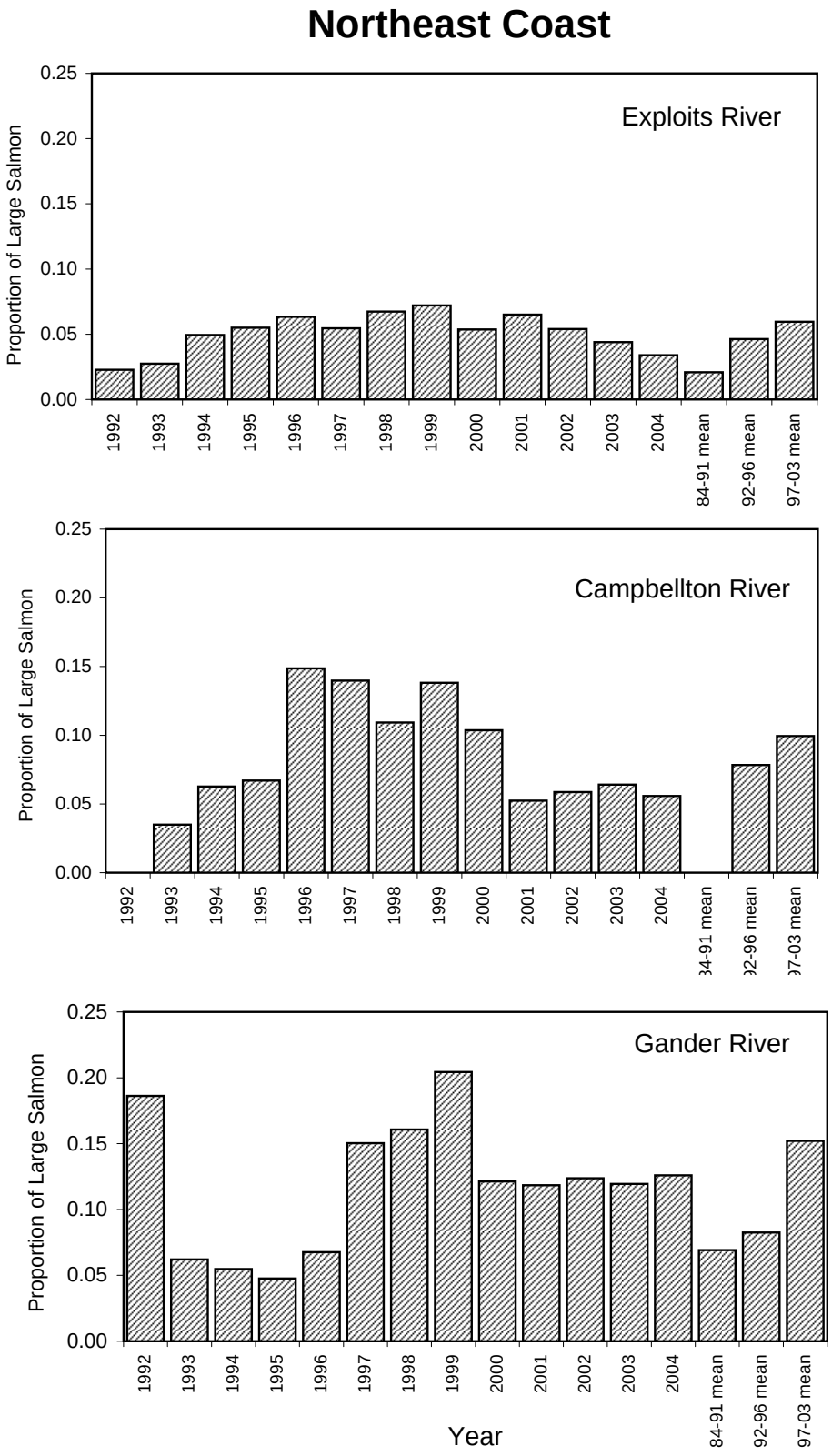


Fig. 7. Proportion of large salmon in total returns to Exploits River, Campbellton River and Gander River, (northeast coast), 1992-2004, and the 1984-1991, 1992-1996 and 1997-2003 means.

EAST COAST
Total Returns

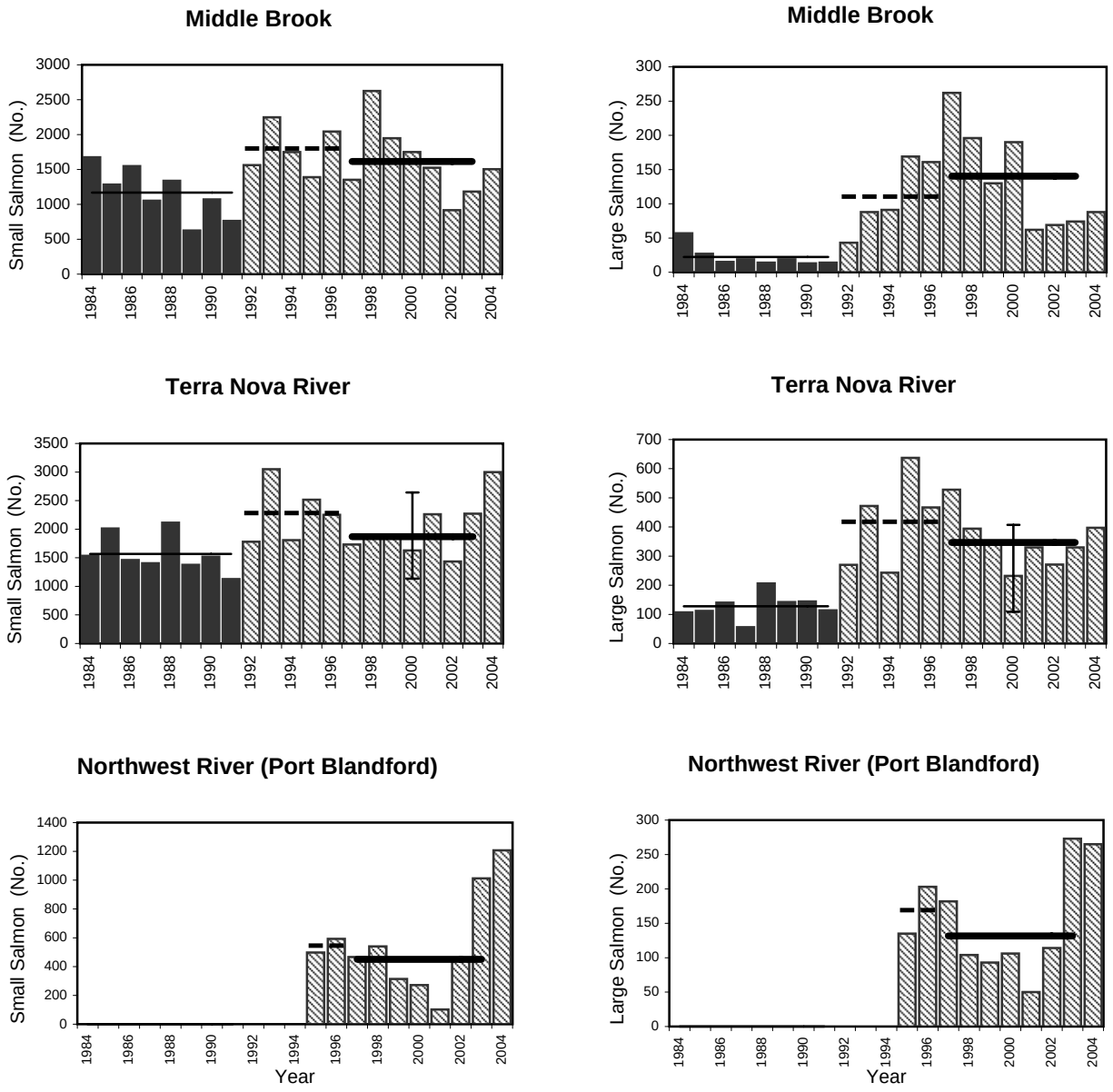


Fig. 8. Total returns of small and large salmon to Middle Brook, Terra Nova River and Northwest River, Port Blandford (east coast), 1984-2004. The thin solid horizontal line represents the 1984-1991 mean, the broken line the 1992-1996 mean, and the thick solid line the 1997-2003 mean. The dark gray bars represent the pre-moratorium years and the cross-hatched bars the moratorium years. Vertical lines are estimates of the 5th to 95th percentiles.

East Coast

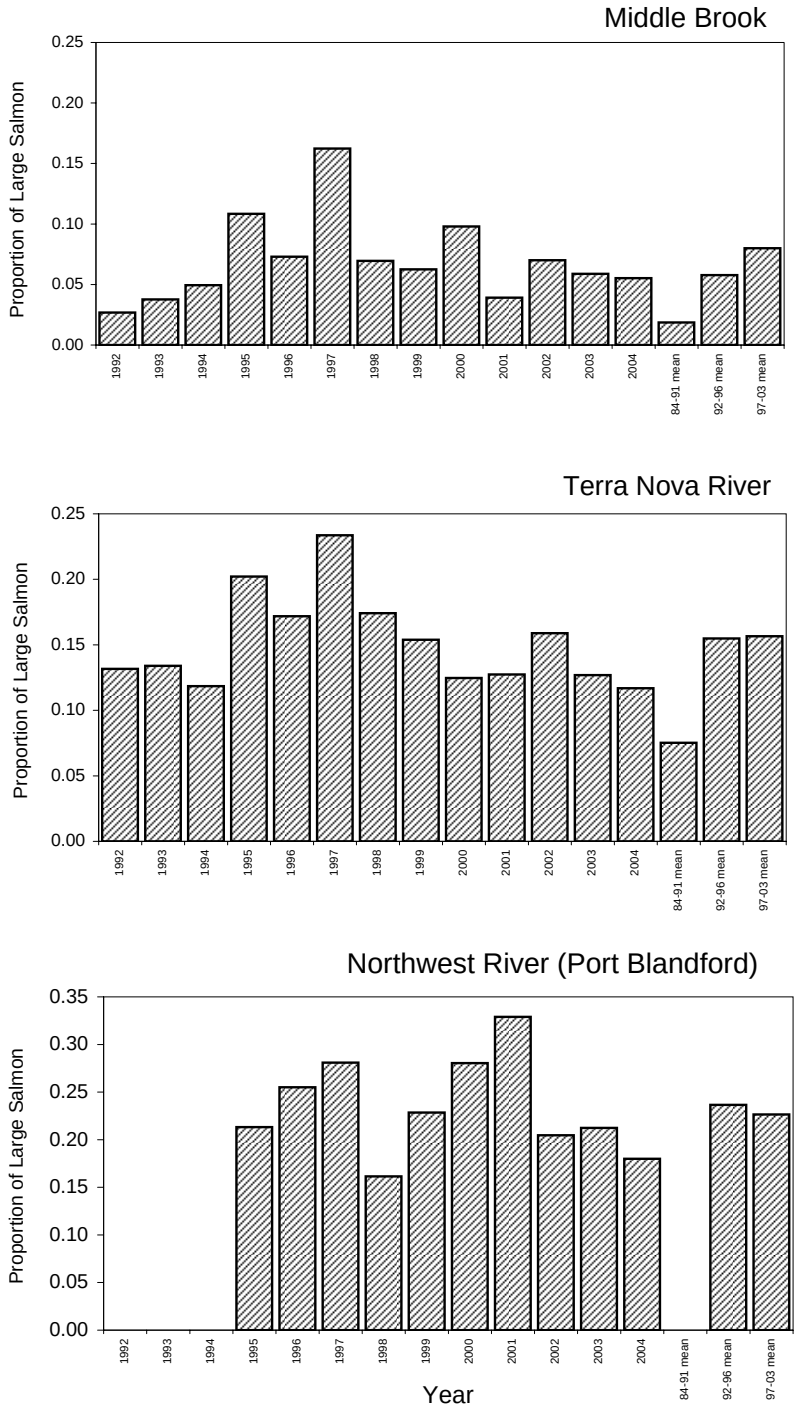
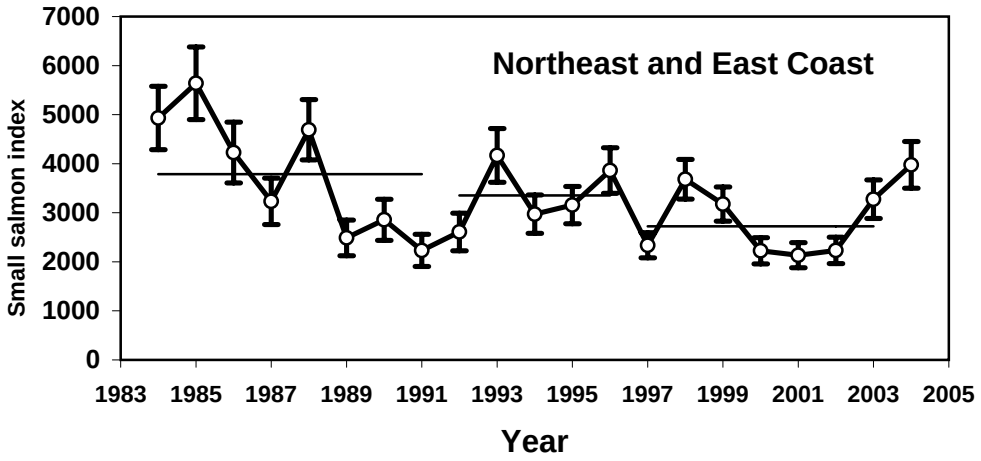


Fig. 9. Proportion of large salmon in total returns to Middle Brook, Terra Nova River and Northwest River, Port Blandford, (northeast coast), 1992-2004, and the 1984-1991, 1992-1996 and 1997-2003 means.



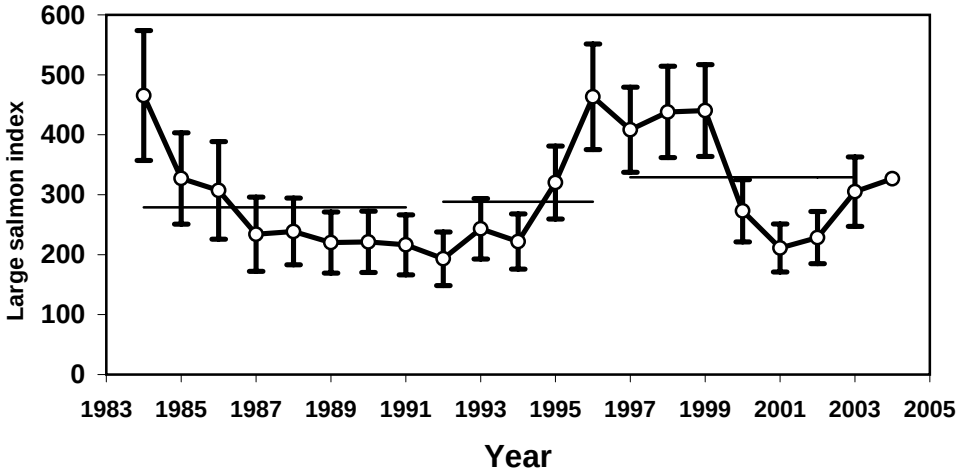


Figure 10. Trends in abundance of small (upper) and large (lower) salmon for northeast and east coast Newfoundland, SFAs 3-8, 1984 to 2004. Vertical lines represent ± 1 standard error. Horizontal lines illustrate the mean abundance index for the periods 1984-1991, 1992-1996, and 1997-2003.

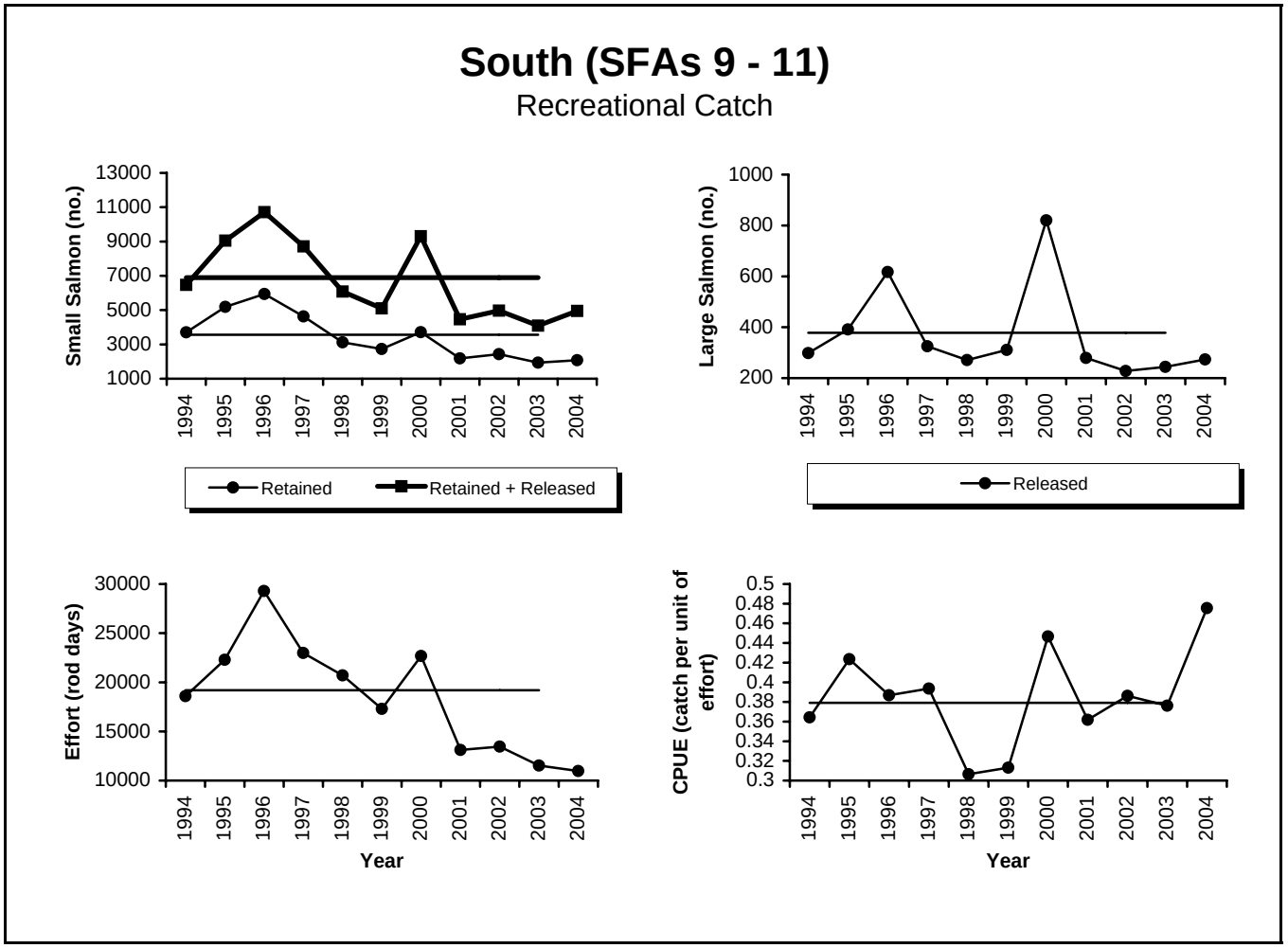


Fig. 11. Recreational catch of small salmon (retained and retained plus released), large salmon released, effort, and CPUE, 1994-2004, for South (SFAs 9-11). The thin horizontal line represents the 1994-2003 mean for small salmon retained, large released, effort and CPUE, and the thick horizontal line the 1994-2003 mean for retained and released small salmon combined.

SOUTH COAST
Total Returns

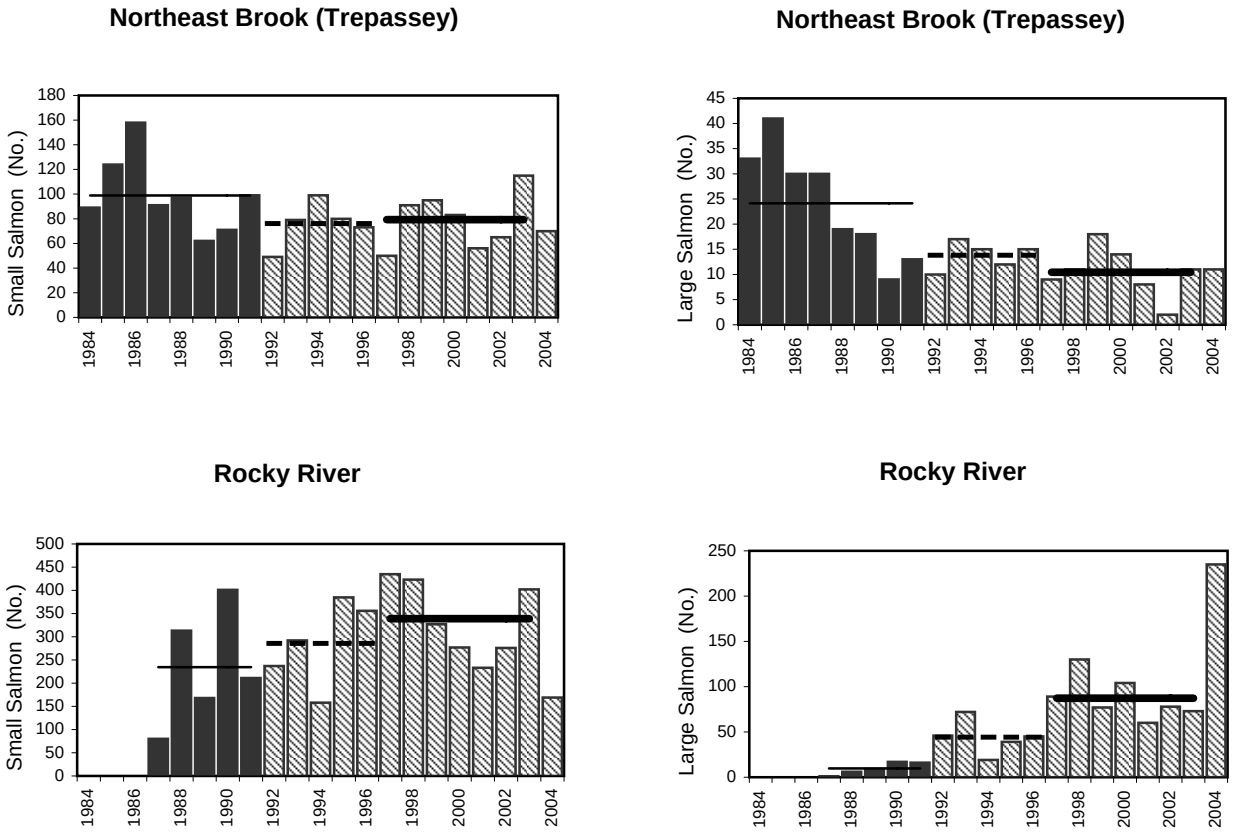


Fig. 12. Total returns of small and large salmon to Northeast Brook (Trepassey), Rocky River, Little River and Conne River (south coast), 1984-2004. The thin solid horizontal line represents the 1984-1991 mean, the broken line the 1992-1996 mean, and the thick solid line the 1997-2003 mean. The dark gray bars represent the pre-moratorium years and the cross-hatched bars the moratorium years. Vertical lines are estimates of the 5th to 95th percentiles.

SOUTH COAST
Total Returns

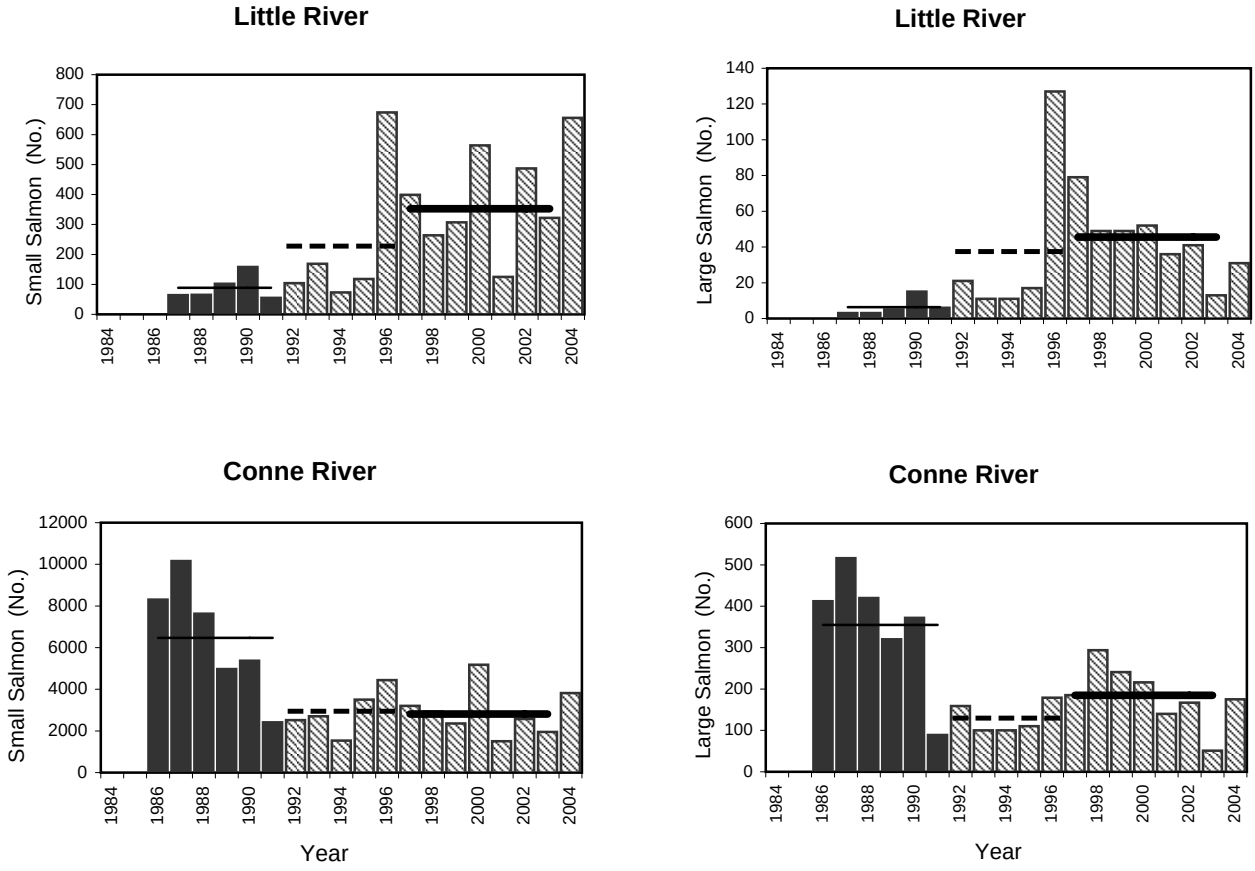


Fig. 12 cont'd

South Coast

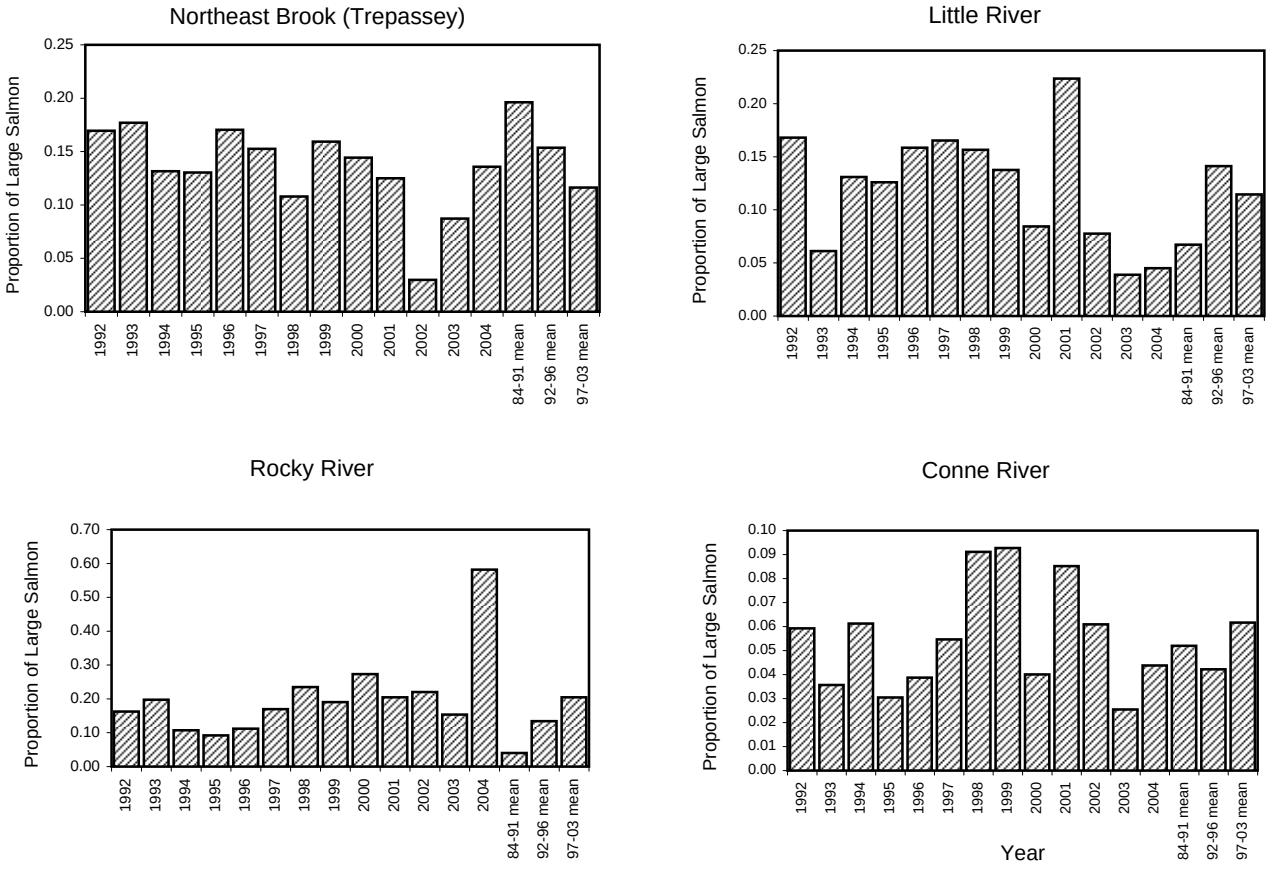


Fig. 13. Proportion of large salmon in total returns to Northeast Brook (Trepassey), Rocky River, Little River and Conne River, (south coast), 1992-2004, and the 1984-1991, 1992-1996 and 1997-2003 means.

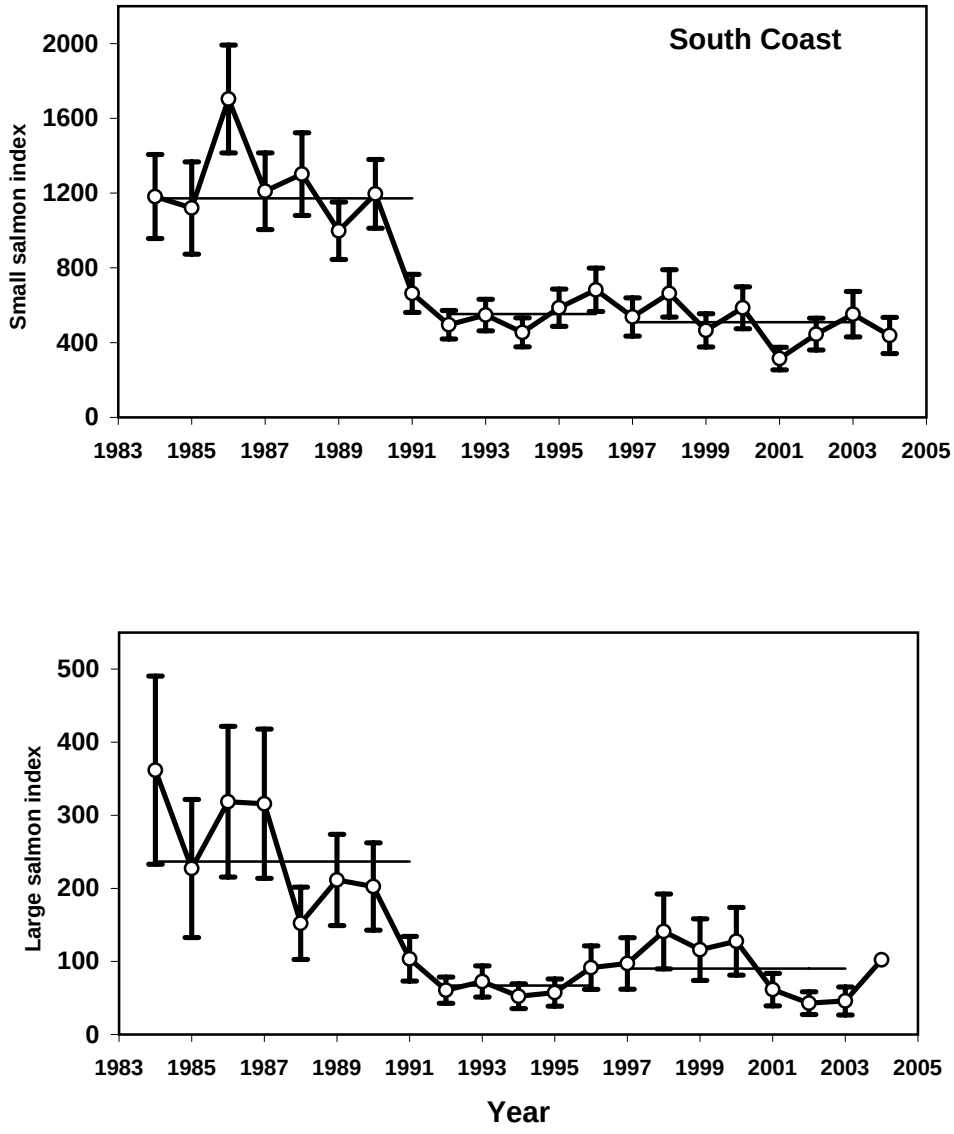


Figure 14. Trends in abundance of small (upper) and large (lower) salmon for south coast Newfoundland, SFAs 9-11, 1984 to 2004. Vertical lines represent ± 1 standard error. Horizontal lines illustrate the mean abundance index for the periods 1984-1991, 1992-1996, and 1997-2003.

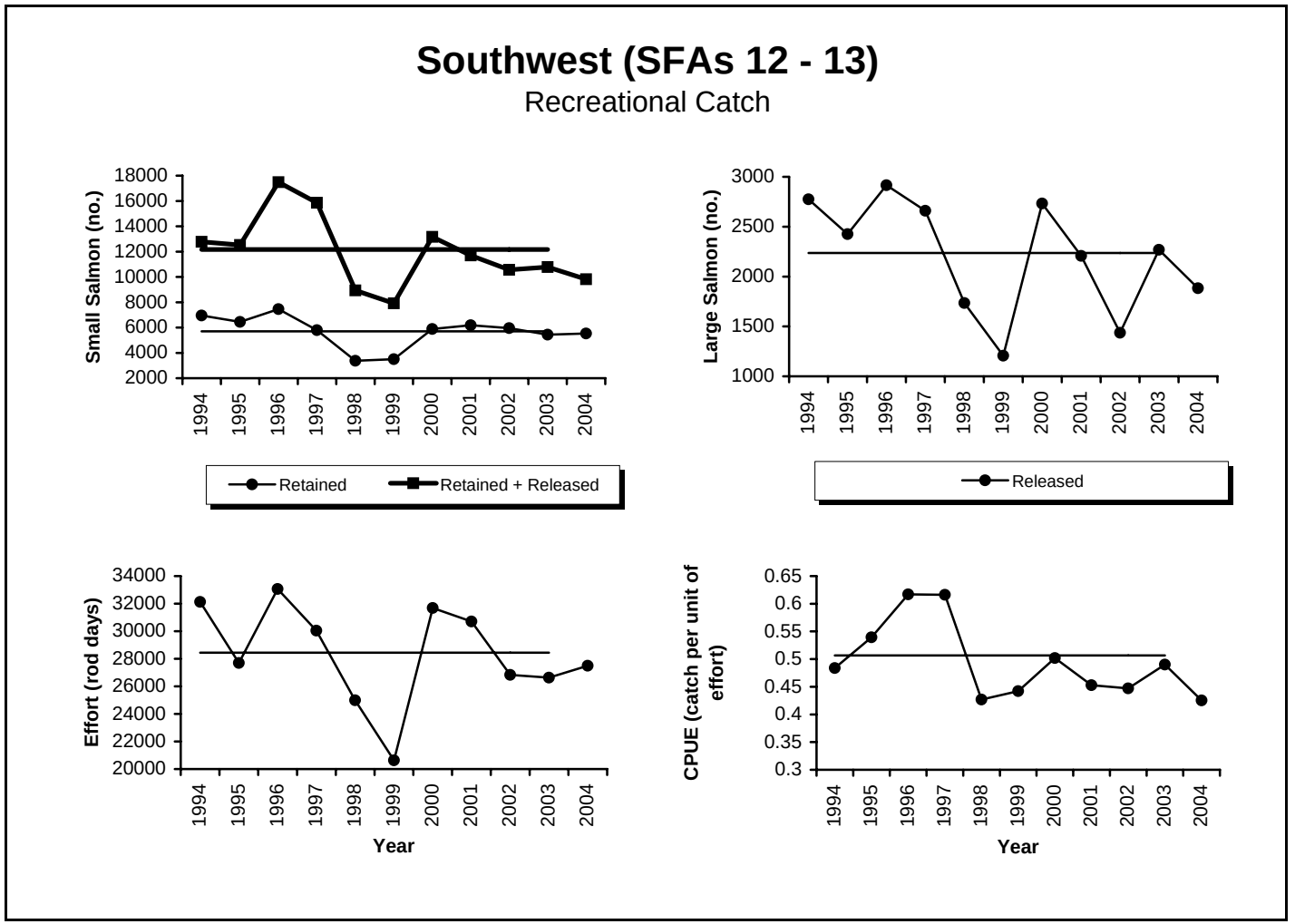


Fig. 15. Recreational catch of small salmon (retained and retained plus released), large salmon released, effort, and CPUE, 1994-2004, for Southwest (SFAs12-13). The thin horizontal line represents the 1994-2003 mean for small salmon retained, large released, effort and CPUE, and the thick horizontal line the 1994-2003 mean for retained and released small salmon combined.

SOUTHWEST COAST
Total Returns

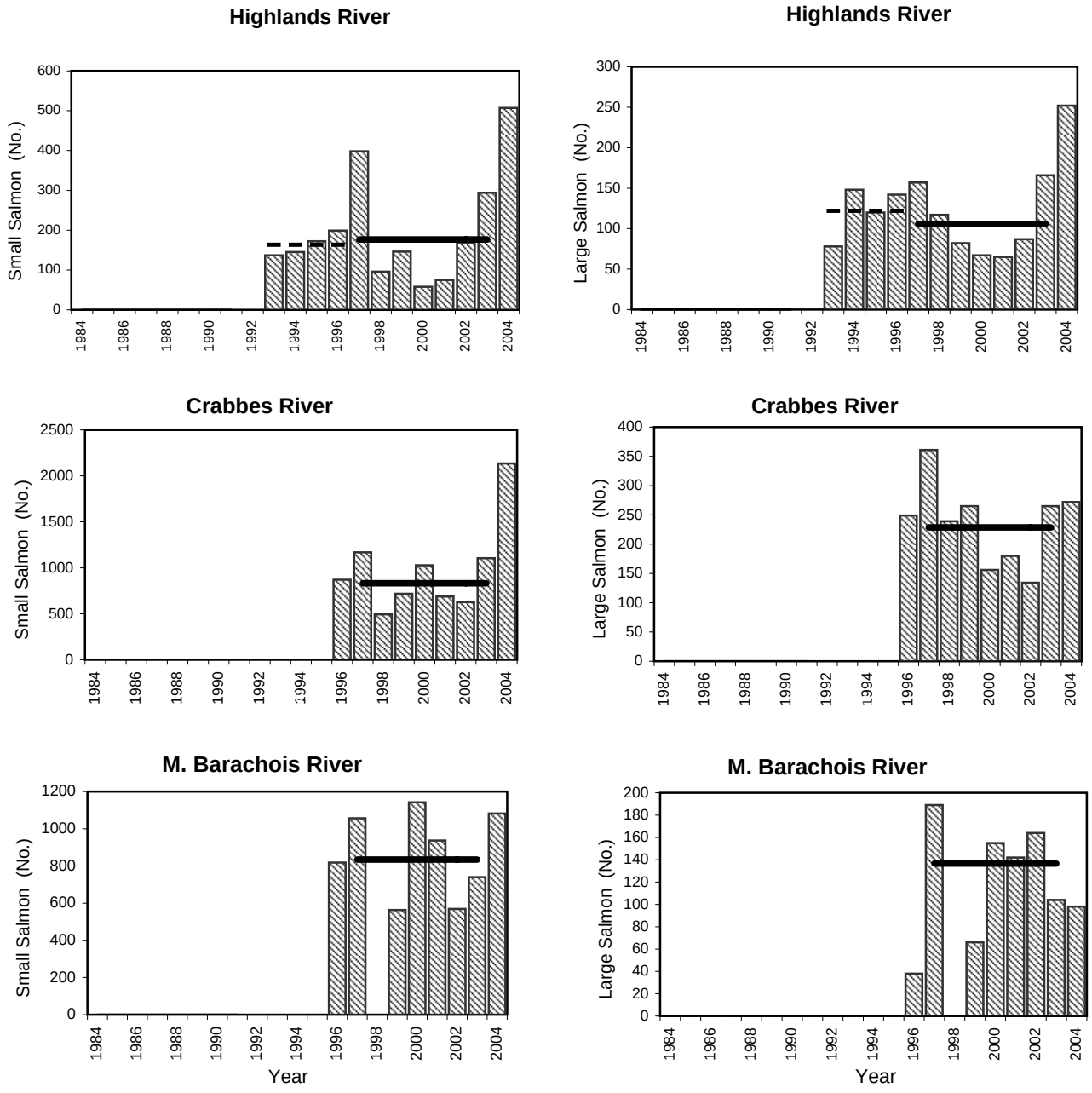


Fig. 16. Total returns of small and large salmon to Highlands River, Crabbes River, M. Barachois River, Robinsons River, Fischells River, Flat Bay Brook and Harry's River (southwest coast), 1984-2004. The broken horizontal line represents the 1992-1996 mean and the thick solid line the 1997-2003 mean.

SOUTHWEST COAST

Total Returns

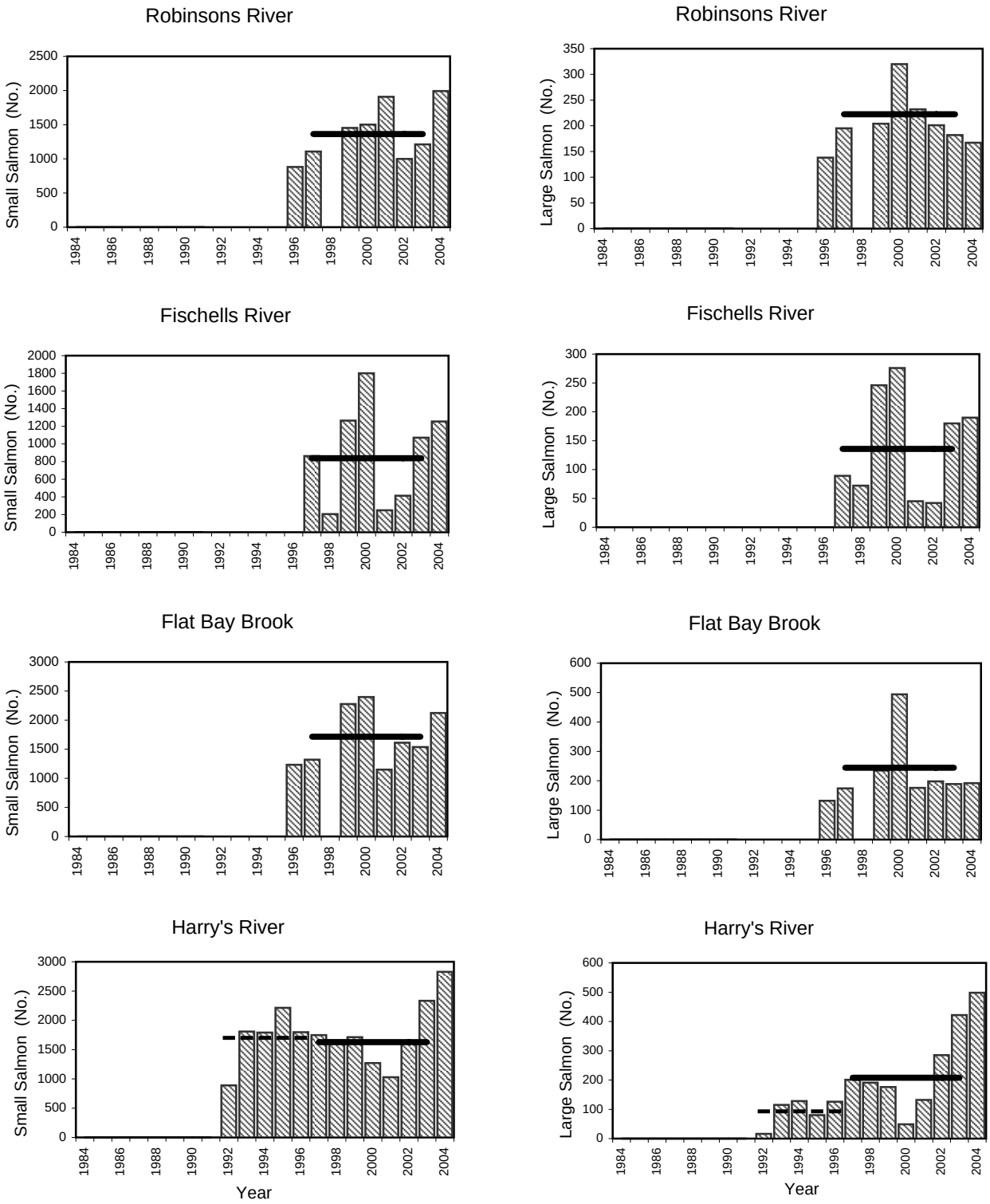


Fig. 16 cont'd

Southwest Coast

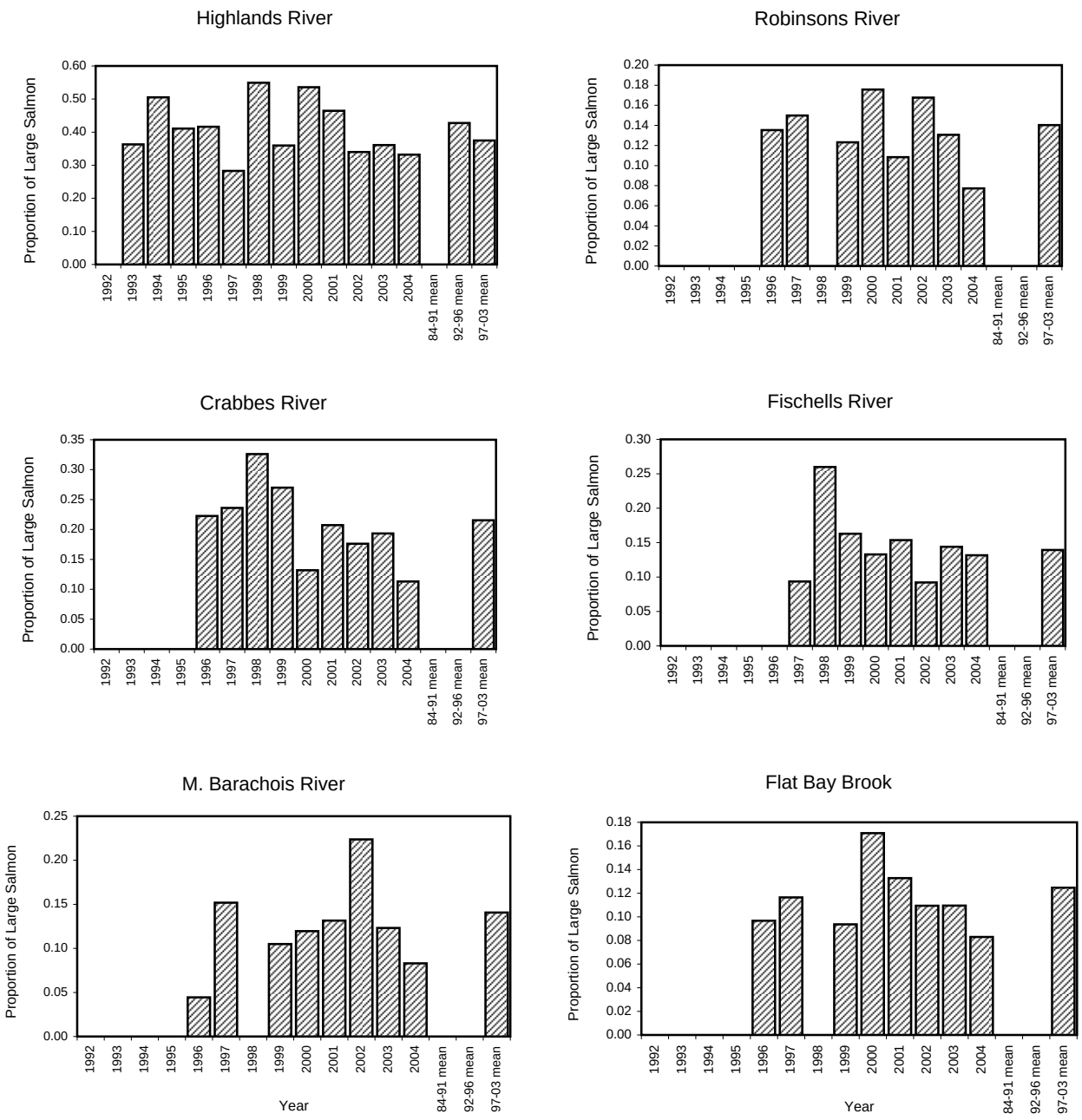


Fig. 17. Proportion of large salmon in total returns to Highlands River, Crabbes River, M. Barachois River, Robinsons River, Fischells River, Flat Bay Brook and Harry's River, (southwest coast), 1992-2004, and the 1984-1991, 1992-1996 and 1997-2003 means.

Southwest Coast

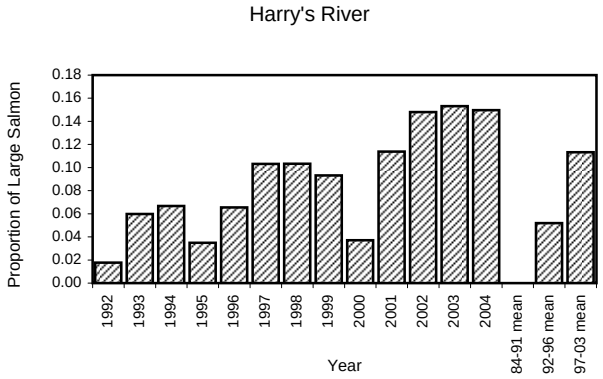


Fig. 17. cont'd

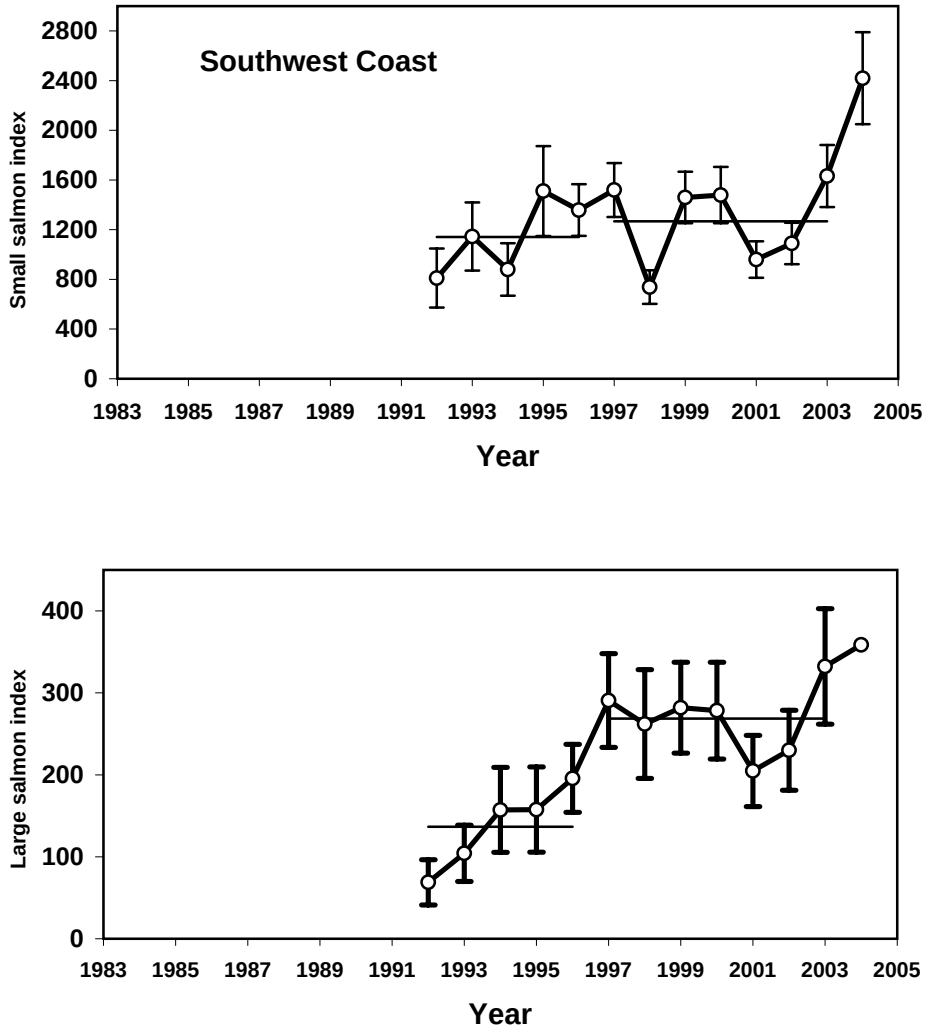


Figure 18. Trends in abundance of small (upper) and large (lower) salmon for southwest coast Newfoundland, SFA 13, 1992 to 2004. Vertical lines represent ± 1 standard error. Horizontal lines illustrate the mean abundance index for the periods

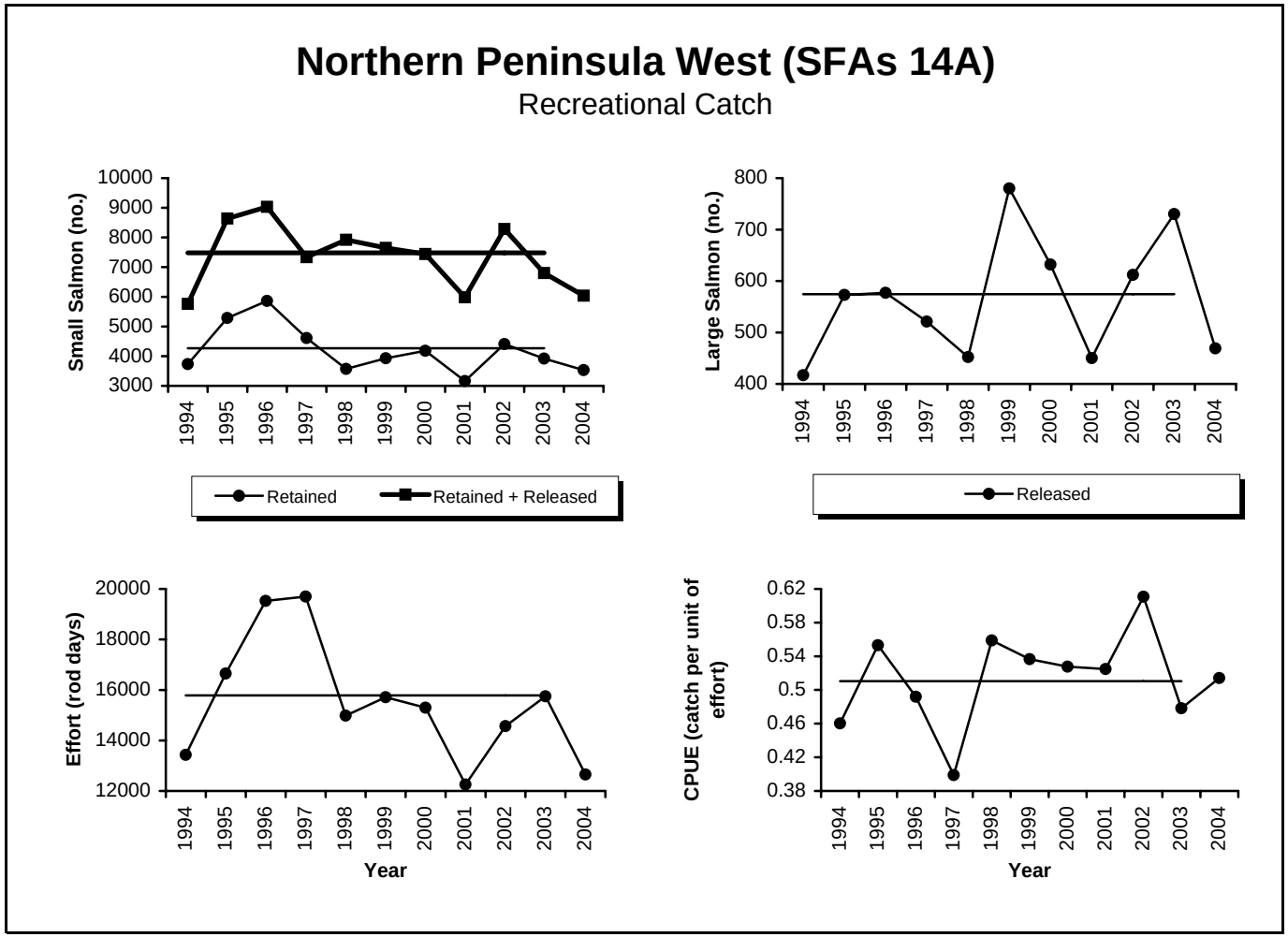


Fig. 19. Recreational catch of small salmon (retained and retained plus released), large salmon released, effort, and CPUE, 1994-2004, for Northern Peninsula West (SFA 14A). The thin horizontal line represents the 1994-2003 mean for small salmon retained, large released, effort and CPUE, and the thick horizontal line the 1994-2003 mean for retained and released small salmon combined.

NORTHWEST COAST
Total Returns

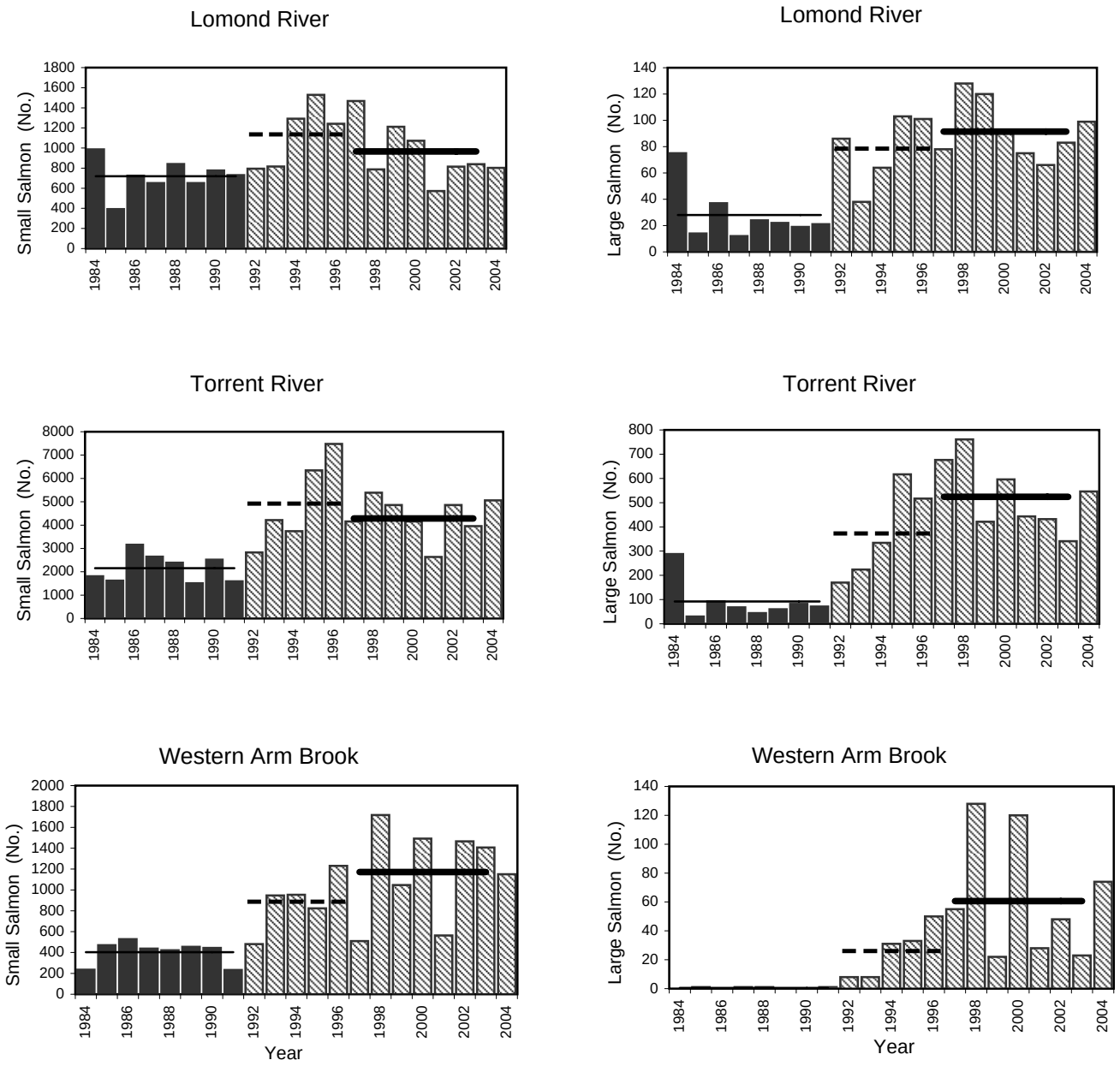


Fig. 20. Total returns of small and large salmon to Lomond River, Torrent River, and Western Arm Brook (northwest coast), 1984-2004. The thin horizontal line represents the 1984-1991 mean, the broken line the 1992-1996 mean and the thick solid line the 1997-2003 mean. The dark gray bars represent the pre-moratorium years and the cross-hatched bars the moratorium years.

Northwest Coast

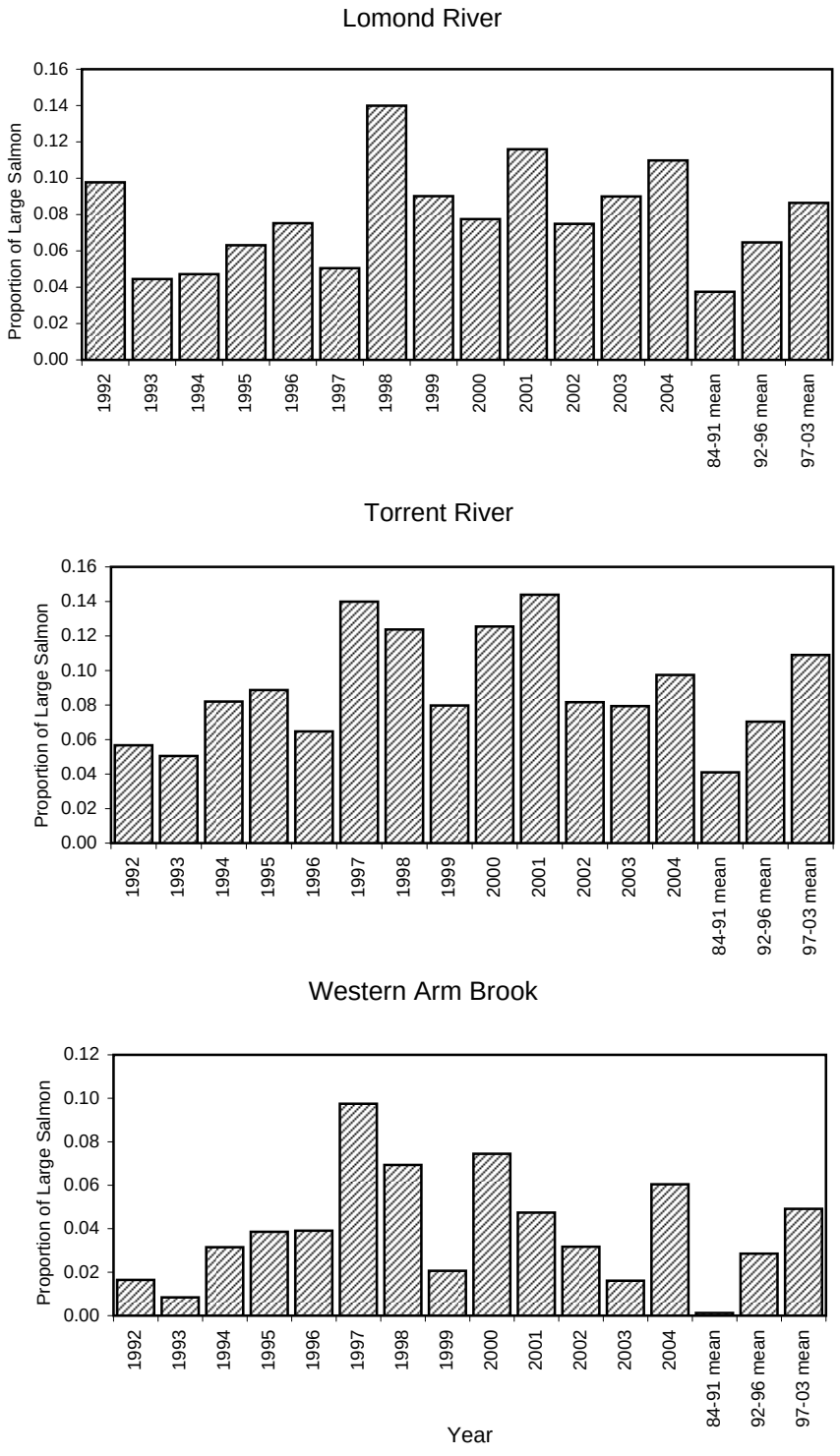


Fig. 21. Proportion of large salmon in total returns to Lomond River, Torrent River and Western Arm Brook, (northwest coast), 1992-2004, and the 1984-1991, 1992-1996 and 1997-2003 means.

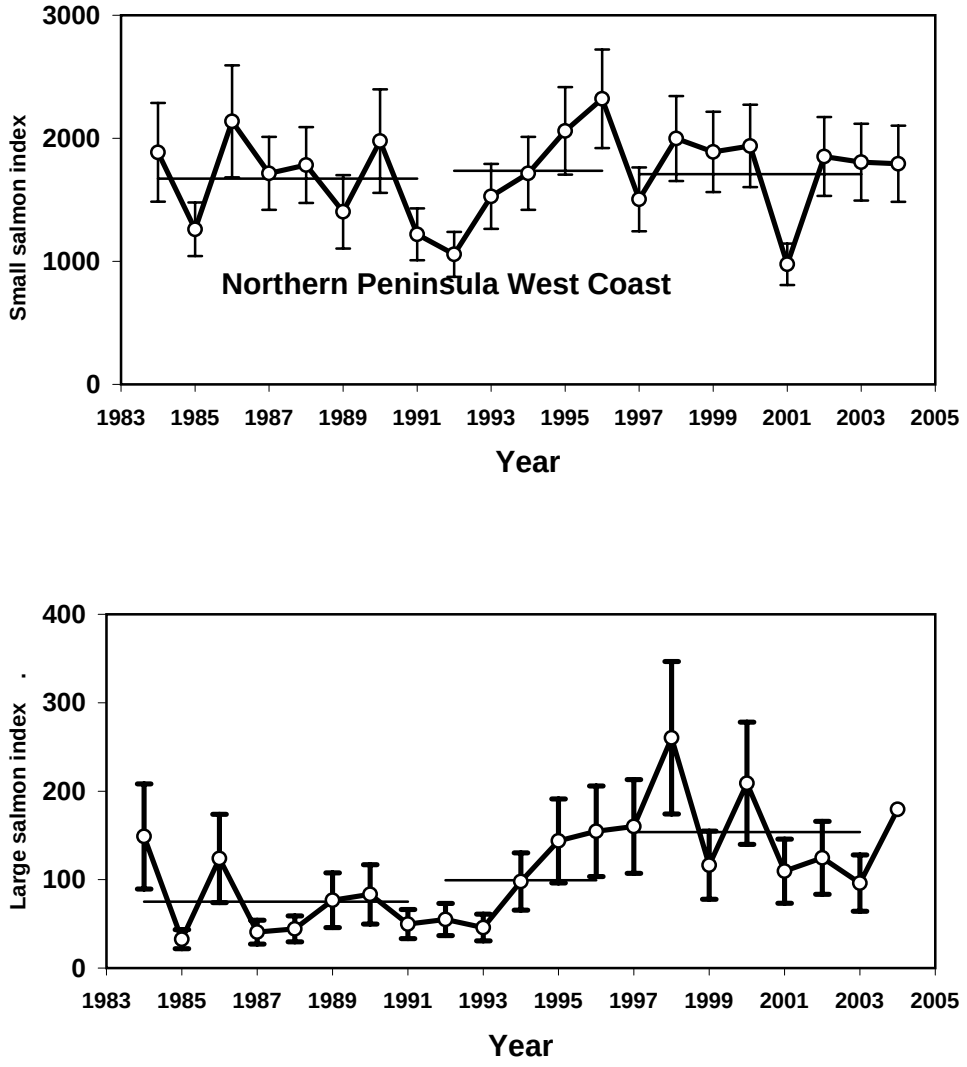


Figure 22. Trends in abundance of small (upper) and large (lower) salmon for the northern peninsula west, Newfoundland, SFA 14A, 1984 to 2004. Vertical lines represent ± 1 standard error. Horizontal lines illustrate the mean abundance index for the periods 1984-1991, 1992-1996, and 1997-2003.

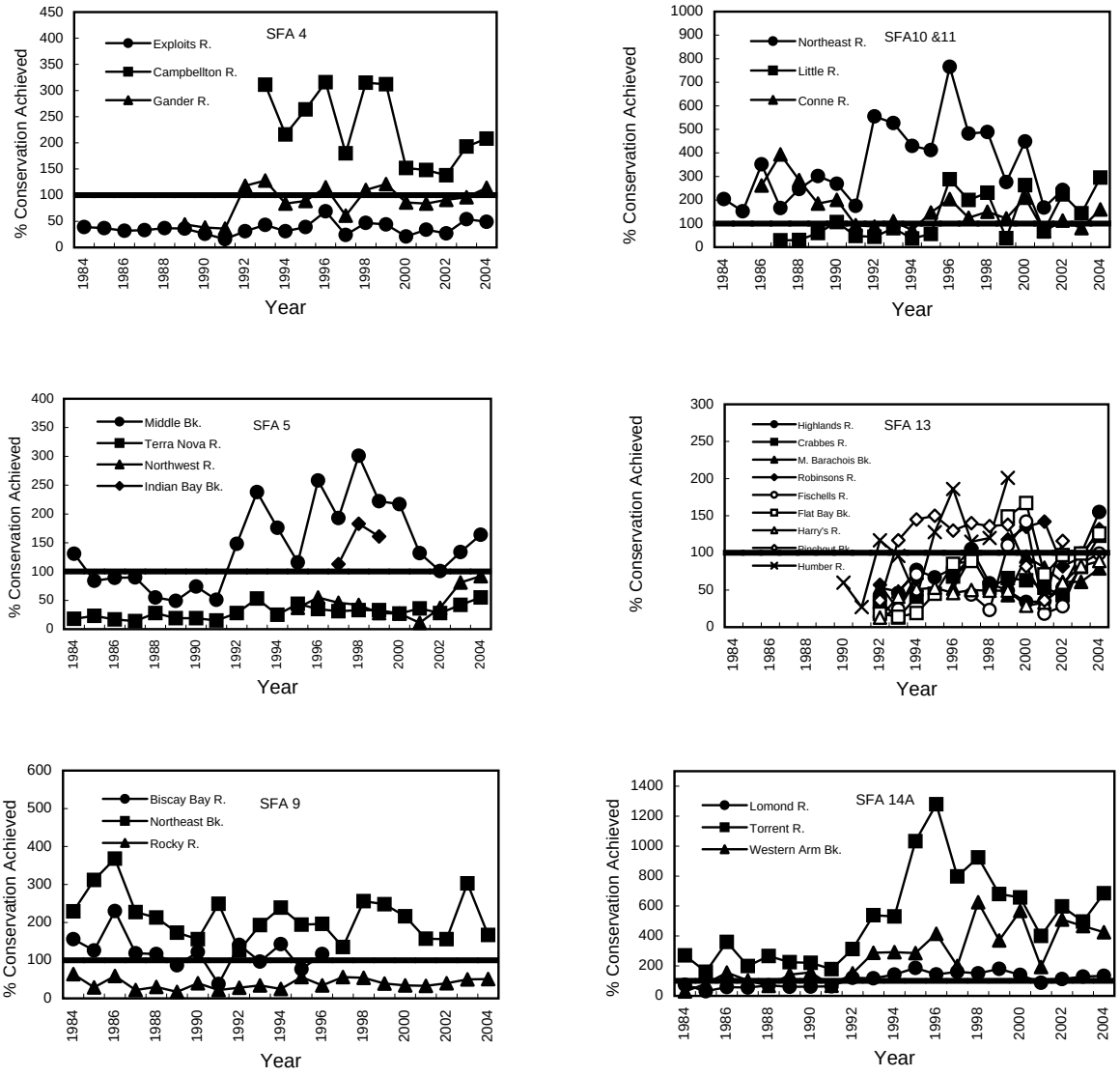


Fig. 23. Percent of conservation egg requirement achieved since 1984 for rivers in insular Newfoundland, by SFA. Horizontal line represents 100% of conservation requirement.

Appendix 1a. Atlantic salmon recreational fishery catch and effort data for insular Newfoundland (SFAs 3 - 14A), 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	132935	29225	20761	49986	*	4685	4685	29225	25446	54671	0.41
1995	128309	30512	22971	53483	*	4658	4658	30512	27629	58141	0.45
1996	153759	35440	30566	66006	*	5720	5720	35440	36286	71726	0.47
1997	123165	22819	23129	45948	*	4154	4154	22819	27283	50102	0.41
1998	123041	22668	27610	50278	*	3561	3561	22668	31171	53839	0.44
1999	123840	22870	20160	43030	*	3222	3222	22870	23382	46252	0.37
2000	127639	21808	22610	44418	*	5033	5033	21808	27643	49451	0.39
2001	102768	20977	17708	38685	*	3716	3716	20977	21424	42401	0.41
2002	95143	20913	18019	38932	*	3014	3014	20913	21033	41946	0.44
2003	94862	21226	16455	37681	*	3639	3639	21226	20094	41320	0.44
2004	88034	18605	14977	33582	*	3094	3094	18605	18071	36676	0.42
1994-2003 mean	120546	24846	21999	46845	.	4140	4140	24846	26139	50985	0.42
95% CL	13086	3609	3176	6159	.	619	619	3609	3592	6648	0.02
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1b. Atlantic salmon recreational fishery catch and effort data for Northern Peninsula East & Eastern (SFAs 3 - 8), 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	68793	14838	10145	24983	*	1196	1196	14838	11341	26179	0.38
1995	61670	13587	9693	23280	*	1269	1269	13587	10962	24549	0.40
1996	71876	16179	12604	28783	*	1611	1611	16179	14215	30394	0.42
1997	50451	7790	6253	14043	*	648	648	7790	6901	14691	0.29
1998	62367	12606	14742	27348	*	1103	1103	12606	15845	28451	0.46
1999	70198	12708	9651	22359	*	925	925	12708	10576	23284	0.33
2000	57989	8021	6480	14501	*	848	848	8021	7328	15349	0.26
2001	46684	9441	7096	16537	*	780	780	9441	7876	17317	0.37
2002	40296	8128	6992	15120	*	737	737	8128	7729	15857	0.39
2003	40957	9929	6075	16004	*	397	397	9929	6472	16401	0.40
2004	36912	7471	5316	12787	*	469	469	7471	5785	13256	0.36
1994-2003 mean	57128	11323	8973	20296	.	951	951	11323	9925	21247	0.37
95% CL	8503	2181	2110	4053	.	251	251	2181	2309	4270	0.04
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1c. Atlantic salmon recreational fishery catch and effort data for South (SFAs 9 - 11), 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	18587	3700	2772	6472	*	298	298	3700	3070	6770	0.36
1995	22293	5188	3863	9051	*	391	391	5188	4254	9442	0.42
1996	29290	5939	4772	10711	*	617	617	5939	5389	11328	0.39
1997	22978	4630	4088	8718	*	325	325	4630	4413	9043	0.39
1998	20708	3120	2957	6077	*	271	271	3120	3228	6348	0.31
1999	17294	2735	2368	5103	*	311	311	2735	2679	5414	0.31
2000	22674	3717	5592	9309	*	820	820	3717	6412	10129	0.45
2001	13118	2186	2282	4468	*	279	279	2186	2561	4747	0.36
2002	13447	2429	2536	4965	*	228	228	2429	2764	5193	0.39
2003	11526	1940	2152	4092	*	244	244	1940	2396	4336	0.38
2004	10975	2079	2867	4946	*	273	273	2079	3140	5219	0.48
1994-2003 mean	19192	3558	3338	6897	.	378	378	3558	3717	7275	0.38
95% CL	3939	959	845	1684	.	137	137	959	970	1790	0.03
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1d. Atlantic salmon recreational fishery catch and effort data for Southwest (SFAs 12 & 13), 1994-2004. Ret. = retained f ish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	32127	6953	5816	12769	*	2774	2774	6953	8590	15543	0.48
1995	27696	6450	6066	12516	*	2425	2425	6450	8491	14941	0.54
1996	33068	7461	10022	17483	*	2915	2915	7461	12937	20398	0.62
1997	30041	5790	10063	15853	*	2660	2660	5790	12723	18513	0.62
1998	24986	3374	5560	8934	*	1735	1735	3374	7295	10669	0.43
1999	20635	3499	4419	7918	*	1206	1206	3499	5625	9124	0.44
2000	31679	5891	7278	13169	*	2733	2733	5891	10011	15902	0.50
2001	30709	6188	5509	11697	*	2207	2207	6188	7716	13904	0.45
2002	26834	5950	4613	10563	*	1437	1437	5950	6050	12000	0.45
2003	26630	5440	5343	10783	*	2268	2268	5440	7611	13051	0.49
2004	27492	5526	4285	9811	*	1883	1883	5526	6168	11694	0.43
1994-2003 mean	28441	5700	6469	12169	.	2236	2236	5700	8705	14405	0.51
95% CL	2744	951	1459	2086	.	424	424	951	1793	2459	0.05
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1e. Atlantic salmon recreational fishery catch and effort data for the Northern Peninsula West (SFA 14A), 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	13428	3734	2028	5762	*	417	417	3734	2445	6179	0.46
1995	16650	5287	3349	8636	*	573	573	5287	3922	9209	0.55
1996	19525	5861	3168	9029	*	577	577	5861	3745	9606	0.49
1997	19695	4609	2725	7334	*	521	521	4609	3246	7855	0.40
1998	14980	3568	4351	7919	*	452	452	3568	4803	8371	0.56
1999	15713	3928	3722	7650	*	780	780	3928	4502	8430	0.54
2000	15297	4179	3260	7439	*	632	632	4179	3892	8071	0.53
2001	12257	3162	2821	5983	*	450	450	3162	3271	6433	0.52
2002	14566	4406	3878	8284	*	612	612	4406	4490	8896	0.61
2003	15749	3917	2885	6802	*	730	730	3917	3615	7532	0.48
2004	12655	3529	2509	6038	*	469	469	3529	2978	6507	0.51
1994-2003 mean	15786	4265	3219	7484	.	574	574	4265	3793	8058	0.51
95% CL	1693	582	472	764	.	86	86	582	503	796	0.05
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1f. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 3, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	11809	3667	2690	6357	*	201	201	3667	2891	6558	0.56
1995	8920	2589	2069	4658	*	293	293	2589	2362	4951	0.56
1996	10947	3492	2981	6473	*	267	267	3492	3248	6740	0.62
1997	7925	2148	1938	4086	*	164	164	2148	2102	4250	0.54
1998	10152	2917	3092	6009	*	229	229	2917	3321	6238	0.61
1999	8557	2037	1393	3430	*	75	75	2037	1468	3505	0.41
2000	9772	2192	1179	3371	*	168	168	2192	1347	3539	0.36
2001	7591	1789	1043	2832	*	151	151	1789	1194	2983	0.39
2002	5036	1742	1386	3128	*	125	125	1742	1511	3253	0.65
2003	7235	2075	1536	3611	*	70	70	2075	1606	3681	0.51
2004	4610	1079	896	1975	*	64	64	1079	960	2039	0.44
1994-2003 mean	8794	2465	1931	4396	.	174	174	2465	2105	4570	0.52
95% CL	1418	489	541	1000	.	53	53	489	578	1037	0.07
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1g. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 4, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	39900	8241	5837	14078	*	847	847	8241	6684	14925	0.37
1995	36736	7976	5904	13880	*	755	755	7976	6659	14635	0.40
1996	44128	9395	7746	17141	*	1138	1138	9395	8884	18279	0.41
1997	31462	4396	3697	8093	*	420	420	4396	4117	8513	0.27
1998	40632	7784	10040	17824	*	588	588	7784	10628	18412	0.45
1999	50159	9054	6975	16029	*	674	674	9054	7649	16703	0.33
2000	35213	4262	4097	8359	*	474	474	4262	4571	8833	0.25
2001	28090	6073	4637	10710	*	571	571	6073	5208	11281	0.40
2002	28340	5692	5186	10878	*	581	581	5692	5767	11459	0.40
2003	29042	7163	4258	11421	*	305	305	7163	4563	11726	0.40
2004	25936	5391	3817	9208	*	367	367	5391	4184	9575	0.37
1994-2003 mean	36370	7004	5838	12841	.	635	635	7004	6473	13477	0.37
95% CL	5295	1305	1402	2491	.	169	169	1305	1498	2606	0.05
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1h. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 5, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel.= released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	14727	2730	1547	4277	*	131	131	2730	1678	4408	0.30
1995	13557	2818	1672	4490	*	210	210	2818	1882	4700	0.35
1996	14328	3110	1786	4896	*	185	185	3110	1971	5081	0.35
1997	9690	1181	589	1770	*	58	58	1181	647	1828	0.19
1998	9683	1764	1556	3320	*	276	276	1764	1832	3596	0.37
1999	9591	1526	1156	2682	*	170	170	1526	1326	2852	0.30
2000	9581	1409	1080	2489	*	191	191	1409	1271	2680	0.28
2001	10257	1523	1392	2915	*	54	54	1523	1446	2969	0.29
2002	5799	642	338	980	*	23	23	642	361	1003	0.17
2003	4019	632	255	887	*	18	18	632	273	905	0.23
2004	5730	981	603	1584	*	36	36	981	639	1620	0.28
1994-2003 mean	10123	1734	1137	2871	.	132	132	1734	1269	3002	0.30
95% CL	2473	629	402	1006	.	64	64	629	452	1051	0.04
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1i. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 6, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	1772	151	63	214	*	15	15	151	78	229	0.13
1995	1505	98	14	112	*	5	5	98	19	117	0.08
1996	1561	115	59	174	*	16	16	115	75	190	0.12
1997	923	43	21	64	*	2	2	43	23	66	0.07
1998	947	80	33	113	*	4	4	80	37	117	0.12
1999	1382	59	28	87	*	4	4	59	32	91	0.07
2000	2744	128	63	191	*	11	11	128	74	202	0.07
2001	550	45	3	48	*	2	2	45	5	50	0.09
2002	648	40	19	59	*	6	6	40	25	65	0.10
2003	533	44	24	68	*	4	4	44	28	72	0.14
2004	552	20	0	20	*	2	2	20	2	22	0.04
1994-2003 mean	1257	80	33	113	.	7	7	80	40	120	0.10
95% CL	491	29	15	43	.	4	4	29	19	46	0.02
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1j. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 7, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	290	18	6	24	*	0	0	18	6	24	0.08
1995	624	59	6	65	*	3	3	59	9	68	0.11
1996	543	27	0	27	*	0	0	27	0	27	0.05
1997	179	11	0	11	*	4	4	11	4	15	0.08
1998	661	37	0	37	*	2	2	37	2	39	0.06
1999	166	10	3	13	*	0	0	10	3	13	0.08
2000	199	18	6	24	*	0	0	18	6	24	0.12
2001	179	8	21	29	*	2	2	8	23	31	0.17
2002	187	0	9	9	*	0	0	0	9	9	0.05
2003	104	10	2	12	*	0	0	10	2	12	0.12
2004	27	0	0	0	*	0	0	0	0	0	0.00
1994-2003 mean	313	20	5	25	.	1	1	20	6	26	0.08
95% CL	151	12	5	12	.	1	1	12	5	12	0.03
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1k. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 8, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	295	31	2	33	*	2	2	31	4	35	0.12
1995	328	47	28	75	*	3	3	47	31	78	0.24
1996	369	40	32	72	*	5	5	40	37	77	0.21
1997	272	11	8	19	*	0	0	11	8	19	0.07
1998	292	24	21	45	*	4	4	24	25	49	0.17
1999	343	22	96	118	*	2	2	22	98	120	0.35
2000	480	12	55	67	*	4	4	12	59	71	0.15
2001	17	3	0	3	*	0	0	3	0	3	0.18
2002	286	12	54	66	*	2	2	12	56	68	0.24
2003	24	5	0	5	*	0	0	5	0	5	0.21
2004	57	0	0	0	*	0	0	0	0	0	0.00
1994-2003 mean	271	21	30	50	.	2	2	21	32	53	0.19
95% CL	104	11	22	26	.	1	1	11	23	27	0.06
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1l. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 9, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	5708	843	403	1246	*	48	48	843	451	1294	0.23
1995	7194	1350	843	2193	*	138	138	1350	981	2331	0.32
1996	7701	1076	704	1780	*	123	123	1076	827	1903	0.25
1997	5928	664	452	1116	*	65	65	664	517	1181	0.20
1998	5104	698	592	1290	*	100	100	698	692	1390	0.27
1999	5034	585	291	876	*	103	103	585	394	979	0.19
2000	6611	891	458	1349	*	147	147	891	605	1496	0.23
2001	3161	311	237	548	*	64	64	311	301	612	0.19
2002	2751	318	364	682	*	63	63	318	427	745	0.27
2003	2112	214	306	520	*	40	40	214	346	560	0.27
2004	1676	201	215	416	*	43	43	201	258	459	0.27
1994-2003 mean	5130	695	465	1160	.	89	89	695	554	1249	0.24
95% CL	1363	258	139	385	.	27	27	258	158	406	0.03
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1m. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 10, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	4872	713	270	983	*	56	56	713	326	1039	0.21
1995	5921	1109	446	1555	*	82	82	1109	528	1637	0.28
1996	10641	1475	825	2300	*	161	161	1475	986	2461	0.23
1997	6723	926	588	1514	*	95	95	926	683	1609	0.24
1998	9425	1163	525	1688	*	88	88	1163	613	1776	0.19
1999	5903	745	552	1297	*	151	151	745	703	1448	0.25
2000	7434	867	1077	1944	*	454	454	867	1531	2398	0.32
2001	3731	445	432	877	*	104	104	445	536	981	0.26
2002	5172	616	477	1093	*	105	105	616	582	1198	0.23
2003	3552	362	411	773	*	54	54	362	465	827	0.23
2004	3049	404	345	749	*	62	62	404	407	811	0.27
1994-2003 mean	6337	842	560	1402	.	135	135	842	695	1537	0.24
95% CL	1649	244	166	351	.	84	84	244	244	403	0.03
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1n. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 11, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	8007	2144	2099	4243	*	194	194	2144	2293	4437	0.55
1995	9178	2729	2574	5303	*	171	171	2729	2745	5474	0.60
1996	10948	3388	3243	6631	*	333	333	3388	3576	6964	0.64
1997	10327	3040	3048	6088	*	165	165	3040	3213	6253	0.61
1998	6179	1259	1840	3099	*	83	83	1259	1923	3182	0.51
1999	6357	1405	1525	2930	*	57	57	1405	1582	2987	0.47
2000	8629	1959	4057	6016	*	219	219	1959	4276	6235	0.72
2001	6226	1430	1613	3043	*	111	111	1430	1724	3154	0.51
2002	5524	1495	1695	3190	*	60	60	1495	1755	3250	0.59
2003	5862	1364	1435	2799	*	150	150	1364	1585	2949	0.50
2004	6250	1474	2307	3781	*	168	168	1474	2475	3949	0.63
1994-2003 mean	7724	2021	2313	4334	.	154	154	2021	2467	4489	0.58
95% CL	1410	556	633	1092	.	60	60	556	678	1141	0.05
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1o. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 12, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	2665	774	385	1159	*	88	88	774	473	1247	0.47
1995	2119	582	232	814	*	67	67	582	299	881	0.42
1996	2750	899	439	1338	*	119	119	899	558	1457	0.53
1997	3199	832	699	1531	*	110	110	832	809	1641	0.51
1998	2456	351	415	766	*	108	108	351	523	874	0.36
1999	1304	166	151	317	*	26	26	166	177	343	0.26
2000	1859	299	440	739	*	45	45	299	485	784	0.42
2001	2062	335	485	820	*	80	80	335	565	900	0.44
2002	1803	385	395	780	*	42	42	385	437	822	0.46
2003	2773	568	666	1234	*	110	110	568	776	1344	0.48
2004	1670	376	462	838	*	54	54	376	516	892	0.53
1994-2003 mean	2299	519	431	950	.	80	80	519	510	1029	0.45
95% CL	407	180	120	256	.	24	24	180	137	276	0.05
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1p. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 13, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	29462	6179	5431	11610	*	2686	2686	6179	8117	14296	0.49
1995	25577	5868	5834	11702	*	2358	2358	5868	8192	14060	0.55
1996	30318	6562	9583	16145	*	2796	2796	6562	12379	18941	0.62
1997	26842	4958	9364	14322	*	2550	2550	4958	11914	16872	0.63
1998	22530	3023	5145	8168	*	1627	1627	3023	6772	9795	0.43
1999	19331	3333	4268	7601	*	1180	1180	3333	5448	8781	0.45
2000	29820	5592	6838	12430	*	2688	2688	5592	9526	15118	0.51
2001	28647	5853	5024	10877	*	2127	2127	5853	7151	13004	0.45
2002	25031	5565	4218	9783	*	1395	1395	5565	5613	11178	0.45
2003	23857	4872	4677	9549	*	2158	2158	4872	6835	11707	0.49
2004	25822	5150	3823	8973	*	1829	1829	5150	5652	10802	0.42
1994-2003 mean	26142	5181	6038	11219	.	2157	2157	5181	8195	13375	0.51
95% CL	2557	838	1407	1894	.	412	412	838	1724	2252	0.05
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.

Appendix 1q. Atlantic salmon recreational fishery catch and effort data for Salmon Fishing Area 14A, insular Newfoundland, 1994-2004. Ret. = retained fish; Rel. = released fish.

	Effort	Small (<63 cm)			Large (≥63 cm)			Total (Small + Large)			
Year	Rod Days	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	Ret.	Rel.	Tot.	CPUE
1994	13428	3734	2028	5762	*	417	417	3734	2445	6179	0.46
1995	16650	5287	3349	8636	*	573	573	5287	3922	9209	0.55
1996	19525	5861	3168	9029	*	577	577	5861	3745	9606	0.49
1997	19695	4609	2725	7334	*	521	521	4609	3246	7855	0.40
1998	14980	3568	4351	7919	*	452	452	3568	4803	8371	0.56
1999	15713	3928	3722	7650	*	780	780	3928	4502	8430	0.54
2000	15297	4179	3260	7439	*	632	632	4179	3892	8071	0.53
2001	12257	3162	2821	5983	*	450	450	3162	3271	6433	0.52
2002	14566	4406	3878	8284	*	612	612	4406	4490	8896	0.61
2003	15749	3917	2885	6802	*	730	730	3917	3615	7532	0.48
2004	12655	3529	2509	6038	*	469	469	3529	2978	6507	0.51
1994-2003 mean	15786	4265	3219	7484	.	574	574	4265	3793	8058	0.51
95% CL	1693	582	472	764	.	86	86	582	503	796	0.05
N	10	10	10	10	.	10	10	10	10	10	10

IN THE ABOVE TABLE A PERIOD INDICATES NO DATA FOR THAT YEAR.
CPUE IS IN TERMS OF SMALL AND LARGE SALMON COMBINED (RETAINED + RELEASED FISH).
* NOT ALLOWED TO RETAIN LARGE SALMON IN INSULAR NEWFOUNDLAND.