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**STATUS OF ATLANTIC SALMON STOCKS IN  
SALMON FISHING AREAS 15, 16, 17 AND 18**

by

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<sup>1</sup>La présente série documente les bases scientifiques des évaluations des ressources halieutiques sur la côte Atlantique du Canada. Elle traite des problèmes courants selon les échéanciers dictés. Les documents qu'elle contient ne doivent pas être considérés comme des énoncés définitifs sur les sujets traités, mais plutôt comme des rapports d'étape sur les études en cours.

Les documents de recherche sont publiés dans la langue officielle utilisée dans le manuscrit envoyé au secrétariat.

## Abstract

Conservation targets for Atlantic salmon were exceeded on the Miramichi and Margaree rivers in 1992, with respective egg depositions at 201% and 380% of target levels. Egg deposition to the Restigouche River was between 62 and 111% of target with a 90% probability of being below target levels; spawning escapement was similar to the 5-year mean value.

Angling catches in SFA 15, 16 and 18 totalled 36,122 small salmon. Catches in SFA 15 and 18 were within 15% of 5-year mean catches. Catches increased by 70% in SFA 16 relative to the previous five years. The Restigouche, Miramichi and Margaree rivers provided 75%, 98% and 55% of the salmon catch in SFA 15, 16 and 18 respectively.

Native harvests in SFA 15, 16 and 18 totalled 2,392 large and 1,906 small salmon. Relative to 5-year means, catches of large and small salmon decreased by 98% and 15% respectively in SFA 15, and increased by 3% and 27% respectively in SFA 16.

Total unreported catch of salmon in SFA 15, 16 and 18 was estimated as 4,393 large and 9,664 small salmon.

## Résumé

Les cibles de conservation de saumon de l'Atlantique ont été dépassées dans la Miramichi et la Margaree en 1992, la ponte y ayant été respectivement de 201 % et de 380 % du niveau cible. Dans la Restigouche, la ponte se situait entre 62 et 111 % de la cible, la probabilité qu'elle se situe sous cette dernière étant de 90 %; les échappées de géniteurs étaient comparables à la moyenne sur cinq ans.

Les prises sportives dans les ZPS 15, 16 et 18 ont été en tout de 36 122 petits saumons. Dans les ZPS 15 et 18, elles correspondaient, à 15 % près, à la moyenne sur cinq ans. Dans la ZPS 16, les prises ont augmenté 70 % par rapport aux cinq années précédentes. Respectivement 75 %, 98 % et 55 % des prises de saumon des ZPS 15, 16 et 18 provenaient de la Restigouche, de la Miramichi et de la Margaree.

Dans ces mêmes ZPS, la récolte des autochtones était de 2 392 gros saumons et de 1 906 petits saumons. Par rapport à la moyenne sur cinq ans, les prises de gros et de petits saumons ont chuté de 98 % et 15 % respectivement dans la ZPS 15 et augmenté de 3 % et 27 % respectivement dans la ZPS 16.

On estime à 4 393 gros saumons et 9 664 petits saumons les prises totales non déclarées dans les ZPS considérées.

## Introduction

This document summarizes data on angling, native food fisheries, unreported (illegal) catches, and river-specific assessments of returns of Atlantic salmon in four Salmon Fishing Areas (SFA 15, 16, 17 and 18) of the Gulf Region.

## Methods

### **Terminology**

In this report, salmon are subdivided into two size classes: small and large. Small salmon are adults less than 63 cm in fork length (1SW or one sea-winter salmon). Large salmon are adults greater than or equal to 63 cm in fork length (MSW or multi-sea-winter salmon).

### **Estimates of recreational catches:**

Recreational catches, data sources and estimation procedures in 1984 to 1988 were summarized in O'Neil et al. (1985, 1986, 1987, 1989, and 1991). Catch estimates for 1989, 1990, and 1991 and preliminary estimates for 1992 were obtained from S. O'Neil, DFO Halifax, Nova Scotia.

Catches reported for the Kedgwick and Patapedia rivers include New Brunswick catch data only. Catches for the Restigouche River include New Brunswick and Quebec data.

### **Estimates of native catches:**

In New Brunswick, native catches were reported by band wardens to DFO personnel. When only total numbers were given, they were apportioned into small and large salmon using ratios of small and large catch available for subsets of the data provided by the band wardens. In SFA 15, weight was estimated by assuming individual weights of 1.5 kg and 6.4 kg for small and large salmon respectively. These weights are those used in past years and represent mean weights of salmon collected in a research trap formerly located at Dalhousie on Chaleur Bay. Mean weights of 1.7 and 5.3 kg (small and large salmon respectively) were used to estimate weight in SFA 16. Mean weights used for SFA 16 salmon vary annually and are based on data collected at the Millbank trap on the Miramichi River.

In Nova Scotia, native catches were estimated by Conservation and Protection Branch field personnel. These estimates include numbers of small and large salmon caught in coastal or inland waters. When only total numbers were given, they were apportioned into small and large salmon, assuming that 90% of the landings consisted of large salmon. If weight estimates were not given then individual weights of 1.6 kg and 4.5 kg were assumed for small and large salmon respectively. Weights and small:large salmon ratios for Nova Scotia fish are those used in past years and were

originally derived from broodstock collections in the Margaree River.

**Estimates of unreported catches:**

In New Brunswick, unreported marine catches were estimated by Conservation and Protection personnel. Unreported freshwater catches were estimated from poaching-and-disease mortality rates calculated for the Restigouche and Miramichi Rivers, then extrapolated to SFA 15 and 16 respectively, using the ratio of the watershed area of the river for which the assessment was made to the watershed area of the whole SFA. Weight estimates were carried out as described above for native catch estimates.

In Nova Scotia, unreported catches were estimated by Conservation and Protection Branch field personnel. These estimates include numbers of 1SW and MSW salmon caught in coastal or inland waters. When only total numbers were given, they were apportioned into 1SW and MSW salmon, using 90% MSW salmon, as described above for native catch estimates. If weight estimates were not given then 1.6 kg and 4.5 kg conversion factors were used for 1SW and MSW salmon respectively.

**River-specific assessments of returns and spawning escapements:**

Methodologies of assessment vary from river to river; details of 1992 assessments of salmon in the Restigouche, Miramichi and Margaree rivers will be published in DFO research documents (Locke et al. 1993; Courtenay et al, 1993; and Chaput et al. 1993).

Results

**SFA 15**

SFA 15 (Figure 1) includes Gulf Region rivers draining into Chaleur Bay and the New Brunswick coast of the Gulf of St. Lawrence (north of Gloucester-Northumberland county). The largest rivers in SFA 15 are the Restigouche and Nepisiguit rivers.

Angling catches of small salmon in 1992 were 5,319 (5,157 bright, 162 kelts), 12% higher than the previous 5-year mean of 4,757 (Table 1). Most of this catch was taken in the Restigouche River and its tributaries (3999 small salmon) and in the Nepisiguit River (800 small salmon) (Table 2). Together these two systems provided 90% of the 1992 catch in SFA 15.

Native food fisheries occurred in the Restigouche and Nepisiguit Rivers. There is no estimate of native harvest in the Nepisiguit River. In 1992, 2 small and 464 large salmon were harvested from the New Brunswick side of the Restigouche River, a decrease of 98% and 15% respectively, relative to previous 5-year means (Table 3).

Unreported catches of salmon in 1992 were estimated as 2,345 small and 2,337 large fish (Table 4).

Based on angling data and an assumed angling exploitation rate of 0.3 to 0.5, returns of Atlantic salmon to the Restigouche River during 1992 were estimated as 11,781 - 18,694 large (3% above previous 5-year means) and 11,113 - 18,485 small salmon (8% above previous 5-year means). Spawning escapement in 1992 was 7,383 - 13,190 large salmon and 4,755 - 11,095 small salmon, resulting in a total egg deposition of 44 to 79 million eggs (62% to 111% of requirements). Returns, spawners, and egg deposition in 1992 were similar to previous 5-year means. There was a 90% probability that egg deposition was below target in 1992. A native co-management project with the Eel River Bar Band commenced in mid-July, with operation of an assessment trapnet for tagging and data collection.

Counts at the Nepisiguit River fence (operated in 1992 as a collaborative project of the Nepisiguit Salmon Association and the Pabineau Indian Band) were 1112 small and 441 large salmon. These returns were lower than those observed in 1986 to 1989 (1990 and 1991 fence counts are incomplete).

In 1992, hatchery fish were stocked to the Restigouche River system (Kedgwick, Little Main Restigouche) and Nepisiguit River.

#### **SFA 16**

SFA 16 includes the Miramichi River and rivers emptying into the New Brunswick coast of the Gulf of St. Lawrence and Northumberland Strait (Figure 2).

Total angling catch of small salmon was 29,554 (24,215 bright, 5,339 kelts), 70% higher than the 5-year mean of 17,371 (Table 1). In total, 28,930 small salmon were landed from the Miramichi River system (Table 5), comprising 98% of the angling catch in SFA 16.

Native harvests in the Miramichi, Richibucto, Tabusintac and Buctouche rivers totalled 1839 small and 1342 large fish (Table 3). Five-year means were not calculated due to the lack of data on most of these rivers in past years.

Estimated unreported catch of salmon in SFA 16 was 7,246 small and 2,056 large fish (Table 4).

Returns to the Miramichi River in 1992 were estimated to be 152,647 small and 31,759 large salmon. Egg deposition target was exceeded (201%), 69% of eggs being supplied by large salmon. For the first time, estimates were made of returns to the two major branches of the river. Returns to the Northwest Miramichi were estimated to be 31,293 small salmon and 6,586 large salmon. Returns to the Southwest Miramichi were estimated to be 121,207 small salmon and 25,134 large salmon. Egg deposition targets were met in both branches.

New assessment projects were initiated on the Richibucto, Tabusintac and Buctouche rivers as native co-management programs with the Big Cove, Burnt Church and Buctouche bands respectively. In 1992, native personnel gained experience in constructing and operating assessment trapnets and collected biological data during the fall salmon run in all three rivers. Sufficient data for assessment of salmon abundance are expected to be collected in 1993.

The Miramichi River was stocked with hatchery fish in 1992.

#### **SFA 17**

The rivers of Prince Edward Island comprise SFA 17 (Figure 1). Estimates of the catches of the recreational and native fisheries and unreported catch are not available for either 1991 or 1992.

The Morell River has the largest salmon returns in SFA 17. Returns to the Leard's Pond fishway on the Morell River were 907 small and 46 large salmon, of which the majority (93% of small and 83% of large salmon) were of hatchery origin. These counts represent increases of 177% and 18% compared to 1991 and translate into a return rate to date of 3.4% for the 26,643 smolts stocked above Leard's Pond in 1991.

Salmon enhancement projects have been initiated on the Trout, Dunk, Valleyfield, and West rivers.

#### **SFA 18**

SFA 18 includes those rivers which empty into the Nova Scotia coast of Northumberland Strait and the Gulf of St. Lawrence (Figure 1).

Preliminary license stub estimates of catch in 1992 were 1249 small salmon and 3268 large (hooked-and-released) salmon for SFA 18 (Table 1). These estimates were very close to 1991 and previous 5-year mean values. The Margaree River, as in previous years, had the largest angling catch of any SFA 18 river, with 55% of the small salmon catch (Table 6).

Native harvests totalled 65 small and 586 large salmon (Table 3). The estimated unreported catch was 73 small and 694 large salmon (Table 4).

Returns to the Margaree River in 1992 were estimated at almost 4000 large salmon and 1000 small salmon, both values within 25% of recent 5-year mean values. Potential egg deposition in 1992 exceeded the conservation target requirements by 380%, similar to recent 5-year mean depositions. The 1993 returns of large salmon are expected to be in the order of 5000 large salmon, very similar to previous 5-year returns.

The Margaree River was stocked with hatchery fish in 1992.

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Table 1. Annual angling catch, SFA 15, 16 and 18.

Year	Bright salmon		Total	Kelts		
	Small	Large		Small	Large	Total
<u>SFA 15</u>						
1984	2113	1822	3935	0	3	3
1985	3639	3629	7268	66	11	77
1986	5961	5390	11351	64	16	80
1987	5386	3746	9132	66	61	127
1988	7278	5238	12516	62	57	119
1989	3652	3993	7645	50	37	87
1990	4277	3222	7499	61	49	110
1991	2894	2541	5435	61	70	131
1992	5157	3752	8909	162	59	221
<u>SFA 16</u>						
1984	10034	1190	11224	720	937	1657
1985	12108	828	12936	3641	75	3716
1986	28624	1329	29953	1524	2413	3937
1987	11805	897	12702	3009	359	3368
1988	16483	407	16890	4322	419	4741
1989	12971	429	13400	7081	828	7909
1990	12060	564	12624	4863	860	5723
1991	9679	214	9893	4580	586	5166
1992	24215	456	24671	5339	602	5941
<u>SFA 18</u>						
1984	302	448	754	---	---	---
1985	619	1705	2325	---	---	---
1986	1181	4448	5631	---	---	---
1987	1290	3011	4301	---	---	---
1988	1349	3076	4425	---	---	---
1989	928	3205	4133	---	---	---
1990	1207	2392	3598	---	---	---
1991	1263	3470	4732	---	---	---
1992	1249	3268	4516	---	---	---



Table 2. Annual summaries of catch (including retained and hooked-and-released salmon) and effort (rod-days) for Salmon Fishing Area 15. Large salmon hook-and-release catch was not consistently reported; catch-per-unit-effort (CPUE) and % large salmon were not calculated if only part of the large salmon catch was reported.

Year	Kelts				Bright fish				
	Small	Large	Total	%Large	Small	Large	Total	%Large	
<u>Jacquet</u>									
1984	0	3	3	100	39	-	39	275	0.14
1985	6	-	6	-	34	52	86	270	0.32
1986	10	6	16	38	76	105	181	355	0.51
1987	15	50	65	77	45	27	72	165	0.44
1988	16	42	58	72	110	70	180	320	0.56
1989	13	25	38	66	70	42	112	330	0.34
1990	20	32	52	62	82	58	140	330	0.42
1991	15	35	50	70	56	23	79	295	0.27
1992	20	15	35	43	105	95	200	455	0.44
<u>Kedgwick</u>									
1984	-	-	-	-	145	154	299	1126	0.27
1985	-	-	-	-	326	172	498	1441	0.35
1986	-	-	-	-	561	476	1037	1103	0.94
1987	-	-	-	-	575	394	969	1147	0.84
1988	-	-	-	-	803	676	1479	1203	1.23
1989	-	-	-	-	207	528	735	1266	0.58
1990	-	-	-	-	300	244	544	1148	0.47
1991	-	-	-	-	277	400	677	970	0.70
1992	-	-	-	-	417	303	720	1195	0.60
<u>Middle</u>									
1984	-	-	-	-	-	-	-	-	-
1985	30	-	30	0.29	52	-	52	425	0.12
1986	33	-	33	0.28	81	-	81	564	0.14
1987	30	-	30	0.26	50	-	50	295	0.17
1988	25	-	25	0.31	32	-	32	169	0.19
1989	25	-	25	0.31	53	-	53	287	0.18
1990	15	-	15	0.17	50	-	50	244	0.20
1991	26	-	26	0.58	66	-	66	271	0.24
1992	100	-	100	0.48	104	-	104	240	0.43

Table 2. Continued.

Year	Kelts			Bright fish					
	Small	Large	Total	Small	Large	Total	Effort	CPUE	%Large
<u>Nepisiquit</u>									
1984	-	-	-	600	150	750	3015	0.25	20
1985	-	-	-	229	-	229	1734	0.13	-
1986	-	-	-	800	500	1300	3600	0.36	38
1987	-	-	-	800	500	1300	4250	0.31	38
1988	-	-	-	1000	600	1600	5000	0.32	38
1989	-	-	-	600	490	1090	4000	0.27	45
1990	-	-	-	500	300	800	3400	0.24	38
1991	-	-	-	700	300	1000	3700	0.27	30
1992	-	-	-	800	270	1070	4700	0.23	25
<u>Patapedia</u>									
1984	-	-	-	19	25	44	156	0.28	57
1985	-	-	-	55	53	108	132	0.82	49
1986	-	-	-	55	99	154	169	0.91	64
1987	-	-	-	107	37	144	162	0.89	26
1988	-	-	-	80	77	157	195	0.81	49
1989	-	-	-	31	35	66	211	0.31	53
1990	-	-	-	38	22	60	237	0.25	37
1991	-	-	-	16	16	32	136	0.24	50
1992	-	-	-	66	36	102	206	0.50	35
<u>Restigouche</u>									
1984	-	-	-	827	1147	1974	4551	0.43	58
1985	-	-	-	1702	2831	4533	7236	0.63	62
1986	-	-	-	2902	3558	6460	7070	0.91	55
1987	-	-	-	2913	2362	5275	6887	0.77	45
1988	-	-	-	3905	3134	7039	7577	0.93	45
1989	-	-	-	1777	2363	4140	6104	0.68	57
1990	-	-	-	2316	2201	4517	7466	0.61	49
1991	-	-	-	1291	1570	2861	6511	0.44	55
1992	-	-	-	2336	2451	4787	6706	0.71	51

Table 2. Continued.

Year	Kelts				Bright fish								
	Small	Large	Total	Effort	CPUE	%Large	Small	Large	Total	Effort	CPUE	%Large	
<u>Tetragouche</u>													
1984	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	18	18	18	75	0.24	-	55	-	55	431	0.13	-	-
1986	10	10	10	45	0.22	-	76	-	76	519	0.15	-	-
1987	15	15	15	70	0.21	-	65	-	65	315	0.21	-	-
1988	15	15	15	60	0.25	-	28	-	28	138	0.20	-	-
1989	10	10	10	65	0.15	-	54	-	54	290	0.19	-	-
1990	23	23	23	136	0.17	-	55	-	55	267	0.21	-	-
1991	16	16	16	40	0.40	-	68	-	68	288	0.24	-	-
1992	30	30	30	60	0.50	-	112	-	112	260	0.43	-	-
<u>Tracadie</u>													
1984	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	12	11	23	30	0.77	-	11	14	25	107	0.23	-	56
1986	11	10	21	30	0.70	-	13	22	35	107	0.33	-	63
1987	6	11	17	45	0.38	-	12	16	28	123	0.23	-	57
1988	6	15	21	46	0.46	-	24	22	46	337	0.14	-	48
1989	2	12	14	41	0.34	-	24	20	44	220	0.20	-	45
1990	3	17	20	62	0.32	-	31	22	53	210	0.25	-	42
1991	4	35	39	88	0.44	-	17	37	54	153	0.35	-	69
1992	12	44	56	193	0.29	-	37	36	73	340	0.21	-	49
<u>Upsalquitch</u>													
1984	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	483	346	829	1465	0.57	-	42
1986	-	-	-	-	-	-	1175	507	1682	1690	1.00	-	30
1987	-	-	-	-	-	-	1397	630	2027	1756	1.15	-	31
1988	-	-	-	-	-	-	819	410	1229	1935	0.64	-	33
1989	-	-	-	-	-	-	1296	659	1955	2101	0.93	-	34
1990	-	-	-	-	-	-	836	515	1351	1804	0.75	-	38
1991	-	-	-	-	-	-	905	375	1280	2313	0.55	-	29
1992	-	-	-	-	-	-	403	195	598	1600	0.37	-	33
							1180	561	1741	1859	0.94	-	32

Table 2. Continued.

Year	Kelts			Bright fish					
	Small	Large	Total	Small	Large	Total			
	Restigouche River System	(Kedgwick, Patapedia, Restigouche, Upsalquituch)							
1984	-	-	-	1474	1672	3146	7298	0.43	53
1985	-	-	-	3258	3563	6821	10499	0.65	52
1986	-	-	-	4915	4763	9678	10098	0.96	49
1987	-	-	-	4414	3203	7617	10131	0.75	42
1988	-	-	-	6084	4546	10630	11076	0.96	43
1989	-	-	-	2851	3441	6292	9385	0.67	55
1990	-	-	-	3559	2842	6401	11164	0.57	44
1991	-	-	-	1987	2181	4168	9217	0.45	52
1992	-	-	-	3999	3351	7350	9966	0.74	46
<u>SFA 15 Totals</u>									
1984	3	3	50	2113	1822	3935	10588	-	-
1985	11	77	235	3639	3629	7268	13466	-	-
1986	16	80	242	5961	5390	11351	15243	-	-
1987	61	127	350	5386	3746	9132	15279	-	-
1988	57	119	366	7278	5238	12516	17040	-	-
1989	50	37	351	3652	3993	7645	14512	-	-
1990	61	49	363	4277	3222	7499	15615	-	-
1991	61	70	323	2894	2541	5435	13924	-	-
1992	162	59	553	5157	3752	8909	15961	-	-

Table 3. Summary of native harvests of salmon (by size class) in SFA 15, 16 and 18.

River	1987	1988	1989	1990	1991	1992	(87-91)	92/mean
<u>Restigouche</u>								
Large	916	509	568	471	252	464	543	-15%
Small	95	70	151	120	10	2	89	-98%
<u>Nepisiquit</u>								
Large	na	na	na	na	na	na	--	--
Small	na	na	na	na	na	na	--	--
<u>SFA 15 TOTALS</u>								
Large	916	509	568	471	252	464	543	-15%
Small	95	70	151	120	10	2	89	-98%
Wt. (kg)	6005	3363	3862	3194	1628	2973	3610	-18%
<u>Richibucto</u>								
Large	na	32	32	73	82	452	55	+722%
Small	na	19	16	93	51	61	45	+ 36%
<u>Buctouche</u>								
Large	na	na	na	na	na	12	--	--
Small	na	na	na	na	na	0	--	--
<u>Tabusintac</u>								
Large	na	na	na	na	20	270	--	--
Small	na	na	na	na	0	126	--	--
<u>Miramichi</u>								
Large	898	348	540	609	544	608	588	+ 3%
Small	1274	944	1085	2110	1111	1652	1305	+ 27%
<u>SFA 16 TOTALS</u>								
Large	--	--	--	--	--	1342	--	--
Small	--	--	--	--	--	1839	--	--
Wt. (kg)	--	--	--	--	--	10239	--	--
<u>SFA 18 TOTALS</u>								
Large	--	--	--	--	--	586	--	--
Small	--	--	--	--	--	65	--	--
Wt. (kg)	--	--	--	--	--	2784	--	--

Table 4. Unreported catches of Atlantic salmon (by size class) in SFA 15, 16 and 18.

Year	Small		Large		Total	
	Number	Kg	Number	Kg	Number	Kg
<u>SFA 15</u>						
1988	2779	4169	2470	15808	5249	19977
1989	1659	2489	2337	14957	3996	17446
1990	2580	3870	2984	19098	5564	22968
1991	1428	2142	2092	13389	3520	15531
1992	2345	3518	2337	14957	4682	18475
<u>SFA 16</u>						
1988	5206	7809	1676	8715	6882	16524
1989	5081	8130	1676	8548	6757	16678
1990	6406	10890	2476	15599	8882	26489
1991	5531	8850	1676	8883	7207	17733
1992	7246	12318	2056	10897	9302	23215
<u>SFA 18</u>						
1992	73	117	694	3123	767	3240

Table 5. Annual summaries of catch (including retained and hooked-and-released salmon) and effort (rod-days) for Salmon Fishing Area 16. Large salmon hook-and-release catch was not consistently reported; catch-per-unit-effort (CPUE) and % large salmon were not calculated if only part of the large salmon catch was reported.

Year	Kelts				Bright fish							
	Small	Large	Total	Effort	CPUE	%Large	Small	Large	Total	Effort	CPUE	%Large
<u>Bartholomew</u>												
1984	-	-	-	-	-	-	season closed	-	-	-	-	-
1985	-	-	-	-	-	-	season closed	-	-	-	-	-
1986	-	-	-	-	-	-	season closed	-	-	-	-	-
1987	-	-	-	-	-	-	season closed	-	-	-	-	-
1988	-	-	-	-	-	-	season closed	-	-	-	-	-
1989	-	-	-	-	-	-	season closed	-	-	-	-	-
1990	-	-	-	-	-	-	0	-	0	0	0.00	-
1991	-	-	-	-	-	-	0	-	0	0	0.00	-
1992	-	-	-	-	-	-	13	-	13	35	0.37	-
<u>Bartibog</u>												
1984	70	80	150	550	0.27	53	87	61	148	495	0.30	41
1985	55	75	130	550	0.24	58	75	-	75	280	0.27	-
1986	4	13	17	114	0.15	76	177	-	177	978	0.18	-
1987	69	-	69	420	0.16	-	330	-	330	620	0.53	-
1988	83	-	83	483	0.17	-	2570	-	2570	1090	2.36	-
1989	700	-	700	355	1.97	-	168	-	168	575	0.29	-
1990	220	-	220	150	1.47	-	304	-	304	780	0.39	-
1991	540	-	540	260	2.08	-	109	-	109	790	0.14	-
1992	190	-	190	135	1.41	-	110	-	110	730	0.15	-
<u>Cains</u>												
1984	7	14	21	109	0.19	67	439	-	439	1687	0.26	-
1985	47	-	47	80	0.59	-	367	-	367	1949	0.19	-
1986	90	400	490	225	2.18	82	795	-	795	3270	0.24	-
1987	45	-	45	40	1.13	-	625	-	625	2301	0.27	-
1988	62	-	62	73	0.85	-	1322	-	1322	3800	0.35	-
1989	84	-	84	99	0.85	-	1591	-	1591	3948	0.40	-
1990	98	-	98	120	0.82	-	1512	-	1512	1224	1.24	-
1991	138	-	138	130	1.06	-	805	-	805	2511	0.32	-
1992	140	-	140	182	0.77	-	820	-	820	2216	0.37	-
<u>Dungarvon</u>												
1984	4	2	6	45	0.13	33	442	-	442	815	0.54	-
1985	35	-	35	50	0.70	-	279	-	279	902	0.31	-
1986	15	-	15	110	0.14	-	367	-	367	1010	0.36	-
1987	27	-	27	28	0.96	-	280	-	280	981	0.29	-
1988	0	-	0	0	0.00	-	301	-	301	1162	0.26	-
1989	45	-	45	106	0.42	-	534	-	534	1996	0.27	-
1990	42	-	42	86	0.49	-	410	-	410	599	0.68	-
1991	0	-	0	0	0.00	-	546	-	546	1774	0.31	-
1992	19	-	19	138	0.14	-	336	-	336	1442	0.23	-

Table 5. Continued.

Year	Kelts				Bright fish							
	Small	Large	Total	%Large	Small	Large	Total	%Large	CPUE	Effort	CPUE	%Large
<u>Little Southwest Miramichi</u>												
1984	33	16	49	33	297	397	694	2495	0.28	57		
1985	275	-	275	-	507	146	653	1900	0.34	22		
1986	100	-	100	-	1146	227	1373	2177	0.63	17		
1987	215	130	345	38	484	291	775	1217	0.64	38		
1988	285	170	455	37	351	-	351	1392	0.25	-		
1989	288	203	491	41	348	294	642	1174	0.55	46		
1990	299	207	506	41	477	367	844	1745	0.48	43		
1991	140	160	300	53	192	169	361	2037	0.18	47		
1992	96	194	290	67	300	270	570	1360	0.42	47		
<u>Northwest Miramichi</u>												
1984	61	45	106	42	2129	637	2766	3470	0.80	23		
1985	380	-	380	-	1279	578	1857	2695	0.69	31		
1986	200	700	900	78	3548	1102	4650	3537	1.31	24		
1987	433	229	662	35	1280	452	1732	2973	0.58	26		
1988	482	249	731	34	1018	299	1317	3128	0.42	23		
1989	1069	625	1694	37	213	102	315	2830	0.11	32		
1990	908	634	1542	41	516	139	655	3430	0.19	21		
1991	737	426	1163	37	139	38	177	796	0.22	21		
1992	401	408	809	50	341	142	483	792	0.61	29		
<u>Renous</u>												
1984	11	10	21	48	957	-	957	2300	0.42	-		
1985	140	-	140	-	1294	-	1294	5055	0.26	-		
1986	130	1300	1430	91	2000	-	2000	6225	0.32	-		
1987	130	-	130	-	1359	-	1359	5460	0.25	-		
1988	106	-	106	-	1523	-	1523	5975	0.25	-		
1989	182	-	182	-	1812	-	1812	5108	0.35	-		
1990	114	-	114	-	1721	-	1721	3003	0.57	-		
1991	45	-	45	-	800	-	800	3471	0.23	-		
1992	38	-	38	-	801	-	801	1914	0.42	-		
<u>Sevogle</u>												
1984	7	5	12	42	1118	95	1213	1280	0.95	8		
1985	28	-	28	-	1060	104	1164	1120	1.04	9		
1986	12	-	12	-	1855	-	1855	1433	1.29	-		
1987	10	-	10	-	851	154	1005	1388	0.72	15		
1988	15	-	15	-	879	108	987	1318	0.75	11		
1989	0	-	0	-	103	33	136	937	0.15	24		
1990	0	19	19	100	270	58	328	1323	0.25	18		
1991	0	0	0	0	55	7	62	1506	0.04	11		
1992	0	0	0	0	39	44	83	1184	0.07	53		



Table 5. Continued.

Year	Kelts				Bright fish				
	Small	Large	Total	%Large	Small	Large	Total	%Large	
<u>Southwest Miramichi</u>									
1984	521	679	1200	0.36	4510	-	4510	16542	0.27
1985	2626	-	2626	0.47	7140	-	7140	19538	0.37
1986	900	-	900	0.18	18588	-	18588	35526	0.52
1987	2036	-	2036	0.43	6484	-	6484	21009	0.31
1988	3116	-	3116	0.72	8338	-	8338	20070	0.42
1989	4151	-	4151	0.74	8064	-	8064	15118	0.53
1990	3040	-	3040	0.78	6678	-	6678	15723	0.42
1991	2750	-	2750	0.61	6919	-	6919	17050	0.41
1992	4300	-	4300	0.92	21286	-	21286	28777	0.74
<u>Tabusintac</u>									
1984	6	86	92	0.13	55	-	55	527	0.10
1985	55	-	55	0.10	107	-	107	591	0.18
1986	73	-	73	0.13	148	-	148	853	0.17
1987	44	-	44	0.14	112	-	112	635	0.18
1988	173	-	173	0.22	181	-	181	739	0.24
1989	562	-	562	0.47	138	-	138	651	0.21
1990	142	-	142	0.23	172	-	172	898	0.19
1991	230	-	230	0.35	114	-	114	505	0.23
1992	155	-	155	0.44	169	-	169	590	0.29
<u>Miramichi River System (includes all of the above except Bartibog and Tabusintac)</u>									
1984	644	771	1415	3817	9892	1129	11021	28589	-
1985	3531	-	3531	6863	11926	828	12754	33159	-
1986	1447	2400	3847	6273	28299	1329	29628	53178	-
1987	2896	359	3255	5740	11363	897	12260	35329	-
1988	4066	419	4485	5326	13732	407	14139	36845	-
1989	5819	828	6647	7319	12665	429	13094	31111	-
1990	4501	860	5361	5279	11584	564	12148	27047	-
1991	3810	586	4396	6004	9456	214	9670	29145	-
1992	4994	602	5596	6034	23936	456	24392	37720	-
<u>SFA_16 totals</u>									
1984	720	937	1657	5087	10034	1190	11224	29611	-
1985	3641	75	3716	7955	12108	828	12936	34030	-
1986	1524	2413	3937	6955	28624	1329	29953	55009	-
1987	3009	359	3368	6470	11805	897	12702	36584	-
1988	4322	419	4741	6580	16483	407	16890	38674	-
1989	7081	828	7909	8861	12971	429	13400	32337	-
1990	4863	860	5723	6049	12060	564	12624	28725	-
1991	4580	586	5166	6914	9679	214	9893	30440	-
1992	5339	602	5941	6519	24215	456	24671	39040	-

Table 6. Annual summaries of catch and effort for Gulf N.S. rivers from 1984-92 using license stub returns. +/- Mean = (1992-Mean)/Mean.

Year	River	No. Angler	Small		Large		Unk. Obs.	Total		Rod-days		CPUE	% MSW
			Obs.	Est.	Obs.	Est.		Obs.	Est.	Obs.	Est.		
<u>Cheticamp</u>													
1984		35	2	2	36	37	0	38	39	132	148	0.288	94.7
1985		24	15	15	52	53	0	67	68	170	182	0.394	77.6
1986		34	4	4	50	50	0	54	54	108	114	0.500	92.6
1987		37	7	7	59	60	0	66	67	124	131	0.532	89.4
1988		28	1	1	37	43	0	38	45	105	127	0.362	97.4
1989		33	6	7	116	140	0	122	148	237	296	0.515	95.1
1990		23	0	0	44	56	0	44	56	107	140	0.411	100.0
1991		29	6	8	81	104	0	87	112	212	281	0.410	93.1
1992		26	10	14	42	57	0	52	70	102	143	0.510	80.8
	Mean(87-91)	30	4	5	67	81	0	71	86	157	195	0.446	95.0
	+/- Mean	-13%	150%	204%	-38%	-29%	.	-27%	-18%	-35%	-27%	14%	-15%
<u>East: Pictou Co.</u>													
1984		70	14	14	39	40	0	53	54	423	474	0.125	73.6
1985		63	38	40	153	162	1	192	203	373	398	0.515	80.1
1986		152	84	89	582	620	0	666	709	1094	1151	0.609	87.4
1987		202	80	83	377	389	0	457	472	1214	1286	0.376	82.5
1988		200	110	129	360	422	0	470	551	1072	1300	0.438	76.6
1989		240	72	87	554	670	0	626	757	1365	1705	0.459	88.5
1990		223	86	109	237	299	0	323	408	1069	1394	0.302	73.4
1991		232	94	121	343	440	0	437	561	1152	1526	0.379	78.5
1992		155	87	118	274	371	0	361	489	717	1002	0.503	75.9
	Mean(87-91)	219	88	106	374	444	0	463	550	1174	1442	0.391	79.9
	+/- Mean	-29%	-2%	12%	-27%	-16%	.	-22%	-11%	-39%	-31%	29%	-5%
<u>Margaree</u>													
1984		678	233	242	293	305	4	530	551	5952	6665	0.089	55.7
1985		793	473	509	1130	1215	3	1606	1724	7324	7824	0.219	70.5
1986		1131	748	782	2522	2636	2	3272	3420	9724	10232	0.336	77.1
1987		1441	925	977	1757	1857	0	2682	2834	12165	12887	0.220	65.5
1988		1455	749	879	1647	1932	0	2396	2810	11582	14042	0.207	68.7
1989		1486	464	561	1298	1570	0	1762	2132	10594	13234	0.166	73.7
1990		1382	514	649	1193	1507	0	1707	2156	10789	14072	0.158	69.9
1991		1236	586	752	1370	1757	0	1956	2509	10142	13432	0.193	70.0
1992		1315	512	693	1458	1973	0	1970	2666	10746	15018	0.183	74.0
	Mean(87-91)	1400	648	764	1453	1725	0	2101	2488	11054	13533	0.189	69.6
	+/- Mean	-6%	-21%	-9%	0%	14%	.	-6%	7%	-3%	11%	-3%	6%
<u>River John</u>													
1984		5	1	1	0	0	0	1	1	20	22	0.050	0.0
1985		6	2	2	55	58	0	57	60	55	59	1.036	96.5
1986		21	29	30	146	154	0	175	184	179	188	0.978	83.4
1987		47	24	25	69	70	0	93	95	224	237	0.415	74.2
1988		47	44	52	101	118	0	145	170	211	256	0.687	69.7
1989		59	15	18	82	99	0	97	117	214	267	0.453	84.5
1990		47	49	62	33	42	0	82	104	232	303	0.353	40.2
1991		36	28	36	66	85	0	94	121	151	200	0.623	70.2
1992		39	10	14	48	65	0	58	79	123	172	0.472	82.8
	Mean(87-91)	47	32	39	70	83	0	102	121	206	253	0.506	67.8
	+/- Mean	-17%	-69%	-64%	-32%	-21%	.	-43%	-35%	-40%	-32%	-7%	22%

Table 6. Continued.

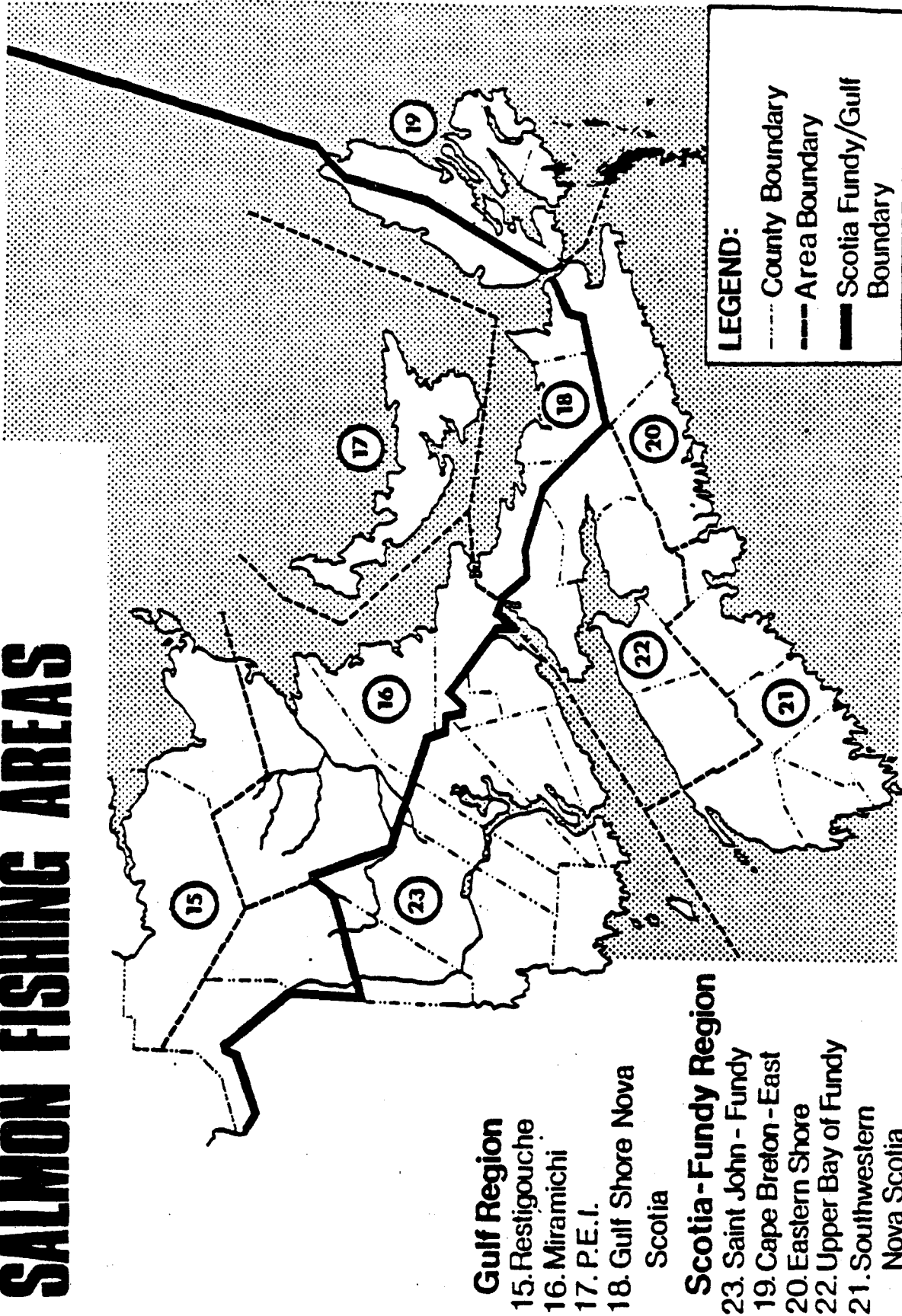
Year	River	No. Angler	ISW		MSW		Unk. Obs.	Total		Rods		CPUE	% MSW
			Obs.	Est.	Obs.	Est.		Obs.	Est.	Obs.	Est.		
<u>River Philip</u>													
1984		53	24	25	57	60	0	81	85	275	308	0.295	70.4
1985		60	11	12	65	69	0	76	81	291	311	0.261	85.5
1986		103	107	111	325	338	0	432	449	608	640	0.711	75.2
1987		160	71	76	317	337	0	388	413	1055	1118	0.368	81.7
1988		167	144	169	280	328	0	424	497	1012	1227	0.419	66.0
1989		144	94	114	336	407	0	430	520	999	1248	0.430	78.1
1990		147	123	155	151	191	0	274	346	873	1139	0.314	55.1
1991		166	128	164	329	421	0	456	585	1112	1473	0.410	72.0
1992		161	130	176	232	314	0	362	490	841	1175	0.430	64.1
	Mean(87-91)	157	112	136	283	337	0	394	472	1010	1241	0.388	70.6
	+/- Mean	3%	16%	30%	-18%	-7%	.	-8%	4%	-17%	-5%	11%	-9%
<u>Wallace</u>													
1984		25	1	1	4	4	0	5	5	48	54	0.104	80.0
1985		28	5	5	16	17	0	21	22	80	85	0.263	76.2
1986		71	16	16	113	115	0	129	131	222	234	0.581	87.6
1987		79	11	11	48	50	0	59	61	269	285	0.219	81.4
1988		81	14	16	28	33	0	42	49	243	295	0.173	66.7
1989		67	10	12	27	33	0	37	45	191	239	0.194	73.0
1990		54	11	14	23	29	0	34	43	198	258	0.172	67.6
1991		104	31	40	69	89	0	100	128	302	400	0.331	69.0
1992		98	23	31	61	83	0	84	114	311	435	0.270	72.6
	Mean(87-91)	77	15	19	39	47	0	54	65	241	295	0.218	71.5
	+/- Mean	27%	49%	67%	56%	77%	.	54%	75%	29%	47%	24%	1%
<u>Waugh</u>													
1984		3	0	0	0	0	0	0	0	7	8	0.000	.
1985		4	0	0	1	1	0	1	1	5	5	0.200	100.0
1986		15	9	10	27	29	0	36	39	32	34	1.125	75.0
1987		23	0	0	7	7	0	7	7	45	48	0.156	100.0
1988		21	8	9	19	22	0	27	32	65	79	0.415	70.4
1989		24	4	5	4	5	0	8	10	74	92	0.108	50.0
1990		17	14	18	14	18	0	28	35	75	98	0.373	50.0
1991		41	15	19	83	106	0	98	126	204	270	0.480	84.7
1992		27	11	15	15	20	0	26	35	94	131	0.277	57.7
	Mean(87-91)	25	8	10	25	32	0	34	42	93	117	0.306	71.0
	+/- Mean	7%	34%	47%	-41%	-37%	.	-23%	-17%	2%	12%	-10%	-19%
<u>West: Antigonish Co.</u>													
1984		20	17	17	2	2	0	19	19	96	107	0.198	10.5
1985		33	32	34	115	122	0	147	156	211	225	0.697	78.2
1986		72	116	126	438	476	0	554	602	498	524	1.112	79.1
1987		117	80	84	188	198	0	268	282	699	741	0.383	70.1
1988		89	57	67	107	126	0	164	192	377	457	0.435	65.2
1989		99	74	90	180	218	0	254	307	420	525	0.605	70.9
1990		126	120	152	158	200	0	278	351	536	699	0.519	56.8
1991		132	51	65	229	294	0	280	359	553	732	0.506	81.8
1992		134	96	130	184	249	0	280	379	511	714	0.548	65.7
	Mean(87-91)	113	76	92	172	207	0	249	298	517	631	0.490	69.0
	+/- Mean	19%	26%	42%	7%	20%	.	13%	27%	-1%	13%	12%	-5%

Table 6. Continued.

Year	River	No. Angler	1SW		MSW		Unk. Obs.	Total		Rods		CPUE	% MSW
			Obs.	Est.	Obs.	Est.		Obs.	Est.	Obs.	Est.		
<u>West: Pictou Co.</u>													
1984		1	0	0	0	0	0	0	1	1	0.000	.	
1985		8	2	2	4	4	0	6	6	29	31	0.207	66.7
1986		12	4	4	4	4	0	8	8	36	38	0.222	50.0
1987		45	14	15	25	26	0	39	41	233	247	0.167	64.1
1988		49	21	25	37	43	0	58	68	257	312	0.226	63.8
1989		60	12	15	50	60	0	62	75	340	425	0.182	80.6
1990		51	27	34	30	38	0	57	72	193	252	0.295	52.6
1991		91	35	45	118	151	0	153	196	484	641	0.316	77.1
1992		85	23	31	85	115	0	108	146	302	422	0.358	78.7
	Mean(87-91)	59	22	27	52	64	0	74	90	301	375	0.237	67.6
	+/- Mean	44%	6%	16%	63%	81%	.	46%	62%	0%	12%	51%	16%
<u>Other Rivers</u>													
1984		3	0	0	0	0	0	0	6	6	0.000	.	
1985		9	0	0	4	4	0	4	4	14	14	0.286	100.0
1986		17	9	9	25	26	0	34	35	42	44	0.810	73.5
1987		23	12	12	16	17	0	28	29	70	73	0.400	57.1
1988		13	2	2	8	9	0	10	11	40	48	0.250	80.0
1989		12	16	19	3	3	0	19	22	43	53	0.442	15.8
1990		20	11	14	10	12	0	21	27	62	80	0.339	47.6
1991		31	10	13	18	23	0	28	35	83	111	0.337	64.3
1992		26	20	27	16	21	0	36	48	134	187	0.269	44.4
	Mean(87-91)	20	10	12	11	13	0	21	25	60	73	0.354	53.0
	+/- Mean	31%	96%	125%	45%	64%	.	70%	94%	125%	156%	-24%	-16%
<u>SFA 18 Totals:</u>													
1984		893	292	302	431	448	4	727	754	6960	7793	0.104	59.6
1985		1028	578	619	1595	1705	4	2177	2325	8552	9134	0.255	73.4
1986		1628	1126	1181	4232	4448	2	5360	5631	12543	13199	0.427	79.0
1987		2174	1224	1290	2863	3011	0	4087	4301	16098	17053	0.254	70.1
1988		2150	1150	1349	2624	3076	0	3774	4425	14964	18143	0.252	69.5
1989		2224	767	928	2650	3205	0	3417	4133	14477	18084	0.236	77.6
1990		2090	955	1207	1893	2392	0	2848	3598	14134	18435	0.201	66.5
1991		2098	984	1263	2706	3470	0	3689	4732	14395	19066	0.256	73.3
1992		2066	922	1249	2415	3268	0	3337	4516	13881	19399	0.240	72.4
	Mean(87-91)	2147	1016	1207	2547	3031	0	3563	4238	14814	18156	0.240	71.4
	+/- Mean	-4%	-9%	3%	-5%	8%	.	-6%	7%	-6%	7%	0%	1%

\* - "Other Rivers" includes Barney's, French, Mabou, Middle: Pictou Co., Pomquet, Pugwash, Shinimikas, South, Tidnish, Tracadie, and Wright.

# SALMON FISHING AREAS



## Gulf Region

- 15. Restigouche
- 16. Miramichi
- 17. P.E.I.
- 18. Gulf Shore Nova Scotia

## Scotia-Fundy Region

- 23. Saint John - Fundy
- 19. Cape Breton - East
- 20. Eastern Shore
- 22. Upper Bay of Fundy
- 21. Southwestern Nova Scotia

Figure 1. Map of Atlantic Salmon Fishing Areas (from O'Neil et al. 1991).