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**ASSESSMENT OF ATLANTIC SALMON,  
(Salmo salar), IN THE  
MARGAREE RIVER, 1989**

by

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**ABSTRACT**

A mark-recapture experiment indicated that fall MSW returns in 1989 exceeded those in 1988, while 1SW fall salmon returns were less than 1988. Creel survey estimates of angling catch support these trends.

Numbers estimated to return in the fall exceeded spawning requirements.

Lower than average 1SW salmon returns in 1989 suggest lower than average MSW returns can be expected in 1990.

**RESUME**

Une expérience de marquage-recapture a révélé que par rapport à 1988, les remontées automnales de saumon en 1989 ont été supérieures dans le cas des redibermarins et inférieures pour ce qui est des unibermarins, ce que confirment les estimations de prises sportives provenant des enquêtes par interrogation directe.

Le nombre estimé de remontées d'automne était supérieur aux besoins de géniteurs.

Les remontées d'unibermarins ayant été inférieures à la moyenne en 1989, on peut s'attendre à ce qu'il en soit de même pour les redibermarins en 1990.

## INTRODUCTION

The purpose of this paper is to provide an assessment of the Margaree River Atlantic salmon stock in 1989 and concentrates on the fall run.

The Margaree River is located on Cape Breton Island, Inverness County, Nova Scotia (Fig. 1). Two principal branches, the Northeast Margaree and Southwest Margaree, meet at Margaree Forks to form the Main Margaree which flows into the Gulf of St. Lawrence. Most of the Atlantic salmon angling occurs in the Main Margaree and Northeast Margaree rivers. Margaree River salmon stocks are composed of two runs: the summer run enters the river up to the end of August; and the fall run, after September 1.

Since 1979, efforts to increase the summer component of the Atlantic salmon stock have consisted of regulatory restrictions and introduction of hatchery-reared progeny from early-run fish. Anglers have been required to release MSW salmon during the early-run (before September 1) since 1979. From 1985-1989, all MSW salmon were released regardless of date caught. In 1984, there was a reduction in the Salmon Fishing Area 18 commercial fishery from eight to three weeks. There was no Salmon Fishing Area 18 commercial fishery from 1985-1989.

## METHODS

### LANDINGS

Angling records from 1947-1989 were provided by fishery officers, Department of Fisheries and Oceans (DFO), Margaree Forks, Nova Scotia. These landings have been updated using historical files which previously had not been edited. Hence, there are some differences between this and previous CAFSAC documents. The reason for this discrepancy is that fish previously reported as size or weight not specified had been assigned to 1SW catch. These unspecified fish have now been portioned into 1SW and MSW categories based on the proportion of known sized salmon (Chaput and Claytor 1988). Sport catches for 1984-1988 were also obtained from Nova Scotia license card returns (LIC) (O'Neil et al. 1985, 1986, and 1987, S. O'Neil, DFO Halifax, Nova Scotia). Preliminary 1989 license card returns were obtained from S. O'Neil, DFO Halifax, Nova Scotia. Seasonal LIC catches are determined as described by (Claytor and O'Neil 1990). Angling catches from creel surveys conducted from 1987-1989 are also presented (Claytor and O'Neil 1990). Commercial landings for Salmon Fishing Area 18 (1967-1984) are also reported (Claytor and Chaput 1988).

### SPAWNING REQUIREMENTS

The required number of spawners was calculated using the method (Method 2) recommended by Randall (1985) for the Miramichi River. The number of spawners required to meet egg deposition requirements was calculated presuming that all egg deposition came from MSW salmon. The numbers of 1SW salmon required were calculated assuming that at least one male spawner was needed for each female MSW salmon.

The characteristics used to determine the spawning requirements were essentially those given by Gray and Chadwick (1984) and are repeated below:

Egg deposition rate	=	2.4 eggs/m <sup>2</sup> (Elson 1975)
Rearing area	=	2,797,600 m <sup>2</sup> (Marshall 1982)
Fecundity MSW	=	1,764 eggs/kg (Elson 1975)
1SW	=	1,764 eggs/kg (Elson 1975)
Mean weight MSW	=	4.9 kg (Marshall 1982)
1SW	=	1.7 kg (Marshall 1982)
Sex ratio male/female MSW	=	25:75 (Marshall 1982)
1SW	=	89:11 (Marshall 1982)
Eggs per MSW	=	6,482 eggs = 1,764 X 4.9 X .75
1SW	=	330 eggs = 1,764 X 1.7 X .11

Spawning requirements for the Margaree River were found to be 1,036 MSW and 579 1SW salmon. These figures were derived as given below:

- (1) egg requirements = 2.4 eggs m<sup>-2</sup> X 2,797,600 m<sup>2</sup>  
= 6,714,600 eggs
- (2) eggs/MSW salmon = 8,643 eggs/MSW X .75 (females)  
= 6,482
- (3) required number of MSW = 6,714,600 ÷ 6,482  
= 1,036
  
- number of female MSW = 1,036 X .75  
= 777
  
- number of male MSW = 259 = 1,036 - 777
  
- number of male 1SW = 518 = 777 - 259
  
- number of 1SW = 582 = 518 ÷ .89

Using these values, MSW salmon account for 100% of the egg deposition requirements and 97% of the total egg deposition.

**EGG DEPOSITION**

In previous assessments (Claytor and Chaput 1988) total egg deposition from 1SW and MSW salmon was calculated as described below:

$$\frac{\text{Sport catch (SC)}}{\text{Sport catch (SC) + Spawners}} = \text{Exploitation rate (ER)}$$
$$\frac{\text{SC (1 - ER)}}{\text{ER}} = \text{Spawners}$$

For 1947-1986, DFO estimates of sport catch are used but for 1987-1989 creel survey estimates are used to calculate egg deposition. Exploitation rates for 1SW and MSW salmon 20.6 and 37.9%, were those determined by Hayes (1949).

For years in which there were hook-and-release regulations, 1979-1989, the MSW salmon caught and released were added to the number of spawners calculated as above. This factor assumes there is no mortality as a result of hook and release.

For all years, egg deposition was calculated as the number of 1SW or MSW spawners times the eggs per 1SW or MSW fish (see above). The eggs obtained from broodstock collections were subtracted from the above egg deposition values.

For 1987-1989, egg deposition was estimated from returns estimated using creel survey angling estimates (Claytor and O'Neil 1990).

#### **HATCHERY RETURNS**

Proportions of hatchery and wild fish returning to the Margaree River were determined from angler logbooks, creel survey, angler spot checks, broodstock collections (Hatchery and McKenzie pools, Fig. 1), and trapnet captures. All hatchery fish released to the Margaree River were adipose fin clipped, allowing hatchery or wild origin to be readily identified.

#### **FORECAST**

At present there is no reliable method of forecasting available for Atlantic salmon in the Margaree River. Assuming a relationship exists between 1SW (year, i-1) and MSW salmon (year i) a qualitative statement concerning relative returns in 1990 can be made based on creel angling catch estimates for 1988 and 1989.

#### **BIOLOGICAL CHARACTERISTICS**

Length-at-age characteristics for 1984-1989 have been determined from angling, broodstock and trapnet samples collected in those years.

#### **DISTANT FISHERIES**

Coded wire tags (CWT) and carlin tags applied as part of Margaree assessment and enhancement activities have been returned from commercial fisheries in Quebec, Newfoundland and Greenland.

### **RESULTS AND DISCUSSION**

#### **LANDINGS**

Commercial landings for Salmon Fishing Area 18 (1967-1984) are presented in Table 1, DFO Sport catch statistics (1947-1989) in Table 2, and Nova Scotia license cards (1984-1989) in Table 3. Seasonal license LIC and DFO statistics are shown in Table 4. Seasonal creel catches are shown in Table 5.

Total, 1SW, and MSW catches estimated by DFO were about 60% lower in 1989 than 1988 (Table 2). Catches estimated from license returns were 50% lower for 1SW and 30% lower for MSW salmon than 1988 (Table 3). In contrast fall 1989 creel catch estimates for 1SW salmon were 74% lower but MSW estimates were 74% higher than fall 1988 estimates (Table 5). Because creel estimates better

represent the fishery than either DFO or LIC (Claytor and O'Neil 1990) it is concluded that at least for the fall season 1SW catches declined but MSW catches increased in 1989 compared to 1988. These trends suggest that 1SW fall returns declined but MSW fall returns increased in 1989 compared to 1988 but were not as high as 1987 (Table 5).

#### **SPAWNING ESCAPEMENT**

Population estimates based on mark-recapture experiments for fall 1988 and 1989 indicate that spawning requirements of 1036 MSW and 579 1SW salmon were exceeded by fall returns in those years (Table 6). Creel surveys and mark-recapture experiments indicate that exploitation rates can vary in the fall from 7-14% for MSW and 7-16% for 1SW salmon from one year to the next (Claytor and O'Neil 1990 Table 7). Variability of these rates is important because prior to 1987 spawning escapement was estimated by applying exploitation rates of 20 and 40% to DFO angling catches. The results from the last two fall seasons indicate these rates are too high for the fall season and that the average fall exploitation rate is about 12%. This rate likely applies to both 1SW and MSW salmon because population estimates and creel catch estimates indicate that exploitation rates for these fish are similar within years, although 1SW were 1-2% higher than MSW (Claytor and O'Neil 1990). Because creel catch estimates better represent the fishery, under current regulations, than either DFO or license returns, future assessments of fall returns will be based on creel catch estimates and a 12% exploitation rate, with upper and lower limits calculated using extremes in exploitation rates.

Applying a 12% exploitation rate to fall creel estimates since 1987 (Table 5) indicates that returns estimated in this way will vary from mark-recapture estimates by -46 to +25% (compare Table 6).

Currently, there is no completely satisfactory means of estimating summer returns. However, a relative comparison can be made by examining creel estimated angling catches (Table 5). These comparisons indicate that summer MSW returns have been declining since 1987 and 1989 summer 1SW returns are 50% of 1987 and 1988 values.

Before evaluating these summer returns with respect to spawning requirements it will be necessary to determine the exploitation rate on summer returns and independently determine summer angling catch by a creel survey. It will also be necessary to establish some criteria for summer spawning requirements.

Egg depositions determined from historical DFO angling catch and creel catch estimates are presented in Table 7.

#### **FORECAST**

If we assume that angling catch is a relative index of river returns and that there is a proportional relationship between 1SW salmon catch (year i-1) and MSW salmon catch (year i) then it appears from creel catch estimates since 1987 that numbers of MSW salmon (year i) are nearly equivalent to 1SW salmon (year i-1). If this trend continues for 1989-90 lower than 1987-1989 average MSW returns can be expected in 1990. These returns are expected because 1SW salmon returns in 1989 are at least 50% of those in 1987 and 1988 (Table 5).

#### **HATCHERY CONTRIBUTION**

Hatchery releases are shown in Table 8. The proportion hatchery released MSW salmon in the summer run is 30-40% and 30-60% for 1SW salmon. In the fall 90% of 1SW and MSW salmon returns are wild (Tables 9, 10).

#### **BIOLOGICAL CHARACTERISTICS**

Average 1SW and MSW salmon lengths were similar for 1987-1988. As in previous years the majority of Margaree smolts are 2+ smolts. Repeat spawners accounted for < 1% of 1SW and 7% of MSW samples in 1988 (Tables 11).

#### **DISTANT FISHERIES**

Fish tagged since 1986 as part of Margaree assessment and enhancement projects have been recovered in distant fisheries in Quebec, Labrador, Newfoundland and Greenland (Table 12).

#### **CORRECTION TO 1988 MARGAREE ASSESSMENT CAFSAC 88/75**

The headings for Table 14 of the 1988 assessment CAFSAC Res. Doc. 88/75 should read 1) Logbook anglers 100% reported; 2) Non-logbook anglers 67% reported; 3) Adjusted tag return from non-logbook; 4) Total estimated tags caught.



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Table 1. Commercial salmon landings for Salmon Fishing Area 18 (1967-1984) in kg.

Year	Northumberland Strait-NS Fisheries Statistical District				Gulf Cape Breton-NS Fisheries Statistical District			Gulf NS Zone 6 total (kg)
	11	12	13	Subtotal	2	3	Subtotal	
1967		10,503	29,885	40,388	10,728	2,124	12,852	53,240
1968	1,175	9,495	14,949	25,619	10,480	2,057	12,537	38,156
1969		9,968	11,050	21,018	7,831	1,598	9,429	30,447
1970		4,605	13,015	17,620	12,760	114	12,874	30,494
1971		1,689	5,597	7,286	4,485	255	4,740	12,026
1972		5,155	18,714	23,869	7,026	996	8,022	31,891
1973		2,562	15,788	18,350	8,043	1,297	9,340	27,690
1974		5,742	17,437	23,179	11,213	3,045	14,258	37,437
1975		2,080	9,824	11,904	10,670	1,057	11,727	23,631
1976		1,606	5,845	7,451	9,954	956	10,910	18,361
1977		4,137	9,171	13,308	11,490	1,423	12,913	26,221
1978		2,940	15,907	18,847	10,691	678	11,369	30,216
1979		169	4,549	4,718	3,117	82	3,199	7,917
1980		2,534	11,932	14,466	9,088	858	9,946	24,412
1981		1,822	8,283	10,105	4,978	479	5,457	15,562
1982		2,805	13,680	16,485	8,704	1,475	10,179	26,664
1983		1,863	9,770	11,633	11,621	1,026	12,647	24,280
1984		1,097	7,850	8,947	5,291	902	6,193	15,140

Table 2. Salmon angling catch on Marganee River (1947-1989) as compiled by Department of Fisheries and Oceans fisheries officers (DFO statistics).

Year	1SW	MSW		Total	Total
		Retained	Released		
1947	36	364			400
1948	106	704			810
1949	42	340			382
1950	113	326			439
1951	21	449			470
1952	84	207			291
1953	50	298			348
1954	70	306			376
1955	53	258			311
1956	28	91			119
1957 <sup>2</sup>	36	136			172
1958 <sup>2</sup>	N/A	N/A			334
1959 <sup>2</sup>	N/A	N/A			235
1960 <sup>2</sup>	N/A	N/A			140
1961	33	56			89
1962	46	410			456
1963	87	212			299
1964	120	289			409
1965	86	254			340
1966	92	165			257
1967	100	271			371
1968	65	203			268
1969	218	141			359
1970	86	217			303
1971	21	94			115
1972	42	105			147
1973	166	117			283
1974	60	107			167
1975	36	64			100
1976	96	82			178
1977	69	141			210
1978	25	158			183
1979	604	63	19	82	686
1980	173	143	2	140	318
1981	899	105	34	139	1,038
1982	692	103	76	179	871
1983	69	109	43	149	221
1984	148	12	109	121	269
1985	223	0	313	313	536
1986	295	0	754	754	1,049
1987	353	0	408	408	761
1988	435	0	580	580	1,015
1989	179	0	244	244	423

<sup>2</sup> Information regarding 1SW and MSW salmon for 1958-1960 are not available.

Table 3. Salmon angling catch on Margaree River, 1984-1989, based on Nova Scotia license stubs. N/A, not available.

	No. of Anglers	1SW			MSW			Unknown	Effort		Percentage	
		Retain	Release	Total	Retain	Release	Total		Rod-days <sup>1</sup>	CUE	1SW	MSW
1984 Obs	678	185	48	232	9	285	294	4	5,956	0.089		
Est		190	50	241	9	294	303	4	6,669	0.082	44%	56%
1985 Obs	793	371	102	473	0	1,130	1,130	3	7,324	0.219		
Est		399	110	509	0	1,215	1,215	3	7,824	0.221	30%	70%
1986 Obs	1,131	622	126	748	0	2,522	2,522	2	9,724	0.336		
Est		650	132	782	0	2,636	2,636	2	10,232	0.334	23%	77%
1987 Est	1,441	826	151	977	0	1,857	1,857	0	12,887	0.220	34%	66%
1988 Est	N/A	784	N/A	N/A	0	2,017	2,017	N/A	15,080	0.163	29%	71%
1989 <sup>2</sup>	N/A	368	123	491	0	1,454	1,454	N/A	14,982	0.122	20%	80%

<sup>1</sup> Rod-days are defined as one angler fishing for any portion of one day.

<sup>2</sup> Preliminary

Table 4. Seasonal 1SW catches according to Nova Scotia licence stubs 1984-1989 and DFO sport catch. MSW releases are not available by season for STUBS.

License	Year	1SW			MSW		
		Summer	Fall	Percent Fall	Summer	Fall	Percent Fall
License	1989	194	174	47%			
	1988	474	310	40%			
	1987	612	215	26%		N/A	
	1986	396	254	39%			
	1985	243	156	39%			
	1984	120	68	36%			
DFO	1989	130	49	27%	80	164	67%
	1988	287	148	34%	293	287	49%
	1987	268	85	24%	123	285	70%
	1986	196	99	34%	297	457	61%
	1985	116	107	48%	144	168	54%
	1984	81	67	45%	27	94	78%

Table 5. Seasonal creel catch estimates from 1987-1989.

Year	ISW			MSW		
	Summer	Fall	Total	Summer	Fall	Total
1989	151 <sup>1</sup>	57	208	152 <sup>1</sup>	311	463
1988	367	222	589	190	178	368
1987	306 <sup>1</sup>	97	403	242 <sup>1</sup>	561	803

<sup>1</sup> Estimated from creel correction factors (Clayton and O'Neil 1990, Table 2).

Table 6. Fall population estimates based on mark-recapture for 1988 and 1989 on the Margaree River (Clayton and O'Neil 1990), compared to estimates based on creel estimated angling catches and 12% exploitation rate (ER). Estimates in parentheses show range in population estimate using highest and lowest exploitation rates estimated in Clayton and O'Neil (1990).

Year	Sea-age	Mark-Recapture	Creel % 12% ER	Percent Difference
1989	1SW	872	457 ( 356- 872)	-46
	MSW	3973	2592 (2221-4443)	-35
1988	1SW	1482	1850 (1388-3171)	25
	MSW	1314	1483 (1271-2543)	13

Table 7. Estimated Atlantic salmon egg deposition in the Margaree River A) from 1947-1986 using non-adjusted DFO statistics. Section B provides egg deposition based on spawners calculated from creel catch estimates and seasonal exploitation rates in Table 5. Exploitation rates (20.6 and 37.9%) used in past assessments have been used to estimate potential MSW and 1SW salmon spawners. Fecundity rates used to calculate egg deposition were 6,482 eggs/MSW and 330 eggs/1SW. Egg deposition requirements are 6,714,600 eggs. \* indicates years in which spawning requirements have been met. N/C, no collection made; N/A, data not available.

A)							
Eggs X 10 <sup>6</sup>							
Year	Collected for hatchery	MSW (20.6)	1SW (20.6)	Total	MSW (37.9)	1SW (37.9)	Total
1947	5.00	9.09	0.05	4.14	3.87	0.02	-
1948	4.50	17.59	0.13	13.22*	7.48	0.06	3.03
1949	2.80	8.49	0.05	5.75	3.61	0.02	0.83
1950	N/C	8.14	0.14	8.29*	3.46	0.06	3.52
1951	N/C	11.22	0.03	11.24*	4.77	0.01	4.78
1952	N/C	5.17	0.11	5.28	2.20	0.05	2.24
1953	N/C	7.45	0.06	7.51*	3.17	0.03	3.19
1954	N/C	7.65	0.09	7.73*	3.25	0.04	3.29
1955	0.50	6.45	0.07	6.01	2.74	0.03	2.27
1956	3.50	2.27	0.04	-	0.97	0.02	-
1957	0.90	3.40	0.05	2.54	1.44	0.02	0.56
1958	1.00	N/A	N/A	N/A	N/A	N/A	N/A
1959	0.50	N/A	N/A	N/A	N/A	N/A	N/A
1960	1.50	N/A	N/A	N/A	N/A	N/A	N/A
1961	2.00	1.40	0.04	-	0.59	0.02	-
1962	0.30	10.24	0.06	10.00*	4.35	0.02	4.08
1963	1.10	5.30	0.11	4.31	2.25	0.05	1.20
1964	0.40	7.22	0.15	6.97*	3.07	0.06	2.73
1965	0.60	6.35	0.11	5.86	2.70	0.05	2.14
1966	0.40	4.12	0.12	3.84	1.75	0.05	1.40
1967	0.20	6.77	0.13	6.70	2.88	0.05	2.73
1968	0.40	5.07	0.08	4.75	2.16	0.04	1.79
1969	0.35	3.52	0.28	3.45	1.50	0.12	1.27
1970	0.20	5.42	0.11	5.33	2.30	0.05	2.15
1971	0.05	2.35	0.03	2.33	1.00	0.01	0.96
1972	0.10	2.62	0.05	2.58	1.12	0.02	1.04
1973	0.10	2.92	0.21	3.03	1.24	0.09	1.23
1974	N/C	2.67	0.08	2.75	1.14	0.03	1.17
1975	0.05	1.60	0.05	1.59	0.68	0.02	0.65
1976	N/C	2.05	0.12	2.17	0.87	0.05	0.92
1977	N/C	3.52	0.09	3.61	1.50	0.04	1.53
1978	0.10	3.95	0.03	3.88	1.68	0.01	1.59
1979	N/C	2.17	0.77	2.94	0.99	0.33	1.32
1980	0.10	3.64	0.22	3.76	1.55	0.09	1.55
1981	0.05	3.69	1.14	4.79	1.70	0.49	2.13
1982	0.20	4.96	0.88	5.64	1.59	0.37	2.57
1983	0.10	4.08	0.09	4.06	1.89	0.04	1.83
1984	0.10	3.73	0.19	3.82	1.99	0.08	1.97
1985	0.15	9.85	0.28	9.98*	5.35	0.12	5.32
1986	0.15	23.73	0.38	23.95*	12.90	0.16	12.91*

B)							
Eggs X 10 <sup>6</sup>							
Year	Collected for hatchery	MSW (20.6)	1SW (20.6)	Total	MSW (37.9)	1SW (37.9)	Total
1987	0.15	25.3	0.6	25.8*	13.7	0.4	14.0*
1988	0.30	11.6	0.9	12.2*	6.3	0.5	6.5*
1989	0.30	14.6	0.3	14.6*	7.9	0.2	7.8*



Table 8. Numbers of salmon smolt and parr released to Margaree River since 1976. MAR, Margaree, RB, Rocky Brook; COB, Cobequid; MER, Mersey.

Year	Rearing location	Smolt				Parr			
		2+		1+		1+		0+	
		MAR	RB	MAR	RB	MAR	RB	MAR	RB
1976	MAR	8,971							
1977	MAR					5,022			
1978	COB		15,250						
1979	COB		15,927 <sup>1</sup>						
1980	COB		14,960						
1981	COB		15,950						
1982	MER			8,481		1,098			
1983	COB	13,486						9,853	
	MAR	3,783							
1984	MAR								
	MER				10,195 <sup>2</sup>				
	COB	11,210		14,483					
1985	MAR			2,669	1,303	5,882	834		
	COB	13,660				7,820	5,860		
1986	MAR			2,105		8,754		25,000	
	COB	8,820	9,684					6,750	
1987	MAR	6,369		8,599		5,400		40,000	
	COB	18,337						12,429	
1988	MAR	4,136		22,313		2,201		40,000	
	COB	12,785						6,300	
1989	MAR	2,600		13,000		10,000		150,000	
	COB	18,500						6,000	

<sup>1</sup> Millbank broodstock

<sup>2</sup> Rocky Brook X Margaree broodstock

Table 9. Numbers of wild and hatchery salmon from summer and fall sampling on Margaree River in 1989.

Season	1SW		MSW	
	Wild	Hatchery	Wild	Hatchery
SUMMER				
June 1 - August 31				
Angling	12	20	23	17
Broodstock	15	21	39	24
Trapnets	3	1	7	0
Summer Total	30	42	69	41
FALL				
September 1 - October 15				
Angling	8	2	38	4
Trapnets	73	3	322	19
Fall Total	81	5	360	23

Table 10. Percentage of wild and hatchery fish returning to Margee River in 1987 - 1989. Percentages are based on angling, broodstock, and trapnet samples.

Season	1SW		MSW	
	Wild	Hatchery	Wild	Hatchery
1989				
SUMMER	42%	58%	63%	37%
FALL	94%	6%	94%	6%
TOTAL	70%	30%	87%	13%
1988				
SUMMER	74%	26%	69%	31%
FALL	97%	3%	98%	2%
TOTAL	82%	18%	83%	17%
1987				
SUMMER	37%	63%	60%	40%
FALL	69%	31%	96%	4%
TOTAL	45%	55%	85%	15%

Table 11. Mean fork lengths and percentage of two year old smolts in wild Margaree River Atlantic salmon samples, 1987-1988. N, sample size.

Sea-age	Year	N	SEASON			Percent 2 Year Smolts
			Summer	Fall	Total	
1SW	1987	54	54.2	54.7	54.4	55
	1988	280	54.8	56.1	55.7	67
MSW	1987	129	75.1	77.7	77.0	71
	1988	178	76.1	77.4	77.2	84
REPEAT						
1SW	1987	2	---	69.0	69.0	0
MSW	1987	7	90.0	89.8	89.9	80
	1988	33	92.4	92.5	92.4	81

Table 12. Summary of maiden tag recaptures from smolt and adult releases in the Margaree River 1986 to 1989.

Release Year	Stock	Stage	No. Tags Applied	Tag Type	Series	Greenland						Newfoundland						Quebec 09	Total Returns
						1A	1B	1C	1D	1E	1F	1	2	3	4	5	6		
1986	Rocky Brook	2t smolt	7311	CWT	55 0/0		2		2	3	1	1			2				11
1986	Rocky Brook	2t smolt	3376	CWT	62 2/23														
1986	Rocky Brook	2t smolt	1992	CWT	62 2/25		1		1										2
1987	Lake O'Law	1t smolt	995	CWT	55 16/7														
1987	Lake O'Law	1t smolt	1107	CWT	55 16/8														
1987	Margaree River	2t smolt	10000	CWT	55 16/16										1				1
1987	Margaree River	1t smolt	8599	CWT	55 16/16														
1987	Lake O'Law	1t smolt	3080	CWT	55 16/17 <sup>1</sup>										2				2
1987	Margaree River	2t smolt	933	Carlin	P22200 - P22299 - P22500 - P23199 - P23300 - P23499 -			1		1									3
1987	Margaree River	MSW	138	Carlin	zz23000 23137								1				1	2	4
1988	Margaree River	2t smolt	4116	CWT	55 16/12														
1988	Margaree River	MSW 1SW	340	Carlin	zz23138 - 23299 - zz23401 - 23581 -								2					1	3
1989	Margaree River	MSW 1SW	425	Carlin	zz23583 - 23999 - zz23300 - 23309 -														

<sup>1</sup> May also be Nepisiguit River origin as same series used for those released

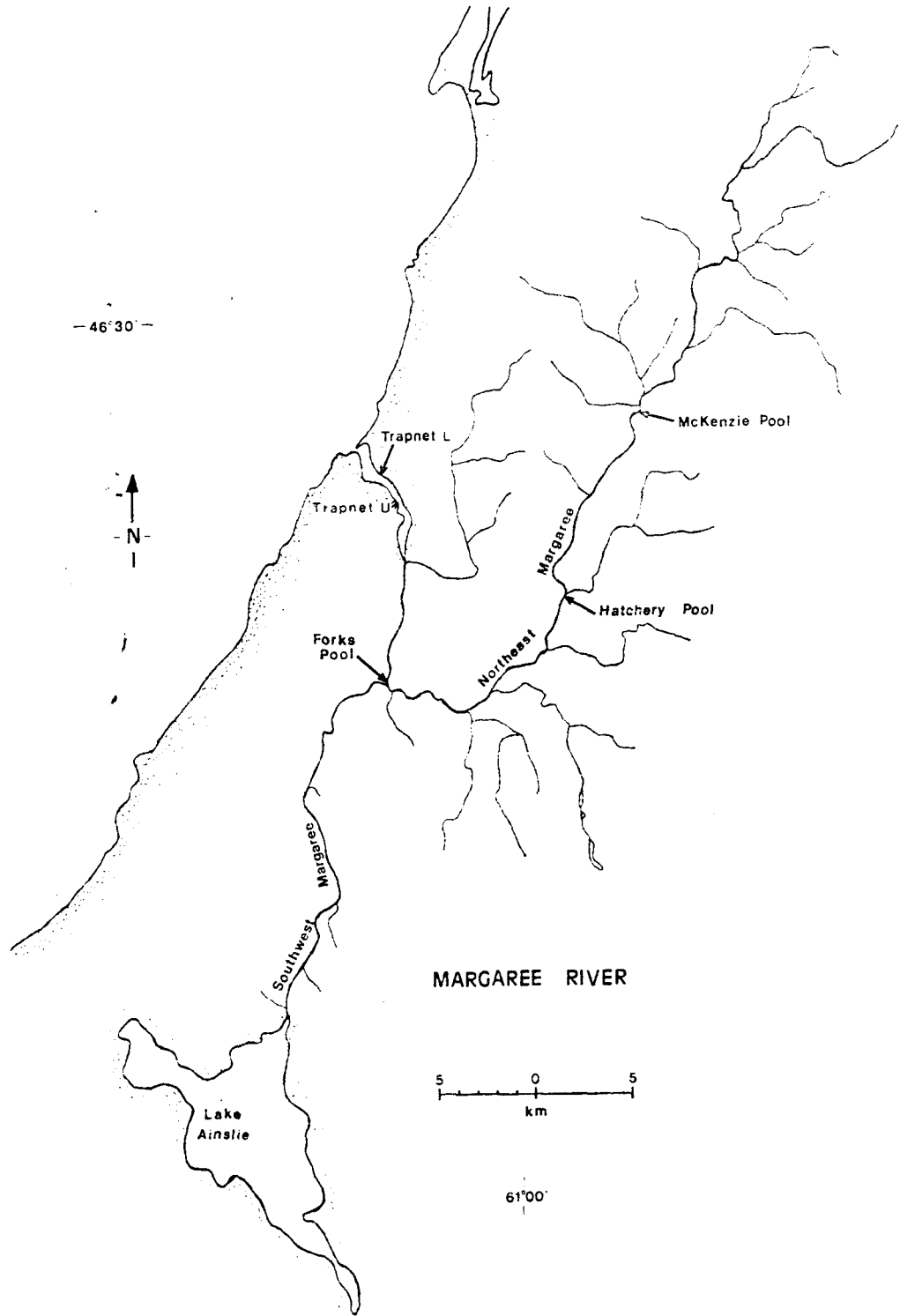


Fig. 1. Location of sampling sites on Margaree River.