Ages at Migration of Atlantic Salmon in the Restigouche River, 1976-78

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Ages at migration (smoltification and spawning migration) of Atlantic salmon in the Restigouche River, New Brunswick, were obtained from three seasons (1976-78) of scale sampling the ascending adult salmon run. This report presents the final ages assigned to all the scale samples read.

Key words: Atlantic salmon, smolt, grilse, large salmon, spawning migration, scale sample, freshwater age, sea age, Restigouche River.

RÉSUMÉ

Pickard, P.R. and J.L. Peppar. 1979. Ages at migration of Atlantic salmon in the Restigouche River, 1976-78. Can. Data Rep. Fish. Aquat. Sci. No. 165. 10 p.

On a établi l'âge migratoire (avalaison des tacons et montaison) du saumon atlantique remontant la rivière Restigouche (Nouveau-Brunswick) grâce au prélèvement au cours de trois saisons (1976 à 1978) d'échantillons d'écailles de saumons adultes à la montaison. Le présent rapport donne les âges définitifs attribués à tous les échantillons prélevés.

Mots clés: saumon atlantique, tacon, madeleineau, saumon adulte, montaison, échantillons d'écailles, âge en eau douce, âge en mer, rivière Restigouche.

INTRODUCTION

This report presents data on the ages at migration (smoltification and spawning migration) of Atlantic salmon in the Restigouche River, New Brunswick. Data were obtained from three seasons of sampling the ascending adult salmon run to the Restigouche River system, 1976-78; data derived for the period 1972-75 have been presented (Peppar and Pickard 1975).

Sampling was conducted by means of a stand of four, interconnected, Chaleur Bay spearhead floating traps, set and operated each year in Chaleur Bay about 315 m south of Bon Ami Rocks, Dalhousie, New Brunswick (48°03'N; 66°21'W). This location was chosen because of its position near the head of the Restigouche River estuary, and its past reputation as a good commercial fishing-trap site (Fig.).

The leaders of all four traps were constructed of 15.2-cm mesh, while the three offshore "pounds" were constructed of 8.9-cm mesh and the inshore "pound" of 6.4-cm mesh. The smaller mesh size in the "pounds" allowed capture of both grilse and large salmon components of the ascending adult run.

The sampling operation was conducted by personnel of the Resource Branch, Fisheries and Marine Service, as part of an adult salmon enumeration and tagging program initiated in 1972. The traps were set and fished by the licensed owner of the stand, J.A. Reid Stewart.

METHODS AND PRESENTATION OF DATA

Ages were determined by scale reading. Scale samples were obtained from all salmon tagged, from those scale sampled only, from those sacrificed for further biological analysis and from those found meshed in the traps. Samples of scales were removed from the left side of each fish, immediately posterior to the base of the dorsal fin and 2-3 scale rows above the lateral line.

Each scale sample was examined under a binocular microscope, and those scales with suitable (entire) centres were subsequently impressed on acetate slides. To read the scales, a microprojector was employed to project the scale image on a white background.

All scale samples were independently read twice; additional readings were made of those samples in which ages disagreed, and final ages were assigned on the basis of majority agreement. Differences in sample sizes recorded in the tables reflect the proportion of scales for which smolt ages could not be determined. Of the 3,134 scale samples read, 4 (0.1%) did not provide suitable centres for determination of freshwater age.

The method used to record data in this report divides total age into two parts — freshwater (smolt) and sea ages; for example, a fish recorded as "3.2" has spent three years in freshwater and all or part of the succeeding two years in the sea. This is commonly referred to as a "two-sea-winter" salmon.

In presenting the age composition data, grilse (fish returning to spawn after spending only one winter at sea) and large salmon (fish returning to spawn after spending two or more winters at sea) are treated separately in the tables. Previously spawned fish are "lumped" in Table 1, regardless of at what age they spawned or how many times they had previously spawned. In Table 2, the previously spawned fish have been separated according to their sea age when entering the river for the first time. Remaining tables present final age (i.e., present age) at year of sampling, irregardless of previous spawning.

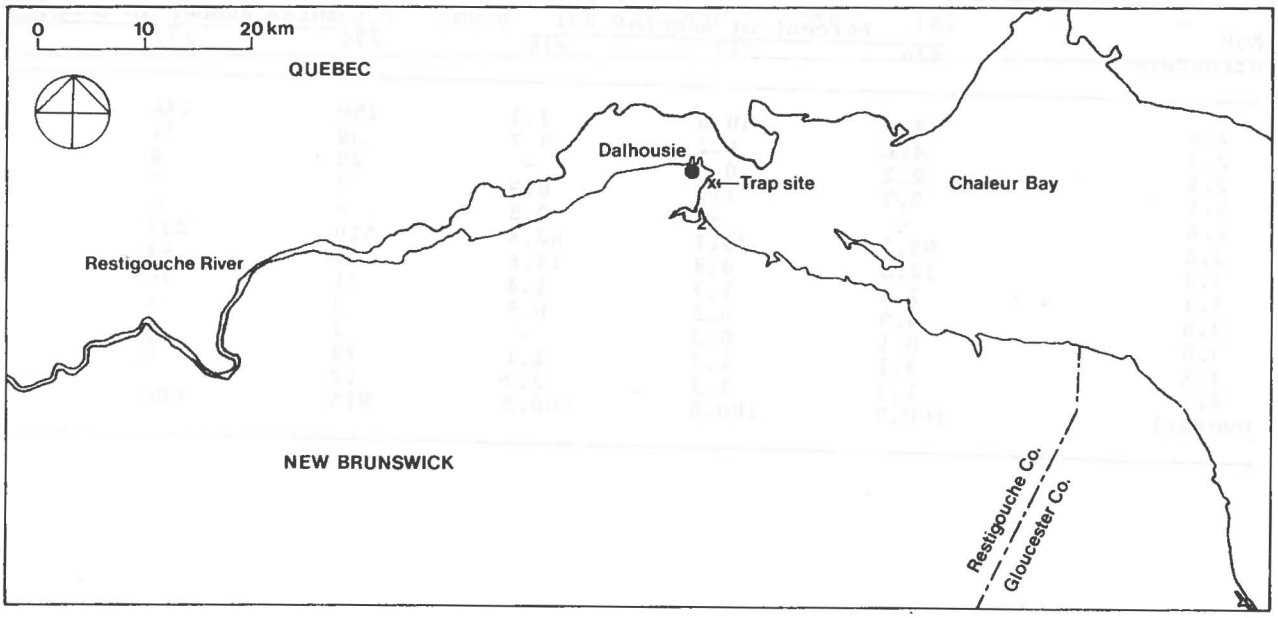

FIG. Location map of salmon trapping site, Restigouche River, 1976-78.

TABLE 1. Percentage composition of sea ages of large salmon caught during successive semi-monthly periods, over the three seasons of sampling, 1976-78.

Semi-monthly period	Percent of sample: Maiden fish, Sea age - 2 yr /76	/77	/78	Maiden fish, Sea age - 3 yr /76	/77	/78	Previous spawners /76	/77	/78	Total number in sample /76	/77	/78
May 16-31	-	25.0	-	-	50.0	-	-	25.0	-	-	8	-
Jun 1-15	53.1	45.2	58.5	30.6	39.8	33.9	16.3	15.1	7.7	147	93	130
16-30	79.0	86.0	72.8	16.2	10.2	23.5	4.8	3.8	3.7	499	315	136
Jul 1-15	81.9	91.4	86.4	12.5	6.5	11.1	5.6	2.2	2.5	216	93	81
16-31	82.6	91.0	70.0	10.9	6.4	30.0	6.5	2.6	-	46	78	20
Aug 1-15	85.7	100.0	-	14.3	-	-	-	-	-	7	19	-
16-31	100.0	100.0	66.7	-	-	33.3	-	-	-	1	2	3
Overall	75.8	80.9	70.5	17.4	13.8	24.9	6.9	5.3	4.6	916	608	370

TABLE 2. Percentage composition of freshwater (smolt) ages in each sea-age group of large salmon over the three seasons of sampling, 1976-78.

Sea age (yr)	Percent of sample: Smolt age - 2 yr /76	/77	/78	Smolt age - 3 yr /76	/77	/78	Smolt age - 4 yr /76	/77	/78	Total number in sample /76	/77	/78
1	30.0	14.3	71.4	60.0	85.7	28.6	10.0	-	-	10	7	7
2	24.4	49.5	10.0	71.8	48.9	88.4	3.8	1.6	1.5	735	505	267
3	22.4	39.4	35.4	71.2	53.2	56.3	6.5	7.5	8.3	170	94	96
Overall	24.0	47.5	17.8	71.6	50.0	78.9	4.4	2.5	3.2	915	606	370

TABLE 3. Age composition (age structure) of large salmon over the three seasons of sampling, 1976-78.

Age structure	Percent of sample /76	/77	/78	Total number in sample /76	/77	/78
2.2	17.4	40.6	7.3	159	246	27
2.3	4.2	5.1	9.7	38	31	36
2.4	2.2	0.7	-	20	4	-
2.5	0.3	1.2	0.3	3	7	1
2.6	-	-	0.5	-	-	2
3.2	55.7	39.1	62.4	510	237	231
3.3	12.6	8.8	14.6	115	53	54
3.4	2.3	1.7	1.4	21	10	5
3.5	0.9	0.2	0.5	8	1	2
3.6	0.1	0.3	-	1	2	-
4.2	3.1	1.3	1.1	28	8	4
4.3	1.3	1.2	2.2	12	7	8
Overall	100.0	100.0	100.0	915	606	370

TABLE 4. Age composition (total age in years) of large salmon over the three seasons of sampling, 1976-78.

Total age (yr)	Percent of sample /76	/77	/78	Total number in sample /76	/77	/78	From spawning of /76	/77	/78
4	17.4	40.6	7.3	159	246	27	1971	1972	1973
5	59.9	44.2	72.2	548	268	267	1970	1971	1972
6	17.8	10.7	15.7	163	65	58	1969	1970	1971
7	3.9	4.0	3.8	36	24	14	1968	1969	1970
8	0.9	0.2	1.1	8	1	4	1967	1968	1969
9	0.1	0.3	-	1	2	-	1966	1967	-
Overall	100.0	100.0	100.0	915	606	370	-	-	-

TABLE 5. Percentage composition of freshwater (smolt) ages in grilse over the three seasons of sampling, 1976-78.

Sea age (yr)	Percent of sample: Smolt age - 2 yr /76	/77	/78	Smolt age - 3 yr /76	/77	/78	Smolt age - 4 yr /76	/77	/78	Smolt age - 5 yr /76	/77	/78	Total number in sample /76	/77	/78
1	37.4	14.0	11.8	59.6	84.9	78.9	3.1	1.1	8.7	-	-	0.6	720	358	161
Overall	37.4	14.0	11.8	59.6	84.9	78.9	3.1	1.1	8.7	-	-	0.6	720	358	161

TABLE 6. Age composition (structure and total age in years) of grilse over the three seasons of sampling, 1976-78.

Age structure	Total age (yr)	Percent of sample /76	/77	/78	Total number in sample /76	/77	/78	From spawning of /76	/77	/78
2.1	3	37.4	14.0	11.8	269	50	19	1972	1973	1974
3.1	4	59.6	84.9	78.9	429	304	127	1971	1972	1973
4.1	5	3.1	1.1	8.7	22	4	14	1970	1971	1972
5.1	6	-	-	0.6	-	-	1	-	-	1971
Overall		100.0	100.0	100.0	720	358	161	-	-	-

REFERENCE

J.L. Peppar and P.R. Pickard. 1975. Ages at migration of Atlantic salmon in the Restigouche River. Resource Development Branch, Fisheries and Marine Service, Dept. of the Environment, Maritimes Region, Halifax, Nova Scotia. Data Record Series No. MAR/D-75-8, 7 p.