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Size and age composition of the 1968, 1969 and 1970 commercial salmon landings in New Brunswick, Canada

by

C. E. Wykes
Resource Development Branch
Fisheries Service
Department of the Environment of Canada
Halifax, Nova Scotia

INTRODUCTION

A study was initiated in 1968 to examine the selective nature of various types of commercial salmon fishing gear and to provide information on the length, weight and age structure of salmon taken in major commercial fishing areas in New Brunswick. Sampling was conducted in Chaleur Bay in 1969 and 1970; and in the Miramichi and Saint John areas in 1968, 1969 and 1970. Figure 1 shows the areas where sampling was conducted. These three areas were chosen as they have traditionally accounted for 60-80 percent of the total Maritime commercial salmon landings.

Salmon fishing in Chaleur Bay was conducted entirely with trap nets having a stretched mesh size ranging between 14.0 and 15.2 centimeters. Trap nets in the Restigouche River estuary were secured to the bottom with poles whereas those in the outer part of Chaleur Bay were floating traps held in place with anchors. In the Miramichi estuary, pole traps were

used and outside the estuary fishing was conducted with drift nets. Floating trap nets were used in the Saint John River estuary whereas outside the estuary drift nets were employed. The stretched mesh size of Miramichi and Saint John trap nets ranged from 12.7 to 14.0 centimeters. Drift nets in both areas had a stretched mesh size between 14.0 and 16.5 centimeters. A small number of gill nets were fished in the Miramichi and Saint John rivers, however, because of the small catches in this type of gear, they were not included in the sampling program.

Although the New Brunswick Fishery Regulations prohibit commercial fishermen from taking or keeping a salmon or grilse that is less than five pounds round weight, fishermen involved in the sampling program were asked to retain all fish captured. Therefore, the grilse component of the commercial catch shown in this paper does not necessarily reflect the composition of catches retained by fishermen under normal circumstances. The official salmon landings for New Brunswick report only fish over five pounds round weight.

A number of pieces of commercial salmon gear were randomly selected within each of the three major fishing areas and their daily catch on regular intervals was sampled. The percent of each type of gear, in each area, from which samples were collected are listed in Table 1. A minimum of 20 percent of the catch from each selected piece of gear was sampled.

The following information was recorded for each fish sampled: fork length (to the nearest centimeter), weight (to the nearest tenth of a kilogram), gear location and gear type. Approximately 15 scales were removed from each fish in an area on an arbitrary line drawn between the posterior insertion of the dorsal fin and the anterior insertion of the anal fin, two or three rows of scales above the lateral line. Scales were subsequently aged with the use of an Eberbach micro-projector.

RESULTS

There were only slight differences from year to year in the age composition of salmon and grilse within each of the three areas. Table 2 shows the age class structure for all sample years combined. It is interesting to note the large grilse component captured in Miramichi trap nets (60.6 percent) and in Saint John River trap nets (12.1 percent). In the Chaleur Bay fishery, the most northerly of the three fisheries, the lowest percentage of 2-year freshwater fish and the highest percentage of 3-year freshwater fish were found. The Saint John fishery, the most southerly, had the highest percentage of 2-year freshwater fish and the lowest percentage of 3-year freshwater fish. The percentages of both 2 and 3-year freshwater fish from the Miramichi fell between those found for the other two sampling areas. There did not appear to be any trend in frequency of 4-year freshwater fish between the three areas.

Table 3 shows the age class structure of large salmon only (2 sea years and older). The predominant age class in all areas was 3 freshwater and 2 saltwater years. The older year classes (3.3, 3.4, 4.3 and 4.4) were apparent in significantly larger numbers in the Bay of Chaleur than the other two areas.

The average lengths and weights of grilse and virgin salmon are shown in Table 4. For each sample year, grilse and 2 sea year salmon from the Saint John were considerably longer and heavier than those from the Miramichi. Sea age 3 salmon from Chaleur Bay were slightly longer and noticeably heavier than sea age 3 salmon from the other two areas. Grilse and 2 sea year salmon captured during 1969 in all areas were smaller fish than those captured during 1968 and 1970.

Table 1. Percent of gear in each area, from which samples were collected during 1968, 1969 and 1970.

Area	Gear Type	Percent of Gear Sampled		
		1968	1969	1970
Chaleur Bay	Trap Nets	-	6.2	8.5
Miramichi	Trap Nets	1.4	5.2	5.2
Miramichi	Drift Nets	2.5	9.0	9.0
Saint John	Trap Nets	4.0	5.0	7.0
Saint John	Drift Nets	6.0	14.0	16.0

Table 2. Percentage composition by age class of salmon and grilse captured in commercial salmon gear from three areas of New Brunswick (all sample years combined).

AREA	GEAR TYPE	AGE COMPOSITION (freshwater.saltwater) 2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4
Chaleur	PTN*	1.0	4.5	3.9	2.0	2.5	45.5	27.7	7.9	0.5	1.0	3.0	0.5
Chaleur	FTN**	-	4.7	2.7	-	1.0	58.1	25.8	3.7	-	1.7	2.0	0.3
Miramichi	PTN	8.9	4.4	0.5	-	47.0	28.5	3.0	0.4	5.8	1.4	0.1	-
Miramichi	DN***	-	18.2	1.2	0.1	0.7	69.1	7.0	0.4	0.1	3.0	0.2	-
Saint John	FTN	2.7	17.1	1.2	0.2	8.2	56.8	5.2	1.5	1.2	5.2	0.7	-
Saint John	DN	0.3	19.6	2.7	0.5	1.0	60.4	8.9	0.8	0.3	4.6	0.8	0.1

* Pole Trap Net

** Floating Trap Net

*** Drift Net

Table 3. Percentage composition by age class of 2 sea year and older salmon captured in commercial salmon gear from three areas of New Brunswick (all sample years combined).

AREA	GEAR TYPE	AGE COMPOSITION (freshwater.saltwater) 2.2	2.3	2.4	3.2	3.3	3.4	4.2	4.3	4.4
Chaleur	PTN*	4.7	4.1	2.1	47.4	28.8	8.2	1.1	3.1	0.5
Chaleur	FTN**	4.8	2.7	-	58.7	26.1	3.7	1.7	2.0	0.3
Miramichi	PTN	11.5	1.3	-	74.4	7.8	1.0	3.7	0.3	-
Miramichi	DN***	18.3	1.2	0.1	69.7	7.1	0.4	3.0	0.2	-
Saint John	FTN	19.5	1.3	0.2	64.7	5.9	1.7	5.9	0.8	-
Saint John	DN	19.9	2.7	0.5	61.6	9.0	0.8	4.6	0.8	0.1

* Pole Trap Net

** Floating Trap Net

*** Drift Net

Table 4. Average fork length (cm) and weight (kg) by year, of salmon and grilse captured in commercial salmon gear from three areas of New Brunswick.

AREA	GEAR TYPE	YEAR	SALTWATER AGE 1 L	1 WT	2 L	2 WT	3 L	3 WT	4 L	4 WT
Chaleur	TN*	1969	-	-	72	3.8	89	9.0	93	9.9
		1970	-	-	76	4.4	88	7.8	91	9.2
Miramichi	TN	1968	56	1.9	72	3.8	78	5.3	-	-
		1969	53	1.5	69	3.5	81	6.0	-	-
		1970	53	1.5	72	4.1	81	6.0	-	-
Miramichi	DN**	1968	-	-	73	4.5	80	6.0	-	-
		1969	-	-	71	3.9	82	6.6	-	-
		1970	-	-	73	4.4	80	5.8	-	-
Saint John	TN	1968	63	2.7	80	5.1	88	6.7	-	-
		1969	57	2.0	73	4.4	83	6.4	-	-
		1970	63	2.3	79	4.9	86	6.0	-	-
Saint John	DN	1968	-	-	78	4.9	83	5.9	-	-
		1969	-	-	75	4.9	80	6.2	-	-
		1970	-	-	77	5.4	76	5.1	-	-

* Trap Net

** Drift Net

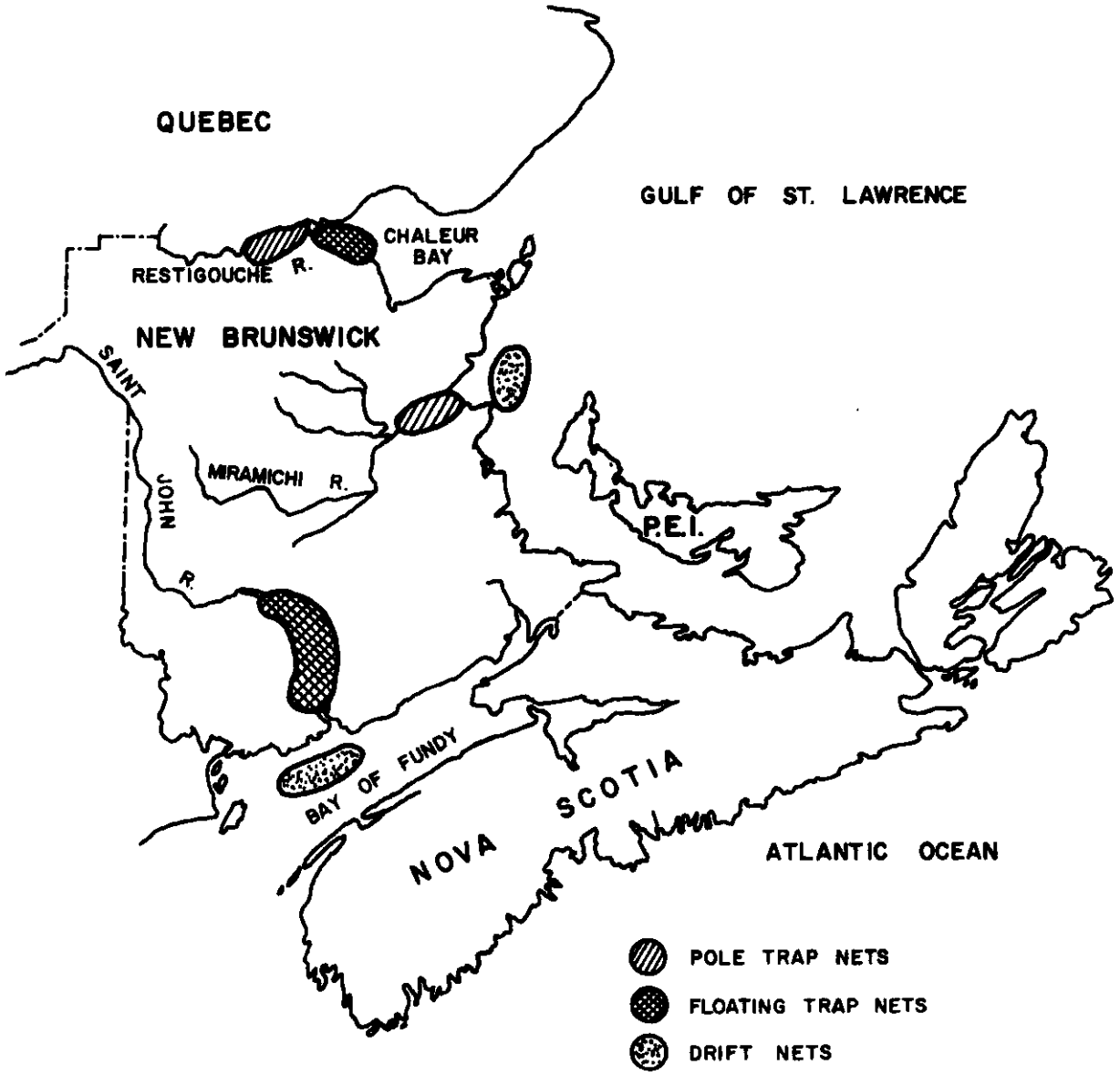

Figure 1. Location and type of gear employed in the areas where samples were collected.