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Catalogue of Rivers in Insular Newfoundland

Volume C

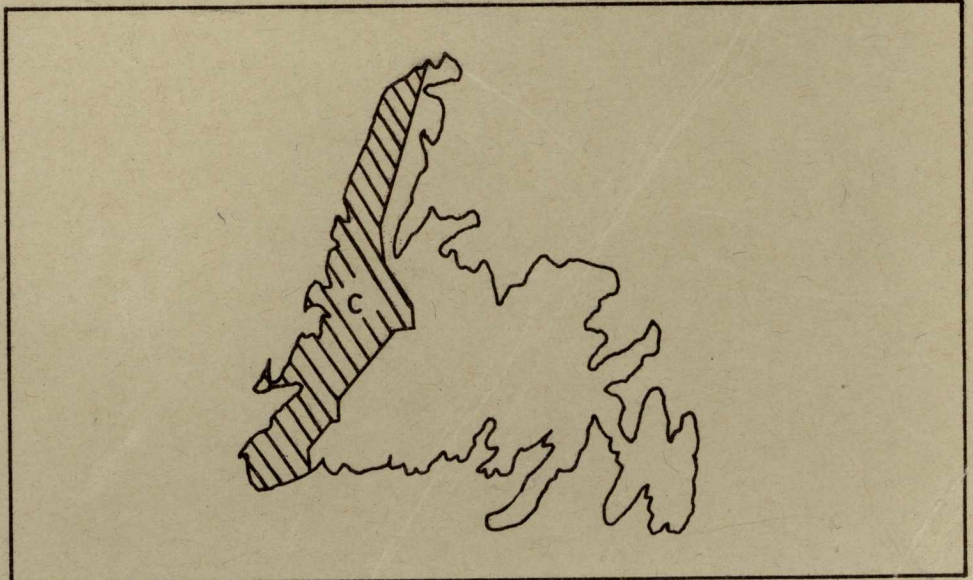
by

T.R.Porter, L.G.Riche and G.R.Traverse

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Resource Development Branch
Newfoundland Region



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DATA REPORT SERIES NO. NEW/D-74-9
VOLUME C

CATALOGUE OF RIVERS IN
INSULAR NEWFOUNDLAND

by

T.R. Porter, L.G. Riche and G.R. Traverse

RESOURCE DEVELOPMENT BRANCH
FISHERIES & MARINE SERVICE
DEPARTMENT OF THE ENVIRONMENT

OCTOBER, 1974

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TABLE OF CONTENTS

	Page
TABLE OF CONTENTS.....	i
RIVER INDEX.....	iv
LIST OF FIGURES.....	vii
GLOSSARY OF TERMS.....	x
INTRODUCTION.....	1
EXPLANATION OF CODES.....	5
Northwest Brook.....S-38-1933.....	7
Rose Blanche Brook.....S-39-1946.....	9
Grandys Brook.....S-39-1959.....	11
Burnt Island Brook.....S-39-1964.....	15
Isle aux Mort River.....S-39-1982.....	17
Little Bay Brook.....S-39-1997.....	21
Grand Bay River.....S-39-2010.....	23
Barachois Brook.....S-39-2025.....	27
Bear Cove Brook.....W-40-0002.....	29
Little Codroy River.....W-40-0014.....	33
Grand Codroy River.....W-40-0033.....	39
Highland River.....W-40-0083.....	43
Crabbs River.....W-40-0086.....	51
Barachois Brook.....W-40-0090.....	59
Robinsons River.....W-40-0092.....	67
Fishels Brook.....W-40-0096.....	77
Barry Brook.....W-40-0097.....	85
Middle Brook.....W-40-0098.....	87
Journois Brook.....W-40-0099.....	89
Flat Bay Brook.....W-41-0108.....	93
Little Barachois River.....W-41-0111.....	103
Southwest Brook and Bottom Brook.....W-41-0115.....	111
Harry's River.....W-41-0120.....	119

	Page
Seal Cove Brook.....W-41-0123.....	131
Blanche Brook.....W-41-0126.....	133
Romaines Brook.....W-41-0130.....	135
Fox Island River.....W-43-0192.....	141
Lewis Brook.....W-44-0201.....	149
Deadman's Brook.....W-44-0206.....	153
Serpentine River.....W-44-0209.....	157
Wild Cove Brook.....W-44-0210.....	163
Blow Me Down Brook.....W-44-0225.....	167
Clarkes Brook.....W-44-0234.....	169
Cooks Brook.....W-44-0237.....	173
Corner Brook.....W-44-0242.....	179
Humber River.....W-44-0243.....	181
Hughes Brook.....W-44-0245.....	197
Gillams Brook.....W-44-0252.....	203
Rattler Brook.....W-44-0254.....	205
Cox's Brook.....W-44-0264.....	209
Barachois Brook.....W-44-0265.....	211
Old Man's Brook.....W-44-0270.....	215
Goose Arm Brook.....W-44-0274.....	219
Penguin Arm Brook.....W-44-0281.....	225
North Arm Brook.....W-44-0302.....	229
Strowbergs Brook.....W-44-0318.....	231
Liverpool Brook.....W-44-0321.....	235
Lower Crabb Brook.....W-44-0328.....	239
Gregory River.....W-44-0344.....	243
Trout River.....W-45-0352.....	247
Middle Brook.....W-45-0374.....	251
Lomond River.....W-45-0392.....	253
Deer Arm Brook.....W-45-0404.....	263
Bakers Brook.....W-45-0412.....	269
Western Brook.....W-46-0422.....	273
St. Paul's River.....W-46-0435.....	277

	Page
Stanford River.....W-46-0454.....	279
Parsons Pond River.....W-46-0456.....	283
Portland Creek.....W-46-0462.....	287
Bowing Brook.....W-47-0465.....	297
Bound Brook.....W-47-0466.....	301
River of Ponds.....W-47-0474.....	305
Little Brook Ponds.....W-47-0475.....	309
Torrent River.....W-47-0480.....	313
Little East River.....W-47-0481.....	321
East River.....W-47-0484.....	325
Doctors Brook.....W-48-0499.....	329
Castor River.....W-48-0503.....	333
St. Genevieve River.....W-49-0517.....	339
West Brook.....W-49-0519.....	345
East River.....W-49-0520.....	351
Green Island Brook.....W-49-0537.....	353
Eddie's Cove Brook.....W-49-0539.....	355
Halfway Brook.....W-49-0542.....	357
Big Brook.....W-49-0546.....	359

RIVER INDEX

RIVER	INDEX NUMBER	PAGE
Bakers Brook.....	W-45-0412.....	269
Barachoix Brook.....	S-39-2025.....	27
Barachoix Brook (Bay of Islands).....	W-44-0265.....	211
Barachois Brook (St. Georges Bay).....	W-40-0090.....	59
Barry Brook.....	W-40-0097.....	85
Bear Cove River.....	W-40-0002.....	29
Big Brook.....	W-49-0546.....	359
Blanche Brook.....	W-41-0126.....	133
Blow Me Down Brook.....	W-44-0225.....	167
Bottom Brook.....	W-41-0115.....	111
Bowing Brook.....	W-47-0465.....	297
Bound Brook.....	W-47-0466.....	301
Burnt Island Brook.....	S-39-1964.....	15
Castor River.....	W-48-0503.....	333
Clarkes Brook.....	W-44-0234.....	169
Cooks Brook.....	W-44-0237.....	173
Corner Brook.....	W-44-0242.....	179
Cox's Brook.....	W-44-0264.....	209
Crabb's River (Crabb's Brook).....	W-40-0086.....	51
Deadman's Brook.....	W-44-0206.....	153
Deer Brook (Deer Arm Brook).....	W-45-0404.....	263
Doctors Brook.....	W-48-0499.....	329
East River (St. Barbe).....	W-49-0520.....	351
East River (Hawkes Bay).....	W-47-0484.....	325
Eddies Cove Brook.....	W-49-0539.....	355
Fishels Brook.....	W-40-0096.....	77
Flat Bay Brook.....	W-41-0108.....	93
Fox Island River.....	W-43-0192.....	141
Gilliams Brook.....	W-42-0252.....	203
Goose Arm Brook.....	W-44-0274.....	219

RIVER	INDEX NUMBER	PAGE
Grand Bay River.....	S-39-2010.....	23
Grand Codroy River.....	W-40-0033.....	39
Grandy's Brook.....	S-39-1959.....	11
Green Island Brook.....	W-49-0537.....	353
Gregory River.....	W-44-0344.....	243
Halfway Brook.....	W-49-0542.....	357
Harry's River, Pinchgut, Spruce Brook and George's Lake.....	W-41-0120.....	119
Highland River.....	W-40-0083.....	43
Hughes Brook.....	W-44-0245.....	197
Humber River.....	W-44-0243.....	181
Isle aux Mort River.....	S-39-1982.....	17
Journois Brook.....	W-40-0099.....	89
Lewis Brook.....	W-44-0201.....	149
Little Barachois River (St. George's Bay).....	W-41-0111.....	103
Little Bay Brook.....	S-39-1997.....	21
Little Brook Ponds.....	W-47-0475.....	309
Little Codroy River.....	W-40-0014.....	33
Little East River.....	W-47-0481.....	321
Liverpool Brook.....	W-44-0321.....	235
Lomond River.....	W-45-0392.....	253
Lower Crabb Brook.....	W-44-0328.....	239
Middle Brook (Bonne Bay).....	W-45-0374.....	251
Middle Brook (Flat Bay).....	W-40-0098.....	87
North Arm Brook.....	W-44-0302.....	229
Northwest Brook.....	S-38-1933.....	7
Old Man's Brook.....	W-44-0270.....	215
Parsons Pond River.....	W-46-0456.....	283
Penguin Arm Brook.....	W-44-0281.....	225
Portland Creek.....	W-46-0462.....	287
Rattler Brook.....	W-44-0254.....	205
River of Ponds.....	W-47-0474.....	305

RIVER	INDEX NUMBER	PAGE
Robinson's River.....	W-40-0092.....	67
Romaines Brook.....	W-41-0130.....	135
Rose Blanche Brook.....	S-39-1946.....	9
St. Genevieve River.....	W-49-0517.....	339
St. Paul's River.....	W-46-0435.....	277
Seal Cove Brook.....	W-41-0123.....	131
Serpentine River.....	W-43-0209.....	157
Southwest Brook and Bottom Brook.....	W-41-0115.....	111
Stanford River.....	W-46-0454.....	279
Strowbergs Brook.....	W-44-0318.....	231
Torrent River.....	W-47-0480.....	313
Trout River.....	W-45-0352.....	247
West Brook.....	W-49-0519.....	345
Western Brook.....	W-46-0422.....	273
Wild Cove Brook.....	W-44-0210.....	163

LIST OF FIGURES

Figure		Page
1.	Statistical Sections and Conservation and Protection Branch Districts for Insular Newfoundland.....	4
2.	Bear Cove Brook showing obstruction locations.....	31
3.	Little Codroy River showing obstruction locations and sections surveyed.....	35
4.	Highland River showing obstruction locations and sections surveyed.....	45
5.	Crabbs River showing obstruction locations and sections surveyed.....	53
6.	Barachois Brook showing obstruction locations and sections surveyed.....	61
7.	Robinsons River showing obstruction locations and sections surveyed.....	69
8.	Fishels Brook showing obstruction locations and sections surveyed.....	79
9.	Journois Brook showing obstruction locations and sections surveyed.....	91
10.	Flat Bay River showing obstruction locations and sections surveyed.....	95
11.	Little Barachois Brook showing obstruction locations and sections surveyed.....	105
12.	Southwest Brook and Bottom Brook showing obstruction locations and sections surveyed.....	113
13.	Harry's River showing obstruction locations and sections surveyed.....	121
14.	Romaines Brook showing obstruction locations and sections surveyed.....	137
15.	Fox Island River showing obstruction locations and sections surveyed.....	143
16.	Lewis Brook showing obstruction locations and sections surveyed.....	150

Figure	Page
17. Deadman's Brook showing obstruction locations and sections surveyed.....	154
18. Serpentine River showing obstruction locations and sections surveyed.....	159
19. Wild Cove Brook showing obstruction locations and sections surveyed.....	165
20. Clarke Brook showing obstruction locations and sections surveyed.....	170
21. Cook's Brook showing obstruction locations and sections surveyed.....	175
22. Hughes Brook showing obstruction locations and sections surveyed.....	199
23. Rattler Brook showing obstruction locations and sections surveyed.....	206
24. Barachois Brook showing obstruction locations and sections surveyed.....	212
25. Old Man's Brook showing obstruction locations and sections surveyed.....	217
26. Goose Arm Brook showing obstruction locations and sections surveyed.....	221
27. Penguin Arm Brook showing obstruction locations and sections surveyed.....	226
28. Strowberg Brook showing obstruction locations and sections surveyed.....	232
29. Liverpool Brook showing obstruction locations and sections surveyed.....	237
30. Lower Crab Brook showing obstruction locations and sections surveyed.....	241
31. Gregory River showing obstruction locations and sections surveyed.....	245
32. Lomond River showing obstruction locations and sections surveyed.....	255

Figure	Page
33. Deer Brook showing obstruction locations and sections surveyed.....	265
34. Bakers Brook showing obstruction locations and sections surveyed.....	271
35. Western Brook showing obstruction locations and sections surveyed.....	275
36. Stanford River showing obstruction locations and sections surveyed.....	280
37. Portland Creek showing obstruction locations and sections surveyed.....	289
38. Bowing Brook showing obstruction locations and sections surveyed.....	298
39. Bound Brook showing obstruction locations and sections surveyed.....	302
40. Torrent River showing obstruction locations and sections surveyed.....	315
41. Little East River showing obstruction locations and sections surveyed.....	322
42. Doctors Brook showing obstruction locations and sections surveyed.....	330
43. West Brook showing obstruction locations and sections surveyed.....	347
44. Big Brook showing obstruction locations and sections surveyed.....	361

GLOSSARY OF TERMS

- Drainage basin: the area drained by a stream and all its tributaries (Murray and Harmon 1969).
- Axial length: the length of the long axis of the basin measured from the mouth to the most distant point on the perimeter.
- Mean width: the average of a number of widths taken at right angles to the axial length.
- Relief: difference in elevation between the basin mouth and the highest point on basin perimeter.
- Gene frequency: frequency of Tf4(TfA) transferrin allele (Payne 1974).
- Mouth of river: downstream end of the stream where it has confluence with another river, lake, estuary or sea.
- Obstructions: natural or man-made barriers to salmon migration. A complete obstruction is impassable to salmon migrants. A partial obstruction is passable at only certain water levels or is a barrier to a portion of the migrants during either all or part of the spawning run.
- Population estimates: number of adult salmon produced by a river system prior to exploitation by the commercial fishery. This is usually based on the estimate that each accessible 100 square yards of parr rearing area can potentially produce 1-2 smolt. The sea survival has been calculated to be 10-15% of total smolt production. In this report the generally accepted range in values for the estimate adult salmon production is enclosed by dotted lines.

INTRODUCTION

In the early 1960's the Program Working Party on Atlantic Anadromous Fishes requested the compilation of a catalogue of base line data on all river systems in insular Newfoundland. These data would be used to identify river systems with the potential to expand or develop Atlantic salmon (Salmo salar) populations. A program to compile the data from all possible sources was initiated as well as a helicopter river reconnaissance survey program. The terms of reference for the survey were: (1) to provide a general description of each river basin (2) to locate and identify obstructions in river systems, drainage area greater than 25 miles², that are barriers to salmon migration (3) to obtain an estimate of potential parr rearing habitat in accessible and inaccessible areas of the river and to estimate potential adult salmon production. Riche (1972) describes the methods used in stream surveys and estimation of salmon production.

The compilation of physical and chemical data on Newfoundland rivers prior to 1967 was presented by Murray and Harmon (1969). The authors emphasized parameters that affected salmon production; however, the report failed to provide an easy reference for identification of rivers with the potential for development to enhance salmon populations.

This report is a compendium of all available data on each river system in insular Newfoundland. It includes: the data reported by Murray et al. (1969); a summary of the stream surveys and estimates of adult salmon production reported by Mercer (1961, 1962, 1963, 1967), Riche (1966a, 1966b, 1969a, 1969b), Riche and Traverse (1969, 1971, 1972),

Traverse (1971, 1972) and Porter et al. (1974); a summary of salmon angling data provided by the Conservation & Protection Branch; water quality data provided primarily by the Water Resources Group of Resource Development Branch (Jamieson 1974a, 1974b); gene frequencies for Atlantic salmon (Payne 1974); information on accessibility of stream to anglers and salmon redd counts provided by Conservation & Protection Branch and Resource Development Branch; references to studies conducted on the river system; and unauthenticated reports (clearly marked) by anglers and local residents. Photographs of sections of each river or activities on the river are kept on file by the Newfoundland River Development Unit, Resource Development Branch, St. John's. Reference to photos on file are indicated in the catalogue.

The report is published in four volumes, A, B, C and D. Each volume corresponds in number to the present district set-up of the Conservation and Protection Branch (Fig. 1). All information on rivers that occur with District A, B, C and D are included in Volume A, B, C and D respectively.

This catalogue has multiple uses. It has been used by government agencies to identify rivers for salmon enhancement programs; by researchers to obtain base data for aquatic studies; by federal, provincial and private agencies involved in impact of development projects on the aquatic resources; by Provincial Department of Tourism and Parks Canada to obtain information on the history of the sport fishery and the recreational potential of selected river systems.

The authors apologize for the inconsistencies in style and format. The length of time required to re-write and re-type the manuscript did not outweigh the benefits gained by an early publication.

It is the authors' intent that the catalogue be updated annually and another edition be published every five years.

Anyone with pertinent information which has not been included in the report, please send it to the authors.

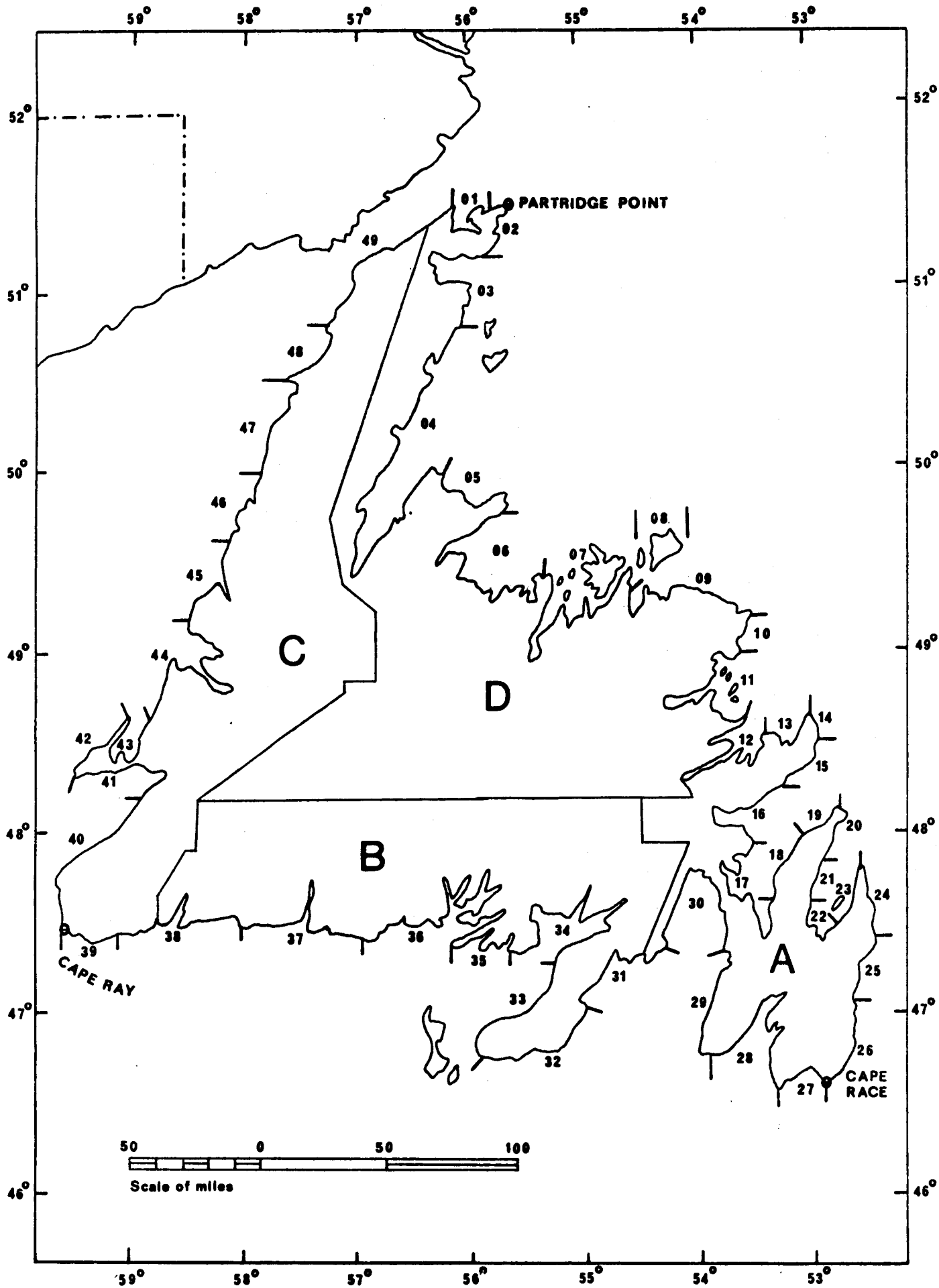


FIG. 1 OUTLINE MAP OF NEWFOUNDLAND SHOWING STATISTICAL SECTIONS AND CONSERVATION AND PROTECTION BRANCH DISTRICTS

EXPLANATION OF RIVER CODES

Each of the 4,404 river systems in insular Newfoundland (39,928 miles²) has been assigned a seven digit code. The purpose of the code is for quick identification and location of each river, and computer coding for comparison of sport and commercial fisheries.

The first digit is a letter indicating the coast on which the mouth of the river is located. East coast rivers (E) are located between Partridge Point and Cape Race; south coast rivers (S) between Cape Race and Cape Ray and west coast rivers (W) between Cape Ray and Partridge Point (Fig. 1). The second and third digits correspond to the statistical sections (Fig. 1) developed by Economics and Intelligence Branch in 1968 (Waldron 1974). The last four digits is the number given to each river system. The rivers were numbered consecutively and clockwise on each coast. In the larger system the tributaries have also been identified by the addition of two digits. Example: Harpoon Brook, tributary of the Exploits River has been coded E-07-0779-78. The E indicates the river system is on the east coast; the mouth of the Exploits River system is in statistical area 07; the river is number 0779 from Partridge Point and Harpoon Brook is tributary 78 of the Exploits River system (E-07-0779).

NORTHWEST BROOK

Location: $47^{\circ} 40' 35''$ N $58^{\circ} 36' 15''$ W. Bay Le Moine.

Map Reference: Rose Blanche. 11 O/10 East.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 20.0 miles², (51.80 kilometers²). Mean width, 2.2 miles, (3.53 kilometers).

Perimeter, 26.4 miles, (42.47 kilometers). Axial length, 9.1 miles, (14.64 kilometers).

Maximum basin relief, 1,750 feet, (533.40 meters).

Geology:

About equal amounts of acidic intrusive rocks and gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration.

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μ mhos/cm)	ppm.	ppm.

Species Present:

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Accessible by boat only. A foot trail leading to headwaters (Kettle's Pond) is located 1 mile (1.61 kilometers) east of Port-aux-Basques. Distance to walk approximately 1.5 miles (2.41 kilometers).

Surveys: None to date.

Redd Counts: None to date.

References:

ROSE BLANCHE BROOK

Location: 47° 36' 55" N 58° 42' 05" W. Rose Blanche Bay
 Map Reference: Rose Blanche. 11 O/10 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 32.3 miles², (83.65 kilometers²). Mean width, 2.6 miles, (4.18 kilometers).

Perimeter, 37.2 miles, (59.85 kilometers). Axial length, 12.5 miles, (20.11 kilometers).

Maximum basin relief, 1,750 feet, (533.40 meters).

Geology:

About half gneiss with the remainder consisting of acidic intrusive rocks and a small amount of Devonian sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Main river:

Falls at mile point 0.5; (0.8 kilometers).

Fishway constructed in 1961: Very few fish pass through fishway.

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μ mhos/cm)	ppm.	ppm.

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.
No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Road crosses river near mouth. Upper reaches accessible
by foot.

Surveys: None to date.

Redd Counts: None to date.

References:

GRANDYS BROOK

Location: $47^{\circ} 37' 17''$ N $58^{\circ} 50' 35''$ W.

Map Reference: Rose Blanche, 11 0/10 West.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 105.5 miles², (273.24 kilometers²). Mean width, 4.1 miles, (6.59 kilometers).

Perimeter, 61.9 miles, (99.59 kilometers). Axial length, 22.1 miles, (35.55 kilometers).

Maximum basin relief, 1,800 feet, (548.64 meters).

Geology:

Almost entirely gneissis with some Devonian sedimentary and acidic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

A number of excellent salmon pools in the first 12 miles (19.30 kilometers) of river above Burnt Island Pond. The river is mainly rocky and rugged with rapid water.

Spawning Areas:

Several good areas in first 12 miles (19.30 kilometers) of main river.

Barriers to Fish Migration:

Main River:

Series of small falls and shutes at mile point 7 (11.26 kilometers), greatest drop of 5' (1.52 meters); partial obstruction.

Falls at mile point 12 (19.30 kilometers) 10' (3.05 meters) vertical; probably complete obstruction.

Falls 20'-25' (6.10-7.62 meters) vertical at mile point 17 (27.35 kilometers); complete obstruction.

Photographs on file; Nos. 70, 851, 852, 893, 894.

Water Quality Data, Sample Collected October 25, 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
5.02		8.0	3.4	4.0	15.0	0.5	

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic salmon angling record - Grandy's Brook.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952 ¹	93	70	324	147.1	22	171	77.6	92	495	224.7
1953	76	44	195	88.5	23	184	83.5	67	379	172.0
1954	58	39	177	80.4	6	49	22.2	45	226	102.6
1955	32	27	99	44.9	2	20	9.1	29	119	54.0
1956	-	52	213	96.7	5	38	17.3	57	251	114.0
1957	135	184	739	335.5	13	106	48.1	197	845	383.6
1958	340	63	284	128.9	8	73	33.1	71	357	162.0
1959	266	113	433	196.6	33	276	125.3	146	709	321.9
1960	421	201	967	439.0	1	10	4.5	202	977	443.5
1961	251	182	679	308.3	38	276	125.3	220	955	433.6
1962	313	232	776	352.3	22	176	79.9	254	952	432.2
1963	398	264	964	437.7	16	128	58.1	280	1092	495.8
1964 ²	337	227	804	365.0	21	162	73.5	248	966	438.5
1965	447	344	1197	543.4	35	286	129.8	379	1483	673.2
1966	382	198	742	336.9	43	312	141.6	241	1054	478.5
1967	491	103	415	188.4	13	89	40.4	116	504	228.8
1968	689	161	653	296.5	25	191	86.7	186	844	383.2
1969	408	239	794	360.5	22	159	72.2	261	953	432.7
1970	441	173	579	262.9	9	61	27.7	182	640	290.6
1971	346	103	325	147.6	3	23	10.4	106	348	158.0
1972	560	226	720	326.9	3	23	10.4	229	743	337.3
1973	501	113	360	163.6	1	7	3.2	114	367	166.8
1974										
1975										
1976										
1977										
MEAN										
1964-68	469	207	762	346.0	27.4	208.0	94.4	234	970	440.4
1969-73	451	171	556	252.3	7.6	54.6	24.8	178	610	277.1

¹Angling data, 1952-1963, estimated to be 85% accurate. (J.Marshall, personal communication)²Angling data, 1964-73, estimated to be 70% accurate. (J. Marshall, personal communication)

Gene Frequency:

Not completed

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Main roads to the settlement of Rose Blanche crosses river at mile 0. Not otherwise accessible other than by J5 trail, the entrance of which is located approximately one mile (1.61 km) north of Isle aux Morts River. This trail connects with the river at only one point, mile 18 (28.96 km).

Surveys:

Biological by C & P Branch, 1968.

Redd Counts:

None to date.

References:

Anonymous. 1943. Dept. Res., Res. Bull. No. 12. St. John's, Newfoundland.

BURNT ISLAND BROOK
(God Bay Brook)

Location: $47^{\circ} 36' 39''$ N $58^{\circ} 52' 12''$ W. God Bay, East of
Port aux Basques.

Map Reference: Rose Blanche. 11 0/10 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 4.2 miles², (10.87 kilometers²). Mean width, 0.8 miles,
(1.28 kilometers).

Perimeter, 14.2 miles, (22.84 kilometers). Axial length, 4.7 miles,
(7.56 kilometers).

Maximum basin relief, 900 feet, (274.32 meters).

Geology:

About equal amounts of Devonian sedimentary and gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μ mhos/cm)	ppm.	ppm.

FISH POPULATIONS

Species Present:

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
-------------	-------------------	------------------	-----------------------------

Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

ISLE AUX MORT RIVER (Brook)

Location: $47^{\circ} 35' 30''$ N. $59^{\circ} 00' 25''$ W. Isle aux Mort Harbour.

Map Reference: Port aux Basques. 11 0/11 East.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 82.7 miles² (214.19 kilometers²). Mean width, 5.0 miles (8.04 kilometers).

Perimeter, 64.5 miles (103.78 kilometers). Axial length, 18.1 miles (29.12 kilometers).

Maximum basin relief, 1,700 feet (518.16 meters).

Geology:

Almost entirely gneissis with some basic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Main River: Falls at mile point 2 (3.21 kilometers), 2 main drops, 1st 8 ft. high (2.34 meters), 8 ft. (2.43 meters) long, 90° angle. 2nd 10.4 ft. (3.19 meters) high, 12 ft. (3.65 meters) long, 60° angle; complete obstruction.

Note: River branches into two streams; one completely obstructed, the other is clear to headwaters.

Channelling completed by Engineering Group at falls at mile 2 (3.2 km) in 1961.

Photographs on file; Nos.

Water Quality Data, Sample Collected October, 1972

pH	Alkalinity (total) ppm	Total Hardness ppm	Turbidity JTU	Chlorides ppm	Spec. Cond. @ 25°C C in μ mhos/cm	Calcium ppm	HCO ₃ Biocarbonate ppm
5.10	0.0	5.0	3.1	5.0	19.0	0.9	

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic salmon angling record - Isle aux Mort River (Brook).

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952 ¹	136	41	188	85.4	37	241	109.4	78	429	194.8
1953	135	57	273	123.9	18	126	57.2	75	399	181.1
1954	79	23	100	45.4	10	70	31.8	33	170	77.2
1955	26	27	109	49.5	5	44	20.0	32	153	69.5
1956	-	52	211	95.8	1	7	3.2	53	218	99.0
1957	219	85	369	167.5	2	19	8.6	87	388	176.1
1958	606	92	438	198.9	6	54	24.5	98	492	223.4
1959 ²	287	108	430	195.2	35	327	148.5	143	757	343.7
1960	548	185	883	400.9	3	21	9.5	188	904	410.4
1961	408	135	545	247.4	35	250	113.5	170	795	360.9
1962	516	181	681	309.2	10	86	39.0	191	767	348.2
1963	644	172	644	292.4	18	129	58.6	190	773	351.0
1964	398	150	534	242.4	35	284	128.9	185	818	371.3
1965	543	197	630	286.0	29	184	83.5	226	814	369.5
1966	278	116	417	189.3	11	73	33.1	127	490	222.4
1967	369	172	588	267.0	41	312	141.6	213	900	408.6
1968	520	249	976	443.1	29	220	99.9	278	1196	543.0
1969	926	300	1156	524.8	51	346	157.1	351	1502	681.9
1970	350	190	676	306.9	58	427	193.9	248	1103	500.8
1971	408	159	537	243.8	11	84	38.1	170	621	281.9
1972	380	244	961	436.3	4	27	12.3	248	988	448.6

Atlantic salmon angling record - Isle aux Mort River (Brook) (cont'd.)

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1973	492	275	1014	460.9	20	148	67.3	295	1162	528.2
1974										
1975										
1976										
1977										
MEAN										
1964-68	422	177	629	285.9	29	215	97.5	206	844	383.5
1969-73	511	234	869	394.9	29	206	93.8	262	1075	488.7

¹Angling data, 1952-58, estimated to be 80-90% accurate. (J.Marshall, Personal Communication).

²Angling data, 1959-73, estimated to be 70% accurate. (J.Marshall, Personal Communication).

Gene Frequency:

Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 14-20	August 14-20	July 6-13 (1968)

Accessibility to Anglers:

Main road crosses river at approximately mile 2 (3.2 km).

Otherwise accessible only by foot trails which are located along banks of river.

Surveys:

Engineering survey, 1960.

C. & P. survey, 1957.

Redd Counts:

None to date.

References:

LITTLE BAY BROOK

Location: 47°35'50" N. 59°04'05" W. Little Bay, Cabot Strait.
 Map Reference: Port aux Basques. 11 O/11 East.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area: 17.0 miles² (44.03 km²). Mean width, 1.2 miles
 (1.93 km).

Perimeter: 11.4 miles (18.34 km). Axial length, 4.6 miles
 (7.40 km).

Maximum basin relief, 700 feet (213.36 m).

Geology:

Gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Main River:

Falls at mile 2 (3.2 km). Height: 6 feet (1.82 m). Partial obstruction.
 In 1961, a channel was blasted around falls, this run-a-round has
 decreased the degree of obstruction.

Photographs on file:

Nos.

Water Quality Data: Sample collected October, 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
4.80	0.0	6.0	3.0	7.5	32.0	0.8	-

FISH POPULATIONS

Species Present:

Nil.

Gene Frequency:

Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Accessible for first mile by vehicle. Remainder accessible only by foot.

Surveys:

None to date.

Redd Counts:

None to date.

References:

- Anonymous. Summary of Stream Obstruction. MS report, Fisheries Service, St. John's, Newfoundland.
- Anonymous. 1943. Dept. Nat. Res. Res. Bull. No. 12. St. John's, Newfoundland.
- Anonymous. 1961. Salmon and Trout Management Program. MS report Fisheries Service, St. John's, Newfoundland.

GRAND BAY RIVER

Location: 47°36'08" N. 59°09'21" W. Bottom of Grand Bay,
Cabot Strait.

Map Reference: Port aux Basques. 11 O/11 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin Area: 51.9 miles² (134.42 km²). Mean width, 3.4 miles
(5.47 km).

Perimeter, 38.7 miles (62.25 km). Axial length, 12.3 miles
(19.79 km).

Maximum basin relief, 2,050 feet (624.84).

Geology:

Almost entirely gneissis with some acidic intrusive rocks
and basic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Main River:

Falls at mile 0 sloping for 200 feet (60.96 m). Partial obstruction.

Falls at mile 1 (1.61 km), passable.

Falls: Complete obstruction. Location and height not available.

Photographs on file:

Nos. 608.

Water Quality Data:

Sample collected October, 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μmhos/cm)	Ca ppm.	HCO ₃ ppm.
4.70	-	6.0	3.5	7.0	26.0	0.8	-

FISH POPULATIONS

Species Present: Atlantic salmon (sea run), brook trout.

Atlantic salmon angling record - Grand Bay River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	150	25	117	53.1	26	177	80.4	51	294	133.5
1953	192	33	136	61.7	14	94	42.7	47	230	104.4
1954	136	31	123	55.8	14	94	42.7	45	217	98.5
1955	43	44	135	61.3	2	16	7.3	46	151	68.6
1956	-	54	226	102.6	7	60	27.2	61	286	129.8
1957	390	72	343	155.7	1	18	8.2	73	361	163.9
1958	461	43	207	94.0	3	29	13.2	46	236	107.2
1959	225	37	153	69.5	8	71	32.2	45	224	101.7
1960	365	91	440	199.8	3	30	13.6	94	470	213.4
1961	353	28	111	50.4	12	95	43.1	40	206	93.5
1962	337	86	323	146.6	14	97	44.0	100	420	190.6
1963	421	70	284	128.9	10	76	34.5	80	360	163.4
1964 ¹	383	108	435	197.5	4	36	16.3	112	471	213.8
1965	650	111	403	183.0	13	101	45.9	124	504	228.9
1966	480	88	267	121.2	-	-	-	88	267	121.2
1967	597	65	248	112.6	-	-	-	65	248	112.6
1968	565	63	263	119.4	-	-	-	63	263	119.4
1969 ²	285	123	453	205.7	3	20	9.1	126	473	214.8
1970	213	82	260	118.0	4	33	15.0	86	293	133.0
1971	259	47	147	66.7	1	7	3.2	48	154	69.9
1972	169	84	252	114.4	1	8	3.6	85	260	118.0
1973	195	51	154	70.0	-	-	-	51	154	70.0
1974										
1975										
1976										
1977										
MEAN										
1964-68	535	87	323	146.9	3.4	27.4	12.5	90	351	159.4
1969-73	224	77	253	115.1	1.8	13.6	6.2	79	267	121.3

¹ Angling data, 1964-68, estimated to be 75% accurate. (J. Marshall, personal communication).

² Angling data, 1969-73, estimated to be 50% accurate. (J. Marshall, personal communication).

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 16 - 22	September 1 - 7	July 13 - 20 (1969)

Accessibility to Anglers:

Accessible only by boat. The entrance of a foot trail which leads to river is located approximately 1 mile (1.61 kilometers) east of Port-aux-Basques.

Surveys: None to date.

Redd Counts: None to date.

References:

Anonymus. 1943. Dept. Nat. Res. Res. Bull. No. 12.
St. John's, Newfoundland.

BARACHOIX BROOK

Location: 47°37'50" N. 59°15'25" W.
 Map Reference: Port aux Basques. 11 O/11 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin Area: 19.1 miles² (49.47 km²). Mean width, 2.0 miles (3.21 km²).

Perimeter, 22.0 miles (35.39 km). Axial length, 8.5 miles (13.67 km).

Maximum basin relief, 1,800 feet (548.64 m).

Geology:

About half acidic intrusive rocks with the remainder consisting of gneiss and a small amount of basic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Falls located at mile 5. Believed to be complete obstruction.

Photographs on file:

Water Quality Data:

Sample collected October, 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
6.40	4.0	12.0	3.2	6.5	31.0	1.6	4.9

FISH POPULATIONS

Species Present: Atlantic salmon.

Atlantic Salmon Angling Record - partial count at Barachois Brook.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1963	No report									
1964	No report									
1965	22	11	44	20.0	-	-	-	11	44	20.0
1966	50	23	87	39.5	-	-	-	23	87	39.5
1967	No report									
1968	No report									
1969	70	10	34	15.4	-	-	-	10	34	15.4
1970	No report									
1971	No report									
1972	No report									
1973	No report									
1974										
1975										
1976										
1977										

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1965-67	July 24 - 30	August 6 - 12	
1969	July 5 - 12	July 19 - 25	

Accessibility to Anglers:

Provincial park located on lower two miles. Remainder accessible only by foot.

Surveys: None to date.

Redd Counts: None to date.

References:

BEAR COVE BROOK

Location: 47°39'35" N. 59°18'35" W. Bear Cove, Cabot Strait.
 Map Reference: Port aux Basques. 1 0/11 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 11.4 miles² (29.52 kilometers²). Mean width, 2.1 miles, (3.38 kilometers).

Perimeter, 15.4 miles (24.78 kilometers). Axial length, 5.0 miles, (8.05 kilometers).

Maximum basin relief, 1,900 feet. (579.12 meters).

Geology:

Acidic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration: None reported.

Entrance to brook shallow, salmon enter only when brook high.

Photographs on file. Nos.

Water Quality Data, Sample Collected October 25, 1972

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Chlorides ppm	Specific Conductance @ 25°C micromhos/cm	Ca ppm.	HCO ₃ ppm.
6.55	10.0	18.0	5.0	8.5	45.0	3.0	12.0

FISH POPULATIONS

Species Present: Atlantic salmon.

Atlantic salmon angling record - Bear Cove Brook.

Year	Rod Days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	156	34	154	70.4	9	100	45.4	43	255	115.8
1953	75	39	157	71.3	2	14	6.4	41	171	77.7
1954	57	31	120	54.5	1	7	3.2	32	127	57.7
1955	109	37	182	82.6	3	27	12.3	40	209	94.9
1956	-	14	56	25.4	1	8	3.6	15	64	29.0
1957	38	22	100	45.4	1	8	3.6	23	108	49.0
1958	77	12	57	25.9	-	-	-	12	57	25.9
1959	106	32	134	60.8	4	45	20.4	36	179	81.2
1960	175	60	279	126.7	-	-	-	60	279	126.7
1961	92	4	20	9.1	4	27	12.3	8	47	21.4
1962	192	48	182	82.6	3	25	11.4	51	207	94.0
1963	209	57	238	108.1	3	27	12.3	60	265	120.4
1964 ¹	216	37	142	64.5	4	35	15.9	41	177	80.4
1965	289	50	182	82.6	1	18	8.2	51	200	90.8
1966	219	34	125	56.8	1	20	9.1	35	145	65.9
1967	420	25	98	44.5	-	-	-	25	98	44.5
1968	212	28	96	43.6	3	22	9.9	31	118	53.5
1969	245	52	182	82.6	-	-	-	52	182	82.6
1970	290	53	178	80.8	4	30	13.6	57	208	94.4
1971	311	18	54	24.5	-	-	-	18	54	24.5
1972	339	20	76	34.5	6	39	17.7	26	115	52.2
1973	158	25	85	38.6	8	64	29.1	33	149	67.7
1974										
1975										
1976										
1977										
MEAN										
1964-1968	271	35	128	58.1	2	19	8.6	37	148	67.2
1969-1973	269	34	115	52.2	4	27	12.1	37	142	64.5

¹ Angling data 1964-73 estimated to be 95% accurate (J. Marshall personal communication).



LEGEND

- FALLS ————— (
- SECTION ————— S
- TRIBUTARY ————— T
- ROAD ————— - - - - -
- TRAIL ————— · · · · ·
- TRACK ————— | | | | |

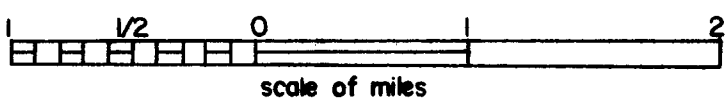
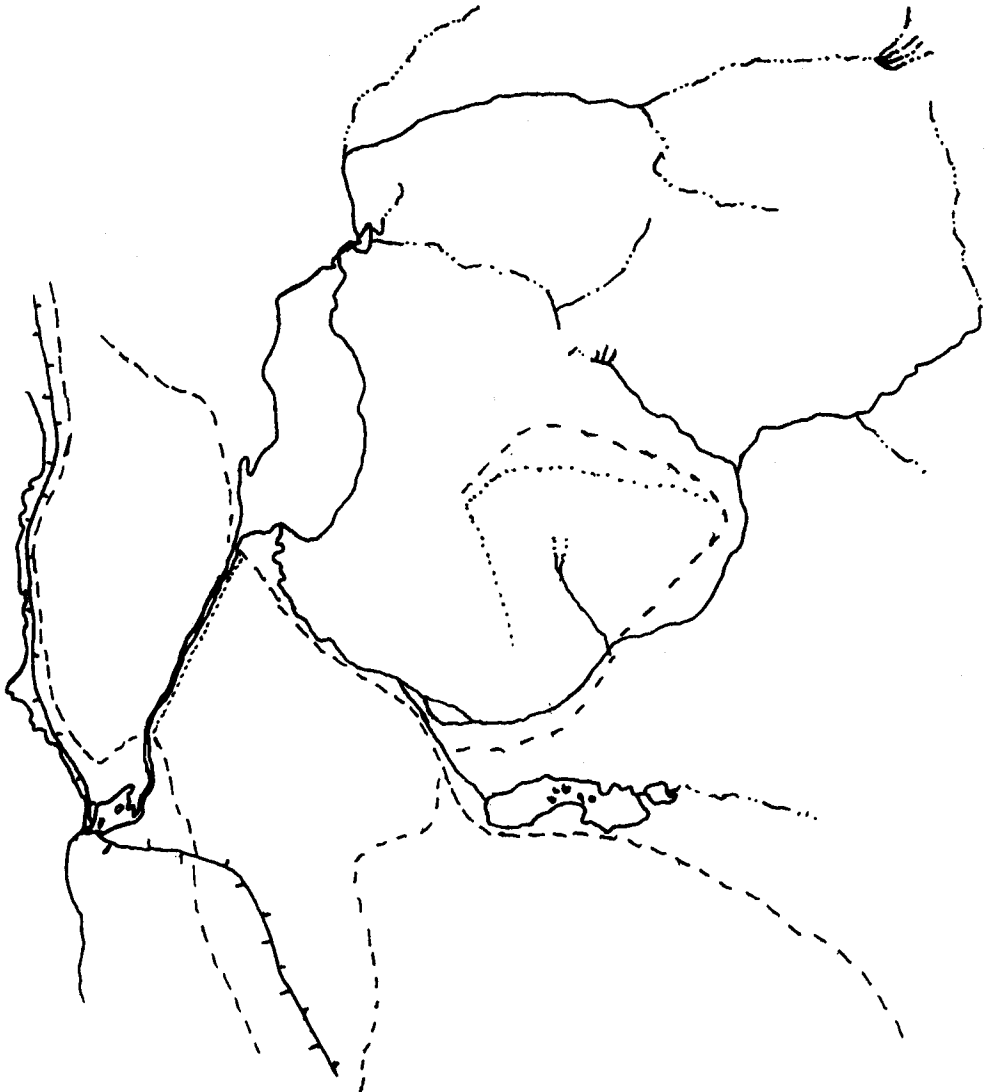


FIG 2 OUTLINE MAP OF BEAR COVE BROOK SHOWING OBSTRUCTIONS

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	July 9 - 15	September 8 - 15	August 20 - 27 (1968)

Accessibility to Anglers:

T.C.H. crosses headwaters (Big Pond) approximately 12 miles (19.32 kilometers) east of Port-Aux-Basques. A by-road parallels the river. Road located several hundred yards west of T.C.H. bridge which crosses river. River totally accessible.

Surveys: None to date.

Redd Counts: None to date.

References:

Anonymous: Nfld. Dept. Nat. Res. 1943. Res. Bull. No. 12,
St. John's, Newfoundland.

LITTLE CODROY RIVER

Location: 47° 45' 51" N. 59° 18' 58" W.

Map Reference: Codroy. 11 0/14 West.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 86.4 miles² (223.77 kilometers). Mean width, 4.6 miles, (7.40 kilometers).

Perimeter, 55.1 miles (88.66 kilometers). Axial length, 18.0 miles, (28.96 kilometers).

Maximum basin relief, 2,050 feet (624.84 meters).

Geology:

About half basic intrusive rocks with the remainder consisting of about equal amounts of acidic intrusive rocks, gneiss and Pennsylvanian sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Dimensions:

Length of entire system including standing water is approx. 160.26 miles (257.85 kilometers).

Length of tributaries143.61 miles (231.06 kilometers)

Length of estuary3.50 miles (5.63 kilometers)

Length of main stream10.49 miles (16.87 kilometers)

Length of lake at upper end of main stream 2.66 miles (4.27 kilometers).

Barriers to Fish Migration:

Main river, Nil; Southern Brook,

Falls, approx. 30 ft. (9.14 meters), about 1.9 miles (3.05 kilometers) from main stream; Frank White's Brook, falls, approx. 10 ft.

(3.04 meters) high, 1.0 miles (1.60 kilometers) from the main stream.

Photographs on file; Nos. 65, 1082.

Spawning Areas:

Suitable spawning areas on the lower parts of the tributaries in most of the running water on the main river.

Water Quality Data, Sample Collected October, 1973.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Chlorides ppm.	Specific Conductance @ 25°C micromhos/cm	Ca ppm.	HCO ₃ ppm.
6.30	4.0	10.0	3.1	7.0	35.0	1.1	4.9

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout, eels, sticklebacks, American smelt, mummichogs, Arctic char, alewife.

Atlantic salmon angling record - Little Codroy River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	139	18	75	34.1	15	136	61.7	33	221	95.8
1953	175	17	76	34.5	79	745	338.2	96	821	372.7
1954	93	14	62	28.1	25	285	129.4	39	347	157.5
1955	140	6	20	9.1	4	48	21.8	10	68	30.9
1956	-	2	8	3.6	6	68	30.9	8	76	34.5
1957	38	4	14	6.4	4	40	18.2	8	54	24.6
1958	57	3	12	5.4	9	108	49.0	12	120	54.4
1959	162	3	13	5.9	2	17	7.7	5	30	13.6
1960	111	1	4	1.8	-	-	-	1	4	1.8
1961	16	1	5	2.3	1	10	4.5	2	15	6.8
1962	76	6	24	10.9	1	8	3.6	7	32	14.5
1963	141	7	29	13.2	4	47	21.3	11	76	34.5
1964 ¹	323	9	38	17.3	12	129	58.6	21	167	75.9
1965	155	20	91	41.3	25	272	123.5	45	363	164.8
1966	197	19	86	39.0	10	114	51.8	29	200	90.8
1967	218	30	115	52.2	6	74	33.6	36	189	85.8
1968	150	50	150	68.1	-	-	-	50	150	68.1
1969	255	10	37	16.8	8	68	30.9	18	105	47.7
1970	381	42	148	67.2	11	120	54.5	53	268	121.7
1971	318	31	111	50.4	11	92	41.8	42	203	92.2
1972	451	38	128	58.1	28	274	124.4	66	402	182.5
1973	531	35	128	58.1	32	298	135.3	67	426	193.4

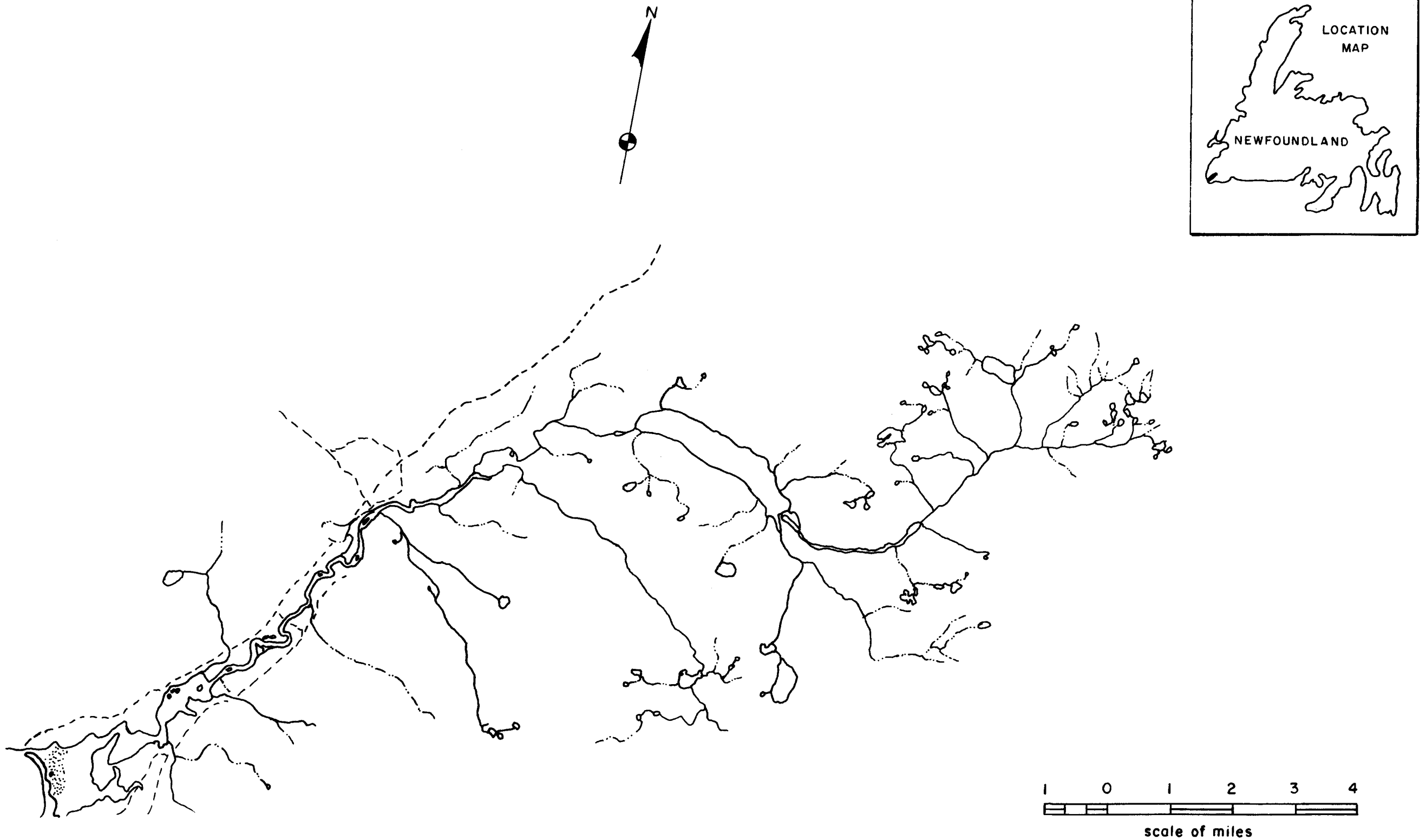


FIG. 3 OUTLINE MAP OF LITTLE CODROY RIVER SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

Atlantic salmon angling record - Little Codroy River (cont'd.)

Year	Rod days	Grilse		Salmon			Total			
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1974										
1975										
1976										
1977										
MEAN										
1964-1968	209	26	96	43.6	11	118	53.5	36	214	97.2
1969-1973	387	31	110	50.1	18	170	77.4	49	281	127.6

¹ Angling data 1964-1973 estimated to be 75% accurate. (J.Marshall, personal communication)

Summary, counting fence data, Little Codroy River.

Year	Salmon	Smolts	Brook trout	
			Upstream	Downstream
1954	219	12,210	-	-
1955	130	11,248	441	-
1956	109	14,772	323	706
1957	166	8,900	219	1067
1958	139	9,341	224	889
1959	103	12,099	644	1074
1960	78	7,829	397	457
1961	59	8,058	349	312
1962	74	8,193	85	698
1963	159	7,326	232	485
MEAN	123	9,997	291	568

Gene Frequency: Not completed.

Timing of run: (Based on angling statistics).

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	July 9 - 15	August 27 - September 2	-

Accessibility to Anglers:

Main River - The lower 8-10 miles (12.88-16.1 kilometers) are accessible by vehicle. T.C.H. crosses stream near settlement of Tompkins. By-road through St. Andrews runs parallel to the river. The river can be reached at any point along this section within a few minutes. T.C.H. runs parallel to river from Tompkins for approximately 3 miles (4.83 kilometers). River along this section can be reached within a few minutes. The headwaters section is accessible only by a tractor trail. A tractor trail is located approximately 10 miles (16.09 kilometers) east of Doyles and extends to Little River Lake.

Campbell's Brook (Tributary of Little Codroy) - T.C.H. crosses the stream approximately 0.25 miles (0.40 kilometers) from outlet to main river, not otherwise accessible.

Surveys: None to date.

Redd Counts: None to date.

References:

Murray, A.R. Technical Report No. 84, Fisheries Research Board of Canada, St. John's, Newfoundland.

GRAND CODROY RIVER

Location: 47°50'37" N. 59°11'50" W. Searston Bay, Cabot Strait.

Map Reference: Codroy. 11 0/14 West.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 369.0 miles² (955.7 kilometers²). Mean width, 11.2 miles (18.02 kilometers).

Perimeter, 94.0 miles (151.24 kilometers). Axial length, 32.7 miles (52.61 kilometers).

Maximum basin relief, 1,850 feet (568.96 meters).

Geology:

Predominantly Mississippian sedimentary with some gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Spawning Areas:

One area approximately 10 miles (16.09 kilometers) from the mouth of the main river. Other areas along the South and North Branch sections.

Barriers to Fish Migration:

Main River:

No obstruction.

North Branch, falls, 20' high (6.09 meters), complete obstruction, 31 miles, (49.87 kilometers), from where it forms main river. South Branch, falls, (Doeball Falls), located 30 miles (48.27 kilometers), from junction of main river. Reported by F/O Marshall to be 60' high, (18.28 meters), complete obstruction.

Photographs on file: Nos.

Water Quality Data, Sample Collected October, 1972, Grand Codroy River.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Chlorides ppm.	Specific Conductance @ 25°C micromhos/cm	Ca ppm.	HCO ₃ ppm.
5.9	3.0	12.0	3.5	9.0	34.0	1.2	3.7

Water Quality Data, Sample Collected October, 1972
North Branch Codroy.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Chlorides ppm.	Specific Conductance @ 25°C micromhos/cm	Ca ppm.	HCO ₃ ppm.
6.30	8.0	16.0	3.4	6.0	39.0	3.5	9.8

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic salmon angling record Grand Codroy: Codroy, South and North Branch.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	1227	720	2888	1311.2	297	2472	1122.3	1017	5360	2433.5
1953	1424	556	2043	927.5	347	2986	1355.6	903	5029	2283.1
1954	1060	310	1206	547.4	154	1407	638.8	464	2613	1186.3
1955	1152	442	1736	788.1	132	1355	615.2	574	3091	1403.3
1956	-	510	2143	972.9	299	2887	1310.7	809	5030	2283.6
1957	1195	545	2205	1001.1	270	2436	1105.9	815	4641	2107.0
1958	1737	414	1607	729.6	349	3440	1561.8	763	5047	2291.4
1959	1665	449	1689	766.8	237	2290	1039.7	686	3979	1806.5
1960	1679	432	1633	741.4	135	1321	599.7	567	2954	1341.1
1961	2011	512	2020	917.1	271	2450	1112.3	783	4470	2029.4
1962	2205	675	2333	1059.2	236	2180	989.7	911	4513	2048.9
1963	2328	728	2519	1143.6	337	3170	1439.2	1065	5689	2582.8
1964 ¹	2465	985	3405	1545.9	332	3069	1393.3	1317	6474	2939.2
1965	2458	862	3234	1468.2	301	2639	1198.1	1163	5873	2666.3
1966	3051	678	2318	1052.4	301	2742	1244.9	979	5060	2297.3
1967	3260	688	2455	1114.6	238	2097	952.0	926	4552	2066.6
1968	3988	925	3241	1471.4	222	1944	882.6	1147	5185	2354.0
1969	3390	965	3157	1433.3	223	1877	856.7	1188	5044	2290.0
1970	3447	627	2080	944.3	137	1190	540.2	764	3270	1484.5
1971	3243	732	2305	1046.5	120	1024	464.9	852	3329	1511.4
1972	2637	468	1615	733.2	120	1005	456.3	588	2620	1189.5
1973	3461	825	2862	1299.4	132	1263	573.4	957	4125	1872.8
1974										
1975										
1976										
1977										
MEAN										
1964-68	3044	828	2931	1330.5	279	2498	1134.2	1107	5429	2464.7
1969-73	3236	723	2404	1091.3	146	1272	577.5	878	3678	1669.6

¹Angling data 1964-1973 estimated to be 75-80% accurate, (J. Marshall, personal communication).

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 4 - 10	August 23 - 29	July 13 - 20 (1968)

Accessibility to Anglers:

Grand Codroy River - Accessible by road from outlet to settlement of South Branch where river forks.

South Branch - T.C.H. runs parallel with stream from settlement of South Branch to T.C.H. bridge. Otherwise not accessible.

North Branch - T.C.H. runs parallel with river from settlement of South Branch to T.C.H. bridge which crosses river. Most of that section is within fifteen minutes walk. A woods road located one mile (1.61 kilometers) east of bridge runs parallel with this branch for approximately 10 miles (16.1 kilometer).

Remainder of stream not accessible.

Crooked Brook, Tributary of North Branch - T.C.H. runs parallel to stream from outlet to North Branch Fork to Codroy Pond, full length of stream.

Surveys: None to date.

Redd Counts:

In 1970, spawning survey of Eastern Brook, Tributary Codroy Pond, 770 redds located.

References:

Palmer, C. H. 1928. The Salmon Rivers of Newfoundland.
Boston Farrington Co.

HIGHLANDS RIVER

Location: 48°11'38" N. 58°53'40" W. St. George's Bay.
 Map Reference: St. Fintans. 12 B/2 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area: 70.7 miles² (183.11 km²). Mean width: 3.1 miles (4.9879 km).

Perimeter: 51.0 miles (82.05 km). Axial length: 18.0 miles (28.96 km).

Maximum basin relief: 1,800 feet (548.64 m).

Geology:

Predominantly Mississippian sedimentary with some gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Length of main stem (including standing water): 21.7 miles (34.9 km).

Number of major tributaries: 4

Total length of tributaries (including standing water): 28.4 miles (45.7 km).

Area of lakes (> 1 miles² (2.6 km²): Nil.

Channel width varies from 10 yards (9.1 m) to 24 yards (21.9 m).

The river is very shallow throughout and subject to extreme fluctuations in discharge.

Bottom Composition:

Approximately 100% of Highlands River is potential parr rearing habitat and approximately one percent only is suitable for spawning. The main spawning areas appear to be in the vicinity of the Trans-Canada Highway and upstream from the first pond at mile 3.4 (5.5 km).

Summary of bottom composition of Highlands River system accessible to anadromous fish.

Units (100 yd ² (83.6 m ²))	Accessible	Inaccessible	Total
Total system	5,971	Not surveyed	
Rearing	5,957		
Spawning	621		

Barriers to Fish Migration:

Main Stem:

Bedrock ledge, located at mile 0.5 (0.81 km). Height; 2-3 feet (0.6-0.9 m). 'Hold-up' at low discharge.

Falls; located at mile 14.6 (23.5 km). Height; 15 feet (4.6 m). Slope: 45-50°. Complete obstruction.

Falls; located near mile 14.6 (23.5 km). Height; overall 25 feet (7.6 m) in a 8 foot (2.4 m) drop at 90° slope and a 15-18 foot (4.6-5.5 m) drop. Complete obstruction.

Tributaries:

No obstructions on the major tributaries.

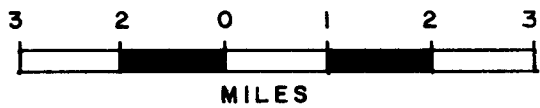
Photographs on File:

No. 194

Water Quality Data:

	Total Alkalinity ppm	Total Hardness ppm	Turbidity JTU	Cl ppm	Conductivity @ 25°C (μ mhos/cm)	Ca ppm	HCO ₃ ppm
pH							

Obstruction (complete) —————)
 Obstruction (partial) —————)
 Section ————— S
 Tributary ————— T
 Road —————



ST. GEORGE'S BAY

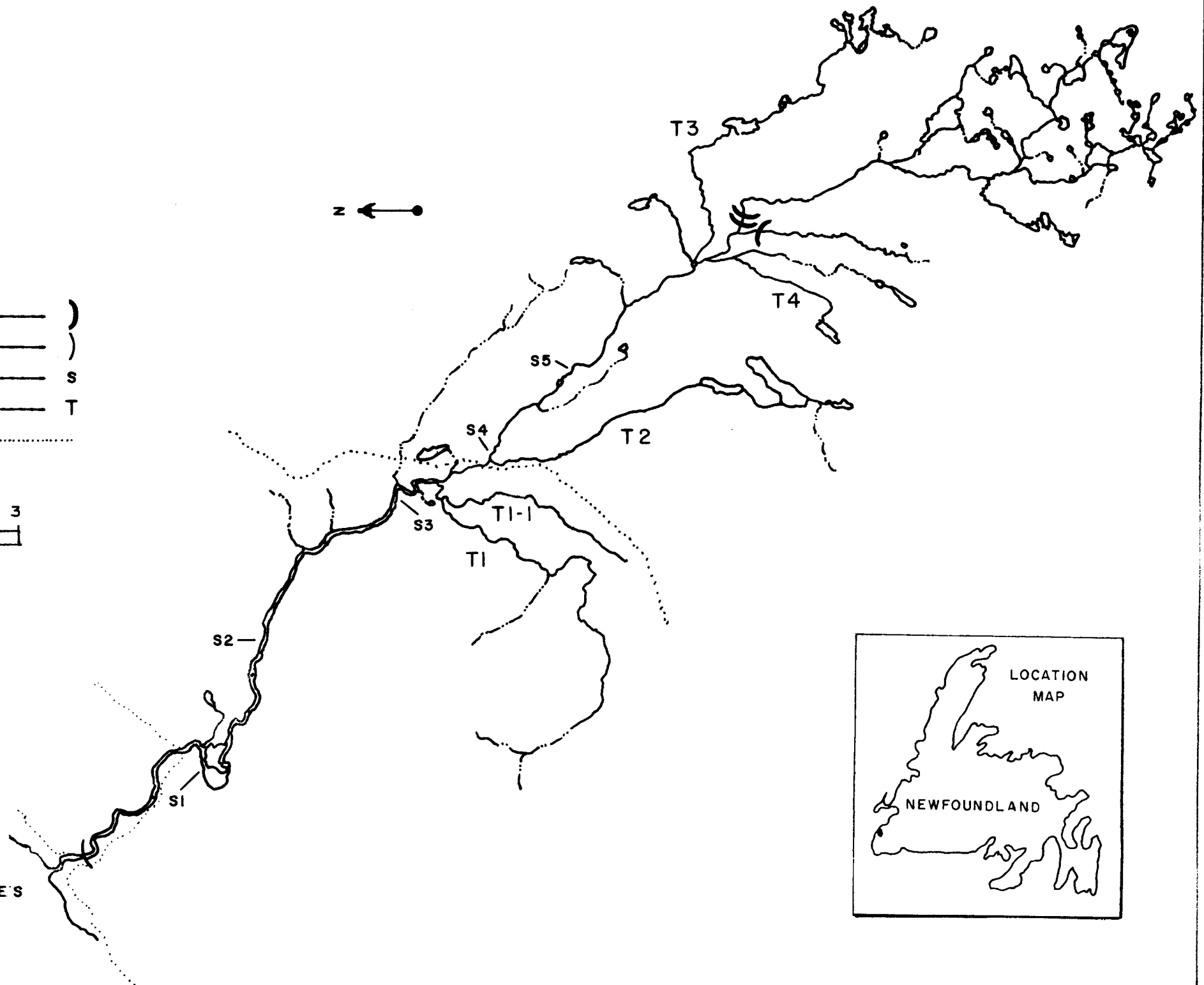


Fig. 4. Highland River system showing obstruction locations. Lines from section number indicates end of section.

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout, tomcod

Atlantic Salmon Angling Record - Highland River

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	63	33	141	64.0	28	208	94.4	61	349	158.4
1953	133	40	177	80.4	50	477	216.5	90	654	296.9
1954	76	7	33	14.9	33	390	177.1	40	423	192.0
1955	134	42	191	86.7	55	602	273.3	97	793	360.0
1956	-	24	102	46.3	23	222	100.8	47	324	147.1
1957	197	43	190	86.3	59	676	306.9	102	866	393.2
1958	451	14	55	24.9	90	1030	467.6	104	1085	492.5
1959	369	16	58	26.3	69	729	330.9	85	787	357.2
1960	507	24	102	46.3	64	723	328.2	88	825	374.5
1961	204	8	35	15.9	11	93	42.2	19	128	58.1
1962	690	12	53	24.1	97	1037	470.8	109	1090	494.9
1963	567	6	22	9.9	92	910	413.1	98	932	423.0
1964	422	3	12	5.4	55	596	270.6	58	608	276.0
1965	200	26	111	50.4	12	149	67.6	38	260	118.0
1966	370	33	138	62.7	15	143	64.9	48	281	127.6
1967	456	27	110	49.9	69	595	270.1	96	705	320.0
1968	269	27	107	48.6	8	82	37.2	35	189	85.8
1969	312	105	395	179.3	9	65	29.2	114	460	208.8
1970	216	63	228	103.5	16	181	82.2	79	409	185.7
1971	179	41	146	66.3	25	188	85.4	66	334	151.7
1972	73	16	71	32.2	4	36	16.3	20	107	48.5
1973	149	19	69	31.3	8	89	40.4	27	158	
1974										
1975										
1976										
1977										
MEAN										
1964-68	343	23	96	43.6	32	313	142.1	55	409	185.5
1968-73	186	49	182	82.5	12	112	50.8	61	294	133.3

¹ Angling data 1964-1973 estimated to be 75-80% accurate (J. Marshall, personal communication).

Angling pressure on Highlands River has decreased sharply since 1969; but fish per rod day has remained relatively stable. The mean recorded Atlantic salmon angling catch, 1964 - 1973 is 58. Although this annual catch is low, Highlands River, noted for its large fish, sometimes produces the largest salmon angled in Newfoundland.

Potential Population Estimates:

It is estimated that the Highlands River system has the potential to produce 6,000 to 12,000 smolt and adult sea survival of 600 to 1,800 salmon per year. The angling data indicate escapement of salmon to the river is considerably less than the apparent potential population. This is attributed to insufficient spawning gravel.

Estimated Atlantic salmon smolt production and adult sea survival of Highlands River, below complete obstruction.

If smolt production per 100 yd ² (83.6 m ²) is:				
Smolt produced				
		<u>1</u>	<u>2</u>	<u>3</u>
		5,957	11,914	17,871
Adult return if sea survival is:	5%	298	596	894
	10%	596	1,191	1,787
	15%	894	1,787	2,681
	20%	1,191	2,381	3,574
	25%	1,489	2,979	4,468

Gene Frequency:

Timing of run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 23-31	Sept. 8-15	July 13-20 (1968)

Accessibility to Anglers:

Accessible by by-road from outlet to Loch Leven, distance approximately 3 miles (4.83 kilometers). Road from Loch Leven to approximately 2 miles (3.21 kilometers) upstream. A woods road exists from railroad to T.C.H., a distance of 7 miles (11.27 kilometers). Relatively little angling above T.C.H.

Surveys: Biological, 1973.

Redd Counts: None to date.

References:

Palmer, C.H. 1928. The Salmon Rivers of Newfoundland. Boston Farrington Co.

Porter, T.R., Moores, R.B., Traverse, G.R. River investigations on the southwest coast of insular Newfoundland. Internal Report Series No. NEW/1-74-2

CRABBS RIVER (Crabbs Brook)

Location: 48°12'50" N. 58°51'40" W. Bay St. George.
 Map Reference: St. Fintans. 12 B/12 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area: 212.6 miles² (550.6 km²). Mean width: 7.6 miles (12.22 km).

Perimeter: 108.3 miles (174.25 km). Axial length: 29.4 miles (47.30 km).

Maximum basin relief: 2,050 feet (624.84 m).

Geology:

About half gneissis with the remainder consisting of Mississippian sedimentary and acidic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Length of main stem (including standing water): 32.2 miles (51.8 km).

Number of major tributaries: 8

Total length of tributaries (including standing water): 150.5 miles (242.2 km).

Area of lakes (1 mile² (2.6 km²): Nil.

Channel width varies from fifty yards in the lower section to fourteen yards in the upper reaches.

Crabbs River is subject to extreme fluctuations in discharge with 40 to 50 percent of rivershed being dry at low water levels.

Bottom Composition:

Crabbs River contains large areas of suitable parr rearing area between mile 0 and mile 24.9 (40.1 km). Large concentrations of spawning habitat are located between mile 0 and mile 6 (9.7 km)

on the main stem and on Little Crabbs River and Southwest Branch.

Summary of accessible and inaccessible spawning and rearing habitat of Crabbs River system.

Units (100 yd ² (8.3 m ²))	Accessible	Inaccessible	Total
Total system	22,163	-	-
Rearing units	22,044	-	-
Spawning units	1,556	-	-

Barriers to Fish Migration:

Main stem:

Series of falls, located at mile 17.9 (28.8 km). Height: range from 4 to 8 feet (1.2-2.4 m). Minor 'hold-up' at low discharge.

Ledge, located at mile 20.6 (33.2 km). Height: 3 to 4 feet (0.9-1.2 m).

Partial obstruction at low discharge.

Falls, located at mile 24.9 (40.1 km). Height: 50 feet (15.3 m).

Slope: 90°.

Falls, located near mile 24.9 (40.1 km). Height: 30 feet (9.2 m).

Slope: 75-80°.

Falls, located near mile 24.9 (40.1 km). Height: 20 feet (6.1 m).

Tributaries:

Tributary	Type of Obstruction	Description	Location (miles from mouth)	Barriers to fish passage
T3	Falls	Height 15' (4.6 m)	0.4 (0.6 km)	Complete
T4	Falls	Height 30' (9.2 m)	0.2 (0.3 km)	Complete
T5	Falls	Height 10' (3.1 m)	0.5 (0.8 km)	Partial
T5-1	Falls	Height 15' (4.6 m)	2.1 (3.4 km)	Complete
T5-3	Falls	Height 100' (31.0 m)	1.3 (2.1 km)	Complete
T5-4	Falls	Height 50-75' (15.3-22.9 m)	0.3 (0.5 km)	Complete
T6	Falls(2)	Height 30' (9.2 m)	1.6 (2.6 km)	Complete

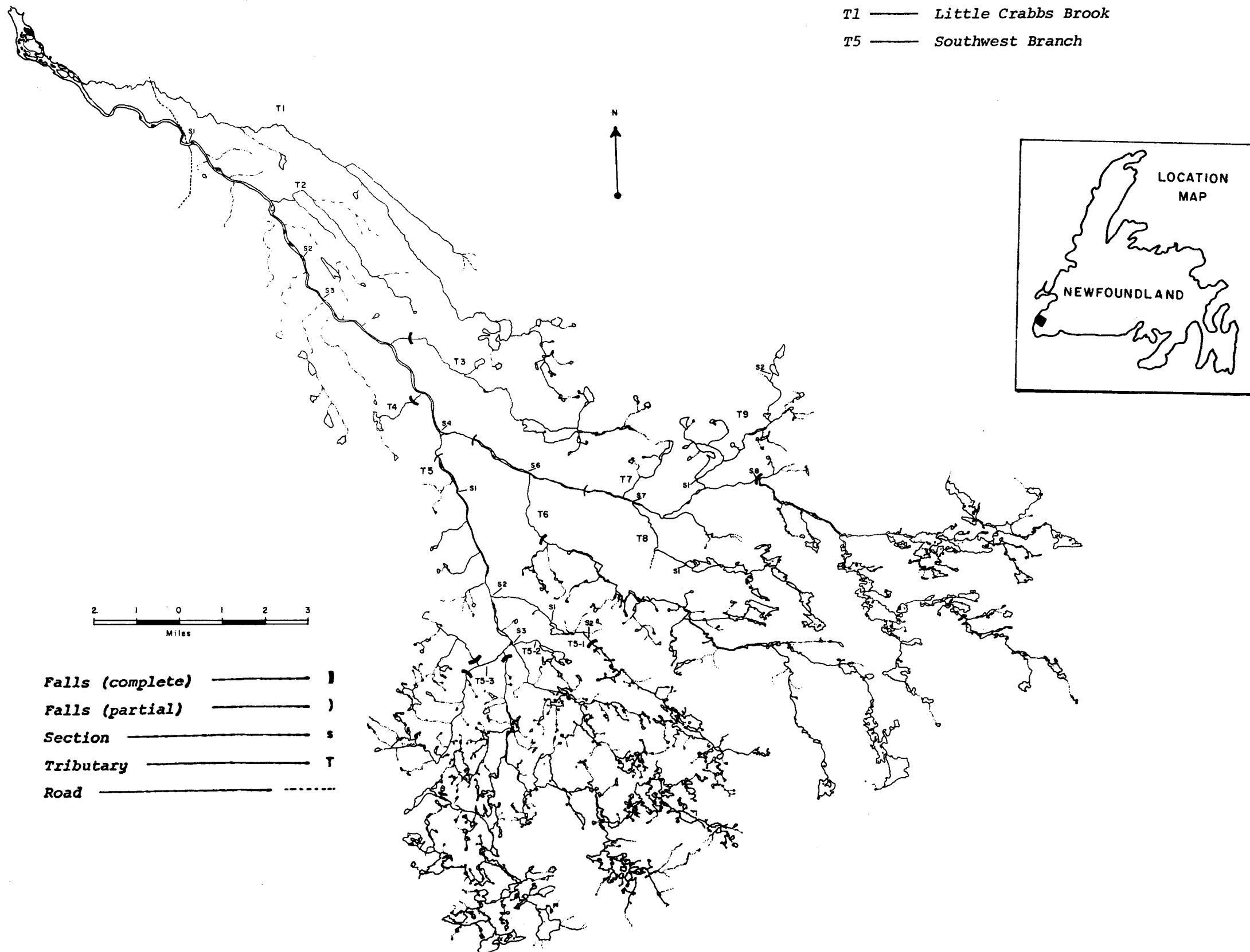


Fig. 5. . Crabbs River system showing obstruction locations. Line from section number indicates end of section.

Photograph on File:

No. 95

Water Quality Data:

Sample collected October 1972

	Total Alkalinity ppm	Total Hardness ppm	Turbidity JTU	Cl ppm	Conductivity at 25°C (mhos/cm)	Ca ppm	HCO ₃ ppm
pH	12.0	30.0	4.4	9.5	69.0	6.2	14.6

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Crabbs River (Crabbs Brook)

Year	Rod days	Grilse			Salmon			Total		
		No.	lbs	kg	No.	lbs	kg	No.	lbs	kg
1952	141	131	495	224.7	73	631	286.5	204	1126	511.2
1953	153	71	275	124.9	34	280	127.1	105	555	252.0
1954	157	116	417	189.3	51	405	183.9	167	822	373.2
1955	194	76	292	132.6	99	861	390.9	175	1153	523.5
1956	-	180	609	276.5	219	1744	791.8	399	2353	1068.3
1957	1278	331	1304	592.0	311	2343	1063.7	642	3647	1655.7
1958	1088	134	538	244.3	274	2244	1018.8	408	2782	1263.1
1959	1142	236	938	425.9	184	1454	660.1	420	2392	1086.0
1960	838	147	597	271.0	50	395	179.3	197	992	450.3
1961	1005	324	1291	586.1	112	838	380.5	436	2129	966.6
1962	1170	569	2213	1004.7	196	1538	698.3	765	3751	1703.0
1963	1272	468	1777	806.8	300	2550	1157.7	768	4327	1964.5
1964 ¹	1625	818	3087	1401.5	291	2435	1105.5	1109	5522	2507.0
1965	1252	430	1566	710.9	242	1857	843.1	672	3423	1554.0
1966	954	240	921	418.1	155	1234	560.2	395	2155	978.3
1967	1054	485	1806	819.9	201	1527	693.3	686	3333	1513.2
1968	1063	452	1590	721.9	227	1779	807.7	679	3369	1529.6
1969	1397	833	2978	1352.0	234	1871	849.4	1067	4849	2201.4
1970	1324	303	1076	488.5	150	1386	629.2	453	2462	1117.7
1971	1026	310	1129	512.6	85	689	312.8	395	1818	825.4
1972	932	398	1472	668.3	152	1266	574.8	550	2738	1243.1
1973	827	333	1190	540.3	107	867	393.6	440	2057	
1974										
1975										
1976										
1977										
MEAN										
1964-68	1190	485	1794	814.5	223	1766	801.9	708	3560	1616.4
1969-73	1101	435	1569	712.3	146	1216	552	581	2785	1264.1

¹ Angling data 1964-73, estimated to be 75% accurate (J. Marshall, personal communication).

Crabbs River provides approximately 857 fish to the sport fishery each year. This catch is suspected to be excessive as the catch per effort has decreased on Crabbs River over the past ten years.

Potential Population Estimates:

It is estimated that Crabbs River system has the potential to produce a total of 22,000 to 44,000 smolt and an adult sea survival of 2,200 to 6,600 salmon.

Estimated Atlantic salmon smolt production and adult sea survival of Crabbs River system. Area enclosed includes most accepted values for production.

If smolt production per 100 yd ² (83.6 m ²) is:				
		1	2	3
Smolt produced		22,044	44,088	66,132
Adult return if sea survival is:	5%	1,102	2,204	3,307
	10%	2,204	4,409	6,613
	15%	3,307	6,613	9,970
	20%	4,409	8,818	13,264
	25%	5,511	11,022	16,533

Miscellaneous Information:

Woods road being constructed near river, which will made it more accessible in future.

Gene Frequency:

Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	May 23-29	September 6-12	July 6-13 (1968)

Accessibility to Anglers:

Crabbs River - accessible by by-road from mouth to T.C.H. By road from railroad to river mouth. There are trails located along the St. Fintan's road which lead to river, within 10 minutes walk.

A woods road is located west of river which runs parallel to stream for 16 miles (26.15 km).

Little Crabbs - by-road located along lower section. Woods road for approximately 8 miles (12.88 km) along the upper section. This road is accessible from Crabbs River on south side of T.C.H. near Robinson's turnoff.

Surveys:

Engineering Survey on two branches - 1967.

Biological Survey, 1973.

Redd Counts:

1970, Little Crabbs River, section surveyed from Ocean Pond to T.C.H.; 210 redds observed.

1971, same section surveyed as in 1970, 53 redds observed.

References:

Morris, R.O. (F.O.) 1966. Stream Obstruction Report. St. John's Can. Dept. of Fish.

Porter, T.R., Moores, R.B. Traverse, G.R. River Investigations on the southwest coast of insular Newfoundland. Fish. and Mar. Serv. Resource Dev. Br. Nfld. Reg. Internal Rept. Series No. NEW/1-74-2 161 p.

BARACHOIS BROOK

Location: 48°15'17" N. 58°49'07" W. St. George's Bay.
 Map Reference: St. Fintans. 12 B/2 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area: 93.0 miles² (240.87 km²). Mean width: 3.8 miles (6.11 km).

Perimeter: 70.3 miles (113.1 km). Axial length: 25.4 miles (40.9 km).

Maximum basin relief: 2,000 feet (609.6 m).

Geology:

Half Mississippian sedimentary with remainder consisting of gneiss and a small amount of acidic intrusive rock.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Length of main stem (including standing water): 29.3 miles (47.1 km).

Number of major tributaries: 9

Total length of major tributaries (including standing water): 50.3 miles (80.9 km).

Area of lakes (> 1 mile² (2.6 m²): Nil.

Due to small quantity of standing water this river system is subject to extreme fluctuations in discharge.

Width range: 34 yards (31.1 m) - 8 yards (7.3 m) on main stem.

Bottom Composition:

Barachois Brook contain 7,878 rearing units on its main stem. Sixteen percent of these units are suitable for spawning Atlantic salmon. The main concentration of spawning habitat are located in the middle reaches between mile 9.2 (14.8 km) and mile 21.5 (34.6 km).

Barriers to Fish Migration:

Obstructions on the main stem of Barachois Brook.

Obstruction Number	Type of Obstruction	Description	Location (miles from mouth)	Barrier to fish passage
1	falls	3-4' vertical ledge	9.0	"hold up" at low discharge
2	falls	3 drops, spaced 50' Height 3' at angle 45° Height 6-7' vertical Height 6' at angle 55°	18.5	"hold up" at all discharges
3	falls	Height 7-8' at angle 80° over 15' length	18.7	"hold up" at medium and low discharges
4	falls	Height 6-7' at angle 80° over 10-15' length	19.0	Complete at low discharge. "Hold up" at all other flows.
5	falls	Height 5' vertical	21.1	"hold up" at low discharge.
6	falls	Height 8-10' vertical	23.0	"hold up" all discharges.

Obstruction on tributaries of Barachois Brook

Tributary	Type of Obstruction	Description	Location (miles from mouth)	Barrier to fish passage
T3	Falls	Height 40'	1.9	Complete
T4	Falls	Height 30'	2.0	Complete
T6	Falls	Height 20'-30'	1.0	Complete
T8	Falls	Height 20'	1.2	Complete
T9	Falls	Three drops Height 4'-8'	1.0	Partial

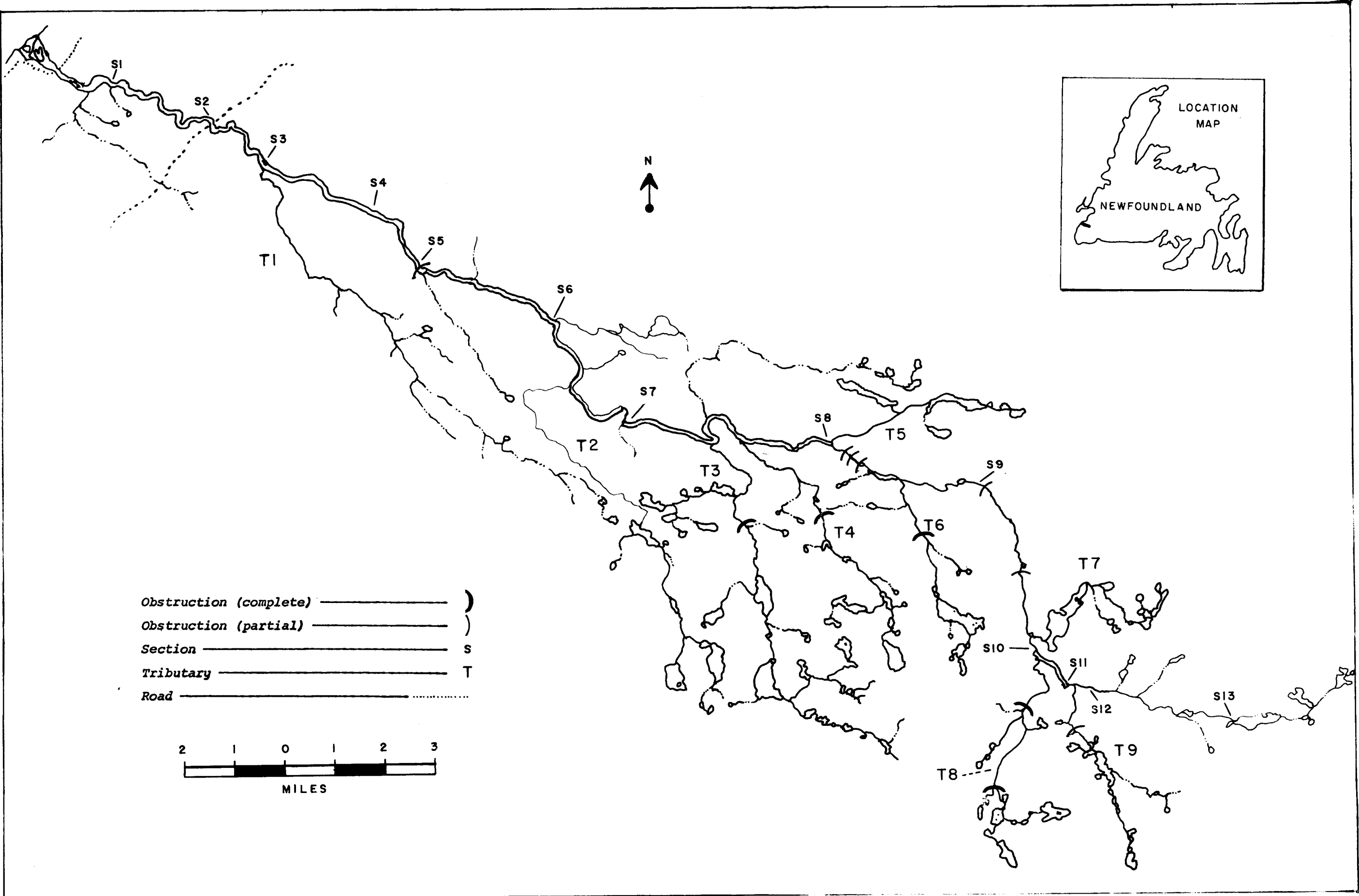


Fig. 6. Barchois Brook system showing obstruction locations. Line from section number indicates end of section.

Summary of bottom composition of Barachois Brook and tributaries accessible to anadromous fish.

Units (100 yd ² (83.6 m ²))	Accessible	Inaccessible	Total
Total system	10,348	-	-
Rearing units	10,042	-	-
Spawning units	1,448	-	-

Photographs on File:

No. 12, 253, 873

Water Quality Data:

Sample Collected October 25, 1972

pH	Total Alkalinity ppm	Total Hardness ppm	Turbidity JTU	Cl ppm	Conductivity at 25°C mhos/cm	Ca ppm	HCO ₃ ppm
5.90	5.0	14.0	4.8	4.0	43.0	2.5	6.1

Fish Populations:

Barachois Brook provides approximately 800 fish to the sport creel each year. There has been a slight decrease in angling pressure during the past nine years; however, the angling catch has shown a gradual downward trend. A comparison of rearing potential and angling catch shows that restrictions may be necessary on the angling catch to prevent a serious decline in fish stocks.

Species Present: Atlantic salmon, brook trout

Atlantic Salmon Angling Record - Barachois Brook

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	45	37	145	65.8	3	18	8.2	40	163	74.0
1953	45	23	91	41.3	4	28	12.7	27	119	54.0
1954	66	33	115	52.2	14	111	50.4	47	226	102.6
1955	60	27	117	53.1	15	109	49.5	42	226	102.6
1956	-	228	803	364.6	70	497	225.6	298	1300	590.2
1957	185	167	684	310.5	68	441	200.2	235	1125	510.7
1958	237	109	404	183.4	87	641	291.0	196	1045	474.4
1959	184	59	222	100.8	16	124	56.3	75	346	157.1
1960	179	86	256	116.2	15	102	46.3	101	358	162.5
1961	336	215	713	323.7	25	168	76.3	240	881	400.0
1962	404	236	785	356.4	47	345	156.6	283	1130	513.0
1963	750	271	908	412.2	145	1042	473.1	416	1950	885.3
1964 ¹	839	342	1077	489.0	99	675	306.5	441	1752	795.4
1965	966	542	1643	746.0	111	823	373.6	653	2466	1119.6
1966	507	187	612	277.8	90	617	280.1	277	1229	557.9
1967	788	546	1734	787.2	159	1079	489.9	705	2813	1277.1
1968	878	613	2026	919.8	124	856	388.6	737	2882	1308.4
1969	1343	766	2571	1167.2	154	1100	499.4	920	3671	1666.6
1970	1300	372	1277	579.8	69	478	217.0	441	1755	796.8
1971	904	550	1686	765.4	54	360	163.4	604	2046	928.8
1972	1025	348	1313	596.1	184	1291	586.1	532	2604	1182.2
1973	1222	568	1924	873.5	77	581	263.8	645	2505	1137.3
1974										
1975										
1976										
1977										
MEAN										
1964-68	796	446	1418	644.0	177	810	367.7	563	2228	1011.7
1969-73	1159	521	1754	796.4	108	762	345.9	628	2516	1142.4

¹ Angling data 1964-73 estimated to be 75% accurate (J. Marshall, personal communication).

Potential Population Estimates:

Estimated Atlantic salmon smolt production and adult sea survival of accessible areas of Barachois Brook. Area enclosed includes most accepted values of production.

If smolt production				
per 100 yd ² (83.6 m ²) is:				
Smolt produced		1	2	3
		10,042	20,084	30,126
Adult return if sea survival is:	5%	502	1,004	1,506
	10%	1,004	2,008	3,013
	15%	1,506	3,013	4,519
	20%	2,008	4,017	6,025
	25%	2,511	5,021	7,532

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	May 22-28	August 23-29	July 1-7 (1968)

Accessibility to Anglers:

By-roads lead to outlet of river and another near settlement of McKay's. A woods road leads to the upper section, the entrance of which is located on south side of T.C.H. near Robinson's turnoff.

Surveys: Biological, 1973.

Redd Counts: 1970, 230-280 redds observed.

References:

Anonymous: Nfld. Dept. Nat. Res. 1943. Res. Bull. No. 12, St. John's, Newfoundland.

References (cont'd.)

Palmer, C.H. 1928. The Salmon Rivers of Newfoundland,
Farrington Co., Boston.

Porter, T.R. Moores, R.B., Traverse, G.R. River Investigations
on the southwest coast of insular Newfoundland. Internal
Report series No. NEW/1-74-2.

ROBINSONS RIVER

Location: 48°14'55" N. 58°49'07" W. St. George's Bay.

Map Reference: St. Fintans. 12 B/2 West Half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area: 169.5 miles² (439.0 km²). Mean width: 48.0 miles, (77.232 km).

Perimeter: 90.0 miles (144.81 km). Axial length: 31.7 miles, (51.00 km).

Maximum basin relief: 2,050 feet (624.84 m).

Geology:

About half Mississippian sedimentary with the remainder consisting of about equal amounts of gneiss and acidic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Length of main stem(including standing water): 38.9 miles (62.6 km).

Number of major tributaries: 14

Total length of tributaries: 122.8 miles (197.7 km).

Area of lakes (>1 mile² (2.6 km): Nil.

Channel width: Ranges from 60 yards (54.9 m) at the mouth to 10 yards (9.1 m) at mile 16 (25.8 km). Extreme fluctuations in discharge are evident in this system.

Bottom Composition:

Robinson's River system contains large areas of riverbed suitable for rearing salmon parr. The river system has 16, 138 units (100 yards² (83.6 m²) of parr rearing units accessible to anadromous fish, seventeen percent of which is suitable spawning habitat. There is at present 9,808 rearing units inaccessible to migrating fish.

Summary of accessible and inaccessible rearing and spawning habitat of Robinson's River system.

Units (100 yd ² (83.6 m ²))	Accessible	Inaccessible	Total
Total system	16,645	11,761	28,406
Rearing	16,138	9,808	25,946
Spawning	2,783	1,039	3,822

The suitable spawning habitat of Robinson's River is distributed throughout the main stem with large areas located between mile 16.3 (26.2 km) and mile 19.1 (30.8 km).

Barriers to Fish Migration:

Main Stem

Falls, located at mile 19.1 (30.8 km). Height: 55-60 feet (16.9-18.5m)

Slope: 60°. Complete obstruction at all discharges. Falls would require a fishway to make it passable to fish migrants.

Three falls, located approximately 100 yards (91.4 m) above mile 19.1 (30.8 km). Height: 6, 7 and 4 feet (1.8, 2.2 and 1.2 m) upstream respectively. Slope: 90°. Partial obstruction.

Falls, located at mile 19.8 (31.9 km). Height: 10 feet (3.1 m).

Slope: 90°.

Tributaries

Tributary	Obstruction	Description	Location (miles from mouth)	Barrier to fish passage
T2	falls	height 40' (12.2 m)	1.4 (2.3 km)	complete
T3	falls	height 50' (15.3 m)	0.2 (0.3 km)	complete
T4	falls	height 30' (9.2 m)	1.4 (2.3 km)	complete
T5	falls	height 50" (15.3 m)	3.5 (5.6 km)	complete
T8	falls	height > 15' (4.6 m)	0.9 (1.4 km)	complete
T10	falls	height > 15' (4.6 m)	0.5 (0.8 km)	complete
T11	falls	height > 15' (4.6 m)	1.0 (1.6 km)	complete

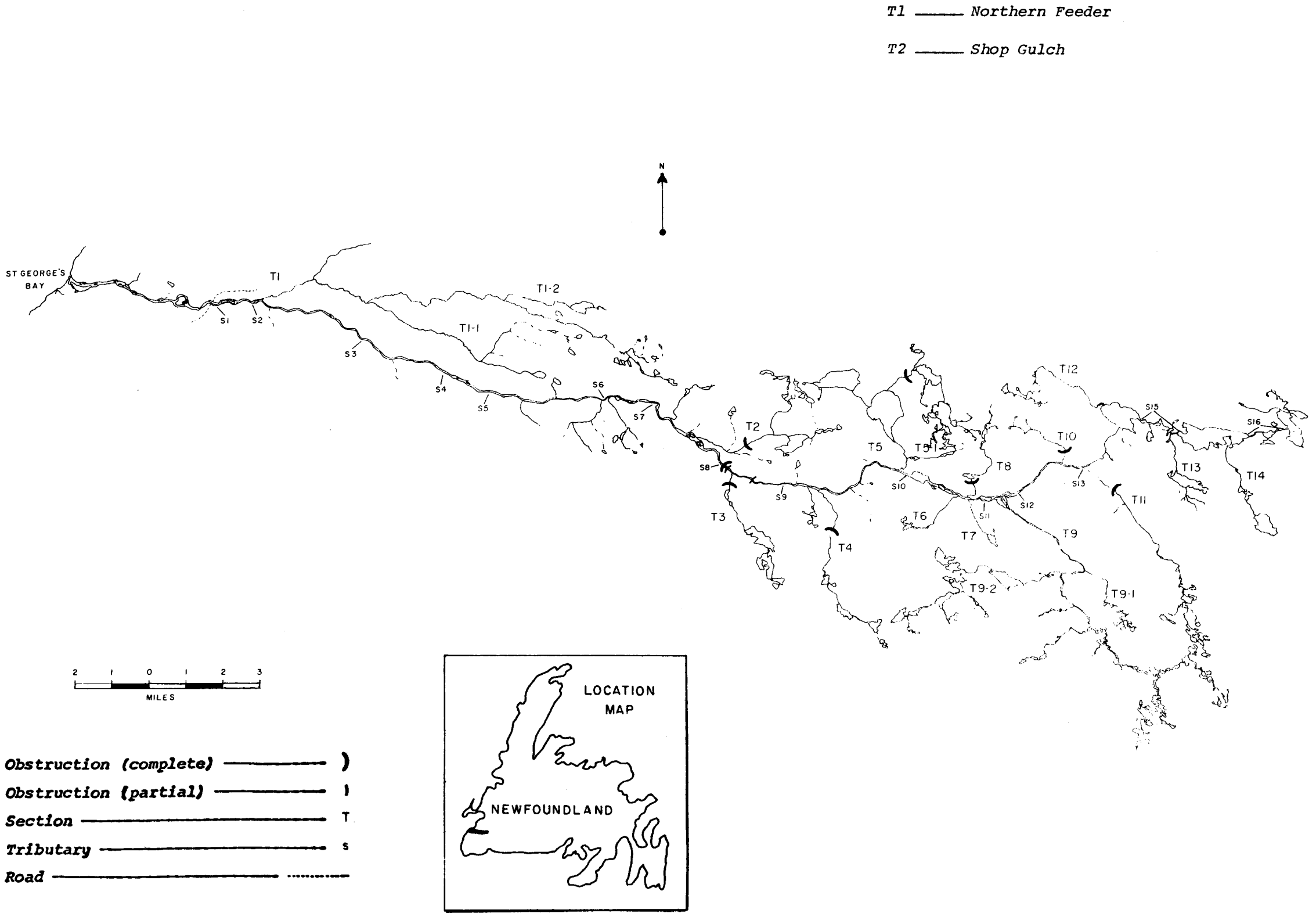


Fig.7. Robyns River system showing obstruction locations. Line from section number indicates end of section.

Photographs on File:

No. 159, 160, 161, 162, 995, 876.

Water Quality Data:

Sample Collected, October 1972							
pH	Total Alkalinity ppm	Total Hardness ppm	Turbidity JTU	Cl ppm	Conductivity at 25°C (μ mhos/cm)	Ca ppm	HCO ₃ ppm
6.23	3.0	11.0	3.0	9.5	35.0	1.5	3.7

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Robinsons River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No.	lbs	kg
1952	900	720	2827	1283.5	155	1187	538.9	875	4014	1822.4
1953	874	489	2100	953.4	152	1194	542.1	641	3294	1495.5
1954	725	370	1535	696.9	203	1518	689.2	573	3053	1386.1
1955	754	363	1373	623.3	106	839	380.9	469	2212	1044.2
1956	-	588	2036	924.3	199	1607	729.6	787	3643	1653.9
1957	1822	796	2868	1302.1	178	1429	648.8	974	4297	1950.9
1958	1772	360	1300	590.2	298	2735	1241.7	658	4035	1831.9
1959	1615	488	1579	716.9	98	801	363.7	586	2380	1080.6
1960	1726	760	2410	1094.1	117	1013	459.9	877	3423	1554.0
1961	1481	732	2569	1166.3	166	1317	597.9	898	3886	1764.2
1962	1438	1005	3442	1562.7	117	1005	456.3	1122	4447	2019.0
1963	1823	1206	4325	1963.6	390	3140	1425.6	1596	7465	3389.2
1964 ¹	1551	935	3198	1451.9	282	2353	1068.3	1217	5551	2520.2
1965	1455	1021	3597	1633.0	200	1702	772.7	1221	5299	2405.7
1966	1070	504	1621	736.0	142	1203	546.2	646	2824	1281.2
1967	1491	847	2778	1261.2	166	1356	615.6	1013	4134	1876.8
1968	1905	805	2642	1199.5	147	1138	516.7	952	3780	1716.2
1969	1040	567	2028	920.7	73	508	230.6	640	2536	1151.3
1970	1037	519	1809	821.3	80	552	250.6	599	2361	1071.9
1971	1171	373	1209	548.9	57	414	188.0	430	1623	736.9
1972	640	287	934	424.0	41	298	135.3	328	1232	559.3
1973	1626	875	2984	1354.7	91	730	331.4	966	3714	1686.2
1974										
1975										
1976										
1977										
MEAN										
1964-68	1494	822	2767	2156.7	187	1550	703.9	1010	4319	1961.0
1969-73	1103	524	1793	831.9	68	500	227.2	593	2291	1040.1

¹Angling data 1964-73 is estimated to be 75% accurate (J. Marshall, personal communication).

The estimated mean annual angling catch in Robinson's River is 1,280. It is also noted that the angling success has decreased over the past five years. The catch per effort has drastically decreased since 1965 from about 0.8 fish per rod day to about 0.4 fish per rod day. It is evident, from comparisons of angling catch and potential production, that the Atlantic salmon in Robinson's River are over-exploited.

Potential Population Estimates:

It is estimated that the accessible area of Robinson's River system has the potential to produce a total of 16,100 to 32,300 smolt and an adult sea survival of 1,600 to 4,800 salmon.

It is estimated that the inaccessible area of Robinson's River, excluding areas above total obstructions on tributaries, has the potential to produce a total of 9,808 to 19,618 smolt and an adult sea survival of 981 to 2,943 salmon.

Estimated Atlantic salmon smolt production and adult sea survival of accessible areas of Robinson's River. Area enclosed includes most accepted values for production.

If smolt production				
per 100 yd ² (83.6 m ²) is:				
Smolt produced		1	2	3
		16,138	32,276	48,414
Adult return if sea survival is:	5%	807	1,614	2,421
	10%	1,614	3,228	4,841
	15%	2,421	4,841	7,262
	20%	3,228	6,455	9,683
	25%	4,038	8,069	12,104

Estimated Atlantic salmon smolt production and adult sea survival of inaccessible areas of Robinson's River. Area enclosed includes most accepted values of production.

If smolt production per 100 yd ² (83.6 m ²) is:		1	2	3
Smolt produced		9,809	19,618	29,427
Adult return if sea survival is:	5%	490	981	1,471
	10%	981	1,962	2,943
	15%	1,471	2,943	4,414
	20%	1,962	3,924	5,885
	25%	2,452	4,905	7,357

Gene Frequency:

Not completed.

Timing of Run: (Based on angling statistics).

Year	First fish	Last fish	Week of peak run
Average 1966-1969	May 23-29	September 3-9	July 6-13 (1968)

Accessibility to Anglers:

A by-road leads to mouth of river. Trails lead to several lower sections from Cartyville and Robinson's. Several farm roads in that area lead to river. Upper section of river is accessible by woods roads, the entrance of which is the same as the road leading to Middle Barachois River. The Big Dribble area is accessible by woods road, the entrance of which is located approximately 1 mile (1.61 km) east of Gillam's Service Station, south side of Trans-Canada Highway.

Surveys:

Preliminary engineering survey of river and profiles of two falls, 1968.

Biological Survey, 1973.

Redd Counts:

None to date.

References:

Porter, T.R., Moores, R.B., Traverse, G.R. River Investigations on the southwest coast of insular Newfoundland. Internal Report Series No. NEW/1-74-2.

FISHELS BROOK

Location: 48°18'55" N. 58°42'30" W. St. George's Bay.
 Map Reference: Flat Bay. 12 B/7 East Half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area: 139.0 miles² (360.01 km²). Mean width: 3.6 miles,
 (5.79 km).

Perimeter: 83.2 miles (133.86 km). Axial length: 30.3 miles,
 (48.65 km).

Maximum basin relief: 1,950 feet (594.36 km).

Geology:

About half Mississippian sedimentary with the remainder consisting
 of gneissis, basic intrusive rocks and acidic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Length of main stem: 30 miles (48.3 km).

Depth (above mile 19 (11.8 km): 0.5 to 2 feet (0.2-0.6 m).

Bottom Composition:

Bottom types are well distributed throughout system except for a
 noticeable lack of bedrock.

Summary of bottom composition of Fishels Brook above complete obstruc-
 tion at mile 13 (20.9 km).

Unit (100 yd ² (83.6 m ²))	Accessible	Inaccessible	Total
Total	Not surveyed	7,381	-
Rearing		7,149	-
Spawning		232	-

Barriers to Fish Migration:

Main Stem

Falls, located at mile 13 (20.9 km). Height: 19 feet (5.8 m).

Tributaries

Above mile 13 (20.9 km).

Tributary	Type of Obstruction	Description	Location (miles from mouth)	Barriers to fish passage
1	falls	height 100' (30.5 m)	0.3 (0.5 km)	complete
2	falls	height 30' (9.2 m)	0.3 (0.5 km)	complete
3	falls	height	0	complete
4	falls	height 15' (4.5 m)	(1.6 km)	complete
5	dry riverbed		0	partial
6	4 falls	height 5, 8, 10, 15' (1.5, 2.4, 3.1, 4.5 m)		partial
8	falls	height 15' (4.6 m)		complete

Photographs on File:

No. 157.

Water Quality Data:

Sample Collected, October, 1972.

pH	Total Alkalinity ppm	Total Hardness ppm	Turbidity JTU	Cl ppm	Conductivity at 25°C (μ mhos/cm)	Ca ppm	HCO ₃ ppm
6.10	4.0	12.0	3.5	8.5	35.0	2.0	4.0

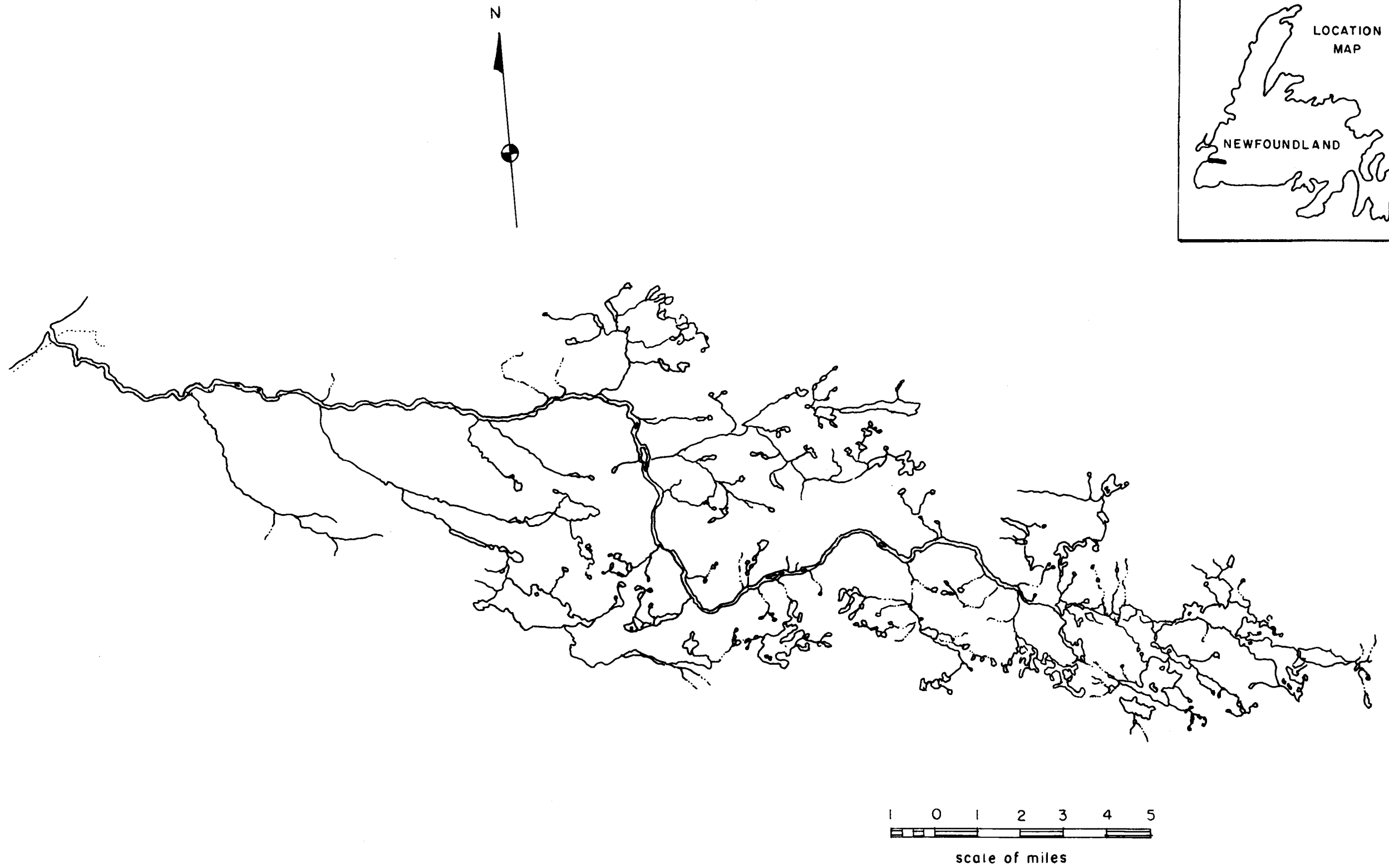


FIG 8 OUTLINE MAP OF FISHELS BROOK SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout, resident and sea-run.

Atlantic Salmon Angling Record - Fishels Brook.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	96	116	452	205.2	43	313	142.1	159	765	347.3
1953	211	97	375	170.3	38	294	133.5	135	669	303.8
1954	172	34	131	59.5	43	321	145.7	77	452	205.2
1955	215	32	135	61.3	45	354	160.7	77	489	222.0
1956	-	147	510	231.5	69	504	228.8	216	1014	460.3
1957	441	182	729	331.0	78	544	247.0	260	1273	578.0
1958	459	156	659	299.2	99	751	341.0	255	1410	640.2
1959	407	144	531	241.1	31	253	114.9	175	784	356.0
1960	366	95	326	148.0	38	315	143.0	133	641	291.0
1961	582	193	633	287.4	72	533	242.0	265	1166	529.4
1962	674	282	1027	466.3	57	443	201.1	339	1470	667.4
1963	943	425	1566	711.0	120	929	421.8	545	2495	1132.8
1964 ¹	874	305	1095	497.1	136	953	432.7	441	2048	929.8
1965	624	202	662	301.0	84	649	294.6	286	1311	595.2
1966	442	52	180	81.7	55	386	175.2	107	566	256.9
1967	612	355	1123	510.0	40	292	132.6	395	1415	642.6
1968	642	277	868	394.1	44	313	142.1	321	1181	536.2
1969	718	416	1468	666.5	77	554	251.5	493	2022	918.0
1970	766	302	1048	475.8	135	908	412.2	437	1956	888.0
1971	582	239	763	346.4	27	188	85.4	266	951	431.8
1972	417	133	423	192.0	63	433	196.5	196	856	388.5
1973	763	346	1106	502.1	75	532	241.5	421	1638	743.7
1974										
1975										
1976										
1977										
MEAN										
1964-68	639	238	786	356.8	72	519	235.6	310	1304	592.1
1969-73	649	287	962	436.6	75	523	237.4	363	1485	674.0

¹Angling data 1964-73 estimated to be 75% accurate (J. Marshall, personal communication).

Potential Population Estimates: (above mile 13.0 (20.9 km)).

There are 7,149 parr rearing units (100 yd² (83.6 m²)) located above the complete obstruction at mile 13 (20.9 km) on the main stem. These units have the potential to produce 715-2,143 Atlantic salmon.

Estimated Atlantic salmon smolt production and adult sea survival of inaccessible areas of Fishels Brook. Area enclosed includes most accepted values of production.

If smolt production				
per 100 yd ² (83.6 m ²) is:				
Smolt produced		<u>1</u>	<u>2</u>	<u>3</u>
		7,149	14,298	21,447
Adult return if sea survival is:	2%	143	286	429
	5%	357	714	1,072
	10%	715	1,429	2,143
	15%	1,072	2,143	3,219

Miscellaneous:

There is no data available on parr rearing potential below the complete obstruction at mile 13.0 (20.9 km).

Gene Frequency:

Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1968	May 22-28	August 23-29	July 6-13 (1968)

Accessibility to Anglers:

By-road leads to mouth of stream. Accessible by trails leading from T.C.H. A woods road located east of T.C.H. bridge which crosses river leads to within 1.5 miles (2.41 km) of upper section.

Surveys:

Engineering survey of falls by E. Tulk, 1968.

Biological survey (above complete obstruction), 1968.

Redd Counts:

None to date.

References:

Anonymous, 1943. Newfoundland Dept. of Nat. Resources, Res. Bul. No. 12, St. John's, Newfoundland.

Riche, L.G. 1969. Fishels Brook and the Upper Humber River: A Comparative Evaluation. MS report, Fisheries Service, St. John's, Newfoundland.

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

No angling data available for this stream. Atlantic salmon confined to lower river section.

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers: By foot from T.C.H. which crosses the upper reaches of the stream.

Surveys: None to date.

Redd Counts: None to date.

References:

MIDDLE BROOK

Location: 48°20'15" N. 58°41'15" W.
 Map Reference: Flat Bay. 12 B/7 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 11.5 miles² (29.78 km²). Mean width, 1.0 miles,
 (1,609 km).
 Perimeter, 22.5 miles (36.20 km). Axial length, 10.3 miles,
 (16.57 km).
 Maximum basin relief, 1,000 feet (303.3 m).

Geology:

Mississippian sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Spawning Areas:

Main river just below and above Trans-Canada Highway bridge.

Barriers to Fish Migration:

Falls complete obstruction, 3-4 miles (0.9-1.21 km) above
 Trans-Canada Highway.

Photographs on file; Nos. 291.

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (µmhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

FISH POPULATIONS

Species present: Atlantic salmon, brook trout.

No angling data available on this stream. Atlantic salmon confined to lower reaches.

Gene Frequency: Not completed.

Timing of run: (Based on angling statistics).

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers: By foot from T.C.H. which crosses Middle Brook on the upper reaches.

Surveys: None to date.

Redd Counts: None to date.

References:

JOURNOIS BROOK

Location: 48°21'20" N. 58°41'18" W.
 Map Reference: Flat Bay. 12 B/7 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 24.9 miles² (64.49 km²). Mean width, 1.2 miles (1.93 km).

Perimeter, 28.1 miles (45.21 km). Axial length, 12.1 miles (19.46 km).

Maximum basin relief, 1,250 feet, (381.00 m).

Geology:

Almost entirely Mississippian sedimentary with some basic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Length of main stem (including standing water): 11.0 miles (17.7 km).

Number of major tributaries: Nil.

Barriers to Fish Migration: Nil.

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μ mhos/cm)	ppm.	ppm.

Potential Population Estimates:

Journois Brook has the potential to produce 1,042 to 2,084 smolt resulting in a possible 104 to 312 adult salmon.

Estimated Atlantic salmon smolt production and adult sea survival of accessible areas of Journois Brook. Area enclosed includes most accepted values of production.

If smolt production				
per 100 yd ² (83.6 m ²) is:				
Smolt produced	<u>1</u>	<u>2</u>	<u>3</u>	
	1,042	2,084	3,126	
Adult return if sea survival is:	5%	52	104	156
	10%	104	208	313
	15%	156	312	469
	20%	208	417	625
	25%	261	521	782

Species Present:

Brook trout. No angling data available on this stream.

Gene Frequency:

Not completed.

Timing of Run: (Based on angling statistics)

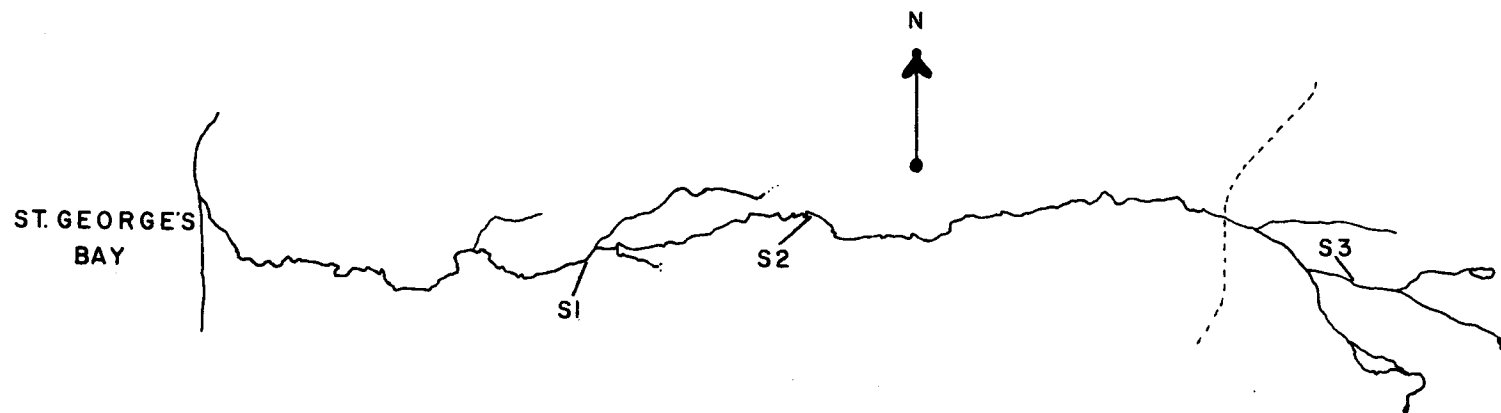
<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

By foot from T.C.H. which crosses Journois Brook at the headwaters.

Surveys:

Biological Survey, 1973.



- Falls (complete)* —————)
- Falls (partial)* —————)
- Section* ————— S
- Tributary* ————— T
- Road* ————— - - - - -

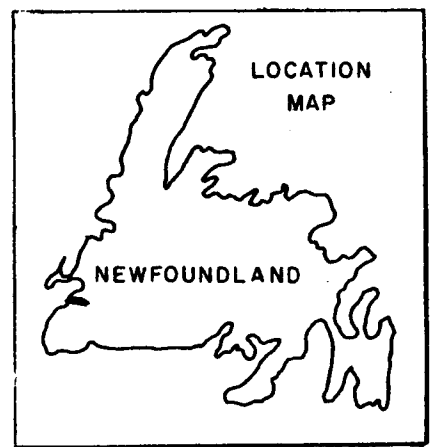


Fig. 9. Journois Brook system. Line from section number indicates end of section.

Redd Counts:

None to date.

References:

Porter, T.R., Moores, R.B., Traverse, G.R. River Investigations
on the southwest coast of insular Newfoundland. Internal
Report Series No. NEW/1-74-2.

FLAT BAY BROOK

Location: 48°24'00" N. 58°33'32" W. Flat Bay, St. George's Bay.
 Map Reference: Flat Bay. 12 B/7 East Half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area: 245.4 miles² (635.2 km²). Mean width: 6.9 miles, (11.10 km).

Perimeter, 104.7 miles (168.45 km). Axial length: 32.5 miles, (52.29 km).

Maximum basin relief: 1,950 feet (594.36 m).

Geology:

About half basic intrusive rocks with the remainder consisting of Mississippian sedimentary, gneissis and acidic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Length of main stem: 33.9 miles (54.5 km).

Number of major tributaries: 9

Total length of tributaries: 149.5 miles (240.5 km).

Area of lakes (>1 mile ²):	Dennis Pond	L1	1.1 miles ²	(704.4 km)
	Long Pond	L2	1.0 miles ²	(640.0 km)
	Cross Pond	L3	1.1 miles ²	(704.0 km)
		L4	1.0 miles ²	(640.0 km)

Bottom Composition:

Flat Bay Brook has 17,260 rearing units and 4,337 spawning units.

Accessible tributaries have 1,893 potential rearing units.

Inaccessible areas of Flat Bay Brook has approximately 1,848 rearing units. Tributaries inaccessible to anadromous fish contain 689 rearing units but no significant spawning areas.

Summary of accessible and inaccessible rearing and spawning habitat of Flat Bay Brook.

Units (100 yd ² (83.6 m ²))	Accessible	Inaccessible	Total
Total system	23,541	2,537	26,078
Rearing	19,153	2,537	21,690
Spawning	4,494	112	4,606

Spawning Area:

Excellent spawning habitat located between the Trans-Canada Highway and T-4 (Three Brook).

Barriers to Fish Migration:

Main Stem

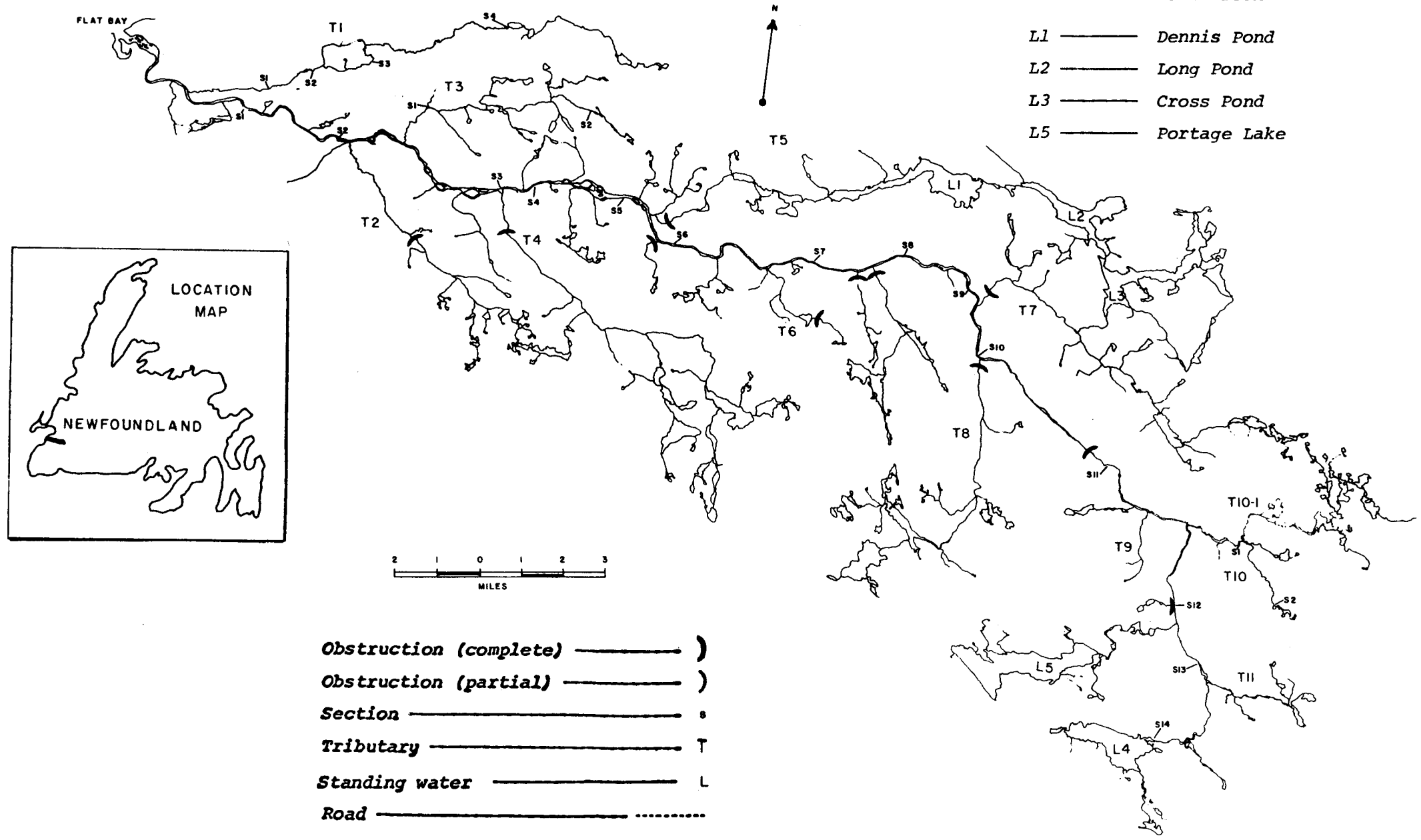
Two sections of dry riverbed located at mile 28.0 (45.1 km). Water flows through broken rock or underground. Complete obstruction. The river is very shallow over its entire course and during periods of low discharge fish migration is delayed throughout the system.

Tributaries

Obstructions on tributaries of Flat Bay Brook.

Tributary	Type of Obstruction	Description (height)	Location (miles from mouth)	Barriers to fish passage
T2	falls	40-50' (12.0-15.4 m)	2.8 (4.5 km)	complete
T3	falls (2)	8-10' (2.4-3.0 m)	1.1 (1.7 km)	passable
T4	falls	20' (6.1 m)	1.0 (1.6 km)	complete
T5	falls	-	near mouth	complete
T7	falls	50' (15.4 m)	0.4 (0.6 km)	complete
T8	falls	20' (6.2 m)	near mouth	complete

- T1 ——— Dribble Brook
- T2 ——— Coal Brook
- T3 ——— Sheep Brook
- T4 ——— Three Brook
- T5 ——— Lookout Brook
- T7 ——— Cross Pond Brook
- T8 ——— Wolf Brook
- L1 ——— Dennis Pond
- L2 ——— Long Pond
- L3 ——— Cross Pond
- L5 ——— Portage Lake



- Obstruction (complete)** ———)
- Obstruction (partial)** ———)
- Section** ——— s
- Tributary** ——— T
- Standing water** ——— L
- Road** ——— ·····

Fig. 10. Flat Bay Brook system showing obstruction locations. Line from section number indicates end of section.

Photographs on file:

No. 862.

Miscellaneous Information:

Lookout Brook, tributary to main river, used for power by West Coast Power Co.

Water Quality Data:

Water Quality Data, Sample Collected, 1972.

	Total Alkalinity ppm	Total Hardness ppm	Turbidity JTU	Cl ppm	Conductivity at 25°C (μ mhos/cm)	Ca ppm	HCO ₃ ppm	
pH	6.55	4.0	10.0	3.9	5.5	22.0	2.0	4.9

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Flat Bay Brook.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	750	442	1612	731.8	77	486	220.6	519	2098	952.4
1953	900	666	2579	1170.9	119	936	424.9	785	3515	1595.8
1954	499	329	1348	612.0	46	356	161.6	375	1704	773.6
1955	864	431	1750	794.5	33	292	132.6	464	2042	927.1
1956	-	566	2180	989.7	29	276	125.3	595	2456	1115.0
1957	884	718	2731	1239.9	19	184	83.5	737	2915	1323.4
1958	902	620	2083	945.7	39	414	188.0	659	2497	1133.7
1959	613	334	1195	542.5	18	196	89.0	352	1391	631.5
1960	1559	1010	3977	1805.6	65	636	288.7	1075	4613	2094.3
1961	1176	760	2849	1293.4	35	298	135.3	795	3147	1428.7
1962	1200	1378	4956	2250.0	74	639	290.1	1452	5595	2540.1
1963	1515	1827	7093	3220.2	92	806	365.9	1919	7899	3586.1
1964 ¹	1657	1853	6903	3133.9	97	797	361.8	1950	7700	3495.7
1965	1658	778	2993	1358.8	175	1499	680.5	953	4492	2039.3
1966	861	576	2212	1004.2	33	347	157.5	609	2559	1161.7
1967	1485	898	3203	1454.2	63	539	244.7	961	3742	1698.9
1968	1505	951	3252	1476.4	40	358	162.5	991	3610	1638.9
1969	1635	857	2959	1343.4	95	779	353.7	952	3738	1697.1
1970	3206	1496	5062	2298.1	115	950	431.3	1611	6012	2729.4
1971	2741	1019	3254	1477.3	80	561	254.7	1099	3815	1732.0
1972	2559	879	3059	1388.8	71	497	225.6	950	3556	1614.4
1973	2064	696	2188	993.4	79	634	287.8	775	2822	1281.2
1974										
1975										
1976										
1977										
MEAN										
1964-68	1433	1011	3713	1685.7	82	708	321.4	1093	4421	2007.1
1969-73	2441	989	3304	1500.2	88	127	57.6	1077	3989	1810.8

¹Angling data 1964-73 estimated to be 80% accurate. (J. Marshall, personal communication).

Flat Bay Brook has been subjected to a mean angling pressure of 1,896 rod days since 1963 and since that time the angling catch has decreased from 1.3 fish per rod day to 0.4 fish per rod day in 1973. This is a decrease of 66 percent in angling catch per effort and it appears that this brook is over-exploited and requires a reduction in harvest.

Potential Population Estimates:

It is estimated that accessible areas of Flat Bay Brook has the potential to annually produce a total of 19,000 to 38,000 Atlantic salmon smolt resulting in an expected 1,900-5,700 adults returning to the fishery.

It is estimated that the inaccessible areas of Flat Bay Brook have the potential to produce 2,500 to 5,000 Atlantic salmon smolt and an adult sea survival of 250 to 760 fish per year.

Estimated Atlantic salmon smolt production and adult sea survival of accessible areas of Flat Bay Brook. Area enclosed includes most accepted values of production.

If smolt production				
per 100 yd ² (83.6 m ²) is:				
Smolt produced		1	2	3
		19,153	38,306	57,459
Adult return if sea survival is:	5%	958	1,915	2,873
	10%	1,915	3,831	5,746
	15%	2,873	5,746	8,619
	20%	3,831	7,661	11,492
	25%	4,788	9,577	14,365

Estimated Atlantic salmon smolt production and adult sea survival of inaccessible area of Flat Bay Brook. Area enclosed includes most accepted values of production.

If smolt production				
per 100 yd ² (83.6 m ²) is:				
Smolt produced				
		<u>1</u>	<u>2</u>	<u>3</u>
		2,537	5,074	7,611
Adult return if sea survival is:	5%	127	254	381
	10%	254	507	761
	15%	381	761	1,141
	20%	507	1,015	1,522
	25%	634	1,269	1,903

Surveys:

Biological Survey, 1973.

Gene Frequency:

Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 18-24	September 8-15	July 20-27 (1968)

Accessibility to Anglers:

Accessible by road from mouth to power house at Lookout Brook, a distance of approximately 18 miles (28.98 km). T.C.H. crosses one section of river.

Redd Counts:

1971, 566 redds observed, reported by F/O May.

References:

- Anonymous. Nfld. Dept. Nat. Res. 1943. Res. Bull. No. 12,
St. John's, Newfoundland.
- Anonymous. Dept. of Northern Affairs and Nat. Res. 1958.
Water Resources of Canada. Queen's Printer. Ottawa.
- Porter, T.R., Moores, R.B., Traverse, G.R. River Investigations
on the southwest coast of insular Newfoundland. Internal
Report Series No. NEW/1-74-2.

LITTLE BARACHOIS RIVER

Location: 48°26'40" N. 58°26'30" W. Flat Bay, St. George's Bay
 Map Reference: Main Gut. 12 B/8 West Half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area: 136.8 miles² (354.31 km²). Mean width: 3.6 miles, (5.79 km).
 Perimeter: 95.4 miles (153.49 km). Axial length: 34.1 miles, (54.86 km).
 Maximum basin relief: 1,900 feet (579.12 m).

Geology:

About half basic intrusive rocks with the remainder consisting of gneissis, acidic intrusive rocks and Mississippian sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Length of main stem: 49.9 miles (79.0 km).
 Number of major tributaries: 5
 Total length of tributaries: 70.6 miles (113.6 km).
 Area of lakes: (>1 mile² (2.6 km²): Nil.
 Main river from mouth to headwaters has an average width; 100 feet (30.48 m) and an average depth of 1 foot (0.3 m).

Bottom Composition:

The total accessible parr rearing habitat of Little Barachois Brook is 8,498 units (100 yd² (83.6 m²). There are 1,627 inaccessible units in the system.

Summary of accessible and inaccessible rearing and spawning habitat of Little Barachois Brook.

Units (100 yd ² (83.6 m ²))	Accessible	Inaccessible	Total
Total system	9,149	1,627	10,776
Rearing	8,498	1,627	10,125
Spawning	2,747		2,747

Spawning Areas:

Distributed between mile 0 and mile 24.5 (39.4 km) and particularly abundant between mile 0 and mile 3.6 (5.8 km).

Barriers to Fish Migration:

Main Stem

Falls, at mile 19.5 (31.1 km). Height: 11'-12' (3.4-3.7 m) in two drops of 6 feet (1.8 m) at 55° angle and 5-6 feet (1.5-1.8 m) at 90° angle. Partial obstruction at all water levels.

Falls, at mile 24.6 (39.6 km). Height: 5 feet (1.5 m). Slope: 90°. Partial obstruction at low discharge.

Falls, at mile 26.7 Height: 40 feet (12.2 m) (two 20 foot (6.1 m) drops at 90° slope). Complete obstruction at all discharges.

Falls, at mile 27.5 (44.3 km). Height: 7 feet (2.1 m). Slope: 90°. Partial obstruction.

Falls, at mile 28.5 (45.8 km). Height: 8 feet (2.4 m). Slope: 90°. Partial obstruction.

Tributaries

Obstruction on tributaries of Little Barachois Brook.

Tributary	Type of Obstruction	Description	Location (miles from mouth)	Barrier to fish passage
T2	falls	Height 50'-75'	3.9	complete
T3	falls	Height 15'	1.8	complete
T5	falls	Height 50'	near mouth	complete

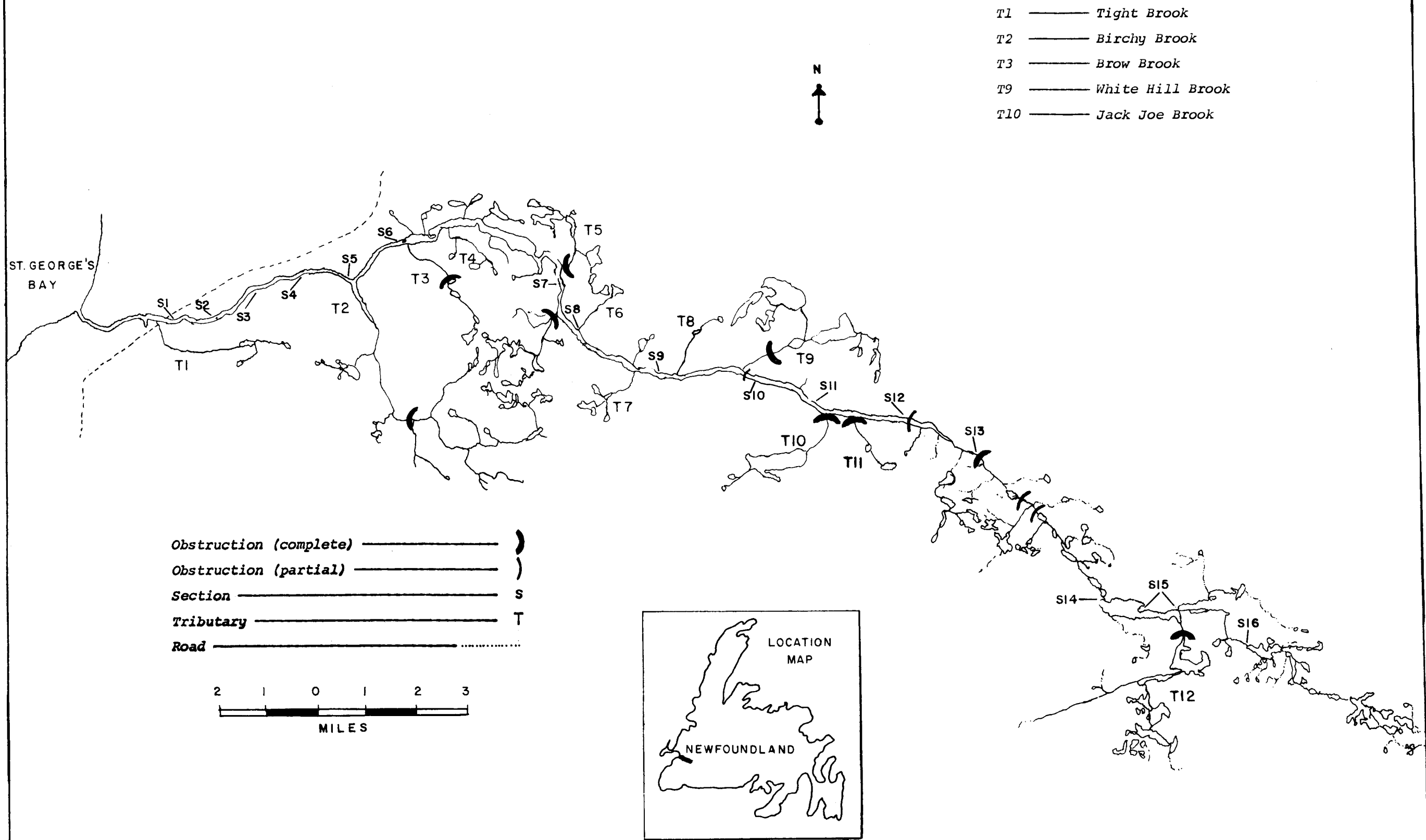


Fig. 11. Little Barchois Brook system showing obstruction locations. Line from section number indicates end of section.

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Little Barachois River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	58	86	365	165.7	17	133	60.4	103	498	226.1
1953	115	68	280	127.1	29	260	118.0	97	540	245.1
1954	96	42	159	72.2	6	81	36.8	48	240	109.0
1955	204	57	243	110.3	3	33	15.0	60	276	125.3
1956	-	140	457	207.5	8	90	40.9	148	547	248.4
1957	226	131	485	220.2	12	109	49.5	143	594	269.7
1958	209	101	404	183.4	10	101	45.9	111	505	229.3
1959	247	44	152	69.0	22	249	113.0	66	401	182.0
1960	346	114	435	197.5	17	154	69.9	131	589	267.4
1961	361	136	488	221.6	7	95	43.1	143	583	264.7
1962	381	189	650	295.1	14	130	59.0	203	780	354.1
1963	357	222	720	326.9	9	80	36.3	231	800	363.2
1964 ¹	569	302	1121	508.9	42	380	172.5	344	1501	681.4
1965	690	253	915	415.4	23	181	82.2	276	1096	497.6
1966	223	150	544	247.0	8	77	35.0	158	621	282.0
1967	253	125	389	176.6	4	26	11.8	129	415	188.4
1968	266	97	335	152.1	-	-	-	97	335	152.1
1969	142	59	178	80.8	-	-	-	59	178	80.8
1970	301	110	408	185.2	-	-	-	110	408	185.2
1971	337	172	509	231.1	4	33	15.0	176	542	246.1
1972	485	295	976	443.1	18	137	62.2	313	1113	505.3
1973	609	230	777	352.8	35	275	124.9	265	1052	477.6
1974										
1975										
1976										
1977										
MEAN										
1964-68	400	185	661	300.1	15	133	60.4	201	794	360.3
1969-73	375	173	570	258.6	11	89	40.4	185	659	299.0

¹ Angling data 1964-73 estimated to be 65% accurate (J. Marshall, personal communication).

The angling catch per rod day has remained relatively stable over the past eleven years on Little Barachois Brook. A comparison of this angling catch and potential population seem to indicate that the sports harvest is about maximum to maintain a stable salmon population.

Potential Population Estimates:

It is estimated that the accessible area of Little Barachois Brook has the potential to produce 8,500 to 17,000 Atlantic salmon smolt. Assuming 10 to 15 percent sea survival, adult production before entry to the fishery would be 850 to 2,550 salmon per year.

Estimated Atlantic salmon smolt production and adult sea survival of accessible areas of Little Barachois Brook. Enclosed are includes most accepted production estimates.

If smolt production				
per 100 yd ² (83.6 m ²) is:				
Smolt produced		1	2	3
		8,498	16,996	25,494
Adult return if sea survival is:	5%	425	850	1,275
	10%	850	1,700	2,550
	15%	1,275	2,550	3,824
	20%	1,700	3,399	5,099
	25%	2,125	4,259	6,374

Estimated Atlantic salmon smolt production and adult sea survival of inaccessible areas of Little Barachois Brook. Enclosed area includes most accepted production estimates.

If smolt production				
per 100 yd ² (83.6 m ²) is:				
Smolt produced		1	2	3
		1,627	3,254	4,881
Adult return if sea survival is:	5%	81	163	244
	10%	163	325	488
	15%	244	488	732
	20%	325	651	976
	25%	407	813	1,220

Gene Frequency:

Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 18-24	September 3-9	July 13-20 (1968)

Accessibility to Anglers:

Local road leads to outlet of river. Section between mouth and headwaters accessible along most areas. Barachois provincial park is located near mouth.

Surveys:

Stream Inventory, 1973.

Redd Counts:

None to date.

References:

Porter, T.R., Moores, R.B., Traverse, G.R. River Investigations on the southwest coast of insular Newfoundland. Internal Report Series No. NEW/1-74-2.

SOUTH WEST BROOK AND BOTTOM BROOK

Location: 48°30'45" N. 58°16'28" W. Main Gut (St. George's River).

Map Reference: Harry's River. 12 B/9 West Half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area: 314.2 miles² (813.78 km²). Mean width: 5.9 miles, (9.49 km).

Perimeter 110.0 miles (176.99 km). Axial length: 33.0 miles, (53.09 km).

Maximum basin relief: 2,057 (627.03 m).

Geology:

About half basic intrusive rocks with the remainder consisting of Pennsylvanian sedimentary, acidic intrusive rocks and Mississippian sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

South West Brook:

Length of main stem (including standing water): 43.9 (70.6 km).

Number of major tributaries: 10

Total length of tributaries (including standing water): 145.0 miles (233.3 km).

Area of lakes (> 1 mile² (2.61 km²):

L-1	2.4 miles ²	(1,536 acres)
L-2	1.4 miles ²	(896 acres)
L-3	2.2 miles ²	(1,408 acres)
L-4	1.0 miles ²	(640 acres)
L-5	3.8 miles ²	(2,432 acres)

Bottom Brook:

Length of main stem (including standing water): 23 miles (37.7 km).

Number of tributaries: 9

Total length of tributaries (including standing water): 97.5 miles (156.9 km).

Area of lakes (> 1 mile²): Nil.

Width range 20-50 feet (6.1-15.2 m). Depth range; 2-3 feet (0.6-0.9 m).

T1-5, East Branch: Average width; 50 feet (15.2 m). Average depth 1 foot (0.31 m).

Bottom Composition:

South West and Bottom Brooks system contain exceptionally large areas of riverbed suitable for rearing salmon parr.

Summary of bottom composition of South West Brook and Bottom Brook and tributaries accessible to anadromous fish.

Section	Total units	Rearing units	Spawning units
South West Brook (main stem)	15,203	14,691	3,710
South West Brook (tributaries)	2,806	2,330	283
Bottom Brook (main stem)	4,401	3,436	964
Bottom Brook (tributaries)	2,245	2,202	43
Total	24,655	22,702	5,000

Spawning areas:

Distributed intermittently throughout the system with main concentrations from mile 4.2 (6.8 km) to mile 13.0 (20.9 km) on the main stem of South West Brook.

Barriers to Fish Migration:

South West Brook:

Falls, at mile 20.7 (33.3 km). Height: 8 feet (2.4 m). Slope 45°.

Partial obstruction at low discharge.

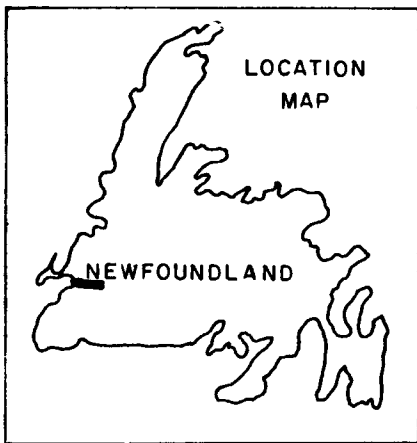
Falls, located 500 feet (150.5 m) above mile 20.7 (33.3 km). Height:

20 feet (6.0 m). Slope: 50°. Length: 40'-50' (12.0-15.0 m).

Passable with extreme difficulty at all water levels.

Shallow riverbed of tightly packed boulders, at mile 25.8 (41.6 km).

Partial obstruction at low discharge.



- T1 — Bottom Brook
- T1-2 — Caribou Brook
- T1-5 — East Branch
- L2 — Battle Pond

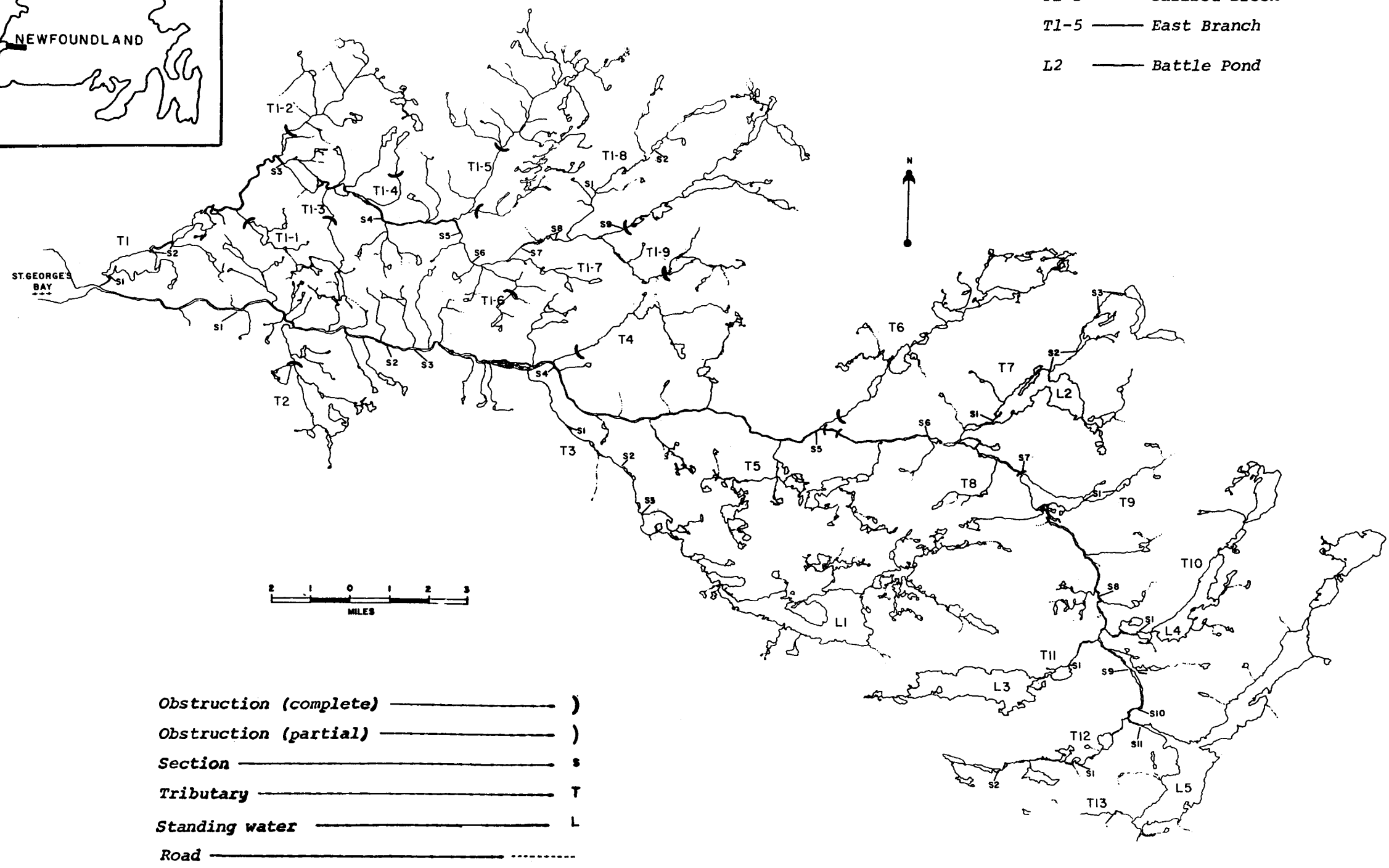


Fig. 12. Southwest Brook and Bottom Brook systems showing obstruction locations. Line from section number indicates end of section.

Bottom Brook:

Falls, at mile 16.0 (25.8 km). Height: 30'-40' (9.0-12.0 m) in two drops of 15'-20' (4.5-6.0 m) each.

Tributaries:**Obstructions on tributaries of South West Brook.**

Tributary	Type of Obstruction	Description	Location (miles from mouth)	Barrier to fish passage
T-2	falls	Height 70' (21.4 m)	1.2 (1.9 km)	complete
T-4	falls	Height 70' (21.4 m)	0.8 (1.3 km)	complete
T-6	falls	Height 70' (21.4 m)	0.4 (0.6 km)	complete

Obstructions on tributaries of Bottom Brook.

Tributary	Type of Obstruction	Description	Location (miles from mouth)	Barrier to fish passage
T-1-1	falls	Height 100' (30.5 m)	0.4 (0.6 km)	complete
T-1-2	falls	Height 40' (12.1 m)	0.8 (1.3 km)	complete
T-1-3	falls	Height 30' (9.2 m)	1.0 (1.6 km)	complete
T-1-4	falls	Height 20' (6.1 m)	1.4 (2.3 km)	complete
T-1-5	falls	Height 30' (9.2 m)	2.2 (3.5 km)	complete
T-1-6	falls	Height 50' (15.3 m)	1.3 (2.1 km)	complete
T-1-9	falls	Height 15' (4.6 m)	2.1 (3.4 km)	complete

Photographs on file; Nos. 200,

Water Quality Data, Sample Collected Southwest Brook
October 25, 1972

pH	Total Alkalinity	Total Hardness	Turbidity	Cl	Specific Conductance @	Ca	HCO ₃
	ppm.	ppm.	JTU	ppm.	25°C micromhos/cm	ppm.	ppm.
6.63	6.0	12.0	3.5	6.0	33.0	1.8	7.3

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout

Atlantic Salmon Angling Record - South West Brook and Bottom Brook

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No.	lbs	kg	No	lbs	kg
1952	161	53	226	102.6	202	1597	725.0	255	1823	827.6
1953	477	117	530	240.6	46	433	196.6	163	963	437.2
1954	193	48	181	82.2	76	649	294.6	124	830	376.8
1955	406	114	547	248.3	61	462	209.7	175	1009	458.0
1956	-	120	449	203.8	37	318	144.4	157	767	348.2
1957	727	223	928	421.3	128	993	450.8	351	1921	872.1
1958	173	265	1013	459.9	78	627	284.7	343	1640	744.6
1959	848	255	1044	474.0	152	1269	576.0	407	2313	1050.0
1960	266	603	2085	946.6	11	101	45.9	614	2186	992.5
1961	1304	307	1090	494.9	144	1103	500.8	451	2193	995.7
1962	1088	597	2250	1021.5	65	579	262.9	662	2829	1284.4
1963	1484	736	2660	1207.6	291	2128	966.1	1027	4788	2173.7
1964 ¹	2375	694	2536	1151.3	155	1110	503.9	849	3646	1655.2
1965	1636	768	2728	1238.5	108	827	375.5	876	3555	1614.0
1966	1970	555	2002	908.9	324	2404	1091.4	879	4406	2000.3
1967	2867	876	3145	1427.8	383	2824	1282.1	1259	5969	2709.9
1968	1696	527	1924	873.5	87	708	321.4	614	2632	1194.9
1969	2188	866	3140	1425.6	28	231	104.9	894	3371	1530.5
1970	2056	604	2239	1016.5	125	954	433.1	729	3193	1449.6
1971	2145	419	1354	614.7	150	1100	499.4	569	2454	1114.1
1972	2613	554	1800	817.2	152	1073	487.1	706	2873	1304.3
1973	2492	888	3062	1390.1	113	919	417.2	1001	3981	1807.4
1974										
1975										
1976										
1977										
MEAN										
1964-68	2109	684	2467	1120.0	211	1575	715.1	895	4042	1835.1
1969-73	2299	666	2319	1052.8	114	856	388.4	780	3174	144.1

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Angling data 1964-73 estimated to be 80% accurate (J. Marshall, personal communication).

Potential Population Estimates:

It is estimated that South West Brook and Bottom Brook systems have the potential to produce a combined total of 22,700 to 45,500 smolt and an adult sea survival of 2,200 to 6,800 salmon.

Estimated Atlantic salmon smolt production and adult sea survival of South West Brook and Bottom Brook. Area enclosed includes most accepted values for production.

If smolt production				
per 100 yd ² (83.6 m ²) is:				
Smolt produced		1	2	3
		22,702	45,404	68,106
Adult return if sea survival is:	5%	1,135	2,270	3,405
	10%	2,270	4,540	6,811
	15%	3,405	6,811	10,216
	20%	4,540	9,080	13,621
	25%	5,676	11,351	17,026

Water Quality Data:

Sample Collected May 10, 1972

pH	Total Alkalinity ppm	Total Hardness ppm	Turbidity JTU	Cl ppm	Conductivity at 25°C (μ mhos/cm)	Ca ppm	HCO ₃ ppm
7.2	38.0		1.8	9.0	85.0	8.2	

Miscellaneous Information:

During construction of the Trans-Canada Highway, Bottom Brook was diverted into South West Brook. This was done to avoid building two bridges, one on each river.

Gene Frequency:

Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	May 22-28	September 3-9	July 1-7 (1968)

Accessibility to Anglers:

South West Brook - accessible by woods road from mouth of Trans-Canada Highway to approximately 1 mile (1.61 km) upstream.

Entrance to woods road located approximately 0.25 (0.40 km) west of highway bridge on south side of highway. This road runs parallel to river along section mentioned.

Bottom Brook - accessible by woods road from mouth to approximately 18 miles (28.98 km) upstream. Road located approximately 0.25 (0.4 km) east of highway bridge on south side and runs parallel with stream.

Surveys:

Stream Inventory, 1973.

Redd Counts:

1968, several redds seen in Main Brook, 20 redds at mouth of Caribou Brook.

References:

Porter, T.R., Moores, R.B., Traverse, G.R. River Investigations on the southwest coast of insular Newfoundland. Internal Report Series No. NEW/1-74-2.

HARRY'S RIVER

Location: $48^{\circ} 30' 45''$ N. $58^{\circ} 25' 00''$ W. Main Gut,
St. George's Bay.

Map Reference: Harry's River. 12 B/9 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 315.0 miles² (815.85 kilometers²). Mean
width, 7.4 miles (11.90 kilometers)

Perimeter, 113.2 miles (182.13 kilometers). Axial length,
36.4 miles (58.56 kilometers).

Maximum basin relief, 1,957 feet (596.55 meters).

Geology: About equal amounts of Ordovician sedimentary,
Pennsylvanian sedimentary, Cambrian sedimentary and
gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics: Total length of the main river is
43.8 miles (70.5 km) (standing water & Pinchgut Brook included).

Main river: Mostly rubble and boulder with some gravel
patches.

Tributaries: (Bottom types % of total area):

(1) Brownmoore Brook, from mouth to mile point 3.0
(4.82 kilometers), width range 15 - 30' (4.57 - 9.14 meters),
Depth range 6" - 5' (15 - 1.52 meters). Boulder 10%;
rubble 15%; gravel 33%; sand 26%; silt 15%. Spawning
ground 350 square yards (292.95 sq. meters). Poor-
medium condition.

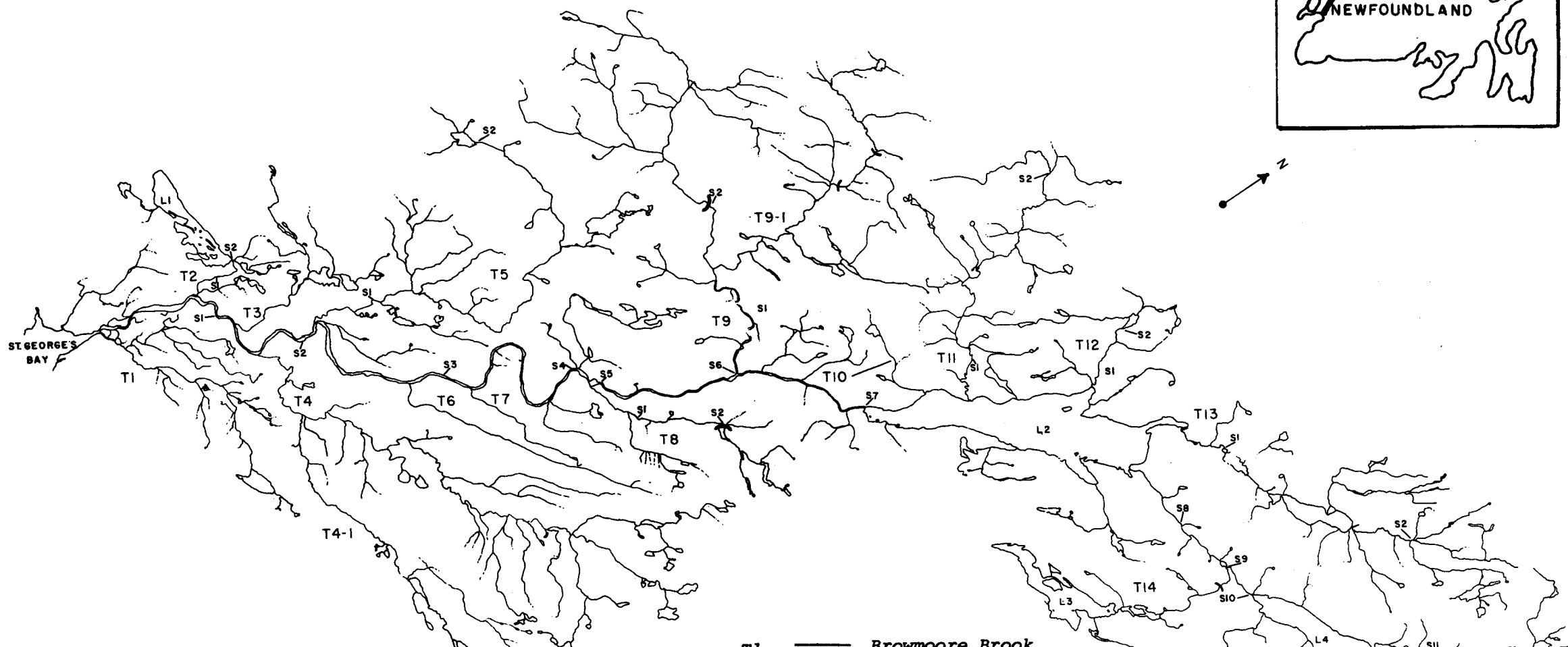
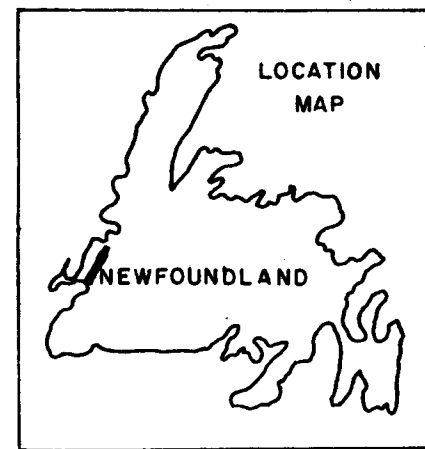
(2) Long Gull Pond Brook, from mouth to Long Gull Pond, approx. $1\frac{1}{2}$ miles (2.41 kilometers). Boulder 10%; rubble 29%; gravel 41%; sand 8%; silt 12%. Width range 5' - 30' (1.52 - 9.14 meters). Depth range 6" - 5' (.15 - 1.52 meters). Spawning areas: 8,440 sq. yds. (7064.28 sq. meters). Poor to good conditions.

(3) Rushy Pond Brook, from mouth to Rushy Pond, distance approx. 1.3 miles (2.09 kilometers). Width range 3 - 4 ft. (.91 - 1.21 meters). Depth range 1 - 2 ft. (.3 - .6 meters). Boulder 5%; rubble 10%; gravel 10%; silt 75%. Spawning areas - nil.

(4) Black Duck Brook, from mouth to Black Duck Pond, approx. distance 4 miles (6.43 kilometers). Width range 15-20 ft. (4.57 - 6.09 meters). Depth range 1 - 2.5 ft. (.3 - .76 meters). Boulder 55%; rubble 20%; gravel 20%; sand 5%. Spawning areas: 4,125 sq. yds. (3452.62 sq. meters). Medium condition.

(5) Trout Brook, from mouth to Bottle Neck Pond, approx. distance 17 miles (27.34 kilometers). Width range 10-100 ft. (3.04 - 34.28 meters). Boulder 27.3%; rubble 33.8%; gravel 21.0%; sand 5.7%; silt 12.2%. Spawning areas: 62,300 sq. yds. (52,145.1 sq. meters).

(6) Roberts Brook, from mouth to mile point 3 (4.82 kilometers). Bedrock 13.0%; boulder 28.0%; rubble 43.0%; gravel 12.5%; sand 2.5%; silt 0.3%. Width range 60 - 70 ft. (18.28 - 21.33 meters). Depth range 1 - 2 ft. (.3 - .6 meters). Spawning areas - nil.



- Obstruction (complete)** —————)
- Obstruction (partial)** —————)
- Section** ————— s
- Tributary** ————— T
- Standing water** ————— L
- Road** —————

- T1 ————— *Browmoore Brook*
- T2 ————— *Long Gull Pond Brook*
- T3 ————— *Black Duck Pond Brook*
- T4 ————— *Trout Brook*
- T5 ————— *Roberts Brook*
- T6 ————— *Furries Brook*
- T8 ————— *Ahwachenseech Brook*
- T9 ————— *North Brook*
- T9-1 ————— *North Brook East*
- T10 ————— *Muskrat Brook*
- T11 ————— *Spruce Brook*
- T12 ————— *Beaver Brook*
- T14 ————— *Big Gull Pond Brook*
- T15 ————— *Stag Hill Brook*
- L1 ————— *Long Gull Pond*
- L2 ————— *George's Lake*
- L3 ————— *Big Gull Pond*
- L4 ————— *Pinchgut Lake*

Fig. 13. Harry's River system showing stream obstruction locations. Line from section number indicates end of section.

- (7) Saunders Brook, from mouth to mile point 1 (1.60 kilometers).
Rubble 4.5%; gravel 1.1%; sand 20.8%; silt 20.2%. Spawning areas - nil.
Average width 12 ft. (3.65 meters). Depth range 6" - 2' (.15 - .6 meters).
- (8) Furriers Brook, from mouth to mile point 1.5 (2.41 kilometers).
Boulder 12.3%; rubble 43.6%; gravel 39.0%; sand 5.0%. Width range 6 - 20 ft.
(1.82 - 6.09 meters). Depth range 6" - 4' (.15 - 1.21 meters). Spawning
areas: 400 sq. yds. (334.8 sq. meters). Poor condition.
- (9) No Name Brook, from mouth to 3,500 ft. (1,066.80 meters), upstream.
Boulder 16.7%; rubble 13.3%; gravel 46.7%; sand 15.0%; silt 8.3%. Width
range 3 - 12' (.9 - 3.65 meters). Depth range 6" - 3' (.15 - .9 meters).
Spawning areas: 310 sq. yds. (259.47 sq. meters). Medium condition.
- (10) North Brook, from mouth to mile point 3.5 (5.63 kilometers). Average
width 100 ft. (30.48 meters). Depth range 10" - 12" (.25 - .30 meters).
Boulder 50%; rubble 47.5%; gravel 1.25%; sand 1.25%. Spawning areas: 500
sq. yds. (418.5 sq. meters).
- (11) Muskrat Brook, from mouth to mile point 2.5 (4.02 kilometers). Average
width 10 ft. (3.04 meters). Average depth 1 ft. (.30 meters). Boulder
26.7%; rubble 13.3%; gravel 26.7%; sand 33.3%. Spawning areas 2,100 sq. yds.
(1757.7 sq. meters). Good areas for trout.
- (12) Spruce Brook, from mouth to mile point 3 (4.82 kilometers). Width
range 15 - 75' (4.57 - 22.86 meters). Depth range 6" - 4" (.15 - .10 meters).
Spawning areas: 9,000 sq. yds. (7533.0 sq. meters). Bedrock 6.7%;
boulder 13.3%; rubble 10.0%; gravel 64.3%; sand 3.0%; silt 2.7%.
- (13) Pinchgut Brook, from mouth to Pinchgut Lake, distance 4 miles (6.43
kilometers). Width range 60 - 125 ft. (18.28 - 33.10 meters). Depth range
6" - 4' (.15 - 1.21 meters). Bedrock 5%; boulder 33%; rubble 50%; gravel 12%.
Spawning areas: 3,650 sq. yds. (3,055 sq. meters). Good condition.
- George's Lake: (Oligotrophic)
Morphometric data: Max. length 7.6 miles (12.22 kilometers). Max width
2.4 miles (3.86 kilometers). Max. Depth: 296 ft. (90.22 meters). Mean
depth: 138.2 ft. (42.12 meters). Estimated average depth: 150 ft.
Area: 8.2 sq. mis. (21.2 sq. kilometers). Mean length: 3.1 miles
(4.98 kilometers). Mean width: 0.9 miles (1.44 kilometers). Volume: 23,171.2
 $\times 10^6$ cu. ft.

Water chemistry: pH (1) 6.5 (1) 75.0 ppm
(2) 7.55 1961, T.D.S. (2) 77.5 ppm 1961

Temperature: (1) 74°F. (2) 73°F. August 15, 1961

Bottom Composition

Harry's River has a large concentration of "spawning gravel" on the lower reaches; however, it appears, from results of several surveys, that it is not utilized by Atlantic salmon to any great extent. The areas of riverbed on the upper reaches and tributaries appear to provide suitable conditions for egg disposition.

The main stem of Harry's River (including Pinchgut Brook) has an estimated 20,250 potential rearing units (100 yd² (83.6 m²) and 5,250 spawning units for Atlantic salmon. Fourteen tributaries have an estimated 11,552 potential rearing units and 2,082 spawning units. Downer (1968) estimated approximately 40,000 rearing units accessible to Atlantic salmon. The variation in the two estimates is attributed to the two methods of surveying.

Summary of accessible rearing and spawning habitat of Harry's River.

Units	Accessible	Inaccessible	Total
Total system	32,073	-	32,073
Rearing	31,572	-	31,572
Spawning	7,332	-	7,332

Barriers to Fish Migration:

Main river: No obstructions.

Tributaries:

(1) North Brook, falls at mile 5 (8.04 km), complete obstruction.

(2) Spruce Brook, falls 10 feet high (3.04 m), 10 feet wide (3.04 m), Angle 90° at mile 3 (4.82 km), complete obstruction.

(3) Pinchgut Brook, wooden dam; kept open most of the year and poses very little obstruction to fish.

Pinchgut Lake dam-fishway constructed to replace inadequate sluice - 1956.

Spillway in dam opened, fishway not in use - 1963.

Photographs on file; Nos. 2, 123, 124, 191, 192, 193, 125, 857, 472, 964, 969.

Miscellaneous Information:

Except for Roberts Brook, most of the salmon population utilize the upper regions of this system for spawning purposes.

Water Quality Data, Harry's River, Sampled October 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
7.70	48.0	54.0	3.0	6.0	85.0	9.5	

**Water Quality Data, Pinchgut Brook (at Trans-Canada Highway)
Samples October 1972.**

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
7.95	70.0	62.0	3.5	5.0	127.0	11.5	85.4

FISH POPULATIONS

Species Present: Atlantic salmon, ouananiche, brook trout, Arctic char,
eels, smelt, sea trout.

Atlantic Salmon Angling Record - Harry's River; Upper, Lower and Pinchgut;
Spruce Brook and George's Lake.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	3102	1033	4035	1831.9	95	935	424.5	1128	4970	2256.4
1953	3458	935	3455	1568.6	146	1321	599.7	1081	4776	2168.3
1954	800	244	920	417.7	18	123	55.8	262	1043	473.5
1955	1464	499	1833	832.1	61	546	247.8	560	2379	1079.9
1956	-	668	2469	1120.9	206	1819	825.8	874	4288	1946.7
1957	1689	1418	5682	2579.6	493	3896	1768.8	1911	9578	4348.4
1958	537	984	3569	1620.3	218	2125	964.8	1202	5694	2585.1
1959	1466	604	2329	1057.3	95	824	374.1	699	3153	1431.4
1960	302	603	2255	1023.7	91	817	370.9	694	3072	1394.6
1961	1676	734	2656	1205.8	119	1075	488.1	853	3731	1693.9
1962	3316	1488	5371	2438.4	226	1944	882.6	1714	7315	3321.0
1963	4354	2467	8623	3914.8	457	4123	1871.8	2924	12746	5786.6
1964 ¹	3933	2673	9228	4189.5	373	3499	1588.5	3046	12727	5778.0
1965	3338	1175	3908	1774.2	262	2257	1024.7	1437	6165	2798.9
1966	2113	620	2111	958.4	316	2931	1330.7	936	5042	2289.1
1967	2630	706	2419	1098.2	248	2145	973.8	954	4564	2072.0
1968	2640	863	3093	1404.2	85	768	348.7	948	3861	1752.9
1969	3360	1491	4731	2147.9	181	1554	705.5	1672	6285	2853.4
1970	5288	1662	5941	2697.2	208	1662	754.5	1970	7603	3451.7
1971	5146	1435	5286	2399.8	47	474	215.2	1482	5760	2615.0
1972	1357	364	1278	580.2	3	32	14.5	367	1310	594.7
1973	4307	1332	4981	2261.4	196	1479	671.5	1528	6460	2932.8
1974										
1975										
1976										
1977										
MEAN										
1964-68	2931	1207	4152	1885.0	257	2320	1053.3	1464	6472	2938.2
1969-73	3892	1257	4443	2017.3	127	1040	472.3	1384	5484	2490.0

¹Angling data 1964-73 estimated to be 65-70% accurate (J. Marshall, personal communications).

Harry's River system provides approximately 2,000 fish to the sport creel each year. A decline in the catch per effort is evident. It appears that the population of Harry's River is endangered and should be more closely managed.

Potential Population Estimates

It is estimated that Harry's River system has the potential to produce a total of 31,600 to 63,100 smolt. The adult sea survival is estimated to be 3,200 to 9,500 salmon. Downer (1968) calculated a smolt production to be 80,000 and escapement of adults to the river to be 3,200. This indicates that Harry's River is producing a 3/4 its potential.

Estimated Atlantic salmon smolt production and adult sea survival of accessible areas of Harry's River. Area enclosed includes most accepted values for production.

If smolt production per 100 yd ² (83.6 m ²) is:				
Smolt produced				
		1	2	3
		31,572	63,144	94,716
Adult return if sea survival is:	5%	1,579	3,157	4,736
	10%	3,157	6,314	9,472
	15%	4,736	9,472	14,207
	20%	6,314	12,628	18,943
	25%	7,893	15,786	23,679

Summary, Counting fence data, Harry's River.

Year	Salmon		Smolt	Parr	Kelt	Smelt	Shad	Eels	Bk. Trout		Frost Fish
	Under 6 lbs (2.7 kg)	6 lbs & over							Adult	Parr	
1967	979	266							242		

Gene Frequency:

Not completed.

Timing of Run: (Based on counting trap data - 1967)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
1967	June 24	September 2	July 15-22
1968	(Based on angling statistics)		July 13-20

Accessibility to Anglers:

Accessible by road from mouth to settlement of Black Duck. Trail leads to river along this section. Another road leads to the river from a gravel pit located approximately 4 miles (6.44 km) from local bridge. This road is suitable for four wheel drive only. Upper section from North Brook to Home Pool accessible by road from Gallant's to George's Lake. Road runs parallel to river.

Pinchgut-Accessible at exit of Pinchgut Lake. T.C.H. runs almost parallel from lake to T.C.H. bridge.

George's Lake-Old woods road located near northern side of T.C.H. bridge leads to outlet of George's Lake. This road runs parallel to river.

Gull Pond Brook-Accessible by woods road at two points where road crosses this brook. The first being located approximately 2 miles (3.21 km) from T.C.H. Entrance to road is approximately 12 miles (19.32 km) west of Corner Brook, south side of road.

Stag Hill Brook-Accessible from Logger School road which is located approximately 7 miles (11.27 km) west of Corner Brook. Only upper sections accessible.

Surveys:

1966, Engineering survey consisting of water line profiles and sections from Black Duck to St. George's Bay by E. Tulk.

1973, Stream Inventory Survey.

Redd Counts:

In 1967, 322 redds observed, for locations of redds see report by Downer, D.F.

References:

Downer, D.F., 1968. Preliminary Investigations of the Harry's River System, MS report, Fisheries Service, St. John's, Newfoundland.

Murphy, H., 1966. A Spawning Survey Report of Harry's River. MS report, Fisheries Service, St. John's, Newfoundland.

Porter, T.R., Moores, R.B., Traverse, G.R. River Investigations on the southwest coast of insular Newfoundland. Internal Report Series No. NEW/1-74-2.

Seabrook, W.D. 1962. A Survey of Nine Lakes on the Island of Newfoundland. MS report, Fisheries Service, St. John's, Newfoundland.

SEAL COVE BROOK

Location: 48°30'55" N. 58°27'45" W.
 Map Reference: Harry's River. 12 B/9 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Geology:

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, sample collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μmhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

FISH POPULATIONS

Species Present: Mummichogs

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

FISH POPULATIONS

Species Present: brook trout and banded Killifish.

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

Scott, W. B. and Crossman, E. J. 1964. Fishes Occurring in the
Fresh Waters of Insular Newfoundland. Queen's Printers, Ottawa.

ROMAINES BROOK

Location: 48°33'05" N. 58°40'25" W. St. George' Bay.

Map Reference: Stephenville. 12 B/10 East Half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin Area: 38.0 miles² (98.42 km²). Mean width: 2.9 miles, (4.82 km).

Perimeter: 38.0 miles (61.14 km). Axial length: 16.1 miles, (25.92 km).

Maximum basin relief: 1,801 feet (548.94 m).

Geology:

Almost entirely Ordovician sedimentary with small amounts of Cambrian sedimentary and acidic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Length of main stem (including standing water): 18.6 miles (29.9 km).

Number of major tributaries: 2

Total length of major tributaries (including standing water); 17.1 miles (27.5 km).

Area of lakes (> mile² (2.6 km²): nil.

Bottom Composition:

The main stem contains 2,752 rearing units and the two significant tributaries 238 rearing units.

Summary of bottom composition of Romaines Brook and tributaries.

Unit (100 yd ² (83.6 m ²))	Accessible	Inaccessible	Total
Total system	2,990	-	2,990
Rearing	2,752	-	2,752
Spawning	918	-	918

Barriers to Fish Migration

No major obstruction. Fish migration possibly delayed at low water levels.

Photographs on file:

No. 859, 4

Water Quality Data:

Sample Collected,							
pH	Total Alkalinity ppm	Total Hardness ppm	Turbidity JTU	Cl ppm	Conductivity at 25°C (μ mhos/cm)	Ca ppm	HCO ₃ ppm

Fish Population:

Atlantic salmon, brook trout.

Angling Data:

Nil.

Potential Population Estimates:

Romaines Brook has the potential to annually produce 3,000 to 6,000 smolt resulting in an expected 300-600 adult salmon.

Estimated Atlantic salmon smolt production and adult sea survival of accessible areas of Romaines Brook. Area enclosed includes most accepted values of production.

If smolt production

per 100 yd² (83.6 m²) is:

Smolt produced	1	2	3
	2,990	5,980	8,970
Adult return if sea survival is:	5% 150	299	449
	10% 299	598	897
	15% 449	897	1,346
	20% 598	1,196	1,794
	25% 748	1,495	2,243

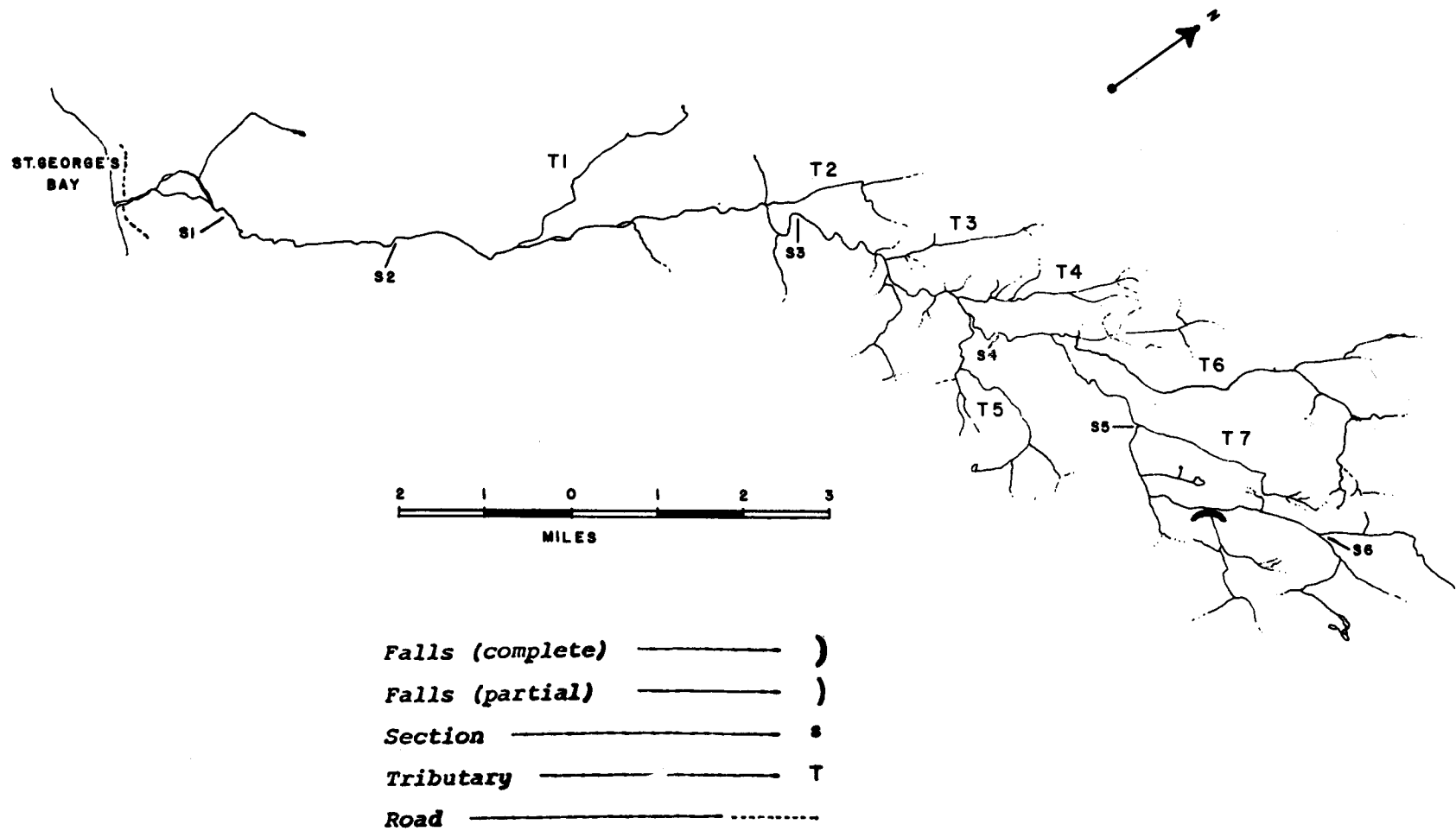
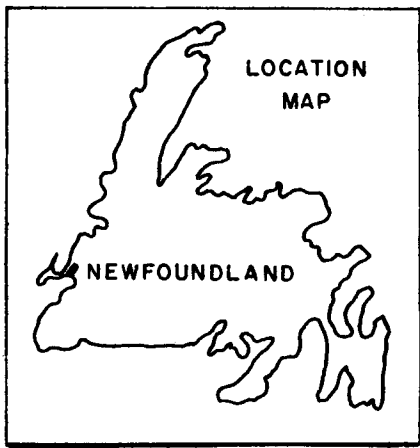


Fig. 14. Romaines Brook system. Line from section number indicates end of section.

Although Romaines Brook has the potential to produce salmon, conditions such as low discharge may be preventing significant build-up in population.

Gene Frequency:

Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Woods road located 0.25 miles (0.4 km) from main bridge which runs parallel to stream for approximately 6 miles (9.66 km). The headwaters are accessible by tractor road.

Surveys:

Biological Survey, 1973.

Redd Counts:

Nil.

Miscellaneous:

Romaines Brook is also called Kippens River, named after a Captain Kippens whose ship was wrecked near the mouth of the stream.

References:

Porter, T.R., Moores, R.B., Traverse, G.R. River Investigations on the southwest coast of insular Newfoundland. Fish. and Mar. Serv. Resource Dev. Br. Rept. Series No. NEW/1-74-2. 161 p.

FOX ISLAND RIVER

Location: 48°41'30" N. 58°40'14" W. North of East Bay,
Port au Port Bay.

Map Reference: Stephenville. 12 B/10 East Half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area: 75.0 miles² (194.25 km²). Mean width: 3.6 miles,
(5.79 km).

Perimeter: 47.0 miles (75.62 km). Axial Length: 18.9 miles,
(30.41 km).

Maximum basin relief: 2,672 (814.42 m).

Geology:

About half Ordovician sedimentary with the remainder consisting
of ultrabasic intrusive rocks and a small amount of basic
intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Length of main stem (including standing water): 22.7 miles
(36.5 km).

Number of major tributaries: 5

Total length of tributaries (including standing water): 75.9 miles
(122.1 km).

Area of lakes (> 1 mile² (2.6 km²): Nil.

Bottom Composition:

The main stem of Fox Island River has 6,650 units (100 yd² (83.6 m²))
of parr rearing habitat and 1,875 units suitable for spawning
adults. Major tributaries contain 1,195 parr rearing units and 51
spawning units.

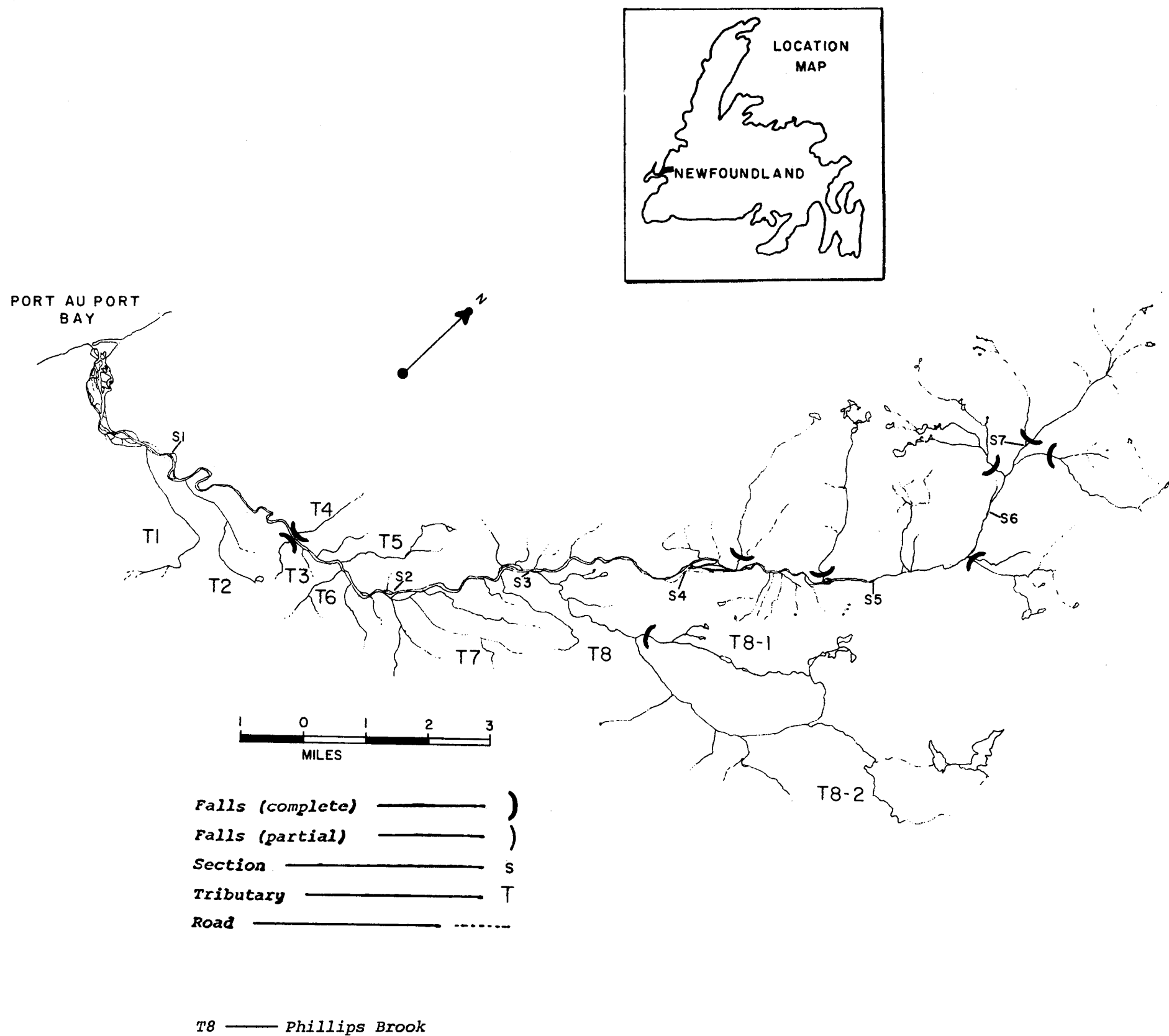


Fig.15. Fox Island River system showing obstruction locations. Line from section number indicates end of section.

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Fox Island River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No.	lbs	kg	No.	lbs	kg
1952	129	15	73	33.1	21	213	96.7	36	286	129.8
1953	217	38	152	69.0	22	212	96.2	60	364	165.2
1954	250	46	183	83.1	28	234	106.2	74	417	189.3
1955	284	66	273	123.9	15	151	68.6	81	424	192.5
1956	-	156	604	274.2	62	649	294.6	218	1253	568.8
1957	541	279	1146	520.3	87	944	428.6	366	2090	948.9
1958	469	78	333	151.2	143	1513	686.9	221	1846	838.1
1959	335	33	133	60.4	54	582	264.2	87	715	324.6
1960	385	89	412	187.0	53	506	229.7	142	918	416.7
1961	233	44	172	78.1	23	230	104.4	67	402	182.5
1962	263	148	558	253.3	39	434	197.0	187	992	450.4
1963	220	132	512	232.4	32	329	149.4	164	841	381.8
1964 ¹	490	207	835	379.1	55	556	252.4	262	1391	631.5
1965	292	68	264	119.9	23	184	83.5	91	448	203.4
1966	198	29	116	52.7	4	31	14.1	33	147	66.7
1967	352	54	215	97.6	57	488	221.6	111	703	319.2
1968	389	64	241	109.4	38	327	148.5	102	568	257.9
1969	32	18	63	28.6	8	73	33.1	26	136	61.7
1970	26	3	9	4.1	1	10	4.5	4	19	8.6
1971	77	12	60	27.2	3	24	10.9	15	84	38.1
1972	76	2	7	3.2	6	52	23.6	8	59	26.8
1973	151	35	143	64.9	3	35	15.9	38	178	80.8
1974										
1975										
1976										
1977										
MEAN										
1964-68	344	84	334	151.7	35	317	143.9	120	651	295.6
1969-73	72	14	36	16.3	4	39	17.6	18	95	43.2

¹Angling data 1964-73 estimated to be 70% accurate (J. Marshall, personal communication).

The biological survey conducted in 1973 revealed that Fox Island River is not producing Atlantic salmon to its maximum potential. Using current production figures of 1.75 smolt per 100 yd² (83.6 m²) unit, 12 percent sea survival and 40 percent commercial harvest there should be 300 adults available to the sport fishery. However, the sport harvest has been considerably less than this. Angling data indicates a serious decline in the salmon population.

Potential Population Estimates:

It is estimated that Fox Island River has the potential to produce 8,000 to 16,000 Atlantic salmon smolt. Assuming a 10-15 percent sea survival adult production before entry to the fishery would be 807-2,400 salmon.

Estimated Atlantic salmon smolt production and adult sea survival of accessible areas of Fox Island River. Area enclosed includes most accepted values for production estimates.

If smolt production per 100 yd ² (83.6 m ²) is:		1	2	3
Smolt produced		7,845	15,690	23,535
Adult return if sea survival is:	5%	392	785	1,177
	10%	785	1,569	2,354
	15%	1,177	2,354	3,530
	20%	1,569	3,138	4,705
	25%	1,961	3,923	5,881

Gene Frequency:

Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 15-21	August 27 - September 2	August 3-10 (1968)

Accessibility to Anglers:

Mouth of stream accessible by road. Abandoned mine road leads from Point au Mal to section approximately 2.5 miles (4.02 km) upstream from mouth. Upper section of road accessible by foot and tractor trail.

Surveys:

Stream Inventory, 1973.

Redd Counts:

None to date.

References:

- Anonymous: Nfld. Dept. Nat. Res. 1943. Res. Bull. No. 12, St. John's, Newfoundland.
- Porter, T.R., Moores, R.B., Traverse, G.R. River Investigations on the southwest coast of insular Newfoundland. Internal Report Series No. NEW/1-74-2.

LEWIS BROOK

Location: 48°49'15" N. 58°35'12" W.
 Map Reference: Shag Island. 12 B/15 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 12.7 miles², (32.89 km²). Mean width, 2.2 miles,
 (3.53 km).
 Perimeter, 15.2 miles (24.47 km). Axial length, 5.6 miles,
 (9.01 km).
 Maximum basin relief, 2,450 feet, (746.76 m).

Geology:

Amlost entirely Ordovician sedimentary with a small amount of
 Ordovician volcanic.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							



LEGEND

- FALLS ———— (
- SECTION ———— S
- TRIBUTARY ———— T
- ROAD ———— - - - -
- TRAIL ———— · · · ·

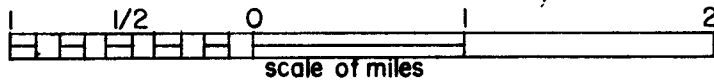
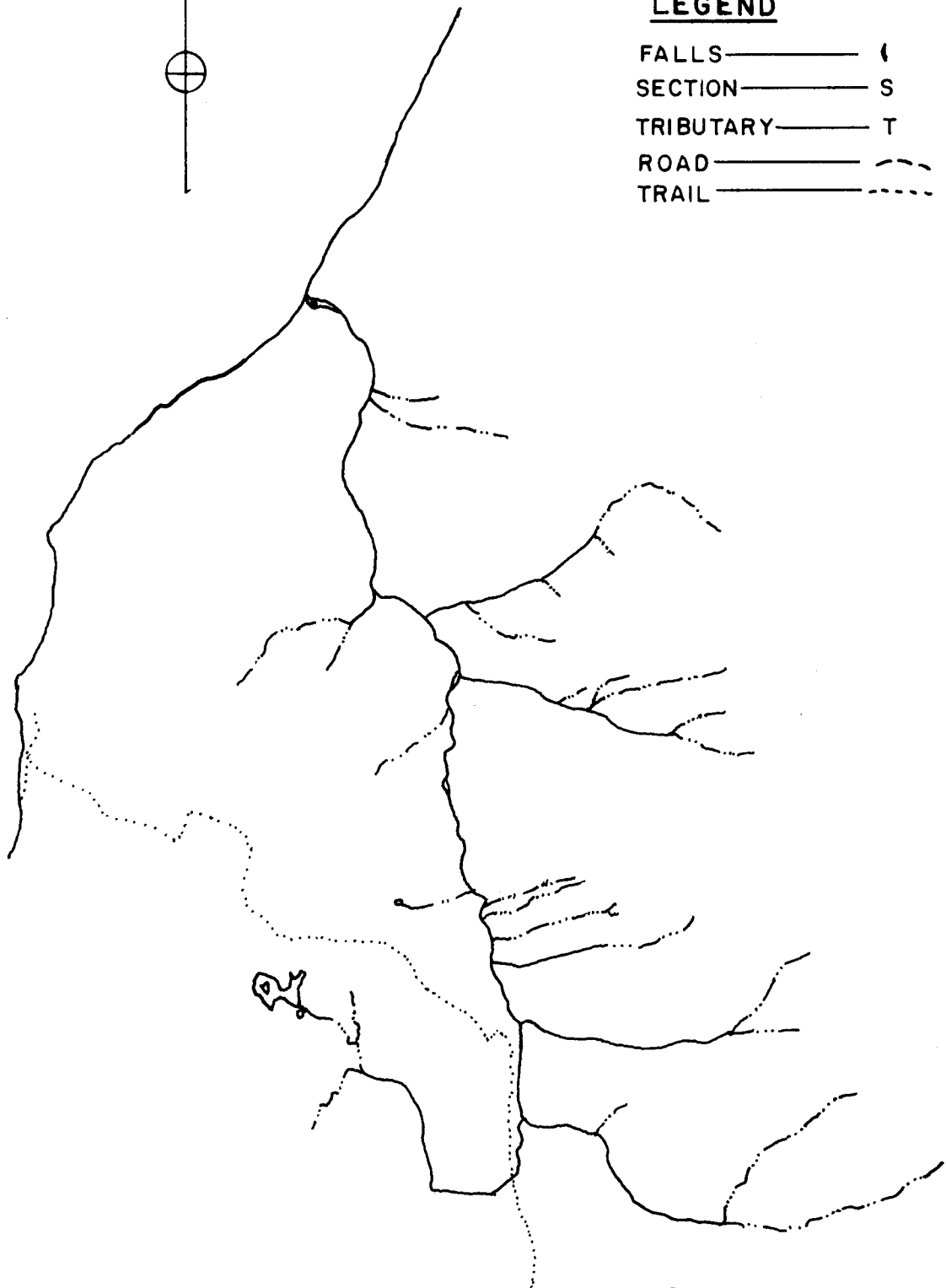


FIG 16 OUTLINE MAP OF LEWIS BROOK SHOWING OBSTRUCTIONS

FISH POPULATIONS

Species Present: Sea-run brook trout occur on lower reaches.
No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

DEADMAN'S BROOK

Location: 48°51'35" N. 58°33'27" W.
 Map Reference: Shag Island. 12 B/15 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 8.5 miles², (22.01 km²). Mean width, 1.2 miles,
 (1.93 km).
 Perimeter, 13.3 miles, (21.39 km). Axial length, 5.3 miles,
 (8.52 km).
 Maximum basin relief, 2,672 feet, (814.42 m).

Geology:

About half Ordovician sedimentary with the remainder consisting
 of basic intrusive rocks and ultrabasic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos. 567.

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

FISH POPULATIONS

Species Present:

No angling data available on this stream.

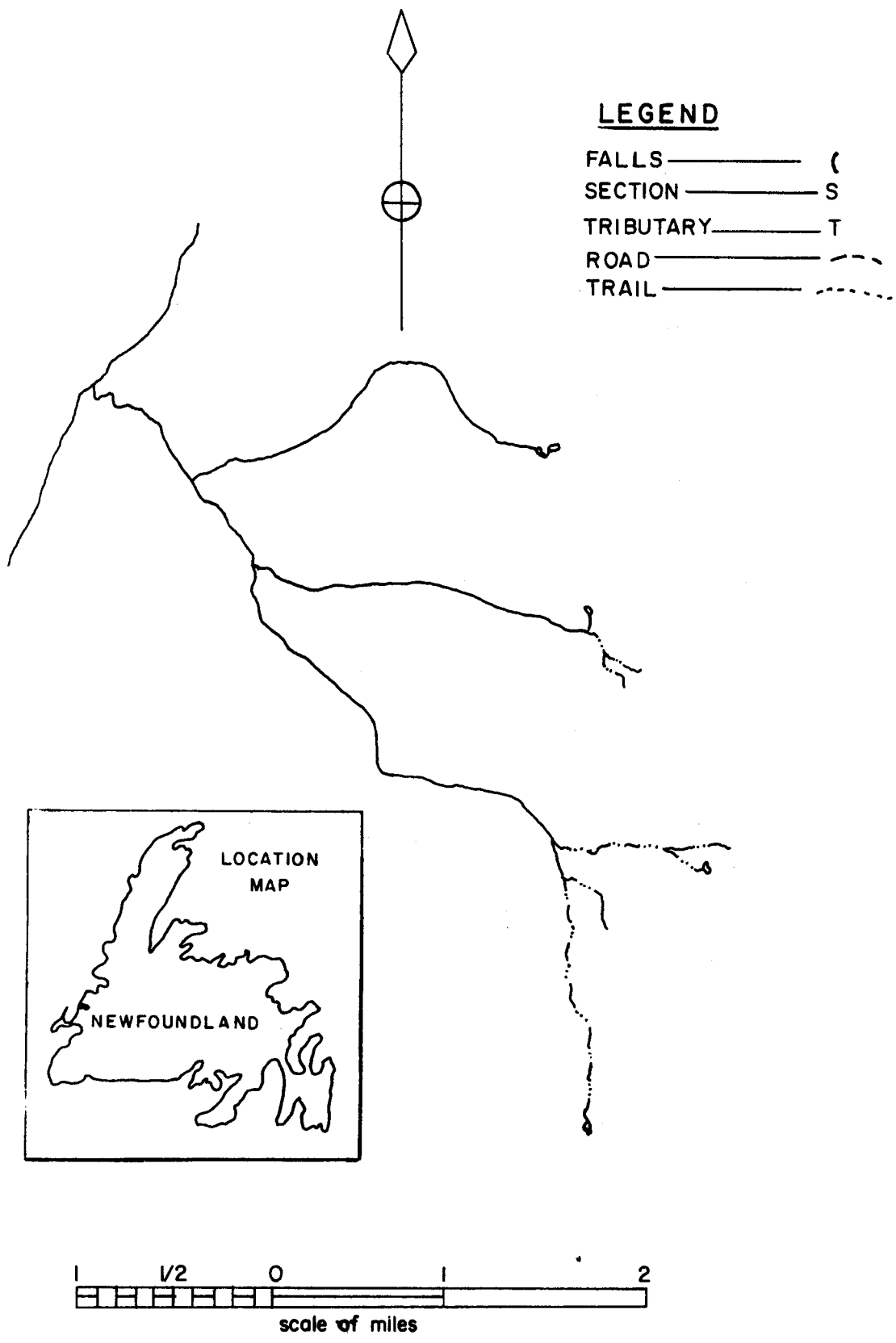


FIG 17 OUTLINE MAP OF DEADMAN'S BROOK SHOWING OBSTRUCTIONS

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First Fish</u>	<u>Last Fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date

Redd Counts: None to date

References:

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout (sea-run and resident).

Atlantic Salmon Angling Record - Serpentine River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	86	65	304	138.0	95	686	311.4	160	990	449.4
1953	143	91	411	186.6	59	611	277.4	150	1022	464.0
1954	184	72	318	144.4	31	294	133.5	103	612	277.9
1955	56	77	285	219.4	39	347	157.5	116	632	286.9
1956	-	160	589	267.4	107	1074	487.6	267	1663	755.0
1957	266	136	544	246.9	115	964	437.7	251	1508	684.6
1958	239	154	723	328.2	72	771	350.0	226	1494	678.2
1959	459	175	803	364.6	138	1322	600.2	313	2125	964.8
1960	416	127	544	246.9	92	958	434.9	219	1502	681.9
1961	639	119	525	238.4	103	963	437.2	222	1488	675.6
1962	613	380	1557	706.9	187	1483	673.3	567	3040	1380.2
1963	330	176	698	316.9	105	938	425.9	281	1636	742.8
1964 ¹	450	351	1588	720.9	322	3084	1400.1	673	4672	2121.0
1965	776	249	1154	523.9	169	1425	646.9	418	2579	1170.8
1966	489	281	1100	499.4	107	1112	504.8	388	2212	1004.2
1967	449	103	408	185.2	50	461	209.3	153	869	394.5
1968	642	209	755	342.8	28	301	136.7	237	1056	479.5
1969	875	182	739	335.5	49	381	172.9	231	1120	508.4
1970	868	138	596	270.6	40	332	150.7	178	928	421.3
1971	834	130	560	254.2	7	80	36.3	137	640	290.5
1972	1088	116	428	194.3	5	49	22.3	121	477	216.6
1973	707	95	366	166.2	40	290	131.7	135	656	297.8
1974										
1975										
1976										
1977										
MEAN										
1964-68	561	239	1001	454.5	135	1277	579.8	374	2278	1034.0
1969-73	874	132	538	244.2	28	226	102.6	160	764	346.9

¹Angling data 1964-73 estimated to be 85% accurate (J. Marshall, personal communication).

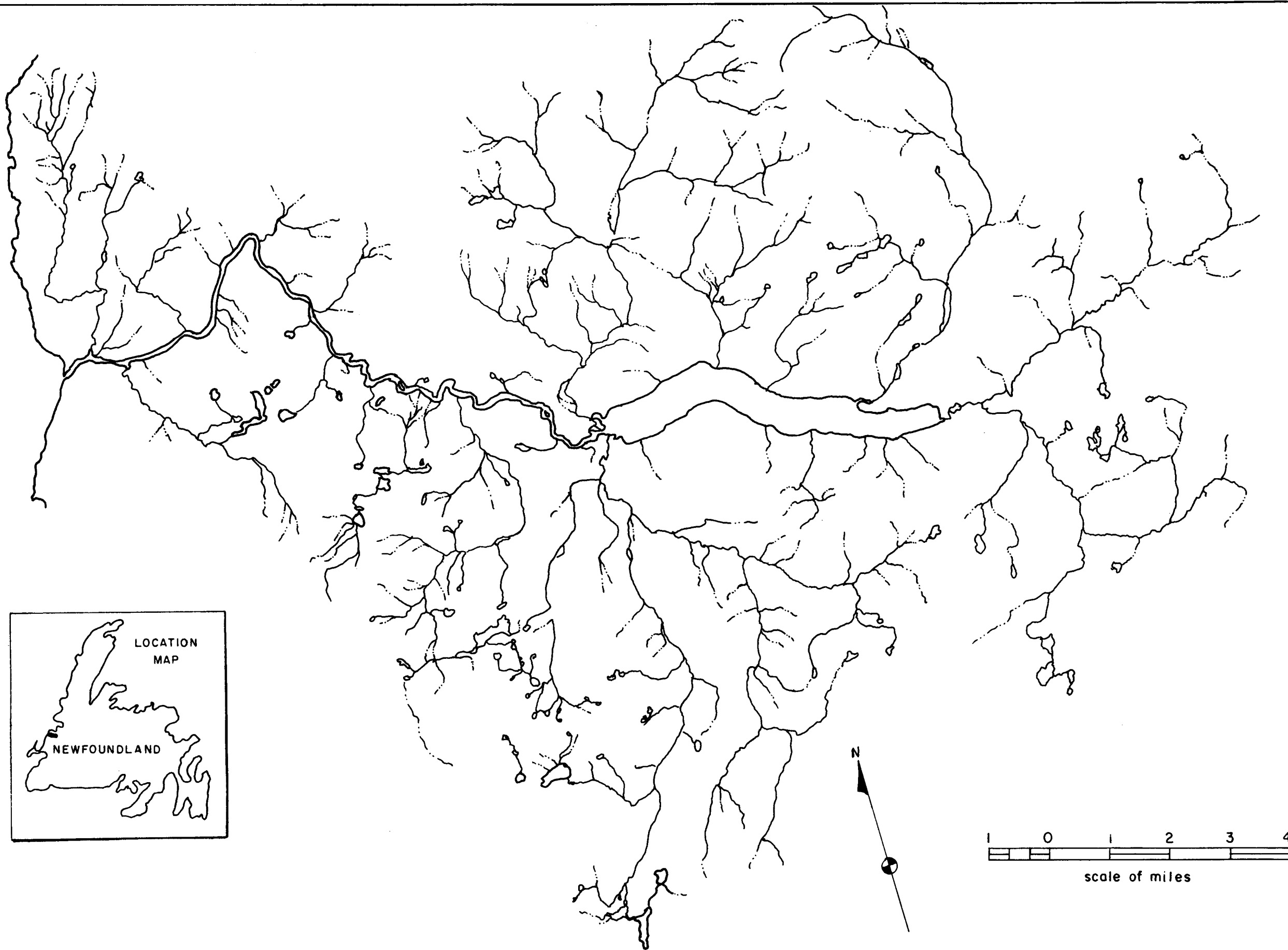


FIG. 18 OUTLINE MAP OF SERPENTINE RIVER SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 16 - 23	September 5 - 12	July 20 - 27 (1968)

Accessibility to Anglers:

The upper section (Serpentine Lake) is accessible by woods road.

Otherwise not accessible only by boat.

Surveys: None to date.

Redd Counts: None to date.

References:

Anonymus. Nfld. Dept. Nat. Res. 1943. Res. Bull. No. 12,
St. John's, Newfoundland.

WILD COVE BROOK

Location: 58°31'25" N. 58°27'45" W. South of Bay of Islands.
 Map Reference: Bay of Islands, 12 G/1 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 31.1 miles² (80.54 km²). Mean width, 4.9 miles,
 (7.88 km).
 Perimeter, 24.1 miles, (38.77 km). Axial length, 6.3 miles,
 (10.13 km).
 Maximum basin relief, 2,501 feet, (762.50 m).

Geology:

Almost entirely Ordovician volcanic with some acidic intrusive
 rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Spawning Areas:

Salmon and sea trout spawn in the lower section of the main river.

Barriers to Fish Migration:

Falls at mile 0.5, (0.80 km), on the main river; complete
 obstruction.

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

FISH POPULATIONS

Species Present: Atlantic salmon and brook trout.

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First Fish</u>	<u>Last Fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers: Accessible by boat only.

Surveys: None to date

Redd Counts: None to date

References:

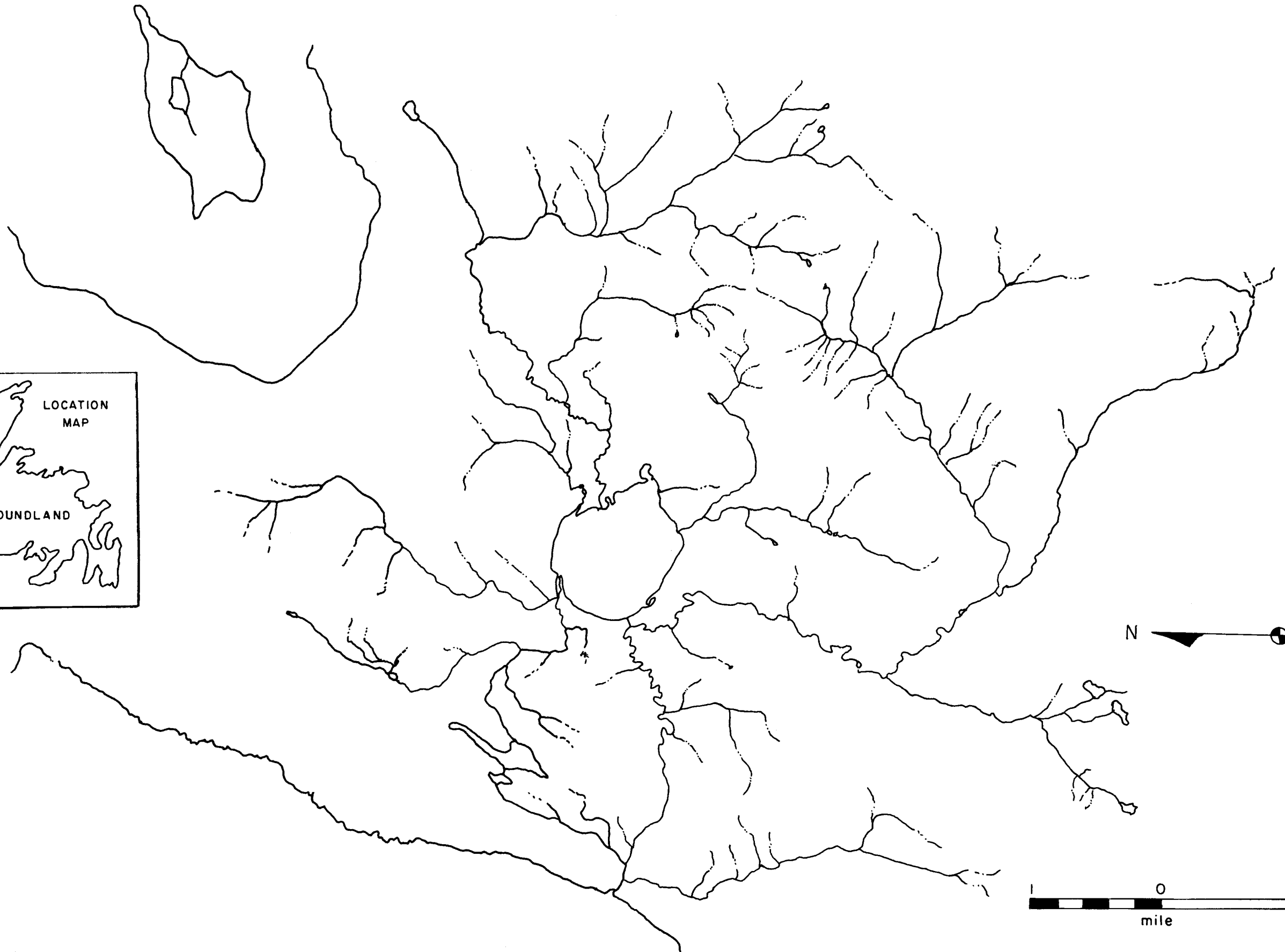
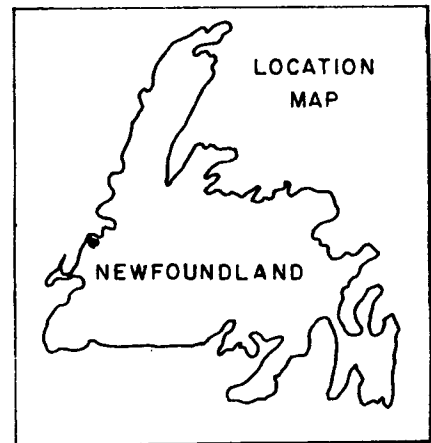


FIG. 19 OUTLINE MAP OF WILD COVE BROOK SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

BLOW ME DOWN BROOK

Location: 49°03'50" N. 58°13'35" W. Bay of Islands.
 Map Reference: Bay of Islands. 12 G/1 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 21.0 miles², (54.39 km²). Mean width, 2.4 miles,
 (3.86 km).
 Perimeter, 26.4 miles, (42.47 km). Axial length, 9.0 miles,
 (14.48 km).
 Maximum basin relief, 2,134 feet, (650.44 m).

Geology:

About half ultrabasic intrusive rocks with the remainder consisting
 of Ordovician sedimentary and basic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Falls, partial obstruction, located at mile 1 (1.61 km) from mouth.

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout (sea run).

No angling data available on this stream.

Gene Frequency: Not completed

Timing of Run:

<u>Year</u>	<u>First Fish</u>	<u>Last Fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers: Accessible by foot from local road which crosses stream approximately 1/2 mile (0.8 kilometres) above mouth.

Surveys: None to date.

Redd Counts: None to date.

References:

CLARKES BROOK

Location: 49°00'40" N. 58°07'58" W. Bay of Islands.
 Map Reference: Bay of Islands. 12 G/1 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 13.2 miles², (34.18 km²). Mean width, 2.6 miles,
 (4.18 km).
 Perimeter, 22.4 miles, (36.04 km). Axial length, 6.7 miles,
 (10.78 km).
 Maximum basin relief, 2,000 feet, (609.60 m).

Geology:

Almost entirely Ordovician sedimentary with the remainder
 consisting of ultrabasic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

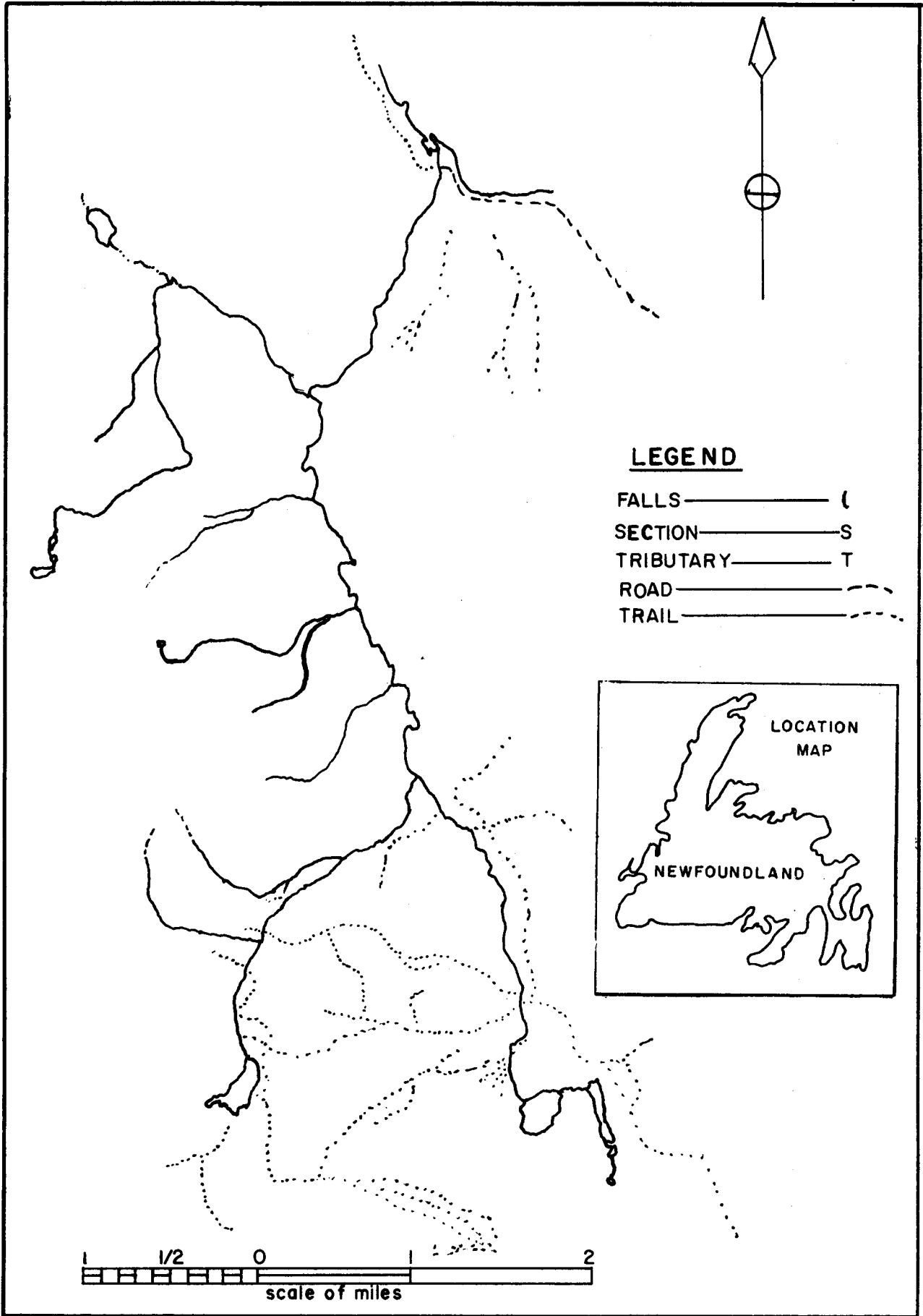


FIG 20 OUTLINE MAP OF CLARKE BROOK SHOWING OBSTRUCTIONS

FISH POPULATIONS

Species Present: Brook trout (resident and sea run).

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of run:

<u>Year</u>	<u>First Fish</u>	<u>Last Fish</u>	<u>Week of peak run</u>
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Accessibility to anglers: Upper sections accessible by foot and tractor via woods road.

Surveys: None to date.

Redd Counts: None to date.

References.

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Cook's Brook.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1964 ¹	211	125	434	197.0	3	23	10.4	128	457	207.4
1965	182	98	299	135.7	-	-	-	98	299	135.7
1966	275	43	133	60.4	-	-	-	43	133	60.4
1967	442	71	223	101.2	-	-	-	71	223	101.2
1968	661	236	804	365.0	-	-	-	236	804	365.0
1969	1631	416	1571	713.2	-	-	-	416	1571	713.2
1970	942	423	1658	752.7	-	-	-	423	1658	752.7
1971	591	48	191	86.7	-	-	-	48	191	86.7
1972	446	47	152	69.0	1	7	3.2	48	159	72.2
1973	448	133	445	202.0	-	-	-	133	445	202.0
1974										
1975										
1976										
1977										
MEAN										
1964-68	354	115	379	172.1	0.6	4.6	2.1	115	383	173.9
1969-73	812	213	803	364.7	0.2	1.4	0.6	213	805	365.4

¹ Angling data 1964-73 estimated to be 65-70% accurate (J. Marshall, personal communication).

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 20-27	August 20-27	July 27-Aug.3 (1968)

Accessibility to Anglers:

The local road along south shore of Bay of Islands crosses near river mouth. A woods road runs parallel to stream from Serpentine Lake No. 3 road to Murray's Pond, distance of approximately 3 miles (4.82 kilometers).

Various sections are accessible by foot along railway track.

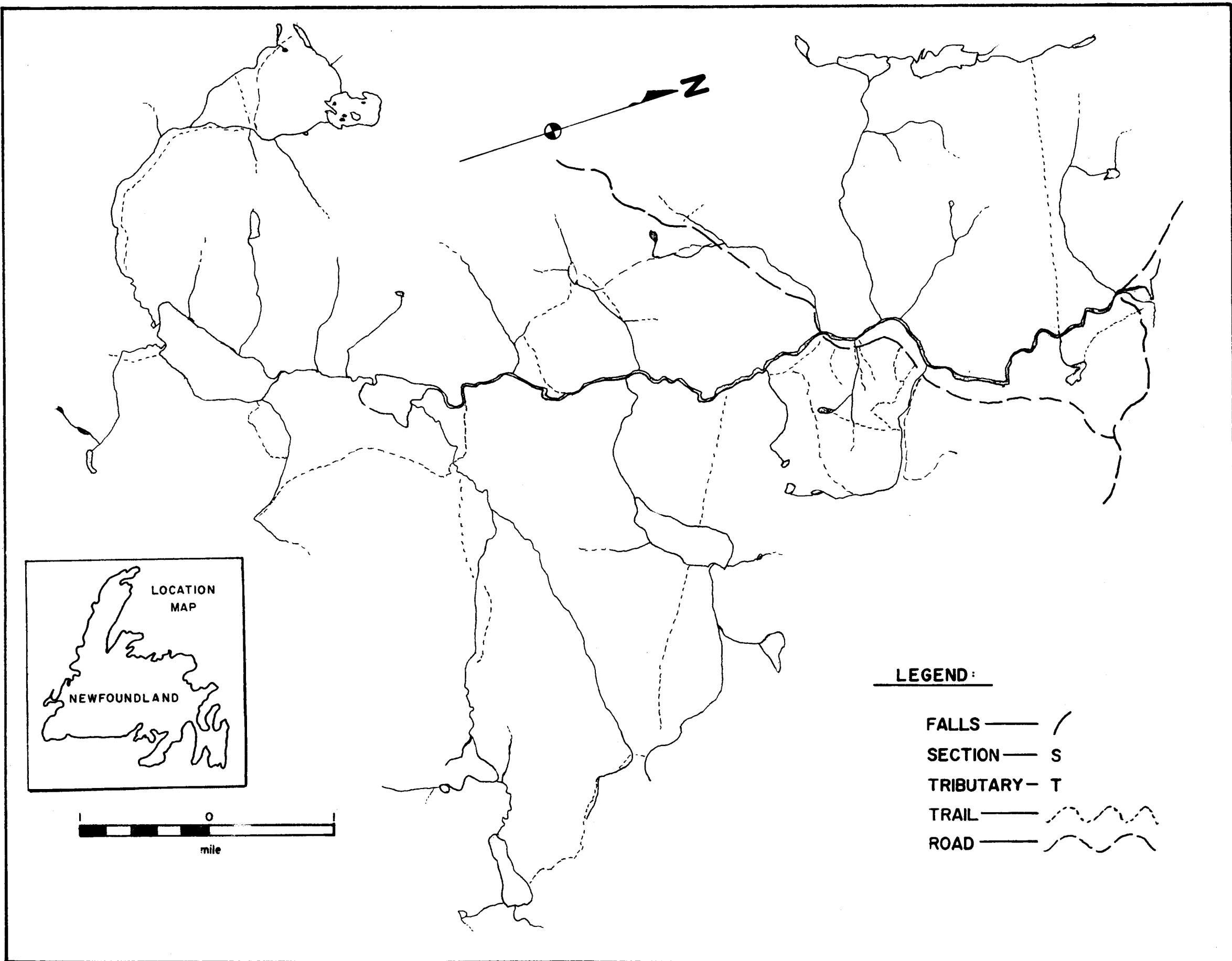


FIG. 21 OUTLINE MAP OF COOKS BROOK SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

Surveys: Engineering survey of lower and upper obstructions, first below
and above bridge, in 1968.

Redd Counts: None to date.

References: Anonymus. Nfld. Dept. Nat. Res. 1943. Res. Bull. No. 12.
St. John's, Newfoundland.

CORNER BROOK

Location: 48°57'25" N. 57°57'08" W. Corner Brook, Bay of Islands.

Map Reference: Corner Brook. 12 A/13 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 60.5 miles², (156.69 km²). Mean width, 3.8 miles, (6.11 km).

Perimeter, 49.3 miles, (79.32 km). Axial length, 22.2 miles, (35.71 km).

Maximum basin relief, 2,050 feet, (624.84 m).

Geology:

About half Ordovician sedimentary with the remainder consisting of Cambrian sedimentary and acidic intrusive rocks.

Miscellaneous Information:

Water used for hydro power and at Bowaters Pulp and Paper Mill. Gross head - 550 feet, (167.84 m). Flow regulated by mill water supply - 100 c.f.s.

Power available from regulated flow - 5,360 h.p.

Power available during peak runoff periods - 8,170 h.p.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Bowater dams located at mile 1/2 (0.8 km) and mile 3 (4.8 km) from mouth. Complete obstructions.

Photographs on file; Nos.

Water Quality Data, Sample Collected October 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
7.70	40.0	44.0	3.1	4.5	77.0	9.0	49.0

FISH POPULATIONS

Species Present: Brook trout occur in upper reaches.

No angling data on this stream.

Gene Frequency: Not completed

Timing of Run:

<u>Year</u>	<u>First Fish</u>	<u>Last Fish</u>	<u>Week of Peak run</u>
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Accessibility to Anglers:

Surveys: None to date

Redd Counts: None to date

References:

W-44-0243

HUMBER RIVER

Location: $48^{\circ} 57' 30''$ N $57^{\circ} 53' 50''$ W. Humber Arm, Bay of Islands.

Map Reference: Corner Brook. 12 A/13 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 2,965.0 miles², (7679.35 kilometers²). Mean width 30.6 miles, (49.23 kilometers).

Perimeter, 734.3 miles, (1181.48 kilometers). Axial length, 75.8 miles, (121.96 kilometers).

Maximum basin relief, 2,163 feet, (659.34 meters).

Geology: About equal amounts of acidic intrusive rocks, Mississippian sedimentary, gneissis and a small amount of Cambrian sedimentary, Ordovician sedimentary and Ordovician volcanic.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics: Total length of all streams in system, 1,523 miles, (2450.50 kilometers).

Main river is 95 miles long (152.85 kilometers), including standing water.

Spawning Areas: The $3\frac{1}{2}$ mile, (5.63 kilometer), section of river, between the inlet of Birchy Basin Dam and Main Falls may well be the chief spawning area of the main river salmon run.

Barriers to Fish Migration: Section: Main River:

Falls (Big Falls) 48 miles, (77.23 kilometers) from mouth, 12 ft., (5.65 meters) high, 300 ft. wide (91.44 meters), 90° angle; partial

obstruction. In 1951, a rock cut made to serve as fishway. Effectiveness is considered poor, except at a narrow range of water levels, when turbulence is not too strong. In 1972, rock was blasted that had fallen in fish passage.

Dam (Birchy Basin Dam) 8 ft. (2.45 meters) high, length bank to bank 200 ft., (60.96 meters) at mile point 65, (104.58 kilometers) partial obstruction. Note: Gates in dam are kept open during salmon run. Dam not presently being used by salmon.

Falls (Main Falls) 70 miles, (112.63 kilometers) from mouth consist of falls and rapids.

Falls is 21 ft. high, (6.40 meters), 50 ft. long (15.24 meters), rapids 10 ft. high, (3.04 meters), 200 ft. (60.96 meters) long; complete obstruction.

Falls and rapids, 77 miles, (123.89 kilometers) from mouth, 39' high (11.38 meters) high, 640' long, (195.07 meters), partial obstruction.

Section: Tributary - Junction Brook dammed, (Grand Lake system flowing into Deer Lake). Power house at mouth; complete obstruction.

Section: Deer Lake:

Mean width 1.4 miles, (2.25 kilometers). Mean length 11 miles, (17.69 kilometers). Area, 22 sq. mi., (56.98 square kilometers).

Maximum depth, 310', (94.48 meters). Mean depth, 145', (44.19 meters).

Volume 95,001 x 10⁶ cu. ft.

Bottom: Brown mud, with considerable bark material mixed therein.

Shoreline is regular and composed of boulder, rubble, sand and gravel.

Species of fish present: ouananiche, brook trout, Arctic char, smelt (possibly landlocked) and tomcod.

Water chemistry: pH 6.7 (1961) Total dissolved solids, 34.6 ppm (1961).

Temperature, 75°F. (Sept. 15, 1961).

Inflow to lake from two sources; 1) Upper Humber River 3,070 cfs.

2) Grand Lake inflow through Deer

Lake power house, 5,070 cfs.

Adies River, wooden sluice constructed by Bowaters, poses no problem to salmon. Sluice modified in 1961. Sluice fenced in 1964.

Photographs on file: Nos. 182-185, 188, 189, 190, 198, 199, 244-247,
 293, 296, 558, 659, 1081, 77, 78, 354, 446, 496, 628, 634, 636,
 808, 829, 830, 995, 986, 1141.

Water Quality Data, Sample Collected Humber R., Deer Lake,
 October 25, 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Specific Conductance @ 25°C micromhos/cm	Ca ppm.	HCO ₃ ppm.
7.10	12.0	20.0	4.0	6.0	40.0	4.0	

Water Quality Data, Sample Collected Humber R., Deer Lake,
 October 25, 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Specific Conductance @ 25°C micromhos/cm	Ca ppm.	HCO ₃ ppm.
6.65	6.0	10.0	1.5	3.5	20.0	1.8	

Miscellaneous Information:

There is much logging activity carried on in the area, and the river system is used to drive and hold pulpwood. Grand Lake system is used for hydro electric power by Bowater's Nfld. Co., since 1925.

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout, Arctic char, ouananiche,
American smelt, three spined stickleback, alewife,
tomcod.

Atlantic Salmon Angling Record - Humber River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	3285	2585	10196	4628.9	100	1276	579.3	2809	11472	5208.2
1953	2565	797	3177	1442.4	121	1850	839.9	918	5027	2282.3
1954	4161	876	3122	1417.4	137	1889	857.6	1013	5011	2275.0
1955	2177	1376	5207	2363.9	138	1656	751.8	1514	6863	3115.7
1956	-	1076	3891	1766.5	110	1394	632.9	1186	5285	2399.4
1957	2637	1778	6241	2833.4	89	1047	475.3	1867	7288	3308.7
1958	3350	1686	6917	3140.3	194	2484	1127.7	1880	9401	4268.0
1959	3681	1996	8188	3717.4	187	2143	972.9	2183	10331	4690.3
1960	3511	1938	8055	3656.9	178	2431	1103.7	2116	10486	4760.6
1961	3639	1867	7751	3518.9	134	1729	784.9	2001	9480	4303.8
1962	4017	2390	9681	4395.2	108	1418	643.8	2498	11099	5039.0
1963	5348	3898	18860	8562.4	160	2016	915.3	4058	20876	9477.7
1964 ¹	7222	4681	22434	10185.0	268	2949	1338.8	4949	25383	11523.8
1965	6551	3951	15830	7186.8	193	1886	856.2	4144	17716	8043.0
1966	8842	3989	15419	7000.2	322	2866	1301.2	4311	18285	8301.4
1967	5317	2252	8506	3861.7	160	1766	801.8	2412	10272	4663.5
1968	5104	2168	7655	3475.4	96	943	428.1	2264	8598	3903.5
1969	9090	4459	17020	7727.1	478	4663	2117.0	4937	21683	9844.1
1970	11785	2776	9694	4401.1	526	4332	1966.7	3302	14026	6367.8
1971	9027	3949	13361	6065.9	375	3012	1367.4	4324	16373	7433.3
1972	9413	3961	13281	6030.0	254	1628	739.1	4180	14909	6768.7
1973	9572	3431	12060	5475.5	297	2110	9579.5	3728	14170	6433.2
1974										
1975										
1976										
1977										
MEAN										
1964-68	6607	3408	13968	6341.8	208	2082	945.2	3616	16051	7287.0
1969-73	9777	3715	13083	5939.6	386	3149	1430.0	4094	16232	7369.4

¹ Angling data 1964-73 estimated to be 70-75% accurate. (J. Marshall, personal communication).

Atlantic Salmon Angling Record - Humber River (Lower).

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1961	536	26	116	52.6	37	647	293.7	63	763	346.3
1962	911	17	77	34.9	33	558	253.3	50	635	288.2
1963	1172	55	251	113.9	54	857	389.1	109	1108	503.0
1964 ¹	953	70	321	145.7	59	967	439.0	129	1288	584.7
1965	827	150	722	327.8	24	432	196.1	174	1154	523.9
1966	1009	111	458	207.9	17	302	137.1	128	760	345.0
1967	559	92	333	151.2	42	613	278.3	134	946	429.5
1968	706	193	873	396.3	29	323	146.6	222	1196	542.9
1969	1757	224	1003	455.4	71	669	303.7	295	1672	759.1
1970	2639	408	1800	817.2	392	2998	1361.1	800	4798	2178.3
1971	2118	323	1711	776.8	333	2654	1204.9	656	4365	1981.7
1972	2619	459	1921	872.1	94	695	315.5	553	2616	1187.6
1973	1810	268	1188	539.4	283	1987	902.1	551	3175	1441.5
1974										
1975										
1976										
1977										
MEAN										
1964-68	811	123	542	246.1	34	527	239.4	157	1069	485.3
1969-73	2189	336	1525	692.2	235	1801	817.5	571	3323	1508.7

¹Angling data 1964-73 estimated to be 80-85% accurate. (J. Marshall, personal communication).

Atlantic Salmon Angling Record - Humber River (Big Falls)

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1961	1712	1084	4456	2023.0	38	413	187.5	1122	4869	2210.5
1962	1905	1260	5019	2278.6	29	320	145.3	1289	5339	2423.9
1963	2086	2117	10560	4794.2	44	537	243.8	2161	11097	5038.0
1964 ¹	3388	2031	10137	4602.2	109	1029	467.2	2140	11166	5069.4
1965	2915	1559	6180	2805.7	111	891	404.5	1670	7071	3210.2
1966	3236	1179	4215	1913.6	135	1135	515.3	1314	5350	2428.9
1967	2357	997	3765	1709.3	55	531	241.1	1052	4296	1950.4
1968	1481	550	1965	892.1	31	305	138.5	581	2270	1030.6
1969	3490	2167	8422	3823.6	336	3238	1470.1	2503	11660	5293.7
1970	4619	779	2567	1165.4	108	1092	495.8	887	3659	1661.2
1971	4503	2866	9206	4179.5	32	255	115.8	2898	9461	4295.3
1972	3798	2127	6736	3058.1	77	659	299.2	2204	7395	3357.3
1973	5563	2300	78170	3548.9	13	117	53.1	2313	7934	3602.0
1974										
1975										
1976										
1977										
MEAN										
1964-68	2675	1263	5252	2384	88	778	353.0	1351	6031	2737.9
1969-73	4395	2048	6950	3155	113	1072	487.0	2161	6435	2921.5

¹Angling data 1964-73 estimated to be 80% accurate (J. Marshall, personal communication).

Atlantic Salmon Angling Record - Humber River (Little Falls).

Year	Rod Days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1961	541	283	1179	535.3	21	218	98.9	304	1397	634.2
1962	610	609	2444	1109.6	15	165	74.9	624	2609	1184.5
1963	1076	1095	5475	2485.7	40	391	177.5	1135	5866	2663.2
1964 ¹	1676	1238	6007	2727.2	70	644	292.4	1308	6651	3019.6
1965	1304	750	3000	1362.0	26	244	110.8	776	3244	1472.8
1966	1856	848	2791	1267.1	50	451	204.8	898	3242	1471.9
1967	516	210	823	373.6	22	224	101.7	232	1047	475.3
1968	696	285	942	427.7	4	49	22.2	289	991	449.9
1969	1153	570	2132	967.9	36	456	207.0	605	2588	1174.9
1970	1642	287	1002	454.9	24	220	99.9	311	1222	554.8
1971	320	101	328	148.9	-	-	-	101	328	148.9
1972	567	270	852	386.8	4	38	17.3	274	890	404.1
1973	420	116	392	178.0	-	-	-	116	392	178.0
1974										
1975										
1976										
1977										
MEAN										
1964-68	1210	666	2713		34	322	146.2	701	3035	1377.9
1969-73	820	269	941	427.1	13	143	64.8	281	1084	492.1

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Angling data 1964-73 estimated to be 80% accurate (J. Marshall), personal communication).

Atlantic Salmon Angling Record - Humber River (Adies Stream)

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1961	172	175	687	311.9	21	274	124.4	196	961	436.3
1962	256	136	558	253.3	8	105	47.7	144	663	301.0
1963	241	160	637	289.2	9	89	40.4	169	726	329.6
1964 ¹	397	387	1714	778.2	17	174	78.9	404	1888	857.1
1965	368	559	2227	1011.1	20	198	89.9	579	2425	1101.0
1966	424	593	2384	1082.3	27	276	125.3	620	2660	1207.6
1967	445	228	847	384.5	9	94	42.7	237	941	427.2
1968	426	291	1087	493.5	8	79	35.9	299	1166	529.4
1969	1206	619	2392	1085.9	21	174	78.9	640	2566	1164.8
1970	734	344	1180	535.7	-	-	-	344	1180	535.7
1971	727	255	845	383.6	4	35	15.9	259	880	399.5
1972	228	156	540	245.2	-	-	-	156	540	245.2
1973	156	75	236	107.1	-	-	-	75	236	107.1
1974										
1975										
1976										
1977										
MEAN										
1964-68	412	412	1652	749.9	16	164	74.5	428	1816	824.5
1969-73	610	290	1039	471.5	5	42	19.0	295	1080	490.5

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Angling data 1964-73 estimated to be 85% accurate. (J. Marshall, personal communication).

Atlantic Salmon Angling Record - Humber River (Taylor's Brook).

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1961	105	105	421	191.1	9	91	41.3	114	512	232.4
1962	88	88	360	163.4	6	66	29.9	94	426	193.3
1963	96	96	386	175.2	3	38	17.3	99	424	192.5
1964 ¹	202	202	830	376.8	3	28	12.7	205	858	389.5
1965	240	240	952	432.2	3	30	13.6	243	982	445.8
1966	315	315	1267	575.2	3	30	13.6	318	1297	588.8
1967	205	106	307	139.4	-	-	-	106	307	139.4
1968	294	294	1044	473.9	22	149	67.6	316	1193	541.5
1969	245	245	895	406.3	8	68	30.9	253	963	437.2
1970	476	328	1015	460.8	-	-	-	328	1015	460.8
1971	509	125	384		3	23	-	128	407	
1972	703	283	975	442.7	-	-	-	283	975	442.7
1973	562	129	402	182.5	-	-	-	129	402	182.5
1974										
1975										
1976										
1977										
MEAN										
1964-68	251	231	880	399.5	6	47	21.3	238	927	420.9
1969-73	499	222	734	333.3	2	18	8.2	224	752	341.6

¹ Angling data 1964-73 estimated to be 85% accurate. (J. Marshall, personal communication).

Atlantic Salmon Angling Record - Humber River (Adies Lake)

Year	Rod Days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1961	126	105	509	231.1	3	32	14.5	108	541	245.6
1962	93	165	751	340.9	13	150	68.0	178	901	408.9
1963	511	289	1190	540.3	8	86	39.0	297	1276	579.3
1964 ¹	347	296	1386	629.2	6	82	37.2	302	1468	666.4
1965	209	272	1000	454.0	2	19	8.6	274	1019	462.6
1966	345	304	1260	572.0	53	371	168.4	357	1631	740.4
1967	236	291	1139	517.0	29	269	122.1	320	1408	639.2
1968	298	103	381	172.9	1	30	13.6	104	411	186.5
1969	434	257	834	378.6	4	36	16.3	261	870	394.9
1970	508	186	584	265.1	-	-	-	186	584	265.1
1971	451	224	719	326.4	3	45	20.4	227	764	346.8
1972	797	357	1241	563.4	1	7	3.2	358	1248	566.6
1973	736	390	1504	682.8	1	6	2.7	391	1510	685.5
1974										
1975										
1976										
1977										
1964-68	287	253	1033	469.0	18	154	69.9	271	1187	538.9
1969-73	585	283	976	443	2	19	8.5	285	995	451.8

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Angling data 1964-73 estimated to be 75% accurate. (J. Marshall, personal communication).

Atlantic Salmon Angling Record - Humber River (Deer Lake area).

Year	Rod Days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1965 ¹	24	13	52	23.6	-	-	-	13	52	23.6
1966	720	304	1410	640.1	17	113	51.3	321	1523	691.4
1967	88	48	222	100.7	2	23	10.4	50	245	111.1
1968	295	212	643	291.9	-	-	-	212	643	291.9
1969	35	1	3	1.4	-	-	-	1	3	1.4
1970	40	6	18	8.2	-	-	-	6	18	8.2
1971	No report									
1972	240	133	461	209.3	43	344	156.2	176	805	365.5
1973	85	12	36	16.3	-	-	-	12	36	16.3
1974										
1975										
1976										
1977										
MEAN										
1965-68	282	144	582	264.1	5	34	15.4	149	616	279.6
1969-70										
1972-73	100	38	130	58.8	11	86	39.0	49	216	97.8

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Angling data 1965-1973 estimated to be 70-75% accurate. (J. Marshall, personal communication).

Atlantic Salmon Angling Record - Humber River (Harrimand Steady) Deer Lake.

Year	Rod Days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1961	58	89	383	173.9	5	54	24.5	94	437	198.4
1962	92	115	472	214.3	4	54	24.5	119	526	238.8
1963	149	86	361	163.9	2	18	8.2	88	379	172.1
1964 ¹	242	457	2039	925.7	4	45	20.4	461	2084	946.1
1965	702	408	1697	770.4	7	72	32.7	415	1769	803.1
1966	1014	335	1634	741.8	20	188	85.4	355	1822	827.2
1967	911	280	1070	485.8	1	12	5.4	281	1082	491.2
1968	358	240	720	326.9	1	8	3.6	241	728	330.5
1969	942	376	1239	562.5	2	22	9.9	378	1261	572.4
1970	1127	447	1528	693.7	2	12	5.4	449	1540	699.1
1971	399	55	168	76.3	-	-	-	55	168	76.3
1972	461	176	555	252.0	-	-	-	176	555	252.0
1973	240	141	485	220.2	-	-	-	141	485	220.2
1974										
1975										
1976										
1977										
MEAN										
1964-68	645	344	1432	650.1	7	65	29.5	351	1497	679.6
1969-73	634	239	795	360.9	1	68	3.1	240	806	364.9

¹ Angling data 1964-73 estimated to be 65-70% accurate (J. Marshall, personal communication).

Gene Frequency: Completed August 1969 and 1972, on Adies Stream.

Frequency of Tf4 (TfA transferrin allele); 0.07.

Timing of Run: (based on angling statistics 1966-1969).

<u>Stream</u>	<u>First Fish</u>	<u>Last Fish</u>	<u>Week of peak run</u>
Lower Humber	June 14-20	Sept. 10-15	August 3-10 (1968)
Big Falls	June 11-17	Sept. 9-15	July 6-13 (1968)
Little Falls	June 20-26	August 20-26	July 13-20 (1968)
Adies Stream	July 10-16	Sept. 10-15	July 27-Aug. 3 (1968)
Taylor's Brook	July 7-13	Sept. 10-15	July 27 -Aug. 3 (1968)
Adies Lake	July 10-16	Sept. 10-15	July 28-Aug. 3 (1968)
Deer Lake area	July 16-22	Aug. 23-29	Aug. 3-10 (1968)
Harrimand Steady	June 23-29	Aug. 28-Sept. 3	July 20-27 (1968)

Accessibility to Anglers:

Humber River Lower - Accessible at different points from mouth to exit from Deer Lake, a distance of approximately 18 mile (28.98 kilometers). The river can be reached by vehicle along several points.

Humber River Upper - The upper section can be reached at various points along the Cormack Road, White's River Road and Taylor's Brook Road. The extreme headwaters are only accessible by foot.

Surveys:

Engineering survey of Upper Humber River Main Falls by Carew - 1961.

Supplementary survey by E. Tulk - 1967. Layout of proposed fishway by B. Flynn - 1971.

Engineering survey around Adies Lake dam by T. P. Carew - 1961.

Engineering survey main falls, Taylor's Brook, 3 miles (4.82 kilometers) from mouth by Gould - 1961.

Engineering survey of wooden sluice Adies River, resulting in sluice being modified - 1961.

Engineering survey Big Falls, Upper Humber River - 1961.

Redd Counts: None to date.

References:

Mascaluk, D. M. and Chamut, P. S., 1970. Preliminary Report on the Hydrography and Pulp and Paper Mills Pollution of the Humber Arm, Bay of Islands, Nfld.

Riche, L. G., 1969. Fishels Brook and the Upper Humber River; A comparative evaluation. MS report, Fisheries Service, St. John's, Newfoundland.

Anonymous. Summary of Stream Obstructions. MS report, Fisheries Service, St. John's, Newfoundland.

Anonymous, 1961. Salmon and Trout Management Program. MS report, Fisheries Service, St. John's, Newfoundland.

Mercer, K. M., 1967. Report of Biological Survey on the Humber River. MS report, Fisheries Service, St. John's, Newfoundland.

Seabrook, W. D., 1961. A Survey of Nine Lakes on the Island of Newfoundland. MS report, Fisheries Service, St. John's, Newfoundland.

HUGHES BROOK

Location: 48°59'15" N. 57°54'30" W. Bottom of Humber Arm,
Bay of Islands.

Map Reference: Corner Brook. 12 A/13 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 51.1 miles², (132.34 km²). Mean width, 4.0 miles,
(6.43 km).

Perimeter, 36.6 miles, (58.88 km). Axial length, 12.0 miles,
(19.30 km).

Maximum basin relief, 1,500 feet, (457.20 m).

Geology:

Predominantly Ordovician sedimentary with some Cambrian
sedimentary and gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Falls at mile 3 (4.82 km), on the main river; partial
obstruction.

Photographs on file; Nos. 40, 41, 581.

Water Quality Data, Sample Collected

	Total	Total	Turbidity	Cl	Conductivity	Ca	HCO ₃
pH	Alkalinity	Hardness	JTU	ppm.	at 25°C	ppm.	ppm.
	ppm.	ppm.			(μ mhos/cm)		

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout, sea trout.

Atlantic Salmon Angling Record - Hughes Brook.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1968	226	57	196	90.0	-	-	-	57	196	90.0
1969 ¹	485	74	308	139.8	7	52	23.6	81	360	163.4
1970	1025	211	956	434.0	27	164	74.5	238	1120	508.5
1971	396	44	178	80.8	-	-	-	44	178	80.8
1972	750	55	197	89.4	-	-	-	55	197	89.4
1973	1059	202	845		12	74		214	919	
1974										
1975										
1976										
1977										
MEAN										
1969-73	743	117	497	225.5	9	58	26.3	126	555	251.9

¹ Angling data 1969-1973 estimated to be partial count only, possibly 60% accurate (J. Marshall, personal communication).

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

The local road along north shore of Bay of Islands crosses river near outlet to the bay. An old woods road crosses stream approximately 3.5 miles (5.63 kilometers) above river mouth.

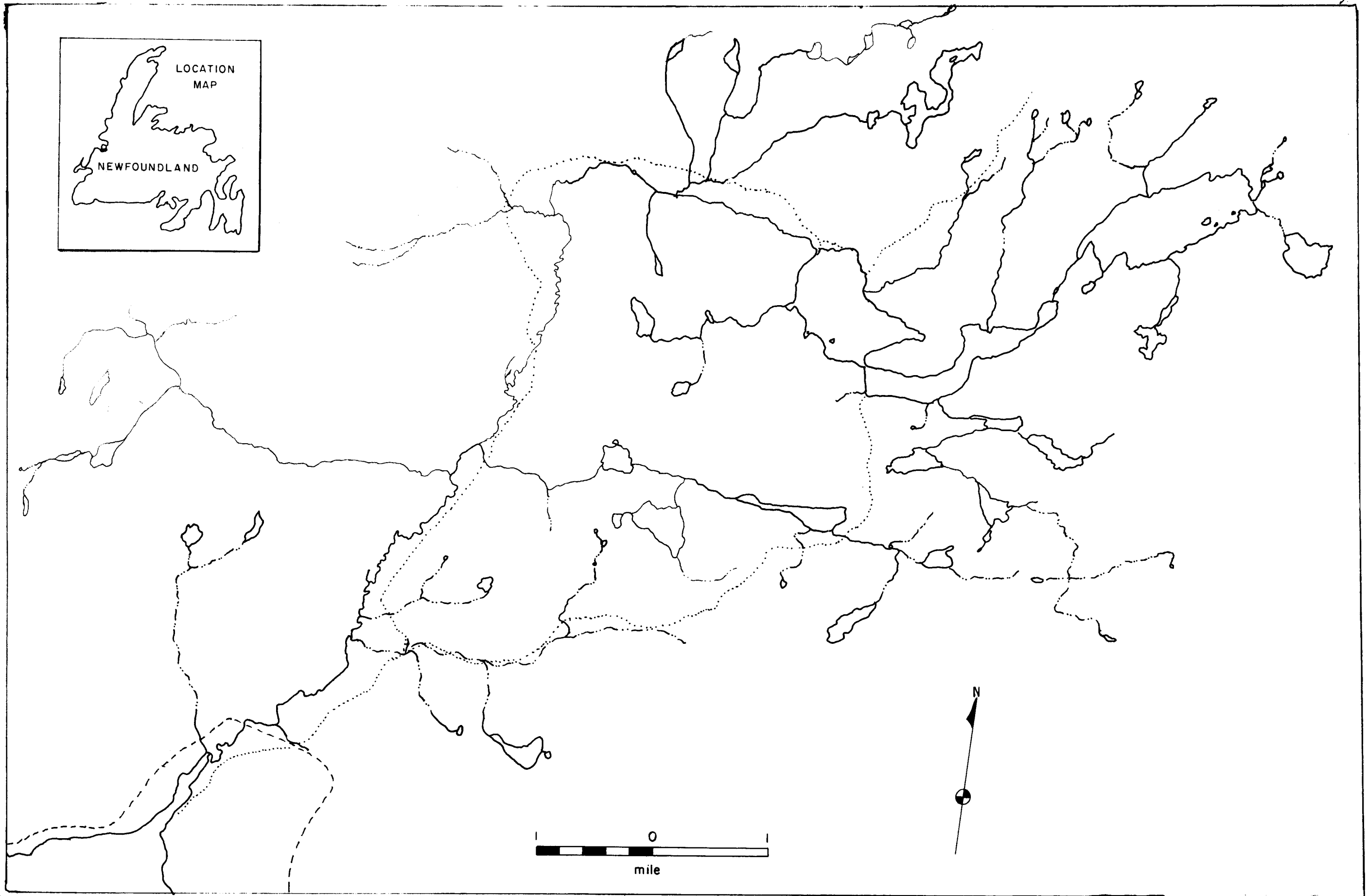


FIG. 22 OUTLINE MAP OF HUGHES BROOK SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

Surveys: None to date.

Redd Counts: None to date.

References:

GILLAMS BROOK

Location: 49°01'03" N. 58°04'10" W. Humber Arm, Bay of Islands.
 Map Reference: Bay of Islands. 12 G/1 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 17.2 miles², (44.54 km²). Mean width, 2.5 miles,
 (4.02 km).

Perimeter, 20.0 miles, (32.18 km). Axial length, 6.4 miles,
 (10.29 km).

Maximum basin relief, 1,350 feet, (411.48 m).

Geology:

Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

FISH POPULATIONS

Species Present:

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

Year

First Fish

Last Fish

Week of
peak run

Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

LEGEND

- FALLS ———— (
- SECTION ———— S
- TRIBUTARY ———— T
- ROAD ———— - - - -
- TRAIL ———— · · · ·

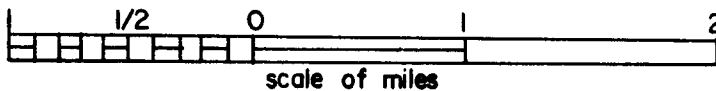


FIG 23 OUTLINE MAP OF RATTLER BROOK SHOWING OBSTRUCTIONS

FISH POPULATIONS

Species Present:

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of run:

<u>Year</u>	<u>First Fish</u>	<u>Last Fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

COX'S BROOK

Location: 49°07'15" N. 58°04'40" W. Middle Arm, Bay of Islands.

Map Reference: Bay of Islands. 12 G/1 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 21.2 miles², (54.90 km²). Mean width, 2.3 miles, (3.70 km).

Perimeter, 28.0 miles, (45.05 km). Axial length, 9.6 miles, (15.44 km).

Maximum basin relief, 1,350 feet, (411.48 m).

Geology:

Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Falls - complete obstruction.

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μ mhos/cm)	ppm.	ppm.

FISH POPULATIONS

Species Present:

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First Fish</u>	<u>Last Fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date

References:

BARACHOIS BROOK

Location: 49°07'21" N. 58°00'59" W. Middle Arm, Bay of Islands.

Map Reference: Bay of Islands. 12 G/1 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 4.3 miles², (11.13 km²). Mean width, 1.4 miles, (2.25 km).

Perimeter, 10.3 miles, (16.57 km). Axial length, 3.4 miles, (5.47 km).

Maximum basin relief, 1,250 feet, (381.00 m).

Geology:

Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected October 26, 1972

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.

FISH POPULATIONS

Species Present:

No angling data available on this stream.



LEGEND

- FALLS ————— (
- SECTION ————— S
- TRIBUTARY ————— T
- ROAD ————— - - - - -
- TRAIL ————— ······

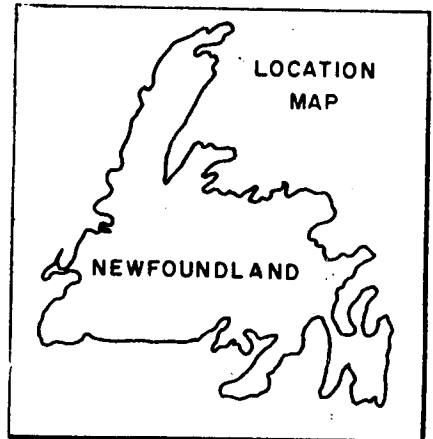


FIG24 OUTLINE MAP OF BARCHOIS BROOK SHOWING OBSTRUCTIONS

Gene Frequency: Not completed.

Timing of Run:

Year

First fish

Last Fish

Week of
peak run

Accessibility to Anglers:

Surveys: None to date.

Redd counts: None to date.

References:

OLD MAN'S BROOK

Location: 49°07'13" N. 57°55'01" W. Goose Arm, Bay of Islands.

Map Reference: Pasadena. 12 H/4 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 61.1 miles², (158.2 km²). Mean width, 5.1 miles, (8.20 km).

Perimeter, 44.3 miles (71.27 km). Axial length, 12.0 miles, (19.30 km).

Maximum basin relief, 1,500 feet, (457.20 m).

Geology:

About half gneiss with the remainder consisting of about equal amounts of Ordovician sedimentary and Cambrian sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μ mhos/cm)	ppm.	ppm.
<hr/>							

FISH POPULATIONS

Species Present:

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

Year

First fish

Last fish

Week of
peak run

Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

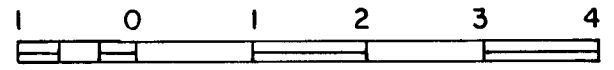
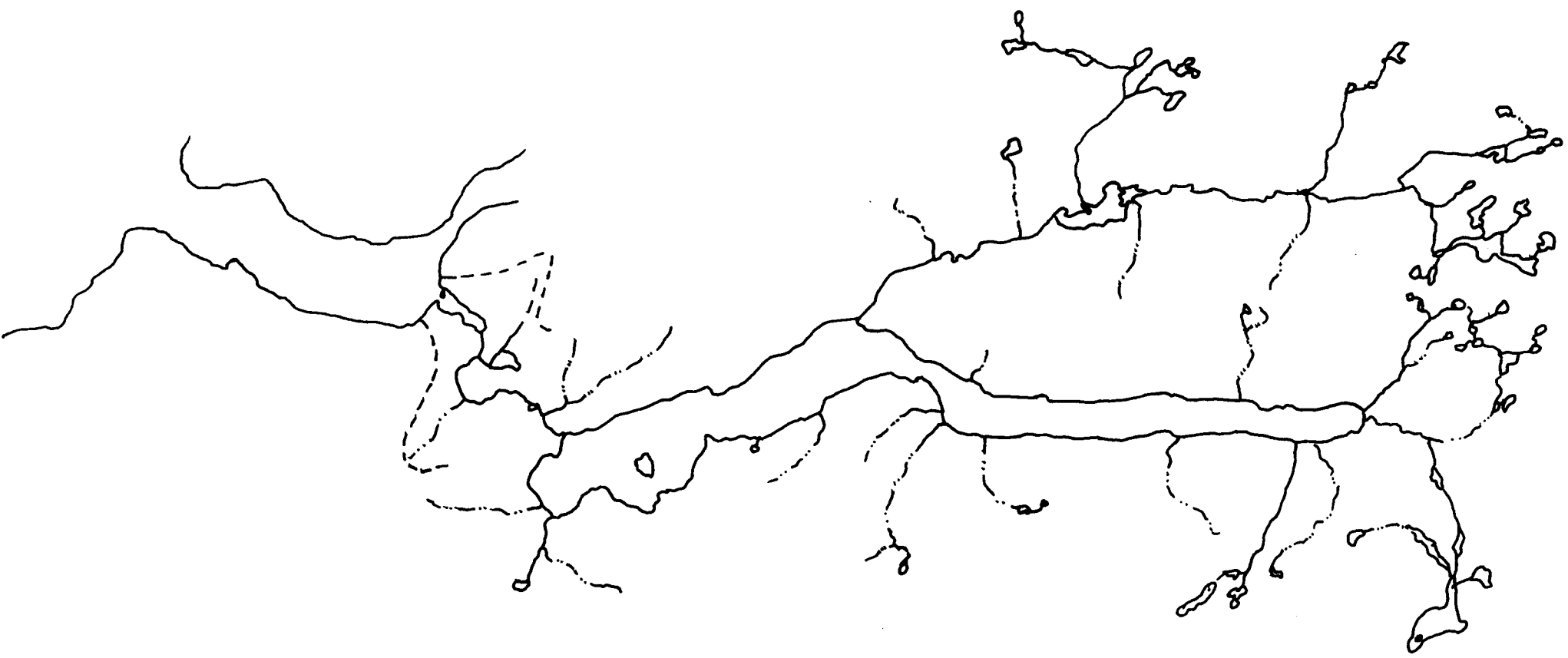
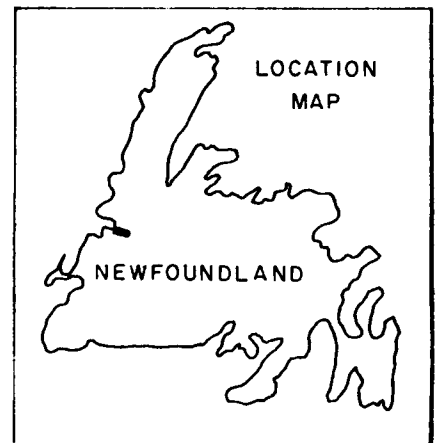


FIG. 25 OUTLINE MAP OF OLD MAN'S BROOK SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

GOOSE ARM BROOK

Location: 49°11'00" N. 57°51'30" W. Bottom of Goose Arm, Bay of Islands.

Map Reference: Pasadena. 12 H/4 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 81.9 miles², (212.12 km²). Mean width, 5.4 miles, (8.68 km).

Perimeter, 49.8 miles, (80.12 km). Axial length, 12.0 miles, (19.30 km).

Maximum basin relief, 1,653 feet, (503.83 m).

Geology:

Almost entirely Ordovician sedimentary with small amounts of Cambrian sedimentary and gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Dam at outlet of Cloudy Pond on the main river; partial obstruction.

Falls on left branch 3/4 mile (1.20 km) from mouth. Partial obstruction, total drop of 12 feet, (3.65 m) in two drops 8 feet and 4 feet, (2.43 and 1.21 m).

Photographs on file; Nos. 309, 655

Miscellaneous Information:

Logging activity on this river, (1955).

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μ mhos/cm)	ppm.	ppm.

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Goose Arm Brook

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1955	40	15	47	21.3	1	12	5.4	16	59	26.7
1956	-	27	94	42.7	4	32	14.5	31	126	57.2
1957	80	8	31	14.1	2	17	7.7	10	48	21.8
1958	8	1	5	2.3	1	10	4.5	2	15	6.8
1959	6	3	15	6.8	-	-	-	3	15	6.8
1960	73	5	27	12.3	1	10	4.5	6	37	16.8
1961	30	17	67	30.4	-	-	-	17	67	30.4
1962	500	21	75	34.1	2	21	9.5	23	96	43.6
1963	620	34	133	60.4	2	24	10.9	36	157	71.3
1964 ¹	1425	26	90	40.9	2	18	8.2	28	108	49.1
1965	392	22	91	41.3	-	-	-	22	91	41.3
1966	188	86	356	161.6	-	-	-	86	356	161.6
1967	125	21	77	34.9	-	-	-	21	77	34.9
1968	185	16	66	30.0	-	-	-	16	66	30.0
1969	92	11	34	15.4	-	-	-	11	34	15.4
1970 ²	202	26	83	37.7	-	-	-	26	83	37.7
1971	No report									
1972	38	2	6	2.7	1	8	3.6	3	14	6.3
1973	53	5	15	-	-	-	-	5	15	-
1974										
1975										
1976										
1977										
MEAN										
1964-68	468	34	136	61.7	0.4	4	1.8	34	140	63.6
1969-70										
1972-73	96	9	35	15.9	0.2	2	0.9	9	36	16.2

¹Angling data 1964-69 estimated to be 85% accurate (J. Marshall, personal communication).

²Angling data 1970-73 estimated to be 75 % accurate (J. Marshall, personal communication).

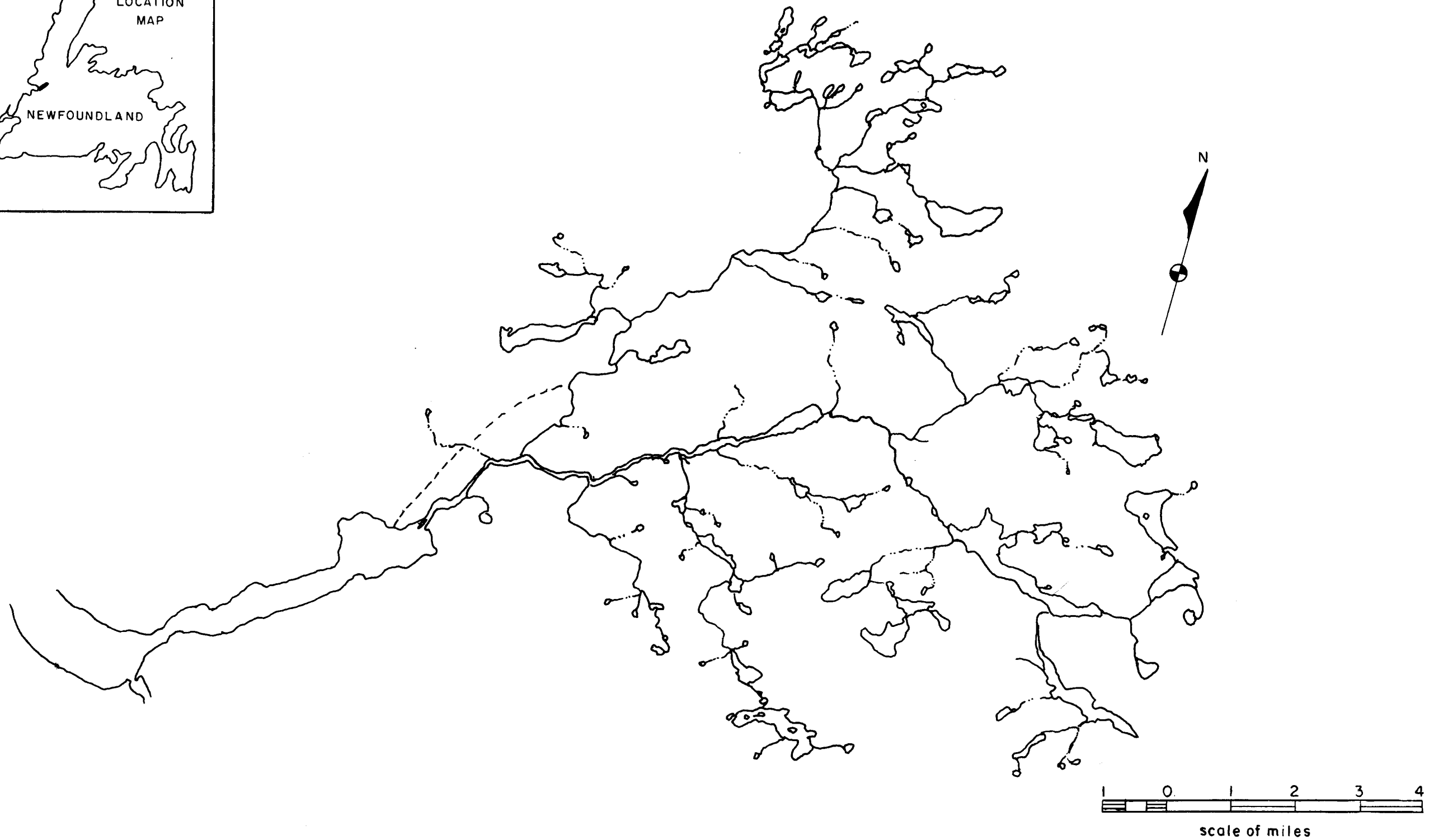
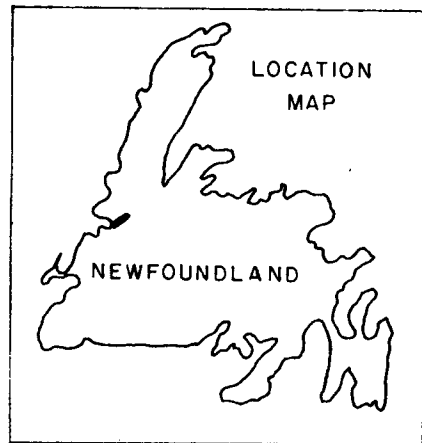


FIG. 26 OUTLINE MAP OF GOOSE ARM BROOK SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics 1966-1969)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-69	July 12 - 18	August 25 - 31	August 10 - 31 (1968)

Accessibility to Anglers:

Accessible by woods road from Deer Lake. Distance from Deer Lake to mouth of stream approximately 26 miles (41.86 kilometers), only ten miles (16.09 kilometers) of road parallels river.

Surveys: None to date.

Redd Counts: None to date.

References:

Palmer, C. H., 1918. The Salmon Rivers of Nfld., Boston
Farrington Co.

PENGUIN ARM BROOK

Location: 49°11'32" N. 57°55'35" W. Penguin Arm, Bay of Islands.

Map Reference: Pasadena. 12 H/4 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 6.7 miles², (17.35 km²). Mean width, 1.4 miles, (2.25 km).

Perimeter, 11.8 miles, (18.98 km). Axial length, 4.3 miles, (6.91 km).

Maximum basin relief, 1,150 feet, (350.52 m).

Geology:

Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μmhos/cm)	ppm.	ppm.



LEGEND

- FALLS ————— (
- SECTION ————— S
- TRIBUTARY ————— T
- ROAD ————— - - - - -
- TRAIL ————— - - - - -

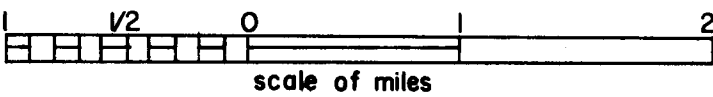
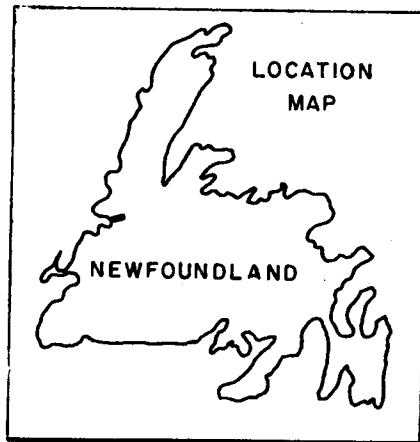
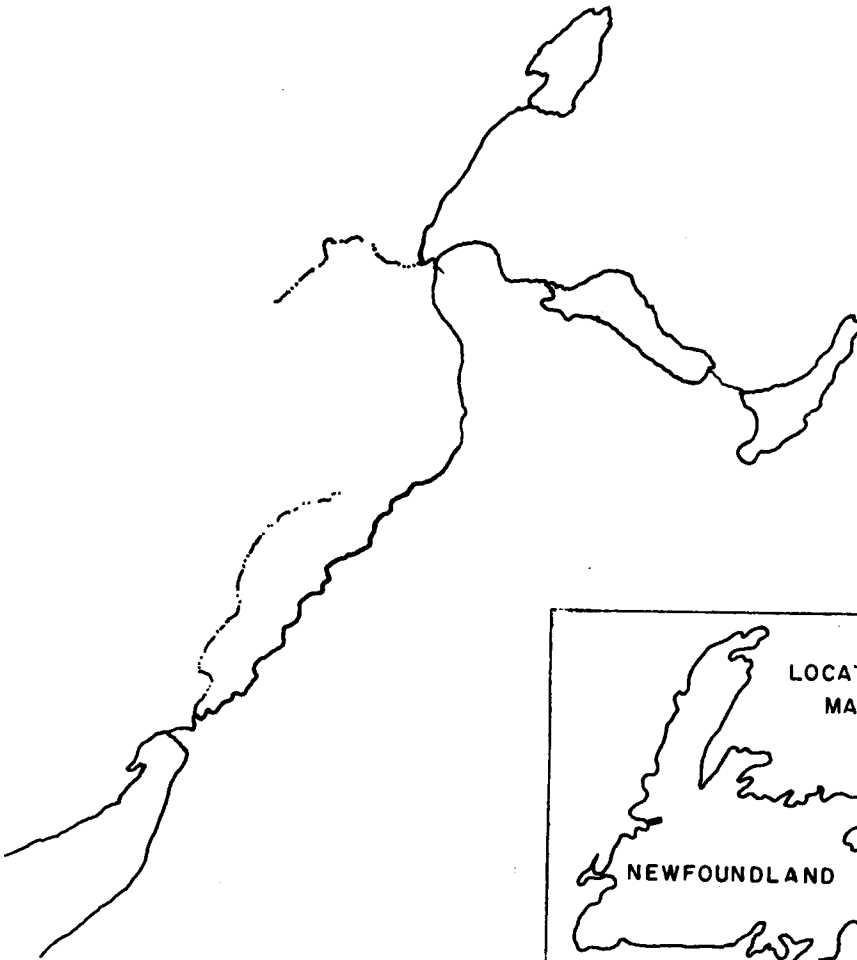


FIG 27 OUTLINE MAP OF PENGUIN ARM BROOK SHOWING OBSTRUCTIONS

FISH POPULATIONS

Species Present:

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date

References:

NORTH ARM BROOK

Location: 49°14'22" N. 57°56'25" W. North Arm, Bay of Islands.
 Map Reference: Pasadena. 12 H/4 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 19.1 miles², (49.47 km²). Mean width, 2.1 miles,
 (3.37 km).

Perimeter, 22.5 miles, (36.20 km). Axial length, 7.8 miles,
 (12.55 km).

Maximum basin relief, 2,250 feet, (685.80 m).

Geology:

Almost entirely Ordovician sedimentary with a small amount of
 ultrabasic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos. 187

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

FISH POPULATIONS

Species Present: Sea run brook trout.

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
-------------	-------------------	------------------	-----------------------------

Accessibility to Anglers: Accessible only by watercraft.

Surveys: None to date

Redd Counts: None to date

References:

STROWBERGS BROOK

Location: 49°12'50" N. 58°05'03" W. North Arm, Bay
of Islands.

Map Reference: Bay of Islands. 12 G/1 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 4.2 miles², (10.88 km²). Mean width, 0.8 miles,
(1.28 km).

Perimeter, 11.0 miles, (17.69 km). Axial length, 4.9 miles,
(7.88 km).

Maximum basin relief, 2,315 feet, (705.61 m).

Geology:

Ultrabasic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

LEGEND

- FALLS ———— I
- SECTION ———— S
- TRIBUTARY ———— T
- ROAD ———— - - - - -
- TRAIL ———— · · · · ·

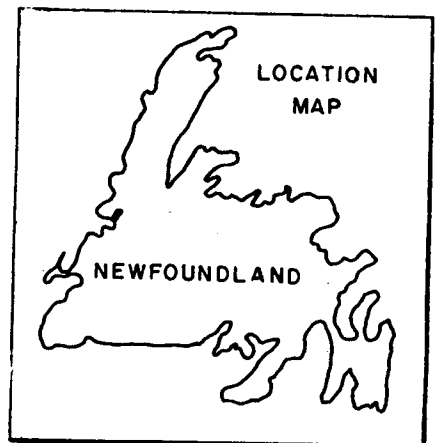
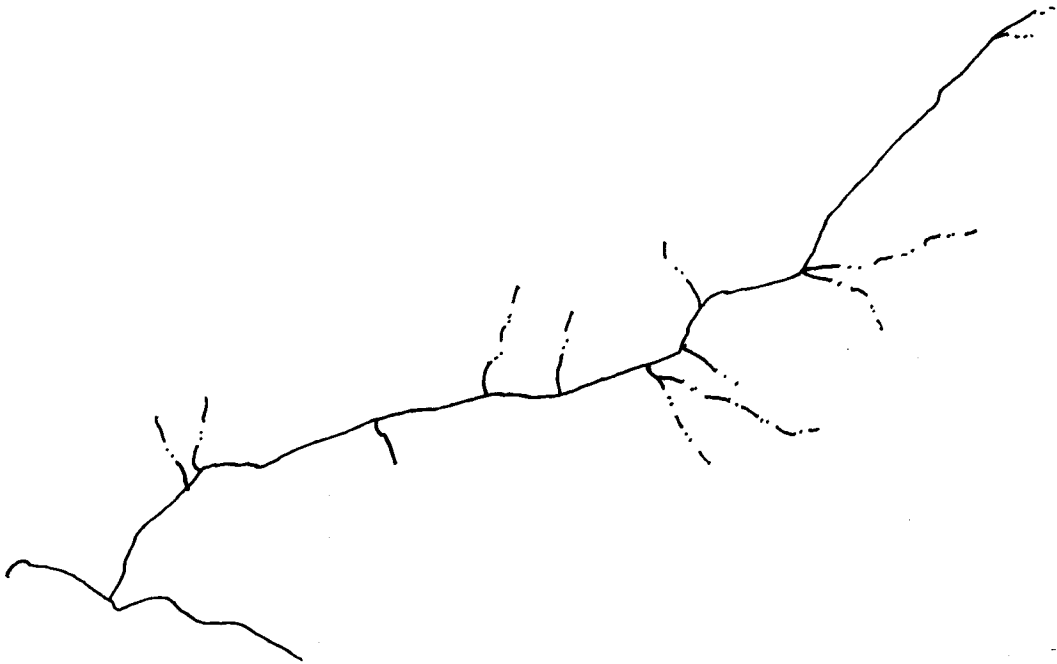


FIG 28 OUTLINE MAP OF STOWBREG BROOK SHOWING OBSTRUCTIONS

FISH POPULATIONS

Species Present: Brook trout (sea run).

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

Year

First fish

Last fish

Week of
peak run

Accessibility to Anglers: Accessible only by boat

Surveys: None to date

Redd Counts: None to date.

References:

LIVERPOOL BROOK

Location: 49°13'30" N. 58°07'25" W. North Arm, Bay of Islands.

Map Reference: Bay of Islands. 12 G/1 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 24.8 miles², (64.23 km²). Mean width, 2.8 miles, (4.50 km).

Perimeter, 27.6 miles, (44.40 km). Axial length, 9.0 miles, (14.48 km).

Maximum basin relief, 2,315 feet, (705.61 m).

Geology:

About half basic intrusive rocks with the remainder consisting of ultrabasic and Ordovician volcanic.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
----	--------------------------	------------------------	------------------	------------	---	------------	--------------------------

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout (sea run).
No angling data available on this stream

Gene Frequency: Not completed

Timing of Run

YearFirst fishLast fishWeek of
peak run

Accessibility to Anglers: Accessible only by boat.

Surveys: None to date

Redd Counts: None to date

References:

Falls (complete) _____
Falls (partial) _____
Section _____
Tributary _____
Road _____

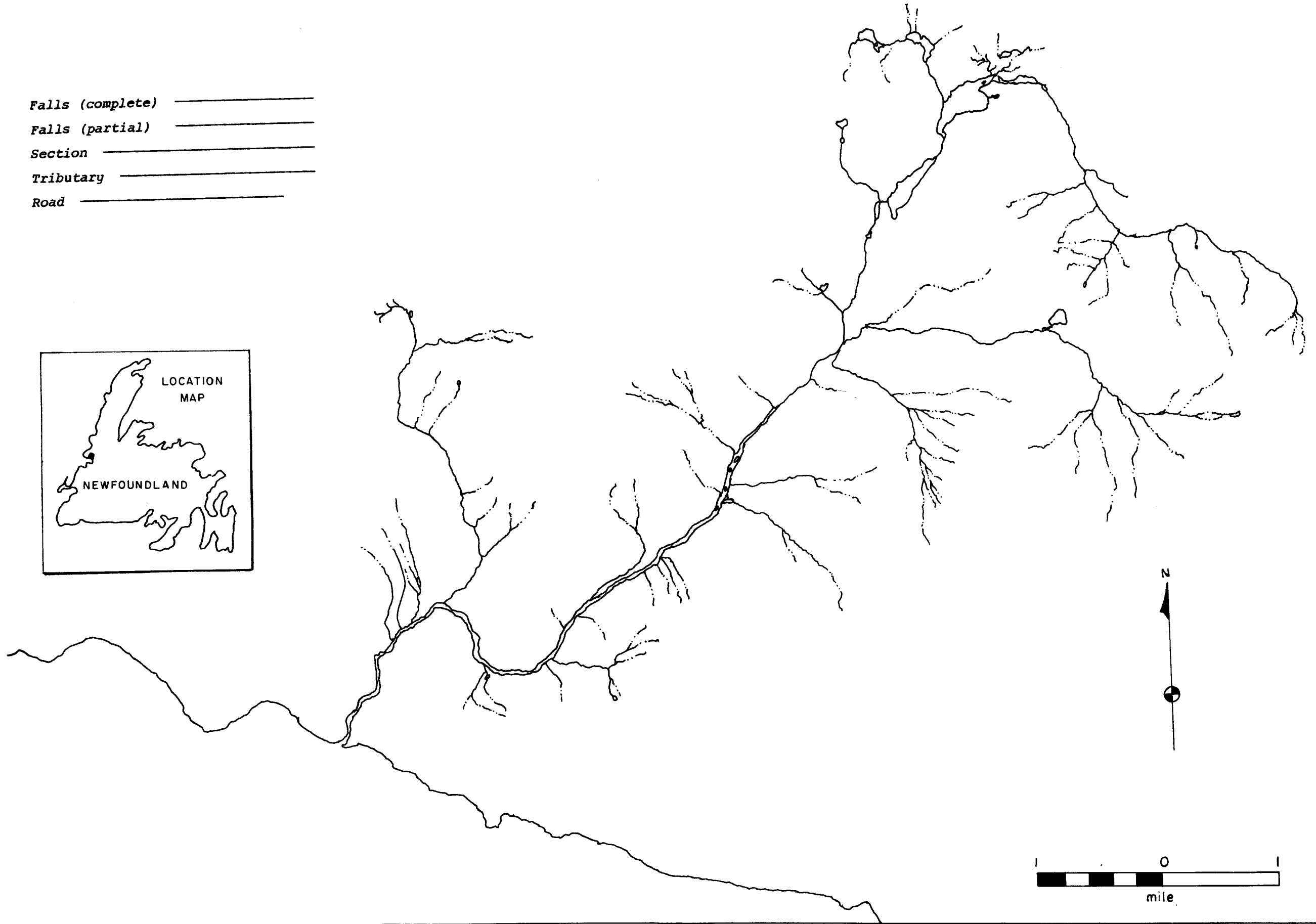
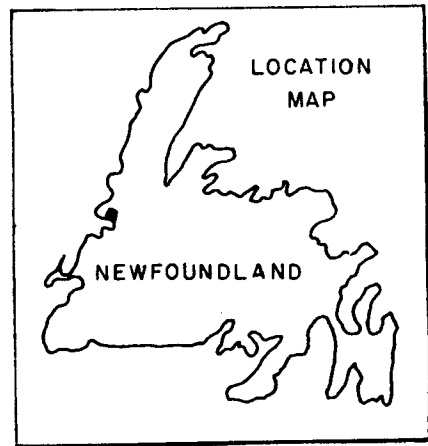


FIG. 29 OUTLINE MAP OF LIVERPOOL BROOK SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

LOWER CRABB BROOK

Location: 49°14'00" N. 58°11'38" W. North Arm, Bay of Islands.

Map Reference: Bay of Islands. 12 G/1 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 32.0 miles², (82.88 km²). Mean width, 3.3 miles, (5.30 km).

Perimeter, 34.9 miles, (56.15 km). Axial length, 11.4 miles, (18.34 km).

Maximum basin relief, 2,251 feet, (686.10 m).

Geology:

About equal amounts of basic intrusive rocks and Ordovician volcanic.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μ mhos/cm)	ppm.	ppm.

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout (sea run).

No angling data available on this stream. Atlantic salmon escapement estimated to be relatively low.

Gene Frequency: Not completed

Timing of Run:

Year

First fish

Last fish

Week of
peak run

Accessibility to anglers: Accessible only by boat.

Surveys: None to date

Redd Counts: None to date

References:

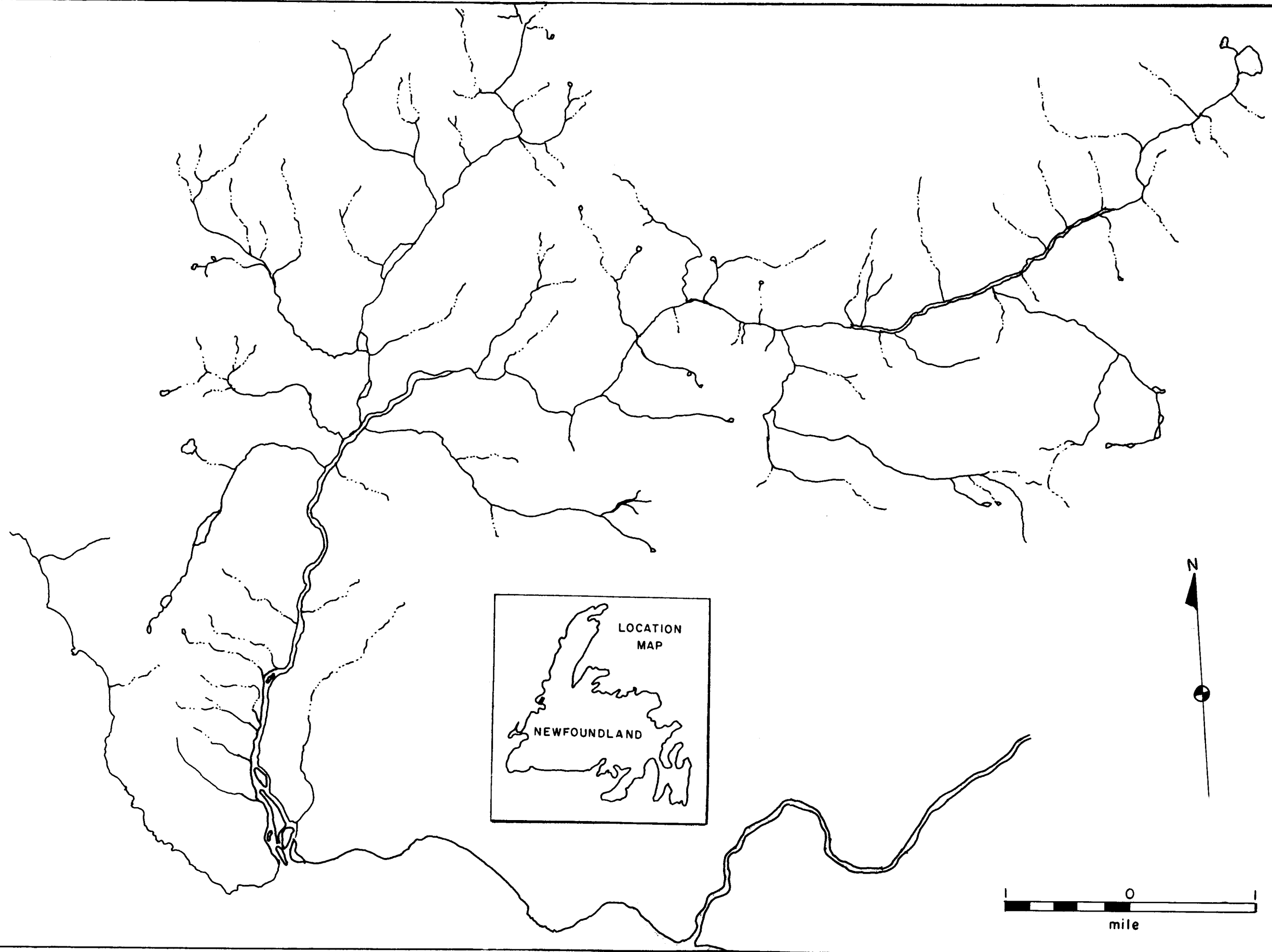


FIG. 30 OUTLINE MAP OF LOWER CRAB BROOK SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

GREGORY RIVER

Location: 49°22'25" N. 58°13'45" W.
 Map Reference: Trout River. 12 G/8 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 52.4 miles², (135.71 km²). Mean width, 3.8 miles,
 (6.11 km).
 Perimeter, 41.5 miles, (66.77 km). Axial length, 10.8 miles,
 (17.37 km).
 Maximum basin relief, 2,100 feet, (640.08 m).

Geology:

Predominantly gneiss with some Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

FISH POPULATIONS

Species Present:

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run

Year

First fish

Last fish

Week of
peak run

Accessibility to Anglers:

Surveys: None to date

Redd Counts: None to date

References:

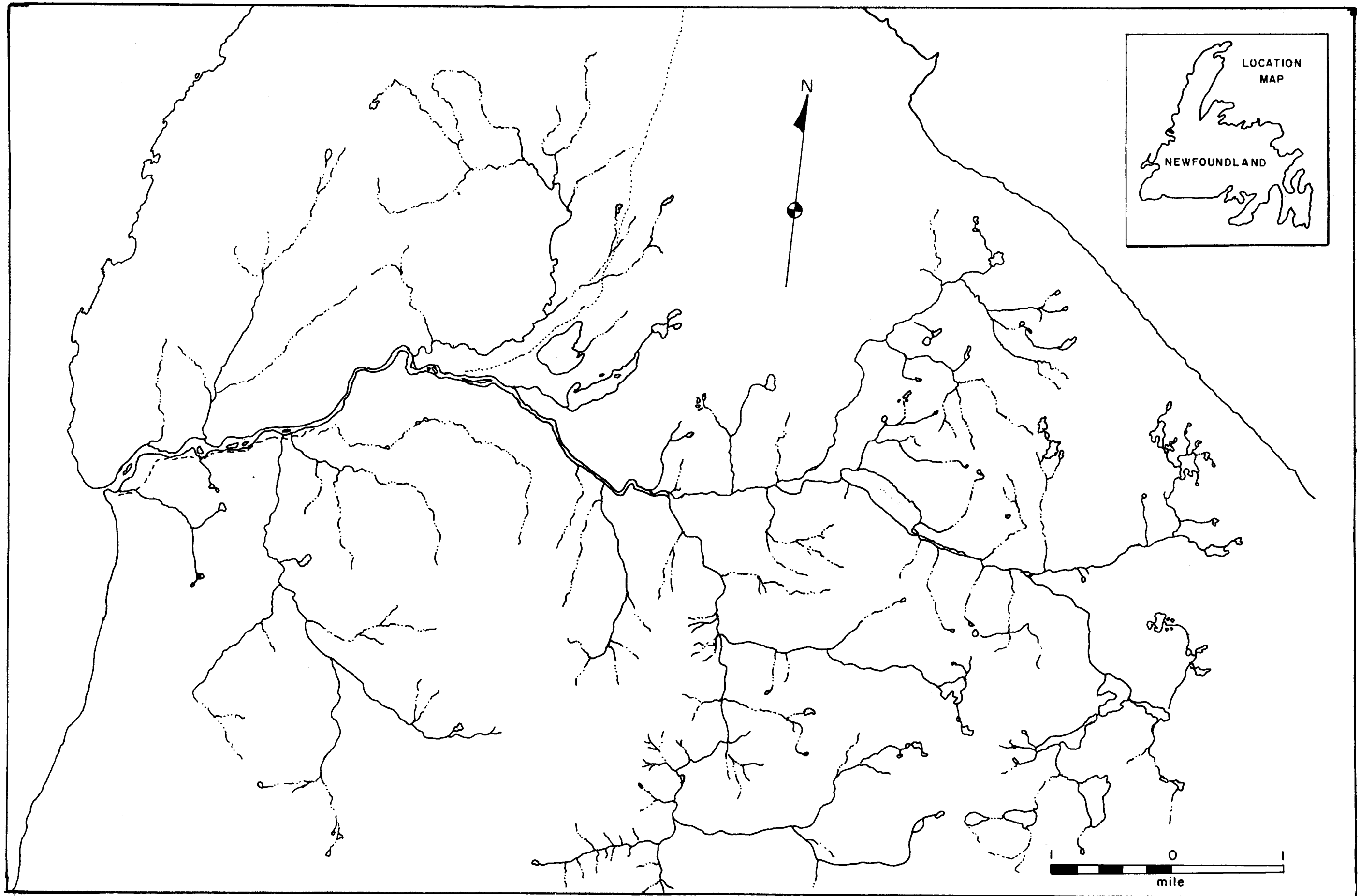


FIG. 31 OUTLINE MAP OF GREGORY RIVER SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

TROUT RIVER

Location: 49°28'50" N. 58°08'00" W. Trout River Bay.
 Map Reference: Trout River. 12 G/8 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 98.2 miles², (254.33 km²). Mean width, 4.4 miles,
 (7.07 km).
 Perimeter, 66.7 miles, (107.32 km). Axial length, 20.7 miles,
 (33.30 km).
 Maximum basin relief, 2,333 feet, (711.09 m).

Geology:

Predominantly Ordovician sedimentary with the remainder
 consisting of ultrabasic intrusive rocks and basic intrusive
 rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
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FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Trout River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	123	60	189	85.8	15	160	72.6	75	349	158.4
1953	218	53	194	88.1	35	336	152.5	88	530	240.6
1954	174	25	99	44.9	15	181	82.2	40	280	127.1
1955	312	50	187	84.9	14	127	57.7	64	314	142.6
1956	-	95	389	176.6	18	152	69.0	113	541	245.6
1957	288	98	376	170.7	30	267	121.2	128	643	291.9
1958	922	58	217	98.5	18	175	79.5	76	392	178.0
1959	513	20	66	30.0	11	123	55.8	31	189	85.8
1960	128	21	77	35.0	6	76	34.5	27	153	69.5
1961	173	32	124	56.3	11	115	52.2	43	239	108.5
1962	364	46	143	64.9	10	95	43.1	56	238	108.0
1963	168	46	210	95.3	27	251	114.0	73	461	209.3
1964	212	24	114	51.8	65	566	257.0	89	680	308.8
1965	158	14	66	30.0	52	420	190.7	66	486	220.7
1966	109	8	40	18.2	24	181	82.2	32	221	100.4
1967 ¹	139	3	12	5.4	10	95	43.1	13	107	48.5
1968	80	4	15	6.8	16	126	57.2	20	141	64.0
1969	45	9	28	12.7	-	-	-	9	28	12.7
1970	101	4	12	5.4	-	-	-	4	12	5.4
1971	No report									
1972	27	1	4	1.8	-	-	-	1	4	1.8
1973	81	3	9	4.1	1	9	4.1	4	18	8.2
1974										
1975										
1976										
1977										
MEAN										
1964-68	140	11	49	22.2	33	278	126.0	44	327	148.5
1969-70										
1972-73	64	4	13	6.0	0.2	2	0.9	4	15	6.8

¹Angling data 1964-73 is incomplete.

POTENTIAL POPULATION ESTIMATION

Estimated Atlantic salmon smolt production and adult sea survival, Trout River and tributaries. (Estimated from topographic map only).

If smolt production per 100 yds ² (83.7 meters ²) is:		<u>1</u>	<u>2</u>	<u>3</u>
Smolts produced		2650	5300	7950
Adult return if sea survival is:	5%	133	265	398
	10%	265	530	795
	15%	398	795	1193
	20%	530	1060	1590
	25%	663	1325	1988

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics 1966-1969)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 26 - July 2	September 8 - 15	July 6 - 13 (1968)

Accessibility to Anglers:

The lake is accessible along road which runs through settlement of Trout River. Extreme upper section only accessible by boat.

Surveys: None to date.

Redd Counts: None to date.

References:

MIDDLE BROOK

Location: 49°26'08" N. 57°53'15" W. South Arm, Bonne Bay.
 Map Reference: Lomond. 12 H/5 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Geology:

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

FISH POPULATIONS

Species Present: Arctic char.

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

LOMOND RIVER

Location: $49^{\circ} 25' 50''$ N. $57^{\circ} 44' 00''$ W. East Arm, Bonne Bay.

Map Reference: Lomond. 12 11/5 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 181.3 miles² (469.56 kilometers²). Mean width, 6.6 miles (106.19 kilometers).

Perimeter, 84.4 miles (135.79 kilometers). Axial length, 14.0 miles, (22.52 kilometers).

Maximum basin relief, 2,200 feet (670.56 meters).

Geology: About half Ordovician sedimentary with the remainder consisting of about equal amounts of Cambrian sedimentary and gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Tributaries:

West Brook joins the main river on the left bank, approx. 2 miles (3.21 kilometers) upstream from the head of Bonne Bay Little Pond. Average width, 20 ft. (6.09 meters). Average depth, 1 ft. (0.3 meter). Velocity, moderate. Bottom type, mostly coarse gravel with some rubble and small boulders.

Longs Brook, on the left bank of the river, approx. 3 miles (4.82 kilometers) upstream from the head of Bonne Bay Little Pond. Width, 10 to 20 ft (3.04 to 6.08 meters). Depth, 15 in. (.38 meters). Velocity, moderate. Bottom type, coarse gravel, small and large boulders and some bedrock.

Wagtail Brook, on the left bank of the river, approx. 5 miles (8.04 kilometers) the head of Bonne Bay Little Pond. Width, 2 to 6 ft. (.60 to 1.82 meters). Depth, shallow. Velocities, sluggish. Bottom type, mud, fine gravel and bedrock.

Whitewash Brook, situated on the southwest side of Bonne Bay Big Pond about 3 miles (4.82 kilometers) from Bonne Bay Big Pond dam. Width, approx. 10 ft. (3.04 meters). Depth, shallow. Velocities, range from sluggish to rapid. Bottom type, fine and coarse gravel and rubble all covered with a layer of fine white clay.

Sand Bar Brook, situated on the south side of Bonne Bay Big Pond, approx. 6 miles (9.65 kilometers) from the dam. Width, 10 to 15 ft. (3.04 - 4.57 meters). Depth, 6 inches to 3 ft. (.15 meters to .91 meters). Velocities, swift. Bottom type, coarse gravel, rubble and small boulders.

Grindstone Brook, situated on the southeast side of Bonne Bay Big Pond approx. 5 miles (8.04 kilometers) from the dam. Width, 10 to 15 ft. (3.04 - 4.57 meters). Depth, 6 to 12 in. (.15 to .30 meters). Velocity, moderate to swift. Bottom type, mud, coarse gravel, rubble and small boulders.

White Hill Brook, situated on the east side of Bonne Bay Big Pond, about 4 miles (6.43 kilometers) by road from the dam. The highroad crosses the brook just above Big Pond. Width, 20 to 30 ft. (6.09-9.14 meters). Depth, 6 in. to 6 ft. (.15 to 1.82 meters). Velocities, sluggish to swift. Bottom type, fine and coarse gravel and small boulders.

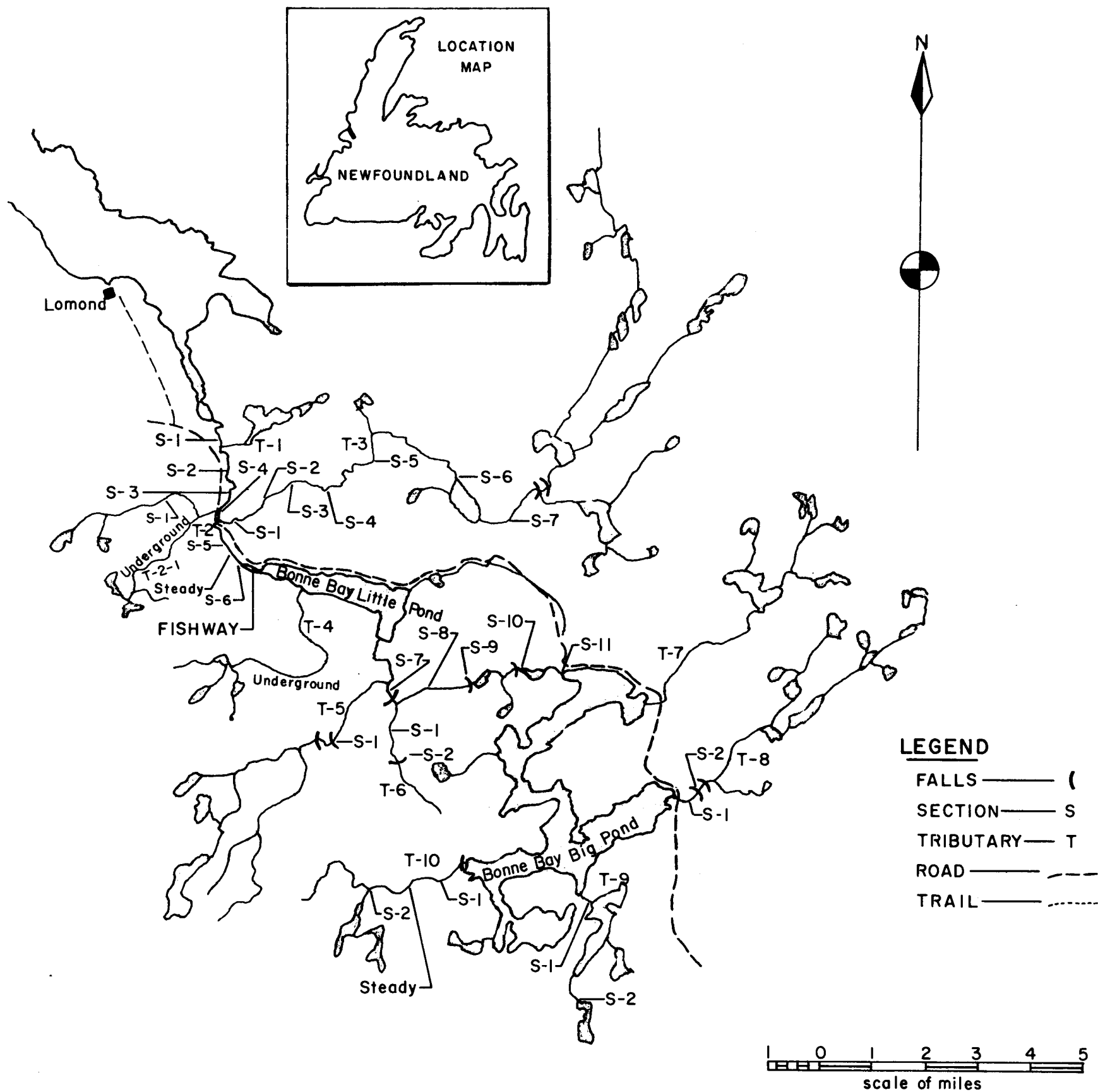


FIG. 32 OUTLINE MAP OF LOMOND RIVER SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

Barriers to Fish Migration:

Obstructions, Lomond River, Main Stem and tributaries

	Type of Obstruction	Distance from mouth (mi.) (kilometers)	Description	Degree of Obstruction
Main River	Falls	1.9 miles (3.05 kilometers)	12' (3.65 meters), 150' long (45.72) at 50°	Poaching problem at low water
Main River	Falls	10 miles (16.09 kilometers)	5'-8' (1.52-2.43 meters)	No apparent holdup.
T-1	Runs underground	0.0	Riverbed completely dry	Complete
T-2-1	Runs underground	0.0	Riverbed completely dry	Complete
T-3	Falls	8.5 mi. (13.67 kilometers)	50' (15.24 meters) high vertical	Complete
T-3	Falls	9.0 mi. (14.48 kilometers)	30' (9.14 meters)	Complete
T-4	Runs underground	0.0 kilometer	1st mi. (1.60 kilometers) of riverbed dry.	Complete
T-5	Falls	1.7 mi. (2.73 kilometers)	30' (9.14 meters) high vertical	Complete
T-5	Falls	2.3 mi. (3.70 kilometers)	20' (6.09 meters) high vertical	Complete
T-6	Falls	0.8 mi (1.28 kilometers)	20' (6.09 meters) high vertical	Complete
T-7	Runs underground	0.0	1st mi. (1.60 kilometer) of stream underground	Complete
T-8	Falls	0.8 mi. (1.28 kilometers)	15' (4.57 kilometers) high, sloping 50°	Passable
T-8	Falls	1.0 mi. (1.60 kilometers)	30' (9.14 meters) high, sloping 80°	Complete
T-10	Falls	0.0	12'-15' (3.65-4.57 kilometers) high, sloping 50°	Passable

NOTE: Gates in logging dams are open and pose little or no holdup to salmon.

Falls at mile 3.2 (5.14 km), outlet of Bonne Bay little pond, run around built 1948, did not function well. Fishway (pool and weir type) construction 1960, improvements made in 1961 and 1962.

Concrete floor placed in bottom pool of fishway, 1965; concrete baffle installed 1966; entrance removed and floors of concrete poured in all pools in 1969; new entrance installed in 1970; general repairs and clean out in 1971.

The fishway appeared to be operating well in 1963, but the count was low. It is assumed that the major portion of the run spawns below the falls or use the East River tributary. Glory Hole Falls, run around built by F.R.B.C. in 1948, did not work well. A partly successful attempt to divert water from Glory Hole in 1971, more work required.

Photographs on file; Nos. 104, 107, 108, 236, 282, 310, 312, 315, 316, 599, 602, 653, 660, 349, 368, 468, 469, 920.

Water Quality Data, Lomond River (East Brook) Sampled May 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
6.45	5.0	11.0	1.7	5.0	26.0	2.5	6.1

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Lomond River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	545	194	695	315.5	44	360	163.4	238	1055	478.9
1953	359	93	302	137.1	22	185	84.0	115	487	221.1
1954	423	81	261	118.5	27	247	112.1	108	508	230.6
1955	448	113	375	170.3	12	117	53.1	125	492	223.4
1956	-	130	410	186.1	28	264	119.9	158	674	306.0
1957	254	116	347	157.5	14	128	58.1	130	475	215.6
1958	359	144	452	205.2	32	307	139.4	176	759	344.6
1959	419	196	751	341.0	65	578	262.4	261	1329	603.4
1960	503	124	406	184.3	28	298	135.3	152	704	319.6
1961	403	160	547	248.3	33	269	122.1	193	816	370.4
1962	778	201	627	284.7	32	270	122.6	233	897	407.3
1963	811	320	1251	568.0	32	272	123.5	352	1523	691.5
1964 ¹	971	349	1366	620.2	24	233	105.8	373	1599	726.0
1965	170	292	1119	508.0	50	439	199.3	342	1558	707.3
1966	347	229	943	428.1	61	511	232.0	290	1454	660.1
1967	568	217	826	375.0	21	185	84.0	238	1011	459.0
1968	454	202	714	324.2	3	27	12.3	205	741	336.5
1969	391	147	457	207.5	5	33	15.0	152	490	222.5
1970 ²	457	145	554	251.5	29	212	96.2	174	766	347.7
1971	217	54	177	80.4	1	7	3.2	55	184	83.6
1972	1648	252	882	400.4	35	326	148.0	287	1208	548.4
1973	1168	278	947	429.9	43	322	146.2	321	1269	576.1
1974										
1975										
1976										
1977										
MEAN										
1964-68	502	258	994	451.1	32	279	126.7	290	1273	577.8
1969-73	776	175	603	273.9	23	180	81.7	198	783	355.7

¹Angling data 1964-69 estimated to be 65% accurate (J. Marshall, personal communication).

²Angling data 1970-73 estimated to be 80-85% accurate (J. Marshall, personal communication).

Summary Fishway Counting Trap Data, Lomond River

Year	Grilse	Salmon	Total No. Fish
	Under 6 lbs. (2.7 kilograms)	6 lbs. (2.7 kilograms) and over	
1962	10	2	12
1963	44	5	49
1964	28	3	31
1965	24	-	24
1966	18	4	22
1967	1	1	2
1968	-	-	-
1969	-	-	-
1970	-	-	-
1971	6	-	6
1972	28	14	42
1973	108	110	218
1974			
1975			
1976			
1977			

NOTE: 12 fish counted through in 1969, after removal of two lower pools and alterations to fishway.

POTENTIAL POPULATION ESTIMATION

Estimated Atlantic salmon smolt production and adult sea survival -
Lomond River and tributaries below obstruction.

If smolt production
per 100 yds² (83.7 meters²) is:

<u>1</u>	<u>2</u>	<u>3</u>
2550	5100	7650

Smolts produced

Adult return if sea survival is:	5%	128	255	383
	10%	255	510	765
	15%	383	765	1148
	20%	510	1020	1530
	25%	638	1275	1713

Estimated Atlantic salmon smolt production and adult sea survival -
Lomond River and tributaries above fishway:

If smolt production per 100 yds ² (83.7 meters ²) is:				
		1	2	3
		1553	3106	4659
<u>Smolts produced:</u>				
Adult return if sea survival is:	5%	78	155	233
	10%	155	311	466
	15%	233	466	699
	20%	311	622	932
	25%	388	777	1165

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics 1966-1969)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 15 - 21	September 1 - 10	July 6 - 20 (1968)

Accessibility to Anglers:

Accessible by foot and car with furthest distance from road being approximately 1 mile (1.61 kilometers). The local road to Bonne Bay crosses and runs parallel to stream along several sections.

Surveys: None to date.

Redd Counts: 1970, 34 redds observed on main river, and 55 redds observed on East Branch.

References:

Anonymous: Summary of Stream Obstructions. MS report, Fisheries Service, St. John's, Newfoundland.

Anonymous: Counting Fence and Counting Trap Data, 1961-1965. MS report, Fisheries Service, St. John's, Newfoundland.

Riche, L. G. & G. R. Traverse - 1971.

River Investigations 1969-1970 - An Inventory - MS report, Fisheries Service, St. John's, Newfoundland.

DEER ARM BROOK

Location: 49°34'00" N. 57°50'20" W. Deer Arm, Bonne Bay.
 Map Reference: Gros Morne. 12 H/12 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 48.5 miles², (125.61 km²). Mean width, 4.0 miles,
 (6.43 km).
 Perimeter, 36.7 miles, (59.05 km). Axial length, 10.4 miles,
 (16.73 km).
 Maximum basin relief, 2,300 feet, (701.04 m).

Geology:

About half Ordovician sedimentary with the remainder consisting
 of Cambrian sedimentary and Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration: Nil.

Photographs on file; Nos.

Water Quality Data, Sample Collected May 1972.

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Summary, angling data, Deer Arm Brook, Bonne Bay.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1968	410	35	140	63.6	11	72	32.7	46	212	96.3
1972 ¹	145	36	118	53.6	-	-	-	36	118	53.6
1973	79	9	31	14.1	-	-	-	9	31	14.1
1974										
1975										
1976										
1977										
MEAN										
1972-73	112	23	75	34.1	-	-	-	23	75	34.1

POTENTIAL POPULATION ESTIMATIONEstimated Atlantic salmon smolt production and adult sea survival, Deer Arm Brook.²

If smolt production per

100 yds² (83.7 meters²) is:

	<u>1</u>	<u>2</u>	<u>3</u>
	1675	3350	5025

Smolts produced

Adult return if sea survival is:	Smolts produced			
	5%	10%	15%	
5%	84	168	251	251
10%	168	335	503	503
15%	251	503	754	754
20%	335	670	1005	1005
25%	419	838	1256	1256

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics 1968)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
1968	July 14 - 20	August 25 - 31	August 3 - 10 (1968)

¹ Angling data is incomplete.² Estimates are from topographic maps only.

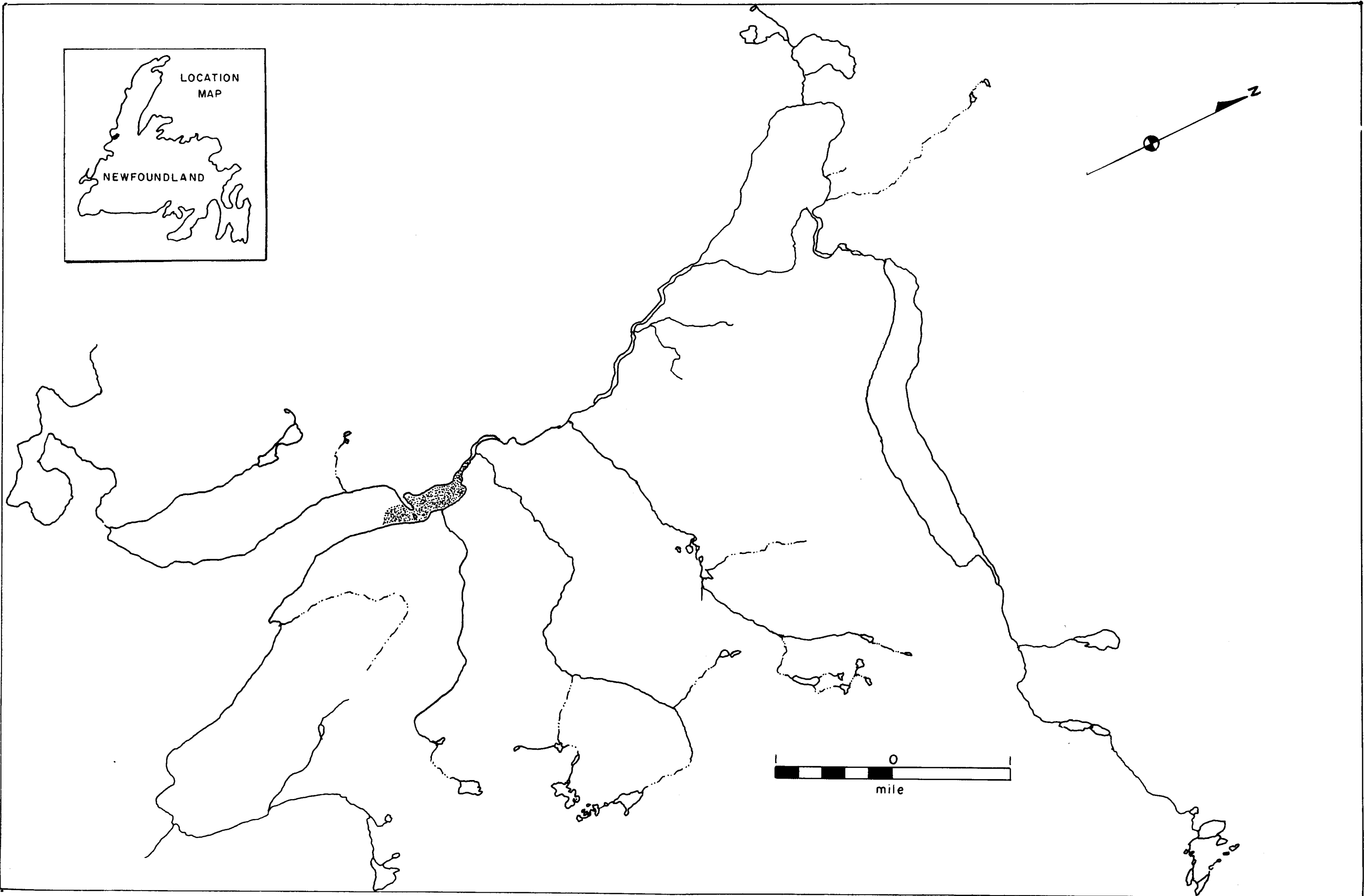


FIG. 33 OUTLINE MAP OF DEER BROOK SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

Anononyous: Nfld. Dept. Nat. Res. 1943. Res. Bull. No. 12.
St. John's, Newfoundland.

BAKERS BROOK

Location: 49°39'25" N. 57°57'45" W.
 Map Reference: Gros Morne, 12 H/12 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 54.3 miles², (140.64 km²). Mean width, 3.3 miles, (5.30 km).

Perimeter, 42.1 miles, (67.73 km). Axial length, 14.9 miles, (23.99 km).

Maximum basin relief, 2,615 feet, (797.05 m).

Geology:

About half gneissis with the remainder consisting of Ordovician sedimentary and Cambrian sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected May 1972

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
6.82	7.0	15.0	2.4	5.5	32.0	2.8	8.4

FISH POPULATIONS

Species Present:

No angling data available on this stream.

Potential Population Estimation

Estimated Atlantic salmon smolt production and adult sea survival -
Bakers Brook . (Estimated from topographic map only).

If smolt production per 100 yds ² (83.7 meters ²) is:		<u>1</u>	<u>2</u>	<u>3</u>
Smolts produced		3150	6300	9450
Adult return if sea survival is:	5%	158	315	473
	10%	315	630	945
	15%	473	945	1418
	20%	630	1260	1890
	25%	788	1275	2363

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

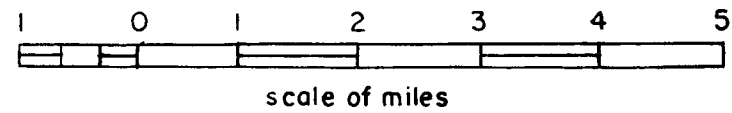
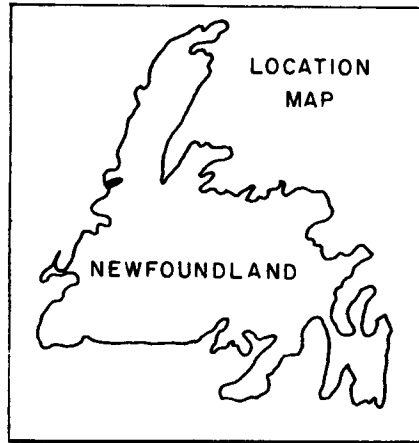


FIG. 34 OUTLINE MAP OF BAKER'S BROOK SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED

WESTERN BROOK

Location: 49°49'35" N. 57°51'30" W. South of St. Paul's Bay.
 Map Reference: St. Paul's Inlet. 12 H/3 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 74.1 miles², (191.91 km²). Mean width, 4.2 miles,
 (6.75 km).

Perimeter, 56.7 miles, (91.23 km). Axial length, 14.5 miles,
 (23.34 km).

Maximum basin relief, 2,615 feet, (797.05 m).

Geology:

Predominantly gneiss with some Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Falls 6 feet to 8 feet high, (1.82-2.43 m.); partial obstruction.

Photographs on file; Nos.

Water Quality Data, Sample Collected May 1972.

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH	6.0	12.0	3.0	5.5	31.0	2.5	7.3

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Western Brook.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1954	12	-	-	-	-	-	-	-	-	-
1955	66	3	13	5.9	-	-	-	3	13	5.9
1956	-	8	32	14.5	3	32	14.6	11	64	29.1
1957	54	2	10	4.5	3	24	10.9	5	35	15.4
1958	52	20	88	40.0	18	146	66.2	38	234	106.2
1959	175	68	308	139.8	6	52	23.6	74	360	163.4
1960	82	18	83	37.7	29	246	111.7	47	329	149.4
1961	181	36	147	66.7	32	281	127.6	68	428	194.3
1962	37	16	49	22.2	5	48	21.8	21	97	44.0
1963	87	54	220	99.9	31	263	119.4	85	483	219.3
1964 ¹	73	79	330	149.8	34	303	137.6	113	633	287.4
1965	79	59	233	105.8	35	332	150.7	94	565	256.5
1966	50	32	144	65.4	29	294	133.5	61	438	198.9
1967	69	44	185	83.9	27	268	121.8	71	453	205.7
1968	47	24	97	44.0	17	151	68.6	41	248	112.6
1969	86	102	365	165.7	64	569	258.3	166	934	424.0
1970	140	61	221	100.3	19	188	85.4	80	409	185.7
1971	123	74	280	127.1	26	236	107.2	100	516	234.3
1972	98	61	223	101.2	27	237	107.6	88	460	208.8
1973	101	53	179	81.3	16	147	66.7	69	326	148.0
1974										
1975										
1976										
1977										
MEAN										
1964-68	64	48	198	89.8	28	270	122.4	76	467	212.0
1969-73	110	70	254	115.1	30	275	125.0	101	529	240.2

¹Angling data 1964-73 estimated to be 85% accurate (J. Marshall, personal communication).

LEGEND

- FALLS ——— (
- SECTION ——— S
- TRIBUTARY ——— T
- ROAD ——— ~~~~~
- TRAIL ——— ·····



FIG. 35 OUTLINE MAP OF WESTERN BROOK SHOWING OBSTRUCTION LOCATIONS

POTENTIAL POPULATION ESTIMATION

Estimated Atlantic salmon smolt production and adult sea survival, Western Brook.¹

If smolt production
per 100 yds² (83.7 meters²) is:

	1	2	3
	2000	4000	6000

Smolts produced

Adult return if sea survival is:	5%	100	200	300	
	10%	200	400	600	
	15%	300	600	900	
	20%	400	800	1200	
	25%	500	1000	1500	

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics 1969, 1967, 1966)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-67; 1969	June 20 - 26	September 4 - 10	-

Accessibility to Anglers:

Great Northern Peninsula Highway crosses river approximately 0.25 miles (0.40 kilometers) from mouth. Not otherwise accessible only by foot.

Surveys: None to date.

Redd Counts: None to date.

References:

¹ Estimates are from topographic maps only.

ST. PAUL'S RIVER

Location: 49°49'18" N. 57°39'50" W. St. Paul's Inlet.
 Map Reference: St. Paul's Inlet. 12 H/13 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 30.1 miles², (77.96 km²). Mean width, 3.1 miles,
 (4.98 km).
 Perimeter, 30.3 miles, (48.75 km). Axial length, 8.3 miles,
 (13.35 km).
 Maximum basin relief, 2,400 feet, (731.52 m).

Geology:

Gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
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FISH POPULATIONS

Species Present:

No angling data available on this stream.

Gene Frequency: Not completed

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date

Redd Counts: None to date

References:

STANFORD RIVER

Location: 49°57'00" N. 57°45'35" W. Shallow Bay.
 Map Reference: St. Paul's Inlet. 12 H/13 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 8.7 miles², (22.53 km²). Mean width, 2.1 miles,
 (3.37 km).
 Perimeter, 11.9 miles, (19.14 km). Axial length, 4.0 miles,
 (6.43 km).
 Maximum basin relief, 450 feet, (137.16 m).

Geology:

Gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μ mhos/cm)	ppm.	ppm.

FISH POPULATIONS

Species Present:

No angling data available on this stream.

LEGEND

- FALLS ——— (
- SECTION ——— S
- TRIBUTARY ——— T
- ROAD ——— - - - - -
- TRAIL ——— - - - - -

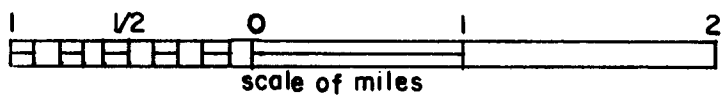
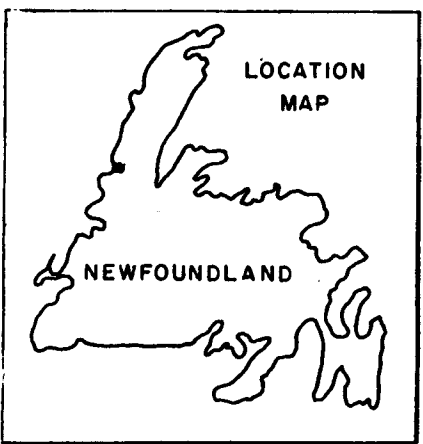


FIG 36 OUTLINE MAP OF STANDFORD RIVER SHOWING OBSTRUCTIONS

Gene Frequency: Not completed

Timing of Run:

Year

First fish

Last fish

Week of
peak run

Accessibility to Anglers:

Surveys: None to date

Redd Counts: None to date.

References:

PARSONS POND RIVER

Location: 50°01'58" N. 57°43'40" W.
 Map Reference: Portland Creek. 12 1/4 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 150.0 miles², (388.50 km²). Mean width, 7.4 miles,
 (11.90 km).
 Perimeter, 65.0 miles, (104.58 km). Axial length, 17.2 miles,
 (27.67 km).
 Maximum basin relief, 2,283 feet, (695.85 m).

Geology:

About equal amounts of Ordovician sedimentary and gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μ mhos/cm)	ppm.	ppm.

FISH POPULATIONS

Species present: Atlantic salmon, sea run Arctic char, eastern brook trout

Atlantic Salmon Angling Record - Parsons Pond River.

Year	Rod Days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1953	42	3	15	6.8	1	10	4.5	4	25	11.3
1954	32	-	-	-	-	-	-	-	-	-
1955	22	-	-	-	2	16	7.3	2	16	7.3
1956	-	4	16	7.3	-	-	-	4	16	7.3
1957	46	12	45	20.4	5	38	17.3	17	83	37.7
1958	12	9	44	20.0	4	34	15.4	13	78	35.4
1959	40	7	35	15.9	13	123	55.8	20	158	71.7
1960	64	3	10	4.5	2	16	7.3	5	26	11.8
1961	14	-	-	-	2	16	7.3	2	16	7.3
1962	38	8	32	14.5	2	14	6.4	10	46	20.9
1963	60	20	93	42.2	-	-	-	20	93	42.2
1964	92	63	270	122.6	14	118	53.6	77	388	176.2
1965	51	88	392	178.0	21	157	71.3	109	549	249.3
1966	65	32	150	68.1	9	68	30.9	41	218	99.0
1967	72	20	90	40.9	12	101	45.9	32	191	86.8
1968 ¹	31	15	67	30.4	1	10	4.5	16	77	34.9
1969	No report									
1970	No report									
1971	96	1	3	1.4	-	-	-	1	3	1.4
1972	27	1	3	1.4	-	-	-	1	3	1.4
1973	20	7	24	10.9	1	10	4.5	8	34	15.4
1974										
1975										
1976										
1977										
MEAN										
1964-68	62	44	194	88.0	11	91	14.2	55	25	11.4
1971-83	29	3	10	4.5	0	3	1.4	3	13	6.0

¹Angling data 1968-73 estimated to be 75% accurate (J. Marshall, personal communication).

Gene Frequency: Not completed.

Timing of Run:

	<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
.	Average 1966-1968	June 23-29	Sept. 1-7	Aug. 31-Sept. 7 ('68)

Accessibility to Anglers: This area is made up of three brooks flowing into a large basin, all brooks are accessible by boat.

Surveys: None to date

Redd Counts: None to date

References:

PORTLAND CREEK

Location: $50^{\circ} 10' 50''$ N. $57^{\circ} 36' 28''$ W. Near Daniel's Harbour.

Map Reference: Portland Creek. 12 1/4 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 380.4 miles² (985.24 kilometers²). Mean width, 13.2 miles (21.23 kilometers).

Perimeter, 109.3 miles (175.86 kilometers). Axial length, 26.2 miles (42.15 kilometers).

Maximum basin relief, 2,421 feet (737.92 meters).

Geology: About equal amounts of Ordovician sedimentary and gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics: Length of all streams in system, not including standing water, is 120 miles, (193.08 kilometers).

Main river, from mouth to Portland Creek Pond (1 mile section), (1.6 kilometers). Depth range, 2 to 6 ft. (.60 to 1.82 meters).

Width range, 300 to 400 ft. (91.44-121.92 meters). Velocity, medium. Bottom types, fine sand - 6%, rubble - 46%, boulder - 46%, gravel - 2%.

Portland Creek Pond: Largest water surface area on the system. Estimated depth, 10 - 50 ft. (3.04 - 15.24 meters). Bottom type, sand with small sections of mud and rock.

Inner Pond: Six mile (9.65 kilometers) long body of water adjoins Portland Creek Pond. Situated between two mountain ridges which rise almost vertically from the shoreline to a height of 1,000 (304.8 meters) to 2,000 (609.60 meters).

Soundings in the northwest end showed a depth of over 100 ft. (30.48 meters).

Main Port Brook: Originates on the slopes of the Long Range Mountains, it flows through a valley bordered by 2,000 ft. (609.80 meters) high mountain ranges and empties into the southeast corner of Inner Pond. Width range 300 ft. (91.44 meters) near mouth to narrow farther upstream. Depth range 1 to 3 ft. (.15 to .91 meters). Velocity, medium, to fast in the lower section to swift further upstream. Bottom type, boulder and rubble in lower section with bedrock and boulder upstream.

Brian's Feeder, flows into the south end of Portland Creek Pond: Length of streams, 50 miles (80.45 kilometers). Basin area, 130 miles² (336.7 kilometers²). Near the mouth is slow moving over rubble and gravel bottom. It then passes for 300 yards (274.32 meters) between high banks bordered by large boulders. Depth range 3 to 6 ft. (.91 to 1.82 meters) affording excellent fishing pools.

Between mile points 0.2 and 0.5 (.32 and .80 kilometers) velocity turbulent over falls and rapids. Bottom type, mostly bedrock. Some small pools and steadies in this section.

Between mile points 0.5 and 1.0 (.80 and 1.60 kilometers) fast stream over bedrock and boulders.

Above mile point 1.0 (1.60 kilometers) velocity slow. River widens into steadies and pools.

South West Feeder, flow into the southwest corner of Portland Creek Pond, this tributary is considered the most important stream on the system.

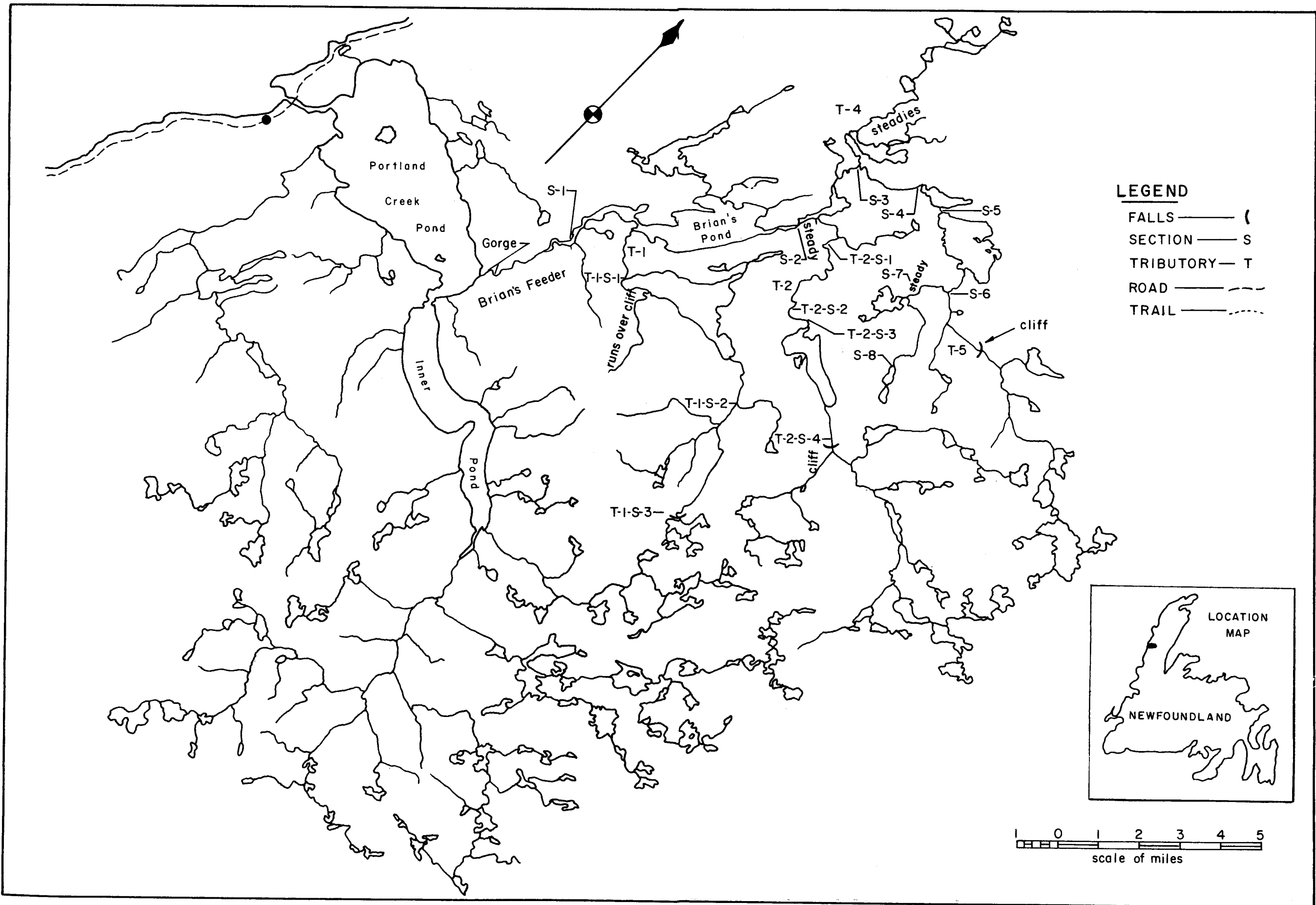


FIG. 37 OUTLINE MAP OF PORTLAND CREEK SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED ON BRIAN'S FEEDER.

From mouth to mile point 0.75 (1.20 kilometers), depth range, 2 - 5 ft (.6-1.52 meters). Bottom type, gravel and sand covered by a thin layer of rubble. Width range, estimated 75 to 100 ft. (22.86 to 30.48 meters). Several good fishing ponds in this section.

Between mile points 1 and 2 (1.609 - 3.21 kilometers) velocities, swift. Several rapid areas and steep pools were noted in this section.

Between mile points 2 and 3 (3.21 and 4.82 kilometers) velocities, swift. Falls and rapids cause increased velocity and turbulence. Many resting pools in this section.

Between mile points 3 and $4\frac{1}{2}$ (4.82 and 7.24 kilometers) velocity, medium over rubble and gravel bottom.

Between mile point $4\frac{1}{2}$ and mile point 5 (7.24 and 8.04 kilometers). River flows through narrow gulch having vertical rock walls and river bottom of bedrock and boulders.

Above mile point 5 (8.04 kilometers). Medium velocity over gravel bottom.

Sam Brown's Brook: This is a small trout stream, four miles (6.43 kilometers) long, having relatively little headwater storage.

Its single headwater pond drains marshland and flows slowly over mud and gravel bottom. Flow is reduced considerably during dry periods.

Spawning Areas:

Accessible Areas:

Main river, from mouth to Portland Creek Pond, one-quarter mile (0.4 kilometers) section suitable for spawning.

Brian's Feeder, at the mouth, has 150 ft. (45.72 meters) of river bottom suitable for spawning.

South West Feeder: The only significant available areas are reported to be located on this tributary where a possible 2 - 3 miles (3.21 - 4.82 kilometers) of stream is probably utilized.

Inaccessible Areas:

These include extensive stream on Brian's Feeder and Main Brook tributaries which is believed presently impossible to migrant fish.

Barriers to Fish Migration:

Main Port Brook, between mile points 2.8 and 5.0 (4.50 and 8.04 kilometers). Drop in elevation, 1,050 ft. (320.04 meters) numerous falls and rapids; complete obstruction.

Brian's Feeder, between mile points 0.2 and 0.5 (.32 and .80 kilometers) rapids and falls; complete obstruction: At upper end there is a falls with a height of 10 - 11 ft. (3.04 to 3.35 kilometers) at a 80° angle. Coupled with the height, an overhanging lip or jagged rock at the top presents an insurmountable barrier to migrating salmon.

South West Feeder, between mile points 2.4 and 3.0 (3.86 and 4.82 kilometers), section contains a rapids and three falls. All considered to be partial obstructions except the upper section "Puddle and Basin". During low water the local warden reports that salmon are held up at the foot of the falls to await suitable water levels. Fish are cut and bruised while attempting to surmount this obstruction. Rapids at mile point 4.8, (7.72 kilometers), fast turbulent water rushing through a long gorge; partial obstruction.

Photographs on file; Nos. 384, 386, 597, 598, 616, 977.

Miscellaneous Information:

Settlement of Portland Creek near mouth of river, pop. 1956-57
1961-73.

Water Qualith Data, Sampled May 1972

Ph	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Specific Conductance @ 25°C micromhos /cm	Ca ppm.	HCO ₃ ppm.
6.80	12.0	24.0	1.7	5.0	38.0	4.3	14.6

FISH POPULATIONS

Species present: Atlantic salmon, brook trout (resident and sea run), smelt,

Atlantic Salmon Angling Record - Portland Creek.

Year	Rod Days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	667	233	1011	459.0	193	1803	818.6	426	2814	1277.6
1953	536	327	1386	629.2	210	1787	811.3	537	3173	1440.5
1954	511	204	835	379.1	152	1610	730.9	356	2445	1110.0
1955	398	203	922	418.6	99	987	448.1	302	1909	866.7
1956	-	329	1274	578.4	95	840	381.4	424	2114	959.8
1957	508	449	1921	872.1	104	994	451.3	553	2915	1323.4
1958	707	658	2918	1324.8	267	2285	1037.4	925	5203	2362.2
1959	700	403	1783	809.5	206	1867	847.6	609	3650	1657.1
1960	728	325	1426	647.4	149	1466	665.6	474	2892	1313.0
1961	792	200	940	426.8	292	2562	1163.1	492	3502	1589.9
1962	739	230	997	452.6	128	1092	495.8	358	2089	948.4
1963	825	369	1587	720.5	258	2099	952.9	627	3686	1673.4
1964	780	455	2012	913.4	201	1737	788.6	656	3749	1702.0
1965	871	476	2063	936.6	237	1839	834.9	713	3902	1771.5
1966	1215	488	2040	926.2	180	1587	720.5	668	3627	1646.7
1967	1116	370	1538	698.3	141	1247	566.1	511	2785	1264.4
1968	876	259	1074	487.6	92	741	336.4	351	1815	824.0
1969	759	597	2344	1064.2	100	812	368.6	697	3156	1432.8
1970 ¹	650	223	982	445.8	35	265	120.3	258	1247	566.1
1971	984	378	1540	699.2	87	691	313.7	465	2231	1012.9
1972	417	49	200	90.8	7	58	26.3	56	258	117.1
1973	694	365	1488	675.6	69	615		434	2103	954.8
1974										
1975										
1976										
1977										
MEAN										
1964-68	972	410	1745	792.4	170	1426	647.4	580	3176	1441.9
1969-73	701	322	1311	595.1	60	796	361.3	382	1799	816.7

¹ Angling data 1970-1973 estimated to be 85% accurate. (J. Marshall, personal communication).

POTENTIAL POPULATION ESTIMATION

Estimated Atlantic salmon smolt production and adult sea survival
Brian's Feeder and tributaries above obstruction.

If smolt production
 per 100 yds² (83.7 meters²) is:

<u>1</u>	<u>2</u>	<u>3</u>
2855	5710	8565

Smolts produced

		5%	143	286	428
Adult return if sea survival is:	10%	285	571	857	857
	15%	428	857	1285	1285
	20%	571	1142	1713	1713
	25%	714	1428	2141	2141

Gene Frequency: Not Completed.

Timing of Run: (Based on angling statistics 1966-69)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 23 - 29	September 1 - 7	July 20 - 27 (1968)

Accessibility to Anglers:

Great Northern Peninsula Highway crosses stream approximately 0.25 miles (0.4 kilometers) from river mouth. Distance from road to first pond is 0.75 miles (0.53 kilometers). Other sections only accessible by foot or amphotat.

Surveys:

Engineering survey of South West Feeder falls, approximately 4 miles (6.43 kilometers) from mouth by E. Tulk, 1962. Engineering survey of Brian's Feeder gorge with photo by E. Tulk, 1966. Biological Survey, 1969.

Redd Counts: None to date.

References:

- Riche, L. G. & G. R. Traverse 1971. River Investigations 1969-1970-An Inventory - MS report, Fisheries Service, St. John's, Newfoundland.
- Mercer, K. M. 1962. Report of A Reconnaissance Survey of Nine Important Streams on the Great Northern Peninsula. MS report, Fisheries Service, St. John's, Newfoundland.

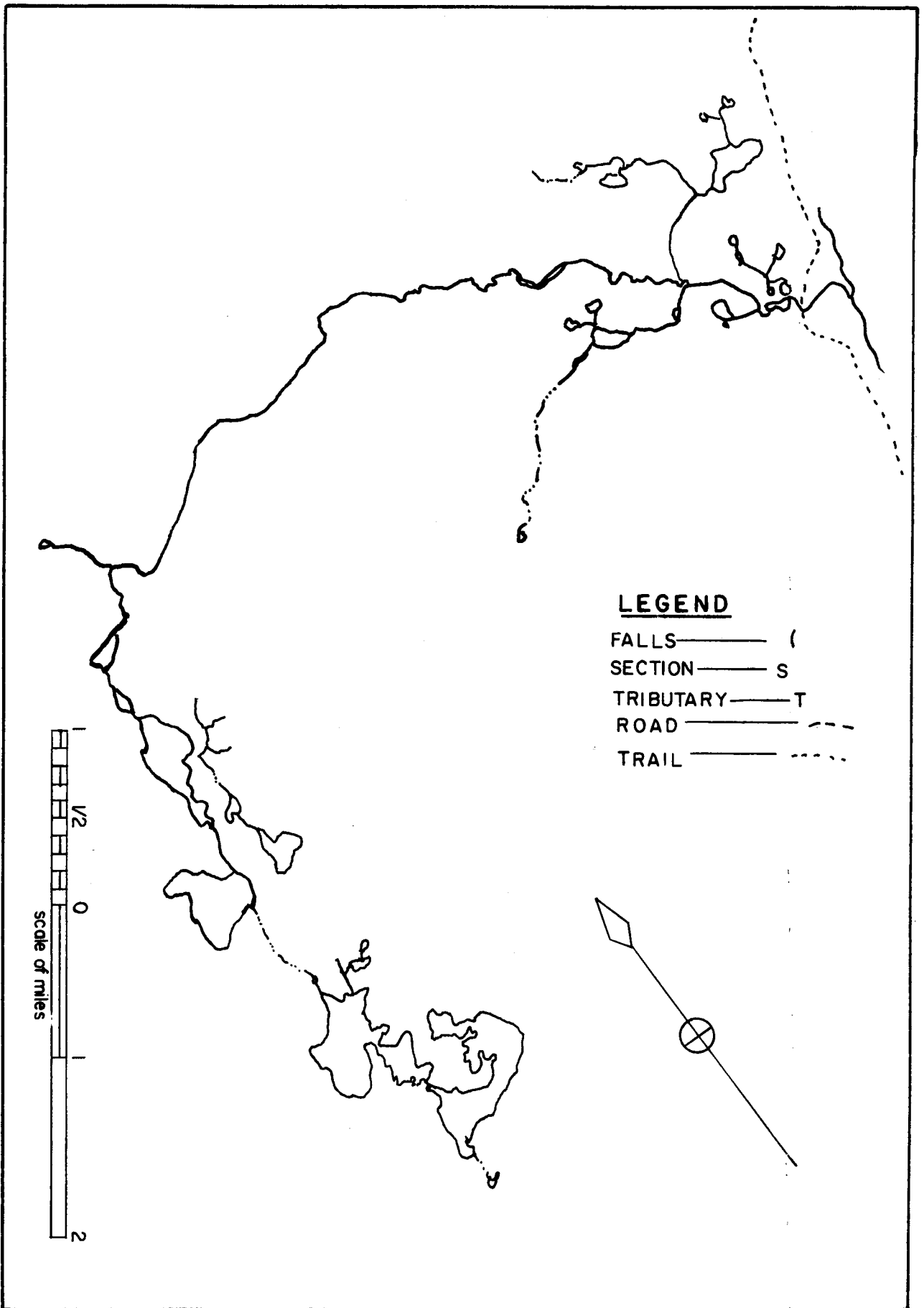


FIG 38 OUTLINE MAP OF BOWING BROOK SHOWING OBSTRUCTIONS

FISH POPULATIONS

Species Present:

No angling data available on this stream

Gene Frequency: Not completed

Timing of Run:

Year

First fish

Last fish

Week of
peak run

Accessibility to Anglers:

Surveys: None to date

Redd Counts: None to date

BOUND BROOK

Location: 50°20'10" N. 57°32'12" W. Bellburns.
 Map Reference: Bellburns. 12 1/5 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 25.6 miles², (66.30 km²). Mean width, 3.1 miles,
 (4.98 km).

Perimeter, 22.9 miles, (36.84 km). Axial length, 6.8 miles,
 (10.94 km).

Maximum basin relief, 500 feet, (152.40 m).

Geology:

Ordovician volcanic.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

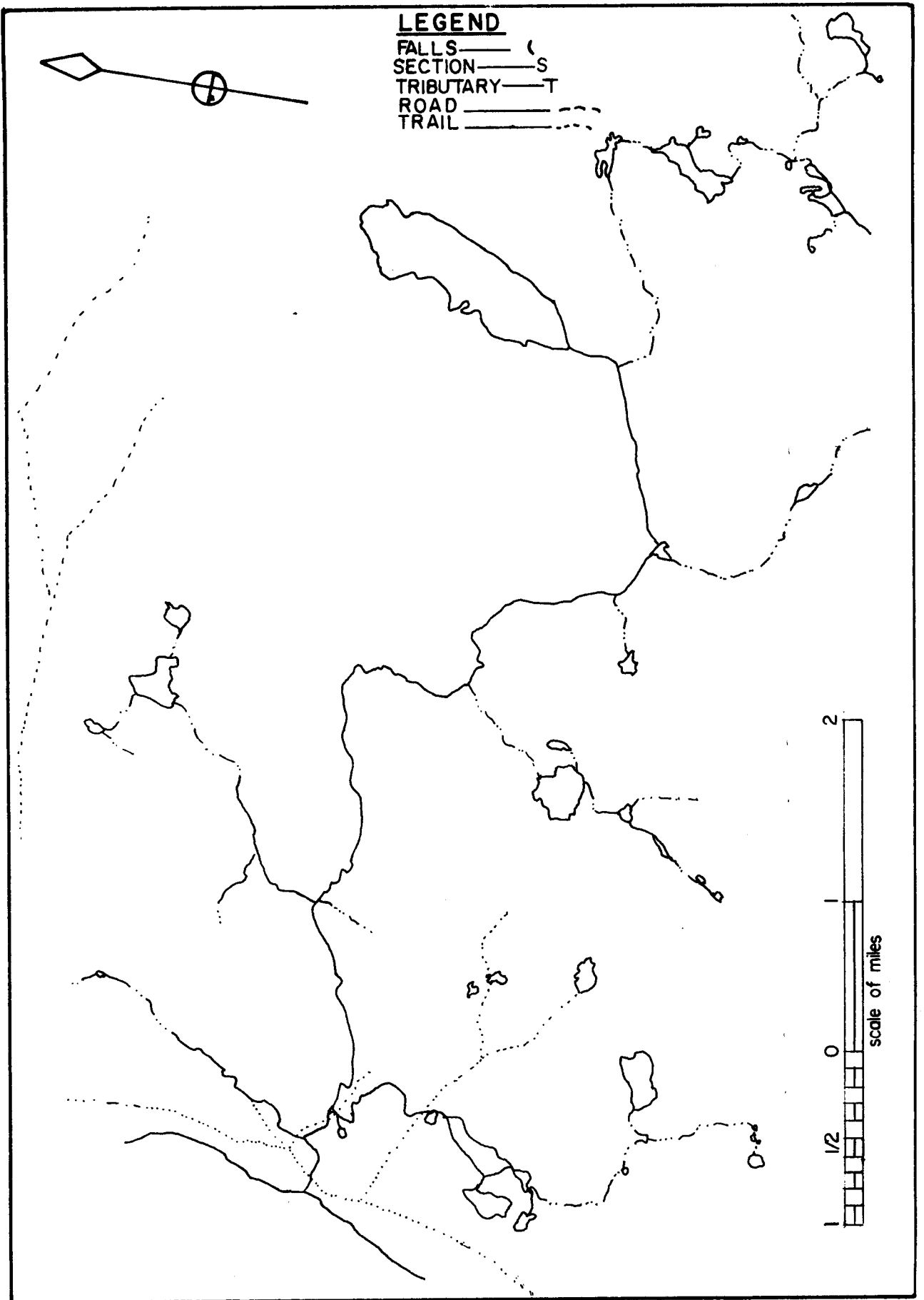


FIG39 OUTLINE MAP OF BOUND BROOK SHOWING OBSTRUCTIONS

FISH POPULATIONS

Species Present:

no angling data available on this stream.

Gene Frequency: Not completed

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date

Reud Counts: None to date

References:

RIVER OF PONDS

Location: 50°32'30" N. 57°23'20" W. South of Hawke's Bay.

Map Reference: Port Saunders. 12 1/11 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 332.5 miles² (861.17 kilometers). Mean width, 10.8 miles, (17.37 kilometers).

Perimeter, 110.1 miles (177.15 kilometers). Axial length, 27.6 miles, (44.40 kilometers).

Maximum basin relief, 2,100 feet (640.08 meters).

Geology:

About half Ordovician with the remainder consisting of acidic intrusive rocks and a small amount of gneissis.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics: Length of all streams in system, not including standing water, 130 miles, (209.17 kilometers).

Spring Tilt Brook (Trib.) from mouth to mile point 0.5:

Depth range, 10 to 20 ft., (3.04 to 6.08 meters). Width range, 50 to 75 ft., (15.24 to 22.86 meters). Velocity, slow.

Spawning Areas: On the main river only limited spawning areas available; from mouth to River of Ponds Lake, largest suitable gravel area (est. 100 yds. long) (91.44 meters), located below the junction of Spring Tilt Brook. Big Gulch Brook: This stream is considered to have some of the major accessible spawning gravel of the system. The first two miles, (3.21 kilometers) has an estimated bottom type of 60% gravel.

Main spawning area considered to be Big Feeder Brook.

Barriers to Fish Migration: On Big Gulch Brook, a series of six falls

between mile points 2.8 and 3.1, (4.50 -4.98 kilometers). Falls No.

1 to 5 going upstream are partial obstructions. Falls No. 6 at

First Pool on stream is a complete obstruction.

Rushy Brook, underground stream at 0.2 miles, (0.32 kilometers), from

mouth. Stream at this point runs underground; complete obstruction

at low water. Spring Tilt Brook, becomes underground stream between

0.5 and 1.0, (0.80-1.60 kilometers), complete obstruction. Falls 3.2

miles, (5.14 kilometers), from mouth; complete obstruction. Big Feeder

Brook runs underground approximately 2 miles (3.2 kilometers) from mouth.

Photographs on file; Nos. 388, 604, 605, 94, 617, 1124.

Water Quality Data, Sampled May 1972

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Specific Conductance @ 25°C micromhos /cm	Ca ppm.	HCO ₃ ppm.
7.25	31.0	40.0	1.3	5.0	68.0	7.5	37.8

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout (sea run and resident).

Atlantic Salmon Angling Record - River of Ponds.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	595	687	2908	1320.2	135	1274	578.4	822	4182	1898.6
1953	630	539	2291	1040.1	73	667	302.8	612	2958	1342.9
1954	582	533	2282	1036.0	74	616	279.7	607	2898	1315.7
1955	571	581	2478	1125.0	78	656	297.8	659	3134	1422.8
1956	-	881	3644	1654.4	92	748	339.6	973	4392	1994.0
1957	723	1182	5097	2314.0	119	960	435.8	1301	6057	2749.8
1958	1169	1384	5885	2671.8	157	1437	652.4	1541	7322	3324.2
1959	1245	1404	5942	2697.7	179	1527	693.3	1583	7469	3391.0
1960	1515	972	4126	1873.2	125	1068	484.9	1097	5194	2358.1
1961	2342	1510	6379	2896.1	218	1755	796.8	1728	8134	3692.9
1962	2679	1274	4953	2248.7	70	605	274.7	1344	5558	2523.4
1963	2730	1520	6075	2758.1	161	1337	607.0	1681	7412	3365.1
1964 ¹	1880	1459	5907	2681.8	158	1094	496.7	1617	7001	3178.5
1965	2003	2058	10535	4782.9	69	555	252.0	2127	11090	5034.9
1966	2299	2071	8276	3757.3	94	749	340.0	2165	9025	4097.3
1967	2351	1257	5114	2321.8	99	791	359.1	1356	5905	2680.9
1968	2203	813	2861	1298.9	27	249	113.0	840	3110	1411.9
1969	2871	1878	6996	3176.2	25	200	90.8	1903	7196	3267.0
1970	3062	705	2757	1251.7	22	155	70.4	727	2912	1322.1
1971	1627	936	3332	1512.7	55	468	212.5	991	3800	1725.2
1972	1114	435	1513	686.9	3	23	10.4	438	1536	697.3
1973	1620	1044	4104	1863.2	19	199	90.3	1063	4303	1953.6
1974										
1975										
1976										
1977										
MEAN										
1964-68	2147	1532	6539	2968.5	89	3438	1560.9	1621	5990	2710.2
1969-73	2059	1000	3740	1698.1	25	209	94.9	1024	3949	1792.8

¹Angling data 1964-73 estimated to be 85% accurate (J. Marshall, personal communication).

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics 1966-1969)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 19 - 25	September 10 - 15	July 20 - 27 (1968)

Accessibility to Anglers:

Great Northern Peninsula Highway crosses approximately 0.25 miles (0.40 kilometers) from river mouth. A woods road located approximately one mile (1.61 kilometers) south of Hawke's Bay leads to several upper sections of the river. However the headwaters are only accessible by foot and boat.

Surveys: None to date.

Redd Counts:

Big Feeder Brook - Section approximately 1.5 miles (2.40 kilometers) surveyed in 1968; 75-80 redds observed.

References:

Mercer, K. M. 1962. Report of a Reconnaissance Survey of Nine Important Streams on the Great Northern Peninsula. MS report, Fisheries Service, St. John's, Newfoundland.

LITTLE BROOK PONDS

Location: 50°33'04" N. 57°23'37" W. North of the River of Ponds.

Map Reference: Port Saunders. 12 1/11 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 29.2 miles², (75.62 km²). Mean width, 3.1 miles, (4.98 km).

Perimeter, 25.3 miles, (40.70 km). Axial length, 8.9 miles, (14.32 km).

Maximum basin relief, 350 feet, (106.68 m).

Geology:

Almost entirely Ordovician sedimentary with some Cambrian sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Nil. Boulder blasted at mouth - 1970.

Photographs on file; Nos. 350

Water Quality Data, Sample Collected May 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
7.50	46.0	60.0	1.5	5.0	102.0	11.5	56.1

FISH POPULATIONS

Species present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Little Brook Ponds.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1962	114	84	338	153.5	1	10	4.5	85	348	158.0
1963	294	94	357	162.1	-	-	-	94	357	162.1
1964 ¹	400	176	710	322.3	2	12	5.4	178	722	327.7
1965	317	143	529	240.2	1	8	3.6	144	537	243.8
1966	458	273	910	413.1	-	-	-	273	910	413.1
1967	640	272	943	428.1	-	-	-	272	943	428.1
1968	680	174	536	243.3	-	-	-	174	536	243.3
1969	1025	293	1044	474.0	-	-	-	293	1044	474.0
1970	841	167	599	271.9	-	-	-	167	599	271.9
1971	684	153	532	241.5	-	-	-	153	532	241.5
1972	524	91	329	149.4	-	-	-	91	329	149.4
1973	754	255	998	453.1	-	-	-	255	998	453.1
1974										
1975										
1976										
1977										
MEAN										
1964-68	499	208	726	329.6	1	4	1.9	209	730	331.4
1969-73	766	192	700	317.8	0	-	-	192	700	317.8

¹ Angling data 1964-73 estimated to be 75-80% accurate. (J. Marshall, personal communication).

Gene Frequency: Not completed

Timing of Run: (Based on angling statistics 1968-1969)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 28-July 4	Sept. 4-10	Aug. 3-10 (1968)

Accessibility to Anglers:

Local road runs parallel to stream for approximately 1.5 miles (2.41 kilometers). A road leading to the vacated settlement of Spirity Cove

crosses near the river mouth. This road is located 200 yards (169.6 m) north of the settlement of River of Ponds.

Surveys: None to date.

Redd Counts: None to Date.

References:

Anonymous: Nfld. Dept. Nat. Res. 1943. Res. Bull. No. 12,
St. John's, Newfoundland.

TORRENT RIVER

Location: 50° 36' 47" N. 57° 10' 14" W. Hawke's Bay, Cornochoix Bay.

Map Reference: Port Saunders. 12 1/11 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin Area, 239.0 miles² (619.0 kilometers²). Mean width, 7.6 miles (12.22 kilometers).

Perimeter, 86.4 miles (139.01 kilometers). Axial length, 24.0 miles (38.61 kilometers).

Maximum basin relief, 1,750 feet (533.40 meters).

Geology: About half gneiss with the remainder consisting of Cambrian sedimentary, acidic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Dimensions: Length of all streams in drainage basin, not including standing water, 100 miles (160.90 kilometers).

Main river: At the mouth, the river is approximately 50 to 100 ft (15.24 - 30.48 meters) wide and fast flowing over large boulders.

Spawning Areas: Bryants Feeder and Main Part Brook (Trib.) have an estimated 2 miles (3.21 kilometers) of river bottom that appears suitable for salmon spawning gravel.

Barriers to Fish Migration: On the main river, falls 1.5 miles (2.41 kilometers) from mouth, 30 ft. (9.14 meters) high; complete obstruction. (See fishway).

Main Part Brook (Trib.) Falls, 100 ft. (30.48 meters) from mouth, 10 to 12 ft. (3.04 - 3.65 meters) high; partial obstruction (Numerous ledges). Remedial work carried out in 1973. Falls channelized allow for easy passage of migrating fish.

Bryants Feeder (Trib.) (1) Dam, mile 0.2 (.32 km) 6 feet high, (1.82 m); complete obstruction when gates closed. (2) Dam, mile 1.2 (1.93 km); complete obstruction when gates closed. (3) Dam, mile 1.7 (2.73 km); partial obstruction. Dam, mile 2.0, (3.21 km), 7 feet, (2.13 m) high, passable when gates are open.

Stream Improvements for Fisheries Purposes:

A vertical slot, concrete fishway, completed October 1965, at falls on main river, 1.5 miles (2.41 km) from mouth. Fishway has opened up 5 miles, (8.04 km) of main river, 10 miles (16.09 km) of surveyed tributaries, and numerous other unsurveyed tributaries.

Miscellaneous Information:

Pulpwood cutting and driving in the area was discontinued in 1958, except for small operations in 1961. Fisheries Wardens believe there has been a gradual buildup of salmon population, since the closing of logging operations. 1972 and 1973, 56 and 203 adult salmon transferred to Torrent River from West River (St. Barbe). Settlement of Hawke's Bay is near mouth, population 1956 - 203; 1961 - 312.

83 Adults transferred from West River (St. Barbe) in 1974.

Photographs on file; Nos. 278, 391, 424, 587, 603, 136, 348, 580, 686, 688.

Water Quality Data, Sample Collected May 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (µ mhos/cm)	Ca ppm.	HCO ₃ ppm.
7.2	14.0	20.0	1.4	4.5	38.0	4.5	14.6

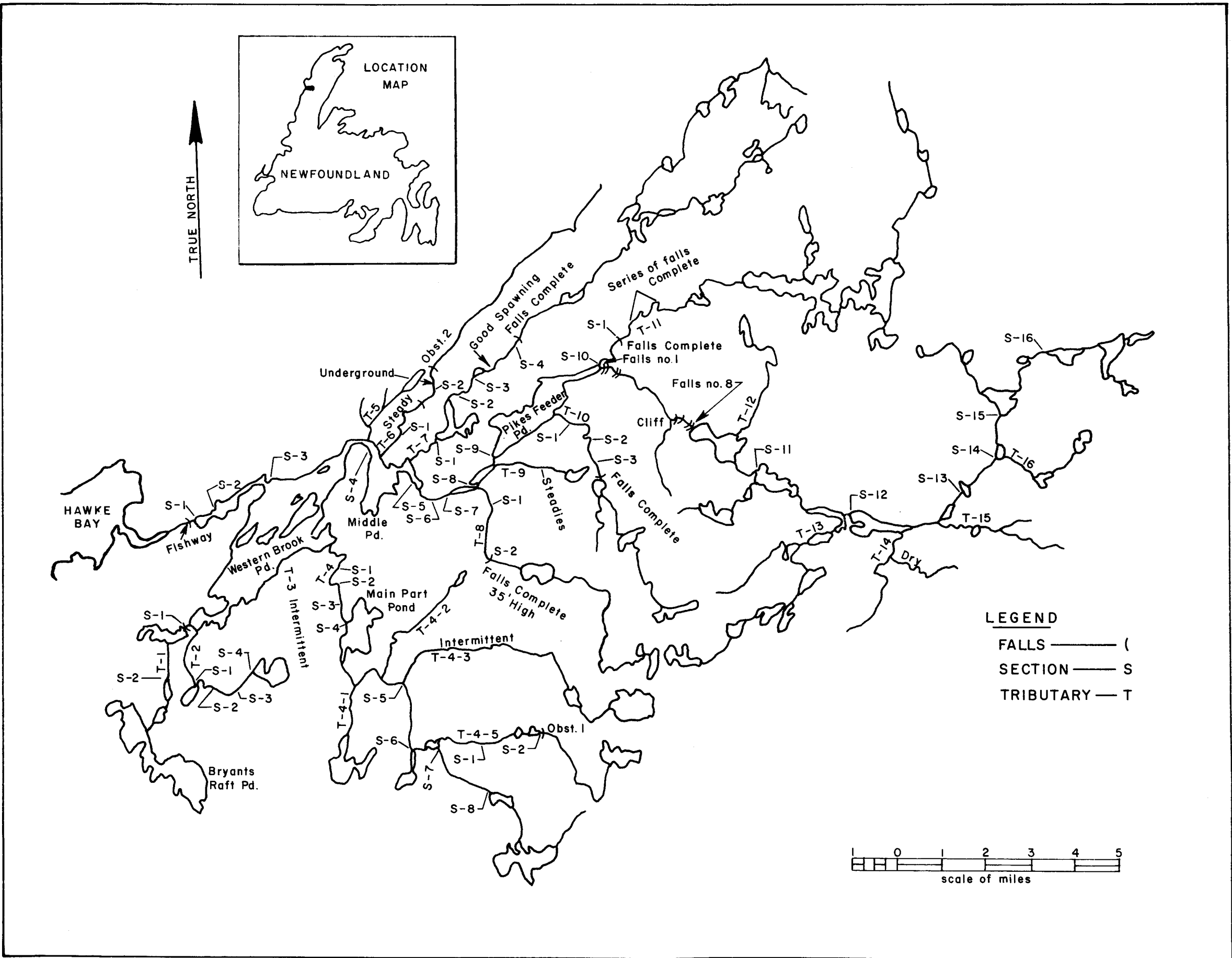


FIG. 40 OUTLINE MAP OF TORRENT RIVER SHOWING OBSTRUCTION LOCATIONS AND SECTIONS SURVEYED.

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout (resident and sea run).

Atlantic Salmon Angling Record - Torrent River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	97	12	51	23.2	6	86	39.0	18	137	62.2
1953	169	4	15	6.8	9	83	37.7	13	98	44.5
1954	187	15	63	28.6	3	56	25.4	18	119	54.0
1955	184	22	95	43.1	15	126	57.2	37	221	100.3
1956	-	51	200	90.8	29	271	123.0	80	471	213.8
1957	377	73	292	132.6	21	181	82.2	94	473	214.8
1958	594	24	103	46.8	34	338	153.5	58	441	200.3
1959	585	31	150	68.1	54	527	239.3	85	677	307.4
1960	401	54	231	104.9	32	361	163.9	86	592	268.8
1961	569	37	174	79.0	43	403	183.0	80	577	262.0
1962	893	107	428	194.3	37	316	143.5	144	744	337.8
1963 ¹	1286	107	466	211.6	64	521	236.5	171	987	448.1
1964 ¹	593	66	283	128.5	40	357	162.1	106	640	290.6
1965	455	62	248	112.6	36	317	143.9	98	565	256.5
1966	794	43	183	83.1	13	113	51.3	56	296	134.4
1967	598	36	139	63.1	11	108	49.0	47	247	112.1
1968	998	70	274	124.4	7	95	43.1	77	369	167.5
1969	315	41	172	78.1	4	38	17.3	45	210	95.4
1970	277	52	208	94.4	9	87	39.5	61	295	133.9
1971	333	53	210	95.3	5	57	25.9	58	267	121.2
1972	306	22	85	38.6	3	25	11.4	25	110	50.0
1973	413	88	340	154.4	3	30	13.6	91	370	170.0
1974										
1975										
1976										
1977										
MEAN										
1964-68	688	55	225	102.3	21	198	90.0	76	423	192.2
1969-73	329	51	203	92.2	5	47	21.5	56	250	113.7

¹ Angling data 1964-73 estimated to be 80-85% accurate. (J. Marshall, personal communication).

Summary, Live trap data, West Lake (Torrent River).

Year	Brook Trout		Eels	Ouananiche	Smelt
	Adult	Parr			
1972	-	-	127	-	-

Note: Trap in operation August 4, 1972 - September 1, 1972.

Summary, Fishway Counting Trap Data, Torrent River Falls

Year	Grilse	Salmon	Total No. Fish
	Under 6 lbs. (2.74 kilograms)	6 lbs. (2.74 kilograms) and over	
1966	40	0	40
1967	49	2	51
1968	29	1	30
1969	18	5	23
1970	36	2	38
1971	51	4	55
1972	57	3	60
1973	95	12	107
1974			
1975			
1976			
1977			

Note: 56 grilse, 19 male, 37 female transferred to Torrent River from West Brook, St. Barbe in 1972.

Gene Frequency: Not completed.

Timing of Run: (Based on fishway trap counts).

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1967-70	July 15 - 22	September 5 - 12	July 22 - 29

Accessibility to Anglers:

Great Northern Peninsula Highway crosses stream near mouth. A road built by the Fisheries Department in order to construct fishway leads to falls. A woods road, the entrance of which is located near Hawke's Bay runs parallel to lower section for several hundred yards.

Surveys:

Engineering survey of Torrent River Falls - 1962.

Blasting out of fish exit of Torrent River fishway to obtain more water - 1970.

Redd Counts:

1970 - twenty-three separate redds observed. Suitable spawning gravel is restricted to one small section 0.5 miles (0.80 kilometers) from the mouth. Total spawning area here is approximately 200 yds² (167.4 meters²).

1972 - 8 redds observed below fishway complete count;

21 redds observed above fishway, partial count only.

1973 - 15 redds observed in T-4.

References:

Mercer, K. M. 1962. A Report on A Reconnaissance Survey of Nine Important Streams of the Great Northern Peninsula. MS report, Fisheries Service, St. John's, Newfoundland.

Traverse, G. R. 1971. A Stream Survey Report, Torrent River, 1971. MS report, Fisheries Service, St. John's, Newfoundland.

Anonymous, 1962. Summary of Stream Obstructions. MS report, Fisheries Service, St. John's, Newfoundland.

Anonymous, 1963. Salmon and Trout Management Program. MS report, Fisheries Service, St. John's, Newfoundland.

LITTLE EAST RIVER

Location: 50°37'10" N. 57°09'25" W. Hawke's Bay.
 Map Reference: Port Saunders. 12 I/11 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 7.6 miles², (19.68 km²). Mean width, 1.0 miles,
 (1.609 km).
 Perimeter, 18.0 miles, (28.96 km). Axial length, 6.9 miles,
 (11.10 km).
 Maximum basin relief, 850 feet, (259.08 m).

Geology:

Cambrian sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

River blocked by series of beaver dams.

Photographs on file; Nos.

Water Quality Data, Sample Collected May 1972

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
7.84	56.0	70.0	2.2	6.5	109.0	11.0	68.0

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout (sea run).

No angling data available on this stream.

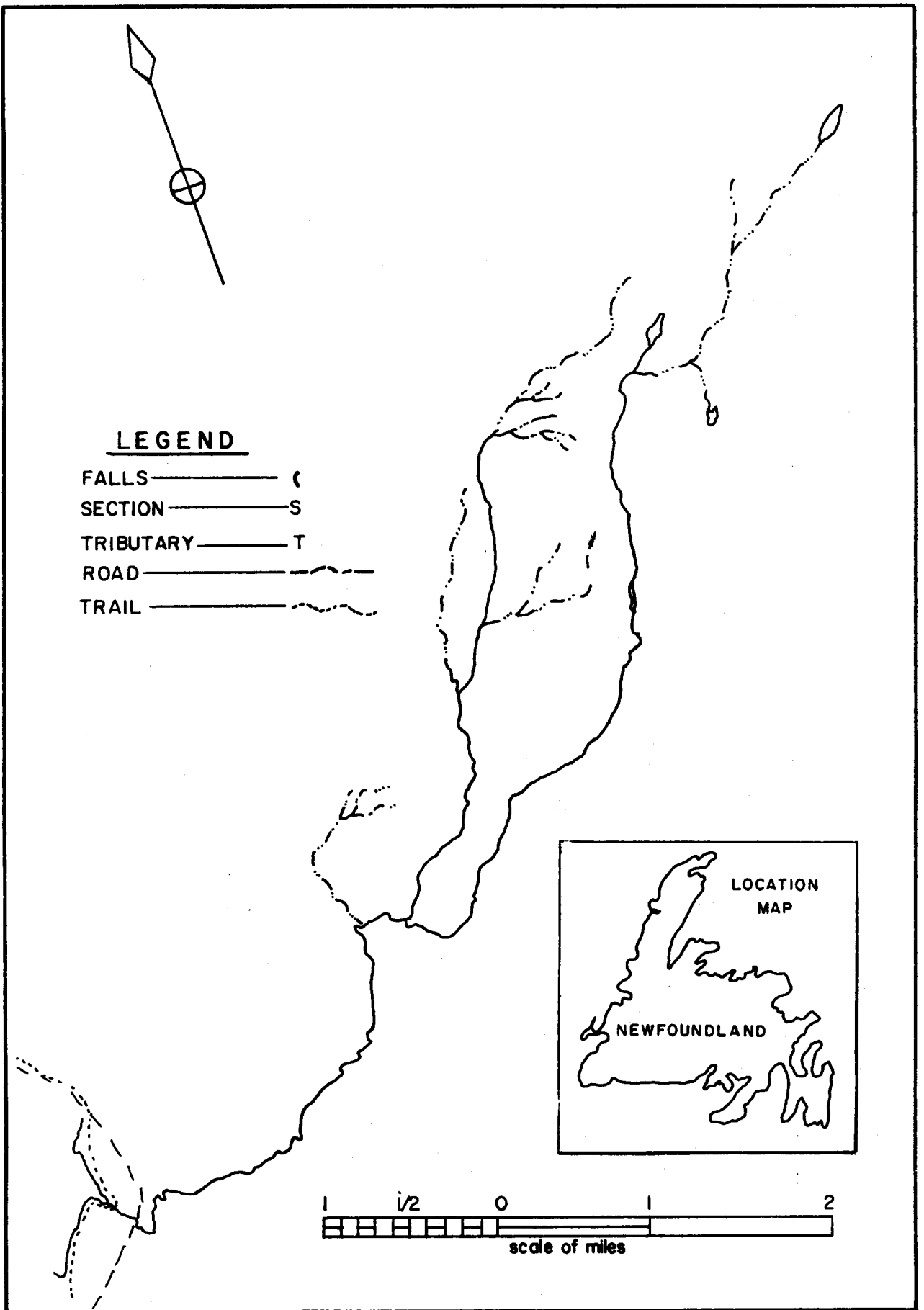


FIG 41 OUTLINE MAP OF LITTLE EAST RIVER SHOWING OBSTRUCTION

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

EAST RIVER

Location: 50° 38' 04" N. 57° 10' 10" W. Hawke's Bay.

Map Reference: Port Saunders. 12 1/11 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 52.6 miles² (136.23 kilometers²). Mean width, 3.0 miles, (4.82 kilometers).

Perimeter, 50.0 miles (80.45 kilometers). Axial length, 20.2 miles, (32.50 kilometers).

Maximum basin relief, 2,050 feet (665.70 meters).

Geology:

Almost entirely Cambrian sedimentary with a small amount of acidic intrusive rocks.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Total length of all streams, 34 miles (54.70 kilometers). Length of tributaries, 13 miles, (20.91 kilometers).

Main River:

Mouth, width range 40 to 50 feet (12.19 - 15.24 meters). From mouth two miles (3.21 kilometers) upstream, average width, 200 ft. (60.96 meters).

Bottom types:

Rock, large rubble mixed with small gravel. Velocity, medium.

Remainder of river:

Bottom types, bedrock, boulder, small quantities of gravel and sand. Velocity, swift.

Tributaries: Velocity, swift.

Barriers to Fish Migration:

On main river, falls 0.3 miles, (.48 km) from mouth, 8 to 10 feet high (2.43-3.04 m), length 16 to 20 feet (4.86-6.08 m), 75 feet (22.86 m) wide, 30° angle; partial obstruction
 Falls, 15 miles (24.13 km), from mouth, length 30 to 40 feet (9.12-12.16 m), complete obstruction.

Photographs on file; Nos. 394

Water Quality Data, Sample Collected May 10, 1972

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
7.1	8.0	16.0	1.8	5.5	32.0	2.0	

Miscellaneous:

This river is commonly called Big East River.

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout (sea run and resident).

Atlantic Salmon Angling Record - East River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	201	128	557	252.9	19	165	74.9	147	722	327.8
1953	394	180	694	315.1	36	306	139.0	216	1000	454.1
1954	488	224	881	400.0	39	363	164.8	263	1244	564.8
1955	223	101	401	182.1	16	139	63.1	117	540	245.2
1956	-	118	460	208.8	4	43	19.5	122	503	228.3
1957	188	109	432	196.1	23	213	96.7	132	645	292.8
1958	259	220	853	387.3	43	406	184.3	263	1259	571.6
1959	438	97	391	177.5	26	263	119.4	123	654	296.9
1960 ¹	389	159	568	257.9	26	283	128.5	185	851	386.4
1961	1462	167	657	298.3	50	435	197.5	217	1092	495.8
1962	1304	153	592	268.8	13	121	54.9	166	713	323.7
1963	878	190	707	321.0	21	185	84.0	211	892	405.0
1964	725	226	852	386.8	32	310	140.7	258	1162	527.5
1965	793	279	1079	489.9	31	300	136.2	310	1379	626.1
1966	785	219	838	380.5	31	319	144.8	250	1157	525.3
1967	1005	192	749	340.0	21	183	83.1	213	932	423.1
1968	1005	174	623	282.8	15	139	63.1	189	762	345.9
1969	829	186	702	318.7	8	67	30.4	194	769	349.1
1970	516	175	646	293.3	12	98	44.5	187	744	337.8
1971	754	90	316	143.5	26	249	113.0	116	565	256.5
1972	663	136	497	225.6	6	61	27.7	142	558	253.3
1973	858	172	617	280.1	15	156	70.8	187	773	350.9
1974										
1975										
1976										
1977										
MEAN										
1964-68	863	218	828	375.9	26	250	113.6	244	1078	489.4
1969-73	724	152	556	252.2	13	126	57.3	165	682	309.5

¹ Angling data 1960-73 estimated to be 90-95% accurate (J. Marshall, personal communication).

Summary, Counting fence data, Big East River

Year	Salmon		Smolt	Parr	Kelt	Smelt	Shad	Eels	Brook Trout	
	Under 6 lbs. (2.7 kilograms)	6 lbs. & over							Adult	Parr
1971	68	19	-	-	-	-	-	-	-	-

Note: 1971 fence operated June 27, 1971 - August 3, 1971.
(Twice washed out).

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics 1967-1969)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1967-1969	June 18 - 24	August 23 - 29	July 20 - 27 (1968)

Accessibility to Anglers:

Great Northern Peninsula Highway crosses river near mouth.

Not otherwise accessible.

Surveys: None to date.

Redd Counts: None to date.

References:

Mercer, K. M. 1962. A Report on A Reconnaissance Survey of Nine Important Streams of the Great Northern Peninsula. MS report, Fisheries Service, St. John's, Newfoundland.

DOCTORS BROOK

Location: 59°47'55: N. 57°04'35" W.
 Map Reference: St. John Island. 12 I/14 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 30.5 miles², (79.0 km²). Mean width, 3.8 miles, (6.11 km).
 Perimeter, 25.5 miles, (41.02 km). Axial length, 8.2 miles, (13.19 km).
 Maximum basin relief, 1,800 feet, (548.64 m).

Geology:

Almost entirely Cambrian sedimentary with small amounts of gneissis and Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Major obstruction located 2.5 miles (.40 km) from mouth.

Photographs on file; Nos.

Water Quality Data, Sample Collected May 1972

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
7.4	20.0	32.0	2.2	8.0	57.0	7.5	26.4

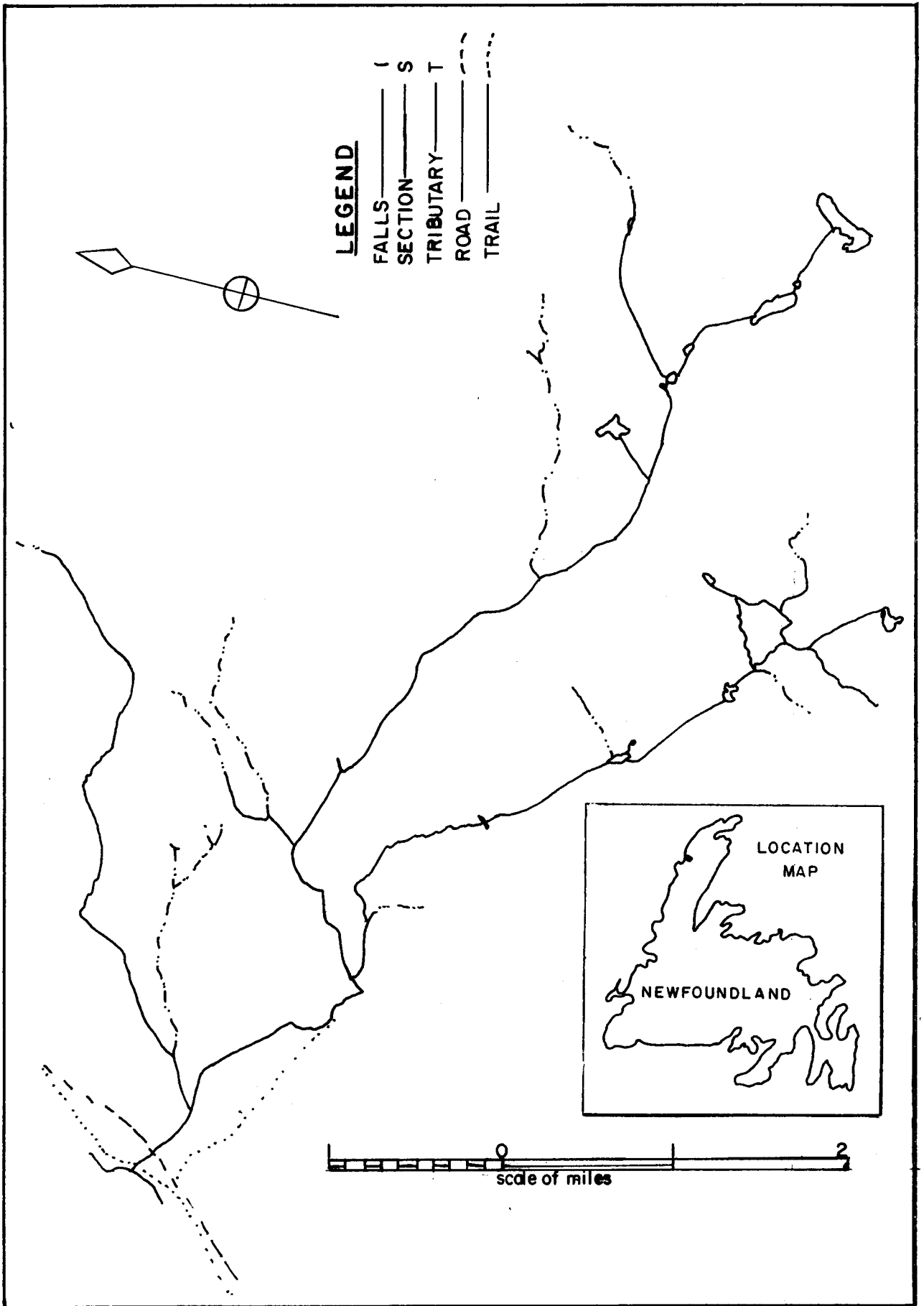


FIG 42 OUTLINE MAP OF DOCTOR'S BROOK SHOWING OBSTRUCTION

FISH POPULATIONS

Species Present: Brook trout (sea run).

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

Year

First Fish

Last Fish

Week of
peak run

Accessibility to Anglers: Great Northern Peninsula Highway crosses near river mouth.

Surveys: None to date.

Redd Counts: None to date.

References:

CASTOR RIVER

Location: $50^{\circ} 55' 00''$ N. $56^{\circ} 55' 38''$ W. Castor Harbour, St. John Bay.

Map Reference: Castor River. 12 1/15 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 210.1 miles² (544.16 kilometers²). Mean width 11.2 miles, (18.02 kilometers).

Perimeter, 79.3 miles (127.59 kilometers). Axial length, 17.1 miles, (27.51 kilometers).

Maximum basin relief, 2,050 feet (624.84 meters).

Geology: About equal amounts of Cambrian sedimentary with acidic intrusive rocks and a small amount of Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Total length of all streams in system, not including standing water, 100 miles (160.9 kilometers).

Main river:

From mouth to first pond, several hundred yards: (Note: 100 yds = 91.44 meters): Depth, shallow.

Average width, 100 yds (91.44 meters). Velocity, swift. Bottom types, bedrock, boulder, rubble and gravel.

From outlet of first pond to 3 miles (4.82 kilometers) upstream: Depth range, 0.5 to 2 ft. (.15 - .60 meters). Width range, 200 to 300 ft. (60.96 - 91.44 meters). Bottom types, rubble and gravel.

From mile point 3 (4.82 kilometers) to outlet of Middle Gulch Brook: Width, river narrow in this section. Velocity, swift. Bottom types, bedrock ledges.

Middle Gulch Brook (Trib.): Velocity, slow, bottom types, gravel and rubble, mud.

Beaver Brook (Trib.): Velocity, swift. Bottom types, bedrock and boulders.

South West Feeder (Trib.): From mouth 2 miles (3.21 kilometers) upstream. Bottom types, mud, sand, scattered gravel areas, small boulders.

Rattling Brook (Trib.): Velocity, fast over rapids and falls.

Flat Brook (Trib.): Bottom types, rocky, large falls and rapids.

Spawning Areas:

On the main river, 3 miles (approx.) (4.82 kilometers) between 1st pond and Leg pond offer good spawning gravel.

Middle Gulch Brook, it is estimated, has about 6 to 8 miles (9.65 to 12.87 kilometers) of suitable gravel.

South West Feeder, Flat Rock Brook and Rattling Brook, spawning areas are believed to be utilized by brook trout.

Barriers to Fish Migration:

On the main river, falls (2) 50 ft. (15.24 meters) apart at mile point 4.9 (7.88 kilometers), (NO. 1) 10 ft. (3.04 meters) high, 15 ft. (7.91 meters) wide, 30° angle. (No. 2) Falls 8 ft. high, (2.44 meters), 15 ft. (7.91 meters) wide, 45° angle; partial obstruction.

Falls at mile 5.0 on the main stem, is 4 ft (13.1 meters) high.

It was a partial obstruction at low discharge but was channeled in

1973 and now presents no difficulty to migration fish at any water level.

Flat Brook (Trib.): Falls, 100 yds. (91.44 meters) from mouth, 100 ft. high (30.48 meters): complete obstruction.

Rattling Brook (Trib.): Falls, 300 yds. (274.32 meters) from mouth, 30 ft. high (9.14 meters), complete obstruction.

Photographs on file; Nos. 395, 396, 91

Miscellaneous Information:

The 1961 survey was confined to the main river, from mouth upstream to Leg Pond. The information on the various tributaries was obtained from local Fisheries personnel. As far as is presently known, migratory fish have unimpeded access to the extensive spawning areas of this system, except for beaver dams which are cleared annually.

Water Quality Data, Sampled May 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Specific Conductance @ 25°C micromhos/cm	Ca ppm.	HCO ₃ ppm.
7.46	32.0	42.0	3.2	5.5	71.0	10.0	39.0

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout (sea run and resident), eels.
Atlantic Salmon Angling Record - Castor River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1952	53	33	168	76.3	1	6	2.7	34	174	79.0
1953	59	64	316	143.5	3	24	10.9	67	340	154.4
1954	51	14	70	31.8	-	-	-	14	70	31.8
1955	111	50	249	113.0	15	127	57.7	65	376	170.7
1956	-	75	365	165.7	8	62	28.1	83	427	193.8
1957	102	149	750	340.5	5	44	20.0	154	795	360.5
1958	142	178	965	438.1	5	51	23.2	183	1016	461.3
1959	128	111	593	269.2	3	25	11.4	114	618	280.6
1960	105	123	635	288.3	-	-	-	123	635	288.3
1961	133	96	528	239.7	2	22	10.0	98	550	249.7
1962	215	319	1598	725.5	5	44	20.0	324	1642	745.5
1963	435	273	1318	598.4	12	113	51.3	285	1431	649.7
1964 ¹	526	428	2005	910.3	13	103	46.8	441	2108	957.1
1965	451	559	2635	1196.3	5	52	23.6	564	2687	1219.9
1966	347	484	2209	1002.9	1	10	4.5	485	2219	1007.4
1967	461	551	2699	1225.3	1	10	4.5	552	2709	1229.8
1968	436	616	2749	1248.0	5	56	25.4	621	2805	1273.4
1969	428	658	2004	909.8	3	31	14.1	661	2035	923.9
1970	438	588	2141	972.0	2	20	9.1	590	2161	981.1
1971	437	657	2112	958.8	1	10	4.5	658	2122	963.3
1972	401	329	1328	602.9	1	10	4.5	330	1338	607.4
1973 ²	529	403	1605	728.7	3	31	10.7	406	1636	742.8
1974										
1975										
1976										
1977										
MEAN										
1964-68	442	528	2460	1116.6	5	46	20.9	533	2506	113.8
1969-73	447	527	1838	834.5	3	20	9.3	530	1858	843.5

¹Angling data 1964-72 estimated to be 85% accurate (W. Samson, personal communication).

²Angling data 1973 estimated to be 80% accurate (J. Marshall, personal communication).

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics 1966-1969)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1969	June 12 - 18	September 1 - 7	July 20 - 27 (1968)
			July 12 - 19 (1969)

Accessibility to Anglers:

Great Northern Peninsula Highway crosses river near mouth. Not otherwise accessible only by boat or foot.

Surveys: None to date.

Redd Counts: None to date.

References:

Mercer, K. M. 1962. Report on A Reconnaissance Survey of Nine Important Streams on the Great Northern Peninsula. MS report, Fisheries Service, St. John's, Newfoundland.

Anonymous. 1943. Res. Bull. No. 12, Dept. of Nat. Res. St. John's, Newfoundland.

ST. GENEVIEVE RIVER

Location: 51° 08' 15" N. 56° 47' 48" W. St. Genevieve Bay.

Map Reference: Brig Bay.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 122.6 miles² (317.53 kilometers²). Mean width, 6.6 miles, (10.61 kilometers).

Perimeter, 52.5 miles (84.47 kilometers). Axial length, 16.3 miles, (26.22 kilometers).

Maximum basin relief, 915 feet, (278.89 meters).

Geology:

Predominantly Cambrian sedimentary with some Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Channel Characteristics:

Total length of all streams in system, not including standing water, 40 miles, (64.36 kilometers).

Section: On main river, from mouth to 8 miles, (12.87 kilometers), upstream.

Depth range, 2 to 4 ft., (.60-1.20 meters). Velocity, 1/2 area fast, other 1/2 steadies.

Bottom types, boulder, large rubble, gravel, bedrock.

Section: Within 1/2 mile, (.80 kilometers), of outlet of 10 mile pond (16.09 kilometers).

Depth range, 2 to 6 ft., (.60-1.82 meters). Velocity, steady area.

Bottom types, rubble and gravel.

Section: Manuels River (Trib.): Velocity, slow. Located approximately 0.75 miles from main river mouth. Also named Angle Pond Brook.

Barriers to Fish Migration:

On the main river, wooden dam in tidal water zone; since 1959, gates kept open; no obstruction.

Falls, 3½ miles, (5.63 kilometers), from mouth, 14 ft. (4.2 meters) high (rises in steps, each 4 to 5 ft.), (1.21-1.52 meters); partial obstruction.

Dams, 2, at mile points 4 and 8 (6.42 and 12.87 kilometers); partial obstructions, since 1959 gates kept open.

Tributary Stream 5:

Dams - Kelly's Brook, Roses Brook and Muskrat Brook.

These obstructions have been removed.

Photographs on file; Nos. 117, 399, 400, 90, 1046.

Miscellaneous information:

Two large bodies of water. Ten mile Pond (20. sq. mi.) (51.8 sq. kilometers) and Round Lake (10 sq. mi.) (25.9 sq. kilometers), constitutes the major water reserves of this system. Manuels River is the largest (6 linear miles) (9.65 kilometers), and only sizable tributary on the main river. Salmon have access to the main river and two chief tributaries.

Until 1959, extensive logging operations were carried out in the area, and the river was utilized for log driving. Bark deposits are still present on river bed.

Water Quality Data, Sampled May 9, 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Specific Conductance @ 25°C micromhos/cm	Ca ppm.	HCO ₃ ppm.
7.8	4.2	50.0	2.2	5.0	83.0	10.7	51.2

FISH POPULATIONS

Species present: Atlantic salmon, brook trout (sea run and resident), eels.

Atlantic Salmon Angling Record - St. Genevieve River.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1953	57	30	146	66.3	1	13	5.9	31	159	72.2
1954	102	35	143	64.9	1	6	2.7	36	149	67.6
1955	53	31	113	51.3	-	-	-	31	113	51.3
1956	-	14	62	28.1	12	80	36.3	26	142	64.4
1957	90	45	206	93.5	23	171	77.6	68	377	171.1
1958	47	21	105	47.7	13	94	42.7	34	199	90.4
1959	20	14	66	30.0	2	15	6.8	16	81	36.8
1960	10	13	52	23.6	-	-	-	13	52	23.6
1961	60	93	399	181.1	4	37	16.8	97	436	197.9
1962	252	246	1035	469.9	7	53	24.1	253	1088	494.0
1963	744	546	2229	1012.0	52	416	188.9	598	2645	1200.9
1964 ¹	822	806	3076	1396.5	103	835	379.1	909	3911	1775.6
1965	824	993	3746	1700.7	55	466	211.6	1048	4212	1912.3
1966	1204	1198	4692	2130.2	71	503	228.4	1269	5195	2358.6
1967	912	1059	4038	1833.2	137	983	446.3	1196	5021	2279.5
1968	1114	1284	4368	1983.1	84	638	289.7	1368	5006	2272.8
1969	1054	1738	5839	2650.9	66	550	249.7	1804	6389	2900.6
1970	1400	1516	5173	2348.5	61	378	171.6	1577	5551	2520.1
1971	797	1015	4005	1818.3	122	901	409.1	1137	4906	2227.4
1972	717	753	2741	1244.4	23	146	66.3	776	2887	1310.7
1973	1495	1777	7513	3410.9	135	1097	498.0	192	8610	3908.9
1974										
1975										
1976										
1977										
MEAN										
1964-68	975	1068	3984	1808.7	91	685	311.9	1158	4669	2119.8
1969-73	1093	1360	5054	2294.5	81	614	278.9	1441.2	5669	2573.8

² Angling data 1964-73 estimated to be 85-90% accurate (W. Samson, personal communication).

Summary, Fyke net data, St. Genevieve River.

Year	Smolt	Parr	Smelt	Shad	Eels	Brook Trout	
						Adult	Parr
1972	113	99	-	-	145	1	2

Note: 1972, fyke net in operation June 20 - July 13.

Gene Frequency:

Number Sampled	Tf1 (TfC)	Tf1/Tf4 (TfA/TfC)	Tf4 (TfA)	Frequency of Tf4 (TfA) tramferrin allele
81	57	21	3	0.17

Timing of Run: (Based on angling statistics 1966-1969)

Year	First fish	Last fish	Week of peak run
Average 1966-1969	June 14-20	Sept. 4-10	July 13-20 (1968)

Accessibility to Anglers:

Local road crosses approximately 0.25 miles (0.40 kilometers) from river mouth. Road to Roddickton crosses one section of Ten Mile Lake, headwaters of St. Genevieve River. Not otherwise accessible only by boat and foot.

Surveys:

Preliminary engineering survey of rapids below Twin Steady, 1967.

Redd Counts:

1970, Manual's Feeder, surveyed from outlet flowing into Ten Mile Lake to 4 miles inland, 150 were observed.

1971 - Manuel's Feeder, same area surveyed as in 1970, 329 redds observed.

1972 - Manuel's Feeder, 373 redds.

Manuel's Brook, 41 redds.

Kelly's Brook, 24 redds

Rose's Brook, 422 redds.

Bear Brook, 79 redds.

Muskrat Brook, 16 redds.

Little Round Pond Brook, 7 redds.

Main River, 60 redds.

Redd Count - 1973:

Little Round Pond Brook, 11 redds.

Muskrat Brook, 86 redds.

Manuel's Feeder Brook, 514 redds

Bear Brook, 105 redds

Rose's Brook, 307 redds

Kelly's Brook, 78 redds.

Angle Pond Brook, 175 redds.

Main stem, 159 redds.

Total system, 1,435 redds.

Manuel's Feeder and Rose's Brook appear to provide 78 to 62 percent, respectively, of the total utilized spawning area.

References:

Mercer, K.M. 1962. Report on a Reconnaissance Survey of Nine Major Rivers of the Great Northern Peninsula. MS Report, Fisheries Service, St. John's, Newfoundland.

WEST BROOK (WESTERN ARM BROOK)

Location: 51 51°11'25" N. 56°45'58" W. St. Barbe Harbour,
St. Barbe Bay.

Map Reference: Brig Bay. 12 P/12 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 57.6 miles² (149.18 kilometers²). Mean width, 3.1 miles. (4.98 kilometers).

Perimeter, 44.5 miles (71.6 kilometers). Axial length, 16.6 miles (26.71 kilometers).

Maximum basin relief, 350 feet (106.68 meters).

Geology:

Almost entirely Ordovician sedimentary with a small amount of Cambrian sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration: Falls on the main river at mile point 0.5 (0.8 kilometers).

4' - 5' high, (1 - 1-1/2 meters) temporary holdup. Blasted in 1971 but requires more work for easy access at all water levels.

Channeled in 1973. Easily accessible at all discharges.

At mile point 10 (16 kilometers) there is an area of heavy slab rock, broken or cracked in several places. In 1971, a channel was blasted through this rock. This now presents no holdup problem at any water level.

Photographs on file: Nos. 97, 610, 654, 99, 411, 687, 690, 691.

Water Quality Data, Sampled May 1972.

pH	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Specific Conductance @ 25°C micromhos/cm	Ca ppm.	HCO ₃ ppm.
7.8	5.6	70.0	2.2	6.5	109.0	6.5	2.4

FISH POPULATIONS

Species present: Atlantic salmon, brook trout, shad, smelt, eels.

Summary, angling data, West and East River, St. Barbe.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No.	lbs	kg
1961	3	1	5	2.3	-	-	-	1	5	2.27
1962	18	-	-	-	-	-	-	-	-	-
1963	97	86	316	143.5	-	-	-	86	316	143.5
1964 ¹	171	130	565	256.5	-	-	-	130	565	256.5
1965	214	123	548	248.8	-	-	-	123	548	248.8
1966	273	219	894	405.9	-	-	-	219	894	405.9
1967	261	192	840	381.4	-	-	-	192	840	381.4
1968	298	176	645	292.8	-	-	-	176	645	292.8
1969	304	327	1117	507.1	13	114	51.8	340	1231	558.9
1970	420	294	1143	518.9	42	268	121.7	336	1411	640.6
1971	128	205	738	335.1	-	-	-	205	738	335.1
1972	100	104	426	193.4	-	-	-	104	426	193.4
1973	409	244	906	-	-	-	-	244	906	-
1974										
1975										
1976										
1977										
MEAN										
1964-68	243	168	698	317.1	0	0	0	168	698	317.0
1969-73	272	235	866	393.2	11	76	34.7	246	942	427.8

¹ Angling data 1964-1973 estimated to be 85-90% accurate (B. Samson, personal communication).

Summary, Counting fence data, West River.

Year	Salmon		Smolt	Parr	Kelt	Smelt	Shad	Eels	Bk. trout		Frost Fish
	Under 6 lbs.	6 lbs. & over							Adult	Parr	
1971	427	305	5767	435	185	108	3	91	18	131	1
1972	309	9	11906	431	210	181	52	197	40	167	-
1973	555	29	8484	250	95	365	5	97	429	-	-
1974	399	3	12053	267	302	539	3	574	809	-	-
1975											
1976											
1977											

Note: 56 grilse; 19 male, 37 female, were transferred to Torrent River, Hawkes Bay in 1972.

Note: 203 grilse; 56 male, 147 female, were transferred to Torrent River, Hawkes Bay in 1973.

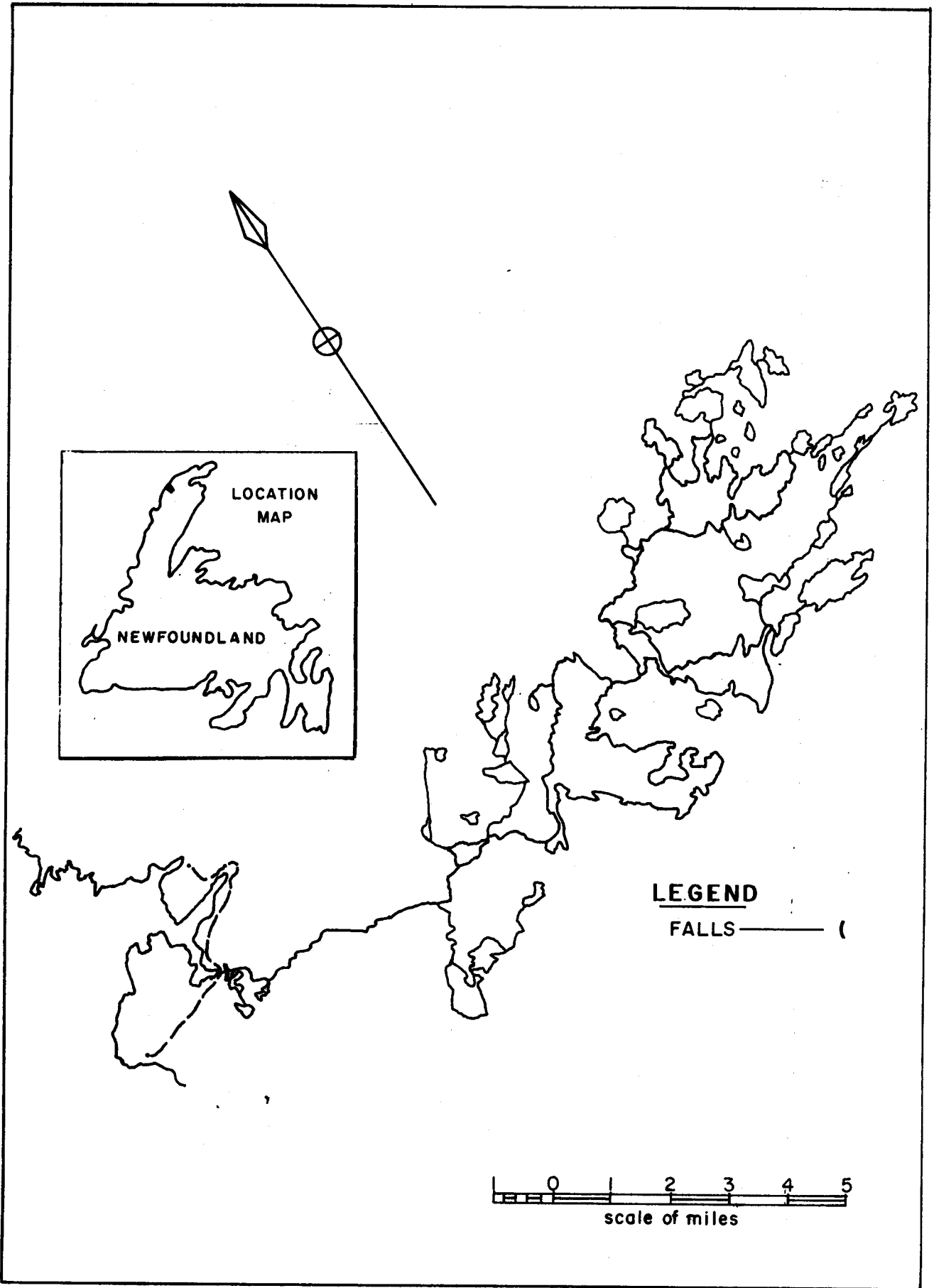


FIG.43 OUTLINE MAP OF WEST BROOK SHOWING OBSTRUCTION

Estimated Atlantic salmon production and adult sea survival West River, St. Barbe from 4,500 units.

If smolt production per
100 yds² (83.7² meters) is:
Smolts produced

	<u>1</u>	<u>2</u>	<u>3</u>
	4,500	9,000	13,500
Adult return if sea survival is:			
5%	225	450	675
10%	450	900	1,350
15%	675	1,350	2,025
20%	900	1,800	2,700
25%	1,125	2,250	3,375

Gene Frequency:

Number Sampled	TF1 (TFC)	TF1/TF4 (TFA/TFC)	TF4 (TFA)	Frequency of TF4 (TFA, framferrin allele)
156	134	22	0	0.07

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
1971	June 22	August 26	July 4-10 (188 fish)

Accessibility to Anglers:

The Great Northern Peninsula highway crosses river mouth. Almost 100% of the angling is done near river mouth. Small foot path to falls at mile point 0.5 (.80 kilometers), near highway bridge.

Surveys:

Stream Inventory in 1971 by Fishways and Stream Clearance Unit, Resource Development Branch.
Engineering Survey of Obstructions, 1971.

Miscellaneous:

There were 83 grilse; 21 males, 62 females transferred to Torrent River, Hawke's Bay, in 1974.

Angling data is a combined total from West and East Rivers with 95% of fish angled at West River.

References:

Anonymous: Nfld. Dept. Nat. Res. 1943. Resource Bull. No. 12.
St. John's, Newfoundland.

Riche, Lester, G. 1972. West Coast River Development, A Brief
Outline, MS Report, Fisheries Services, St. John's, Newfoundland.

EAST RIVER

Location: 51°12'35" N. 56°44'35" W. St. Barbe Bay.
 Map Reference: Brig Bay. 12 P/2 East half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 16.7 miles², (43.25 km²). Mean width, 2.0 miles,
 (3.21 km).
 Perimeter, 19.9 miles, (32.01 km). Axial length, 7.7 miles,
 (12.38 km).
 Maximum basin relief, 300 feet, (91.44 m).

Geology:

Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos. 1049

Water Quality Data, Sample Collected

	Total Alkalinity ppm.	Total Hardness ppm.	Turbidity JTU	Cl ppm.	Conductivity at 25°C (μ mhos/cm)	Ca ppm.	HCO ₃ ppm.
pH							

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout (sea run).

Angling Data:

See West River, W-49-0519.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First Fish</u>	<u>Last Fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

The Great Northern Peninsula Highway crosses
near mouth of river. Not otherwise accessible only by foot.

Surveys: None to date.

Redd Counts: None to date

References:

FISH POPULATIONS

Species Present: In 1964, it was reported that large numbers
of Arctic Char entered this brook.

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First Fish</u>	<u>Last Fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers: Great Northern Peninsula Highway crosses
near mouth of river. Not otherwise accessible except by foot.

Surveys: None to date.

Redd Counts: None to date.

References:

FISH POPULATIONS

Species Present: Atlantic salmon, brook trout.

Atlantic Salmon Angling Record - Eddie's Cove Brook

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1966 ¹	7	5	17	7.7	-	-	-	5	17	7.7
1967	47	59	248	112.6	-	-	-	59	248	112.6
1968	27	10	35	15.9	-	-	-	10	35	15.9
1970	No Report									
1971	18	21	67	30.4	-	-	-	21	67	30.4
1972	1	-	-	-	-	-	-	-	-	-
1973										
1974										
1975										
1976										
1977										

Gene Frequency: Not completed.

Timing of Run: (Based on angling statistics 1966-1968)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1968	July 13 - 20	August 18 - 24	August 10 - 16 (1968)

Accessibility to Anglers: Great Northern Peninsula Highway crosses the river near mouth, otherwise accessible only by foot.

Surveys: None to date.

Redd Counts: None to date.

References:

¹Angling data 1966-1973 is incomplete.

HALFWAY BROOK

Location: 51°28'20" N. 56°17'40" S.
 Map Reference: Eddie's Cove. 12 P/8 West half.

CHARACTERISTICS OF DRAINAGE BASIN

Geomorphological Factors:

Basin area, 15.3 miles², (39.62 km²). Mean width, 1.1 miles,
 (1.76 km).

Perimeter, 26.4 miles, (42.47 km). Axial length, 11.7 miles,
 (18.82 km).

Maximum basin relief, 200 feet, (60.96 m).

Geology:

Ordovician sedimentary.

CHARACTERISTICS OF STREAMS IN DRAINAGE BASIN

Barriers to Fish Migration:

Photographs on file; Nos.

Water Quality Data, Sample Collected

	Total Alkalinity	Total Hardness	Turbidity	Cl	Conductivity at 25°C	Ca	HCO ₃
pH	ppm.	ppm.	JTU	ppm.	(μ mhos/cm)	ppm.	ppm.

FISH POPULATIONS

Species Present: Brook trout

No angling data available on this stream.

Gene Frequency: Not completed.

Timing of Run:

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
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Accessibility to Anglers:

Surveys: None to date.

Redd Counts: None to date.

References:

Palmer, C. H. 1928. The Salmon Rivers of Newfoundland.
Farrington Co. Boston.

FISH POPULATIONS

Species present: Atlantic salmon, brook trout (sea run).

Atlantic Salmon Angling Record - Big Brook.

Year	Rod days	Grilse			Salmon			Total		
		No	lbs	kg	No	lbs	kg	No	lbs	kg
1960 ¹	12	14	57	25.9	3	23	10.4	17	80	36.3
1961	2	3	12	5.4	1	9	4.1	4	21	9.5
1964	39	31	109	49.5	2	24	10.9	33	133	60.4
1965	32	35	119	54.0	-	-	-	35	119	54.0
1966	37	34	150	68.1	-	-	-	34	150	68.1
1967	86	101	429	194.8	-	-	-	101	429	194.8
1968	144	107	357	162.1	20	126	57.2	127	483	219.3
1970	648	500	2000	908.0	-	-	-	500	2000	908.0
1971	63	64	213	96.7	-	-	-	64	213	96.7
1972	63	75	263	119.4	-	-	-	75	263	119.4
1973 ²	160	204	819	371.8	10	77	35.0	214	896	406.8
1974										
1975										
1976										
1977										
MEAN										

Gene Frequency: Not completed

Timing of Run: (based on angling statistics 1966-1968)

<u>Year</u>	<u>First fish</u>	<u>Last fish</u>	<u>Week of peak run</u>
Average 1966-1968	June 30-July 6	August 20-26	July 20-27 (1968)

Accessibility to Anglers: Local road crosses stream near outlet, otherwise accessible only by foot.

Surveys: None to date.

¹Angling data 1960-1972 is incomplete

²Angling data in 1973 is estimated to be 75% accurate. (W. Samson, personal communication).

LEGEND

- FALLS ——— (
- SECTION ——— S
- TRIBUTARY ——— T
- ROAD ———
- TRAIL ———

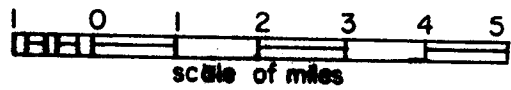
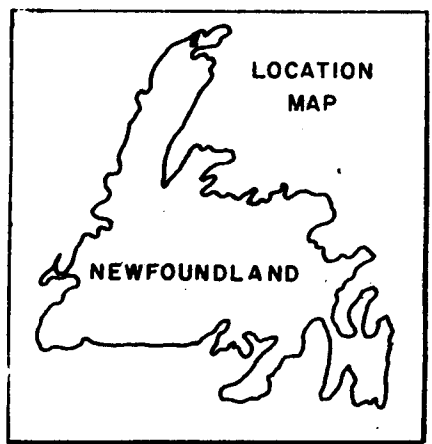
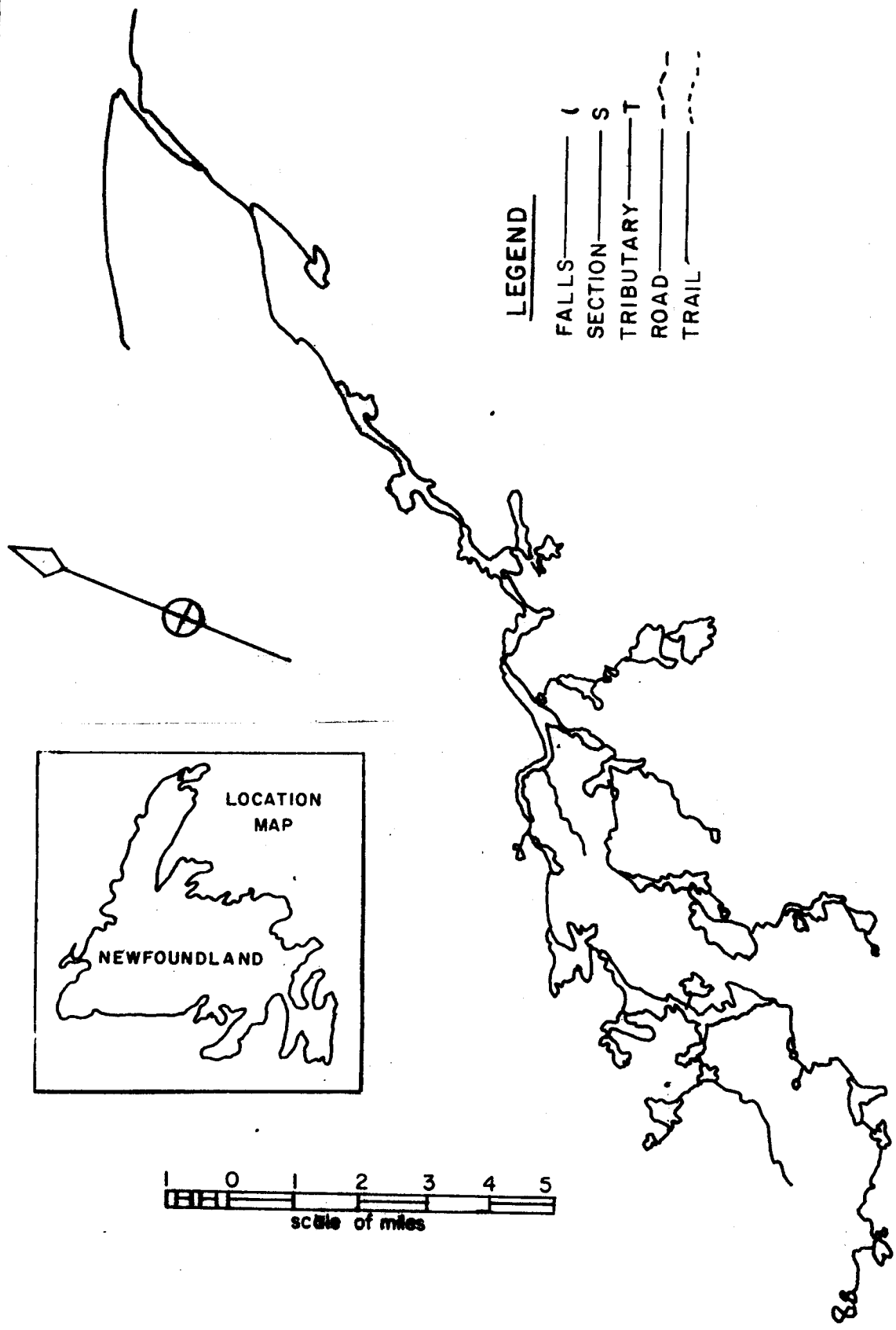


FIG 4 4 OUTLINE MAP OF BIG BROOK SHOWING OBSTRUCTION

Redd Counts: None to date

References:

ACKNOWLEDGMENT

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