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## Effects of the Alternate Closure of Algonquin Park Lakes

by

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When highway No. 60 was completed through the southern portion of Algonquin Park in 1936, that area became much more accessible to anglers than in the past. A creel census initiated by the Ontario Fisheries Research Laboratory in 1936 soon provided evidence that in some of the more heavily fished lakes large proportions of the mature trout were being removed by anglers (Fry, 1939a). It was believed that if this situation continued, spawn production might be reduced to a point where it would limit the population of trout. In order to reduce the possibility of further deterioration in certain lake trout fisheries, closure to fishing in alternate years was proposed for lakes where fishing mortality was believed to form a large part of the total mortality and where mature trout were fully exposed to fishing pressure. In these situations the closure was to be undertaken to allow periodic strengthening of spawning stocks and encourage higher egg production.

Relatively heavy fishing pressure on the eastern brook or speckled trout population in Redrock Lake in 1936 and 1937 was followed by a marked drop in the quality of fishing. The lake was closed to fishing in 1938 and opened in 1939. The improvement in fishing (Fry, 1939b) resulted in the application of the closure plan to a number of lakes providing speckled trout fishing.

Some 21 of the more accessible lakes in the southern part of the Park were on the closure list by 1940 and by 1948 the total reached 36. No lakes with cottages or lodges on their shores were included. Lakes in the alternate closure system were grouped in pairs, one lake remaining open while the adjacent lake was closed and vice versa in the following year.

After 1948 further extension of the closure plan was considered because of the increase in air travel. In 1948 about 900 anglers were flown to lakes in the interior of the Park. It was suggested that these lakes, at one time accessible only by canoe, might require the same protection afforded lakes close to the highway, particularly, as it soon became evident that commercial aircraft operators were concentrating their fishermen year after year in the same lake. The closure plan was therefore extended in 1949 to include 106 lakes in the interior of the Park. While this extension may be judged premature, in so far as the effects of closure were still unknown, it was prompted by the fear that the increased fishing intensity brought to bear on the interior lakes by airborne anglers might damage a number of attractive sport fisheries. This action might be called "term insurance" to be carried until such time as adequate information on the effects of fishing was collected.

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## Methods

The Algonquin Park creel census has been used to study the effects of alternate closure. The information it has provided has been of two types. A general census in southern Algonquin Park from 1937 to 1950 has provided information on the average length of the fish taken and the catch per unit effort or availability in about 20 lakes. The catch reported by the census on these lakes is believed to be 30 to 80 per cent of the total catch.

In one group of five lakes a more complete census has been possible because fishermen in this area generally pass through one centrally located checking station. Examination of a major portion of the catch from these lakes has been possible and scale collections have allowed study of the age composition of the catch. The census in these lakes gives an estimated coverage of from 80 to 90 per cent of the total catch.

## Results: Lake Trout

The quality of lake trout fishing has been given a numerical value or index (Fry and Chapman, 1948). This value for any particular lake has been calculated in the following manner. When availability or catch per unit effort is plotted against the average length of the season's catch for Algonquin Park lakes the points tend to fall within a profile marked by a curve which rises steeply at 14 inches, reaches a peak of availability at 16 inches and then falls off as the average length of the catch increases. Below the profile, which represents the best fishing that can be expected in these lakes, other curves can be drawn at equal intervals to represent lower levels of angling quality. The fishing quality in a lake in any year can therefore be given a single value dependent on both the availability and the size of the fish. These values generally vary from 10 to 90 but values of 110 occasionally occur when fishing is exceptionally good.

In Table 1, which is an extension of a table presented in a previous paper (Fry, 1949), angling quality in the more heavily fished lakes covered by the general census is shown. The data have been grouped to allow a rough comparison of the quality in those lakes incorporated in the alternate closure system, Group A, and those open to fishing in consecutive years, Group B. As yet there is no marked difference in the quality of fishing in these two groups of lakes. There is a possibility, however, that a difference may still develop for the following reason. The lake trout fisheries in Algonquin Park are, at the present time, dependent on those year classes spawned during the period 1942-1945. At this time fishing pressure on almost all the lakes in the area was comparatively light as a result of wartime travel restrictions. After 1945 fishing pressure increased. Year classes entering the fisheries in the next few years should reflect the effects of closure better than those year classes now in the fisheries.

In Table 2 the creel census returns of the three lake trout lakes to be studied in detail are compared with those of Lake Opeongo which has been statistically analysed previously by Fry (1949).

It may be seen that the fisheries of Happy Isle, Merchants, and Redrock Lakes have undergone marked fluctuations in the availability and size composition of the catch. In Merchants Lake in particular, the average length has varied over a range of four inches and the availability risen and fallen some 100 units. The total catch of lake

Table I  
Quality of lake trout fishing in some accessible Algonquin Park lakes as measured against a standard profile of availability (see text)

Lake	Index of angling quality for years:													
	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
<b>Group A—</b>														
Canibay.....	—	50	30	cl	30	cl	50	cl	50	cl	30	cl	50	cl
Head.....	—	50	30	cl	50	cl	30	cl	30	cl	30	cl	30	cl
Little Island.....	—	—	30	cl	50	cl	30	cl	30	cl	30	cl	30	cl
Merchants.....	90	90	70	cl	cl	cl	cl	30	cl	50	cl	30	cl	30
Ragged.....	70	cl	70	cl	50	cl	70	cl	50	cl	70	cl	—	cl
Redrock.....	30	cl	50	cl	50	cl	70	cl	30	cl	30	cl	30	cl
Average Index.....	63	63	42	50	46	70	50	30	38	50	38	30	35	30
<b>Group B—</b>														
Burnt Island.....	—	—	110	90	10	90	50	70	90	90	—	50	30	50
Catche.....	30	30	10	30	30	30	30	30	30	30	50	30	30	50
Louisa.....	70	110	70	50	50	90	90	50	70	30	30	30	cl	30
Opsego.....	70	50	50	50	30	50	70	70	70	50	50	30	30	30
Smoke.....	50	50	50	50	50	70	70	70	50	—	50	50	—	70
Source.....	30	30	30	—	10	10	10	10	30	—	50	30	50	30
Tanamakoon.....	—	30	30	—	10	10	30	30	30	30	50	30	50	—
Two Rivers.....	30	—	30	30	30	30	50	50	50	30	10	10	—	—
Average Index.....	47	50	47	50	27	50	50	48	52	43	41	32	38	43
Average Index, all lakes.....	52	54	45	50	35	52	50	46	47	44	40	32	37	41

cl—closed to fishing.

Table II  
Summary of creel census returns for lake trout from four Algonquin Park lakes, 1937-1952

Year	Opeongo			Merchants			Happy Isle			Redrock		
	Number of fish reported	Average length in inches	Fish per 100 boat hrs.	Number of fish reported	Average length in inches	Fish per 100 boat hrs.	Number of fish reported	Average length in inches	Fish per 100 boat hrs.	Number of fish reported	Average length in inches	Fish per 100 boat hrs.
1937	2,029	18.7	121	87	19.8	136	105	17.7	169	328	18.1	144
1938	1,304	18.4	101	441	20.3	122	264	17.7	113		closed	
1939	1,233	18.4	112		closed		73	18.5	120	331	18.1	113
1940	1,133	17.9	120	137	16.8	182	76	15.7	144		closed	
1941	885	17.4	97		closed		50	16.7	100	216	17.9	120
1942	504	18.5	111	97	17.7	201	77	15.9	183		closed	
1943	704	18.4	126		closed		75	15.0	139	87	18.7	153
1944	835	18.8	126	131	17.2	106	78	17.1	97		closed	
1945	1,139	19.7	101		closed		21	17.6	85	78	17.4	69
1946	976	18.8	70	476	18.9	112	78	16.6	118		closed	
1947	705	18.3	72		closed		13	15.0	70	177	17.6	81
1948	984	18.2	68	143	16.7	96	122	15.8	130		closed	
1949	1,133	18.4	74		closed		190	15.7	139	146	17.5	97
1950	1,343	18.5	62	452	16.7	95		closed			closed	
1951	1,208	17.9	58		closed		524	15.8	123	172	19.6	81
1952	994	18.8	70	803	16.5	152		closed			closed	

trout in 1952 in this lake was nearly that reported for Opeongo, a lake more than ten times its size. A similar fluctuation is apparent in Happy Isle Lake and to a lesser extent in Redrock. As will be pointed out such fluctuations are the result of uneven year class strength in these lakes. In Lake Opeongo on the other hand, there has been a consistent decline in the fishery since the early forties. No strong year classes

Table III

Percent age composition of the lake trout catch from Happy Isle Lake, Algonquin Park, 1938-1951

Year	Reported catch	Age group											
		4	5	6	7	8	9	10	11	12	13	14	15
1938	264	—	—	1	24	42	9	15	2	1	2	1	2
1939	73	No age data											
1940	76	—	—	4	68	21	4	4	—	—	—	—	—
1941	50	No age data											
1942	77	No age data											
1943	75	No age data											
1944	78	No age data											
1945	21	No age data											
1946	93	No age data											
1947	13	No age data											
1948	85	—	—	5	64	23	3	3	2	—	2	—	—
1949	190	1	1	10	63	13	7	1	1	—	—	1	—
1950	Closed	—	3	19	57	18	—	3	—	—	—	1	—
1951	524	—	2	13	52	22	3	5	1	—	1	1	—
1938-1951		—	2	13	52	22	3	5	1	—	1	1	—

Table IV

Percent age composition of the lake trout catch from Merchants Lake, Algonquin Park

1939-1952

Year	Reported catch	Ages													
		4	5	6	7	8	9	10	11	12	13	14	15	16	
1937	87	—	4	10	28	30	12	6	4	2	2	2	—	—	
1938	441	1	1	—	10	27	24	11	10	6	5	3	3	—	
1939	Closed														
1940	176	—	1	6	26	33	10	15	8	—	—	—	—	1	
1941	Closed														
1942	97														
1943	Closed														
1944	131	No age data 1941-1947													
1945	Closed														
1946	477														
1947	Closed														
1948	143	—	2	14	52	18	8	3	—	3	—	—	—	—	
1949	Closed														
1950	452	—	—	12	54	16	5	4	1	5	1	2	—	—	
1951	Closed														
1952	803	—	1	6	45	33	10	3	1	1	—	1	1	—	
1937-1952	2,807	—	1	6	32	28	14	7	5	3	2	1	1	—	

Table V

Per cent age composition of the lake trout catch from Redrock Lake, 1937-1951

Year sampled	Reported catch	Per cent of catch in ages									
		4	5	6	7	8	9	10	11	12	13
1937	328	3	4	17	31	22	14	4	4	1	—
1938	Closed	—	8	23	42	15	2	2	5	—	2
1939	331	—	4	6	25	36	17	8	2	2	—
1940	Closed	—	4	6	25	36	17	8	2	2	—
1941	216	—	4	6	25	36	17	8	2	2	—
1942	Closed	—	4	6	25	36	17	8	2	2	—
1943	87	No age data 1942-1946									
1944	Closed										
1945	78										
1946	Closed										
1947	177										
1948	Closed	2	—	1	21	34	25	13	4	—	—
1949	146	2	—	1	21	34	25	13	4	—	—
1950	Closed	—	1	2	14	25	22	24	7	5	1
1951	172	—	1	2	14	25	22	24	7	5	1
1937-1951	1,535	2	3	11	24	26	17	11	4	2	—

have entered the fishery in this time. It has been pointed out by Fry (1949) that the intensity of the fishing in this lake which has a sparse population of trout, has reduced the spawning escapement sufficiently to adversely affect year class strength.

The percentage age composition of the lake trout catches in certain years is given in Tables 3, 4, and 5, for Happy Isle, Merchants and Redrock Lakes. These data are based on the examination of scale samples from 1,750 fish. Unfortunately scale collections are sparse for the period 1941-1944 so that only the material from the years prior to 1941 and the last five years has been adequate for analysis. The data presented show that since 1945 only a few lake trout are taken in the fisheries in their fourth or fifth year, about 10 per cent in their sixth while most enter at age seven at a length of about 16 inches.

It is interesting to note the difference in age composition between the 1938 catches when the fisheries were fished heavily for the first time and the catches in recent years. About 40 per cent of the fish in Happy Isle Lake in 1938 were nine years and over and about the same percentage in Merchants Lake in the same year were 10 years and over. In recent years these groups of fish have only made up about 10 per cent of the catch. In Happy Isle and Merchants Lakes the seven and eight year old fish have made up 70 to 80 per cent of the total catch since 1947 and in Redrock Lake about half of the fish caught were in these two age groups.

In Tables VI, VII and VIII the data have been organized into year classes which were based on spawning rather than hatching years. The treatment adopted for Lake Opeongo lake trout by Fry (1949) is used to compare the strength of year classes spawned in open and closed years. The complete contribution of any one year class to the fishery cannot of course be shown over the five years span covered by these tables. Part of the data represents the "tail ends" of preceding year classes in the fishery or the beginnings of new ones. However, as the major part of the fishery in each lake

Table VI  
Year class contribution to the lake trout fishery in Happy Lake Lake, 1948-1951

Year of Capture	Year spawned											
	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
1948.....	1	—	1	3	3	19	54	4	—	—	—	—
1949.....	3	—	—	3	3	14	24	118	19	3	3	—
1951.....	—	—	3	—	—	—	17	—	94	297	99	14
Total contribution to date.....	—	—	—	—	—	—	95	122	113	300	—	—

Table VII  
Year class contribution to the lake trout fishery in Merchants Lake, Algonquin Park,  
1937-40 and 1948-1952  
1937-1940

Year sampled	Year spawned												
	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
1937.....	2	2	2	3	5	10	26	24	9	3	—	—	—
1938.....	13	13	23	27	43	47	108	120	43	0	4	2	—
1939 Closed													
1940.....	—	2	—	—	—	—	12	20	13	45	35	8	2
Total contribution to date.....	—	—	—	—	—	—	—	164	65	—	—	—	—

1948-1952

Year sampled	Year spawned											
	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
1948.....	4	—	4	11	26	73	20	2	—	—	—	—
1949 Closed												
1950.....	11	5	21	5	16	21	74	242	58	—	—	—
1951 Closed												
1952.....	—	8	4	—	4	11	22	78	264	366	48	4
Total contribution to date.....	—	—	—	—	—	105	116	322	322	—	—	—

Table VIII

Year class contributions to the lake trout fishery in Redrock Lake, Algonquin Park,  
1937-1941 and 1947-1951

1937-1941

Year sampled	Year spawned											
	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
1937.....	3	3	16	46	74	101	59	15	12	—	—	—
1938 Closed												
1939.....	—	8	—	17	8	8	49	141	74	25	—	—
1940 Closed												
1941.....	—	—	—	—	4	4	18	36	77	54	14	9
Total contribu- tion to date	—	—	—	—	—	113	126	192	163	—	—	—

1947-1951

Year sampled	Year spawned										
	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945
1947.....	2	2	16	42	61	44	6	3	—	—	—
1948 Closed											
1949.....	—	—	6	19	37	49	31	1	—	—	—
1950 Closed											
1951.....	—	—	1	9	11	41	38	43	24	4	1
Total contribution to date.....	—	—	—	—	109	134	75	—	—	—	—

is supported by two or three year classes, it is possible to estimate the total contribution of a year class even if it has not entirely passed through the fishery. In the tables the "Total contributions to date" represents 80-90 per cent of the complete totals. The total contribution of each of these year classes, apart from the 1942 and 1943 in Merchants Lake and the 1943 in Happy Isle has been of the order of 90-200 lake trout. Strong 1943 year classes in Happy Isle and 1943 and 1944 in Merchants Lake will each contribute over 350 lake trout to the fisheries of the respective lakes.

The sudden entrance of a year class into the fishery at seven years of age is demonstrated in 1949 when the 1941 year class appeared in Happy Isle Lake. The sudden disappearance two years later indicates an intensive fishery in 1951.

On the basis of the data in the foregoing tables, which are summarized in Table IX, there appears to be no evidence at the moment that alternate closure has been instrumental in providing stronger year classes of lake trout. In Merchants Lake, which has been closed in the odd years, the 1940 and 1941 year class contributions have been approximately the same as have the 1942 and 1943. The 1944 year class which first entered the fishery in 1952 as seven year old fish, is exceptionally strong (see Table VII). Although it was probably heavily exploited in 1952 it may still provide 400-500 trout to the fishery. In Redrock Lake, which has been closed in the even years, the little evidence at hand does not indicate stronger year classes in closed years. In Happy Isle Lake, where the closure was not put into effect until 1950, there has been a uniform year class production up to the 1942 year class of 100-130 trout. Apparently there are two very strong succeeding year classes in this lake, the 1943 which was the mainstay of the 1951 angling and the 1944 which began to enter the fishery in 1951 and which may contribute considerably to the fishing in 1953.

Table IX

Summary of year class contribution to the lake trout fisheries of Happy Isle, Merchants and Redrock Lakes, Algonquin Park

Year spawned	Number of fish of various spawning years contributed to the fishery		
	Happy Isle Lake	Merchants Lake	Redrock Lake
1928	—	—	—
1929	—	164	113
1930	—	65	126
1931	—	—	192
1932	—	—	163
1939	—	—	109
1940	95	105	134*
1941	122	116*	75
1942	113	322	—
1943	300	322*	—

\* Spawmed in year closed to fishing.

There does not appear to be any correspondence in the years when strong year classes are spawned in the various lakes, which suggests that the factors concerned in year class production are determined in each lake itself rather than being of an overall nature such as meteorological conditions.

### Results: Speckled Trout

Four speckled trout lakes have been under the closure system since 1940. Only two lakes, Redrock and Proulx, have been well covered by the creel census and it is on these two lakes that the effects of closure on speckled trout fisheries are being studied. In these lakes the reported catch is estimated to be about 80 per cent of the total catch although somewhat better coverage was obtained in 1947 and 1949 for the fishing in Redrock Lake.

A summary of the information provided by the creel census is presented in Table X. Information on gill net catches appears as a footnote.

Table X.

A summary of creel census returns for speckled trout from Redrock and Proulx lakes, Algonquin Park, 1936-1952

Year	Lake	Number of fish reported taken	Fishing pressure in boat hours	Fish per 100 boat hours	Average length in inches
1936	Redrock	555	347	160	11.7
1937	"	398	312	124	11.1
1939	"	631	297	212	12.6
1941	"	487	271	180	12.7
1943	"	352	189	186	13.1
1945	"	497	270	184	12.5
1947	"	346	286	121	11.7
1949	"	662	525	126	12.8
1951	"	480	424	113	13.2
1938	Proulx	138	67	206	12.3
1939	"	118	147	80	12.5
1940	"	107	96	112	12.4
1942	"	83	85	98	12.2
1944	"	336	295	114	12.6
1946	"	156	211	74	12.0
1948	"	373	256	146	11.9
1950	"	238	345	69	13.0
1952	"	282	297	95	13.6

156 trout averaging 8.1 inches taken in gillnets in 1947

36 " 12.8 " " " " 1949

5 " 10.0 " " " " 1951

31 " 12.0 " " " " 1950

According to the outfitters and guides in the area, Redrock was lightly fished prior to 1936. In 1936 and 1937 fishing pressure increased. The average size of the catch and the availability fell in 1937. After it was closed to fishing for a year it again provided fish of good size. The availability also rose. During the open years 1941-43-45 the lake was lightly fished and the size and availability of speckled trout remained high. In 1947 and 1949 fishing pressure became heavier and although the average size of the fish taken remained high the availability dropped to a lower level. A record catch of speckled trout for this lake was taken in 1949. A tagging experiment in the spring of that year (Baldwin, 1949) showed that about 75 per cent of the mature trout in the population were removed by angling. The results of the tagging experiments coupled with observations in seasonal changes in size of trout caught (Baldwin, 1948), and rough reciprocal relationships between fishing pressure and availability support the contention that Redrock was very thoroughly fished in the years 1947, 1949 and 1951. Theoretically therefore, the closure should be particularly beneficial to the speckled trout fishing now.

Proulx Lake, on the other hand, has probably been underfished. Although it is slightly larger than Redrock the catch has been smaller and the availability generally lower. The proportion of old fish in the Proulx catch has been higher than in the Redrock catch. Closure in alternate years would not on theoretical grounds, therefore, be as effective as in Redrock.

Since 1947 scale samples have been collected from the speckled trout caught in Redrock and Proulx lakes. The age composition of the catch from Redrock and Proulx lakes, based on the examination of scales from about 1000 speckled trout representing about half the catch, is presented in Tables XI and XII. Speckled trout enter these fisheries as two-year-olds and disappear from the fishery almost completely as six-year-olds. About half the catch in Redrock has been composed of three-year-olds while in Proulx four-year-olds have made the major contribution. This is believed to reflect the lighter fishing pressure in the latter lake.

Table XI  
Percent age composition of the speckled trout catch from Redrock Lake, Algonquin Park, 1947-1951

Year	Reported catch	Age group					
		1	2	3	4	5	6
1947.....	346	—	34	30	33	3	—
1949.....	662	—	6	69	24	7	—
1951.....	480	—	18	47	29	6	—
1947-49-51	1,488	—	16	53	28	3	—

Table XII  
Percent age composition of the speckled trout catch from Proulx Lake, Algonquin Park, 1950-1952

Year	Reported catch	Age group					
		1	2	3	4	5	6
1950.....	241	—	14	30	44	11	1
1952.....	282	—	23	33	35	8	1
1950-52.....	523	—	18	32	39	10	1

It has been possible to build up Tables XIII and XIV showing the contributions to the fishery of four year classes in Redrock and two year classes in Proulx. The total contributions of the year classes spawned between 1944 and 1947 in Redrock range from 185 to 569 fish. The strongest year class recorded was spawned in 1945, a year open to fishing. The weakest year class recorded was spawned in 1946 after the lake had been closed to fishing for a year. In Proulx Lake the year class spawned in

Table XIII  
Year class contributions to speckled trout fishery, Redrock Lake, Algonquin Park,  
1947-1951

Year sampled	Method	Year spawned							
		1941	1942	1943	1944	1945	1946	1947	1948
1947.....	angling netting	11 —	115 2	102 8	117 84	1 62	—	—	—
1949.....	angling netting	— —	— —	6 —	159 —	457 20	40 16	— —	— —
1951.....	angling netting	— —	— —	— —	— —	29 —	139 —	224 —	88 5
Total Contribu- tion.....		—	—	—	350	569	185	224	—

Table XIV  
Year class contributing to the speckled trout fishery in Proulx Lake, Algonquin Park,  
1950-52

Year sampled	Method	Year spawned							
		1943	1944	1945	1946	1947	1948	1949	1950
1950.....	angling netting	3 —	27 —	105 —	72 16	34 15	— —	— —	— —
1952.....	angling netting	— —	— —	2 —	24 —	99 —	93 —	64 —	— —
Total contribu- tions.....		—	—	—	112	148	—	—	—

the closure year was stronger than that spawned in an open year but no great significance should be attached to this limited information. There is no evidence yet that the closure is materially aiding these speckled trout fisheries by encouraging stronger year classes.

#### Discussion and Conclusions

Some limited conclusions can be drawn from the evidence collected to date. First, the quality of the lake trout fishing in the lakes on the closure plan has not differed materially from the quality in those lakes open to fishing in consecutive years. Secondly, there is no evidence that stronger year classes have arisen in closed years in three lakes during the period 1939 to 1943. Thirdly there is no evidence that stronger year classes of speckled trout have developed in the closure years in one lake during the period 1944 to 1947.

The data at hand for lake trout, however, reflects the effects of closure in a period when fishing pressure was relatively light. Whether this will change with

present fishing pressure, which is comparatively heavy, has yet to be seen. In the next four years the collection of census material should greatly improve our understanding of the effects of closure on lake trout for this information, coupled with that now on hand, will cover a span of years in which fishing pressure was first light, then heavy. The material collected by that time should justify fuller treatment than has been accorded it now.

Similarly, a study of the effects of alternate closure on speckled trout fisheries should be continued and an evaluation delayed until the 1948 and 1949 year classes of speckled trout have passed through the Redrock and Proulx fisheries.

It has not been possible to compare a group of speckled trout lakes on the closure system with a group not on the closure system. It may, therefore, be advisable to open either Redrock or Proulx or perhaps both to fishing in consecutive years in order to provide a comparison of the effects of closure on speckled trout fishing.

There are two things that the closure may have accomplished but which cannot be easily demonstrated. First, the closure system has interrupted the fishing habits of certain groups of anglers who, instead of returning year after year to the same lake, have in the last few years successfully fished a large number of lakes thus giving a wider distribution of angling pressure than might otherwise have occurred. Second, one of the angling attractions in the Park is the large size of the speckled trout taken in early spring. These spectacular spring catches would probably not occur as frequently if fishing in consecutive years was allowed.

#### Literature Cited

- BALDWIN, N. S. 1948. *A study of the speckled trout, Salvelinus fontinalis (Mitchill) in a Pre-Cambrian lake.* Univ. Toronto, M. A. Thesis: 1-55.
- BALDWIN, N. S. 1949. *Speckled trout investigation, Redrock Lake, Algonquin Park.* Ont. Dept. Lands & Forests, Typewritten Rept.
- FRY, F. E. J. 1939a. *A comparative study of lake trout fisheries in Algonquin Park, Ontario.* Univ. Toronto Studies, Biol. Ser. No. 46: 1-69. (Pubns. Ont. Fish. Res. Lab., No. 58.)
- 1939b. *First results from the closure of Redrock Lake.* Ont. Dept. Lands & Forests, Mimeographed: 1-2.
- FRY, F. E. J. and V. B. CHAPMAN. 1948. *The lake trout fishery in Algonquin Park from 1936 to 1945.* Trans. Am. Fish. Soc. (1945), 75: 19-35.
- FRY, F. E. J. 1949. *Statistics of a lake trout fishery.* Biometrics, 5: (1): 27-67.