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cc : Education - Game
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DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

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ANN ARBOR, MICHIGAN

November 28, 1951

Report No. 1310

THE INTENSIVE CREEL CENSUS OF THE EXPERIMENTAL WATERS OF THE HUNT CREEK DRAINAGE, 1950 SEASON.

by

David S. Shetter and Karl E. Proshek

Abstract

Intensive creel census operations for the twelfth consecutive trout season were successfully conducted during 1950 on 2.43 miles of Hunt Creek, 1.87 miles of Fuller Creek, on East Fish Lake (16.0 acres) and the Fuller Creek Beaver Pond (10 acres, estimated). The permit system inaugurated in 1949 continued to function well and met with angler-approval.

Eight hundred and seventy-five permits were issued to 519 individuals for 994 trips (79.4 percent of the permits went to licensed anglers, 8.8 percent to licensed anglers' wives, and 11.8 percent to minors under age 17).

Section D was most heavily fished despite the fact the second dam was out for approximately 3 weeks, followed closely by Section Z. Sections A, B, and C were relatively lightly fished. Angling quality, based on a comparison of the catch per hour, was best in Section A (0.77 fish), followed by Section D (0.50 fish), Section Z (0.34 fish), Section B (0.30 fish) and Section C (0.23 fish). Per acre yield to the anglers was best in Section Z (19.07 pounds), followed by Section D

(16.40 pounds), Section C (12.21 pounds), Section A (9.57 pounds), and Section B (2.66 pounds).

The combined records of all experimental sections show that 533 angling trips (43.2 percent successful) were made involving 1,388 hours of fishing. This effort yielded 578 trout (3 returned) weighing 96.50 pounds for angling quality indices of 0.42 fish per hour and 0.070 pound per hour. On a per acre basis, the angling pressure was 198 hours per acre; yield was 82 legal fish and 13.75 pounds of legal brook trout per acre. The total catch for 1950 including 29 undersized fish removed from Sections Z, A, and B, and 166 special fish from Sections C and D, amounted to 114.38 pounds, or 16.29 pounds per acre.

The average size of the brook trout taken in the experimental sections varied between 7.4 inches and 0.14 pound (Section A) to 8.2 inches and 0.21 pounds(Section D). For the experimental stream sections as a whole the 1950 average size was 7.8 inches and 0.17 pound.

The 1950 season was the last during which 6-inch trout were legal in Sections C, D and Fuller Creek west of the rotary screen. In Sections C and D, in 809.75 hours of fishing 158 six- to seven-inch brook trout weighing 15.13 pounds were creeled. Quality indices on this special fishing thus were 0.21 fish per hour and 0.019 pound per hour. The average length of the special trout was 6.5 inches, average weight, 0.10 pound. In Fuller Creek, there were 162.25 hours of angling on the special portion. The anglers removed 55 fish between 6 and 7 inches in size which weighed 4.92 pounds. The angling quality indices were 0.34 fish per hour, 0.030 pound per hour. The average size of the special brook trout was 6.4 inches and 0.09 pound.

In a total of 184.50 hours of angling on Fuller Creek 12 adult brook trout weighing 1.90 pounds were creeled. The average size of these fish was 7.6 inches and 0.16 pound. Angling quality indices were 0.07 fish per hour, 0.010 pound per hour.

The re-established Fuller Creek Beaver Pond provided the best fishing of 1950 on the experimental area. In 429.75 hours of angling, 136 angling trips yielded 347 (4 returned) adult brook trout and 10 special brook trout weighing 109.43 pounds and 1.01 pounds respectively. Adult brook trout averaged 9.3 inches and 0.32 pound in size, while the special trout were 6.6 inches and 0.10 pound. The angling quality indices were 0.81 fish per hour and 0.255 pound of fish per hour.

East Fish Lake angling pressure dropped off approximately 40 percent over 1950 and the anglers' catch was down about one-half. In 613.25 hours of fishing, 50 (3 returned) brook trout weighing 38.50 pounds were taken. These fish were of an average size of 12.3 inches and 0.82 pound. Quality indices were 0.08 fish per hour and 0.063 pound per hour. Large common suckers also appeared in the catch for the first time since the 1941 poisoning. Seventeen suckers weighing 11.38 pounds were brought in.

Tabulation of the individual anglers catching various numbers of brook trout during the season indicated, as in previous years, that a minority of expert anglers (from about 2 to 17 percent) removed from 38 to 73 percent of the total season's catch on the experimental waters. In general less than 10 percent of the individuals are removing 50 or more percent of the total season's catch.

Comparison was made of the fall population studies of recent years on the stream, East Fish Lake and Fuller Creek Beaver Pond with catches made by anglers in those waters. Assuming the population estimates of legal trout to be reasonably correct, the 1950 anglers removed 56.6 percent of the adult trout available and 37.7 percent were left for spawning. The remainder may be accounted for through migration and observed mortality.

Comparison of catch and population study data suggest that East Fish Lake anglers removed 38.1, 27.6 and 27.6 percent of the total

estimated available legal populations in 1948, 1949, and 1950 respectively.

Similar comparison for the Fuller Creek Beaver Pond data suggests that the 1950 anglers captured 50 percent of the total estimated available legal brook trout present in that season. These data, however, appear to be affected by migration into the pond and rapid growth.

The residence of the anglers followed the usual pattern for streams in Northeastern Michigan. Wayne County anglers were most numerous, followed by Montmorency, Genesee, Oakland and Bay County fishermen. Ohio trout fishermen led the nonresidents, with residents of Illinois, Indiana and New York also fishing the experimental sections.

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The creel census operations during the 1950 trout season marked the twelfth consecutive year of this activity. Angling records were obtained from 2.43 miles of Hunt Creek (7.02 acres), 1.87 miles of Fuller Creek (3.57 acres), East Fish Lake (16 acres), and from the re-established Fuller Creek Beaver Pond (10 acres, estimated).

Method of Collecting Creel Census Data

As in 1949, the experimental waters were posted with appropriate departmental signs. Angling was by permit issued free to all persons with fishing licenses bearing trout stamps, or to minors under age 17 and licensed anglers' wives. Under the terms of the permit all anglers returned to the checking station at the conclusion of their fishing each day. Here the trout catch was weighed and measured, and the time and locality of fishing recorded. Also numerous stomach and scale collections were obtained from beaver pond specimens and stream-caught brook trout for a comparative study of the feeding habits and growth of the fish living in these differing habitats (to be reported on by A. K. Adams).

Angling Results, 1950

Permits issued

Eight hundred and seventy-five (875) angling permits were written for 519 different individuals for the various experimental waters during the 1950 trout season--almost identical with the 1949 totals (876 permits for 522 individuals). Of the 875 permits, 695 (79.4 percent) were for licensed trout fishermen, 77 (8.8 percent) were for wives of licensed anglers, and 103 (11.8 percent) were for minors under age 17 years. In 1950 20.6 percent of the total pressure was angling for trout on the Hunt Creek waters free of charge (in 1949, the free angling amounted to 22.5 percent of the total pressure).

Of the total number of permits issued, there were 9 infractions of the regulations (1.0+ percent of total permits, 1.7 percent of total individuals). All occurred during the opening week end, and all were for failure to surrender the angling permit and report angling success. Except for one Ohio resident, all were successfully prosecuted.

Angling results, experimental sections, Hunt Creek

The experimental sections of Hunt Creek proper under intensive creel census in 1950 amounted to 2.43 miles of stream which had a water area of 7.02 acres. The dimensions of the various sections, along with the angling regulations in force, are given in Table 1 (See also Figure 1 for locations).

In Section Z, 164 angling trips were made, involving 473.25 hours, during which time 161 adult brook trout were caught (Table 2). The total weight of 160 of these fish (1 legal fish was returned to the water) was 21.36 pounds. The catch per hour and pounds per hour indices for 1950 were 0.34 fish and 0.045 pound respectively. The average size of

Table 1

Dimensions of the various experimental waters on the Hunt Creek drainage, with the angling regulations in force, 1950 trout season. Mileage in parentheses.

Experimental water	Dimensions		Area (acres)	1950 Angling regulations
	Length (feet)	Average width (feet)		
Section Z	2,397 (0.45)	20.3	1.12	7 inches minimum size, 15 per day
Section A	2,577 (0.49	24.3	1.44	7 inches minimum size, 15 per day
Section B	1,605 (0.30)	17.5	0.64	7 inches minimum size, 15 per day
Section C	3,970 (0.75)	11.8	0.71[1]	6 inches minimum size, 15 per day
Section D	2,896 (0.55)	50.0	3.11	6 inches minimum size, 15 per day
Totals experimental sections, Hunt Creek	13,445 (2.55)		7.02	
Lower Fuller Creek	1,140 (0.22)	25.4	0.66	7 inches minimum size, 15 per day
Upper Fuller Creek	8,735 (1.65)	14.5	2.91	6 inches minimum size, 15 per day
Fuller Creek from Hunt Creek to East Fish Lake and Fuller Creek Pond	9,875 (1.87)		3.57	
East Fish Lake			16.00	7 inches minimum size, 5 per day use of live minnows as bait prohibited

[1] Approximately 1,300 feet of Section C around the experimental diversions is closed to fishing. The figure given for acreage was determined from plane table maps.

MICHIGAN DEPARTMENT OF CONSERVATION
FISH DIVISION

HUNT CREEK FISHERIES EXPERIMENTAL AREA

MONTMORENCY COUNTY

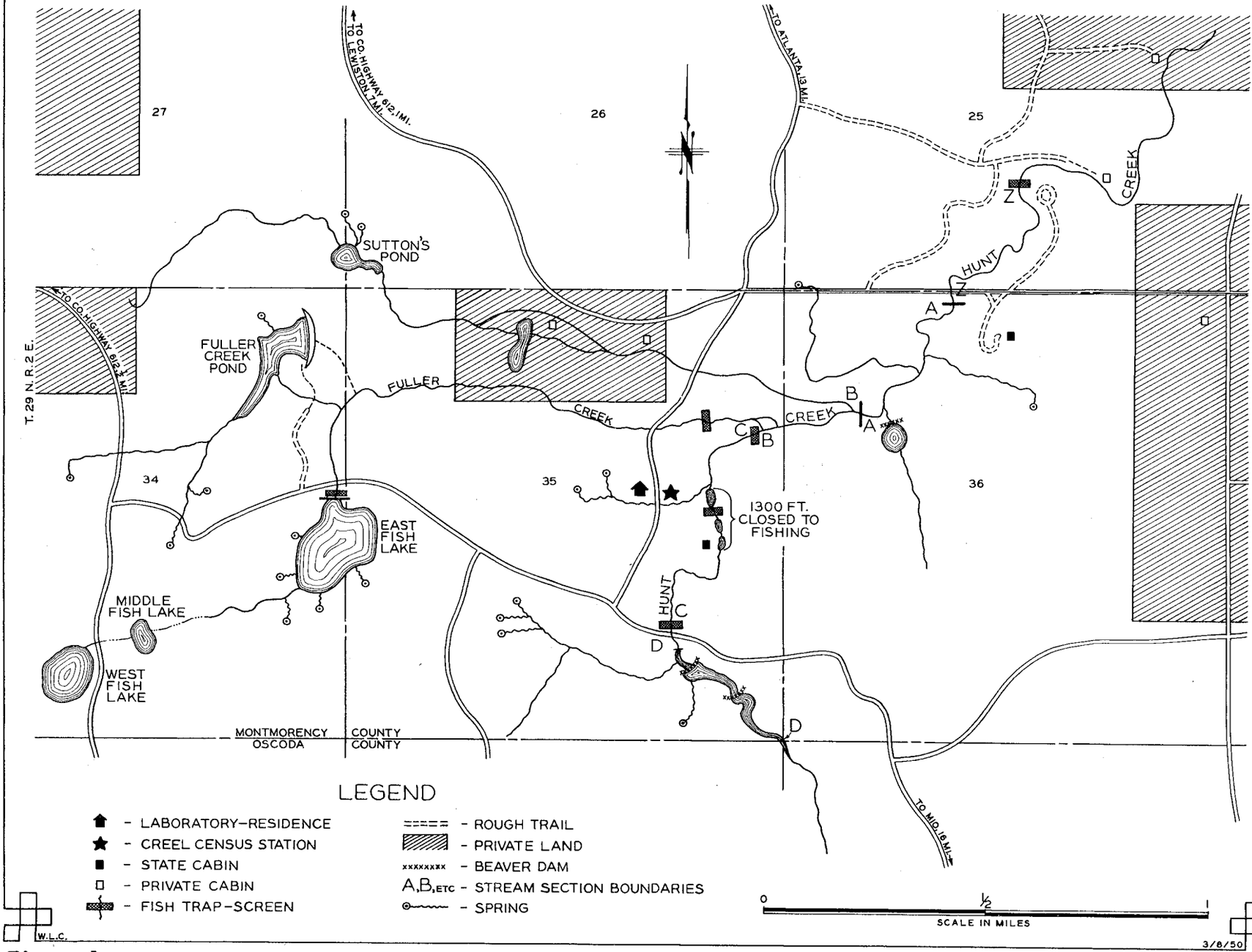

Figure 1.

HUNT CREEK FISHERIES EXPERIMENTAL AREA

OBJECTIVE -- The Hunt Creek Fisheries Experiment Station was established in 1939 as a year-round testing ground and outdoor research laboratory where trained biologists might study brook trout and the effects of angling on a typical brook trout stream. The Hunt Creek drainage was chosen because of availability of state-owned stream frontage and also because of the variety of brook trout habitats present in the area.

State ownership has made possible various experimental restrictions and management procedures not otherwise feasible.

The purpose of the investigations is to find out by observation or by controlled experiments what methods of stream management will increase the quality of the brook trout angling and also preserve the species for the enjoyment of future anglers.

THE ANGLERS' PART IN OUR RESEARCH -- The best measure of an experimental procedure in trout stream management is how it affects the anglers' catch. Therefore, registration of anglers and collection of creel census records constitute an important part of the work each year. Such records provide a measure of the effects of changes in size and creel limits, and, in connection with marking experiments and year-round population estimates, reveal origin and movements of trout within the system. Creel census records compared with population estimates correspond to sales records compared with production schedules in industry.

RESEARCH HERE DURING THE LAST TEN YEARS -- has indicated that:

(1) Natural reproduction is more than adequate in Hunt Creek;
(2) Fall plantings of hatchery-reared brook trout fingerlings contribute less than 3% to the anglers' catches in subsequent years;
(3) Stream improvement, properly carried out, can improve the quality of angling.
(4) Tributary streams are not an important source of adult fish for main stream angling;
(5) In the proper type of lake good brook trout fishing can be created by the elimination of rough fish populations.

Some of the other accomplishments of the station include detailed food studies of the brook trout by Dr. J. W. Leonard, who also identified new species of trout stream insects not previously described; an exhaustive study of the use of brook trout scales in age and growth studies of Michigan brook trout by Dr. E. L. Cooper; and the development by the past and present staff of the electric shocker as a substitute for seines in trout population investigations.

CURRENT INVESTIGATIONS -- include further study of brook trout movements in the main stream through the use of the recently-installed upper and lower screens, detailed year-round population studies on the brook trout population between these traps, trout lake and beaver pond population studies by means of netting, marking and recovery, and investigations of the effect of beaver dams on the fishing in dammed portions of trout streams.

REGULATIONS -- Except for about 1,300 feet of stream in Section C of Hunt Creek, all the waters on the map on the reverse of this sheet are open to angling. The posted waters, marked by Departmental signs, are open to angling under the following restrictions set by the Conservation Commission:

(1) Each angler must first obtain at the checking station a daily free-use permit before fishing.
(2) Each angler must report the results of his fishing at the checking station on conclusion of his angling.
(3) Special regulations are to be observed in certain waters and such waters will be posted with appropriate signs. Otherwise the usual regulations for other waters of the state are in effect on the Hunt Creek Area.

SUMMARY, ANGLING STATISTICS, EXPERIMENTAL SECTIONS, HUNT CREEK, 1939-1949

	YEAR										
	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949
TOTAL ANGLER-DAYS.....	438	505	1,015	800	311	340	375	753	607	504	593
TOTAL HOURS FISHED.....	780	901	1,546	1,267	540	640	637	1,206	872	869	1,415
LEGAL BROOK TROUT TAKEN.	492	406	722	543	378	364	315	439	187	492	698
TOTAL POUNDS REMOVED....	67	60	116	83	59	53	52	68	26	78	115
CATCH PER HOUR.....	0.63	0.45	0.47	0.43	0.70	0.57	0.49	0.36	0.21	0.57	0.49
AVERAGE TOTAL LENGTH....	7.5	7.6	7.7	7.6	7.5	7.7	7.9	7.7	7.6	7.7	7.8

SUMMARY, ANGLING STATISTICS, EAST FISH LAKE, 1939-1949

	YEAR										
	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949
TOTAL ANGLER-DAYS.....	63	111	155	159	121	311	436	430	344	287	283
TOTAL HOURS FISHED.....	126	308	386	289	200	651	928	935	711	853	1,024
LEGAL BROOK TROUT TAKEN.	51	172	242	367	69	108	169	93	89	117	91
TOTAL POUNDS REMOVED....	--	28	47	97	26	79	131	69	54	55	70
CATCH PER HOUR.....	0.41	0.56	0.63	1.26	0.29	0.17	0.18	0.10	0.13	0.14	0.09
AVERAGE TOTAL LENGTH....	--	8.0	8.5	9.0	9.3	11.2	11.9	11.5	11.1	10.4	11.6

Table 2

Angling Statistics, Section Z, Hunt Creek 1950 trout season. Figures in parentheses give the number of angling days on which no legal brook trout were taken.

Date	Total angling days	Total hours of angling	Brook trout catch		Angling quality		Total inches of legal brook trout	Average length inches
			Number	Total pounds	Catch per hour	Pounds per hour		
April 29-May 12	37 (29)	106.75	18	2.19	0.17	0.021	133.8	7.4
May 13-26	19 (12)	61.50	13	1.56	0.21	0.025	94.4	7.3
May 27-June 9	17 (8)	70.00	33	4.32	0.47	0.062	242.8	7.4
June 10-23	7 (3)	14.00	12	1.64	0.86	0.117	88.4	7.4
June 24-July 7	19 (10)	62.50	29	3.95	0.46	0.063	214.7	7.4
July 8-21	11 (5)	32.50	16	2.07	0.49	0.064	117.9	7.4
July 22-August 4	4 (0)	11.25	7	1.06	0.62	0.094	52.7	7.5
August 5-18	25 (18)	58.75	24	3.44	0.41	0.059	179.0	7.5
August 19-September 1	18 (14)	40.50	5	0.74	0.12	0.018	36.5	7.3
September 2-10	7 (4)	15.50	4 [1]	0.40 [1]	0.26	0.026 [1]	22.0 [1]	7.3 [1]
Totals; Averages	164 (103)	473.25	161 [1]	21.36 [1]	0.34	0.045 [1]	1,182.2 [1]	7.4 [1]

[1] 1 7 inch trout released after capture, length and weight net included.

the brook trout creeled in 1950 was 7.4 inches and 0.19+ pound. On a per acre basis anglers fished this piece of experimental water at the rate of 423 hours per acre and removed 144 adult fish and 19.07 pounds per acre in 1950. Successful angling trips amounted to 61 or 37 percent.

Section A again had relatively light angling pressure in comparison with earlier years (Table 3). In 62 trips involving 132 hours of fishing a total catch of 101 "keeper" brook trout were listed (two of these were released). The weight of 99 fish creeled was 13.78 pounds. The average size of the 1950 catch was 7.4 inches and 0.14 pound. Angling quality indices were 0.77 brook trout per hour and 0.104 pound of fish per hour. Anglers fished Section A at the rate of 92 hours per acre, and the per acre catch may be calculated to be 70 adult brook trout and 9.57 pounds of brook trout. The successful angling trips (36/62) constituted 58 percent of the total trips.

Section B, as usual, was not fished very heavily (Table 4). Twenty-one angling trips, for which 33 hours were recorded, produced a catch of 10 legal brook trout which weighed 1.70 pounds, for a catch per hour of 0.30 fish and a pounds-per-hour index of 0.052 pound. The average size of the fish removed from this section in 1950 was 7.9 inches and 0.17 pound. On a per acre basis, Section B was subjected to an angling pressure of 52 hours per acre, while the per acre removal amounted to 16 adult brook trout and 2.66 pounds of fish per acre. The successful angling trips comprised 24 percent of the total trips (5/21).

Section C was fished during 1950 at about the usual rate (Table 5). This is the lowermost of the two experimental sections of Hunt Creek where a 6-inch minimum size limit has been in effect since 1946. A total of 104 angling trips was recorded for this 0.71-acre section,

Table 3

Angling Statistics, Section A, Hunt Creek 1950 trout season. Figures in parentheses give the number of angling days on which no legal trout were taken.

Date	Total angling days	Total hours of angling	Brook trout catch		Angling quality		Total inches of legal brook trout	Average length inches
			Number	Total pounds	Catch per hour	Pounds per hour		
April 29-May 12	8 (8)	17.75	0					
May 13-26	7 (6)	13.00	1 ⩒1		0.08			
May 27-June 9	5 (2)	15.75	4	0.59	0.25	0.037	30.2	7.6
June 10-23	7 (3)	9.75	9	1.22	0.92	0.125	65.3	7.3
June 24-July 7	5 (3)	11.50	16	2.24	1.39	0.195	120.7	7.5
July 8-21	3 (0)	6.00	15	2.02	2.50	0.337	111.0	7.4
July 22-August 4	6 (2)	13.25	18	2.49	1.36	0.188	132.7	7.4
August 5-18	7 (4)	12.25	13	1.83 ⓪4	1.06	0.149	97.0	7.5
August 19-September 1	9 (5)	21.25	19	2.74 ⓪2	0.89	0.129	139.3	7.3
September 2-10	5 (3)	11.50	6 ⩒1	0.65	0.52	0.057	36.2	7.2
Totals; Averages	62 (36)	132.00	101 ⩒7	13.78 ⓪6	0.77	0.104	732.4	7.4

⩒ The number in the caret indicates the number of trout released after capture, length and weight are not given.

⓪ The number in the circle indicates the number of legal trout cleaned prior to creel inspection to which weights were assigned.

Table 4

Angling Statistics, Section B, Hunt Creek 1950 [illegible] trout season. Figures in parentheses give the number of days on which no legal trout were taken.

Date	Total angling days	Total hours of angling	Brook trout catch		Angling quality		Total inches of legal brook trout	Average length inches
			Number	Total pounds	Catch per hour	Pounds per hour		
April 29-May 12	12 (11)	17.50	1	0.17	0.06	0.010	8.6	8.6
May 13-26	3 (3)	5.50	0		0.00	0.000		
May 27-June 9	0							
June 10-23	1 (1)	0.75	0		0.00	0.000		
June 24-July 7	0							
July 8-21	1 (0)	3.00	3	0.47	1.00	0.157	22.5	7.5
July 22-August 4	0							
August 5-18	1 (1)	1.00	0		0.00	0.000		
August 19-September 1	1 (0)	2.00	2	0.29	1.00	0.145	14.1	7.1
September 2-10	2	3.25	4	0.79	1.23	0.243	33.4	8.4
Totals; Averages	21 (16)	33.00	10	1.70	0.30	0.052	78.6	7.9

Table 5

Angling Statistics, Section C, Hunt Creek 1950 trout season. Figures in parentheses are as follows: Under "Total angling days" the number of angling days on which no legal or 6- to 7-inch trout were taken. The other data in parentheses give the statistics on the angling for 6- to 7-inch brook trout.

Date	Total angling days	Total hours of angling	Brook trout catch		Angling quality		Total inches of legal brook trout	Average length inches
			Number	Total pounds	Catch per hour	Pounds per hour		
April 29-May 12	22 (16)	52.00	8 (10)	1.08 (0.78)	0.15 (0.19)	0.021 (0.015)	62.1 (65.4)	7.8 (6.5)
May 13-26	12 (4)	33.25	6 (8)V2	0.72 (0.54)V2	0.18 (0.24)	0.022 (0.016)V2	44.3 (38.2)V2	7.4 (6.4)
May 27-June 9	12 (7)	26.25	6 (6)	0.89 (0.54)	0.23 (0.23)	0.034 (0.021)	45.8 (38.8)	7.6 (6.5)
June 10-23	15 (7)	33.50	10 (5)	1.58 (0.44)	0.30 (0.15)	0.047 (0.013)	76.3 (31.4)	7.6 (6.3)
June 24-July 7	3 (2)	6.75	0 (3)	(0.20)	(0.44)	(0.030)	(18.1)	(6.0)
July 8-21	6 (2)	18.50	9 (22)	1.51 (2.16)	0.49 (1.19)	0.082 (0.117)	68.5 (142.4)	7.6 (6.5)
July 22-August 4	10 (8)	32.25	8 (3)	1.05 (0.28)	0.25 (0.09)	0.033 (0.009)	59.6 (20.0)	7.5 (6.7)
August 5-18	5 (2)	7.00	2 (3)	0.28 (0.28)	0.29 (0.43)	0.040 (0.040)	14.5 (19.8)	7.3 (6.6)
August 19-September 1	7 (3)	15.50	7 (10)	1.00 (1.01)	0.45 (0.65)	0.065 (0.065)	51.3 (65.3)	7.3 (6.5)
September 2-10	12 (4)	27.00	3 (10)	0.56①(0.94)	0.11 (0.37)	0.021 (0.035)	23.7 (64.4)	7.9 (6.4)
Totals; Averages	104 (55)	252.00	59 (80)V2	8.67①(7.18)V2	0.23 (0.32)	0.034 (0.028)V2	446.1 (503.8)V2	7.6 (6.5)

○ The number in the circle indicates the number of trout cleaned prior to creel inspection to which weights were assigned.

V The number in the caret indicates the number of trout released after capture, length and weight not included.

of which 59 were successful (success in the 6-inch waters is defined as the capture of brook trout larger than 6 inches), or 47 percent. In 252 hours of fishing 59 adult brook trout weighing 8.67 pounds were removed. The 6-inch law permitted the capture of 80 brook trout between 6 and 7 inches in length which weighed 7.18 pounds (weight of 78 kept). The angling quality indices were as follows: adult brook trout, 0.23 fish per hour, 0.034 pound per hour; 6- to 7-inch brook trout 0.32 fish per hour, 0.028 pound per hour. The average sizes of the anglers' catch was: adult brook trout, 7.6 inches, 0.15 pound; 6- to 7-inch brook trout, 6.5 inches 0.09 pound.

On a per acre basis, Section C was fished at the rate of 355 hours per acre during 1950, Under this angling pressure it yielded 83 adult brook trout and 12.21 pounds of adult brook trout per acre. To this total may be added 113 special trout and 10.11 pounds of special trout per acre.

Section D, with its three beaver ponds continued to attract the greatest number of stream anglers and was subjected to more pressure than any of the other experimental sections of Hunt Creek. However in comparison with 1949, angling pressure in this water dropped off from approximately 664 hours to approximately 498 hours. The drop in angling pressure can be partially explained by the fact that the second beaver dam broke through on June 27 and the water level was reduced to the old stream channel. This low level remained for a period of 20 days, as the pond was noted to be at normal level on July 16, following repair of the dam by the beaver. In its low stage, the second pond did not have its usual attraction for the anglers.

During 1950 Section D was the scene of 182 angling trips, of which 89 were successful, or 49 percent. (Table 6) In 498.25 hours of

Table 6

Angling Statistics, Section D, Hunt Creek 1950 trout season. Figures in parentheses are as follows: Under "Total angling days" the number of angling days on which no legal or 6- to 7-inch trout were taken. The other data in parentheses give the statistics on the angling for 6- to 7-inch brook trout.

Date	Total angling days	Total hours of angling	Brook trout catch		Angling quality		Total inches of legal brook trout	Average length inches
			Number	Total pounds	Catch per hour	Pounds per hour		
April 29-May 12	32 (24)	77.00	16 (1)	2.31 (2) (0.06)	0.21 (0.01)	0.030 (0.001)	122.8 (6.1)	7.7 (6.1)
May 13-26	12 (5)	35.00	32 (7)	6.55 (0.69)	0.91 (0.20)	0.187 (0.020)	264.9 (46.8)	8.3 (6.7)
May 27-June 9	32 (10)	115.50	49 (23)	10.25 (2.14)	0.42 (0.20)	0.089 (0.019)	409.3 (147.5)	8.4 (6.4)
June 10-23	13 (5)	37.00	28 (12)	5.65 (1.28)	0.76 (0.32)	0.153 (0.035)	225.5 (79.5)	8.1 (6.6)
June 24-July 7	26 (15)	61.50	42 (14) v5	8.26 (0.86) v5	0.68 (0.23)	0.134 (0.014)	339.6 (59.7) v5	8.1 (6.6)
July 8-21	18 (8)	42.00	25 (6)	5.23 (0.62)	0.60 (0.14)	0.125 (0.015)	206.0 (39.7)	8.2 (6.6)
July 22-August 4	2 (1)	3.50	2 (0)	0.44	0.57	0.126	17.5	8.8
August 5-18	10 (6)	20.00	4 (6) v1	1.47 (0.53) v1	0.20 (0.30)	0.074 (0.027) v1	39.0 (33.3) v1	9.8 (6.7)
August 19-September 1	16 (7)	54.50	25 (7)	5.57 (0.79)	0.46 (0.13)	0.102 (0.014)	207.4 (46.1)	8.3 (6.6)
September 2-10	21 (12)	52.25	24 (10)	5.25 (1.01)	0.46 (0.19)	0.100 (0.019)	201.7 (65.4)	8.4 (6.5)
Totals; Averages	182 (93)	498.25	247 (86) v6	50.99 (7.95) v6	0.50 (0.17)	0.102 (0.016)	2,033.7 (524.1) v6	8.2 (6.6)

○ The number in the circle indicates the number of trout cleaned prior to creel inspection to which weights were assigned.

v The number in the caret indicates the number of trout released after capture, length and weight not included.

fishing 247 brook trout larger than 7 inches were creeled whose total weight was 50.99 pounds. The catch of 6- to 7-inch brook trout amounted to 86 fish, 6 of which were released. The 80 special fish kept weighed 7.95 pounds. The average size of the seasons' catch from Section D was: adult fish, 8.2 inches and 0.21 pound; special brook trout, 6.6 inches and 0.10 pound. The angling quality indices were as follows: adult brook trout, 0.50 fish per hour, 0.102 pound per hour; special trout, 0.17 fish per hour, 0.016 pound per hour.

On an acreage basis, the 3.11 acres [1] supported a per acre angling pressure of 160 hours during 1950. The yield per acre to anglers was: adult brook trout, 79 fish and 16.40 pounds of fish; special brook trout, 28 fish and 2.56 pounds of fish.

Compared with the previous two seasons, the catch of Section D in 1950 dropped approximately 27 percent. It will be of interest to see if the 1948 and 1949 seasons represent the peak angling in the fishing cycle during the beaver occupancy of this experimental section.

The combined records for the experimental sections of Hunt Creek are summarized in Table 7. This tabulation records the angling pressure and the catch data from 2.43 miles of stream with a water area of 7.02 acres. A total of 533 angling trips were made, of which 230 (43.2 percent) were successful. In the course of these trips, 1,388 hours of fishing were expended, and 578 adult brook trout were caught. The total weight of the 575 fish creeled was 96.50 pounds. From Sections C and D where 6-inch brook trout were legal game, 166 special trout were

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[1] This acreage figure has been used although the water area was obviously less for the 20 days the second beaver pond was out.

Table 7

Angling Statistics, all experimental sections combined, Hunt Creek 1950 trout season. Figures in parentheses are as follows: Under "Total angling days" the number of angling days on which no legal or 6- to 7-inch trout were taken. The other data in parentheses give statistics on the angling for 6- to 7-inch brook trout in sections C and D.

Date	Total angling days	Total hours of angling	Brook trout catch: Number	Brook trout catch: Total pounds	Angling quality: Catch per hour	Angling quality: Pounds per hour	Total inches of legal brook trout	Average length inches
April 29-May 12	111 (88)	270.50 (128.50)	43 (11)	5.75② (0.84)	0.16 (0.09)	0.021 (0.007)	327.3 (71.5)	7.6 (6.5)
May 13-26	53 (30)	148.25 (68.25)	52 V1 (15) V2	8.83 V1 (1.23) V2	0.35 (0.22)	0.060 V1 (0.018) V2	403.6 V1 (85.0) V2	7.9 (6.5)
May 27-June 9	66 (27)	227.50 (141.75)	92 (29)	16.05 (2.68)	0.40 (0.20)	0.071 (0.019)	728.1 (186.3)	7.9 (6.4)
June 10-23	43 (19)	95.00 (70.50)	59 (17)	10.09 (1.72)	0.62 (0.24)	0.106 (0.024)	455.5 (110.9)	7.7 (6.5)
June 24-July 7	53 (30)	142.25 (128.25)	87 (17) V5	14.45 (1.06) V5	0.61 (0.13)	0.102 (0.008) V5	675.0 (77.8) V5	7.8 (6.5)
July 8-21	39 (15)	102.00 (60.50)	68 (28)	11.30 (2.78)	0.67 (0.46)	0.111 (0.046)	525.9 (182.1)	7.7 (6.5)
July 22-August 4	22 (11)	60.25 (35.75)	35 (3)	5.04 (0.28)	0.58 (0.08)	0.084 (0.008)	262.5 (20.0)	7.5 (6.7)
August 5-18	48 (31)	99.00 (27.00)	43 (9) V1	7.02 (0.81) V1	0.43 (0.33)	0.071 (0.030) V1	329.5 (53.1) V1	7.7 (6.6)
August 19-September 1	51 (29)	133.75 (70.00)	58 (17)	10.34 (1.80)②	0.43 (0.24)	0.077 (0.026)	448.6 (111.4)	7.7 (6.6)
September 2-10	47 (23)	109.50 (79.25)	41 V2 (20)	7.65 V2 (1.95)①	0.37 (0.25)	0.070 V2 (0.025)	317.0 V2 (129.8)	8.1 (6.5)
Totals; Averages	533 (303)	1,388.00 (809.75)	578 V3 (166) V8	96.50 V3 ③ (15.13) V8 ⑥	0.42 (0.21)	0.070 V3 0.019 V8	4,473.0 V3 (1,027.9) V6	7.8 (6.5)

V The number in the caret indicates number of keeper trout released after capture, length and weight are not given.

○ The number in the circle indicates the number of trout to which a weight was assigned, as they were cleaned prior to creel inspection.

caught in 809.75 hours, and the total weight of these 6- to 6.9-inch fish, of which 158 were kept, was 15.13 pounds. The average size of the two categories of fish was: adult brook trout, 7.8 inches and 0.17 pound; 6- to 6.9-inch brook trout, 6.5 inches and 0.10 pound.

For the experimental sections as a whole, the 1950 quality indices were: adult fish 0.42 fish per hour, 0.070 pound per hour; 6- to 6.9-inch fish, 0.21 fish per hour, 0.019 pound per hour.

For the 1950 season, the angling pressure per acre for the entire experimental waters was 198 hours. Brook trout larger than 7 inches were caught at the rate of 82 fish per acre, and the pounds per acre yield of adult brook trout was 13.75.

In addition to the legal take discussed here, anglers were observed to possess 29 fish from Sections Z, A and B, which were less than the 7 inches prescribed by law for those waters. These fish weighed 2.75 pounds. The total weight of 6- to 7-inch brook trout taken was 15.13 pounds. Thus the total poundage of all brook trout removed during 1950 from the experimental sections amounted to 114.38 pounds (yield per acre, 16.29 pounds). The 6- to 6.9-inch brook trout were captured at the rate of 43 fish per acre, and their pounds per acre yield to the anglers was 3.94.

Angling results, Fuller Creek and East Fish Lake Outlet

During 1950, all but the lowermost 0.22 miles of Fuller Creek was under the 6-inch regulation. In the 6-inch waters upstream from the rotary screen, 84 angling trips involving 162.25 hours yielded 11 brook trout larger than 7 inches and 55 brook trout between 6.0 and 6.9 inches. Thirty-seven percent (31/84) of the angling trips were successful. The total weight of brook trout removed was: adult fish 1.72 pounds; 6.0- to 6.9-inch fish 4.92 pounds.

Table 8

Angling Statistics, Fuller Creek (Except Fuller Creek Pond) and East Fish Lake Outlet, 1950 trout season. Figures in parentheses are as follows: Under "Total angling days" the number of angling days on which no legal or 6- to 7-inch trout were taken. The other data in parentheses give the statistics on the angling for 6- to 7-inch brook trout.

Date	Total angling days	Total hours of angling	Brook trout catch		Angling quality		Total inches of legal brook trout	Average length inches
			Number	Total pounds	Catch per hour	Pounds per hour		
April 29-May 12	20 (13)	44.75	2 (16)	0.34 (1.36)	0.04 (0.36)	0.008 (0.030)	16.6 (100.6)	8.3 (6.3)
May 13-26	17 (10)	36.00	2 (10)	0.23 (0.87)	0.06 (0.28)	0.006 (0.024)	14.0 (64.0)	7.0 (6.4)
May 27-June 9	7 (5)	13.75	2 (5)	0.27 (0.52)	0.15 (0.36)	0.020 (0.038)	14.6 (33.1)	7.3 (6.6)
June 10-23	4 (0)	3.75	1 (3)	0.12 (0.27)	0.27 (0.80)	0.032 (0.072)	7.1 (19.1)	7.1 (6.4)
June 24-July 7	20 (12)	31.75	2 (18)	0.38 (1.66)	0.06 (0.57)	0.012 (0.052)	15.4 (115.7)	7.7 (6.4)
July 8-21	2 (2)	4.00						
July 22-August 4	2 (2)	4.00						
August 5-18	0							
August 19-September 1	10 (7)	21.25	2 (3)	0.38 (0.24)	0.09 (0.14)	0.018 (0.011)	15.7 (18.7)	7.9 (6.2)
September 2-10	2 (2)	3.00						
Totals; Average Upper Fuller	84 (53)	162.25	11 (55)	1.72 (4.92)	0.07 (0.34)	0.011 (0.030)	83.4 (351.2)	7.6 (6.4)
Totals; Averages Lower Fuller	23 (22)	22.25	1	0.18	0.04	0.008	7.8	7.8
Grand Totals	107 (75)	184.50 (162.25)	12 (55)	1.90 (4.92)	0.07 (0.34)	0.010 (0.030)	91.2 (351.2)	7.6 (6.4)

Quality indices for the special regulation portion of Fuller Creek were: adult brook trout, 0.07 fish per hour and 0.011 pound per hour; special brook trout, 0.34 fish per hour and 0.030 pound per hour. The average size of the adult brook trout creeled was 7.6 inches and 0.16 pound; of the 6.0 to 6.9-inch fish, 6.4 inches and 0.09 pound.

On Lower Fuller Creek, one successful angler out of 23 recorded trips caught one adult brook trout which was 7.8 inches long and weighed 0.18 pound in 22.25 hours of fishing.

Angling pressure in 1950 on the entire Fuller Creek waters (3.57 acres) was at the rate of 52 hours per acre. The per acre yield to the anglers was 3 adult brook trout and 0.54 pounds of fish larger than 7 inches, 15 specila trout and 1.38 pounds of fish. Angling pressure and yield in 1950 were noticeably lower than in earlier years.

Angling results, Fuller Creek Beaver Pond, 1950

The season's best angling on the area was to be found at the re-established Fuller Creek Beaver Pond. This impoundment was completed in May, 1949 on the site of an old beaver dam which furnished excellent fishing in 1939, 1940, and 1941 (see comparative totals at the foot of Table 9). Although the 6-inch regulation applied to this impoundment in 1940, relatively few anglers took advantages of it because of the larger average size of the brook trout population. Several limit catches were made in mid-May; all were taken by worm or minnow angling.

On this pond, 136 angling trips were made, and 77 were successful (57 percent). In the course of these trips 429.75 hours of angling yielded 347 adult brook trout and 10 special brook trout. The total poundage of the two categories was 109.43 pounds and 101 pounds respectively.

Table 9

Angling Statistics, Fuller Creek Pond, 1950 trout season. Figures in parentheses are as follows: Under "Total angling days" the number of angling days on which no legal or 6- to 7-inch trout were taken. The other data in parentheses give the statistics on the angling for 6- to 7-inch brook trout.

Date	Total angling days	Total hours of angling	Brook trout catch: Number	Brook trout catch: Total pounds	Angling quality: Catch per hour	Angling quality: Pounds per hour	Total inches of legal brook trout	Average length inches
April 29-May 12	28 (11)	72.75	102 (1)	33.53 (0.12)	1.40 (0.01)	0.461 (0.002)	955.7 (6.8)	9.6 (6.8)
May 13-26	21 (7)	90.25	60 (4)	17.21 (0.37)	0.66 (0.04)	0.191 (0.004)	545.1 (25.8)	9.1 (6.4)
May 27-June 9	17 (9)	46.50	24 (4)	6.25 (0.43)	0.32 (0.09)	0.134 (0.009)	199.3 (26.5)	9.1 (6.6)
June 10-23	12 (4)	34.50	10 (1)	3.16 (0.09)	0.29 (0.03)	0.092 (0.003)	91.7 (65)	9.2 (6.5)
June 24-July 7	22 (7)	64.25	83	26.72	1.29	0.416	767.0	9.2
July 8-21	5 (2)	15.25	16	4.80	1.05	0.315	144.3	9.0
July 22-August 4	3 (2)	7.50	8	2.61	1.07	0.348	73.8	9.2
August 5-18	6 (4)	20.00	7	2.28	0.35	0.114	64.8	9.2
August 19-September 1	7 (3)	20.00	18	5.41	0.90	0.271	161.1	9.0
September 2-10	15 (10)	58.75	19	7.46 (3)	0.32	0.127	190.6	10.0
Totals; Averages 1950	136 (59)	429.75	347 (10)	109.43 (3)	0.81 (0.02)	0.255 (0.002)	3,193.4 (65.6)	9.3 (6.6)
Totals; Averages, 1939	112 (51)	249.50	164	86.71	0.66	0.348	...	10.9
Totals; Averages, 1940	65 (30)	144.25	88	37.30	0.61	0.259	...	9.7
Totals; Averages, 1941	26 (7)	50.25	57	14.24	1.13	0.283	...	8.6

○ The number in the circle indicates the number of trout cleaned prior to creel inspection weights assigned.

V The number in the caret indicates the number of trout released after capture on which weight and length are not given.

The catch per hour for adult fish was 0.81 and the pound per hour index was 0.255. Special trout were removed at the rate of 0.02 fish and 0.002 pound per hour.

The adult fish in the anglers' catches ranged in size from 7 to 12.6 inches and were of an average size of 9.3 inches and 0.32 pound. The 6.0- to 6.9-inch brook trout taken averaged 6.6 inches in length and 0.10 pound in weight.

In 1939 the Fuller Creek Beaver Pond was known only to a few anglers. From the standpoint of the modern angler it was almost inaccessible--it was more than 1/4 mile from a road. Consequently it had been lightly fished. Once the quality of the angling available there became known, it received considerable attention in 1939, 1940, and 1941 until the dam failed and the pond level dropped to the original stream channel. The effect of heavy angling pressure is well demonstrated by the drop in average size of the catch from 1939 through 1941. The 1950 angling statistics provide evidence that fishing of the originally-observed quality can be provided by the re-establishment of this impoundment. Because it was known from scale studies that the brook trout population had a faster-than-average growth rate in the pond, it was recommended that a 10-inch minimum size limit be established. To eliminate, insofar as possible, the practice of "meat" fishing, a 5-trout daily creel limit also was proposed. A Conservation Commission order embodying both proposals was enacted for the 1951 trout season.

Yield and pressure per acre cannot be given as the Fuller Creek Pond acreage has not been determined accurately as yet. It is estimated that it has a surface area of approximately 10 acres.

Angling results, East Fish Lake (Table 10)

During 1950, the angling regulations allowed a daily creel limit of 5 fish 7 inches long or larger. All lures except live minnows were permitted. A total of 613.25 hours of fishing were expended during 218 trips. Only 29 trips were successful or 13 percent of the total. The season's catch amounted to 50 brook trout, 47 of which were creeled. The poundage of fish removed was 38.50 pounds. The average size of the 1950 catch was 12.3 inches and 0.82 pound. Quality indices were 0.08 fish per hour and 0.063 pound per hour.

In comparison with the 1949 season, fishing pressure dropped about 40 percent (from over 1,039 hours to 613 hours), but angling quality was approximately the same.

The pressure per acre in 1950 was 38 hours per acre and the yield to the fishermen amounted to 3 legal trout and 2.41 pounds per acre.

The lake provided good trout fishing during the opening two weeks of 1950. The 35 fish taken weighed 36.06 pounds for an average weight of over one pound apiece. One additional fair fish was captured by May 22, but between that date and July 10 old anglers were unsuccessful. The remaining 14 fish that were captured after July 10 were small, ranging from 7 to 9 inches.

Common suckers began to come into the catch in 1950. A total of 17 suckers weighing 11.38 pounds were removed by anglers. These fish ranged in size from 8 to 14 inches. They are present as the result of incomplete poisoning or the illegal use of suckers as bait sometime since 1942.

Because of the known rapid growth rate of the brook trout population in East Fish Lake, the same regulations as proposed for Fuller Creek

Table 10

Angling Statistics, East Fish Lake, 1950 trout season. Figures in parentheses give the number of days on which no legal trout were taken.

Date	Total angling days	Total hours of angling	Brook trout catch		Angling quality		Total inches of legal brook trout	Average length inches
			Number	Total pounds	Catch per hour	Pounds per hour		
April 29-May 12	81 (63)	246.25	35	36.06	0.14	0.146	483.1	13.8
May 13-26	18 (17)	62.75	1	0.62	0.02	0.010	11.5	11.5
May 27-June 9	30 (30)	73.25	0					
June 10-23	10 (10)	19.00	0					
June 24-July 7	15 (15)	29.75	0					
July 8-21	16 (13)	41.00	4	0.66	0.10	0.016	30.2	7.6
July 22-August 4	11 (9)	29.00	2	0.35	0.07	0.012	15.2	7.6
August 5-18	9 (9)	29.25	1 V 1		0.03			
August 19-September 1	16 (13)	62.50	5	0.83	0.08	0.013	38.5	7.7
September 2-10	12 (10)	20.50	2 V 2		0.10			
Totals; Averages	218 (189)	613.25	50 V 3	38.50 V 3	0.08	0.063 V 3	578,5 V 3	12.3

V The number in the caret indicates the number of trout released after capture, length and weight not given.

Pond (10-inch minimum size limit, 5 trout daily creel limit, use of live minnows and bait prohibited were enacted by the Conservation Commission for the 1951 trout season.

Angling results on the 6-inch waters

A separate report is being prepared which will discuss in detail the results of the angling on Sections C and D of Hunt Creek and on Fuller Creek west of the rotary screen. This report will cover the past five years (including 1950) which are the seasons when this special regulation was in force.

Number of individual anglers catching various numbers of adult brook trout during the 1950 trout season

The creel census data were again sorted by listing the season's results for individual anglers. Separate tabulations were made for stream fishing (Hunt and Fuller Creeks), trout lake fishing (East Fish Lake), and beaver pond fishing (Fuller Creek Pond). Only trout larger than 7 inches were considered in this tabulation so that the results might be directly comparable with similar data from experimental waters of the Rifle River Area and the Pigeon River.

On Hunt and Fuller Creeks, (Table 11) 360 different anglers made a total of 640 trips and caught 590 adult brook trout. The successful individuals who caught from one to five fish during 1950 made up 29.2 percent of the total individuals and they made 33.7 percent of the total trips and caught 34.2 percent of the seasons' catch. The anglers catching 6 to 10 fish constituted 5.8 percent of the individuals and they made 11.4 percent of the total trips and creeled 27.5 percent of the 1950 catch. There were seven individuals who caught 11, 14, 17, 26, 31, 63,

Table 11

Number of adult brook trout caught and number of angling trips made by individual anglers 1950 trout season. Hunt and Fuller creeks (Fuller Creek Pond not included).

Number of adult brook trout caught per angler	Number of individuals catching them	Number of angling trips made	Total trout caught	Percent of total individuals	Percent of total angling trips	Percent of total catch
0	227	307	0	63.1	48.0	0.0
1	52	100	52			
2	23	44	46			
3	20	34	60	29.2	33.7	34.2
4	6	13	24			
5	4	25	20			
6	4	9	24			
7	7	27	49			
8	5	17	40	5.8	11.4	27.5
9	1	2	9			
10	4	18	40			
11	1	2	11			
14	1	2	14			
17	1	4	17			
26	1	7	26	1.9	6.9	38.3
31	1	7	31			
63	1	10	63			
64	1	12	64			
Total	360	640	590	100.0	100.0	100.0

and 64 fish respectively from the streams and these fishermen made up 1.9 percent of the total individuals. Their trips amounted to 6.9 percent of all angling trips and their catch was 38.3 percent of the total. There were 227 unsuccessful individuals (or 63.1 percent) who made 48 percent of the total trips. These results are similar to those observed in 1949, except that in 1950 a higher percentage of the total catch was made by successful fishermen taking 6 to 10 fish, and a lower percentage of the total catch was creeled by the anglers removing 11 to 64 fish.

On East Fish Lake, angling success was lower than usual 85.7 percent of the 168 individuals caught no fish in 163 trips. Catches for the season for the successful 14.3 percent ranged from one to 9 fish. The five most successful individuals comprised 3.0 percent of the total individuals, made 4.5 percent of the trips, and caught 50.00 percent of the total catch. The other 50 percent of the catch was made by 19 successful anglers (11.3 percent) who took one and two fish in 19.7 percent of the total trips.

On the Fuller Creek Pond, 38 successful anglers caught from 1 to 43 brook trout in 94 trips while 40 individuals were blanked in 42 trips. Here there were more successful anglers catching 10 or more fish during the season; 16.7 percent of the total individuals made 37.5 percent of all trips and removed 72.6 percent of the catch. Anglers taking 1 to 5 fish in 1950 made up 21.8 percent of the individuals, made 19.1 percent of the trips and caught 11.0 percent of the total catch; those individuals catching 6 to 10 fish constituted 10.2 percent of all fishermen, made 12.5 percent of the trips and took home 16.4 percent of the 1950 catch.

Table 12

Number of adult brook trout caught and number of angling trips made by individual anglers, 1950 trout season, East Fish Lake.

Number of legal brook trout per angler	Number of individual anglers catching them	Number of angling trips made	Total legal trout caught	Percent of total individuals	Percent of total angling trips	Percent of total catch
0	144	163	0	85.7	74.8	0.0
1	13	19	13	7.7	8.7	26.0
2	6	24	12	3.6	11.0	24.0
3	2	2	6			
4	0			2.4	3.7	32.0
5	2	6	10			
9	1	4	9	0.6	1.8	18.0
Total	168	218	50	100.0	100.0	100.0

These tabulations provide additional evidence that generally less than 10 percent of the individual trout fishermen are removing 50 or more percent of the total season's catch from these experimental waters.

Comparison of 1950 anglers' catches with the estimated adult population of brook trout

Hunt Creek

The trout population of the acres of Hunt Creek between the Section D and Section Z bulkheads was studied after the close of the 1950 trout season in September. The brook trout population of this portion of Hunt Creek (Sections Z, A, B and C) was successfully confined during the period April 29 - September 28, 1950 except for about one hour on June 27, 1950 when the second beaver dam in Section D gave way. The dam failure caused the stream to overtop the Section D bulkhead and fish traps until the self-cleaning rotary screens were set in place. Subsequent sampling with the shocker and recoveries from the fish traps indicate that very few fish, if any, carried downstream by this sudden flood.

The population estimate of September, 1950 was made by the customary mark-and-recapture method, and involved two trips over the two miles of blocked-off stream with the electric shocker.

The data concerning adult brook trout 7 inches or larger are presented in Table 14. The observed mortality (consisting of 9 brook trout found dead on the screens in the traps), the numbers moving into (14) or out of (13) the blocked-off sections and the take by angling (328) are listed. The sum of the above categories (364) plus the population estimate after the season's close (220) yields a total of 584 legal trout available to the anglers at some time during the 1950 trout season from Sections Z, A, B, and the open waters of Section C.

Table 13

Number of adult brook trout caught and number of angling trips made by individual anglers 1950 trout season in Fuller Creek Pond.

Number of adult brook trout caught per angler	Number of individuals catching them	Number of angling trips made	Total trout caught	Percent of total individuals	Percent of total angling trips	Percent of total catch
0	40	42		51.3	30.9	0.0
1	6	9	6			
2	4	5	8			
3	5	8	15	21.8	19.1	11.0
4	1	3	4			
5	1	1	5			
6	3	4	18			
7	3	5	21			
8	1	3	8	10.2	12.5	16.4
9	0					
10	1	5	10			
11	1	4	11			
12	1	4	12			
13	1	1	13			
14	2	7	28			
19	2	7	38	16.7	37.5	72.6
20	1	4	20			
21	2	7	42			
22	1	3	22			
23	1	9	23			
43	1	5	43			
Total	78	136	347	100.0	100.0	100.0

Table 14

Population estimates and catch data for 3.91 acres of experimental waters confined between the upper and lower bulkhead traps (Sections Z, A, B, and C) Hunt Creek from April 29, 1951 to completion of fall population study.

Item	Legal trout 7+
Observed mortality	9
Migrated out	13
Immigration in	14
Trout taken by anglers 1950 season as legals	328 ^2
Population study Fall 1950	220
Theoretically available to anglers at some time during the 1950 season	584 ^*

^ The number in the caret indicates trout released by anglers; released trout are not included in the figure 328.

^* Estimated legal population in the open water of Section C plus legals of sections Z, A, and B.

Thus the 1950 anglers removed 56.6 percent of the total fish available (328/584), and there were left for spawning 37.7 percent (220/584). Observed mortality (9 fish) accounted for 1.5 percent. Four of the immigrants were included in the anglers' catch; 10 of the immigrants theoretically were among the estimated population of adult brook trout for September, 1950. The 13 emigrants which left the blocked-off 2 miles of stream between April 29 and September 22, 1950, did not return during the period of fall spawning.

The 1950 results were similar to those observed in 1949. The size of the fall population was approximately the same. Angling removed somewhat fewer fish and as a result there were more fish left for spawning. In 1949 the percentage of escapement for spawning was 34.5 whereas in 1950 the percentage of escapement for spawning was 37.7. Calculated on a per acre basis, under an angling pressure of 228 hours per acre, on an available population of 149 adult trout per acre, a removal of 84 legal brook trout pereacre was affected in 1950.

East Fish Lake

For the past three falls, the Hunt Creek staff has netted the lake with hoop nets and fyke nets and made estimates of the brook trout population 7 inches or larger. The method for estimating the population utilized has been the Schumacher-Eschmeyer method, a modificiation of the Schnabel method. In practice, detailed records of the numbers of fish netted daily and the proportion of marked and unmarked fish in the catch are noted. Usually all unmarked fish captured each day are marked. Netting operations are generally continued until the proportion of marked to unmarked fish in the net catches remains constant for a week or ten days. The cumulative data are summarized and the last estimate is in theory the most valid estimate of the population available to

capture by the gear used. In the East Fish Lake operations this has been brook trout 7 inches or larger, except for relatively few individual fish. The relationship between the population of brook trout available to the anglers and the catch by angling in the past years is given in Table 15. The fall population estimates are given here, mainly for comparison with the known catch during the past three seasons. The circumstances surrounding the estimates will not be discussed, because of space limitations. We have done considerable cross-checking and it does appear that our population estimates are reasonable.

From Table 15, it can be shown that the 1948 catch of 108 brook trout was from an estimated population of 283 fish; the 1949 anglers' catch of 93 fish came from an estimated total population of 337 fish; while the 1950 fishermens' take of 47 legal fish resulted from a population of 170 legal brook trout. In those three years anglers removed 38.1 percent, 27.6 percent and 27.6 percent respectively of the estimated total legal trout available. This removal was effected under a yearly angling pressure of 53 hours (1948), 64 hours (1949) and 38 hours (1950) per acre. As can be seen in the table, there has been a reduction in the available population over the period 1948-1950, which occurred sometime between the fall of 1949 and the fall of 1950. This decrease apparently was the result of mortality mainly among fish marked for the first time in the 1949 fall population study, judging from the relatively few recoveries made on this group of fish. Migration cannot influence the estimate because of the presence of the Wolf trap at the outlet dam. This device prevents escapement of the lake residents and access to the lake by stream-inhabiting brook trout.

Table 15

Catch and population data for East Fish Lake, 1948-1950

Item	Total tagged trout available after fall population study	Survivors from 1948 population study		Survivors from 1949 population study		Grew into catchable size	Totals	Estimated fall population	Estimated total available in year
		Known[1]	Estimated[2]	Known	Estimated				
1948 Catch							108		
1948 Fall population study	149						149	175 ± 6	283 ± 6
1949 Catch		33	13			47	93		
1949 Fall population study	71	26	16			55	97	244 ± 28	337 ± 28
1950 Catch		17	4	8	2	16	47		
1950 Fall population study	66			6	6	60	72	123 ± 24	170 ± 24

[1] Known = tagged fish

[2] Estimated = unmarked fish from fall marking as estimated by direct proportion. For example in the 1949 catch

$$33/149 = \frac{60}{x}, \quad x = 13.$$

Table 16

Catch and population study data, Fuller Creek Beaver Pond 1949-1950

Item	Total tagged trout available after 1949 fall population study	Survivors from 1949 population study		Grew into catchable size or moved in	Totals	Estimated fall population	Estimated total available in year
		Known[1]	Estimated[2]				
1949 Catch					5		
1949 Fall population study	174				174	258 ± 16	263 ± 59
1950 Catch		79	121	143	343		
1950 Fall population study	124	9	15	109	133	347 ± 59	690 ± 59

[1] Known = tagged fish

[2] Estimated = Unmarked fish taken same year of marking, as estimated by direct proportion. See footnote [2] in Table 15.

Fuller Creek Beaver Pond

Although the fill was completed and the pond filled early in the 1949 trout season, almost no fishing was done here in 1949, but visual observations on several occasions indicated that a fair population of brook trout was present. Therefore it was decided that a population study should be conducted here before any great amount of angling was presented. This was done in the fall of 1949. In Table 16 the 1949 fall population estimate is shown, along with the 1950 catch, followed by the 1950 population estimate.

In the fall of 1949, the estimate of the brook trout population 7 inches or larger was 258 ± 16. From the study 174 brook trout bearing jaw tags theoretically survived to the 1950 trout season, or 67.4 percent of the estimated population.

As shown in Table 9, the 1950 anglers' catch amounted to 347 brook trout larger than 7 inches, of which 79, or 228 percent bore jaw tags from the previous fall.

In October, 1950, the fall population study yielded a population estimate of .347 ± 59.

The discrepancy between the 1949 fall population estimate and the 1950 catch can only be explained by the assumption that (a) the population estimate was low because of incomplete sampling of all parts of the population; (b) that rapid growth of the size groups 4.0-6.9 inches increased the numbers of fish legally available to the anglers between November, 1949 and May, 1950; or (c) that migration into the pond following November, 1949 (and possibly during the population study) increased the population well above the figure estimated as a result of the netting studies.

Concerning assumption (a), six fyke nets were set at varying locations in all parts of the pond, and both marked and unmarked trout were captured in all localities except one. It appears likely that the increase in the population was the result of assumptions (b) and (c). That some migration into the pond did take place is shown by the presence in the 1950 anglers' catch of two right-pectoral-clipped brook trout. These fish were originally marked and placed in SectionsZ, A, B, and C of Hunt Creek, as part of a test of wild fingerling vs. hatchery fingerling survival, and were two of the 1,000 hatchery-reared fingerlings released in the fall of 1949. To reach the pond these two fish had to migrate up Fuller Creek approximately 1.9 miles.

The part that growth plays in increasing the available population of fish larger than 7 inches can be observed in Table 17. This tabulation lists the size-frequency of the fish handled in the population studies and the creel census since the fall of 1949. Note that angling captured many more fish in the smaller size groups in 1950 than did the nets in the fall of 1949. However, in the fall of 1950, numerous brook trout in the smaller size groups between 4.5 and 6.5 inches began to appear in the net catches.

On the basis of the 1950 catch data and the 1950 fall population study it can be calculated that a total of 690 brook trout larger than 7 inches were available at some time during 1950 for the anglers. The anglers removed 344 of these fish, or approximately 50 percent of the estimated population available.

Table 17

Size-frequency of Fuller Creek Beaver Pond brook trout taken in population studies and by angling since the fall of 1949.

Size range	1949 Fall population study[1]	1950 Catch		1950 Fall population study	
		Tagged	Unmarked	Tagged	Unmarked
4.5-4.9	1				2
5.0-5.4					9
5.5-5.9					6
6.0-6.4			1		13
6.5-6.9			9		8
7.0-7.4	4		21		9
7.5-7.9	19		32		13
8.0-8.4	34	3	33		15
8.5-8.9	40	6	32		16
9.0-9.4	32	10	27		16
9.5-9.9	24	22	43		18
10.0-10.4	15	20	29	2	12
10.5-10.9	5	11	14	2	9
11.0-11.4	3	7	14	2	6
11.5-11.9			7	2	6
12.0-12.4			1	1	3
12.5-12.9			1		1
Totals	177	79	264	9	162

[1] All these fish were jaw tagged. Tagged fish taken in the 1950 season by angling and in the netting in the fall were survivors from the 1949 tagging. Two tagged fish died, and the one small fish has been excluded from the calculations.

Residence of anglers (Table 18)

Fishermen from 41 Michigan counties of the Lower Peninsula and four other states used the experimental waters during 1950. The most fishing was done by residents of Wayne, Montmorency, Genesee, Oakland and Bay counties in that order. Nonresident trout fishermen were led by Ohioans (54 trips), followed by Illinois trouters (11 trips), and New York and Indiana fishermen (2 trips and 1 trip respectively). In general, the residence and use pattern was similar to that observed in earlier years.

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Table 18

Residence of individual anglers, also residence of anglers as tabulated by angling days, 1950 trout season Hunt Creek Fisheries Experimental Area.

County	Number of individuals	E. Fish Lake	Fuller Creek	Fuller Cr. Pond	Hunt Creek	Totals
Allegan	2				2	2
Alpena	4				9	9
Arenac	7		2		7	9
Barry	1			1		1
Bay	23	4	14	2	33	53
Calhoun	9	3	2	5	6	16
Cheboygan	1				2	2
Clare	1			1		1
Clinton	1			1	3	3
Crawford	3	1		2		3
Emmet	1	1			1	2
Eaton	3	3				3
Genesee	43	17	24		29	70
Gladwin	1	2				2
Grand Traverse	1	1				1
Gratiot	3			1	4	5
Hillsdale	1				1	1
Ingham	17	9	1	6	8	24
Isabella	1				2	2
Jackson	15	8			8	16
Kalamazoo	3	3				3
Kent	7	8	1	2	3	14
Lenawee	5				5	5
Livingston	4	4	2			6
Macomb	11	7		3	12	22
Mason	2	6		2		8
Midland	11	1	6		11	18
Monroe	4				8	8
Muskegon	1	1				1
Montmorency	61	60	10	56	56	182
Oakland	36	4			56	60
Ogemaw	2	2				2
Oscoda	12		4	3	17	24
Roscommon	1	1				1
Saginaw	15	10		18	13	41
Sanilac	2				4	4
Shiawassee	1				1	1
St. Clair	15	2			31	33
Tuscola	2	2				2
Washtenaw	14	3	4	11	10	28
Wayne	140	51	34	15	138	238
Total residents	488	214	104	128	480	926
Illinois	5	3		2	6	11
Indiana	1				1	1
New York	2				2	2
Ohio	23	1	3	6	44	54
Total nonresidents	31	4	3	8	53	68
Grand Total	519	218	107	136	533	994