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DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
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THE EIGHTEENTH ANNUAL INTENSIVE CREEL CENSUS,
HUNT CREEK FISHERIES EXPERIMENT STATION, 1956

By Gaylord Alexander and David S. Shetter

Introduction

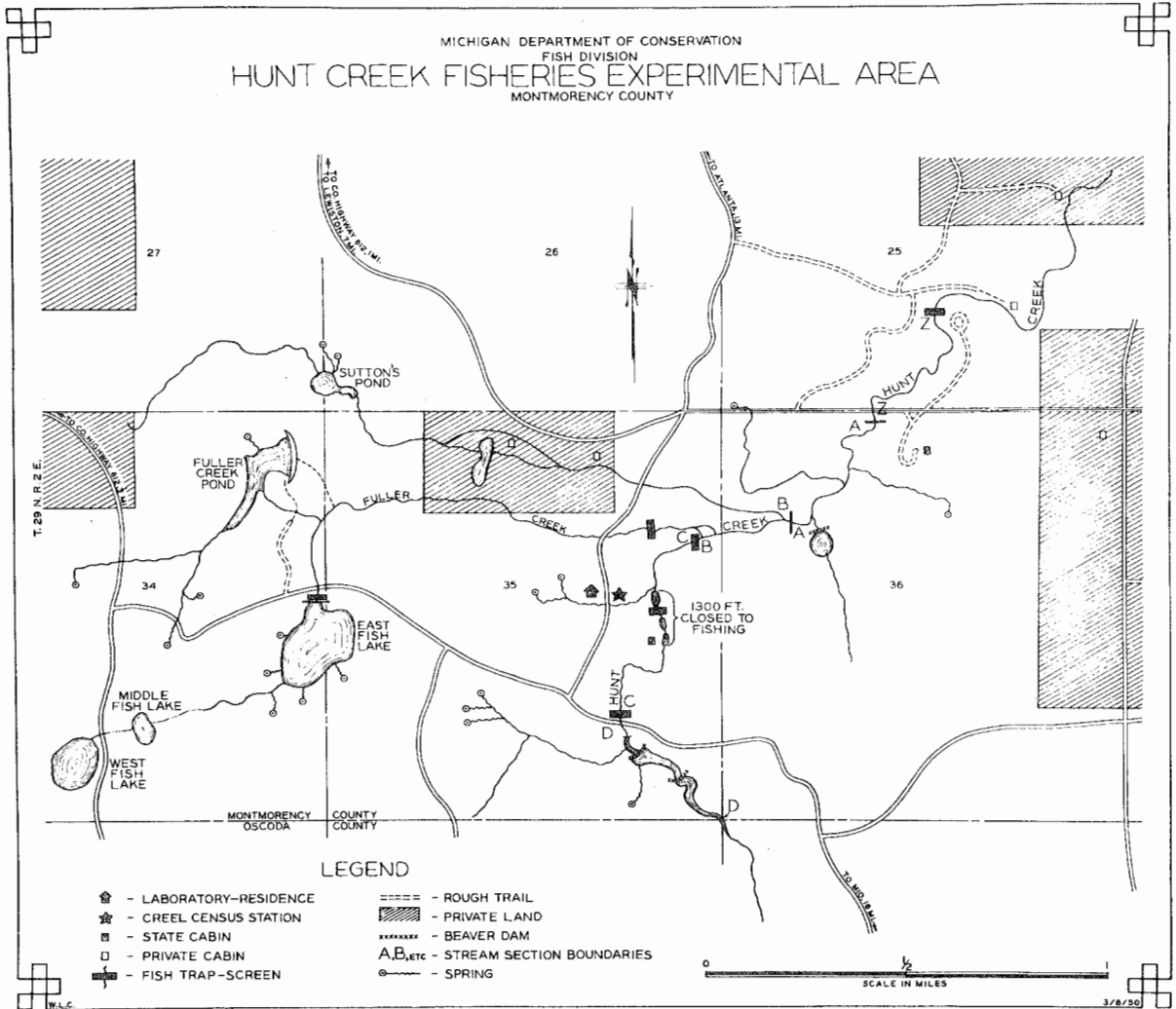
Hunt Creek, Montmorency County, flows from Harders Lake, Oscoda County, northeastward for approximately 10 miles to its confluence with the Thunder Bay River. The experimental waters are located in a four-square-mile area on the upper reaches of Hunt Creek (Fig. 1).

Angling was censused intensively in 1956 for the eighteenth consecutive year. Experimental waters included in the census were Hunt Creek, Fuller Creek, Fuller Creek Pond, and East Fish Lake. The dimensions of these waters and the fishing regulations for 1956 are summarized in Table 1.

Methods

Anglers fishing the experimental waters were required to obtain a daily permit from a centrally located checking station, where they were briefed on the area regulations. The experimental waters were posted at all boundary and access sites to aid anglers in reporting their fishing results. At the conclusion of fishing, anglers reported back to the checking station, where all legal fish were weighed and measured and other pertinent data, including anglers' reports on the number of sublegal fish caught and released, were recorded.

MICHIGAN DEPARTMENT OF CONSERVATION
 FISH DIVISION
HUNT CREEK FISHERIES EXPERIMENTAL AREA
 MONTMORENCY COUNTY



LEGEND

- | | |
|--------------------------|-------------------------------------|
| 🏠 - LABORATORY-RESIDENCE | ==== - ROUGH TRAIL |
| ★ - CREEL CENSUS STATION | ▨ - PRIVATE LAND |
| 🏠 - STATE CABIN | ⋯⋯⋯ - BEAVER DAM |
| 🏠 - PRIVATE CABIN | A,B,ETC - STREAM SECTION BOUNDARIES |
| 🔍 - FISH TRAP-SCREEN | ○ - SPRING |

0 1/2 1
 SCALE IN MILES

FIG. 1

Table 1.--Morphometry (mileage in parentheses) of experimental waters on Hunt Creek drainage, with angling regulations for 1956

Experimental water Section of Hunt Creek:	Dimensions			1956 Regulations		
	Length (feet)	Average width (feet)	Area (acres)	Lure	Minimum length (inches)	Daily creel limit
Z	2,397 (0.45)	20.3	1.12	Flies only	7	10
A	2,577 (0.49)	24.3	1.44	Flies only	7	10
B	1,605 (0.30)	17.5	0.64	Any	7	10
C ¹	2,700 (0.51)	11.8	0.71	Any	7	10
D ²	2,896 (0.55)	50.0	3.11	Any	7	10
Total, Hunt Creek	12,175 (2.30)	25.1	7.02			
Fuller Creek	9,875 (1.87)	15.7	3.57	Any	7	10
Fuller Creek Pond	.... ....	....	14.58	No live minnows	10	5
East Fish Lake	.... ....	....	16.0	No minnows	10	5

¹ Excludes 1,270 feet of Section C which are experimental diversions closed to fishing.

² The data listed are from a 1949 survey. Beaver activities have increased the average width and area slightly.

Fishing permits and violations

A total of 1,101 permits were issued to anglers in 1956, representing 1,464 trips. Anglers were allowed to fish in all waters open to fishing with one daily permit; however, each area (Sections Z, A, B, C, and D of Hunt Creek, Fuller Creek, Fuller Creek Pond, and East Fish Lake) fished was tabulated as a separate trip. Licensees made 76 percent of all trips, their wives 7 percent, and minors (under 17 years of age) 17 percent.

Eleven anglers failed to report their fishing results on the date of issuance of the permit. Eight reported on the following day, but warrants were issued for the arrest of the other three. Other violations during the season included one angler who fished without a permit and two anglers who used worms in sections with a flies-only regulation. Fifteen stomachs (presumably from trout which were caught illegally) were found on the shore of East Fish Lake.

Seventeen trout of illegal length were creeled during the season. All were within 0.2 inch of legal size and possibly had shrunk after capture.

Stocked and transferred trout

The number and sizes of fish planted or transferred in experimental waters of Hunt Creek in recent years, the number caught in 1956, the number caught to date, and the estimated number remaining in the stream or recovered during poisoning operations in the fall of 1956 are summarized in Table 2.

In 1956, fishermen recovered 1 of 3,000 rainbow trout stocked in Hunt Creek in 1952, 1 of 400 brook trout planted in 1953, 112 of 5,997 brook trout stocked in 1954, and 3 of 378 planted in 1955.

Table 2.--Fish planted (1952-1955) or transferred (1950-1952) in the experimental waters of Hunt Creek, and anglers' harvest through 1956

Area and date	Species of trout	Number planted	Total length when planted (inches)	Number creeded, 1956	Total legal fish creeded to date		Number of fish remaining after 1956 season ¹
					Number	Percentage	
Hunt Creek and Fuller Creek							
Oct., 1952	Rainbow	3,000	2.8-5.0	1	297	10	5
Apr., 1953	Brook	916	4.7-6.5 ²	0	191	21	...
Aug., 1953	"	400	8.1 ²	1	312	78	...
Apr., 1954	"	400	7.1 ²	0	236	59	...
Oct., 1954	"	5,997	4.3	112	155	3	23
May 1955	"	378	7.0-7.9	3	239	63	...
East Fish Lake							
Nov., 1950	Brook ³	500	3.6	0 ⁴	24	5	0
Nov.-Dec., 1951	" ³	1,001	3.1	1	46	5	0
Sept., 1952	" ³	1,032	3.1	4	19	2	0
Nov., 1952	"	1,007	5.8	0	29	3	0
Aug., 1953	"	650	8.1 ⁵	0	41	6	0
Apr., 1954	"	600	7.1 ⁵	0	34	6	0
Oct., 1954	"	9,745	4.1	113 ⁵	127	1	4
Fuller Creek Pond							
Oct., 1954	Brook	4,366	4.1	3	11	tr	1

¹Numbers estimated present in 1956 post-season population study (Hunt Creek), or number recovered by poisoning in fall of 1956 (East Fish Lake and Fuller Creek Pond).

²Data from Fish Planting Record, Michigan Department of Conservation, 1953 or 1954.

³Trout transferred from Hunt Creek to East Fish Lake.

⁴Three trout in 1955 and one trout in 1956 were taken in addition by anglers. These fish could not be assigned to a specific planting because of fin regeneration or improper clipping.

⁵Seven sublegal length trout were creeded in addition by anglers.

Total recoveries to date range from 3 to 21 percent among different lots of fish which were of sublegal size when planted and from 59 to 78 percent among three groups of legal-size fish. No further recoveries are expected from these experiments, with the possible exception of the large group of fingerlings planted in 1954, of which an estimated 23 remained at the end of the 1956 season.

Recoveries of planted or transferred brook trout in East Fish Lake during 1956 included 1 of 1,001 which had been planted in 1951, 4 of 1,032 planted in 1952, and 113 of 9,745 stocked in 1954. Total recoveries to date range from 1 to 5 percent from 5 lots of fish stocked at lengths less than 7 inches, and 6 percent from each of 2 lots of fish with average lengths of 7.1 and 8.1 inches at the time of planting. Only 4 stocked fish (all from the October, 1954 planting) were recovered when East Fish Lake was poisoned in the fall of 1956.

Three of 4,366 brook trout stocked in Fuller Creek Pond in October 1954 were recovered by anglers in 1956; only 1 was recovered when the pond was poisoned. The entire planting had disappeared within 2 years, even though only 11 fish were accounted for by fishermen.

Angling results

Hunt Creek--Results are reported separately for each of the experimental sections, beginning with Section Z, which is the farthest downstream, then proceeding upstream to Sections A, B, C, and D. These data are summarized in Table 3 along with combined totals for all sections.

Section Z, the lowermost of the experimental sections, is accessible from many points and can be waded easily. Because a high proportion

Table 3.--Summary of angling data, experimental waters of Hunt Creek drainage, 1956

Experimental water	Total fishing		Total catch				Catch per hour ³		Average size	
	Trips ¹	Hours	Species	Origin	Number ²	Pounds	Number	Pounds	Total length (inches)	Weight (pounds)
Section of Hunt Creek:										
Z	176 (83)	354.0	Brook	Wild	197	32.25	0.56	0.09	7.6	0.16
			Brook	Hatchery	46	7.78	0.13	0.02	7.7	0.17
			Rainbow		1	0.14	tr	tr	7.3	0.14
			All		244	40.17	0.69	0.11	7.6	0.17
A	117 (66)	248.5	Brook	Wild	174	29.89	0.70	0.12	7.8	0.17
			Brook	Hatchery	23	4.45	0.09	0.02	8.0	0.19
			Rainbow		5	1.11	0.02	tr	8.3	0.22
			All		202	35.45	0.81	0.14	7.9	0.18
B	89 (55)	168.0	Brook	Wild	133	23.23	0.79	0.14	7.8	0.17
			Brook	Hatchery	10	1.66	0.06	0.01	7.7	0.17
			Rainbow		1	0.31	0.01	tr	9.0	0.30
			All		144	25.20	0.86	0.15	7.8	0.18
C	216 (76)	401.0	Brook	Wild	163	24.61	0.41	0.06	7.4	0.15
			Brook	Hatchery	13	2.01	0.03	0.01	7.6	0.16
			Rainbow		2	0.27	tr	tr	7.1	0.13
			All		178	26.89	0.44	0.07	7.4	0.15
D	282 (67)	427.0	Brook	Wild	115	26.56	0.27	0.06	8.3	0.23
			Brook	Hatchery	16	4.34	0.04	0.01	8.8	0.27
			All		131	30.90	0.31	0.07	8.4	0.24
Hunt Creek										
Total or average	880 (347)	1,598.5	Brook	Wild	782	136.53	0.49	0.09	7.8	0.18
			Brook	Hatchery	108	20.25	0.07	0.01	7.9	0.19
			Rainbow		9	1.81	tr	tr	9.8	0.20
			All		899	158.59	0.56	0.10	7.8	0.18
Fuller Creek										
	230 (64)	475.5	Brook	Wild	192	35.42	0.40	0.07	8.0	0.18
			Brook	Hatchery	8	1.69	0.02	0.01	8.2	0.21
			All		200	37.11	0.42	0.08	8.0	0.19
Fuller Creek Pond										
	49 (10)	120.5	Brook	Wild	11	5.83	0.09	0.05	11.2	0.53
			Brook	Hatchery	3	1.24	0.02	0.01	10.3	0.41
			All		14	7.07	0.11	0.06	11.0	0.51
East Fish Lake										
	305 (64)	856.0	Brook	Wild	5 ⁴	3.88	0.01	0.01	13.3	0.78
			Brook	Hatchery	114	50.64	0.13	0.06	10.6	0.44
			All		119	54.52	0.14	0.07	10.7	0.46
All waters, Hunt Creek Experimental Area										
	1,464 (485)	3,050.5	Brook	Wild	990	181.65	0.32	.06	7.9	0.18
			Brook	Hatchery	233	73.81	0.08	.02	10.0	0.32
			Rainbow		9	1.81	tr	tr	9.8	0.20
			All		1,232	257.27	0.40	.08	8.1	0.21

¹Number of successful fishing trips in parentheses.

²An additional 10 sublegal trout weighing 1.12 pounds were caught in Hunt Creek, and 7 sublegal trout weighing 2.17 pounds were creeled from East Fish Lake.

³Tr indicates value less than 0.005.

⁴All wild trout transferred from Hunt Creek.

of it flows through areas of meadow and low brush, it is well suited for fly fishing. A flies-only regulation has been in effect in Section Z since 1955 to determine whether protection given to sublegal trout against bait-hooking mortalities would increase the catch of trout in following seasons. Fishing intensity has been lower in this section since the inception of flies-only regulations as compared to fishing intensities during the six previous seasons. However, the fewer fishermen caught as many fish, and had a significantly higher catch per hour than did anglers in the six years preceding the regulation. In 1956 anglers creeled 244 legal trout (40 pounds) in 176 trips, at an average rate of 0.69 trout per hour. The fish averaged 7.6 inches in length. Approximately 47 percent of the trips were successful (one or more trout caught). In addition to legal fish, one sublegal brook trout was creeled and 699 sublegal fish were released.

The population study^{1/} in September, 1956, immediately following the close of the fishing season, indicated that approximately 109 legal and 904 sublegal native brook trout remained in Section Z. A few additional rainbow and hatchery brook trout were present in this section, but due to the small numbers in each of the individual sections, only estimates for all sections combined were attempted. These are given later in this report.

Section A, immediately upstream from Section Z, is typified, like the preceding section, by meadow-type vegetation along its banks, thus making this section well suited for fly fishing. The height of

^{1/}Hunt Creek population estimates were made by the mark-and-recovery method, September 10-16, 1956. The fish were captured by electro-fishing.

conifers (mostly tamarack) in Section A have increased very noticeably during the last 4 years. Formerly few conifers were taller than the winter snow depth, but now many in the meadow area in Section A are 3 to 6 feet in height. This apparent change in the vegetative type may affect the stream and its fish population in the future.

Like Section Z, Section A has had a flies-only regulation since the opening of the 1955 season. Fishing intensity in this section increased immediately after the adoption of the regulation and has remained nearly constant in the last two seasons. No good explanation can be given as to why Section A had an increase in fishing intensity, whereas Section Z showed a decrease.

Anglers creeled 202 trout (35 pounds) in 117 trips to Section A. The average catch per hour was 0.81 trout; the fish averaged 7.9 inches in length. About 56 percent of the trips were successful. One sublegal trout was creeled, and 589 sublegal fish were released. At the completion of the fishing season, an estimated 158 legal and 2,403 sublegal native brook trout remained in this section. A few rainbow trout and hatchery brook trout were present also.

Section B, immediately upstream from Section A, flows through an area dominated by typical cedar swamp vegetation. This section is open to fishing under current state-wide regulations (fishing with any legally accepted bait or lure). Bait fishing (mostly with worms) was the most common method used.

Anglers creeled 144 trout weighing 25 pounds in 89 trips. The average catch per hour (0.86 fish) was about 250 percent above that of 1955. The fish averaged 7.8 inches in length. About 62 percent

of the fishing trips were successful. In addition to legal fish, one sublegal fish was creeled and 751 were released. Immediately following the trout season an estimated 29 legal and 1,003 sublegal native brook trout, and a few rainbow trout and hatchery brook trout remained in Section B.

Section C flows through a varied vegetative environment. The lower portion is chiefly bordered by cedar swamp like that of Section B. The upper and larger fraction flows through a fairly open aspen-white birch association; however, immediately adjacent to the stream edges narrow borders of mixed alder and conifers tend to form a canopy over the stream. For this reason bait fishing is the most popular method of angling. A 1,300-foot section in the central portion of Section C is closed to all fishing.

Anglers in Section C creeled 178 trout weighing 27 pounds in 216 trips. The average catch per hour was 0.44 fish, average length 7.4 inches. About 35 percent of the trips were successful. Five sublegal trout were creeled, and 917 were released. An estimated 30 legal and 2,212 sublegal native brook trout remained after the fishing season.

Section D, the uppermost section of experimental water on Hunt Creek, is separated from Section C by a concrete bulkhead containing two-way fish traps. The lowermost 200 yards of the section is stream habitat similar to Section C. Upstream from this normal stream channel is a beaver pond which extends about one-fourth mile from the face of the dam to the upper limit of Section D (near the county line). The stream above Section D is small and has numerous small tributaries draining into it from the surrounding swamp.

Anglers in Section D creeled 131 trout weighing 31 pounds in 282 trips. The average catch per hour was 0.31 trout; average length of the fish was 8.4 inches. About 24 percent of the anglers were successful in creeling one or more trout. One sublegal fish was creeled and 307 sublegal brook trout were caught and released. No population estimate was made in Section D in 1956.

Semimonthly results of angling for native brook trout caught in all sections of Hunt Creek in 1956 are summarized in Table 4 to facilitate comparisons with other years. If average catch per hour is used as an indicator of angling quality, the latter part of May, the month of July, and the first part of September produced the best angling in 1956. The periodicity of angling success was not similar to that in other seasons, when the first month of the season produced the best fishing. The poor catch for the first period in 1956 probably can be attributed to the inclement weather and the late spring. In general, angling quality was much better in 1956 than in 1955 which was considered a good season. The number of trout creeled during each period increased, in general, as the fishing intensity increased.

The total catch of all trout from Hunt Creek was down about 9 percent from 1955, but the total catch of wild brook trout was up about 11 percent. Population estimates for Sections Z, A, B, and C indicated a total of 378 legal and 7,282 sublegal native brook trout remaining in these sections at the close of the season. This is about a 10 percent increase over 1955 in the post-season standing crop of legal-size fish; the standing crop of sublegal fish was about the same as in 1955.

Table 4.--Semimonthly angling statistics for wild brook trout,
Section Z, A, B, C, and D of Hunt Creek (combined), 1956

Dates	Total fishing		Native trout		Catch per hour		Average size	
	Trips [✓]	Hours	Number	Pounds	Number	Pounds	Total length (inches)	Weight pounds
April 28-May 11	116 (30)	196.0	88	12.82	0.45	0.07	7.3	0.15
May 12-May 25	65 (32)	107.5	66	10.91	0.61	0.10	7.7	0.17
May 26-June 8	90 (47)	184.5	89	16.41	0.48	0.09	8.0	0.18
June 9-June 22	82 (28)	152.0	68	11.30	0.45	0.07	7.8	0.17
June 23-July 6	112 (49)	223.0	103	19.97	0.46	0.09	7.9	0.19
July 7-July 20	98 (47)	187.0	108	18.22	0.58	0.10	7.8	0.17
July 21-Aug. 3	100 (30)	149.5	77	13.77	0.52	0.09	8.0	0.18
Aug. 4-Aug. 17	100 (30)	177.0	66	13.00	0.37	0.07	7.9	0.20
Aug. 18-Aug. 31	72 (28)	128.5	56	9.11	0.44	0.07	7.4	0.16
Sept. 1-Sept. 9	45 (26)	93.5	61	11.04	0.65	0.12	7.9	0.18
Total or average	880 (347)	1,598.5	782	136.53	0.49	0.09	7.8	0.17

[✓]Number of successful fishing trips in parentheses.

A small population of rainbow trout in Hunt Creek resulted from the planting of 3,000 hatchery fingerlings in 1952. An estimated 133 rainbow trout were present at the close of the 1956 season. About 5 (4 percent) of these are survivors of the original planting; the others resulted from successful spawning in 1954, 1955, and 1956. Nine rainbow trout (one from the original planting and eight native fish) were creeled in Hunt Creek during the 1956 season. Creel returns to date from the original planting are listed in Table 2.

Angling statistics for the Hunt Creek Experimental Area for the years 1939-1956 are summarized in Tables 5, 5a, 5b, and 5c. They are included in this report to keep the records up to date and in a readily accessible form.

Fuller Creek and East Fish Lake outlet.--Fuller Creek heads about one-half mile west of Fuller Creek Pond (Fig. 1). Its channel runs through the pond and flows about 800 feet to the southeast where it is joined by the outlet stream of East Fish Lake, which approximately doubles the volume of Fuller Creek at this point. It then flows eastward for 3/4 mile to its confluence with Hunt Creek at the upper end of Section B. Fuller Creek flows almost entirely through dense cedar swamp which forms a canopy over the stream; consequently it is most frequently fished with natural baits.

Anglers creeled 200 trout weighing 37 pounds in 230 fishing trips. The average catch per hour was 0.42 trout; about 28 percent of the angling trips were successful. Ninety-six percent of the fish caught were wild brook trout (average length, 8.0 inches). The catch of wild brook trout was 4 times larger than the average of the 16 preceding years (Table 5a). This large increase may have been due to the draining of Fuller Creek Pond mid-way in the 1956 season, which liberated the pond fish into Fuller Creek.

Table 5.--Legal wild brook trout caught in Hunt Creek, 1939-1956

Section and year	Total fishing		Total catch		Catch per hour		Average size	
	Trips	Hours	Number	Pounds	Number	Pounds	Length (inches)	Weight (pounds)
Sections A, B, C, and D								
1939	438	780	461	67	0.59	0.09	7.5	0.15
1940	505	901	406	60	0.45	0.07	7.6	0.15
1941	1,015	1,546	706	113	0.46	0.07	7.7	0.16
1942	808	1,267	532	83	0.42	0.07	7.6	0.16
1943	311	540	372	59	0.69	0.11	7.5	0.16
1944	340	640	337	53	0.53	0.08	7.7	0.16
1945	375	637	312	52	0.49	0.08	7.9	0.17
1946	753	1,206	434	68	0.36	0.06	7.6	0.16
1947	607	872	184	26	0.21	0.03	7.6	0.14
1948	504	869	476	78	0.55	0.09	7.7	0.16
1949	432	1,063	517	87	0.49	0.08	7.8	0.17
1950	369	915	415	75	0.45	0.08	8.0	0.18
1951	552	1,066	431	76	0.40	0.07	8.0	0.18
1952	488	1,195	556	103	0.47	0.09	8.0	0.19
1953	656	1,587	572	118	0.36	0.07	8.4	0.21
1954	748	1,649	483	88	0.29	0.05	8.0	0.19
1955	702	1,522	508	94	0.33	0.06	8.0	0.19
1956	704	1,245	585	104	0.47	0.08	7.8	0.19
Average	573	1,083	460	78	0.42	0.07	...	...
Section Z								
1949	165	375	186	28	0.50	0.07	7.6	0.15
1950	164	473	160	21	0.34	0.04	7.4	0.13
1951	129	322	124	18	0.39	0.06	7.5	0.14
1952	188	570	222	34	0.39	0.06	7.7	0.15
1953	225	566	183	27	0.32	0.05	7.6	0.15
1954	363	838	143	22	0.17	0.03	7.7	0.16
1955	139	293	198	29	0.68	0.10	7.6	0.15
1956	176	354	197	32	0.56	0.09	7.6	0.16
Average	194	474	177	26	0.37	0.05	...	...

Table 5a.--Legal wild brook trout caught in Fuller Creek, 1940-1956

Year	Total fishing		Total catch		Catch per hour		Average size	
	Trips	Hours	Number	Pounds	Number	Pounds	Length (inches)	Weight (pounds)
Fuller Creek								
1940	20	36	16	3	0.44	0.08	...	0.19
1941	59	97	21	3	0.22	0.03	...	0.15
1942	31	39	11	2	0.28	0.05	8.3	0.18
1943	19	25	19	3	0.76	0.12	7.6	0.14
1944	96	145	61	8	0.42	0.06	7.6	0.15
1945	102	159	64	9	0.40	0.06	7.5	0.14
1946	223	278	56	8	0.20	0.03	7.4	0.14
1947	212	219	27	4	0.12	0.02	7.5	0.14
1948	190	196	31	5	0.16	0.03	7.7	0.16
1949	115	296	43	6	0.15	0.02	7.4	0.13
1950	107	185	12	2	0.06	0.01	7.6	0.16
1951	110	246	59	9	0.24	0.04	7.6	0.16
1952	85	221	64	10	0.29	0.05	7.6	0.15
1953	86	212	84	14	0.40	0.07	7.8	0.16
1954	99	201	68	11	0.34	0.05	7.7	0.16
1955	110	214	68	10	0.32	0.05	7.6	0.14
1956	230	476	192	35	0.40	0.07	8.0	0.18
Averages	111	191	53	8	0.28	0.04	...	...

Records for 1945-1948 included anglers' results on Fuller Creek Pond which reverted from pond to stream habitat during those years.

Fuller Creek Pond.--This impoundment was restored by the erection of a dirt fill dam at an old beaver dam site in May, 1949. The pond is located on the upper portion of Fuller Creek and has a surface area of approximately 14 acres. Anglers creeled 14 trout weighing 7 pounds in 49 trips, at an average rate of 0.11 fish per hour (average length, 11.0 inches). About 20 percent of the anglers were successful. Angling statistics for the 1939-1956 seasons are listed in Table 5b.

In July, 1956, the pond was drained to prepare for the complete removal of the fish population by chemical treatment. Only four angling trips were made after drainage of the pond.

East Fish Lake.--This lake is a designated trout lake with a surface area of approximately 16 acres and an average depth of nearly 20 feet. It stratifies thermally during the summer but retains adequate oxygen and low water temperatures for trout.

In 1956, anglers creeled 119 brook trout weighing 55 pounds in 305 trips. The average catch per hour was 0.14 trout, and the fish averaged 10.7 inches in length. About 21 percent of the trips were successful. Angling statistics for 1939-1956 are given in Table 5c.

All waters.--From all experimental waters of the area, anglers creeled 1,232 trout weighing a total of 257 pounds, in 1,464 angling trips.

Fishing Methods

Comparison of various fishing methods.--For the fifth consecutive season, stream and pond creel records were tabulated separately for comparison of fishing methods. Stream habitat included Sections Z, A, B, and C of Hunt Creek, and Fuller Creek. Waters considered pond habitat were East Fish Lake, Fuller Creek Pond, and Section D of Hunt Creek.

Table 5b.--Legal wild brook trout caught in Fuller Creek Pond, 1939-1956

Year	Total fishing		Total catch		Catch per hour		Average size	
	Trips	Hours	Number	Pounds	Number	Pounds	Length (inches)	Weight (pounds)
1939	112	250	155	88	0.62	0.35	10.6	0.54
1940	65	144	88	37	0.61	0.26	9.7	0.42
1941	26	50	57	14	1.14	0.28	8.6	0.35
1942	10	12	6	1	0.50	0.08	8.5	0.21
1943	4	8	14	2	1.75	0.25	7.6	0.13
1944	4	6	33	5	5.50	0.83	7.5	0.14
1945 ¹	...	...	...	...	...	...	...	...
1949	2	16	5	2	0.31	0.13	9.1	0.30
1950	136	430	343	109	0.80	0.25	9.3	0.32
1951 ²	65	165	22	12	0.13	0.07	11.0	0.53
1952	88	239	43	24	0.18	0.10	11.3	0.56
1953	60	172	33	20	0.19	0.12	11.6	0.62
1954	67	182	15	10	0.08	0.05	11.5	0.60
1955	37	143	13	7	0.09	0.05	11.0	0.52
1956	49	121	11	6	0.09	0.05	11.2	0.53
Average	52	138	60	24	0.43	0.17	...	...

¹Pond reverted to stream condition; new dam completed May 1949.

²Size limit changed from 7 to 10 inches and daily creel limit reduced from 10 to 5 trout effective at opening of 1951 season.

Table 5c.--Legal wild brook trout caught in East Fish Lake, 1939-1956

Year	Total fishing		Total catch		Catch per hour		Average size	
	Trips	Hours	Number	Pounds	Number	Pounds	Length (inches)	Weight (pounds)
1939	63	126	51	...	0.40	...	...	...
1940	111	308	44	...	0.14	...	...	...
1941	156	386	71	11	0.18	0.03	7.4	0.15
1942	159	289	34	10	0.12	0.03	9.1	0.29
1943	121	200	68	26	0.34	0.13	9.3	0.37
1944	311	651	105	79	0.16	0.12	11.2	0.75
1945	436	928	158	131	0.17	0.14	11.9	0.83
1946	430	935	92	69	0.10	0.07	11.5	0.76
1947	344	711	89	54	0.13	0.08	11.1	0.61
1948 ¹	287	853	113	56	0.13	0.07	10.4	0.49
1949	287	1,040	93	71	0.09	0.07	11.5	0.76
1950	218	613	47	39	0.08	0.06	12.3	0.82
1951 ²	200	732	56	36	0.08	0.05	11.9	0.64
1952	174	596	24	16	0.04	0.03	12.3	0.65
1953	129	446	16	11	0.04	0.02	12.6	0.70
1954	264	940	7	4	0.01 ³	...	12.0	0.54
1955	230	902	2	1	... ³	... ³	11.0	0.48
1956	305	856	...	...	...³	... ³	...	...
Average	235	640	59	38	0.09	0.06	...	...

¹ Creel limit changed from 10 to 5 trout per day.

² Size limit changed from 7 to 10 inches effective at opening of 1951 season.

³ Less than 0.005.

The relative success of fly, natural bait, and combination-lure fishermen was compared for stream anglers; another category, artificial lure, was added for pond anglers. The t test was used to determine if there was any statistically significant difference in the mean catch per hour per trip. The Chi-square test of significance was used to determine whether the ratio of successful fishing trips to total trips was different among the various categories.

Analysis of stream data revealed that angler success, as measured by catch per hour per trip, was significantly higher for fly fishermen than natural bait fishermen. No significant difference could be demonstrated between fly and combination anglers. Combination anglers were, however, more successful than anglers who used natural bait. The Chi-square test suggested the same relationships as the t test (Table 6).

These tests indicate the relative success of 1956 anglers at Hunt Creek using the various methods of angling; however, it is believed that the better average success shown by anglers using flies on stream waters is due to the individual ability of a few good fly fishermen who use the area frequently, and not due to the method itself. Also fly fishermen are at a definite advantage because the two lower stream sections, which contain a higher population of legal-sized fish than the other sections, are under the flies-only regulation.

Analysis of data from ponds (using the t test) showed that combination lure fishermen were more successful than fly fishermen, natural bait was superior to flies, natural bait was superior to artificial lures, and combination lures were better than artificial lures. No differences were detected between flies and artificial lures or between

Table 6.--Comparison of fishing methods in Hunt Creek experimental waters, 1956

Water	Lure	Total fishing trips			Total catch				
		Number	Successful	Hours	Number	Number per hour	Number per hour per trip Average	Standard error	
Streams	Flies	312	157	626.0	460	0.735	0.785	0.039	
	Natural	430	138	833.0	331	0.397	0.361	0.031	
	Artificial	1	...	...	...	...	...	...
	Combination	83	49	180.5	177	0.981	0.976	0.117	
		826	344	1,639.5	968	0.590	...	...
Ponds	Flies	45	4	55.0	6	0.109	0.092	0.015	
	Natural	438	105	1,011.0	198	0.196	0.177	0.008	
	Artificial	14	2	22.0	4	0.182	0.077	0.006	
	Combination	133	29	306.0	56	0.183	0.183	0.018	
		630	140	1,394.0	264	0.189	...	...
Percentage probability that the mean catch per hour per trip was different between fishing methods (<u>t</u> test)					Percentage probability that the number of successful trips was different between fishing methods (chi-square test)				
Streams		<u>Natural</u>	<u>Artificial</u>	<u>Combination</u>	Streams		<u>Natural</u>	<u>Artificial</u>	<u>Combination</u>
	Flies	99	...	88		Flies	99	...	80
	Natural			99	Natural			99	
Ponds	Flies	99	65	99	Ponds	Flies	96	8	91
	Natural		99	24		Natural		38	10
	Artificial			99		Artificial			8

natural and combination lure fishermen. The Chi-square test showed that natural bait was better than flies, but differences in the remaining categories were not statistically significant. These findings are, in general, in agreement with findings reported in 1955.

Popularity of lures.--Worms were used on 803 fishing trips or about 55 percent of the total (Table 7). Flies were second with 357 trips (24 percent) and combination lures were third with 216 (15 percent). Insects, minnows, artificial lures and salmon eggs made up the remaining 6 percent.

Chemical Treatment of East Fish Lake and Fuller Creek Pond.--East Fish Lake was treated with rotenone on September 18, 1956. Prior to poisoning, determinations of water temperature and oxygen content at various depths in the lake indicated a discontinuity layer at 25 feet. One day before treatment five cages containing live brook trout and muddlers were placed at the 5-, 10-, 25-, 32-, and 39-foot levels. When the cages were checked immediately prior to the application of rotenone, all fish at 39 and 32 feet were dead; all trout were dead, but muddlers were still alive at 25 feet; and all fish at 5 and 10 feet were alive. These observations were in agreement with the chemical determinations.

Nox-Fish (liquid, emulsifiable, 5-percent-rotenone content) was sprayed on the surface waters of the lake by a Lake and Stream Improvement crew directed by Roger Wicklund and Fred Owens. An aqueous solution of the poison was pumped down through a hose to the deeper strata of the lake. It was hoped that this procedure plus wind action would give a nearly uniform mixture of approximately 0.5 ppm. of rotenone.

Fish began to appear about one half hour after treatment, and the pickup was begun immediately. Trout, suckers, creek chubs and assorted

Table 7.--Lures used by anglers in 1956

Lure	Streams				Ponds		Number of trout creeled	Percentage of trips using lure	Combined waters			
	Trips	Hours	Number of trout creeled	Percentage of trips using lure	Trips	Hours			Trips	Hours	Number of trout creeled	Percentage of trips using lure
Worms	393 (122)	752.5	288	47.5	410 (97)	967.5	184	64.5	803 (219)	1,720.0	472	54.8
Flies	312 (157)	626.0	460	37.7	45 (4)	55.0	6	7.1	357 (161)	681.0	466	24.4
Minnows	14 (6)	18.5	11	1.6	20 (7)	31.5	12	3.1	34 (13)	50.0	23	2.4
Insects	23 (10)	62.0	32	2.8	5 (0)	5.5	...	0.8	28 (10)	67.5	32	1.9
Spinning gear	...	...	...	...	6 (1)	9.5	1	0.9	6 (1)	9.5	1	0.4
Artificial lure	1 (0)	1.5	...	0.1	14 (2)	22.0	3	2.2	15 (2)	23.5	3	1.0
Combination	83 (49)	180.5	177	10.0	133 (29)	306.0	56	20.9	216 (78)	486.5	233	14.8
Unknown	2 (0)	6.0	...	0.3	...	...	...	...	2 (0)	6.0	0	0.1
Salmon eggs	...	...	...	...	3 (1)	6.5	2	0.5	3 (1)	6.5	2	0.2
Total	828 (344)	1,647.0	968	100.0	636 (141)	1,403.5	264	100.0	1,464 (485)	3,050.5	1,232	100.0

✓ Number of successful trips in parentheses.

minnows were the categories into which the fish were sorted. Scale samples were taken from all trout and from representative numbers of the other groups. Measurements of the fish removed from the lake are tabulated in Table 8. The lake was checked daily for ten days, and nearly all visible fish were picked up. Henry Vondett, of the Institute Staff, swam a 500-foot transect along the northwest shore of the lake with an aqua-lung. He was able to see the bottom to a depth of 18 to 20 feet and observed only two small suckers dead on the bottom. Most of the fish population was believed recovered in the pickup, although it is possible that numerous fish were dead on the bottom in the deeper parts of the lake. All fish were dead in all test cages one day after poisoning. Test cages were again placed at the outlet and at a 15-foot depth in the lake on September 26, 1956. On the following day all suckers, muddlers, and trout, but only about half of the redbelly dace, were dead. After September 27, 1956 no redbelly dace were killed, but the outlet waters killed trout until late October.

The outlet of East Fish Lake joins Fuller Creek about 300 yards below the lake. A higher concentration of rotenone than expected was produced in the outlet area of the lake, and the small amount of seepage (an estimated 50 g.p.m.) that passed through the slash boards of the dam resulted in a fish kill for the entire length of Fuller Creek (Table 8). The dilution of Fuller Creek water by Hunt Creek at their confluence was sufficient to confine the kill to Fuller Creek.

Fuller Creek Pond was treated with rotenone November 7, 1956. The pond had been drawn down and reduced in area from 14 acres to approximately 3 acres to reduce the cost of treatment. About 2

Table 8.--Fish recovered from East Fish Lake, Fuller Creek, and Fuller Creek Pond after rotenone treatment, fall 1956

Species	East Fish Lake			Fuller Creek			Fuller Creek Pond	
	Size range (inches)	Number	Weight (pounds)	Size range (inches)	Number	Weight (pounds)	Size range (inches)	Number
Brook trout	2 - 13	32	3.88	2 - 11	474	19.50	4 - 11 3 - 4	10 10
Brown trout	16	1	2.06					
White sucker	2 - 17	221	84.75	4 - 7	14	0.63	5 - 13 3 - 5	76 11
Creek chub	2 - 9	169	15.07					
Small fishes	1 - 5 ✓	...	111.30	...	29	0.63	1 - 5	541
Total	...	...	217.06	...	517	20.76	...	...

✓ Northern Redbelly dace, mudminnow, brook stickleback, northern common shiner, and northern blacknose shiner were included in the category of "small fishes".

hours prior to poisoning 36 large trout (4-11 inches), 11 small trout (2-4 inches), and 29 white suckers (8-12 inches) were released in the pond in the hope of getting an estimate of the resident population at the time of treatment, and to test the efficiency of our pickup after treatment. An attempt was made to recover all trout and suckers over 3 inches in length. It was impossible to recover the multitudes of assorted minnows that accumulated among the dead timber and luxuriant growth of Chara which is present in the waters of Fuller Creek Pond. The pond began to freeze on the day following treatment, further hindering any attempts for complete recovery.

The recovery of 75 percent of the marked large trout and 64 percent of the marked small trout suggested a resident population of 13 large and 16 small trout at the time of treatment.

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