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INSTITUTE FOR FISHERIES RESEARCH
DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
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ANN ARBOR, MICHIGAN

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Report No. 1382

INTENSIVE CREEL CENSUS RESULTS, 1952 TROUT SEASON, HUNT CREEK FISHERIES EXPERIMENTAL STATION

By

Marvin J. Whalls and David S. Shetter

Abstract

The experimental waters of the Hunt Creek drainage were under intensive creel census for the 14th consecutive season during 1952. Angling records were obtained from 2.31 miles of Hunt Creek, 1.87 miles of Fuller Creek, from East Fish Lake and Fuller Creek Pond. Angling was by free daily permit obtained on presentation of current license and trout stamp.

Eight hundred and thirty-four (834) permits were issued to 457 individuals; 78 percent of the permits were for license-holders, 9 percent were for wives, and 13 percent for anglers under 17 years of age.

Experimental sections Z, A, B, C, and D of Hunt Creek were the scene of 676 trips during which 1,764.75 hours of angling were expended for a total catch of 778 legal brook trout weighing 137.207 pounds. Quality indices were 0.44 fish per hour, 0.078 pound per hour. When 46 sublegal fish are included, the total pounds removed by angling amounts to 142.178 pounds, or 20.253 pounds per acre. Judged on the catch-per-hour basis, Section A yielded the best fishing (0.64 fish); the best period was August 2-15 (0.60 fish). The most fish (263) and fish of the best average size (8.5 inches, 0.225 pound)

were caught from Section D. For the stream as a whole, the average brook trout caught was 7.9 inches long, and 0.176 pound in weight during 1952.

Fuller Creek was fished for 220.75 hours in 85 trips. The season's catch amounted to 64 brook trout weighing 9.885 pounds. Anglers creeled 0.29 fish per hour, 0.045 pounds per hour, or 2.77 pounds per acre. The average brook trout measured 7.6 inches, 0.154 pound.

Fuller Creek Pond, where a 10-inch minimum size limit is in effect, was the scene of 88 trips involving 239.25 hours of angling. Forty-three (43) brook trout which weighed 24.162 pounds were creeled. Quality indices were 0.18 fish per hour, 0.101 pound per hour, and the catch per acre was 1.66 pounds. The average size of the Fuller Creek Pond fish was 11.3 inches, 0.652 pound.

East Fish Lake, also fished under a 10-inch minimum size limit, was angled on for 596 hours in 174 trips. Thirty-seven (37) brook trout weighing 22.534 pounds were caught. The average fish was 11.8 inches long and weighed 0.604 pound. Quality indices were 0.06 fish per hour, 0.038 pound per hour; the catch per acre was 1.40 pounds. A total of 31 common white suckers weighing 25.35 pounds also was taken by the anglers.

Detailed sorting of the 1952 catch records continued to demonstrate that a small fraction of the total angling public takes a high percentage of the total catch. For 1952 on Hunt and Fuller Creek, 6.9 percent of all individuals made 22.3 percent of the total trips and caught 59.5 percent of the total catch.

The majority of resident anglers using the area came from Wayne, Oakland and Genesee Counties. Ohio anglers led the non-residents, who came from six other states.

Examination of the relative success of artificial flies and natural bait

in stream and pond habitat revealed that flies were significantly more productive than bait (includes worms, minnows, insects) in taking brook trout from stream habitats; no difference could be found between the various lures in the ponded experimental areas.

A history of the re-infection of East Fish Lake with rough fish since the 1941 rotenoning, and the possible relationship of the increase of suckers and creek chubs in recent years to the diminishing brook trout catch in East Fish Lake, is presented.

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Introduction

The experimental waters of Hunt Creek, Montmorency County, Michigan, were under an intensive creel census for the fourteenth consecutive year during 1952. Angling records were obtained from 2.31 miles of Hunt Creek (7.02 acres), 1.87 miles of Fuller Creek (3.57 acres), from East Fish Lake (16 acres), and Fuller Creek Pond (14.58 acres).

Method of Collecting Creel Census Data

As in previous years, the experimental waters were posted with Department signs authorizing the angling restrictions and informative signs delimiting the various stream sections, indicating areas open or closed to fishing, and displaying the fishing regulations for the 1952 trout season. Both types of signs were placed at all fishing access points.

Fishing was by permit only. Upon entering the centrally-located checking station and displaying the necessary license and trout stamp, the angler was issued a permit for that day and briefed on the special fishing regulations. Concluding his angling for the day, the angler was required to return to the

checking station where the following information was recorded: angler's name, county of residence (state only if angler was not a resident of Michigan), date, section(s) fished, number, length, weight and marks (if any) of all fish taken, and time spent angling. A scale sample from each fish captured was also collected.

Angling Results, 1952

Eight hundred and thirty-four permits were issued in 1952. The number of permits were obtained by 652 license holders (78 percent); 78 wives of license holders (nine percent) and 104 minors under 17 years of age (13 percent).

The numbers of "skips" - anglers who failed to return to the checking station at the end of the day - numbered six, or 0.72 percent of the number of permits issued. The small percentage of skips was not of sufficient magnitude of influence the creel census data which follows.

Angling Results, Experimental Sections of Hunt Creek

The dimensions of the various sections and the angling regulations in force are listed in Table 1. Creel census statistics are summarized in Table 2.

Section Z, the lowermost experimental section, is typified by its open meadow setting, rapid current, and predominantly sandy bottom. It is excellent for fly fishing, but can be fished equally well with all lures.

Section Z was the site of a feeding experiment during the 1952 angling season. The results of the experiment will be reported at a later date. At the time of this writing, it is not known whether the above experiment influenced the quality of angling in Section Z.

Hunt Creek anglers made 188 fishing trips to Section Z, and were successful on 80 trips (43 percent). They spent 570.25 hours on the section and creeled 222 brook trout weighing 34.139 pounds. Their average trout was

7.7 inches long and weighed 0.154 pound. They creeled 0.39 fish per hour, 0.060 pound per hour, or 30.48 pounds from each acre of Section Z. These indices differ from those of 1951 (for comparisons see Institute Report No. 1349 and others).

Anglers removed twenty-one sublegal brook trout from Section Z during the 1952 season. The average length and total weight of the sublegal trout were 6.8 inches and 2.266 pounds respectively.

Section A, located immediately upstream from Section Z, is characterized by its open marsh setting, moderate current, and sand bottom. It is excellent fly water, but can be fished equally well with all lures.

Anglers made 73 fishing trips to Section A and were successful on 43 trips, (57 percent). They spent 205.00 hours angling on the Section and creeled 131 brook trout weighing 19.471 pounds. Their average brook trout was 7.6 inches long and weighed 0.149 pound. They creeled 0.64 fish per hour, 0.095 pound per hour, or 13.52 pounds per acre.

Anglers removed six sublegal brook trout from Section A in 1952. The average length and total weight of the sublegal fish were 6.8 inches and 0.660 pounds respectively.

Section B lies immediately upstream from Section A. Its rapid current flows over a gravel bottom and through a dense cedar swamp. Section B can be fished with a fly, but here the bait fisherman begins to be favored by the swamp setting. Terrestrial vegetation crowds close to the stream banks.

The anglers made 31 trips to Section B in 1952, and were successful on 14 trips (45 percent). They spent 58.50 hours angling on the section and creeled 28 brook trout weighing 4.240 pounds. Their average trout was 7.6 inches long and weighed 0.151 pound. They creeled 0.48 fish per hour, 0.072 pounds per hour, or 6.63 pounds per acre.

One sublegal brook trout was taken from Section B in 1952. It was 6.9

inches long and weighed 0.115 pound.

Section C, immediately upstream from Section B, is characterized by its rapid current and gravel bottom; its channel nestles between high wooded slopes. This section is best suited for the bait fisherman.

Anglers made 143 trips to Section C in 1952, and were successful on 47 trips (33 percent). They angled 329.25 hours and took 134 brook trout weighing 20.236 pounds. Their average trout was 7.6 inches long and weighed 0.151 pound. They creeled 0.41 trout per hour, 0.061 pound per hour, or 28.50 pounds per acre.

Anglers removed 10 sublegal brook trout from Section C in 1952. The average length and total weight of the sublegal fish were 6.8 inches and 1.050 pounds respectively.

Section D is immediately upstream from Section C, and separated from it by a concrete bulkhead. The bulkhead contains devices for capturing migrating fish. Section D is chiefly a series of beaver ponds - less than 10 percent remains as normal stream habitat. In 1952, as in 1951, Section D was the scene of much beaver activity. Beaver activities remained normal until September 9-14, when construction of a new dam began 45 feet upstream from the lowermost dam. By October 10-15, the new dam was completed; at which time the difference in the water level between pond I and II was three feet. Beginning on October 23, the new number two dam was extended 50 feet to the northeast, over the bank, and around the northwest edge of a cluster of aspens. The extension increased the height of the new dam about 19 inches and thereby increased the difference between the water level in ponds I and II to about five feet. Since this additional dam was not constructed until late in the trout fishing season, its effect on the 1952 angling in the Section was probably negligible. This section is equally suited for both fly and bait fishing.

Hunt Creek anglers made 241 fishing trips to Section D in 1952, and were successful on 97 trips (40 percent). They fished 601.75 hours and creeled 263 brook trout weighing 59.121 pounds. Their average fish was 8.5 inches long and weighed 0.225 pound. They removed 0.44 fish per hour, 0.098 pound per hour, or 19.01 pounds per acre from Section D (pounds per acre figure is subject to correction following revision of acreage determination of Section D).

Anglers removed eight sublegal brook trout from Section D in 1952. The average length and total weight of the sublegal trout were 6.8 inches and 0.880 pound respectively.

The combined semi-monthly records for the experimental sections of Hunt Creek proper are summarized in Table 3. Sublegal brook trout are excluded.

Anglers made 676 trips to the combined sections of Hunt Creek in 1952, and were successful on 281 trips (42 percent). They fished 1,764.75 hours and creeled 778 legal brook trout weighing 137.207 pounds. Their average trout was 7.9 inches long and weighed 0.176 pound. They creeled 0.44 legal fish per hour, 0.078 pound per hour, or 19.545 pounds per acre; including the sublegal brook trout, the anglers creeled 824 fish weighing 142.178 pounds, a harvest of 0.081 pound per hour or 20.253 pounds per acre.

The most productive fishing occurred from August 2 to August 15 when 101 brook trout were creeled by 73 anglers (45 percent successful) fishing 173.25 hours.

The largest number of brook trout were taken during the last two weeks of the season, but fishing quality dropped to 0.43 fish per hour as compared to 0.60 fish per hour for the August 2-15 period.

The opening and closing two-week periods of the 1952 trout season on the combined sections of Hunt Creek involved the largest number of fishing trips. During the two-week period opening the trout season 99 fishing trips

involving 279.00 fishing hours were made; during the two week period closing the trout season 98 fishing trips were made involving 238.00 fishing hours.

The brook trout creeled by anglers fishing Section D averaged 0.9 inch longer and 0.073 pound heavier than the combined average of the trout from Sections Z, A, B, and C.

Angling Results, Fuller Creek and East Fish Lake Outlet

The Fuller Creek course is "Y" shaped, the base of which, lies in an east-west direction. Its north branch is the outlet of Fuller Creek pond and its south branch is the East Fish Lake Outlet. This rapid stream flows through a dense cedar swamp and over a gravel bottom. Fuller Creek is best suited for bait fishing.

Anglers made 85 trips to Fuller Creek in 1952, and were successful on 28 trips (33 percent). They fished for 220.75 hours and creeled 64 brook trout weighing 9.885 pounds. Their average trout was 7.6 inches long and weighed 0.154 pound. They creeled 0.29 fish per hour, 0.045 pound per hour, or 2.77 pounds per acre.

Anglers removed seven sublegal brook trout from Fuller Creek during 1952. The average length and total weight of the sublegal trout were 6.8 inches and 0.659 pound respectively.

Angling Results, East Fish Lake

East Fish Lake is a 16-acre oligotrophic lake. It can be fished equally well with fly or bait. Angling with live minnows is prohibited.

Angling on East Fish Lake was dissapointing in 1952. Anglers made 174 trips to the lake, and were successful on only 23 trips (13 percent). They fished for 596.00 hours and creeled 37 brook trout weighing 22.354 pounds. Their average fish was 11.8 inches long and weighed 0.604 pound. They

creeled 0.06 trout per hour, 0.038 pound per hour, or 1.40 pounds per acre.

An angler removed one sublegal brook trout from the lake. Its length and weight were 9.8 inches and 0.405 pound, respectively.

Common white suckers increased in number in the 1952 catch, compared to the 1951 sucker catch. The nine suckers taken in 1951 had an average length of 13.2 inches and an average weight of 0.86 pound. In 1952, 31 suckers were taken by 15 less anglers, making 26 fewer trips, and fishing 136.00 less hours than in 1951. Their average sucker was 14.5 inches long and weighed 0.85 pound. All suckers in the 1952 catch were taken on the first three days of the season. Twenty-eight were taken on worms, 1 on a plug, and two on a fly. Systematic cropping of suckers began in 1952, as recorded in a later section of this report.

Number of Individual Anglers Catching Various Numbers of Legal Brook Trout During the 1952 Season.

Hunt and Fuller Creek anglers made 761 fishing trips to the stream in 1952. The 761 trips were made by 522 individuals (Table 4). Individuals taking no brook trout constituted 62.6 percent of the total number of anglers and made 45.6 percent of the angling trips. Individuals taking one to five brook trout constituted 30.5 percent of the total number of anglers, made 32.1 percent of the angling trips, and caught 40.5 percent of the catch. Individuals taking six to 10 brook trout constituted 4.0 percent of all anglers, made 8.4 percent of the angling trips, and creeled 18.8 percent of the total catch. Individuals taking more than 10 brook trout constituted 2.9 percent of the total number of anglers, made 13.9 percent of the angling trips, and took the lion's share of the trout, 40.7 percent. The 36 more successful fishermen made 179 trips to Hunt and Fuller Creeks; thus 6.9 percent of all individuals made 22.3 percent of the angling trips and caught

50.5 percent of the brook trout.

The catches in Fuller Creek Pond and East Fish Lake were not so widely scattered among the individual anglers as in Hunt and Fuller Creeks. Fuller Creek Pond anglers made 88 fishing trips to the pond in 1952. The 88 trips were made by 59 individuals (Table 5). Individuals taking no brook trout constituted 79.6 percent of all anglers and made 61.4 percent of the fishing trips. Individuals taking one to five brook trout constituted 18.6 percent of all anglers, made 29.5 percent of the angling trips, and creeled 65.2 percent of the catch. One individual took more than 10 brook trout.

East Fish Lake anglers made 174 fishing trips to the lake in 1952. The 174 fishing trips were made by 125 individuals (Table 6). No East Fish Lake angler was able to catch more than three brook trout. Individuals taking one to three trout constituted 16.0 percent of all anglers, made 23.0 percent of the fishing trips, and creeled 100.0 percent of the catch.

Combining the Hunt Creek, Fuller Creek, Fuller Creek Pond, and East Fish Lake data, the following is had. The anglers made 1,023 fishing trips to the various waters. The 1,023 trips were made by 706 individuals. This higher total was obtained because some of the 652 individuals were listed more than once when they fished different waters; i.e. on E. Fish Lake and on Hunt Creek. Individuals taking no brook trout constituted 67.8 percent of all anglers and made 52.3 percent of the fishing trips. Individuals taking one to five brook trout constituted 26.9 percent of all anglers, made 30.3 percent of the fishing trips, and caught 44.1 percent of the trout. Individuals taking six to ten brook trout constituted 3.0 percent of all anglers made 6.3 percent of the fishing trips, and caught 17.1 percent of the trout. The select group of individuals taking more than 10 brook trout constituted 2.3 percent of all anglers, made 11.1 percent of the angling trips, and caught 38.8 percent of the trout. For the entire experimental area, 5.3

percent of the individual anglers took 55.9 percent of the catch. It has been an annual occurrence for less than 10 percent of the Hunt Creek Experimental Area anglers to remove more than 50 percent of the catch.

Residence of Anglers

The Hunt Creek waters were fished by 421 individual Michigan residents and by 36 individual non-residents (Table 7). As usual, the majority of the resident anglers came from our three most heavily populated counties in southeastern Michigan; Wayne, 108 individuals; Oakland, 53 individuals; and Genesee, 42 individuals. Twenty-nine Montmorency County residents fished the area. Non-resident anglers were led in number by Ohioans (21). Fifteen individuals from five other states also fished on the area.

Flies Vs. Bait Angling Success

The purpose of the flies vs. worm bait comparison was to determine the relative success of fly fishermen vs. bait fishermen. We suspected that fly fishermen were more successful than bait fishermen on Section Z, A, and D of Hunt Creek, and that bait fishermen were more successful on Section C. A more inclusive, general comparison was desired. To obtain the information for this comparison, the 1952 creel census records were divided into two groups (Table 8). Group 1 included records from Hunt Creek(excluding Section D) and Fuller Creek. Group 2 included records from Section D of Hunt Creek, Fuller Creek Pond, and East Fish Lake. Habitat differences of the groups suggested this division.

The heading, "flies", includes those anglers who fished using the various artificial insect lures. The heading, "bait", includes all anglers who used worms, minnows, insects and other lures excluding artificial flies. Worms were the most popular bait (Table 9). The heading, "flies - bait", includes

all anglers who used both fly and bait lures on any one trip.

The anglers who fished with flies in group 1 waters made 127 fishing trips (58 percent successful), angled for 320.00 hours, and caught 225 brook trout; their catch per hour per angling trip was 0.723 fish. The anglers who fished with bait made 367 fishing trips (35 percent successful), angled for 987.75 hours, and caught 334 brook trout; their catch per hour per angling trip was 0.329 fish. The anglers who fished with flies and bait made 24 fishing trips (33 percent successful), angled for 68.00 hours, and caught 20 brook trout; their catch per hour per angling trip was 0.253 fish. Fly anglers were significantly more successful than either the bait or the flies-bait anglers in the group 1 waters.

The anglers who fished with flies in the group 2 waters made 64 fishing trips (39 percent successful), angled for 149.75 hours, and caught 56 brook trout; their catch per hour per angling trip was 0.402 fish. The anglers who fished with bait made 407 fishing trips (26 percent successful), angled for 1,198.50 hours, and caught 261 brook trout; their catch per hour per angling trips was 0.204 fish. The anglers who fished with flies and bait made 31 angling trips (29 percent successful), angled for 88.00 hours, and caught 26 brook trout; their catch per hour per angling trip was 0.261 fish. In group 2 waters, there was no statistical difference between the success of the anglers using the two types of lures nor the combination of lures.

Rough Fish Removal from East Fish Lake

The history of rough fish removal from East Fish Lake was initiated on August 25, 1941, when poisoning of the lake water to remove an over-population of stunted yellow perch and other rough fishes

was begun. On November 7, 1941, several wire cages containing fingerling brook trout were suspended at various depths in the lake to determine if the water was habitable by trout - it was. At this time the lake was supposedly devoid of all fish (for further details see Institute Report No. 848).

Following the poisoning, four hundred and ninty-nine legal-sized hatchery brook trout were planted in the lake, 250 in the fall of 1941 and 249 in the spring of 1942. All of these fish were marked, either by jaw tags or by fin removal, so all planted fish recovered by anglers in 1942 could be recognized. Prohibition of the use of live minnows as bait in East Fish Lake was initiated in 1942.

Upon the termination of the 1942 trout season, 333 of the marked hatchery trout had been recovered by anglers. The anglers also took 34 legal-sized wild brook trout and six sub-legal wild brook trout, thus indicating that the 1941 poisoning of East Fish Lake did not result in a complete kill of the brook trout, either resident in, or having access to, the lake.

The poisoning did effect a complete kill of the yellow perch. No perch have been observed in the lake since the poisoning, nor has this species ever been taken by angling or netting since the poisoning.

Northern creek chubs reappeared in the anglers' catch in the 1943 angling season during which the anglers took three chubs whose average size was 7.5 inches and 0.17 pound. The chubs were present in the lake as the result of incomplete poisoning in 1941, or of fishermen emptying their bait buckets - containing chubs - into the lake, or as the result of chubs escaping from anglers' hooks. There has been a population of chubs in the lake since their presence was discovered in 1943.

Common white suckers first reappeared in the anglers' catch in 1948 when a 12.0-inch specimen was taken. It is believed that the entire sucker population was destroyed by the 1941 poisoning of East Fish Lake, and that

the reoccurrence of suckers is directly attributable to fishermen activities - emptying bait buckets in the lake or allowing living suckers to escape off bait hooks.

Angling on East Fish Lake has fluctuated somewhat from 1942 to 1952 (Table 10). For this discussion the fluctuations are followed by dividing the 1941 to 1952 angling seasons into three periods: 1942-1945, 1946-1948, and 1949-1952. The foregoing division is based primarily on the number and average weight of brook trout taken by anglers during the various years.

During the 1942-1945 period the number of wild brook trout creeled increased from 34 to 169. Coinciding with the numerical increase was an increase in the average weight of the trout from 0.20 pound to 0.88 pound. Catch per hour was satisfactory. The increase in the size and number is probably related to the beneficial effects of removing the perch and rough fish in 1941, along with the increase in shoal area brought about by raising the water level. As early as 1943, chubs had re-entered the anglers' catch but they apparently were not present in sufficient number to retard the advancement of the brook trout. No hatchery trout were taken by anglers after 1942. The most productive season for the anglers of this period, or any period, was 1945.

During the 1946-1948 period, the number of brook trout taken was relatively constant, as was the catch per hour figure, but the average weight of the brook trout dropped from 0.75 pound to 0.49 pound. Angling was considered normal and satisfactory during this period. Numerically, chubs increased rapidly in the lake over the 1946-1948 period. One sucker was taken in 1948.

During 1949-1952 the number of brook trout taken decreased from 93 to 37 fish. The average weight increased from 0.77 pound in 1949 to 0.82 pound in 1950 then dropped to 0.61 in 1952. Estimates of the number of brook trout available to the angler at the beginning of the season (calculated from

population study data) indicate that there has been a decline in available trout from 1948 through 1952.

The figures for the 1949 to 1952 period are influenced by two factors: the planting of 500 wild brook trout fingerlings in the lake in fall of 1950 and a change from the legal minimum size of 7 inches in 1950 to 10 inches in 1951. Twelve of the adipose-marked fish planted in 1950 entered the anglers catch in 1952, further emphasizing the reduction of native fish creeled in 1952. The change in the legal size limit reduced the number of trout available to the anglers in 1951 and in 1952; even so, the trend in the number of trout taken, the catch per hour, and the trout available to the anglers has been downward since 1949. Suckers increased rapidly in number and size in East Fish Lake after 1948. Chubs continued to be present in large numbers.

The cause of the general decline of brook trout in East Fish Lake was not apparent, but the presence of an increasing number of common white suckers and northern creek chubs was suspected as being partially to blame. The suckers were in competition with the brook trout for habitat space and the chubs were in competition with the brook trout for habitat space and food. The latter species also was suspected of preying on the young trout.

The first year after East Fish Lake was poisoned no chubs or suckers entered the anglers' catch. From 1943 to 1952, chubs either entered the catch or were observed to be present in the lake. No sucker entered the anglers' catch until 1948, thereafter, they were creeled each year.

During the 1948 fall brook trout population study on the lake, 161 chubs and 121 suckers were netted (Table 11). The suckers and chubs were either destroyed or put over the outlet dam.

Since chubs and suckers were well established by 1948, it was decided to include them in the 1949 fall population study. From the 1949 data estimates (Schumacher and Eschmeyer modification of the Schnabel method) of 567 $\pm$ 104

suckers and 302 ± 32 chubs were obtained for the lake. Ninety-six suckers and 154 chubs were netted and marked during this study. They were all returned to the lake.

Sucker and chub recoveries during the 1950 fall population study were too few to permit a reliable estimate of their number. Sixty-three suckers and 31 chubs were netted and marked during this study. All were returned to the lake.

The population study data from the fall of 1951 indicated a population of 129 ± 38 suckers and 88 ± 18 chubs in East Fish Lake. Thirty-seven suckers and 52 chubs were netted and marked during this study. Ninety-eight suckers and five chubs 3-to-4 inches long were removed from the lake. On the first day of netting 85 3- to 4-inch suckers were marked and returned to the lake.

In 1952 the systematic cropping of the sucker and chub populations was begun. The cropping was carried on at two periods, one in the spring during the sucker and chub spawning season, and the other in conjunction with the fall brook trout population studies.

The morphological characteristics of East Fish Lake restrict the spawning activities of the suckers and chubs to the outlet bay, and to a lesser extent, to the inlet stream. The spawning activities of these two fishes have never been observed elsewhere in the lake.

Seven fyke nets were employed in both the spring and fall removals. Five of the fyke nets were 3-foot, 1-inch stretched mesh nets with 8-foot wings and two were 4-foot, 2-inch stretched mesh nets with 50-foot wings. All nets were inspected daily.

The spring netting began on April 23, when sucker spawning activities were observed in the outlet bay and continued until netting became unproductive on June 22. The original netting sites were in the outlet bay and at the entrance of the inlet stream, but it was soon evident that netting at the

inlet was unproductive, so all nets were moved into the outlet bay and channels leading into the outlet bay. During the 60 days of netting 1,108 suckers weighing 479.0 (exclusive of 20 fish not weighed), and 448 chubs weighing 32.2 pounds were removed from the lake. The average sucker removed over this period was 9.2 inches long and weighed 0.44 pound. We cropped 29.94 pounds of suckers per acre, 18.5 suckers per day netted, or 0.50 pound per acre per day netted. The average chub was 5.5 inches long and weighed 0.08 pound. We cropped 2.01 pounds of chubs per acre, 7.5 chubs per day netted, or 0.03 pound per acre per day netted.

Fall netting in East Fish Lake began on October 19, and continued until the termination of the brook trout population study on November 5. The majority of suckers and chubs netted in the fall were taken at the entrance of the inlet - six of the seven nets were operated in the vicinity of the inlet. During the 17 days of netting, 184 suckers weighing 22.08 pounds and 121 chubs weighing 12.24 pounds were removed from the lake. The average sucker removed during this period was 6.6 inches long and weighed 0.12 pound. We cropped 1.35 pounds of suckers per acre, 10.8 suckers per day netted or 0.08 pound per acre per day netted. The average chub removed over this period was 6.6 inches long and weighed 0.10 pound. We cropped 0.77 pound per acre, 7.1 chubs per day netted, or 0.05 pound per acre per day netted.

Whether we materially reduced the sucker population in the spring of 1952, as would seem to be the case from the results of our fall netting, or whether a reduction is falsely indicated by our sampling of two size groups (the large spawners in the spring, and the general population in the fall) will not be known until the spring netting is repeated in 1953. Our present data indicate that we reduced the sucker population in numbers, and that the suckers remaining in the lake at the end of the fall netting averaged less in length and weight than those present at the beginning of the spring netting.

Comparing the spring and fall figures for the chubs, the number of chubs taken per day netted changed little, yet the average length and weight of the fall catch were greater than those for the spring-netted chubs. The chub data also may be weighed by the possibility that we sampled different size groups in the spring and in the fall. The present figures suggest that our partial cropping of the chub population was beneficial to the chubs which escaped capture.

INSTITUTE FOR FISHERIES RESEARCH

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Report approved by: A. S. Hazzard

Report typed by: P. R. Darling

Table 1.--Dimensions of the various experimental waters on the Hunt Creek drainage, with the angling regulations in force, 1952 trout season (mileage is given in parentheses)

Experimental water	Dimensions		Area (acres)	1952 angling regulations
	Length (feet)	Average width (feet)		
Section Z	2,397 (0.45)	20.3	1.12	7 inches minimum size 10 per day
Section A	2,577 (0.49)	24.3	1.44	7 inches minimum size 10 per day
Section B	1,605 (0.30)	17.5	0.64	7 inches minimum size 10 per day
Section C	2,700 #/ (0.51)	11.8	0.71 #/	7 inches minimum size 10 per day
Section D	2,896 (0.55)	50.0 +/	3.11 +/	7 inches minimum size 10 per day
Totals: Experimental sections, Hunt Creek	12,175 (0.31)	25.1	7.02	7 inches minimum size 10 per day
Fuller Creek below Fuller Creek Pond, including East Fish Lake outlet	9,875 (1.87)	15.7	3.57	7 inches minimum size 10 per day
Fuller Creek Pond	---	---	14.58	10 inches minimum size 5 per day
East Fish Lake	---	---	16.00	10 inches minimum size 5 per day

#/ Excluding 1,270 feet of Section C around experimental diversions which are closed to fishing.

+/ The data given is from a 1949 survey; increased beaver activity has increased the average width and the area.

Table 2.--Summary of angling statistics, experimental waters of the Hunt Creek drainage, 1952 trout season. Figures in parentheses represent the numbers of unsuccessful fishing trips.

Experimental water	Number fishing trips	Total hours of angling	Brook trout catch		Angling quality		Average size of brook trout	
			Number	Total pounds	Catch per hour	Pounds per hour	Length inches	Weight, pounds
Hunt Creek								
Section Z	188 (108)	570.25	222	34.139	0.39	0.060	7.7	0.154
Section A	73 (30)	205.00	131	19.471	0.64	0.095	7.6	0.149
Section B	31 (17)	58.50	28	4.240	0.48	0.072	7.6	0.151
Section C	143 (96)	329.25	134	20.236	0.41	0.061	7.6	0.151
Section D	241 (144)	601.75	263	59.121	0.44	0.098	8.5	0.225
Totals, averages, Hunt Creek	676 (395)	1,764.75	778	137.207	0.44 0.47	0.078 0.0772	7.9 7.8	0.176 0.166
Fuller Creek	85 (57)	220.75	64	9.885	0.29	0.045	7.6	0.154
Fuller Creek Pond	88 (69)	239.25	43	24.162	0.18	0.101	11.3	0.562
East Fish Lake	174 (151)	596.00	37	22.354	0.06	0.038	11.8	0.604

Table 3.--Angling statistics, all experimental sections combined, Hunt Creek, 1952 trout season. Figures in parentheses represent the numbers of unsuccessful fishing trips.

Date	Number fishing trips	Total hours of angling	Brook trout catch		Angling quality		Average weight,	Average length,
			Number	Total pounds	Catch per hour	Pounds per hour	pounds	inches
April 26-May 9	99 (60)	279.00	96	14.493	0.35	0.052	0.151	7.8
May 10-23	45 (28)	131.25	56	8.532	0.42	0.065	0.152	7.7
May 24-June 6	63 (35)	187.75	78	13.507	0.42	0.072	0.173	8.1
June 7-20	42 (20)	101.25	53	8.733	0.52	0.086	0.165	7.7
June 21-July 4	62 (30)	146.50	85	14.563	0.59	0.100	0.171	7.7
July 5-18	55 (35)	156.25	52	8.525	0.33	0.055	0.164	7.8
July 19-August 1	63 (45)	155.00	57	9.095	0.37	0.058	0.160	7.6
August 2-15	73 (40)	173.25	101	18.350	0.60	0.106	0.182	7.8
August 16-29	76 (40)	196.50	97	20.422	0.49	0.104	0.211	8.2
August 30-September 14	98 (62)	238.00	103	20.987	0.43	0.088	0.204	8.2
Totals	676 (395)	1,764.75	778	137.207	0.44	0.078	0.176	7.9
					0.453	0.0786	0.173	

Table 4.--The number of legal brook trout caught and number of angling trips made by individual anglers, 1952 trout season, Hunt and Fuller creeks

Number of brook trout caught	Number of individuals catching them	Total number of		Percent of total		
		Fishing trips	Trout caught	Individuals	Angling trips	Catch
0	327	347	0	62.6	45.6	0.0
1	63	93	63			
2	41	61	82			
3	32	52	96	30.5	32.1	40.5
4	15	24	60			
5	8	14	40			
6	6	21	36			
7	5	8	35			
8	4	12	32	4.0	8.4	18.8
9	5	13	45			
10	1	10	10			
11	2	11	22			
12	3	17	36			
13	2	8	26			
17	1	9	17			
22	1	10	22	2.9	13.9	40.7
25	1	9	25			
29	2	15	58			
36	1	10	36			
48	1	7	48			
53	1	10	53			
Totals	522	761	842	100.0	100.0	100.0

Table 5.--The number of legal (10.0+) brook trout and number of angling trips made by individual anglers, 1952 trout season, Fuller Creek Pond

Number of brook trout caught	Number of individuals catching them	Total number of		Percent of total		
		Fishing trips	Trout caught	Individuals	Angling trips	Catch
0	47	54	0	79.6	61.4	0.0
1	2	3	2	3.4	3.4	4.7
2	5	9	10	8.5	10.2	23.3
3	1	1	3	1.7	1.1	7.0
4	2	8	8	3.4	9.1	18.6
5	1	5	5	1.7	5.7	11.6
15	1	8	15	1.7	9.1	34.8
Totals	59	88	43	100.0	100.0	100.0

Table 6.--The number of legal (10.0+) brook trout and number of angling trips made by individual anglers, 1952 trout season, East Fish Lake

Number of brook trout caught	Number of individuals catching them	Total number of		Percent of total		Catch
		Fishing trips	Trout caught	Individuals	Angling trips	
0	105	134	0	84.0	77.0	0.0
1	8	14	8	6.4	8.0	21.6
2	7	15	14	5.6	8.6	37.8
3	5	11	15	4.0	6.4	40.6
Totals	125	174	37	100.0	100.0	100.0

Table 7.--Residence of individual anglers using the experimental waters, Hunt Creek drainage, 1952 trout season. Residence tabulated by fishing trips

County of residence	Number of individuals	East Fish Lake	Fuller Creek Pond	Fuller Creek	Hunt Creek	Totals
Alpena	1	...	...	...	1	1
Arenac	1	...	...	...	1	1
Bay	10	6	3	...	29	38
Berrien	2	2	...	...	...	2
Branch	2	...	...	2	2	4
Calhoun	5	...	...	1	5	6
Genesee	42	28	8	6	67	109
Gratiot	3	...	3	...	...	3
Hillsdale	7	...	...	...	16	16
Ingham	21	4	4	1	37	46
Ionia	2	2	...	...	...	2
Isabella	9	1	2	...	27	30
Jackson	10	9	...	...	10	19
Kalamazoo	1	...	...	...	2	2
Kent	11	14	...	2	3	19
Lapeer	3	1	...	...	2	3
Lenawee	4	2	...	...	7	9
Livingston	4	3	...	...	1	4
Macomb	13	4	...	. 3	13	20
Marquette	1	...	...	...	2	2
Midland	2	2	...	...	1	3
Monroe	5	1	...	1	7	9
Montmorency	29	30	20	1	36	87
Muskegon	2	1	1	...	3	5
Oakland	53	14	4	24	76	118
Ogemaw	1	...	...	...	1	1
Oscoda	10	4	1	2	19	26
Otsego	1	...	1	...	2	3
Ottawa	2	2	...	...	1	3
Saginaw	23	2	16	...	25	43
St. Clair	6	...	...	8	35	43
Sanilac	1	...	...	...	1	1
Shiawassee	5	...	...	...	13	13
Tuscola	5	2	...	4	...	6
Washtenaw	16	4	5	6	27	42
Wayne	108	29	15	21	147	212
Total residents	421	167	83	82	619	951
Arkansas	1	...	...	...	1	1
Illinois	3	...	...	...	5	5
Indiana	6	...	...	...	11	11
New York	2	...	...	...	2	2
Ohio	21	7	5	3	35	50
Virginia	3	...	...	...	3	3
Total non-residents	36	7	5	3	57	72
Grand totals	457	174	88	85	676	1,023

Table 8.--Flies vs. bait-relative angling quality for Group 1 waters, Hunt Creek (Exc. Sec. D) and Fuller Creek, and Group 2 waters, Hunt Creek (Sec. D), Fuller Creek Pond, and East Fish Lake, 1952 trout season

Group		Fishing trips	Hours angled	Total catch	Catch per hour	Catch per hour per trip	Standard error	Percent successful trips
1	Flies	127	320.00	225	0.703	0.723	0.084	58
	Bait	367	987.75	334	0.338	0.329	0.032	35
	Flies-bait	24	68.00	20	0.294	0.253	0.102	33
	Totals	518	1,375.75	579	0.421	.....	.....	41
2	Flies	64	149.75	56	0.374	0.402	0.111	39
	Bait	407	1,198.50	261	0.218	0.204	0.024	26
	Flies-bait	31	88.00	26	0.295	0.261	0.096	29
	Totals	502	1,436.25	343	0.239	.....	.....	28

Percent of probability that catch per hour per fishing trip was different when different lures were employed.

		Bait	Flies-bait
Group 1	Flies	99.99+	99.96
	Bait	.....	51.60
Group 2	Flies	91.80	66.28
	Bait	.....	43.78

Table 9.--Numerical relationship of types of bait employed by anglers, 1952 trout season. Calculated on total basis, example: on Group 1 waters worms were employed on 338 angling trips, these trips may have also involved the use of flies, plugs, or others.

Bait employed	Group 1 waters fishing trips		Group 2 waters fishing trips		Totals fishing trips	
	Number	Percent	Number	Percent	Number	Percent
Worms	338	84.3	393	83.9	731	83.9
Minnows	38	9.5	46	9.6	84	9.6
Insects	24	6.0	14	4.4	38	4.4
Plugs	1	0.2	15	1.9	16	1.9
Frogs	...	...	2	0.2	2	0.2
Totals	401	100.0	470	100.0	871	100.0

Table 10.--Summary of brook trout and rough fish removed from East Fish Lake by anglers for the years 1941 to 1952.

Fishing season	Number of fishing trips	Number of legal brook trout available to anglers	Number of brook trout taken	Catch per hour	Average weight of brook trout pounds	Rough fish taken	
						Chubs	Suckers
1941	156 [1]	...	244	0.63	0.19	Many [2]	0
1942	159	...	367 [3]	1.27	0.20	0	0
1943	121	...	69	0.29	0.37	3	0
1944	311	...	108	0.17	0.75	5	0
1945	436	...	169	0.18	0.88	9	0
1946	430	...	93	0.10	0.75	14	0
1947	344	...	89	0.13	0.61	4	0
1948	287	288	117	0.14	0.49	36	1
1949	287	284	93	0.09	0.77	11	2
1950	218	185	50	0.08	0.82	0	20
1951	200	151 [4]	56	0.08	0.62	1	9
1952	174	79	37	0.06	0.61	0	31

[1] East Fish Lake poisoned during August of 1941.

[2] The number of chubs caught by anglers was not recorded in 1941. One angler caught 18 chubs and six anglers caught "several"

[3] Thirty-four of these were legal-sized trout.

[4] The 1951 angling season began with a 10-inch size limit--it had been 7-inches in previous years.

Table 11.--Summary of the suckers and chubs netted from East Fish Lake during the fall brook trout population studies from 1948 to 1952 and during the 1952 spring netting period. Figures in parentheses are sample sizes from which average was determined for weight and length.

Species and year netted	Dates netted	Number of days netted	Number of fish netted	Number taken per day netted	Pounds netted	Pounds per acre	Average Weight	Average Length
Suckers								
1948	Oct. 14 to Nov. 13	31	121	3.9	...	...	...	4.5 (30)
1949	Oct. 1 to Nov. 21	45	96	2.1	...	...	...	8.4 (87)
1950	Oct. 24 to Nov. 10	18	63	3.5	...	...	...	...
1951	Oct. 9 to Nov. 5	28	220	7.9	...	...	...	7.3 (37)
1952	Apr. 23 to June 22	60	1,108	18.5	479.0	29.94	0.44	9.2 (1,088)
1952	Oct. 19 to Nov. 5	17	184	10.8	21.6	1.35	0.12	6.6 (184)
Chubs								
1948	Oct. 14 to Nov. 13	31	161	5.2	...	...	...	6.7 (94)
1949	Oct. 1 to Nov. 21	45	154	3.4	...	...	...	6.7 (128)
1950	Oct. 24 to Nov. 10	18	31	1.7	...	...	...	7.0 (31)
1951	Oct. 9 to Nov. 5	28	57	2.0	...	...	...	6.8 (41)
1952	Apr. 23 to June 22	60	448	7.5	32.2	2.01	0.07	5.5 (448)
1952	Oct. 19 to Nov. 5	17	121	7.1	12.2	0.77	0.10	6.6 (121)