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RESULTS OF THE INTENSIVE CREEL CENSUS ON EAST FISH
LAKE DURING THE 1941 AND 1942 TROUT SEASONS.

by

David S. Shetter

East Fish Lake is one of the two brook trout lakes which lie within the general Hunt Creek Experimental Area in southern Montmorency County. Since the establishment of the Hunt Creek Laboratory in 1939 the laboratory staff has kept intensive creel census records of the angling done on the lake, and have practiced various forms of fisheries management in an effort to increase the quality of the angling. Management procedures which have been used are: stocking with legal-sized brook trout; removal of an overabundant and apparently stunted perch population; coarse fish and minnows by poisoning; and increasing the water level by placement of a dam with controllable spillway at the lake outlet.

A study of the creel census data presented in this report will demonstrate that a program of intelligent habitat and species control plus moderate stocking can increase the quality of the angling. This increase in angling quality (as measured in terms of the catch of legal brook trout per hour of fishing) has been consistently higher each successive year. This report will present the creel census data for the past two seasons, discuss briefly the elimination of unwanted species by poison, and discuss the results from hatchery stocking of legal brook trout in the lake. Implications from certain of the data also will be pointed out.

Results of angling in 1941

In 1941, a total of 156 anglers fished 385.50 hours and caught 244 legal brook trout at an average rate of 0.63 fish per hour of angling. Ninety-one fishermen (58 per cent of the total number of anglers) caught no fish. The total weight of the legal catch was estimated to be 47.23 pounds, or a rate of capture of 0.122 pounds of trout per hour of fishing. The 1941 anglers reported that they released 79 undersized fish - in other words sub-legal brook trout were caught at the rate of 0.20 fish per hour of fishing. (Table 1).

Table 1

Intensive Creel Census Data for East Fish Lake, 1941 Trout Season.

Two-week period	Number of anglers	Number taking no fish	Per cent taking no fish	Total hours of angling	Legal Brook Trout		Sublegal Brook Trout		Total weight of legal trout (grams)	Wt. of legal fish caught per hour (grams)
					Number	Catch per hour	Number	Catch per hour		
Apr 26-May 9	77	33	43	216.5	196	0.91	48	0.22	17,513 ¹¹	80.89
May 10-23	14	10	71	31.5	15	0.48	3	0.10	942 ³	29.90
May 24-June 6	10	5	50	22.0	11	0.50	14	0.64	826 ⁸	37.54
June 7-20	11	5	45	18.5	7	0.38	6	0.32	675	36.48
June 21-July 4	6	5	83	9.5	4	0.42	5	0.53	282	29.68
July 5-18	14	14	100	43.0	0	0.00	0	0.00	0	0.00
July 19-Aug. 1	13	8	62	25.0	11	0.44	3	0.12	1,186	47.40
Aug. 2-15	7	7	100	15.5	0	0.00	0	0.00	0	0.00
Aug. 16-20	4	4	100	4.0	0	0.00	0	0.00	0	0.00
Totals, averages	156	91	58	385.5	244	0.63	79	0.20	21,424 ²²	55.57

(47.23 lb.)(0.122 lb/hr.)

ⁿ/_v - indicates number of fish not weighed and measured. The average weight for the particular period was used for these fish.

All undersized fish taken and released were wild fish as stocking was with legal-sized hatchery fish only.

Almost 50 per cent of the fishing effort was expended during the first two weeks of the season, and the catch per hour was highest in that period (0.91 legal brook trout per hour of fishing). In successive weeks the catch per hour varied from 0.00 to 0.50 fish.

The average size of the legal trout taken (given in detail in Table 2) was greatest in the firsttwo-week period when the average length and weight of 185 trout was 8.6 inches and 3.12 ounces (218 m m, 89 gr.). In succeeding weeks the average size of the brook trout caught varied between these figures and 7.9 inches and 2.50 ounces. The average size of the season's catch (based on measurements of 222 of 244 fish) was 8.54 inches and 3.12 ounces.

The season on East Fish Lake was slightly shorter than usual in 1941, as it was desired to poison the lake during the warm summer weather. No fishing was done after August 20, during the 1941 season.

Dam construction and removal of species competing with the brook trout

Construction of an earth fill dam was begun in late July and completed about August 20, 1941. A step spillway was built of wood construction with slots on the lakeside face to permit the operation of slash-boards.

On August 25, 1941, poisoning of the lake was begun. The poisoning operations and subsequent tallying of the fish removed from the lake was performed by the poisoning crew under the direction of Mr. Louis Krumholz, assisted by the writer and various members of the Hunt Creek staff when needed.

Between August 25 and Sept. 11, 406 pounds of fish were removed from the lake. Only approximately 17.7 pounds of the total weight consisted of brook trout. The total number of brook trout which were found by netting and poisoning was 188, of which 66 were of legal size. Despite the fact that 314 marked hatchery brook trout were theoretically not yet removed, only 3 marked hatchery fish were recovered in the course of the poisoning and experimental netting. The great majority of the fish in the lake consisted of common suckers and yellow perch. In addition, the other species present were grayling, (one specimen), smelt (one specimen), creek chub, common shiner, blacknosed shiner, Iowa darter, red-bellied dace, mud minnow, golden shiner, common sunfish, stickleback, brassy minnow and river chub.

✧ This crew consisted of Lee Anderson, Pat Galvin and Mike Pawlick. Mrs. Lorene Krumholz also assisted by recording much of the data taken by the poisoning crew.

The grayling was a survivor from an experimental planting made in Fuller Creek or in Fuller Creek Beaver Pond in May, 1940. It had migrated at least one-half mile up the East Fish Lake outlet stream to reach the lake.

The single smelt found probably was introduced into East Fish Lake from an angler's bait pail or was the survivor of a number of smelt planted by some unauthorized person. It is extremely doubtful that this fish migrated from Lake Huron via the Thunder Bay River and Hunt Creek. Such unauthorized transfers have, in many instances, later affected the angling detrimentally where undesirable species were given opportunity to establish themselves. The presence of such species as the common sunfish, the river chub and the brassy minnow suggests that they escaped from or were dumped from bait pails, or were purposely released because some angler thought he was following a good fisheries practice in releasing his remaining bait fish alive, or else had a personal desire to establish the species in that locality. Because of these practices, which have been observed in the past, the Commission order was requested which prohibits the use of live minnows on lakes which have been poisoned and re-stocked with trout.

After November 7 the water of the lake was determined to be habitable for fish by means of test cages containing brook trout fingerlings suspended at various depths. A normal level approximately two feet higher than in the 1941 trout season was established and has been maintained with the exception of minor fluctuations caused by heavy rains. At this increased water level, a much greater food-producing shoal area has been made available for the trout. A two-way fish trap was installed immediately below the dam to prevent the re-establishment of any minnow populations in the lake, and also to determine what-if any - trout movement might take place out of or into the lake. At the request of the Institute, the Conservation Commission placed East Fish Lake on the list of trout lakes where fishing with live minnows is prohibited. These latter measures should make difficult any re-establishment of the competing fish population previously encountered.

Results of angling, 1942

In 1942, the number of anglers increased from 156 to 159, but the total hours of fishing was 25 per cent less (289.25 hours as compared with 385.50 in 1941) than in 1941. Fifty-five per cent (87 individuals) of the anglers caught no legal brook trout. The total legal catch for the entire season was 367 brook trout, which were caught at the rate of 1.27 fish per hour of fishing. The total weight of the legal catch was estimated at 97.06 pounds, or a rate of capture of 0.336 pounds of fish per hours of fishing. Six under-sized brook trout were reported as captured and released - a catch per hour of less than 0.01 sublegal fish (Table 3). Compared with the results of the 1941 fishing, the catch per hour was doubled, and the weight of legal trout removed by the anglers was slightly more than doubled.

Approximately 75 per cent of the fishing effort was recorded during the first two weeks of the season, and the total catch (315 legal trout) and the catch per hour for this period (1.49 fish) was the highest of any period during the season.

In successive periods the catch per hour varied from 0.00 fish to 1.09 fish. For the first time since creel census records were kept on this lake, brook trout were taken in every month of the season on flies at the surface. Undoubtedly this was the result of a comparatively cool summer.

The average size of the brook trout in the legal catch (given in detail in Table 4) was greatest in the period July 18-31, when two fish averaged 10.78 inches in length and 9.20 ounces in weight. The lowest average length and weight for any two-week period was for the opening two-weeks (Apr. 25-May 8) when the average length and average weight were 8.81 inches and 3.84 ounces. The average size of the entire season's catch (based on measurements of 361 fish measured and 357 fish weighed) was 8.97 inches and 4.23 ounces.

The residence of the anglers using East Fish Lake in both 1941 and 1942 was presented in Table 5. In general, the lake was used chiefly by anglers living in the eastern half of the Lower Peninsula. In both years, more than half of the anglers came from Montmorency, Wayne and Genesee counties. In 1941, Wayne County anglers were most numerous followed by Montmorency and Genesee counties. In 1942, Montmorency County fishermen were followed in numbers by Wayne and Genesee county anglers. Non-resident fishermen were four in number each year; in 1941 they came from Indiana, in 1942 from Ohio.

The role of hatchery-reared trout in the catches of 1941 and 1942

The number of hatchery-reared trout which were theoretically available to the fishermen in each season was almost the same (490 in 1941, and 499 in 1942). For purposes of determining whether fall or spring planting yielded more fish to the anglers, approximately one-half of the fish were released in the fall and one-half in the spring preceding each season. In each of the four plantings, one-half of the fish were jaw-tagged, measured, weighed, and a scale sample removed from each fish. The remaining one-half from the same lot of fish were measured individually and weighed as a group and were fin-clipped, using a different mark for each planting.

The hatchery trout were marked by both fin-clipping and jaw-tagging to see if there was any difference between recovery results obtained from either method. There appeared to be no significant difference between the methods.

The number planted at the various seasons and the results from the plantings are to be found in Table 6. A more detailed breakdown is also to be found on the lower left and upper right portions of Tables 2 and 4.

In 1941, the legal catch of 244 fish consisted of 176 hatchery-reared brook trout and 68 wild brook trout. In other words 72.1 per cent of the catch consisted of hatchery fish. Of 243 fall-planted hatchery fish available, some 34, or 13.9 per cent were recovered. The number of spring-planted hatchery fish available to the anglers were 247, and of this number 142, or 57.4 per cent were recovered by angling. Of the total weight of fish removed by angling in 1941, fall-planted hatchery trout made up 12.3 per cent, spring-planted hatchery fish made up 63.8 per cent, and wild fish 23.9 per cent.

In 1942, after the poisoning of the lake, theoretically the only fish available should have been the 499 marked hatchery fish from the 1941 fall

and the 1942 spring planting. Since 34 wild, unmarked brook trout were captured by anglers (plus 6 undersized brook trout), an unknown number of brook trout escaped the poison or survived its effects. These wild fish constituted 9.3 per cent of the total number of fish caught and 9.9 per cent of the total weight of fish removed by angling. The total number of fall-planted hatchery fish caught was 133, or 53.5 per cent recovery. The highest percentage of recovery noted to date on any planting of marked trout in Michigan waters was made on the spring planting of hatchery trout - 198 out of 250 fish were caught - a recovery of 79.5 per cent. These hatchery plantings contributed to the total catch and total weight of the catch as follows: spring planting 53.9 per cent of total catch, 57.3 per cent of total weight, fall planting 36.2 per cent of total catch, 32.8 per cent of total weight (Table 4, 6).

The above data provide convincing evidence that the bulk of the fishing in East Fish Lake has been furnished during the past two seasons by hatchery trout. Also the evidence indicates definitely that in trout lake management as in trout stream management, a larger number of hatchery brook trout can be made available to the anglers through releases made in the spring of the year rather than in the fall of the year. However, it should be noted that the survival to the anglers' creel of fall-planted fish was between 3 and 4 times higher in 1942 (53.3 per cent as compared with 13.9 per cent in 1941) after the removal of competing species by poisoning and the increased lake level was effected. Since approximately the same number of hatchery trout were planted before and after poisoning the improved catch following poisoning must be attributed to either or both of these factors.

Distribution of the total catch over the season and among the anglers

The data presented in the preceding pages indicate that where trout lakes are concerned we can manage them so that a high percentage of the hatchery product is utilized. There yet remains the problem of distributing the product more fairly among the anglers and as far as possible over the entire season. In Table 7 will be found tabulations comparing the total number of anglers, number of anglers taking "limit" catches (15 trout), number of anglers catching five to 14 trout, and the number of anglers catching no trout (a), for the opening two days of the season, and (b), for the remainder of the season. These tabulations are taken from intensive creel census data recorded on East Fish Lake in 1941 and 1942, and the North and South Basins of Twin Lake (Oscoda County) in 1942. At the time of planting in 1941 and 1942 East Fish Lake and the North Basin of Twin Lake contained only brook trout, while the South Basin of Twin Lake contained largemouthed black bass and bluegills. All were planted, either in the spring or in the fall with hatchery-reared brook trout of legal size.

A study of Table 7 shows that 50 or more per cent of all angling on lakes containing only brook trout was done on the opening week-end. These anglers (and in particular the successful anglers) who were either fortunate enough to be able to fish at this particular season, take a disproportionate amount of the total catch for the season. As shown in the table, "limit" catches were

*Data for Twin Lakes provided by Louis Krumholz.

not unusual on the opening week-end, and in three instances as many or more catches of from five to 14 fish were made at the same time. However, no "limit" catches were made after the opening week-end, and never more than three catches of from five to 14 fish after the first two days of the season.

Considering only the fish taken by anglers making "limit" catches, 9.4 per cent of the total anglers removed 61.3 per cent of the total catch in 1942 from East Fish Lake on the opening week-end. In 1941 on the same lake, 1.3 per cent of the total anglers removed 12.3 per cent of the total catch in this period. In 1942 on the North Basin of Twin Lake, 6.6 per cent of the total anglers fishing over the fall planting of brook trout captured 41.8 per cent of the total catch; in the South Basin 4.3 per cent of the total anglers caught 48.5 per cent of the total catch of brook trout during the first two days.

There is evidence at hand to demonstrate that a similar situation exists or has existed in almost every brook trout lake in the state where legal-sized hatchery plantings were made. Intensive creel censuses conducted on the opening day or opening week-end on Kimes Lake (Newaygo County) and Holland Lake (Luce County) indicated an unusual number of "limit" catches, with a removal of from 40 to 70 per cent of the planted stock by a very small percentage of the total number of anglers who might possibly use the lake after the first two days. (Inst. Reports 783 and 784). Reports from Conservation Officers indicate that numerous "limit" catches of brook trout were made in the early days of the 1941 and 1942 seasons on Wilson (Big Trout) and Swanzey Lakes in Marquette County after poisoning and re-stocking with legal-sized brook trout.

To the writer, it appears that the opening-day anglers of brook trout lakes have had (and used) the opportunity to take several times their share of fish. A small but consistent percentage has been observed to misuse the privilege by taking several "limits", i.e., one for themselves, their wives, and as many children as they have accompanying them. Assuming the cost of a legal brook trout planted in East Fish Lake to be 20 cents (and hatchery supervisor estimated 15 cents, another 25 cents), every fisherman who took home a catch of 15 fish from East Fish Lake received the value of his license (\$1.00) three times over. Obviously the Department of Conservation cannot furnish such fishing to very many anglers over any extended period of time.

Since the management of the inland lakes is primarily for the production of sport rather than food, it is recommended that the daily creel limit on all trout lakes be reduced to five fish (with poundage limits as at present) in order that the total catch be spread more throughout the season and among a larger number of anglers. This recommendation is consistent with the present regulation of creel limits by Conservation Commission order on two rainbow trout lakes, Birch Lake (Cass County), and Lake Charlevoix (Charlevoix County), where local sentiment favored a lowered daily creel limit to prevent a relatively few individuals from taking more than their share when the fish were "coming good".

Another method which might be used to disperse hatchery-reared trout to a greater number of anglers would be to release one half of the yearly allotment of legal fish for any particular lake in the late spring or early summer (the date would vary with local conditions). The usual limnological conditions

occurring in trout lakes in midsummer would serve to protect many fish released at such a time from the average angler, and a fairly high percentage of the fish so released would be either available for late-season fishing or might carry over to the following season.

Summary and Recommendations.

1. It can be demonstrated from the intensive creel census data that the quality of the brook trout fishing in East Fish Lake has been improved since 1939 from a level of 0.41 fish per hour of angling to a level of 1.27 fish per hour of angling (Table 3). This improvement has been effected through a combined program of lake management including stocking with brook trout of legal size. The greatest improvement was noted after the removal by poisoning of yellow perch, rough fish, and minnows in August, 1941. The recovery of hatchery fish in 1942 was greatly increased, and the average size of wild unmarked brook trout increased 0.43 inches and 1.11 ounces. The hatchery trout were observed to be in much better condition in 1942 than in 1941 on recapture, particularly those taken in midsummer. A comparison of differences of growth between the two seasons will be the subject of another report. In order to determine through creel census and observation whether or not the remaining brook trout population can re-stock the lake sufficiently by natural reproduction in the comparatively limited area in the inlet and outlet, and in order to determine the natural productive capacity of the lake it is recommended that no further plantings of any fish be made in East Fish Lake until advised by the Institute for Fisheries Research. After the natural productive capacity under present conditions is determined the effect of spawning ground improvement and the planting of various numbers and sizes of hatchery trout can be ascertained with considerable accuracy.

2. Careful analysis of the catch records from East Fish Lake, and also from several other brook trout lakes in both the Upper and Lower Peninsula, show that a very small percentage (probably seldom more than 20 per cent) of the anglers who fish these brook trout lakes on the opening week-end are taking from 40 to 80 per cent of the total catch for the season. In order that more anglers may benefit from these plantings of legal-sized trout, it is recommended that the daily limit for anglers fishing on trout lakes be reduced from 15 to five.

INSTITUTE FOR FISHERIES RESEARCH

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Table 2.

The average length and average weight of the brook trout by types (wild or hatchery-reared) with percentage of total catch, and percentage in parentheses indicate number of specimens where not all specimens were measured in millimeter, we

Two - week period	1940 Fall Tag		1940 Fall Fin-clip		1941 Spring Tag		1941 Spring Fin-clip		Wild Fish		All
	number recovered	average l. - w.	number recovered	average l. - w.	number recovered	average l. - w.	number recovered	average l. - w.	number caught	average l. - w.		number caught
Apr. 26-May 9	11	214 82 (10) (10)	21	211 75 (20) (20)	56	223 106 (54) (54)	70	217 88 (65) (65)	38	209 76 (36) (36)	196
May 10-23	1	no data	...	.....	3	212 85 (1) (1)	4	197 67	7	195 56	15
May 24-June 6	...	....	...	....	1	no data	2	no data	7	206 75 (3) (3)	11
June 7-20	...	....	1	217 91	3	225 104	1	208 102	2	196 89	7
June 21-July 4	...	....	...	....	...	....	....	....	4	200 71	4
July 5-18	...	....	...	....	...	....	....	....	...	....	...
July 19-Aug. 1	....	....	...	....	....	....	1	206 71	10	214 112	11
Aug. 2-15	...	....	...	....	...	....	...	....	...	....	...
Aug. 16-25	...	....	...	....	...	....	...	....	...	....	...
Totals, averages	12	214 82 (10) (10)	22	211 76 (21) (21)	63	223 106 (58) (58)	79	216 87 (71) (71)	68	207 80 (62) (62)	244
Number released	118	193 72	125	193 76	124	221 104	123	209 93	...	...	490
Percentage recovery	10.2		17.6		50.8		64.2		...	...	35.2
Percentage of total catch	4.9		9.0		25.8		32.4		27.9		72.1

✓ - Total weight of legal trout removed estimated by adding the weight obtained by multiplying the average weight for each

to catch of East Fish Lake during the 1941 trout season
 percentages of recovery from each planting
 percentage of weight in the total catch (Figures
 specimens on which averages are based
 used or weighed. Length given are
 weights in grams).

Fish average l. - w.	Total weight of legal trout weighed	Number of grams and percentage of total weight of legal trout made up of				wild	Weight of legal trout removed (estimated)
		fall tag	fall fin-clip	spring tag	spring fin-clip		
218 89 (185) (185)	16,534	817 (4.9)	1,502 (9.1)	5,731 (34.7)	5,748 (34.8)	2,736 (16.5)	17,513
214 67 (12) (12)	741	...	...	85 (11.5)	266 (35.9)	390 (52.6)	942
206 75 (3) (3)	226	...	...	...	226 (100.0)	...	826
213 96	675	...	91 (13.5)	313 (46.4)	102 (15.1)	169 (25.0)	675
200 71	282	...	...	...	...	282 (100.0)	282
....
213 108	1,186	...	...	...	71 (6.0)	1,115 (94.0)	1,186
....
....
217 89 (222) (222)	19,644	817 (4.2)	1,593 (8.1)	6,129 (31.2)	6,413 (32.6)	4,692 (23.9)	21,424 (47.23 lb.)

In period by the number of unweighed fish to the known weight already obtained.

Table 3

Instensive Creel Census Data for East Fish Lake, 1942 Trout Season

Two-week periods	Number of anglers	Number taking no fish	Per cent taking no fish	Total hours of angling	Legal Brook trout		Sublegal Br. Trout		Total wts. of legal fish (grams)	Wt. legal fish caught per hour (grams)
					number	catch per hour	number	catch per hour		
Apr. 25-May 8	102	57	56	210.25	315	1.49	2	0.009	34,111 ⁶ _N	163.68
May 9-22	3	3	100	2.75	0	0.00	1	0.36	...	0.00
May 23-June 5	6	5	83	6.50	6	0.92	0	...	906 ² _N	139.38
June 6-19	8	3	38	11.50	7	0.61	0	...	1,278 ² _N	111.13
June 20-July 3	11	2	18	17.50	19	1.09	0	...	3,634	207.66
July 4-17	7	1	14	14.50	14	0.97	2	0.14	2,312	159.45
July 18-31	7	5	71	7.25	2	0.28	0	...	522	72.00
Aug. 1-14	7	5	71	9.25	2	0.22	0	...	479	51.78
Aug. 15-28	8	6	75	9.75	2	0.21	1	0.10	482	49.54
Totals or Averages	159	87	55	289.25	367	1.27	6	0.002	44,027 ¹⁰ _N (97.06 lb)	152.21 (0.336 lb/hr.)

^N indicates number of fish not weighed. The average weight for the particular period was used for these fish.

Table 4.

The average length and average weight of the brook trout (wild or hatchery-reared), with the percentages of and percentage of weight in the total catch (F on which averages are based where not all

Two-week period	1941 Fall Tag			1941 Fall Fin-clip			1942 Spring Tag			1942 Spring Fin-clip			Wild Fish		All	
	number recovered	average l. - w.		number recovered	average l. - w.		number recovered	average l. - w.		number recovered	average l. - w.		number caught	average l. - w.	number caught	
Apr. 25-May 8	65	217	97	61	221	104	80	232	121	101	226	113	7	201	74	315 ^a
		(65)	(63)		(60)	(59)					(101)	(100)				
May 9-22	...	....		...	....		...	....		...	....		...	....		...
May 23-June 5	...	....		1	250	195	2	no data		3	237	136	...	....		6
June 6-19	2	263	193	...	....		1	264	189	...	....		3	251	169	7 ^a
														(2)	(2)	
June 20-July 3	...	....		1	282	260	5	279	244	1	315	378	12	233	148	19
July 4-17	...	....		...	....		...	....		3	240	165	11	233	147	14
July 18-31	...	....		1	314	376	...	....		...	....		1	233	146	2
Aug. 1-14	1	250	147	1	297	332	...	....		...	....		...	....		2
Aug. 15-28	...	....		...	....		2	274	241	...	....		...	....		2
Aug. 29-Sept. 7	...	....		...	....		....	....		...	....		...	....		...
Totals, averages	68	218	101	65	220	112	90	232	132	108	228	119	34	227	133	367
		(68)	(66)		(64)	(63)		(88)	(88)		(108)	(107)		(33)	(33)	
Number released	125	203	85	125	200	83	124	222	118	125	220	105	...	....		499
Percentage recovery	54.4			52.0			72.6			86.4			...	....		66.7
Percentage of total catch	18.5			17.7			24.5			29.4			9.3			90.7

^a - One fin-clipped fish added to total catch for period not measured or described accurately.

^b - Total weight of legal trout removed estimated by adding weight obtained by multiplying the average weight for each p

catch of East Fish Lake during the 1942 trout season by types
 recovery from each planting, percentage of the total catch,
 figures in parentheses indicate the numbers of specimens
 1 specimen were measured or weighed).

Fish	Total weight of legal trout weighed	Number of grams and percentage of total weight of legal trout made up of				wild	Weight of legal trout removed (estimated)	
		fall tag	fall fin-clip	spring tag	spring fin-clip			
224 (313)	109 (309)	33,758	6,116 (18.1)	6,116 (18.2)	9,711 (28.8)	11,270 (33.4)	515 (1.5)	34,414
.....
240- (4)	151 (4)	604	...	195 (32.3)	...	409 (67.7)	...	906
260 (5)	183 (5)	913	386 (42.3)	...	189 (20.7)	...	338 (37.0)	1,278
252 (19)	191 (19)	3,634	...	260 (7.2)	1,219 (33.5)	378 (10.4)	1,777 (48.9)	3,634
240 (14)	165 (14)	2,312	...	...	...	692 (29.9)	1,620 (70.1)	2,312
274 (2)	261 (2)	522	...	376 (72.0)	...	...	146 (28.0)	522
274 (2)	240 (2)	479	147 (30.7)	332 (69.3)	...	...	...	479
274 (2)	241 (2)	482	...	...	482 (100.0)	...	...	482
....
228 (361)	120 (357)	42,704	6,649 (15.6)	7,309 (17.1)	11,601 (27.2)	12,749 (29.9)	4,396 (10.2)	44,027 (97.06 lb)

period by number of fish not measured to the known weight already obtained.

Table 5.
 Residence of anglers using East Fish Lake
 in 1941 and 1942 trout seasons.

County of State	1941	1942
Alcona	...	2
Allegan	1	...
Alpena	4	...
Bay	4	...
Calhoun	...	3
Crawford	1	1
Genesee	22	22
Ingham	9	15
Ionia	1	...
Jackson	...	8
Keht	3	...
Midland	...	4
Monroe	8	...
Montmorency	28	43
Oakland	2	9
Ascoda	8	5
Otsego	...	2
Saginaw	2	...
Shiawassee	2	...
Roscommon	1	...
Washtenaw	11	8
Wayne	43	27
Unknown	2	2
Ohio	...	4
Indiana	4	...
Totals	156	159

Table 6

Comparison of results from spring and fall plantings of brook trout
in East Fish Lake 1941, and 1942

Caught in	Type of fish	Planted		Recovered by anglers		Percentage recovery of		Percentage of total catch	
		Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
1941 Season	Fall plant	243	39.75	34	5.31	13.9	13.3	13.9	12.3
	Spring plant	247	53.96	142	27.65	57.4	51.2	58.2	63.8
	Wild fish	?	?	68	10.34	...	...	27.9	23.9
Lake poisoned August 25, 1941, and competing species removed									
1942 Season	Fall plant	250	46.36	133	30.77	53.5	66.1	36.2 [↓]	32.8
	Spring plant	249	61.50	198	53.68	79.5	87.5	53.9 [↓]	57.3
	Wild fish	?	?	34	9.37	...	...	9.3	9.9

[↓] - Percentages do not total 100 per cent because of two marked fish improperly described.

Table 7

Comparison of angling success between the opening week-end and the remainder of the season in three different lakes

Lake	Year	First two days				Remainder of season				Total catch of fish for season ^c
		Total anglers	anglers ^a catching 15 fish	anglers catching 5 to 14 fish	anglers catching 0 fish	total anglers	anglers catching 15 fish	anglers catching 5 to 14 fish	anglers catching 0 fish	
East Fish	1942	94	15 (9.4)	7	53	65	0	2	34	367 (61.3)
East Fish	1941	52	2 (13)	16	22	104	0	3	67	244 (12.3)
North Twin ^b	1942	103	12 (6.6)	18	50	79	0	1	71	430 (41.8)
South Twin ^b	1942	76	13 (4.3)	16	26	226	0	2	201	402 (48.5)

^a - Creel census data between Apr. 25- July 12 only was used because of a midsummer planting of brook trout.

^b - Figures in parentheses indicate percentage of the total anglers.

^c - Figures in parentheses indicate percentage of the total catch taken by anglers catching 15 fish.

Table 8

Comparison of angling results on East Fish Lake, 1939-1942 inclusive.

Year	Number of anglers	Number taking no fish	Per cent taking no fish	Total hours of angling	Legal brook trout caught		Sublegal Brook trout returned		Total weight of legal trout caught (pounds)	Pounds of trout removed per hour of angling
					number	catch per hour	number	catch per hour		
1939	63	49	77	125.50	51	0.41	68	0.54	(not known)	
1940	111	57	51	308.00	172	0.56	43	0.14	27.92	0.091
1941	155	91	59	385.50	244	0.63	79	0.20	47.23	0.122
1942	159	87	55	289.25	367	1.27	6	0.00+	97.06	0.336