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MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
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THE SEVENTH ANNUAL CREEL CENSUS, PIGEON RIVER TROUT RESEARCH STATION, 1957

By

Thomas F. Waters

The Pigeon River Trout Research Station was established in 1949 on the site of the former Pigeon River Forest Headquarters, 13 miles east of Vanderbilt in Otsego County. The experimental trout waters of the station include seven small pot-hole lakes (Ford, Section 4, Hemlock, Lost, West Lost, North Twin, and South Twin) and, at the time of the station's establishment, included 4.8 miles of the Pigeon River. This portion of the stream was divided into four experimental sections (A, B, C, and D), each approximately 1.2 miles in length (Fig. 1). In 1953, a fifth experimental section (E), also approximately 1.2 miles long, was added at the upstream end of the controlled area. This addition increased the total length of experimental stream to about 6 miles. Table 1 presents the physical features of the experimental stream sections.

Since 1949 a compulsory permit system has been in effect on the experimental waters. Each angler is required to obtain a free, one-day permit before proceeding to his selected water, whether experimental

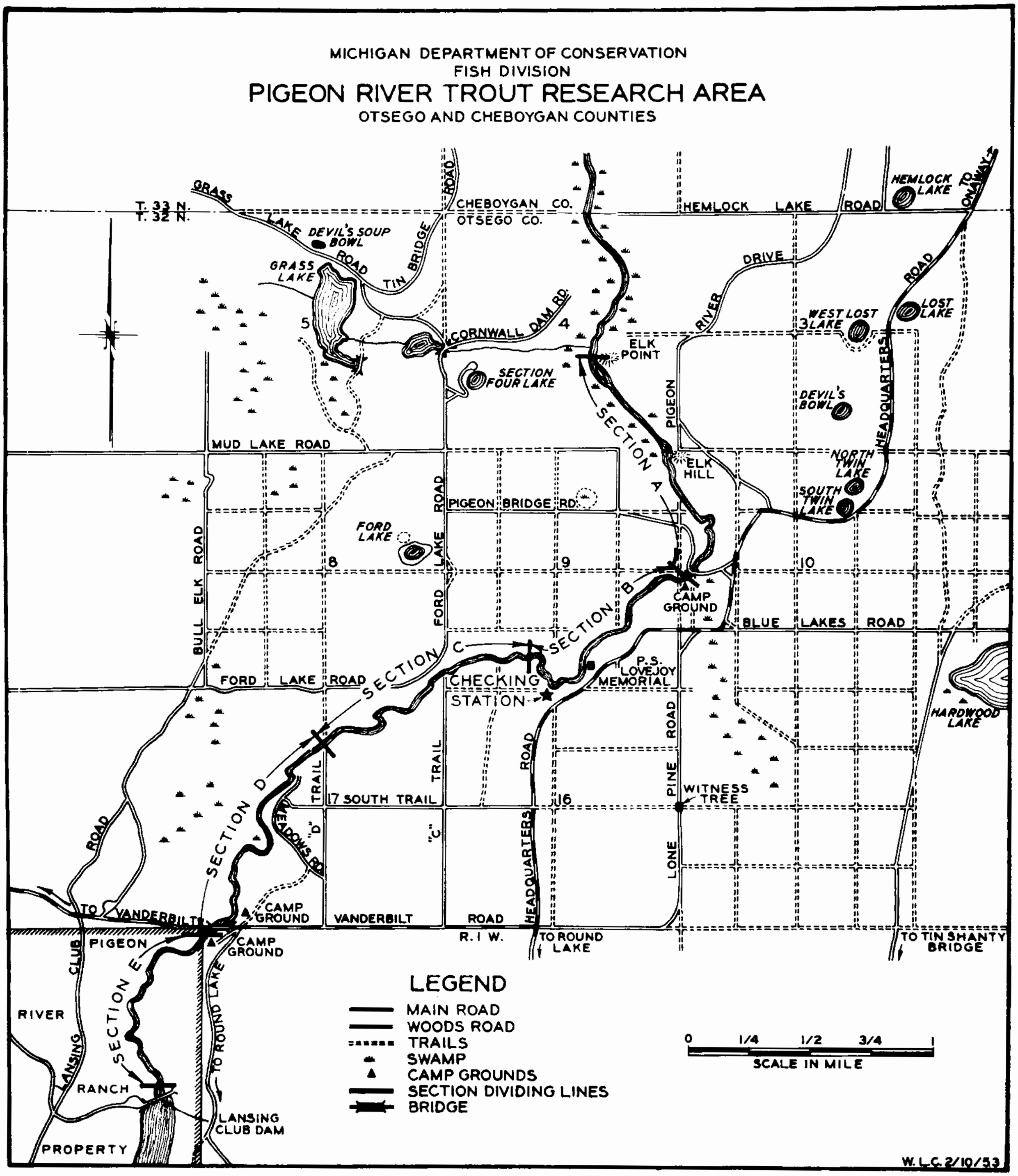
MICHIGAN DEPARTMENT OF CONSERVATION
FISH DIVISION
PIGEON RIVER TROUT RESEARCH AREA
OTSEGO AND CHEBOYGAN COUNTIES
T. 33 N.
T. 32 N.
GRASS LAKE ROAD
DEVIL'S SOUP BOWL
GRASS LAKE
TIN BRIDGE ROAD
CHEBOYGAN CO.
OTSEGO CO.
HEMLOCK LAKE ROAD
HEMLOCK LAKE
TO ONAWAY
DRIVE
ROAD
RIVER
CORNWALL DAM RD.
ELK POINT
SECTION FOUR LAKE
WEST LOST LAKE
LOST LAKE
HEADQUARTERS
DEVIL'S BOWL
PIGEON
SECTION A
ELK HILL
NORTH TWIN LAKE
SOUTH TWIN LAKE
MUD LAKE ROAD
PIGEON BRIDGE RD.
FORD LAKE
BULL ELK ROAD
FORD LAKE ROAD
CAMP GROUND
BLUE LAKES ROAD
SECTION B
SECTION C
CHECKING STATION
P.S. LOVEJOY MEMORIAL
HARDWOOD LAKE
SECTION D
TRAIL
17 SOUTH TRAIL
WITNESS TREE
PINE ROAD
LONE
MEADOWS RD.
"D"
"C"
HEADQUARTERS ROAD
SECTION
ROAD
TO VANDERBILT
CAMP GROUND
VANDERBILT ROAD
R. 1 W.
TO ROUND LAKE
TO TIN SHANTY BRIDGE
PIGEON
CLUB
RIVER
LANSING
SECTION E
RANCH
PROPERTY
TO ROUND LAKE
LANSING CLUB DAM
LEGEND
MAIN ROAD
WOODS ROAD
TRAILS
SWAMP
CAMP GROUNDS
SECTION DIVIDING LINES
BRIDGE
0 1/4 1/2 3/4 1
SCALE IN MILE
W. L. C. 2/10/53

FIGURE 1

Table 1.--Morphometry of experimental stream sections, Pigeon River Trout Research Station[1]

Item	Section				
	A	B	C	D	E
Length, miles	1.31	1.19	1.13	1.18	1.17
Average width, feet	45	41	40	40	40
Area, acres	7.16	5.90	5.39	5.65	5.67

[1] Data for sections A, B, C, and D from Cooper, 1952a. Length of Section E from E. H. Bacon, unpublished; average width of Section E was estimated.

section of the stream or individual lake, and is also required to report on his trip and to allow examination of his catch by station personnel.

The creel census serves as a tool in evaluation of experimental methods of trout management, such as special regulations, methods of planting, etc. Because a compulsory permit system was in effect, insuring a complete, or nearly complete, census, information could be secured which could not otherwise be obtained. Previous annual creel census reports have appeared as Institute for Fisheries Research Report Numbers 1250, 1288 (Cooper, 1950, 1951) and 1512 (Waters, 1957).

It is the primary purpose of this report to record certain features of special interest concerning the trout fishing in the research area so that the data may serve, with limitations, as indices of general trout fishing success in Michigan. These features are: fishing success according to experimental section of the stream and to individual lake, according to lure used, according to time of season, and according to the frequency of trips of individual anglers; the various classes of anglers using the area; the residence of anglers; the age composition of the catch; and fishing success through the years since the establishment of the research station. Data are also presented on the annual post-season fall population estimate made in the experimental area of the stream in order that the degree of exploitation by anglers may be noted.

In addition to the creel census, the activities of the research station personnel are concerned with research projects of special interest, some of which may not utilize the creel census as a research tool, and some of which are conducted on waters outside the area. The results of these special projects will be given in separate reports, inasmuch as the projects often continue over a number of years. Since the experimental plantings of hatchery fish in the stream are special projects, the data recorded in this report for the creel census do not include records of hatchery fish, but wild

trout only. Likewise, since the entire fisheries in the lakes are the result of hatchery plantings involved in special projects, the results of the lake fishing have been, in general, reserved for separate reports, except for certain features of general interest which are included in this report.

During 1955, the research station was under the supervision of Edward H. Bacon and Gerald F. Myers, while the rest of the permanent staff consisted of Harold H. Brado, John M. MacGregor, and Earl L. Wolf. During the post-season fall population study, additional assistance was received from Richard L. Sides and Gayle D. Betts. Supervisory assistance was provided by Albert S. Hazzard, Gerald P. Cooper, and David S. Shetter.

Creel census

Since the establishment of the research station certain special regulations have been in effect. The evaluation of such special regulations will be made in separate reports; however, a summary of these special regulations is given in Table 2, so that a more proper interpretation of the creel census results may be made by the reader.

Table 3 presents the catch statistics for 1955 for the stream sections and individual lakes. Average catch per hour per angler, which is determined by taking a simple average of the catch per hour for all trips, was computed so that statistical tests may be made for evaluation of special projects.

In 1955 (as in 1954) over half of the total catch was from Section E and in this section brook trout made up the bulk of the catch (Table 3). Fishing quality, as measured by average catch per hour per angler, was lower in sections C and D than in the other sections, probably because of the higher minimum size in effect in these two sections; the total catch also was less in these two sections as was particularly the catch of brook

Table 2.--Experimental regulations, Pigeon River and Pigeon River lakes, 1949-1955

1949	Sections A and B: 5 trout per day, 7-inch minimum, no bait restriction Sections C and D: 15 trout per day 7-inch minimum, no bait restriction (State-wide regulations) Lakes: 5 trout per day, 7-inch minimum, no minnows (State-wide regulations)
1950	Same as 1949
1951	Sections A and B: 5 trout per day, 7-inch minimum, no bait restriction Sections C and D: 2 trout per day, 9-inch minimum, no bait restriction Lakes: Same as 1949 (State-wide regulations)
1952	Same as 1951
1953	Sections A and B: 5 trout per day, 7-inch minimum, no bait restriction Sections C and D: 2 trout per day, 9-inch minimum, no bait restriction Section E (added this year): 10 trout per day, 7-inch minimum, no bait restriction (State-wide regulations) Lakes: Same as 1949 (State-wide regulations)
1954	Same as 1953
1955	Sections A and B: 5 trout per day, 7-inch minimum, no bait restriction Sections C and D: 5 trout per day, 9-inch minimum, no bait restriction Section E: 10 trout per day, 7-inch minimum, no bait restriction (State-wide regulations) Ford Lake: 5 trout per day, 7-inch minimum, artificial flies only Other lakes: 5 trout per day, 7-inch minimum, no minnows (State-wide regulations)

Table 3.--Results of creel census for 1955, according to stream section and lake, Pigeon River Trout Research Station

Water	Number of trips	Percentage successful	Number of trout caught				Hours fished	Average catch per hour per angler
			Brook	Brown	Rainbow	Total		
Stream section								
A	372	25.5	165	24	6	195	977.0	0.17
B	448	27.9	168	48	14	230	1,125.0	0.18
C	301	16.9	30	52	3	85	925.0	0.09
D	536	10.6	35	39	7	81	1,550.5	0.06
E	382	49.0	561	87	3	651	1,198.0	0.53
Total	2,039	25.3	959	250	33	1,242	5,775.5	0.20
Lake								
Ford	214	50.5	328*				494.0	0.82
Section 4	114	36.8	105				299.0	0.30
Hemlock	255	32.6	263				773.0	0.30
Lost	184	54.4	365				477.0	0.96
West Lost	208	39.9	250				501.5	0.51
North Twin	114	51.8	213				268.0	0.76
South Twin	299	37.5	341				766.5	0.44
Total	1,388	42.3	1,865*				3,579.0	0.57

* Includes one rainbow trout

trout. Fishing success was consistently better in the lakes than in the experimental stream sections. These observations were also made in the 1954 annual report (Waters, 1957); however, the fishing quality in the stream sections in 1955 was considerably lower than in 1954, possibly due to the extremely hot weather and high water temperatures of the summer of 1955.

When fishing success was evaluated according to type of lure used, it was observed that stream anglers using flies were more successful than those using other lures; likewise, flies were responsible for a greater total catch in the stream than all other lures combined (Table 4). Conclusions drawn from these data, however, should be viewed with caution, since the greater degree of success may be only indirectly related to the type of lure. In the lakes, the relative success among anglers using the various types of lures was the reverse of that in the stream since worm fishermen fared best (Table 4).

Table 5 shows the catch statistics for the stream by weekly periods through the trout season and Table 6 presents the variation in average and total weight, by species, among weekly periods. It can be noted that fishing success decreased sharply after the early part of July.

Table 7 shows fishing success arranged according to the number of times fished by individual anglers. It cannot be definitely concluded that anglers fishing the area the most often are the most skilled and therefore enjoy greater fishing success (note the anglers who fished 27 and 17 times); however, it would appear that anglers fishing 1, 2, or 3 times were, on the average, the least successful. From the data included in Table 7 it was possible to compute the following: Approximately one-third of the anglers caught 90 percent of the fish; and approximately 5 percent of the anglers caught 50 percent.

Table 4.--Fishing success according to lure used, Pigeon River Trout Research Station, 1955

Lure	Number of trips	Percentage successful	Number of trout caught				Hours fished	Average catch per hour per angler
			Brook	Brown	Rainbow	Total		
Stream								
Worms	518	22.6	223	33	13	269	1,360.5	0.16
Flies	912	29.3	469	179	15	663	2,505.0	0.26
Worms and spinner	314	20.7	149	9	1	159	936.0	0.17
Other*	295	22.4	118	29	4	151	974.0	0.13
Total	2,039	25.3	959	250	33	1,242	5,775.5	0.20
Lakes (except Ford)								
Worms	674	41.4	882				1,818.0	0.50
Flies	66	24.2	45				139.0	0.26
Worms and spinner	300	46.0	453				797.5	0.64
Other*	134	34.3	157				330.5	0.47
Ford Lake (Flies only)	214	50.5	328**				494.0	0.82
Total	1,388	42.3	1,865**				3,579.0	0.57

* "Other" refers to (1) baits other than worms, flies or worms and spinner, (2) combinations of worms and flies, (3) combinations of worms or flies with other lures, and (4) two or more lures used successively on same trip.

** Includes one rainbow trout.

Table 5.--Fishing success by weekly periods, Pigeon River, 1955

Week	Number of trips	Percentage successful	Total catch	Hours fished	Average catch per hour per angler
Apr. 30-May 6	214	45.8	274	632.0	0.37
May 7-May 13	72	40.3	114	226.5	0.48
May 14-May 20	112	39.3	114	381.5	0.30
May 21-May 27	91	29.7	77	285.0	0.28
May 28-June 3	173	27.8	97	544.0	0.18
June 4-June 10	119	38.7	115	296.5	0.38
June 11-June 17	162	29.6	99	500.0	0.23
June 18-June 24	130	26.9	75	362.0	0.20
June 25-July 1	147	29.3	103	418.5	0.25
July 2-July 8	133	9.0	17	318.5	0.03
July 9-July 15	117	14.5	40	270.5	0.13
July 16-July 22	81	8.6	13	256.0	0.06
July 23-July 29	63	11.1	9	149.0	0.06
July 30-Aug. 5	69	4.4	6	190.5	0.03
Aug. 6-Aug. 12	63	4.8	6	177.5	0.02
Aug. 13-Aug. 19	47	12.8	11	106.0	0.09
Aug. 20-Aug. 26	44	4.6	2	93.0	0.03
Aug. 27-Sept. 2	75	20.0	27	196.0	0.13
Sept. 3-Sept. 9	93	21.6	32	262.5	0.14
Sept. 10-Sept. 11	34	14.7	11	110.0	0.07
Total	2,039	25.3	1,242	5,775.5	0.20

Table 6.--Average and total weight of anglers' catch by weekly periods, Pigeon River, 1955

Week	Brook trout			Brown Trout			Rainbow trout		
	Number of fish	Total weight (pounds)	Average weight (pounds)	Number of fish	Total weight (pounds)	Average weight (pounds)	Number of fish	Total weight (pounds)	Average weight (pounds)
Apr. 30-May 6	244	41.95	0.17	29	17.53	0.60	1	0.35	0.35
May 7-May 13	103	17.67	0.17	11	4.83	0.44	0	...	...
May 14-May 20	90	16.49	0.18	20	8.17	0.41	4	1.08	0.27
May 21-May 27	70	14.52	0.21	5	3.35	0.67	2	0.77	0.39
May 28-June 3	64	14.03	0.22	30	19.71	0.66	3	1.16	0.39
June 4-June 10	76	15.88	0.21	38	21.10	0.56	1	0.17	0.17
June 11-June 17	76	17.33	0.23	22	10.48	0.48	1	0.31	0.31
June 18-June 24	60	11.95	0.20	14	6.43	0.46	1	0.84	0.84
June 25-July 1	80	20.34	0.25	23	9.05	0.39	0	...	....
July 2-July 8	11	2.09	0.19	6	2.04	0.34	0	...	...
July 9-July 15	25	4.09	0.16	12	4.85	0.40	3	1.07	0.36
July 16-July 22	3	0.56	0.19	9	3.83	0.43	1	0.15	0.15
July 23-July 29	4	0.69	0.17	5	1.96	0.39	0	...	...
July 30-Aug. 5	3	0.79	0.26	2	0.54	0.27	1	0.24	0.24
Aug. 6-Aug. 12	5	0.70	0.14	1	1.10	1.10	0	...	...
Aug. 13-Aug. 19	5	1.23	0.25	4	1.47	0.37	2	0.30	0.15
Aug. 20-Aug. 26	1	0.18	0.18	1	0.56	0.56	0	...	...
Aug. 27-Sept. 2	10	1.77	0.18	11	5.58	0.51	6	1.13	0.19
Sept. 3-Sept. 9	22	5.66	0.26	5	4.88	0.98	5	0.75	0.15
Sept. 10-Sept. 11	7	1.64	0.23	2	1.86	0.93	2	0.70	0.35
Total	959	189.56	0.20	250	129.32	0.52	33	9.02	0.27

Table 7.--Fishing success according to frequency of fishing trips, Pigeon River, 1955

Number of fishing trips during season	Number of anglers	Total number of trips	Total catch	Average catch per hour per angler
33	1	33	11	0.21
32	1	32	27	0.28
27	1	27	12	0.12
26	1	26	136	1.72
25	1	25	15	0.17
20	1	20	12	0.29
17	1	17	5	0.05
16	1	16	15	0.35
15	2	30	48	0.41
14	2	28	14	0.28
13	2	26	44	0.56
12	2	24	19	0.44
11	4	44	18	0.23
10	3	30	60	0.56
9	5	45	37	0.35
8	5	40	29	0.30
7	9	63	75	0.35
6	4	24	23	0.26
5	20	100	84	0.24
4	39	156	111	0.22
3	58	174	76	0.14
2	181	362	178	0.14
1	697	697	193	0.10
Total	1,041	2,039	1,242	0.20

Two-year-old fish made up the major portion of the anglers' catch of brook and brown trout in the Pigeon River in 1955; three-year-olds placed second for both species (Table 8). Among the small number of rainbow trout caught, one-year-old fish were predominant, possibly reflecting a more rapid growth. Cooper's (1952a) appraisal of the age composition of brook and brown trout in the Pigeon River was again supported, in that very few individuals were observed to live to their fifth summer. One-year-old brook trout and brown trout first appeared in the catch on May 28; however, yearlings began to appear in significant numbers about the middle of June. This is somewhat earlier than reported for 1954, possibly reflecting earlier optimum conditions for growth during 1955.

The length and weight data of Table 8 suggest that the growth of brown and rainbow trout was somewhat more rapid than that of brook trout; the differential, in fact, may be even greater than indicated by the data since Cooper (1952a) has indicated that angling exerts a greater bias in favor of the faster-growing individuals among brook than among brown trout. The differential in size between one-year-old fish and two-year-old fish is also probably greater than indicated in Table 8 because the yearlings were taken during the later part of the year after most of the season's growth had been attained, whereas the two-year-old fish were collected throughout the season.

Cooper (1952b) determined the rates of exploitation of brook and brown trout in the Pigeon River by comparing the catch with the legal fish remaining in the stream at the end of the trout season as determined by the post-season fall population estimate. He stated that, for brook trout, three fish were caught for each one remaining in the stream after the season, and for brown trout, one fish was caught for each three remaining after the fishing season. In previous annual reports data were given in support of these

Table 8.--Age composition of anglers' catch and average length and weight of age groups, Pigeon River, 1955

Species	Age group	Number of fish*	Average length (inches)	Average weight (pounds)
Brook Trout	I	81	7.3	0.14
	II	742	8.1	0.19
	III	118	9.3	0.29
	IV	2	11.5	0.58
Brown Trout	I	50	7.5	0.15
	II	121	10.0	0.36
	III	58	13.0	0.84
	IV	12	14.8	1.13
	V	4	18.1	2.24
	VI	1	19.9	2.75
Rainbow Trout	I	18	7.7	0.16
	II	12	9.7	0.34
	III	3	12.3	0.63

*The age of 20 fish caught in 1955 was not determined.

conclusions; a similar presentation is offered in Table 9 where the rates of exploitation have been calculated for all three species, separating the experimental sections into two groups with different minimum size regulations. For the 7-inch-minimum sections, Cooper's rates of exploitation appear generally to be confirmed; during 1955 the exploitation rates were reduced somewhat when compared to 1954, possibly due to warm water conditions. The effect of the higher minimum size appeared to reduce the rate of exploitation for brook trout, and to increase it for brown trout. Too few data regarding rainbows were obtained to justify a generalized conclusion.

The classes of anglers visiting the area are shown in Table 10. The figures given are in terms of angler-trips, rather than individual anglers, since this means of expression lends greater accuracy to the interpretation of results in terms of fishing pressure. Approximately 80 percent of the anglers fishing the stream and 70 percent of those fishing the lakes were licensed. Among stream fishermen, 87 percent were Michigan residents, whereas among lake fishermen, 94 percent were residents (compared with 84 and 94 percent, respectively, for 1954).

Table 11 presents a breakdown of the angler-trips in the Pigeon River by place of residence. The greatest amount of fishing pressure was supplied by the Detroit-Lansing area, with local fishermen (Otsego and adjoining counties) placing second; few fishermen came from other parts of the state. This predominance of eastern-Michigan anglers (and also the predominance of Ohio residents among out-of-state anglers) is probably, (as noted by Cooper, 1951) the result of convenient access by highway to the Pigeon River from these areas. Only one angler from the Upper Peninsula (Gogebic County) was registered during 1955. Table 12 shows the place of residence of lake fisher-

Table 9.--Numbers of legal-sized wild trout caught by anglers, estimated numbers remaining at the end of the fishing season, and rate of exploitation, Pigeon River, 1955

	Species of Trout		
Sections A, B, and E (7-inch minimum)	Brook	Brown	Rainbow
Number caught	894	159	23
Population estimate, September	184	444	7
Percentage exploitation	82.9	26.4	76.7
Sections C and D (9-inch minimum)			
Number caught	65	91	10
Population estimate, September	29	135	1
Percentage exploitation	69.2	40.3	90.9

Table 10.--Classes of anglers using the Pigeon River experimental waters (Percentages are given in parentheses)

Water, and residence	Licensed males	Licensed females	Wives	Minor males	Minor females	Total
Stream						
Resident	1,394	7	172	181	20	1,774 (87.0)
Non-resident	188	26	...	24	27	265 (13.0)
Total	1,582 (77.6)	33 (1.6)	172 (8.4)	205 (10.1)	47 (2.3)	2,039
Lakes						
Resident	901	8	189	182	26	1,306 (94.1)
Non-resident	68	4	...	9	1	82 (5.9)
Total	969 (69.8)	12 (0.9)	189 (13.6)	191 (13.8)	27 (1.9)	1,388

Table 11.--Residence of anglers fishing Pigeon River, 1955

County	Number of trips	County	Number of trips	County or State	Number of trips
Wayne	370	Montcalm	12	Montmorency	2
Otsego	340	Branch	11	Tuscola	2
Bay	153	Cheboygan	10	Allegan	1
Ingham	146	Jackson	10	Gogebic	1
Oakland	125	Barry	9	Manistee	1
Washtenaw	91	Calhoun	8	Mecosta	1
St. Clair	64	Charlevoix	8	Monroe	1
Genesee	54	Clare	7	Oxford	1
Muskegon	36	Mason	7	Total resident	1,774
Shiawassee	29	Roscommon	6	Michigan	1,774
Saginaw	28	Arenac	5	Ohio	163
Livingston	27	Lenawee	5	Indiana	58
Kent	25	Van Buren	5	Illinois	17
Midland	24	Grand Traverse	4	Missouri	14
Macomb	21	Hillsdale	4	New Jersey	4
Alpena	19	Berrien	3	West Virginia	4
Isabella	19	Eaton	3	New York	2
Gratiot	18	Lapeer	3	Kentucky	1
Ionia	16	Newaygo	3	Pennsylvania	1
Presque Isle	16	St. Joseph	3	Virginia	1
Kalamazoo	15	Clinton	2	Total	2,030

Table 12.--Residence of anglers fishing Pigeon River lakes, 1955

County	Number of trips	County	Number of trips	County or State	Number of trips
Otsego	253	Branch	16	Mecosta	3
Wayne	143	Barry	14	Alpena	2
Ingham	84	Montmorency	12	Arenac	2
St. Clair	84	Calhoun	10	Benzie	2
Kalamazoo	65	Eaton	8	Houghton	2
Genesee	56	Saginaw	8	Osceola	2
Presque Isle	55	Ottawa	7	Clare	1
Oakland	53	Clinton	6	Huron	1
Muskegon	51	Lenawee	6	Total resident	1,306
Washtenaw	43	Monroe	6		
Bay	35	Montcalm	6	Michigan	1,306
Cheboygan	34	Emmet	5	Ohio	42
Shiawassee	30	Midland	5	Indiana	16
Macomb	26	Hillsdale	4	Illinois	2
Charlevoix	24	Kalkaska	4	Missouri	2
Gratiot	24	Newaygo	4	New Jersey	2
Livingston	21	Tuscola	4	Pennsylvania	2
Allegan	19	Wexford	4	Florida	1
Isabella	19	Berrien	3	Washington D.C.	1
Jackson	17	Crawford	3	Total	1,388
Kent	17	Lapeer	3		

men. The distribution is similar to that on the stream, except that Otsego County residents were most numerous.

Table 13 is offered to show annual trends in fishing pressure and fishing success. Since various experimental management methods have been tested during these years, it would be difficult to interpret the data per se. However, it would appear that fishing success decreased during 1955 below that noted for 1954 (apparently a particularly favorable year); this decrease may have been the result of exceptionally high air and water temperatures during 1955.

Post-season fall population estimate

The method used for estimating the trout population in the experimental stream area of the Pigeon River Trout Research Station is basically the Petersen method of mark-and-recapture. Electro-fishing with a direct-current shocker, two runs were made through the 6 miles of stream (5 experimental sections). Trout were marked by clipping the top corner of the caudal fin on the first run and the appropriate data recorded so that estimates could be made for each species, size group, and experimental section. A detailed description of the method used was given in Institute for Fisheries Research Report Number 1512 (Waters, 1957).

Table 14 presents the results of the fall population estimate. The data are grouped into the original size classifications in which four basic computations were made. The estimate showed a total of 9,104 brook, 3,107 brown, and 119 rainbow trout, of all sizes, for the six miles of stream, representing a total of 25.4 pounds per acre.

The post-season population of trout in the Pigeon River showed a trend toward an increase since 1949 (Table 15), with a maximum in 1954 and a subsequent decrease in 1955 (again, perhaps due to the high water temperatures during 1955).

Table 13.--Results of creel census, Pigeon River, 1949-1955

Year	Number of trips	Percentage successful	Legal trout creeled			Total catch	Hours fished	Catch per hour[1]
			Brook	Brown	Rainbow			
1949	2,233	26.3	793	198	57	1,048	6,817.0	0.15
1950	2,160	27.3	917	255	18	1,190	6,195.0	0.19
1951[2]	2,850	15.4	453	228	10	691	7,066.0	0.10
1952[2]	1,453	24.5	463	128	47	638	3,957.5	0.16
1953[2][3]	1,943	25.0	742	203	88	1,033	5,689.5	0.18
1954[3]	2,427	32.8	1,435	437	66	1,938	6,584.5	0.29
1955[3]	2,039	25.3	961	250	33	1,242	5,775.5	0.22

[1] The values here termed "catch per hour" are the quotients of total number of fish caught divided by total number of hours fished during each year. These quotients are not exactly equivalent to "average catch per hour per angler" values given elsewhere in this report. The latter values, which show the degree of variation in the data and which are more suitable for detailed statistical treatment, are not available for the earlier years included in the table.

[2] Annual reports on the Pigeon River creel census were not completed in 1951-1953, years when a senior biologist was not assigned to the Pigeon River Station. Data presented here are tentative, pending the completion of the more detailed reports for these years (currently being prepared).

[3] Section E added to the experimental area in 1953.

Table 14.--Results of post-season population estimate (wild trout only), Pigeon River, 1955

Section	Species of trout	Total length (inches) 0-3.9 Number	0-3.9 Weight (pounds)	4.0-6.9 Number	4.0-6.9 Weight (pounds)	7.0-9.9 Number	7.0-9.9 Weight (pounds)	>9.9 Number	>9.9 Weight (pounds)	Total Number	Total Weight (pounds)	Pounds per acre
A	Brook	690	7.44	363	23.72	39	7.56	7	2.91	1,099	41.63	5.81
	Brown	194	2.73	121	8.40	68	12.24	41	33.59	424	56.96	7.96
	Rainbow	8	0.08	8	0.73	5	0.75	1	0.41	22	1.97	0.28
	Total	892	10.25	492	32.85	112	20.55	49	36.91	1,545	100.56	14.05
B	Brook	785	7.91	364	26.16	36	6.48	0	0.00	1,185	40.55	6.87
	Brown	379	5.30	145	8.69	118	20.58	46	31.55	688	66.12	11.21
	Rainbow	10	0.10	5	0.46	0	0.00	0	0.00	15	0.56	0.09
	Total	1,174	13.31	514	35.31	154	27.06	46	31.55	1,888	107.23	18.17
C	Brook	1,676	19.22	653	45.22	84	15.30	4	1.71	2,417	81.45	15.11
	Brown	597	8.68	227	10.50	171	29.77	71	59.64	1,066	108.59	20.14
	Rainbow	29	0.37	4	0.33	6	0.90	1	0.41	40	2.01	0.37
	Total	2,302	28.27	884	56.05	261	45.97	76	61.76	3,523	192.05	35.62
D	Brook	1,078	12.14	1,000	71.59	142	25.20	5	2.38	2,225	111.31	19.70
	Brown	164	2.35	94	6.20	191	33.87	54	45.83	503	88.25	15.62
	Rainbow	18	0.23	1	0.03	2	0.37	0	0.00	21	0.63	0.11
	Total	1,260	14.72	1,095	77.82	335	59.44	59	48.21	2,749	200.19	35.43
E	Brook	1,221	13.60	855	62.18	95	16.53	7	3.13	2,178	95.44	15.88
	Brown	253	3.66	82	4.75	146	26.98	25	23.50	506	58.89	9.80
	Rainbow	4	0.06	15	1.34	2	0.30	0	0.00	21	1.70	0.28
	Total	1,478	17.32	952	68.27	243	43.81	32	26.63	2,705	156.03	25.96
All sections	Brook	5,450	60.31	3,235	228.87	396	71.07	23	10.13	9,104	370.38	12.44
	Brown	1,587	22.72	669	38.54	694	123.44	237	194.11	3,187	378.81	12.72
	Rainbow	69	0.84	33	2.89	15	2.32	2	0.82	119	6.87	0.23
	Total	7,106	83.87	3,937	270.30	1,105	196.83	262	205.06	12,410	756.06	25.39

Table 15.--Post-season population estimate of wild trout, Pigeon River, 1949-1955

Year	Number of fish	Weight (pounds)	Pounds per acre	Number of fish	Weight (pounds)	Pounds per acre	Number of fish	Weight (pounds)	Pounds per acre
	Section A			Section B			Section C		
1949	585	48.18	6.73	1,373	91.66	15.54	3,287	148.37	27.53
1950	930	61.15	8.54	2,334	140.93	23.89	2,460	141.21	26.20
1951	1,380	74.70	10.43	3,063	134.80	22.85	4,322	180.70	33.53
1952	1,454	85.29	11.91	3,714	117.84	19.97	6,406	234.11	43.43
1953	2,249	127.28	17.78	3,287	173.19	29.35	5,022	354.88	65.84
1954	2,285	90.29	12.61	4,005	218.19	36.98	5,011	307.69	57.09
1955	1,545	100.56	14.05	1,888	107.23	18.17	3,523	192.05	35.62
	Section D			Section E			All Sections		
1949	2,491	135.59	24.00	...	...	...	7,736	423.80	17.59
1950	4,525	231.24	40.93	...	...	...	10,249	574.53	23.84
1951	5,746	336.80	59.61	...	...	...	14,511	727.00	30.17
1952	5,348	265.96	47.07	...	...	...	16,922	703.20	29.18
1953*	4,080	304.02	53.81	3,681	229.20	40.42	18,319	1,188.57	39.93
1954	4,503	286.30	50.68	5,313	226.11	39.88	21,117	1,128.58	37.91
1955	2,749	200.19	35.43	2,705	156.03	25.96	12,410	756.06	25.39

* Section E added to the experimental area in 1953.

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Appendix

Special research projects in progress

Since detailed treatment of all special research projects will be made in separate reports, no experimental data or conclusions are given here. However, a brief description of special projects in progress at the Pigeon River station during 1955 follows:

1. Testing of a higher minimum size in the Pigeon River. A 9-inch minimum has been in effect in Section C and D since 1951. The effects of the special regulations will be evaluated through the complete creel census and fall population studies. Scheduled date of completion: not definite.

2. Testing of trout trained by Psychological Research Services. Plantings of trained trout were begun in the Pigeon River experimental area in 1953, with plantings being made in both the stream and lakes. In 1955, 200 trained legal brook trout and 200 untrained (control) fish were planted in Section B of the stream, and 300 legal brook trout (half trained, half control) were planted in Ford Lake. Effects of the training upon the anglers' catch and natural mortality will be determined through creel census and fall population studies. Scheduled date of completion: 1956.

3. Fingerling trout planting--Pigeon River lakes (project 30f). This project was initiated in 1952 to determine the survival to the creel of fingerling brook trout planted in the lakes in the fall. Lakes included were South Twin, North Twin, Lost, West Lost, Ford, and Hemlock; Section 4 Lake, although originally included in the project, received an initial planting of brook trout fry, rather than fingerlings, and has continued to receive fry plantings through 1955. In 1955, a special regulation of "artificial flies only" was applied to Ford Lake to determine if this special regulation would increase the anglers' catch. Scheduled date of completion: not definite.

4. Planting of sub-legal brook and brown trout to compensate for lack of natural spawning (project 27k). This project was initiated in 1952 with stocking of fingerling brook and brown trout in Section A of the experimental area where natural reproduction had been extremely low. Plantings of 2,500 brook and 500 brown trout have been made each fall since 1952. Evaluation of these plantings will be made by creel census and fall population estimates. Scheduled date of completion: fall, 1956.

5. Effects of stream improvement on density of trout populations (project 26b). Stream improvement structures were constructed in Section A of the experimental area in 1953; this section of stream had previously been wide and shallow, with shifting sand and little natural cover. Evaluation of the structures will be made by comparisons of anglers' catch and population estimates before and after construction. Scheduled date of completion: fall, 1956.

6. Pool construction as a tool for trout management (project 26c). A series of pools was dredged in 1953 in the Pigeon River immediately upstream from the Red Bridge (Cheboygan County, east of Wolverine) in an area of stream that previously had few pools and little natural cover. Evaluation of the method will be made by population estimates before and after the dredging to determine the effects of pool construction on the density of trout populations. Scheduled date of completion: fall, 1956.

7. Spring plantings of sub-legal trout in streams (project 27n). This project, designed to determine if sub-legal trout planted in the spring would contribute to the anglers' catch during the same or succeeding seasons, was initiated on Gamble Creek (Rifle River Area), and Hunt and Fuller creeks (Hunt Creek station) as well as on Section E of the Pigeon River, in the spring of 1953. In Section E of the Pigeon River, equal numbers of brook and rainbow trout, half fin-clipped and half with serially numbered jaw

tags, were planted in the spring of 1953, 1954 and 1955. Evaluation of the method will be made through creel census and fall population estimates. Scheduled date of completion: not definite.

8. Kidney-disease in trout in Michigan (project 6h). A portion of the field phase of this project, supervised by Dr. Leonard N. Allison, was initiated during 1955 on this area with the planting in South Twin Lake of fingerling brook trout known to be infected with kidney-disease. This planting was made in lieu of the regular fingerling planting in this lake to investigate the possibility of establishment of kidney disease in lakes by stocking diseased fish. Scheduled date of completion: not definite.

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