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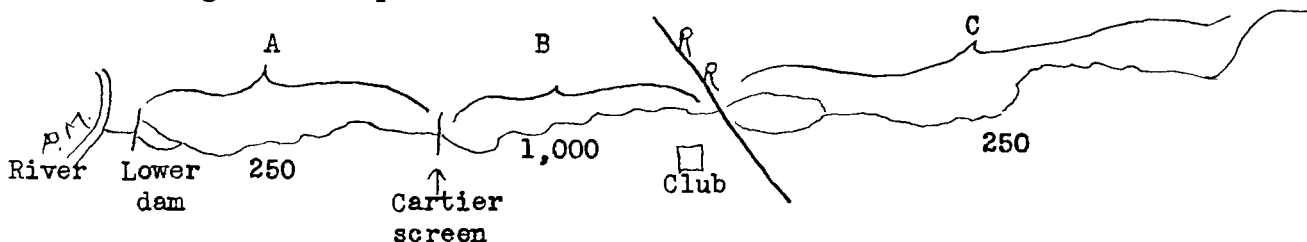
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REPORT NO. 531

A SUMMARY OF THE 1938 TROUT SEASON  
ON KINNE CREEK, WINGLETON CLUB

This report will be a brief discussion of the fishing records obtained from the Wingleton Club register and the lists of the tag numbers from jaw-tagged brook trout, all of which were very kindly furnished by the members of the Wingleton Club. The jaw-tagged brook trout, 1500 in number, which were distributed in the Kinne Creek on April 12 and 13, 1938, were purchased from a commercial hatchery in Wisconsin and were tagged by Messrs. Clark and Shetter of the Institute for Fisheries Research. The marked trout were distributed as pictured on the following sketch map of Kinne Creek. The fish were scattered



along the stream, a few in each pool so that they would have as much space as possible. Recoveries of tagged fish were recorded by sections in which they were retaken, but catches of unmarked fish unfortunately were not listed in this manner.

The fishing season has been divided into weeks to simplify the tabulation of the data, and the results are shown in Table 1, which lists by weeks the number of fishermen, total number of legal trout

taken (which includes the marked brook trout), the number of fish taken per fisherman, and the number of tagged fish taken in each of the sections of the stream (A, B, or C). From this table it will be noted that 251 fishermen<sup>1</sup> took 343 brook trout, 370 brown trout and 4 rainbow trout. The average number of fish caught per angler for each day's fishing was 2.9. A total of 180 jaw-tagged brook trout were included in the brook trout catch, or in other<sup>words</sup>, 52.5 per cent (180/343) of the total brook trout catch was of recent hatchery origin, despite the fact that only a 12 per cent (180/1500) recovery was made on the total number of marked brook trout planted, or 16.5 per cent on the total number of trout which were 7 inches or longer when planted, and 6.1 per cent of those marked fish less than 7 inches.

From the recorded catch and from the lists of fish tagged and recovered, a "balance sheet" for the brook trout population of Kinne Creek may be computed (Table 2). Original records at the time of tagging show that 847 of the tagged trout were 7 inches (178 mm.) or longer on April 13, 1938, and that 653 were less than 7 inches long. From the tag numbers recovered we know that 140 of the tagged fish recovered were of legal size at the start of the 1938 season, while 40 attained legal size during the season, which makes a total of 180 marked trout caught. Since the total brook trout catch was 343, previous fingerling and yearling stocking combined with natural propagation must have produced the remaining 163 brook trout in the catch.

Since we know the number of wild brook trout caught, the number of marked brook trout caught, and the total number of marked brook trout planted (and the number which were of legal size at the start of the 1938 season), an estimate of the Kinne Creek legal brook trout population is

<sup>1</sup> This does not mean 251 different individuals; for instance, one man fishing three days in succession must be tallied in the records as 3 fishermen.

possible. It is known that not all the tagged fish were of legal size, but grew into the class of legal fish at an unknown rate during the season, so the computations of the population are based only on the 847 tagged fish, which because of their size, were immediately available to the fishermen. Computation of the average number of "wild" brook trout available during 1938 is as follows:

$$\frac{\text{Total "wild" brook trout}}{847 \text{ (tagged brook trout of legal size planted April 13, 1938)}} = \frac{163 \text{ (total "wild" brook trout caught)}}{140 \text{ (total tagged fish caught which were 7 inches or longer at start of season)}}$$

$$\begin{aligned} \text{Total "wild" brook trout} &= \frac{163}{140} \times 847 \\ &= 986 = \text{average Kinne Creek brook trout population of "wild" fish} \end{aligned}$$

From this estimated average population of "wild" fish, and with the knowledge of the tagged fish added, and the total number of fish removed, an estimate of the maximum number of legal fish available for the 1939 season has been made (Table 2). To the estimated average "wild" brook trout of legal size should be added the 847 tagged brook trout known to be 7 inches or longer on April 13, 1938, and also 242 tagged trout which were not of legal size on April 13 but which may be calculated as the average number which would grow to 7 inches or longer during 1938, assuming these latter fish grew into the class of legal fish at a constant rate. The total legal sized population of brook trout in Kinne Creek during 1938 may be estimated at 2,075 fish. Of these, 343 were taken. Therefore at the end of the 1938 season an estimated population of all brook trout of 1,732 was present (tagged and "wild" fish included). To this last total may be added 411 tagged brook trout which were not of legal size at the opening of the 1938 season and which were not caught during 1938. However, if these fish survive the winter and remain in Kinne Creek they might be expected

to reach legal size before the opening of the 1939 trout season. The estimated population of legal brook trout available on the opening day of the 1939 season may thus be placed at 2,143.

It should be pointed out that these figures probably have been or will be altered by the several assumptions made where the data have been incomplete or lacking. Other factors which would tend to reduce the population are predation on both marked and unmarked fish by birds, brown trout (except in Section C), natural mortality, and the escapement of fish through the revolving screens.

There was some evidence to indicate movement between the three sections of the stream. Undoubtedly there did occur migrations between Sections A and B, Section A and the Pere Marquette River, and also from Section B through Section A to the Pere Marquette River (4 fish each). However, it is doubtful if any fish moved through the turbines of the electric light plant from Section B to Section C, as was indicated by club records for four different tagged trout recovered. It is possible that fish might be able to pass in the reverse direction (downstream through the turbines, as was indicated in a few instances). Passage of marked trout into and out of Sections A and B indicate a possible source of loss of planted fish. The revolving screens should be checked and kept as fish-tight as possible at all times.

Measurements of 160 of the 180 tagged fish recovered during the season were available. Five tagged trout were taken by Messrs. Shetter and Cooper on September 9, 1938, for stomach analysis and scale samples and weight measurements. These recoveries have been grouped into monthly periods, and the average number of days free, the average total length at time of tagging of the fish recovered in that period, and the average

length at time of recovery, and the average growth of these fish has been calculated (Table 3). The average total length of all tagged fish released on April 13, 1938 was 180 millimeters (7 1/4 inches). Of these fish, 847 were 7 inches or larger, while 653 were less than 7 inches in total length. The average growth represents the increase in size of the fish from April 13 to the average time of recovery in any one month. For example, the brook trout increased an average of 9 mm. (about 0.4 of an inch) from April 13 to July 1 (76 days after April 13). The average growth over the spring and summer (April 13-September 1) has been calculated as about 0.6 inches (16 mm.)

It is also apparent from Table 3 that the larger trout entered the catch earlier in the season, and the average size of the fish at tagging showed a decrease as the season progressed, as the fish which were less than 7 inches on April 13 began to grow and become legally available to the angler.

Suggestions for 1939 Creel Census  
in Kinne Creek

The Institute for Fisheries Research would like to have the members of the Wingleton Club continue to keep detailed records of their catches. If it is possible to do so, we would like to have the fishing recorded by sections (A, B, or C), giving the total trout of all species (as well as the tagged trout) taken in the respective sections, so that it could be determined which section of the stream is producing the best fishing. It would also be desirable to have the members record the time spent in fishing on the various sections of the stream. Heretofore the catch records have been entered in the club register. If these records are to be kept properly, angling statistics might better be written in a separate

ledger placed in the refrigerator house where they could be filled out as soon as a fisherman comes in with his creel.

INSTITUTE FOR FISHERIES RESEARCH

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Table 1

Number of Fishermen, Total Number of Legal Trout Taken, and  
 Number of Tagged Brook Trout Taken, Kinne Creek,  
 Season of 1938

Period	Number of fishermen	Legal trout taken			Fish per fisherman	Tagged brook trout taken in <sup>1</sup>		
		Brook	Brown	Rainbow		Section A	Section B	Section C
Apr. 30-May 6	11	28	29	1	5.3	5	11	...
May 7-13	18	49	25	...	4.1	2	6	1
May 14-20	10	31	...	...	3.1	6	18	6
May 21-27	12	24	5	...	2.4	1	7	3
May 28-June 3	12	15	21	...	3.0	...	3	...
June 4-10	10	31	42	...	7.3	2	18	1
June 11-17	21	12	15	...	1.3	5	15	2
June 18-24	46	51	74	...	2.7	2	22	1
June 25-July 1	28	6	10	...	0.4	1	4	2
July 2-8	32	16	24	...	1.5	1	3	...
July 9-15	14	20	33	...	3.8	1	4	...
July 16-22	1	3	...	...	3.0	...	...	...
July 23-29	5	21	24	2	13.0	3	10	2
July 30-Aug. 5	6	8	3	1	2.0	...	...	...
Aug. 6-12	5	2	14	...	3.2	...	2	...
Aug. 13-19	5	8	23	...	6.1	...	1	...
Aug. 20-26	1	...	8	...	8.0	...	...	1
Aug. 27-Sept. 5	14	18	20	...	2.6	...	2	3
Totals	251	343	370	4	2.9	29	126	22

<sup>1</sup> To the total of marked fish shown, there should be added  
 3 marked trout on which data were incomplete. There were  
 180 jaw-tagged fish taken.

Table 2

"Balance Sheet" for Kinne Creek Brook Trout

I	<u>Planted in 1938</u>	
	(a) Brook trout less than 178 mm. (7 inches) on April 13, 1938	- 653
	(b) Brook trout 178 mm. or longer on April 13, 1938	- 847
	Total brook trout jaw-tagged and planted Apr. 13, 1938	- <u>1,500</u>
II	<u>Legal brook trout caught by Wingleton Club in 1938</u>	
	(a) Jaw-tagged brook trout which were 7 inches or longer on April 13, 1938	- 140
	(b) Jaw-tagged brook trout which were less than 7 inches long on April 13, 1938	- <u>40</u>
	Total jaw-tagged brook trout taken as legal trout in 1938 season	- 180
	"Wild" <sup>1</sup> brook trout taken as legal fish in 1938 season	- <u>163</u>
	Total brook trout catch for 1938 in Kinne Creek	- 343
III	<u>Estimate of "wild" brook trout population and of fish left for 1939 season</u>	
	Estimated average "wild" brook trout population of fish 7 inches or larger in 1938	- 986
	Legal brook trout planted plus average number becoming legal during 1938	- 1089
	Average legal brook trout population during 1938	- <u>2075</u>
	Brook trout catch for 1938 season	- 343
	Estimated average population of legal brook trout left after the 1938 season	- <u>1732</u>
	Jaw-tagged brook trout not of legal size at start of 1938 season and not caught during 1938, but which, <u>if surviving</u> to 1939, might be expected to be of legal size	- <u>411</u>
	Estimated population of legal brook trout available April 29, 1939	- 2143

<sup>1</sup> By "wild" we mean unmarked brook trout resulting from natural spawning or previous fingerling planting by the Club.



Table 3

Growth of Tagged Brook Trout in Kinne Creek, 1938.

(Measurements in millimeters)

Recovered between	Number of recoveries	Average number of days out	Average total length		Average growth
			April 13	At recovery	
4/13-5/13	52	27	189.3	194.6	5.3
5/14-6/13	50	55	194.0	200.0	6
6/14-7/13	42	76	182	191	9
7/14-8/13	11	108	185	201	15
8/13-9/13	<sup>1</sup> 10	144	180	196	16

<sup>1</sup> Five tagged brook trout taken September 9, 1938 by the Institute for Fisheries Research were used in the calculations for the last period.