Original: Lansing
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Institute for Fisheries Research
Alvan Macauley, Jr.
J. T. Wilkinson
D. S. Shetter
E. L. Cooper

**INSTITUTE FOR FISHERIES RESEARCH**
DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

ALBERT S. HAZZARD, PH.D.
DIRECTOR

ADDRESS
UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

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# POPULATION STUDY, EAST BRANCH, BLACK RIVER, BLACK RIVER RANCH JUNE, 1949

By
David S. Shetter

In connection with the proposed direct feeding of 50 pounds weekly of ground horse-meat to a small section of trout ~~stream~~ on the Black River Ranch, it was thought desirable to obtain estimates of the brook trout population prior to the feeding operations in the section where feeding was to be conducted and also in a "control" section immediately upstream.

The cooperative study was arranged with the Ranch through Alvan Macauley, Jr., chairman of the fish and game committee for this private organization. The Ranch is to buy and feed the horse-meat (secured from Larry Lewis) which is ground through a 1/4 inch plate and frozen. Records of the catch in the "feeding" and "control" sections are to be kept as specified. Board and lodging are to be furnished gratis to Institute workers and two or more assistants are to be supplied by the Ranch for population studies. The Institute will furnish all equipment and supervisory personnel and make the growth, population and creel census analysis to evaluate the results of the experiment.

Arrangements to carry on such a study were made in mid-June, and on June 22 and 23, 1949, Drs. E. L. Cooper and David S. Shetter, assisted by Mr. Sam Moss and two of his aides, and Mr. Wilkerson, a member of the

Black River Ranch, made population counts in the vicinity of the Lower (Macomber) Dam on the East Branch of the Black River (T. 32 N., R 1 E., sections 10, 11, Montmorency County). Approximately 1/4 mile of the stream downstream from the dam was chosen as the area in which the stream was to be fed with ground horse-meat. A similar length of stream immediately upstream from the dam, which will receive no feeding, will serve as a control.

On June 22, 1949, with the aid of the aforementioned crew and the electric shocker, a total of 65 brook trout were captured in the experimental section and marked by clipping the top 1/3 of the tail fin. In the upper or control section, a total of 48 brook trout were captured and marked by clipping the lower 1/3 of the tail fin. In the course of marking, scale samples were removed from all but the young-of-the-year brook trout for comparative growth study. At 3 PM. on June 22 the air temperature was 73° F., water temperature was 69° F.

On June 23, 1949, the same stretch of water was again covered with the shocker, and records kept of the numbers of marked and unmarked brook trout captured. Combined with the known numbers of marked brook trout present, the recovery data can be utilized to estimate the populations of the various size classes of fish present. The population data are presented in Table I.

It was not possible to estimate the population of young-of-the-year brook trout because none of the marked fish were recaptured on the counting trip. Theoretically this means the number of such fish is infinitely large. The population of this size class for both sections has been indicated as equal to the total number handled + ? .

The lower section, where the food will be introduced into the stream, is well-shaded, bordered by cedar-spruce-swamp, and has a bottom consisting

chiefly of gravel, rubble and sand. The current is rather rapid. There are three large pools and four or five smaller pools with good cover, but good bank cover is absent over much of this area. Over half of the area would be considered a shallow riffle. In this section, a total of 22 (16 marked, 6 unmarked) young-of-the-year brook trout were handled, so the population of fish of this size-class can be set at 22+?. A total of 42 marked brook trout between 3.0 and 6.9 inches were captured on June 23. On that date, 9 marked fish and 21 unmarked fish between 3.0 and 6.9 inches were recovered. By direct proportion, the number of unmarked fish present is estimated to be 98, to which may be added the 42 marked fish, or a total of 140 fish between 3.0 and 6.9 inches ($9/42=\frac{21}{x}$; $9X=882=98$). In a similar manner, the number of unmarked brook trout larger than 7 inches is calculated to be 11 fish ($2/7 = \frac{3}{3/4}$, $2X=21$, $X=10.5$, or for practical purposes, 11), and the total population consists of 11 unmarked fish and 7 marked fish, or 18 altogether.

(See: "Institute" 10-26-49 letter re-errors)

The upper, or control section is a rather wide, sluggish portion of the stream with no shade. The bottom is predominantly sand and silt with thick beds of Chara at the edges. There are some deep runs (2 1/2-3 1/2 ft.) and pockets between the Chara beds with gravel bottoms. The young-of-the-year population was 12+? (10 marked fish and 2 unmarked fish handled). In the 3.0-6.9 inch size class 30 brook trout were marked. On the following day, 6 marked fish and 39 unmarked fish were taken by the shocking activities. It may be calculated that there are 195 unmarked fish of this size class present, to which we should add the 30 marked fish, making a total of 225 brook trout in the 3.0-6.9 inch class ($6/29=\frac{39}{x}$; $6X = 1170$, $X= 195$). Eight brook trout larger than 7 inches were marked on June 22 in the upper section, and 2 marked fish and 5 unmarked fish were recaptured which provides an estimate of 20 unmarked fish present.

To this we add the 8 marked fish to arrive at a calculated population of 28 brook trout larger than 7 inches.

Other species of fish captured were the slimy muddler (Cottus cognatus gracilis), the black-nosed dace (Rhinichthys a. meleagris), long-nosed dace (Rhinichthys c. catarctae), creek chub (Semotilus a. atromaculatus), common shiner (Notropis c. frontalis), common sucker (Catostomus c. commersonnii), northern rainbow darter (Poecilichthys c. caeruleus), Johnny darter (Boleosoma n. nigrum), and the lawyer (Lota l. maculosa). Specimens of the latter from 5 to 12 inches in length were noted. No attempt to assay the population of minnows and other fish was made because of a lack of time. As a collective group, numerically, they are present in considerably greater numbers than the brook trout.

Tentative plans call for a repetition of the study on the same waters in August or September after the feeding has been underway to observe what, if any, effect is brought about by the feeding. Scale samples will also be collected to determine what growth changes are brought about by the feeding program.

Additional data on the effects of feeding a portion of the East Branch may show up in the fishing results. To determine this, a simple creel census record sheet has been forwarded to the Black River Ranch for the use of the club members and guests who fish either the experimental water where feeding is done, or the control section immediately above. A record of all fishing in the above-mentioned waters, whether any fish are caught or not, is essential.

INSTITUTE FOR FISHERIES RESEARCH

By David S. Shetter

Approved by A. S. Hazzard

Report typed by E. J. Bair

**TABLE 1**

Numbers of brook trout marked, and numbers of marked and unmarked brook trout recovered in approximately 1/4 mile of stream above and below Lower Dam, East Branch, Black River June 22 and 23, 1949, and estimated populations.

| Stream section | Item | Young 0"-2.9" | Immature 3.0"-6.9" | Adults 7.0"-and over | Mark used |
|---|---|---|---|---|---|
| Experimental water (to be fed) | Number marked June 22 | 16 | 42 | 7 | Top 1/3 of tail |
| | Number of marked fish recovered June 23 | 0 | 9 | 2 | |
| | Number of unmarked fish recovered June 23 | 6 | 21 | 3 | |
| | Estimated population 6/22 | 22+? | 140 | 18 | |
| Control water | Number marked June 22 | 10 | 30 | 8 | Bottom 1/3 of tail |
| | Number of marked fish recovered June 23 | 0 | 6 | 2 | |
| | Number of unmarked fish recovered June 23 | 2 | 39 | 5 | |
| | Estimated population 6/22 | 12+ ?? | 225 | 28 | |