

INSTITUTE FOR FISHERIES RESEARCH
UNIVERSITY MUSEUMS
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN

January 24, 1936

REPORT NO. 335

WINTER OBSERVATIONS ON CERTAIN TROUT

STREAMS OF THE LOWER PENINSULA

From January 3rd to 17th, 1936, the Institute for Fisheries Research had investigators in the field. Between the 6th and 14th, detailed observations were made on the North Branch of the AuSable, Crawford Co., in the vicinity of Lovells. The purpose of this report is to record the findings of the latter period.

Ice Formation

The winter season from its beginning through the last date mentioned, was free from any prolonged period of sub-zero temperatures. Consequently, no heavy ice formations of any sort were observed. On January 6th, in a section of stream about 1 mile below Lovells, shelf ice was formed along the stream edge, varying in thickness from 1 to 4 inches. Some ice was found to have formed on logs and islands in the stream, but in general this section was relatively free of ice. There is no stream improvement here.

On January 7th, about 6 miles of stream above Lovells was examined. Shelf ice formation was more extensive, especially around improvement devices. Ice sheets form over the relatively quiet water in the lee of deflectors and partial dams, and, during a hard freeze, might easily cover the entire stream in certain sections.

On January 13th, around noon, when the temperature dropped to + 15° F. (see chart) shelf ice was found to be thickening and extending, and slush ice was forming in the channel.

Temperature Chart (Fahrenheit), N. Br. AuSable, Lovells

(Temperatures taken with maximum-minimum thermometers)

(Readings are for the preceding 6 hours)

Date	Water at edge. 3" deep. Near store			Air by streamside			Air at store		
	Morning	Noon	Night	Morning	Noon	Night	Morning	Noon	Night
January 6		33-33	33-35		22-22	22-32			
January 7	33-38	34-37	34-36	22-31	25-27	22-28	20-30	23-23	21-23
January 8	33-37	33-37	36-38	21-23	22-29	24-30	20-22	24-30	23-28
January 9	34-36	34-34	34-36	22-24	23-27	24-28	20-23	22-26	22-24
January 10	36-38	35-37	36-36	22-24	24-28	23-27	21-24	22-26	20-24
January 11	36-39	36-36	36-37	20-28	22-26	20-29	20-26	20-24	21-25
January 12	34-36	36-36	34-37	20-24	22-24	28-32	17-21	20-22	24-26
January 13	33-37	33-35	29-35	13-30	13-20	14-35	13-20	15-15	14-16
January 14	31-35	33-36		13-20	20-28		13-17	22-26	

It is of interest to note the differences in water temperature of various springs along the stream bank. At a point near some springs, the stream temperature, in still water, was 57.4° F. In a large spring the temperature was 45.9° F., while two smaller springs just above registered 43.7° F. and 41.9° F. Apparently the temperature varies with the amount of exposure to the surface soil, as the highest temperature was found in a large spring arising in a good-sized pool, while the lower temperatures were in springs which seeped out over sand bars.

Predator Activities

Some signs of otter were observed. On January 6th eight fresh otter scats were collected along the bank about 1 mile above Lovells. Most of these droppings were within five feet of the water's edge. Numerous slides were observed in this section of stream.

On January 7th, an otter scat was found about four miles above Lovells. There were indications that the animal had been denned up in a log pile about twenty yards

from the stream. A multitude of tracks indicated considerable activity.

No mergansers were observed on the North Branch.

General Wildlife

Tracks of rabbits, squirrels and mice (Microtis) were abundant everywhere along the stream side. Some grouse tracks were seen. Our observations indicate that there were about 100 American golden-eye ducks on the stretch of river studied, and about 25 black ducks.

Very few other birds were seen. Flocks of snow buntings are still common in the Lovells region, and during our stay about 25 grouse were seen. Downy woodpeckers were not uncommon in wooded areas along the stream.

Seining Activities

On January 10th and January 14th, seinings were made. The sections worked are above Lovells, near the Akron Club and near Anderson's Ranch. Both of these sections bear a heavy concentration of brook trout during the spawning season.

During the two days of seining, at least 1000 trout were taken, 77 of which bore tags. The first seine haul produced 221 fish, of which 28 bore tags. The fish seemed to be congregated in the spawning areas; but this cannot be stated as a definite fact, since few of the deeper holes can be seined at this time of year. It is difficult for the observer to see trout in the stream at this season, for the stream bed is often coated with a layer of dead leaves, twigs and silt, a background with which the dark fish blend almost indistinguishably. The seinings indicate, however, that trout tend to concentrate near spring seepage areas.

The majority of the recoveries were tagged during the spawning season. The fish had moved little or not at all. Since the time of tagging (early November), the majority had grown somewhat,--from 0.125 to 0.500 of an inch.

Stomach Analyses

During the seining operations, a small series of trout of various sizes were preserved for stomach analysis. The results clearly demonstrate the availability to trout of the season's dominant food organism, the midge larva (Chironomidae). A series

of five trout, ranging in size from 8.5 to 5.25 inches show the following ratio of percentages of chironomid larvae to all other organisms combined:

- (1) 100%
- (2) 98.6% : 1.4%
- (3) 98.5% : 1.5%
- (4) 94.4% : 5.6%
- (5) 91.6% : 8.4%

All but one of these stomachs were very well filled, indicating that active feeding continues well into the winter. The condition of the organisms within these stomachs argues against a greatly retarded metabolic rate. The habitat preferences of the species of chironomid larvae taken by the trout indicates that at this season the trout feed more along deflectors and natural obstructions and in shallow water near the banks, over muck and silt deposits, than in faster, deeper water, over stone and gravel bottoms.

It should be mentioned that one large trout secured in a seine haul regurgitated, upon being handled, two well-digested minnows, one of which was recognizable as a muddler (Cottus sp.).

Insect Counts

From January 10th to 13th, inclusive, the routine bottom sampling studies were prosecuted. Due to the relatively mild weather which had thus far obtained through this section, little opportunity was afforded for observations on the effect of ice formations, especially anchor ice, on the various food organisms of the stream, nor upon the feeding habits of the trout. Valuable data, however, were obtained bearing on seasonal abundance and distribution of food organisms, and winter feeding habits of trout as shown above.

Comparison with bottom samples collected through summer and fall reveals that the bulk of stream organisms is greater now than at any time since the first samples of the year were taken in mid-June.

One of the most interesting findings was the discovery that at this season, midge larvae (Chironomidae and allies) occur in the stream bed in greater quantities than at any other season, as shown by our previous studies. In suitable locations

(especially along stream improvement deflectors) the muck bars which they inhabit appeared reddish to the eye, due to the excessive number of red-bodied chironomid larvae present.

Summary

1. Up to January 14, little ice formation had taken place on the North Branch of the AuSable near Lovells. Heaviest formations of shelf ice were observed in the shelter of stream improvement devices.

2. The temperature of spring seepage areas appears to be directly related to the amount of surface exposed.

3. Otter were obviously active. No mergansers were seen.

4. Golden-eye ducks were common, but not so numerous as in February and March of 1935. Some black ducks were seen, as well as 25 grouse, several rabbits and squirrels, and many tracks of mice, especially Microtis.

5. Seining produced, in two days, over 1000 trout, 77 of which bore tags. Recoveries indicated little movement since November, and showed growths varying from 0.125 to 0.500 inches.

6. Well-filled stomachs indicated active feeding by trout. Preference for midge larvae was shown by their presence almost to the exclusion of other food organisms.

7. Insect counts revealed an amplitude of food in the stream, greater than at any time since June.

INSTITUTE FOR FISHERIES RESEARCH

By: J. W. Leonard
David S. Shetter

J. W. Leonard
David S. Shetter