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TEMPERATURES AND OTHER OBSERVATIONS ON LITTLE RABBIT RIVER IN
ALLEGAN COUNTY, PINE RIVER IN MONTCALM AND GRATIOT COUNTIES,
NORTH BRANCH FISH CREEK IN MONTCALM COUNTY, AND SOUTH
BRANCH LOOKING GLASS RIVER IN SHIAWASSEE COUNTY

by

Gerald P. Cooper

During the past few years fishermen, by correspondence and otherwise, have expressed an interest in trout plantings in the above mentioned streams. Some of this correspondence is cited below. The policy of the Fish Division as to these plantings has been uncertain because these streams were believed to be marginal for trouts, and adequate data on water temperatures and other conditions have not been available.

Some information was obtained on these streams during the summer of 1945, which is the basis of this report. The examinations were made by Mr. I. A. Rodeheffer and the writer on August 8, 9, and 10, 1945. Weather conditions during this period were fairly favorable for getting maximum water temperatures. Mid-day air temperatures during the three days were between 78° and 81° F., and consistently the sky was clear and the sun bright. The night of August 7 was cool (down to about 58° F.) but subsequent nights were warmer. In interpreting the data on water temperatures some allowance must be made in the direction of higher water temperatures for periods when air temperatures might exceed 90° F.

Little Rabbit River

An interest in this stream was expressed by Mr. Rollo G. Mosher of the Wayland Globe, Wayland. Mr. Mosher accompanied us on the examination of the Little Rabbit on August 8. A letter dated May 4, 1946, from Merwyn F. Herbert, 209 E. Prouty Street, Kalamazoo, to Mr. Westerman also indicated an interest in this stream.

The results of our examinations on the Little Rabbit were summarized in a letter of May 22, 1946, by the present author to Mr. DeBoer in the Lansing office. Most of this letter is repeated here as follows:

"We examined that portion of the Little Rabbit in T. 3 N., R. 11 W., Wayland Twp., east of the village of Wayland, at stations indicated below. The date was August 8, 1945. It was a moderately hot day, but during the previous night the air temperature was down to about 58° F.; thus August 8 was a fairly good (but not the best) time for checking maximum temperatures. Our stations (numbered downstream) and a summary of our observations are as follows:

- Station 1 - 3 1/2 miles E. of Wayland, center of Sec. 2.
- Station 2 - 3 miles E. of Wayland, on line of Secs. 2 and 3.
- Station 3 - Outlet of Pickerel Lake, S.W. corner of Sec. 10.
(Tributary of L. Rabbit)
- Station 4 - 1 1/2 miles E. of Wayland, N.E. quarter of Sec. 9.
- Station 5 - 1 1/2 miles E. of Wayland, S. half of Sec. 4.
- Station 6 - 1 mile E. of Wayland, W. half of Sec. 4.

Station	Time: P.M.	Air: °F.	Water: °F.	Flow: c.f.s.	Water turbidity	Bottom	Pools, cover, etc.
1.	2:10	79	63	2	Clear	Sand, gravel	Pools and cover fair to poor for trout.
2.	2:20	79	67	2 1/2	Clear	Mostly sand	Pools and cover fair to poor.
3.	2:30	81	76	1	Clear	Sand, silt	Pools fair, shade good.
4.	2:40	81	71	4	Clear	Mostly sand	Pools and cover fair.
5.	2:45	81	70	4	Clear	Sand, silt	Pools and cover good.
6.	2:00	79	67	4	Slightly turbid	Mostly sand	Pools and cover fairly good.

The Little Rabbit along the aforementioned stations is quite uniform in width and shallow depth. About half of the stream is open and very poor trout habitat (shallow and poor cover); the other half has mostly dense overhanging alders, willows, etc., and hence good shade and very good cover over shallow water. In this latter type of habitat, fishing would be quite difficult.

Judging from the above temperatures, the five miles of the Little Rabbit above Wayland should support brown trout. There was a 10-to 16-degree differential between air and water temperatures which should mean that water temperatures in portions of the stream would not reach a lethal point during very hot weather. The stream probably should be classed as "marginal" trout water. Where about half of the stream now has very poor shade and poor underwater cover, a program of stream improvement probably would greatly benefit the stream as a trout habitat."

It is recommended that Mr. O. H. Clark examine the stream and consider it for possible stream improvement.

Pine River

The examination of the Pine River above Alma was prompted by correspondence to the Fish Division from Mr. H. G. Mallory (of the Gratiot County Conservation League) of Alma, Michigan. Mr. Mallory indicated an active interest on the part of the Gratiot League in plantings of brown trout for the headwaters of the Pine River in Montcalm and Gratiot counties.

Examinations were made at eight stations on the Pine and two stations on tributaries on August 9. The stations (numbered downstream) and a summary of our observations are as follows:

- Station 1 - Pine R., Montcalm Co., T. 12 N., R. 5 W., west half of Sec. 5.
- Station 2 - Pine R., Montcalm Co., T. 12 N., R. 5 W., on line of Secs. 8 and 17.
- Station 3 - S. Br. (?) Pine R., Montcalm Co., T. 12 N., R. 5 W., S.E. corner of Sec. 18.
- Station 4 - Pine R., Montcalm Co., T. 12 N., R. 5 W., on line of Secs. 15 and 16.
- Station 5 - Pine R., Montcalm Co., T. 12 N., R. 5 W., on line of Secs. 13 and 14.
- Station 6 - N. Br. Pine R., Montcalm Co., T. 12 N., R. 5 W., S.E. corner of Sec. 12.
- Station 7 - Pine R., Gratiot Co., T. 12 N., R. 4 W., on line of Secs. 19 and 30.
- Station 8 - Pine R., Gratiot Co., T. 11 N., R. 4 W., on line of Secs. 6 and 7.
- Station 9 - Pine R., Gratiot Co., T. 11 N., R. 4 W., S.W. 1/4 of Sec. 19.
- Station 10 - Pine R., Gratiot Co., T. 11 N., R. 3 W., on line of Secs. 18 and 19.

Station	Time: P.M.	Air: °F.	Water: °F.	Flow: c.f.s.	Bottom type	Shade, cover, etc.
1.	4:50	81	69	25	Gravel, sand	80% shaded, cover and pools fair, aquatic plants common.
2.	4:40	78	73	30	Gravel, rubble	90% shaded, cover and pools fair, aquatic plants common.
3.	5:00	81	75	4	Sand, rubble	25% shaded, cover and pools fair to poor.
4.	4:30	78	75	30	Sand, gravel	50% shaded, cover fair.
5.	5:30	82	73	35	Gravel, rubble	50% shaded.
6.	5:40	81	68	6	Sand, gravel, silt	75% shaded, cover fair.
7.	6:00	80	74	40	Silt, sand, gravel	75% shaded.
8.	6:15	82	73	40	Silt, sand, gravel	50% shaded.
9.	6:25	82	75	40	Silt, sand	75% shaded.
10.	6:50	74	74	50	Silt, sand	50% shaded.

The above stations cover the Pine River from the Montcalm-Isabella County line to within about 5 miles of Alma. In this area the river averages about 50 feet wide and 2 feet deep. It is quite uniformly well shaded. The North Branch of the Pine in Montcalm County (examined at Station 6) is about 10 to 25 feet wide. The tributary in Richland, which enters the Pine from the southwest, is listed in the Department's fish-planting records as the South Branch (examined at our Station 3); but a different tributary, in Isabella County (T. 13 N., R. 6 W., Secs. 15, 16, 17), is named South Branch on the Field Administration map of Isabella County. The lower part of the South Branch in Richland is about 10 to 20 feet wide (Station 3).

For most of the Pine River in Montcalm and Gratiot counties, our water temperatures varied from 73° to 75° F., at air temperatures of 78° to 82° F. It is believed that at air temperatures in excess of 90° F., the water temperatures along this section of the Pine would reach 80° F. or higher, and would be too warm for trouts. The lower end of the South Branch in Richland is no more favorable as to cold water--see Station 3. Temperatures on the North Branch in Richland, and on the Pine itself near the Isabella County line were the most favorable for trout, as compared to all other stations.

Records of trout plantings since 1940 cite browns, rainbows, and brooks for the South Branch in Richland and Home; rainbows and brooks for the North Branch in Richland; and rainbows and browns for the Pine itself in Richland; but no plantings for the Pine River in Gratiot or Isabella counties.

It is recommended that trout plantings in the Pine River in Montcalm County and Gratiot County above Alma, and in the South Branch in Richland be discontinued. We have no recommendations for the headwaters of the South Branch in Home, nor for the Pine and its tributaries in Isabella County, since these waters were not examined. From the single station on the North Branch it is judged that this tributary should carry browns or rainbows.

North Branch Fish Creek

A letter of October 28, 1944, by Mr. Claude Lydell to Mr. Westerman raises some question as to the present trout stocking program for the North Branch of Fish Creek and its tributaries in Day and Evergreen townships, Montcalm County. Mr. Lydell states that brook trout are being planted in the tributaries, and rainbows in the main stream.

We examined these waters at eight stations on August 9, making observations on temperature, stream flow, and habitat conditions as follows:

- Station 1 - N. Br. Fish Cr., T. 11 N., R. 5 W., in Sec. 5.
- Station 2 - N. Br. Fish Cr., T. 11 N., R. 5 W., N.W. corner of Sec. 20.
- Station 3 - Tributary of N. Br. Fish Cr., T. 11 N., R. 6 W., N.W. corner of Sec. 25.
- Station 4 - N. Br. Fish Cr., T. 11 N., R. 6 W., at N. line of Sec. 36.
- Station 5 - N. Br. Fish Cr., T. 10 N., R. 6 W., at N. line of Sec. 1.
- Station 6 - N. Br. Fish Cr., T. 10 N., R. 6 W., N.E. corner of Sec. 11.
- Station 7 - N. Br. Fish Cr., T. 10 N., R. 6 W., line between Secs. 11 and 14.
- Station 8 - Tributary of N. Br. Fish Cr., T. 10 N., R. 6 W., line between Secs. 10 and 15.

Station	Time: P.M.	Air: °F.	Water: °F.	Flow	Bottom type	Shade, cover, etc.
1.	3:45	None	..	Stream dredged, no flow.
2.	3:30	80	67	3 c.f.s.	Silt, sand	Stream dredged, muck farm area, water cress abundant, pools and cover fair.
3.	3:15	81	69	150 g.p.m.	Silt, sand	Cover and shade good.
4.	3:00	81	73	4 c.f.s.	Silt, sand	75% shaded, pools and cover fair.
5.	2:45	81	72	5 c.f.s.	Silt, sand, gravel	50% shaded, pools and cover fair.
6.	2:30	81	71	7 c.f.s.	Sand, gravel	50% shaded, pools and cover fair.
7.	1:50	81	72	8 c.f.s.	Gravel, sand, silt	Pools and shade fair.
8.	1:30	81	69	250 g.p.m.	Silt, sand	Shade and cover good, pools fair.

The North Branch of Fish Creek in Day and Evergreen is about 10 to 20 feet wide on the average, and generally has fair pools and cover and is about 50 percent shaded. Much of its course in Ferris Township is dredged and the upper part was found to be dry to pools on August 9. Its lower course in Ferris, though dredged, has a good flow of cold water. In Day and Evergreen, water temperatures were from 71° to 73°, and would be expected to approach 80° F. on very hot days. The two larger tributaries entering Fish Creek from the west, one in Day and one in Evergreen, were each 69° F., and their temperatures would approach 75° F. on very hot days. In the writer's opinion the whole stream system is too warm for brook trout, since during very hot weather temperatures suitable to this species would prevail only in the headwaters of the tributaries and in the headwaters of the North Branch itself in Ferris. Rainbows or browns, in view of their tolerance of warmer water, would be more adapted to the entire stream system. Mr. Lydell in his letter raises the question as to whether or not brook trout should be planted in the main stream (North Branch), with the idea that they would survive in the main stream the length of time they would be there before being caught out. We do not recommend planting trout in streams where they cannot survive throughout the summer,

and on this basis would not recommend brook trout for the main stream. By the same logic we recommend rainbows or browns (rather than brook trout) for the lower parts of the tributaries. Since this would limit brook trout to the upper ends of the tributaries and to a portion of the dredged main stream at Ferris, it would seem logical to substitute rainbows or browns for all stocking in the drainage. Continued plantings of rainbows in the main stream is recommended.

South Branch Looking Glass River and Tributaries

Correspondence between Mr. C. K. Colby of Laingsburg and Mr. Westerman prompted the examination of these waters. We interviewed Mr. Colby and he accompanied us on August 10 in an examination of the streams in his neighborhood which he thought might be suitable for trout. These included the South Branch of the Looking Glass River and two of its tributaries in Woodhull Township, Shiawassee County. Pulver Creek, one of the tributaries, in sections 15, 16, and 21, is not shown on the General Highway Map of Shiawassee County. The second tributary, in sections 29, 32, and 33 is not named on our maps. The survey stations (all in T. 5 N., R. 1 E.) and the results of our examinations are as follows:

- Station 1 - Unnamed tributary, S.W. corner of Sec. 33.
- Station 2 - Same tributary, N.E. corner of Sec. 32.
- Station 3 - Same tributary, central part of Sec. 29.
- Station 4 - Pulver Creek, N.E. corner of Sec. 21.
- Station 5 - Pulver Creek, central part of Sec. 16.
- Station 6 - S. Br. Looking Glass, on line between Secs. 17 and 20.

Station	Time: A.M.	Air: °F.	Water: °F.	Flow: g.p.m.	Turbidity	Pools, cover, etc.
1.	11:50	81	65	100	Clear	Fair pools and cover.
2.	11:40	81	65	100	Clear	Fair pools and cover.
3.	11:30	81	64	100	Clear	50% shaded, fair pools and cover.
4.	11:00	81	71	50	Clear	...
5.	11:10	81	70	50	Clear	Stream choked with vegetation
6.	11:20	81	71	...	Very turbid	...

The unnamed tributary, at stations 1 to 3, has an average width of between 3 and 4 feet, and an average depth of less than six inches. Its water is sufficiently cold for trout, but the stream is not large enough to provide much trout fishing.

Pulver Creek is very small, mostly runs through open pastures where it is choked with meadow grass and aquatic plants, and is too warm to be trout water. It is too small to provide trout fishing.

The South Branch of the Looking Glass, where it was examined in sections 17 and 20, is a sluggish stream, very turbid, probably too warm to support trout, and is reported to contain rock bass, bullheads, and pickerel.

Of these waters which were shown to us by Mr. Colby, none are regarded as suitable for trout plantings.

INSTITUTE FOR FISHERIES RESEARCH

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