Original: Fish Division
cc: Education-Game
Institute for Fisheries Research
R. S. Marks
E. H. Bacon
O. H. Clark

INSTITUTE FOR FISHERIES RESEARCH
DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
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ALBERT S. HAZZARD, PH.D.
DIRECTOR

ADDRESS
UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

June 25, 1952

Report No. 1339

# SURVEY OF MILLER CREEK,

(T. 3, 4 N., R. 14 W., Secs. 5, 6, 7, 8, 17, 31, 36)

ALLEGAN COUNTY

by

I. A. Rodeheffer and Jason Da



Abstract

Miller Creek, a tributary of the Rabbit River in the Kalamazoo River drainage, has been stocked annually with brook trout. While there were favorable reports on the fishing it provides early in the season, the stream appeared to contain only a small population of trout at the time of the survey in June, 1947. The temperatures were found quite suitable for trout, but good pools were few, and food organisms relatively scarce. The bottom consisted mostly of shifting sand with occasional outcroppings of clay hardpan. There was some gravel in the upper third of the stream.

Installation of deflectors was considered one means of improving conditions for trout in Miller Creek. Ponds could be created with dams at three locations where dams had previously existed, and such impoundments probably would provide fairly good trout water. However, complete private ownership of land bordering this small stream presently is an obstacle to extensive improvement for fishing.

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## ALLEGAN COUNTY

by

I. A. Rodeheffer and Jason Day

Miller Creek, regarded as a good trout stream by Allegan County sportsmen, was investigated by an Institute for Fisheries Research survey party to determine its trout productivity and to select possible dam sites for trout ponds. The survey party consisting of I. A. Rodeheffer and Jason Day, worked on Miller Creek the last week of June, 1947.

Miller Creek rises in T. 3 N., R. 13 W., Sec. 17 of Monterey Township, immediately south of the north boundary of Section 17. The source consists of a group of small springs which form a brooklet that runs to the road in a westerly direction for about 300 feet. Here it enters a culvert under the east-west road and flows into Section 8 of the same township through a pasture lot of about 50 acres where the stream is only about a foot wide. Here it meanders in a northwesterly direction toward a wooded area approximately 200 yards from the road. The stream continues flowing northwest through a heavily wooded area, and increases in width because of the entrance of numerous springs.

Near the junction of Sections 8, 5, 6, and 7 it has become a rapid stream, approximately 5 feet in width and 9 inches deep. The lower one-third of its course through Section 8 is paralleled by banks approximately 20 to 40 feet high. The bottom here is made up of stretches of sand, fine gravel, some coarse gravel, and some large boulders.

Approximately at the junction of Sections 8, 5, 6, and 7, the stream crosses the north-south road between these Sections through a culvert about 8 feet in diameter, and enters Section 6 of Monterey Township. It continues meandering in a northwesterly direction at the bottom of a valley averaging 20 to 30 yards in width at the bottom and with steep banks 15 to 30 feet high. Tag alders grow thickly along the banks of the stream and medium sized hardwoods grow on the steep banks. On both sides of this gorge the area is heavily forested with hardwoods. The eastern side of the stream valley is usually parallel with the stream's general direction but the western side quite often recedes 60 to 100 feet and forms an amphitheater overlooking a flat flood plain supporting tag alders. The upstream and downstream extremities of these emphitheaters narrow so that dams might be constructed across them to impound headwaters 10 to 20 feet in depth.

About one-third mile downstream from the north-south road crossing at the junction of Sections 8, 5, 6, and 7, the valley widens into a swampy area approximately 50 yards in width with steep banks 15 to 30 feet in height. This widened area continues downstream about one-third mile and is comparatively free of growth except grasses and low bushes. Through this area the stream continues its rapid course, abetted by many springs, over bottom consisting entirely of sand. At the end of the swampy area the stream enters a narrow cut between banks 15 to 20

feet high where a dam existed about 60 years ago. At this point the stream has run about two-thirds its length, or approximately 2 miles, through a completely forested area except for the pasture of about 50 acres near its source.

For a quarter mile below this old dam site the valley is about 75 yards across at the top and 50 yards at the bottom, with the banks gradually getting lower until they are only 8 to 10 feet high. The bottom of the valley is heavily wooded with large hardwoods.

Beginning a quarter mile below this old dam site, the area is grassy and the valley banks are far from the stream. The area is pasture-land and swamp, and the stream flows rapidly over sand, hardpan, and some muck. The stream here is about 5 feet wide and 1 foot deep. Evidence of some flooding is present.

Downstream about half a mile from the old dam site this pastured area narrows sharply as it approaches the east-west township road (442) between Salem and Monterey townships near the hamlet of Diamond Springs. About 50 yards upstream from this road is the location of another dam which was destroyed by heavy rains about 10 to 12 years before the survey.

The stream goes under the east-west Salem-Monterey township road through a culvert, the bed of the stream lying 10 to 15 feet below the road surface. Continuing northwest across the southwest corner of Section 31 of Salen Township and into Section 36 of Overisel Township, Miller Creek enters the Big Rabbit River about three-quarters of a mile from Diamond Springs. Throughout this lower portion of the stream, the bed is composed of sand and occasional outcroppings of hardpan. The banks are 10 to 12 feet high over one-third of the distance of this

three-fourths mile, and recede to form a wide valley in the lower two-thirds of the distance. All this area on either side of the stream below the Diamond Springs bridge is farm land, either cultivated or pastured, with occasional large hardwoods partially shading the stream.

The survey party walked the entire length of Miller Creek to determine the physical, chemical, and biological conditions of the stream. Three stations were selected for study.

The lower station was about 200 yards below the bridge on the township road between Overisel and Salem townships, on the stretch of stream that flows approximately east and west in that area. This is roughly three-fourths mile by stream, or one-eighth straight mile, above the mouth of the stream.

The middle station was located just above the upper old dam site, in about the center of Section 6 of Monterey Township. This should not be confused with the lower old dam site which is just above the Monterey-Salem township road No. 442.

The upper station was in Section 8, approximately 200 yards above (north of) the east and west road between Sections 8 and 17 of Monterey Township. This is approximately 300 yards below the southernmost springs that are the source of Miller Creek. The data collected at these stations are presented in Tables 1, 2, and 3.

## Physical Conditions

Water temperatures were taken the latter part of June after several warm days (air temperatures in the 70's). Water temperatures in the high 50's and low 60's show that the temperatures are suitable for trout. For comparison, the water temperature of Dumont Lake outlet in Allegan Township, T. 2 N., R. 12 W., (not recognized as a trout stream), on June 26, 1947, was 68° F.

The middle station, just below an area where numerous springs flow or seep into the stream, showed the cooling effect of the springs.

On July 13, 1947, temperatures were again taken after air temperatures had been in the high 80's for several days. These readings (Table 1) indicated that the water temperatures here do not become critically high for trout.

Miller Creek is about 3.5 miles in length (measured from aerial photos). It has a velocity of about 1 to 1.5 feet per second, with a volume of 6 to 7 cubic feet per second in the lower third of its course. (See Table 3.). The water comes from springs and surface run-off. In general, the stream bottom is shifting sand, with occasional outcroppings of clay hardpan, and some gravel in the upper third of the stream. In swampy areas the muck is usually covered with shifting sand. The part of the stream that traverses the northern half of Section 8 and Section 5 (map on file at Institute for Fisheries Research) has some gravel bottom, and possibly trout may spawn here.

About two-thirds of the stream in this area is well shaded. Only in the upper part of the stream near its source (200 to 300 yards) and in the lower one-third of its length is the stream open enough for fly fishing. Throughout the shaded area tag alders overhang the stream in many places. Pools average about 6 or 8 per 100 yards of stream, but the majority are scouring types, small and shallow. There are few good pools in the stream.

Chemistry

There is nothing in the chemistry data to indicate that the stream is not suited for trout. These data are listed in Table 2.

Table 1

Temperature Series for Miller Creek

| Station | Date | Time | Weather | Air Temperature ° F. | Water Temperature ° F. |
|---|---|---|---|---|---|
| lower | 6-24-47 | 3:30 p.m. | Clear | 73 | 60 |
| | 7-13-47 | 6:00 p.m. | Clear | 86 | 62 |
| middle | 6-25-47 | 5:00 p.m. | P. cloudy | 74 | 56 |
| | 7-13-47 | 6:30 p.m. | Clear | 84 | 54 |
| upper | 6-26-47 | 11:45 p.m. | P. cloudy | 72 | 60 |
| | 7-13-47 | 7:00 p.m. | Clear | 84 | 56 |

Table 2

Chemical Data on Miller Creek

| Station | Date | Time | $O_2$, ppm. | $CO_2$, ppm. | Carbonates, ppm. | $CaCO_3$, ppm. |
|---|---|---|---|---|---|---|
| lower | 6-24-47 | 3:00 p.m. | 8.4 | 0.0 | 0.0 | 132 |
| middle | 6-25-47 | 4:00 p.m. | 8.4 | 0.0 | 0.0 | 144 |
| upper | 6-26-47 | 11:45 p.m. | 7.9 | 0.0 | 0.0 | 231 |

Table 3

Physical Data on Miller Creek

| Station | Date | Average Width, feet | Average Depth, feet | Velocity, f.p.s. | Volume, c.f.s. | Kind of bottom |
|---|---|---|---|---|---|---|
| lower | 6-24-47 | 7 | 3/4 | 1.4 | 6.5 | sand |
| middle | 6-25-47 | 9.5 | 2/3 | 1.3 | 7.0 | sand |
| upper | 6-26-47 | 2.4 | 1/4 | 1.0 | 0.5 | sand |

Biological Conditions

The stream was visited on five different days in June and July, 1947. Not a single trout fisherman was seen during these visits. In a careful check of the entire stream, only one small trout was seen. In the upper third of the stream, numerous creek chubs (Semotilus atromaculatus) were observed. The stream had been planted with brook trout yearly since 1944, but in spite of these plantings, the stream appeared rather barren of trout. This condition probably was due to a combination of factors, including smallness of the stream, lack of good cover, shifting sand bottom, scarcity of fish food, and intensity of fishing in early spring.

Bottom samples at the three stations indicated that this stream is very poor in fish foods. Samples at the lower and middle stations revealed fresh-water shrimp (Gammarus) as the dominant organism, with some Chironomid larvae present. The volume of all forms was less than 1 c.c. per square foot of bottom. At the upper station, "blood worms" were the most common forms found in the bottom sample but the numbers were small, and the food supply for fish rather limited.

Improvement of Miller Creek

Miller Creek might well be improved with deflectors, particularly in the lower third of the stream. Floating cover would be of benefit over such pools, especially in the area that is open enough for fly fishing. The stream is sufficiently rapid, and carries enough volume in the lower half of its course to make improvement devices effective.

Local sportsmen have requested dams for the stream to make trout ponds. The stream lends itself admirably to installation of dams. The temperature of the water will permit it. The smallness of the

stream, together with the lack of good pools and a limited food supply, prevents it from being a productive trout stream in its present state. Ponds would undoubtedly increase productivity, although complete private ownership probably bars provision of dams.

The steep banks on the sides of a narrow valley offer many possible dam sites in the middle half of the stream's course. There are three outstanding locations for dams which will be briefly described (map, a tracing from an aerial photo, on file at the Institute for Fisheries Research).

Dam site No. 1 is about 50 yards above the Salem-Monterey Township road and near Diamond Springs. Possibly this is the least desirable of the three proposed sites because it would result in a comparatively shallow pond spreading over a considerable area. It would give a head of water of about 10 feet. A point in its favor is that good trout fishing was reported for the pond which existed here before the old dam washed out.

Dam site No. 2, known locally as the old Aldrich dam site, is probably the best of the three. A dam existed here about 60 years ago. The area for the pond is ideal, being a valley of 50 yards or so in width with a minimum amount of brush growing on ground that would become the pond bed, hence comparatively little brushing-out would be required. Some tag alders grow along the sides of this valley, and there are hardwood trees on the steep slopes. The remains of the old dam would require only a little fill dirt to complete a dam which would produce a head of more than 15 feet. The steep banks of the valley would insure a large area of fairly deep water. Mr. Herbert Lampen, the owner of the old dam and pond site, favors a dam here and hopes that

it would be wide enough so that he might use it as a road to get to his land on the opposite side of Miller Creek.

Dam site No. 3 is the road between Sections 5 and 6 of Monterey Township. The stream is bridged here by a concrete culvert about 8 feet in diameter, and the road bed is about 12 feet above the stream bed. The pond would flood an area which in 1947 supported hardwood trees up to 12 and 15 inches in diameter. It would also flood some of the area where the stream bed is of gravel. Flooding would reduce the limited spawning area on this stream. The volume of flow, measured just above the road on July 20, 1947, was 3.5 cubic feet per second.

In Section 8 of Monterey Township the state owns 80 acres. From aerial photos it appeared that Miller Creek might cross a corner of this 80 acres. With the help of Paul Schroeder, the District Forester of the Allegan State Forest, we chained this 80 acres to make sure if the stream crossed it. Our measurements showed that the stream comes within 40 feet of the state-owned land. On July 10, 1947, the volume of the stream at this point was about 1 cubic foot per second.

If dams were constructed at Sites No. 1 or No. 2 possibly arrangements could be made for the outflow to come from the bottom of the ponds to insure cold water in the stream below the dams. The majority of the springs that feed the stream enter above dam site No. 2.

INSTITUTE FOR FISHERIES RESEARCH

I. A. Rodeheffer and Jason Day

Approved by: A. S. Hazzard

Typed by: M. C. Tait