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REPORT ON THE INVESTIGATION OF BEAVER DAM CREEK AND ROGERS CREEK, Crawford Co. Presque Isle County

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Beaver Dam Creek

From appearances and reports this creek was formerly a fairly good trout stream. Due to the work of the beaver, at present only a very small portion of its total length is fit for trout; namely the large spring holes at the source and a very short part of the extreme upper end of the creek proper.

The beaver have wrought great havoc with this stream. Formerly it was narrow and well shaded. Flooding caused by the beaver dam has killed the trees and destroyed the shade. At present, there is no shade what ever and the dead trees have fallen over in confused heaps along the edge of the stream and in the stream. The banks have been flattened out and many side channels formed while the former channel has been filled up with a soft organic muck. As a result of these changes the stream is very wide and shallow, and has so many stagnant side channels and pools that the whole valley is converted into a marsh. This results in a very slow movement of the water and great warming due to excessive exposure. Since the movement is slow and the flow is small the warming is so thorough that only the upper portions of the stream are suitable for trout in the summer. Of course they can range the full length of the stream during the spring and fall.

Good shade would undoubtedly make the larger part of the stream suitable as far as temperature is concerned. The stream is now so wide and shallow, however, that it would be difficult to establish proper shade or to narrow the stream sufficiently to cause it to clean out its channel. I do not believe the results

would justify the large expense involved. If the beaver were kept out and the present dam entirely removed to lower the water as much as possible the shade should reestablish itself in time. Perhaps this would be the best solution of the problem. Since the stream will never be fished very heavily the portion which is now favorable for trout should, with improvement, support enough trout to supply the demand.

The springs which feed the creek emerge at 46°F. The following temperatures were taken along the creek at about 10 A.M. on July 28th. The air was 60°F. The spring holes had a surface temperature of 55°F. while just below the point where they unite the stream temperature was 57°F. About half-way between the headwaters and the beaver dam the stream was 62°F., 200 yards above the dam it was 67°F., and just above the dam it was 71°F. These temperatures taken at the lower end of the stream are high considering that the air temperature was only 60°F. and that the former temperatures were taken early in the morning. It is safe to say that on a hot day the temperature in the lower section of the stream would go over 85°F.

On July 29 at 3:50 P.M. with an air temperature of 68°F. the water temperature was 79°F. On that day water samples were taken to determine the hydrogen ion concentration (pH, a measure of acidity), oxygen content, and carbon dioxide content of the water. The water is acid, having a pH of 5.5-6.0. The oxygen content is low; 5.2 parts per million, which is about 50% of saturation. This low oxygen content is due to the large amount of organic material in the water. The carbon dioxide content is a little high, 7 parts per million. While these tests show that the water is not as good as it might be, they do not indicate any condition particularly dangerous to trout life under ordinary circumstances. These tests were made at the dam. The oxygen content may be higher in the spring holes, but it might be as low or even lower there.

Brook trout were seen only in the large ponds or spring holes which are fed by springs at bottoms of the pools. The temperature in these holes varies a good deal from top to bottom. At 2:30 P.M. the surface temperature of one of these

pools was 67°F., when the air temperature was 74°F. Just 18 inches below the surface the water temperature was 55°F. This shows that at the bottom of the holes the water must be much colder, perhaps 46°F., the temperature of the springs in this region. Farther down stream in the warmer water other fishes were present. Fishes taken or observed here are sticklebacks (Eucalia inconstans), mud minnows (Umbra limi), suckers (Catostomus commersonnii), sunfish (Eupomotis gibbosus) perch (Perca flavescens), large-mouth black bass (Aplites salmoides), red-bellied dace (Chrosomus eos), black-nosed shiner (Notropis atrocaudalis heterolepis), fat-headed minnow (Pimephales promelas). This assemblage of species indicates a warm stream, in fact the perch and bass are unfavorable to trout, and they are seldom found together.

In conclusion, it might be said that the lower section is unfavorable to trout both as regards temperature and fish population. The spring holes at the source of the stream are the only places favorable for trout throughout the year and it is here that they should be encouraged. Since it is doubtful if spawning would be successful here, it will probably be desirable to plant fish at regular intervals. When plantings are made it would be best to plant fish 6 inches or more in length, since this habitat is not very good for young fish.

These spring holes are very open at present. They can be and should be improved. Since there is not shade at all, some shelter for the fish should be installed. Fish are attracted by something under which they can hide. Such a hide can easily be made of a few cedar poles or logs wired together to form a raft which is held up by stakes and cross pieces placed underneath, so it cannot sink to the bottom on becoming waterlogged. Fish prefer some cover which they can get directly under or into as shown by the way they collect around docks and under boats. This type of covers (such as the "square cover" described in the bulletin), not only furnish a hiding place for the fish but they also shade a portion of the pool and help to keep it cool. These hides should be so located

that it is possible to fish around them. These hides and covers also augment the food supply by furnishing a suitable substratum for the attachment of insect life. Brush which could be fastened to the bank and allowed to project out into the pools would be even more valuable in increasing food production. Shade could be planted on the south side of the pools. If these devices are installed in the spring holes the environment will be made more suitable for trout and consequently there should be better fishing.

Rogers Creek

This creek has a smaller flow than Beaver Dam Creek and is not so long. Its upper end is well shaded by trees while for the rest of its length, it is lined by bushes. As a result, it is cooler than Beaver Dam Creek. The following temperatures were secured on July 28th at about 3:00 P.M. At the upper end where the shade was good I found places where the water was as low as 49°F. with an air temperature of 67°F. Farther down toward the mouth of the creek, I found a spring entering from the right with a temperature of 50°F. Below this a short distance the creek was 64°F. and at its mouth the water was 65°F. The next morning at 8:15 with an air temperature of 65°F. the water at the mouth of the creek was 55°F. While the temperatures in the creek are high and on hot days would be too hot for trout in some places there are other places in which they could live on hot days.

The oxygen content of the water in Rogers Creek at its mouth is slightly higher than it is at the dam in Beaver Dam Creek. It was found to be 7.4 parts per million at a water temperature of 55°F. Since the oxygen content of Beaver Dam Creek was taken at a temperature of 68°F. the difference is not so great as it appears since the amount of oxygen that can be dissolved in water increases with the decrease in temperature of the water. The water is acid, having a pH of 5.5-6.0. Carbon dioxide content is somewhat high for a stream,--9 parts per million. While these tests do not indicate that fish can not live in this stream they do

show that there is a large amount of organic matter present, since the oxygen is low at even such a low temperature of 55°F. On very hot days when decomposition would be speeded up the oxygen content might become dangerously low.

Food conditions in this stream are not so good as they are in Beaver Dam Creek since in the lower section of this latter creek there are numerous aquatic plants which furnish a very good habitat for insect life. In Rogers Creek there is some filamentous algae which supports some life, but is very sparse. After diligent search I found crayfish (Cambarus virilis) in fair numbers, some snails (Planorbis), one caddis fly larva (family, Limnophylidae). In the very soft organic bottom material I found some blood worms, other midge larvae, and aquatic earth worms. The type of bottom in the creek is not favorable to insect life. It is very soft and almost bottomless and has a high organic content which makes it very acid.

I was unable to see or collect any trout. I collected the following fishes at the mouth of the creek just above the screen: common sucker (Catostomus commersonnii), Johnny Darter (Boleosoma nigrum nigrum), and two minnows (Margariscus margarita nachtriebi and Hybognathus hankinsoni).

Conditions are not very favorable for trout in this stream. The winters would be very severe on them, since the food supply is meagre and the water is so shallow that during very cold weather there would be serious ice action. The large amount of sphagnum moss around the creek may explain the absence of trout, since it has been found that leachings from the moss are poisonous to fish until the water has been very well aerated.

It would be well I believe to form some pools in this creek, and to try a modest planting of fish; then to watch the fish very closely to see how they thrive.

Since the bottom is very soft, holes would have to be made by sinking a cribbing and then cleaning out the unwanted material. In selecting a place for

this cribbing an effort should be made to put it where a spring is entering from the bottom or jam the side of the stream. The pool formed in this cribbing should be at least 4 ft. deep. It seems desirable to put some cover over these holes. This could be done by sinking long stakes at the corners of the cribbing, then fastening a raft of poles to them so the latter would give cover over the pool formed by the cribbing. Six cribbings would be sufficient to test their results. If, after forming pools and planting trout, no fish results, I believe efforts to make the stream into trout water should be given up. Care must be taken to insure that the fish are not poached. If this stream proves unsatisfactory efforts will have to be concentrated on the spring holes which can and will produce good trout.

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