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cc: Mr. Ruhl
Mr. Lydell
Dr. Leonard

INSTITUTE FOR FISHERIES RESEARCH
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ALBERT S. HAZZARD, PH.D.
DIRECTOR

ADDRESS
UNIVERSITY MUSEUMS
ANN ARBOR, MICHIGAN

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CURSORY OBSERVATION ON CERTAIN MARGINAL TROUT STREAMS OF KENT COUNTY, TOGETHER WITH RECOMMENDATIONS FOR IMPROVEMENT DEVICES TO BE INSTALLED IN HONEY CREEK, KENT COUNTY

J. W. Leonard

At the request of Mr. Claude Lydell, Supervisor of Fisheries Operations, District Number Eight, the writer devoted parts of April 4 and 5, 1939, to a hasty inspection of certain Kent County streams. Mr. Lydell accompanied the writer and, so far as was possible, supplied him with a general account of the fishing history and present rod pressure for each stream examined. This report is prepared with a view to recording some of the more salient observations made in the hope that they may serve as a basis for more detailed investigations at a future date.

The Kent County Conservation League has recently acquired a tract of land, 90 acres in extent, which includes about one-half mile of Honey Creek, a tributary of the Grand River, lying in Section 23 of T. 7 N., R. 10 W. It is the desire of the membership to install, by their own effort, various stream improvement devices in this portion of the stream and in accordance with this wish they sought advice on how to plan and execute such a program.

Honey Creek through the holdings of the K. C. C. L. is a small, meandering stream with a flow, when inspected, calculated at 5.0 cubic feet per second. Its banks are for the most part low, between ten inches and two feet in height. They are well sodded with grass to the very

edge, rendering erosion a factor of little importance. Very dense shade is supplied throughout a major portion of the course by a mixed growth of elm and basswood, with thick clumps of young ironwoods fringing the water's edge. In many places the binding effect of the ironwood roots has permitted extensive undercutting of the low banks, resulting in the formation of attractive natural "hides" for trout, simulating rather closely the ecological situation created by tag alder along more northern trout streams. (See Plate I).

Through the upper third of the section the bottom is largely composed of sand with a large admixture of silt and muck, which causes the water to become roiled when the stream is waded. Proceeding downstream gravel begins to appear, and soon becomes the dominant bottom element. Throughout the section examined there appeared to be a paucity of pools. According to the standard classification of pool conditions[1] a rating of $S_3T_2F_3$ would be warranted. Few pools occur in mid stream, but shallow pools partially overhung by the banks are found along the edges. The lower two-thirds of the stream is characterized by numerous attractive gravel riffles.

Food conditions in the gravel areas were considered very good. Nymphs of an early spring mayfly, Ephemerella subvaria, and larvae of the common stream caddis Hydropsyche sp., were very abundant and generally distributed on submerged stones and brush. Larvae of various midges (Chironomidae and Ceratopogonidae) were observed in numbers. Although no quantitative samples could be taken in the time available, it seems safe to opine that food conditions are at least Grade 2 and quite possibly Grade 1 through the winter and spring months.

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1 Inventory Methods, 1938, mimeo. By A. S. Hazzard & C. J. D. Brown

A large number of spring feeders and seepages enter the stream, and, according to Mr. Lydell, maintain the stream at a temperature within the tolerance limits of brook trout.

The early date of the inspection made it impossible to appraise the kinds and abundance of aquatic plants in the stream. Most of the spring seepage areas contained watercress; and it is probable that during summer this species extends its range of occurrence. Various mosses and algae grew on stones in the stream bed.

In the opinion of the writer, no great amount of stream improvement is required by Honey Creek. Throughout the greater portion of the section examined shade from trees and shrubs was dense, too dense to allow much dry-fly angling. The League membership appears to prefer this situation; therefore no recommendations for pruning were made. Except in the upper reaches, fine stretches of gravel, ranging in size from that of a marble to that of a man's two fists and bearing porous, food-harboring incrustations of marl, are quite numerous. Unless summer water temperatures rise higher than the volume of spring water increment would indicate, the rate of flow is fast enough.

The condition considered to be in greatest need of alteration was the poor quality and small number of pools. Accordingly, a list of recommendations for structures was drawn up with special emphasis on structures designed to produce pools. Twenty-four devices (see appendix for details) were suggested, with the idea that after they have passed through a winter other structures may be placed, to incorporate modifications which may be indicated by the fate of the initial installations. Too little stream improvement has been carried out on southern Michigan waters to empower the designer to make certain predictions as to its success. It is imprudent to initiate a large-scale stream improvement program until reliable data are at hand bearing on such problems as the

extent and severity of winter ice action, tendency toward flooding in spring or late fall, and dependability of summer water supply.

A complete catch record from the League's section of Honey Creek would be most useful when developing additional management plans. In view of the large membership (nearly one thousand), the League may find it necessary to stock a certain number of legal fish at the beginning of the season, or to impose catch limits considerably below the present state limit if they wish to maintain fishing throughout the season. Honey Creek has been stocked regularly during the past, but no observations have been made on the extent and success of natural reproduction there. No young fry were seen by the writer while cruising the stream.

Bear Creek, a tributary of the Grand River, was viewed briefly where crossed by roads in Sections 19, 20 and 29 of T. 8 N., R. 10 W. (See PlateII). As shown in the photograph, the stream where examined was almost wholly devoid of any shade or cover, and flowed through heavily pastured fields. In spite of this, the bottom was composed almost entirely of mixed gravel and rubble, and the water itself was clear and free from turbidity. Spring feeders and seepage areas appeared to be numerous. It is quite possible, therefore, that streamside plantings of trees and shrubs protected from cattle, augmented by suitable stream improvement devices, might result in the creation of several miles of productive trout water in a location admirably suited for easing the strain of rod pressure on trout streams further north. From the character of the bottom it would appear almost certain that food conditions would be adequate for the support of trout.

A spring tributary of Bear Creek is shown on Plate III. It may be seen that beds of watercress fringe the edge of the stream, and that the bottom contains a considerable amount of fine to moderate gravel. After flowing through fields for about half a mile the stream enters a tamarack swamp.

Hansen's Creek and Wabasis Creek were seen in Section 14 of T. 9 N., R. 9 W. The first named flows through a dense willow swamp. Seldom over three feet wide, it offers sport to those who enjoy angling with a short rod and section of line. Several brook trout were seen under the shelter of a culvert. Wabasis Creek is a larger stream, well provided with shade and gravel bottom. It is probable that water temperature is its limiting factor as regards trout production.

Shaw Creek in Section 25, and Stegman Creek at the corners of sections 13, 14, 23 and 24, T. 9 N., R. 11 W., and several sections of the Rogue River, were examined briefly. Little can be concluded as to their possibilities for trout production until information is available on peak summer temperatures.

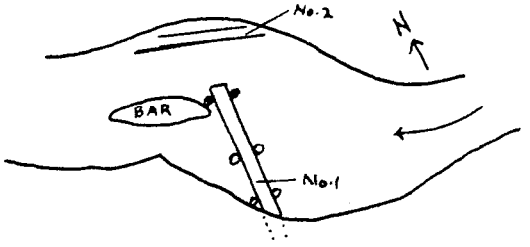
INSTITUTE FOR FISHERIES RESEARCH

By J. W. Leonard
Assistant Aquatic Biologist

APPENDIX

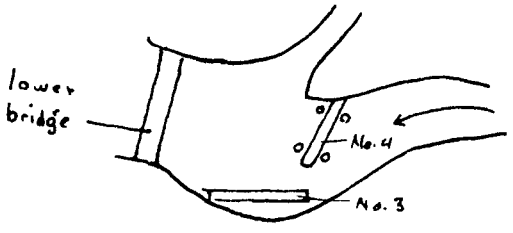
List of Improvement Devices Recommended For
Honey Creek, Kent County

1. Wing deflector from left bank to 1 ft. beyond upper end of mud bar. 45° angle upstream.
2. Bank cover just below outer end of #1 to protect right bank and dig protected hole.



East side of creek.

3. Large log parallel to left bank at water's edge.
4. Wing deflector on right bank, bank end to be placed about 15 feet above mouth of tributary at 30 degree angle--to throw current against log # 3 wing deflector should be about 20 feet long or long enough for outer end to reach mid point of channel.



5. Same as No. 1.
6. Same as No. 2.
7. Remove poplar tree. Use for deflectors.

Main Stream

8. V deflector, to accelerate current through sluggish, sandy bottom section.
9. Bank cover, to dig hole and protect bank from current deflected by No. 10.
10. Deflector 6 ft. above elm run at 45 degrees across creek to throw current under brush.

11. Log deflector about 1/2 way across stream at 45 degrees.

12. Bank cover.

13. Bank cover if needed.

14. Log deflector 1/2 across stream. Not strong enough current.

15. Single log 30 ft. long or separate logs of that distance, to serve as cover for natural holes and to increase its depth.

16. Log deflector rather gradual so as to throw current not too squarely into bank protected by No. 15.

17. Log deflector and bank raft.

18. Opposite #18--1/3 way across creek.

19. Short deflector to protrude to point 3 feet from bank.

20. V deflector, to accelerate flow and direct it under alder bank.

21. Log deflector--narrow angle about 30°.

22. Bank raft 30 ft.

23. No bank protection unless needed later. If erosion sets in, a bank cover, one log wide and 20 feet long to protect bank.

24. Log deflector about on angle with basswood now above stream.

General Suggestions on Materials and Construction

Unless stones and boulders at least as large as a man's head are available, logs should be used. The size of the logs will be determined largely by what is available. A discussion of materials will be found in Institute Bulletin No. 1 by Hubbs, Greeley and Tarzwell, and in the MECW Handbook.

The bottom log of a wing deflector should be embedded almost full thickness in the streambed. Logs should be laid on top of it until 3 or 4 inches above high water level, as the purpose of a deflector is partially

defeated if water washes over the top. Inner, or bank ends of all deflector logs, should be dug back at least 2 feet into the bank to insure against being cut around by the current.

Stakes supporting deflectors should be long enough to drive at least 5 feet into the bottom. When the structure is complete, the tops of the stakes may be sawed off flush with the deflector.

Bank covers may be designed according to plans for bank cover, #5, in MECW Handbook, or according to directions in Institute Bulletin No. 1. The MECW design is best if the cover is to be only one or two logs wide.

Be sure to seal all wing deflectors with gravel and stone, even if these must be hauled in. Deflectors in soft bottom streams undercut in a very short time unless this seal is carefully executed.

At all times endeavor to keep wire, nails, staples, etc. as well concealed as possible to avoid the appearance of artificiality.

When available, one or two large boulders should be placed on each side of deflector to increase its resistance and to create additional "hides" for trout.

Plate I

Honey Creek near upper end of frontage held by Kent County Conservation League. Notice sand and muck bottom, slightly undercut banks, and heavy stream-side shade. This photo shows the site of proposed devices 1 and 2, a deflector to confine stream to right channel, a raft to protect the right bank.

Plate II

Bear Creek, Kent County, showing complete lack of bank cover brought about by heavy pasturing.

Plate III

Tributary of Bear Creek, Kent County, showing general character of spring feeders in this vicinity.