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EXAMINATION OF SOME STREAM IMPROVEMENT IN THE HURON AND THE MANISTEE NATIONAL FORESTS

by

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On July 22 I met W. A. Elkins, in charge of wildlife work for Region 9 of the U. S. Forest Service. After a short conference in the Supervisor's office at East Tawas, Messrs. Elkins, R. E. Crowell, Gifford Adams and John Frauson, respectively Supervisor, Wildlife Technician and District Ranger of the Huron National Forest, and I examined Silver Creek for approximately one mile from about a mile below the trout rearing station downstream. The upper part of this section flows through old beaver meadows; the lower end through dense cedar. Following removal of beaver dams in 1935, log wing deflectors and underpass logs were installed to flush out the accumulated muck, narrow the stream bed, create pools and if possible expose gravel bottom. Most of the deflectors appear to have remained in place and solid bars of sand and silt have established downstream from all which did not undercut. Some deflectors which undercut at the ends were lost; others are acting as digging logs and have created fair pools. The bottom in this section is dominantly sand and no gravel was evident for at least a foot below

the present bed. However, some of the deflectors have caused the current to sort out shallow bars of gravel on top of the sand. At a few bends some slight bank erosion was evident which might be controlled by the use of boom logs. Some additional deflectors and covers (anchored stumps or bend rafts) might be installed in this section, but on the whole it appears to be quite suitable trout habitat and doubtless has been much improved by the removal of beaver dams and installation of structures. Bank planting as proposed by Mr. Adams should be helpful in lowering temperatures and stabilizing bank margins.

At the upper end of the densely wooded section, beaver have built a dam which should be removed and kept out by live-trapping the beaver if necessary. Temperatures in this part of Silver Creek are already high, so that any impoundment and warming of the water should be avoided.

The stream channel through the cedar swamp is wider than desirable, but the numerous down logs acting as underpass deflectors have scoured out many small pools and provide good cover. It seems questionable whether trout habitat could be greatly improved in this section without considerably altering the natural beauty of this part of the stream.

That evening Elkins, Adams and I fished the East Branch of the Au Gres River in the southern part of Iosco County about two miles north of M-55. This stream contains a few good pools, but if the section I fished is typical, I believe the stream could be improved considerably by the use of wing deflectors.

On July 23, Messrs. Crowell, Elkins, Adams, District Ranger Brayton and I inspected the South Branch of the Pine River and the East and West Branches of Big Creek near Luzerne. Due to cloudbursts on the Pine drainage the night before, it was impossible to examine the work there

properly. We therefore inspected the West Branch of Big Creek for about one mile above M-72. As temperatures taken on this stream earlier had shown the water to be dangerously warm, improvement was aimed at directing the channel toward shaded banks, narrowing the stream bed by deflectors and cutting off side channels. Deflectors were also installed in hopes that sand would be removed from gravel found to be present a few inches below the sand. The original work was done in 1936 but some maintenance was necessary this year. A few triangular covers anchored to logs in midstream and some stumps had been used effectively. As all structures had been sodded, the appearance was very natural. In fact, several covers had to be examined very closely to determine that they had been man-made.

The improvement in this section of the West Branch of Big Creek appears to be well constructed and with some unavoidable maintenance should be effective indefinitely. If Mr. Adams' memory of conditions prior to improvement is correct, the deflectors have functioned admirably in removing sand and exposing productive gravel. Except just above the bridge, gravel is the dominant bottom type in midstream. Double wing deflectors set one several feet above the other have created pools which could not be waded with hip boots. It is possible that altering the usual design of the V deflector in this way may result in a better pool for trout providing that the downstream deflector can withstand the full force of the current which is thrown against it by the upstream arm of the V.

Trout were observed using artificial covers and pools formed by deflectors. It was also evident that in a number of places the stream channel had been narrowed by at least one-third and that the current had been successfully directed toward shaded banks or spring seepage areas.

Although comparable temperatures are not available, it would seem that the improvement should have resulted in cooling the stream to some extent. When examined by us, water temperatures were well below the critical point for brook trout in spite of an air temperature of 89 degrees and trout were observed in the stream at various points.

The East Branch of Big Creek was examined briefly about one mile above M-72. Mr. Adams reported that this branch was considered too cold for good trout production and that improvement had been designed with a view to raising temperatures as well as creating additional pools. That this attempt has not been entirely successful was evidenced by a temperature reading of 57° F. with an air temperature of 89° at 6 p.m. Log dams about two feet in height had been used at the point where the stream was examined. Although considerable silt had accumulated in the margins of the small ponds, wing deflectors were keeping much of the bottom clean and good depth was still present over most of the area. Although the use of dams in the majority of Michigan trout streams has usually been discouraged by the Conservation Department, it appears that on this stream they should be considered proper if constructed or maintained so as to be permanent and if, as in the case of the one examined, depth is maintained by the use of deflectors. It is suggested that stream side timber removal, judiciously effected, might be considered in the program of raising water temperatures on the East Branch of Big Creek. Preliminary findings of Dr. J. W. Leonard, in charge of the Department's Hunt Creek Fisheries Experiment Station, indicate that some Michigan streams are deficient in fish food production, presumably because they are too densely shaded.

Stream improvement on the White River was inspected at the bridge east of Etna. About one-half mile of stream was cruised by Mr. Elkins, Mr. Horn and the writer on July 26. The work consisted mainly of log crib and rock fill double wing deflectors placed at a slight angle upstream. Single wing log deflectors held in place by pole and wire mats loaded with boulders were also used. A number of large stumps had also been staked in positions where the current had caused small pools to be formed under them. This work was done in 1939 under the direction of Harry Adams, formerly District Ranger. Long, deep pools have been created by these deflectors and many trout were reported caught from them early in the season. A creel census operated by the Forest Service at the request of the Institute has shown this to be a "seasonal trout stream" in the section improved. Very few trout have been caught there since about July first, when the water presumably warmed above the limit of toleration and the trout retreated to colder sections. Trout will probably utilize these pools for nine or ten months each year, which would seem to justify the improvement on this marginal trout water.

I question the permanence and therefore the value of stump covers in this part of the White River. Since it warms up in summer, it undoubtedly carries considerable ice in winter. Dr. Tarzwell's experimental work for the Institute has shown that stumps cannot be held effectively in streams which freeze over. One stump cover which had presumably been lost this way was noted washed up along the bank.

We next examined deflectors at the U. S. Forest Service Pine camp ground on the White River. These were log-crib, rock-fill single wings installed to check erosion of the bank at this camp site. The deflectors are at a downstream angle and extend almost to the middle of the channel.

The tops are barely above water at flood stage. These structures are reported by Mr. Horn to have required 20 man-days including securing the material. They appear to be doing effective work.

On July 27 a trip by canoe was made down the Pere Marquette River from about one mile above the Pere Marquette Club to County Road 669 crossing--approximately 18 miles of stream. Mr. Iverson, District Ranger, and Mr. Horn, Wildlife Technician of the Manistee National Forest, conducted us (Elkins and writer). The trip was made to inspect stream improvement and bank erosion control installed by state CCC camps in 1933 and 1934. The great majority of the log wing deflectors have washed out, stakes presumably having been pulled by ice action. Some of these structures could probably have been saved by proper maintenance, although much of what remains does not appear to have been well located or properly built. Most of the attempts at bank erosion control have also failed due to inadequate protection of the base of the bank. Log cribbing at these points, while still holding in some places, has largely washed through, allowing the bank to continue sliding. Possibly, as suggested by Mr. Iverson, the spaces between the log cribbing accelerated rather than retarded erosion of the bank. Mr. Iverson has given this problem considerable thought and he has discussed it with the Forest Service district engineer, who helped design the White River work previously referred to. They are proposing an experimental installation this summer of wing deflectors faced with planks treated with creosote. These should prevent entrance of currents which presumably caused the loss of the bases of the earlier control structures. From observation of log-crib, rock-filled wing deflectors in the West and in New York and Connecticut, where these

structures are used to divert the current away from eroding banks, I believe the idea is sound and should be given a trial. Such deflectors are further effective in improving fishing as each structure creates a pool at the end. A series of these necessary to protect a bend in the river would have the added advantage of varying the trout habitat and making a series of "homes" for good-sized trout instead of a single long pool which might be pre-empted by one large trout. Although we know little of the territorial requirements of trout, it is suspected that a four pound brown trout may dominate a rather large pool, and if there is only one choice feeding or hiding spot in it, the pool will be unproductive of other fish until the original occupant is removed and even then it continues to shelter only one large fish which moves in shortly after the original occupant is caught. Stoddard's quail investigations have shown that the only way to increase the number of birds per acre is to break up the territory controlled by a male through planting hedges or otherwise limiting a single bird's area of domination. I believe this principle is applicable also in fisheries management.

In contrast to the failure of the majority of the erosion control structures, bank plantings, especially of black locust, made at the same time have been generally effective. Dense thickets of these desirable wildlife trees have covered many of the formerly barren sand slopes. Wherever the base of the bank still holds these plantings are thriving, but in many places erosion has begun again and huge sections of the banks, including some with plantings, are slipping into the river. If the experimental structures proposed by Mr. Iverson are effective, it would seem desirable to install these first where plantings are now thriving and where there is danger of them being lost.

On this trip two brown trout, one 11 inches, the other about 16 inches, were picked up. These fish had just died and showed symptoms of furunculosis. The diagnosis was verified from smears made from these fish by Mr. Allison and reported in Report No. 610. A more severe epidemic of this same disease occurred in this stream in 1937.

It was felt that this field trip with Mr. Elkins was of considerable value in affording an opportunity for exchange of ideas and discussion of problems of mutual interest. The examination of this improvement work should be helpful to both agencies in future relations and programs.

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