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OBSERVATIONS ON THE OPERATION OF THE FISH LADDER OF THE REEDSBURG DAM ON THE MUSKEGON RIVER

by

W. F. Carbine

This report has been written at the suggestion of Dr. Hazzard in an attempt to answer some of the questions regarding the operation of the fish ladder that Mr. Martin Webb of the Game Division mentioned in a memorandum to Mr. Westerman on May 1, 1941.

Between April 17 and 20 the writer was at Houghton Lake investigating spawning conditions for northern pike and several trips were made to the Reedsburg Dam both by day and at night to determine to what extent the fish ladder was being utilized by fish.

At this time all of the stoplogs were out of the dam and approximately two feet of water was flowing over the dam. Because of this tremendous amount of water going over the dam, it is doubtful whether any fish could buck the swift current of the ladder. Many large suckers, and a few small suckers (5 to 10 inches long), a few dogfish, numerous sticklebacks, red-bellied dace and other minnows were working upstream along the river's edge toward the dam. Some of the larger suckers were attempting to jump over the dam, but were unsuccessful in their attempts. No fish were observed working upstream in the middle of the river and none was noticed using the fish ladder.

see file on this dam in Missaukee Co dam file

On May 13 and 14 the writer again made a trip to Houghton Lake. Approximately four hours were spent at the dam on May 13 and one hour on May 14. Thewater going over the dam was approximately six inches lower than on April 17, but was extremely swift in the fish ladder. Suckers were unsuccessful in their attempts to jump over the dam. Occasional fish were moving near the center of the river in the vicinity of the fish ladder. Minnows were still fairly numerous along the quiet water at the river's edge. Many large redhorse and a few suckers were observed immediately above the dam. These fish were apparently not making any effort to go over the dam. Several hours were spent diligently watching the fish ladder for signs of fish, but none were observed to use it. It is believed that the water in the ladder was still too swift for fish, or else they were not attracted to it.

The majority of the northern pike, walleyed pike, suckers and redhorse had spawned by the middle of May. Many of the suckers and redhorse that were observed (several were captured by means of a hand net) were in such a weakened condition that they were barely able to buck the weak current near the banks of the river. These fish would undoubtedly be unable to negotiate the swift water of the fish ladder.

From the observations that have been made at the Reedsburg Dam, it is the writer's opinion that very few fish used the fish ladder during the period of high water. This may have been due to the following: (1) the swift water in the ladder; (2) because the bulkheads in the ladder were too close together; (3) the current in the ladder, being equal to that flowing over the rest of the dam, failed to attract fish to the ladder; and (4) that the fish ladder may not be located in the proper place in the dam.

The first two factors mentioned above could probably be remedied by placing stoplogs in the ladder during periods of high water. Some experimentation would undoubtedly be necessary before the correct combination of stoplogs could be found. It is the opinion of the writer that the fish ladder should have extended half again as far downstream. When all of the stoplogs are out of the dam, an equal amount of water flows over the entire dam, ladder included. One of the primary functions of a fish ladder is to attract fish by means of a greater current than is found at any other place at the dam. It is rather difficult for the present fish ladder to accomplish this purpose because it does not extend downstream far enough and the amount of water going over the dam and in the fishladder is equal. We know very little about the operation of fish ladders, but from observations made, it is our belief that perhaps two ladders, one at each end of the dam, might have been more efficient than the present ladder.

Results obtained from the operation of the weir on the Muskegon River, just below the County Dam, in 1939 and 1940, showed that just a few walleyed pike and northern pike leave Houghton Lake in the spring to run downstream to spawn. Tagging results indicate that most of the northern pike that moved downstream to spawn, later returned to Houghton Lake. Tagging experiments also showed that most of the pike that passed through the weir in the spring and early summer were Houghton Lake fish and not normal residents of the river. After weighing the evidence at hand, we are of the opinion that even though the fish ladder is not too successful, that little difference will result in the fish population of Houghton Lake whether the fish are able to get over the dam or not. The loss of these few fish should be more than counterbalanced by the fish that are produced in the new pond. Of course we do not know just how far downstream the few pike and walleyes from Houghton Lake go to spawn. It may be found later

that they do go below the dam some distance to spawn.

Mr. Tom White, Conservation Officer at Houghton Lake, reports that very good catches of northern pike have been made immediately below the Reedsburg Dam during the month of May. On May 27, he estimates that about one hundred pike were taken. Perhaps these fish were attempting to get over the dam. This might indicate that the fish ladder is not being used by northern pike or else that the pike find an abundance of food and other things to their liking below the dam and desire to remain instead of trying to get over.

As long as a fish ladder is present in the Reedsburg Dam, it would be desirable to have it operating as efficiently as possible. This would require some experimentation. At the same time that this experimentation occurs, the effect and importance of the movement of fish over the dam could be determined.

INSTITUTE FOR FISHERIES RESEARCH

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