



Restoration of Hardwood Creek

Project # 00-214



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I. INTRODUCTION

Hardwood Creek, a tributary in the headwaters of the Black River, is located in Otsego County, MI (see map, Figure 1). Flow of this creek was impeded at its only road/stream crossing on Chandler Dam Road. A small plastic culvert restricted the flow of the creek, backed up the water, and created a small impoundment that

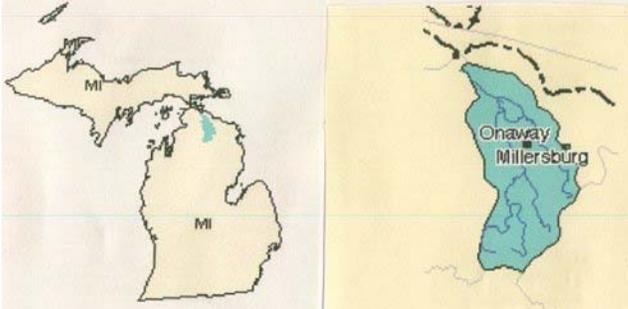


Figure 1. Location of Black River Watershed

warmed the water, and washed out the road during instances of high precipitation. Additionally the culvert was perched on the downstream side of the road, which created a fish passage barrier to a native population of brook trout. Active local beaver populations further impeded the flow of Hardwood Creek at this crossing by clogging the culvert with

woody debris. Although the restoration of this crossing is a high environmental priority, it is not a high priority for the county road commission. Located in the heart of the Pigeon River State Forest, this road gets little traffic. Primary users are sportspersons, tourists, logging trucks, and oil and gas well companies. Tax dollars in sparsely populated counties are spent on roads in the more populous sections of the county. Although this crossing caused considerable problems for the road commission by washing out at least once a year, the annual funding of the road commission did not allow for culvert replacement.

National Fish & Wildlife Foundation (NFWF) funding allowed for the U.S. Fish and Wildlife Service (Service) and partners to remove the plastic culvert and replace it with a 6'8" x 4'8" x 30' wooden box culvert. The culvert was made in Michigan utilizing red pine harvested in Michigan. A wooden culvert was chosen to accommodate aesthetic concerns as well as cost and functionality. The box culvert allows for fish passage, can accommodate a 50-year flood, and allows the stream to regain unimpeded flow.



Figure 2. Hardwood creek with plastic culvert. Notice the culvert is floating. April 1998

II. PHYSICAL & BIOLOGICAL IMPEDIMENTS

The plastic culvert caused a number of physical and biological impediments to Hardwood Creek. The first and most obvious impediment was that the culvert restricted flow in the creek, and backed up the water to create an impoundment. The road acted as a dam, and during events of high precipitation the water would crest over the road and wash silt, sediment, and gravel into the creek. Gravel, sand and silt from the road were evident over ½ mile downstream from the road crossing. This excess sediment loading altered the hydrology of the stream filling pools, riffles, covering large woody debris, and created a stream habitat with little variance. The shallow impoundment created by the culvert acted as a silt trap, and warmed the water. Warmer water decreases the amount of dissolved oxygen available to aquatic organisms, and can warm the stream to a point where temperature-sensitive brook trout are unable to live.



Figure 3. Hardwood Creek washing over the road, April 1998

The culvert acted as a fish passage barrier. The downstream side of the culvert was perched, making it impossible for brook trout or any other fish to move upstream. A grate placed on the intake side of the culvert to thwart beaver activity not only did not slow the beaver but also acted as a “trash rack” collecting floating debris and not allowing woody debris to pass downstream. This added to the ineffectiveness of the culvert.

III. PROJECT CONSTRUCTION

Construction on the Hardwood Creek/Chandler Dam Rd. crossing began in early September, and ended with the placement of the culvert the first week of October. In early September a temporary culvert was placed to drain the impoundment and to act as an alternate outlet for the creek during the placement of the wooden box culvert. The impoundment was drained slowly to reduce erosion, and by the end of September the site was ready for culvert replacement. The old culvert was removed, a new base was set, filter fabric was placed, and the four sections of culvert were placed and aligned by



Figure 4. The drained impoundment, Oct. 2000

Lowshaw Brothers' crane. Lowshaw Brothers gave a 50% discount of their usual rates due to the environmental nature of this project.



Figure 5. Lining up sections of the box culvert, Oct. 2000

An Intra-Service Endangered Species Assessment was done for this project (see Appendix I), and it was concluded that none of the Endangered Species potentially located in the vicinity of the construction site would be adversely affected by this project. Due to the proximity of a bald eagle nest construction was delayed until late August to allow the eagle chicks to fledge. There was some discussion concerning the draining of the impoundment. Historic aerial photographs proved that the impoundment was created due to road construction in the 1950's. Prior to construction the land in question was an unforested wetland. Draining the impoundment was considered to be beneficial for two additional reasons: 1) it restored the wetland to its original state, and 2) habitat was restored for the eastern massasauga rattlesnake, a federally endangered species. The rattlesnake's prefer to nest in unforested wetlands.

IV. PARTNERSHIPS/BUDGET

NFWF funds were matched 4.5:1 by non-federal funds both by in-kind and cash donations by five partners (see table). Through this funding the Service and partners provided the Otsego Road Commission with all materials needed for the project, and the Road Commission provided the labor and equipment for installation of the culvert.

Partners	In-Kind Contributions	Cash Contributions	Total
MI Dept. of Natural Resources	\$ 1,993		\$ 1,993
Upper Black River Watershed Restoration Committee	\$ 1,409.82		\$ 1,409.82
Huron Pines RC&D	\$ 2,830	\$ 5,000	\$ 7,830
MI Flyfishing Club		\$ 3,000	\$ 3,000
Otsego County Road Comm.	\$ 29,980.81		\$ 29,980.81
TOTAL	\$36,213.63	\$ 8,000	\$ 44,213.63

IV. CONCLUSION

Restoration of this road/stream crossing has alleviated all biological impediments caused by the former culvert. The wooden box culvert compensates for a 50-year storm event, and allows the creek to once again flow freely. The former reservoir will have extensive new growth by early summer 2001, and revert into a non-forested wetland. This

is the first time in 40 years that Hardwood Creek was able to flow in its original channel and allow passage of fish and nutrients at the crossing. Hardwood Creek is now being utilized as a demonstration site for other northern Michigan crossing restorations. It is an excellent example of what partnerships can accomplish with minimal amounts of funding. This project highlights the benefits restored crossings can provide to our natural resources.



**Figure 6. The completed culvert,
Nov. 2000**