



Upper Black River Road Crossing Restoration



Tin Shanty Bridge



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National Fish and Wildlife Foundation

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INTRODUCTION

Two culverts were removed and replaced with a 28 ft. steel span on the main branch of the Black River in Otsego County on August 23rd, 1999. Twelve organizations from federal, state and local government, local industry, and non-governmental organizations



Figure 1. Tin Shanty Bridge, before restoration

partnered and pooled their funding to restore Tin Shanty Bridge. Concern had grown by local groups because this road/stream crossing was a large source of sand and silt pollutants into the watershed. The two culverts at the crossing acted as fish passage barriers as well (see Figure 1). The Upper Black River is renowned throughout Michigan as containing an excellent native brook trout fishery. The high sediment loads coupled with the lack of fish passage made the restoration of this road/stream crossing a high priority for all involved parties.

BIOLOGICAL IMPEDIMENTS

There were a number of problems that contributed to the sediment load in the stream and the blocking of fish passage. Due to inadequate culvert size this sand/gravel road periodically washed out during high water events (see Figure 2). The sand and silt from the road washed directly into the river, contributing several tons of sediment to the watershed with every incident. Sediment filled in several river-miles of brook trout spawning habitat, located directly downstream from the road/stream crossing. The culverts were also fish passage barriers to a native strain of brook trout. Spawning habitat is located both upstream and downstream of this road/stream crossing. The culverts were perched. Perched culverts mean that the culverts were not properly placed in the streambed. Downcutting resulted on the downstream side of the culverts, making fish passage from the downstream side challenging if not impossible. The restrictive size of the culverts backed up water, warmed it, and created an accelerated flow through the culverts to compensate for the size restriction. These factors effectively blocked fish passage.

Restoration of Tin Shanty Bridge has alleviated the restriction in the river, allowing the river to regain its natural flow rates and natural stream bed, it no longer blocks fish passage, and the bottomless span compensates for 50 year storm events.



Figure 2. Before restoration the road would wash out.

PARTNERSHIPS/BUDGET

Planned for almost two years, this project cost over \$100,000. Twelve federal, state, and local organizations partnered to carry out this enhancement (see Figure 3). Huron Pines

RC&D through their “Better Back Roads” program organized the meetings, acted as treasurer for the partnership, and oversaw all aspects of the construction. Trout Unlimited (TU) donated \$19,000 from a combination of four Michigan chapters matched with \$10,000 from an Embrace-A-Stream grant from National TU. Shell Noreast donated \$10,000. The U.S. Fish and Wildlife Service (Service) through a National Fish and Wildlife Foundation grant was able to contribute \$20,000 to the cost of the structure. The Montmorency County Conservation Club (MCCC) donated \$10,000 through a



Figure 3. Sign displayed at dedication ceremony listing partners.

FishAmerica grant, and provided some in-kind labor as well. The Otsego Wildlife Legacy Society (OWLS) donated \$4,000. The Otsego Road Commission, NRCS, Michigan DNR (Forestry and Fisheries Divisions), Michigan DEQ, and Upper Black River Watershed Restoration Committee (UBRWRC) provided extensive In-Kind Services (see Figure 3). Both the excavator operator (hired by the Otsego Road Commission) and Lowshaw Brothers (crane rental, hired through OWLS) worked for half price due to the nature of the project. A table documenting both In-Kind and Cash sources follows (Table 1).

TABLE 1

Partners	In-Kind Contributions	Cash Contributions	Total
National Fish and Wildlife Foundation (USFWS)	\$2,800	\$20,000	\$22,800
Otsego Road Commission	\$36,200		\$36,200
Trout Unlimited	\$1,236	\$17,797	\$19,033
Shell Noreast		\$10,000	\$10,000
Huron Pines RC&D	\$6,595		\$6,595
Michigan DNR	\$4,925		\$4,925
Michigan DEQ	Permit Acquisition		
MCCC		\$10,000	\$10,000
OWLS		\$4,000	\$4,000
UBRWRC	\$4,100		\$4,100
TBRWRC	\$1,200		\$1,200
Lowshaw Brothers	\$517		\$517
Earthworks	\$1,775		\$1,775
TOTAL	\$59,348	\$61,797	\$121,145

All partners signed a partnership agreement (Appendix A) as funding was acquired, and as groups became aware of the contributions that they were able to donate. This partnership agreement served as a gentleman's agreement, and spelled out the contributions of each group. The agreement was given to all media that reported on the restoration, and was given to local interested parties.

ASSEMBLY OF BRIDGE

The "bottomless culvert" (bridge) was purchased from St. Regis Culvert, Inc., and was delivered the week of August 9th to an assembly site ¼ mile north of the road/stream crossing. The bridge came unassembled. Pieces fitted together with large nuts and bolts like a Tinker Toy from childhood days (see Figure 4). A forklift from the Otsego Road Commission was utilized to position the pieces during assembly. The Michigan Civilian Conservation Corps (MDNR) were the majority of the workers present, and members of the road commission and a representative from St. Regis were on-site at all times to supervise. The bridge was fully assembled in two days.



Figure 4. Assembly of bridge

BRIDGE PLACEMENT

On August 23, 1999 Tin Shanty Bridge Road was officially closed, and construction began. The first difficulty was moving the new bridge to the site without warping it or damaging the structural integrity. Two large front-end loaders were used with large logs placed in the buckets to cushion the bridge as it was being moved.



Figure 5. Culvert removal

Once the bridge was on-site the excavator began culvert extraction. Water was diverted through one culvert as the other (culvert) was removed.

After the first culvert was removed the excavator leveled the area where the steel footings for the bridge would be placed. Removal of the second culvert soon followed, footings were leveled, and by 6:00PM the crane prepared to place the bridge. The bridge was placed and properly angled with the river by 7:30PM.



Figure 6. Placement of bridge by crane

The Otsego Road Commission placed the wing-walls and placed the fill over the bridge for the next two days. Rock rip-rap was placed by the Upper Black River Watershed



Figure 7. Tin Shanty Bridge after restoration

Restoration Committee against the wing-walls and along the footing to assist with stabilization of the structure. The Montmorency County Conservation Club hired a work crew of college students to assist the road commission, and to do the final seeding and “clean-up” of the site. The water levels of the river were so restricted by the former culverts, that by August 24th, the day after culvert removal, the river levels above the bridge had

dropped two feet. The culverts had affected flow and impounded water almost one river-mile above the crossing.

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Dan Boss, a reporter from CBS Affiliate TV 9&10 out of Cadillac, MI presented this restoration project on the popular “Hook & Hunting” segment of their news broadcast. Upper Black River Watershed Restoration Committee’s Chairman Robert Slingerland and Service Fishery Biologist Heather Enterline were interviewed for the report. (Note: a copy of the newscast and construction process is available on request.) The Montmorency County Tribune reporter Tom Williams was present on-site as well during construction and placed an article in the Tribune the following day (Appendix B).

DEDICATION CEREMONY

On October 5th, 1999 a dedication ceremony was held for all partners involved with the Tin Shanty Bridge restoration. The board from the Otsego Road Commission was present for the ribbon-cutting ceremony (See Figure 8). Representatives from all of the agencies and clubs involved were present as well. A copy of the program for the ceremony and the dedication sign is located in Appendix C. An article, printed in the Montmorency Tribune on October 6th, 1999 reporting on the dedication ceremony is located in Appendix C as well.



Figure 8. The ribbon-cutting ceremony dedicating Tin Shanty Bridge

ROAD/STREAM CROSSING INVENTORY FOR THE BLACK RIVER WATERSHED

The remaining \$8,000 from the \$28,000 grant awarded to the Service by the National Fish and Wildlife Foundation was used for a road/stream crossing inventory of the Black River Watershed. The inventory was modeled after similar inventories done in Northern Michigan. Each of the 56 road/stream crossings on the Black River Watershed were inventoried, photographed, and GPS coordinates were taken at each site. The purpose of the inventory was to examine the rates and causes of sedimentation to the river, condition of the structure (culverts, bridges), and to check for possible fish passage impediments. All conditions marked on the data sheet fell into a particular scoring category. When the inventory was completed, all data was

entered into a spreadsheet, scores were calculated, and then the road/stream crossings were ranked according to severity of erosion (and other impediments). This

ranking allows the Upper Black River Watershed Restoration Committee and natural resource agencies to focus their efforts and funds to repair the worst road/stream crossings. Each crossing will be listed individually in the inventory book, and the GPS coordinates have allowed a GIS specialist to pinpoint the road/stream crossings on a township map. The inventory will not be available in its entirety until the summer of 2000. A copy will be mailed to the National Fish and Wildlife Foundation as soon as it is available.



Figure 9. Road/Stream crossing impeding Tomahawk Creek. The culverts are barely functional.