The Pere Marquette and Pine River Road Crossings Improvement Project
In 2009, the US Forest Service awarded the Conservation Resource Alliance (CRA) and the Lake County Road Commission (LCRC) grants totaling $1,100,000 through the American Recovery and Reinvestment Act. CRA and LCRC provided an additional $650,565 in match and grants, and completed 8 stream restoration projects. The focus was replacing and improving road/stream crossings in Lake County in the Pere Marquette and Pine River watersheds. Lake County is home to 200,000 acres of public-owned land, much of it in the Huron-Manistee National Forest. The Pere Marquette and Pine Rivers are both National Wild and Scenic Rivers, and State-designated Blue Ribbon Trout Streams and Natural Rivers. Human disturbances such as outdated road/stream crossings are problematic to these rivers. They contribute excessive sediment, act as barriers to aquatic species, change the shape of the stream channel, and can impact water temperatures. In addition, Lake County is fairly rural and has one of the highest poverty rates of all of Michigan’s counties. The combination of existing partnerships, natural resource problems, and economic needs helped make the Pere Marquette and Pine Rivers in Lake County an ideal location for USFS ARRA support.
In August 2011, the Baker Creek and 56th Street crossing, site #L-51, completely failed. A high water event during which the area received 6 inches of rain in a 12 hour period, combined with woody debris getting lodged in the culvert caused the road crossing to wash out. The road was closed and the Lake County Road Commission (LCRC) received a temporary permit from MDEQ to re-install the existing culvert under the condition that it be upgraded to a larger structure in 2012. LCRC estimated that 150 cubic yards of sediment washed into Baker Creek and the Middle Branch from the failure event.

Prior to the wash-out, the culvert at 56th Street was undersized and perched thus blocking the movement of most aquatic organisms between Baker Creek and the Middle Branch, a main tributary in the headwaters of the Pere Marquette River. The Middle Branch has the coldest water temperatures and the most gravel beds of the 3rd order tributaries to the Pere Marquette mainstem. Baker Creek is the longest tributary to the Middle Branch, and flows mostly through wetland and forests. A bottomless arch culvert and paved road approaches now provide a stable and safe road crossing that allows fish passage and prevents runoff from reaching Baker Creek.

**PROJECT COST:** $162,128 including match

**LOCATION:** N 43.887605  W 85.732340

**BEST MANAGEMENT PRACTICES:**
- Replaced 48” diameter culvert with an aluminum arch 16’2” span, 5’1” rise, 45’ long
- 900’ of paving & curbing approaches
- 2 spillways & ditching
- Guardrail
- Fieldstone placement, slope stabilization & revegetation

**PROJECT BENEFITS:**
- Halt annual input of up to 3 tons of sediment from road into the river
- Restore passage for fish & other aquatic life to 2 miles of Baker Creek
- Restore the natural movement of woody debris & substrate
- Provide natural stream bottom under the road
- Prevent future threats of road crossing failure

**PARTNERS:**
- USDA Forest Service
- US Fish and Wildlife Service
- Lake County Road Commission
- Conservation Resource Alliance
- Pere Marquette River Watershed Council
- Michigan Department of Environmental Quality
- Pere Marquette River Restoration Committee
- Michigan Department of Natural Resources
- Wilcox Professional Services
- McDowell Construction

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*Before – The undersized culvert contributed to road failure.*

*During – Sheet pile footings isolate the stream from the work area.*
Sanborn Creek and Kings Highway

Sanborn Creek is the longest tributary to the Baldwin River, measuring over 10 miles. Sanborn Creek is a coldwater stream with a combination of gravel and sand substrate, a heavily forested corridor, and brook and brown trout populations. Site #L-82 is where Kings Highway crosses Sanborn Creek, and the site is located in the upper half of the subwatershed. Perched culverts blocked fish passage and altered the shape of the stream, impounding substrate and widening upstream reaches. Installation of a bottomless arch culvert that spanned the width of Sanborn Creek restored passage of all aquatic species, and allowed for a natural stream channel width and depth.

PROJECT COST: $181,669 including match

LOCATION: N 43.909019 W 85.711988

BEST MANAGEMENT PRACTICES:
- Replaced twin 36” diameter culverts with an aluminum arch 16’2” span, 5’1” rise, 58.5’ long
- Pavement
- Guardrail
- Fieldstone placement, slope stabilization & revegetation

PROJECT BENEFITS:
- Restore passage for fish & other aquatic life to 4 miles of Sanborn Creek & tributaries
- Restore the natural movement of woody debris & substrate
- Provide natural stream bottom under the road
- Prevent scouring & pool formation at the outlet
- Halt annual input of up to 1 ton of sediment from road into the river

PARTNERS:
- USDA Forest Service
- Lake County Road Commission
- Conservation Resource Alliance
- Michigan Department of Environmental Quality
- Pere Marquette River Watershed Council
- Michigan Department of Natural Resources
- Pere Marquette River Restoration Committee
- Wilcox Professional Services
- McDowell Construction

Before - The stream was slow and laden with sand.

The previous culverts blocked fish passage and formed a plunge pool at the outlet.
Sanborn Creek and Nelson Road

Site #L-60 is located downstream of the Kings Highway crossing, and is where Nelson Road crosses Sanborn Creek. In prior biological surveys conducted by the Michigan Department of Environmental Quality, habitat at this road crossing site was rated good and the macroinvertebrate community rated excellent with abundant sensitive species present. The issues reported by MDEQ at the site were the plunge pool from the culverts and lack of woody debris. With the installation of a bottomless arch culvert, the plunge pool has been eliminated and woody debris upstream is being uncovered by sand impounded by the previous undersized culverts.

PROJECT COST: $172,608 including match

LOCATION: N 43.910310 W 85.762123

BEST MANAGEMENT PRACTICES:
- Replaced 48” & 36” diameter culverts with an aluminum arch 16’2” span, 5’1” rise, 45’ long
- Pavement & 2 spillways
- Guardrail
- Fieldstone placement, slope stabilization & revegetation

PROJECT BENEFITS:
- Restore passage for fish & other aquatic life to 6 miles of Sanborn Creek & tributaries
- Restore the natural movement of woody debris & substrate
- Provide natural stream bottom under the road
- Prevent scouring & pool formation at the outlet
- Halt annual input of up to 1 ton of sediment from road into the river

PARTNERS:
- USDA Forest Service
- Lake County Road Commission
- Conservation Resource Alliance
- Pere Marquette River Watershed Council
- Pere Marquette River Restoration Committee
- Wilcox Professional Services
- McDowell Construction
Rural roads comprised of sand and gravel can drain into streams. The Baldwin River streambank is now stabilized as it flows along 40th Street.

### Baldwin River and 40th Street

The Baldwin River flows from the Luther Swamp, one of the largest wetland complexes in the Pere Marquette Watershed. The Baldwin River is one of the main tributaries that make up the headwaters of the Pere Marquette River. In 1883 and 1884, it was the Baldwin River that received the first stocking of brown trout in the US. The Baldwin River is about 12 miles long and site #L-26 is the location where 40th Street Bridge crosses the river. Long approaches on the rural road combined with the unstable embankment where the river flowed along 40th Street, were problematic and contributed excessive sediment to the stream. Streambank stabilization efforts, paving the sloped approaches, and guardrail installation provided for a more stable location and a safer roadway.

**PROJECT COST:** $121,721 including match

**LOCATION:** N 43.915257 W 85.818139

**BEST MANAGEMENT PRACTICES:**
- Stabilization of 200’ streambank with 90 cubic yards of fieldstone
- 1,200’ of paving & curbing approaches
- 8 spillways
- Guardrail

**PROJECT BENEFITS:**
- Halt annual input of up to 4 tons of sediment from road into the river
- Halt bank erosion
- Ensure safe roadway for vehicle traffic

**PARTNERS:**
- USDA Forest Service
- Lake County Road Commission
- Conservation Resource Alliance
- Michigan Department of Environmental Quality
- Pere Marquette River Watershed Council
- Michigan Department of Natural Resources
- Pere Marquette River Restoration Committee
- Wilcox Professional Services

After – Pavement is often the only effective solution in channeling road runoff away from streams.
The previous culverts were significantly undersized for the stream. A narrowed stream channel and gravel bottom were revealed after construction.

**Kinney Creek and Wingleton Road**

The Wingleton Road crossing, site #L-15, is the only road crossing on Kinney Creek, a stream that connects Wingleton Lake to the Pere Marquette River mainstem. Kinney Creek is approximately 3 miles long, and the lake and creek corridor are forested and undeveloped. This timber bridge project opened up passage for all aquatic organisms to over a mile of stream and prevented the road bed from continually washing sand into the stream. The road embankments over the culverts were vertical and the Lake County Road Commission was doing regular maintenance at the site, adding fill and spreading grass seed. Once the bridge was constructed, the stream channel at the inlet narrowed up as impounded sand and water flushed out revealing a gravel stream bottom.

**PROJECT COST:** $273,997

**LOCATION:** N 43.907990 W 85.927519

**BEST MANAGEMENT PRACTICES:**
- Replaced twin 2’ diameter, 50’ long culverts with a 20’ span, 30’1” wide timber bridge
- 1,500’ of paving and curbing approaches
- 6 spillways
- Guardrail
- Fieldstone placement, slope stabilization & revegetation

**PROJECT BENEFITS:**
- Halt annual input of up to 4 tons of sediment from road into the river
- Restore passage for fish and other aquatic life to a mile of Kinney Creek
- Restore the natural movement of woody debris and substrate
- Provide natural stream bottom under the road
- Prevent scouring and pool formation at the inlet

**PARTNERS:**
- USDA Forest Service
- Lake County Road Commission
- Conservation Resource Alliance
- Michigan Department of Environmental Quality
- Pere Marquette River Watershed Council
- Michigan Department of Natural Resources
- Pere Marquette River Restoration Committee
- Wilcox Professional Services
- McDowell Construction
- River Care Program, The George Fund & DTE Energy Foundation

*A narrowed stream channel and gravel bottom were revealed after construction.*
This unnamed Pere Marquette tributary is about a mile long and flows mostly through federal lands. The Lake County Road Commission replaced one of the two crossings on this stream 6 years ago, leaving site #L-13 as the last project in need. The sandy road approaches were constantly washing into the stream during rain events and with snow melt, inundating it with a heavy sand bedload that eventually made its way into the Pere Marquette mainstem. The culvert replacement and approach work has created a stable site where excessive sedimentation is no longer an issue.

**PROJECT COST:** $91,796 including match

**LOCATION:** N 43.885260  W 85.958872

**BEST MANAGEMENT PRACTICES:**
- Replaced 32” diameter culvert with a 42” concrete culvert & end sections
- 650’ of paving & curbing approaches
- 4 spillways
- Fieldstone placement, slope stabilization & revegetation

**PROJECT BENEFITS:**
- Halt annual input of up to 2 tons of sediment from road into the river
- Restore passage for fish & other aquatic life to a half mile of the creek
- Restore the natural movement of woody debris & substrate
- Stabilize road embankments

**PARTNERS:**
- USDA Forest Service
- Lake County Road Commission
- Conservation Resource Alliance
- Michigan Department of Environmental Quality
- Pere Marquette River Watershed Council
- Michigan Department of Natural Resources
- Pere Marquette River Restoration Committee
- Wilcox Professional Services
Sweetwater Creek and Wingleton Road

The Wingleton Road crossing, site #L-5, is the only road crossing on Sweetwater Creek, a tributary to the Pere Marquette River mainstem. Sweetwater Creek is approximately 1.5 miles long, and the creek corridor is forested and undeveloped with the headwaters on federal land. This timber bridge project opened up passage for all aquatic organisms to over a mile of stream and prevented the road bed from continually washing sand into the stream. Once the bridge was constructed, the stream channel at the inlet narrowed up as impounded sand and water flushed out revealing pockets of gravel upstream.

PROJECT COST: $218,681 including match
LOCATION: N 43.932194 W 85.986764
BEST MANAGEMENT PRACTICES:
• Replaced twin 22” diameter, 34’ long culverts with a 20’ span, 30’1” wide timber bridge
• 1,000’ of paving & curbing approaches
• 4 spillways
• Guardrail
• Fieldstone placement, slope stabilization & revegetation

PROJECT BENEFITS:
• Halt annual input of up to 3 tons of sediment from road into the river
• Restore passage for fish & other aquatic life to over a mile of Sweetwater Creek
• Restore the natural movement of woody debris & substrate
• Provide natural stream bottom under the road
• Prevent scouring & pool formation at the outlet

PARTNERS:
• USDA Forest Service
• Lake County Road Commission
• Conservation Resource Alliance
• Michigan Department of Environmental Quality
• Pere Marquette River Watershed Council
• Michigan Department of Natural Resources
• Pere Marquette River Restoration Committee
• Wilcox Professional Services
• McDowell Construction
• River Care Program, The George Fund & DTE Energy Foundation

Sweetwater Creek bridge was supported by 24 timber pilings driven over 12 feet down below the stream bottom.

Paved approaches and spillways channel runoff away from the creek.
Silver Creek and State Road

Silver Creek is a coldwater tributary to the Pine, and serves as a nursery stream for rainbow, brook and brown trout. The State Road crossing, site #P126, is located less than a quarter mile upstream of the confluence of Silver Creek and the Pine River, and was comprised of a corrugated steel arch pipe perched almost 5’ high on top of a spillway of boulders. Thus, fish passage was completely blocked to over 5 miles of Silver Creek, with much of the stream corridor in federal ownership. By partnering together, multiple grants were secured to engineer and contract out the installation of a precast concrete arch, allowing the passage of fish and other aquatic organisms, as well as the natural movement of sediment and woody debris.

PROJECT COST: $527,965 including match
LOCATION: N 44.118771  W 85.683444

BEST MANAGEMENT PRACTICES:
• Replaced 6’ x 8’ corrugated metal pipe arch with a 12’ span x 10’ rise x 100’ long precast concrete arch culvert
• 300’ of instream channel work
• 665’ of paving & curbing approaches
• Ditches & spillways  • Guardrail
• Rock placement, slope stabilization & revegetation

PROJECT BENEFITS:
• Restore passage for fish & other aquatic life to over 5 miles of Silver Creek
• Restore natural movement of woody debris & substrate
• Provide increased capacity for stream flows
• Provide natural stream bottom under the road
• Prevent scouring & pool formation at the outlet

PARTNERS:
• USDA Forest Service (Aquatic Organism Passage, Legacy Roads & ARRA grants)
• US Fish and Wildlife Service
• Michigan Department of Natural Resources (Habitat Improvement Account)
• NRCS – Conservation Innovation Grant
• National Forest Foundation
• Conservation Resource Alliance
• Lake County Road Commission
• Pine River Restoration Committee
• Michigan Department of Environmental Quality
• Wade Trim  • Team Elmers’

The perched culvert completed blocked aquatic species passage and was located only 400 yards from the confluence of Silver Creek with the Pine River.
The project area was sizeable and almost 700' of approach work was needed.

The original culvert was moved to the west and the stream routed through it, in order to dewater the area where the new concrete culvert was to be built.

Right - A significant amount of rock work was needed to establish the gradient of the new stream channel, accommodating 10' of fall over 600' of Silver Creek.

Above - Silver Creek is rich with instream woody debris and pockets of gravel beds.

The project area was sizeable and almost 700' of approach work was needed.
This endeavor was a success thanks to the help of more than 20 partners and $1,750,565 in federal, state, and private funds and local match. Thank you for restoring our rivers!