Jordan River Chestonia Bridge & Cokirs Creek Project

2013-2017

The Jordan River is a high quality, coldwater, Blue Ribbon Trout stream that was first to become a State designated Natural River. The watershed is home to the Jordan River Valley, an 18,000-acre block of state owned forest land that is rich in hiking, paddling, fishing, hunting and wildlife viewing opportunities. The Jordan River is a tributary to Lake Charlevoix, that connects to Lake Michigan. Anadromous and resident, native fish species all utilize and inhabit the Jordan River including coho and chinook salmon, steelhead, white and golden redhorse suckers, brook and brown trout, mottled and slimy sculpin. Monitoring work shows that 23 different families of macroinvertebrates (mayflies, stoneflies, caddisflies) are found in the river with 11 of those being sensitive species. This means the Jordan is indeed high quality and worth protecting.

The crossing on Old State Road, site #JO-8, was also known as the MDNR's *Chestonia Bridge* access and was comprised of twin 16' wide culverts sitting 2' higher above what should have been the original streambed. The Antrim County Road Commission wrestled with embankment erosion, using poured concrete and an aging timber retaining wall as stabilization measures. The culverts were undersized, altered stream morphology, and created a velocity barrier to aquatic species at different life stages. Stream velocities at the outlet of the culverts range up to 11.5 fps during normal flows; this was 5x faster than what it should've been. Partners collaborated to construct a bridge over the river, with enough funds to construct a box culvert over Cokirs Creek on adjacent state land to meet recreational access needs.

Total Project Cost (design, construction, match): **$1,353,000**

Funders & Partners:

- Charlevoix County Community Foundation
- Conservation Resource Alliance
- Herbert H. & Grace A. Dow Foundation
- Harry A. & Margaret D. Towsley Foundation
- Great Lakes Fishery Trust
- Frey Foundation
- J.A. Woollam Foundation
- Oleson Foundation
- Grand Traverse Band of Ottawa & Chippewa Indians
- Natural Resources Conservation Service
- Antrim County Road Commission
- Antrim Conservation District
- Friends of the Jordan River
- Michigan Department of Environmental (
- Michigan Department of Natural Resourc Aquatic Habitat Program
- National Fish & Wildlife Foundation – Sus Our Great Lakes Program
- U.S. Fish & Wildlife Service – Great Lakes Basin Fish Habitat Program
- U.S. Environmental Protection Agency – Great Lakes Restoration Initiative
- River Care Program – River Care Program – DTE Energy Foundation, George Fund, ITC

Location

Jordan Twp. Section 29
Antrim County, MI
N45.060419
W85.069172

Best Management Practices:

- Replacement of twin 16' wide culverts with concrete single span I-beam bridge 90' long deck, 34' clear road width including two 11' wide lanes, 6' wide shoulders, and 54" high railing
- 4 spillways & 600' of road approach work to channel road runoff into adjacent low areas
- Installation of concrete box culvert 14' wide, 28' long, 11' high recessed 2' into the stream bottom
- 40 cu.yds. topsoil placed & 7,500 square feet of seeding

Project Benefits:

- Excess sedimentation of 7 miles of river downstream is halted
- Full passage of all aquatic life at all life stages and stream flows to 48 miles of upstream habitat
- Natural transport of woody debris, gravel, sediment, detritus
- Natural stream function, habitat and dimensions are restored; culverts had caused pool formation doubling stream width and scouring and impounding the river

Jordan River Chestonia Bridge Photos

Before - Inlet, 16' wide culverts funneled the 50' wide river under the road. The design survey showed that the culverts were sitting 2' above what was the original stream bottom elevation.

After – Chestonia Bridge! A 90' span concrete bridge allows for the natural flow of the river during high water events & for the movement of fish, wildlife, aquatic insects at all life stages.

Before – Culverts caused major pool formation at both the inlet & outlet, giving water a chance to warm & sand to build up over time. This is not ideal instream habitat.

After – Bridges are the preferred structure for mainstem crossings; they allow for a natural stream bottom & the movement of fallen trees, branches, leaves. This is also safer for paddlers.

Before - Stream velocities approached 11.5 feet/second, 4 times higher than what they should be. The day we took these measurements the river was flowing at 195 cubic feet/second (cfs). For comparison, heavy rain in October 2017 caused the river to spike to 780 cfs. Typical rain events can increase flow to 400 cfs. Imagine a young fish trying to swim upstream through these.

Before - Recreational use at the outlet was heavy; the illicit “driveway” down to the river caused bank erosion and reached out of the road-right-of-way onto private land where 12’ of riverbank had washed away over the years.

The road embankment was supported by a timber retaining wall that was leaning & close to failure.

February 2017-Getting started! Driving sheet pile east of the culverts to re-route water & dewater the construction zone.

Sheet pile work continues & provides a channel for the river to flow during construction so that the support structure of the bridge can be built in the dry.

East footing constructed with concrete poured & cured. The “forms” for pouring the concrete are comprised of frames made of green epoxy coated steel rebar & plywood. The rebar provides the “skeleton” & the epoxy coating prevents possible corrosion.

Removing the culverts allows the river to “breathe.” Note the area in the lower left corner that was previously submerged.

Footings & wingwalls are constructed. Kayakers enjoy the free flowing river, one of them paddling the Jordan for the first time. Road Commission Engineer-Manager, Burt Thompson, looks on.

Beam day! Seven concrete I-beams weighing 26 tons each, measuring 88’ in length were set to comprise & support the deck.

Got to get them just right!

Because of their size, beams were trucked individually up from Kalamazoo where they were cast. Semi-trucks backed almost a half mile down the road from the highway to the site, where a crane took it from there.

Workers have to be pretty agile & able to balance for this beam work.

Pouring the concrete deck! Looking at the concentrated steel rebar form for this, you know it will be sturdy.

Bridge deck looks awesome & accommodates two 6’ wide shoulders & two 11’ wide vehicle lanes for a total width of 34’ versus the former 25’ width.

Replacing old with new. There was originally a bridge at this site before the culverts were installed in the 1960s. An old bridge concrete abutment was excavated during construction. Note the wood grain impressions from the form used to pour & set it.

Marl formations are sizeable and actually pretty interesting; rust color shows the presence of iron in the water. Some of it was chipped away for paddler safety, most of it will have to wash away over time.

Before – The old guardrail & sandy road shoulders weren't ideal.

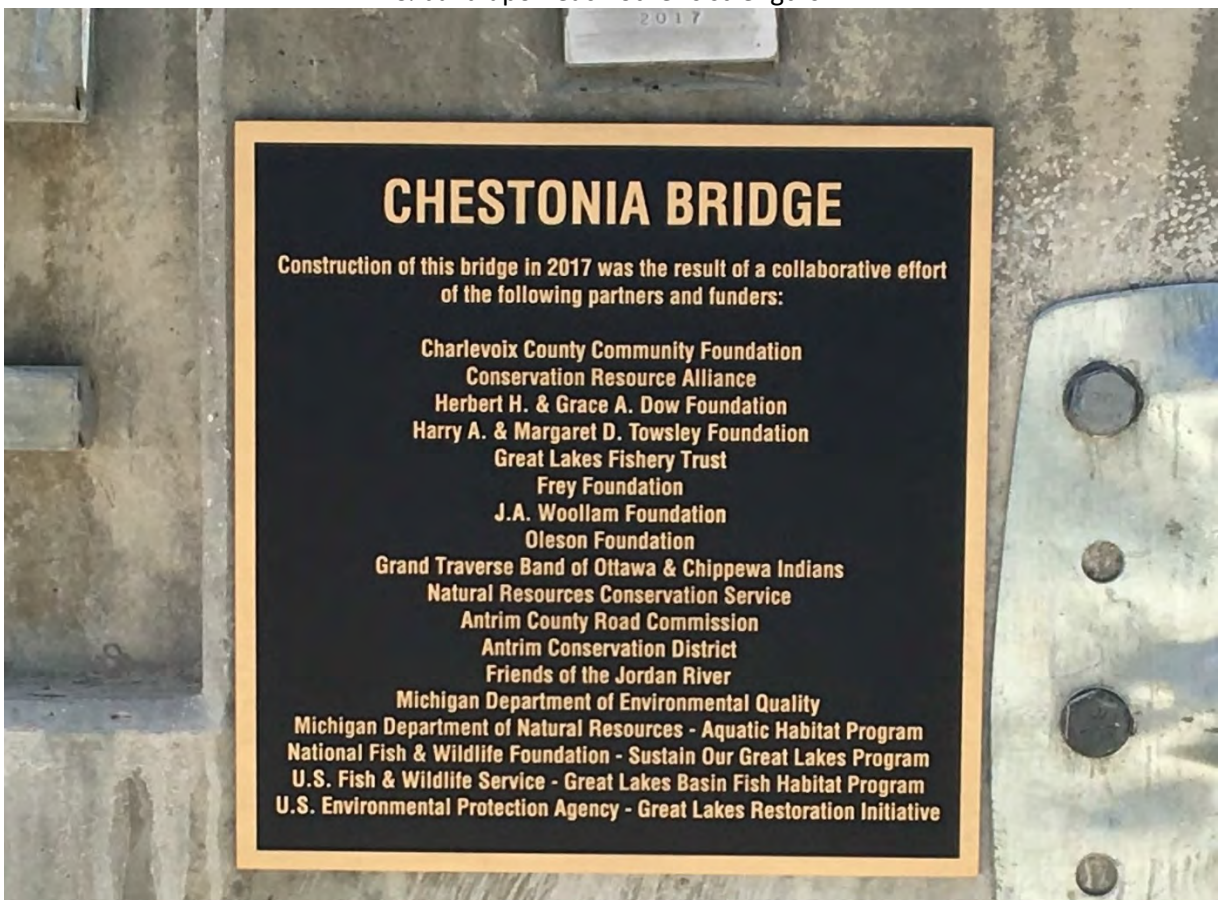
After - Bridge rails are 54" high & have parapet tubing; they are safe for both pedestrians and vehicles.

Before – Looking upstream from the crossing; the river was slow & wide. Areas like this can get warm & shallow, not ideal habitat for fish & aquatic insects. The embankment above the culverts was continually eroding.

After – The same view, note how the current is fast & river has narrowed. No more eroding embankment to be concerned with either.

After – About 800' upstream of the crossing, the Jordan River is a model of a healthy Great Lakes stream corridor, attesting to why it is important to resolve anthropogenic disturbances before they get even worse.

The Chestonia Bridge Project is an excellent example of how partners can accomplish so much more when we stack hands & build upon each other's strengths.



Cokirs Creek Crossing Photos

Before - Moving next door… State land at the upstream side of the new Chestonia bridge provided opportunity for a paddler access site on the river. The snowmobile bridge there over Cokirs Creek had to be replaced though to safely handle 2-way vehicle traffic.

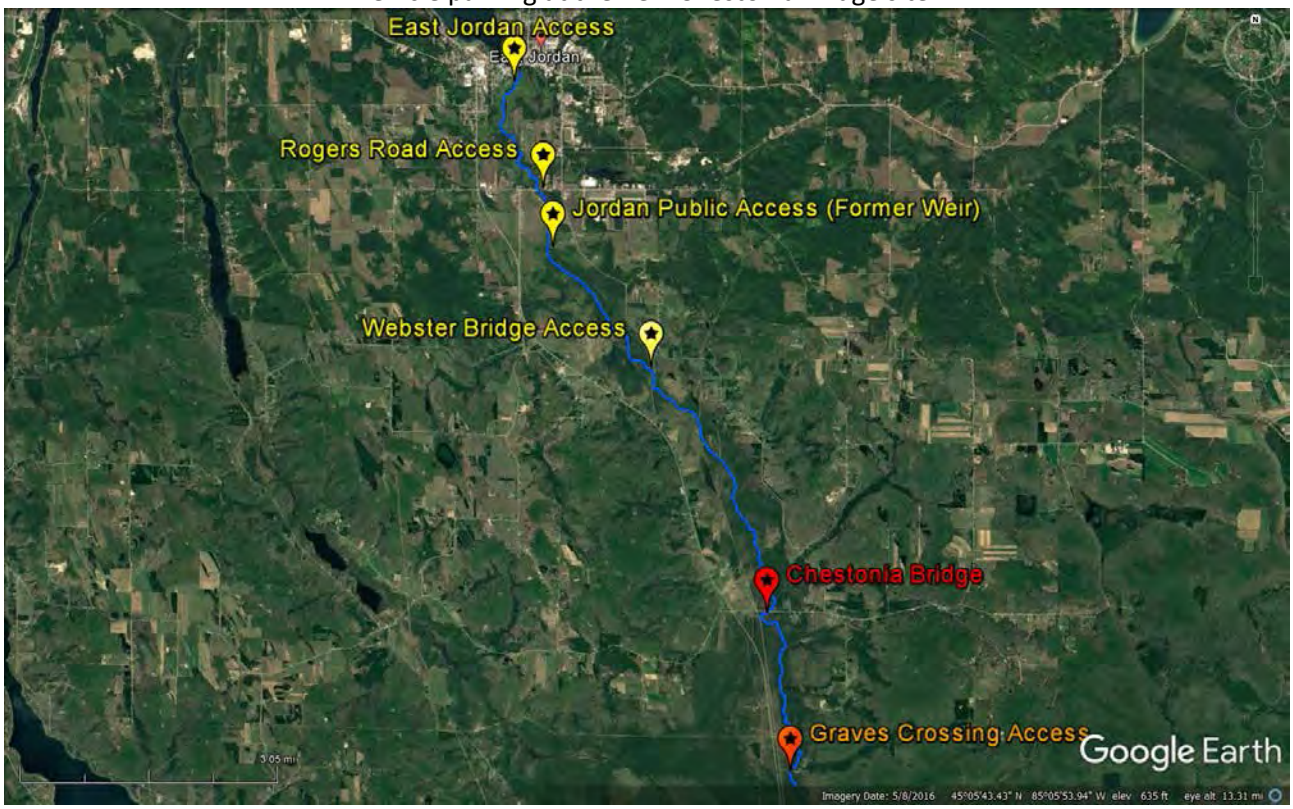
After – A concrete box was installed, measuring 14’ wide, 11’ high, 28’ long & recessed 2’ into the stream bottom.

Cokirs Creek can get pretty high. This stream was unfortunately ditched 100+/- years ago but still has trout with its cold water temperatures.

The concrete box was installed in sections that were sealed together. With overhead power lines, proximity to the road, & tough soil conditions a concrete box was the best fit for this site versus a timber bridge or bottomless arch.

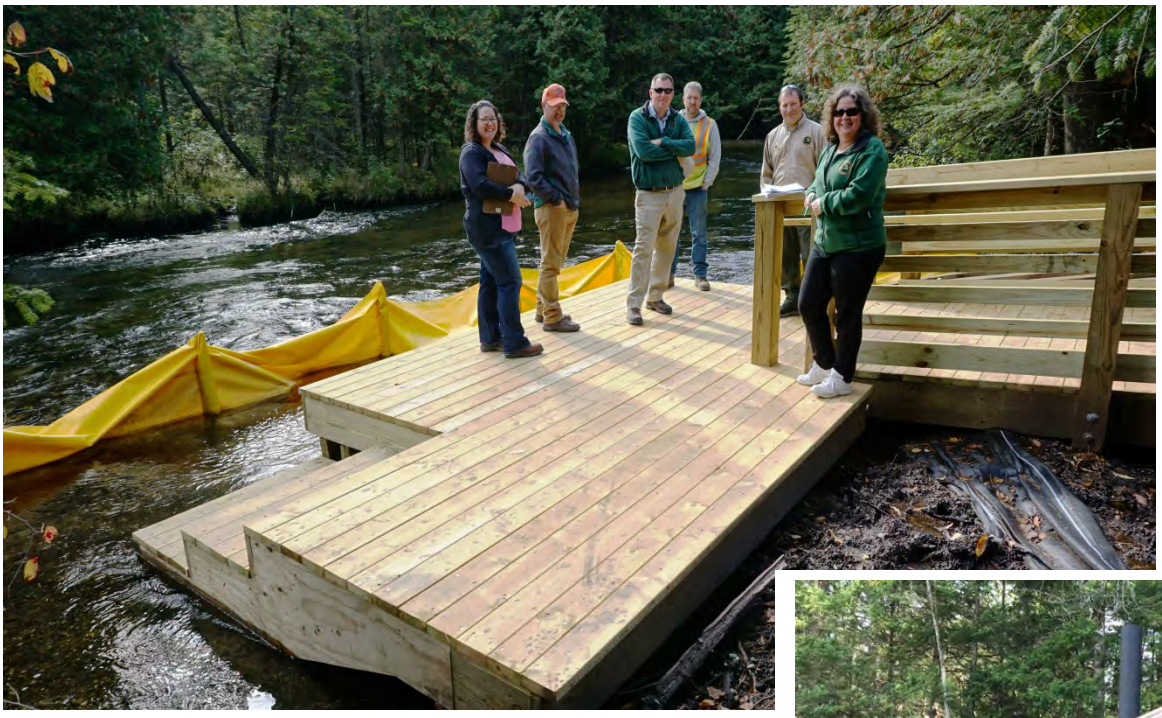
MDNR Recreational Boating Access Site

Looking at the Jordan Watershed, it was logical to have a formal, safe recreational access site with vehicle parking at the new Chestonia Bridge site.



Boardwalk and boat slide will have guardrail and mesh added this spring to make it safer and easier to use.

Cleats will be added to the deck.



Restroom facility is on-site, parking is available. CRA is working on a planting plan for open, bare areas along creek and at access/bridge sites.

Jordan River Watershed River Care™

Completed Projects

1. Jordan River Salmon Weir Removal
2. Jordan River Non-operational Lamprey Barrier Removal
3. Jordan River & Webster Rd Bridge (ACRC)
4. Severance Creek & Mt Bliss Rd Culvert Replacement (ACRC)
5. Jordan River & Old State Rd Chestonia Bridge, Cokirs Creek Box Culvert & Improved Access
6. Jordan River & Graves Crossing Timber Bridge & Improved Access
7. Green River Trout Farm Dam Removal
8. Green River & Pinney Bridge Rd Timber Bridge
9. Green River & Green River Rd Timber Bridge
10. Landslide Creek & Cascade Rd Culvert Replacement
11. Tributary to Landslide Creek & Cascade Rd Culvert Replacement
12. Jordan River & Jordan River Rd. Culvert Replacement
13. Warner Creek & Tebo School Rd. Culvert Replacement

Future Needs

A. Deer Creek & Fuller Road Crossing Replacement
B. Jordan River & Jordan River Road Crossing Replacement
C. Green River Headwaters & Rail Road Crossing Replacements

ACRC = Antrim County Road Commission

Conservation Resource Alliance

Contact us at 231-946-6817 or visit www.rivercare.org for more information

What is next for the Jordan River Watershed?