



Carlton SWCD improves road safety, trout habitat on Nemadji River tributary



Top funding sources

- \$414,830 Clean Water Fund
- \$51,170 U.S. Fish & Wildlife Service Fish Passage Program
- \$50,000 Carlton County Transportation Department, in-kind estimate

A rebuilt, free-flowing stretch of Skunk Creek that fixed an eroding county road and reconnected a stretch of trout stream is among Clean Water Fund-backed projects that remove experimental, 1970s structures. Partners included the DNR, U.S. Fish & Wildlife Service, and Carlton Transportation Department.

CARLTON — A county road in danger of slumping into Skunk Creek was stabilized and the first stretch of a trout migration route from Lake Superior was restored in Blackhoof Township south of Carlton, a collaborative effort that drew from county, state and federal funding sources.

The \$518,830 Carlton Soil & Water Conservation District project, made possible by a Clean Water Fund grant from the Minnesota Board of Water and Soil Resources, moved Skunk Creek away from Carlton County Road 103, residents' and emergency responders' only access to the area when the Nemadji River floods Minnesota Highway 23.

One month after construction finished, on Sept. 30, 2019, the project withstood a 200-year flood that brought 5 to 6 inches of rain within six hours and caused the

Nemadji River headwaters to rise more than 10 feet.

"It's not an ideal situation to have a 200-year flood event immediately after you complete construction that involves in-stream structures or channel modifications," said Will Bomier, Carlton County Transportation Department permits and right-of-way technician. "The project functioned as planned, and it was amazing to see the process of sediment transport and floodplain connectivity return to this area after 50-plus years."

At a second site downstream, contractors removed a 1970s structure — an experimental design meant to reduce sediment and stabilize the road by diverting the creek into a concrete culvert. Over time, erosion had blocked fish passage and chewed away at the

A Carlton SWCD project moved Skunk Creek away from a county road and, farther downstream, removed a structure built in the 1970s to stabilize the road by diverting the creek into a concrete culvert. The project, which finished in August 2019, reconnected a stretch of trout stream to Lake Superior. A Clean Water Fund grant from the Minnesota Board of Water and Soil Resources is in play.

Photo Credit:
Carlton SWCD



The Minnesota Board of Water and Soil Resources' mission is to improve and protect the state's water and soil resources by working in partnership with local organizations and private landowners.
Website: www.bwsr.state.mn.us

road's edge. In recent years, water topped the concrete weir at least once a year — something engineers had estimated might happen once every four years.

The 1970s project forced a 20-foot stream through a 4-foot pipe.

“When you do that, you get the firehose effect. You get a huge increase in velocity,” Bomier said. “The fish aren’t able to move up that pipe because the water is too fast for too far.”

The project reopened nearly 7 miles of cold-water trout stream — including nearly 3 miles of Skunk Creek’s main stem, the entire 3.5-mile stretch of Duessler Creek and just over a half-mile of Elim Creek.

“It’s the key, the first one in the series that blocks fish passage,” said Melanie Bomier, Carlton SWCD water resources technician.

The project will keep an estimated 226 tons of sediment — more than 17 dump truck loads — out of the Nemadji River annually. The Nemadji River flows into Lake Superior. Had the undersized pipe clogged, it could have caused a structure failure with the potential to release the equivalent of 600 dump truck loads of sediment.

Funding included a \$414,830 Clean Water Fund grant from BWSR. Partners included the Carlton County Transportation Department, the Minnesota Department of Natural Resources and the U.S. Fish & Wildlife Service.

The SWCD and transportation department collaboration began with a spring 2017 culvert inventory and several culvert designs made possible through a \$103,220 Enbridge Ecofootprint grant.



The 1970s structure forced the 20-foot-wide stream through a 4-foot pipe, seen here in 2017. Photo Credit: Ann Wessel, BWSR

Flooding twice delayed work on the Skunk Creek project, most recently in June 2018. But Melanie Bomier said the SWCD saved money by seeking bids in December when contractors were less busy. The project came in under budget. The final amount hinged on the cost of tree and live-stake willow and dogwood planting.

Originally, the 1970s culvert and pipe project was a collaboration among the SWCD, transportation department and township meant to showcase new drain tile and slope techniques. The site was chosen because it was easily visible from the road.

Once again, the site will serve as a demonstration — this time to show how red clay dam removal can work elsewhere in the Nemadji River watershed. By late 2019, Carlton SWCD had removed four of the 16 structures prioritized in an inventory

funded by an Environmental Protection Agency grant. Those that remained included a 40-foot dam.

“Now they have a place where they can see what it looks like,” Melanie Bomier said. “When you have a pond, it’s hard to imagine it as a stream. Most of these dams are way back in the woods and hard to access. This, people drive past every day.”

David Cartwright, a business manager for a local trade union in Duluth, is among the daily commuters.

Cartwright lives on 20 acres between Skunk Creek and the Nemadji River, which he bought as hunting property. He allowed contractors to spread nearly 600 dump truck loads of clay removed from the Skunk Creek project site on his land, which will level it out and make deer habitat easier to maintain.

He’s among the half-dozen

residents who were in danger of becoming stranded if County Road 103 and Highway 23 both flooded.

Daily traffic counts on County Road 103 average 50 vehicles. Will Bomier said that number doubles when other roads close.

Melanie Bomier described the need for the upstream work on Skunk Creek, where two banks were slumping: “After every rain event, the road slope was sloping into the stream. There was the danger that we were going to lose the road.”

Contractors moved two 70-foot-long segments of the curving stream farther away from the highway. To attain optimal flow, the rerouted stream incorporated width and length calculations plus floodplain connections.

Toe-wood structures armored the banks and diverted the fast, erosive flow. Strategically placed root balls (trees with roots attached) plus boulders diffused and directed the water. Rock J-hooks (lines of rocks angled upstream and then curved in mid-channel) helped to keep water from scouring the banks and created velocity-slowing pools. The reconstructed stream segments are a series of pools and riffles.

At the shorter and straighter culvert-and-pipe removal site downstream, the design incorporated more J-hooks.

While he’s not an avid trout angler, Cartwright said he could appreciate the reconnected fish passage plus improved road safety.

“I’m hoping it takes away the chance of that happening, the roads washing out. Having the trout stream would be good for everybody,” Cartwright said.