

Designed for trout and traffic



Carlton SWCD worked with county transportation department, federal and state funds to replace a culvert with a free span bridge, restore a length of Stateline Creek to improve habitat, water quality



Part of a Clean Water Fund grant from BWSR, awarded to Carlton SWCD for its [red clay dam projects](#), supplemented funding from the Federal Highway Administration and Minnesota Department of Public Safety.

HOLYOKE — Flooding changed the course of the Carlton Soil & Water Conservation District’s (SWCD) planned culvert replacement on Stateline Creek for the better, resulting in federal funding and a redesigned stream crossing that improved highway safety, fish habitat and water quality.

The \$2 million project on the Minnesota-Wisconsin border 30 miles south of Duluth complements years of restoration focused on the St. Louis River estuary and Lake Superior. Stateline Creek flows to the Nemadji River, which enters Lake Superior at Superior Bay.

A 140-foot-long free span bridge replaced an undersized culvert crossing on Carlton County Road 8. A route for logging trucks heading to the mill, the road was used by about 100 vehicles per day.

A 500-foot-long stream restoration employed natural channel design methods to narrow and stabilize the channel, and to re-establish the stream’s connection to its floodplain. A series of constructed riffle pools act as stair steps, allowing fish passage. Root and log structures anchored to downstream banks are designed to



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— Melanie Bomier, Carlton SWCD water resources assistant manager

mend streambank erosion.

Funding included \$1.5 million from the Federal Highway Administration Emergency Relief Program and \$388,000 from the Minnesota Department of Public Safety’s Homeland Security and Emergency Management division. A total of \$76,120 in Clean Water Funds from the Minnesota Board of Water and Soil Resources (BWSR) — part of a 2017 grant the SWCD received for red

An upstream view of Stateline Creek features the free span bridge, **left**, which replaced an undersized culvert crossing on Carlton County Road 8, **right**. The bridge was part of a \$2 million project that redesigned the stream crossing to improve highway safety, fish habitat and water quality.

Photo Credits: Carlton SWCD

An aerial view of the Stateline Creek site, **center**, depicts water flowing through the culvert. The new free span bridge will allow fallen trees and other debris to more easily pass under the road.

Photo Credit: Carlton County Transportation Department

clay dam replacements — covered part of the stream restoration cost.

Construction took 11 weeks, beginning in August 2020.

“It’s a great example of a lot of what we’ve been focused on in the Nemadji watershed: reconnecting these streams — not just for fish, although the fish are a big part of it, but also for climate resiliency, road safety, and then the erosion portion of it. For us, as a soil and water conservation district, that’s a really big, important part,” said Melanie Bomier, Carlton SWCD water resources assistant manager.

The project reduces soil loss by an estimated 156 tons and phosphorus by an estimated 179 pounds annually. It reconnects 8 miles of stream, allowing aquatic organisms to migrate.

The original 11.6-foot-wide culvert was installed in the 1970s when design was based on preventing water from topping the road in a 100-year flood event (meaning it has a 1% chance of occurring in any given year). While safe and cost-effective, it forced the stream through a narrow opening and caused a fire-hose effect — destabilizing the downstream channel, eroding the banks, and restricting fish passage. Eventually, a 2-foot drop developed from the culvert to the stream.



Top: A stream restoration on a 500-foot length of Stateline Creek used natural channel design methods to narrow and stabilize the channel, and to re-establish connection to the natural floodplain. A series of constructed riffle pools allow fish passage. The project also addressed streambank erosion. **Bottom:** This post-construction view of Stateline Creek was captured in 2021. **Photo Credits:** Carlton SWCD



“It was just this waterfall coming out of the end of the culvert, and there was a big hole at the end of it,” Bomier said. Over time, the stream had become wide and shallow, making it difficult for fish to navigate when water levels were low.

A culvert inventory, funded in part by a 2017 Enbridge Ecofootprint grant, identified the Stateline Creek site as a priority. A June 2018 flood that damaged the culvert prompted a discussion between Carlton SWCD and Carlton County Transportation Department staff. With input from University of Minnesota Duluth students in a graduate-level civil engineering stream crossing design class, a free span bridge was deemed the best option. The other choice was a larger culvert.

The bridge allows downed trees to pass underneath. A culvert might last longer, but Bomier said its pieces would be more likely to shift in the red clay soil. The floodplain will handle the overflow that previously caused erosion.

Historically, Stateline Creek supported native brook trout, introduced brown trout and — only as far upstream as the culvert — the steelhead that swim upstream from Lake Superior to spawn. The SWCD received anecdotal reports of trout being caught in spring 2021.