

## SCOTT WATERSHED MANAGEMENT ORGANIZATION



An upstream view shows trees surfing down the bluff toward Sand Creek near Jordan. The sediment that will continue to pile atop the area planted with grass and trees is meant to result in a more gradual grade. Stabilizations of two banks and an adjacent ravine are among the capital improvements Scott Watershed Management Organization funded with help from a Targeted Watershed Demonstration grant.

Photo Credits: BWSR

# Engineered erosion: A fix on a Minnesota River tributary



Ravine and bluff stabilizations near Jordan are the most dramatic, but watershed-wide efforts to clear up Sand Creek are multiplying.

JORDAN – A stabilization method more common in West Coast salmon restorations is keeping 80-foot-tall banks from crumbling into Sand Creek along a particularly unstable stretch of this Minnesota River tributary.

Amid the bluffs just south of Jordan, fast-moving water churned eroded soil. Suspended sediment loads were five to 10 times higher than elsewhere in the creek.



Sediment degrades habitat and water quality; both Sand and Porter

creeks are impaired for aquatic life because of turbidity.

Where Sand Creek eroded the toe of the stream, tons of sediment were being lost. A restored floodplain was revegetated and root wads were installed in the bank to reduce the energy of flowing water. Netting protects planted trees from deer. The slope will continue to erode; sediment deposited at the bottom will result in a more stable slope that revegetates on its own.

“We’re jump-starting the geologic process in a way,” said Marty Melchior, regional director for Inter-Fluve, the Madison, Wisconsin-based contractor handling the Scott Watershed Management Organization project.

At the base of two bluffs – one on Sand Creek; one just upstream on Porter Creek – log jams anchor near-vertical banks while deflecting water. The structures form shelves, which catch bluff erosion and give bank-stabilizing plants a place to grow.

“The bluff will fail. It will revegetate,” Melchior said.

When WMO staff led a project tour in June, log jams were in a stark, just-constructed state, the black willows and cottonwoods were newly planted. Among the tour highlights: the Porter Creek bluff stabilization, where the banks rise 100 feet, and Sand Creek’s adjacent bank and ravine stabilizations.

“(The ravine) was incising where it had near-vertical sidewalls that were constantly caving in and washing that sediment down with every rain event that occurred. There was also head-cutting upstream toward an agricultural field,” said Ryan Holzer, Scott County water resources scientist.

Rock check dams slow the rushing water and stabilize the ravine.

Those three projects accounted for \$600,000 in capital improvements funded through a \$2.2 million Targeted Watershed Demonstration Program grant from the Minnesota Board of Water and Soil Resources.

Sand Creek enters the



*Bolts hold tree trunks and roots in place along a bend in Sand Creek, where fast-moving water has caused erosion.*

## Getting Involved

A new Sand Creek Watershed Story Map depicts projects, progress and outlines several ways for landowners and volunteers to get involved. One of the WMO’s objectives is to build momentum for cost-share and landowner-funded best management practices. “You can’t always rely on a \$2.2 million grant to be

available. For landowners to take responsibility themselves without any financial contribution, that’s how we might make (progress) in the future,” Holzer said. (The grant covered about \$10,000 in staff time to build the story map.) Find it here: <https://gis.co.scott.mn.us/sandcreek/>

Minnesota River near Jordan by way of the Louisville Swamp. Its watershed drains 271 square miles in Le Sueur, Rice and Scott counties.

The grant aims to cut Sand Creek’s sediment-loading by about 25 percent – keeping an estimated 2,000 tons, the equivalent of 154 dump

truck loads, out of the stream annually.

An intensive study in 2010 showed erosion from streambanks, bluffs and ravines – not fields – were the primary source of sediment.

“If you were going to go for

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The stream is starting to get outside of its floodplain and eroding its larger bluffs. With the stress at the toe of the stream, it created an unstable upper face of that bluff. You’d get events of large mass wasting, several cubic yards during an event. When it dries out, it’s also still active.”

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– Ryan Holzer, Scott County water resources scientist

immediate benefit, you’d go in and stabilize those points. But they tend to be really, really big and cost a lot of money to do because they’re areas subject to landslides, they’re very steep, they’re remote, they are changing in response to flow,” said Paul Nelson, Scott County environmental services program manager.

Another approach: Reduce the runoff that contributes to unstable banks.

Since 2010, the WMO has worked with landowners to plant native grasses, restore wetlands and riparian corridors. The BWSR grant continues that effort with a streambank restoration on a golf course, the purchase of an inter-seeder designed to plant cover crops, and more money for cost-share projects.

“What we chose was a strategy that was in



Between the root installations are a series of bays. The project is seen from farther downstream.

between,” Nelson said. “We said we want to work on moderating runoff coming into these areas, and we want to work on improving the vegetative characteristics along the stream in areas where that’ll make a difference. Now on bluffs, planting vegetation – because those are almost vertical – is not terribly helpful. That’s a really long-term thing, to try to moderate flow, to get vegetation. But we chose that.”

Recognizing that its tributaries are still down-cutting to the level of the Minnesota River, Nelson said the WMO decided to stabilize the most active ravines.

“We don’t have enough money – nor does the state, nor does the public across all of Minnesota – to stabilize all those ravines,” Nelson said.

So the WMO sets priorities and works with willing landowners such as Marlene Mullin.

In 2011, Mullin bought the

### Scott WMO Projects

Throughout the watershed, landowners since 2006 have implemented more than 2,000 conservation practices using federal, state and local funding. The Scott Watershed Management Organization initiated about 700 of those. The Targeted Watershed Demonstration Program grant would enable the WMO to complete 33 cost-share projects in addition to the capital improvement projects. The WMO anticipates more landowners will sign up. By January 2018, the BWSR grant had enabled the following:

- STREAMBANK STABILIZATION:** 300 feet
- SHORELINE PROTECTION:** 405 feet
- BUFFERED WATERWAYS:** 3,840 feet
- COVER CROPS:** 595 acres
- NATIVE GRASS PLANTINGS:** 53 acres
- GRADE-CONTROL STRUCTURES:** 16
- RESTORED WETLANDS:** 4.3 acres

100-acre property where the Sand Creek ravine and bank stabilization took place. She rents out the farmland, occasionally visits the property to take in the sweeping views, and in the spring lets her priest hunt turkeys there.

“We wanted to keep it farmland as long as possible because it’s being built

up and these farms are being sold for housing developments,” Mullin, 79, said of the land, which is held in trust. “It’s absolutely beautiful, and lots of wildlife. The views are spectacular up there.”

Mullin, who owns Mullin Trucking in Jordan, visited the site a few times during construction.

“It was unbelievable, the amount of rock and stones (brought in). But that water is very powerful, especially in the spring it really gets deep,” Mullin said.

The Scott Watershed Management Organization doesn’t require a landowner match for its capital improvement projects. Mullin estimated she spent \$50,000 shortly after purchasing the property to have the barrels and refrigerators and other appliances and debris hauled out of the creek. In a way, the restoration is an extension of that cleanup.

“It really helps the creek and the water system and the Minnesota River,” Mullin said.

Like Mullin, Michael Malone appreciates the beauty and power of the creek.

Malone developed a golf course spanning Sand Creek just south of Jordan. Ridges at Sand Creek opened in 2000; its 18 holes range from bluff top to streamside. Its website extolls “the beautiful winding Sand Creek, natural wetlands, rolling terrain, elevated tees ...”

“It’s a constant battle keeping an eye on what’s moving and what’s eroding,” Malone said.

The golf course is one of three properties where 11 riparian buffers were planted as part of the Targeted Watershed Demonstration Program grant. Volunteers organized by the St. Paul-based nonprofit Great River Greening planted native grasses and forbs meant to stabilize the shoreline. Elsewhere, berms are designed to slow the flow of rainwater.

Malone’s biggest concern

about the project was getting equipment in place without damaging the course. Shovels were used where bulldozers would normally do the work.

“We’ve had to work on a lot of projects to shore up the shoreline,” Malone said. Most damage arrives with the spring ice-out. The creek washes some plants away. Drought kills others.

“We are a big part of the land and the land is very important to us. Our business is the land. We try to take care of it,” Malone said.



*The Minnesota Board of Water and Soil Resources’ mission is to improve and protect Minnesota’s water and soil resources by working in partnership with local organizations and private landowners. Website: [www.bwsr.state.mn.us](http://www.bwsr.state.mn.us).*



**From left:** Ryan Holzer, Scott County water resources scientist, views the Sand Creek bank stabilization project with Troy Kuphal, Scott Soil & Water Conservation District director, and Paul Nelson, Scott County environmental services program manager, on June 13 near Jordan.

## Funding Sources

The Scott Watershed Management Organization will match the \$2.2 million BWSR grant with \$573,500 in county cash and in-kind contributions, and landowners’ cost-share; plus \$40,000 in Minnesota Agricultural Water Resources Center staff time to run a farmer-led council. An additional \$565,000 federal Clean Water Act grant will augment the budget.

“Having access to that amount of finances for these projects is obviously very beneficial,” Holzer said. “The big thing, too, is the partners. Scott County houses the grant, but we’re working with Great River Greening, three different soil and water offices, the University of Minnesota, our sportsmen’s clubs and other organizations.”

# McMahon Lake delisting proposed

Delisting McMahon Lake was one goal of the Targeted Watershed Demonstration Grant that was accomplished before those funds became available.

“We believe that it’s meeting standards,” said Miranda Nichols, Minnesota Pollution Control Agency research scientist.

The 110-acre lake 8 miles south of Prior Lake was listed as impaired for nutrients in 2002. Keeping 1,380 pounds of phosphorous out of McMahon and Cedar lakes was one of the WMO’s stated goals.

“The phosphorus (level) was high. It was creating a lot of algae in the lake, and therefore it was impaired for aquatic

recreation. It wasn’t really good to swim in because it was getting so green in the summer,” Nichols said.

By 2016, McMahon Lake met water quality standards. It was included in the MPCA’s Oct. 11, 2017, update of delisted and impaired water bodies.

Technically, the MPCA is proposing that McMahon Lake be delisted. The formal delisting process can take months or years. It requires a public comment period, which in the case of McMahon Lake ran through Jan. 26, and Environmental Protection Agency approval. The EPA rarely reverses an MPCA delisting.

Paul Nelson, Scott County environmental

services program manager, said practices put in place starting in 2009 contributed to the turn-around. So did land-use changes and increased rainfall. When most of the lake’s watershed changed from agricultural land to rural residential housing, perennial plantings replaced crops. More rain meant pollutants were more diluted when they reached the lake.

“We did not anticipate it responding that quickly,” Nelson said.

The \$120,000 in grant funds budgeted for sediment treatment will be used to make other improvements within the watershed.