



Traverse County's first ditch retrofit eases flood damage as it improves water quality within the Bois de Sioux Watershed District



**Top:** John Mathias' farm borders Traverse County Ditch 37, Lateral 1. A Clean Water Fund grant helped pay for elements of a ditch retrofit with clean water benefits. Mathias said the fix alleviated flooding in his field. **Left:** None of the road crossings changed. "We increased the capacity of the ditch itself to hold more water, and we stabilized the banks so we wouldn't have ... dirt going downstream," said Scott Gillespie of the Bois de Sioux Watershed District board.

**Photo Credits:** Ann Wessel, BWSR

# 'It will demonstrate what we're capable of'



WHEATON — The Bois de Sioux Watershed District's first ditch retrofit could be the first of many retrofits designed to alleviate flooding and improve water quality.

The watershed spans 1,400 square miles in parts of six west-central Minnesota counties. The district serves as the ditch authority for 420 miles of ditches in Traverse County plus parts of Wilkin and Grant counties.

The retrofit on Lateral 1 of Traverse County Ditch 37 benefits water quality as well as cropland.

Scott Gillespie sees it as a showpiece.

"It's huge. It will demonstrate what we're capable of and what the other ditches can be," Gillespie, a farmer and Bois de Sioux board member, said during a late September site visit.

John Mathias sees it as a solution.

Lateral 1 borders Mathias' 320-acre Dollymount Township field, where he said past flooding had cost him about \$50,000 a year.

"I would lose from a third to half of my crop," Mathias said, describing the damage caused by 2 feet of standing water during the growing season. "Last fall was extremely wet, and it really did a great job. We had 11 inches at harvest time. It was really devastating, but the ditch kept up. It wasn't overflowing. It did a great job."

The work on 2.5-mile-long Lateral 1 is part of a \$637,600 retrofit and repair on 7-mile-long Traverse County Ditch 37.

A \$135,000 Clean Water Fund grant from the Minnesota Board of Water and Soil Resources helped pay for clean-water aspects of the Lateral 1 retrofit, which reins in sediment loss. (Traverse Soil & Water Conservation District received \$10,000 of the grant for project development.) The 30-plus landowners whose 4,860 acres of cropland benefit from the entire Traverse County Ditch 37 project will pay \$512,600 in taxes levied by the watershed district over 15 years. A redetermination of benefits increased from \$18,990 to \$2.86 million the maximum amount the watershed district could levy to pay for repairs.

Contractors finished the project in 2017.

Chad Engels of Moore Engineering in Fergus Falls described the retrofit:

Contractors flattened the channel's side slopes to create more stability. Material excavated from the channel was used to construct a



**Top:** The Mustinka River flows north of Wheaton in Traverse County. Water from Traverse County Ditch 37 flows into Twelvemile Creek, the Mustinka and Lake Traverse — headwaters of the Bois de Sioux River. **Left:** Engineer Chad Engels, left, and Assistant Engineer Jim Guler stand on a buffer installed in conjunction with a Traverse County Ditch 37 retrofit in the Bois de Sioux Watershed District. The buffer was separate from work done through a Clean Water Fund grant. The district used ditch assessment proceeds to pay landowners for permanent right-of-way easements, installing buffers on both sides of Traverse County Ditch 37.

berm adjacent to the ditch. Side inlet culverts were then installed through that berm to allow water to drain from adjacent fields into the ditch. The design results in less ditch-bank erosion and keeps more topsoil in the field.

"By installing the culvert, you are armoring that side slope," Engels said. "The side-inlet culvert meters the flow. So when we have a large rain event that results in high runoff, the culvert will meter the flow and allow silt that's being carried in the runoff to settle out in the field."

Previously, Mathias said field

after field would flood during the spring snowmelt when north-flowing water overran tree-shaded, ice-filled ditches.

Agricultural production accounts for about 93 percent of land use in the watershed, which lies in the flat bed of Glacial Lake Agassiz. Here, volume — not peak flow — drives flooding as snowmelt and north-flowing rivers send water into iced-up regions.

From Traverse County Ditch 37, water flows into Twelvemile Creek, the Mustinka River and Lake

Traverse — headwaters of the Bois de Sioux River. The Bois de Sioux and Otter Tail rivers join to become the Red River at Breckenridge.

Built by horse-drawn equipment in 1902, Traverse County Ditch 37 had received only minor repairs. Before this project, the only maintenance since 1988 consisted of silt and cattail removal. Cottonwood trees exceeding 3 feet in diameter grew in the channel.

"The project was really twofold," Engels said. "There was a hydraulic component to restore

the original capacity and there was a water-quality component with the retrofit.”

The watershed district used ditch assessment proceeds to pay landowners for permanent right-of-way easements, installing buffers



along both sides of Traverse County Ditch

37. Easements allow the watershed district access for maintenance work.

“Over time, someday all of the landowners in the Bois de Sioux Watershed District will be compensated for these buffers. That’s my goal. As we do the redetermination of benefits, that will naturally happen. We’re going to put in these easements and they’re going to be paid for the easements,” Engels said.

Less in-channel erosion will mean less maintenance and less cost to landowners. Ditch clean-outs average about \$6,750 a mile and were necessary every five to seven years.

The way Gillespie sees it, everyone wins — and phosphorus and nitrates are kept in check by curbing erosion. The retrofit will keep an estimated 340 tons



Scott Gillespie, a Bois de Sioux Watershed District board member, stood near the bottom of Traverse County Ditch 37’s Lateral 1, where a Clean Water Fund grant covered clean-water aspects of the district’s first ditch retrofit.

of sediment — about 26 dump trucks’ worth — out of the ditch and downstream waters.

“We aren’t adding to flooding. We are cleaning the water because we’re keeping the dirt out of the ditch. We’re providing better drainage for the farmer. Buffer strips are getting installed but it is not controversial. So the water is winning. The landowner is winning,” Gillespie said.

Mathias, 68, who farms about 3,500 acres, said he’d been working for 30 years to get the ditch fixed.

“The ditch was virtually inoperative,” Mathias said. “Now that the water is going the correct direction, it’s taken

pressure off of other ditches as well and it’s improved the drainage and the timeliness of the water getting off the fields and going down the ditches properly.”

The watershed district is partnering with the Wilkin Soil & Watershed Conservation District on a related project under construction this year. The SWCD received a \$176,500 Clean Water Fund multipurpose drainage management grant to install side-inlet culverts and berms on Wilkin County Ditch 8.

If funding is approved, the watershed district will begin retrofits on Wilkin County ditches 9 and 10 in 2019.

“It’s the beginning of retrofitting all of the rest of the ditches. I’m convinced

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**This is where the Clean Water Fund money is the best money spent. It is right on the ground. It directly goes into cleaning water. It directly keeps phosphates and nitrate out of the water. I don’t know where you could spend money better than that.**

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— Scott Gillespie, Bois de Sioux Watershed District board member

from discussions that the board has had that this is a long-term strategy. Over time, they intend to retrofit all the ditches in the Bois de Sioux,” Engels 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. [www.bwsr.state.mn.us](http://www.bwsr.state.mn.us).*



**Left:** Gently sloped sides are one element of a Traverse County Ditch 37 retrofit. The retrofit will help alleviate flooding in farm fields and improve water quality within the Bois de Sioux Watershed by allowing nutrient-carrying sediment to settle. **Middle:** Side-inlet culverts in the berm connect the ditch to the field. When the water level in the ditch is high, the pressure pushes a flap-gate shut. Water then remains on the field until the level in the ditch drops. **Right:** Check dams help to reduce the velocity within the ditch.