

FIELD TO STREAM PARTNERSHIP



Steph and Josh Dahl are making changes to their 160-cow dairy operation that one day might benefit their children, twins Jaxie and Cashton, 4, and Bricker, 1. The Dahl farm is part of a Root River Field to Stream Partnership, which will track what effect farmland conservation practices have on streams.

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Ann Wessel, BWSR

Root causes, Root solutions

The Root River Field to Stream Partnership seeks to answer how farm practices affect water quality. Findings apply to fields and rivers across southeastern Minnesota.

By Minnesota Board of Water and Soil Resources

RUSHFORD – Today, they ride trike in the calf barn, climb hay bales in pink cowboy boots, snuggle in a toddler-size John Deere sweatshirt. One day, Josh and Steph Dahl's three children could become fifth-generation family farmers.

The Dahls are positioning their 160-

cow Houston County dairy operation for the future with improvements made possible through the Root River Field to Stream Partnership.

The partnership is using intensive edge-of-field and in-stream data collection to determine what effect specific conservation practices have



on water quality. On the Dahl farm, a 1.9 million gallon manure storage facility, a calf barn, heifer barn, sediment control basins and waterways were designed to reduce runoff and soil erosion.

Monitoring started in 2010 on four farms within Houston, Fillmore and Mower counties. The Minnesota Department of Agriculture-led venture targets three small watersheds that drain into Root River tributaries. What is learned will apply to watersheds throughout southeastern Minnesota.

The effort involves federal, state and local agencies working with farmers.

Forty-seven farmers agreed to field walk-overs meant to identify spots where conservation practices could benefit high-risk erosion areas. Ron Meiners, retired Root River Soil & Water Conservation District manager, started



Top: Previously, Josh and Steph Dahl's dairy operation south of Rushford had five days' manure storage. In the winter, that sometimes meant repeatedly spreading on the flattest fields closest to the barn. **Above:** State Clean Water Fund and federal Environmental Quality Incentives Program grants covered 90 percent of the cost to build a manure storage facility.

each field visit by noting the conservation practices already in place.

The walk-overs followed seven years' monitoring that established baseline data. That \$1.1 million phase of the project ended in June 2016.

"This first phase is asking

the question: What is the water quality like today under current farming practices and conditions?" said Preston-based Kevin Kuehner, the Minnesota Department of Agriculture soil scientist coordinating the partnership.

Within two years, more than 60 percent of the

“
People live in an ag community because they want to be here. They want to be where they can see farm fields and animals on the land. By supporting that and making it possible for farmers to make a living and do it well and still be environmentally friendly is probably how we're going to sustain our local communities.

– Donna Rasmussen, Fillmore SWCD





A roofed calf barn will curb runoff. Houston County's steep topography plus runoff leads to surface water quality concerns – one aspect addressed by the Root River Field to Stream Partnership.



farmers who participated in field walk-overs had agreed to conservation fixes.

“We still have more work to be done, but that speaks volumes about the farmers’ commitment to be proactive and help improve water quality,” Meiners said.

Implementation started in July 2016.

Conservation fixes draw from two Minnesota Board of Water and Soil Resources grants totaling nearly \$1.3 million. Environmental Quality Incentives Program and landowner matches bring the initial budget to nearly \$1.9 million.

“It answers ‘What if we can really target practices in

strategic locations within these watersheds that have a high risk for runoff? What if we can get additional practices in those locations, and what effect might that have in the watershed?” Kuehner said.

“What’s the best we can do with a saturated, focused approach?” Kuehner said.

Projects on the Dahls’ farm are counted among more than 50 throughout the three watersheds that were finished or under construction this fall.

Within the Bridge Creek watershed, conservation practices implemented on the Dahls’ 450-acre farm south of Rushford had the greatest

About the Partnership

Ongoing work in the Minnesota Department of Agriculture-led Root River Field to Stream Partnership involves three county soil and water conservation districts – Root River SWCD in Houston County, Fillmore SWCD and Mower SWCD; the Minnesota Board of Water and Soil Resources; the Minnesota Pollution Control Agency; the Minnesota Department of Natural Resources; the Minnesota Agricultural Water Resource Center; the Natural Resources Conservation Service; and The Nature Conservancy.

potential to improve water quality – partly because of the farm’s proximity to the creek.

“It was important to get that one addressed. Because you can do everything else in the watershed and if that’s still a source, it’s going to affect your outcomes of water quality,” said Donna Rasmussen, Fillmore SWCD district administrator. Fillmore SWCD is the fiscal agent for the Clean Water Fund grant.

Josh Dahl said few surprises emerged during his field walk-over.

“We knew that our waterways were filling up and we knew that our manure storage was probably not the best, but we didn’t have the funds to do anything different,” Dahl said.

The farm had about five days’ worth of manure storage.

“Probably the worst has been when, during the winter, we would try to apply to our flattest ground up on top. If the roads were bad or the fields were especially muddy, we would just keep on applying to the same fields because we wouldn’t want to go on the steeper stuff. Then you would probably get some runoff,” Dahl said.

Dahl estimated his cost-share for all projects will total \$200,000.

The benefits of improvements made on Dahl’s farm extend well beyond the Bridge Creek Watershed.

“There’s a huge investment of public dollars, but there’s a huge return to the public, too, as far as



Alternating strips of alfalfa and corn help curb soil erosion on Josh and Steph Dahl’s 450-acre farm. Cover crops and grassed waterways are among the conservation practices planned.

Field to Stream Monitoring

In-stream and edge-of-field testing continues at nine stations. One more was added as monitoring moves from collecting baseline data collection to measuring the effects of conservation practices.

SITE SELECTION: Five edge-of-field, three in-stream, one spring, one intermittent stream between upland cultivation and steep forested bluffs.

DATA COLLECTION: Volume readings track runoff. Sediment and nutrient readings focus on nitrogen (nitrate vs. ammonia form) and phosphorus (dissolved vs. attached to sediment). Streams are tested for about 45 types of pesticides. Climate readings include rainfall, soil moisture, air and soil temperature, humidity and wind speed.

START-UP COSTS: The Nature Conservancy and Monsanto paid for about \$145,000 in initial monitoring equipment.

FIRST-PHASE FUNDS: The \$100,000 in annual monitoring and testing costs were paid through 2012 with the Legislature’s 2008 appropriation of \$395,000 in Legislative-Citizen Commission on Minnesota Resources funds, and then by Minnesota Department of Agriculture Clean Water Fund awards. A \$33,000 U.S. Fish & Wildlife Service Fishers and Farmers Partnership for the Upper Mississippi grant helped with outreach and monitoring.

the water quality benefits,” Rasmussen said. “It’s not just the feedlot. It’s the other environmental benefits to keeping a small dairy on the land. They have hay in the rotation, so you have that filtering effect of hay strips on the land.”

In early September,

alternating swaths of alfalfa and corn undulated over the rolling hills, stretching from the farmyard toward Bridge Creek. A contractor within a week of finishing the 1.9 million gallon manure storage facility operated a skid-steer loader. Calves kicked up

their heels in the calf barn built last year. A video crew filmed the family for a promotional piece about the partnership.

The Dahl farm represents what Rasmussen would like to see replicated across the southeastern Minnesota landscape 10 years from now.

“I still hope that we see livestock on the land, that we have dairy farms and beef operations that are profitable and can maintain or provide income for families,” Rasmussen said. “There’s all these social things that go on, too. For your small communities to be strong, you need families with children, your school district needs to be strong, your churches need to be viable and all of these community building networks that are needed to support families and the people that live here.”

The Dahls and their children – 4-year-old twins Cashton and Jaxie and 1-year-old Bricker – live in the house where Josh’s grandmother grew up. His great-grandfather, his grandmother’s brother and his father ran this farm before him; his father, Jerry, still owns the adjoining farm.

“They’re a young family, and there’s potential for family to continue in that operation. It’s a great investment to keep that there, knowing that they’re part of the community. They’re a young family that can stay on the landscape and be farming,” Rasmussen said.

By late November, the heifer barn was nearly complete. New water and sediment control basins were in place in the fields.

About one month's worth of manure was stored in the new facility, which can store 12 months' worth. Waterway construction was planned for spring.

"We are very thankful for everything that has happened but it has been quite a process to get everything lined up. When you combine a federal project with a state project, you don't necessarily always know who you should be talking with and how they are going to mesh together," Dahl said. "It has been challenging at times."

Improvements on the Dahl farm were among 160 individual projects proposed across the three watersheds.

"The effort was to accelerate the adoption of conservation practices in the target area," said Gary Larson, Caledonia-based NRCS district conservationist. "The combination of the federal and state or local cost-share package – it really was a sale on conservation as far as financial assistance."

The proposed improvements include 105 waterways totaling 111,200 feet, three manure storage facilities, 25 water and sediment control basins and grade stabilization structures, a sinkhole diversion, a milkhouse waste system – plus a \$226,000 flood-control structure restoration. Nutrient management plans, contour buffer strips, and 40 acres of cover crops a year within each watershed round out the list.

"Hopefully we're going to demonstrate that that needle is moving in regards to reduced soil erosion and sediment-loading. Hopefully we're going to show kind of a before-and-after picture,



The South Branch Root River flows over riffles just outside Preston.

Trout Streams

The South Branch Root River is considered one of Minnesota's premiere trout streams, with brown and brook trout. It's a stocked, too; a heavily fished tributary flows through Forestville State Park. The South Branch's headwaters are a warm-water fishery. Crystal Creek supports brown trout. Bridge Creek

has naturally reproducing brown and native brook trout.

"If you have brook trout, that's an indication of water quality, because they're sensitive to temperature and food sources," Kuehner said. Consistent groundwater flow has supported both species.

and really showcase how local units of government can work with federal government to deliver that conservation product to move that needle," Larson said.

Dave Walter, Root River SWCD manager, said he hoped the Field to Stream project would have a broader effect in Houston County.

"I hope as the big picture grows here and, like Gary says, that needle does move and we prove that this is effective, we can go to other watersheds and say this has worked in the past, we can write some grants up," Walter said.

Adam Beilke, Rochester-based BWSR board conservationist, said work

in the small watersheds demonstrates what the targeted approach can achieve on a larger scale.

Root River Field to Stream data will apply to southeastern Minnesota's Cannon and Zumbro rivers, too.

"The outcome of this project is going to be very useful. Because you look at the Cannon, you look at the Zumbro, those watersheds in particular, they have the same landscape changes – you go from glaciation through karst to the blufflands. And those landscapes have similar farming practices and similar water quality issues," Rasmussen said.

I think the transferability of this information is really

critical and really going to be helpful down the road," Rasmussen said.

Improvements made on ag land within the three targeted watersheds will benefit the Root River, which feeds the Mississippi River. The Root River is impaired for turbidity, bacteria and macroinvertebrates. Willow Creek, which is fed by Crystal Creek, is impaired for nitrates, bacteria and macroinvertebrates.

"The biggest thing we're working on is reducing the sediment load that gets to the water. That has obvious benefits to your average recreator – just for water clarity, for fishing opportunities in the trout streams in this area," Beilke said.

"They're also studying some of the movement of nitrates through groundwater. That has ramifications for drinking water concerns in this area. It's not just focused on these small watersheds but overall the whole Root and even beyond that as far as how this approach can move forward and reduce some of these sediment and phosphorus, nitrate concerns," Beilke said.



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