# Pomme de Terre conservation aims to improve water quality

**With more than $4.7 million in grants, the joint powers board in the past 10 years has monitored, targeted, prioritized and, with willing landowners, addressed some of the top sources of sediment and phosphorus in this northernmost Minnesota River tributary**

**Top:** *Contractors rerouted a previously straightened segment of Drywood Creek into its historic channel in September 2018 in Fairfield Township, Swift County.* **Left:** *Andy Albertsen, left, Swift SWCD manager, walked toward Drywood Creek during a site visit with Steve Linow of West Central Technical Service Agency 2 and Stephanie Adams, watershed projects coordinator for the Pomme de Terre River Association.*
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Ann Wessel, BWSR

MORRIS — For the first time in nearly 50 years, Drywood Creek is flowing freely this summer in a sinuous streambed.

A two-year, $127,580 Pomme de Terre River Association Joint Powers Board project removed Drywood Dam in 2017, and then returned the creek to its historic corridor last fall. It's one piece of the PDTRA's ongoing effort to improve water quality within the watershed, which has drawn more than $4.7 million in state and federal grants in the past 10 years.

*The Drywood Creek project addressed one of the top sources of sediment entering the Pomme de Terre River, and will help connect the river back to its floodplain. High water the previous season delayed final construction work until September 2018.*

The Pomme de Terre River is the northernmost Minnesota River tributary.

Two Clean Water Fund grants from the Minnesota Board of Water and Soil Resources and a grant from the Minnesota Department of Natural Resources funded the project about 17 miles southwest of Morris. The erosion control and habitat improvements at Drywood Creek will keep an estimated 212 tons of sediment — 16 dump truck loads' worth — out of the river annually.

"What we hope to see here in 10 years is that those banks are nice and stable and you don't have culverts full of sediment," said Andy Albertsen, Swift Soil & Water Conservation District manager.

**"A success for us is also that we can get the excess water off the land and make sure the excessive nutrients don't get into the rivers and tributaries."**

— Keith Swanson, Pomme de Terre River Association Joint Powers Board chairman

Drywood Dam was in Swift County; Albertsen worked directly with the landowner.

The PDTRA collaborates with six SWCDs and six counties within its 874-square-mile watershed. The 106-mile-long river runs from Fiske Lake 16 miles east of Fergus Falls in Otter Tail County to the Minnesota River near Appleton in Swift County.

Projects installed to date include 166 water and sediment control basins, 205 alternative tile intakes (which filter water before it enters streams and rivers), 91 rain gardens, 273 acres of fenced livestock exclusions, 11 lakeshore protections and six manure pit closures. Other work protected 800 feet of Pomme de Terre shoreline, placed 138 acres in a conservation easement and restored a

## Watershed Details

**COUNTIES:** The Pomme de Terre River watershed encompasses parts of the following counties: Big Stone, Douglas, Grant, Otter Tail, Stevens, Swift. Nearly 40 percent of the watershed lies within Stevens County, 23 percent in Otter Tail, 18 percent in Grant and nearly 13 percent in Swift. Big Stone and Douglas counties each contain less than 4 percent.

**CITIES:** All of Alberta, Ashby, Barrett, Chokio, Dalton and Morris, plus parts of Appleton, Donnelly and Underwood lie within the watershed. Morris is the largest, with a population of nearly 5,300.

**SPECIES:** The watershed contains seven species of mussels, three species of fish, one species of reptile and several plant species designated as threatened or of special concern in Minnesota.

2-acre wetland.

Some of the installed best management practices drew from Natural Resources Conservation Service Environmental Quality Incentives Program (EQIP) assistance.

Since 2011, the USDA's Conservation Reserve Program and Continuous Conservation Reserve Program have brought nearly $4.9 million in payments to retire 6,750 acres of marginal farmland within the watershed. Together, those programs have reduced phosphorus loading by nearly 79,760 pounds a year and sediment loading by nearly 79,760 tons a year.

Minnesota Pollution Control Agency staff has evaluated data collected as part two of a 10-year intensive watershed monitoring cycle. A report due out next spring will compare 2017-18 samples with those collected in 2007-08. Raw data show the biggest improvements occurred in fish communities near Appleton.

"If you really think about that, it's the pour point of accumulation of everything going on above it. If you look at it in a large scale, technically it's getting better," said Aaron Onsrud. A St. Paul-based environmental specialist with the MPCA's environmental analysis and outcomes division, he was involved with the most recent sampling.

*Steve Linow of West Central Technical Service Agency 2 collected data in September 2018 on Drywood Creek in Swift County. The creek is a tributary of the Pomme de Terre River, which flows into the Minnesota River.*

To be declared free of the index of biological integrity impairment for fish, all sample results on that final, 48-mile-long stretch of the Pomme de Terre River must meet the standard.

An MPCA progress report dated July 2016 noted slight improvements in phosphorus levels and total suspended solids near Appleton. That report compared levels from 2014-15 with 2007-08.

The more forested northern part of the watershed remains in better overall condition.

"Upstream of Barrett Lake, everything was in good shape. Some of it was in really, really good shape. I wouldn't use the word 'pristine,' but it stayed in good shape," Onsrud said.

Five stream segments north of Barrett Lake produced 48 sample results — including measures of fish and invertebrate habitat, water clarity, pH and phosphorus. In three reaches north of Barrett Lake, MPCA staff sampled for ammonia and chloride. Twenty-seven of the 48 results met water-quality standards or supported fish and invertebrates. Five did not. Sixteen were inconclusive or could not be assessed.

"We're constantly re-evaluating our success and looking at what our turbidity results are and our phosphorus levels. Sometimes we're disappointed. But we have to say, 'Where would those levels be if we weren't doing anything?" said Keith Swanson of Hoffman, a Grant County commissioner and chairman of the 12-member Pomme de Terre River Association Joint Powers Board.

"I hope we've made the Pomme de Terre tributaries and lakes a little bit cleaner, a little bit safer for people to enjoy," Swanson said.

The PDTRA formed in 1981 to address both water quality and quantity issues.

"A success for us is also that we can get the excess water off the land and make sure the excessive nutrients don't get into the rivers and tributaries," Swanson said.

The watershed includes 751 river and stream miles.

The MPCA's 2007-08

**Left:** *The Pomme de Terre River flows 106 miles from Otter Tail County to the Minnesota River near Appleton in Swift County. Its watershed includes 874 square miles in all or part of six counties.* **Middle:** *Planners used old photos as a guide when they rebuilt Drywood Creek's sinuous channel in Swift County. The Pomme de Terre River tributary was a major contributor of sediment within the watershed.* **Right:** *Streambank erosion such as this contributes to sediment-loading. In the past 10 years, projects within the watershed have focused primarily on reducing phosphorus and sediment.*

Watershed Restoration and Protection Strategy (WRAPS) monitoring, assessment and prioritization within the Pomme de Terre River watershed gave the PDTRA a blueprint for action. The MPCA in 2008 approved the watershed's plan to address fecal coliform bacteria levels in a southern stretch of the Pomme de Terre.

BWSR

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.

Work began in earnest in 2009 with a $286,320 EPA grant to monitor fecal coliform and a $24,370 MPCA Surface Water Assessment Grant.

In the past 10 years, projects have focused primarily on reducing phosphorus and sediment — sources of the most common impairments throughout the watershed.

Swanson listed the biggest challenges: Fertilizer. Topography. Money.

Swanson said the river association has educated both farmers and residential property owners about the effects of fertilizer on water quality. Agriculture accounts for nearly 70 percent of land use within the watershed, which includes nine cities.

**Top:** *Drywood Creek erosion control and habitat improvements will keep an estimated 212 tons of sediment — 16 dump truck loads' worth — out of the river annually.* **Bottom:** *A corn field obscured contractors' work.*

Topography ranges from more forested, rolling hills in the north to flat, gravelly farmland in the south. Conservation practices vary accordingly.

Finally, money makes it possible for willing landowners to implement the projects and practices that address resource concerns.

Stephanie Adams, the Pomme de Terre River Association watershed projects coordinator, credited funding success to a longstanding collaboration that predates One Watershed, One Plan — a current movement to a locally driven, watershed-based approach that spans political boundaries as it prioritizes conservation work.

"We have a very, very strong partnership with the counties and the soil and water (conservation) districts. Because of that, for the last 10 years they've been incredibly successful at getting Clean Water Funds and (U.S. Environmental Protection Agency) grants to get projects on the ground," Adams said.

In 2019 the Pomme de Terre River Association received a $541,775 Clean Water Fund grant to address the top sediment-producing catchments on ag land plus stormwater runoff identified in the Watershed Restoration and Protection Strategy.

The projects proposed in that grant would reduce sediment by an estimated 14,690 tons — 1,130 dump trucks' worth — and phosphorous by an estimated 12,270 pounds annually.

Since 2011 the PDTRA has received more than $2.7 million in Clean Water Fund grants for technical assistance, project development and implementation. It also received a $115,250 Clean Water Fund grant in 2016 to develop Prioritize, Target and Measure application (PTMApp) — a tool for matching strategies to the best management or conservation practices in priority areas.

"If we're helping to take down some of this turbidity, I think we're hoping to get the public more interested in recreating on the river again," Adams said.

Adams leads educational presentations and organizes an annual paddle down the Pomme de Terre.

"I think that's a mover when it comes to water quality," Adams said. "If you get the public out on the river and finding a reason (they'll think), 'We have something here that we want to protect because we use it in our everyday lives and it's sort of important to our community.'"

A 27-mile stretch of the Pomme de Terre River from Swift County to the Minnesota River is a designated State Water Trail.

Public education topped Swanson's list of the joint powers board's biggest successes to date.

"In west-central Minnesota, we're proud of what we do," Swanson said. "We have all the lakes and wildlife habitat. It brings people out here, and we want to continue to do that."

*The 106-mile-long Pomme de Terre River flows through six counties in west-central Minnesota.*

# Unleashed Drywood Creek provides fish habitat, water quality benefits

Drywood Dam was installed in 1971 to keep carp out of upstream lakes, which include North and South Drywood lakes. When the dam failed after a 1997 flood, erosion worsened around the structure. It was flagged as a major source of sediment entering the creek, which is impaired for turbidity, biological fish indicators and E. coli.

"The one thing that rough fish, especially carp, are known for is overcoming obstacles. If nothing else, they're very persistent," said Ryan Bjerke, Ortonville-based DNR area hydrologist.

The dam did little to keep carp out, but the failed dam still restricted macroinvertebrates' movement.

"One of the biggest things this project's accomplished is restoring the ability of those native fish species moving upstream and downstream longitudinally, and then providing competition to non-native fish species," Bjerke said.

The PDTRA expanded upon the dam removal project. Engineers rebuilt the once-straightened stream, using DNR aerial photos from the 1930s and 1960s as a reference. They restored 1,050 linear feet of disconnected streambed, and reconnected Drywood Creek to its floodplain.

**Bjerke**

"It slows the water down so it allows for those microorganisms to have better habitat," Albertsen said of the meandering stream and rock riffles. "Also from a water quality standpoint, it helps those sediments settle out."

Bjerke said straightening and channelizing a stream affects water quantity and quality. The reconnected floodplain can temporarily store water on the landscape while sediment and the pollutants it carries settles out instead of flowing downstream.

"A lot of our water quality issues derive from (an increased quantity of water running off the landscape)," Bjerke said.

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# MPCA evaluating 10-year watershed monitoring cycle

The most significant single sample-site improvements showed up the farthest downstream, while a reassessment of one stretch of Pelican Creek south of Ashby eventually could prompt re-evaluation of the entire stretch. That, in turn, could result in delisting its aquatic invertebrate index of biological integrity (IBI) impairment.

Those are among the findings from Round 2 of the Minnesota Pollution Control Agency's once-every-10-years intensive watershed monitoring cycle conducted in 2017-18 in the Pomme de Terre watershed. The report is due out in spring 2020. Highlights follow.

**IMPROVED FISH COMMUNITIES:** Both occurred in the watershed's southernmost reach. The fish IBI score met the standard on the Pomme de Terre River downstream of Swift County Road 59 in Appleton. That score improved from 46.3 in 2007 to 57.8 in 2018. The threshold is 49 (out of 100). The fish IBI score improved from 37 to 42.2 on the Pomme de Terre River downstream of Swift County Road 51 west of Appleton.

**WHAT IT MEANS:** The MPCA's Aaron Onsrud explained fish IBI: "The stream has been degraded enough by humans that it is not allowing a (less tolerant) fish community in there," he said. Carp, bullheads and fathead minnows fare better in degraded conditions.

**PELICAN CREEK STATUS:** The northern segment of the watershed, north of Barrett Lake, remained the healthiest. Four of the five sites sampled in 2017-18 met standards for both fish and invertebrate IBIs, and for aquatic life. The exception, Pelican Creek, will be resampled this year because high water may have skewed results.

**NEW IMPAIRMENTS, EXPLAINED:** Six of the seven new fish impairments added after 2017-18 do not reflect worsening conditions. Instead, new tools assessed previously unassessed, channelized sites that would not have met standards 10 years earlier.