

Restoring a metro trout stream



South Creek flows about 9 miles from Lakeville to Farmington in west-central Dakota County. In Lakeville, the stream flows through Airlake Industrial Park. Two Clean Water Fund projects involving the VRWJPO and the city of Lakeville improved trout habitat in the stream. Here, a Clean Water, Land and Legacy sign marks the location of the new pond outlet and emergency overflow structure.

Photo Courtesy of Lakeville city staff



In Dakota County, a partnership between the Vermillion River Watershed JPO and the city of Lakeville, plus 2 recent Clean Water Fund grant projects lead to lower water temperature and less sediment in South Creek

A designated trout stream that flows through a Lakeville industrial park and a rapidly developing part of town is colder and less turbid today as the result of \$463,400 in projects made possible by Clean Water Funds — and a partnership between the Vermillion River Watershed Joint Powers Organization (VRWJPO) and the city of Lakeville.

South Creek flows about 9 miles from Lakeville to Farmington in Dakota County.

One of the coldest reaches within the watershed, it supports a naturally



Brown trout reproduce naturally in South Creek. **Photo Credit:** VRWJPO

reproducing brown trout population, plus northern pike and stocked rainbow trout. Trout require colder water than other species, and gravel streambeds with fast-moving water in which to spawn.

Long stretches of the creek had been modified and straightened over the years, degrading habitat and natural stream processes.

As the result of Clean Water Fund-backed work, South Creek's summer water temperatures now average 11 degrees lower compared with pre-project conditions. Dissolved oxygen concentrations have improved by 2 parts per million, on average. Sediment-loading decreased by more than 4 tons a year and phosphorus-loading decreased by 30 pounds a year.

"A resource worth protecting" is how Travis Thiel, senior watershed specialist for Dakota County and the VRWJPO, described South Creek.

One of four major tributaries to the Vermillion River, located near

the headwaters, South Creek is the second-highest subwatershed priority identified in the JPO's [Watershed Management Plan](#).

For Lakeville, the creek is a natural resources and recreational amenity. It aligns with the Lake Marion South Creek Greenway corridor in Dakota County, which will bring opportunities for recreation and community engagement to the area. The city recognized it was poised to bring together different interests to protect the creek and continue economic growth.

The Minnesota Department of Natural Resources (DNR) designated South Creek a trout stream in 1988. That designation, with additional South Creek tributaries designated in 1996, helped to jump-start restoration — and the JPO-city partnership.

Restoration efforts have come a long way since the city began the first South Creek channel restoration project in 2001. Its South Creek management plan, adopted in 2000, is designed to preserve trout stream habitat within the city and minimize negative impacts downstream.

The JPO completed a geomorphic assessment of the creek in 2010 and a subwatershed assessment of the industrial and commercial areas in 2016. Those assessments allowed the JPO to understand channel condition and stability, characterize riparian and aquatic habitats, and identify restoration opportunities to improve water quality and aquatic and riparian ecosystems.

Both entities have been working together to manage stormwater runoff, improve water quality flowing to



Vegetated riprap helps to stabilize the streambanks and control erosion. **Photo Courtesy of Lakeville city staff**

the creek, and complete in-stream restoration work. Stormwater runoff from both agricultural and developing urbanized areas poses a threat to the trout stream. As new development occurs, it presents an opportunity for the dynamic partnership to continue leveraging opportunities for protection and restoration projects.

In 2017 the Minnesota Board of Water and Soil Resources (BWSR) awarded the JPO, in partnership with the city, two Clean Water Fund grants totaling \$310,800 to help complete two projects to protect and improve South Creek.

The JPO received a \$144,000 Clean Water Fund grant to help the city install a hydrodynamic separator, a stormwater treatment device, in an existing underground stormwater pipe that drains to South Creek. Completed in 2019, the project ultimately reduced stormwater-carried total suspended solids (TSS) by 4.2 tons per year and phosphorus by 30 pounds per year. Sediment can degrade or reduce spawning habitat by filling in riffles. Phosphorus feeds the algae that can turn waters green.

To combat increased stream

temperatures resulting from nonpoint source runoff, the JPO received a \$166,800 Clean Water Fund grant to separate South Creek from an existing stormwater pond. In previous studies, the JPO found that open-water stormwater ponds directly connected to, or within close proximity to the Vermillion River and its tributaries, are susceptible to increased water temperatures by sun exposure.

The South Creek Temperature Reduction Project was completed in 2019. The JPO assisted the city with construction of a dedicated stream channel around the stormwater pond. Previously, the stream flowed through the pond. Pollutant-laden stormwater runoff now is treated by the stormwater pond before it's discharged to South Creek, and warm water from the stormwater pond is prevented from directly mixing with the creek.

Mac Cafferty, Lakeville's environmental resources manager, said restoration would be much slower without the established working partnerships and grant funds.

The JPO and city contributed a combined total of about

\$165,570 in matching funds for both projects.

"Financial assistance from Clean Water Fund and Conservation Partners Legacy grants has allowed us to leverage additional dollars for more on-the-ground projects and an accelerated implementation schedule," VRWJPO Administrator Mark Zabel said.

The partnership and restoration work continue.

Two Outdoor Heritage Fund Conservation Partners Legacy grants from the DNR allowed the JPO and city to restore two reaches of the South Creek channel — a 2,000-linear-foot restoration in 2018 and a 1,400-linear-foot restoration in 2020.

The first restoration removed obstructions, narrowed the channel to increase stream velocity, stabilized the bank to prevent erosion, installed habitat features for fish and macroinvertebrates, and added fishing access.

The second narrowed the channel; stabilized the bank; removed stream-blocking trees; installed rocks, woody habitat and riffles (which improve aeration); and established native vegetation within the riparian area.

A narrower channel can more easily move sediment, resulting in deeper pools, better channel substrate, adequate cover and more areas for fish to spawn. The added habitat features provide cooler temperatures and improved dissolved oxygen concentrations. Improvements to the channel and its habitat make it easier to fish the stream.