



NONPOINT SOURCE SUCCESS STORY

Wisconsin

Restoration of Pleasant Valley Branch Through Stream Corridor Rehabilitation

Waterbody Improved

Excess sedimentation from agricultural sources degraded water quality and habitat in Pleasant Valley Branch. As a result, the entire creek was added to Wisconsin's 1998 Clean Water Act (CWA) section 303(d) impaired waters list for degraded habitat. The Dane County Land and Water Resources Department (LWRD) led efforts to implement best management practices (BMPs) to control sediment from agricultural nonpoint sources, which resulted in improvement in this nearly 6-mile-long stream. As a result, Pleasant Valley Branch was removed from the state's impaired waters list in 2016.

Problem

Pleasant Valley Branch is a tributary to Kittleson Valley Creek and is in the Gordon Creek watershed (Figure 1). Wisconsin placed Pleasant Valley Branch, totaling 5.92 miles (ID = 367), on its 1998 CWA section 303(d) list of impaired waters for degraded habitat. Biologists believed the stream had the potential to be a high-quality trout stream.

Habitat and fish assessments of Pleasant Valley Branch (WBIC 908500, HUC 070900030501) in the early and mid-2000s found that the stream continued to fail to support its fish and aquatic life use. A fish survey conducted by the Wisconsin Department of Natural Resources (WDNR) found a pollution-tolerant fish assemblage, made up predominantly of white suckers, creek chubs and brook stickleback. The lack of trout appeared to be the result of degraded fish habitat due to sediment deposition in the stream. Streambank erosion caused by excessive livestock pasturing along the stream and soil erosion within the watershed were the likely sources of the deposited sediment. Although the habitat score averaged 45, which is considered "fair," other scores were noted as "poor," including the bank erosion, fish cover and soft sediment metrics, and the coldwater index of biotic integrity (IBI).

Project Highlights

The Pleasant Valley Branch subwatershed was part of a multifaceted effort to improve the riparian corridor and habitat of the stream, while also addressing nonpoint source issues in the watershed as a whole. From 1998 to 2014, the Dane County LWRD worked

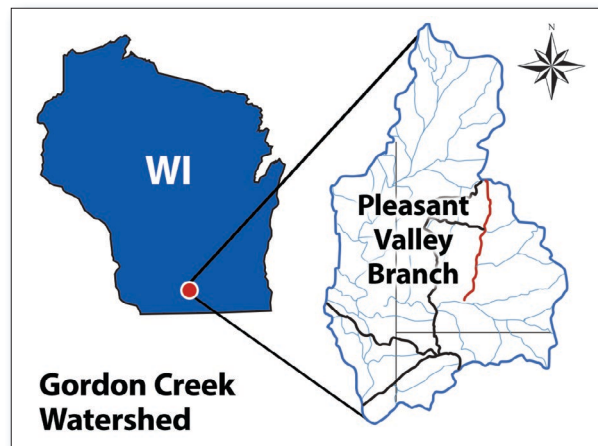


Figure 1. Pleasant Valley Branch is in southern Wisconsin's Gordon Creek watershed.

with landowners to implement practices along the riparian corridor. Concurrently, a consortium of public and private partners worked with landowners in the watershed to improve barnyards and to reduce the amount of sediment and nutrient runoff from agricultural lands and pastures. These projects showed that targeting the application of conservation practices on agricultural lands with the highest pollutant loading, rather than randomly throughout the watershed, will result in cleaner water. Between 1998 and 2014, landowners in the subwatershed installed three grade stabilization structures and eight water/sediment control basins, restored 27,556 feet of streambank and 11 acres of wetlands, and implemented numerous agricultural BMPs (Table 1). The estimated total cost of BMPs implemented in the Pleasant Valley Branch subwatershed between 2010 and 2014 was over \$900,000.

Table 1. Agricultural BMPs installed in the Pleasant Valley Branch subwatershed (1998–2004)

Practice Type Installed	Amount
Residue management, no-till/mulch-till	3,041 acres
Nutrient management	3,405 acres
Comprehensive nutrient management plans	9 plans
Conservation cover	843 acres
Contour farming	854 acres
Stripcropping	75 acres
Fence	32,301 feet
Filter strip	36 acres
Grassed waterway	2,010 feet
Animal trails and walkways	3,890 feet
Access road	550 feet

Results

In response to the installation of BMPs within the Pleasant Valley Branch subwatershed, the WDNR conducted another set of assessments of Pleasant Valley Branch in 2009 and 2013. Prior to rehabilitation, the stream was rated “fair” to “good” for habitat, using a quantitative habitat index, with fine sediments making up an average of 71 percent of the stream bottom. After rehabilitation, this percentage decreased by over half, and the habitat rating rose to “good” and “excellent.” Mean bank erosion (measured length of raw, eroding bank) dropped from a mean of 2.5 feet before the projects were implemented to a mean of 1.5 inches afterwards (Figure 2).

The health of the fishery, as measured by the cold water IBI and catch-per-unit effort (i.e., extrapolated number of trout per mile), showed immediate improvement. The pollution-tolerant fish assemblage was replaced with a community of pollution-sensitive coldwater species, consisting of brown trout, mottled sculpin and brook lamprey. The coldwater IBI increased at all sites from “poor” and “fair” to “fair” and “good” after the restoration. The numbers of trout increased 70 to 150 percent and, in some cases, well over that by taking areas that held few or no trout to the point where they now hold 40 to 70 individual fish over the same station length.

Based on the evaluation monitoring results, the stream meets its potential use, and the WDNR removed



Figure 2. Pleasant Valley Branch at CTH H (upper crossing) before restoration in 2003 (top) and after restoration in 2008 (bottom).

Pleasant Valley Branch from the CWA section 303(d) list of impaired waters in 2016 for its degraded habitat impairment. As an added benefit, U.S. Geological Survey water quality data showed a 55 percent decrease in phosphorus loading to the stream during storm events.

Partners and Funding

The restoration of Pleasant Valley Branch was supported by numerous partners and programs that provided technical assistance, BMP implementation, and local assistance, including Dane County LWRD, private landowners, WDNR’s Targeted Runoff Management Grant Program, Wisconsin Department of Trade and Consumer Protection’s Soil and Water Resources Management Grant Program, University of Wisconsin–Madison’s College of Agriculture and Life Sciences, University of Wisconsin Extension, The Nature Conservancy, U.S. Geological Survey, Iowa County Land Conservation Department, Green County Land and Water Conservation Department, and the U.S. Department of Agriculture’s Environmental Quality Incentives Program, Wildlife Habitat Incentives Program, Conservation Reserve Program, and Conservation Reserve Enhancement Program. U.S. Environmental Protection Agency CWA section 319 grant funding from 2005 to 2015 helped to cover the cost of WDNR Nonpoint Source Program staff, BMPs, and monitoring costs associated with the project.



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For additional information contact:

Jim Amrhein
Wisconsin Department of Natural Resources
608-275-3280 • james.amrhein@wisconsin.gov
Amy Callis
Dane County Land & Water Resources Department
608-224-3740 • callis.amy@countyofdane.com