Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Wisconsin

Installing Upland and Stream Restoration Practices Reduces Sediment in German Valley Branch

Waterbody Improved

Agricultural runoff contributed high levels of sediment to Wisconsin's German Valley Branch, degrading the stream's aquatic life habitat. The stream failed to meet the state's criteria to support the aquatic life designated use, prompting Wisconsin to add it to the 1998 Clean Water Act (CWA) section 303(d) list of impaired waters for sedimentation and degraded habitat. Stakeholders implemented best management practices (BMPs) to control upland sediment sources, restored riparian areas, and improved fish habitat in the stream. These efforts improved water quality and restored the stream's aquatic life designated use. As a result, Wisconsin removed the stream from its 2012 list of impaired waters.

Problem

German Valley Branch is a spring-fed stream that flows seven miles through the townships of Perry and Blue Mounds in Dane County to its confluence with Gordon Creek. Approximately 50 percent (3,294 acres) of the German Valley Branch watershed is composed of agricultural lands.

Over many years, sediment from cropland and streambank erosion degraded the in-stream habitat for aquatic life in German Valley Branch (Figure 1). Fisheries and habitat surveys conducted in the mid-1990s indicated that the stream was dominated by fish species tolerant of disturbed habitat and that the overall habitat condition was only "fair." The stream's cold-water fish Index of Biotic Integrity (IBI) scores (based on several metrics used to assess the fish community) ranged from zero (very poor) to 40 (fair), and the macroinvertebrate IBI scores were as low as 2.4 (poor). Quantitative habitat surveys, which factor in stream width, bank erosion, width-to-depth ratio, riffle and/or pool ratio, percent soft sediment, and fish cover, resulted in scores ranging from 25 (fair) to 63 (good) before rehabilitation efforts. These data indicated that the stream was not supporting its aquatic life designated use. On the basis of the data, the state added the 7-mile-long German Valley Branch to its CWA section 303(d) list of impaired waters in 1998 because of excessive sediment from agricultural nonpoint source pollution.

In 2005 EPA approved a total maximum daily load (TMDL) for German Valley Branch and 19 other streams in the Sugar-Pecatonica River Basin. The TMDL specifies an average annual sediment load capacity for German Valley Branch of 5,845 tons. To address the sediment load, the Dane County Land and Water Resources Department's Land Conservation Division (LCD), coordinated several stream restoration projects. The water quality objective was to reduce sediment loading by 90 percent.

Figure 1. Before restoration, German Valley Branch was deeply entrenched and had highly eroding banks.

Project Highlights

During the late 1990s and early 2000s, watershed landowners enrolled 525 acres in the U.S. Department of Agriculture's Conservation Reserve Program (CRP), which provides agricultural landowners with annual rental payments and cost-share assistance in exchange for their taking

Figure 2. Project partners worked with a local farmer to install a fenced cattle crossing to limit livestock access to the stream.

Figure 3. Project partners installed livestock exclusion fencing and restored the stream channel and its natural meanders.

highly erodible, eligible farmland out of agricultural use. Erosion from the CRP-enrolled lands declined, thereby reducing the amount of sediment reaching the stream. In addition, more water infiltrated into the uplands, which translated into higher base flows (the portion of stream flow that results from seepage of water from the ground, not from runoff) in the stream. This subsequently led to cooler stream water temperatures, which also improved aquatic life habitat.

Dane County LCD continued restoration efforts from 2004 to 2006, supported by the Wisconsin Department of Natural Resources' (WDNR) Targeted Runoff Management (TRM) Grant Program and Dane County cost-share funds. The county worked with eight landowners to implement three TRM projects that rehabilitated the stream corridor and improved fish habitat. The projects included restoring streambanks, stabilizing critical areas, adding wastewater treatment strips (vegetated buffers) near livestock holding areas, installing waterway systems (vegetated waterways that convey excess runoff across fields), and installing livestock exclusion fencing (Figures 2 and 3). Project partners improved fish habitat in the stream by placing rock and log weirs (channel-spanning rock structures that protect streambanks by redirecting stream flow), as well as lunker structures (cells of heavy wooden planks and blocks installed along streambanks to improve aquatic life habitat and minimize bank erosion). In total, watershed efforts restored more than four miles of stream habitat, which significantly improved water quality and habitat. In addition, all landowners in the stream restoration area provided public access easements to allow people to fish and hike.

Results

Restoration projects in the German Valley Branch watershed stabilized streambanks and reduced soil erosion into the stream. Cold-water fish IBI and habitat data collected in 2007 and 2009 (after project implementation) indicated improved aquatic habitat. Quantitative habitat survey scores improved following watershed restoration efforts, ranging from a low of 65 (good) to a high of 78 (excellent). Cold-water fish IBI scores also improved, with post-project scores ranging from 50 (fair) to 70 (good). Thanks to the riparian corridor and stream habitat restoration work, water quality in German Valley Branch now meets the more stringent criteria required to support a Class II trout stream. As a result, Wisconsin removed the 7-mile-long German Valley Branch from its 2012 list of impaired waters.

Partners and Funding

WDNR, Dane County LCD, landowners and several volunteer organizations worked to improve the Green Valley Branch watershed. Dane County LCD received and implemented three TRM grants—funded by state bond revenue and serving as matching funds for the state's CWA section 319 grant—which totaled over $400,000. Volunteer groups, including the Blue Mounds Area Project, Trout Unlimited, the Upper Sugar River Watershed Association and the Deer Creek Sports and Conservation Club, provided labor for the TRM projects. The U.S. Fish and Wildlife Service also contributed funding for the restoration work. EPA CWA section 319 grant funding helped to cover the cost of WDNR Nonpoint Source Program staff.

U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-12-001AAA
December 2012

For additional information contact:

James Amrhein
Wisconsin Department of Natural Resources
608-275-3280 • james.amrhein@wisconsin.gov

Patrick Sutter, Dane County Land & Water Resources Department, Land Conservation Division
608-224-3740 • sutter@countyofdane.com