



NONPOINT SOURCE SUCCESS STORY

Illinois

Implementing Erosion Control Practices and Shoreline Restoration Improved Blue Creek

Waterbody Improved

Sedimentation from hydromodification and agriculture resulted in degraded habitat for aquatic life in Illinois' Blue Creek. As a result, Illinois added the creek to its Clean Water Act (CWA) section 303(d) list for sedimentation in 1998. In the early 2000s project partners implemented best management practices (BMPs) in the upper watershed that decreased sedimentation. As a result of these efforts, water quality improved and Illinois removed Blue Creek from its impaired waters list in 2014.

Problem

Blue Creek is a direct tributary of the 18,000-square-mile Lower Illinois River watershed. Agricultural runoff, channel and drainage modifications, and urbanization impaired aquatic habitat and biological communities in these watersheds. The Blue Creek (071300110801) subwatershed covers 39 square miles in Pike County (Figure 1). Primary land uses include 42 percent row crop (primarily corn and soybeans), 35 percent deciduous forest, 15 percent pasture, 4 percent residential and 2 percent open lands. Agriculture uses include some small livestock operations such as hog production (open lots), and cattle on pasture.

Blue Creek is 17 miles long with topography varying from gentle slopes and grassed gullies to rolling lands that contain narrow forested ravines. A 241-acre impoundment (Lake Pittsfield) was constructed on Blue Creek in 1961 as a flood control reservoir and to provide a public water supply for the city of Pittsfield, Illinois. Sedimentation from the surrounding watershed led Illinois to add the lake to the state's impaired waters list in 1992 for failing to support aquatic life uses due to nutrients and siltation. In subsequent years this excess sedimentation impacted the downstream areas of Blue Creek.

On the basis on monitoring data collected in Blue Creek in 1995, the state listed the creek on the 1998 CWA section 303(d) list for aquatic life impairment due to sedimentation/siltation. Further sampling in 2006 at station IL _ DZC-07 showed that Blue Creek remained impaired through 2009.

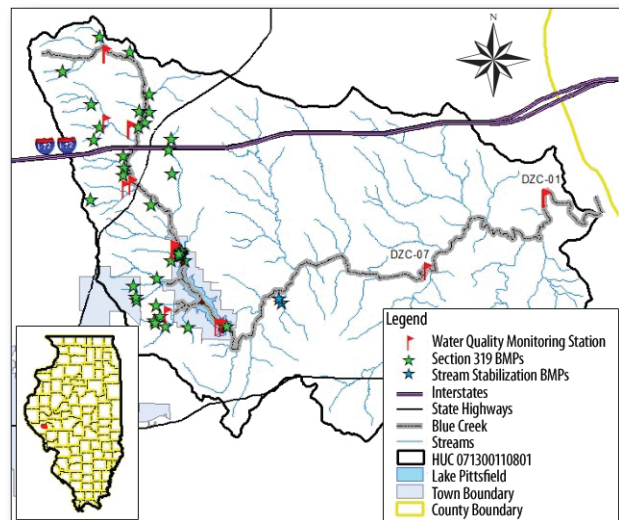


Figure 1. Blue Creek watershed, in western Illinois.

Project Highlights

Work to improve water quality in the Blue Creek watershed was initiated in 1991 (and continued through 1998) with a federal Clean Lakes Program Phase II Implementation project that addressed sedimentation/siltation impairments in Lake Pittsfield. This restoration work included activities such as dredging, aeration/destratification, shoreline stabilization, watershed management and algae management (with the majority of funding coming from local sources).

Further restoration work was implemented in 1994–1995 by the Illinois Environmental Protection Agency (Illinois EPA), the University of Illinois, Illinois State



Figure 2. Partners installed 29 water and sediment control basins in the Blue Creek watershed, including this one.

Figure 3. Partners restored and stabilized this section of Blue Creek above Lake Pittsfield.



Water Survey (Illinois SWS), and the Pike County Soil and Water Conservation District (SWCD). These partners collaborated to construct 29 water and sediment control basins (WASCOBs) to reduce the transport of sediment into Lake Pittsfield (Figure 2). They constructed an additional basin above Lake Pittsfield in 1996 with CWA sections 314(h) and 319(h) funding. This basin was estimated to trap over 90 percent of the sediment entering Lake Pittsfield.

In 2002, watershed partners stabilized 2,100 linear feet of shoreline on Lake Pittsfield with rip rap placed over filter fabric. In 2008 they stabilized another 1,075 linear feet of an unnamed tributary to Blue Creek using stone toe protection methods (Figure 3). The efficacy of the restoration work to reduce sediment loading was monitored from 1994 to 2004 through the Illinois Section 319 Nonpoint Source Management National Monitoring Program.

Results

Illinois collected Index of Biotic Integrity (IBI) and Macroinvertebrate Index of Biotic Integrity (mIBI) scores in Blue Creek in 2011 that showed improving biological and habitat conditions. A site's IBI score represents how much that site's biotic integrity differs from a known reference condition (representing biological conditions that would be expected in Illinois streams least disturbed by human impacts). IBI scores of less than 41 indicate that a site is of lower biotic integrity than reference conditions, and is therefore not fully supporting its aquatic life designated use. IBI scores of greater than 41 indicate a site exhibits similar biotic integrity to reference conditions, and is considered fully supporting.

Similarly, mIBI scores of greater than 41.8 indicate full support. As shown in Table 1, Blue Creek's IBI score increased from "below reference condition" in 2006, to "similar to reference condition" in 2011. The mIBI score already indicated support in 2006, but Blue Creek had remained listed as not supporting because of the low IBI score. The mIBI score showed further improvement in 2011. Because the 2011 mIBI and IBI data showed that Blue Creek (IL _ DZC) fully supported its aquatic life designated use, it was removed from the impaired waters list in 2014.

Table 1. Index of Biotic Integrity and Macroinvertebrate Index of Biotic Integrity scores in Blue Creek, Illinois

| Location in Blue Creek Watershed | Station Code | Year | mIBI Score | IBI Score |
|----------------------------------|--------------|------|------------|-----------|
| Below Lake Pittsfield | DZC-07 | 2006 | 51.95 | 23 |
| Below Lake Pittsfield | DZC-01 | 2011 | 55.65 | 50 |

Partners and Funding

Many partners collaborated in the restoration of Blue Creek, including the U.S. Environmental Protection Agency (USEPA), the U.S. Department of Agriculture's (USDA's) Farm Service Agency and Natural Resources Conservation Service, Illinois EPA, Illinois Department of Natural Resources (DNR)/Illinois SWS, Pike County SWCD, city of Pittsfield, and the Farm Bureau of Pike County. Illinois EPA provided staff hours to administer \$1,439,044 of USEPA CWA section 314(h)/319(h) funding that was provided for BMPs (\$1,174,824 of CWA 319(h) and \$264,220 of CWA 314(h)). USDA provided \$32,000 in Farm Bill funding to support conservation practice design and implementation, information and education outreach efforts, and evaluation of possible participation interests. Illinois DNR/Illinois SWS provided \$459,333 of in-kind funds through implementing field work and monitoring activities using CWA section 314(h)/319(h) funds, and providing presentations and technical publications. Illinois Department of Agriculture and Pike County SWCD provided \$223,332 in state and local funds for supporting contract administration, designing and implementing BMPs, conducting project information and education outreach efforts to stakeholders, and evaluating possible participation interests. The city of Pittsfield provided \$132,110 in city funds for contract administration, labor and equipment resources. Lastly, the Farm Bureau of Pike County helped educate producers about BMPs, conducted outreach and evaluated possible participation interests.



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