Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Illinois

Implementing Nonpoint Source Pollution Controls Restores Honey Creek

Waterbody Improved

Sediment and organic matter from eroding streambanks and cropland areas caused low dissolved oxygen conditions in Illinois's Honey Creek. As a result, Honey Creek failed to support its aquatic life designated use, prompting the Illinois Environmental Protection Agency (Illinois EPA) to add a 13-mile-long segment of the creek to the list of impaired waters in the 1992–1993 *Illinois Water Quality Report*. Stakeholders stabilized stream channels and worked with local landowners to implement best management practices (BMPs) to reduce sedimentation/siltation and organic enrichment loading into the creek. Water quality improved, prompting Illinois EPA to remove the creek from the state's list of impaired waters in 2008. Honey Creek now fully supports its designated use for aquatic life.

Problem

Honey Creek is a 13-mile-long stream in Pike County, Illinois (Figure 1). The creek begins at the west end of the city of Pittsfield and flows south-southeast to the point of confluence with Bay Creek, about 3.5 miles north of the village of Nebo. The 21,672-acre Honey Creek watershed is made up of approximately 77 percent cropland, 10 percent pastureland, 8 percent woodland and 5 percent other land uses.

Water quality monitoring conducted in 1992 indicated that dissolved oxygen levels in Honey Creek were 4.0 milligrams per liter (mg/L), which failed to meet the applicable state water quality standard requirements—a minimum of 6.0 mg/L for 16 hours in any 24-hour period and a 5.0 mg/L instantaneous minimum. As a result, Illinois EPA first designated Honey Creek as impaired due to siltation and organic enrichment in the 1992–1993 *Illinois Water Quality Report*. The creek remained listed as impaired for those pollutants through the 2006 *Illinois Integrated Water Quality Report and Section 303(d) List*. (Note that organic enrichment was redefined as dissolved oxygen in the 2004 *Illinois Integrated Water Quality Report* and subsequent reports.) Illinois EPA identified the sources of impairment as streambank modification/destabilization and agriculture/crop production.

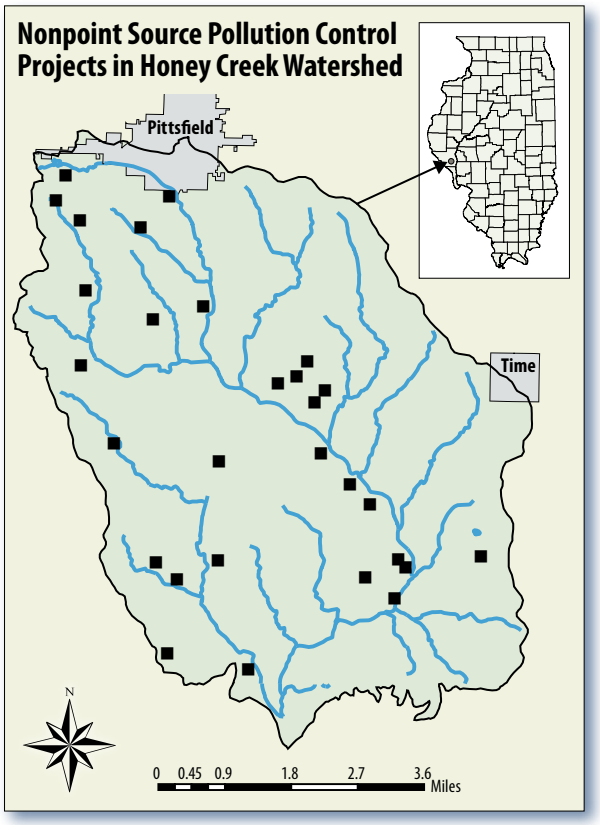

Figure 1. The Honey Creek watershed is in western Illinois. Project partners implemented BMPs to reduce nonpoint source pollution in agricultural runoff and to stabilize the creek.

Project Highlights

Between 1999 and 2002, Illinois EPA implemented a Clean Water Act (CWA) section 319-funded project that provided landowners with cost-share to implement BMPs throughout the watershed (see Figure 1). This project augmented ongoing conventional land and water treatment programs. Project partners in the Honey Creek Watershed Project worked with landowners to construct 25 large ponds/basins in agricultural areas to prevent silt, nutrients and

pesticides from entering the stream. Partners also added sediment ponds designed to remove suspended and soluble nonpoint source pollutants in the extreme lower reaches of the side tributaries off the main stem of Honey Creek (Figure 2). Project partners focused their efforts on sites on the tributaries of Honey Creek that had drainage areas of 100 acres or more and were suitable for dam installation. They added riprap outlet erosion control (stilling basins) immediately below and for a distance of up to 100 feet downstream from the outlet pipe of each pond. The outlet of each pond was raised above the normal elevation of the streambed to increase the amount of dissolved oxygen carried by the water into the stream.

Within the tributary streams of Honey Creek, partners also installed six riffles and stream barbs (rock structures installed in streams to modify flow patterns and streambed topography) to help direct flow and increase dissolved oxygen levels. Additionally, project partners worked with the 23 participating farms in the Honey Creek watershed (covering approximately 1,288 acres) to develop conservation plans, as well as nutrient and pesticide management plans. Between 2007 and 2008, the Illinois Department of Agriculture's *Streambank Stabilization and Restoration Program* supported a project to stabilize an additional 700 feet of eroding streambank in the Honey Creek watershed.

Results

Based on the BMPs implemented, Illinois EPA estimates that the 1997–2002 Honey Creek Watershed Project reduced annual pollutant loads by approximately 14,880 tons of sediment, 5,041 pounds of phosphorus and 10,080 pounds of nitrogen. The 2007–2008 streambank stabilization project further reduced annual pollutant loadings by approximately 71 tons of sediment, 71 pounds of phosphorus and 141 pounds of nitrogen.

Data collected in 1992, 2004 and 2009 show dramatic improvements in dissolved oxygen and sediment levels in Honey Creek. While dissolved oxygen levels failed to meet state water quality standards in 2002, levels increased to 8.22 mg/L by 2004, which met the state minimum of 6.0 mg/L. Data show that by 2009, dissolved oxygen levels increased further to 10.4 mg/L—still meeting the applicable dissolved oxygen standard, which had changed in 2008 to include seasonal and various time-related requirements.

Figure 2. Example of a sediment pond constructed along a tributary stream in an agricultural watershed. The pond is designed to remove suspended and soluble nonpoint source pollutants.

According to state water quality standards, a waterbody is considered impaired for sediment if bottom sediment coverage is greater than 34 percent. In 1992, data showed that silt and mud covered 64.3 percent of the stream bottom, indicating impairment. By 2004, that percentage had dropped to 2.36 percent. In 2009, no excess sediment was observed on the stream bottom.

Finally, biological data also show that Honey Creek now meets criteria to support aquatic life. To be classified as supporting the aquatic life designated use, Illinois EPA requires that the macroinvertebrate Index of Biotic Integrity (mIBI) score be at least 41. Honey Creek received mIBI scores of 68.0 in 2004 and 56.4 in 2009, showing that the creek has fully supported its aquatic life designated use since at least 2004. On the basis of these data, sedimentation/siltation and organic enrichment/dissolved oxygen were removed as causes of impairment in Honey Creek in the 2008 *Illinois Integrated Water Quality Report*. Illinois EPA has identified Honey Creek as fully supporting its designated uses for aquatic life in 2008, 2010 and 2012.

Partners and Funding

Contributing a total of $380,661 of CWA section 319 funds, Illinois EPA partnered with the Pike County Soil and Water Conservation District, Bay Creek River Conservancy District, and local landowners to implement BMPs in the Honey Creek watershed. Local partners provided $253,774 in matching funds, bringing the total cost for the Honey Creek Watershed Project to $634,435.

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