NONPOINT SOURCE SUCCESS STORY

Mississippi

Implementing Conservation Practices Reduced Polluted Runoff and Restored the Biological Integrity of Limekiln Creek

Waterbody Improved

Organic enrichment from agricultural activity impacted water quality in Mississippi's Limekiln Creek. As a result, the Mississippi Department of Environmental Quality (MDEQ) placed Limekiln Creek on the state's 1998 Clean Water Act (CWA) section 303(d) list of impaired waters for aquatic life use impairment. Implementing best management practices (BMPs) as part of the Bogue Chitto Creek Watershed Project significantly reduced organic material entering Limekiln Creek. As a result, Limekiln Creek was assessed as attaining the aquatic life use in the state's 2014 CWA section 305(b) report and removed from the impaired waters list.

Problem

Limekiln Creek is in the Limekiln Creek Watershed (HUC 080602020601) in central Mississippi's Hinds and Madison counties. The watershed spans approximately 28,880 acres, and is comprised of 45% forest, 21% pasture/grassland, 14% scrub/barren, 8% urban, 5% wetland, 4% water, and 3% cropland (Figure 1). The primary source of pollution in Limekiln Creek was organic enrichment from agricultural processes.

Biological community data are routinely used by MDEQ to determine if streams are healthy enough to support a balanced aquatic community. Limekiln Creek (Waterbody ID: MS106911) was monitored in 2003 as part of Mississippi's biological monitoring program. Using MDEQ's index of biological integrity, the Mississippi Benthic Index of Stream Quality (M-BISQ), Limekiln Creek scored 30.93, less than the assessment threshold of 38.5 required to attain aquatic life use support for this region.

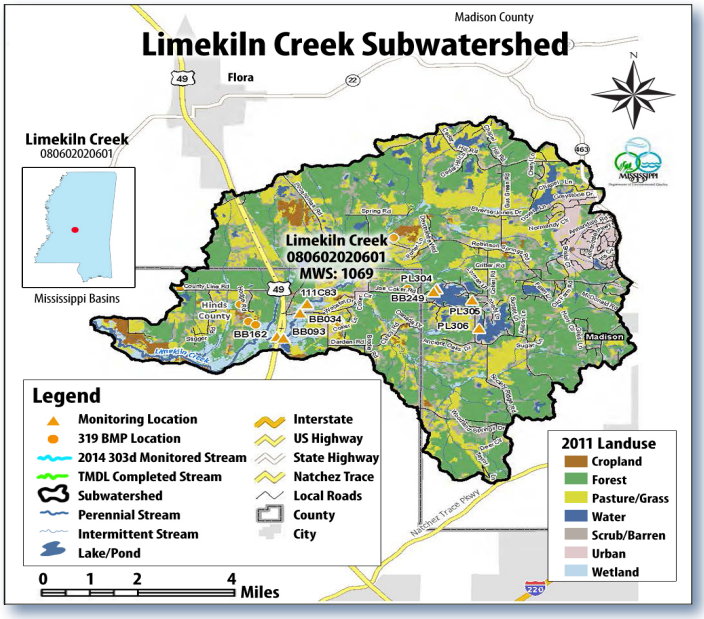

Figure 1. The 28,880-acre Limekiln Creek subwatershed is in central Mississippi.

Project Highlights

Between 2004 and 2007, MDEQ partnered with the Mississippi Soil and Water Conservation Commission, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) and the Hinds County and Madison County soil and water conservation districts to implement the Bogue Chitto Creek Watershed Project. BMP installations within the Limekiln Creek–Bogue Chitto Creek area began in 2005 and concluded in 2007. Supported with CWA section 319 funds, the implemented BMPs included 25 water and sediment control basins, 13 grade stabilization structures, 10 acres of critical area planting, 6 acres of permanent vegetation, 84 acres of pasture and hayland planting, 25 nutrient management practices, 14,642 feet of fencing, a heavy use area, a diversion, and a stream crossing (Figures 2 and 3). A total of 77 practices were installed, affecting approximately 2,024 acres and saving an estimated 9,525 tons of soil per year with additional load reductions of 2,320 pounds per year of phosphorus and 4,611 pounds per year of nitrogen.

Figure 2. Water and sediment control basins were used to trap sediment and runoff from agricultural areas.

Figure 3. Fencing was used to provide a barrier to control livestock and manage sensitive riparian areas.

In addition, NRCS implemented 12 BMPs in the Limekiln Creek watershed between 2009 and 2015 and plans to install 15 more practices. Some of the implemented BMPs include critical area stabilization, heavy use area protection, livestock pipeline, seasonal high tunnel systems for crops, and watering facilities.

Results

In 2011 MDEQ returned to Limekiln Creek to collect biological community data. The score was 45.54, above the assessment threshold of 38.5 required to indicate water quality is sufficiently good to support healthy populations of aquatic life in this region of Mississippi. Using this 2011 data, Limekiln Creek was assessed as attaining the aquatic life use in the 2014 CWA section 305(b) report and was removed from the state's impaired waters list.

Partners and Funding

The restoration of Limekiln Creek was a collective effort between the Mississippi Soil and Water Conservation Commission, MDEQ, U.S. Environmental Protection Agency, NRCS, and the Hinds County and Madison County soil and water conservation districts. The total cost of the Bogue Chitto Creek Watershed Project was $701,100, of which $356,556 was comprised of CWA section 319 funds. Participating state and local stakeholders contributed a total of $344,544 towards the implementation of this watershed project. Additionally, NRCS contributed $36,483 towards practices installed during the 2009–2015 period, and has planned additional expenditures of $39,847 towards future practices.

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

EPA 841-F-17-001R
September 2017

For additional information contact:

Donetta McCullum-Weatherspoon, PhD
Mississippi Department of Environmental Quality
601-961-5348 • dmccullum@mdeq.ms.gov
Ajay Parshotam
Mississippi Department of Environmental Quality
601-961-4253 • aparshotam@mdeq.ms.gov