



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Indiana

Using a Watershed Approach Reduces Creek's Bacteria Levels

Waterbody Improved

High levels of bacteria from livestock manure, leaking and failing septic systems, and wildlife caused a segment of lower Clifty Creek to violate water quality standards. As a result, the Indiana Department of Environmental Management (IDEM) added an 8.12-mile-long segment of lower Clifty Creek to Indiana's 2002 Clean Water Act (CWA) section 303(d) list of impaired waters for *Escherichia coli* bacteria. Using CWA section 319 funds, project partners educated stakeholders about sound agricultural management and installed best management practices (BMPs) throughout the watershed. Data show that the lower Clifty Creek segment now meets water quality standards for bacteria, prompting IDEM to propose removing the segment from the state's 2010 CWA section 303(d) list of impaired waters.

Problem

Lower Clifty Creek (Figure 1) flows through south-central Indiana in Bartholomew County, just south-east of Columbus. Agriculture is the watershed's primary land use. Two small streams, Sloan Branch and an unnamed tributary from Suhre Lake, contribute flow to Clifty Creek, which in turn empties into the East Fork White River.

In 2002 IDEM assessed waterbodies in south-central Indiana to identify which were impaired for bacteria and would require a total maximum daily load (TMDL) report. Samples collected on lower Clifty Creek had levels of *E. coli* that exceeded both the single sample and geometric mean water quality standards for bacteria, prompting IDEM to add an 8.12-mile-long segment to the 2002 CWA section 303(d) list of impaired waters.

IDEM identified nonpoint source runoff as the main contributor of *E. coli*. Key bacteria sources in the watershed include manure spread on pastures and crops, livestock, leaking and failing septic systems, and wildlife. Potential point sources of *E. coli* in the basins include three small community wastewater treatment plants; however, the plants have no history of violations, further supporting IDEM's assertion that nonpoint sources caused the *E. coli* impairments in lower Clifty Creek.

Project Highlights

IDEM used CWA section 319 funds to support three projects in the greater Clifty Creek watershed between 2003 and 2009. Watershed stakeholders worked with local and state agencies to develop a



Figure 1. Clifty Creek is in south-central Indiana.

comprehensive watershed management plan, identify critical areas and needed actions, and target resources necessary to install BMPs designed to improve water quality.

Landowners implemented BMPs on almost 10 percent of the surface area of the Lower Clifty Creek subwatershed (Figure 2). BMPs include adopting prescribed grazing, planting pasture and hayland areas, adding heavy use area protection for livestock, adopting residue management using no-till and green manure crop cover, installing alternate watering facilities, and excluding livestock from stream using fencing and stream crossings. In addition, several farmers developed and implemented nutrient management plans for their operations.

The Natural Resources Conservation Service (NRCS), working with SWCDs and the watershed project,

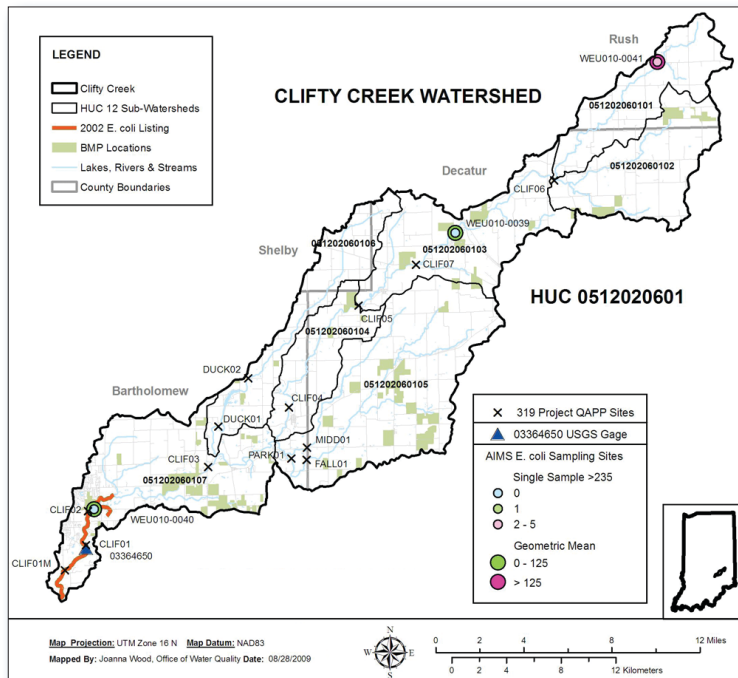


Figure 2. Monitoring stations and CWA section-319 funded BMPs in the Clifty Creek watershed.

provided general technical support to producers managing more than 106,000 acres in the larger Clifty Creek watershed from 2003 through 2009. Additionally, NRCS's Environmental Quality Incentives Program (EQIP) supported water quality improvement projects on 46,729 acres, which included nutrient management plans covering 15,562 acres, pest management plans for 13,701 acres, and 8,745 acres of residue management. Also, farmers used NRCS's Conservation Reserve Program (CRP) to create 54 acres of riparian zones, 185 acres of grassed waterways, and 152 acres in filter strips.

Results

IDEM reassessed the water quality in the larger Clifty Creek watershed in 2007. Data show that bacteria levels dropped in the creek and that a TMDL was no longer needed. The geometric mean of five samples collected in 2007 was 67.58 most probable number (MPN) *E. coli* colonies per 100 milliliters—well below the water quality standard, which requires *E. coli* levels to be less than 125 MPN. The 2007 data show that *E. coli* levels have dropped by 67 percent when compared to data collected in 2002 (the geometric mean in 2002

was 205 MPN). Furthermore, data collected by the U.S. Geological Survey at a fixed station site in the watershed in 2007 support the conclusion that the lower creek segment meets the bacteria water quality standard. On the basis of that information, IDEM has proposed to remove the 8.12-mile segment of Clifty Creek from the 2010 CWA section 303(d) list of impaired waters.

Partners and Funding

The Bartholomew County Soil and Water Conservation District (SWCD) worked closely with the Decatur County SWCD, the NRCS regional conservation staff, and a number of local and state partners including the Indiana Department of Natural Resources; Indiana State Department of Agriculture; Hope Hardwoods; Bartholomew County Cattleman's Association; Strand Associates; Bartholomew County and Decatur County health departments; kidsCommons Children's Museum; Hoosier River Watch; Indiana Project WET; Southside, Rockcreek and LF Smith Elementary Schools; Columbus East High School; Sand Creek Watershed Project; Friends of the Muscatatuck River Society; Indiana-Purdue University Columbus; and Columbus City Utilities. Partners contributed resources to support education and outreach to stakeholders, water quality monitoring, and technical support for installing BMPs.

Considerable funds and technical resources have been focused within the larger Clifty Creek watershed. The Bartholomew County SWCD used \$1,088,175 in CWA section 319 grant funds (with an additional \$532,742 contributed as local match) to support the 2003 project to develop the Clifty Creek Watershed Plan. These funds also supported projects in 2005 and 2007 to implement the plan by installing BMPs, coordinating with other partners' water quality improvement activities, and performing outreach and education activities.

The Decatur County SWCD received \$70,000 in Clean Water Indiana grants and approximately \$18,000 in Emergency Conservation Assistance Program grants from the Indiana State Department of Agriculture for water quality improvement projects. The Bartholomew County SWCD received \$70,000 in Clean Water Indiana grants and approximately \$87,400 in Emergency Conservation Assistance Program grants for similar projects. The NRCS worked with the SWCDs and other partners to help landowners implement BMPs using EQIP and CRP funds.



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