



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Kentucky

Targeting Animal Waste Best Management Practices Improves Water Quality

Waterbody Improved

Pollutants in agricultural runoff impaired water quality in Kentucky's Fleming Creek and many of its tributaries. The Kentucky Division of Water (KDOW) added numerous watershed segments to Kentucky's Clean Water Act (CWA) section 303(d) list of impaired waters in 1994 because of pathogens or nutrients and organic enrichment/low dissolved oxygen. Using approximately \$3.6 million in state and federal financial support, watershed partners implemented numerous restoration activities, including targeted agricultural best management practices (BMPs). While much of the watershed still does not fully support its primary contact recreation use, habitat and biological monitoring indicate that a 4.8-mile segment of Fleming Creek now fully supports its designated use of warm water aquatic habitat. As a result, KDOW removed the segment from Kentucky's 2006 CWA section 303(d) list of impaired waters.

Problem

The Fleming Creek watershed is in the beautiful rolling farmland of Fleming County in northeastern Kentucky. Fleming Creek, a tributary of the Licking River, is 39 miles long and drains an area of 61,670 acres (95 square miles) (see Figure 1). The watershed includes the mainstem of Fleming Creek and 11 tributaries. A total of 75.2 stream miles in the watershed did not meet water quality standards for primary contact recreation, and 53.7 stream miles did not meet water quality standards for warm water aquatic habitat. KDOW considers agricultural runoff to be the primary source of impairment because of the historically high concentration of dairy operations along the creeks. KDOW developed a total maximum daily load for pathogens in Fleming Creek in 2001.

Project Highlights

In 1989 a group of local landowners initiated the Fleming Creek Watershed Nonpoint Source Demonstration Project. The landowners' sustained commitment to improving water quality has generated numerous restoration efforts throughout the watershed.

From 1992 through 1994, KDOW biologists gathered physicochemical, bacteriological and biological data designed to target animal waste pollution

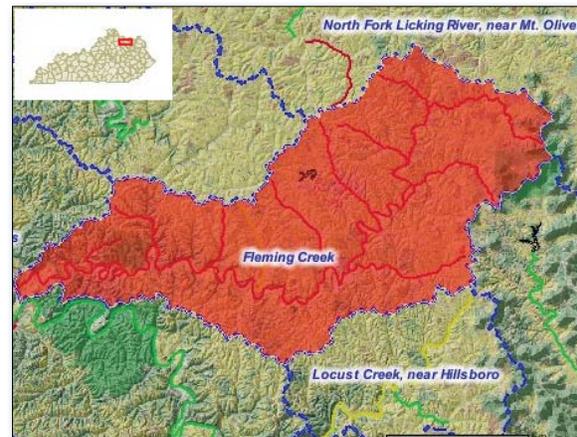


Figure 1. Fleming Creek is a tributary of northeast Kentucky's Licking River watershed.

Source: Kentucky's Watershed Viewer (<http://eppcmapping.ky.gov/website/watershed/>)

problems in the watershed and to establish baseline water quality conditions. Landowners benefitted from education efforts and implemented numerous BMPs in the watershed between 1992 and 1997 using funds from Kentucky agricultural cost-share program, the CWA section 319 program and several U.S. Department of Agriculture (USDA) programs. However, comparison of pre- and post-BMP data collected in 1999 indicate that water quality had not significantly improved.

Photo courtesy of USDA NRCS

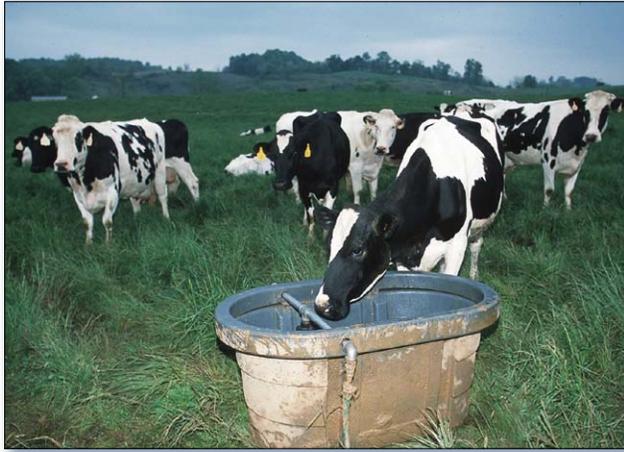


Figure 2. Farmers keep cows out of Fleming Creek by installing alternative water sources such as this one.

Watershed partners then refined their efforts. Using an adaptive management approach, partners targeted agricultural BMPs in two subwatersheds—Allison Creek (8.6 square miles) and Wilson Run (6.75 square miles)—to maximize results. The BMPs included approximately 80 animal waste facilities, 30 miles of riparian fencing and more than 200 alternative watering facilities (Figure 2).

The Fleming County Conservation District and the USDA Natural Resources and Conservation Service provided oversight and technical assistance for planning, installing, operating and maintaining BMPs. A CWA section 319 grant funded a full-time watershed coordinator. One-on-one outreach and assistance to local landowners, along with targeting of smaller subwatersheds, has helped to reduce pollutant loadings to the creeks.

Results

KDOW monitored water quality in 2004 to assess pathogen and biological recovery in the Fleming Creek watershed. Pathogen data analysis indicates a trend of increasing recovery for Allison Creek and Wilson Run, as well as downstream reaches of Fleming Creek. Because of this success, two additional tributaries, Flat Run (3 square miles) and Cassidy Creek (3.9 square miles), have been selected for targeted BMP implementation. Landowner participation is predicted to be high. Watershed partners are developing a watershed plan to address both agricultural and nonagricultural land uses in a

third subwatershed, Town Branch (6 square miles), which contains the city of Flemingsburg.

While the much of the watershed still does not fully support its primary contact recreation use, habitat and biological monitoring indicate that a 4.8-mile segment of Fleming Creek now fully supports its designated use of warm water aquatic habitat. In-situ physicochemical data and macroinvertebrate community data show that the segment meets water quality standards. Additionally, dissolved oxygen levels were above the 5 milligrams per liter standard, and the biological community scored a 68.5, which is considered good. On the basis of these data, KDOW removed the 4.8-mile segment of Fleming Creek from the state's 2006 CWA section 303(d) list of impaired waters.

Partners and Funding

Project partners include agricultural producers, Fleming County Conservation District Board of Supervisors; Fleming County Conservation District; Kentucky Division of Conservation; KDOW; Redwing Ecological Services, Inc.; the University of Kentucky's Cooperative Extensive Service and Department of Agronomy; and the Community Farm Alliance.

Federal financial assistance through the CWA section 319 Nonpoint Source Implementation Grants supported targeted BMP efforts in the watershed. Between 1991 and 2007, watershed partners spent more than \$1.6 million and contributed more than \$970,000 in nonfederal match contributions. The Kentucky Soil Erosion and Water Quality Cost Share Program (state cost-share) provided cost-share assistance to landowners to install agricultural BMPs worth \$2,134,884 in the watershed. The state cost-share program provided \$1,408,288, and landowners provided another \$726,595 in cash payments or in-kind labor.

Several USDA programs supported landowner's efforts to install agricultural BMPs including the Agricultural Conservation Program, Water Quality Special Project, Water Quality Incentive Program, Environmental Quality Incentive Program and Conservation Reserve Program. Since 1992 more than \$1.2 million in federal financial support from USDA has been targeted to the Fleming Creek watershed for implementing agricultural BMPs.



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

EPA 841-F-09-001U
August 2009

For additional information contact:

Paulette Akers
Kentucky Division of Water
502-564-3410 • Paulette.Akers@ky.gov