Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Kentucky

Watershed Restoration Efforts Improve Water Quality in the Licking River

Waterbody Improved

Nonpoint source pollution from urban and agricultural areas contributed to high levels of organic enrichment and low levels of dissolved oxygen (DO) in northern Kentucky's Licking River. As a result, a 4.6-mile segment at the mouth of the river failed to support its aquatic life designated use. In 2000 the Kentucky Division of Water (KDOW) added this segment to the Clean Water Act (CWA) section 303(d) list of impaired waters for low DO. Implementing best management practices (BMPs) and conducting outreach and education activities in target watersheds led to improved DO levels in the Licking River. Data collected in 2004 showed that river miles 0–4.6 of the Licking River met water quality standards and supported the river's aquatic life designated use, prompting KDOW to remove the segment from the state's list of impaired waters in 2006.

Problem

The Licking River watershed drains forested hills in the river's upper reaches, rolling farmland along the middle regions, and areas of urban/industrial development near its mouth. The river flows northwest for about 300 miles before emptying into the Ohio River between Newport and Covington. The river drains an area of roughly 3,600 square miles, or about 10 percent of the entire state.

Data collected in 1999 indicated that the lowermost segment of the Licking River did not meet Kentucky's water quality standard for DO, which requires that DO levels be no less than 5.0 milligrams per liter (mg/L) as a 24-hour average and that the instantaneous minimum be no less than 4.0 mg/L for aquatic life use.

Data showed that DO levels violated these standards in May through August 1999, causing the Licking River to support its aquatic life designated use only partially. As a result of low DO levels and organic enrichment, in 2000 KDOW added the lowermost segment (river miles 0.0–4.6) to the CWA section 303(d) list of impaired waters for not meeting its aquatic life designated use. Suspected pollution sources included combined sewer overflows, urban runoff, and storm sewers. Additional sources included cumulative impacts from agriculture, improperly treated wastewater, and loss of riparian habitat.

Project Highlights

From 1999 to 2006, Kentucky invested CWA section 319 funding in four watersheds—Banklick Creek, Townsend Creek, Strodes Creek, and Fleming Creek—which are all tributaries to the larger Licking River (Figure 1). In the Banklick Creek watershed, CWA section 319 funding was used to help establish the Banklick Watershed Council, a group composed of local agencies, officials, and concerned citizens. The group worked with local stakeholders on an education and outreach campaign that was essential to the success of stormwater management programs and the implementation of nonpoint source BMPs. The group continues to be active and has received additional CWA section 319 funding for developing and implementing watershed plans.

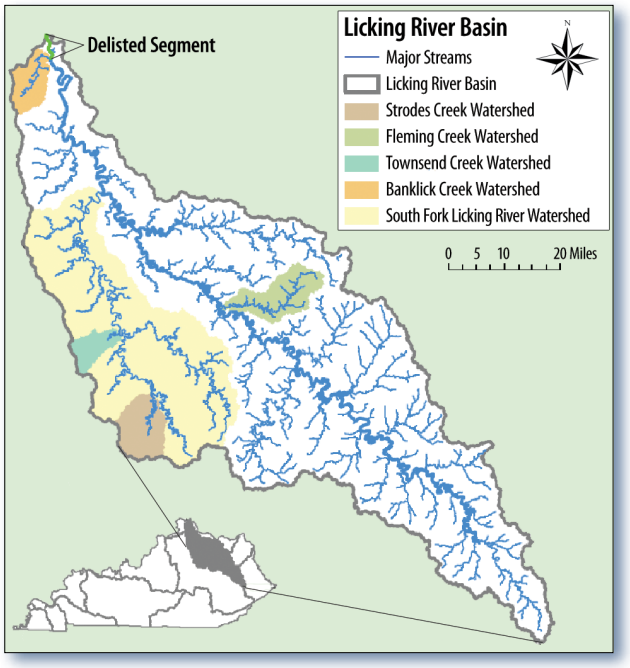

Figure 1. Northern Kentucky's Licking River Basin.

Efforts to restore the Townsend Creek watershed began in 2005 and focused on building capacity through field days and landowner meetings. This coordinated effort prompted landowners to implement agricultural BMPs, such as installing stream crossings, excluding livestock from streams, restoring riparian areas, and stabilizing areas frequently used by livestock. In the Strodes Creek watershed, the Strodes Creek Conservancy has worked with landowners since 2003 to conduct watershed planning, repair and replace septic tanks, exclude livestock from streams, restore riparian areas, and acquire and protect land. In the Fleming Creek watershed, stakeholders implemented agricultural BMPs that helped to restore a 4.8-mile creek segment. (Refer to the Fleming Creek Success Story at http://water.epa.gov/polwaste/nps/success319/ky _ fleming.cfm). In 2010 stakeholders continued their work by developing and implementing a Fleming Creek subwatershed plan.

Results

In 2004 KDOW collected monthly samples to reassess conditions along the 4.6-mile impaired segment of the Licking River. The data showed that DO levels ranged from around 6.0 mg/L to 8.0 mg/L during the sampling season, well above the minimum level required for aquatic life use support (Figure 2). As a result, KDOW removed this segment (river miles 0.0–4.6) from the state's list of impaired waters in 2006. This represents a move from partial to full support of the aquatic life designated use for this segment of the Licking River; however, the segment remains listed as impaired for bacteria.

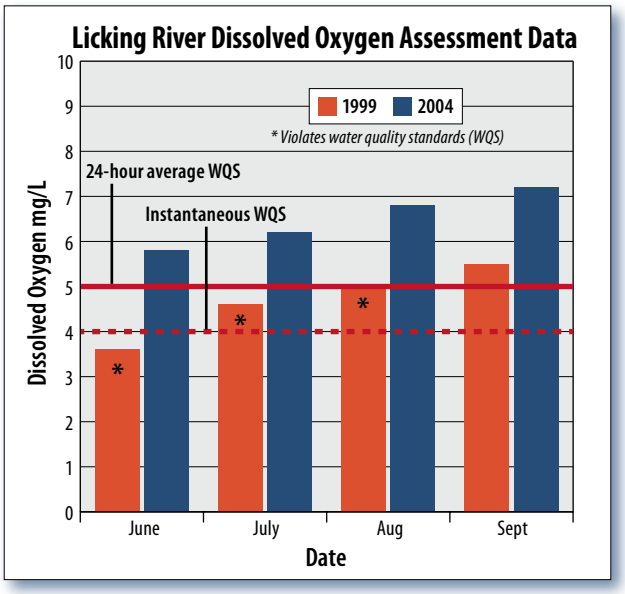

Figure 2. Data collected in 1999 (orange) show violations of the dissolved oxygen water quality standard. Follow-up data collected in 2004 (blue) show that Licking River dissolved oxygen levels fully comply with the standard.

Partners and Funding

Partners involved in developing the Banklick Watershed Council included the Kentucky Waterways Alliance, Sanitation District No.1, the Kenton County Conservation District, the local planning commission, and concerned citizens. Approximately $12,500 in CWA section 319 funding supported this effort, of which about $7,500 was used for personnel and education.

Partners involved in the Townsend Creek watershed restoration effort included The Nature Conservancy (TNC), the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), conservation districts, Kentucky Department of Fish and Wildlife Resources, U.S. Fish and Wildlife Service (USFWS), Kentucky Division of Forestry, University of Kentucky Agricultural Extension Service, Bourbon County 4H, Licking River Valley Resource Conservation and Development Program, Friends of Stoner Creek, and multiple landowners. Approximately $900,000 in CWA section 319 funding was spent in this watershed, $537,200 of which supported project management, monitoring, and BMP-related costs.

Partners involved in the Strodes Creek watershed restoration effort included the Strodes Ceek Conservancy, City of Winchester, Winchester Municipal Utilities, Licking River Watershed Watch, Clark County Health Department, Kentucky Waterways Alliance, Clark County Conservation District, Kentucky Division of Conservation, U.S. Forest Service, and TNC. Approximately $680,000 was spent in this watershed, including $408,000 in CWA section 319; funds supported the Strodes Creek Watershed Coordinator staff position, monitoring, and BMP-related costs.

Partners involved in the Fleming Creek watershed restoration effort included the NRCS, Fleming County Conservation District, Kentucky Division of Conservation, Farm Service Agency, Redwing Ecological Services, Kentucky Farm Bureau, Community Farm Alliance, University of Kentucky Agricultural Extension Service, and numerous landowners. Approximately $1.6 million in CWA section 319 funding was used in this watershed through three separate projects. Approximately $950,000 supported agricultural BMP implementation, water quality monitoring, and the Fleming Creek Watershed Coordinator staff position.

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