Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Kentucky

Watershed-Based Restoration Efforts Lead to Water Quality Improvements on Townsend Creek

Waterbody Improved

Bacteria loadings from farmland and pasture land led to high bacteria counts that violated water quality standards in Kentucky's Townsend Creek. As a result, Kentucky added a 4.8-mile segment of Townsend Creek to its 2002 Clean Water Act (CWA) section 303(d) list of impaired waters for failure to attain its primary contact recreation designated use. Installing agricultural best management practices (BMPs) resulted in decreased bacteria levels in Townsend Creek. These measures allowed Kentucky to remove one segment (2.9 miles of the originally listed 4.8 miles) from its list of impaired waters in 2012.

Problem

Townsend Creek is a 25,648-acre subwatershed of the South Fork Licking River (Figure 1). Most of the watershed is rural and consists of farmland and pasture land. The creek's riparian areas are often unfenced and are used heavily by cattle, which led to fecal coliform contamination and sedimentation. State water quality standards for bacteria require that fecal coliform levels are lower than 400 colony-forming units per 100 milliliters of water (cfu/100 mL) in 80 percent of samples collected during the swimming season (May to October). Monitoring results collected at the mouth of Townsend Creek from May to October of 1999 failed this standard, with more than 20 percent of samples exceeding 2,000 cfu/100 ml. This resulted in the 2002 CWA section 303(d) listing of Townsend Creek (miles 0.0 to 4.8; waterbody ID KY505401 _ 01) as impaired for its primary contact recreation, or swimming, designated use.

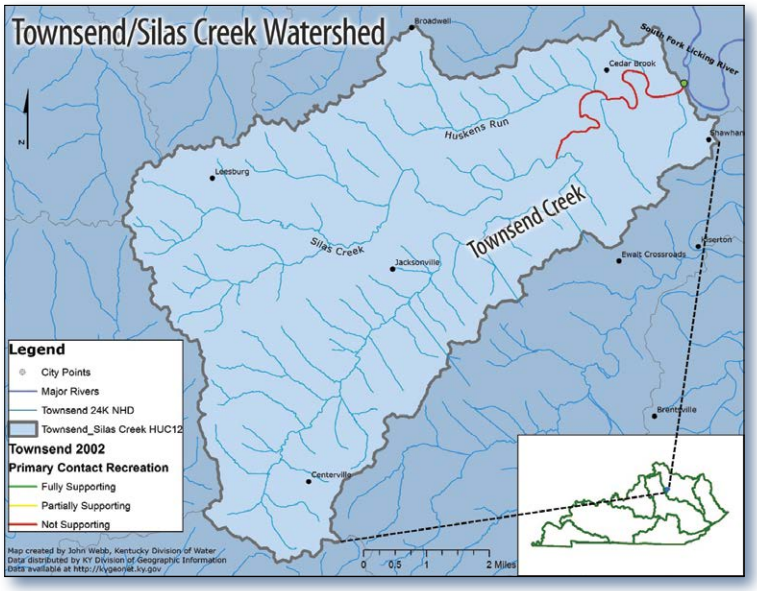

Figure 1. The Townsend Creek watershed is in northern Kentucky.

Project Highlights

The Townsend Creek Watershed Project (TCWP) began with a 2003 CWA section 319 nonpoint source implementation grant to the Kentucky Chapter of The Nature Conservancy (TNC). The primary goal of the TCWP was to improve water quality in Townsend Creek by reducing pathogen levels and increasing safe recreational opportunities within the watershed. The methods for achieving this goal included installing agricultural BMPs, conducting pre- and post-BMP water quality monitoring, and implementing a strong K–12 and adult water education and outreach program.

Through this project, TNC employed a full-time Licking River project director as well as Townsend Creek project manager to seek out agricultural BMP implementation opportunities throughout the watershed. The TCWP identified individual farms within high-priority subwatersheds that were then targeted for BMPs and other conservation practices. The project goal was to holistically address conservation issues on particular farms and tie those individual BMP projects together to provide cumulative benefits to the watershed. As the project moved toward the BMP implementation phase, the Kentucky Division of Water (KDOW) and TNC decided that TNC personnel time would be better spent working

Figure 2. Farmers in the Townsend Creek watershed fenced riparian areas and planted shade trees for the livestock (top); they also installed alternative water supplies to limit livestock access to streams (bottom).

with landowners to gain participation in programs rather than having the TNC personnel actually implement the BMPs. Therefore, BMPs were installed under reimbursement contracts to individual farmers.

From 2003 to 2005, BMPs implemented using cost-share assistance from the TCWP included stream crossings, livestock exclusion fencing, riparian forest buffers, riparian grass buffers, sinkhole protection, waste storage facilities, tree and shrub establishment, heavy-use area development, alternative livestock watering facilities, limited access ramps, animal trails, livestock shade structures, pipelines, tank and spring development, and wetland conservation easements (Figure 2).

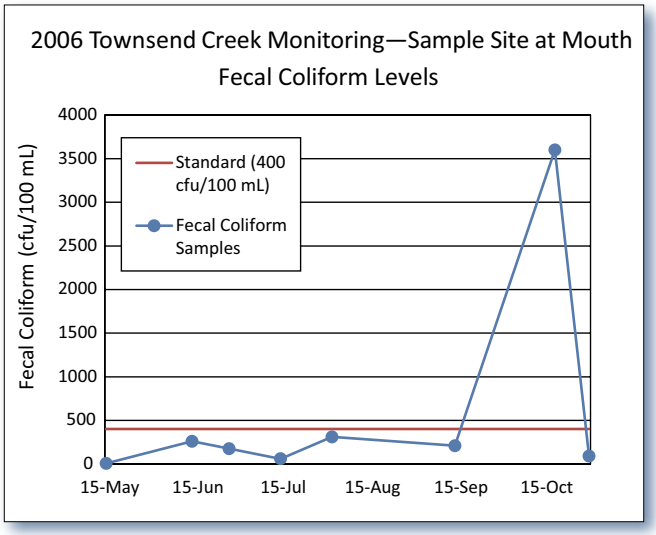

Figure 3. Data collected during the 2006 swimming season show that fecal coliform levels exceeded 400 cfu/100 mL in one out of eight samples (12 percent), thereby meeting the less than 20 percent exceedance requirement.

Results

As a result of the water quality management measures implemented in Townsend Creek, pathogen levels have decreased. Samples collected in 2006 at the mouth of Townsend Creek only exceeded the maximum allowable fecal coliform level 12 percent of the time (Figure 3).

These measures indicate that the segment including river miles 0.0–2.9 now fully supports its primary contact recreation designated use. (The segment including river miles 3.0–4.8 was listed as a separate segment between 2008 and 2010; this segment remains list as impaired).

Partners and Funding

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service helped develop landowner contracts for the Wetland Reserve Program. The USDA Farm Service Agency provided funding and administration of the Conservation Reserve Program, which helped support implementation of BMPs. Both the Bourbon and Harrison county conservation districts provided technical assistance for installing BMPs in watershed. Local landowners installed BMPs and allowed access to their properties for field day demonstrations as well as water quality monitoring.

The TCWP received a total of $1.5 million in funding from the 2003 CWA section 319 grant to support Licking River projects, including those projects that contributed to the improvements seen in Townsend Creek. Approximately $420,000 was used to support TNC personnel who provided technical assistance for BMP implementation and project management in addition to the education and outreach project component. Another $435,000 in nonpoint source program funding was used for on-the-ground agricultural BMP implementation, while $45,000 was used for baseline water quality and project success monitoring (in addition to the monitoring work that KDOW completed). The required $600,000 of nonfederal match was provided through the Kentucky Department of Fish and Wildlife Resources' in-lieu-fee mitigation program as well as conservation easements donated by local landowners.

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

EPA 841-F-15-001U
March 2015

For additional information contact:

John Webb, Kentucky Division of Water
502-564-3410 • John.webb@ky.gov
Lajuanda Haight–Maybriar, Licking River Basin Coordinator
Kentucky Division of Water
502-564-3410 • Lajuanda.Haight-Maybriar@ky.gov