



NONPOINT SOURCE SUCCESS STORY

Kentucky

Implementing Management Practices and Education Improves Stoner Creek

Waterbody Improved

A 12.8-mile segment of Stoner Creek (river miles 17.3–30.1) was assessed and added to the 2010 Clean Water Act (CWA) section 303(d) list/Integrated Report as impaired for primary contact recreation (PCR) due to elevated *Escherichia coli* bacteria. An investigation of land use and demographics determined the source of the impairment to be nonpoint sources such as animal feeding operations, livestock grazing, unrestricted cattle access to the stream, and municipal point source discharges. Following implementation of various agricultural best management practices (BMPs), monitoring conducted in 2013 showed that bacteria levels in stream miles 23.5–30.1 had declined, leading to a delisting in the 2016 Integrated Report to Congress.

Problem

Stoner Creek is in central Kentucky, and is a major tributary of the South Fork Licking River in Bourbon and Clark counties. Stoner Creek flows through both the inner and outer Bluegrass regions. There are four subwatersheds within the 128,227-acre Stoner Creek watershed: Kennedy Creek-Stoner Creek, Harrods Creek-Stoner Creek, Donaldson Creek-Stoner Creek, and the Headwaters of Stoner Creek (Figure 1). The delisted segment is in the 112-acre Harrods Creek-Stoner Creek watershed (HUC 051001020203) (Figure 1).

Kentucky's water quality standard (WQS) for meeting the use of PCR has two parts: the *E. coli* concentration as a geometric mean based on at least five samples collected during a 30-day period during PCR season must not exceed 130 colonies (col) per 100 milliliters (mL); additionally, *E. coli* concentrations cannot exceed 240 col/100 mL in 20 percent or more of all samples taken during the 30-day period.

Monitoring for a proposed total maximum daily load (TMDL) in 2009 demonstrated the segment was not meeting the WQS for PCR due to *E. coli* bacteria levels. Samples collected in spring 2009 exceeded 240 col/100 mL in 60 percent of samples, and the geometric mean was 335 col/100 mL. Although no TMDL has been completed for this section of the creek, the segment was placed on the 2010 CWA section 303(d) list as partially supporting the PCR use. The sources of the impairments were listed as nonpoint sources (animal feeding operations, livestock grazing, unrestricted cattle access) and municipal point source discharges.

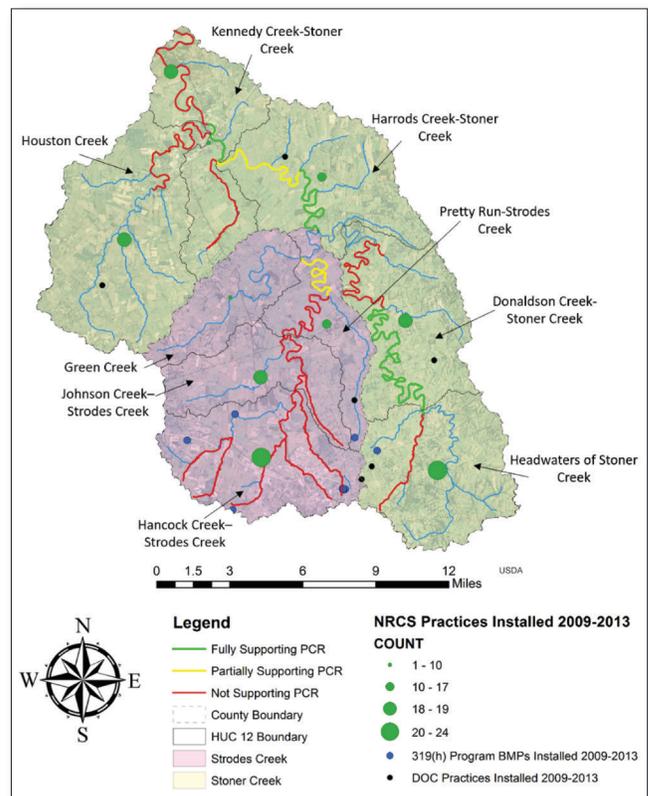


Figure 1. Stoner Creek is in central Kentucky.

Story Highlights

The 112-acre watershed containing the delisted segment (Hancock Creek-Stoner Creek) has not seen extensive BMP implementation. However, high interest in agricultural BMPs (Figure 2), riparian zone improvements, and septic



Figure 2. Stakeholders implemented agricultural BMPs that reduced pollution from livestock.

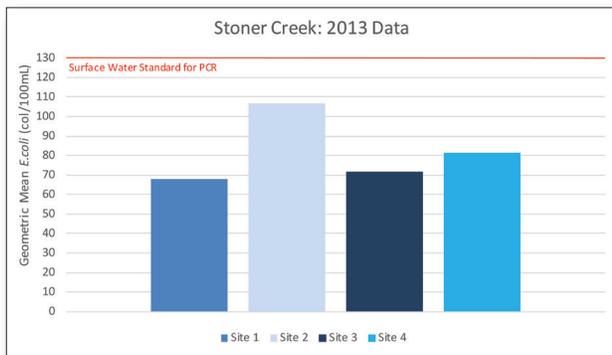


Figure 3. Geometric mean of *E. coli* levels in Stoner Creek remained below WQS (05/2013–09/2013).

improvements in the surrounding connected watersheds have resulted in the installation of a variety of BMPs upstream of the impaired area. The Strodes Creek watershed and the Hancock Creek watershed, both upstream of Stoner Creek, have had BMPs targeted through an implemented watershed plan (the Hancock Creek Watershed Plan) using available funding from the Natural Resource Conservation Service (NRCS) and state cost share dollars through the Kentucky Division of Conservation (DOC). NRCS installed 112 agricultural BMPs in the headwaters of Stoner Creek, including comprehensive nutrient management planning, cover crops, critical area planting, heavy use protected areas, and riparian forest buffers. In the Strodes Creek watershed, NRCS funded 90 BMPs in 2009–2013, including critical area planting, grassed waterways, heavy use protected areas and watering facilities (see Figure 1). The Kentucky

DOC also engaged with stakeholders in both Stoner and Strodes creeks to fund a rotational grazing system and several heavy use feeding areas.

CWA section 319(h) grant funding has been used in the upper sections of the Strodes Creek watershed and, to a limited extent, in Stoner Creek. In 2010–2013, the Hancock Creek Watershed Improvement Initiative worked in the Hancock Creek region installing riparian buffer zones, tree plantings, rain garden installations and one septic replacement. The project improved the public’s knowledge of watershed issues and increased public involvement in watershed plan implementation.

Results

Water quality improved due to bacteria loading reduction achieved largely through implementation of agricultural BMPs that limited access of livestock to the streams, prevented erosion and slowed stormwater runoff. Water quality results collected in 2013 by the Kentucky Division of Water (DOW) in collaboration with the Friends of Stoner Creek showed that the 12-mile segment was fully supporting of the PCR designated use, with a geometric mean below the standard of 130 col/100 mL (Figure 3). As a result, DOW removed it from the impaired waters list in the 2016 Integrated Report.

Partners and Funding

Key partners in the watershed effort include the NRCS, the Kentucky DOC, the Friends of Stoner Creek, the Strodes Creek Conservancy, and local producers and farmers. The NRCS was the driving agency in the implementation of agricultural BMPs, using funding and technical resources from the NRCS Environmental Quality Incentives Program and Conservation Technical Assistance Program. The Friends of Stoner Creek facilitated the monitoring data collection and community involvement to quantify changes in the water quality. DOC facilitated agricultural BMP installation through use of state cost share dollars.

The CWA section 319(h) grant that supported implementation of the watershed plan in the Hancock Creek watershed totaled \$218,570. The DOW’s Nonpoint Source and Basin Team Section provided technical assistance throughout implementation of these projects and coordinated with the NRCS and DOC to best direct funding in the basin and surrounding regions.



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

EPA 841-F-20-001C
January 2020

For additional information contact:

Dale Booth
Division of Water
502-782-6895 • dale.booth@ky.gov