



# NONPOINT SOURCE SUCCESS STORY

# Kentucky

## Agricultural Best Management Practice Implementation Reduces Bacteria in Bayou de Chien

### Waterbody Improved

Bacteria concentrations exceeded water quality standards in a segment of the Bayou de Chien (river miles 8.8 to 14.3). As a result, the bayou segment was added to the Clean Water Act (CWA) section 303(d) list as impaired for primary contact recreation (PCR) due to fecal coliform bacteria. The source of the impairment was listed as agricultural practices. Over 361 agricultural best management practices (BMPs) were installed in the watershed immediately upstream of Bayou de Chien (in the Cane Creek watershed) beginning in 2006. Monitoring data collected in 2007–2010 showed the stream met water quality standards for bacteria; as a result, the impaired segment of Bayou de Chien was removed from the CWA section 303(d) list in 2012.

### Problem

The Bayou de Chien is in far western Kentucky and flows into Obion Creek 1.3 miles above its confluence with the Mississippi River (Figure 1). The watershed of the Bayou de Chien covers nearly 210 square miles, and contains five 12-digit hydrologic units (HUC 12s). Two of these HUC 12s, the Middle Bayou de Chien watershed (HUC 080102010404) and the Cane Creek watershed (HUC 080102010402), contribute to the bacteria loading in Bayou de Chien. Cane Creek is a major tributary to Bayou de Chien, and merges with it at river mile 14.3.

Kentucky's water quality standard for meeting primary contact recreational use has two parts: the *Escherichia 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 per 100 milliliters of water (col/100 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.

Kentucky has an ambient surface water monitoring network. Data collected in 2006 at the ambient station on Bayou de Chien showed an exceedance of the water quality standard for fecal coliform bacteria. As a result, Bayou de Chien was added to the 2006 CWA section 303(d) list for not meeting water quality standards for PCR due to high levels of fecal coliform bacteria. The suspected source identified by the

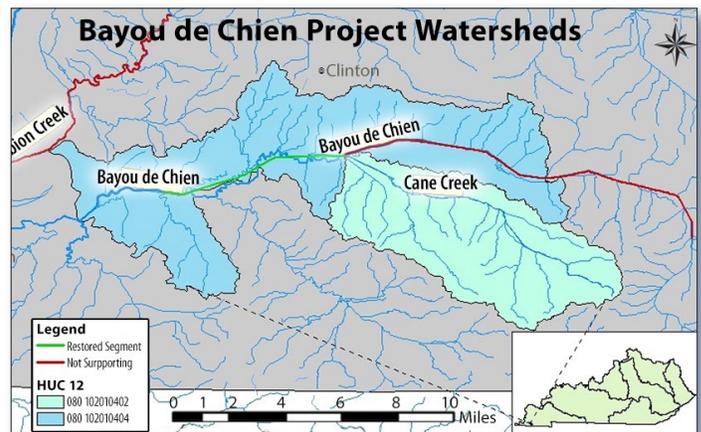


Figure 1. The Bayou de Chien and Cane Creek watersheds are in western Kentucky.

section 303(d) list was agriculture. The 2008 watershed plan for Bayou de Chien and Cane Creek further identified pollutants of eutrophication, siltation and sedimentation due to agricultural runoff and the removal/absence of streamside vegetation.

### Project Highlights

The main focus of this project was in the Cane Creek watershed (upstream of Bayou de Chien). Local watershed group capacity and available funding from the Natural Resource Conservation Service (NRCS) for Cane Creek provided the resources to demonstrate the improved water quality downstream in Bayou de Chien.

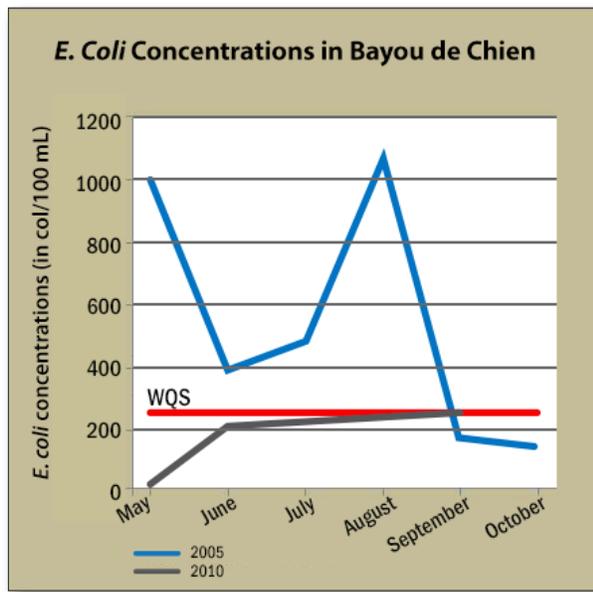


Figure 2. *E. coli* concentrations in Bayou de Chien met the water quality standard in 2010.

In 2005 a CWA section 319(h) grant to develop a Cane Creek and Bayou de Chien watershed plan was awarded to the Jackson Purchase Resource Conservation and Development (RC&D) Foundation, a nonprofit organization directed by key local community leaders and focused on issues involving land conservation, water management, environmental enhancement and community development. The RC&D also led the implementation of the watershed plan. The goal of the project was to identify significant sources of pollution, develop practical solutions, and prioritize projects for future implementation for both impaired stream reaches and also the unlisted sections of this watershed.

Over 361 agricultural practices were implemented in the Cane Creek watershed. Practices that focused on reducing the amount of bacteria in the water and improving aquatic habitat included installing waste storage facilities for livestock, installing grassed filter strips and waterways, managing grazing and access to streams for watering livestock, restoring wetlands and planting cover crops, and adopting no-till residue management on fields. These BMPs were implemented through several voluntary NRCS programs.

The upper mile of Bayou de Chien on the impaired segment is now managed as an Outstanding State Resource Water (OSRW) in Kentucky. The entire Cane

Creek watershed is also designated as an OSRW. An OSRW includes certain unique waters, including those with federally threatened or endangered species. The watershed's OSRW designation states that biological collections have identified a federally endangered species, the relict darter (endemic to Kentucky and found only in the Bayou de Chien watershed). OSRWs can have additional measures from water resource uses that include more protective water quality criteria. Although the Cane Creek and Bayou de Chien watersheds are not currently targeted for additional watershed improvement work, the OSRW designation should offer more protection to both watersheds in future management planning.

## Results

Due to successes in reducing bacteria loading through implementation of on-the-ground practices in the Cane Creek watershed, the Kentucky Division of Water was able to delist the impaired segment of Bayou de Chien immediately below Cane Creek. Based on a water quality data assessment of *E. coli* bacteria in 2010, the Bayou de Chien segment (river miles 8.8 to 14.3) now fully supports its designated use for PCR (Figure 2). It was delisted in Kentucky's 2012 Integrated Report to Congress.

## Partners and Funding

Key partners included the NRCS, the Jackson Purchase RC&D and the Four Rivers Watershed Basin Team. The NRCS was the driving agency in the organization and implementation of the agricultural BMPs, using funding and technical resources from the Environmental Quality Incentives Program, the Conservation Reserve Program, the Conservation Stewardship Program, the Conservation Technical Assistance Program, and the Wetlands Reserve Program. The Jackson Purchase RC&D is the facilitating group that employs the Four Rivers Watershed Basin Team Coordinator. The coordinator works on watershedwide initiatives, including the grant that developed the Cane Creek and Bayou de Chien watershed plan.

The CWA section 319(h) grant that supported the watershed plan was \$59,868; the match in nonfederal dollars was \$39,912. This includes the total amount over the course of the project for development of the watershed plan and coordinating with NRCS and the Jackson Purchase RC&D.



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