NONPOINT SOURCE SUCCESS STORY

Oklahoma

Conservation Practices Reduce Bacteria in Lower Honey Creek

Waterbody Improved

High bacteria levels resulted in the impairment of lower Honey Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list of impaired waters in 2010. Pollution from grazing lands contributed to this impairment. Implementing conservation practice systems (CPs) to promote better agricultural land management decreased *Escherichia coli* (*E. coli*) levels in the creek. As a result, the upper segment was removed from the 2012 CWA section 303(d) list (see October 2016 Nonpoint Source Success Story: Implementing Agricultural Conservation Practices Improves Bacteria Levels in Upper Honey Creek) and Oklahoma is recommending removal of lower Honey Creek from its 2018 CWA section 303(d) list for *E. coli*. Honey Creek now partially supports its primary body contact (PBC) designated beneficial use.

Problem

Honey Creek is a 9.5-mile stream flowing through Benton County, Arkansas and McDonald County, Missouri, into Delaware County, Oklahoma, before it flows into Grand Lake O' the Cherokees (Figure 1). Land use in the 79,000-acre watershed is predominantly pasture and grasslands (57 percent) for cattle and hay production. The watershed is 33 percent forested with only about 7 percent cropland. The lakeside areas of the watershed are developed with vacation and primary homes, and a portion of the city of Grove (population 6,692) extends into the near-lake area.

Grazing land and animal waste management and development contributed to listing the Oklahoma portions of the stream as impaired for *E. coli* in 2010 when the geomean of samples collected during the recreation season was 134 colony-forming units per 100 mL (CFU/100 ml). The PBC designated use is considered impaired if the recreation season geometric mean exceeds 126 CFU/100 ml. Oklahoma added the 4.9-mile-long lower segment of Honey Creek (OK121600030455_00) to the 2010 CWA section 303(d) list for nonattainment of its PBC designated beneficial use.

Story Highlights

A watershed-based plan was developed in 2007, followed by a total maximum daily load in 2008. Landowners in the Oklahoma portion of the watershed worked with the Delaware County Conservation

Figure 1. The Honey Creek Watershed is in northwestern Oklahoma.

District, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) and the Oklahoma Conservation Commission (OCC) to implement CPs through NRCS's Environmental Quality Incentives Program (EQIP), Grazing Lands Conservation (GLC) and general conservation technical assistance programs, the U.S. Environmental Protection Agency (EPA) Region 6 section 319 Nonpoint Source Program, and Oklahoma's Locally Led Cost Share Program (LLCP). CPs installed between 2006 and 2017 focused on reducing erosion and pollutant runoff in the watershed (Table 1).

Table 1. CPs installed in the Honey Creek watershed.

Practice name	Amount installed
Riparian protection	2,734 ac
Brush management	133 ac
Conservation cover	11 ac
Water well	87
Comprehensive nutrient management plans	11
Heavy use areas	239
Fence	491,762 ft
Upland wildlife habitat management	186 ac
Forage and biomass planting	1,329 ac
Integrated pest management	4,882 ac
Forage harvest management	107 ac
Nutrient management	4,179 ac
Livestock pumping plant	1
Prescribed grazing	6,728 ac
Livestock pipeline	50,012 ft
Ponds	48
Waste storage facility	37
Amendments for treatment of animal waste (in animal units)	16,770
Septic system	16
Watering facility (tanks)	279
Cakeout/composting storage facilities	8
Waste transfer outside watershed	26,627 lb
Waste recycling	134,888 lb
Herbaceous weed treatment	890 ac
Roofs and covers	4

Results

The OCC documented improved water quality in Honey Creek due to the installation of CPs. The installed CPs worked to decrease the runoff of fecal bacteria to downstream waterbodies. Monitoring data compiled for the 2010 integrated report showed that the geomean of Honey Creek's recreation season *E. coli* was 134 CFU/100 mL, which violated the standard of 126 CFU/100 mL (Figure 2). However, by the 2018 assessment, bacteria levels had dropped, and the *E. coli* geometric mean was 14 CFU/100 mL. Based on these data, Oklahoma is proposing to remove lower Honey Creek from the CWA section 303(d) list for *E. coli* in 2018. Honey Creek now partially supports its PBC beneficial use; all other assessed beneficial uses are now fully supported.

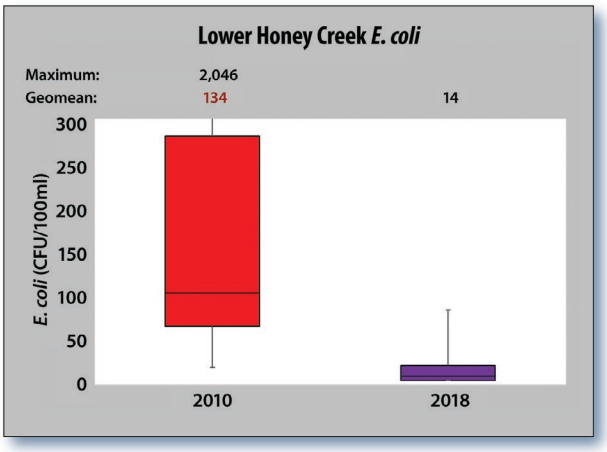

Figure 2. *E. coli* concentrations decreased after the installation of CPs.

Partners and Funding

Through a series of EPA section 319 projects, the EPA, OCC and Oklahoma's Office of Secretary of Energy and Environment invested approximately $4,133,803 of CWA section 319 and required matching dollars in the watershed for program management, water quality monitoring, and installation of CPs. Using CWA section 319 ($1,362,879) and matching state dollars ($817,566), plus matching dollars from landowners ($1,340,940), more than $3.29 million has been invested in CPs alone through the CWA section 319 program. Education efforts were supplemented through the Oklahoma Blue Thumb Program. Approximately $500,000 in EPA CWA section 319 supports statewide education, outreach and monitoring efforts through the Blue Thumb program. From 2002 to 2017, NRCS supplied approximately $350,000 for implementation of CPs in the watershed through NRCS EQIP. The OCC LLCP provided $7,947 in funds matched by $16,637 from landowners. In addition, many practices were funded by landowners based on recommendations through NRCS general technical assistance and GLC technical assistance.

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

EPA 841-F-18-001II
November 2018

For additional information contact:

Shanon Phillips
Oklahoma Conservation Commission
405-522-4728 • shanon.phillips@conservation.ok.gov