NONPOINT SOURCE SUCCESS STORY

Oklahoma

Conservation Programs Reduce Bacteria Levels in Little Cabin Creek

Waterbody Improved

Elevated bacteria levels resulted in the impairment of Little Cabin Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list of impaired waters in 2004. Grazing and hay production contributed to these impairments, and implementation of conservation practice systems (CPs) to promote better quality grazing lands decreased *Escherichia coli* (*E. coli*) bacteria levels in the creek. As a result, Little Cabin Creek was removed from Oklahoma's 2014 CWA section 303(d) list for *E. coli* bacteria. Little Cabin Creek now partially supports its primary body contact (PBC) designated use.

Problem

Little Cabin Creek is a 32.3-mile stream that flows through Craig, Ottawa, and Delaware counties in Oklahoma before discharging to Big Cabin Creek, a tributary of the Neosho River (Figure 1). Land use in the 102,000-acre watershed is primarily grasslands (77 percent of total) for beef cattle and hay production. About 5 percent of the watershed is developed land primarily for highways and roads, and 10 percent of the watershed is forested. Less than 8 percent of the watershed is cropland.

Grazing and hay land management contributed to excess bacteria in Little Cabin Creek. Little Cabin Creek was listed as impaired for *E. coli* in 2004 when the geometric mean of samples collected during the recreation season was 237 colony forming units per 100 milliliters (CFU/100 mL). The PBC designated use is considered impaired for *E. coli* if the geometric mean during the recreation season exceeds 126 CFU/100 mL. On the basis of these assessment results, Oklahoma added the Little Cabin Creek (OK121600060080_00) to the 2004 CWA section 303(d) list for nonattainment of the PBC designated beneficial use.

Story Highlights

Landowners in the watershed worked with the Craig, Delaware, and Ottawa county conservation districts, the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), and the Oklahoma Conservation Commission (OCC) to implement conservation practices (CPs) through Oklahoma NRCS's Environmental Quality Incentives Program (EQIP) and general conservation technical assistance program, and through the OCC's Locally Led Cost Share Program (LLCP).

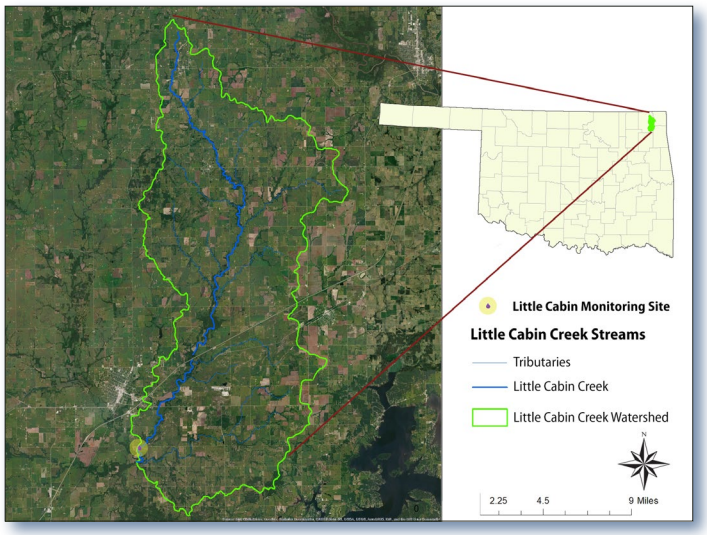

Figure 1. Little Cabin Creek is in northeastern Oklahoma.

From 2002 to 2015, landowners improved many acres (ac) of grasslands, pasture, and hay meadows, which reduced runoff of bacteria and other pollutants by decreasing erosion of pollutants and better utilizing available grazing lands (Table 1).

Results

Through its statewide nonpoint source Rotating Basin Ambient Monitoring Program, the OCC documented improved water quality in Little Cabin Creek due to landowners implementing CPs. The installed practices worked to decrease runoff of bacteria to streams by improving vegetative cover and improving the natural hydrology of the system. Monitoring data compiled for the 2004 integrated report had shown excessive *E. coli* in Little Cabin Creek (the geometric mean of 237 CFU/100 mL exceeded the state standard of 126 CFU).

Table 1. Water quality (values are means) improved after lime doser installation

Practice name	Amount installed
Access control	21 ac
Brush management	1,931 ac
Forage harvest management	399 ac
Conservation crop rotation	1,304 ac
Nutrient management	925 ac
Integrated pest management	5,803 ac
Forage and biomass planting	2,360 ac
Critical area planting	16 ac
Constructed wetland	17 ac
Fence	15,301 ft
Stream crossing	1
Heavy use area protection	8 ac
Waste recycling	25 ac
Well decommissioning	1
Wetland wildlife habitat management	133 ac
Prescribed grazing	15,424 ac
Livestock pipeline	13,727 ft
Herbaceous weed treatment	982 ac
Seasonal residue management	829 ac
Pond	46
Upland wildlife habitat management	1,681 ac
Prescribed burning	926 ac
Diversion	730 ft
Contour farming	183 ac
Grade stabilization structure	2
Water control structure	3
Rotation of supplement and feeding areas	241 ac
Watering facility	28
Wetland restoration	4 ac
Diversion	768 ft

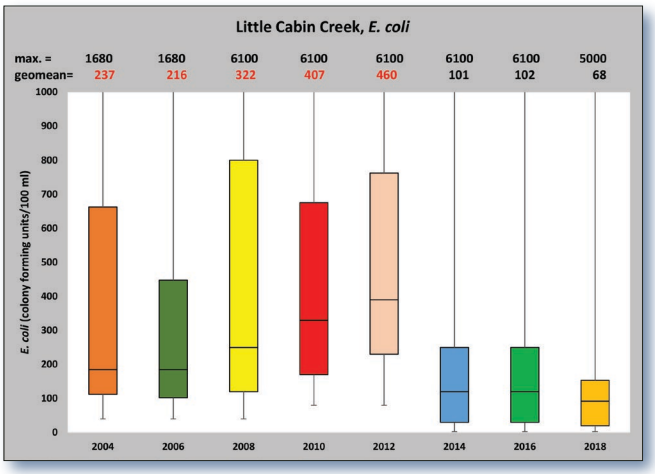

Figure 2. *E. coli* decreased in Little Cabin Creek as producers focused on improving pasture management.

However, by 2014, *E. coli* levels had decreased to a geometric mean of 101 CFU/100 mL and this decreasing trend continues through the 2018 assessment (Figure 2). Based on these data, Little Cabin Creek was removed from the Oklahoma CWA section 303(d) list for *E. coli* in 2014. Little Cabin Creek is now in partial support of its PBC beneficial use. Monitoring in Little Cabin will continue in order to track progress towards full support of its beneficial uses.

Partners and Funding

The OCC monitoring program is supported by the U.S. Environmental Protection Agency's (EPA) CWA section 319 funds at an average annual statewide cost of $1 million and approximately $500,000 in EPA 319 funds support statewide water quality educational efforts through Blue Thumb. Approximately $302,000 of these federal and state matching funds have been devoted to Little Cabin Creek. Working in partnership with local conservation districts, NRCS supplied approximately $125,000 for implementation of CPs in the watershed through NRCS EQIP. The LLCP provided $61,910 matched by $80,630 from landowners. Landowners self-funded a large number of practices based on recommendations through NRCS general technical assistance and conservation planning.

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

EPA 841-F-18-001P
September 2018

For additional information contact:

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