



NONPOINT SOURCE SUCCESS STORY

Oklahoma

Conservation Programs Improve the Wewoka Creek Watershed

Waterbodies Improved

High bacteria, chloride, and pH levels resulted in impairment of Wewoka Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list of impaired waters in 2002, 2004 and 2012 for these pollutants, respectively. Pollution from grazing and crop lands contributed to these impairments. Implementing conservation practice systems (CPs) to promote better land management decreased *Escherichia coli* (*E. coli*), chloride, and pH levels in the watershed. As a result, Oklahoma removed the following impairments from its CWA section 303(d) lists: pH in 2006 and chloride and *E. coli* in 2016. Wewoka Creek now partially supports its primary body contact (PBC), warm water aquatic community (WWAC), and agricultural (AG) designated beneficial uses.

Problem

The Wewoka Creek Watershed covers 225,000 acres (ac) in central Oklahoma (Figure 1). Land use is about 61 percent hay/grazing lands, 24 percent forested, and 3 percent cropland. There are a limited number of large swine operations. Poor grazing lands management contributed to water quality impairment.

In 2002, at least 16 percent of water samples exceeded the individual sample chloride standard of 430 milligrams per liter (mg/L) and the annual mean of 385 mg/L exceeded the yearly mean standard one time. A stream violates the chloride criteria if more than 10 percent of samples exceed the individual sample standard or if the annual mean of samples exceeds the yearly mean standard of 334 mg/L. In 2004, 12 percent of samples were outside the acceptable pH range of between 6.5 and 9.0 standard units. A stream violates the pH criteria if more than 10 percent of samples fall outside the acceptable range. In 2012, the geometric mean of *E. coli* in samples collected during the recreation season was 164 colony-forming units per 100 milliliters (CFU/100 mL). The PBC designated use is considered impaired if the recreation season geometric mean exceeds 126 CFU/100 mL for *E. coli*. As a result of these impairments, the Oklahoma Conservation Commission (OCC) added segment OK520500020010_00 (42.99 miles long) to the CWA section 303(d) list in 2002 (for bacteria), in 2004 (for chloride), and in 2012 (for pH) due to nonattainment of the AG, WWAC, and PBC designated beneficial uses.

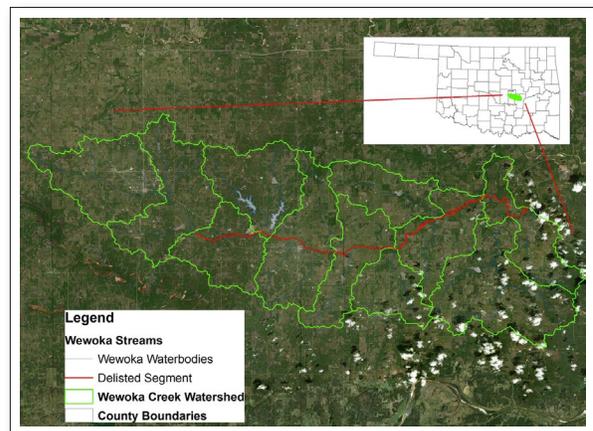


Figure 1. Wewoka Creek is in central Oklahoma.

Story Highlights

Landowners worked with the Hughes County, Seminole County and Shawnee conservation districts; the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS); and the OCC to implement CPs through the OCC's Locally Led Cost Share Program (LLCP) and NRCS's Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentives Program (WHIP), Conservation Securities Program (CSP), Conservation Stewardship Program (CStWP) and general conservation technical assistance program. From 2000 to 2018, landowners improved pasture and hay meadows, which reduced runoff of sediment and other pollutants. They enrolled at least 10,493 ac in CSP and CstWP, showing commitment to enhanced

conservation efforts related to grazing management such as rotation of supplement and feeding areas, intensive management of rotational grazing, and stockpiling of forages to extend the grazing season.

Specific CPs installed included forage harvest management (2,913 ac), forage and biomass planting (1,558 ac), grade stabilization structure (2), comprehensive nutrient management plan (17), diversions (675 feet [ft]), conservation crop rotation (855 ac), watering facilities (12), water wells (11), conservation cover (95 ac), pest management (2,546 ac), heavy use area protection (1.6 ac), livestock pipeline (17,673 ft), fencing (121,619 ft), critical area planting (105 ac), ponds (101), prescribed grazing (28,959 ac), waste transfer facilities (16), nutrient management (4,897 ac), brush management (1,797 ac), and sprinkler systems (193 ac).

Results

The OCC documented improved water quality in the Wewoka Creek watershed due to installation of CPs through its statewide nonpoint source Rotating Basin Ambient Monitoring Program (Figure 2). By 2006, data showed only 5 percent of pH values were outside the acceptable range of 6.5 – 9 pH units. By the 2016 assessment, chloride had decreased such that 10 percent or fewer samples exceeded the criteria. In addition, the *E. coli* geometric mean had fallen to 33 CFU/100 mL by 2016, which met the criteria. Based on these data, Oklahoma removed Wewoka Creek from the CWA section 303(d) list for pH in 2006 and chloride and *E. coli* in 2016. Wewoka Creek now partially supports its AG, WWAC, and PBC beneficial uses.

Partners and Funding

The OCC monitoring program is supported by U.S. Environmental Protection Agency's (EPA) CWA section 319 funding at an average annual statewide cost of \$1 million. Approximately \$500,000 in EPA 319 funds support statewide water quality educational efforts through Blue Thumb. Approximately \$284,260 of these federal and state matching funds have been devoted to Wewoka Creek. From 2000 to 2018, NRCS supplied more than \$197,000 for CP implementation in Oklahoma through EQIP. Funds for other NRCS programs (e.g., CSP, CStWP) helped to ensure continued improvements in land management. Landowners funded many practices based on recommendations

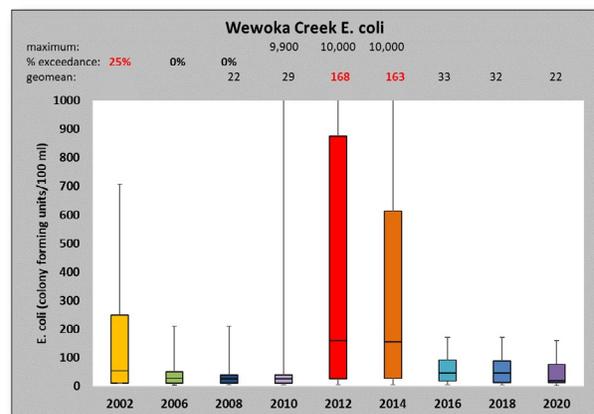
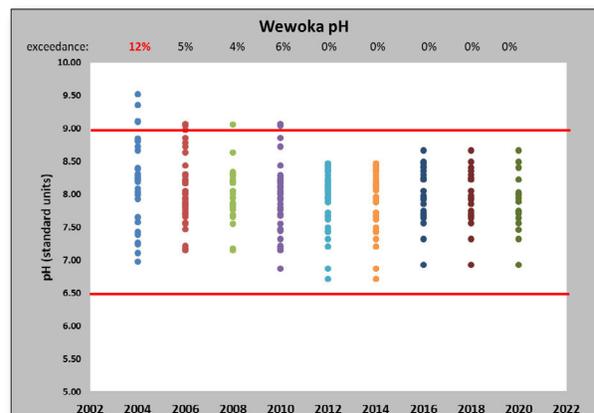
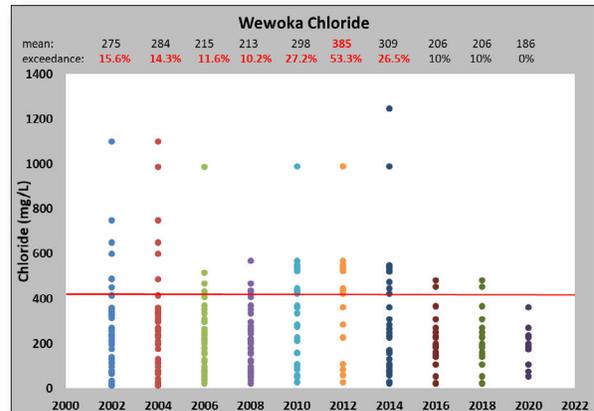


Figure 2. Chloride (top), pH (middle), and *E. coli* (bottom) levels declined as CPs were installed.

through NRCS general technical assistance. Finally, the OCC, conservation districts, and landowners funded more than \$300,000 worth of CPs, at least \$153,083 of which was funded by landowners through the LLCP.



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