



# NONPOINT SOURCE SUCCESS STORY

## Oklahoma

### Implementing Agricultural Conservation Practices Improves Turbidity Levels in Caney Boggy Creek

#### Waterbody Improved

High turbidity resulted in the impairment of Caney Boggy Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list of impaired waters in 2008. Grazing and hay production contributed to the impairment. Implementing conservation practice systems (CPs) to promote better quality grazing land decreased sediment loading into the creek. As a result, the entire length of Caney Boggy Creek was removed from Oklahoma's 2010 CWA section 303(d) list for turbidity impairment.

#### Problem

Caney Boggy Creek is a 26.5-mile-long stream in Hughes, Coal and Pittsburg counties in southeastern Oklahoma (Figure 1). Land use in the 65,000-acre watershed is approximately 47 percent pasture and grasslands for cattle and hay production and about 48 percent forested. Less than 1 percent is cropland for corn, soybeans and wheat production.

Poor grassland management contributed to excess sedimentation in Caney Boggy Creek. It was listed as impaired for turbidity in 2008 when 20 percent of samples collected at seasonal baseflow exceeded the criterion of 50 nephelometric turbidity units (NTU). A stream is considered impaired by turbidity if more than 10 percent of the seasonal base flow water samples exceed 50 NTU (based on 5 years of data before the assessment year). On the basis of these assessment results, Oklahoma added the entire length of Caney Boggy Creek (OK410400060120\_00) to the 2008 CWA section 303(d) list for nonattainment of the fish and wildlife propagation designated use due to turbidity and dissolved oxygen impairment. Caney Boggy Creek was also listed in 2008 for impairments to its primary body contact beneficial use based on excessive *Enterococcus* bacteria concentrations.

#### Project Highlights

Landowners implemented CPs with assistance from Oklahoma's Locally Led Cost Share Program (LLCP) program and through the local U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentive Program (WHIP) and

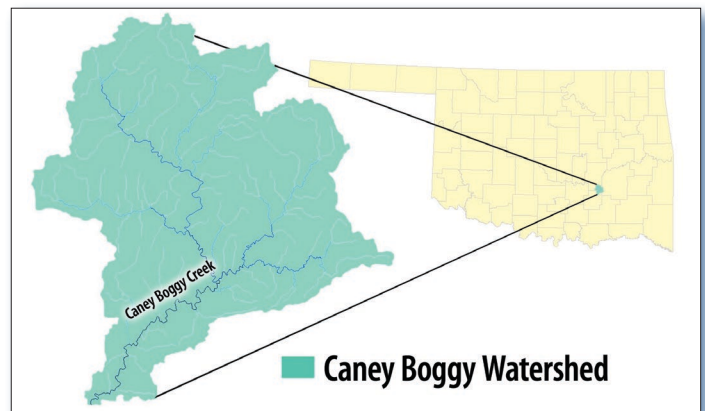


Figure 1. Caney Boggy Creek is in Hughes, Coal and Pittsburg counties in southern Oklahoma.

general conservation technical assistance program. From 2007 to 2010, landowners improved many acres of pasture and rangeland, which reduced runoff of sediment and other pollutants. CPs installed to accomplish this improvement included 4,057.6 acres of prescribed grazing, 189.3 acres of forage and biomass planting, 607.3 acres of nutrient management, 2,522 acres of integrated pest management (IPM), 49.2 acres of brush management, four ponds, 332 acres of upland wildlife habitat management, 1 acre of critical area planting, 1,700 linear feet of cross-fencing, 188.6 acres of prescribed burning, 16,219.5 feet of firebreak and 377.1 acres of waste recycling.

To reduce erosion of soil and the runoff of nutrients from cropland, landowners also implemented prescribed grazing on 142 acres and IPM on 405 acres. Forage harvest management was implemented on 341 acres. These practices return degraded land to a more natural, less-erosive state.

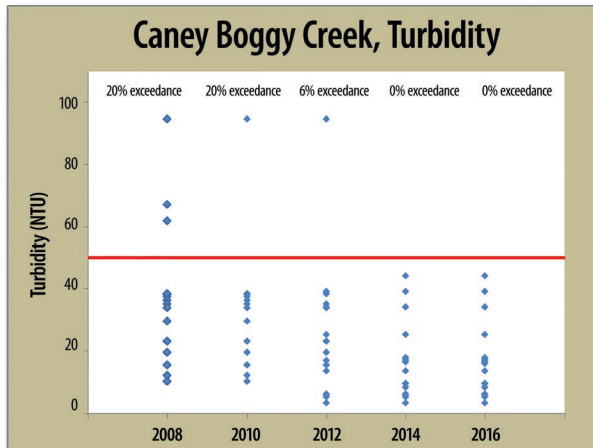


Figure 2. Monitoring data indicate base flow turbidity levels in Caney Boggy Creek have steadily declined.

Conservation work continues in the watershed through EQIP, general technical assistance and WHIP. Since 2010, an additional 547 acres of cropland were improved through forage harvest management; 242 acres were improved through IPM.

Additional CPs since 2010 on pasture and rangeland include four grade stabilization structures, 40 acres of forage and biomass planting, 7,508 linear feet of cross-fencing, 148 acres of brush management, 2.3 acres of critical area planting, 404 acres of IPM, 1,962 linear feet of livestock pipeline, 2.3 acres of nutrient management, one pond, 8.9 acres of restoration and management of rare and declining wildlife habitats, 1,040 acres of upland wildlife management, 12,385 acres of firebreak, 700 acres of prescribed burning and 761.3 acres of prescribed grazing.

## Results

Through its statewide nonpoint source ambient monitoring program, the Oklahoma Conservation Commission (OCC) documented improved water quality in Caney Boggy Creek due to landowners implementing CPs. In the 2008 assessment, 20 percent of seasonal base flow water samples exceeded the turbidity criteria of 50 NTU. The exceedance rate was reduced to 7 percent in 2010 and to 0 percent by 2014 (Figure 2). On the basis of these data, Caney Boggy Creek was removed from the Oklahoma CWA section 303(d) list for turbidity in 2010, resulting in the partial



Figure 3. Caney Boggy Creek partially attains its fish and wildlife propagation designated use.

attainment of its fish and wildlife propagation designated use (Figure 3). Although dissolved oxygen and bacteria concentrations have improved, they do not yet meet the water quality standards required for full support. Monitoring will continue to hopefully allow for the documentation of additional success in the Caney Boggy Watershed.

## Partners and Funding

The Rotating Basin Monitoring Program is supported in part by EPA's CWA section 319 funds at an average annual statewide cost of \$1 million. Monitoring costs include personnel, supplies and lab analysis for 18 parameters from samples collected every 5 weeks at about 100 sites, for a total of 20 episodes per 5-year cycle. Instream habitat, fish and macroinvertebrate samples are also collected. Approximately \$500,000 in EPA CWA section 319 supports statewide education, outreach and monitoring efforts through the Blue Thumb program. The OCC LLC program provided \$6,112 in state funding for CPs in this watershed through the Hughes, Coal and Pittsburgh county conservation districts; landowners contributed \$6,557 in match. NRCS invested approximately \$50,000 for implementation of CPs in the watershed through NRCS EQIP and WHIP. In addition, landowners implemented a significant number of CPs with their own funding based on conservation plans supported by NRCS general technical assistance and match for EQIP and WHIP contracts.



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