



NONPOINT SOURCE SUCCESS STORY

Oklahoma

Implementing Agricultural Conservation Practices Improves Turbidity Levels in Canadian Sandy Creek

Waterbody Improved

High turbidity resulted in the impairment of Canadian Sandy Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list of impaired waters in 2008. Stormwater runoff, grazing and crop production contributed to the impairments. Implementing conservation practice systems (CPs) to promote better quality grazing land and cropland decreased sediment loading into the creek. As a result, the entire length of Canadian Sandy Creek was removed from Oklahoma's 2010 CWA 303(d) list for turbidity impairment. Canadian Sandy Creek is now in full attainment of its fish and wildlife propagation beneficial use.

Problem

Canadian Sandy Creek is a 37.7-mile stream in Pontotoc and Garvin counties in south-central Oklahoma (Figure 1). Land use in the 145,000-acre watershed is primarily pasture and grasslands for cattle and hay production. About a third of the watershed is forested, and less than 5 percent is cropland for corn, soybeans and wheat production. The town of Ada (population 17,000) is bisected by the watershed boundary in the northeast corner of the watershed.

Development and poor grassland and cropland management contributed to excess sedimentation in Canadian Sandy Creek. It was listed as impaired for turbidity in 2008 when 13 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 Canadian Sandy Creek (OK520600030010_00) to the 2008 CWA section 303(d) list for nonattainment of the fish and wildlife propagation designated use due to turbidity impairment. Canadian Sandy Creek was also listed in 2008 for impairments to its primary body contact beneficial use based on excessive *Escherichia coli* and *Enterococcus* bacteria concentrations.

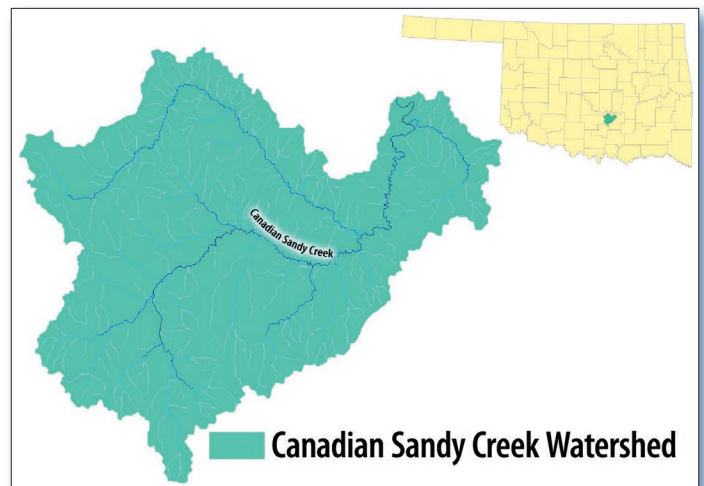


Figure 1. Canadian Sandy Creek is in southern Oklahoma.

Project Highlights

Landowners implemented CPs with assistance from Oklahoma's Locally Led Cost-Share Program (LLCP) and through Oklahoma's U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) and general conservation technical assistance program. From 2007 to 2010, landowners installed CPs including 12,370 acres of prescribed grazing, 74.5 acres of forage and biomass planting, 3,241 acres of nutrient management, 4,742 acres of integrated pest management (IPM), four grade stabilization structures, 315 acres of brush management, 25 ponds, one water well, 84 acres of wetland creation, 106 acres of wetland restoration, 219 acres of wetland wildlife habitat

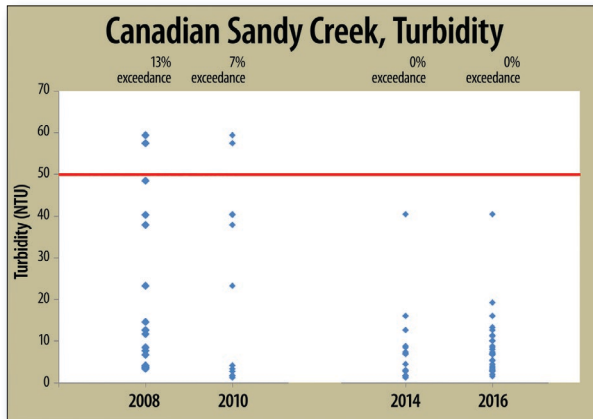


Figure 2. Monitoring data indicate that base flow turbidity levels in Canadian Sandy Creek have declined.

management, 219 acres of access control, 219 acres of riparian herbaceous cover, 11 acres of critical area planting, 27,851 linear feet of cross-fencing, 209 acres of prescribed burning, and 1,131 acres of upland wildlife habitat management.

Landowners also implemented cropland CPs including 478.6 acres of residue and tillage management, 271 acres of irrigation water management, 263 acres of prescribed grazing, 96 acres of nutrient management, 73 acres of IPM, 25.5 acres of forage and biomass planting, 254.5 acres of forage harvest management, and 25 acres of brush management.

Conservation work continues in the watershed through EQIP, general technical assistance and the Conservation Stewardship Program (CSP). CPs implemented on cropland since 2010 include residue and tillage management/reduced tillage on 442 acres, 7,622 linear feet of fencing on cropland, forage harvest management on 140 acres, IPM on 11 acres, 21 acres of nutrient management, two ponds, and improved irrigation on 88 acres.

Additional CPs since 2010 on pasture and rangeland include four grade stabilization structures, 23 acres of forage and biomass planting, 124.1 acres of forage harvest management, 19,512 linear feet of cross-fencing, 14 acres of access control, 59 acres of heavy use area protection, 251 acres of brush management, 3.6 acres of critical area planting, 247 acres of herbaceous weed control, 1,670 acres of IPM, 1,805 linear feet of

livestock pipeline, 61 acres of nutrient management, 516 acres of on-farm forage-based grazing systems, 12 ponds, 2,006 acres of supplement/feeding area rotation, 1,517 acres of upland wildlife management, 1,271 acres of improved irrigation efficiency, one watering well, 15 watering facilities, 22 acres of prescribed burning, and 2,537 acres of prescribed grazing.

Results

Through its statewide nonpoint source ambient monitoring program, the Oklahoma Conservation Commission (OCC) documented improved water quality in Canadian Sandy Creek due to landowners implementing CPs. In the 2008 assessment, 13 percent of seasonal base flow water samples exceeded the turbidity criteria of 50 NTU. This exceedance was reduced to 7 percent in the 2010 assessment (Figure 2). On the basis of these data, Canadian Sandy Creek was removed from the Oklahoma CWA section 303(d) list for turbidity in 2010, resulting in the full attainment of its fish and wildlife propagation designated use. Bacteria concentrations have also improved in Canadian Sandy Creek. In 2016 the OCC is recommending that Canadian Sandy Creek be delisted for bacteria impairments based on decreased concentrations of indicator bacteria. Monitoring will continue to hopefully allow for documenting additional success in the watershed.

Partners and Funding

The Rotating Basin Monitoring Program is supported by U.S. Environmental Protection Agency (EPA) CWA section 319 funds in part at a statewide average annual 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. In-stream habitat, fish and macroinvertebrate samples are also collected. Approximately \$500,000 in EPA CWA section 319 funding supports statewide education, outreach and monitoring efforts through the Blue Thumb program. The OCC LLC provided \$45,464 in state funding for CPs in this watershed through the Pontotoc and Garvin county conservation districts; landowners contributed \$81,616 in match. NRCS spent approximately \$650,000 to implement CPs in the watershed through NRCS EQIP and CSP. Landowners provided a significant percentage of funding toward CP implementation in these programs as well.



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