



# NONPOINT SOURCE SUCCESS STORY

## Oklahoma

### Implementing Agricultural Conservation Practices Improves Turbidity Levels in Otter Creek (Tillman County)

#### Waterbody Improved

Elevated turbidity levels resulted in the impairment of Otter Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list of impaired waters in 2008. Poor grazing, hay production and cropland management contributed to this impairment. Implementation of conservation practice systems (CPs) to promote better quality grazing and crop land management decreased turbidity in the creek. As a result, Otter Creek was removed from Oklahoma's 2012 CWA 303(d) list for turbidity impairment. Otter Creek now fully supports its warm water aquatic beneficial use.

#### Problem

Otter Creek is a 23.1-mile stream that flows through Kiowa and Tillman counties before discharging to Oklahoma's Cimarron River (Figure 1). Land use in the 43,000-acre watershed is primarily cropland (66 percent of total) for wheat production. About 20 percent of the watershed is pasture for cattle and hay production and approximately 7 percent is forested.

Poor management of crop and grazing lands contributed to excess turbidity in Otter Creek. The stream was listed as impaired for turbidity in 2008 when 21 percent of baseflow turbidity samples violated standards. A stream violates the turbidity standard when more than 10 percent of baseflow samples are higher than 50 nephelometric turbidity units (NTU). On the basis of these assessment results, Oklahoma added Otter Creek (OK311500010080\_00) to the 2008 CWA section 303(d) list for nonattainment of the warm water aquatic beneficial use.

#### Project Highlights

Landowners in the watershed worked with the Kiowa and Tillman county conservation districts, the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), the USDA Farm Services Agency (FSA) and the Oklahoma Conservation Commission (OCC) to implement CPs through Oklahoma NRCS's Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentives Program (WHIP), Conservation Stewardship Program (CSP), Wetland Restoration Program (WRP) and general conservation technical assistance program; FSA's

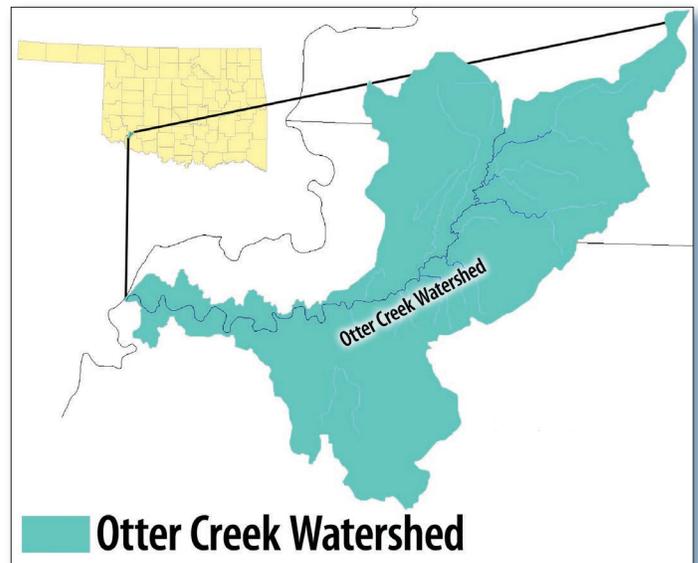


Figure 1. Otter Creek is in southwestern Oklahoma.

Conservation Reserve Program (CRP); and the OCC's Locally Led Cost-Share Program (LLCP). From 2006 to 2010, landowners implemented pasture and grassland CPs, including 817 acres of prescribed grazing, 7 acres of critical area planting, one diversion, five ponds, three wells, two pumping plants, 103 acres of forage and biomass planting, 94 acres of nutrient management, 1,363 acres of brush management, 71 acres of prescribed burning and 7,900 feet of firebreak.

Landowners implemented multiple cropland CPs, including 35 acres of conservation crop rotation, 1,692 acres of reduced tillage residue and tillage management, 33 acres of conservation cover, 981 acres of

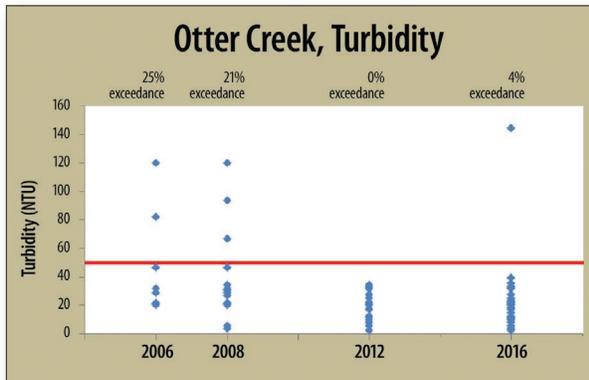


Figure 2. Monitoring data indicate that turbidity levels in Otter Creek have declined and now meet standards.



Figure 3. Otter Creek fully supports its warm water aquatic beneficial use.

cover crops, 461 acres of access control, one diversion, 138 acres of ridge-till and 996 acres of strip-till tillage management, 4,100 feet of field border, 150 acres of forage and biomass planting, 211 acres of forage harvest management, one pond, one pumping plant, 486 acres of seasonal residue management, 38.2 acres of improved irrigation efficiency through sprinkler irrigation, 5.5 acres of grassed waterway, 158 acres of nutrient management, 461 acres of range planting, reduced tillage residue and tillage management on 1,566 acres, 216 acres of integrated pest management (IPM), 770 feet of low-pressure underground irrigation pipeline, 158 acres of irrigation water management, and upland wildlife habitat management on 1,007 acres.

Partners implemented more CPs in 2011–2015, including 101 acres of livestock access control, 126 acres of brush management, 240 acres of conservation cover, 4 acres of critical area planting, 6,825 feet of cross-fencing, 2,408 acres of GPS-based precision pesticide application and 2,459 acres of pesticide application improvements to reduce drift, 153 acres of herbaceous weed control, 345 acres of nutrient management, 1,852 acres of prescribed grazing and similar grazing management practices, 560 acres of split nitrogen applications, one pond, two wells, 276 acres of range planting, 1,336 acres of no-till residue and tillage management, 554 acres of IPM, 516 acres of reduced-till or ridge-till residue and tillage management, 7,180 feet of terrace, 1,301 acres of supplement/feeding area rotation, four water control structures, 452 acres of irrigation systems improvements, 153 acres of wetlands restoration and 85 acres of seasonal residue management.

## Results

Through its statewide nonpoint source Rotating Basin Ambient Monitoring Program, the OCC documented improved water quality in Otter Creek. Monitoring data compiled for the 2012 integrated report showed that turbidity values had decreased—no baseflow samples exceeded 50 NTU and exceedances remain well below 10 percent for the 2016 assessment (Figure 2). On the basis of these data, Otter Creek was removed from the CWA section 303(d) list for turbidity in 2012; it now fully supports its warm water aquatic beneficial use (Figure 3). Monitoring will continue to ensure this water quality improvement is maintained.

## Partners and Funding

The OCC monitoring program is supported in part by the U.S. Environmental Protection Agency’s (EPA) CWA section 319 funds at an average annual statewide cost of \$1 million. Approximately \$500,000 in EPA CWA 319 funds support statewide water quality educational efforts through Blue Thumb. From 2004 to 2010, NRCS supplied at least \$25,000 through EQIP and additional funds through CRP to implement CPs. From 2011 through early 2016, NRCS invested \$700,000 in CPs through EQIP and CSP. Additional funds were provided through FSA for CRP practices, and through NRCS for WHIP- and WRP-funded practices. In addition, some practices were funded by landowners based on recommendations through NRCS general technical assistance and conservation planning. The OCC worked through the Tillman and Kiowa county conservation districts to provide \$9,026 in LLCP funds, which were matched by \$11,439 from cooperating landowners.



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