



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# Oklahoma

## Implementing Agricultural Best Management Practices Reduces Turbidity in Deer Creek

### Waterbody Improved

High turbidity, due in part to practices associated with wheat, cattle and corn production, resulted in impairment of Deer Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list in 2006. Implementation of best management practices (BMPs) to promote better quality grazing land and conservation cropping methods decreased sediment loading into the creek. As a result, the entire 41-mile length of Deer Creek was removed from Oklahoma's 2010 CWA section 303(d) list for turbidity impairment. Deer Creek is now in partial attainment of its fish and wildlife propagation designated use.

### Problem

Deer Creek is in Kay and Grant counties in northern Oklahoma. Land use in the 98,322-acre watershed is primarily wheat cropland, with rangeland and pasture for cattle production, and some corn production as well. An abundance of conventional farming methods and poor grazing land management contributed to excess sedimentation in the watershed. In the 2006 water quality assessment, monitoring showed that 17 percent of Deer Creek's seasonal base flow water samples exceeded 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 five years of data before the assessment year). On the basis of these assessment results, Oklahoma added the entire 41-mile-long Deer Creek (OK621000040010\_00) to the 2006 CWA section 303(d) list for nonattainment of the fish and wildlife propagation designated use due to turbidity impairment.

### Project Highlights

Landowners implemented BMPs with assistance from Oklahoma's locally led cost-share program and through the local U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) General Conservation Technical Assistance Program, Conservation Reserve Program (CRP) and Environmental Quality Incentives Program (EQIP). From 2006 to 2009, landowners reduced erosion

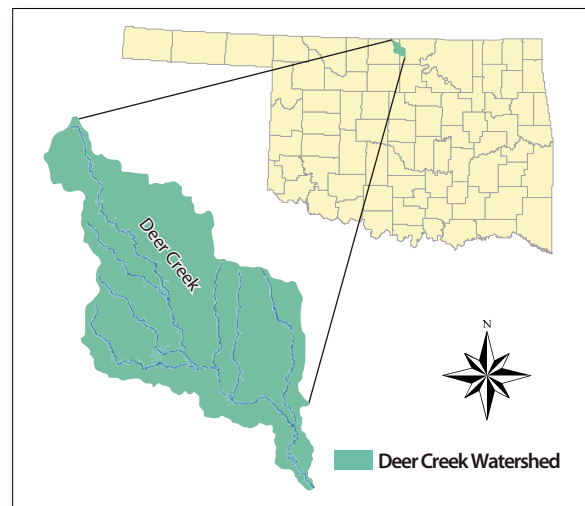


Figure 1. The Deer Creek watershed is in northern Oklahoma.

potential from cropland through 3,278 acres of no-till, strip-till, mulch-till and deep tillage methods, coupled with 2,084 acres of conservation crop rotations, 978 acres of conservation cover crops and 1,198 acres of seasonal residue management. In addition, one 600-foot diversion, more than 16,000 linear feet of terraces and 47 acres of grassed waterways were installed to slow runoff from cropland. Improved grazing land condition was accomplished through supplemental vegetation planting on 1,878 acres, 888 acres of prescribed grazing, and the installation of 9,067 feet of fencing,

eight ponds, and one watering facility. More than 3,000 acres of upland wildlife habitat and 421 acres of rare and declining habitat were managed and improved through the CRP.

From 2010 to 2013, additional BMP implementation further improved croplands and grazing lands and kept erosion potential low. Landowners used no-till cropping methods on 11,163 acres, with conservation crop rotations on over 1,100 acres. One 1,161-foot diversion was installed, in addition to two grade-stabilization structures, more than 20 acres of grassed waterways and more than 35,600 feet of terraces. Six additional ponds were installed, along with more than 3,500 feet of fencing, to promote optimal grazing on approximately 3,000 acres. Nutrient management was implemented on 3,447 acres, and supplemental planting on more than 300 acres helped enhance pasture condition. Another 1,000 acres of upland wildlife habitat was also properly managed.

The Oklahoma Conservation Commission's (OCC's) education program, Blue Thumb, held volunteer trainings in Kay County in 2005 and 2010. As a result, several groups of volunteers monitored area streams and helped educate area residents about nonpoint source pollution prevention.

## Results

The OCC's Rotating Basin Monitoring Program, a statewide nonpoint source ambient monitoring program, documented improved water quality in Deer Creek due to landowners implementing BMPs. In the 2006 assessment, 17 percent of seasonal base flow water samples exceeded the turbidity criteria of 50 NTU. This exceedance was reduced to zero percent in 2010, and Deer Creek was removed from Oklahoma's CWA section 303(d) list for turbidity impairment. Deer Creek is currently in partial attainment of the fish and wildlife propagation designated use and has been proposed for full attainment in the 2014 integrated report based on further improvements.

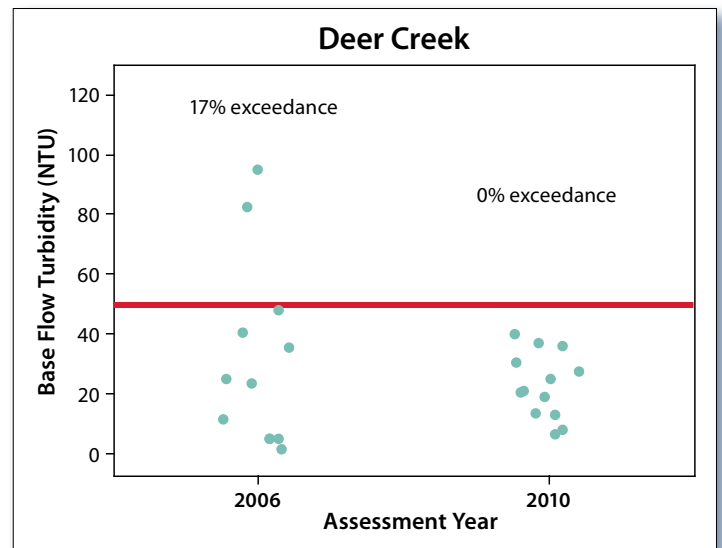


Figure 2. Monitoring data indicate that base flow turbidity levels in Deer Creek have declined.

## Partners and Funding

The Rotating Basin Monitoring Program is supported by the U.S. Environmental Protection Agency's CWA section 319 program at an average annual cost of \$1 million. Monitoring costs include personnel, supplies and lab analyses for 18 parameters from samples collected every 5 weeks at about 100 sites. In-stream habitat, fish and macroinvertebrate samples are also collected. Approximately \$600,000 in CWA section 319 funding supports statewide education, outreach and monitoring efforts through the Blue Thumb program. The Oklahoma cost-share program provided approximately \$16,500 in state funding for BMPs in this watershed through the Kay and Grant county conservation districts. NRCS spent approximately \$1.8 million for implementation of BMPs in Kay and Grant counties from 2005 to 2009. An additional \$1 million was spent from 2010 to 2012 to maintain these practices and continue to promote good grazing land management. Landowners provided a significant percentage of funding toward BMP implementation in these programs as well.



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