



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# Oklahoma

## Turbidity Levels in Mill Creek Decline After Agricultural Best Management Practice Implementation

### Waterbody Improved

High turbidity, due in part to practices associated with cattle production, resulted in impairment of Mill Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list in 2004. Implementation of best management practices (BMPs) to promote better quality grazing land decreased sediment loading into the creek. As a result, a 24-mile-long segment of Mill Creek was removed from Oklahoma's 2010 CWA 303(d) list for turbidity impairment. This segment of Mill Creek is currently in partial attainment of its fish and wildlife propagation designated use and has been proposed for full attainment of the use in the 2014 integrated report.

### Problem

Mill Creek is in McIntosh County in central-eastern Oklahoma. Land use in the 41,669-acre watershed is primarily rangeland and pasture for cattle production, with a small amount of corn production as well. Poor grazing land management contributed to excess sedimentation in the watershed. In the 2004 water quality assessment, monitoring showed that 40 percent of Mill 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 a 24-mile-long segment of Mill Creek (OK220600010100 \_ 20) to the 2004 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, Grazing Lands Conservation Program and Environmental Quality Incentives Program (EQIP). From 2005 to 2009, landowners improved pasture and range condition with more than 15,000 acres of prescribed grazing, installation of 29 ponds for

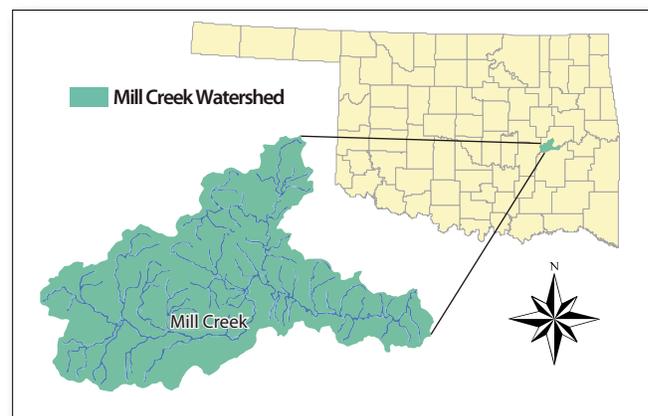


Figure 1. The Mill Creek watershed is in central-eastern Oklahoma.

alternative water sources, 11,920 linear feet of fencing, 6,175 acres of integrated pest management and 5,793 acres of upland wildlife habitat management. Erosion from cropland was reduced through 239 acres of reduced tillage and mulch-till methods, 353 acres of nutrient management and 37 acres of forage planting and harvest management.

From 2010 to 2012, additional BMP implementation further improved grazing lands and kept erosion potential low. Twenty additional ponds were installed, along with more than 8,400 feet of fencing, to promote optimal grazing on approximately 4,000 acres. Nutrient management was implemented on 3,639 acres, and brush management, integrated pest management and supplemental

planting on more than 1,500 acres helped enhance pasture condition. Finally, rangeland was improved through 6,000 acres of grazing management for wildlife habitat through the NRCS Conservation Stewardship Program.

## Results

The Oklahoma Conservation Commission's Rotating Basin Monitoring Program, a statewide nonpoint source ambient monitoring program, documented improved water quality in Mill Creek due to landowners implementing BMPs. In the 2004 assessment, 40 percent of seasonal base flow water samples exceeded the turbidity criteria of 50 NTU. This exceedance was reduced to 8 percent in 2010, and the 24-mile segment of Mill Creek was removed from Oklahoma's CWA section 303(d) list for turbidity impairment. Turbidity has continued to decline, with a zero percent exceedance in the 2012 assessment. This segment of Mill Creek is currently in partial attainment of the fish and wildlife propagation designated use and has been proposed for full attainment of this use due to further improvements.

## 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

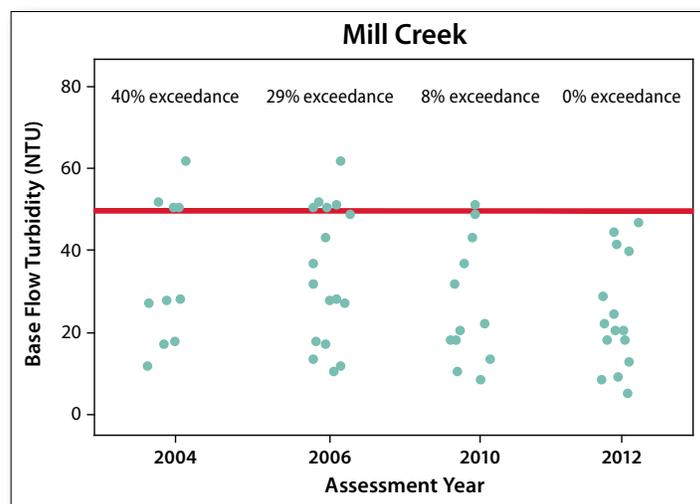


Figure 2. Monitoring data indicate that base flow turbidity levels in Mill Creek (segment OK220600010100 \_ 20) have declined.

in CWA section 319 funding supports statewide education, outreach and monitoring efforts through the Blue Thumb program. The Oklahoma cost-share program provided approximately \$13,000 in state funding for BMPs in this watershed through the McIntosh County Conservation District. NRCS spent approximately \$485,000 for implementation of BMPs in McIntosh County from 2005 to 2009. An additional \$615,684 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.



U.S. Environmental Protection Agency  
Office of Water  
Washington, DC

EPA 841-F-14-001DDD  
September 2014

### For additional information contact:

**Shanon Phillips**  
Oklahoma Conservation Commission  
405-522-4500 • shanon.phillips@conservation.ok.gov