Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Oklahoma

Agricultural Best Management Practice Implementation Decreases Turbidity in Gray Horse Creek

Waterbody Improved

High turbidity, due in part to practices associated with cattle production, resulted in impairment of Gray Horse 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, the entire length of Gray Horse Creek was removed from Oklahoma's 2010 CWA section 303(d) list for turbidity impairment. Gray Horse Creek is now in full attainment of its fish and wildlife propagation designated use.

Problem

Gray Horse Creek is in Osage County in north central Oklahoma (Figure 1). Land use in the 27,427-acre watershed is primarily rangeland and pasture for cattle production. Poor grazing land management contributed to excess sedimentation in the watershed. In the 2004 water quality assessment, monitoring showed that 18 percent of Gray Horse Creek's seasonal baseflow 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 5 years of data before the assessment year). On the basis of these assessment results, Oklahoma added the entire length of 16-mile-long Gray Horse Creek (OK621200010400_00) to the 2004 and subsequent CWA section 303(d) lists for nonattainment of the fish and wildlife propagation designated use due to turbidity impairment.

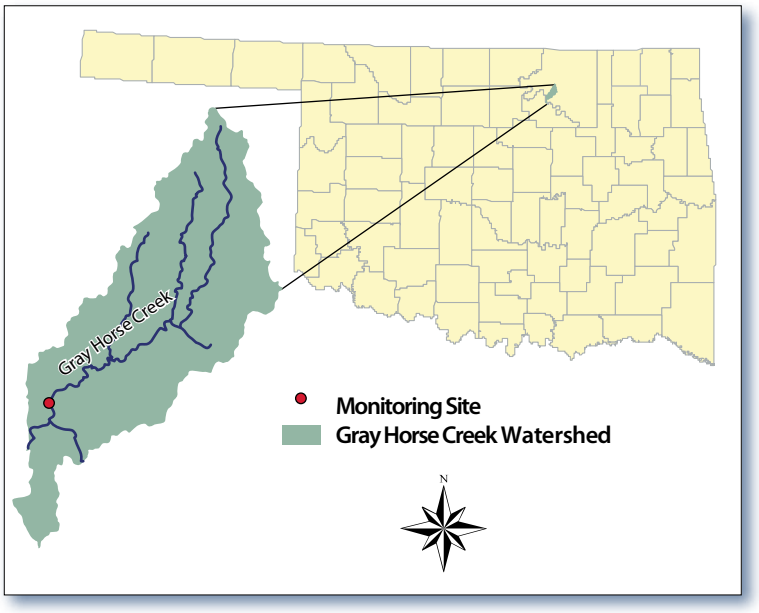

Figure 1. The Gray Horse Creek watershed is in north central Oklahoma.

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. From 2005 to 2009, landowners addressed erosion from grazing lands by improving pasture condition with 610 acres of prescribed grazing and enhancing rangeland condition through 250 acres of brush management. One pond was installed to provide an alternative water source for better pasture management. From 2010 to 2012, the NRCS Environmental Quality Incentives Program and the Conservation Stewardship Program incentivized installation of 3,085 acres of prescribed grazing, 2,021 acres of nutrient management, 2,483 acres of integrated pest management, and 151 acres of rotational grazing, all of which promote healthy grazing lands and reduce erosion potential.

In addition, the Oklahoma Conservation Commission's (OCC's) education program, Blue Thumb, has had several active volunteer monitoring sites in Osage County for a number of years.

Figure 2. Blue Thumb volunteers actively monitor streams in Osage County and help educate area residents about nonpoint source pollution and stream health.

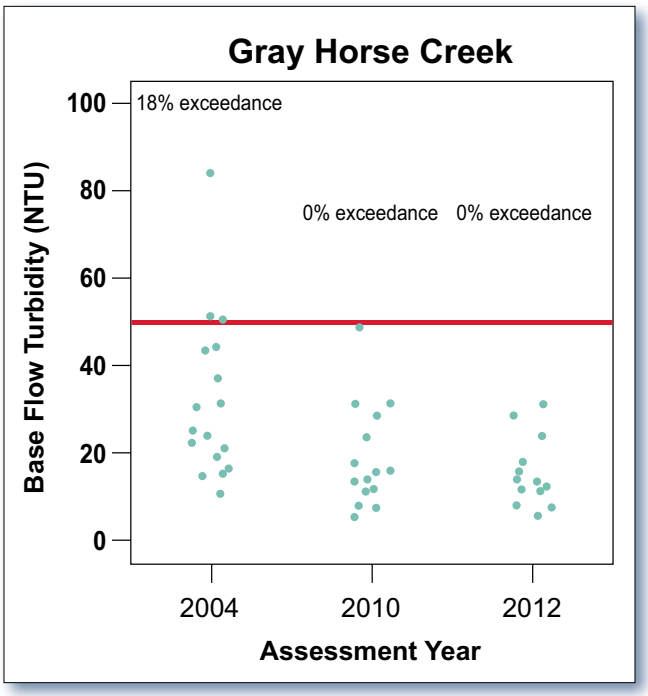

Figure 3. Monitoring data indicate that base flow turbidity levels in Gray Horse Creek declined by 2010 and currently meet water quality standards.

Educational programs have been offered by Blue Thumb staff in the county, and volunteers work to educate watershed residents, including the Kaw and Osage tribal nations, about nonpoint source pollution and the status of area streams as well (Figure 2).

Results

The OCC's Rotating Basin Monitoring Program, a statewide nonpoint source ambient monitoring program, documented improved water quality in Gray Horse Creek due to landowners implementing BMPs. In the 2004 assessment, 18 percent of seasonal base flow water samples exceeded the turbidity criteria of 50 NTU. This exceedance was reduced to zero percent in 2010 and remained at this level in the 2012 assessment (Figure 3). Gray Horse Creek was removed from Oklahoma's 2010 CWA section 303(d) list for turbidity impairment and is now in full attainment of the fish and wildlife propagation designated use.

Partners and Funding

The Rotating Basin Monitoring Program is supported through EPA's CWA section 319 program at an average annual cost of $1 million. Monitoring costs fund 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 $2,000 in state funding for BMPs in this watershed through the Osage County Conservation District. NRCS spent approximately $677,000 for implementation of prescribed grazing and brush control BMPs in Osage County from 2005 to 2009 through general technical assistance funds. An additional $300,000 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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