Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Oklahoma

Implementing Agricultural Best Management Practices Decreases Turbidity in Sandstone Creek

Waterbody Improved

High turbidity, due in part to practices associated with wheat and cattle production, resulted in impairment of Sandstone Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list of impaired waters in 2008. Implementation of best management practices (BMPs) to promote better quality grazing land and cropland decreased sediment loading into the creek. As a result, Oklahoma removed a 15-mile-long segment of Sandstone Creek from the state's 2012 CWA 303(d) list of impaired waters for turbidity. Sandstone Creek is now in full attainment of its fish and wildlife propagation (FWP) designated use.

Problem

Sandstone Creek is located in Roger Mills and Beckham counties in western Oklahoma (Figure 1). Land use in the 65,905-acre watershed is primarily wheat and pasture for cattle production. Poor grazing land and cropland management contributed to excess sedimentation in the watershed. In the 2008 water quality assessment, monitoring showed that 11 percent of Sandstone 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 a 15-mile-long segment of Sandstone Creek (OK310840020020 _ 00) to the 2008 and subsequent CWA section 303(d) lists for nonattainment of the FWP designated use due to turbidity impairment.

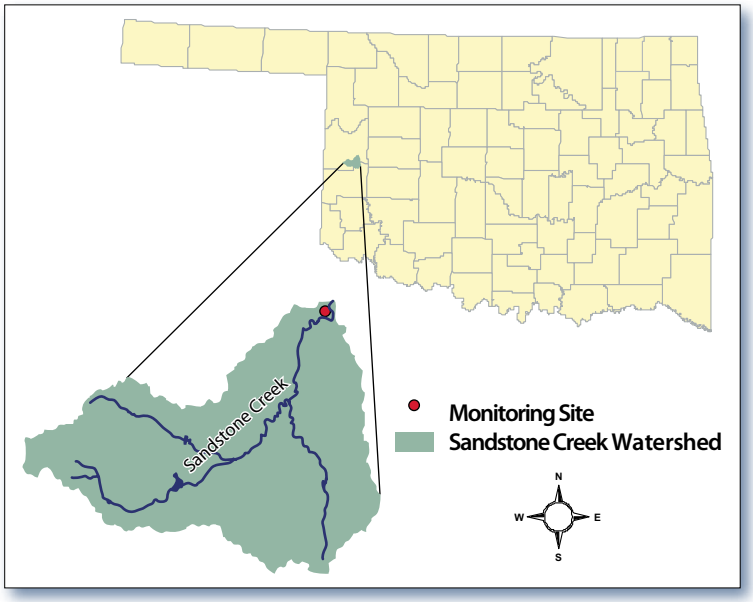

Figure 1. The Sandstone Creek watershed is in western Oklahoma.

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) Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP), and general conservation technical assistance program. From 2008 to 2011, landowners addressed erosion from grazing and crop lands with 12,322 acres of prescribed grazing, 94 acres of access control, and seven ponds and 23 tanks for alternative water sources. Hay and forage planting on 88 acres, forage harvest management on 641 acres and 2,248 acres of pest (weed) management helped to improve the quality of grazing lands. Reduced cropland erosion potential was achieved by implementing conservation cover crops on 78 acres and residue/conservation tillage methods on 60 acres. Installation of 17 grade stabilization structures along with 3 acres of grassed waterways, and 13 diversions also reduced loss of soil due to runoff (Figure 2). An additional 2,669 acres of prescribed grazing

was implemented in 2012, along with continued conservation tillage, alternative water supplies, and another grade stabilization structure, which will further reduce erosion potential.

The OCC's education program, Blue Thumb, has had an active volunteer monitoring group in Roger Mills County for over a decade. The conservation district offers numerous environmental education programs at schools and local events as well. Such activities provide vital education for the residents of the watershed and may help facilitate behavior changes. Active volunteer monitoring and education is continuing in the area.

Results

The OCC's Rotating Basin Monitoring Program, a statewide nonpoint source ambient monitoring program, documented improved water quality in Sandstone Creek due to landowners implementing BMPs. In the 2008 assessment, 11 percent of seasonal base flow water samples exceeded the turbidity criteria of 50 NTU (Figure 3). This exceedance was reduced to zero percent in the 2012 assessment (Figure 2). Hence, Sandstone Creek has been removed from Oklahoma's CWA section 303(d) list for turbidity impairment and is now in full attainment of the FWP designated use.

Partners and Funding

The Rotating Basin Monitoring Program is supported by U.S. Environmental Protection Agency CWA section 319 funds 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 OCC's Blue Thumb program.

The Oklahoma cost-share program provided $3,916 in state funding for BMPs in this watershed through the Upper Washita and North Fork of Red River conservation districts, and landowners contributed $3,786 through this program. NRCS spent approximately $3.5 million for implementation of BMPs in the watershed from 2008 to 2011 through EQIP, CSP, and general technical assistance funds. Landowners provided a significant percentage of funding toward BMP implementation in these programs as well.

Figure 2. Installing grade stabilization structures reduced erosion.

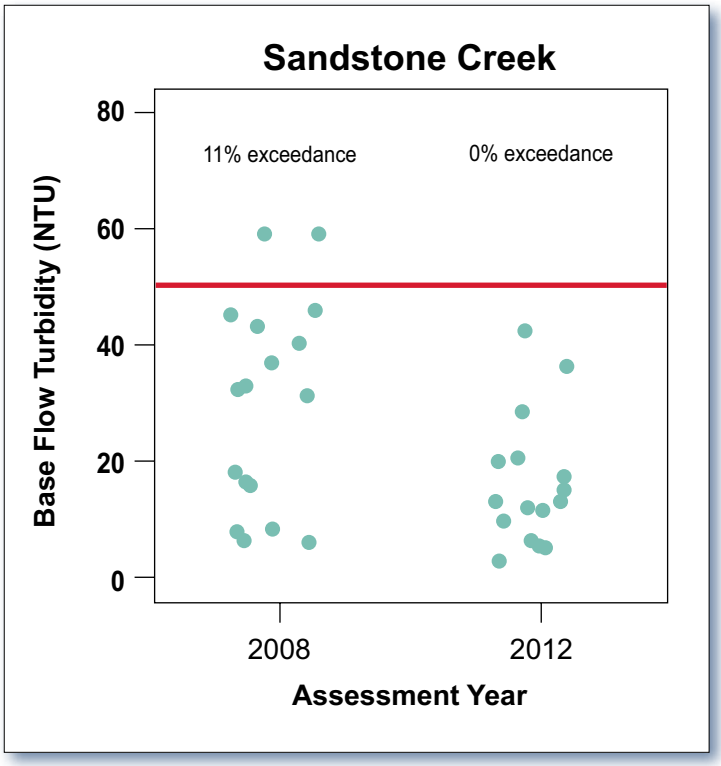

Figure 3. Monitoring data show that turbidity levels in Sandstone Creek have declined.

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

EPA 841-F-14-001U
April 2014

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