



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Oklahoma

Implementing Agricultural Best Management Practices Reduces Turbidity

Waterbody Improved

Excess turbidity due in part to practices associated with cattle production impaired a portion of Oklahoma's California Creek.

As a result, Oklahoma added California Creek to the state's 2004 Clean Water Act (CWA) section 303(d) list of impaired waters for turbidity. Implementing best management practices (BMPs) helped reduce erosion from grazing lands, and turbidity levels decreased. As a result, California Creek was removed from the CWA section 303(d) list for turbidity in 2008.

Problem

California Creek is in Nowata County in the north-eastern part of Oklahoma (Figures 1 and 2). Land use in the watershed is primarily cow/calf production. Sediment from eroding grazing lands contributed to turbidity in California Creek. Contributing to the erosion problem was a lack of pasture and range cover because of an overgrowth of invasive weeds such as musk thistle, serecia lespedeza and eastern red cedar. Sediment eroding from the watershed's small amount of cropland also contributed to elevated turbidity levels.

Monitoring showed that seasonal base flow water samples exceeded 50 nephelometric turbidity units (NTU) in 2004 (by 13 percent) and 2006 (by 16 percent). A stream is considered impaired by turbidity if 10 percent or more of the seasonal base flow water samples exceed 50 NTUs (based on five years' worth of data prior to the assessment year). The high turbidity levels prevented California Creek from attaining the warm water aquatic community subcategory of the fish and wildlife propagation designated use, prompting Oklahoma to add a 25-mile segment of California Creek to the 2004 CWA section 303(d) list of impaired waters.

Project Highlights

Landowners implemented numerous BMPs with support from Oklahoma's locally led cost-share program and Natural Resources Conservation Service (NRCS) programs such as the Environmental Quality Incentives Program, Conservation Reserve Program, Grassland Reserve Program and Wildlife Habitat Incentives Program (WHIP). From 2003 to 2007, landowners implemented prescribed (managed) grazing on 11,901 acres, which included installing 20,960 linear feet of cross-fencing and constructing 11 ponds.

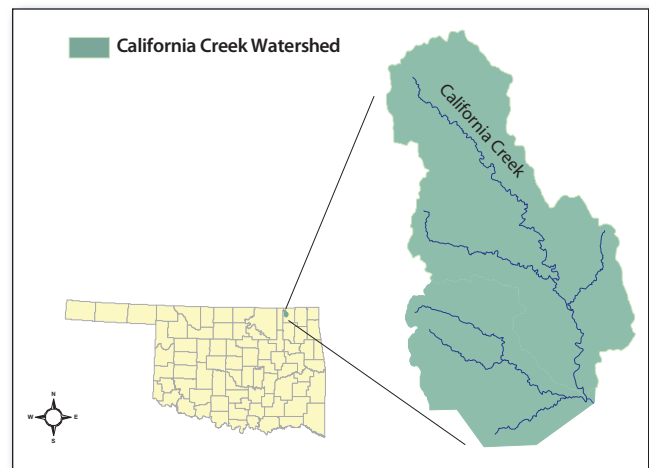


Figure 1. The California Creek watershed is in northeast Oklahoma.

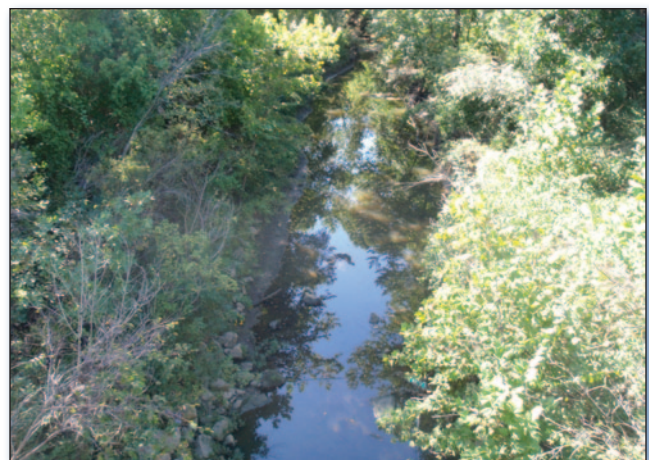


Figure 2. This stretch of Oklahoma's California Creek supports a well-established riparian area.

Landowners planted hay and pasture vegetation on 295 acres to enhance the quality of grazing lands. To address the invasive weed problem, they began weed management efforts on 19,856 acres and conducted prescribed burning on 3,358 acres.

Landowners also adopted several cropland BMPs, including converting 456 acres of land from conventional tillage to conservation tillage, implementing conservation/cover crop rotation on nearly 500 acres, constructing two diversions, adding 6 acres of grassed waterways, building 11,370 feet of terraces and adopting nutrient management plans for 428 acres. Landowners established riparian buffers using WHIP funds, which helped to reduce erosion and enhance wildlife habitat.

Landowners implemented additional BMPs in 2008 and 2009 that built on the initial grazing land improvements. Recent BMPs included more conservation tillage (152 acres), conservation crop rotation (198 acres), fencing (17,604 linear feet), pasture planting (343 acres), nutrient management (390 acres), prescribed grazing (3,439 acres) and terraces (5,685 feet).

Results

The Oklahoma Conservation Commission's (OCC's) statewide nonpoint source ambient monitoring program, known as the Rotating Basin Monitoring Program, documented water quality improvements

in California Creek. As a result of the implemented practices, turbidity levels decreased in the California Creek watershed. In the 2008 assessment, no samples exceeded the 50 NTU turbidity criterion (Figure 3), prompting Oklahoma to remove California Creek from the 2008 CWA section 303(d) list of impaired waters for turbidity. California Creek now partially meets its fish and wildlife propagation designated use.

Partners and Funding

OCC's Rotating Basin Monitoring Program, which now includes a probabilistic component, is funded using U.S. Environmental Protection Agency (EPA) CWA section 319 funds at an average annual cost of \$1 million. Monitoring costs fund personnel, supplies and laboratory analysis for 19 parameters from samples collected every 5 weeks at about 100 sites for a total of 20 episodes per 5-year cycle. In-stream habitat, fish and macroinvertebrate samples are also collected. Approximately \$600,000 in EPA section 319 funds supports statewide education, outreach and monitoring efforts through the Blue Thumb program.

The Oklahoma cost-share program provided \$15,711 in state funding for BMPs in the watershed, and landowners contributed nearly \$24,000. NRCS invested approximately \$335,203 to implement BMPs in the area from 2003 to 2007 and just over \$640,000 for additional BMPs in 2008 and 2009.

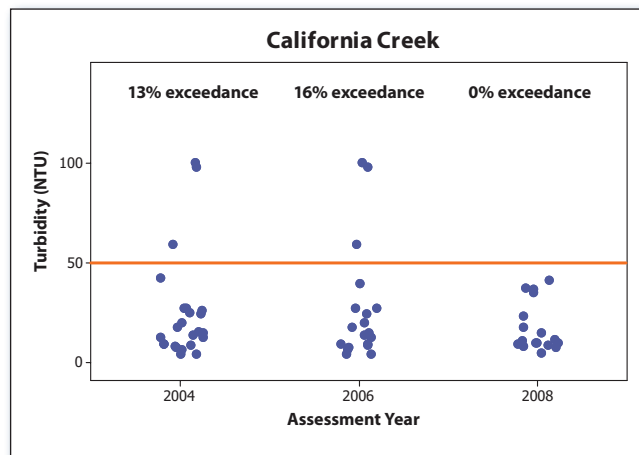


Figure 3. Turbidity levels in California Creek declined from 2004 to 2008. The creek now meets the turbidity water quality standard.



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