

Section 319 NONPOINT SOURCE PROGRAM SUCCESS STORY

Implementing Best Management Practices Restores Creek

Waterbody Improved Little Wewoka Creek was impaired due in part to practices associated with wheat and cattle production, prompting Oklahoma to add the creek to the state's Clean Water Act (CWA) section 303(d) list of impaired waters for turbidity (1998) and dissolved oxygen (2006). Educating landowners and implementing best management practices (BMPs) to improve pasture and nutrient management led to decreased sediment in the creek. As a result, Little Wewoka Creek was removed from Oklahoma's 2006 CWA section 303(d) list for turbidity impairment. Water quality has continued to improve and Little Wewoka Creek has been nominated for removal from Oklahoma's 2010 CWA section 303(d) list for dissolved oxygen impairment. This brings the stream into full attainment of its fish and wildlife propagation designated use.

Problem

The 20-mile-long Little Wewoka Creek flows through Seminole, Okfuskee and Hughes counties in central Oklahoma (Figures 1 and 2). The majority of the land in the area is used for cattle and hog production, along with some wheat farming. Erosion of poorly maintained pasture areas (including overstocking and allowing brush and weed overgrowth) contributed large amounts of sediment to Little Wewoka Creek.

In the 1998 and 2002 water quality assessments, monitoring showed that 25 percent of Little Wewoka Creek's seasonal baseflow water samples exceeded 50 nephelometric turbidity units (NTU). A stream is considered impaired by turbidity if 10 percent or more of the seasonal base flow water samples exceed 50 NTU (based on 5 years of data before the assessment year). On the basis of the assessment results, Oklahoma added the entire length of Wewoka Creek (20 miles) to the 1998 and subsequent CWA section 303(d) lists for nonattainment of the fish and wildlife propagation designated use due to suspended solids/turbidity impairment.

In addition, the creek has been included on Oklahoma's CWA section 303(d) list since 2006 as not attaining its fish and wildlife propagation use because of low dissolved oxygen levels. In the 2006 and 2008 assessments, 15 percent of samples fell below the critical value of 5.0 milligrams per liter (mg/L) dissolved oxygen. A stream is considered impaired for dissolved oxygen if more than 10 percent of samples are below 5 mg/L. Runoff of wastes and sediment from poor pasture maintenance and improper management of cattle wastes may contribute nutrients to the creek. Excess nutrients may lead to the overgrowth of nuisance algae, and the subsequent breakdown of the algae may then cause dissolved oxygen levels to drop.



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Figure 1. The Wewoka Creek watershed is in central Oklahoma.



Figure 2. Little Wewoka Creek flows through agricultural areas.

Project Highlights

Landowners implemented numerous BMPs with support from Oklahoma's locally led cost-share program and funds from a Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program Local Emphasis Area project. The primary goal of the project was to improve grazing land quality.

From 2002 to 2009, landowners improved pastures through supplemental planting on 378 acres, brush management on 48 acres, and weed management on over 3,400 acres. In addition, 2,155 acres had nutrient management plans and over 8,660 acres had grazing management plans implemented. Landowners installed 135 acres of critical area planting, 10,665 linear feet of cross-fencing, 10 acres of heavy use area protection around feeding and watering areas, one grade stabilization structure, and eight ponds to further improve pastures and range and to reduce erosion from cattle activity in the watershed. Finally, conservation crop rotations were adopted on 191 acres, in addition to 30 acres of no-till and 859 acres of forage harvest management practices.

Results

The Oklahoma Conservation Commission's Rotating Basin Monitoring Program (RBMP), a statewide nonpoint source ambient monitoring program, documented improved water quality in Little Wewoka Creek due to landowners implementing BMPs. In the 2006 water quality assessment, monitoring showed that turbidity levels in Little Wewoka Creek met the 50 NTU water quality standard (Figure 3). Therefore, Oklahoma removed the 20-mile segment of Little Wewoka Creek from the 2006 CWA section 303(d) list for turbidity.

Since 2006 turbidity in the stream has remained low thanks to stakeholders' continued implementation of new BMPs and maintaining existing BMPs. As a result of the practices implemented beginning in 2002, dissolved oxygen values have also improved in the Little Wewoka Creek watershed. In the 2006 and 2008 assessments, 15 percent of the creek's dissolved oxygen samples were below the critical value of 5.0 mg/L. This was reduced to 0 percent in the 2010 assessment (Figure 4). Hence, Little Wewoka Creek has been nominated for removal from Oklahoma's 2010 CWA section 303(d) list for dissolved oxygen impairment and now fully attains its fish and wildlife propagation designated use. Tours and field days showcasing implemented practices in the watershed increased producer awareness and improved grazing land management



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Figure 4. Little Wewoka Creek met the dissolved oxygen water quality standard in 2010.

skills, enhancing the decrease in sedimentation and nutrients in the area streams overall.

Partners and Funding

The RBMP, which now includes a probabilistic component, is funded through the U.S. Environmental Protection Agency's (EPA's) CWA section 319 program at an average annual cost of \$1 million. Monitoring costs include personnel, supplies and lab analysis for 19 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 EPA CWA section 319 funding supports statewide education, outreach and monitoring efforts through the Blue Thumb program. The Oklahoma cost-share program provided \$7,463 in state funding for BMPs in the watershed (channeled through the conservation districts in Seminole, Okfuskee and Hughes counties), and landowners contributed \$8,514. The NRCS invested approximately \$893,470 for implementing BMPs in the area from 2002 to 2009.

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