



NONPOINT SOURCE SUCCESS STORY

Oklahoma

Conservation Efforts Sustained Through the National Water Quality Initiative Reduce Turbidity in Turkey Creek (Garfield County)

Waterbody Improved

High turbidity levels resulted in the impairment of Turkey Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list of impaired waters in 2004. Pollution from cropland, grazing and hay production areas contributed to this impairment. Implementing conservation practice systems (CPs) to promote better cropland and grazing lands management decreased turbidity levels in the creek. As a result, Turkey Creek was removed from Oklahoma's 2012 CWA section 303(d) list for turbidity. Turkey Creek now fully supports its fish and wildlife propagation (FWP) beneficial use.

Problem

Turkey Creek is an 82.59-mile stream that flows through Alfalfa, Major, Garfield and Kingfisher counties in Oklahoma before joining the Cimarron River (Figure 1). Land use in the 416-square-mile watershed is approximately 61 percent row crop used almost exclusively for winter wheat production. About 31 percent of the watershed is grazing lands for cattle and hay production, and 14 percent of the watershed is forested. Less than 2 percent of the watershed is developed for towns and roads.

Challenges with cropland and grazing lands management contributed to the stream being listed as impaired for turbidity in 2004 when 25 percent of samples collected at seasonal baseflow were higher than 50 nephelometric turbidity units (NTU). The FWP designated use is considered impaired if more than 10 percent of baseflow samples are greater than 50 NTU. Oklahoma added Turkey Creek (OK620910060010_00) to the 2004 CWA section 303(d) list for nonattainment of its FWP beneficial use.

Project Highlights

Landowners in the watershed worked with the Alfalfa, Major, Garfield and Kingfisher county conservation districts, the U.S. Department of Agriculture's (USDA's) Natural Resources Conservation Service (NRCS), USDA Farm Services Agency (FSA) and the Oklahoma Conservation Commission (OCC) to implement CPs through Oklahoma NRCS's Environmental Quality Incentives Program (EQIP), Conservation Security Program (CSP), Conservation Stewardship

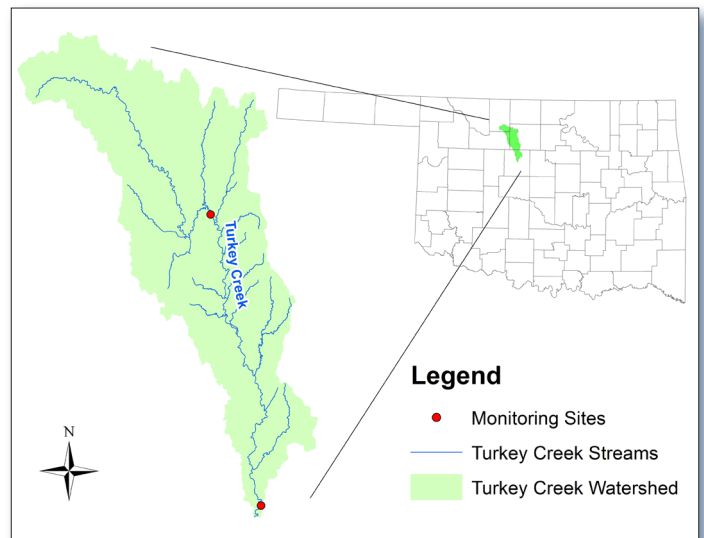


Figure 1. Turkey Creek is in north-central Oklahoma.

Program (CStWP), Wetland Reserve Program (WRP), Grazing Lands Conservation Initiative (GLC) and general conservation technical assistance program; FSA's Conservation Reserve Program (CRP); and Oklahoma's Locally Led Cost-Share Program (LLCP). The watershed was also selected for NRCS's National Water Quality Initiative (NWQI) partnership with the U.S. Environmental Protection Agency (EPA), which brought additional resources for CP installation.

Landowners focused on reducing erosion and pollutant runoff from cropland and grazing lands in the watershed primarily by reducing tillage and increasing cover on cropped fields. CPs included 19,073 acres of no-till, 5,126 acres of reduced tillage, 364 acres of mulch-till,

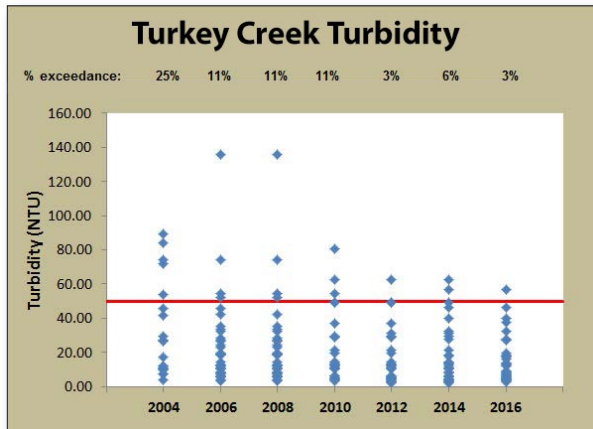


Figure 2. Turbidity levels decreased as conservation practice installation increased in the watershed.

791 acres of strip-till, 3,739 acres of seasonal residue management and 788 acres of cover crops.

Other practices included 696 acres of access control, deep tillage on 2,944 acres, 7,031 acres of conservation crop rotation, 171 acres of contour farming, 2,264 acres of forage and biomass planting, 3,958 feet of diversion, 117 acres of critical area planting, 9 grade stabilization structures, 1,495 acres of nutrient application no more than 30 days prior to planting, 806 acres of conservation cover, 629 acres of forage harvest management, 2.6 acres of filter strips, 87 acres of grassed waterways, 1,834 feet of cross-fencing, 3,194 acres of integrated pest management, 5,924 acres of nutrient management, 14 ponds, 4,810 acres of prescribed grazing, 4 watering facility pumps, 508 acres of range planting, 1.8 acres of riparian herbaceous cover, 81,648 feet of terrace, 5 acres of tree establishment, 949 acres of upland wildlife habitat management, 7 wells, 1 well decommissioning, 3 watering facilities, 4 wetland restorations on 913 acres, 1,073 acres of wetland wildlife habitat management, and 2,143 acres of windbreak and shelterbelts.

Additional practices installed included GPS-enabled precision techniques such as Smart Sprayer-targeted chemical application on 119 acres and precision nutrient application on 375 acres. Deep-rooted crops were used on 297 acres to reduce soil compaction and drift-reducing nozzles were used on 290 acres to reduce pesticide drift. Irrigation was improved with 3 acres of micro-irrigation and 3,215 feet of irrigation pipeline.



Figure 3. Turkey Creek now fully supports its FWP beneficial use.

Results

The OCC documented improved water quality in the Turkey Creek due to landowners implementing CPs. The installed CPs worked to decrease soil erosion and pollutant loading to downstream waterbodies. Monitoring data compiled for the 2004 Integrated Report showed that Turkey Creek turbidity levels violated state standards when 25 percent of seasonal baseflow samples were greater than 50 NTU. However, by the 2012 assessment, only 3 percent of samples violated the criteria (Figure 2). On the basis of these data, Turkey Creek was removed from the Oklahoma CWA section 303(d) list for turbidity in 2012 and remains supporting through at least 2016. This change results in full support of the creek's FWP beneficial use (Figure 3).

Partners and Funding

The OCC monitoring program is supported by EPA CWA section 319 funds at an average annual statewide cost of \$1 million. Approximately \$500,000 in EPA CWA section 319 funds support statewide water quality educational efforts through Blue Thumb. From 2004 to 2010, NRCS supplied approximately \$925,000 for implementation of CPs in the watershed through NRCS EQIP and the NWQI. Additional funds were provided through FSA for CRP, and through NRCS for CSP, CstwpP, WRP, and GLC practices. The Oklahoma LLCP provided \$35,698 matched by \$36,150 from landowners. In addition, a large number of practices were funded by landowners based on recommendations through NRCS general technical assistance and conservation planning.



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