



NONPOINT SOURCE SUCCESS STORY

Oklahoma

Forest and Grazing Land Management Improve Water Quality in Big Eagle Creek

Waterbody Improved

Dissolved oxygen (DO) concentrations resulted in the impairment of Big Eagle Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list of impaired waters in 2008. Pollution from forested and grazing lands contributed to this impairment. Implementing conservation practice systems (CPs) to promote better land management decreased the runoff of sediment, bacteria, and other pollutants and resulted in improved water quality. As a result, Oklahoma removed the DO impairment in 2018 from its CWA section 303(d) list. Big Eagle Creek now partially supports its Cold Water Aquatic Community (CWAC) beneficial use.

Problem

The Big Eagle Creek watershed covers approximately 218,754 acres (ac) in LeFlore and McCurtain counties in Oklahoma before draining to the Mountain Fork of the Little River (Figure 1). Land use in the watershed is about 87% forested and 8% grasslands and pasture. The watershed ranges from steep slopes in the western Ouachita Mountains to the gentler slopes of the Athens Plateau (level IV ecoregions). There are four older, smaller poultry operations in the lower portion of the watershed (which produce approximately 200,000 – 260,000 broilers per year), and the primary agricultural products from the watershed are poultry and cattle.

Water quality monitoring in the early 2000s determined that challenges with forest land and grazing lands management contributed to a 2008 listing of the 20.5-mile creek as being impaired by DO, when 19% of samples were below acceptable criteria. A CWAC waterbody is considered impaired for DO if more than 10% of samples fall below the “not attaining” criteria of 6.0 milligrams per liter (mg/L) from April 1 through June 15 or below 5.0 mg/L during the remainder of the year. Based on these results, Oklahoma added segment 410210060160_00 to the CWA section 303(d) list in 2008 for nonattainment of the CWAC beneficial use.

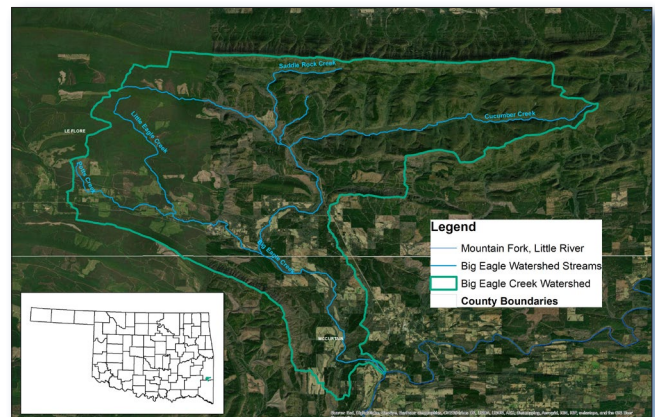


Figure 1. Big Eagle Creek is in southeastern Oklahoma.

Story Highlights

Approximately 20 landowners in the watershed worked with the Talihina and Little River conservation districts, the Natural Resources Conservation Service (NRCS), and the Oklahoma Conservation Commission (OCC) to implement CPs through Oklahoma NRCS's Environmental Quality Incentives Program (EQIP) and general conservation technical assistance program and through the OCC's State Cost Share Program (SCSP). From 2002 to 2020, landowners improved their management of animal waste, forests, and grazing lands,

which reduced runoff of sediment, nutrients, and other pollutants by reducing bare soil and increasing vegetative cover and infiltration. Landowners implemented CPs, including animal mortality facilities (2), brush management (145 ac), critical area planting (2 ac), fence (5,381 feet (ft)), fire break (72,037 ft), forest stand improvement (130 ac), heavy use area protection (454 square ft), herbaceous weed control (63 ac), nutrient management (123 ac), pasture and hayland planting (99 ac), pest management (434 ac), ponds (8), prescribed burning (698 ac), prescribed grazing (145 ac), roofs and covers (2), tree and shrub site preparation (639 ac), tree and shrub planting (740 ac), and one waste storage facility.

Results

The OCC documented improved water quality in Big Eagle Creek due to the installation of CPs through its statewide nonpoint source Rotating Basin Ambient Monitoring Program. By 2018, DO concentrations had improved, and less than 5% were below acceptable criteria (Figure 2). Based on these results, Big Eagle Creek was removed from the 2018 CWA section 303(d) list and now partially supports its CWAC beneficial use.

Partners and Funding

The OCC monitoring program is supported by U.S. Environmental Protection Agency's (EPA's) CWA section 319 funding at an average annual statewide cost of \$1 million. Approximately \$600,000 in EPA section 319 funds support statewide water quality educational efforts through Blue Thumb. Approximately \$283,013 of these federal and state matching funds have been devoted to Big Eagle Creek.

From 2002 to 2020, NRCS invested a minimum of \$401,000 for CP implementation in Oklahoma through EQIP. In addition, many practices were funded by landowners based on recommendations through NRCS general technical assistance. Finally, the OCC, Little River and Talihina conservation districts, and landowners funded more than \$19,230 worth of CPs (at least \$9,855 of which was funded by landowners through the SCSP).

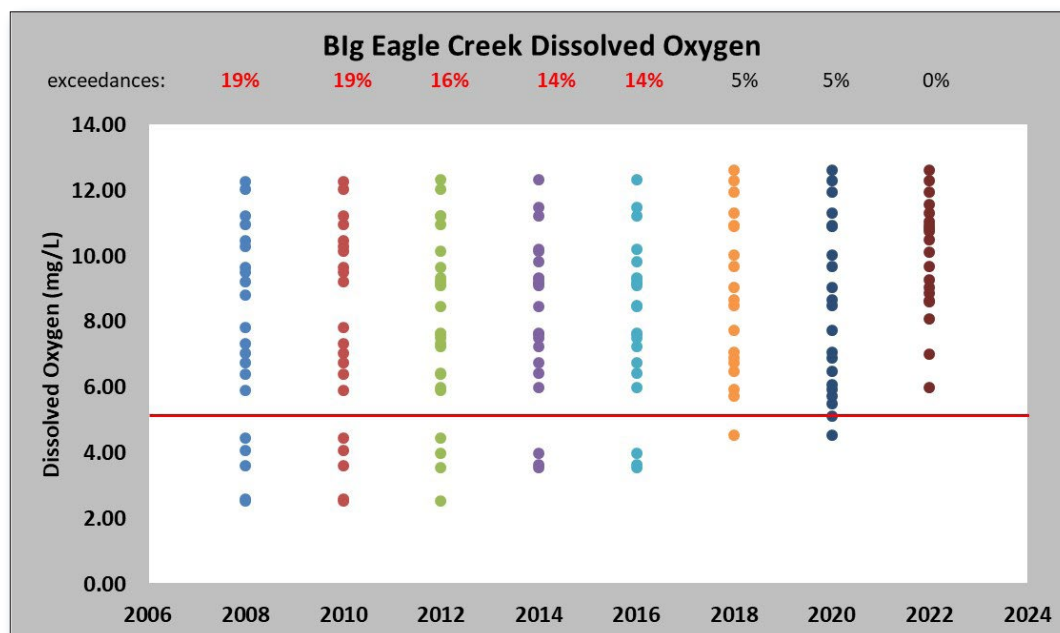


Figure 2. Big Eagle DO concentrations increased with the installation of CPs.



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