NONPOINT SOURCE SUCCESS STORY

Oklahoma

Conservation Practices Reduce Turbidity in the Glover River

Waterbody Improved

High turbidity levels resulted in the impairment of the Glover River and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list of impaired waters in 2006 for turbidity. Pollution from grazing lands and forest management practices contributed to this impairment. Implementing conservation practice systems (CPs) to promote better pasture and forest management decreased turbidity levels in the creek. As a result, Oklahoma removed the Glover River from its 2014 CWA section 303(d) list for turbidity. The Glover River partially supports its fish and wildlife propagation (FWP) beneficial use.

Problem

The Glover River is a 33.95-mile stream that flows through McCurtain and Pushmataha counties before flowing into the Little River (Figure 1). Land use in the 220,000-acre (ac) watershed is about 80 percent deciduous and evergreen forests and about 13 percent grazing lands. The watershed has over 1,300 ac of bottomland hardwood and emergent wetlands. There is some poultry production as well. Challenges with forest and grazing lands management contributed to listing the river as impaired for turbidity in 2006 when 20 percent of individual samples violated the turbidity criteria for cool water aquatic community. The FWP designated use is considered impaired if 10 percent or more of baseflow samples are greater than 10 Nephelometric turbidity units (NTU). Based on these results, Oklahoma added the Glover River (OK410210080010_00) to the 2006 CWA section 303(d) list for nonattainment of its FWP designated beneficial use.

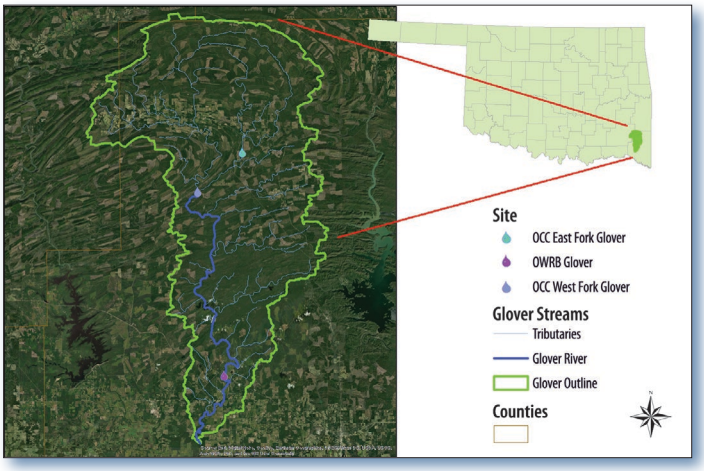

Figure 1. The Glover River watershed in southeastern Oklahoma.

Story Highlights

Landowners in the watershed worked with the Little River and Pushmataha County conservation districts, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), the Oklahoma Department of Agriculture, Food, and Forestry (ODAFF), 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 Oklahoma's Locally Led Cost Share Program (LLCP). CPs installed between 2004 and 2017 focused on reducing erosion and pollutant runoff from forest and grazing lands in the watershed (Table 1). ODAFF Forestry Services Division worked with forest landowners to design and implement forest management plans and to recommend best management practices to reduce impacts from harvesting operations.

Results

The OCC and the Oklahoma Water Resources Board (OWRB) documented improved water quality in the Glover River due to installation of CPs. The installed CPs worked to decrease sediment erosion to downstream waterbodies. Monitoring data compiled for the 2006 integrated report showed that Glover River turbidity levels violated the turbidity 20 percent of the time (Figure 2). However, by the 2014 assessment, turbidity levels had dropped and only violated the criteria 9 percent of the time. Based on these data, Oklahoma removed the Glover River from the CWA section 303(d) list for turbidity in 2014. The Glover River now partially supports its FWP beneficial use.

Table 1. CPs installed in the Glover River watershed.

Practice name	Amount installed
Comprehensive nutrient management plan	2
Brush management	226 acres
Forest stand improvement	280 ac
Pond	11
Nutrient management	453 ac
Tree/shrub establishment	518 ac
Pest management	532 ac
Alley cropping	3 ac
Tree/shrub site preparation	634 ac
Fence	12,633 ft
Waste recycling	322 ac
Prescribed grazing	3,070 ac
Trails and walkways	2
Forage and biomass planting	148 ac
Prescribed burning	166 ac
Heavy use area protection	13 ac
Herbaceous weed treatment	153 ac
Waste storage facility	5
Critical area planting	4 ac
Upland wildlife habitat management	48 ac
Firebreak	11,900 ft

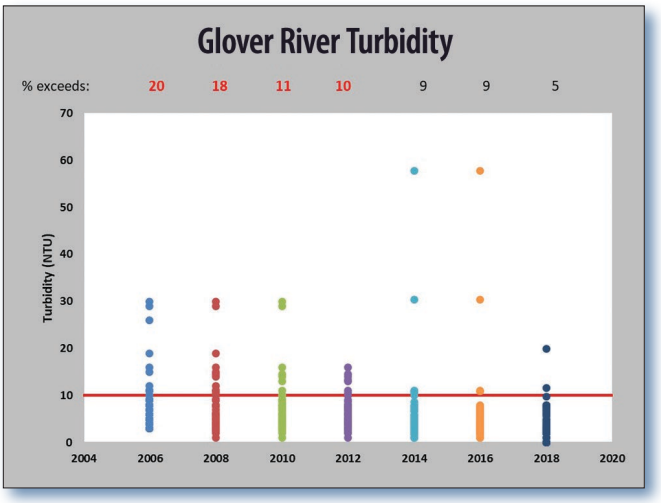

Figure 2. Turbidity decreased in the Glover River as CPs were installed.

Partners and Funding

The OCC monitoring program is supported by U.S. Environmental Protection Agency's (EPA) CWA section 319 funding at an average annual statewide cost of $1 million. Approximately $500,000 in EPA 319 funds support statewide water quality educational efforts through Blue Thumb. Approximately $290,000 of these federal and matching state funds have been devoted to the Glover River. The OWRB also monitors the Glover River through its Beneficial Use Monitoring Program. From 2004 to 2017, NRCS supplied approximately $80,000 for implementation of CPs in the watershed through NRCS EQIP. Additional funds were provided through NRCS for technical assistance. The state LLCP worked through the conservation districts to provide $8,123, which was matched by $13,952 from landowners. In addition, many practices were funded by landowners based on recommendations through NRCS general technical assistance and conservation planning. ODAFF provides technical assistance for silviculture activities in the watershed to reduce impacts to downstream waterbodies.

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