



# NONPOINT SOURCE SUCCESS STORY

## Oklahoma

### Voluntary Conservation Programs Reduce Bacteria Concentrations in Upper Salt Creek

#### Waterbody Improved

Elevated *Escherichia coli* (*E. coli*) levels, contributed by grazing and hay production, resulted in the impairment of Upper Salt Creek and placement on Oklahoma's Clean Water Act (CWA) section 303(d) list of impaired waters in 2010. Implementation of conservation practice systems (CPs) promoted better quality grazing lands and decreased *E. coli* levels in the creek. As a result, Upper Salt Creek was removed from Oklahoma's 2016 CWA section 303(d) list for *E. coli*. Upper Salt Creek now partially supports its primary body contact (PBC) designated use.

#### Problem

Salt Creek flows through Osage County before discharging to the Arkansas River in northern Oklahoma (Figure 1). Its watershed is in the Flint Hills Ecoregion and is comprised of tallgrass prairie on rolling hills with relatively steep, narrow valleys composed of shale and cherty limestone with rocky soils.

Land use in the 185,000-acre watershed is primarily grasslands (85 percent) for beef cattle and hay production. About 6 percent of the watershed is developed land (primarily for highways and roads), 2 percent is forested, and less than 4 percent of the watershed is cropland.

Grazing and hayland management contributed to excess *E. coli* in Salt Creek. The upper segment of Salt Creek (43.97 miles) was listed as impaired for bacteria in 2010 when the geometric mean of samples violated Oklahoma's water quality standards. An Oklahoma stream is considered to violate the *E. coli* standard when the geometric mean of recreation season samples exceeds 126 colony-forming units per one hundred milliliters (CFU/100ml). On the basis of these assessment results, the Oklahoma Conservation Commission (OCC) added the upper segment of Salt Creek (OK621200040010\_10) to the 2010 CWA section 303(d) list for nonattainment of the PBC designated beneficial use.

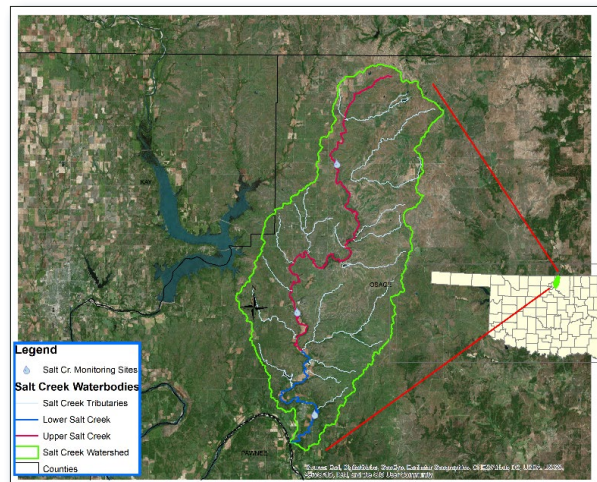


Figure 1. Salt Creek is in Osage County, Oklahoma.

#### Story Highlights

Landowners in the watershed worked with the Osage County Conservation District, the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), and the OCC to implement CPs through Oklahoma NRCS's Environmental Quality Incentives Program (EQIP) and general conservation technical assistance program, and through the OCC's Locally Led Cost Share Program (LLCP). From 2002 to 2017, landowners improved many acres of pasture and hay meadows, which reduced runoff of sediment and other pollutants by decreasing erosion and better utilizing available grazing lands (Table 1).

**Table 1. CPs installed in the Salt Creek watershed.**

Practice name	Amount installed
Upland wildlife habitat management	21,975 acres
Use exclusion	89 acres
Prescribed burning	22,000 acres
Pest management	25,051 acres
Forage harvest management	754 acres
Conservation crop rotation	512 acres
Prescribed grazing	84,316 acres
Conservation tillage	902 acres
Pond	8
Pasture and hayland planting	644 acres

## Results

The OCC documented improved water quality in Salt Creek through its statewide nonpoint source Rotating Basin Ambient Monitoring Program. Improvements were due to landowners implementing CPs. The installed practices worked to decrease *E. coli* concentrations. Monitoring data compiled for the 2010 integrated report had showed excessive *E. coli*

in Salt Creek (geomean of 282 CFU exceeded the state criteria of 126 CFU). By 2016, *E. coli* values had decreased to a geomean of 25 CFU. This decreasing trend continues through the 2020 assessment (Figure 2). On the basis of these data, Upper Salt Creek was removed from the Oklahoma CWA section 303(d) list for *E. coli* in 2016. Salt Creek is now in partial support of its PBC beneficial use.

## 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 \$130,000 of these federal and state matching funds have been devoted to Salt Creek. Working in partnership with local conservation districts, NRCS supplied approximately \$324,000 for implementation of CPs in the watershed through NRCS EQIP. The LLCP provided \$16,084, which was matched by \$30,436 from landowners. Many practices were funded by landowners based on recommendations through NRCS general technical assistance and conservation planning.

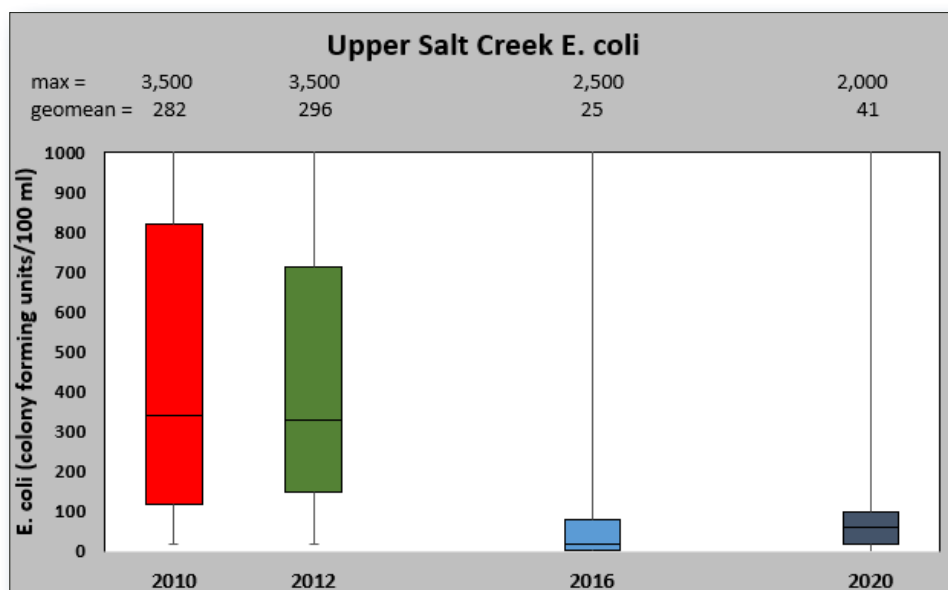


Figure 2. *E. coli* decreased in the upper segment of Salt Creek as producers improved pasture management.



U.S. Environmental Protection Agency  
Office of Water  
Washington, DC

EPA 841-F-19-001Y  
October 2019

### For additional information contact:

Shanon Phillips  
Oklahoma Conservation Commission  
405-522-4728 • shanon.phillips@conservation.ok.gov