



# NONPOINT SOURCE SUCCESS STORY

# Texas

## Implementing Conservation Practices and Conducting Watershed Outreach Improves Water Quality in the Upper Leon River and Pecan Creek

### Waterbodies Improved

High levels of bacteria prompted the Texas Commission on Environmental Quality (TCEQ) to add the Leon River (in 1996) and Pecan Creek (in 2006) to the Clean Water Act (CWA) section 303(d) list of impaired waters for not supporting the primary contact recreation use. The Texas State Soil and Water Conservation Board (TSSWCB) provided CWA section 319 grant funding to develop a watershed protection plan (WPP) to address the bacteria impairments in the Leon River watershed. Stakeholders within the watershed voluntarily implemented best management practices (BMPs) and conducted public outreach and education. Through these efforts water quality was improved and Pecan Creek and a portion of the Leon River (below Proctor Lake) were removed from the state's list of impaired waters in 2010 and 2012, respectively.

### Problem

The 1,375-square-mile Leon River watershed in central Texas is bounded by Proctor Lake upstream and Belton Lake downstream (Figure 1). The Leon River is 190 miles long, and drains portions of Comanche, Erath, Hamilton, and Coryell counties. The watershed is largely rural, with most of the land suited for grazing by cattle and goats; a few animal feeding operations are also present. Pecan Creek, a tributary of the Leon River, shares the land use features of the larger watershed.

Water quality data collected in the Leon River from 1990 to 1995 showed that fecal coliform levels exceeded the bacteria water quality standard for contact recreation. As a result, TCEQ added the river to the 1996 CWA section 303(d) list of impaired waters for not supporting its primary contact recreation use.

In 2000, the bacteria water quality standard changed to an *Escherichia coli*-based bacteria standard. The new standard requires that *E. coli* levels not exceed a geometric mean of 126 colony-forming units (cfu) per 100 milliliters (100 mL) of water.

Data collected from 1998 to 2005 showed that the geometric mean for *E. coli* exceeded the contact recreation standard in Pecan Creek, a tributary of the Leon River. As a result, TCEQ added Pecan Creek to the 2006 CWA section 303(d) list of impaired waters for not supporting its primary contact recreation use.

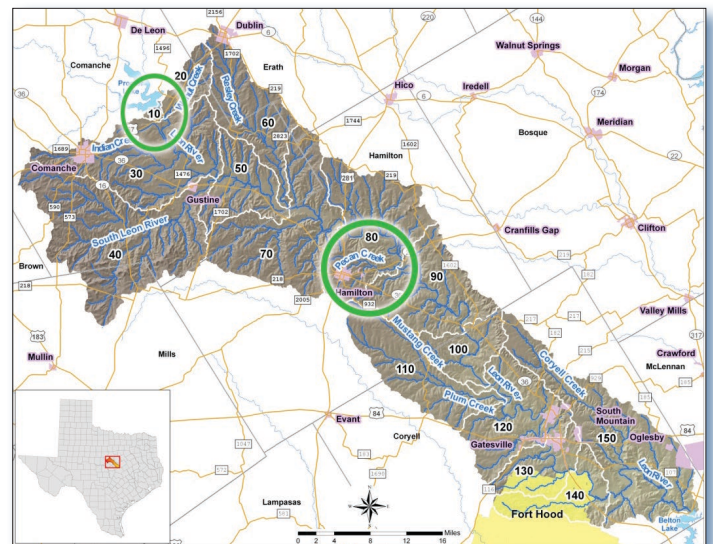


Figure 1. The Leon River watershed is in central Texas. Numbers represent subwatersheds within the Leon River watershed. Restored waters are within subwatersheds 10 and 80 (indicated by green circles).

### Project Highlights

In September 2002, the TCEQ initiated a total maximum daily load (TMDL) study for the Leon River. Local stakeholders expressed interest in taking an active role in developing management strategies to reduce bacteria loadings in the watershed and sought to initiate the development of a WPP. The TSSWCB provided CWA section 319 funding to the Brazos River Authority (BRA) to facilitate the development of a WPP for the Leon River.

The stakeholder group that led the development of the WPP consisted of representatives from Commissioner's courts (i.e., county governments), agricultural producers, wildlife interests, soil and water conservation districts (SWCDs), the dairy industry, cities and various other interests in the watershed. A technical advisory group was also formed to provide expertise to the stakeholder group. This group consisted of representatives from federal, state and local agencies; universities; and other entities.

Throughout the planning process, stakeholders were identified and encouraged to holistically address the pollution sources and water quality threats to surface water resources within the watershed. Several outreach and education programs were implemented in the city of Hamilton to inform local stakeholders of BMPs.

The TSSWCB, partnering with the Upper Leon SWCD and the Hamilton-Coryell SWCD, certified and implemented 13 water quality management plans (WQMP) in the impaired watersheds. The Upper Leon SWCD in Comanche and Erath counties implemented eight WQMPs on 1,857 acres. The Hamilton-Coryell SWCD implemented five WQMPs on 1,097 acres near Pecan Creek. Several animal feeding operations were included in these WQMPs. These plans included alternative water sources, prescribed grazing, cross-fencing, grassed waterways, nutrient management and grass planting. In addition, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) worked with landowners in both subwatersheds to implement conservation practices on over 2,800 acres using Environmental Quality Incentives Program funding and another 1,840 acres using Agricultural Water Enhancement Program funding. The conservation practices implemented included prescribed grazing, grass and range planting, nutrient management, residue management, conservation cover, water wells, water troughs and ponds.

## Results

Water quality monitoring data show that the long-term *E. coli* geometric means meet the state water quality standard for contact recreation in a portion of the Leon River (121.83 cfu/100 mL for assessment data collected from 2003–2010) and all of Pecan Creek (123.81 cfu/100 mL for assessment data collected from 2001–2008) (Figure 2). Consequently, the entire length (11.9 miles) of Pecan Creek (segment 1221C\_01) was removed from the state's list of impaired waters in 2010. In addition, a 3.9-mile segment in the upper portion of Leon River (seg-

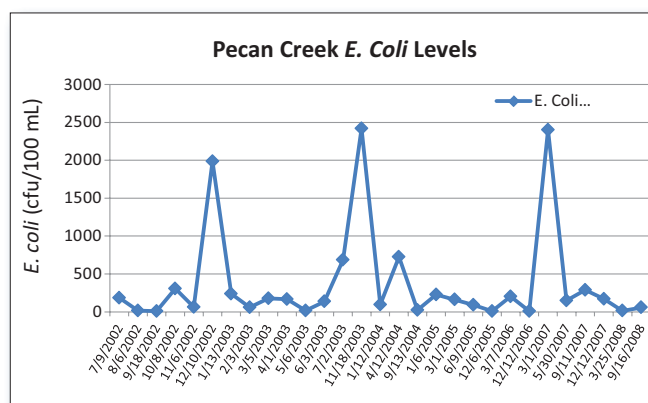


Figure 2. *E. coli* data collected for Pecan Creek (2002–2008) shows only periodic elevated bacteria levels. The geometric mean of these data (i.e., 123.81 cfu/100 mL) indicates that the creek meets state water quality standards.

ment 1221\_07, from the confluence of Walnut Creek upstream to Lake Proctor) was removed from the impaired waters list in 2012. These waterbodies currently support all of their designated uses.

The success can be attributed to increased stakeholder awareness due to the watershed planning process and to conservation practices being implemented along or near the waterbodies. Continued water quality improvements have been achieved since the implementation of additional BMPs following the delisting of Pecan Creek. Water quality monitoring continues to track and measure interim progress to implement the WPP and ensure this restoration effort remains a success.

## Partners and Funding

Over \$433,550 in U.S. Environmental Protection Agency CWA section 319 funds (provided by the TSSWCB), combined with more than \$353,680 in non-federal matching funds from TSSWCB and the Brazos River Authority, supported developing the WPP, collecting and analyzing water samples, developing pollutant loading models, facilitating stakeholder involvement in the watershed planning process and crafting the watershed protection plan.

The Hamilton-Coryell and Upper Leon SWCDs worked with landowners to voluntarily implement conservation practices to reduce the impact of livestock on grazing land. The TSSWCB and the NRCS worked through the SWCDs to provide approximately \$60,700 in state funding, \$14,900 in CWA section 319 funding, and \$143,245 in federal Farm Bill funding to landowners as financial incentives to implement BMPs and provide technical assistance in the Leon River watershed.



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