NONPOINT SOURCE SUCCESS STORY

Texas

Addressing Agricultural and Residential Bacteria Sources Improves Water Quality in the Leon and South Leon Rivers

Waterbodies Improved

High levels of bacteria prompted the Texas Commission on Environmental Quality (TCEQ) to add the Leon River (in 1996) and South Leon River (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(h) grant funding to develop a watershed protection plan (WPP) to address the bacteria impairments in the Leon River watershed. Watershed stakeholders voluntarily implemented best management practices (BMPs) and conducted public outreach and education. Through these efforts, water quality improved and the South Leon River (assessment unit [AU] 1221B_01) and three assessment units of the Leon River below Proctor Lake (AU 1221_01, 1221_04, and 1221_05) were removed from the state's list of impaired waters in 2014.

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. These agricultural operations, wildlife, feral hogs and on-site sewage facilities (OSSFs) have the potential to be sources of bacteria loadings. South Leon River, a tributary of the Leon River, shares the land use features of the larger watershed.

Data collected in the Leon River (1990–1995) showed that fecal coliform levels exceeded the bacteria water quality standard (WQS) for contact recreation. As a result, TCEQ added the river to the 1996 CWA section 303(d) list for not supporting its primary contact recreation use. In 2000 the bacteria WQS changed to an *Escherichia coli*-based standard requiring that *E. coli* levels not exceed a geometric mean of 126 colony-forming units (cfu) per 100 milliliters (mL) of water. Data collected from 1998 to 2005 showed that the geometric mean for *E. coli* exceeded the standard in South Leon River. As a result, TCEQ added South Leon River to the 2006 CWA section 303(d) list for not supporting its primary contact recreation use.

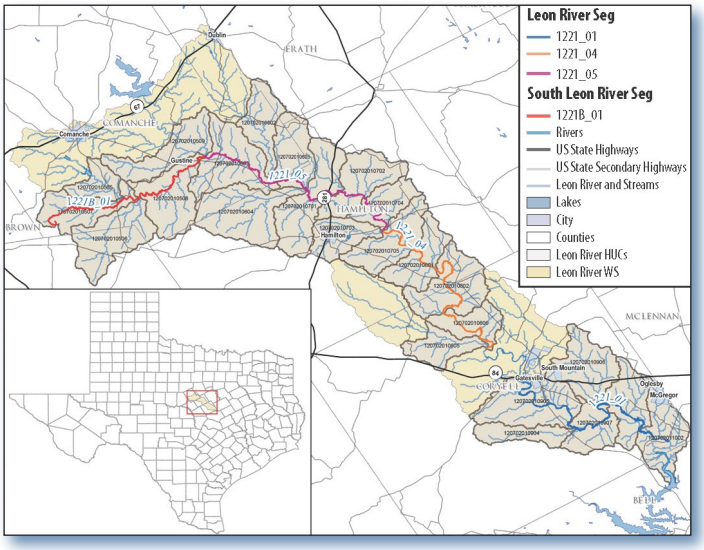

Figure 1. The Leon River watershed is in central Texas.

Project Highlights

Water quality impairments in the Leon River and some of its tributaries prompted TCEQ to begin developing a bacteria total maximum daily load in 2002. Local stakeholders, wanting to take an active role in developing management strategies to reduce bacteria loadings, sought to initiate the development of a WPP. The TSSWCB provided CWA section 319(h) funding to

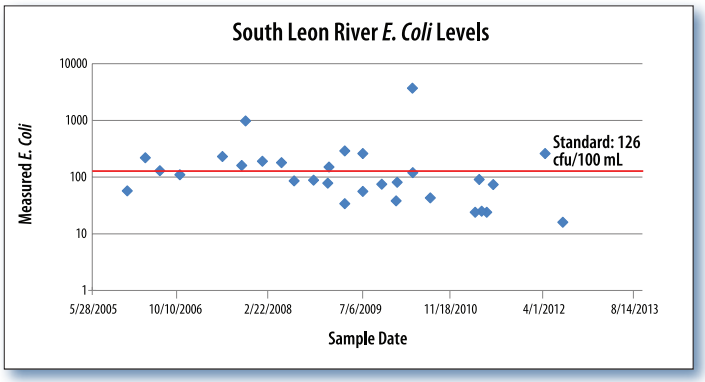

Figure 2. Bacteria levels in the South Leon River have dropped.

the Brazos River Authority to facilitate the development of a WPP for the Leon River. The stakeholder group leading the WPP development included 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, composed of representatives from federal, state and local agencies; universities; and other entities provided expertise to the stakeholder group.

Management measures identified in the WPP were implemented by stakeholders. Several outreach and education programs were implemented to inform local stakeholders of available resources.

The TSSWCB, partnering with the Upper Leon, Mills County and the Hamilton-Coryell SWCDs, certified and implemented 13 water quality management plans on 4,058 acres in the impaired watersheds. 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 to implement conservation practices (e.g., prescribed grazing, grass and range planting, nutrient management, residue management, conservation cover, water wells, water troughs, ponds) using Environmental Quality Incentives Program and Agricultural Water Enhancement Program funding on over 388,600 acres in the Leon River watershed and over 47,600 acres in the South Leon River watershed. From May through November 2012, TSSWCB partnered with Hamilton County and Texas A&M AgriLife to help repair or replace 10 failing OSSFs along or near the Leon River in Hamilton County. Implementation continued after 2012, and additional counties in the watershed have received funding to fix failing OSSFs.

Results

Monitoring data show that waters meet the state WQS for contact recreation in several portions of the Leon River (101.82 cfu/100 mL in AU 1221_01; 67.82 cfu/100 mL in AU 1221_04; 99.23 cfu/100 mL in AU 1221_05 for 2005–2012 assessment data) and all of South Leon River (116.93 cfu/100 mL for 2005–2012 assessment data)(Figure 2). Consequently, the entire length (17 miles) of the South Leon River (AU 1221B_01) was removed from the state's list of impaired waters in 2014. In addition, three AUs of the Leon River (1221_01, 1221_04, and 1221_05) were removed from the impaired waters list in 2014 (see Figure 1). These waterbodies currently support all their designated uses.

The success can be attributed to conservation practice implementation, repaired or replaced failing OSSFs, and increased stakeholder awareness due to the watershed planning process. Water quality monitoring continues to track and measure interim progress to implement the Leon River WPP and ensure the restoration effort remains a success.

Partners and Funding

Over $433,550 in CWA section 319(h) funds (provided by the TSSWCB), combined with more than $353,680 in nonfederal 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 WPP.

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 $47,200 in state funding and $1,924,000 in federal Farm Bill funding to landowners as financial incentives to implement BMPs and provide technical assistance. More than $60,000 in CWA section 319(h) funds matched with over $8,500 in state and local funds were used to repair or replace failing OSSFs.

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