NONPOINT SOURCE SUCCESS STORY

Texas

Implementing Best Management Practices and Low Impact Development Improves Water Quality in the Upper San Antonio River

Waterbody Improved

The Upper San Antonio River assessment unit (AU) 1911_07 was first identified as impaired due to elevated bacteria in the 1996 Texas Integrated Report of Surface Water Quality Inventory and Clean Water Act (CWA) section 303(d) List (Integrated Report). Since then, efforts to improve water quality by state and federal agencies and local outreach have been focused on implementing best management practices (BMPs), education and outreach, and construction of low impact development (LID). These combined efforts have led to water quality improvements in the Upper San Antonio River. As a result, AU 1911_07 was identified as fully supporting recreational use water quality standards in the 2020 Integrated Report.

Problem

The San Antonio River in South Central Texas flows 240 miles through Bexar, Wilson, Karnes, Goliad, and Refugio counties, converging with the Guadalupe River before flowing into San Antonio Bay on the Gulf of Mexico. The Upper San Antonio River (segment 1911) is located in the southern portion of the Salado Creek–San Antonio River watershed (Figure 1). AU 1911_07 has a designated primary contact recreation 1 use and an *Escherichia coli* (*E. coli*) criterion of 126 colony forming units (cfu)/per 100 milliliters (126 per 100 mL). The geometric mean concentration of *E. coli* samples from the Upper San Antonio River (AU 1911_07) was not meeting the criterion of 126 per 100 mL and was first added to the state's CWA section 303(d) list of impaired waters in 1996.

In 2007, a total maximum daily load (TMDL) for bacteria in segment 1911 was adopted by the Texas Commission on Environmental Quality (TCEQ) and approved by the U.S. Environmental Protection Agency (EPA). The TMDL identified nonpoint sources, including urban stormwater, failing septic tanks, livestock, and wildlife, as contributing to the impairment. A TMDL implementation plan (I-Plan) for segment 1911 followed and was approved by TCEQ in 2016. Thirty management measures to reduce bacteria are specified in the TMDL I-Plan.

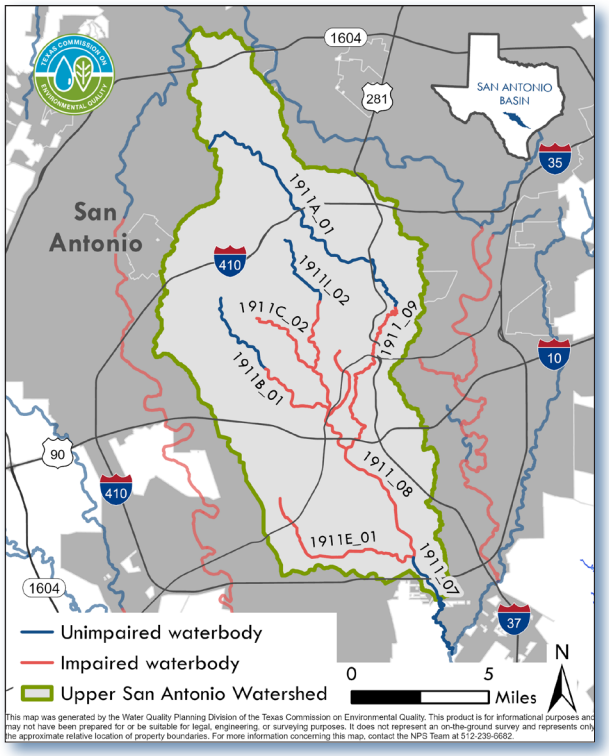

Figure 1. The Upper San Antonio River watershed is in southern Texas.

Story Highlights

In 2006, the San Antonio River Authority (SARA) completed the Upper San Antonio River Watershed Protection Plan (WPP). An update to the WPP was approved by EPA in 2015. From 2008 to 2010, CWA section 319(h) funds were used for the San Antonio River Walk implementation project. This project funded 23 educational workshops, installed 10 signs to educate the public about why they should not feed wildlife, and used power washers to clean San Antonio River Walk sidewalks and recapture the waste.

CWA 319(h) funds were also used to implement several LID projects in the watershed. In 2011–2015, a project at the Mission Library installed LID features, including permeable pavement, a bioswale, a bioretention area, and a rain garden with rainwater harvesting system. The Mission Library project also funded six workshops and five site tours of the installed LID features. Another LID project using CWA 319(h) funds to implement the Upper San Antonio River WPP was conducted in 2015–2018 at two sites located at SARA's corporate campuses. A permeable parking lot, nine bioretention cells, and seven water-capturing cisterns were installed. Monitoring analysis of these sites estimated the combined potential to remove 46 percent of the annual bacterial load from stormwater runoff. The bioretention cells also served as an outdoor classroom that SARA used to educate the public about native plant species, LID and BMP features, and reduction of potable water use. SARA has hosted more than 13 site tours and two workshops at this location.

Other nonpoint source pollution management measures include avian management for the San Antonio River Walk and riparian areas, expansion of the Pooper Scooper Program, and feral hog management. Since 2016, the City of San Antonio has used a falconer and a laser device to reduce the grackle population in the downtown area and installed over 173 pet waste dispensers in 75 public parks via the Pooper Scooper Program. Texas A&M AgriLife Extension has hosted three feral hog workshops. A new outreach campaign emphasizing "Don't Feed the Wildlife" was launched in fall 2019 for all areas of the San Antonio River Walk, Museum Reach, and Mission Reach.

Along with activities conducted by TCEQ, the Texas State Soil Water and Conservation Board (TSSWCB) has funded programs responsible for 12 workshops with over 700 attendees from 2015 to 2020. Programs offered included Texas Well Owner Network, Texas Watershed Stewards, feral hog education, and Texas Stream and Riparian workshops partnering with Texas Water Resources Institute, Texas A&M AgriLife Extension, and Texas A&M AgriLife Research.

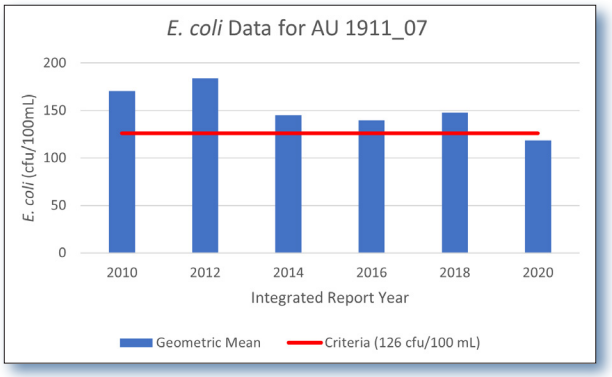

Figure 2. Upper San Antonio River (AU 1911_07) *E. coli* geometric means from the 2010–2020 Integrated Reports.

Results

During the 2008–2020 period, targeted implementation activities in the watershed have helped to reduce nonpoint source pollution. TMDL I-Plan's management measures that focus on point sources, such as maintenance programs to reduce sanitary sewer overflows, have also helped to reduce bacteria. SARA has continued to promote LID projects; since 2016, 96 LID projects have been received, and 41 have been approved. New data collected in 2011–2018, after management measures were put in place, were assessed in the 2020 Integrated Report, and the geometric mean of *E. coli* samples was 118.56 cfu/per 100 mL (Figure 2). As a result, AU 1911_07 was identified as fully supporting the recreational use water quality standards in the 2020 Integrated Report.

Partners and Funding

Watershed partners have spent approximately $2,078,791 on education and outreach efforts and implementing BMPs, combining $1,247,275 in federal CWA 319(h) funds with $831,516 in matched funds by local entities. Watershed partners include the City of San Antonio, SARA, San Antonio Water System, Texas Water Resources Institute, Texas A&M AgriLife Extension, and Texas A&M AgriLife Research.

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