



NONPOINT SOURCE SUCCESS STORY

Georgia

Installing Agricultural and Stormwater Management Practices Reduces Bacteria in the Lower Soque River below the City of Clarkesville

Waterbody Improved

Bacteria in runoff from agricultural and urban lands led to high bacteria counts in Georgia's Soque River below Clarkesville. As a result, the Georgia Environmental Protection Division (GAEPD) added a 6-mile segment of the lower Soque River to its 2002 Clean Water Act (CWA) section 303(d) list of impaired waters for failure to attain its fishing designated use. Beginning in 2008, the installation of agricultural and stormwater best management practices (BMPs) resulted in decreased bacteria levels that met state water quality standards. These measures allowed Georgia to remove fecal coliform as an impairment from the 6-mile segment of the Soque River below Clarkesville in 2014.

Problem

The Soque River is the northeastern-most tributary of the Chattahoochee River and has a number of important uses both locally and regionally within the state (Figure 1). The main stem of the river serves as the drinking water source for the city of Clarkesville, and the river's tributaries provide water for other localities in Habersham County. The small community of Clarkesville serves as the county seat of Habersham County. Water quality in the Soque River below Clarkesville is impacted by both runoff from the city itself and upstream agricultural areas.

Georgia's water quality standards for the months of May through October require that fecal coliform not exceed a geometric mean of 200 colony-forming units per 100 milliliters (cfu/100 mL). For the months of November through April, fecal coliform is not to exceed a geometric mean of 1,000 cfu/100 mL or a maximum of 4,000 cfu/100 mL for any single sample.

Data collected by GAEPD indicated that these standards were not being met. In July 2000 the fecal coliform geometric mean from Georgia sampling station RV_12_3990 (USGS Station # 02331200) was 304 cfu/100 mL. This prompted GAEPD to add a 6-mile segment of the lower Soque River (beginning at State Route 17 Bridge in the city of Clarkesville and ending at the confluence with the Chattahoochee River) to the 2002 CWA section 303(d) list for not supporting its fishing designated use. In 2003 GAEPD developed a total maximum daily load (TMDL) for fecal coliform in the impaired segment (SR 17, Clarkesville to Chattahoochee River segment # GAR031300010201). The TMDL was revised in 2008.

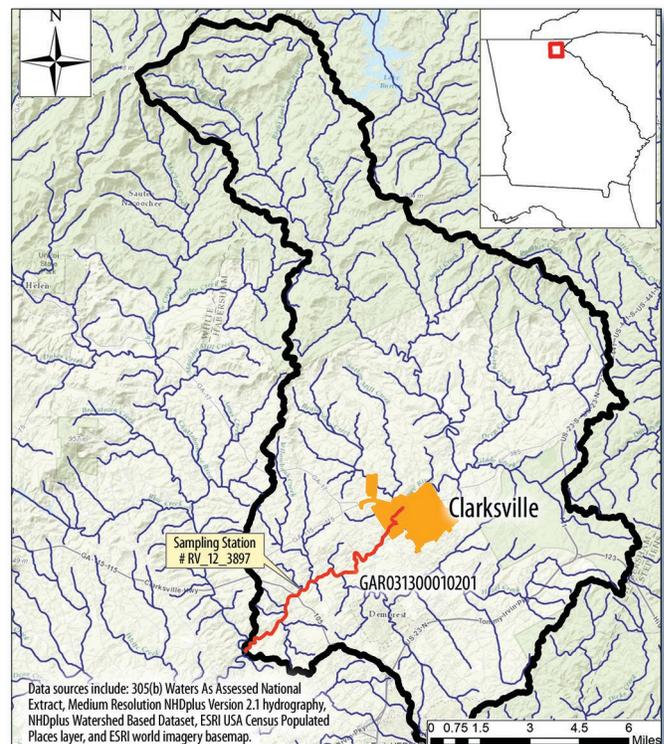


Figure 1. The Soque River watershed is in northeastern Georgia.

Project Highlights

The city of Clarkesville has taken an active lead in addressing the fecal coliform impairment of the Soque River. In 2013 the city installed a bioretention area to treat runoff from impervious surfaces (Figure 2), and implemented a stormwater inventory



Figure 2. An impervious parking area before construction (left) and the new bioretention area after construction (right) in Clarkesville.

to identify and prioritize infrastructure needs and opportunities for additional stormwater practices. Additionally, a rain garden was installed on public property in the city of Cornelia.

In 2008 a FY2005 CWA section 319 implementation grant was initiated to carry out recommendations outlined in the 2007 Soque River Watershed Protection Plan. The primary focus areas of the implementation grant included (1) cost sharing with 20 farmers on cattle exclusion projects to eliminate fecal coliform bacteria and reduce streambank erosion, (2) implementing two sediment reduction BMPs, and (3) implementing two stormwater-control BMPs. The implementation grant also called for public education and outreach activities.

The restoration efforts from 2008 to 2014 resulted in a total of 2,025 acres under contract, including 81,053 linear feet of exclusion and cross-fencing to facilitate rotational grazing; 174,619 square feet of heavy-use area protected; six stream crossings built; and four water wells installed for off-stream watering. Approximately 1,715 animals, predominantly beef cattle, have been excluded from surface waters.

Streambank restoration work included using a natural channel design (provided by North Carolina State University researchers) to restore 585 linear feet of severely eroding streambanks. Stormwater restoration projects included a rain barrel distribution program for homeowners, which distributed more than 300 barrels over the project span.

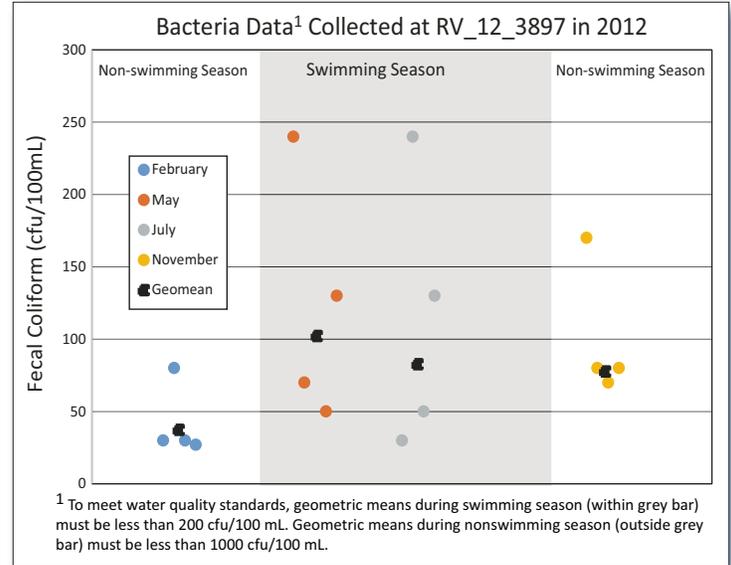


Figure 3. Data collected in 2012, after restoration, showed that the fecal coliform geometric in the lower Soque River complied with water quality standards.

Results

Bacteria samples collected at Georgia sampling station RV_12_3897, (U.S. Geological Survey station #02331500) in 2012 by GAEPD and the Soque River Watershed Association showed the Soque River below Clarkeville was meeting standards (Figure 3).

On the basis of these data, GAEPD removed the fecal coliform impairment from the 6-mile segment of the lower Soque River on the state's 2014 list of impaired waters. This segment's list of designated uses has been expanded to include drinking water.

Partners and Funding

The restoration of the Soque River has primarily been the result of partnerships between GAEPD and the city of Clarkesville. CWA section 319 grant funding was provided from FY2005 and FY2010 (totaling \$789,833) to support the implementation of restoration projects. Another \$550,555 in local match and documented landowner contributions was provided by the city of Clarkesville to implement these restoration projects. Additional monitoring data to support the impairment removal was collected by the Soque River Watershed Association.



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