# NONPOINT SOURCE SUCCESS STORY

Georgia

# Repairing Septic Systems Reduces Bacteria in Stamp Creek

## Waterbody Improved

Polluted runoff from failing septic tanks in low-density residential areas and agricultural fields caused high levels of fecal coliform (FC) bacteria concentrations in Stamp Creek, Georgia. As a result, the Georgia Environmental Protection Division (GAEPD) placed the 9-mile-long Stamp Creek on its 1996 Clean Water Act (CWA) section 305(b)/303(d) list of impaired waters for FC bacteria. Using CWA section 319 and third-party grant funds, stakeholders repaired two failing septic systems in 2009. The repairs contributed to water quality improvements in the 9-mile segment of Stamp Creek, prompting GAEPD to remove it from Georgia's 2012 list of impaired waters for FC bacteria.

## Problem

The 9-mile-long Stamp Creek is east of Cartersville in Bartow and Cherokee counties in northwest Georgia (Figure 1). The creek flows into a northern arm of Lake Allatoona, an impoundment on the Etowah River. The Etowah River combines with the Oostanaula River to form the Coosa River. Stamp Creek is in the Blue Ridge ecoregion, which is underlain by a mix of igneous, metamorphic, and sedimentary rocks and contains mostly high-gradient, cool, clear streams that flow through forested, rugged terrain. The southern Blue Ridge is one of the richest centers of biodiversity in the eastern United States—containing Appalachian oak forests, shrub, grass, and heath balds. The ecoregion's hemlock, cove hardwoods, and oak-pine communities are also significant.

Monitoring data collected in the early 1990s indicated that Stamp Creek was not meeting the state's FC bacteria water quality standard necessary to support its fishing designated use. As a result, GAEPD added the 9-mile-long creek to Georgia's 1996 CWA section 305(b)/303(d) list of impaired waters for high FC bacteria concentrations due to unknown nonpoint source pollution.

A review of aerial images from 1996 showed that low-density residential land use and sporadic agricultural areas were present in the watershed at the time of the original CWA section 305(b)/303(d) listing. Since the area is not serviced by municipal sewer system, GAEPD assumed that faulty septic systems were the cause of FC impairment.

GAEPD conducted additional monitoring in 2001 that showed continued problems with elevated FC bacteria levels. The applicable FC bacteria water quality standard requires that FC levels not exceed a geometric mean (based on at least four samples collected over a 30-day period) of 200 colony-forming units per 100 milliliters (cfu/100 mL) in the summer (May–October) and 1,000 cfu/100 mL in the winter (November–April). Analysis of water quality samples collected during a 30-day period in August and September 2001 period showed a FC bacteria geometric mean of 268 cfu/100 mL, exceeding the water quality standard for FC bacteria (Table 1).

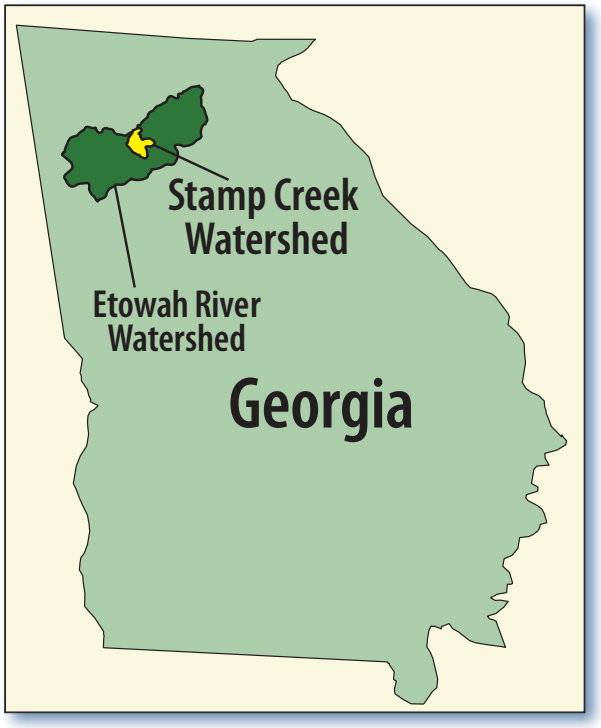


Figure 1. Stamp Creek is in northern Georgia.

**Table 1. Stamp Creek Monitoring Data, 2001 and 2009–2010**

| Date | FC Bacteria Geometric Mean (cfu/100 mL) | Applicable Water Quality Criteria[1] | Meets Criteria? |
|---|---|---|---|
| Feb/Mar 2001 | 28 | 1,000 cfu/100 mL | Yes |
| May/Jun 2001 | 68 | 200 cfu/100 mL | Yes |
| Aug/Sept 2001 | 268 | 200 cfu/100 mL | No |
| Oct 2001 | 40 | 200 cfu/100 mL | Yes |
| Jun/Jul 2009 | 24 | 200 cfu/100 mL | Yes |
| Jul/Aug 2009 | 23 | 200 cfu/100 mL | Yes |
| Mar 2010 | 9 | 1,000 cfu/100 mL | Yes |
| Jul 2010 | 119 | 200 cfu/100 mL | Yes |
| Nov/Dec 2010 | 31 | 1,000 cfu/100 mL | Yes |
| Feb/Mar 2011 | 32 | 1,000 cfu/100 mL | Yes |

[1] Fecal coliform bacteria levels may not exceed a geometric mean of 200 cfu/100 mL in the summer (May–October) and 1,000 cfu/100 mL in the winter (November–April).

A total maximum daily load (TMDL) study for pathogen loads in the Stamp Creek watershed was developed by the U.S. Environmental Protection Agency (EPA) in 1998. Based on land use data available at the time, EPA's water quality model assumed the watershed land use to be 100 percent forested; therefore, the final TMDL load reduction for FC bacteria was identified as zero percent. However, EPA concluded that since a water quality violation had been established, some source of pollution must be occurring in the watershed. As a result, EPA recommended in its TMDL report that GAEPD conduct a reconnaissance survey of the watershed to confirm land use information and to locate potential sources of fecal contamination (e.g., faulty septic tanks from low-density residential areas). GAEPD developed a TMDL implementation plan in 2001. Based on the zero percent reduction, additional monitoring was recommended as a management measure.

## Project Highlights

As part of a CWA section 319-funded watershed improvement project (2006–2011), the Limestone Valley Resource Conservation and Development Council (RC&D) worked with local stakeholders to promote and install best management practices to reduce FC bacteria runoff into Etowah River and its tributaries, including Stamp Creek. To better target areas with septic problems in the Stamp Creek watershed, a GAEPD contractor performed a preliminary land use review. The RC&D then worked with two Stamp Creek watershed homeowners to repair their failing residential septic systems in 2009 (Figure 2). The homeowners participated voluntarily and provided partial funding for the repairs.

Etowah River watershed project partners have conducted extensive education and outreach by developing and distributing brochures, conducting workshops and presentations, and creating a website.

Figure 2. Before the restoration project, bacteria-laden effluent from a failing septic system was surfacing and draining off of this yard in the Stamp Creek watershed.

## Results

Bartow County representatives conducted long-term monitoring of Stamp Creek, in accordance with a GAEPD-approved Sample Quality Assurance Plan, beginning in June 2009 and continuing through March 2010. Bartow County found that none of the six geometric means violated the state-established criterion for FC bacteria. The data indicate that the stream is meeting water quality standards (see Table 1). Therefore, GAEPD removed Stamp Creek (segment GAR031501041004) from its 2012 list of impaired waters for FC bacteria.

## Partners and Funding

Stamp Creek has directly benefited from $5,600 in CWA section 319 funding for septic system repairs. Homeowners provided the remaining 40 percent of repair costs for a total of $9,300 directed towards septic repair. Key partners in this effort include the Upper Etowah River Alliance, Limestone Valley RC&D, Bartow County Environmental Health Department, and Cherokee County Environmental Health Department. Agents of these generous partners provided technical expertise and labor. Other partners involved in the larger Etowah River watershed project include landowners, The Nature Conservancy, the Wildlife Fund, and the City of Canton. Landowners in the Etowah River watershed contributed in-kind labor hours and some matching funds to the overall project.

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