



NONPOINT SOURCE SUCCESS STORY

Georgia

Ecological Restoration of Degraded Landscapes Improves Water Quality in Cane Creek

Waterbody Improved

Cane Creek, a tributary of the Chestatee River in Lumpkin County, Georgia, was included on Georgia's 2008 Integrated Clean Water Act (CWA) sections 305(b)/303(d) List of Waters as "Not Supporting" the designated use of fishing due to Bio F (fish) impacted by sediment. The Chestatee Watershed Partnership used a 2015 CWA section 319(h) nonpoint source implementation grant to restore high-priority degraded landscapes with locally generated organic amendments that would increase natural filtration of storm runoff, control erosion, and improve soil nutrient cycling and plant productivity. An 8-mile segment of Cane Creek was restored to "Supporting" status in 2020 based on 2018 data from Georgia's Wildlife Resources Division (WRD).

Problem

The 4,068-acre Cane Creek watershed (HUC-12 #031300010603) lies near the city of Dahlonega in northern Georgia's Upper Chattahoochee River watershed (Figure 1). The watershed lies within the Piedmont ecoregion of moderately dissected irregular plains and some hills. Land cover is 4.7% developed; 90.4% forested; 4.8% pasture/hay; and 0.2 % transitional, with 0.4% impervious surface. Cane Creek and other watersheds within the larger Chestatee River drainage area are considered a high priority for watershed protection and restoration efforts, as they provide 28% of the annual average inflow to Lake Sydney Lanier, the primary water supply to the Atlanta metropolitan area. This area is also a priority for aquatic species biodiversity conservation by the Georgia Department of Natural Resource's Comprehensive Wildlife Conservation Strategy.

Cane Creek was assessed in May 2004 at WRD sampling site #701, resulting in an Index of Biotic Integrity (IBI) narrative rating of *very poor* against a standard range of *excellent-good-fair*. Due to the very poor rating, Cane Creek was added to the 2008 Integrated 305(b)/303(d) List of Waters as not supporting the designated use of fishing due to Bio F (fish) impacted by sediment. The 2017 *Total Maximum Daily Load (TMDL) Evaluation for 29 Stream Segments in the Chattahoochee River Basin for Sediment* supported a preliminary 2015 Chestatee River-Yahoola Creek TMDL Implementation Plan by identifying nonpoint sources



Figure 1. Cane Creek is in northern Georgia.

impacting fish biota in Cane Creek, which includes silviculture, row crops, agricultural livestock, strip mines/quarries, unpaved roads/rights-of-way, and urban development (namely degraded landscapes). These studies set a goal of maintaining an acceptable sediment load of 173 tons/year sustained by implementing recommended best management practices such as mulching, critical area planting and tree/shrub establishment, which would allow Cane Creek to repair itself over time.



Figure 2. UNG Radar Ridge restoration site (2017).

Story Highlights

Sedimentation in Cane Creek was addressed by the Chestatee Watershed Partnership as one of several projects that would implement the 2015 TMDL Implementation Plan in the Chestatee River-Yahoola Creek drainage area. A geographical information system-based model developed by the University of North Georgia (UNG) prioritized “potential erosion hotspots” for sediment runoff in urban settings and targeted several locations on the UNG Dahlonega campus for remediation with organic amendments (leaf mold and/or wood mulch).

Project work took place in 2016–2018 and set the stage for continued ecological restoration of disturbed or degraded soils and vegetation going forward. Leaf mold provided by the City of Dahlonega and wood mulch supplied by the Amicalola Electric Membership Corporation were delivered to sites on the UNG campus. Radar Ridge (Figure 2) was the first site selected for a demonstration restoration; chipped wood mulch was placed on both flat surfaces and slopes draining to an intermittent stream. The Commons Dorms site was restored by spreading aged leaf mold on a hillslope with gullied erosion, followed by planting winter rye and perennial fescue grasses covered with wheat straw, then allowing the grasses to grow taller for much of the late summer to encourage deeper root

penetration and carbon sequestration of compacted soils. In addition, hands-on field days and onsite signage supported communication among watershed stakeholders and “Reserve Your Topsoil” telephone surveys of developers about stockpiling and respreading topsoil promoted adoption of best practices.

Results

At completion, approximately 65% of bare soils (9,001 square feet, or 0.21 acres) on the UNG Dahlonega campus were covered with mulch at a depth of 1–2 inches, and grass was successfully established as a “biofilter of stormwater runoff as it flows across the surface” (per Georgia Stormwater Management Manual Volume 2, page 135). Installed soil amendments were estimated by a U.S. Environmental Protection Agency Region 5 model to reduce acceptable sediment loadings into the Cane Creek watershed by 8 tons/year.

Cane Creek was assessed in August 2018 at WRD site #1471 (downstream from the original sampling site). The resulting IBI narrative rating of *fair* met the minimum standard. In 2020 Georgia Environmental Protection Division revised the Cane Creek listing by assigning “Not Supporting” status to an additional 3 miles upstream of the original impaired reach and restoring 8 miles downstream (Cane Creek Falls to Chestatee River near Dahlonega) to “Supporting” status for Bio F sediment based on the 2018 data from WRD #1471.

Mulching projects that produced immediate results on campus have impacted UNG’s thinking about land development and stormwater management practices. Additional outcomes include sustained, cost-effective operation and maintenance which has enhanced landscape aesthetic. UNG facilities staff has improved grounds maintenance practices by identifying and mulching additional areas prone to erosion; composting leaves and trimmings to nourish flowerbeds and reseed bare spots; and receiving mulch at no cost from a local tree service.

Partners and Funding

A 2015 CWA section 319(h) grant (\$18,329) supported UNG campus project expenses. Matching funds were contributed by the Georgia Mountain Regional Commission (\$321) for grant administration; UNG (\$12,955) for project management; the City of Dahlonega (\$1,196) for mulch delivery; and Kimmel’s Lawn Care and Landscaping (\$3,850).



U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-21-001FF
December 2021

For additional information contact:

Mary Gazaway
Georgia EPD
404-651-8522 • mary.gazaway@dnr.ga.gov
Justin Ellis
Longwood University
434-395-4897 • ellisjs@longwood.edu