

Deer Brook Gully Restoration, Georgia, Vermont

STONE
ENVIRONMENTAL
100% EMPLOYEE-OWNED

Services / Expertise

Vermont Water Quality
Conventional Stormwater & Retrofit Planning
Developed Lands Erosion Solutions
Hydraulic & Hydrologic Modeling
Stormwater BMPs & GSI Design
Open Channel Flow
Stream and Bank Restoration
Stakeholder Involvement & Stewardship

Markets

Watershed Organizations
Local & Regional Government
State Government

Project Location

Georgia, Vermont

Duration

2017–2019; 2021–Present

Project Owner

Friends of Northern Lake Champlain

Project ID#

17-084
20-116

Project Manager

Peter Lazorchak, PE, LEED AP
plazorchak@stone-env.com
802.793.0076

Project Team

Amy Macrellis, Gabe Bolin, PE, Branden Martin, PE



Installation of the new outfall and energy dissipating stone step pools on September 14, 2022.

DEER BROOK is an 8.4 square-mile watershed located in Georgia and Fairfax, that flows south to Arrowhead Mountain Lake, which is part of the Lamoille River, and eventually drains to Lake Champlain. The brook is classified as sediment-impaired from its confluence with Arrowhead Mountain Lake to 2.5 miles upstream. The construction of I-89 and related U.S. Route 7 improvements in the 1970s, as well as the subsequent addition of homes and businesses near the intersection with Route 104A, have contributed to a substantial increase in stormwater runoff discharging to the head of the Deer Brook Gully. These stormwater flows, combined with deteriorating culverts along Route 7 and 104A in Georgia, have caused the gully to erode and deposit sediment into Deer Brook. The problem was first documented by ESPC and Stone in a 2007 report for the Northwest Regional Planning Commission (NRPC). Stone further evaluated the site and provided conceptual solutions to reduce flows to the Deer Brook Gully as part of a 2013 stormwater master planning project for the Friends of Northern Lake Champlain (FNLC) in Georgia, Vermont.

Beginning in 2017, Stone once again worked with FNLC, NRPC, and other stakeholders using Vermont DEC Ecosystem Restoration Grant funding awarded to FNLC to identify, design, and implement stormwater management practices in upland areas and within the gully. Stone produced final designs for gully stabilization and restoration, as well as seven stormwater retrofit practices in the contributing watershed. The upland restoration designs that will reduce peak flows and improve water quality include four gravel wetlands, two catch basin risers, and a series of off-line deep sump catch basins along Route 7. The outlet and gully restoration designs include culvert upsizing and a deep manhole at the outlet, as well as seven bioengineered log jam structures that will reduce flow velocities and stabilize the gully banks and channel. As implemented, these measures mitigate sediment loads contributed from the upland watershed and the gully to Deer Brook.



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Following the submittal of 100% designs in mid-2019, Stone continued to support FNLC's efforts to secure funding to complete to complete construction plans, permitting, and project implementation. In late 2020, FNLC and Stone received a Lake Champlain Basin Program grant, administered by the Vermont DEC and the first phase of construction was completed in September and October 2022. Stone assisted FNLC through the bidding process by creating bidding documents, advertising the project to prospective bidders, reviewing bids received, and selecting the preferred contractor. Stone also provided construction oversight throughout the duration of the project, which included daily field reports and photo documentation.

The portion of the project constructed in September and October 2022 included gully and bank stabilization and installing a properly sized outlet, deep manhole, one deep sump catch basin, and all associated piping. Stone provided construction oversight throughout the duration of the project, including daily field reports and photo documentation. We are now supporting FNLC's application to the Missisquoi CWSP to construct the next phase of the project.



Left: Existing condition in the lower reach of Deer Brook gully, seen in November 2017. Gray-colored water in the channel is due to fine sediment transport during a moderate rain event. Right: Construction of new outfall and energy-dissipating stone step pools in September 2022.

