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

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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, part of the Lamoille River, 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 and 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 and 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 Erosion Prevention and Sediment Control (EPSC) 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 VTDEC 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 and 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, a deep manhole at the outlet, and 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.

Following submittal of 100% designs in mid-2019, Stone continued to support FNLC's efforts to secure funding to complete construction plans, permitting, and project implementation. FNLC and Stone received an LCBP grant administered by VTDEC 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 that constructed in 2022 included gully and bank stabilization and installation of the upsized outfall, deep manhole, and one deep sump catch basin and all associated piping. It is the hope of all interested parties that the remainder of the large-scale project can be constructed in future phases.

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