



# Ahead of the Storm

## Charlotte Park and Wildlife Refuge

US Route 7 and Greenbush Road, Charlotte

### Introduction

Ahead of the Storm (AOTS) grew out of a group of citizens from Charlotte, Hinesburg, and Shelburne who were concerned about the serious decline of Lake Champlain's health and water quality. Stormwater runoff from driveways, fields, parking areas, and lawns is a major factor in the deterioration of our water quality. Most impervious surfaces were created before regulations requiring water quality treatments were in place or fall below regulatory thresholds. Therefore, runoff is not managed to remove pollutants or slow flows and soils and phosphorus are mobilized and end up in Lake Champlain. AOTS helps communities change the way stormwater is managed on properties to reduce water pollution and be more prepared for extreme weather events and impacts of climate change. Fifteen municipal, educational, and private properties have been selected to become demonstration sites to showcase more optimal conservation practices in a variety of landscape settings. Monitoring and stewardship over time is crucial to successfully addressing water quality issues.

### Why here?

The Charlotte Park and Wildlife Refuge is a 290-acre property with 2.25 miles of gravel trails, 1 mile of hiking trail, 95 acres of active agriculture, 24 acres of meadows, and significant forested areas. Gully erosion is occurring at two sites where stormwater runoff is concentrated. Runoff carrying sediment from both locations eventually flows to a tributary of Holmes Creek. Both sites are at the beginning stages of gully formation and indications appeared to show that continued erosion could be expected. Site 1 is located at the edge of a hay field just beyond the brush line where concentrated flow from the field and upper portions of the property have caused rill and gully erosion along a swale. Erosion is occurring where a horse path crosses the swale. Site 2 is a cross-slope swale parallel to the Byington Trail that collects 2.1 acres of runoff and is eroding. Active head-cutting is occurring in the swale, along with evidence of additional head-cut erosion beginning in the swale upstream of the active head-cut.



Active gully erosion occurring where the swale meets the stream



Looking northeast along the cross-slope swale running parallel to Byington Trail



Gully erosion is migrating further to the northeast along the swale



Take a tour of the AOTS locations at [lewis creek.org](http://lewis creek.org)!

## Design: how can we filter the water?

Engineers at Milone & MacBroom developed a 2-phase design to reduce erosion and slow runoff. The first treatment design will stabilize gully erosion by installing log check dams to slow concentrated runoff and retain sediment. The second phase will increase the vegetated buffer between the hay field and existing swale to filter sediment and pollutants. The design was chosen to maintain the natural aesthetic of the Park and use as many local materials as possible in order to minimize initial and long-term costs of the project. The OCPs maximize water quality improvements while largely maintaining current land use, site features, and maintenance needs. The gully stabilization techniques utilize natural materials such as logs, vegetation, and cobble rather than other hard techniques.

## Implementation

The Charlotte Park and Wildlife Refuge Committee worked with Lewis Excavating and volunteers to complete the work. In September 2017, Phase I of implementation was completed, which included installing 8 log check dams along the Byington Trail. Phase II was completed in November 2018, which included the installation of an additional 8 log check dams and a log trail crossing along the brush line of a sloped meadow.



Completed swale



Drilling rebar into logs so they stay in place



Log jam installation

## How much did it cost?

Funding for this project occurred in phases:

Concept Design \$4,000

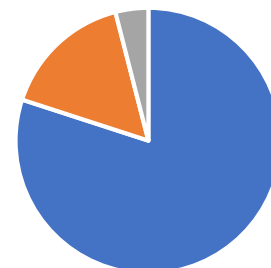
Planning and Design Phase II (not required)

Implementation \$6,000

**Total \$10,000**



### Funding Sources



- Grants
- Charlotte Park Committee Volunteers
- Lewis Creek Association