ASHOKAN WATERSHED STREAM MANAGEMENT PROGRAM

6375 State Rt. 28, Phoenicia, NY 12464 ♦ (845) 688-3047 ♦ www.ashokanstreams.org

Project Report:

Below Fawn Hill, Woodland Valley Road Bank Stabilization Project, Town of Shandaken, Ulster County, New York

Report and Project No.
AWSMP_1008T2

1 February 2011

Cory Ritz[1]
Jake Wedemeyer[1]
Gary Capella[1]
Deron Davis[2]
Elizabeth Higgins[3]
Danny Davis[4]
Eric Hofmeister[5]

[1]Ulster County Soil & Water Conservation District
[2]Natural Resources Conservation Service (USDA)
[3]Cornell Cooperative Extension of Ulster County
[4]New York City Department of Environmental Protection
[5]Town of Shandaken Highway Department

Lead author contact details:
cory.ritz@ashokanstreams.org

Executive Summary

The goal of this project was to stabilize a road-threatening, eroding stream bank on Woodland Creek by using best management practices for stream restoration. The Town of Shandaken was concerned about the Woodland Valley Road washing out, essentially cutting off access to over 100 residents. No other roads were available for entering or exiting Woodland Valley. The project resulted in the construction of a 152ft stacked rock wall and a bio-engineering application above the rock wall. Subsequently, post construction of the rock wall, the valley experienced three major flood events (two storms were rated as 25 year and one storm the 100 year return interval flood events). The floods caused no damage to the road or rock wall at the project site.

The project was spearheaded by the Town of Shandaken, designed and constructed under the guidance of Ulster County Soil and Water Conservation District and the USDA Natural Resources Conservation Service and funded with FEMA mitigation funds (covering 75% of costs) and Cornell Cooperative Extension of Ulster County managed grant funds (covering 25% of costs).

Staffs from Ulster County Soil and Water Conservation District and the Natural Resources Conservation Service led the assessment and design for the site starting in fall 2009 and submitted engineering designs for permitting in February 2010. Construction started in August of 2010 by the excavating company Fastracs Inc. with assistance from the Town of Shandaken Highway Department. Construction was completed in December 2010.

Acknowledgements

We are grateful for the assistance and services of:

- New York City Department of Environmental Protection, Stream Management Program for funding support for the Ashokan Watershed Stream Management Program
- U.S. Department of Homeland Security FEMA Hazard Mitigation Assistance Program for funding support of project costs
- U.S. Department of Agriculture, Natural Resource Conservation Service for assessment and engineering design support.
- Jack Isaacs and Brian Drumm, New York State Department of Environmental Conservation for permitting assistance
- Fastracs Inc., Leigh Cookingham and John DiMuccio, for construction of the stacked rock wall and bio-engineering application.
- Ed Twerdack landowner of the project site
- Members of the Ashokan Watershed Subcommittee for Project Review
- Doug Dekoskie for engineering advice, NYC Department of Environmental Protection
- Carol Seitz from Woodland Valley View web blog for communication assistance
- Catskills Streams Buffer Initiative program for tree planting support

Table of Contents

List of Figures

1.0 Introduction

The Woodland Valley Road Below Fawn Hill project was primarily a bank stabilization project initiated by the Town of Shandaken to protect the Woodland Valley Road. The project site is situated on private property owned by Ed Twerdak at 790 Woodland Valley Road, Town of Shandaken New York and 600(ft) below the Fawn Hill Road bridge on the left bank (facing downstream) of Woodland Valley Creek.

Figure 1 Eroding stream bank and area of undercut road.

The project site had previously been identified as a potential problem by the property owner and by the Town of Shandaken Highway Superintendent, Eric Hofmeister. Hofmeister approached the Ashokan Watershed Stream Management Program (AWSMP) office in September 2009 for possible funding and technical assistance. The eroding stream bank was approximately 25ft high and 100ft long. The bank was composed from the bottom up of dense clay-rich glacial till, old stream deposits, and road fill material. The Woodland Valley Road runs adjacent to the bank and portions of the road are approximately 5ft from the edge of the eroding bank. The stream channel at the base of the eroding area is primarily a bedrock controlled pool. Bedrock forms the entire right descending bank and channel bed, therefore erosional migration of the channel was expected to continue toward the road.

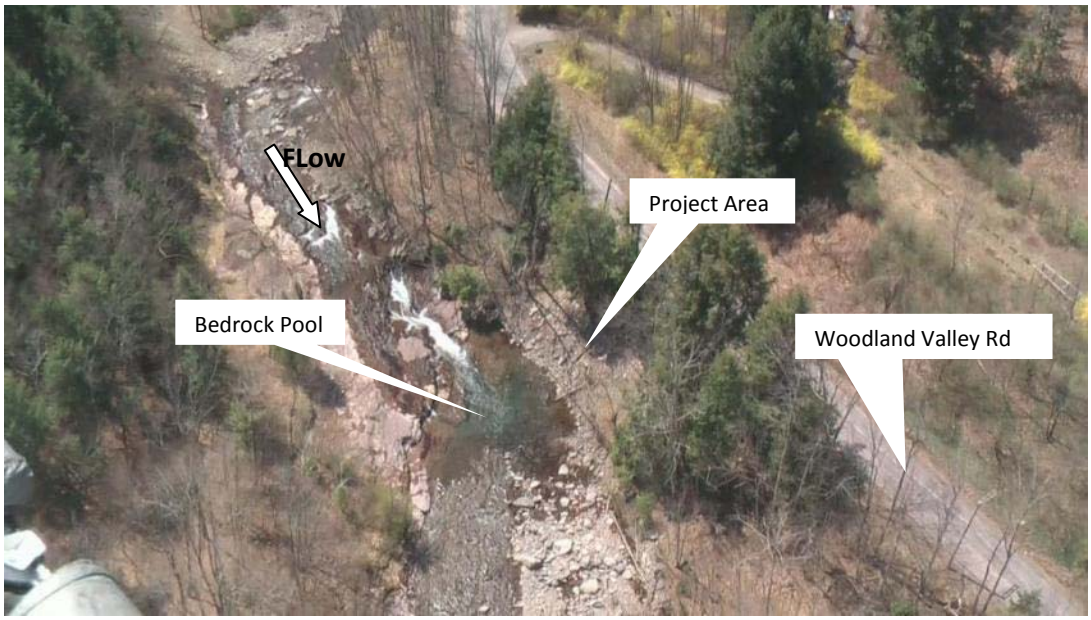

Figure 2 Aerial photo of Woodland Valley Creek (2008), bedrock controlled pool, project location and proximity to the Woodland Valley Road.

2.0 Problem Assessment

A thorough investigation of this site was completed by staff from UC SWCD and from the NRCS. A survey, hillslope evaluation and stream function were part of our investigation into this failure.

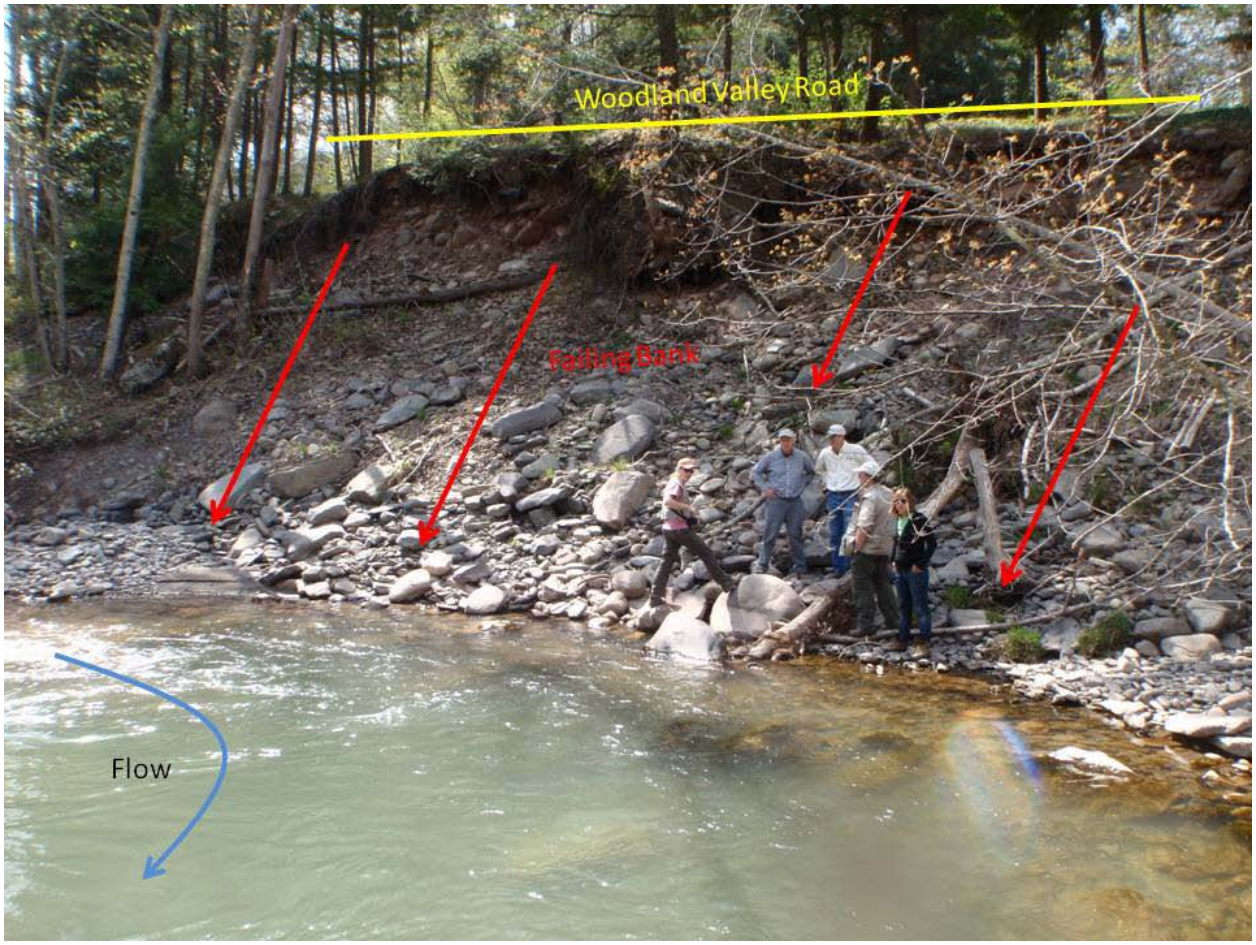

Figure 3 Visual analysis depicting pool, failing bank and location of Woodland Valley Road.

3.0 Project Goals

Objectives:

- Stabilize stream to prevent continued road deterioration/failure to protect the only transportation access in and out of the valley.
- Demonstrate the use of bio-engineering to stabilize a steep slope
- Collaborate with municipal officials and resource management groups for a coordinated response
- Maintain pool for habitat and recreation

Current Status

- Cost of project covered at 75% level from a FEMA mitigation fund, AWSMP funds 25% level.
- Overall cost of project approximately $125,000.
- Completed project installation. Installed 150ft of stacked stone wall and bio-engineered vegetated reinforced soil slope (VRSS).
- Final step scheduled for spring 2011 to plant trees and shrubs on upper slope

4.0 Engineering Design

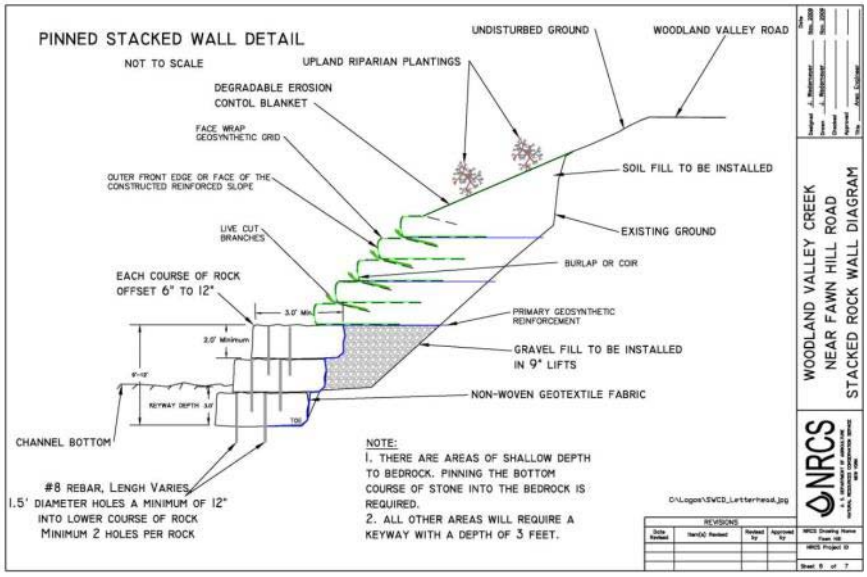

Figure 4 Engineering design of stacked rock wall and bio-engineering application

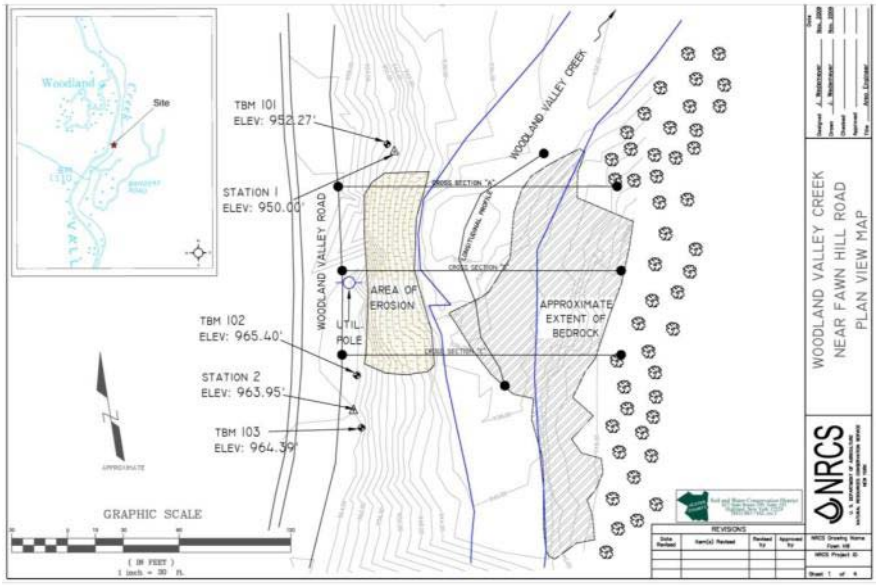

Figure 5 Engineering survey

5.0 Results

Construction of the stacked rock wall was completed September 29th 2010, and the upper portion bio-engineered soil slope was completed December 10th 2010. Since completed, the rock wall has withstood three (3) major flood events, including Hurricane Irene with little to no damage.

Figure 6 Post-Hurricane Irene (9/4/2011). Observations indicate rock wall and bio-engineered slope no damage.

6.0 Appendix A: Miscellaneous photos

Figure 7 Construction of pinned and stacked rock wall to stabilize hillslope failure.

Figure 8 Setting the stacked rock wall deep, keyed into stream bed.

Figure 9 Progress of work during construction

Figure 10 Construction crew using jack-hammers to pin stone wall together with rebar.

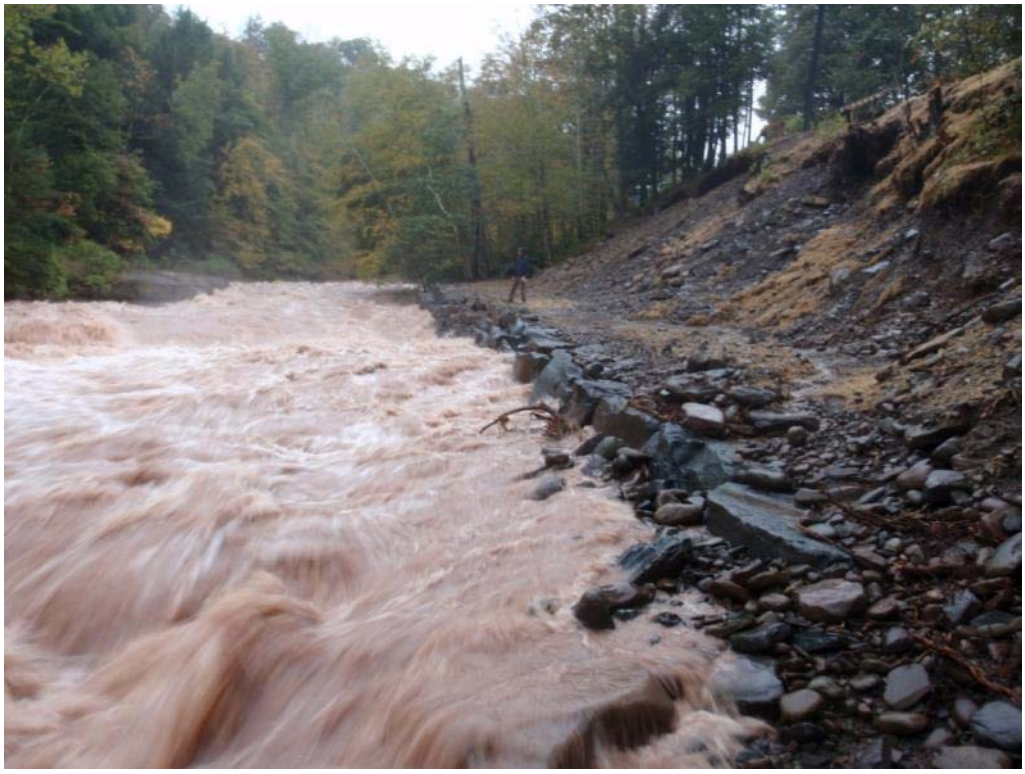

Figure 11 October 1st 2010 flood event approximately one hour after peak stage

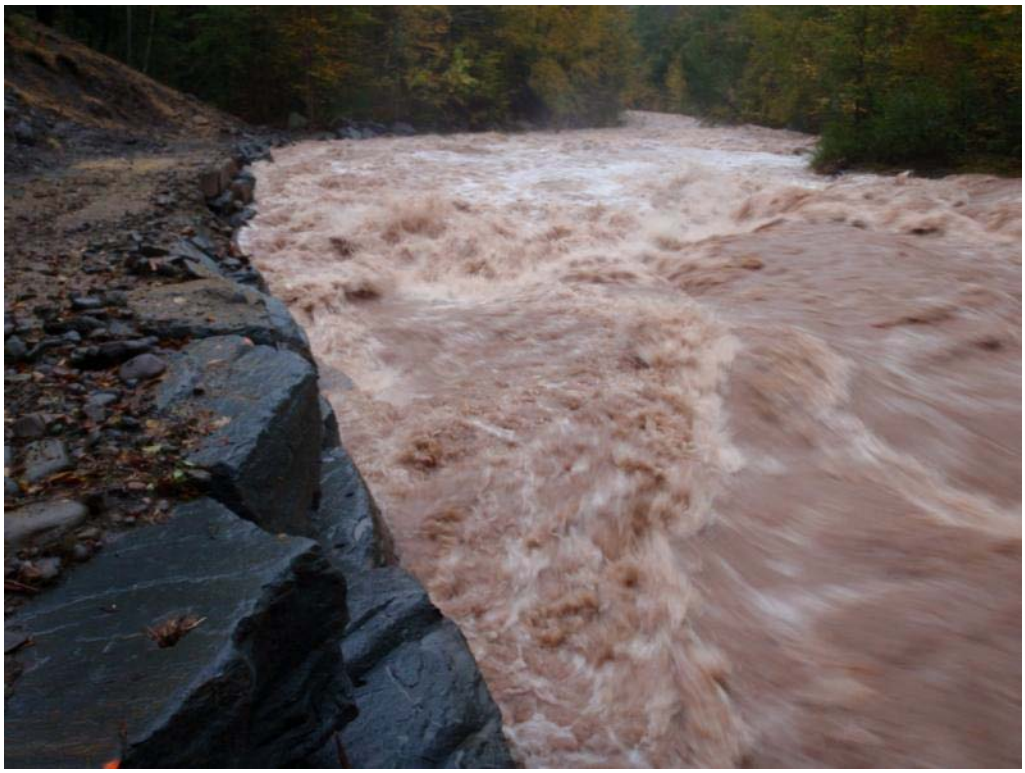

Figure 12 View looking downstream during October 1st 2010 flood event

Figure 13 Construction of bio-engineering vegetated reinforced soil slope (VRSS). Nov 2010

Figure 14 Construction of the bio-engineering soil slope, VRSS 2

Figure 15 Construction of VRSS 3

Figure 16 Application of erosion control matting

Figure 17 Erosion control matting 2

Figure 18 Completed project December 10 2010