

Final Report Narrative

Project Name: Upper Genesee River Streambank Stabilization – Caneadea, NY

Project Number: WS06-16-05

Project Sponsor: Center for Environmental Initiatives (dba Genesee RiverWatch)

Implementation: Three conservation practices were installed as part of this project. Each one is described below. The landowner has accepted responsibility to do the post-construction maintenance for the life of this practice. His workers are in the field regularly to plant and harvest crops and spread manure. They will routinely inspect the condition of the stabilized bank and riparian zone, then follow up with appropriate corrective measures.

Practice Name/Title (with NRCS Code, if applicable)	Streambank and Shoreline Protection (580)
Total Acres, Linear Feet and/or Number of this Practice to be installed over life project:	900 feet
Description of Conservation Practice:	Cut back bank from water edge at 1 to 2 slope, place large rip rap at appropriate elevation, grade remaining slope through the riparian buffer, place jute mesh on slope and seed with riparian mix
Installation Date:	October 2017
Life of Installed Practice:	30 years
Incentive Method:	Save valuable farmland. This farmer lost 0.47 acres over a 10 year period
Total Estimated Soil Savings	511 tons per year
Total Estimated Particulate Phosphorus Reduction	312 pounds per year
Total Estimated Dissolved Phosphorus Reduction	18 pounds per year
Description of Calculation Methods:	<p>Meander analysis estimated that 0.47 acres of farmland were lost over 10 years. Assumed average depth of soil to be 5 feet. (Did not count rock and clay layers.). Assumed soil density of 100 pounds per cubic foot. This yielded a soil loss of 511 tons per year.</p> <p>Based upon soil P of 332 mg/kg (from soil P layer in GIS) the annual phosphorus reduction will be 330 pounds per year. Dissolved phosphorus value was calculated from water quality data on TP and SRP.</p>

Practice Name/Title (with NRCS Code, if applicable):	Riparian Forest Buffer (391)
Total Acres, Linear Feet and/or Number of this Practice to be installed over life project:	900 feet, 1.0 acres
Description of Conservation Practice:	Planting a variety of native trees and shrubs in a 50 foot wide strip along the length of the restoration
Installation Date:	May 2018
Life of Installed Practice:	30 years
Incentive Method:	NA
Total Estimated Soil Savings	None
Total Estimated Particulate Phosphorus Reduction	None
Total Estimated Dissolved Phosphorus Reduction	0.9 pounds per year
Description of Calculation Methods:	Based upon 5% of the total load associated with the streambank restoration

Practice Name/Title (with NRCS Code, if applicable):	Riparian Herbaceous Cover (390)
Total Acres, Linear Feet and/or Number of this Practice to be installed over life project:	900 feet, 1.0 acres
Description of Conservation Practice:	Planting of riparian seed mix in the riparian buffer and sloped area of the restoration above the rip rap
Installation Date:	May 2018
Life of Installed Practice:	30 years
Incentive Method:	NA
Total Estimated Soil Savings	None
Total Estimated Particulate Phosphorus Reduction	None
Total Estimated Dissolved Phosphorus Reduction	0.1 pounds per year
Description of Calculation Methods:	Based upon 1% of the total load associated with the streambank restoration

Pictures



Before Construction, Upstream End, 2016



Before Construction, Whole Project Site, 2016



During Construction, Upstream End, Summer 2017



During Construction, Whole Project Site, Summer 2017



During Construction, Tree Planting, Spring 2018



During Construction, Finally Finished Planting, Landowner and Genesee RiverWatch Director, Spring 2018



After Construction, Upstream End, August 2019



After Construction, Whole Project Site, Fall 2018



After Construction, Whole Project Site, August 2019

Narrative of Activity

Summary of Original Problem/Issue:

Streambank erosion is a major contributor to the sediment and nutrient loading in the Upper Genesee River. Given the steep topography and soils of the area, some streambank erosion and the associated sediment and nutrient load would be expected. However, human influences on the watershed and riparian areas exacerbate this erosion. Recent monitoring and modeling studies by SUNY Brockport (1) suggests that streambank erosion and the presence of agricultural lands without riparian buffers are causes of increased sediment and nutrient loading in this section of the river. This study suggested that a streambank stabilization program would effectively reduce the sediment and nutrient loads of the Upper Genesee River.

SUNY College at Brockport also produced a series of reports which characterized the loads and sources of phosphorus and sediment for the entire Genesee River basin (Makarewicz J. C., et al., 2013). Those investigations were built upon flow measurements and an intensive water quality sampling and analysis program over several years. Calibrated Soil Water Assessment Tool (SWAT) models were developed

using those data. Those models were then utilized to further identify and allocate sources of sediment and phosphorus and estimate potential load reductions from various management practice scenarios.

As a result of this work by SUNY Brockport, NYSDEC published *Addressing Phosphorus and Sediment in the Genesee River Basin: A Synopsis of Existing Reports to Meet EPA's Nine Elements of a Watershed Plan* in August 2015. This document outlines the work done and further actions necessary to reduce the sediment and phosphorus loadings in the Genesee River Basin in order to meet water quality goals in the Genesee River and nearshore areas of Lake Ontario. It documents that the Genesee River is impaired for phosphorus and sediment while identifying erosion of streambanks along agricultural land with poor riparian zones as a major contributor to those impairments.

Several specific sections of the main stem of the Genesee River in Allegany County, New York have been identified in the SUNY Brockport study and in our subsequent meander analysis (described later) as being significantly eroded. One of those segments is located near Houghton, New York – Site 2 in our meander analysis. The landowner of that segment was very interested in a project to slow down his loss of valuable farmland. He has lost of over 0.47 acres of land in ten years.

A shovel-ready project was developed to stabilize of 900 linear feet of un-buffered agricultural field along the Genesee River in the town of Houghton, New York. This restoration reduced sediment and phosphorus loads to the river while adding 900 feet of new riparian zone. This project emphasized the use of bioengineering techniques and habitat enhancement as describe above.

What Was Completed from Original Workplan:

The major tasks associated with this project are described below. All the tasks identified in the original workplan were completed.

Engineering Design: Our engineer established a design for this streambank segment based upon field measurements, conversations with the landowner, and review of the GIS information from our meander analysis. He then estimated the cost of his design based upon his previous experience on restoration projects, obtaining materials and excavation estimates from local providers, and similar work by others in the region. His design included the use of bioengineering technologies: a slightly graded riparian zone with jute mesh, riparian seed mix, and tree/bush plantings.

NYSDEC states that “soft or natural approaches to shoreline stabilization are recognized now as being more environmentally effective. When shoreline repair or stabilization becomes necessary, these methods should be considered first. Natural approaches seek to restore hydrological and ecological balance by using methods that are structurally sound as well as economically feasible and ecologically sustainable. While there are many ways to protect an existing shoreline or restore an eroded one, choosing appropriate materials and design is important. Soft methods may include planting native, deep-rooting vegetation, as well as bioengineering. In all cases, the proposed stabilization method should follow the natural contour of the shoreline.”

Environmental Permitting: Our environmental permitting team worked with the design engineer, NYSDEC officials, the landowner, the Allegany County Soil and Water Conservation District, and the USACE to prepare the permit application for submittal to NYSDEC and USACE.

We were aware of project permitting requirements and developed a project plan and budget identifying resources and project approaches that would meet permit conditions.

NYSDEC regulates streambank restoration projects under its Protection of Waters program. They use a Joint Application Form to bring together the four agencies with jurisdiction on projects that cause a “stream disturbance”: NYSDEC, UASCE, NYS Office of General Services, and Department of State. In this case we filed for and obtained our permit from NYSDEC and USACE.

Once we obtained our environmental permits from DEC and USACE we applied for and received a flood plain permit from the Town of Caneadea.

Bid Packages: The project engineer prepared bid packages for distribution to local/regional contractors for the purchase and delivery of the rip rap we needed to stabilize the river bank. Since the landowner provided excavation, stone placement, jute mesh installation, riparian buffer grading and seeding, and post-construction monitoring as his in-kind match for this project we did not include these tasks in any bid packages.

Restoration: Our design engineer conducted routine site visits to ensure that the work was accomplished in accordance with the drawings, specifications, and other provisions.

Once the bank was stabilized with rip rap, the riparian buffer was graded and seeded in the fall. In the spring of the next year (2018) we were able to attract 65 volunteers to help us plant the 1,000 bare-root seedlings necessary to complete the restoration.

The landowner has also agreed to conduct post-restoration maintenance and monitoring to ensure proper plant growth and stability of the restoration. Subsequent site inspections since then have shown the seedling survival rate to be around 40% as we expected. The trees and shrubs have grown nicely as has the riparian mix. The pictures provided show that well.

Problems/Issues Encountered: Hard, rocky soil presented difficulties for volunteers to dig holes to plant seedlings but they persevered to complete the task.

Completed Media Outreach Activities: The initial media event was held at the Town of Caneadea Town Hall on August 3, 2017. There were 15 attendees including the Town Supervisor, representative from the NYS Farm Bureau, NYS Department of Environmental Conservation, US Army Corps of Engineers, several local landowners, and a regional land conservancy organization.

We also included reports of the progress of this project in our quarterly newsletters sent to the over 1,700 contacts/stakeholders/interested parties we have listed in our Constant Contact database.

Quote from Self: Thanks to the farmer’s commitment to and enthusiasm for this project it was successfully completed in the spring of 2018. It represents a demonstration of the efficacy of applying bioengineering techniques in streambank restoration. The success of this first venture laid the groundwork for future projects. We have completed another similar project in 2019 to similarly stabilize 1,800 feet of river bank and have two more on the books for 2020. This work totals to 7,700 linear feet of streambank.

Lessons Learned: Volunteers are critical to planting the number of trees selected to restore the riparian buffer. The riparian seed mix we selected works very well to stabilize the soil in the riparian zone.

Other Comments: We were able to secure funding from the Great Lakes Commission due in large part to the landowner's in-kind contribution of his resources to complete the restoration. The grant of about \$100,000 covered the cost of permitting, engineering and materials. The Mallards Dairy team contributed the nearly \$50,000 of skilled work associated with excavation, grading the slope, and placing stone, trees and seed.

Creative or Innovative Activities Attempted: During the planting of the bare root seedlings we ran into an unexpected problem associated with sliding the protection tube over the planted seedling. The branches of the seedlings would get caught in the mesh of the tube. We fashioned a device out of cardboard (the only material on site that would work) to allow the tube to be easily slid over the seedling. This significantly sped up the process.



Seedling with Tube Protector

Administration

Number of Contracts Approved with Landowner: one memorandum of understanding
Grant Dollars Obligated to Landowner: \$10,140.00
Total Grant Dollars Expended: \$100,895.92
Total Match Dollars Earned: \$56,230
Other Items: None