

**CENTERVILLE CREEK
RESTORATION PROJECT
STREAMBANK AND FLOODPLAIN
PLANTING AND MONITORING PLAN**



Prepared by:

Thompson Environmental Surveys & Permitting, LLC.

February 2025

Table of Contents

Sections 1-6		Page
1	Introduction	1
2	Background.....	1
	2.1 Existing Soils.....	1
	2.2 Existing Hydrology	1
	2.3 Existing Plant Communities.....	2
3	Planting Design	2
	3.1 Proposed Planting and Stabilization.....	2
4	Performance Standards.....	2
5	Monitoring Plan	3
6	Project Development Schedule	3

Appendices

Appendix A Planting Notes

Appendix B Planting Plan

1 Introduction

Stephen Miller is proposing to restore and stabilize portions of a roughly 800 feet of stream bank along the Centerville Creek in Codorus and Shrewsbury Townships, York County, PA. Watershed Alliance of York (WAY) has assisted Mr. Miller in securing a PADEP Section 319 Nonpoint Source Management Grant C990004785 for this project. As part of the project, WAY proposes to plant approximately 2.5 acres of the adjacent streambank and floodplain following construction. This planting and monitoring plan has been developed as part of the Waiver 16 Permit Authorization Package for the project.

2 Background

The Project is located within the United States Geological Survey (USGS) Glen Rock and Seven Valleys, PA 7.5-minute series topographical quadrangles (USGS, 2013). Land cover within the Study Area consists of forested land, open fields, and wetland/riparian areas. Land uses in the vicinity of the Project consisted of forested floodplain, forested slopes, agricultural properties, wetlands, watercourses, and secondary roadways.

2.1 Existing Soils

Three soil map units are located within the Project Study Area. Each soil map unit has a hydric soil rating given by the Natural Resources Conservation Service (NRCS) (**Table 1**).

Table 1. Soil Map Units by Study Area

Soil Map Unit	Description	Hydric Rating
MOD	Mt. Airy and Manor soils, 15 to 25 percent slopes	0
Cm	Codorus silt loam	11
MRF	Mt. Airy and Manor soils, 25 to 60 percent slopes, extremely stony	0

2.2 Existing Hydrology

The Project area drains north via Centerville Creek which is in the South Branch Codorus Creek watershed and the lower Susquehanna River Basin. Centerville Creek and its unnamed tributaries have a PA Code, Title 25, Chapter 93 designated protected aquatic life uses of Warm-Water Fishery, Migratory Fishes (WWF, MF) (Commonwealth of PA, 2025a). The Pennsylvania Department of Environmental Protection (PADEP) lists Centerville Creek as having an Existing Use Classification of Cold-Water Fishery, Migratory Fishes (CWF, MF) (PADEP, 2025). The Pennsylvania Fish and Boat Commission (PFBC) lists Centerville Creek as Wild Trout Waters (PFBC, 2025). According to the 2024 Final Pennsylvania Integrated Water Quality Monitoring and Assessment Report, Centerville Creek does not have an existing impairment (PADEP, 2024).

The primary source of hydrology for the existing wetlands is provided by a seasonal high-water table, surface water retention, and Centerville Creek. The hydrology will not be altered to the onsite wetlands.

It is anticipated that the project will result in improved water quality to the surrounding floodplain and adjacent wetlands.

2.3 Existing Plant Communities

The current vegetative community of the floodplain is primarily mowed meadow.

3 Planting Design

Design plans for 2.5 acres of stream bank stabilization and floodplain and wetland enhancement are located in Appendix B. The proposed site seeding, planting and stabilization, and construction sequencing necessary for the planting plan are detailed in the following discussion.

3.1 Proposed Planting and Stabilization

After construction all disturbed areas will be permanently seeded and stabilized with the specified seed mixture. The stream corridor and adjacent floodplain will be planted with willow live stakes and a diversity of native tree and shrub species including sycamore (*Platanus occidentalis*), river birch (*Betula nigra*), pin oak (*Quercus palustris*), swamp white oak (*Quercus bicolor*), red maple (*Acer rubrum*), silky dogwood (*Cornus amomum*), southern arrowwood (*Viburnum dentatum*), and winterberry (*Ilex verticillata*). Woody material will be planted at a density of 100 stems/acre for trees and 300 stems/acre for shrubs.

Any temporarily disturbed wetland areas will be seeded with a wetland seed mix (Ernst 122 FACW Wetland Meadow Mix) seeded at a rate of 20 lb/acre (or ½ pound/1,000 sf) with a cover crop of grain rye (*Secale cereal*) seeded at a rate of 30 lb/acre. The wetland seed mix includes fox sedge (*Carex vulpinoidea*, 23%), lurid sedge (*Carex lurida*, 22%), Virginia wildrye (*Elymus virginicus*, 20%), blunt broom sedge (*Carex scoparia*, 14%), soft rush (*Juncus effuses*, 3%), blue vervain (*Verbena hastata*, 3%), swamp milkweed (*Asclepias incarnata*, 2.0%), star sedge (*Carex intumescens*, 2%), golden alexanders (*Zizia aurea*, 2%), New England aster (*Aster novae-angliae*, 1%), path rush (*Juncus tenuis*, 1%), white vervain (*Verbena urticifolia*, 1%), wrinkleleaf goldenrod (*Solidago rugosa*, 0.7%), lance leaved aster (*Aster lanceolatus*, 0.5%), purplestem aster (*Aster puniceus*, 0.2%), nodding bur marigold (*Bidens cernua*, 0.5%), fringed sedge (*Carex criniata*, 0.5%), great blue lobelia (*Lobelia siphilitica*, 0.5%), square stemmed monkeyflower (*Mimulus ringens*, 0.5%), awl sedge (*Carex stipata*, 0.4%), boneset (*Eupatorium perfoliatum*, 0.4%), common sneezeweed (*Helenium autumnale*, 0.3%), American water horehound (*Lycopus americanus*, 0.3%), green bulrush (*Scirpus atrovirens*, 0.3%), woolgrass (*Scirpus cyperinus*, 0.3%), bigleaf mountainmint (*Pycnanthemum muticum*, 0.3%), and mud plantain (*Alisma subcordatum*, 0.1%). Spring seeding should be completed between March 1 and June 1 and fall seeding should be completed between September 1 and November 1.

4 Performance Standards

The following performance standards are applicable to the Project stream restoration and floodplain enhancement areas. The Project will be monitored and maintained in accordance with the Permits, There are no permanent wetland impacts or wetland conversion impacts to PSS and PFO wetland

habitats proposed with the Project.

The nature of this Project is restoration of aquatic habitats and sediment loading due to stream bank erosion. Compensatory mitigation is not required as this activity is considered to be self-crediting. The site will be monitored for a period of three years to ensure that the restoration activities do not adversely affect hydrology and significantly decrease the size of on-site wetlands.

5 Monitoring Plan

The project will be monitored and maintained in accordance with the Water Obstruction and Encroachment (WO&E) Permit terms and conditions. Any observed problems will be summarized in an annual monitoring memo report.

To ensure the long-term sustainability of the restoration project, the applicant or their consultant will initially perform annual evaluations of the restoration areas. The permittee anticipates that these activities will be minimal as the project is designed to be self-sustaining with limited management activities. Annual inspections will be conducted during the growing season to identify any issues. Walk-through surveys will be conducted annually to qualitatively monitor the general conditions of the habitats on the site. Notes to be made may include observations of species encountered, water quality, general extent of wetland and streams, and any occurrences of erosion, structure failure, or invasive or non-native species establishment. If there are any noted items that require maintenance, this should be recorded and submitted in an annual report to the PADEP.

The proposed monitoring period will begin the following year after completion of construction and will be conducted in accordance with the Permits. It is anticipated that the monitoring will be required for a period of three growing seasons.

6 Project Development Schedule

The start of construction of the stream restoration wetland enhancement project is proposed to begin in 2027. A mixture of bare root and containerized trees and shrubs is proposed for planting between May 15th and July 15th 2027. Seeding with the specified native wetland seed mix is proposed as a final step and expected to occur early fall 2027. Monitoring of the project will be initiated in late spring of 2028. The results from the yearly monitoring will be submitted to PA DEP.

Appendix A

Planting Notes

**PERMANENT SEEDING AND STABILIZATION (WETLAND/FLOODPLAIN
ENHANCEMENT AREAS)**

1. The temporary impacted wetland areas will be permanently seeded and stabilized with the specified seed mixture following site preparation.
 2. Organic (non-woody) debris should remain within the wetland and floodplain enhancement areas.
 3. Fall seeding should be completed between September 1 and November 1.
 4. Broadcast fertilizer and lime should not be applied to any wetland area.
 5. The areas of temporary wetland impact will be seeded with Ernst 122 FACW Wetland Meadow Mix seeded at a rate of 20 lb/acre (or ½ pound/1,000 sf) with a cover crop of grain rye (*Secale cereal*) seeded at a rate of 30 lb/acre. The wetland meadow mix includes fox sedge (*Carex vulpinoidea*, 23%), lurid sedge (*Carex lurida*, 22%), Virginia wildrye (*Elymus virginicus*, 20%), blunt broom sedge (*Carex scoparia*, 14%), soft rush (*Juncus effuses*, 3%), blue vervain (*Verbena hastata*, 3%), swamp milkweed (*Asclepias incarnata*, 2.0%), star sedge (*Carex intumescens*, 2%), golden alexanders (*Zizia aurea*, 2%), New England aster (*Aster novae-angliae*, 1%), path rush (*Juncus tenuis*, 1%), white vervain (*Verbena urticifolia*, 1%), wrinkleleaf goldenrod (*Solidago rugosa*, 0.7%), lance leaved aster (*Aster lanceolatus*, 0.5%), purplestem aster (*Aster puniceus*, 0.2%), nodding bur marigold (*Bidens cernua*, 0.5%), fringed sedge (*Carex criniata*, 0.5%), great blue lobelia (*Lobelia siphilitica*, 0.5%), square stemmed monkeyflower (*Mimulus ringens*, 0.5%), awl sedge (*Carex stipata*, 0.4%), boneset (*Eupatorium perfoliatum*, 0.4%), common sneezeweed (*Helenium autumnale*, 0.3%), American water horehound (*Lycopus americanus*, 0.3%), green bulrush (*Scirpus atrovirens*, 0.3%), woolgrass (*Scirpus cyperinus*, 0.3%), bigleaf mountainmint (*Pycnanthemum muticum*, 0.3%), and mud plantain (*Alisma subcordatum*, 0.1%).
 6. The floodplain enhancement areas (2.5 acres) will be planted at an average of 300 shrubs per acre or 100 trees per acre and at a spacing of 8ft x 8ft for shrubs and 10ft x 10 ft for trees. The plantings will include Pennsylvania native species such as (but not limited to) pin oak (*Quercus palustris*), red maple (*Acer rubrum*), swamp white oak (*Quercus bicolor*), river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), southern arrowwood (*Viburnum dentatum*), silky dogwood (*Cornus amomum*), and winterberry (*Ilex verticillata*). Species composition will depend on availability.
-

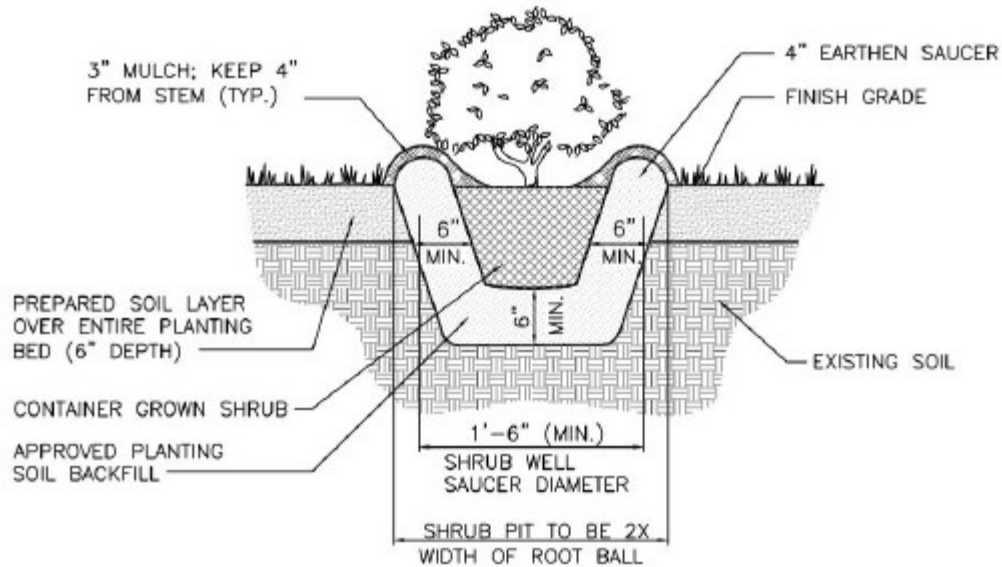
LIVE PLANTINGS

PLANTING NOTES: SPECIFIC SPECIES HAVE NOT BEEN FINALIZED. PLANTINGS WILL INCLUDE LIVE STAKES, TREES AND SHRUBS NATIVE TO PENNSYLVANIA.

1. SHRUBS OR LIVE STAKES SHALL BE PLANTED IN THE DESIGNATED AREAS ALONG THE STREAMBANKS AS SHOWN ON THE PLAN AT A MAXIMUM SPACING OF 8' ON CENTER. SHRUBS ARE TO BE PLANTED ABOVE BANKFULL ELEVATION, IN TWO ROWS APPROXIMATELY 8' APART.
2. TREES SHALL BE PLANTED ALONG FLOODWAY ABOVE BANKFULL IN ROWS APPROXIMATELY 10' APART AT A MAXIMUM SPACING OF 10-FOOT ON CENTER USING SPECIES FROM THE LIST PROVIDED UNLESS AS OTHERWISE NOTED ON PLAN.
3. TREES AND SHRUBS SHALL BE A MINIMUM OF ONE GALLON CONTAINER SIZE.
4. TREES AND SHRUBS SHALL NOT BE PLANTED CLOSER THAN 4' FROM ANY EXISTING WOODY VEGETATION PRESENT.

HERBIVORE DEFENSE PROTECTION SHALL BE INSTALLED FOR EACH PLANTED TREE

SHRUB PLANTING DETAILS

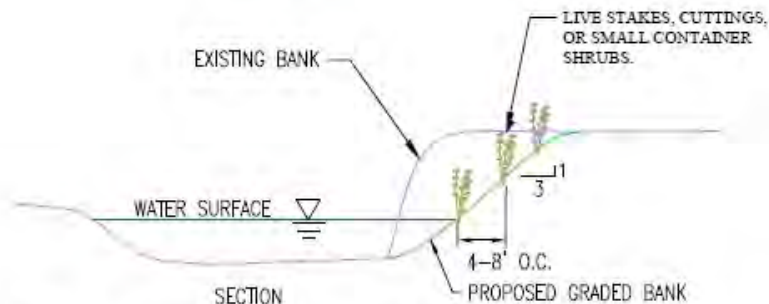


SHRUB PLANTING DETAIL

SCALE: NTS



PLAN



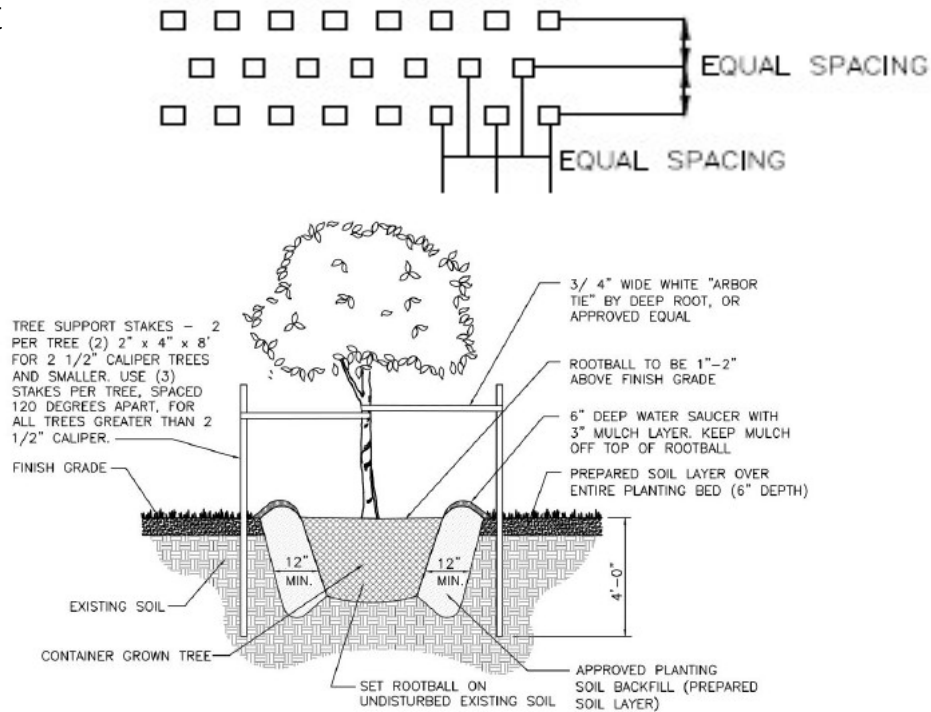
SECTION

RIPARIAN PLANTING DETAIL FOR GRADED STREAM BANK

NOT TO SCALE

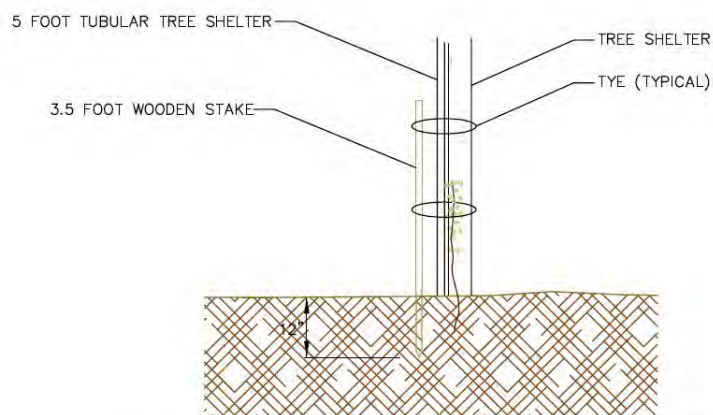
TREE PLANTING DETAILS

10ft x10ft



TREE PLANTING DETAIL

SCALE: NTS



NOTE: TREE SHELTERS ARE TO BE MADE FROM BIODEGRADABLE PLASTIC TUBING.

Appendix B

Planting Plan

CENTERVILLE CREEK STREAM RESTORATION PROJECT



- Legend**
-  Proposed Tree Planting Area
 -  Proposed Shrub Planting Area
 -  Delineated Watercourses Area
- Delineated Wetland Cowardin Classifications
-  Palustrine Emergent (PEM)
 -  Palustrine Scrub Shrub (PSS)
 -  Open End

Shrub Planting Area : 0.22 ac
Tree Planting Area : 2.28 ac



0 40 80
Feet

Created By: JTR
Date: 12/5/2025