

Tar River Headwaters Stream and Ditch Buffer

Person County NC -- Tar-Pamlico River HUC# 03020101-0102

MY-2 (2018) Fall Monitoring Report

NC-DEQ Division of Mitigation Services:

DMS Project # 97071; DEQ # 2016-0233

Data Collected: October 2018 Final Report: Nov 2018

(Asset table Rev 3/2019)



	<p>Submitted To: N.C. Department of Environmental Quality Division of Mitigation Services 1652 Mail Service Ctr, Raleigh, NC 27699-1652</p> <hr/> <p>DMS Project Manager: Lindsay Crocker DEQ-DMS Contract # 007016</p>
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1.0. Project Background Summary

1.1. Project Goals and Success Criteria

The Tar River Headwaters Stream and Ditch Buffer (TRHSDB) project is a riparian buffer restoration project that connects a DMS full-delivery wetland mitigation project (*'Tar River Headwaters Wetland Restoration Site'*) to an adjacent private mitigation bank project (*'Tar River Headwaters Riparian Buffer and Nutrient Offset Mitigation Bank'*). This project will provide riparian buffer and/or nutrient offset credits along approximately 460 feet of the main north-south ditch and riparian buffer credits along approximately 150 feet of intermittent stream downstream of the ditch.

Performance standards were established to verify that the vegetation component supports community elements necessary for forest development and the maintenance of diffuse flow through the riparian buffer in accordance with North Carolina Division of Water Resources Administrative Code 15A NCAC 02B.0295 (Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers). Performance standards are dependent upon the density and growth of at least four native hardwood tree species where not one species is greater than 50% of the stems. After five years of monitoring, an average density of 260 woody stems per acre must be surviving and diffuse flow maintained.

1.2. Project Setting and Pre-Restoration Conditions

The project is located in the Tar-Pamlico river basin, 12-digit HUC # 03020101- 0102, in eastern Person County, on a 228-acre farm owned by Roy and Joyce Huff at 333 Bunnie Huff Road, Oxford NC 27565 (Figure 1). The gravel access road into the site is at Latitude = 36.3913, Longitude = -78.8171. The TRHSDB project site and adjacent wetland restoration site (TRHWR) were a cattle pasture dominated by forage grasses interspersed with native and non-native herbs. This site was in continuous agricultural use for about 70 years, and land use in the surrounding area has changed little over the past several decades. Several drainage ditches were constructed in the 1940s to dewater the area sufficiently for pasture use.

A southward flowing ditch runs through the existing pasture and is hydrologically connected with an intermittent stream downstream of a ford crossing, which flows into a perennial stream beyond the project boundary. A conservation easement was acquired on 9.98 acres, which encompasses both the TRHSDB and TRHWR projects and the upstream network of ditches. The TRHWR project occupies most of this easement area, and the TRHSDB project occupies approximately 1.3 acres in the southeastern portion of the easement, downstream of the restored wetlands.

Based on LIDAR topographic mapping (from Person County GIS) the watershed draining to the project site is approximately 50 to 80 acres with an average slope of 2%. This watershed is undeveloped, containing natural hardwood forest, planted pines, cropland, pasture, and a powerline. The only man-made structures in the watershed are two powerline towers. The project ditch feature measures between 2 and 3 ft deep and was confirmed to meet buffer requirements of (o)(8) in a 10/24/2016 DWR viability letter.

1.3. Mitigation Approach and Expected Improvements

The project includes installing livestock exclusion fencing and planting native hardwood buffer trees at a minimum of 50' from top of bank on both sides of the ditch and at a minimum of 30' from top of bank on the eastern portion of the intermittent stream. The proposed work restores approximately one acre of riparian areas. Establishment of a forested riparian area and cattle exclusion will reduce soil erosion and nutrient laden runoff

from the adjacent pasture within its watershed and help retain agricultural chemicals. This riparian area is also expected to improve water quality through removal of bacterial and agricultural inputs and slow surface water runoff. Habitat connectivity will be re-established between two distinct restoration areas adjacent to a regionally rare ecosystem.

2.0. Current Site Conditions

The TRHSDB project area upstream of the ford crossing is vegetated with a dense native herbaceous cover including aster and various grasses as well as a high percentage of surviving planted live stems. All three vegetation plots met success criteria in Oct 2018, with an average stem density of 405 native woody stems per acre (Table 5). Seven planted tree species currently contribute to species diversity, including muscledwood, green ash, swamp blackgum, sycamore, willow oak, water oak, and American elm. The ditch and stream banks were assessed and appear stable after heavy rain from Hurricanes Florence and Michael. The project section downstream of the ford crossing along the intermittent stream contains scattered native mature trees interspersed with planted trees. The easement fence surrounding both areas were inspected and are intact. No signs of livestock or other easement integrity issues were noted.

3.0. Methods

Three vegetation monitoring plots, each 10 x 10 meters (Figure 2), were marked with steel conduit pipe, and planted and volunteer trees within each plot were mapped and identified following the CVS Level II protocol (Lee et al, 2008).

Three permanent photo locations were established at representative locations along the ditch and buffer area. Two are located above the crossing and one is located below the crossing. Please refer to the CCPV for Photo Point locations in Figure 2.

Fence integrity will be assessed at each site visit and repaired if necessary.

4.0. References

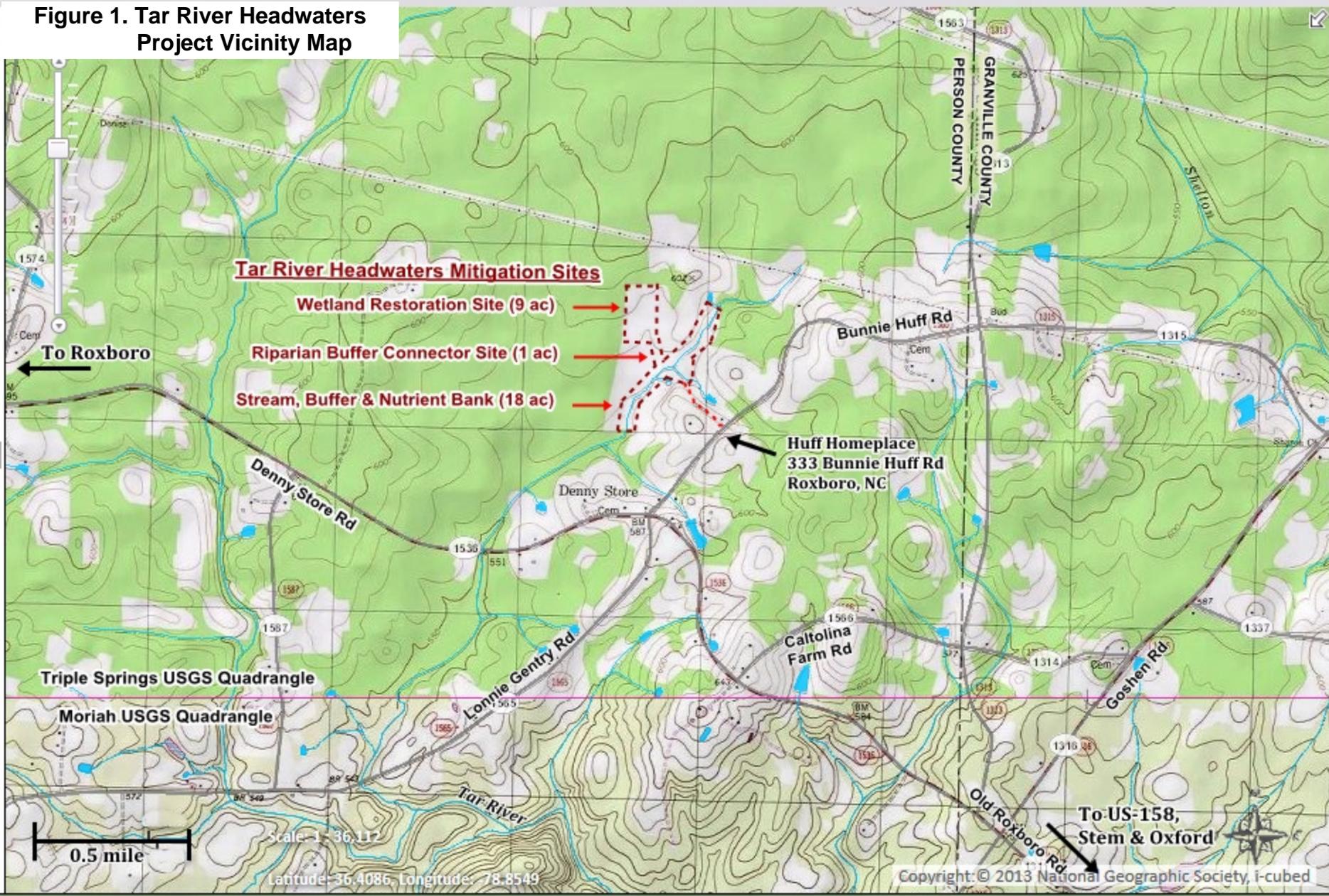
- Lee, Michael T., Peet, Robert K., Roberts, Steven D., Wentworth, Thomas R. (2008). *CVS-EEP Protocol for Recording Vegetation version 4.2, October 2008*. Retrieved September 2011, from: <http://cvs.bio.unc.edu/methods.htm>
- LeGrand, Harry E. Jr. (2007) Natural Areas Inventory of Person County, NC. NC Natural Heritage Program, Raleigh NC.
- NC Division of Mitigation Services. (2017). *NC-DMS Annual Monitoring Report Format, Data Requirements, and Content Guidance June 2017*. <http://portal.ncdenr.org/web/eep/dbb-resources>
- Schafale, M.P., Weakley, A.S., 1990. Classification of the Natural Communities of North Carolina, Third Approximation. NC Natural Heritage Program, Raleigh, NC.
- Sink, Larry T. (1995). *Soil Survey of Person County, North Carolina*. USDA Soil Conservation Service (Natural Resources Conservation Service), Raleigh, NC.

United States Department of Agriculture, Natural Resources Conservation Service, 2016. Web Soil Survey. Available: <http://websoilsurvey.nrcs.usda.gov/app/>

United States Geological Survey, 2013. 7.5 Minute Topographic Quadrangle, *Triple Springs*.

Appendix A: Project Background Data

**Figure 1. Tar River Headwaters
Project Vicinity Map**



**Table 1. Project Components and Mitigation Assets
Tar River Headwaters Stream and Ditch Buffer, DMS # 97071**

RIPARIAN BUFFER (15A NCAC 02B.0295)							NUTRIENT OFFSET (15A NCAC 02B.0240)		
Reach ID or Component	Restoration Level	Buffer Width (ft)	Creditable Area (sf)*	Initial Credit Ratio (x:1)	% Full Credit	Mitigation Credits (BMU)		Nutrient Offset: N (lbs)	Nutrient Offset: P (lbs)
Ditch TOB-50'	Restoration	0-30	29,621	1	100%	29,621	OR	2,571	165
		30-50	19,655	1	100%	19,655			
Stream TOB-50'	Restoration	0-30	4,787	1	100%	4,787	N/A	-	-
		30-50	1,697	1	100%	1,697			
55,760									

* Creditable buffer areas are at least 30 ft wide.

**Creditable nutrient offset areas are at least 50 ft wide.

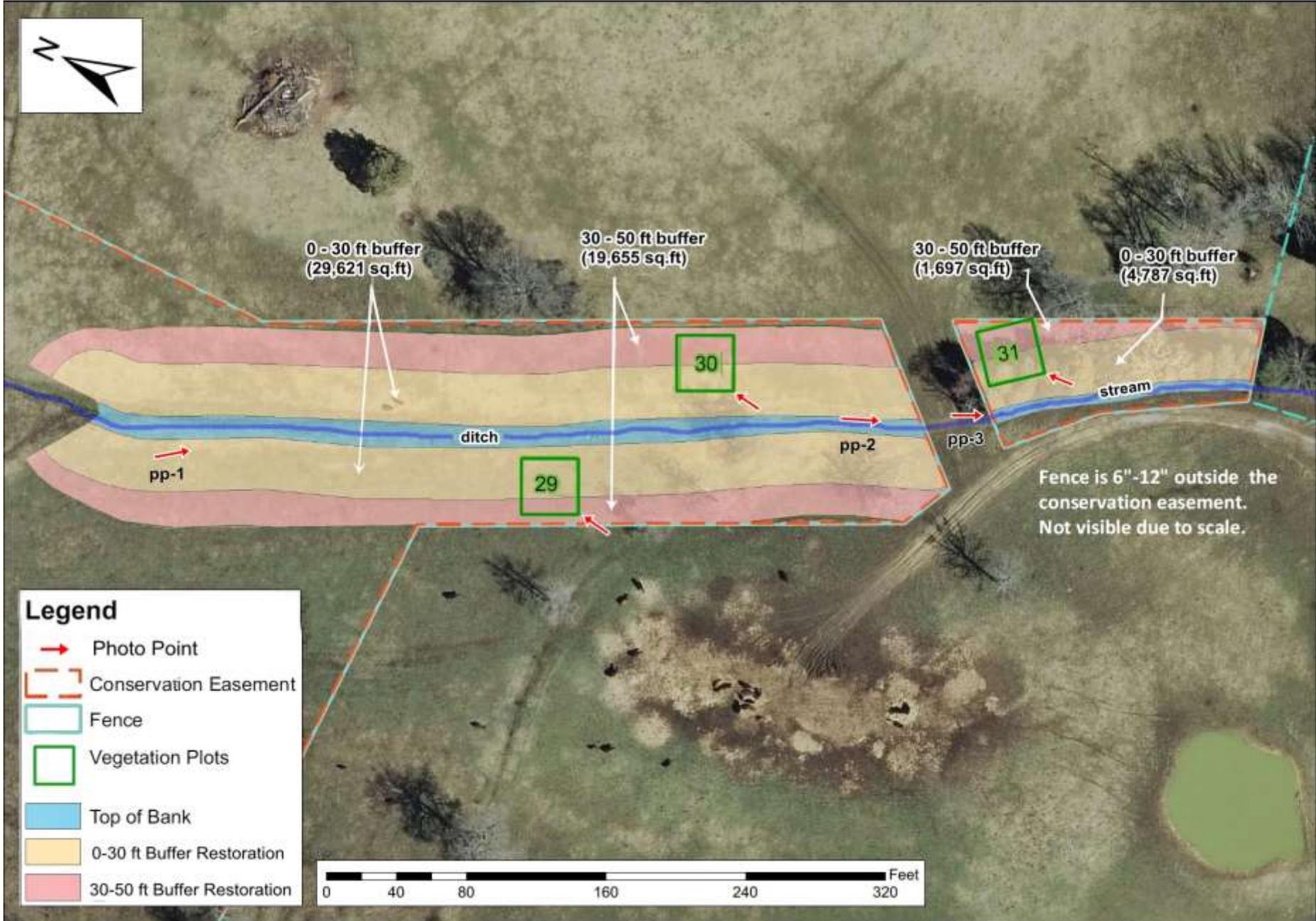
**Table 2. Project Activity and Reporting History
Tar River Headwaters Stream and Ditch Buffer DMS # 97071**

Activity or Deliverable	Data Collection Complete	Completion or Delivery
Conservation Easement Recorded	NA	Oct-16
Mitigation Plan	NA	Nov-16
Fencing and Construction	NA	Jan-17
Planting and Vegetation Plots Installed	NA	Feb-17
As-Built MY0 Baseline Monitoring	Feb-17	Apr-17
Year 1 Monitoring	Oct-19	Nov-19
Year 2 Monitoring	Oct-19	Nov-19
Year 3 Monitoring		
Year 4 Monitoring		
Year 5 Monitoring		

Table 3. Project Contacts Table**Tar River Headwaters Stream and Ditch Buffer, DMS Project # 97071**

Designer	Mogensen Mitigation Inc, Charlotte NC Rich Mogensen: 704-576-1111; Gerald Pottern: 919-556-8845
Construction Contractor	KBS Earthworks, Greensboro NC Kory Strader & Brett Strader: 336-685-4339
Survey Contractor	Michael T. Brandon, PLS, Roxboro NC Michael Brandon: 336-597-8673
Fence Contractor	Strader Fencing, Inc., Julian NC Kenneth Strader: 336-314-2935
Herbicide and Seeding	KBS Earthworks, Greensboro NC Kory Strader & Brett Strader: 336-685-4339
Planting Contractor	Mogensen Mitigation Inc, Charlotte NC Rich Mogensen: 704-576-1111; Gerald Pottern: 919-556-8845
Nursery Stock Suppliers	Mellowmarsh Farms, Siler City NC Joanie McLean: 919-742-1200
Monitoring Performers	Mogensen Mitigation Inc, Charlotte NC Rich Mogensen: 704-576-1111; Gerald Pottern: 919-556-8845

Appendix B: Visual Assessment Data



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CURRENT CONDITIONS PLAN VIEW:
 TAR RIVER HEADWATERS STREAM AND DITCH BUFFER SITE
 DMS PROJECT # 97071

PERSON COUNTY
 NORTH CAROLINA



Figure 2

Table 4. Vegetation Conditions Assessment
Tar River Headwaters Stream and Ditch Buffer (TRHSDB) Project, DMS # 97071.
Monitoring Year 2 (Oct 2018) -- Person County NC. Tar-Pamlico HUC# 03020101-0102.

Planted Acreage 1.3

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	N/A	0	0.00	0.0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY4 criteria.	0.1 acres	N/A	0	0.00	0.0%
				Total	0	0.00
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acres	N/A	0	0.00	0.0%
				Cumulative Total	0	0.00

Easement Acreage 9.98

Vegetation Category	Definitions	Mapping Threshold (SF)	CCPV Depiction	Number of Polygons	Combined Acreage	% of Easement Acreage
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	0	N/A	0	0.00	0.0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	0	N/A	0	0.00	0.0%

Vegetation Plots: Tar River Headwaters Stream and Ditch Buffer DMS #97071 MY-2 (2018)



Veg Plot 29: 23 Feb 2017

CVS VegPlot-29: MY-0 Spring 2017

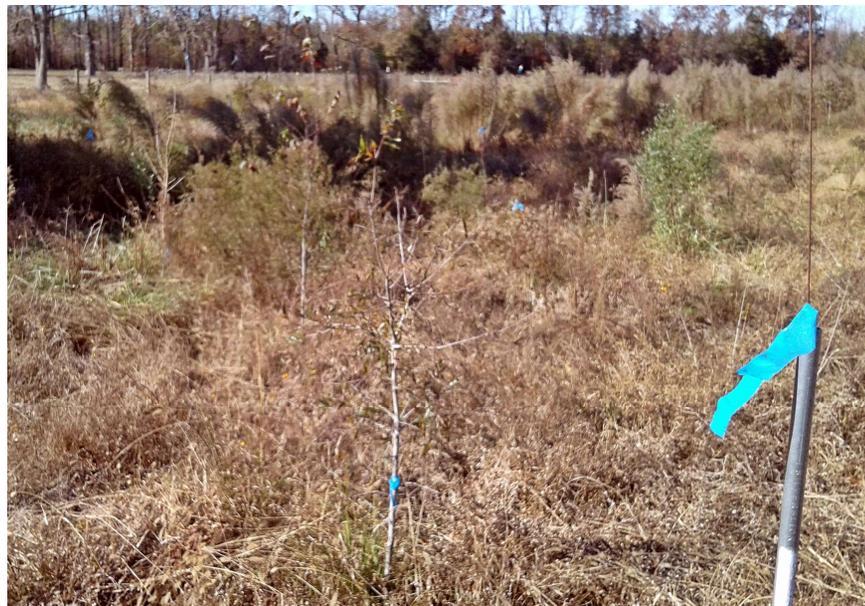


CVS VegPlot-29: MY-2 Fall 2018



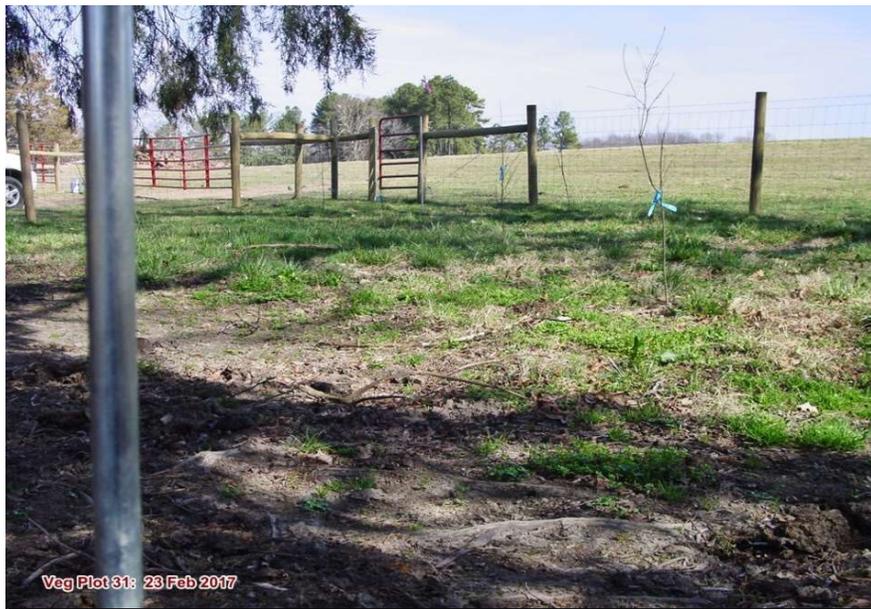
Veg Plot 30: 23 Feb 2017

CVS VegPlot-30: MY-0 Spring 2017



CVS VegPlot-30: MY-2 Fall 2018

Vegetation Plots: Tar River Headwaters Stream and Ditch Buffer DMS #97071 MY-2 (2018)



Veg Plot 31: 23 Feb 2017

CVS VegPlot-31: MY-0 Spring 2017



CVS VegPlot-31: MY-2 Fall 2018

Photo Points: Tar River Headwaters Stream and Ditch Buffer DMS #97071 MY-2 (2018)



PhotoPoint 1: MY-0 Spring 2017



PhotoPoint 1: MY-2 Fall 2018



PhotoPoint 2: MY-0 Spring 2017



PhotoPoint 2: MY-2 Fall 2018

Photo Points: Tar River Headwaters Stream and Ditch Buffer DMS #97071 MY-2 (2018)



PhotoPoint 3: MY-0 Spring 2017



PhotoPoint 3: MY-2 Fall 2018

Appendix C: Vegetation Plot Data

Tar River Headwaters Stream and Ditch Buffer (TRHSDB) Project, DMS # 97071.
Monitoring Year 2 (Oct 2018) -- Person County NC. Tar-Pamlico HUC# 03020101-01

Table 5. CVS Plot Stem Counts and Density by Species.

Scientific Name	Common Name	Growth Type	Current Plot Data (MY2 - Oct 2018)						Annual Means						
			97071-29		97071-30		97071-31		MY0 (2017)		MY1 (2017)		MY2 (2018)		
			Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	
Betula nigra	River Birch	Tree (P)										1	1		
Carpinus caroliniana	Musclewood	Tree (P)	1	1	5	5	5	5	14	14	13	13	11	11	
Diospyros virginiana	Persimmon	Tree (P)													
Fraxinus pennsylvanica	Green Ash	Tree (P)	3	3	2	2			7	7	7	7	5	5	
Liriodendron tulipifera	Tulip Poplar	Tree (P)							1	1					
Nyssa biflora	Swamp Blackgum	Tree (P)	1	1					1	1	1	1	1	1	
Platanus occidentalis	Sycamore	Tree (P)	3	3					3	3	3	3	3	3	
Quercus bicolor	Swamp White Oak	Tree (P)							1	1	1	1			
Quercus phellos	Willow Oak	Tree (P)	2	2	4	4	2	2	8	8	8	8	8	8	
Quercus nigra	Water Oak	Tree (P)	1	1					1	1	1	1	1	1	
Ulmus americana	American Elm	Tree (P)					1	1	1	1	1	1	1	1	
(P) = planted species Total = Planted + Volunteer Stems			Stem count	11	11	11	11	8	8	37	37	36	36	30	30
			ares	1	1	1	1	1	1	3	3	3	3	3	3
			acres	0.025	0.025	0.025	0.025	0.025	0.025	0.074	0.074	0.074	0.074	0.074	0.074
			Species count	6	6	3	3	3	3	9	9	9	9	9	7
			Stems per ACRE	445	445	445	445	324	324	499	499	486	486	405	405

Color codes for Plot Density & Success

Exceeds criteria by 10% or more	(352 or more)
Exceeds criteria by less than 10%	(320 - 351)
Fails criteria by less than 10%	(289 - 319)
Fails criteria by more than 10%	(288 or less)

Table 6. CVS Plot Stem Density and Success Summary

CVS Plot #	Planted + Volunteer Native Stems		Invasive Woody Stems	Success Criteria Met?
	per plot	per acre		
97071- 29	11	445	0	Yes
97071- 30	11	445	0	Yes
97071- 31	8	324	0	Yes
Project Avg	10	405	0	Yes