

Tar River Headwaters Stream and Ditch Buffer

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

MY-0 (2017) As-Built Baseline Monitoring Report

NC-DEQ Division of Mitigation Services: DMS Project # 97071

Data Collected: February 2017

Final Report: April 2017



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DEQ Division of Mitigation Services
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1.0. Project Summary

1.1. Project Setting and Background Conditions

The Tar River Headwaters Stream and Ditch Buffer (TRHSDB) project is in the Tar-Pamlico river basin, 12-digit HUC # 03020101- 0102, and is proposed for riparian buffer and/or nutrient offset credits per 15A NCAC 02B.0295 and 15A NCAC 02B.0240. The Project is located 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 project site was a cattle pasture dominated by forage grasses interspersed with native and non-native herbs. Several large trees were left standing to provide shade for the cattle when the site was cleared in the 1940s, and a few younger trees have sprouted and survived. 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 north-south 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 offsite. A conservation easement was acquired on 9.98 acres, which includes the entire ditched network described above and the upslope pasture. The ditch and intermittent stream features are the focus of this mitigation plan. This mitigation plan will provide riparian buffer or nutrient offset credits along the main north-south ditch and riparian buffer credits along the hydrologically connected intermittent stream from riparian restoration.

This riparian restoration will connect a DMS full-delivery wetland mitigation project (*'Tar River Headwaters Wetland Restoration Site'*) located within the same conservation easement and upslope of the buffer project to an adjacent private bank project *'Tar River Headwaters Riparian Buffer and Nutrient Offset Mitigation Bank'* located downslope (south) in a separate conservation easement.

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 requirements of (o)(8) in a 10/24/2016 DWR viability letter.

1.2. 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-enriched 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.

1.3. As-Built Conditions

The easement boundary was fenced to exclude livestock using 4-foot high woven wire field fence plus single strand barbed wire on top and 10-ft pressure-treated wooden post spacing. Site preparation that occurred on-site included soil aeration and chemical control for invasive grasses and weeds. The site was planted with eleven species of native riparian trees. Power augers and shovels were used to dig planting holes for the gallon-size potted trees. Soils were fertilized and amended following NC Department of Agriculture soil testing recommendations. Three vegetation monitoring plots, each 10 x 10 meters (Figure 2), were marked with steel conduit pipe, and planted trees within each plot were mapped and identified following the CVS protocol (Lee et al, 2008).

Tree planting was conducted in the dormant season in early 2017. Three vegetation plots were installed shortly thereafter at representative locations to show planting densities; all vegetation plots met success criteria (Table 4). No invasive weed problem areas were noted. A few large trees remain in the ditch buffer restoration area and more than a dozen remain in the stream buffer restoration area; none of these large trees are within the vegetation monitoring plots.

2.0. 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 Ecosystem Enhancement Program. (2014). *NC-EEP Monitoring Report Template and Guidance version 1.0, February 2014*. <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. Background Tables and Figures

Table 1. Project Components and Mitigation Assets
Tar River Headwaters Stream and Ditch Buffer, DMS Project # 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	OR	338	22
		30-50	1,697	1	100%	1,697			
TOTALS						55,760		2,909	186

Table 2. Project Activity and Reporting History
Tar River Headwaters Stream and Ditch Buffer, DMS Project # 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		
Year 2 Monitoring		
Year 3 Monitoring		
Year 4 Monitoring		
Year 5 Monitoring		

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

Table 3. Project Contacts Table Tar River Headwaters Stream and Ditch Buffer, DMS Project # 97071	
Designer	Ecological Engineering, Raleigh NC Heather Smith: 919-557-0929
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

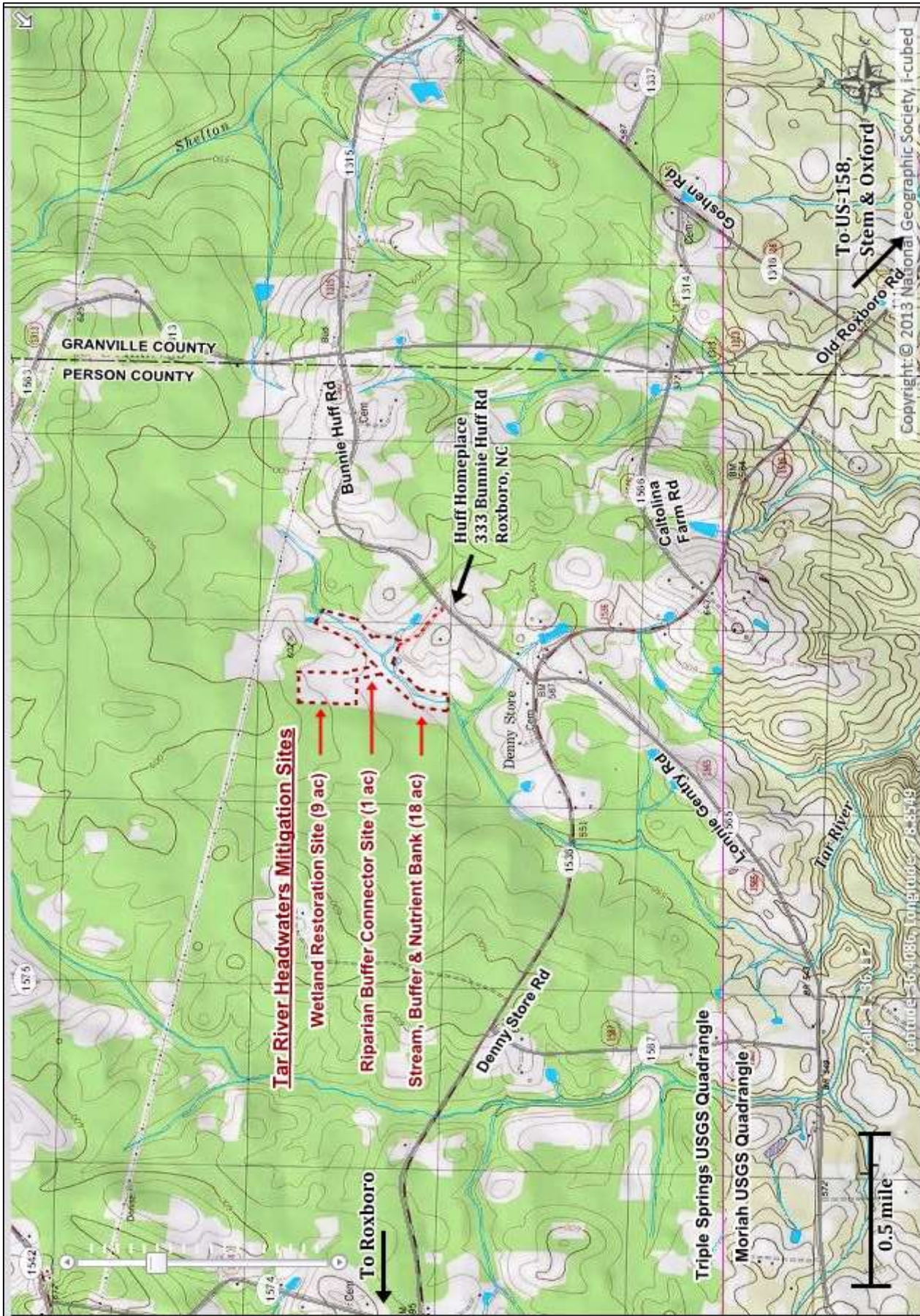


Figure 1. Project Vicinity Map: Tar River Headwaters Wetland Restoration Site and related mitigation projects on the Huff Farm property, Person County NC, Tar-Pamlico River HUC# 03020101-0102. DIRECTIONS: From US-158 in Berea, Granville County NC, turn right (northwest) on Old Roxboro Rd, which becomes Denny Store Rd where it crosses into Person County. Turn right (north) on Bunnie Huff Rd, go 0.4 mile, and turn left into the driveway just past the Huff Homeplace sign. Proceed through the gate at end of driveway to the project sites.

APPENDIX B. Baseline Vegetation and Visual Data

Tar River Headwaters Stream and Ditch Buffer (TRHSDB) Project, DMS # 97071.
Monitoring Year 0 (Feb 2017) -- Person County NC. Tar-Pamlico HUC# 03020101-0102.

Table 4. Tree Species and Approximate Numbers Planted.

Scientific Name	Common Name	approx # planted
Betula nigra	River Birch	20
Carpinus caroliniana	Musclewood	90
Diospyros virginiana	Persimmon	15
Fraxinus pennsylvanica	Green Ash	80
Liriodendron tulipifera	Tulip Poplar	20
Nyssa biflora	Swamp Blackgum	15
Platanus occidentalis	Sycamore	40
Quercus bicolor	Swamp White Oak	15
Quercus phellos	Willow Oak	85
Quercus nigra	Water Oak	20
Ulmus americana	American Elm	20
Total Planted Stems	All Species	420

**Tar River Headwaters Stream and Ditch Buffer (TRHSDB) Project, DMS # 97071.
Monitoring Year 0 (Feb 2017) -- Person County NC. Tar-Pamlico HUC# 03020101-0102.**

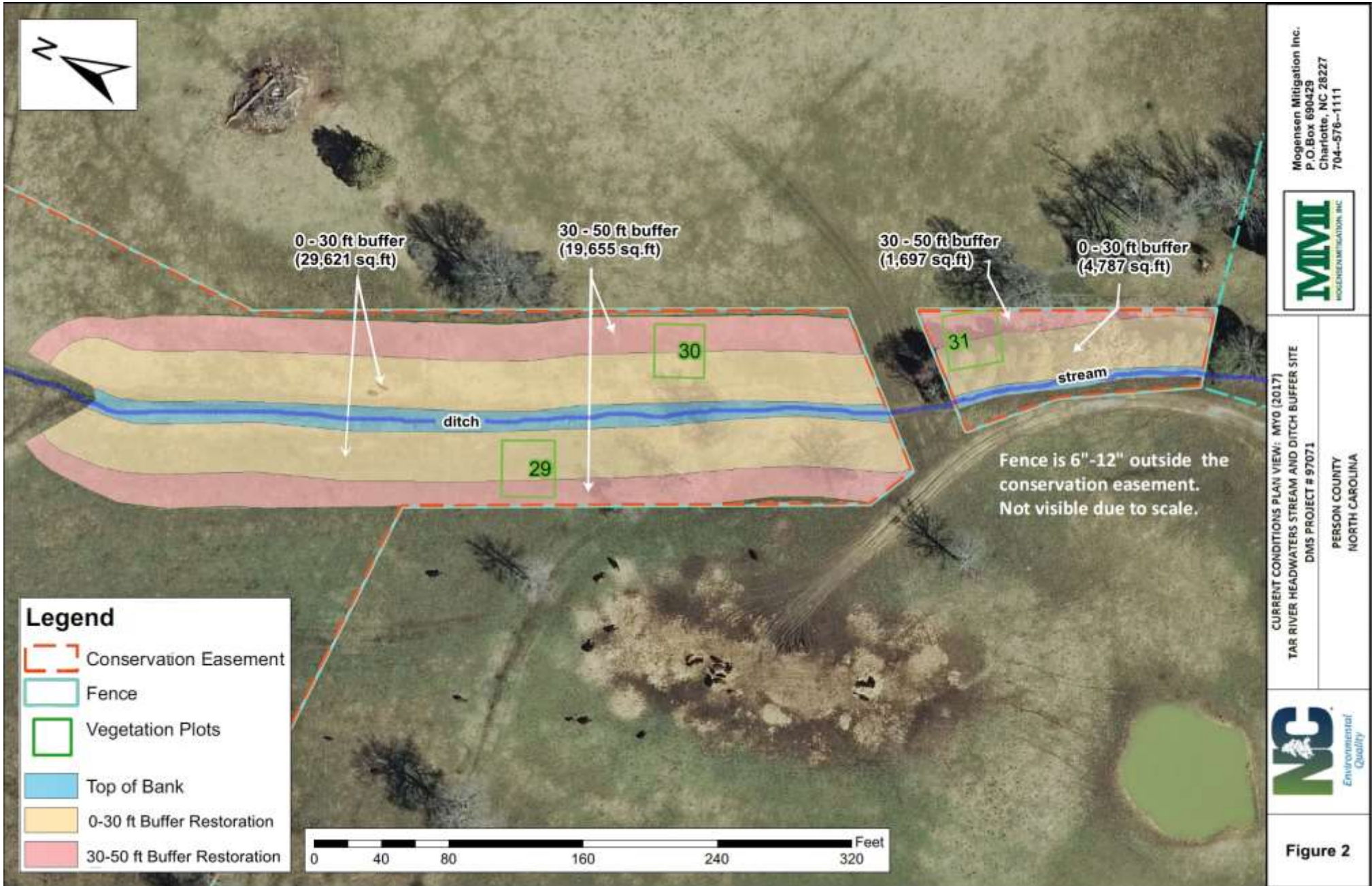
Table 5. CVS Plot Stem Counts and Density by Species.

Scientific Name	Common Name	Growth Type	Current Plot Data (MY0 - Feb 2017)						Annual Means			
			97071-29		97071-30		97071-31		MY0 (2016)			
			Plant	Total	Plant	Total	Plant	Total			Plant	Total
Betula nigra	River Birch	Tree (P)									0	0
Carpinus caroliniana	Musclewood	Tree (P)	3	3	5	5	6	6			14	14
Diospyros virginiana	Persimmon	Tree (P)									0	0
Fraxinus pennsylvanica	Green Ash	Tree (P)	4	4	3	3					7	7
Liriodendron tulipifera	Tulip Poplar	Tree (P)	1	1							1	1
Nyssa biflora	Swamp Blackgum	Tree (P)	1	1							1	1
Platanus occidentalis	Sycamore	Tree (P)	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
Quercus nigra	Water Oak	Tree (P)	1	1							1	1
Ulmus americana	American Elm	Tree (P)					1	1			1	1
Stem count			16	16	12	12	9	9			37	37
ares			1	1	1	1	1	1			3	3
acres			0.025	0.025	0.025	0.025	0.025	0.025			0.074	0.074
Species count			8	8	3	3	3	3			11	11
Stems per ACRE			648	648	486	486	364	364			499	499

Plant = Planted Native Woody Stems; Total = Planted + Volunteer Native Stems

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)



Tar Headwaters Stream & Ditch Buffer #97071
Person County – Tar-Pam HUC 03020101

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CVS Vegetation Plot Photos: Tar River Headwaters Stream & Ditch Buffer # 97071: MY0 (Feb 2017)
All vegetation plot photos are taken from the SW plot corner, facing NE.



Vegetation Plot 29:
23 Feb 2017



Vegetation Plot 30:
23 Feb 2017



Vegetation Plot 31:
23 Feb 2017