Annual Monitoring Report (MY2)

BOSEMAN BUFFER MITIGATION SITE

Edgecombe County, NC
NCDEQ Contract No. 7872
DMS ID No. 100119
DWR Project No. 2019-0800
RFP No. 16-007711

Prepared for:

Mitigation Services
ENVIRONMENTAL QUALITY

NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center, Raleigh, NC 27699-1652

November 2021

December 28, 2021

Lindsay Crocker
1652 Mail Service Center
Raleigh, NC 27699-1652

Subject: MY2 Annual Report Comments (DMS) – Boseman Buffer Mitigation Site (DMS #100119) Tar-Pamlico 03020101; Edgecombe County, NC, Contract No. 7872

Dear Lindsay,

SWE/Eco Terra has addressed comments received by DMS on December 16, 2021 for the MY2 Annual Report, Boseman Buffer Mitigation Site. Our responses are below in blue:

1. Clarify the supplemental planting discussion. Page 4 indicates that there was a supplemental plant of 4,500 tress after MY1. The paragraph goes on to explain that another 16,300 trees were supplementally planted. Please explain if this was a second supplemental plant that occurred during the same dormant season and include the dates of both plantings. Please also describe tree species and number of each, and if this was a site-wide planting. If this planting only occurred in a specific area, show that area on the CCPV. Also clarify if the planted species were part of the original Mitigation Plan species list.

   One supplemental planting occurred during February 2021 after the MY1 report and addressing general comments from DWR to ensure species diversity across the site. The second paragraph on Page 4 has been revised to clarify what occurred as written below:

   "After the first full growing season and during the subsequent dormant season (February 2021), five (5) additional species of trees were distributed evenly across the site selected from the original proposed species as well as appropriate species found within and transitioning to a Coastal Plain Small Stream Swamp (blackwater subtype) as proposed in the approved Mitigation Plan. Species planted include 1,000 cherrybark oak (*Quercus pagoda*), 1,000 Shumard oak (*Quercus shumardii*), 1,000 river birch (*Betula nigra*), 1,000 sycamore (*Platanus occidentalis*), and 500 persimmon (*Diospyros virginiana*). This supplemental planting resulted in increasing the species diversity to fourteen (14) species total for the project. In addition to the original planting, approximately 16,300 trees (1,093 stems/ac) have been planted across the Site to date."
   .

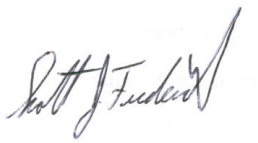
2. Table 1. Provide dates of supplemental plant on this table
   Revised.

3. Minor encroachments were noted on the report. Clarify if these were too small to map/measure or show them on the CCPV with their respective areas (sf).
   Impacts observed were too small to map/measure and no trees were removed or destroyed.

4. Please submit the photo point photos and vegetation from report as JPEGs.
   Photos have been submitted for file.

Included in this letter package (via email) is one (1) pdf copy of the revised MY2 Annual Monitoring Report and supporting data. Please let us know if additional information is needed.

Sincerely,



Scott J. Frederick
SWE Group
sjfrederick@swegrp.com

cc: Norton Webster, Eco Terra

ANNUAL MONITORING REPORT (MY2)

BOSEMAN BUFFER MITIGATION SITE

Edgecombe County, NC
NCDEQ Contract No. 7872
DMS ID No. 100119

Tar-Pamlico River Basin
HUC 03020101

Prepared For:

NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center, Raleigh, NC 27699-1652

Prepared By:

1328 DeKalb Ave NE
Atlanta, GA 30307
404.913.0020

This Annual Monitoring Report has been written in conformance with the requirements of the following:

- 15A NCAC 02B.0295 Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers.

These documents govern DMS operations and procedures for the delivery of compensatory mitigation.

Contributing Staff

Michael Bienenson, Principal

Jamey O'Shaughnessey, Construction Oversight, QA/QC

Scott Frederick, Construction and Monitoring Lead, SWE/ET

Robbie Bentley, Monitoring

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APPENDICES

1.0 Mitigation Project Summary

The Boseman Buffer Mitigation Site (Site) is a riparian buffer and adjacent riparian areas restoration project located approximately 2.5 miles southeast of the Town of Rocky Mount in Edgecombe County, NC (Appendix 1: Figure 1). The Site is approximately 14.91 acres (649,889 ft^2) of a total 276 ac tract situated along two unnamed tributaries to the Tar River (Appendix 1: Figure 2). The project is located in a targeted local watershed (TLW) within the Tar-Pamlico River basin hydrologic unit code (HUC) 03020101120030 and Subasin 03-03-02. The unnamed tributaries flow into the Tar River approximately one and half miles downstream of the project. According to the as-built survey and most recent DWR Buffer Mitigation Calculation Tool V.2 (Updated 1/17/20), the Site is expected to generate 617,518.702 riparian buffer mitigation units (BMU).

The Boseman Buffer Mitgation Site will help to reduce future sediment and nutrient loading into the unnamed tributaries and downstream Tar River. It will also improve terrestrial habitats along this stream by establishing a riparian corridor and allowing the land to convert to forested communities. The surrounding area is primarily agricultural fields. The project restored forested riparian buffers and adjacent riparian areas to a maximum of approximately 115 feet from the top of bank of the streams and removed rotating crops and fertilizer inputs. The restored Tar-Pamlico riparian buffer and adjacent riparian areas will filter runoff from the surrounding farm fields and provide shading to improve stream temperatures and aquatic habitat. Invasive vegetation will be treated as needed within the project area to promote native vegetation.

1.1 Project Goals

According to the N.C. Division of Mitigation Services' (DMS) 2010 Tar-Pamlico River Basin Restoration Priorities (RBRP) document, amended 2018, the project will support the identified goals for the TLW, as well as the overall HUC. As stated in the RBRP, restoration of riparian buffers and adjacent riparian areas to address agricultural runoff is a high priority for this 14-digit TLW HUC.

The major goals of the proposed buffer restoration project are to address agricultural runoff, including nutrients and sediment, protect the project site in perpetuity, and restore terrestrial habitat. The detailed goals and objectives are:

Reduce Nutrient Levels – Nutrient inputs will be decreased by filtering runoff and sequestering nutrients dispersed from stormwater flows from agricultural fields. These nutrients will be absorbed through the 30-115 ft wide riparian buffer and adjacent riparian areas restored with native woody vegetation. This goal is supported by both the TLW and RBRP for reducing nutrient inputs to the Tar-Pamlico River Basin.

Reduce Sediment Levels – Sediment inputs will be decreased by filtering runoff and attenuating flood flows from agricultural fields through 30-115 ft wide riparian buffer and adjacent riparian areas restored with native woody vegetation. This goal is supported by both the TLW and RBRP for reducing sediment inputs to the Tar-Pamlico River Basin.

Project Protection in Perpetuity – Implement a project in a TLW and record a conservation easement. This goal is supported by the RBRP to protect aquatic habitat and surface waters.

Restore Terrestrial Habitat – Riparian buffer and adjacent riparian areas will be restored with native vegation and invasive vegetation will be managed. This goal is supported by the RBRP and is a DMS Programmatic Goal (NCGS 143-214.10).

1.2 Existing Site Conditions

The buffer restoration project contains approximately 14.9 acres of former agricultural fields along two unnamed tributaries (hereinafter referred to as UT 1, and UT 2).

UT 1 enters the project site along the western property boundary and flows in an eastward direction. UT 1 meets the definition of at least intermittent per the NCDWR On-Site Determination for Applicability to the Tar-Pamlico Buffer Rules Letter dated July 9, 2019 (Appendix 1). UT 2 originates within the property boundary as an ephemeral channel (Reach 2a) and transitions to an intermittent channel (Reach 2b) prior to it's confluence with UT 1.

The project was successfully planted with appropriate trees and herbaceouse vegetation and is now at the end of the second (2nd) full growing season and early stages of successful buffer restoration.

2.0 Determination of Credits

Riparian buffer and adjacent riparian area restoration was accomplished in accordance with the Consolidated Buffer Mitigation Rule (15A NCAC 02B .0295) including the

alternative mitigation option of restoration activities along ephemeral streams. Restoration was accomplished specifically by:

Buffer Restoraiton on Ephemeral Channels (15A NCAC 02B .0295(o)(7)):

a.) NCDWR conducted an on-site stream determination of subject streams and ephemeral channels on the property
b.) Ephemeral channels are directly connected to intermittent or perennial stream channels
c.) Total mitigation area of ephemeral channels is less than 25% of the total buffer mitigation area (Table 2, Appendix 1).

All areas within 115 ft of the top of bank of subject streams as measured from the top of bank landward, will be devoted to generating riparian buffer mitigation credits. Total mitigation area on ephemeral channels is 12.7% of total buffer mitigation area. Mitigaiton credits generated are found in Table 2 and Figure 2 in Appendix 1 and are based upon the most recent DWR Buffer Mitigation Calculation Tool v 2 (Updated 1/17/20).

3.0 Project Construction Summary

The project construction was completed in early March 2020, following mitigation plan approval. Eco Terra and supporting team members successfully planted and restored the proposed areas dedicated for riparian buffer and adjacent riparian area restoration with high quality native trees, shrubs, and herbaceous vegetation.

3.1 Riparian Area Restoration Activities

Restoration of the riparian areas involved planting bare root one to two-year-old trees and shrubs in designated planting zones based on soil wetness and in accordance with the mitigation plan. In addition, five to six-year-old trees were planted at representatively selected areas designated for plots to aid in identifying plot locations. These trees are not included in any individual plot tree count. However, they are an overall beneficial component of stem diversity and age-class in the restored forest ecology and serve as important components in restored habitat, nutrient sequestration, leaf litter for trapping sediment, and soil health. A combination of machine and manual planting techniques were used depending on site conditions. Older trees were planted by a combination of hand and machine.

Species planted within the riparian areas included: overcup oak (*Quercus lyrata*) 2,500 stems, laurel oak (*Quercus laurifolia*) 1,000 stems, water oak (*Quercus nigra*) 3,000 stems, willow oak (*Quercus phellos*) 3,000 stems, green ash (*Fraxinus pennsylvanica*) 500 stems, silky dogwood (*Cornus amomum*) 1,000 stems, button bush (*Cephalanthus occidentalis*)

500 stems, and swamp blackgum (*Nyssa sylvatica* var. *biflora*) 300 stems. Approximately 11,800 stems (791 stems/ac) were planted initially within the riparian areas designated for restoration. Differences in stem density and quantities occurred relative to the proposed planting list in the mitigation plan due to plant availability at the time.

After the first full growing season and during the subsequent dormant season (February 2021), five (5) additional species of trees were distributed evenly across the site. Two species selected were from the original proposed species in the Mitigation Plan. Three species selected represented tree species found within a Coastal Plain Small Stream Swamp (brownwater subtype), also appropriate for the site and overarching Tar River brownwater system. Species planted included 1,000 cherrybark oak (*Quercus pagoda*), 1,000 Shumard oak (*Quercus shumardii*), 1,000 river birch (*Betula nigra*), 1,000 sycamore (*Platanus occidentalis*), and 500 persimmon (*Diospyros virginiana*). This supplemental planting resulted in increasing the species diversity to fourteen (14) species total for the project. Including the original planting, approximately 16,300 trees (1,093 stems/ac) have been planted across the Site to date; 11,800 stems originally (March 2020), and 4,500 stems from the supplemental planting (February 2021).

Temporary and permanent seed mix was installed in any disturbed soil areas following debris removal and planted with native trees to secure sediment from entering surface waters. Temporary and permanent seed mixtures planted included Foxtail millet (*Setaria italica*) and Indiangrass (*Sorgastrum nutans*), switchgrass (*Panicum virgatum*), and big bluestem (*Andropogon gerardii*), respectively.

In accordance with 15A NCAC 02B .0295, a sufficient density of stems was planted to achieve 260 trees/ac at the end of a minimum five-year project monitoring period whereby no one tree species planted was greater than 50% of the planted stems, and a minimum of four native hardwood tree and native shrub species were planted. In total, eight species were selected and planted in specific areas depending on soil type, landscape position, soil wetness, community type, and reference forest stands nearby. Initial vegetation management post planting included specific preemergent herbicide band application over planted trees for herbaceous competition that may compete with planted stems, conducted by a North Carolina licensed applicator.

4.0 Annual Monitoring and Performance Criteria

The Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers (15A NCAC 02B .0295) and RFP 16-007711 set forth specific performance criteria for the successful development and close-out of the Boseman Buffer Mitigation Site. Performance criteria monitoring includes standardized vegetation plot establishment

and annual monitoring for planted stems including individual plot photo documentation, overall site photo documentation, biannual visual assessments for project status and easement integrity including herbaceous and/or invasive species competition, stem mortality, stand health, incidental damage from agricultural equipment, and stem loss or damage from natural causes such as fire, disease, or animal predation. Figure 3 (Appendix 1) illustrates the location of project easement, permanent vegetation plots/photo points, as well as overall site photo points.

4.1 Vegetation

Twelve permanent vegetation plots were established according to the most recent Carolina Vegetation Survey (CVS) protocol within the restored buffer area. Representative vegetation plots were established at a minimum density of 2% of the planted area. Specifically, vegetation monitoring was obtained for all plots according to Level 1 protocols from the CVS-EEP Protocol for Recording Vegetation V4.2 (2008) manual. Monitoring year two (MY2) vegetation stem data is included in Appendix 5, Table 3. All vegetation plots meet criteria for stem densities and overall site density is 826 stems/ac.. Herbivore predation above and below ground damaged some trees in the project area, particularly vegetation monitoring plot 1, but not enough to warrant remedial action.

4.2 Photo Reference Stations

Individual plot photos taken at the southwest corner (origin) of each plot are included in this annual monitoring report. Additional Site reference photos were taken at designated points along the conservation easement boundary providing an overall view of the project success (Appendix 1: Figure 3). All photo points were located by survey and georeferenced for map production to provide a consistent means for photo replication annually and in the event a plot or photo location must be reestablished during the monitoirng period. Photo orientation (direction and bearing) were recorded as well as approximate vertical position for consistency in photo logging.

4.3 Visual Assessments

Additional observations were made of site conditions and vegetation conditions outside of monitoring plots. This biannual effort was made in order to appropriately monitor changing site conditions and address any issues to ensure Site success and performance criteria are met after the monitoring period. Overall tree vigor across the site is adequate for second (2^{nd}) year survival and project success averaging 3.6 and overall tree height averaged 74.1 cm. Some minor easement encroachments were observed where farm equipment has crossed into the easement at two locations. These areas were flagged and additonal fence posts installed to eliminate this easement infringement. No other encroachments were identified during the two site visits in June and September. Any future Site problems will be noted and discussed in the annual reports and

monitored biannually to ensure performance criteria are met following any remedial action.

4.4 Annual Reporting Performance Criteria

All monitoring reports, including this annual report, will be compiled and submitted to DMS annually in accordance with the Riparian Buffer and Nutrient Offset Buffer Baseline and Annual Monitoring Report Template Ver. 2.0 (May 2017). Annual monitoring will occur for a minum of five years or until performance criteria are met.

4.5 Maintenance and Contingency Plans

Any Site observations identified through vegetation plots or visual assessments, whereby the performance criteria is not met, will be noted and discussed in the annual reports and addressed with a contingency plan as necessary. DMS/NCDWR will be notified, and if necessary, collaborate with Eco Terra to develop a contingency plan with remedial action steps to correct the performance criteria deficiency. Any contingency plan and remedial actions will occur within an agreed timeframe and monitoring adjusted accordingly, if necessary. Site problem areas will be monitored biannually to ensure performance criteria are met following any remedial action.

5.0 References

15 NCAC 02B .0295 Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers. 2015.

Lee, Michael T. Peet, Robert K., Steven D. Wentworth, Thomas R. 2008. CVS-EEP Protocol for Recording Vegetation Version 4.2. http://cvs.bio.unc.edu/protocol/cvs-eep-protocol-v4.2-lev1-2.pdf

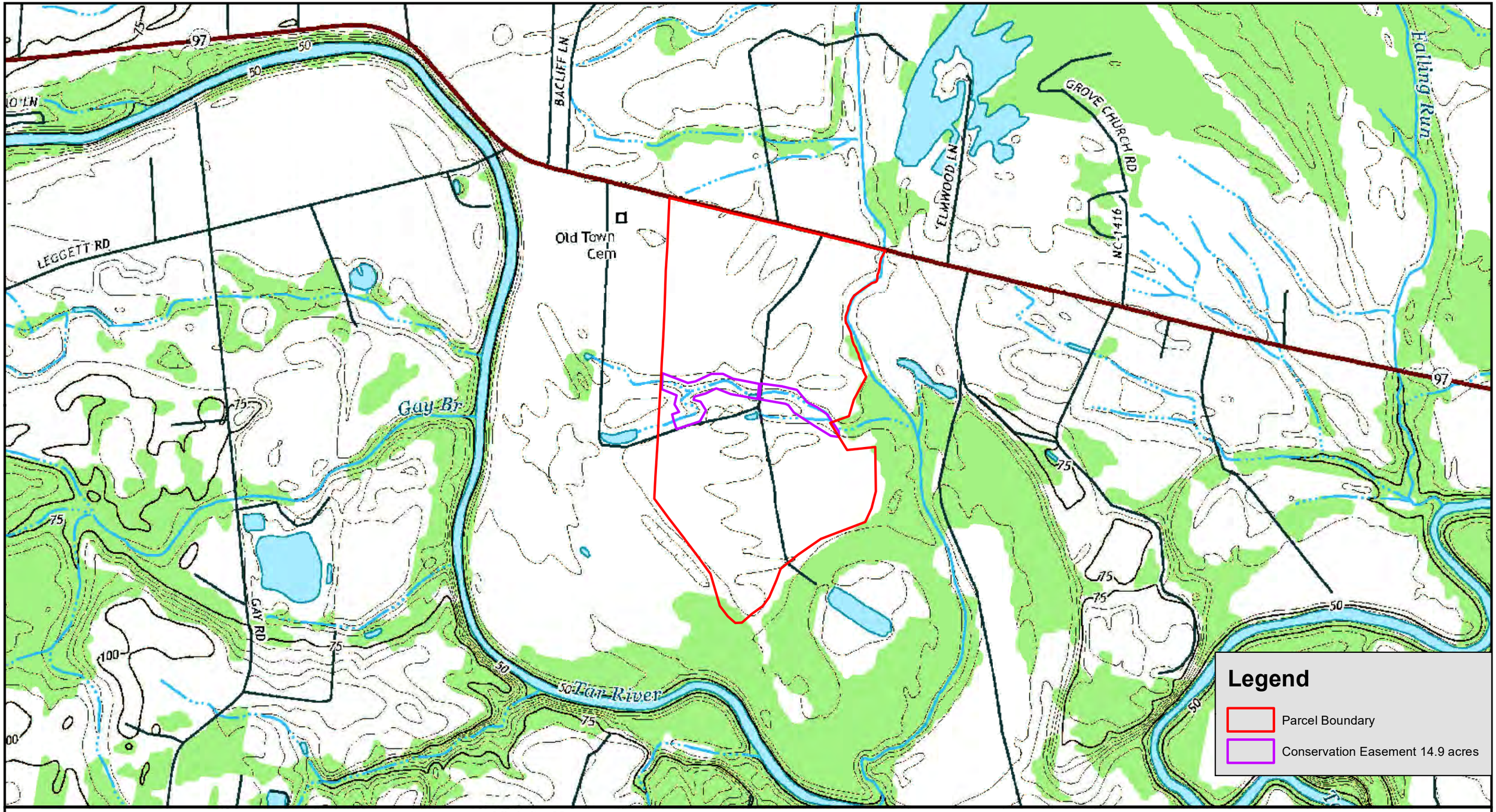
Natural Resources Conservation Service (NRCS). Web Soil Survey of Edgecombe County. http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

North Carolina Department of Environmental Quality. Division of Mitigation Services (NCDMS). 2017. Riparian Buffer and Nutrient Offset Buffer Baseline and Annual Monitoring Report Template Version 2.0.

North Carolina Department of Environmental Quality. Division of Mitigation Services (NCDMS). 2018. Tar-Pamlico River Basin Restoration Priorities.

APPENDIX 1

FIGURES AND TABLES



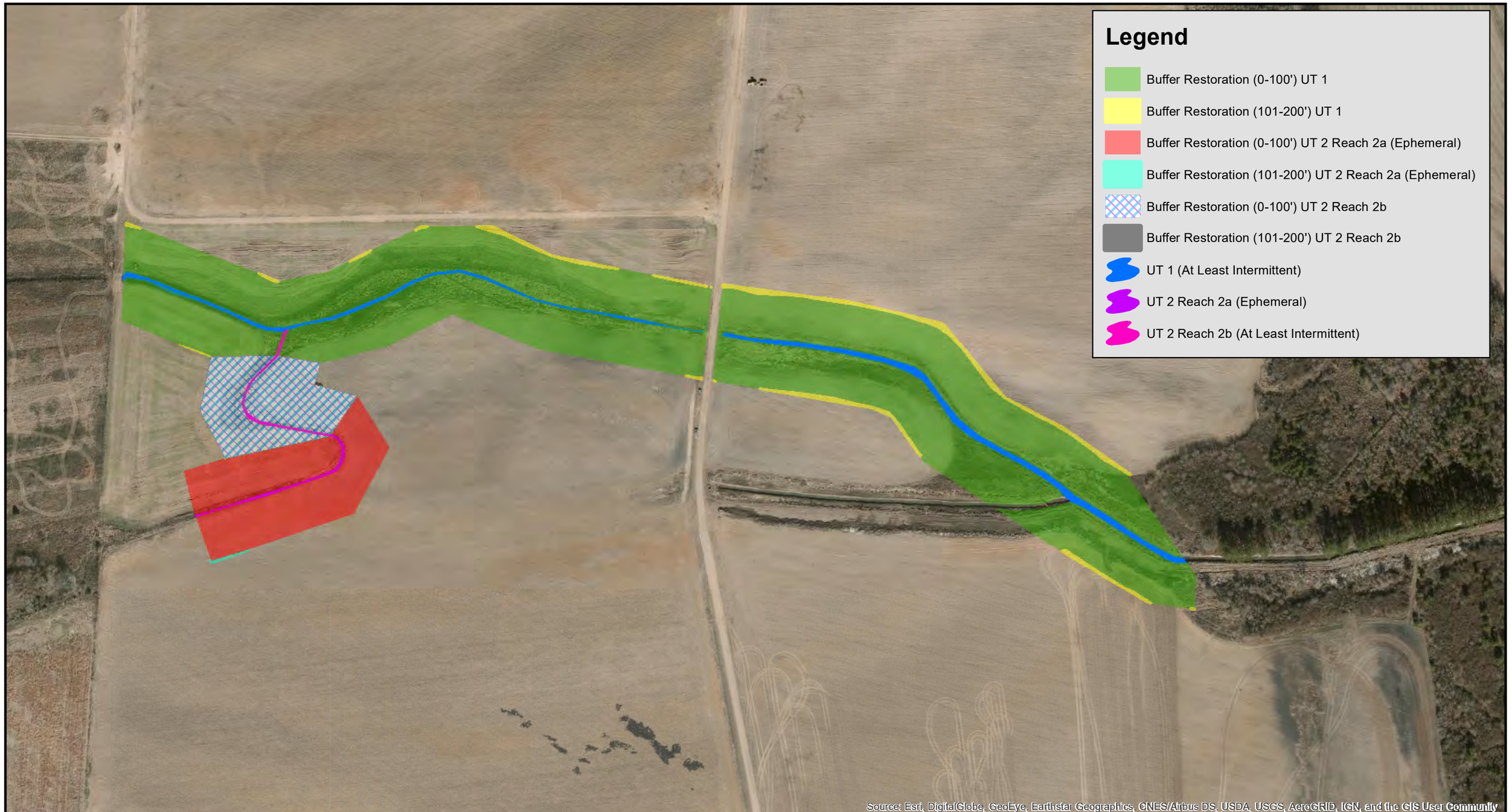
Vicinity Map
Boseman Buffer Mitigation Site
Annual Monitoring Report (MY2)
Tar-Pamlico 03020101
Edgecombe County, North Carolina
December 2021

2013 Hartsease USGS Quadrangle

N

1,200 600 0 1,200
Feet

Figure 1



Project Component/Asset Map
Boseman Buffer Mitigation Site
Annual Monitoring Report (MY2)
Tar-Pamlico 03020101
Edgecombe County, North Carolina
December 2021
2017 Aerial from NCOneMap

N

200 100 0 200
Feet

Figure 2

Legend

- Vegetation Plot (N=12)
- Photo Points
- Conservation Easement 14.9 acres
- UT 1 (At Least Intermittent)
- UT 2 Reach 2a (Ephemeral)
- UT 2 Reach 2b (At Least Intermittent)
- Buffer Restoration (0-100') UT 1
- Buffer Restoration (101-200') UT 1
- Buffer Restoration (0-100') UT 2 Reach 2a (Ephemeral)
- Buffer Restoration (101-200') UT 2 Reach 2a (Ephemeral)
- Buffer Restoration (0-100') UT 2 Reach 2b
- Buffer Restoration (101-200') UT 2 Reach 2b

Origin Latitude/Longitude (Decimal Degrees)		
Plot Number	Y Coordinate	X Coordinate
1	35.96294899	-77.70073591
2	35.96341822	-77.70147906
3	35.96396443	-77.70243013
4	35.964284	-77.70433461
5	35.96448024	-77.70544498
6	35.96394198	-77.70670793
7	35.96322236	-77.7070397
8	35.96440173	-77.70664643
9	35.96480553	-77.70528385
10	35.96433174	-77.70271205
11	35.96408549	-77.70191544
12	35.9635377	-77.70111746

Note: Vegetation Plot photos are from the origin of the vegetation plot. The origin is located in the southwest corner of each plot.

Pp 8 Pp 9 Pp 10 Pp 11 Pp 4 Pp 3 Pp 2 Pp 12 Pp 7 Pp 5 Pp 6 Pp 1

8 9 5 4 10 11 6 3 12 2 7 1

NC Center for Geographic Information & Analysis

Current Condition Monitoring Plan View
Boseman Buffer Mitigation Site
Annual Monitoring Report (MY2)
Tar-Pamlico 03020101
Edgecombe County, North Carolina
December 2021

2017 Aerial from NCOneMap

N

200 100 0 200
Feet

Figure 3

Table 1: Buffer Project Attributes
Boseman Buffer Mitigation Site
DMS ID No. 100119
DWR Project No. 2019-0800
Monitoring Year 2 – 2021

Project Name	Boseman Buffer Mitigation Site
Hydrologic Unit Code	03020101
River Basin	Tar-Pamlico
Geographic Location (decimal degrees)	35.96451, -77.705926
Site Protection Instrument (BK, PG)	1707/675
Total Credits (BMU)	617,518.702
Types of Credits	Riparian Buffer
Mitigation Plan Date	January 2020
Initial Planting Date	March 2020
Baseline Report Date	May 2020
MY1 Report Date	December 2020
Supplemental Planting Date	February 2021
MY2 Report Date	December 2021
MY3 Report Date	December 2022
MY 4 Report Date	December 2023
MY 5 Report Date	December 2024
Close out Report Date/Visit	May 2025

Table 2: Buffer Project Components and Assets

Boseman Buffer Mitigation Site

DMS ID No. 100119

DWR Project No. 2019-0800

Monitoring Year 2 – 2021

BOSEMAN BUFFER MITIGATION SITE, PROJECT NO. 2019-0800, 617,518.702 CREDITS

Tar-Pamlico 03020101	**Project Area**
19.16394	**N Credit Conversion Ratio (ft^2/pound)**
297.54099	**P Credit Conversion Ratio (ft^2/pound)**

Credit Type	Location	Subject? (enter NO if ephemeral or ditch [1])	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (ft^2)	Total (Creditable) Area of Buffer Mitigation (ft^2)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Convertible to Riparian Buffer?	Riparian Buffer Credits	Convertible to Nutrient Offset?	Delivered Nutrient Offset: N (lbs)	Delivered Nutrient Offset: P (lbs)
Buffer	Rural	Yes	I / P	Restoration	0-100	UT1	484,072	484,072	1	100%	1.00000	Yes	484,072.000	N/A	0.000	0.000
Buffer	Rural	Yes	I / P	Restoration	101-200	UT1	6,496	6,496	1	33%	3.03030	Yes	2,143.682	N/A	0.000	0.000
Buffer	Rural	No	Ephemeral	Restoration	0-100	UT2 (Reach 2a)	78,631	78,631	1	100%	1.00000	Yes	78,631.000	N/A	0.000	0.000
Buffer	Rural	No	Ephemeral	Restoration	101-200	UT2 (Reach 2a)	82	82	1	33%	3.03030	Yes	27.060	N/A	0.000	0.000
Buffer	Rural	Yes	I / P	Restoration	0-100	UT2 (Reach 2b)	52,641	52,641	1	100%	1.00000	Yes	52,641.000	N/A	0.000	0.000
Buffer	Rural	Yes	I / P	Restoration	101-200	UT2 (Reach 2b)	12	12	1	33%	3.03030	Yes	3.960	N/A	0.000	0.000
						Totals:	621,934	621,934								

Enter Preservation Credits Below

Eligible for Preservation (ft^2): 207,311

Credit Type	Location	Subject?	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (sf)	Total (Creditable) Area for Buffer Mitigation (ft^2)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits
Buffer				Preservation								–
												–

Preservation Area Subtotal (ft^2):	0
Preservation as % Total Area of Buffer Mitigation:	0.0%
Ephemeral Reaches as % Total Area of Buffer Mitigation:	12.7%

TOTAL AREA OF BUFFER MITIGATION (TABM)		
Mitigation Totals	**Square Feet**	**Credits**
Restoration:	621,934	617,518.702
Enhancement:	0	0.000
Preservation:	0	0.000
Total Riparian Buffer:	621,934	617,518.702
TOTAL NUTRIENT OFFSET MITIGATION		
Mitigation Totals	**Square Feet**	**Credits**
Nutrient Offset: Nitrogen:	0	0.000
Nutrient Offset: Phosphorus:		0.000

1. The Randleman Lake buffer rules allow some ditches to be classified as subject according to 15A NCAC 02B .0250 (5)(a).

last updated 01/17/2020

APPENDIX 2

SITE PHOTOGRAPHS

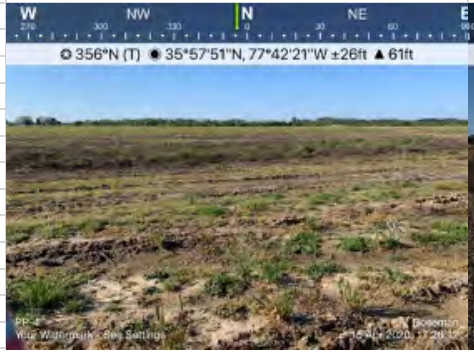
Photo Location	Baseline 2020	MY1 2020	MY2 2021
Pp1			
Pp2			
Pp3			
Pp4			

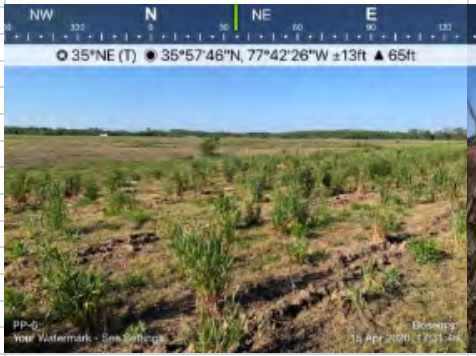
Photo Location	Baseline 2020	MY1 2020	MY2 2021
Pp5			
Pp6			
Pp7			
Pp8			

Photo Location	Baseline 2020	MY1 2020	MY2 2021
Pp9			
Pp10			
Pp11			
Pp12			

APPENDIX 3

VEGETATION PLOT DATA
VEGETATION PLOT PHOTOGRAPHS

Photo Location	Baseline 2020	MY1 2020	MY2 2021
MP1			
MP2			
MP3			
MP4			

Photo Location	Baseline 2020	MY1 2020	MY2 2021
MP5			
MP6			
MP7			
MP8			

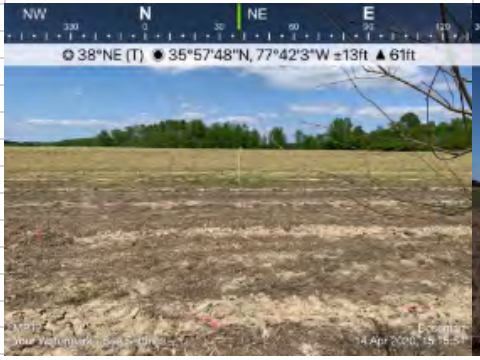
Photo Location	Baseline 2020	MY1 2020	MY2 2021
MP9			
MP10			
MP11			
MP12			

Table 3: Planted and Total Stems

Boseman Buffer Mitigation Site
DMS ID No. 100119
DWR Project No. 2019-0800
Monitoring Year 2 – 2021

		Current Plot Data (MY-2 2021) - Total Stems													Annual Means		
Scientific Name	**Common Name**	**Species Type**	**MP1**	**MP2**	**MP3**	**MP4**	**MP5**	**MP6**	**MP7**	**MP8**	**MP9**	**MP10**	**MP11**	**MP12**	**MY2**	**MY1**	**MY0**
Betula nigra	river birch	Tree	1	2	4	2	2	3			1	2	4	1	22	2	
Cornus amomum	silky dogwood	Tree		7					4	1					12	14	24
Diospyros virginiana	persimmon	Tree	1	1	2			3	2			2	2	4	17	2	
Fraxinus pennsylvanica	green ash	Tree								2	2				4	4	4
Nyssa aquatica	swamp blackgum	Tree				2	4			1					7	5	10
Platanus occidentalis	sycamore	Tree	2	2	10			2	1	5	1	3	1	4	31	2	
Quercus laurifolia	laurel oak	Tree		1				2	1			1		1	6	17	19
Quercus lyrata	overcup oak	Tree				8	4		5	3		1			21	23	25
Quercus nigra	water oak	Tree	3	3	4			2	1		4	5	4	1	27	24	34
Quercus pagoda	cherry bark oak	Tree	1	2	2		1	2	2	2		1	1	3	17	2	
Quercus phellos	willow oak	Tree	1	3	1	1		10	5	3	1	6	8	10	49	59	75
Quercus shuardii	shumard oak	Tree	1	4	3	1	1	2	2	4	1		1	1	21	5	
Taxodium distichum	bald-cypress	Tree				6	2			2	1				11	1	
Cephalanthus occidentalis	buttonbush	Shrub															
		Stem Count	10	25	26	20	14	26	23	23	11	21	21	25	245	160	191
		Species #	7	9	7	6	6	8	9	9	7	8	7	8	14	9	7
		Vigor	3.8	3.7	3.9	3.8	3.9	3.7	3.1	4	2.6	3.6	3.8	3.7	3.6	2.8	3.8
		Height (cm)	72.9	72.4	70.7	94.0	96.3	65.2	47.2	88.6	75.7	73.0	64.3	69.2	74.1	42.1	47.0
		Stems/ac	405	1012	1052	809	567	1052	931	931	445	850	850	1012	826	540	644
		Total Stems:	245														
		Total Acres:	0.30		Exceeds criteria (260 stems/ac) by 10%												
		Total Avg Vigor:	8.1		Exceeds criteria (260 stems/ac), but by less than 10%												
		Total Avg Height (cm):	3.6		Fails to meet criteria (260 stems/ac), by less than 10%												
		Total Avg Stems/ac:	826		Fails to meet criteria (260 stems/ac) by more than 10%												
					Plot Size (ares/ac):	1 / 0.0247											

Boseman Buffer Mitigation Site Aerial - MY2 (November 2021)

West Project Side

Boseman Buffer Mitigation Site Aerial - MY2 (November 2021)

East Project Side