Annual Monitoring Report (MY1)

KINGFIELD BUFFER MITIGATION SITE

Jones County, NC
NCDEQ Contract No. 0103-01
DMS ID No. 100176
DWR Project No. 2021-0020v2
RFP No. 16-20200103

Prepared for:

Mitigation Services
ENVIRONMENTAL QUALITY

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

November 2022

MEMO
Emily Dunnigan, DMS

January 20, 2023

Subject: Task 5 Draft Year 1 Monitoring Report Comments – Kingfield Buffer Mitigation Project (DMS #100176)
Neuse River 03020204; Jones County, NC
Contract No. 0103-01

On November 23, 2022, DMS received the Draft Year 1 Monitoring Report for the Kingfield Buffer Mitigation Project from Eco Terra. DMS has completed our review of the draft report and has the following comments:

1. Page 3, Section 4.2: Change baseline monitoring to Year 1 monitoring report.
This has been corrected.

2. Page 3, Section 4.3: What is the acreage of the low stem areas? Please include in report and add to the CCPV legend.
Approximately 1.93 acres. This has been added to Section 4.3 and in the updated CCPV.

3. The Mitigation Plan states "…Rule 15A NCAC 02B .0295 of 260 trees per acre at the end of five years." If that is the correct performance standard, then all plots on site are meeting the requirements. Please add in performance standard language to the report and make any necessary changes. Update color coding for performance criteria in Table 3.
That is correct – all plots onsite met success criteria. Table 3 color coding has been updated.

4. Figure 1: Does the red centerline of the stream represent the easement or is that the surveyed stream? Please add the surveyed stream to the CCPV legend if that is the case and differentiate the easement from the stream.
The Site encompasses three CEs each outlined in a red polygon. CE polygons follow the thalweg of UT1 and Musselshell Creek, and the surveyed thalweg linework has been included in the updated CCPV (see legend). The surveyed stream TOB polygon is shown in blue.

5. During the site visit on January 5th, multiple areas were identified for additional easement marking. As discussed in the field, mowing along the inside of the easement on the edge near UT1 must cease. Please add additional marking and provide photo documentation of completed work with the final report.
Additional easement marking will be added during MY2 around the time of supplemental planting to address areas of low stem density affected by knotweed.

Please let us know if you have any further comments or questions related to the MY1 Annual Report. We look forward to working with you and ensuring a successful project moving forward.

Regards,

D. Norton Webster, Eco Terra

ANNUAL MONITORING REPORT (MY1)

KINGFIELD BUFFER MITIGATION SITE

Jones County, NC
NCDEQ Contract No. 0103-01
DMS ID No. 100176

Neuse River Basin
HUC 03020204

Prepared For:

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

Prepared By:

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Cary, NC 27513
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This Baseline Monitoring Plan 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
- 15A NCAC 02B.0703 Nutrient Offset Credit Trading

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

Contributing Staff

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QA/QC

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APPENDICES

1.0 Mitigation Project Summary

The Kingfield Buffer Mitigation Site (Site) is a buffer restoration project located approximately 3.4 miles northeast of Trenton in Jones County, NC. The Project is located within the Neuse River basin, 14-digit hydrologic unit code (HUC) 03020204010071. The Site comprises approximately 8.59 acres along an unnamed tributary (UT) to Musselshell Creek in the Crooked Creek targeted watershed (HUC 03020204010070) that drains into the Neuse River. Located within North Carolina Division of Mitigation Services (DMS) identified Hydrology and Water Quality Targeted Resource Areas (TRA), the Site has been implemented along a Class C, Sw, NSW, 303(d)-listed water impaired for aquatic life and ecological and biological integrity, according to the North Carolina Department of Environmental Quality (DEQ) 303(d) Final List (2022). According to the as-built survey and Division of Water Resources (DWR) Buffer Mitigation Calculation Tool v3 (updated August 2020), the Site is expected to generate 315,430.000 buffer mitigation units (BMU) (Appendix 1: Table 2).

1.1 Project Goals

The major goals of the Site are to address agricultural runoff, including nutrients and sediment, protect the project site in perpetuity, and restore terrestrial habitat. The Site will reduce future sediment and nutrient loading into Crooked Creek watershed and the Neuse River downstream. It will also improve terrestrial habitats along this stream by establishing a riparian corridor and allowing the land to convert to forested communities.

The project goals and objectives are consistent with those of the DMS, and the specific goals outlined in the 2018 Neuse River Basin Restoration Priorities (RBRP). As proposed, the Kingfield Buffer Mitigation Site will further help DMS to meet these goals.

1.2 Existing Site Conditions

The Site is located within three parcels (~135 acres) currently used for agricultural row crop production and animal pasture. Adjacent land use includes pasture and row crop agriculture. Additionally, minimal vegetated buffer exists within the Site along the length of the UT to Musselshell Creek (UT1) as well as Musselshell Creek proper.

The project was successfully planted with appropriate trees and herbaceous vegetation and is now at the end of the first (1st) full growing season and early stages of successful buffer restoration. The project restored forested riparian buffers and adjacent riparian

areas to a maximum of approximately 100 feet from the top-of-bank of both streams and removed rotating crops and fertilizer inputs.

The restored Neuse 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

Vegetative success criteria was confirmed at all plots, with Plot 3 stem density being notably lower than most accompanying monitoring plots (Table 3). Low stem densities were noted as depicted in Figure 1. Supplemental planting of approved trees and herbaceous competition management will be accomplished during 2023 winter/spring seasons in order to ensure future project success.

2.0 Regulatory Considerations

Riparian buffer and adjacent riparian area restoration was accomplished in accordance with the Consolidated Buffer Mitigation Rule (15A NCAC 02B .0295) and the Nutrient Offset Credit Trading Rule (15A NCAC 02B .0703). All areas within 100+ linear feet of the top-of-bank of subject streams as measure from the top-of-bank landward were planted and devoted to generating riparian buffer mitigation credits. Areas designated for future nutrient offset conversion were planted similarly at a minimum 50 linear feet of the top of bank. Mitigation credits generated are listed in Table 2 and are based upon the DWR Buffer Mitigation Calculation Tool v3 (October 2020) (Appendix 1).

3.0 Project Construction Summary

Site construction was completed in February 2022, 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

In accordance with the Mitigation Plan, restoration of the riparian areas involved planting bare root one- and two-year old trees in planting zones specific to soil and site conditions. A combination of machine and manual planting techniques were used depending on site conditions. Approximately 6,900 stems (803 stems/acre) were planted within the riparian areas designated for restoration.

4.0 Annual Monitoring and Performance Criteria

The Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers (15A NCAC 02B .0295) and RFP 16-20200208 set forth specific performance criteria for the successful development and close-out of the 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. The CCPV (Figure 1) illustrates the location of project easement, permanent vegetation plots/photo points, as well as overall site photo points.

4.1 Vegetation

Seven 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 the CVS-EEP Level I Protocol for Recording Vegetation, v4.2 (2008). First year monitoring (MY1) vegetation stem data is included in Appendix 3: Table 3. All vegetation plots met success criteria for stem densities, averaging 549 stems/ac; overall tree vigor, averaging 3.8; and overall tree height, averaging 60.6 cm.

4.2 Photo Reference Stations

Site reference photo points were taken at designated points along the conservation easement boundary, providing an overall view of project success (Appendix 2). Individual plot photos were taken at the approximate southwest corner (origin) of each plot and are included in Appendix 3. All photo points were located by survey and georeferenced for map production to provide a consistent means for photo replication annually, or in the event a plot or photo location must be reestablished during the monitoring 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. Initial implementation and planting of the Site resulted in a density of 803 stems/acre. However, native trees are needed to supplement approximately 1.93 acres of low tree density due to aggressive herbaceous competition (Figure 1). Biannual visual assessments will continue in order to appropriately monitor changing site conditions and address any issues to ensure Site success and performance criteria are met in

subsequent monitoring years. Any additional Site problems will be noted and discussed in the annual reports, addressed in a remedial action plan if necessary, 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/DWR 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.

15A NCAC 02B .0703 Nutrient Offset Trading. 2020.

NC Department of Water Resources. Methodology for Determining Nutrient Reductions Associated with Riparian Buffer Establishment. 1998.

NC Department of Water Resources. Buffer Interpretation/Clarification #2008-019 Memorandum. August 19, 2008.

NC Department of Environmental Quality. Division of Water Resources. Clarified Procedures for Calculating Buffer Mitigation Credits & Nutrient Offset Credits for Riparian Projects Regulated under 15A NCAC 02B .0295 and 15A NCAC 02B .0240. November 21, 2019.

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

NC Department of Environmental Quality. Division of Mitigation Services. 2017. Riparian Buffer and Nutrient Offset Buffer Baseline and Annual Monitoring Report Template Version 2.0.

NC Department of Environmental Quality. Division of Mitigation Services. 2018. Tar-Pamlico River Basin Restoration Priorities.

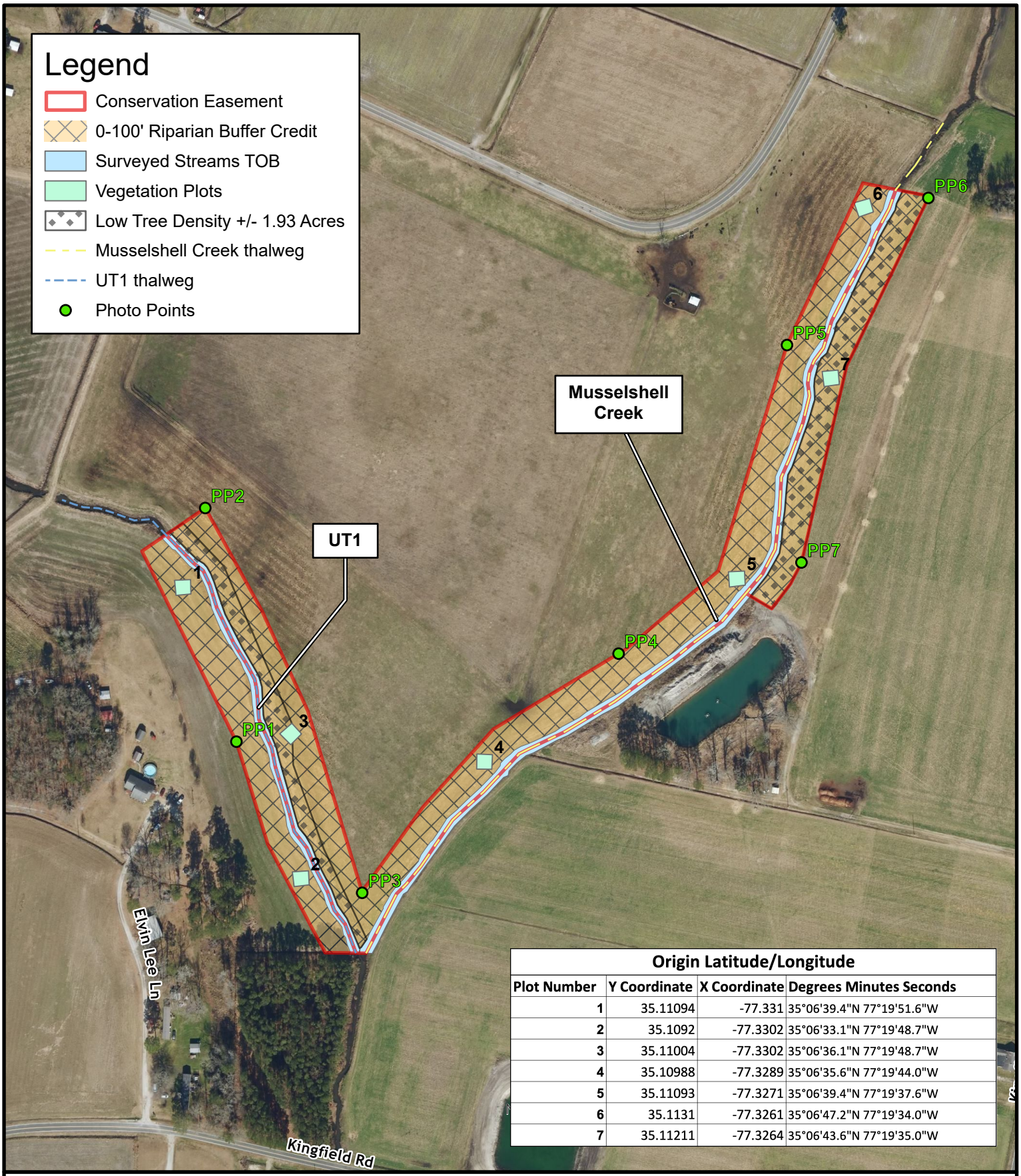
US Department of Agriculture. Natural Resources Conservation Service. 2021. Web Soil Survey. https://websoilsurvey.nrcs.usda.gov/app/. Accessed April 2021.

US Environmental Protection Agency. North Carolina Final 303(d) List. 2022. https://edocs.deq.nc.gov/WaterResources/DocView.aspx?dbid=0&id=2361776&cr=1. Published June 8, 2022.

US Geological Survey. 2013. Trenton. 1:24,000. North Carolina Topographic Quadrangle (7.5-minute series). Reston, VA: U.S. Department of the Interior, USGS, 2013.

APPENDIX 1

PROJECT DATA



Origin Latitude/Longitude			
Plot Number	Y Coordinate	X Coordinate	Degrees Minutes Seconds
1	35.11094	-77.331	35°06'39.4"N 77°19'51.6"W
2	35.1092	-77.3302	35°06'33.1"N 77°19'48.7"W
3	35.11004	-77.3302	35°06'36.1"N 77°19'48.7"W
4	35.10988	-77.3289	35°06'35.6"N 77°19'44.0"W
5	35.11093	-77.3271	35°06'39.4"N 77°19'37.6"W
6	35.1131	-77.3261	35°06'47.2"N 77°19'34.0"W
7	35.11211	-77.3264	35°06'43.6"N 77°19'35.0"W

Figure 1: Current Condition Plan View
Kingfield Buffer Mitigation Site
Neuse 03020204
Jones County, North Carolina
January 2023

NC Onemap 2021 Aerial Imagery

0 125 250 500 Feet

Table 1: Buffer Project Attributes
Kingfield Buffer Mitigation Site
DMS ID No. 100176
DWR Project No. 2021-0020v2
Monitoring Year 1 – 2022

Project Name	Kingfield Buffer Mitigation Site
Hydrologic Unit Code	03020204
River Basin	Neuse
Geographic Location (decimal degrees)	35.110000, -77.330000
Site Protection Instrument (BK, PG)	422/637-688
Types of Credits	Riparian Buffer (315,430.000)
Mitigation Plan Date	December 2021
Initial Planting Date	February 2022
Baseline Report Date	June 2022
MY1 Report Date	November 2022
MY2 Report Date	November 2023
MY3 Report Date	November 2024
MY4 Report Date	November 2025
MY5 Report Date	November 2026
Close out Report Date/Visit	May 2027

Table 2: Buffer Project Components and Assets

Kingfield Buffer Mitigation Site
DMS ID No. 100176
DWR Project No. 2021-0020v2
Monitoring Year 1 – 2022

Table 3. Kingfield Buffer Mitigation Site, DMS No: 100176, Project Credits: 315,430.000 BMU

Neuse 03020204	Project Area
19.16394	N Credit Conversion Ratio (ft²/pound)
N/A	P Credit Conversion Ratio (ft²/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 (ft²)	Total (Creditable) Area of Buffer Mitigation (ft²)	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	133,008	133,008	1	100%	1.00000	Yes	133,008.000	Yes	6,940.535	—
Buffer	Rural	Yes	I / P	Restoration	0-100	Musselshell Creek	182,422	182,422	1	100%	1.00000	Yes	182,422.000	Yes	9,519.024	—
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						Totals (ft2):	315,430	315,430					315,430.000		16,459.559	0.000
						Total Buffer (ft2):	315,430	315,430								
						Total Nutrient Offset (ft2):	0	N/A								
						Total Ephemeral Area (ft²) for Credit:	0	0								
						Total Eligible Ephemeral Area (ft²):	78,858	0.0%	Ephemeral Reaches as % TABM							
Enter Preservation Credits Below						Total Eligible for Preservation (ft²):	105,143	0.0%	Preservation as % TABM							

Credit Type	Location	Subject?	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (sf)	Total (Creditable) Area for Buffer Mitigation (ft²)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits
	Rural	Yes	I / P		0-100				10	100%		—
	Rural	Yes	Ephemeral		0-100				10	100%		—
												—
												—
												—
						Preservation Area Subtotals (ft²):	0	0				

TOTAL AREA OF BUFFER MITIGATION (TABM)			
Mitigation Totals		Square Feet	Credits
Restoration:		315,430	315,430.000
Enhancement:		0	0.000
Preservation:		0	0.000
Total Riparian Buffer:		315,430	315,430.000
TOTAL NUTRIENT OFFSET MITIGATION			
Mitigation Totals		Square Feet	Credits
Nutrient Offset:	Nitrogen:	0	0.000
	Phosphorus:		0.000

Credit conversions must be calculated using the guidance provided in the Clarified Procedures for Calculating Buffer Mitigation Credits and Nutrient Offset Credits letter issued by the DWR in November 2019 and located at: https://files.nc.gov/ncdeq/Water%20Quality/Surface%20Water%20Protection/401/Mitigation/Issues---Resolutions-Ver-1.0-buffer-mitigation-nutrient-offset.pdf

APPENDIX 2

SITE PHOTO-POINTS

Photo-Points

Kingfield Buffer Mitigation Site

DMS ID No. 100176

DWR Project No. 2021-0020v2

Photo Location	Baseline (MY0) 2022	MY1 2022
Pp1		
Pp2		
Pp3		
Pp4		

Photo Location	Baseline 2022	MY1 2022
Pp5		
Pp6		
Pp7		

APPENDIX 3

MONITORING PLOT DATA
MONITORING PLOT PHOTOGRAPHS

Table 3: Monitoring Plot Planted and Total Stems

Kingfield Buffer Mitigation Site

DMS ID No. 100176

DWR Project No. 2021-0020v2

Monitoring Year 1 – 2022

			Current Plot Data (MY1-2022)														Annual Summary	
			MP1		MP2		MP3		MP4		MP5		MP6		MP7		MY1	MY0
Scientific Name	Common Name	Species Type	P	T	P	T	P	T	P	T	P	T	P	T	P	T	2022	2022
Betula nigra	River Birch	Tree	1	1	1	1			1	1	2	2	1	1			6	10
Diospyros virginiana	Persimmon	Tree															0	6
Fraxinus pennsylvanica	Green Ash	Tree	3	3	3	3	1	1									7	8
Liriodendron tulipifera	Tulip Poplar	Tree	2	2					3	3	1	1					6	8
Quercus laurifolia	Laurel Oak	Tree			4	4			1	1	3	3	5	5	4	4	17	19
Quercus michauxii	Swamp Chestnut Oak	Tree	1	1	2	2	2	2	6	6	1	1	2	2	3	3	17	19
Quercus nigra	Water Oak	Tree	2	2					1	1	5	5	4	4	2	2	14	12
Quercus phellos	Willow Oak	Tree	1	1	3	3	1	1	2	2	2	2	1	1	4	4	14	13
Quercus shumardii	Shumard Oak	Shrub Tree	1	1			2	2			1	1	3	3			7	8
Taxodium distichum	Bald-cypress	Tree	1	1	2	2	1	1	2	2	1	1					7	12
		Stem count	12	12	15	15	7	7	16	16	16	16	16	16	13	13	95	115
		size (ares)		1		1		1		1		1		1		1	7	13
		Size (acres)		0.02		0.02		0.02		0.02		0.02		0.02		0.02	0.17	0.17
		Species count		8		6		5		7		8		6		4	10	10
		Vigor		3.3		3.9		3.9		4		3.9		4		3.8	3.8	4
		Height (cm)		62.9		53.3		55.7		61.9		69.7		60.9		59.6	60.6	44.1
		Stems/acre		486		607		283		647		647		647		526	549	665

Color for Density	
Exceeds requirements by 10%	
Exceeds requirements, but by less than 10%	
Fails to meet requirements, by less than 10%	
Fails to meet requirements by more than 10%	
Plot Size (ares/ac):	1 / 0.0247
P: planted stems	
T: total stems	

Monitoring Plots
Kingfield Buffer Mitigation Site
DMS ID No. 100176
DWR Project No. 2021-0020v2

Photo Location	Baseline (MY0) 2022	MY1 2022
MP1		
MP2		
MP3		
MP4		

Photo Location	Baseline 2022	MY1 2022
MP5		
MP6		
MP7		

Site post construction (October 2022)