



# Baseline Monitoring Report

March 2023

## Little River Ford Mitigation Site

Johnston County, NC  
NCDEQ Contract No. 0402-09  
DMS ID No. 100182  
DWR No. 2021-0112v2

Neuse River Basin  
HUC 03020201

RFP #: 16-20200402

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PREPARED FOR:



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



March 20, 2023

Ms. Emily Dunnigan  
Project Manager  
NCDEQ- Division of Mitigation Services  
217 West Jones Street  
Raleigh, NC 27603

Subject: MYO Report Review  
Little River Ford Mitigation Site, Johnston County  
Neuse River Basin: 03020201  
DMS Project ID No. 100182  
DEQ Contract # 0402-09

Dear Ms. Dunnigan:

On March 15, 2023, Wildlands Engineering received comments from the North Carolina Division of Mitigation Services (DMS) regarding the Draft As-Built Baseline Report dated March 10, 2023. The following letter documents DMS feedback and Wildlands' corresponding responses and revisions to the As-Built Report.

**Please update the CCPV with a zoomed in area of the nutrient offset along Ditch A, it's difficult to see on the map.**

*Response: The update has been made.*

**The Mitigation Plan stated tilling and soil testing would be completed prior to planting. Please include a discussion of these activities in the narrative.**

*Response: Soil compaction was assessed prior to planting, and it was determined that tilling was no longer necessary. Additionally, tobacco crops were previously planted on-site, which included tilling at the time of crop planting to break up any plowing pan which may have been present. Furthermore, volunteer vegetation began to appear prior to planting, further indicating that soil compaction was not an issue. Soil testing for various nutrient and mineral levels will be performed in the spring of 2023. The update has been made to the narrative.*

**Wildlands is under contract to provide 369,078.600 riparian buffer credits. The Baseline Report indicates that the site will only provide 355,765.834 riparian buffer credits, a shortfall of 13,312.77 credits. The Task 4 payment should be 65,326.91 (15% of the total contract value). However, the 13,312.77 buffer shortfall below the contracted amount reduces the contract value by \$15,709.06 (at\$1.18/buffer credit). In order to reconcile the difference resulting from the 13,312.77 buffer credit shortfall, please adjust the Task 4 payment downward to a revised amount of \$49,617.85.**

*Response: The Task 4 payment amount is revised to the amount of \$49,617.85.*

Sincerely,

A handwritten signature in black ink, appearing to read "Jason Lorch".

**Jason Lorch, Monitoring Coordinator**

PREPARED BY:

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**Wildlands Engineering, Inc.**  
312 W Millbrook Road, Suite 225  
Raleigh, NC 27609  
Phone: (919) 851-9986

**This Mitigation 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 Payments
- NCDEQ Division of Mitigation Services In-Lieu Fee Instrument signed and dated July 28, 2010.

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

**Contributing Staff:**

Andrea Eckardt, *Project Manager*  
John Hutton, *Principal in Charge*  
Kaitlyn Hogarth, *Baseline Monitoring Plan*

Daniel Taylor, *Construction Administrator*  
Kaitlyn Hogarth, *Monitoring Lead*  
Jason Lorch, *Lead Quality Assurance*

## TABLE OF CONTENTS

<b>1.0</b>	<b>Mitigation Project Summary</b> .....	<b>1</b>
1.1	Project Goals.....	1
1.2	Pre-construction Site Conditions.....	2
<b>2.0</b>	<b>Determination of Credits</b> .....	<b>2</b>
<b>3.0</b>	<b>Baseline Summary</b> .....	<b>2</b>
3.1	Parcel Preparation .....	2
3.2	Riparian Area Restoration Activities.....	3
<b>4.0</b>	<b>Annual Monitoring and Performance Criteria</b> .....	<b>3</b>
4.1	Overview Photographs .....	3
4.2	Visual Assessments.....	3
4.3	Annual Reporting Performance Criteria .....	4
4.4	Maintenance and Contingency Plans .....	4
<b>5.0</b>	<b>References</b> .....	<b>4</b>

## APPENDICES

### **Appendix 1**      **General Figures and Tables**

Figure 1	Vicinity Map
Figure 2	Credit Service Area Map
Figure 3	Project Component/Asset Map
Figure 4	Monitoring Plan View Map
Table 1	Project Attributes
Table 2	Planted Tree Species
Table 3	Project Areas and Assets
Table 4	Monitoring Components

### **Appendix 2**      **DWR Correspondence**

NC Division of Water Resources Site Viability for Buffer Mitigation and Nutrient Offset Letter – July 27, 2021

### **Appendix 3**      **As-Built Survey**

### **Appendix 4**      **Overview Photographs**

Overview Photographs

### **Appendix 5**      **Vegetation Plot Data**

Table 5	Vegetation Plot Data
Table 6	Vegetation Performance Standards Summary Table
	Vegetation Plot Photographs
	Erosion Stabilization Photographs



## 1.0 Mitigation Project Summary

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The Little River Ford Mitigation Site (Site) is in Johnston County approximately four miles west of the Town of Kenly (Figure 1). The Site involves riparian restoration and preservation on two unnamed tributaries (UT1 and UT2) and one ditch (Ditch A) that flow to the Little River. The Site has been completed for buffer mitigation credit and nutrient offset credit in the Neuse River Basin Hydrologic Unit Code (HUC) 03020201, in accordance with the Consolidated Buffer Mitigation Rules (15A NCAC 02B .0295) and the Nutrient Offset Payments Rule (15A NCAC 02B .0703). See Figure 2 for the Service Area of the Site. The Site is expected to generate 355,765.834 riparian buffer credits and 57.756 nutrient offset credits.

The project is located within the Neuse River Basin HUC 03020201180060, and North Carolina Division of Water Resources (NCDWR) Subbasin 03-04-06. Project streams flow into the Little River, which is classified as Nutrient Sensitive Waters (NSW) by the NCDWR. The proposed project supports specific goals identified in the 2018 Neuse Basin Restoration Priorities Plan (RBRP) by promoting “nutrient and sediment reduction in agricultural areas by restoring and preserving wetlands, streams and riparian buffers.”

### 1.1 Project Goals

The major goals of the riparian restoration project are to provide ecological and water quality enhancements to the Neuse River Basin by creating a functional riparian corridor and restoring the riparian area.

This buffer restoration project will reduce sediment and nutrient loading, provide and improve terrestrial and in stream habitats, and improve stream and bank stability. The area surrounding the streams was previously agricultural fields, typically used to grow hay, soybeans, and cotton. Restoring up to 100 feet of vegetative buffer along the channels has removed the crops and fertilizer inputs within the project area. The restored floodplain areas will assist in filtering sediment during high rainfall events. The establishment of riparian areas will create shading to minimize thermal heating. Finally, invasive vegetation will be treated within the project area and the newly planted native vegetation will provide cover and food for wildlife. Specific enhancements to water quality and ecological processes are outlined below.

- Decrease nutrient levels by filtering runoff from the agricultural fields through restored native buffer zones. The off-site nutrient input will also be absorbed on-site by filtering flood flows through restored floodplain areas, where flood flows can disperse through native vegetation.
- Sediment from off-site sources will be captured by deposition on restored floodplain areas where native vegetation will slow overland flow velocities. Planted vegetation will help stabilize streams.
- Decrease water temperature and increase dissolved oxygen concentrations with the establishment and maintenance of riparian areas creating additional long-term shading of the channel flow to reduce thermal pollution.
- Establishment of a riparian area that will slow flood flows and allow for greater infiltration, reducing peak flows downstream.
- Create appropriate terrestrial habitat by removing invasive vegetation and planting native vegetation.
- Diffuse flow will be maintained throughout the conservation easement area where possible, thereby reducing erosion and filtering of nutrients into the project features.



- Permanently protect the project Site from harmful uses by establishing a conservation easement on the Site that will protect the riparian corridor in perpetuity.

## 1.2 Pre-construction Site Conditions

Prior to construction, the Site was primarily agricultural fields located on five parcels. The project included the restoration of riparian areas along two unnamed tributaries and one ditch: UT1, UT2, and Ditch A (Figure 3).

UT1 and UT2 had areas of established forest, which remain. Ditch A was completely surrounded by agricultural fields, while UT1 was surrounded by agricultural fields in areas where existing forest was not present. The downstream section of UT1 is within a forested area protected by a permanent conservation easement held by Triangle Land Conservancy (TLC). The TLC easement protects UT1 to its confluence with the Little River. Overview photos are shown in Appendix 4.

On July 14, 2021, NCDWR conducted on-site determinations to review features and land use within the project boundary. The resulting NCDWR site viability letter and map confirmed the three project features on-Site are suitable for riparian buffer credit pursuant to 15A NCAC 02B .0295 and for nutrient offset mitigation per 15A NCAC 02B .0703. The Site Viability letter from NCDWR is in Appendix 2.

## 2.0 Determination of Credits

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Mitigation credits are presented in Table 3 and Figure 3 in Appendix 1 and are based upon the as-built survey included in Appendix 3. Slight deviations from the Little River Ford Mitigation Plan occurred as a result of improved accuracy that the as-built survey provides in comparison to estimates obtained from GIS software. Additionally, further deviations resulted from a correction made to the creditable area along Ditch A. Within the Mitigation Plan a portion of forested buffer along the right side of Ditch A was included as riparian preservation for buffer credit. This area was corrected to be not-for-credit. Additionally, an area along the left side of Ditch A that was outside of the 0-50' buffer zone was included within the square footage of restoration for buffer credit but has been corrected to be counted toward nutrient offset credit. The following changes resulted in nitrogen offset credits increasing from 14.037 pounds to 57.756 pounds. Total riparian buffer credits changed from 356,808.856 square feet to 355,765.834 square feet.

## 3.0 Baseline Summary

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Wildlands restored high quality riparian areas along UT1, UT2, and Ditch A. The project design ensured that no adverse impacts to existing riparian buffers occurred. Figure 3 illustrates the credit zones for the Site. Detailed descriptions of the restoration activity follow in Sections 3.1 and 3.2. Overview photographs are included in Appendix 4.

### 3.1 Parcel Preparation

Prior to planting, the buffer restoration area was occupied by agricultural fields, mainly used to produce hay, cotton, and soybeans. The mitigation plan states that soil tilling would be performed prior to planting, however, soil compaction was assessed, and tilling was determined too no longer be necessary. Additionally, tobacco crops were previously planted on-site, which included tilling at the time of crop planting to break up any plowing pan which may have been present. Furthermore, volunteer vegetation began to appear prior to planting, further indicating that soil compaction was not an issue. Soil testing for various nutrient and mineral levels will be performed in the spring of 2023. Any areas of deficient herbaceous cover will be seeded in the spring of 2023 with a mix of warm season cover crops and permanent species seed. Within isolated areas along UT1 banks were stabilized using live stakes.





Along both UT1 and Ditch A erosional rills were addressed by placing straw bales adjacent to the area of concern to diffuse overland flow, thereby preventing further rill erosion until vegetation becomes established on Site. Photographs taken following the erosion stabilization can be found in Appendix 5.

### **3.2 Riparian Area Restoration Activities**

Riparian area restoration involved planting appropriate native tree species along the riparian corridor. Revegetation efforts will be coupled with controlling invasive species population as deemed necessary. The species composition planted was selected based on the community type, observation of occurrence of species in riparian areas adjacent to the Site, best professional judgement on species establishment, and anticipated Site conditions in the early years following project implementation. See Table 2 in Appendix 1 for a list of tree species planted along with their composition at planting. Trees were planted at a density sufficient to meet the performance standards outlined in the Rule 15A NCAC 02B .0295 of 260 trees per acre at the end of five years. No one tree species planted was greater than 50% of the established stems. Planting was completed on December 30, 2022.

Vegetation management and herbicide applications will be implemented as needed during tree establishment in restoration areas to prevent establishment of invasive species that could compete with the planted native species.

## **4.0 Annual Monitoring and Performance Criteria**

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The performance criteria for the Site follows approved performance criteria presented in the guidance documents outlined in RFP 16-20200402 and the Consolidated Buffer Rule (15A NCAC 02B .0295). Annual monitoring and semi-annual Site visits will be conducted to assess the condition of the finished project. The buffer restoration project has been assigned specific performance criteria components for vegetation. Performance criteria will be evaluated throughout the five-year post-construction monitoring. An outline of the performance criteria and monitoring components follows and are depicted in Figure 4 and included in Table 4, located in Appendix 1.

The final vegetative success criteria will be the survival of 260 planted stems per acre in the riparian corridor at the end of the required five-year monitoring period. The extent of invasive species coverage will also be monitored and treated as necessary throughout the required monitoring period.

Seven vegetation monitoring plots were installed across the Site to measure the survival of the planted stems (Figure 4). Vegetation monitoring will follow the CVS-EEP Level 2 Protocol for Recording Vegetation (2008). Reference photographs of the vegetation plots and Site will be taken during the annual vegetation assessments, planted stems will be flagged annually to discern in the provided photos. Appendix 5 includes the baseline (MY0) vegetation plot photographs and the planted and total stem counts.

### **4.1 Overview Photographs**

Photographs will be taken of the project area once a year to visually document stability for five years following construction. A drone will be used to document the project's overall vegetative growth and ground cover. Overview photographs are shown in Appendix 4.

### **4.2 Visual Assessments**

Visual assessments should support the specific performance standards for each metric as described above. Visual assessments will be performed within the Site on a semi-annual basis during the five-year monitoring period. Problem areas with vegetative health will be noted (e.g. low stem density, vegetation mortality, invasive species or encroachment). Areas of concern will be mapped and photographed, and accompanied by a written description in the annual report. Problem areas will be re-evaluated during each subsequent visual assessment.



#### **4.3 Annual Reporting Performance Criteria**

Using the DMS Riparian Buffer and Nutrient Offset Buffer Baseline and Annual Monitoring Report Template version 2.0 (May 2017), monitoring reports will be prepared in the fall of each monitoring year and submitted to DMS. Annual monitoring reports will be based on the above referenced DMS Template (May 2017). The monitoring period will extend five years beyond completion of construction or until performance criteria have been met.

#### **4.4 Maintenance and Contingency Plans**

The Site boundary was properly marked with NCDMS placards approximately every 100 feet. Directly outside the NCDMS Little River Ford Mitigation Site exists the Little River Ford II Mitigation Bank Parcel, which extends the riparian corridor out to 200 feet from project channels. Adaptive management will be performed during the monitoring years to address issues as necessary. If, during annual monitoring it is determined the Site's ability to achieve Site performance standards are jeopardized, Wildlands will notify the members of DMS/NCDWR and work with them to develop contingency plans and remedial actions. Any actions implemented will be designed to achieve the success criteria specified previously and will include a work schedule and updated monitoring criteria (if applicable).

### **5.0 References**

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Lee, Michael T. Peet, Robert K., Steven D. Wentworth, Thomas R. 2008. CVS-EEP Protocol for Recording Vegetation Version 4.2.

Natural Resources Conservation Service (NRCS). Web Soil Survey of Wayne County.

North Carolina Division of Environmental Quality, Division of Water Resources (NCDWR) 2011. Surface Water Classifications.

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

Wildlands Engineering, Inc. (2022). Little River Ford Mitigation Site – Mitigation Plan. North Carolina Department of Environmental Quality, Division of Mitigation Services (NCDMS), Raleigh, NC.





## **APPENDIX 1: General Figures and Tables**

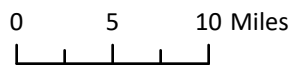
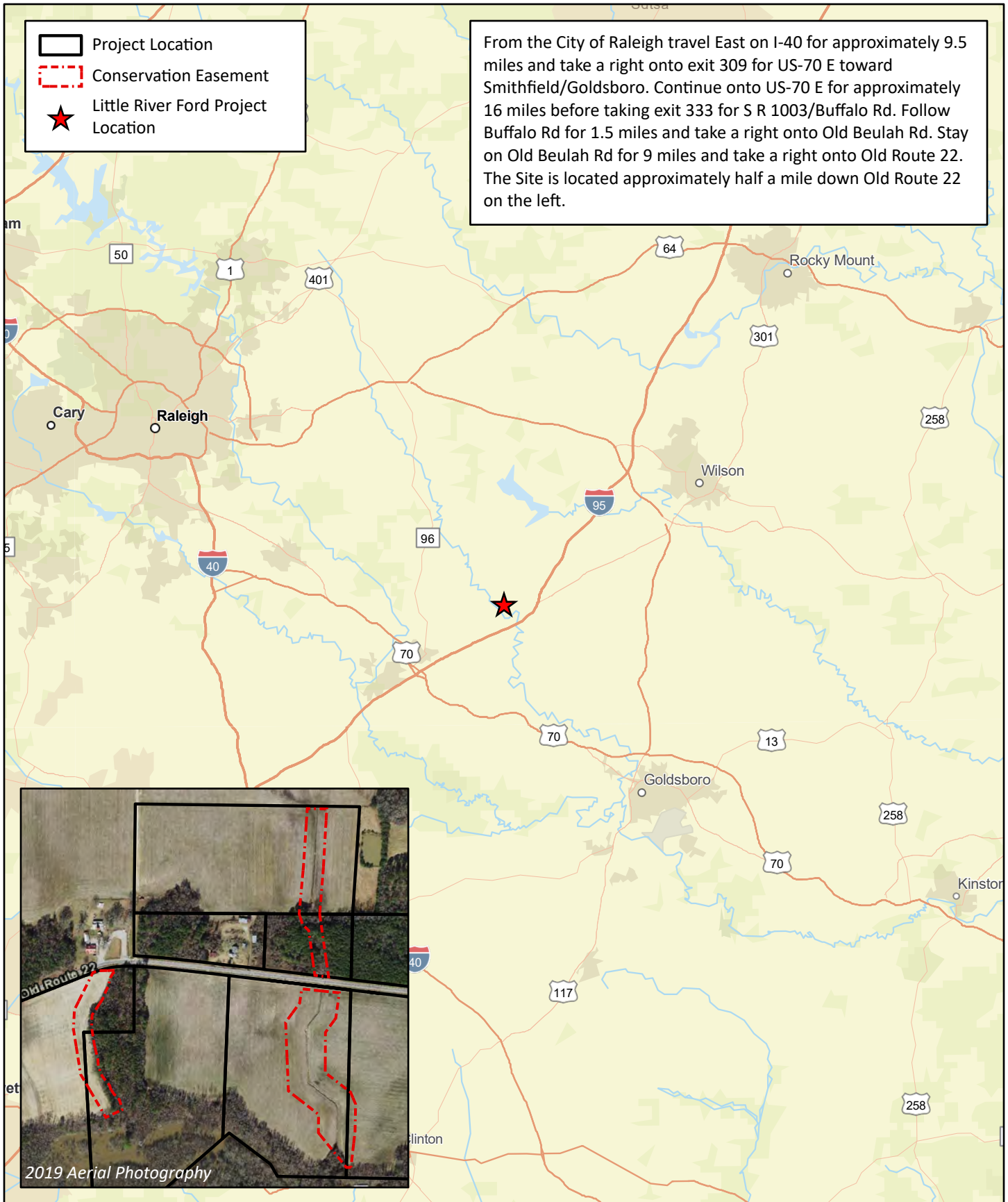
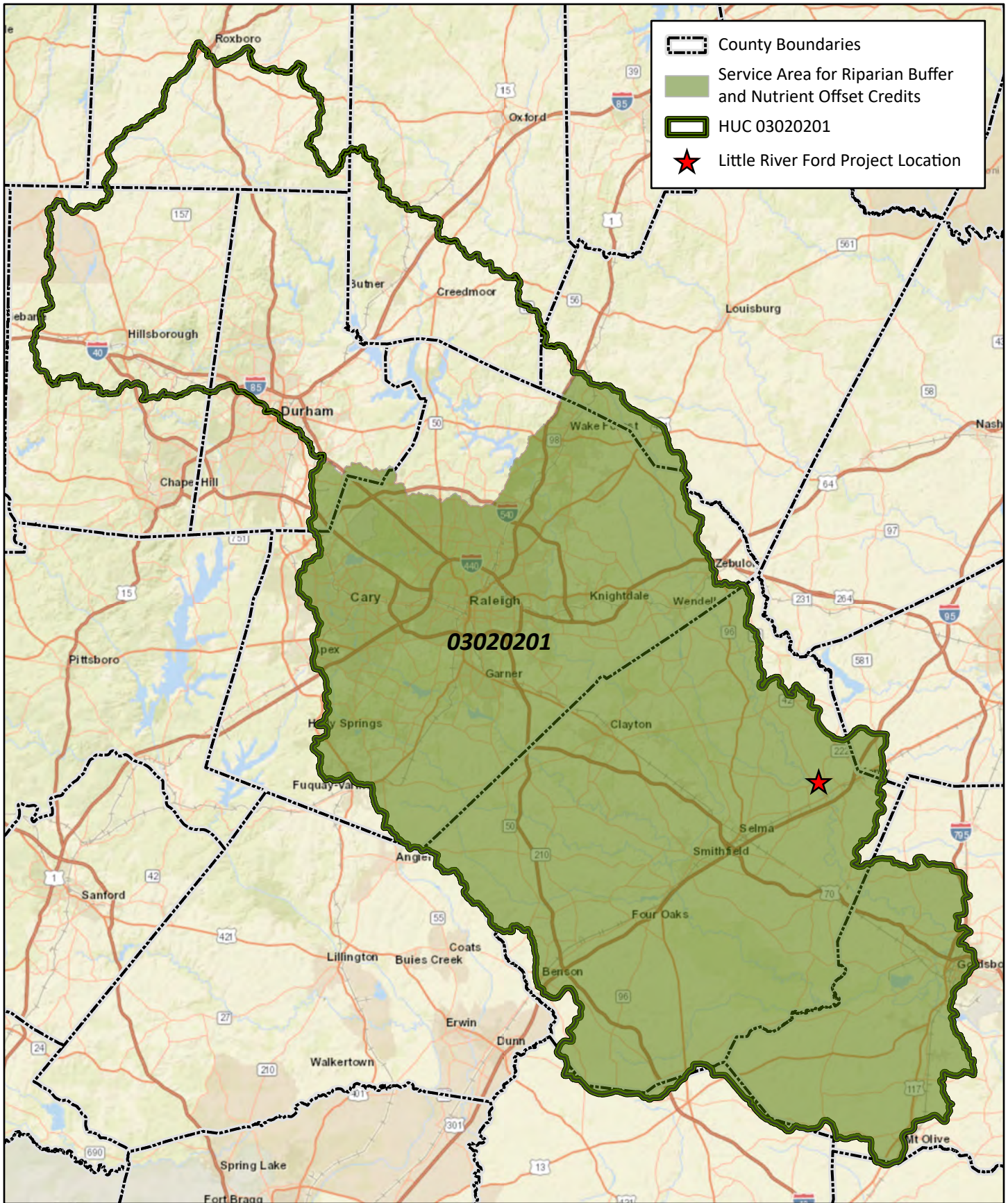






Figure 1. Vicinity Map  
 Little River Ford Mitigation Site  
 As-Built Report  
 Neuse River Basin (03020201)



-  County Boundaries
-  Service Area for Riparian Buffer and Nutrient Offset Credits
-  HUC 03020201
-  Little River Ford Project Location

**03020201**

Figure 2. Credit Service Area Map  
 Little River Ford Mitigation Site  
 As-Built Report  
 Neuse River Basin (03020201)



0 5 10 Miles





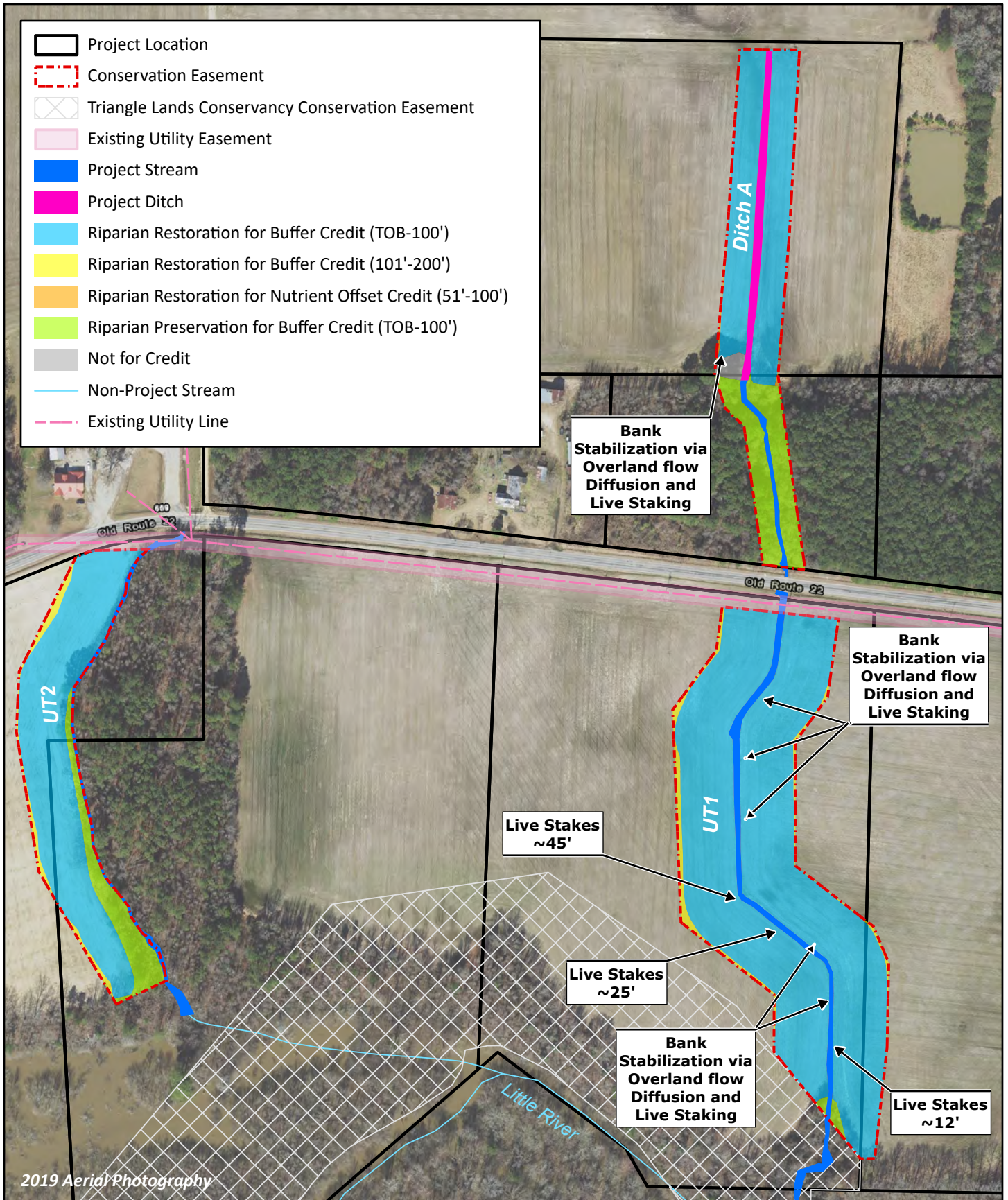
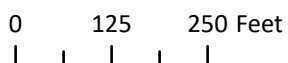


Figure 3. Project Component/Asset Map  
 Little River Ford Mitigation Site  
 As-Built Report  
 Neuse River Basin (03020201)





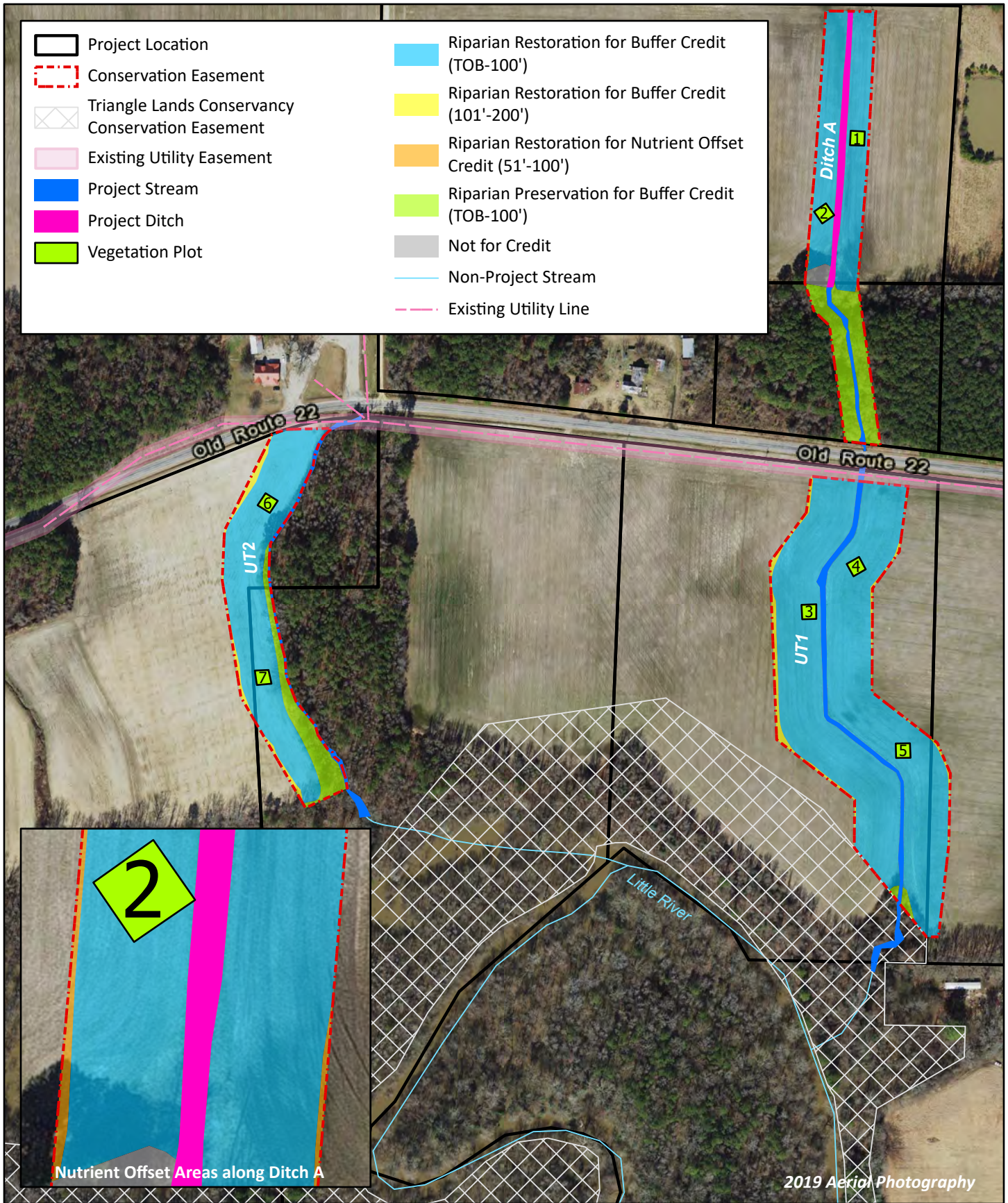
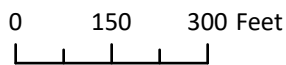


Figure 4. Monitoring plan View Map  
 Little River Ford Mitigation Site  
 As-Built Report  
 Neuse River Basin (03020201)



**Table 1. Project Attributes**

Little River Ford Mitigation Site

DMS Project No. 100182

**Monitoring Year 0 - 2023**

Project Information	
Project Name	Little River Ford Mitigation Site
USGS Hydrologic Unit 14-digit	03020201180060
River Basin	Neuse
Project Coordinates (latitude and longitude)	35.353192 N, -78.104116 W
Planted Acres	8.21
Total Credits (BMU)	355,765.834
Total Credits (Nitrogen Offset)	57.765
Types of Credits	Riparian Buffer and Nutrient Offset
Mitigation Plan Date	April 2022
Bare Root Planting	December 2022
As-Built & Baseline Monitoring Document	March 2023
Year 1 Monitoring Report Date	December 2023
Year 2 Monitoring Report Date	December 2024
Year 3 Monitoring Report Date	December 2025
Year 4 Monitoring Report Date	December 2026
Year 5 Monitoring Report Date	December 2027

**Table 2. Planted Tree Species**

Little River Ford Mitigation Site

DMS Project No. 100182

**Monitoring Year 0 - 2023**

Common Name	Scientific Name	Number Planted	% of Total
American Sycamore	<i>Platanus occidentalis</i>	632	15%
River Birch	<i>Betula nigra</i>	632	15%
Common Persimmon	<i>Diospyros virginiana</i>	421	10%
Cherrybark Oak	<i>Quercus pagoda</i>	421	10%
Eastern Cottonwood	<i>Populus deltoides</i>	421	10%
Swamp Chestnut Oak	<i>Quercus michauxii</i>	421	10%
Boxelder	<i>Acer negundo</i>	421	10%
Black Cherry	<i>Prunus serotina</i>	211	5%
American Elm	<i>Ulmus americana</i>	211	5%
Willow Oak	<i>Quercus phellos</i>	211	5%
Sweetbay Magnolia	<i>Magnolia virginiana</i>	211	5%



**Table 3. Project Areas and Assets**

Little River Ford Mitigation Site

DMS Project No. 100182

Monitoring Year 0 - 2023

Neuse 03020201 - Outside Falls Lake				Project Area												
19.16394				N 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)	Convertibl e to Riparian Buffer?	Riparian Buffer Credits	Convertible to Nutrient Offset?	Delivered Nutrient Offset: N (lbs)	
Buffer	Rural	No	I / P	Restoration	0-100	UT1, UT2	282,605	282,605	1	100%	1.00000	Yes	282,605.000	Yes	14,746.707	
Buffer	Rural	No	I / P	Restoration	101-200	UT1, UT2	13,611	13,611	1	33%	3.03030	Yes	4,491.634	Yes	710.240	
Buffer	Rural	No	Ditch	Restoration	0-50	Ditch A	60,185	60,185	1	100%	1.00000	Yes	60,185.000	Yes	3,140.534	
Nutrient Offset	Rural	No	Ditch	Restoration	0-100	Ditch A (51'-100')	1,107		1	100%	1.00000	No	—	Yes	57.765	
<b>Totals (ft2):</b>							<b>357,507</b>	<b>356,400</b>					<b>347,281.634</b>	<b>18,655.245</b>		
<b>Total Buffer (ft2):</b>							<b>356,400</b>	<b>356,400</b>								
<b>Total Nutrient Offset (ft2):</b>							<b>1,107</b>	<b>N/A</b>								
<b>Total Ephemeral Area (ft2) for Credit:</b>							<b>0</b>	<b>0</b>								
<b>Total Eligible Ephemeral Area (ft2):</b>							<b>99,560</b>	<b>0.0%</b>					<b>Ephemeral Reaches as % TABM</b>			
<b>Total Eligible for Preservation (ft2):</b>							<b>118,800</b>	<b>8.8%</b>					<b>Preservation as % TABM</b>			

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	No	I / P		0-100	UT1,UT2	42,421	42,421	5	100%	5.00000	8,484.200	
<b>Preservation Area Subtotals (ft2):</b>							<b>42,421</b>	<b>42,421</b>					

TOTAL AREA OF BUFFER MITIGATION (TABM)			
Mitigation Totals	Square Feet	Credits	
<b>Restoration:</b>	356,400	347,281.634	
<b>Enhancement:</b>	0	0.000	
<b>Preservation:</b>	42,421	8,484.200	
<b>Total Riparian Buffer:</b>	398,821	355,765.834	
TOTAL NUTRIENT OFFSET MITIGATION			
Mitigation Totals	Square Feet	Credits	
<b>Nutrient Offset:</b>	<b>Nitrogen:</b>	1,107	57.756
	<b>Phosphorus:</b>		0.000

**Table 4. Monitoring Components**

Little River Ford Mitigation Site

DMS Project No. 100182

**Monitoring Year 0 - 2023**

Parameter	Monitoring Feature	Quantity/Length By Reach			Frequency
		UT1	UT2	Ditch A	
<b>Vegetation</b>	<b>CVS Level 2</b>	7			Annual
Visual Assessment		Y	Y	Y	Semi- Annual
Exotic and Nuisance Vegetation		Y	Y	Y	Semi- Annual
Project Boundary		Y	Y	Y	Semi- Annual
Reference Photographs		Overview Photographs			Annual

## **APPENDIX 2: DWR Correspondence**

ROY COOPER  
Governor

ELIZABETH S. BISER  
Secretary

S. DANIEL SMITH  
Director



July 27, 2021

Andrea Eckardt  
Wildlands Engineering, Inc.  
(via electronic mail: [aeckardt@wildlandseng.com](mailto:aeckardt@wildlandseng.com))

Re: Site Viability for Buffer Mitigation & Nutrient Offset – Little River Ford Site  
Near 35.593559, -78.180276 in Kenly, NC  
Neuse 03020201  
Johnston County

Dear Ms. Eckardt,

On June 8, 2021, Katie Merritt, with the Division of Water Resources (DWR), received a request from you on behalf of Wildlands Engineering, Inc. (Wildlands) for a site visit near the above-referenced site in the Neuse River Basin within the 8-digit Hydrologic Unit Code 03020201. The site visit was to determine the potential for riparian buffer mitigation and nutrient offset within a proposed conservation easement boundary, which is more accurately depicted in the attached map labeled “Figure 1-Site Map” (Figure 1) prepared by Wildlands. The proposed easement boundary in Figure 1, includes all riparian areas intended to be proposed as part of the mitigation site. On July 14, 2021, Ms. Merritt performed a site assessment of the subject site. Staff with Wildlands were also present.

Ms. Merritt’s evaluation of the features onsite and their associated mitigation determination for the riparian areas are provided in the table below. This evaluation was made from Top of Bank (TOB) and landward 200’ from each feature for buffer mitigation pursuant to 15A NCAC 02B .0295 (effective November 1, 2015) and for nutrient offset credits pursuant to 15A NCAC 02B .0703.



<u>Feature</u>	<u>Classification onsite</u>	<u><sup>1</sup>Subject to Buffer Rule</u>	<u>Riparian Land uses adjacent to Feature (0-200')</u>	<u>Buffer Credit Viable</u>	<u><sup>3</sup>Nutrient Offset Viable</u>	<u><sup>4,5</sup>Mitigation Type Determination w/in riparian areas</u>
UT1	Stream	No	Combination of mature forested areas and non-forested agricultural fields and partially located within a DOT Right Of Way (ROW)  Most of the row crops are planted in rows perpendicular to the stream and create non-diffused sheet flow of stormwater through the riparian areas. Grading down of these rows will be required during site preparation for a Restoration Site.	<sup>2</sup> Yes	Yes (non-forested fields only)	Non-forested fields - <b>Restoration Site</b> per 15A NCAC 02B .0295 (o)(3)  Forested areas - <b>Preservation Site</b> per 15A NCAC 02B .0295 (o)(4)  <i>Minor bank stabilization efforts and grading needed where bank stability is compromised and where erosional rills, sink holes and gullies are observed.</i>  <u>Note:</u> No credits are allowed within the DOT R.O.W
Ditch A	Ditch <3' depth	No	Non-forested agricultural fields.	*see note	Yes	<b>Restoration Site</b> per 15A NCAC 02B .0295 (o)(8)  <b>*Buffer Mitigation Note</b> – Assessment concludes the ditch meets 15A NCAC 02B .0295 (o)(8) (A, B, C, D & E). More information is required to be provided in a mitigation plan for complete assessment. See rule.
UT2	Stream	No	Left Bank – mature forest ( <i>not in proposed project boundary</i> ) Right Bank - Non-forested agricultural fields  Stream is partially located within a DOT Right Of Way	<sup>2</sup> Yes	Yes (non-forested fields only)	Non-forested fields - <b>Restoration Site</b> per 15A NCAC 02B .0295 (o)(3)  Forested areas - <b>Preservation Site</b> per 15A NCAC 02B .0295 (o)(4)  <u>Note:</u> No credits are allowed within the DOT R.O.W
Ditch B	Not evaluated	No	Outside of project boundary	N/A	N/A	N/A

<sup>1</sup>Subjectivity calls for the features were determined by DWR in correspondence dated May 27, 2021 (DWR# 2021-0112) using the 1:24,000 scale quadrangle topographic map prepared by USGS and the most recent printed version of the soil survey map prepared by the NRCS .

<sup>2</sup>The area of preservation credit within a buffer mitigation site shall comprise of no more than 25 percent (25%) of the total area of buffer mitigation per 15A NCAC 0295 (o)(5) and 15A NCAC 0295 (o)(4). Site cannot be a Preservation Only site to comply with this rule.

<sup>3</sup>NC Division of Water Resources - Methodology and Calculations for determining Nutrient Reductions associated with Riparian Buffer Establishment

<sup>4</sup>Determinations made for this Site are determined based on the proposal provided in maps and figures submitted with the request.

<sup>5</sup>All features proposed for buffer mitigation or nutrient offset, must have a planted conservation easement established that includes the tops of channel banks when being measured perpendicular and landward from the banks, even if no credit is viable within that riparian area.

<sup>6</sup>The area of the mitigation site on ephemeral channels shall comprise no more than 25 percent (25%) of the total area of buffer mitigation per 15A NCAC 02B .0295 (o)(7).

Determinations provided in the table above were made using a proposed easement boundary showing proposed mitigation areas shown in Figure 1. The map representing the proposal for the site is attached to this letter and initialed by Ms. Merritt on July 27, 2021. Substantial changes to the proposed easement boundary as well as any site constraints identified in this letter, could affect the Site's potential to generate buffer mitigation and nutrient offset credits.

This letter does not constitute an approval of this Site to generate buffer and nutrient offset credits. Pursuant to 15A NCAC 02B .0295, a mitigation proposal and a mitigation plan shall be submitted to DWR for written approval **prior** to conducting any mitigation activities in riparian areas and/or surface waters for buffer mitigation credit. Pursuant to 15A NCAC 02B .0703, a proposal regarding a proposed nutrient load-reducing measure for nutrient offset credit shall be submitted to DWR for approval prior to any mitigation activities in riparian areas and/or surface waters.

All vegetative plantings, performance criteria and other mitigation requirements for riparian restoration, enhancement and preservation must follow the requirements in 15A NCAC 02B .0295 to be eligible for buffer and/or nutrient offset mitigation credits. For any areas depicted as not being viable for nutrient offset credit above, one could propose a different measure, along with supporting calculations and sufficient detail to support estimates of load reduction, for review by the DWR to determine viability for nutrient offset in accordance with 15A NCAC 02B .0703.

**This viability assessment will expire on July 27, 2023 or upon approval of a mitigation plan by the DWR, whichever comes first. This letter should be provided in any nutrient offset, buffer, stream or wetland mitigation plan for this Site.**

Please contact Katie Merritt at (919) 707-3637 if you have any questions regarding this correspondence.

Sincerely,

DocuSigned by:  
*Paul Wojoski*  
949D91BA53EF4E0...

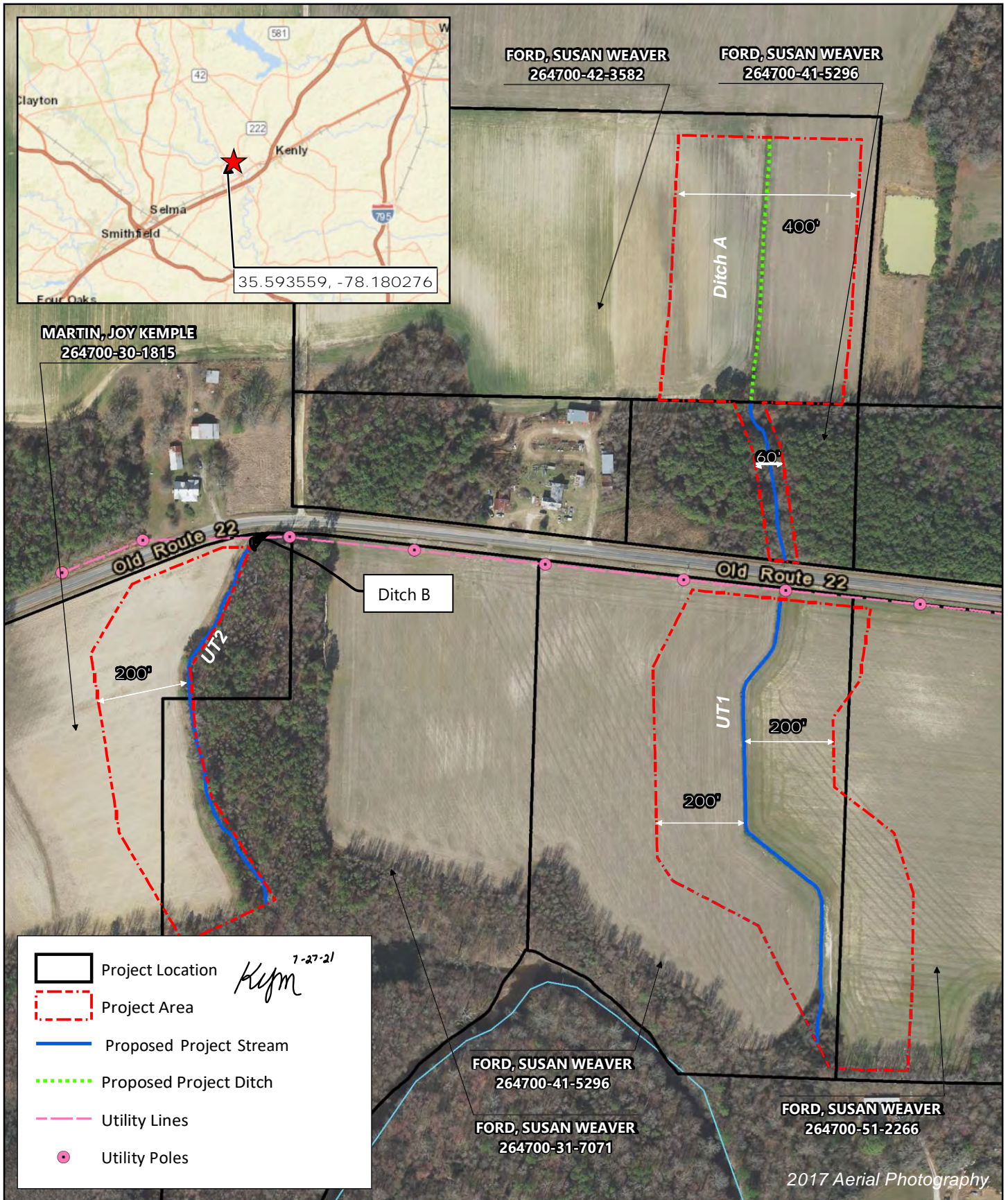
Paul Wojoski, Supervisor  
401 and Buffer Permitting Branch

*PW/kym*

Attachments: Figure 1: Site Map

cc: File Copy (Katie Merritt)





0 150 300 Feet



Figure 1. Site Map  
Little River Ford  
Neuse River Basin (03020201)

Johnston County, NC



## **APPENDIX 3: As-Built Survey**

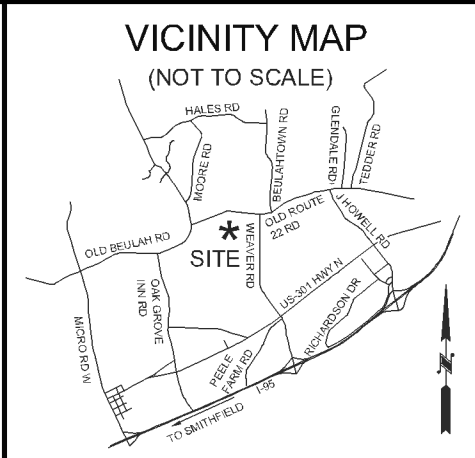
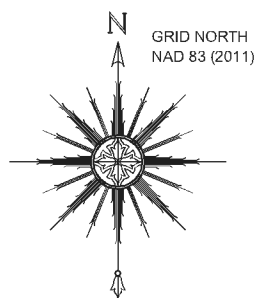
CERTIFICATE OF SURVEY AND ACCURACY

I, **PHILLIP B. KEE**, CERTIFY THAT THIS BUFFER MAP WAS DRAWN UNDER MY SUPERVISION, IS AN ACCURATE CALCULATION OF THE BUFFER AREAS AND IS BASED ON THE EXISTING CONDITIONS TOPOGRAPHIC SURVEY DATED JANUARY 2ND, 2021, BY KEE MAPPING AND SURVEYING, THE CONSERVATION EASEMENT SURVEY AS RECORDED IN BOOK: 97 PAGES:129-134 IN THE JOHNSTON COUNTY REGISTRY AND INFORMATION PROVIDED BY WILDLANDS ENGINEERING INC.; THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DASHED LINES AS REFERENCED; AND THAT THIS MAP DOES NOT REPRESENT AN OFFICIAL BOUNDARY SURVEY AND IS ONLY FOR THE PURPOSE OF DEPICTING THE RIPARIAN BUFFER AREAS.

WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER, AND SEAL THIS 22ND DAY OF FEBRUARY, 2023, A.D.



DocuSigned by:  
**Phillip Kee**  
D965004A7692407...  
PHILLIP B. KEE, PLS L-4647



THIS MAP IS NOT FOR RECORDATION, SALES, OR CONVEYANCES AND DOES NOT COMPLY WITH G.S. 47-30 MAPPING REQUIREMENTS

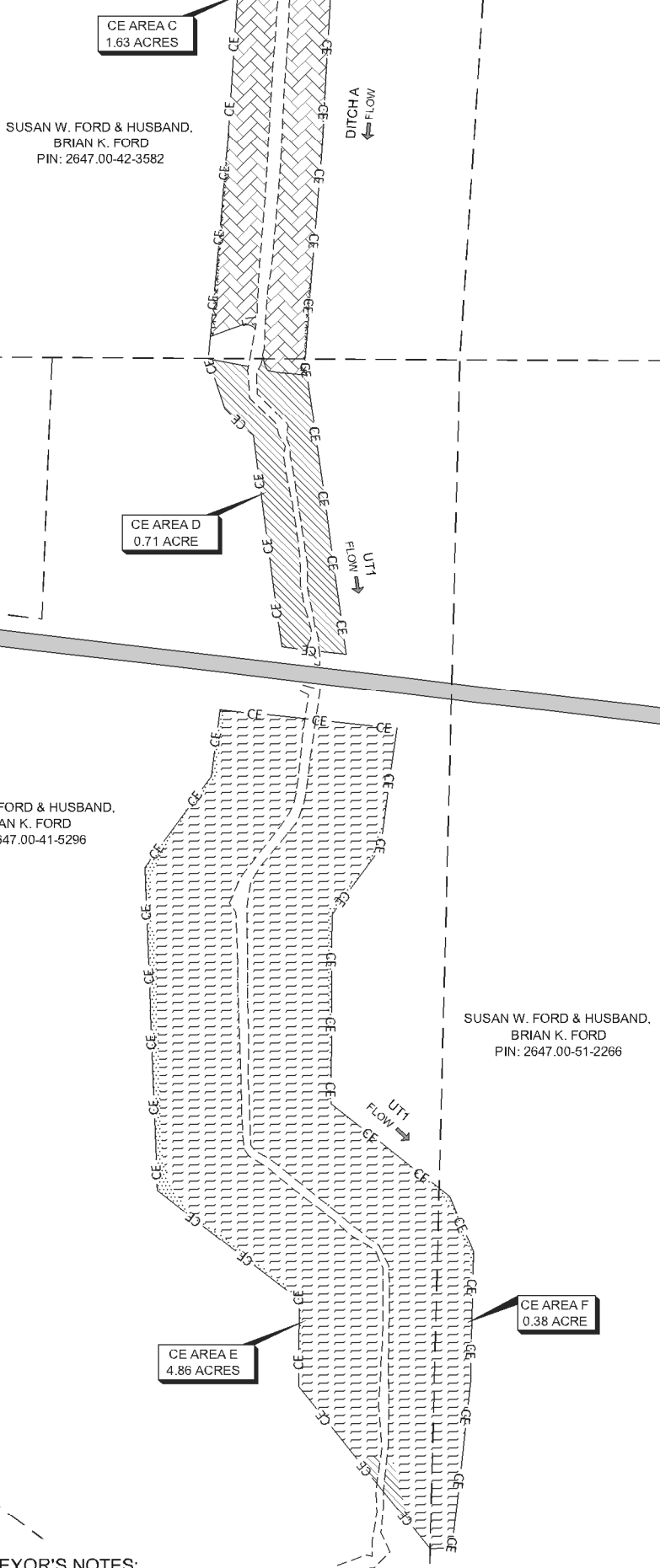
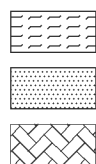
LEGEND:

- CE — CE — CONSERVATION EASEMENT
- - - - - TOP OF BANK
- - - - - BOUNDARY LINE NOT SURVEYED
- NO CREDIT AREA
- ASPHALT

RIPARIAN BUFFER AREAS		
RESTORATION	SQ. FT.	ACRES
STREAM 0'-100'	282,605	6.49
STREAM 101'-200'	13,611	0.31
DITCH 0'-50'	60,185	1.38
TOTAL	356,401	8.18

RIPARIAN BUFFER AREAS		
PRESERVATION	SQ. FT.	ACRES
STREAM 0'-100'	42,421	0.97
TOTAL	42,421	0.97

RIPARIAN BUFFER AREAS		
NUTRIENT OFFSET	SQ. FT.	ACRES
DITCH 51'-100'	1,107	0.03
TOTAL	1,107	0.03



TOTAL AREAS	SQ FT	ACRES
NO CREDIT AREA	28,480	0.66
BUFFER AREA	399,929	9.18
CE AREA	428,409	9.84

SURVEYOR'S NOTES:

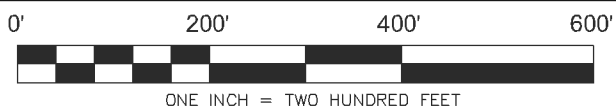
- ALL DISTANCES AND COORDINATES (NAD83 2011) ARE GRID MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED. TO OBTAIN GROUND MEASUREMENTS THE GRID DISTANCE SHOULD BE DIVIDED BY THE AVERAGE COMBINED FACTOR (.99988803). SEE PB: 97 PAGES: 129-134.
- THE PURPOSE OF THIS MAP IS TO SHOW THE AS-BUILT AREAS FOR RIPARIAN BUFFER CREDITS WITHIN THE CONSERVATION EASEMENT. THIS MAP IS NOT A BOUNDARY SURVEY AND SHOULD NOT BE USED FOR LEGAL PURPOSES. THE LAND PARCELS AND THEIR BOUNDARIES AFFECTED BY THIS CONSERVATION EASEMENT ARE NOT CHANGED BY THIS MAP.
- AREAS SHOWN HERON WERE COMPUTED USING THE COORDINATE COMPUTATION METHOD AND WERE DERIVED FROM INFORMATION PROVIDED BY WILDLANDS ENGINEERING.
- BOUNDARY LINES NOT SURVEYED ARE SHOWN AS DASHED LINES AND WERE TAKEN FROM INFORMATION REFERENCED HERON.
- PROPERTIES ARE SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS, AND/OR ENCUMBRANCES AFFECTING THEM AND ARE NOT SHOWN. SEE PB: 97 PAGES: 129-134.
- BUFFER AREAS ARE BASED ON THE EXISTING CONDITIONS TOPOGRAPHIC SURVEY DATED JANUARY 2ND, 2021, BY KEE MAPPING AND SURVEYING, THE CONSERVATION EASEMENT SURVEY AS RECORDED IN BOOK: 97 PAGES:129-134 IN THE JOHNSTON COUNTY REGISTRY AND INFORMATION PROVIDED BY WILDLANDS ENGINEERING INC.
- JOHNSTON COUNTY GIS WEBSITE USED TO IDENTIFY PROPERTY OWNERS.

A BUFFER MAP FOR WILDLANDS ENGINEERING, INC. LITTLE RIVER FORD DMS PROJECT

DMS SITE ID NO. 100182 DWR NO. 2021-0112v2  
SPO FILE NO. 51-LA-165 & 51-LA-166  
NEUSE RIVER BASIN: 03020201

BEULAH TOWNSHIP, JOHNSTON COUNTY, NORTH CAROLINA

DRAWN BY: NL CHECKED BY: PBK  
SURVEY DATE: 02/22/23 JOB #2011113-BUFFER  
REVISION: DATE:



SHEET SIZE: 11"x17" SCALE: 1"=200'



P.O. Box 2566  
Asheville, NC 28802  
(828) 575-9021  
www.keemap.com  
License # C-3039

## **APPENDIX 4: Overview Photographs**









## **APPENDIX 5: Vegetation Plot Data**

**Table 5. Vegetation Plot Data**

Little River Ford Mitigation Site

DMS Project No. 100182

Monitoring Year 0 - 2023

Planted Acreage	8.21
Date of Initial Plant	2022-12-30
Date of Current Survey	2023-01-05
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1		Veg Plot 2		Veg Plot 3		Veg Plot 4		Veg Plot 5		Veg Plot 6		Veg Plot 7	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	<i>Acer negundo</i>	boxelder	Tree	FAC	1	1	1	1	1	1	1	1	2	2	1	1	2	2
	<i>Betula nigra</i>	river birch	Tree	FACW	3	3	4	4	4	4	2	2	2	2	2	2	5	5
	<i>Diospyros virginiana</i>	common persimmon	Tree	FAC	2	2	1	1	1	1	1	1	1	1	3	3	2	2
	<i>Magnolia virginiana</i>	sweetbay	Tree	FACW	1	1	1	1			1	1			1	1	1	1
	<i>Platanus occidentalis</i>	American sycamore	Tree	FACW			2	2	2	2	5	5	2	2	4	4		
	<i>Populus deltoides</i>	eastern cottonwood	Tree	FAC	2	2	2	2	3	3			1	1	1	1		
	<i>Prunus serotina</i>	black cherry	Tree	FACU	2	2			1	1			1	1	1	1	1	1
	<i>Quercus michauxii</i>	swamp chestnut oak	Tree	FACW			2	2	2	2	2	2	2	2	2	2		
	<i>Quercus pagoda</i>	cherrybark oak	Tree	FACW	3	3	1	1			1	1	1	1			1	1
	<i>Quercus phellos</i>	willow oak	Tree	FACW	2	2	1	1	1	1			2	2			2	2
<i>Ulmus americana</i>	American elm	Tree	FAC							2	2	1	1	1	1	1	1	
<b>Sum</b>	<b>Performance Standard</b>				<b>16</b>	<b>16</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>16</b>	<b>16</b>	<b>15</b>	<b>15</b>
Mitigation Plan Performance Standard	Current Year Stem Count					16		15		15		15		15		16		15
	Stems/Acre					<b>648</b>		<b>607</b>		<b>607</b>		<b>607</b>		<b>607</b>		<b>648</b>		<b>607</b>
	Species Count					<b>8</b>		<b>9</b>		<b>8</b>		<b>8</b>		<b>10</b>		<b>9</b>		<b>8</b>
	Dominant Species Composition (%)					<b>19</b>		<b>27</b>		<b>27</b>		<b>33</b>		<b>13</b>		<b>25</b>		<b>33</b>
	Average Plot Height (ft.)					<b>3</b>		<b>2</b>		<b>2</b>		<b>2</b>		<b>2</b>		<b>2</b>		<b>2</b>
	% Invasives					<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>
Post Mitigation Plan Performance Standard	Current Year Stem Count					16		15		15		15		15		16		15
	Stems/Acre					<b>648</b>		<b>607</b>		<b>607</b>		<b>607</b>		<b>607</b>		<b>648</b>		<b>607</b>
	Species Count					<b>8</b>		<b>9</b>		<b>8</b>		<b>8</b>		<b>10</b>		<b>9</b>		<b>8</b>
	Dominant Species Composition (%)					<b>19</b>		<b>27</b>		<b>27</b>		<b>33</b>		<b>13</b>		<b>25</b>		<b>33</b>
	Average Plot Height (ft.)					<b>3</b>		<b>2</b>		<b>2</b>		<b>2</b>		<b>2</b>		<b>2</b>		<b>2</b>
	% Invasives					<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>

- 1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
- 2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded), species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
- 3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

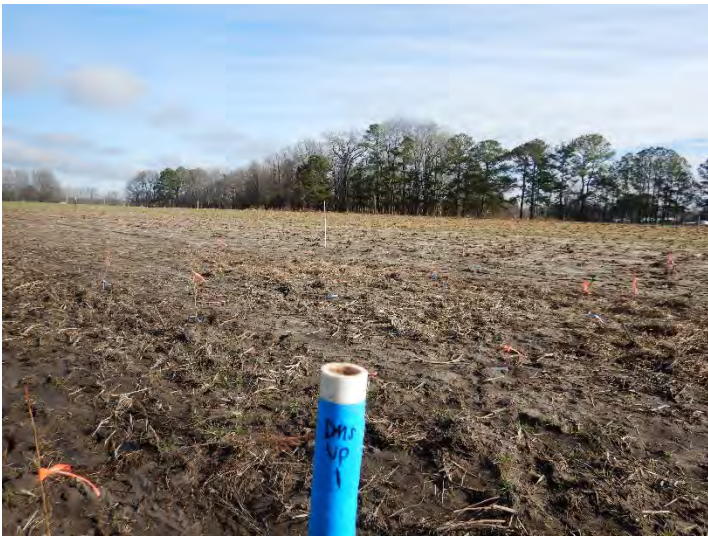


**Table 6. Vegetation Performance Standards Summary Table**

Little River Ford Mitigation Site  
 DMS Project No.100182  
 Monitoring Year 0 - 2023

	Veg Plot 1				Veg Plot 2				Veg Plot 3			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 5												
Monitoring Year 4												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	648	3	8	0	607	2	9	0	607	2	8	0
	Veg Plot 4				Veg Plot 5				Veg Plot 6			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 5												
Monitoring Year 4												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	607	2	8	0	607	2	10	0	648	2	9	0
	Veg Plot 7											
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives								
Monitoring Year 5												
Monitoring Year 4												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	607	2	8	0								

**VEGETATION PLOT PHOTOGRAPHS**



**VEG PLOT 1** (1/5/2023)



**VEG PLOT 2** (1/5/2023)



**VEG PLOT 3** (12/30/2022)



**VEG PLOT 4** (12/30/2022)



**VEG PLOT 5** (12/30/2022)



**VEG PLOT 6** (1/5/2023)







**VEG PLOT 7 (1/5/2023)**



**EROSION STABILIZATION PHOTOGRAPHS**





**UT1 Erosion Reduction via Overland Flow Diversion (1/16/2023)**



**UT1 Erosion Reduction via Overland Flow Diversion and Live Stakes (1/16/2023)**







**UT1 Erosion Reduction via Overland Flow Diversion and Live Stakes (1/16/2023)**



**UT1 Erosion Reduction via Overland Flow Diversion and Live Stakes (1/16/2023)**







**UT1 Erosion Reduction via Overland Flow Diversion and Live Stakes (1/16/2023)**



**UT1 Erosion Reduction via Overland Flow Diversion (1/16/2023)**

