MY05 Monitoring Report

Wingfoot Riparian Buffer Mitigation Site

Pitt County, NC

DMS Project No. 100078

DMS Contract Number: 7607

DWR Project Number: 2018-0854

Data Collection Period: September 26, 2023

Submittal Date: February 9, 2024

Little Contentnea Creek Watershed

Neuse River Basin

HUC 03020203

RFP #16-007402

Prepared For:

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

February 22, 2024

Mr. Jeremiah Dow
NCDEQ Division of Mitigation Services
217 W. Jones Street, Suite 3000
Raleigh, NC 27603

Re: Wingfoot – Task 9 - MY 5 Report (DMS Project No. 100078/DMS Contract 7607)
Response to Comments

Dear Mr. Dow,

Please find below the response to comments on the Wingfoot Buffer Mitigation Monitoring Report provided by DMS dated January 23, 2024:

1. Section 2.0 – says that DWR viability letter is included in Appendix B. The viability letter is not included.

   Re: Complete. See attached viability letter at the end of Appendix B.

2. Please correct legal multiple legal citations that read "15 NCAC…" to "15A NCAC…"

   Re: 15 NCAC has been corrected to 15A NCAC throughout the report.

3. Section 3.2, paragraph 2 says the site was planted at approximately 538 stems/acre, but Section 4.3 the baseline was 666 stems/acre with a current planted stem density averaging 570 stems/acre (higher than the planted density referenced in Section 3.2). Please clarify.

   Re: The inconsistencies regarding stems/acre was clarified in Section 3.2. After construction, planted stems resembled 666 stems/acre rather than the 538 stems/acre described in the planting plan.

4. Final sentence in first paragraph of Section 4.3 says to "Refer to Figure 9…" for "proposed supplemental planting areas." Figure 9 only shows supplemental planting that occurred in MY4. Please clarify.

Clearwater Mitigation Solutions
604 Macon Place
Raleigh, NC 27609
919-624-6901
clearwatermitigation@gmail.com

Re: The final sentence in first paragraph of Section 4.3 was revised to read "Figure 9 (Current Condition Plan View) and Table 4 in Appendix B for additional information and previously supplemental planted areas." Within the legend for Figure 9 - CCPV, the supplemental planting area is further distinguished by adding a "MY04 2022" label.

5. Please orient all Figures the same direction (horizontal)

Re: All figures have been modified to ensure landscape orientation.

6. Figure 9 – an invasive treatment area is shown on the CCPV, but the report indicates that invasives were not treated in 2023. Please indicate in the legend the year the invasive treatment polygon represents, or remove. Additionally, we recommend adding indicating that the Riparian Habitat Corridor is "Not for Credit" in the legend.

Re: The polygon representing the previously implemented invasive treatment was removed from CCPV (Figure 9). The label distinguishing the Riparian Habitat Corridor has been modified to include "Not for Credit" and is displayed on Figure 9.

7. Please fix Appendix B title page text. Please orient the photo pages horizontally.

Re: The title page for Appendix B has been corrected and the photo pages have been reoriented.

8. Per recent requests from DWR, please include individual veg plot stem locations and height/vigor to Appendix B. Field sheets are acceptable.

Re: Field monitoring sheets for year 5 vegetation monitoring have been scanned and included after Site Photos – Existing Conditions.

Please do not hesitate to contact me with questions at 919-624-6901.

Sincerely,

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PREPARED FOR:

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

PREPARED BY:

Clearwater Mitigation Solutions

CLEARWATER MITIGATION SOLUTIONS

604 Macon Place
Raleigh, North Carolina
Authorized Representative: Mr. Kevin Yates
Phone: 919-624-6901

This Mitigation Plan has been written in conformance with the requirements of the following:
NCAC rule 15A NCAC 02B .0295, effective November 1, 2015 and Nutrient Offsets Payments Rule 15A NCAC 02B. 0240, amended effective September 1, 2010 and DWR – 1998. Methodology and Calculations for determining Nutrient Reductions associated with Riparian Buffer Establishment.

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

Contributing Staff:
Kevin Yates, Clearwater Mitigation Solutions
Christian Preziosi, *Davey Resource Group*
Wes Fryar, *Davey Resource Group*
Kim Williams, *Davey Resource Group*

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LIST OF FIGURES, TABLES, AND APPENDICES

1.0 Mitigation Project Summary

The Wingfoot Riparian Buffer Restoration Project ("the Site") is a buffer restoration project located in Pitt County, approximately three (3) miles southeast of Farmville, NC and east of State Route 1139 (Moye Turnage Road) (Figure 1). The Site is comprised of 22.31 acres and is located within the Little Contentnea Creek TLW of the Neuse River (Figures 2 & 3). The buffer restoration and enhancement areas are located along unnamed tributaries (UTs) and drainages that flow directly into Little Contentnea Creek approximately 0.3 miles downstream (Figures 3-5). The Site is surrounded by areas managed for agricultural production (corn, cotton, and soybean) and prior to the project completion lacked existing forested buffer along a majority of the streams and drainageways dissecting the site. The Site is expected to generate 541,415.369 riparian buffer credits (BMU).

The Site is located within Hydologic Unit Code (HUC) 03020203070030 and North Carolina Department of Water Resources (NC DWR) Sub-Basin 03-04-07. Four (4) unnamed tributaries on the Site flow into Little Contentnea Creek (Reach A1, B1-B3). Little Contentnea Creek is a 303d-listed impaired waterbody with a NC DEQ surface water classification of C; Sw, NSW.

1.1 Project Goals

The main goals of the project are to provide water quality and ecological enhancements to the Little Contentnea Creek watershed of the Neuse River basin by creating a riparian corridor and restoring the historic riparian buffer. The project addresses the watershed goals identified in the Neuse River Basin Restoration Plan (RBRP) (NC EEP, 2010). These goals include:

- Promote nutrient and sediment reduction in agricultural areas by restoring and preserving wetlands, streams, and riparian buffers;
- Promote re-establishment of riparian corridors of substantial width to improve connectivity of protected lands; and
- Support implementation of Coastal Habitat Protection Plan (CHPP) strategies.

These watershed goals have been achieved via the restoration and enhancement of woody buffer along unnamed tributaries of the Little Contentnea Creek (a 303d-listed impaired waterbody). Specific objectives of the project which achieved the desired goals included:

- Conversion of existing agricultural fields into wooded riparian buffer zones along existing tributaries via planting of characteristic hardwood species;
- Enhancement of degraded buffer areas (in areas of fields laid to fallow) via planting of characteristic hardwood species;
- Ensuring diffuse flow throughout the riparian buffer zone;
- Establishment of a conservation easement to protect the riparian buffer restoration site in perpetuity and to connect to existing DMS protected site; and
- Invasive species management during the monitoring period.

Ancillary benefits of the project include:

- Increase of organic material as food for invertebrates, fish and wildlife;
- Supply of woody debris that provides increased niche habitat for fish, invertebrates and amphibians;
- Reduction of sunlight reaching the stream and modulation of surface water temperatures;
- Floodwater attenuation via temporary storage, interception and slow releases from heavy rains; and
- Habitat connectivity between currently protected riparian buffer areas (NC DMS Fox Run Site) and downstream riverine swamp forest via a protected riparian habitat corridor (including expansion of refuge and foraging habitat).

1.2 Pre-construction Site Conditions

The project includes 22.31 acres of mostly open agricultural fields along four (4) unnamed tributaries to Little Contentnea Creek. The Site has historically been managed for agricultural production (corn, cotton, and soybean). Site drainage and hydrology have been historically altered with channelized streams and cleared agricultural lands prevalent on historic aerial photos dating back to the 1940s. The majority of the Site has been cleared as recent as 1998 (Figure 6) with some areas revegetating in recent years (Figure 7).

The Site consists of four reaches (A1, B1, B2, and B3) as illustrated in Figures 8A and 8B. Reach A1 is a perennial stream located on the northern boundary of the site and is contiguous with the existing NC DMS buffer project easement (Fox Run). Reach A1 flows from the NC DMS easement on the northwestern boundary to the north and into Little Contentnea Creek approximately 1,800 lf downstream. There is approximately 850 lf of stream associated with Reach A1 within the proposed buffer easement area. The upper portion of Reach A1 has been restored as a forested riparian buffer to 200-ft. The lower segment near the confluence with Reach B1 has been restored to 100-ft. Reach B1 is the perennial stream that dissects the central portion of the site. It drains into Little Contentnea Creek (approximately 1,300 lf downstream from the eastern property boundary). There is approximately 2,690 lf of stream channel associated with Reach B1 within the proposed buffer easement area. The cleared portion of Reach B1 has been restored to 100-ft. A small area along the north side has been enhanced by establishing woody stems to 100-ft. The remaining portion of the reach near the confluence with Reach A1 and along the north side of the reach (extending east to the property line) has re-vegetated in past years and has been preserved. Reaches B2 and B3 flow into Reach B1 from smaller drainage areas on the southern portion of the site. Reach B2 is partly an intermittent stream consisting of approximately 210 lf of stream channel and partly a non-stream tributary of approximately 385 lf of channel. Reach B3 is a non-stream tributary that flows directly into reach B2 and consists of approximately 420 lf of channel. The first 50-ft from these tributaries have been restored. The project attributes are listed in Table 1, located in Appendix A.

2.0 Determination of Credits

On August 30, 2018, Ms. Katie Merritt of the Division of Water Resources (DWR) performed an evaluation of surface water features and adjacent riparian areas within the proposed mitigation site for the determination of riparian buffer mitigation pursuant to 15A NCAC 02B .0295 (effective November 1, 2015) and for nutrient offset credits pursuant to 15A NCAC 02B .0240 (refer to attached Site Viability Letter, Appendix B). Based upon this evaluation, DWR determined that areas within 200 ft of Reach A-1 and Reach B-1 are eligible for both buffer restoration credit and nutrient offset credit (with the latter eligible in non-forested fields only). Riparian areas along Reach B-2 and B-3 are eligible for nutrient offset. In addition, the downstream segment of B-2 is eligible for buffer restoration credits. In addition to buffer restoration on subject streams, per the Consolidated Buffer Mitigation Rules (15A NCAC 02B 0.0295 (o)), alternative mitigation is proposed on the site in the form of: 1) preservation of buffers on subject streams and, 2) restoration and enhancement on ditches. The project is in compliance with these rules as it meets the following criteria:

Preservation on Subject Streams (15A NCAC 02B 0.0295 (o)(5)):

(A) The buffer width is at least 30 feet from the stream;

(B) The area meets the requirements of 15A NCAC 02R 0.0403(c)(7), (8), and (11) with no known structures, infrastructure, hazardous substances, soild waste, or encumbrances within the mitigation boundary;

(C) Preservation mitigation is being requested on no more than 25% of the total buffer mitigation area (Table 2, Appendix A)

Restoration and Enhancement on Ditches (15A NCAC 02B 0.0295 (o)(8)):

Reach B-3 and the upstream segment of Reach B-2 were determined to be conditionally eligible for buffer credit value provided that the watershed drainage area is of sufficient size to meet the rule criteria per 15A NCAC 02B .0295 (o)(8). Note that the ditches proposed for buffer restoration meet the following criteria:

(A) are directly connected with and draining towards an intermittent or perennial stream;

(B) are contiguous with the rest of the mitigation site protected under a perpetual conservation easement;

(C) stormwater runoff from overland flow shall drain towards the ditch (Not Applicable);

(D) are between one and three feet in depth; and

(E) the entire length of the ditches have been in place prior to the effective date of the applicable buffer rule.

F) The buffer width is at least 30 feet from the stream

Similarly, in accordance with Subparagraph (o)(8), the perpetual conservation easement includes the ditch and the confluence of the ditch with the stream. The easement includes language prohibiting future maintenance of the ditch. In addition, the watershed draining to the ditch is at least four times larger than the restored or enhanced area along the ditch. The watershed draining to the upper end of Reach B-2 is approximately 782,392 sf (relative to a corresponding buffer area of 32,671 sf). The watershed draining to Reach B-3 is approximately 312,499 sf (relative to a corresponding buffer area of 35,609 sf).

There are no known site constraints that would impede or adversely affect the restoration, enhancement, and preservation of riparian buffer within the recorded easement area. Diffuse flow of runoff will be maintained in the riparian buffer except where the upstream portions of non-subject ditch segments of B2 and B3 enter the buffered area. Where such diffuse flow cannot be attained in these areas and where NCDWR agrees that such treatment of stormwater is not possible, deduction of credit has been calculated and applied following guidance of Buffer Interpretation/Clarification Memo #2008-019. In these upstream areas, an immediate drainage area equaling 0.10-acre from the point of discharge has been used to calculate the area of buffer being short-circuited by the ditch. Since the upstream origin of the ditch is not buffered, the credit deduction has been applied to the most upstream portion of the ditch on the Site.

Mitigation credits are presented in Table 2 and Figure 8A/8B in Appendix A and are based upon the conservation easement survey included in Appendix C.

3.0 Baseline Summary

The project team restored high quality riparian buffers along all unnamed tributaries within the Site. The project design ensured that no adverse impacts to wetlands of existing riparian buffers occurred during implementation. Refer to Figure 8A/8B for the conceptual design of the project. Details of the restoration activity that occurred follows in the sections below. Refer to site photos in Appendix D.

3.1 Planting Preparation

Based upon pre-project assessment of compaction within the proposed planting areas, the project team identified two select areas of the buffer restoration project that warranted site disking (refer to Figure 7). The areas included an approximate 150-ft long area of the right top of bank of the upper end of Reach B-1 and the riparian area of the right top of bank of Reach A-1 (including the area of field identified as the "Riparian Habitat Corridor"). These areas were disked prior to planting to reduce compaction and to enhance microtopography. In addition, selective mowing occurred within the riparian buffer enhancement area to limit blackberry and smaller, volunteer red maple (refer to Figure 7). This area was observed to contain a population of Japanese honey-suckle (*Lonicera japonica*) which was spot treated with herbicide. No other site preparation occurred. No observed drain tiles were observed prior to, or during, construction and planting and no other land disturbance was needed to maintain diffuse flow as required.

3.2 Riparian Area Restoration and Enhancement Activities

Prior to planting, the conservation easement boundary was marked using 6-inch diameter treated posts buried 2 feet, standing 6 feet above the ground surface, within the agricultural fields. T-posts were installed to provide supplemental marking within areas between the treated posts, within the enhancement area, and within the preservation areas as needed. The easement boundary was also marked with standard yellow Conservation Area signs, per the 01/23/14 NCDMS Boundary Marking Standards.

The planting plan consisted of the planting of four hardwood species and one softwood species on a density of approximately 538 stems per acre. This density was selected to be sufficient to meet performance standards outlined in the Rule 15A NCAC 02B .0295 of 260 trees per acre at the end of five years. After construction, the actual number of planted stems resembled 666 stems per acre rather than the 538 stems per acre described in the planting plan. Species selection and distribution were matched closely to micro-site hydrologic and edaphic conditions and include species characteristic of riparian buffer assemblages in the watershed and adjacent to the site. Species more tolerant of poorly drained soils (i.e. bald cypress and willow oak) were planted within lower landscape positions generally consisting of the Tuckerman soil series while species characteristically occurring in better drained soils will be planted in slightly higher convex landscape positions. The selected native trees are well-suited to the site-specific conditions of the property to promote high survivorship rates. No one tree species planted was greater than 50% of the established stems. Site planting was conducted on March 12-13th, 2019 by Superior Forestry Services, Inc. and supervised by project managers from both Clearwater Mitigation Solutions and Davey Resource Group.
Table 3 summarizes the trees planted by species for the Wingfoot mitigation site.

Table 3. Planting Plan[1]

Common Name	Scientific Name	% Composition	Acreage	Quantity
River Birch	*Betula nigra*	25	3.72	2,000
American Sycamore	*Plantanus occidentalis*	17.5	2.60	1,400
Bald Cypress[2]	*Taxodium distichum*	27.5	4.09	2,200
Willow Oak	*Quercus phellos*	15	2.23	1,200
Water Oak	*Quercus nigra*	15	2.23	1,200
Total	**N/A**	**100**	**14.87**	**8,000**

[1]Note planted area includes approximate 1.0 acres of field included for riparian habitat corridor. While no credit is proposed for this area, it was planted per the same specifications (species density and composition) as those contained within final, approved mitigation plan.

[2]Cypress trees are conifers, but unlike most American softwoods, they are deciduous trees that shed foliage in the fall like hardwoods. Although cypress is a softwood, it grows alongside hardwoods and was selected as an appropriate species to be planted in the wetter parts of the site.

3.3 Riparian Area Preservation Activities

No work was done in the buffer preservation areas. The preservation area will be protected in perpetuity under a conservation easement.

4.0 Annual Monitoring and Performance Criteria

Annual Monitoring has been conducted during the growing season for a period of five years. The reports include all information required by DMS monitoring guidelines including photographs, plot locations, and documentation of existing species density and composition. Monitoring has been performed in accordance with the Consolidated Mitigation Buffer Rule (15A NCAC 02B .0295) and current DMS standards. The performance criteria for the Site follows approved performance criteria presented in the guidance documents outlined in the Consolidated Buffer Rule (15A NCAC 02B .0295). Performance criteria has been evaluated throughout the five-year post-construction monitoring.

4.1 Methods

The final vegetative success criteria is the survival of 260 planted stems per acre in the riparian buffer at the end of the required monitoring period (Monitoring Year (MY05)). Native hardwood and native shrub volunteer species may be included to meet the final performance standard of 260 stems per acre. Vegetative monitoring included the establishment of eleven (11) permanent plots consistent with the Carolina Vegetation Survey (CVS) protocol Level 2 (version 4.2) (refer to Figure 9 for plot locations). Reference photos of the vegetation plots and Site were taken at each predetermined photo point location. Appendix B includes the monitoring year five (MY05) vegetation plot photographs and the planted and total stem counts. Any vegetative problem areas in the site are noted and reported in each monitoring report. Vegetative problem areas may include areas that either lack vegetation or include populations of exotic vegetation. Monitoring reports identify any contingency measures that may need to be employed to remedy site deficiencies.

Permanent photo stations were established across the project area in order to document site stability for five years post construction. Markers were established and located with GPS equipment so that the same locations and view directions on the Site were photographed each year. Photo reference stations are shown on Figure 9.

Visual assessments have been performed annually during the five-year monitoring period. Problem areas of vegetative health have been noted and areas of concern have been mapped, photographed, and documented in each subsequent annual monitoring report. Problem areas have been re-evaluated in each monitoring event.

4.2 Tables

(MY05) vegetation plot photographs and the planted and total stem counts (Table 3) are included in Appendix B.

4.3 Results and Discussion (MY05)

Annual monitoring (MY05) was conducted on September 26, 2023 by DRG staff. Overall, the Site has exceeded the required vegetative success criteria. An average stem density of 570 planted stems per acre was tallied across the site (approximately 86% of the recorded baseline (MY0) density (666 stems per acre)). Stem densities within individual monitoring plots range from 202 to 728 planted stems per acre. Planted stem counts within individual plots range from 5 to 18 stems with an average of 14 planted stems per plot. Ten different hardwood species were observed across the site, exceeding the minimum diversity criterion. All vegetation plots except plot 8 have met the MY05 success criteria and many planted stems have exhibited prolific growth during the first five years of monitoring. In previous years, trees were lost to Japanese honeysuckle strangulation. In MY05 all trees in Plot 8 from MY04 were accounted for. The Site has met the final success criteria in all but one plot. Refer to Figure 9 (Current Condition Plan View) and Table 4 in Appendix B for additional information and previously supplemental planted areas.

Japanese Honeysuckle (*Lonicera japonica*) and Chinese Privet (*Ligustrum sinense*) were observed and limited to the vicinity of Plot 8 as documented in previous years. The remaining trees within Plot 8 appear to be unaffected by the continued presence of Japanese Honeysuckle and dense herbaceous coverage. The remaining six trees continued to demonstrate growth and displayed an excellent vigor. This is the first year throughout the monitoring process where Plot 8 did not document any mortalities or planted trees characterized by low vigor. The remaining enhancement area of the site maintained relatively similar conditions to MY04. Refer to Appendix B for monitoring year five (MY05) vegetation plot photographs and the planted and total stem counts.

4.4 Maintenance and Management

Overall, the vast majority of the Site has met the target success criteria. Small populations of invasive species were noted in the vicinity of Plot 8. Invasive conditions did not continue to permeate throughout Year 5 and treatments were not applied in the spring of 2023. Monitoring problem areas and invasive treatment areas at the site has been conducted for the required five years. Supplemental planting was conducted within a small area of low vigor trees at the upper end of the A1 reach in the early MY04 growing season. While this area was meeting required stem density, stem growth was noticeably less than the surrounding areas. For this reason, larger bare root stems were planted in this area. Approximately (100) 4-ft bare root stems consisting of river birch, sycamore, and willow oak were planted throughout this area. The five required years of monitoring have been completed, and the site has met the performance standards in all but one plot. Upon review and approval of this final monitoring report by NCDMS and NCDWR, we respectfully request closeout of the Site.

5.0 References

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 Randolph County. http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

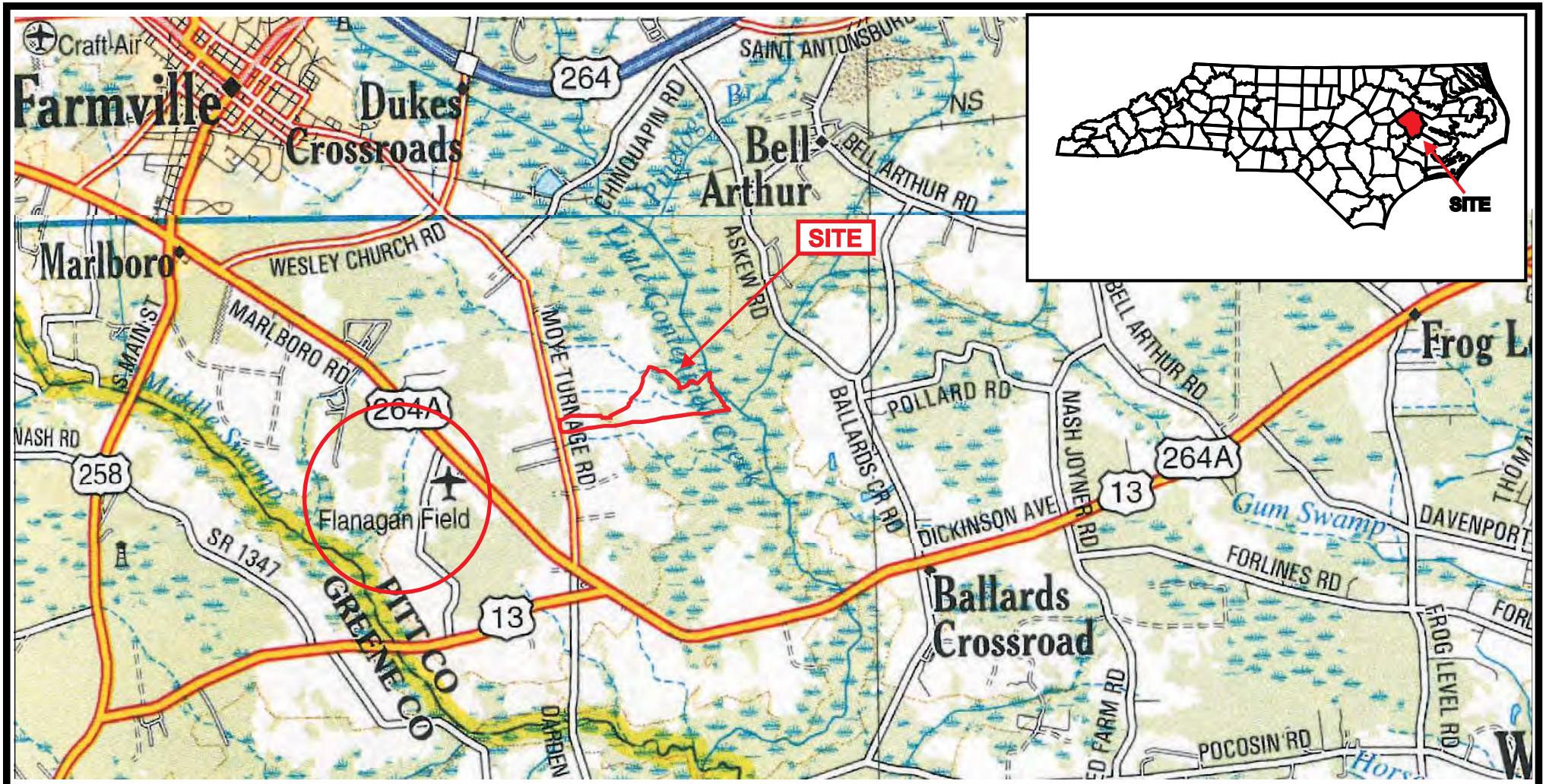
North Carolina Ecosystem Enhancement Program. 2009. Cape Fear River Basin Restoration Priorities 2009. http://www.nceep.net/services/lwps/cape_fear/RBRP%20Cape%20Fear%202008.pdf

North Carolina Division of Mitigation Services (DMS). 2017. Riparian Buffer and Nutrient Offset Buffer Baseline & Annual monitoring Report Template (Version 2.0, 05-2017). Raleigh, North Carolina. https://ncdenr.s3.amazonaws.com/s3fspublic/Mitigation%20Services/Document%20Management%20Library/Guidance%20and%20Templa te%20Documents/RB_NO_Base_Mon_Template_2.0_2017_5.pdf

North Carolina Division of Water Quality (NCDWQ), 2011. Surface Water Classifications. http://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/classifications

APPENDIX A:

Figures/Tables



Public Use Airport (not listed as a general aviation airport nor listed in the National Plan of Integrated Airport Systems or "NPIAS")

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*Boundaries are approximate and are not meant to be absolute.

Map Source: DeLorme 2012 Atlas & Gazeteer, Pages 43 & 65

Wingfoot Riparian
Buffer Mitigation Site
Cataloging Unit 03020203
Pitt County, NC
March 2018
LMG # 40-18-093

CLEARWATER MITIGATION SOLUTIONS

LMG
LAND MANAGEMENT GROUP INC.
Environmental Consultants

Figure 1
Vicinity Map

L:\WETLANDS\2018 WETLANDS FILES\LMG18.305 --- Wingfoot Buffer Project, Kevin Yates\GIS
Boundaries are approximate and not meant to be absolute.
Map Source: OpenStreetMap

N

0 5 10 20 Miles

Wingfoot Riparian
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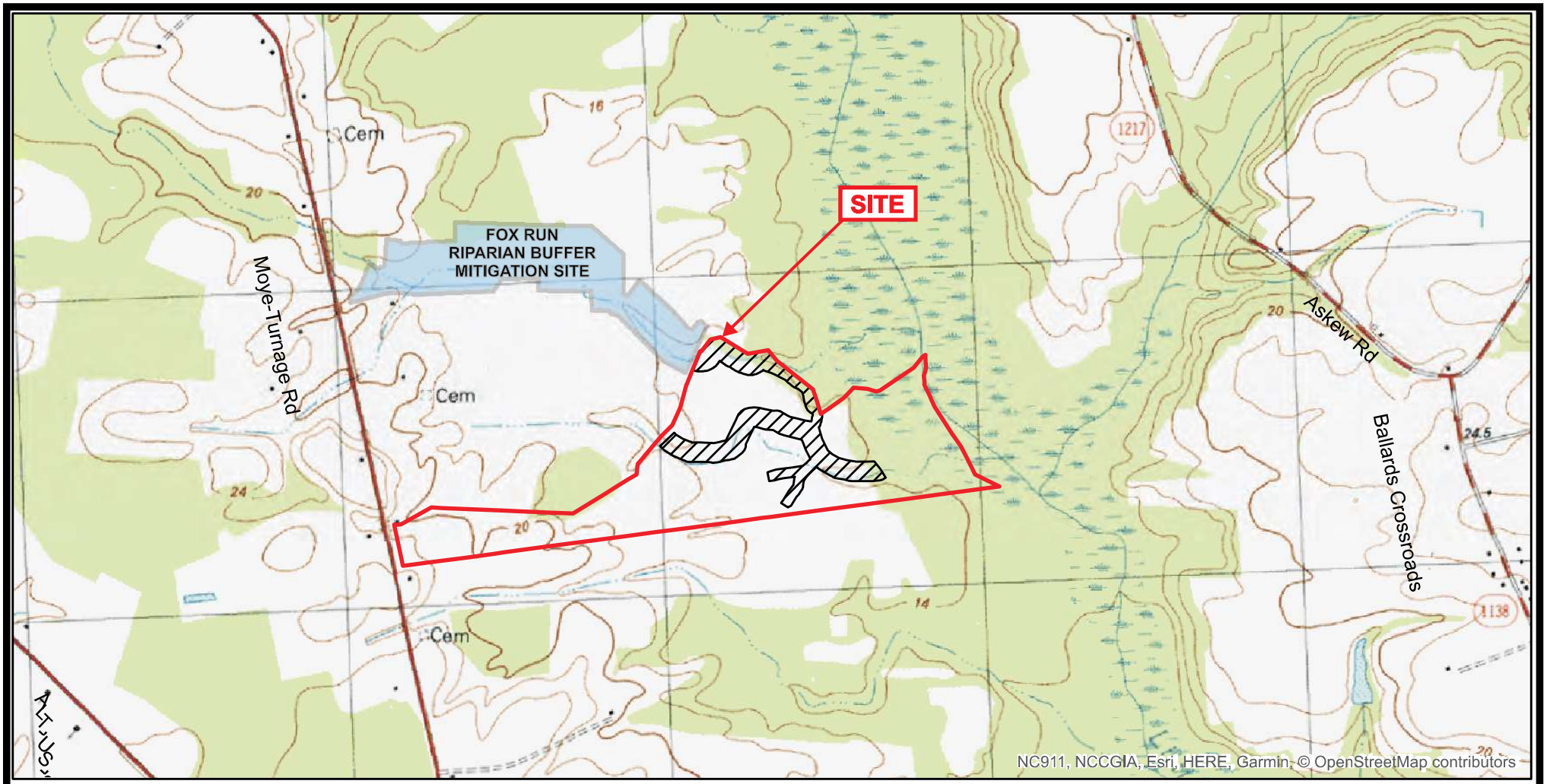
Figure 2
Watershed Map



Legend

Conservation Easement

L:\WETLANDS\2018\40-18-093\maps\mapset

*Boundaries are approximate and are not meant to be absolute.

Map Source: USGS Farmville Quadrangle 7.5 minute

N

SCALE 1" = 1,500'

Wingfoot Riparian
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March 2018
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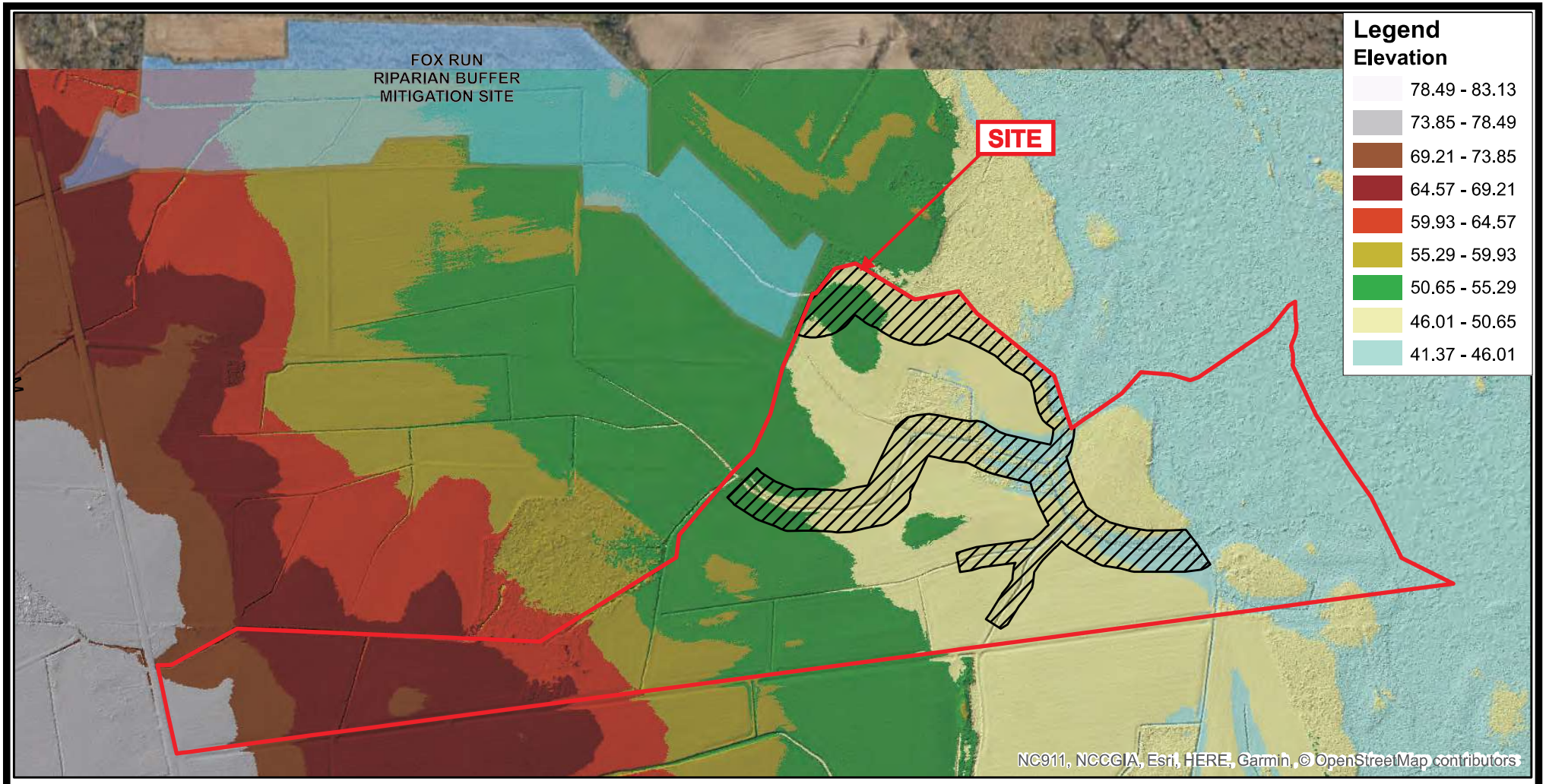
Figure 3
Topographic Map



Legend

Conservation Easement

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*Boundaries are approximate and are not meant to be absolute.

Map Source: NC Floodplain Mapping Program 2014 QL2 LiDAR Data

N

SCALE 1" = 700'

Wingfoot Riparian
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Pitt County, NC
March 2018
LMG # 40-18-093

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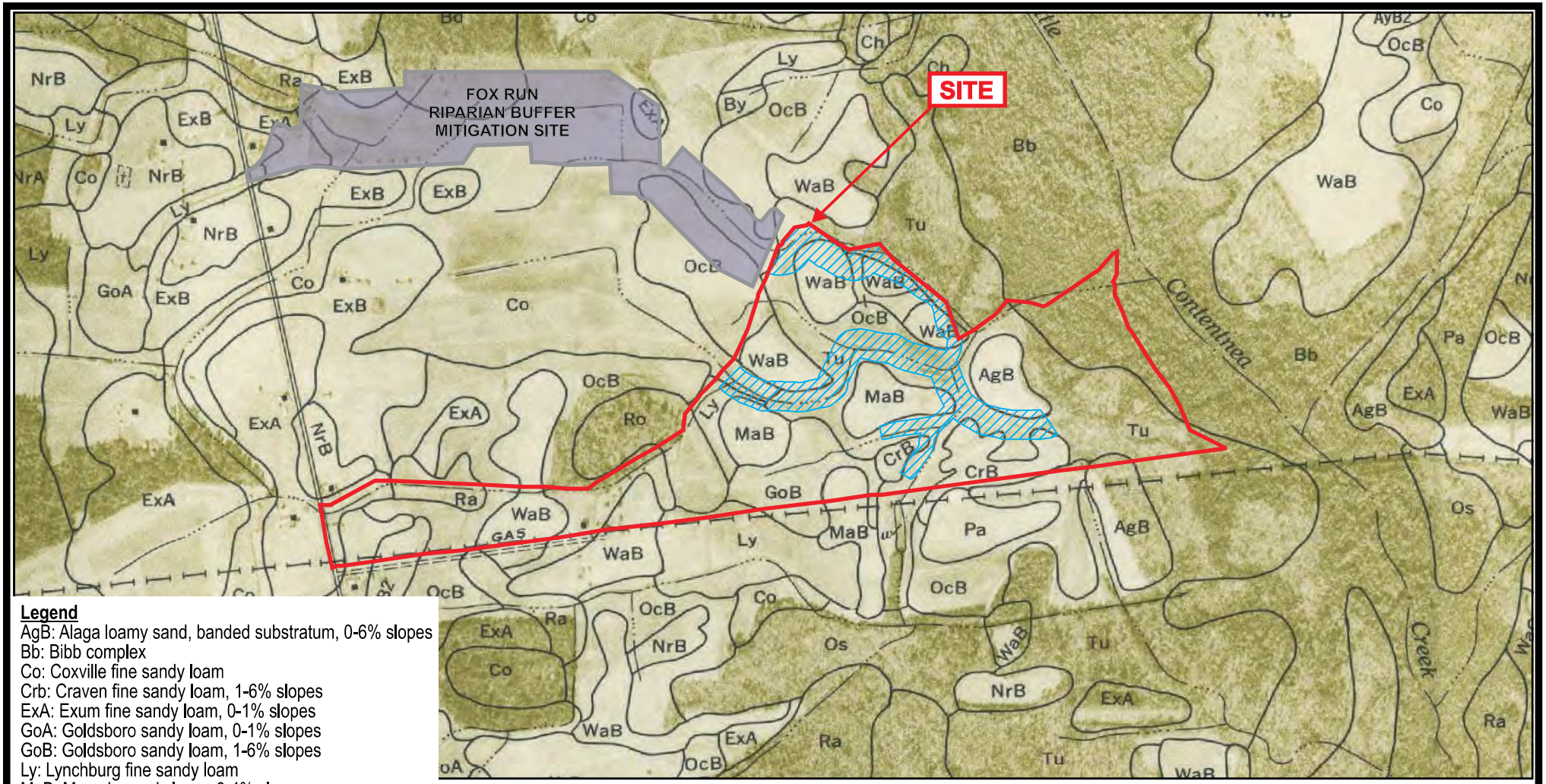
Figure 4
LiDAR map



Legend

AgB: Alaga loamy sand, banded substratum, 0-6% slopes
Bb: Bibb complex
Co: Coxville fine sandy loam
Crb: Craven fine sandy loam, 1-6% slopes
ExA: Exum fine sandy loam, 0-1% slopes
GoA: Goldsboro sandy loam, 0-1% slopes
GoB: Goldsboro sandy loam, 1-6% slopes
Ly: Lynchburg fine sandy loam
MaB: Masada sandy loam, 0-4% slopes
NrB2: Norfolk sandy loam, 1-6% slopes, eroded
OcB: Ocilla loamy fine sand, 0-4% slopes
Ra: Rains fine sandy loam
Tu: Tuckerman fine sandy loam
WaB: Wagram loamy sand, 0-6% slopes

Conservation Easement

N

SCALE 1" = 1,000'

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*Boundaries are approximate and are not meant to be absolute.
Map Source: NRCS Pitt County Soil Survey, 1974

Wingfoot Riparian
Buffer Mitigation Site
Cataloging Unit 03020203
Pitt County, NC
March 2018
LMG # 40-18-093

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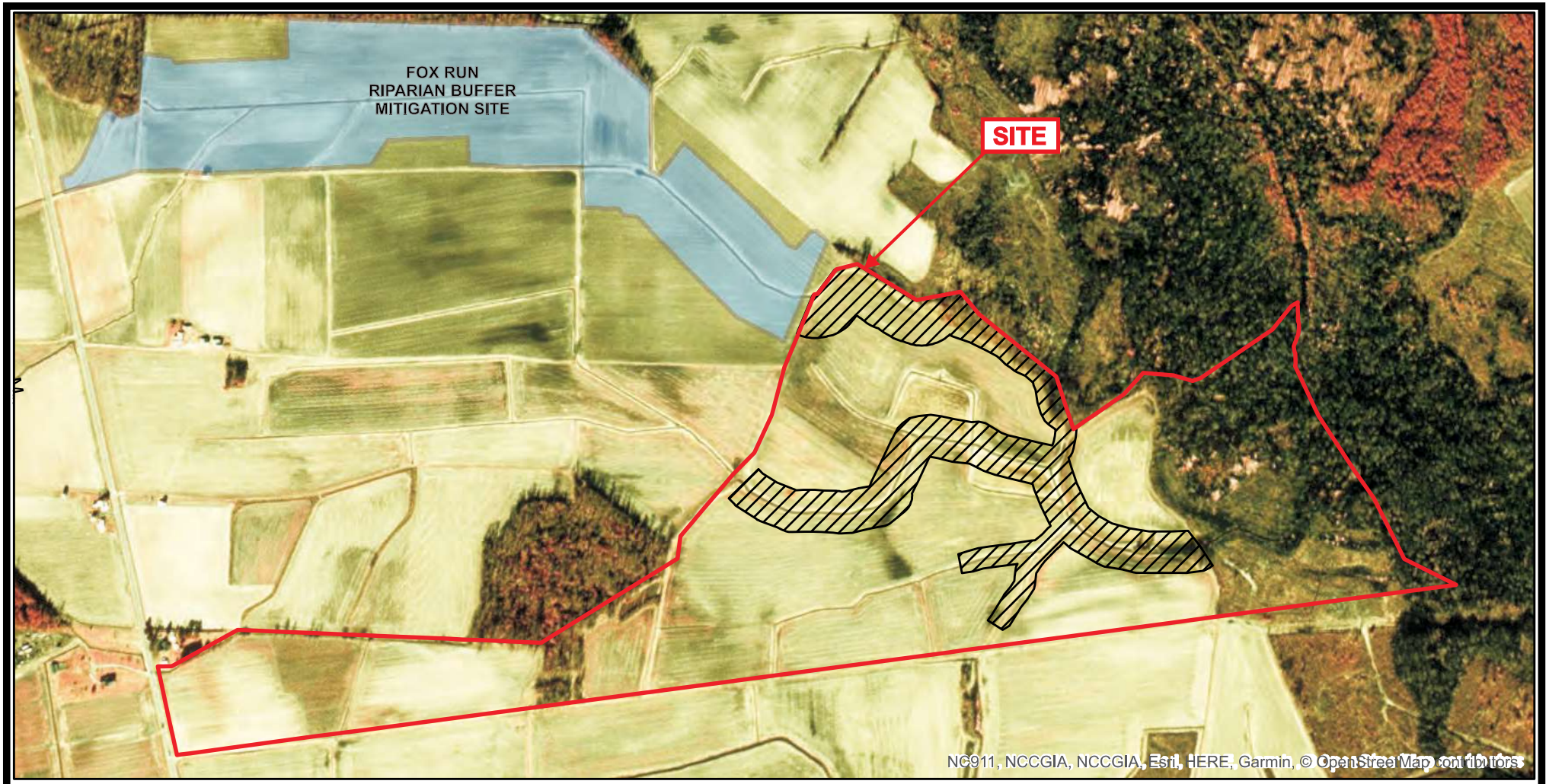
Figure 5
Soils Map



Legend

Conservation Easement

L:\WETLANDS\2018\40-18-093\maps\mapset

*Boundaries are approximate and are not meant to be absolute.

Map Source: 1998 NAPP Aerial Photography

N

SCALE 1" = 700'

Wingfoot Riparian
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March 2018
LMG # 40-18-093

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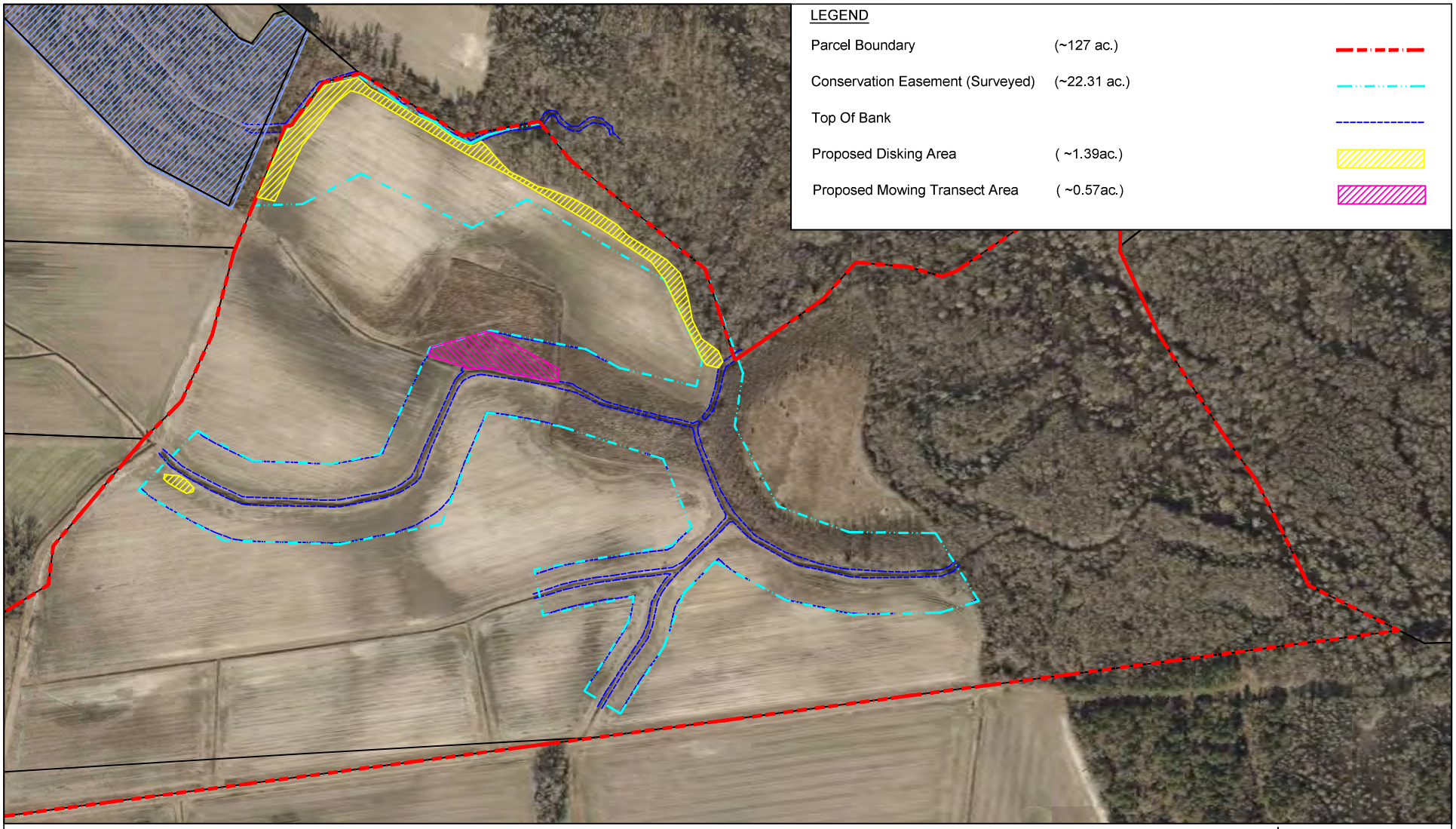
Figure 6
1998 Aerial Photograph



NOTES:
1. BUFFER MITIGATION BOUNDARIES BASED UPON BASE SURVEY DRAWING FROM K2 DESIGN GROUP.

0 200 400 800
SCALE 1"=400'

Wingfoot Riparian Buffer Mitigation Site
Cataloging Unit 03020203
Pitt County, NC
January 2019
LMG18.093

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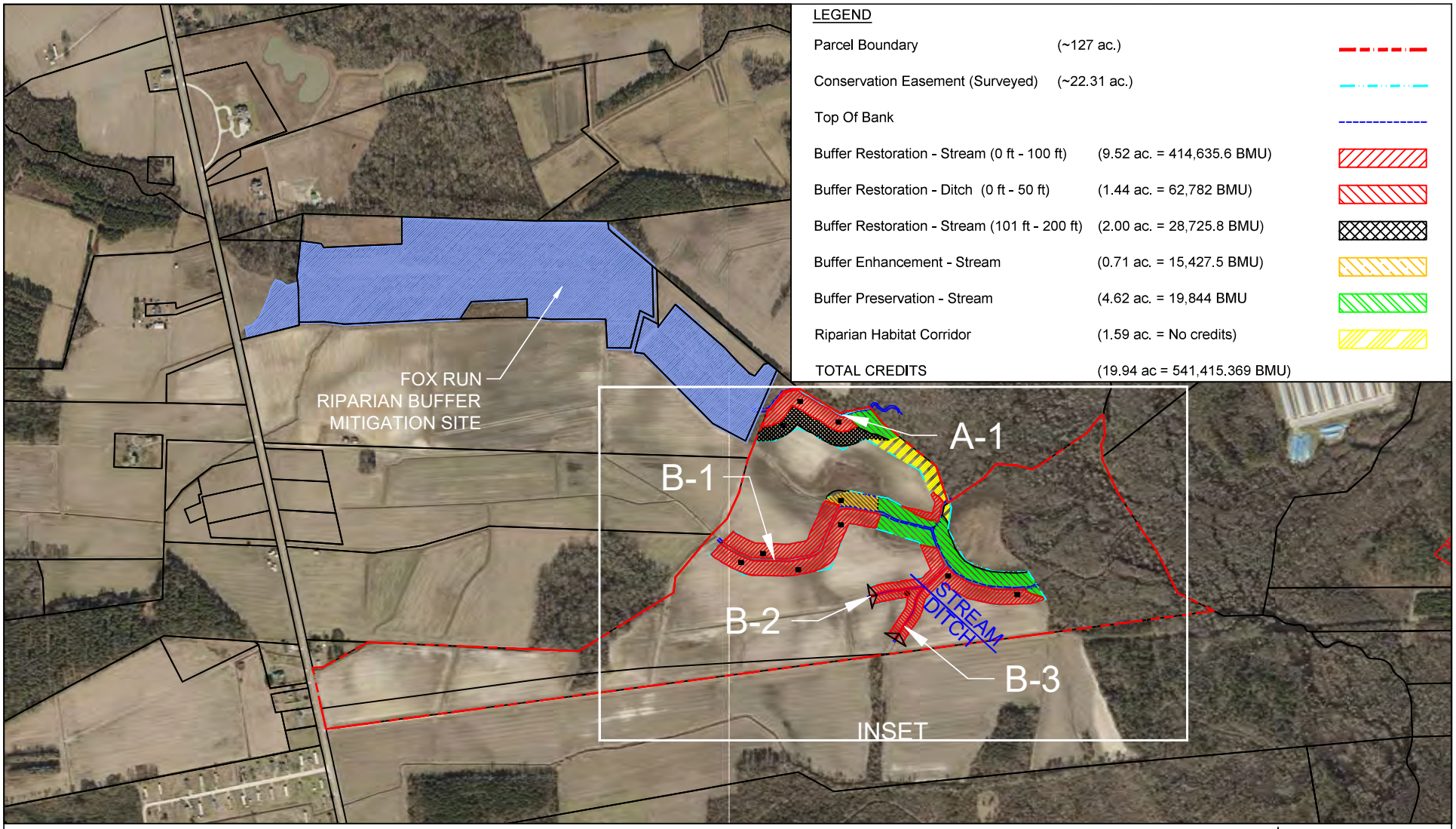
Figure 7
Conservation Easement
with Proposed Disking Areas

L:\WETLANDS\2018 WETLANDS FILES\LMG18.305 --- Wingfoot Buffer Project, Kevin Yates\CAD\Wingfoot.dwg



NOTES:
1. BUFFER MITIGATION BOUNDARIES BASED UPON BASE SURVEY DRAWING FROM K2 DESIGN GROUP.

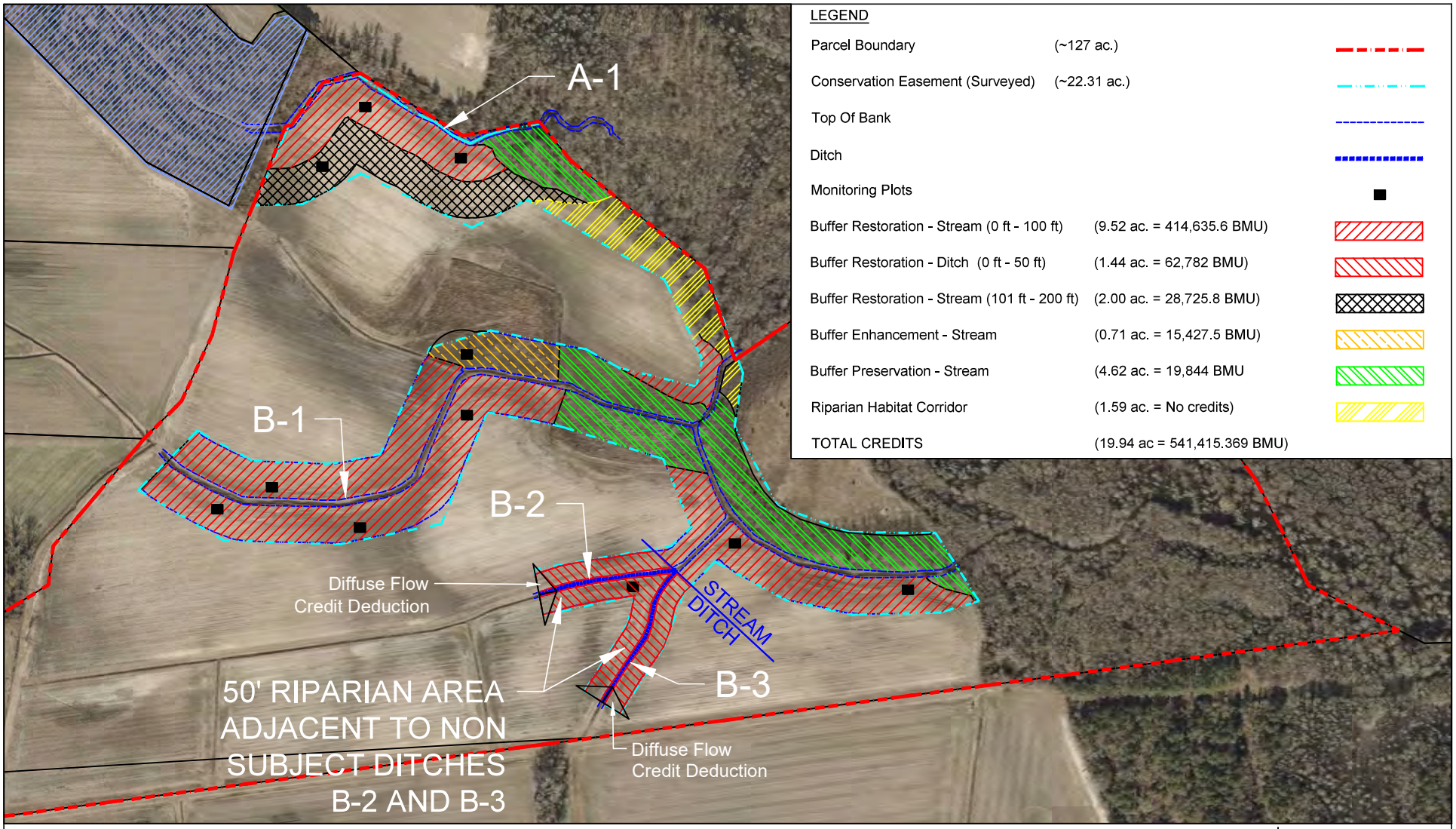
0 500 1000 2000
SCALE 1"=1000'

Wingfoot Riparian Buffer Mitigation Site
Cataloging Unit 03020203
Pitt County, NC
January 2019
LMG18.093

CLEARWATER MITIGATION SOLUTIONS
LMG LAND MANAGEMENT GROUP a DAVEY company

Figure 8A
Mitigation Plan Overview

L:\WETLANDS\2018 WETLANDS FILES\LMG18.305 --- Wingfoot Buffer Project, Kevin Yates\CAD\Wingfoot.dwg



LEGEND

Parcel Boundary	(~127 ac.)	
Conservation Easement (Surveyed)	(~22.31 ac.)	
Top Of Bank		
Ditch		
Monitoring Plots		
Buffer Restoration - Stream (0 ft - 100 ft)	(9.52 ac. = 414,635.6 BMU)	
Buffer Restoration - Ditch (0 ft - 50 ft)	(1.44 ac. = 62,782 BMU)	
Buffer Restoration - Stream (101 ft - 200 ft)	(2.00 ac. = 28,725.8 BMU)	
Buffer Enhancement - Stream	(0.71 ac. = 15,427.5 BMU)	
Buffer Preservation - Stream	(4.62 ac. = 19,844 BMU	
Riparian Habitat Corridor	(1.59 ac. = No credits)	
TOTAL CREDITS	(19.94 ac = 541,415.369 BMU)	

NOTES:
1. BUFFER MITIGATION BOUNDARIES BASED UPON BASE SURVEY DRAWING FROM K2 DESIGN GROUP.

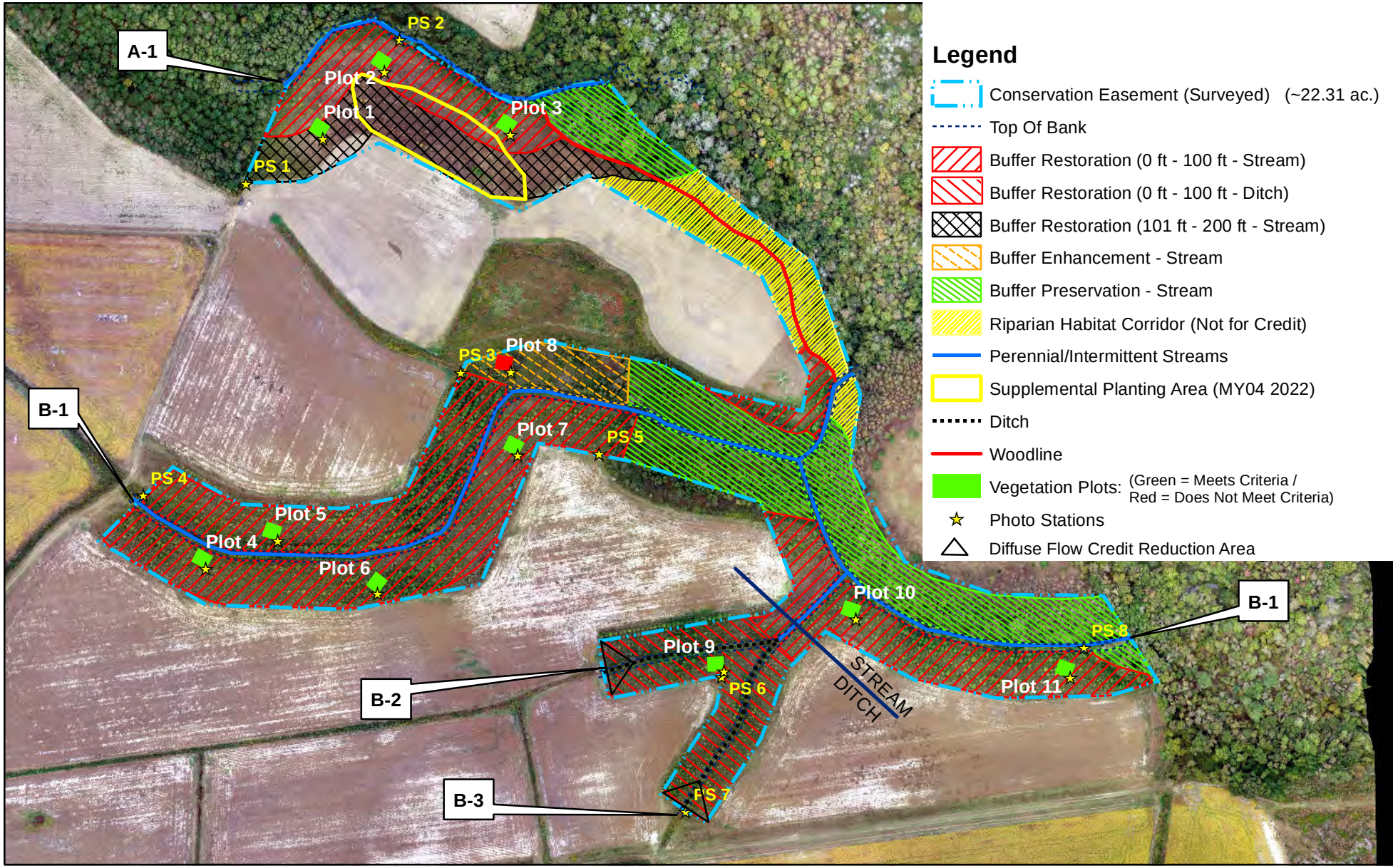
0 200 400 800
SCALE 1"=400'

Wingfoot Riparian Buffer Mitigation Site
Cataloging Unit 03020203
Pitt County, NC
January 2019
LMG18.093

CLEARWATER MITIGATION SOLUTIONS
LMG LAND MANAGEMENT GROUP a DAVEY company

Figure 8B
Mitigation Plan Inset
with Plot Locations

L:\WETLANDS\2018 WETLANDS FILES\LMG18.305 --- Wingfoot Buffer Project, Kevin Yates\CAD\Wingfoot.dwg



L:\WETLANDS\2018 WETLANDS FILES\DRGNCW18.305 --- Wingfoot Buffer Project, Kevin Yates\Maps

Map Source: MY04 Drone Imagery (DRG)

Wingfoot Riparian Buffer Mitigation Site
Cataloging Unit 03020203
Pitt County, NC

Map Date: 2-8-24
DRGNCW18.305

DAVEY Resource Group
3805 Wrightsville Avenue
Wilmington, NC 28403
(910) 452-0001

Figure 9
Current Condition Plan View
(MY05)

Table 1. Buffer Project Attributes
Wingfoot Riparian Buffer Mitigation Site
Monitoring Year 5 – 2023

Project Name	Wingfoot Riparian Buffer Restoration Project
Hydrologic Unit Code	**03020203070030 (14 digit)**
River Basin	Neuse
Geographic Location (Lat, Long)	35.565723, -77.533763
Site Protection Instrument (DB, PG)	To Be Recorded
Total Credits (BMU)	544,080 (sf)
Types of Credits	Riparian Buffer
Mitigation Plan Date	February 2019
Initial Planting Date	March 12th-13th, 2019
Baseline Report Date	March 13th-20th, 2019
MY1 Report Date	December 2019
MY2 Report Date	December 2020
MY3 Report Date	October 2021
Supplemental Planting	March 2022
MY4 Report Date	November 2022
MY5 Report Date	**November 2023**

Mitigation Services
ENVIRONMENTAL QUALITY

Table 2. Wingfoot, 100078, Project Mitigation Credits

Neuse 03020203	**Service Area**
19.16394	**N Credit Ratio (sf/credit)**
N/A	**P Credit Ratio (sf/credit)**

Credit Type	Location	Subject? (enter NO if ephemeral or ditch [1])	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (sf)	Total (Creditable) Area of Buffer Mitigation (sf)	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	A1, B1, B2	414,636	414,636	1	100%	1.00000	Yes	414,636.000	Yes	21,636.261	—
Buffer	Rural	Yes	I / P	Restoration	101-200	A1, B1, B2	87,048	87,048	1	33%	3.03030	Yes	28,725.869	Yes	4,542.281	—
Buffer	Rural	Yes	I / P	Enhancement	0-100	B1	30,855	30,855	2	100%	2.00000	Yes	15,427.500	No	—	—
Buffer	Rural	No	Ditch	Restoration	0-50	B2, B3 (ditches)	71,494	62,782	1	100%	1.00000	Yes	62,782.000	Yes	3,730.652	—
													—		—	—
						Totals:	604,033	595,321								
						Eligible for Preservation (sf):		198,440								

Enter Preservation Credits Below

Credit Type	Location	Subject?	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (sf)	Total (Creditable) Area for Buffer Mitigation (sf)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits
	Rural	Yes	I / P		0-100	A1, B1	201,074	198,440	10	100%	10.00000	19,844.000
						Preservation Area Subtotal (sf):		198,440				
						Preservation as % Total Area of Buffer Mitigation:		25.0%				
						Ephemeral Reaches as % Total Area of Buffer Mitigation:		0.0%				

TOTAL AREA OF BUFFER MITIGATION (TABM)		
Mitigation Totals	**Square Feet**	**Credits**
Restoration:	564,466	506,143.869
Enhancement:	30,855	15,427.500
Preservation:	198,440	19,844.000
Total Riparian Buffer:	793,761	541,415.369

TOTAL NUTRIENT OFFSET MITIGATION			
Mitigation Totals		**Square Feet**	**Credits**
Nutrient Offset:	**Nitrogen:**	0	0.000
	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).

APPENDIX B:

Vegetation Data
&
Viability Letter

Table 4. Planted and Total Stems

Wingfoot Riparian Buffer Mitigation Site

DMS Project No. 100078

Monitoring Year 5 – 2023

CVS Project Code 80. Project Name: WINGFOOT

Scientific Name	Common Name	Species Type	Current Plot Data (MY5 2023)																															Annual Means																	
			000-01-0001			000-01-0002			000-01-0003			000-01-0004			000-01-0005			000-01-0006			000-01-0007			000-01-0008			000-01-0009			000-01-0010			000-01-0011			MY5 (2023)			MY4 (2022)			MY3 (2021)			MY2 (2020)			MY1 (2019)			MY0 (2019)		
			Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T	Pnol	P-all	T
Acer rubrum	Red Maple	Tree																									4			4			24			32			1			154			33			5		
Baccharis halimifolia	Silverling, High-tide Bush, Mullet Bush, Grour	Shrub Tree																	1			2							5						4																	
Betula nigra	River Birch, Red Birch	Tree				2	2	2	1	1	1	4	4	4	1	1	1	3	3	3	1	1	1				4	4	4	4	4	4	6	6	6	26	26	26	26	26	26	28	28	28	29	29	29	30	30	30	31	31	31
Carya illinoinensis	Pecan	Tree																																					1			1			1			1			1
Carya ovata	Common Shagbark Hickory	Tree																																																	
Diospyros virginiana	American Persimmon, Possumwood	Tree																																																
Ligustrum sinense	Chinese Privet	Shrub Tree																					2													2			1			1			2			1			1
Liquidambar styraciflua	Sweet Gum, Red Gum	Tree			2			6			11			2			7			1			1			3			4			27			64			35			63			24			1		
Morella cerifera	Common Wax-myrtle, Southern Bayberry	Shrub Tree																																		1																
Myrica	Sweet Gale	Shrub																																					1													
Pinus taeda	Loblolly Pine, Old Field Pine	Tree			3						2			1						4															10			6													
Platanus occidentalis	Sycamore, Plane-tree	Tree	5	5	5	1	1	1				4	4	4	4	4	4	6	6	6	6	6	6	1	1	1	6	6	6	6	6	6	4	4	4	43	43	43	44	44	44	43	43	43	44	44	44	47	47	47	48	48	48
Quercus nigra	Water Oak, Paddle Oak	Tree				2	2	2	2	2	2	3	3	3	2	2	2	1	1	1																10	10	10	10	10	10	10	10	10	10	10	10	12	12	12	19	19	19
Quercus phellos	Willow Oak	Tree	3	3	3	1	1	1	4	4	4	5	5	5	5	5	5				4	4	4	4	4	4	5	5	5								31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Rhus copallinum	Winged Sumac	Shrub Tree																																															6		5
Taxodium distichum	Bald-cypress	Tree	8	8	8	4	4	4	9	9	9	2	2	2	1	1	1	7	7	7	3	3	3				1	1	1	6	6	6	4	4	4	45	45	45	47	47	47	47	47	47	48	48	48	50	50	50	52	52	52
	Stem count		16	16	21	10	10	16	16	16	29	18	18	18	13	13	16	17	17	25	14	14	21	5	5	8	16	16	24	16	16	24	14	14	66	155	155	268	158	158	203	159	159	378	162	162	223	170	170	195	181	181	188
	size (ares)			1			1			1			1			1			1			1			1			1			1			1			11			11			11			11			11		
	size (ACRES)			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.27			0.27			0.27			0.27			0.27		
	Species count		3	3	5	5	5	6	4	4	6	5	5	5	5	5	7	4	4	6	4	4	7	2	2	4	4	4	7	3	3	5	3	3	6	5	5	11	5	5	11	5	5	9	5	5	10	5	5	11	5	5	8
	Stems per ACRE		647	647	850	405	405	647	647	647	1174	728	728	728	526	526	647	688	688	1012	567	567	850	202	202	324	647	647	971	647	647	971	567	567	2671	570	570	986	581	581	747	585	585	1391	596	596	820	625	625	681	666	666	592

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%

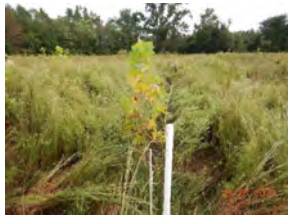
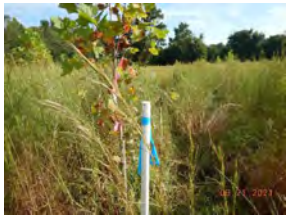
PnoLS: Number of planted stems excluding live stakes

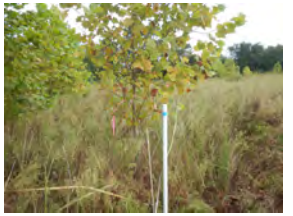
P-All: Number of planted stems including live stakes

T: Total stems

Plot 1:

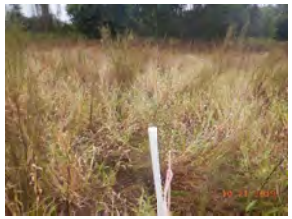


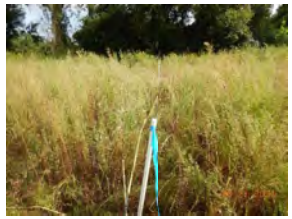





Baseline | Year 01 | Year 02 | Year 03 | Year 04 | Year 05

Plot 2:

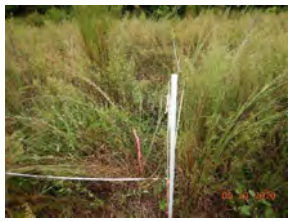





Baseline | Year 01 | Year 02 | Year 03 | Year 04 | Year 05

Plot 3:

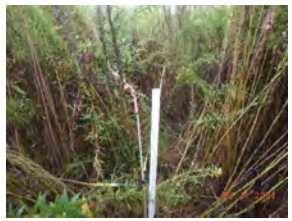





Baseline | Year 01 | Year 02 | Year 03 | Year 04 | Year 05

Plot 4:



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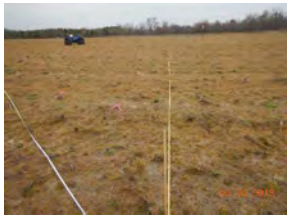
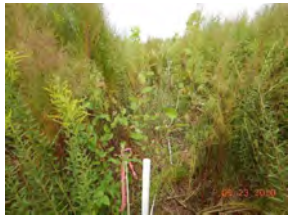
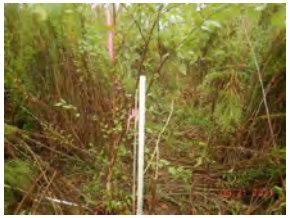
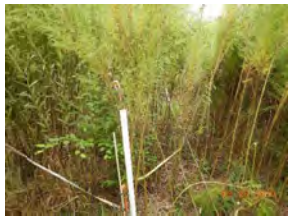


Baseline | Year 01 | Year 02 | Year 03 | Year 04 | Year 05

Plot 6:






Baseline | Year 01 | Year 02 | Year 03 | Year 04 | Year 05

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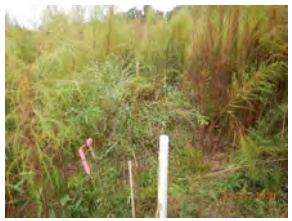
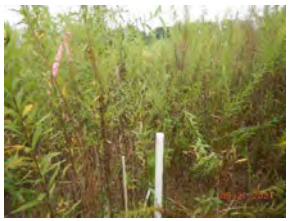



Baseline | Year 01 | Year 02 | Year 03 | Year 04 | Year 05

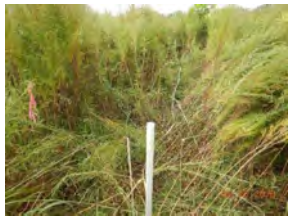
Plot 8:





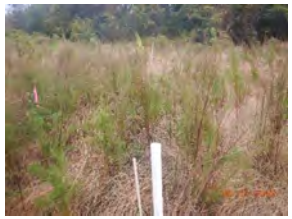
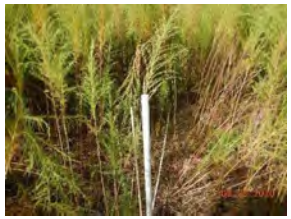
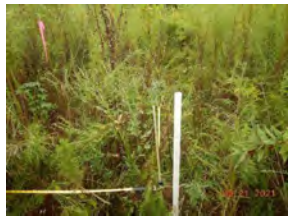

Plot 9:

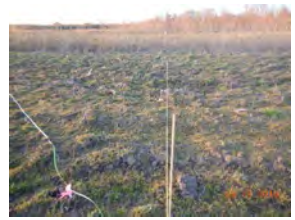





Baseline | Year 01 | Year 02 | Year 03 | Year 04 | Year 05

Plot 10:

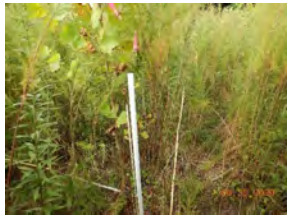
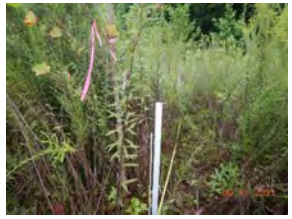







Baseline | Year 01 | Year 02 | Year 03 | Year 04 | Year 05

Plot 11:



Baseline | Year 01 | Year 02 | Year 03 | Year 04 | Year 05

(1) PS1 (Looking north towards Reach A1)

(2) PS1 (Looking northeast towards CE boundary)

(3) PS2 (Looking west along Reach A1)

(4) PS2 (Looking east along Reach A1)

(5) PS3 (Looking east along enhancement area)

(6) PS3 (Looking northeast into enhancement area)

(7) PS4 (Looking east along Reach B1)

(8) PS4 (Looking northeast into restoration area)

(9) PS5 (Looking north towards preservation area)

(10) PS5 (Looking west into restoration area)

(11) PS6 (Looking north towards Reach B2)

(12) PS6 (Looking west into restoration area)

(13) PS7 (Looking north along Reach B3)

(14) PS7 (Looking north into restoration area)

(15) PS8 (Looking west along Reach B1)

Plot (continued): 000-01-0001

ID	Species	map char	source	X (m)	Y (m)	Nov 2022 Data ddh (mm)	Nov 2022 Data Height (cm)	Nov 2022 Data DBH (cm)	Notes*	THIS YEAR'S DATA ddh (mm)	THIS YEAR'S DATA Height (cm)	THIS YEAR'S DATA DBH (cm)	THIS YEAR'S DATA Re-sprout	THIS YEAR'S DATA Vigor*	THIS YEAR'S DATA Damage*	THIS YEAR'S DATA Notes

Vegetation Monitoring Data (VMD) Datasheet — **Please fill in any missing data and correct any errors.**

Plot 000-01-0001

VMD Year (1-5): 5 Date: 9/26/23 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 35.567407 Datum: NAD83/WGS84

Longitude or UTM-E: -77.536035 UTM Zone:

Coordinate Accuracy (m): 5 X-Axis bearing (deg): 46

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party: WF, MW, JP — Role:

Date last planted:

New planting date m/yy? /

☐ Check box if plot was not sampled, specify reason below

Notes:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Nov 2022 Data Height 1cm*	Nov 2022 Data DBH 1 cm	Notes*	THIS YEAR'S DATA Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
16	Platanus occidentalis	c	R	1.2	0.2	325.0	4.0	☑	365	5	☐	4		
17	Taxodium distichum	l	R	6.1	0.5	71.0		☐	50	3	☐			Broken mainstem
18	Taxodium distichum	b	R	0.6	1.8	73.0		☐	92		☐	4		
19	Platanus occidentalis	f	R	2.1	3.1	366.0	4.5	☐	487	5	☐	4		
20	Taxodium distichum	n	R	6.8	3.6	42.0		☑	37		☐	1		no leaves broken
21	Taxodium distichum	e	R	1.6	5.0	150.0	1.0	☐	180		☐	4		
22	Platanus occidentalis	o	R	7.9	5.2	396.0	4.5	☐	457	8	☐	4		
23	Taxodium distichum	r	R	9.0	6.6	88.0		☑	143	1.5	☐	4		
24	Taxodium distichum	g	R	3.3	1.1	69.0		☑	88		☐	4		
25	Taxodium distichum	q	R	9.0	2.7	27.0		☑	25		☐	4		resprout
26	Taxodium distichum	j	R	4.2	4.7	79.0		☑	95		☐	4		
27	Taxodium distichum	p	R	8.2	8.7	64.0		☐	78		☐	4		
28	Platanus occidentalis	h	R	3.3	6.4	275.0	2.0	☐	457	4	☐			
29	Quercus phellos	m	R	6.1	7.9	62.0		☐	64		☐	3		grazed
30	Platanus occidentalis	k	R	4.4	7.1	458.0	5.0	☐	518	9	☐	4		
31	Quercus phellos	a	R	0.2	9.5	120.0	*DBH?*	☐	102		☐	3		broken mainstem
32	Platanus occidentalis	d	R	1.5	10.0	365.0	3.0	☐	396	3.5	☐	4		
33	Quercus phellos	i	R	3.2	9.0	73.0		☐	68		☐	3		shaded

 # stems: 18

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:**
16-broken mainstem
20-yr2: mainstem broken | yr3: Shade | yr4: shaded out
23-mainstem broken
24-shaded out
25-yr1: broken mainstem | yr2: broken mainstem; shade | yr3: Shade | yr4: shaded out
26-broken mainstem

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM. HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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X DIAG Y

Plot (continued): 000-01-0001

ID	Species	map char	source	X (m)	Y (m)	Nov 2022 Data ddh (mm)	Height (cm)	DBH (cm)	Notes*	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	SEEDLINGS — HEIGHT CLASSES: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	SAPLINGS — DBH: Sub-Sapl	0-1 cm	1-2.5	TREES — DBH: 2.5-	5-	=10 (write DBH)
Lob pine			•				•	•			
Sw Gum			•					•			

**Required if cut-off >10cm or subsample ? 100% ●1 ●2 ●3 ●4 ●5 ●6 ●7 ●8 ●9 ●10 Form WS2, ver 9.1

Horseweed 30%

Andropogon virginicus 50%

Sicklepod 2%

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Vegetation Monitoring Data (VMD) Datasheet **Please fill in any missing data and correct any errors.**

Plot 000-01-0002

VMD Year (1-5): 5 Date: 9/26/23 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 35.567799 Datum: NAD83/WGS84

Longitude or UTM-E: -77.535561 UTM Zone:

Coordinate Accuracy (m): 5 X-Axis bearing (deg): 40

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
WF	
MW	
JD	

Date last planted:

New planting date m/yy? /

☐ Check box if plot was not sampled, specify reason below

Notes:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Nov 2022 Data Height 1cm*	Nov 2022 Data DBH 1 cm	Notes*	THIS YEAR'S DATA Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
35	Platanus occidentalis	a	R	1.5	4.3	320.0	3.0	☐	365	3.5	☐	4		
36	Quercus phellos	k	R	7.5	0.8	53.0		☐	56		☐	3	[illegible]	
37	Quercus nigra	c	R	3.0	1.8	65.0		☐	67		☐	3		
38	Taxodium distichum	l	R	9.8	2.7	78.0		☐	83		☐	2	early leaf drop	
39	Taxodium distichum	e	R	4.5	5.2	82.0		☐	85		☐	4		
42	Quercus nigra	b	R	1.5	9.7	52.0		☐	87		☐	4		
43	Taxodium distichum	f	R	4.9	8.8	88.0		☐	97		☐	4		
44	Taxodium distichum	h	R	6.2	2.9	63.0		☐	103		☐	4		
45	Betula nigra	i	R	7.0	7.5	74.0		☐	78		☐	4	gnawed	
46	Betula nigra	g	R	5.9	9.6	115.0	*DBH?*	☐	120		☐	4		
892	Platanus occidentalis	j	R	7.2	4.5	104.0	*DBH?*	☐	120		☐	3	spindly	
893	Platanus occidentalis	d	R	3.5	9.9	120.0	*DBH?*	☐	116		☐	4	gnawed	

 # stems: 12

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes
[illegible]								
Taxodium Distichum		10	9.0	97		4		

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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X DIA 6 4

Plot (continued): 000-01-0002

ID	Species	map char	source	X (m)	Y (m)	Nov 2022 Data: ddh (mm)	Height (cm)	DBH (cm)	Notes*	THIS YEAR'S DATA: ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	SEEDLINGS — HEIGHT CLASSES: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	SAPLINGS — DBH: Sub-Sapl	0-1 cm	1-2.5	TREES — DBH: 2.5-	5-	=10 (write DBH)
Sw Gum			●●	●			●				

**Required if cut-off >10cm or subsample ? 100%

●1 ●2 ●3 ●●4 ●●5 ●●6 ●●7 ●●8 ●●9 ●●10

Form WS2, ver 9.1

Andropogon virg. 40

Herbaceous 20

Dogfennel 10

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Vegetation Monitoring Data (VMD) Datasheet **Please fill in any missing data and correct any errors.**

Plot 000-01-0003

VMD Year (1-5): 5 Date: 9/26/23 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 35.567420 Datum: NAD83/WGS84

Longitude or UTM-E: -77.534662 UTM Zone:

Coordinate Accuracy (m): 5 X-Axis bearing (deg): 40

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
WF	
MW	
SP	

Date last planted:

New planting date m/yy? /

☐ Check box if plot was not sampled, specify reason below

Notes:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Nov 2022 Data Height 1cm*	Nov 2022 Data DBH 1 cm	Notes*	THIS YEAR'S DATA Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
48	Quercus phellos	ⓓ	R	0.4	0.1	88.0		☐	88		☐	4		
49	Taxodium distichum	ⓒ	R	0.2	3.1	192.0	1.5	☐	230	2.5	☐	4		
50	Taxodium distichum	ⓐ	R	0.1	6.0	220.0	1.0	☐	225	3	☐	4		
51	Taxodium distichum	ⓑ	R	0.1	8.9	207.0	1.4	☐	275	3	☐	4		
52	Quercus nigra	ⓘ	R	3.0	8.0	115.0	*DBH?*	☑	98		☐	4		
53	Taxodium distichum	ⓗ	R	3.0	5.4	145.0	0.4	☐	190	2.0	☐	4		
54	Taxodium distichum	ⓖ	R	3.0	2.9	195.0	1.0	☐	200	2.0	☐	4		
55	Quercus phellos	ⓕ	R	3.0	0.2	55.0		☐	53	-	☐	3	stunted	
56	Quercus nigra	ⓙ	R	6.0	1.9	96.0		☐	88		☐	4	broken mainstem	
57	Taxodium distichum	ⓚ	R	6.1	4.7	160.0	0.5	☐	147	0.5	☐	4	broken mainstem	
58	Taxodium distichum	ⓜ	R	6.2	7.3	182.0	0.7	☐	230	2.5	☐	4		
59	Taxodium distichum	ⓛ	R	6.3	10.0	142.0	0.5	☐	147	1	☐	4		
60	Taxodium distichum	ⓟ	R	9.1	8.5	206.0	1.5	☐	300	3	☐	4		
61	Betula nigra	ⓞ	R	9.0	6.1	82.0		☐	83		☐	4		
62	Quercus phellos	ⓝ	R	9.0	3.8	118.0	*DBH?*	☐	122		☐	3		
63	Quercus phellos	ⓠ	R	9.6	1.8	130.0	*DBH?*	☐	182	1.5	☐	63	gnawed by moth	
895	Platanus occidentalis	ⓔ	R	1.5	7.0	102.0	*DBH?*	☐	190	0.75	☐	4		

 # stems: 17

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes
Taxodium distichum		7.0	1.1	121		4		

***Notes by ID:** 52-dead leaves

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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4 DIAG 4

Plot (continued): 000-01-0003

ID	Species	map char	source	X (m)	Y (m)	Nov 2022 Data: ddh (mm)	Height (cm)	DBH (cm)	Notes*	THIS YEAR'S DATA: ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	SEEDLINGS — HEIGHT CLASSES: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	SAPLINGS — DBH: Sub-Sapl	0-1 cm	1-2.5	TREES — DBH: 2.5-	5-	=10 (write DBH)
Lob Pine				•				•			
Sw Gum			••	••				••	•		

**Required if cut-off >10cm or subsample ? 100%

•1 •2 •• 3 •• 4 •• 5 •• 6 •• 7 •• 8 •• 9 •• 10

Form WS2, ver 9.1

Goldenrod
Horsenettle
Sicklepod
Ragweed
Johnson grass

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Vegetation Monitoring Data (VMD) Datasheet **Please fill in any missing data and correct any errors.**

Plot 000-01-0004

VMD Year (1-5): 5 Date: 9/26/23 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 35.564821° Datum: NAD83/W GS84

Longitude or UTM-E: -77.536952° UTM Zone:

Coordinate Accuracy (m): 5 X-Axis bearing (deg): 32

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
WF	
MW	
JP	

Date last planted:

New planting date m/yy? /

☐ Check box if plot was not sampled, specify reason below

Notes:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data Height 1cm*	Last Year's Data DBH 1 cm	Notes*	THIS YEAR'S DATA Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
64	Quercus phellos	c	R	0.4	0.2	210.0	0.9	☐	250	2.0	☐	4		
65	Betula nigra	d	R	0.4	3.1	19.0	0.5	☐	240	2.0	☐	4		
66	Betula nigra	a	R	0.3	5.9	190.0	0.5	☐	190	0.5	☐	1		
67	Betula nigra	b	R	0.3	8.8	205.0	0.5	☑	260	3	☐	4		
69	Quercus nigra	h	R	3.7	8.1	105.0	DBH?	☑	114		☐	4		
70	Quercus nigra	g	R	3.7	5.4	122.0	DBH?	☑	104		☐	4	broken mainstem	
71	Quercus nigra	f	R	3.7	2.6	137.0	0.2	☐	150	0.5	☐	4		
72	Betula nigra	q	R	9.7	0.9	68.0		☐	70		☐	2	gnawed	
73	Taxodium distichum	r	R	9.9	4.0	57.0		☑	80 [illegible]		☐	4	broken mainstem	
74	Taxodium distichum	e	R	10.0	6.9	125.0	DBH?	☑	157	2.0	☐	4		
75	Quercus phellos	p	R	7.3	9.6	108.0	DBH?	☐	118		☐	4		
76	Quercus phellos	o	R	7.2	7.1	92.0		☐	100		☐	4		
77	Quercus phellos	n	R	6.9	4.4	219.0	1.3	☐	240	2.5	☐	4		
78	Quercus phellos	m	R	6.9	2.0	214.0	1.2	☐	274	2.5	☐	4		
79	Platanus occidentalis	j	R	5.0	1.1	230.0	1.0	☐	280	2.0	☐	4		
80	Platanus occidentalis	k	R	5.0	3.6	315.0	3.0	☐	365	3.5	☐	4		
81	Platanus occidentalis	l	R	5.1	6.5	335.0	3.0	☐	365	3.5	☐	4		
82	Platanus occidentalis	i	R	4.9	9.3	354.0	3.0	☑	365	4.0	☐	4		

 # stems: 18

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:**

67-broken mainstem
69-shade
70-shade
73-broken mainstem
74-yr1: no leaves | yr2: broken mainstem
82-shade

Goldenrod 80
Dogfennel 10

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane. DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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X DIAG 4

Plot (continued): 000-01-0004

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data: ddh (mm)	Height (cm)	DBH (cm)	Notes*	THIS YEAR'S DATA: ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	SEEDLINGS — HEIGHT CLASSES: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	SAPLINGS — DBH: Sub-Sapl	0-1 cm	1-2.5	TREES — DBH: 2.5-	5-	=10 (write DBH)

**Required if cut-off >10cm or subsample ? 100%

Form WS2, ver 9.1

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Vegetation Monitoring Data (VMD) Datasheet **Please fill in any missing data and correct any errors.**

Plot 000-01-0005

VMD Year (1-5): 5 Date: 9/26/23 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 35.564979 Datum: NAD83/W GS84

Longitude or UTM-E: -77.536428 UTM Zone:

Coordinate Accuracy (m): 5 X-Axis bearing (deg): 26

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
WF	
MW	
JP	

Date last planted:

New planting date m/yy? /

☐ Check box if plot was not sampled, specify reason below

Notes:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Nov 2022 Data Height 1cm*	Nov 2022 Data DBH 1 cm	Notes*	THIS YEAR'S DATA Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
83	Betula nigra	a	R	0.3	0.3	426.0	3.5	☐	457	6.5	☐	4		
84	Taxodium distichum	g	R	2.7	0.9	114.0	*DBH?*	☐	130		☐			
85	Platanus occidentalis	h	R	3.7	2.4	396.0	3.0	☐	426	3.5	☐	4		
86	Platanus occidentalis	l	R	5.9	1.0	42.0	4.5	☐	365	4.5	☐	4		
87	Quercus phellos	o	R	8.5	2.6	124.0	*DBH?*	☐	130		☐	3		
88	Taxodium distichum	d	R	2.1	4.0	126.0	*DBH?*	☐	165	0.5	☐	4		
89	Quercus phellos	n	R	7.9	5.4	67.0		☑	109		☐	3		
90	Platanus occidentalis	e	R	2.4	5.3	304.0	2.5	☐	365	3.5	☐	4		
92	Quercus phellos	m	R	7.3	8.3	171.0	0.7	☐	240	2.0	☐	4		
93	Quercus phellos	k	R	5.3	3.4	73.0		☐	77		☐	3		
94	Platanus occidentalis	f	R	2.4	7.9	335.0	3.0	☐	396	5	☐	4		
95	Quercus nigra	i	R	3.8	9.3	120.0	*DBH?*	☐	120		☐	4		
96	Quercus phellos	j	R	4.4	6.2	73.0		☐	73		☐	3	snowed	
97	Quercus nigra	c	R	10.0	8.1	196.0	0.6	☐	243	2	☐	4		
898	Quercus nigra	b	R	1.0	8.0	95.0		☐	105		☐	3	snowed	

 # stems: 15

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:** 89-broken mainstem

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Printed in the CVS Entry Tool ver. 2.5.0

4 DIAG 4

Plot (continued): 000-01-0005						Nov 2022 Data				THIS YEAR'S DATA						
ID	Species	map char	source	X (m)	Y (m)	ddh (mm)	Height (cm)	DBH (cm)	Notes*	ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	SEEDLINGS — HEIGHT CLASSES				SAPLINGS — DBH			TREES — DBH		
		Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	Sub-Sapl	0-1 cm	1-2.5	2.5-	5-	=10 (write DBH)
Pine taeda		—			•	—					
Sw Gum		—		•		—		•			
		—				—					
		—				—					
		—				—					
		—				—					
		—				—					

**Required if cut-off >10cm or subsample ? 100%. 1 2 3 4 5 6 7 8 9 10 Form WS2, ver 9.1

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVEStock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DIScased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Vegetation Monitoring Data (VMD) Datasheet **Please fill in any missing data and correct any errors.**

Plot 000-01-0006

VMD Year (1-5): 5 Date: 9/26/23 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 35.564664 Datum: NAD83/W

Longitude or UTM-E: -77.535666 UTM Zone:

Coordinate Accuracy (m): 5 X-Axis bearing (deg): 44

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
WF	
MW	
SD	

Date last planted:

New planting date m/yy? /

☐ Check box if plot was not sampled, specify reason below

Notes:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Nov 2022 Data Height 1cm*	Nov 2022 Data DBH 1 cm	Notes*	THIS YEAR'S DATA Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
98	Betula nigra	ⓐ	R	0.4	0.5	365.0	4.0 ☐		457	7.0	☐	4		
99	Taxodium distichum	ⓑ	R	0.8	4.9	185.0	0.3 ☑		215	2.0	☐	4		
100	Platanus occidentalis	ⓒ	R	1.0	8.9	518.0	6.0 ☑		609	8.5	☐	4		
101	Quercus nigra	ⓗ	R	4.0	9.9	243.0	1.5 ☐		360	3.0	☐	4		
102	Betula nigra	ⓖ	R	3.9	7.7	259.0	1.0 ☑		360	3.0	☐	4		
103	Platanus occidentalis	ⓕ	R	3.0	6.6	487.0	4.0 ☐	SP8	598	5.5	☐	4		
104	Taxodium distichum	ⓔ	R	3.0	2.5	184.0	1.2 ☐	S	195	2.0	☐	4		
105	Taxodium distichum	ⓚ	R	5.2	0.1	175.0	0.5 ☐		201	2	☐	4		
106	Platanus occidentalis	ⓘ	R	5.0	4.5	548.0	7.5 ☑		670	10	☐	4		
107	Platanus occidentalis	ⓞ	R	8.4	0.2	490.0	6.5 ☐		609	9.0	☐	4		
108	Platanus occidentalis	ⓛ	R	6.9	2.2	518.0	6.0 ☐		670	8.5	☐	4		
109	Betula nigra	ⓝ	R	7.8	3.4	210.0	0.5 ☐		230	2.0	☐	4		
110	Taxodium distichum	ⓜ	R	7.1	6.6	182.0	1.0 ☐		185	1.5	☐	4		
111	Taxodium distichum	ⓟ	R	8.9	5.0	210.0	1.0 ☐		230	2	☐	4		
112	Taxodium distichum	ⓠ	R	9.7	8.5	180.0	0.9 ☐		205	1.0	☐	4		
113	Taxodium distichum	ⓙ	R	5.1	8.5	116.0	*DBH?* ☐		79		☐	4	resprout	
546	Platanus occidentalis	ⓓ	R	2.4	1.5	187.0	0.8 ☐		280	2	☐	4		

 # stems: 17

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:**
99-broken mainstem
100-broken mainstem
102-broken mainstem
106-broken mainstem

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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4 DIAG 4

Plot (continued): 000-01-0006

ID	Species	map char	source	X (m)	Y (m)	Nov 2022 Data: ddh (mm)	Height (cm)	DBH (cm)	Notes*	THIS YEAR'S DATA: ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	SEEDLINGS — HEIGHT CLASSES: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	SAPLINGS — DBH: Sub-Sapl	0-1 cm	1-2.5	TREES — DBH: 2.5-	5-	=10 (write DBH)
SW Gum				●● ●●				●● ●			
Blackwood							●				

**Required if cut-off >10cm or subsample ? 100%.

●1 | ●2 ●● | ● 3 ●● | ●● 4 ●● | ●● 5 ●● | ●● 6 ●● | ●● 7 ●● | ●● 8 ●● | ●● 9 ●● | ●● 10 ●●

Form WS2, ver 9.1

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Vegetation Monitoring Data (VMD) Datasheet **Please fill in any missing data and correct any errors.**

Plot 000-01-0007

VMD Year (1-5): 5 Date: 9/26/23 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 35.565475 Datum: NAD83/WGS84

Longitude or UTM-E: -77.534645 UTM Zone:

Coordinate Accuracy (m): 5 X-Axis bearing (deg): 34

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
KF	
MW	
JP	

Date last planted:

New planting date m/yy? /

☐ Check box if plot was not sampled, specify reason below

Notes:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data Height 1cm*	Last Year's Data DBH 1 cm	Notes*	THIS YEAR'S DATA Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
114	Quercus phellos	a	R	0.2	0.1	260.0	1.5	☐	265	3.0	☐	4		
115	Betula nigra	c	R	0.6	2.7	77.0		☑	91	3	☐	4		
116	Taxodium distichum	d	R	0.6	4.8	100.0		☐	110		☐	4		
117	Platanus occidentalis	b	R	0.5	9.0	385.0	5.0	☑	550	5	☐	4		
118	Quercus phellos	g	R	3.7	0.4	182.0	1.5	☐	240	1.5	☐	4		
120	Betula nigra	f	R	3.0	3.1	96.0		☐			☐	0		Dead
121	Taxodium distichum	e	R	1.9	6.0	110.0	*DBH?*	☑	138	0.4	☐			
122	Quercus phellos	k	R	6.5	0.8	96.0		☐	106		☐	4		
123	Platanus occidentalis	h	R	3.7	9.5	275.0	2.0	☐	308	3	☐	4		
124	Platanus occidentalis	j	R	5.9	3.0	335.0	4.0	☐	426	45	☐	4		
125	Platanus occidentalis	l	R	7.1	9.8	360.0	3.5	☑	420	4	☐	4		
126	Quercus phellos	o	R	9.2	0.5	304.0	2.5	☐	356	4	☐	4		
127	Platanus occidentalis	m	R	8.8	3.5	365.0	3.5	☑	426	4	☐	4		
128	Platanus occidentalis	n	R	9.0	6.7	360.0	3.5	☐	426	4	☐	4		
129	Taxodium distichum	i	R	5.6	6.4	30.0		☑	31		☐	3		resprout

 # stems: 15 New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:**
115-yr1: die back | yr2: broken mainstem
117-broken mainstem
121-yr0: broken mainstem | yr1: no leaves
125-broken mainstem
127-broken mainstem
129-broken mainstem

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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4 DIA 6 4

Plot (continued): 000-01-0007						Last Year's Data			Notes*	THIS YEAR'S DATA						
ID	Species	map char	source	X (m)	Y (m)	ddh (mm)	Height (cm)	DBH (cm)		ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	SEEDLINGS — HEIGHT CLASSES: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	SAPLINGS — DBH: Sub-Sapl	0-1 cm	1-2.5	TREES — DBH: 2.5-	5-	=10 (write DBH)
Brcchaws		—				—		••			
Lob pine		—		••		—		••			
SW Gum		—		•		—					
		—				—					
		—				—					
		—				—					
		—				—					

**Required if cut-off >10cm or subsample ? 100%

Tally key: 1 2 3 4 5 6 7 8 9 10

Form WS2, ver 9.1

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m

Vegetation Monitoring Data (VMD) Datasheet **Please fill in any missing data and correct any errors.**

Plot 000-01-0008

VMD Year (1-5): 5 Date: 9/26/23 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 35.565976 Datum: NAD83/WGS84

Longitude or UTM-E: -77.534694 UTM Zone:

Coordinate Accuracy (m): 5 X-Axis bearing (deg): 20

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
WF	
MW	
JP	

Date last planted:

New planting date m/yy? /

☐ Check box if plot was not sampled, specify reason below

Notes:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data Height 1cm*	Last Year's Data DBH 1 cm	Notes*	THIS YEAR'S DATA Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
136	Quercus phellos	c	R	5.5	2.8	88.0		☐	98		☐	3	shaded	
138	Quercus phellos	d	R	5.5	4.9	66.0		☐	67		☐	4		
141	Quercus phellos	a	R	4.4	9.4	140.0	DBH!!	☑	147	1.0	☐	4		
144	Platanus occidentalis	e	R	6.6	6.6	365.0	3.6	☐	457	4.5	☐	4		
149	Quercus phellos	b	R	4.8	7.1	80.0		☑	71		☐	3	broken main stem	
902	Platanus occidentalis	f	R	9.5	9.5	275.0	2.0	☐	396	3.0	☐	4		

 # stems: 6

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:** 141-dead leaves
149-shade

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	Seedlings — Height Classes: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	Saplings — DBH: Sub-Sapl	0-1 cm	1-2.5	Trees — DBH: 2.5-	5-	=10 (write DBH)
Pecan		___				___					14
Privet		___				___			•		
Sw Gum		___	•			___					
		___				___					
		___				___					
		___				___					
		___				___					

**Required if cut-off >10cm or subsample ? 100%. ●1 ●2 ●3 ●4 ●5 ●6 ●7 ●8 ●9 ●10 Form WS2, ver 9.1

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m

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X DIA 6 4

Vegetation Monitoring Data (VMD) Datasheet **Please fill in any missing data and correct any errors.**

Plot 000-01-0009

VMD Year (1-5): 5 Date: 9 /20 /23 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 35.564148 Datum: NAD83/WGS84

Longitude or UTM-E: -77.533170 UTM Zone:

Coordinate Accuracy (m): 5 X-Axis bearing (deg): 0

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
WF	
MW	
JP	

Date last planted:

New planting date m/yy? /

☐ Check box if plot was not sampled, specify reason below

Notes:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Last Year's Data Height 1cm*	Last Year's Data DBH 1 cm	Notes*	THIS YEAR'S DATA Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
1	Betula nigra	e	R	0.7	0.8	280.0	3.5 ☐		396	5.5	☐	4		
2	Platanus occidentalis	c	R	0.2	7.6	457.0	5.0 ☐		457	4.5	☐	4		
3	Platanus occidentalis	h	R	2.9	3.7	487.0	5.0 ☐		609	6.5	☐	4		
4	Platanus occidentalis	j	R	3.4	7.0	518.0	8.0 ☑		670	10.5	☐	4		
5	Betula nigra	i	R	3.4	0.2	213.0	0.8 ☐		274	2.5	☐	4		
6	Quercus phellos	m	R	6.6	7.9	101.0	*DBH?* ☑		171	0.5	☐	4		
7	Quercus phellos	k	R	6.0	2.5	365.0	1.0 ☐	y	426	6	☐	4		
8	Quercus phellos	l	R	6.4	5.4	214.0	1.2 ☑		243	2.0	☐	4		
9	Quercus phellos	n	R	8.0	0.4	82.0	☑		114		☐	4		
10	Quercus phellos	f	R	10.0	5.1	304.0	2.5 ☑		304	3.5	☐	4		
11	Taxodium distichum	o	R	9.6	2.0	200.0	0.5 ☑		220	1.5	☐	4		
12	Platanus occidentalis	g	R	10.0	7.3	548.0	10.0 ☑		670	13	☐	4		
13	Platanus occidentalis	a	R	0.0	4.5	213.0	1.0 ☑	a	~~274~~	2.5	☐	4		
14	Betula nigra	d	R	0.2	9.7	114.0	*DBH?* ☐		122		☐	4		
15	Platanus occidentalis	p	R	9.9	9.6	548.0	9.0 ☐		640	8.5	☐	4		
723	Betula nigra	b	R	~~0.0~~ 6.0	~~6.0~~ 0.0	244.0	1.0 ☑		365	2.5	☐	4		

 # stems: 16

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:**

4-broken mainstem
6-no leaves
8-shade
9-shade
10-broken mainstem
11-broken mainstem
12-broken mainstem
13-broken mainstem
723-Re-sprout

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane. DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Printed in the CVS Entry Tool ver. 2.5.0

X DIA 6 Y

Plot (continued): 000-01-0009

ID	Species	map char	source	X (m)	Y (m)	Last Year's Data ddh (mm)	Height (cm)	DBH (cm)	Notes*	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	SEEDLINGS — HEIGHT CLASSES: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	SAPLINGS — DBH: Sub-Sapl	0-1 cm	1-2.5	TREES — DBH: 2.5-	5-	=10 (write DBH)
Basswood			•								
Red Maple			••								
Sweet Gum				••							

**Required if cut-off >10cm or subsample ? 100%.

●1 ●2 ●3 ●4 ●5 ●6 ●7 ●8 ●9 ●10

Form WS2, ver 9.1

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Vegetation Monitoring Data (VMD) Datasheet **Please fill in any missing data and correct any errors.**

Plot 000-01-0010

VMD Year (1-5): 5 Date: 9/26/23 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 35.564458 Datum: NAD83/WGS84

Longitude or UTM-E: -77.532176 UTM Zone:

Coordinate Accuracy (m): 5 X-Axis bearing (deg): 20

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party: ELF, MW, JP Role:

Date last planted:

New planting date m/yy? /

☐ Check box if plot was not sampled, specify reason below

Notes:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Nov 2022 Data Height 1cm*	Nov 2022 Data DBH 1 cm	Notes*	THIS YEAR'S DATA Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
154	Betula nigra	ⓓ	R	1.7	1.2	365.0	3.0 ☐		476	5.0	☐	4		
155	Taxodium distichum	ⓒ	R	0.8	4.3	160.0	1.0 ☑	205	205	1.5	☐	4		
156	Taxodium distichum	ⓗ	R	4.9	0.0	111.0	*DBH?* ☑		159	1.0	☐	4		
157	Platanus occidentalis	ⓑ	R	0.2	8.9	518.0	6.0 ☐		579	8.0	☐	4		
158	Taxodium distichum	ⓐ	R	0.0	2.6	125.0	*DBH?* ☐		123		☐	4		
159	Platanus occidentalis	ⓛ	R	6.9	0.2	548.0	5.5 ☑		701	10.5	☐	4		
160	Betula nigra	ⓖ	R	3.6	8.8	304.0	3.0 ☑		426	5.5	☐	4		
161	Betula nigra	ⓕ	R	3.0	4.8	84.0	☐		75		☐	4	grazed	
162	Taxodium distichum	ⓞ	R	9.1	0.8	145.0	0.5 ☐		180	1.5	☐	4		
163	Platanus occidentalis	ⓘ	R	5.8	3.7	548.0	5.0 ☐		609	6.0	☐	4		
164	Betula nigra	ⓔ	R	10.0	3.9	487.0	5.0 ☐		609	8.5	☐	4		
165	Platanus occidentalis	ⓜ	R	7.5	3.9	548.0	6.5 ☑		640	9.0	☐	4		
166	Platanus occidentalis	ⓝ	R	7.9	7.0	548.0	8.0 ☑		670	9.0	☐	4		
167	Platanus occidentalis	ⓟ	R	9.3	9.6	548.0	5.0 ☐		640	8.5	☐	4		
168	Taxodium distichum	ⓙ	R	6.1	5.7	175.0	0.3 ☐		205	2.5	☐	4		
169	Taxodium distichum	ⓚ	R	6.5	9.0	74.0	☑		95		☐	4		

 # stems: 16

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:**

155-early dieback
156-broken mainstem
159-broken mainstem
160-broken mainstem
165-broken mainstem
166-broken mainstem
169-yr1: shade | yr4: shaded out

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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4 DIAG 4

Plot (continued): 000-01-0010

ID	Species	map char	source	X (m)	Y (m)	Nov 2022 Data: ddh (mm)	Height (cm)	DBH (cm)	Notes*	THIS YEAR'S DATA: ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	SEEDLINGS — HEIGHT CLASSES: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	SAPLINGS — DBH: Sub-Sapl	0-1 cm	1-2.5	TREES — DBH: 2.5-	5-	=10 (write DBH)
Sw Gum			•		•			•			
Red maple			••								

**Required if cut-off >10cm or subsample? 100% ●1 ●2 ●3 ●●4 ●●5 ●●6 ●●7 ●●8 ●●9 ●●10

Form WS2, ver 9.1

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Vegetation Monitoring Data (VMD) Datasheet **Please fill in any missing data and correct any errors.**

Plot 000-01-0011

VMD Year (1-5): 5 Date: 9/26/23 - / /

Taxonomic Standard:

Taxonomic Standard DATE:

Latitude or UTM-N: (dec.deg. or m) 35.564084 Datum: NAD83/W GS84

Longitude or UTM-E: -77.530608 UTM Zone:

Coordinate Accuracy (m): 5 X-Axis bearing (deg): 20

Plot Dimensions: X: 10 Y: 10 ☐ Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X

Party:	Role:
WF	
MW	
JP	

Date last planted:

New planting date m/yy? /

☐ Check box if plot was not sampled, specify reason below

Notes:

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Nov 2022 Data Height 1cm*	Nov 2022 Data DBH 1 cm	Notes*	THIS YEAR'S DATA Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
170	Betula nigra	a	R	0.1	9.5	304.0	1.7 ☑	426	488	4	☐	4		
171	Platanus occidentalis	b	R	0.4	0.3	457.0	4.5 ☐		487	6.0	☐	4		
172	Taxodium distichum	c	R	1.0	6.2	140.0	0.3 ☐		140	0.5	☐	4		
173	Taxodium distichum	d	R	2.1	3.0	130.0	*DBH?* ☑		170	1.0	☐	4		
174	Betula nigra	f	R	3.4	0.1	243.0	1.7 ☐		274	2.5	☐	4		
175	Taxodium distichum	j	R	6.8	0.1	169.0	0.5 ☑		245	2.0	☐	4		
176	Platanus occidentalis	e	R	2.7	6.0	457.0	5.0 ☐		640	6.0	☐	4		
177	Betula nigra	g	R	3.7	8.2	101.0	*DBH?* ☐		120		☐	3	broken mainstem ground	
178	Platanus occidentalis	h	R	4.8	5.5	518.0	3.5 ☐		609	6.0	☐	4		
179	Taxodium distichum	i	R	5.7	2.9	195.0	1.0 ☐		260	2.5	☐	4		
180	Betula nigra	n	R	9.7	0.9	185.0	0.3 ☐		274	[illegible]	2.5	4		
181	Betula nigra	l	R	8.0	6.5	117.0	*DBH?* ☑		259	1.5	☐	4		
182	Betula nigra	m	R	8.9	3.4	81.0	☑		148	.25	☐	3		grazed
183	Platanus occidentalis	k	R	6.9	9.4	609.0	5.5 ☑		701	9.0	☐	4		

 # stems: 14

New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:**

170-broken mainstem
173-shade
175-broken mainstem
181-shaded out
182-shaded out
183-broken mainstem

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

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Plot (continued): 000-01-0011

ID	Species	map char	source	X (m)	Y (m)	Nov 2022 Data ddh (mm)	Height (cm)	DBH (cm)	Notes*	THIS YEAR'S DATA ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): ☐ 10cm ☐ 50cm ☐ 100cm ☐ 137cm

Species Name	☑ c	SEEDLINGS — HEIGHT CLASSES: Sub-Seed	10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	SAPLINGS — DBH: Sub-Sapl	0-1 cm	1-2.5	TREES — DBH: 2.5-	5-	=10 (write DBH)
SW Gum				1	1		2	2	1		
Red maple			3								
Wax myrtle										1	

**Required if cut-off >10cm or subsample ? 100% ●1 ●2 ●3 ●4 ●5 ●6 ●7 ●8 ●9 ●10

Form WS2, ver 9.1

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing.

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRicane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Interim Director

NORTH CAROLINA
Environmental Quality

September 26, 2018

Kevin Yates
Clearwater Mitigation Solutions
604 Macon Place, Raleigh, NC 27609
Raleigh, NC 27609
(via electronic mail: clearwatermitigation@gmail.com)

DWR #: 2018-0854 v1

Re: Site Viability for Buffer Mitigation & Nutrient Offset – Wingfoot Site
Located off Moye Turnage Rd, Farmville, NC
Neuse River Basin/HUC 03020203
Pitt County

Dear Mr. Yates,

On August 30, 2018, Katie Merritt, with the Division of Water Resources (DWR), assisted you and others from Clearwater Mitigation Solutions, LLC (CMS) at the proposed Wingfoot Mitigation Site (Site) in Farmville, NC. Staff with the Division of Mitigation Services (DMS) were also present onsite. The Site is in the Neuse River Basin. The Site is being proposed as part of a full-delivery buffer mitigation project for the DMS (RFP # 16-007402). At your request, Ms. Merritt performed an onsite assessment of riparian land uses adjacent to surface waters onsite, which are shown on the attached map labeled "Figure 8B".

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 .0240.

Feature	Classification onsite	[1]Subject to Buffer Rule	Riparian Land uses adjacent to Feature (0-200')	Buffer Credit Viable	[2]Nutrient Offset Viable at 2,273.02 lbs/acre	Mitigation Type Determination w/in riparian areas
A (B-1)	Stream	Yes	Mostly row crop agriculture but also a combination of partially forested & forested areas downstream (see Figure 8B)	Yes[3]	Yes *(non-forested fields only)*	Non-forested fields - **Restoration Site** per 15A NCAC 02B .0295 (n) Partially Forested areas - **Enhancement Site** per 15A NCAC 02B .0295 (n) Forested areas - **Preservation Site** per 15A NCAC 02B .0295 (o)(5)
B (B-2) upstream	Ditch	No	Row crop agriculture	*see note	Yes	**Restoration Site** per 15A NCAC 02B .0295 (o)(8) ***Buffer Mitigation –** Assessment concludes the ditch meets 15A NCAC 02B .0295 (o)(8) (A, B, C, D & E). More information on watershed drainage is needed for complete assessment. See rule.
B (B-2) downstream (at DWR Flag)	Stream	Yes	Row crop agriculture	Yes	Yes	**Restoration Site** per 15A NCAC 02B .0295 (n)
C (B-3)	Ditch	No	Row crop agriculture	*see note	Yes	**Restoration Site** per 15A NCAC 02B .0295 (o)(8) ***Buffer Mitigation –** Assessment concludes the ditch meets 15A NCAC 02B .0295 (o)(8) (A, B, C, D & E). More information on watershed drainage is needed for complete assessment. See rule.
D (A-1)	Stream	Yes	Row crop agriculture along right bank w/ forested areas along left bank	Yes[3]	Yes *(non-forested fields only)*	Non-forested fields - **Restoration Site** per 15A NCAC 02B .0295 (n) Forested areas - **Preservation Site** per 15A NCAC 02B .0295 (o)(5)
E	Not present	N/A	N/A	N/A	N/A	N/A

[1]Subjectivity calls for the features were determined by DWR in correspondence dated September 24, 2018 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

[2] *NC Division of Water Resources - Methodology and Calculations for determining Nutrient Reductions associated with Riparian Buffer Establishment*

[3]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.

The map that is attached (Figure 8B) was prepared by CMS for DMS and accurately represents the mitigation type determinations of each feature labeled in the table above. This map was initialed by Ms. Merritt on September 25, 2018. **This letter should be provided in all stream and wetland, buffer and/or nutrient offset mitigation plans for this Site.**

This letter does not constitute an approval of this site to generate mitigation 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 .0240, 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 .0240.

This viability assessment will expire on September 26, 2020 or upon the submittal of an As-Built Report to the DWR, whichever comes first. This letter should be provided in all stream, wetland or buffer mitigation plans for this Site.

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

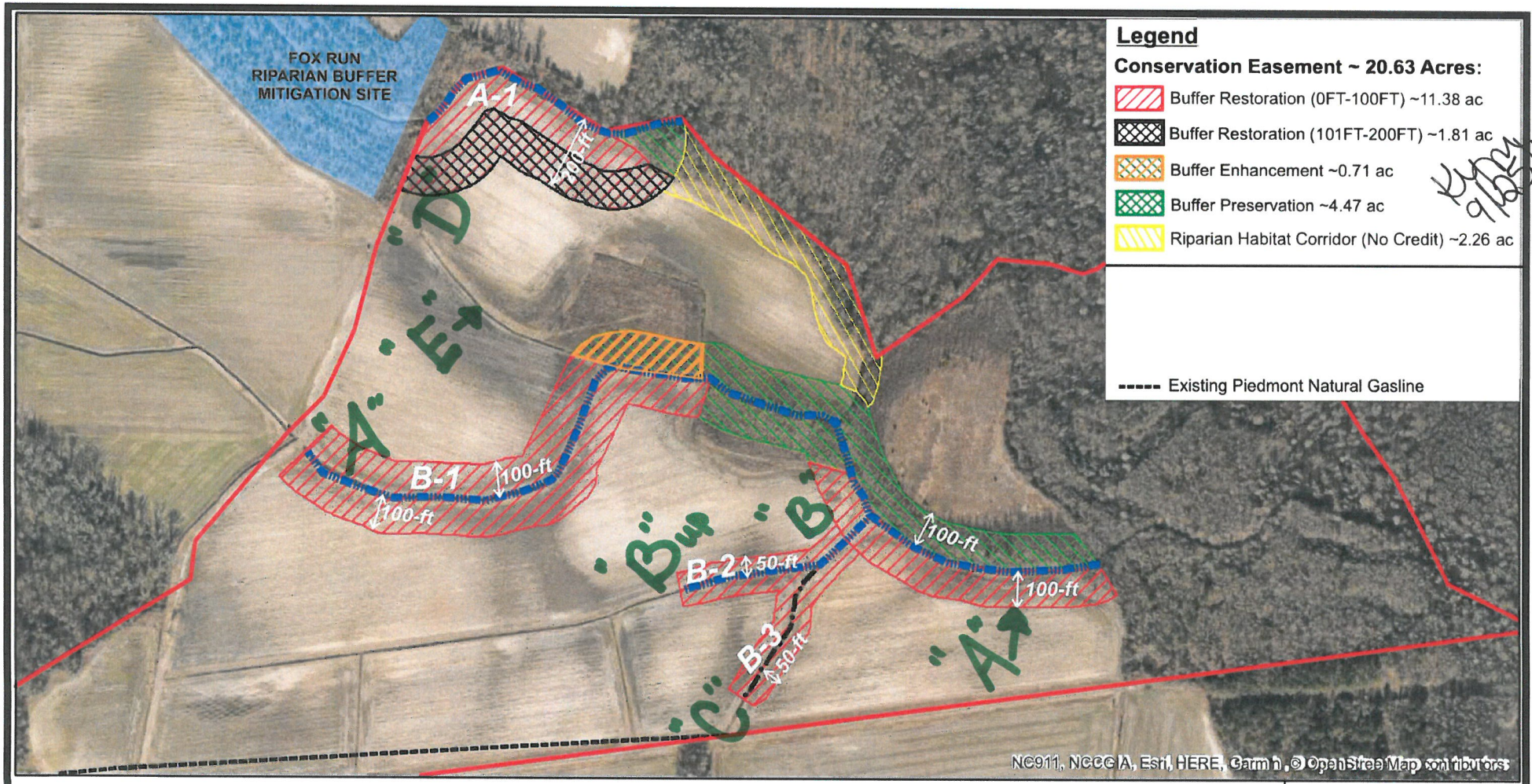
Sincerely,

Karen Higgins

Karen Higgins, Supervisor
401 and Buffer Permitting Branch

KAH/*km*
Attachments: Figure 8B

cc: File Copy (Katie Merritt)
Jeff Schaffer (DMS) – via electronic mail



Parcel Boundary ~127 ac

kym 9/25/18

kym 9/25/18

L:\WETLANDS\2018\40-18-093\maps\mapset

*Boundaries are approximate and are not meant to be absolute.

Map Source: 2016 NC OneMap Aerial Photography

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SCALE 1" = 400'

Wingfoot Riparian
Buffer Mitigation Site
Cataloging Unit 03020203
Pitt County, NC
March 2018
LMG # 40-18-093

CLEARWATER MITIGATION SOLUTIONS

LMG
LAND MANAGEMENT GROUP INC.
Environmental Consultants

Figure 8B
Concept Mitigation Plan
Inset
Response to RFP # 16-007402