

Baseline Monitoring Report

Longhorn Riparian Buffer Mitigation Site

Randolph County, NC

DMS Project No. 100114

DMS Contract Number: 7866

DWR Project Number: 2019-0681

Randleman Lake Watershed

Cape Fear River Basin

HUC 03030003

RFP #16-007703



Prepared For:



NC Department of Environmental Quality

Division of Mitigation Services

1652 Mail Service Center

Raleigh, NC 27699-1652

Baseline Monitoring Report

Longhorn Riparian Buffer Mitigation Site
Randolph County, NC

DMS Project No. 100114
DMS Contract Number: 7866
DWR Project Number: 2019-0681

Randleman Lake Watershed
Cape Fear River Basin
HUC 03030003

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, *Land Management Group*
Wes Fryar, *Land Management Group*
Kim Williams, *Land Management Group*

June 29, 2020

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

**Re: Longhorn As-Built / MY0 (DMS Project No. 100114)
Response to Comments**

Dear Mr. Dow,

Please find below the response to comments on the Longhorn Buffer As-Built / MY0 provided by DMS dated June 23, 2020:

1. Table of Contents – The report only contains a Figure 8, but Figures 8A and 8B are listed.
Please correct.
Re: Corrected.
2. Figure 9 – Please add installed fencing to this map.
Re: Installed fencing has been added to Figure 9.
3. Table 1 – Please show buffer credits to three (3) decimal places.
Re: Buffer Credits have been shown to three decimal places on Table 1.
4. Table 4 – We recommend rounding “Stems per ACRE” to the nearest whole number.
Re: Stems per Acre have been rounded to the nearest whole number on Table 4.
5. General – We recommend renumbering the Tables in the order they appear in the report (i.e.the current Table 3 would be Table 1, etc).
Re: Noted. Tables 1 and 2 are described in the report before Table 3, just not shown in the text, so we left them as currently listed in the Table of Contents.
6. Electronic – Please provide DMS with the vegetation plot shapefile(s).
Re: Provided.

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

Sincerely,



Kevin Yates

TABLE OF CONTENTS

1.0	Mitigation Project Summary	1
1.1	Project Goals	1
1.2	Pre-Construction Site Conditions	2
2.0.	Determination of Credits	2
3.0.	Baseline Summary	3
3.1	Planting Preparation.....	3
3.2	Riparian Area Restoration and Enhancement Activities	4
4.0	Baseline Monitoring and Performance Criteria	5
4.1	Vegetation.....	5
4.2	Photo Reference Stations	5
4.3	Visual Assessments.....	5
4.4	Annual Reporting of Performance Criteria	5
4.5	Maintenance and Contingency Plans.....	6
5.0	References	6

LIST OF FIGURES, TABLES, AND APPENDICES

Figure 1	Vicinity Map
Figure 2	Watershed Map
Figure 3	USGS Glenola 7.5 Minute Topographic Map
Figure 4.....	NC DOT QL2 LiDAR Map
Figure 5.....	Randolph County NRCS Soil Survey
Figure 6.....	1998 NAPP Aerial Photography
Figure 7.....	2016 Aerial with Conservation Easement
Figure 8.....	Mitigation Plan Overview
Figure 9	Current Condition Plan View
Table 1.....	Buffer Project Attributes
Table 2.....	Buffer Project Areas and Assets
Table 3	Planting Plan
Table 4.....	Planted and Total Stem Counts
Appendix A.....	Figures/Tables
Appendix B.....	Veg Data/Veg Plot Photos/Photo Stations

1.0 Mitigation Project Summary

The Longhorn Riparian Buffer Restoration Project (“the Site”) is a buffer restoration project located in Randolph County, approximately 1.5 miles northwest of the Town of Sophia, North Carolina and approximately 9 miles south of High Point (NC). The property is situated just east of NC Highway 311 and is bounded to the south by Marlboro Church Road (refer to Figure 1). The Longhorn Buffer Mitigation Site is located within the Muddy Creek 12-digit HUC (030300030106) of the Randleman Lake watershed (Figure 2). The buffer restoration and enhancement areas are located along an unnamed tributary (UT) of Bob Branch and drainages that flow directly into Randleman Lake Reservoir approximately 2 river miles downstream (refer to Figure 3 and Figure 4). Prior to project completion, the Site was surrounded by areas managed for cattle production and lacked existing forested buffer along a majority of the streams and pond dissecting the site. The Site is expected to generate 376,644.994 riparian buffer credits (BMU).

The Site is located within Hydrologic Unit Code (HUC) 03030003010060 and North Carolina Department of Water Resources (NC DWR) Sub-Basin 03-04-07. The buffer mitigation site consists of one stream reach (A1) and an in-line pond (P1) as illustrated in Figure 8. Reach A1 is a perennial stream that flows from the in-line pond (P1) to the north and into Bob Branch approximately 1,300 lf downstream. Bob Branch has a NC DEQ surface water classification as a WS-IV* waterbody.

1.1 Project Goals

The main goals of the project are to provide high quality compensatory mitigation for authorized riparian buffer impacts credited through the NC DMS in-lieu-fee program and occurring within the Randleman Lake Watershed by creating a riparian corridor and restoring the historic riparian buffer. The project addresses the watershed goals identified in the Cape Fear River Basin Restoration Plan (RBRP) (NC EEP, 2010). These goals include:

- Removal of non-point source pollution (including nitrogen, phosphorous, and fecal bacteria) resulting from current land-use practices (principally cattle pasture);
- Reduction of sediment run-off/sediment loading to creek waters resulting from cattle hoof shear, bank instability, and lack of riparian buffer woody vegetation;
- Increased floodwater attenuation;
- Enhancement and protection of stream ecology and aquatic/semi-aquatic habitats; and
- Enhancement and protection of terrestrial habitats along stream terraces and hillside slopes.

These goals will be achieved via the restoration and protection of riparian buffers and adjacent riparian areas along an unnamed tributary of Bob Branch (which flows east into Randleman Lake Reservoir). Specific objectives of the proposed project to achieve the desired goals include:

- Conversion of existing cattle pasture into wooded riparian buffer and wooded riparian areas along the existing stream channel and pond via planting of characteristic hardwood species and installation of cattle-exclusion fencing;
- Reduction of stream bank instability via woody stem plantings (i.e. increased woody root material) and cattle exclusion fencing;

- Ensuring diffuse flow and increased surface roughness throughout the buffer mitigation area;
- Establishment of a conservation easement to protect the riparian buffer restoration site in perpetuity; and
- Invasive species management (as needed) during monitoring period.

Ancillary benefits of the proposed riparian buffer and adjacent riparian area restoration effort include:

- Increase of organic material as food for invertebrate, 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; and
- Floodwater attenuation via temporary storage, interception and slow releases from heavy rains.

1.2 Pre-construction Site Conditions

The project includes 20.81 acres of mostly open cattle pasture with one stream reach (A1) and an in-line pond (P1) which drains to Bob Branch. An additional 0.89-acres was added to the project area to include the pond dam within the conservation easement and will be reflected in an amendment to the Conservation Easement Plat. The Site has historically been managed for agricultural and cattle production. Site drainage and hydrology have been historically altered via the impoundment of waters. Based upon a review of available aerial photography, the tributary was impounded in the early 1970s (between 1970 and 1973). A portion of the site was in cropland as early as 1948. The remaining land was cleared and converted to agricultural production in the 1950s.

The buffer mitigation site consists of one stream reach (A1) and an in-line pond (P1) as illustrated in Figure 8. Reach A1 is a perennial stream that flows from the in-line pond (P1) to the north and into Bob Branch. There is approximately 625 lf of stream associated with Reach A1 within the proposed buffer easement area. Pond (P1) is an in-line pond that is approximately 5.3-acres and lies entirely within the proposed conservation easement area.

The stream reach (A1) and an in-line pond (P1) have been restored as a forested riparian buffer to 200-ft (approximately 12.73 acres) while approximately 0.40 acres of partially forested areas are considered suitable for buffer enhancement. An additional 0.21 acres of existing, wooded riparian area will be enhanced as cattle exclusion fencing will be installed around the conservation easement boundary. As indicated above, an amendment to the Conservation Easement Plat to include the pond dam will be provided to NCDMS and NCDWR following recordation. The project attributes are listed in Table 1, located in Appendix A.

2.0 Determination of Credits

On June 19th, 2019, 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). Based upon this evaluation, DWR determined that areas within 200 ft of Reach A-1 and Pond P-1 are eligible for buffer credit. Inclusive of this area are approximately 12.73 acres of non-forested restoration site per 15A NCAC 02B 0.0295 (n). In addition, 0.40 acres of partially forested areas are considered suitable for buffer enhancement per 15A NCAC 02B 0.0295 (n) (i.e. areas classified such that the establishment of woody stems (i.e., tree or shrub species) will maximize nutrient removal and other buffer functions).

In addition to buffer restoration and enhancement on subject streams, per the Consolidated Buffer Mitigation Rules (15 A NCAC 02B 0.0295 (o)), alternative mitigation is proposed on the site in the form of: 1) enhancement of grazing areas adjacent to streams. The project is in compliance with these rules as it meets the following criteria:

Enhancement of Grazing Areas Adjacent to Streams (15A NCAC 02B 0.0295 (o)(6)):

Buffer credit at a 2:1 ratio shall be available for an applicant or mitigation provider who proposes permanent exclusion of grazing livestock that otherwise degrade the stream and riparian zone through trampling, grazing, or waste deposition by fencing the livestock out of the stream and its adjacent buffer.

An additional 0.21 acres of existing, wooded riparian area will be enhanced as cattle exclusion fencing will be installed around the conservation easement boundary.

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.

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

3.0 Baseline Summary

The project team restored high quality riparian buffers along all unnamed tributaries and an in-line pond within the Site. The project design ensured that no adverse impacts to wetlands of existing riparian buffers occurred during implementation. Refer to Figure 8 for the conceptual design of the project. Details of the restoration activity that occurred follows in the sections below.

3.1 Planting Preparation

Based upon pre-project assessment of compaction within the proposed planting areas, all areas targeted for vegetative plantings within the buffer restoration project were ripped to reduce compaction and to enhance microtopography. Spot spraying of herbicide was initiated for control of invasive species within the restoration, enhancement and preservation areas (i.e. Chinese privet (*Ligustrum sinense*), Multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), and Chinese tree-of-heaven (*Ailanthus altissima*)). Treatment areas are depicted on Figure 9. The existing 84-ft pond spillway was stabilized prior to planting. The spillway was widened to approximately 10-feet and tapered down to 6-feet. The side

slopes were lined with coir fiber matting, and the bottom of the spillway lined with rip-rap. Appropriate erosion control measures were implemented before, during, and after the spillway maintenance to prevent sediment loss into downstream waters. 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

The conservation easement boundary was marked using 6-inch diameter treated post buried 2 feet, standing 5 feet above the ground surface, within the pasture. Woven wire fencing with a top strand of barbed wire was installed along the entire easement boundary. One pedestrian access gate was installed for future monitoring and access. Three 12-ft wide gates were installed in appropriate locations to allow cattle to exit in case they were to breach the fence and enter the conservation easement. The easement boundary was marked with standard yellow Conservation Area signs, per the 01/23/14 NCDMS Boundary Marking Standards.

The planting plan consisted of the planting at least four hardwood species on a density of approximately 538 stems per acre. Species selection and distribution were matched closely to micro-site hydrologic and edaphic conditions and include species characteristic of riparian assemblages in the watershed. In other words, species more tolerant of poorly drained soils (i.e. river birch, green ash, and willow oak) were planted within lower landscape positions generally consisting of the Chewacla and Wedhakee soil series while species characteristically occurring in better drained soils (Wynott-Enon complex) will be planted in higher landscape positions (i.e. hillside slopes). 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 April 1st, 2020 by Carolina Silvics, Inc. and supervised by project managers from both Clearwater Mitigation Solutions and Land Management Group.

Table 3 summarizes the planting plan for the Longhorn mitigation site.

Table 3. Planting Plan¹

Common Name	Scientific Name	% Composition	Acreage	Quantity
American Sycamore	<i>Plantanus occidentalis</i>	30	3.94	2,119
Yellow Poplar	<i>Liriodendron tulipifera</i>	25	3.28	1,766
River Birch	<i>Betula nigra</i>	25	3.28	1,766
Willow Oak	<i>Quercus phellos</i>	15	1.97	1,060
Green Ash	<i>Fraxinus pennsylvanica</i>	5	0.66	353
Total	N/A	100	13.13	7,064

¹Note the planted area includes approximate 0.74 acres of conservation area. 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.

4.0 Baseline Monitoring and Performance Criteria

Annual Monitoring will be conducted during the growing season for a period of five years. The report will include all information required by DMS monitoring guidelines including photographs, plot locations, and documentation of existing species density and composition. Monitoring will be 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 will be evaluated throughout the five-year post-construction monitoring.

4.1 Vegetation

The final vegetative success criteria will be the survival of 260 planted stems per acre in the riparian buffer at the end of the required monitoring period (Monitoring Year (MY) 5). 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 baseline (MY0) vegetation plot photographs and the planted and total stem counts (Table 4). Any vegetative problem areas in the site will be 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 will identify any contingency measures that may need to be employed to remedy site deficiencies.

4.2 Photo Reference Stations

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 are photographed each year. Photo reference stations are shown on Figure 9 and photos are included in Appendix B.

4.3 Visual Assessments

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

4.4 Annual Reporting Of Performance Criteria

Monitoring reports will be prepared in the fall of each monitoring year utilizing the NCDMS Riparian Buffer and Nutrient Offset Buffer Baseline and Annual Monitoring Report Template (ver. 2.0) (May 2017). Monitoring reports will be submitted to NCDMS by December 31st of the current monitoring year. The monitoring period will occur five years post-construction or until the performance criteria have been met.

4.5 Maintenance and Contingency Plans

Any problem areas in the Site will be 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 will identify any contingency measures that may need to be employed to remedy site deficiencies. For instance, invasive vegetation management may be needed if exotic species volunteer into the site. If it is determined that the Site's ability to achieve the performance standards are jeopardized, staff members of NCDMS/NCDWR will be notified and an adaptive management plan will be developed to address these issues.

5.0 References

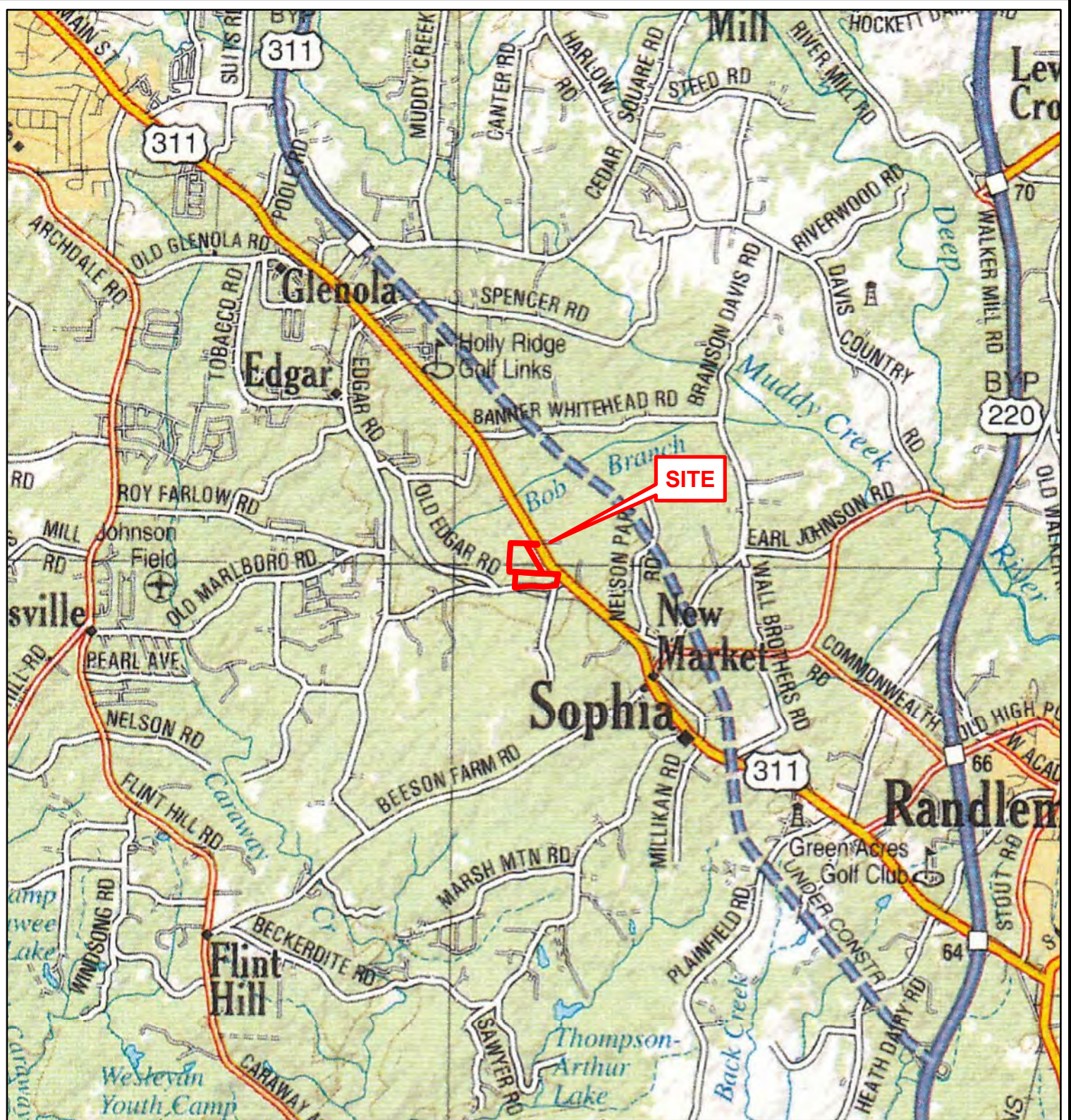
Lee, Michael T. Peet, Robert K., Steven D. Wentworth, Thomas R. 2008. CVS-EEP Protocol for Recording Vegetation Version 4.2. <http://cvs.bio.unc.edu/protocol/cvs-EEP-protocol-v4.2-lev1-2.pdf>

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

North Carolina 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



Boundaries are approximate and not meant to be absolute.

Map Source: DeLorme 2012 Atlas & Gazetteer

L:\WETLANDS\2018 WETLANDS FILES\LMG18.457 --- Randleman DMS Buffer Site, Kevin Yates\Proposal\Figures

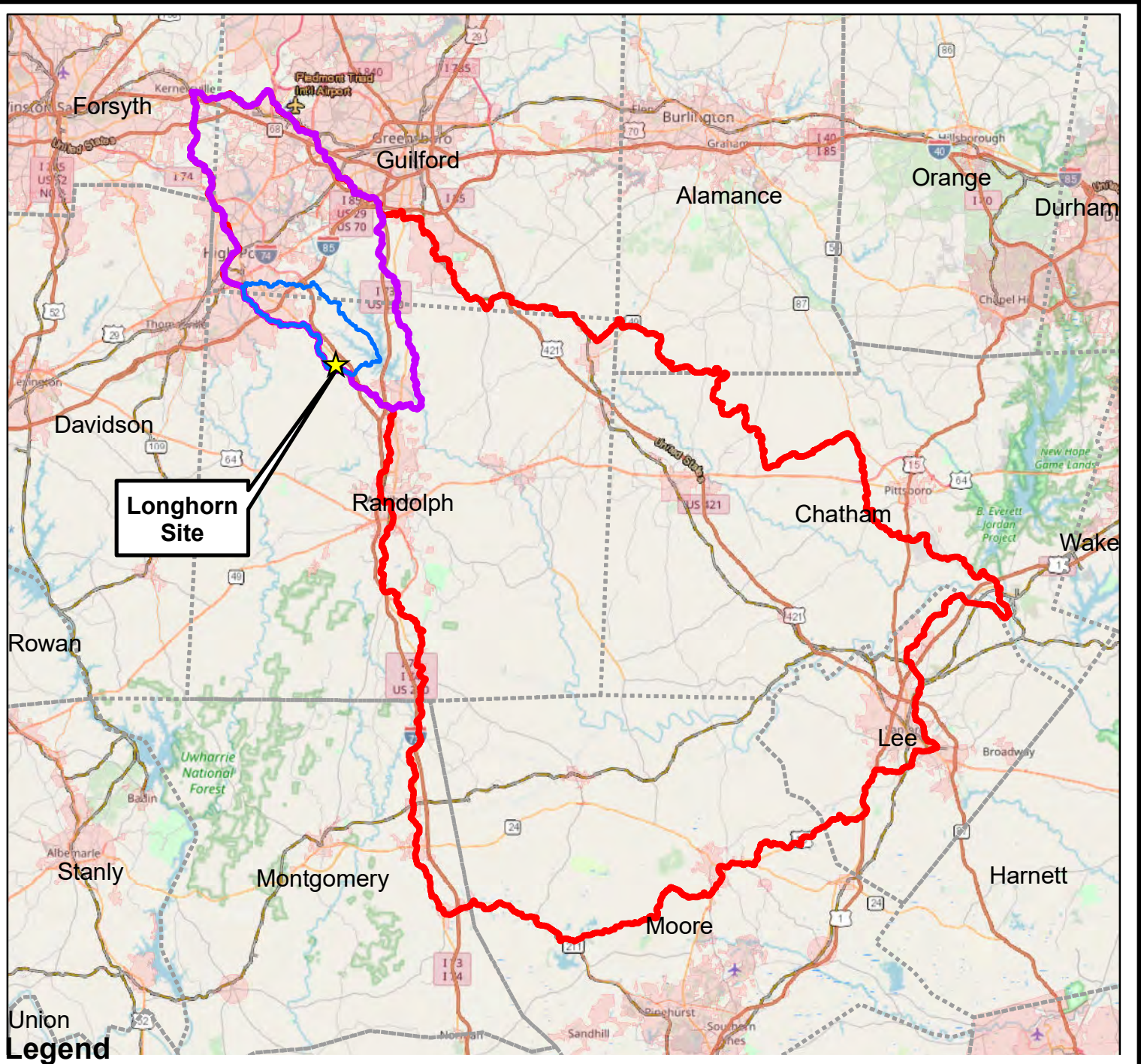






Longhorn Riparian
 Buffer Mitigation Site
 Cataloging Unit 03030003
 Randolph County, NC
 Map Date: 01-07-19
 LMG # 40-18-457

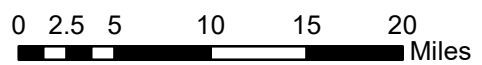
CLEARWATER MITIGATION
 SOLUTIONS



Figure 1
 Vicinity Map



-  Longhorn Project Boundary
-  Muddy Creek Watershed (030300030106)
-  Randleman Lake Watershed
-  8-Digit Hydrologic Unit (03030003)



Boundaries are approximate and not meant to be absolute.

Map Source: ArcGIS Open Street Map

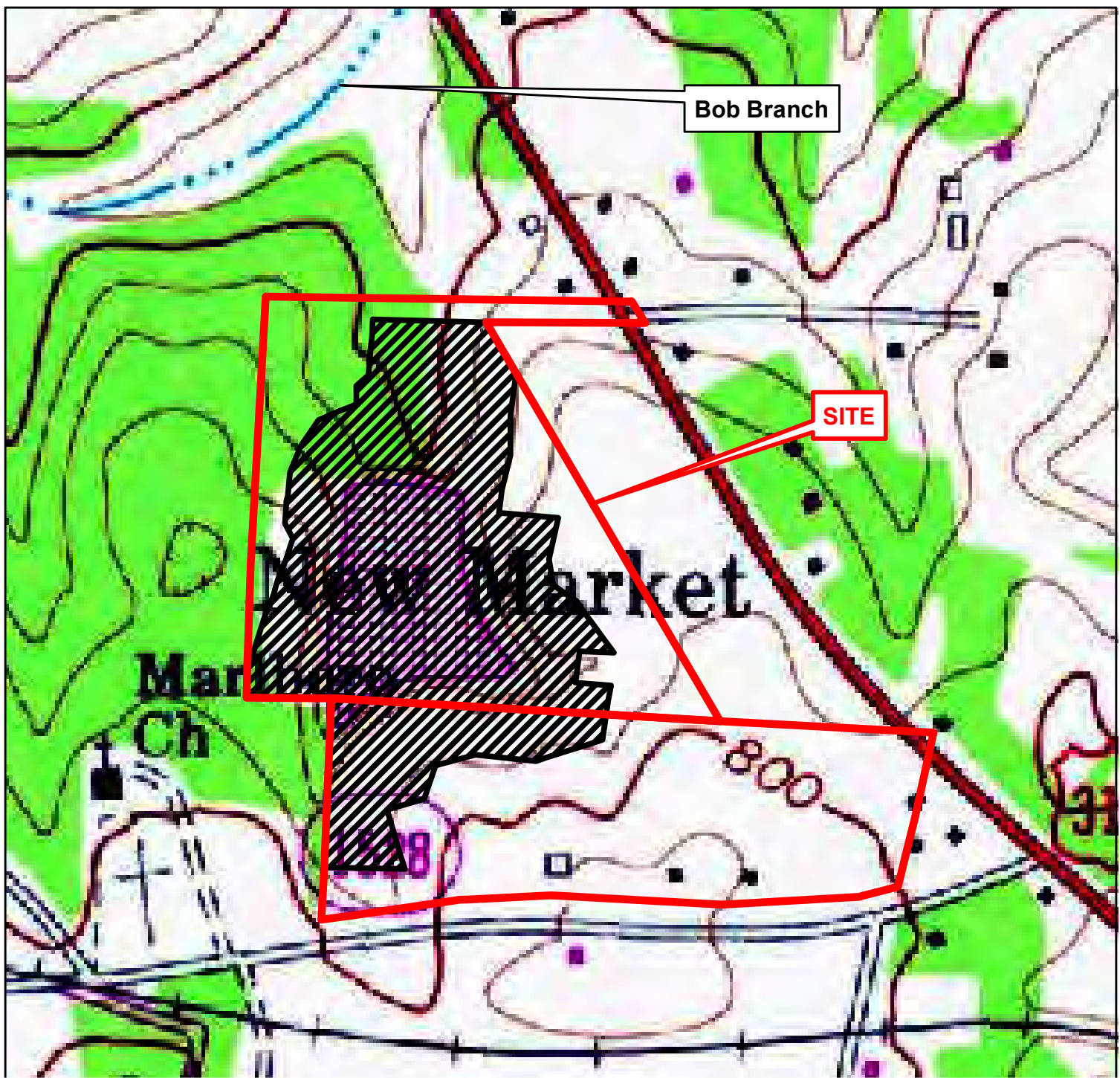
L:\WETLANDS\2019 WETLANDS FILES\LMG19.249 --- Longhorn Buffer Project, Kevin Yates\Mitigation Plan\Draft Mit Plan\Figures

Longhorn Riparian
 Buffer Mitigation Site
 Cataloging Unit 03030003
 Randolph County, NC
 Map Date: 02-24-20
 LMG # 19.249



CLEARWATER MITIGATION
 SOLUTIONS



Figure 2
Watershed Map



Legend

-  Parcel Boundary: ~45.18 Acres
-  Longhorn Conservation Easement: ~20.81 Acres

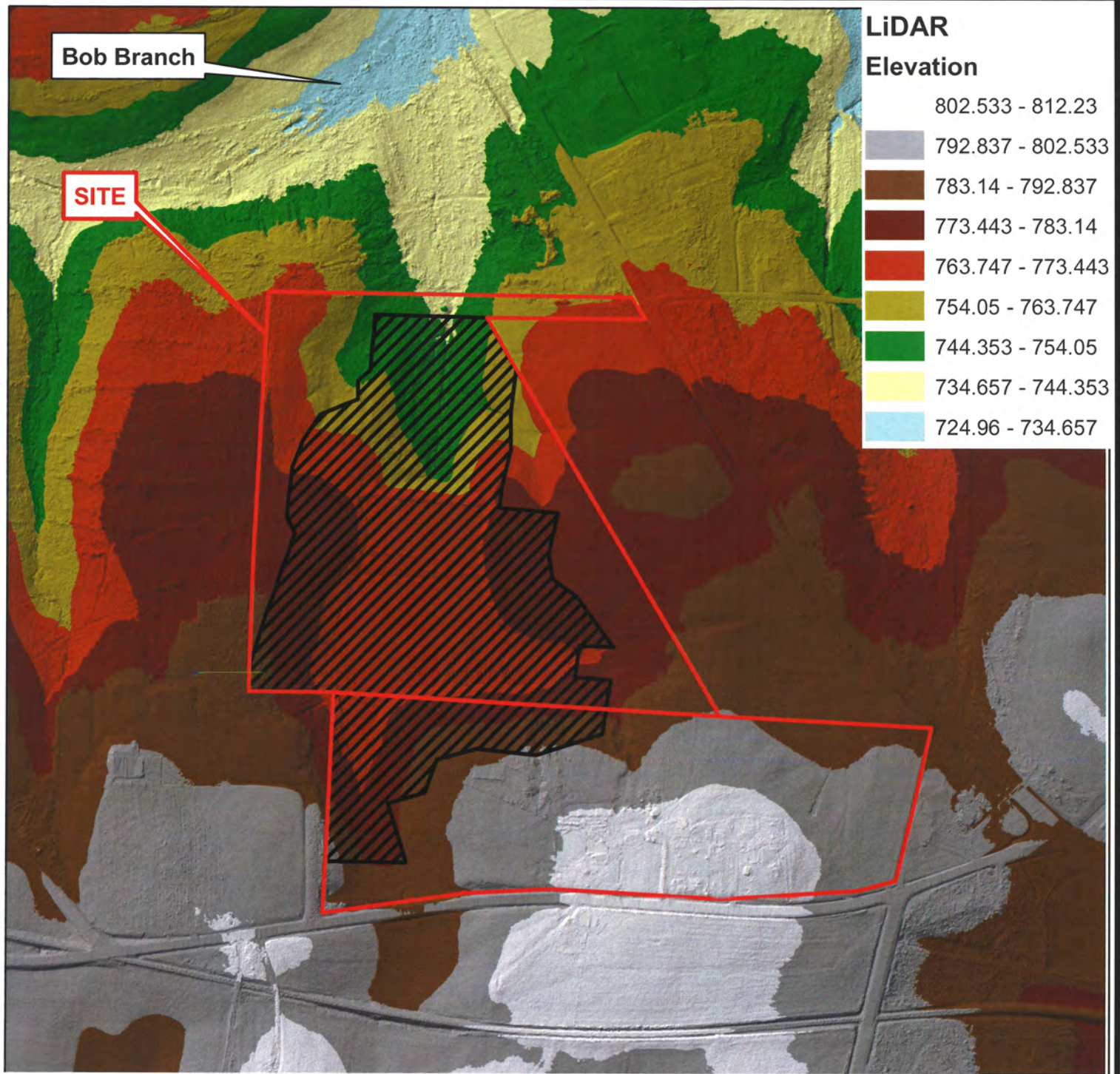
L:\WETLANDS\2019 WETLANDS FILES\LMG19.249 --- Longhorn Buffer Project, Kevin Yates\Mitigation Plan\Draft Mit Plan\Figures
 Boundaries are approximate and not meant to be absolute.
 Map Source: USGS Glenola Quadrangle 7.5 Minute



Longhorn Riparian
 Buffer Mitigation Site
 Cataloging Unit 03030003
 Randolph County, NC
 Map Date: 02-24-20
 LMG # 19.249



**Figure 3
 Topographic Map**



LiDAR Elevation

802.533 - 812.23
792.837 - 802.533
783.14 - 792.837
773.443 - 783.14
763.747 - 773.443
754.05 - 763.747
744.353 - 754.05
734.657 - 744.353
724.96 - 734.657

Legend

- Parcel Boundary: ~45.18 Acres
- Longhorn Conservation Easement: ~20.81 Acres

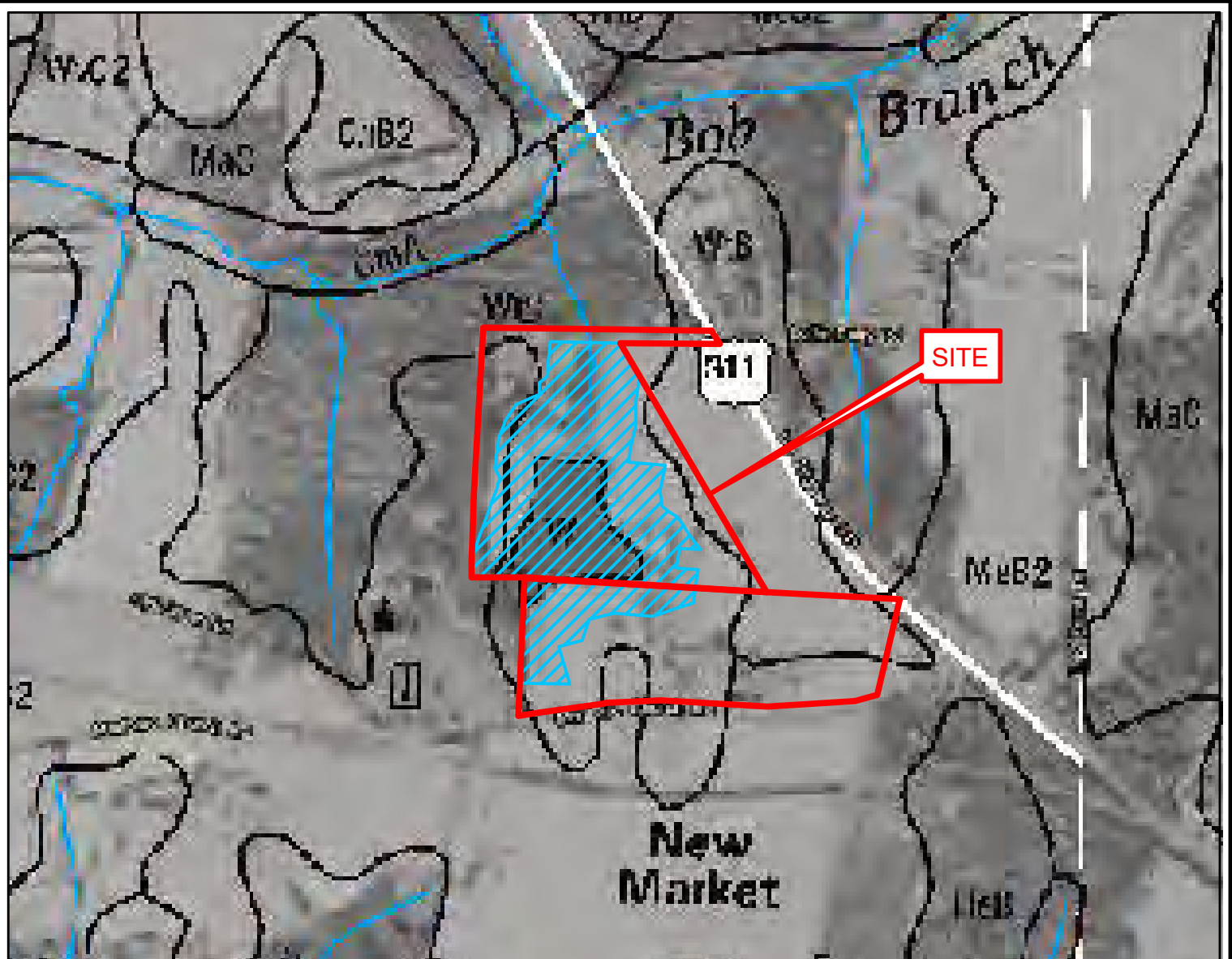
L:\WETLANDS\2019 WETLANDS FILES\LMG19.249 --- Longhorn Buffer Project, Kevin Yates\Mitigation Plan\Draft Mit Plan\Figures
 Boundaries are approximate and not meant to be absolute.
 Map Source: NC Floodplain Mapping Program 2014 QL2 LiDAR Data



Longhorn Riparian
 Buffer Mitigation Site
 Cataloging Unit 03030003
 Randolph County, NC
 Map Date: 02-24-20
 LMG # 19.249



**Figure 4
 LiDAR Map**



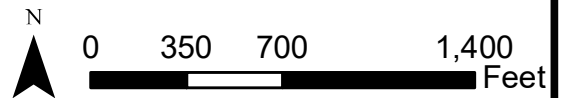
Legend

- CmA: Chewacla and Wehadkee soils, 0-2% slopes, frequently flooded
- CnB2: Coronaca clay loam, 2-8% slopes, moderately eroded
- CnC2: Coronaca clay loam, 8-15% slopes, moderately eroded
- HeB: Helena sandy loam, 2-6% slopes
- HeC: Helena sandy loam, 6-10% slopes
- MaC: Mecklenburg loam, 8-15% slopes
- MeB2: Mecklenburg clay loam, 2-8% slopes, moderately eroded
- MeC2: Mecklenburg clay loam, 8-15% slopes, moderately eroded
- WtB: Wynott-Enon complex, 2-8% slopes
- WtC: Wynott-Enon complex, 8-15% slopes
- WvB2: Wynott-Enon complex, 2-8% slopes, moderately eroded
- WvC2: Wynott-Enon complex, 8-15% slopes, moderately eroded
- WzB: Wynott-Wilkes-Poindexter complex, 2-8% slopes

Longhorn Conservation Easement

\\WETLANDS\2019 WETLANDS FILES\LMG19.249 - Longhorn Buffer Project, Kevin Yates\Mitigation Plan\Draft Mit Plan\Figures
 Boundaries are approximate and not meant to be absolute.

Map Source: NRCS Randolph County Soil Survey, 2006

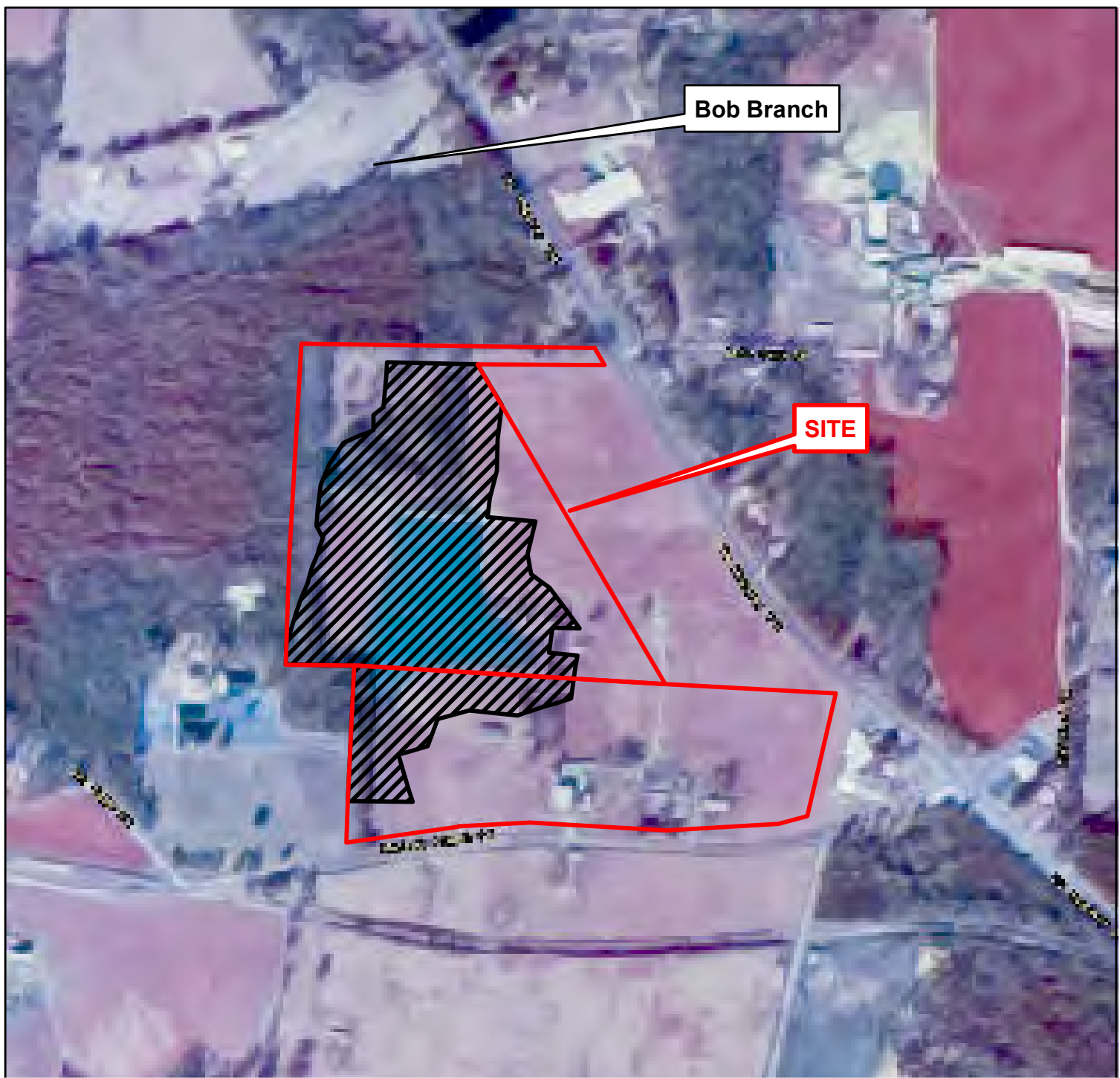


Longhorn Riparian
 Buffer Mitigation Site
 Cataloging Unit 03030003
 Randolph County, NC
 Map Date: 02-24-20
 LMG # 19.249



CLEARWATER MITIGATION
 SOLUTIONS



**Figure 5
 Soils Map**



Legend

-  Parcel Boundary: ~45.18 Acres
-  Longhorn Conservation Easement: ~20.81 Acres

L:\WETLANDS\2019 WETLANDS FILES\LMG19.249 --- Longhorn Buffer Project, Kevin Yates\Mitigation Plan\Draft Mit Plan\Figures
 Boundaries are approximate and not meant to be absolute.
 Map Source: 1998 NAPP Aerial Photography





Longhorn Riparian
 Buffer Mitigation Site
 Cataloging Unit 03030003
 Randolph County, NC
 Map Date: 02-24-20
 LMG # 19.249



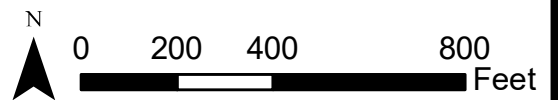
Figure 6
1998 Aerial Photograph



Legend

-  Parcel Boundary: ~45.18 Acres
-  Longhorn Conservation Easement: ~20.81 Acres

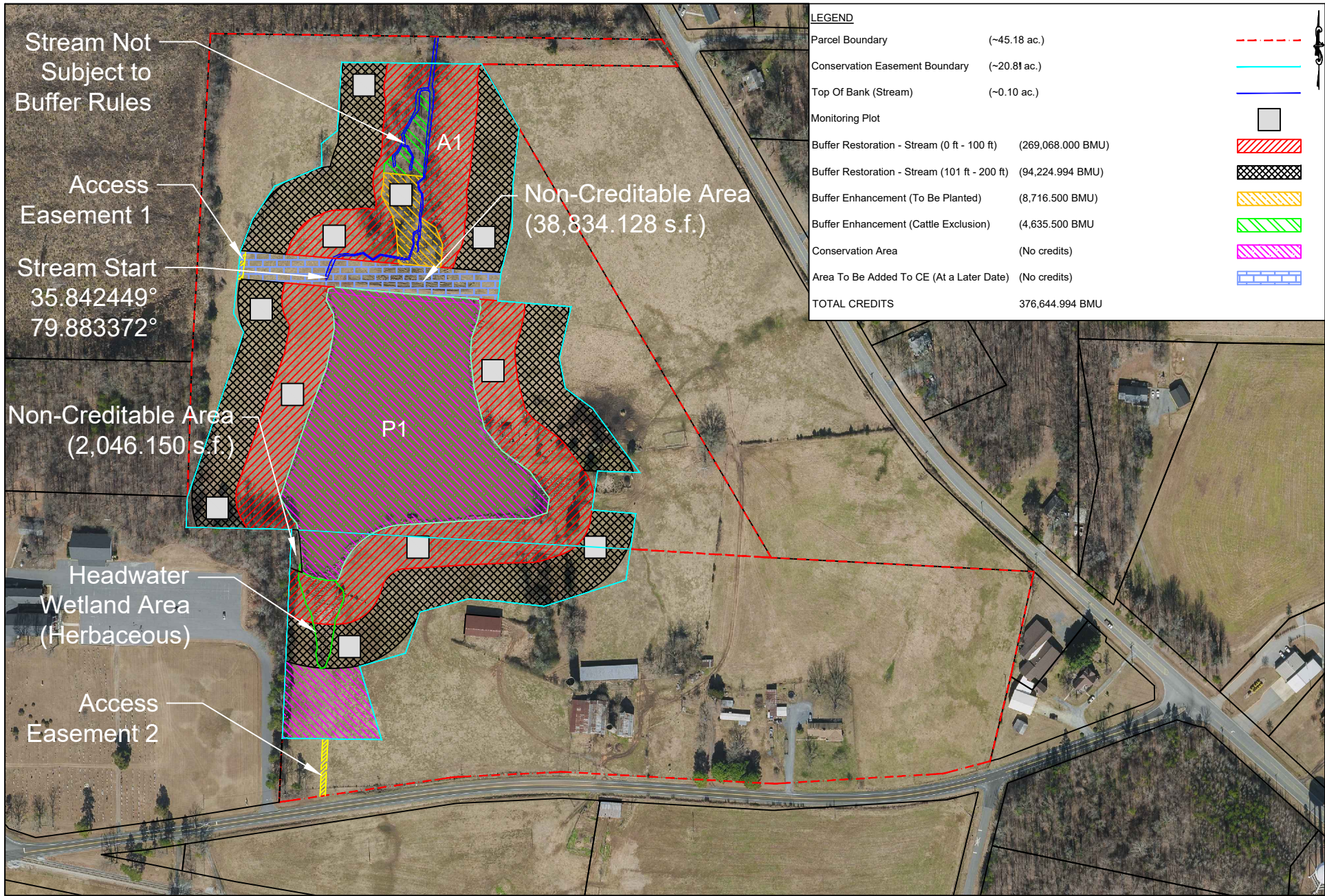
L:\WETLANDS\2019 WETLANDS FILES\LMG19.249 --- Longhorn Buffer Project, Kevin Yates\Mitigation Plan\Draft Mit Plan\Figures
 Boundaries are approximate and not meant to be absolute.
 Map Source: 2016 ESRI World Imagery



Longhorn Riparian
 Buffer Mitigation Site
 Cataloging Unit 03030003
 Randolph County, NC
 Map Date: 02-24-20
 LMG # 19.249



**Figure 7
 Aerial Photograph**



LEGEND

Parcel Boundary	(~45.18 ac.)	
Conservation Easement Boundary	(~20.81 ac.)	
Top Of Bank (Stream)	(~0.10 ac.)	
Monitoring Plot		
Buffer Restoration - Stream (0 ft - 100 ft)	(269,068.000 BMU)	
Buffer Restoration - Stream (101 ft - 200 ft)	(94,224.994 BMU)	
Buffer Enhancement (To Be Planted)	(8,716.500 BMU)	
Buffer Enhancement (Cattle Exclusion)	(4,635.500 BMU)	
Conservation Area	(No credits)	
Area To Be Added To CE (At a Later Date)	(No credits)	
TOTAL CREDITS	376,644.994 BMU	

Stream Not Subject to Buffer Rules

Access Easement 1

Stream Start
35.842449°
79.883372°

Non-Creditable Area
(2,046.150 s.f.)

Headwater Wetland Area
(Herbaceous)

Access Easement 2

Non-Creditable Area
(38,834.128 s.f.)

A1

P1

- NOTES:**
- TAX PARCEL BOUNDARIES AND 2018 AERIAL FROM NCONEMAP.
 - BOUNDARIES ARE APPROXIMATE AND NOT MEANT TO BE ABSOLUTE.



Project:
Longhorn Riparian Buffer
Mitigation Site
Catalog Unit 03030003

Title:
Mitigation Plan

Date:
November 2019

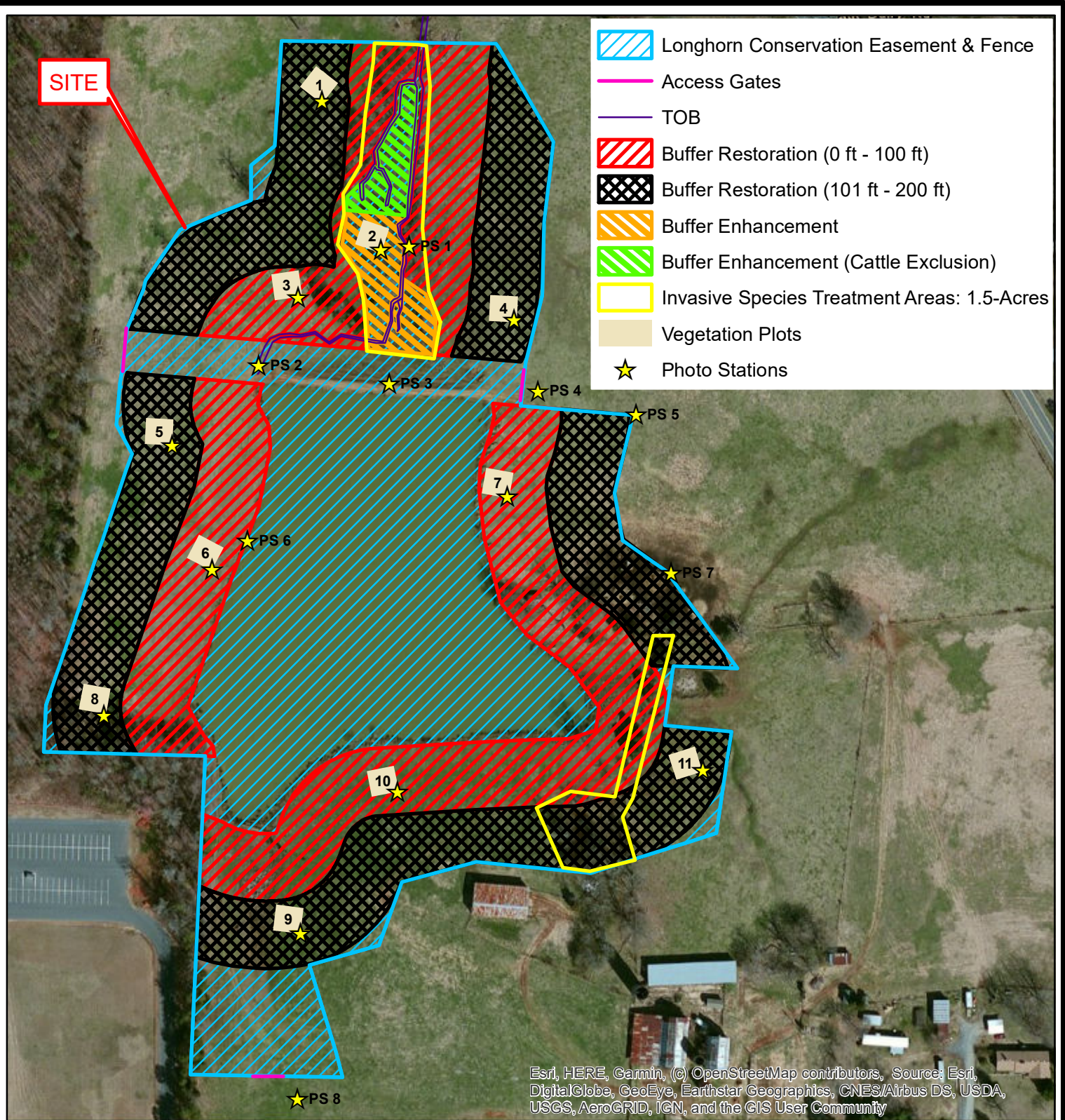
Scale:
1"=300'

Drawn By:
GSF

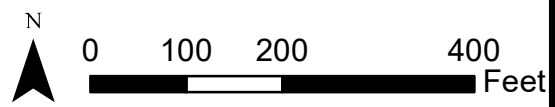
Revision Date:
2/26/2020

Job Number:
LMG19.249

Figure:
8



L:\WETLANDS\2019 WETLANDS FILES\LMG19.249 --- Longhorn Buffer Project,
 Kevin Yates\Annual Monitoring\Baseline Monitoring\Figures
 Boundaries are approximate and not meant to be absolute.
 Map Source: 2016 ESRI World Imagery



Longhorn Riparian
 Buffer Mitigation Site
 Cataloging Unit 03030003
 Randolph County, NC
 Map Date: 06-02-20
 LMG #19.249



Figure 9
Current Condition Plan View

**Table 1. Buffer Project Attributes
 Longhorn Riparian Buffer Mitigation Site
 Monitoring Year 0 - 2020**

Project Name	Longhorn Riparian Buffer Restoration Project
Hydrologic Unit Code	03030003010060 (14 digit)
River Basin	Cape Fear
Geographic Location (Lat, Long)	35.841600, -79.882810
Site Protection Instrument (DB, PG)	DB 163 Page 99
Total Credits (BMU)	376,644.994
Types of Credits	Riparian Buffer
Mitigation Plan Date	February 2020
Initial Planting Date	April 1st, 2020
Baseline Monitoring Date	April 6th, 2020
Baseline Report Date	June, 2020
MY1 Report Date	
MY2 Report Date	
MY3 Report Date	
MY4 Report Date	
MY5 Report Date	

Table 2. Longhorn, 100114, Project Mitigation Credits																	
Cape Fear - Randleman				Service Area													
N/A				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	82,245	82,245	1	100%	1.00000	Yes	82,245.000	No	—	—	
Buffer	Rural	Yes	I / P	Restoration	101-200	A1	96,615	96,615	1	33%	3.03030	Yes	31,882.982	No	—	—	
Buffer	Rural	Yes	I / P	Enhancement	0-100	A1	17,433	17,433	2	100%	2.00000	Yes	8,716.500	No	—	—	
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	0-100	A1	9,271	9,271	2	100%	2.00000	Yes	4,635.500	No	—	—	
Buffer	Rural	Yes	In-Line Pond	Restoration	0-100	P1	186,823	186,823	1	100%	1.00000	Yes	186,823.000	No	—	—	
Buffer	Rural	Yes	In-Line Pond	Restoration	101-200	P1	188,915	188,915	1	33%	3.03030	Yes	62,342.012	No	—	—	
Totals:							581,302	581,302									
Enter Preservation Credits Below								Eligible for Preservation (sf):	193,767								
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					
												—					
Preservation Area Subtotal (sf):								0									
Preservation as % Total Area of Buffer Mitigation:								0.0%									
Ephemeral Reaches as % Total Area of Buffer Mitigation:								0.0%									
												TOTAL AREA OF BUFFER MITIGATION (TABM)					
												Mitigation Totals	Square Feet	Credits			
												Restoration:	554,598	363,292.994			
												Enhancement:	26,704	13,352.000			
												Preservation:	0	0.000			
												Total Riparian Buffer:	581,302	376,644.994			
												TOTAL NUTRIENT OFFSET MITIGATION					
												Mitigation Totals	Square Feet	Credits			
												Nutrient	Nitrogen:	0	0.000		
												Offset:	Phosphorus:	0	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:

Veg Data/Veg Plot Photos/Photo Stations

Table 4. Planted and Total Stems

Longhorn Riparian Buffer Mitigation Site

DMS Project No. 100114

Monitoring Year 0 – 2020

Scientific Name	Common Name	Species Type	Current Plot Data (MY0 2020)																											Annual Means											
			LRBMS-01-0001			LRBMS-01-0002			LRBMS-01-0003			LRBMS-01-0004			LRBMS-01-0005			LRBMS-01-0006			LRBMS-01-0007			LRBMS-01-0008			LRBMS-01-0009			LRBMS-01-0010			LRBMS-01-0011			MY0 (2020)					
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T			
Betula nigra	River Birch, Red Birch	Tree				5	5	5	6	6	6	3	3	3				2	2	2	2	2	2	1	1	1	1	1	1	7	7	7	1	1	1	28	28	28			
Fraxinus pennsylvanica	Green Ash, Red Ash	Tree	8	8	8	11	11	11				2	2	2													1	1	1	3	3	3				25	25	25			
Liriodendron tulipifera	Tulip Poplar	Tree							6	6	6	5	5	5	9	9	9	5	5	5	4	4	4				6	6	6	2	2	2	9	9	9	4	4	4	46	46	46
Platanus occidentalis	Sycamore, Plane-tree	Tree	6	6	6	1	1	1	1	1	1	7	7	7	7	7	7	3	3	3	9	9	9	8	8	8	8	8	8	3	3	3	4	4	4	57	57	57			
Quercus phellos	Willow Oak	Tree	3	3	3				6	6	6	1	1	1				6	6	6	1	1	1	6	6	6				1	1	1	3	3	3	27	27	27			
Stem count			17	17	17	17	17	17	19	19	19	18	18	18	16	16	16	16	16	16	16	16	16	15	15	15	16	16	16	16	16	16	17	17	17	183	183	183			
size (ares)			1			1			1			1			1			1			1			1			1			1			11								
size (ACRES)			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.27								
Species count			3	3	3	3	3	3	4	4	4	5	5	5	2	2	2	4	4	4	4	4	4	3	3	3	4	4	4	5	5	5	4	4	4	5	5	5			
Stems per ACRE			688	688	688	688	688	688	769	769	769	728	728	728	648	648	648	648	648	648	648	648	648	607	607	607	648	648	648	648	648	648	688	688	688	673	673	673			

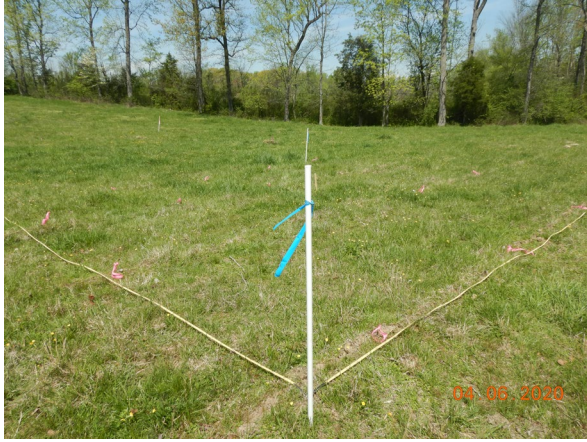
Color for Density
Exceeds requirements by 10%
Exceeds requirements, but by less than 10%
Fails to meet requirements, by less than 10%
Fails to meet requirements by more than 10%

PnoLS: Number of planted stems excluding live stakes

P-All: Number of planted stems including live stakes

T: Total stems

APPENDIX B. VEG PLOT PHOTOS



(1) Plot 1



(2) Plot 2



(3) Plot 3



(4) Plot 4



(5) Plot 5



(6) Plot 6

APPENDIX B. VEG PLOT PHOTOS



(7) Plot 7



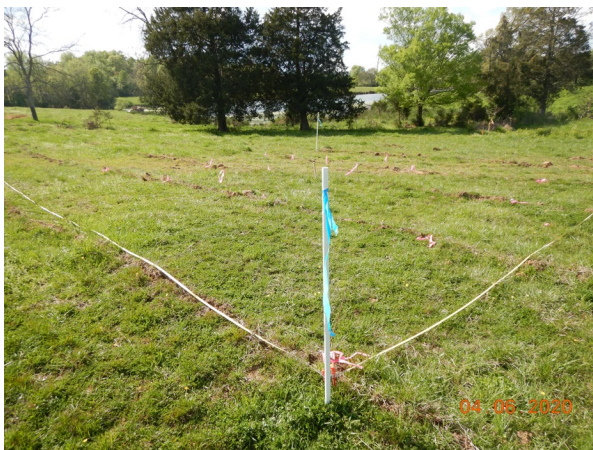
(8) Plot 8



(9) Plot 9



(10) Plot 10



(11) Plot 11

APPENDIX B. PHOTO STATIONS



(1) PS1 (looking north)



(2) PS2 (looking west towards CE boundary)



(3) PS2 (looking north towards restoration area)



(4) PS2 (looking south towards pond)



(5) PS3 (looking north into enhancement area)



(6) PS4 (looking west towards dam)

APPENDIX B. PHOTO STATIONS



(7) PS4 (looking south into easement)



(8) PS5 (looking west along conservation easement)



(9) PS6 (looking north along pond edge)



(10) PS7 (looking southwest into restoration area)



(11) PS8 (looking into restoration area)



(12) View of site planting