Baseline Monitoring Report

MAPLE SWAMP BUFFER MITIGATION SITE

Edgecombe County, NC
NCDEQ Contract No. 200208-01
DMS ID No. 100189
DWR Project No. 2021-0614v2
RFP No. 16-20200208

Prepared for:

Mitigation Services
ENVIRONMENTAL QUALITY

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

April 25, 2022

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary

NORTH CAROLINA
Environmental Quality

Sent via email sjfrederick@swegrp.com
April 11, 2021

Scott Frederick
SWE for EcoTerra

Re: Maple Swamp Buffer Site Draft As-Built Report
DMS Site #100189, Contract #200208-01

Scott:

After receiving the draft Mitigation Plan review on April 7, 2022 and conducting a site visit on the 8th, DMS offers the following comments:

1. There were two additions to the planted species (swamp chestnut oak and bald cypress). Please mention this in the report narrative as an addition to the suitable species list. Please confirm that these are species are common in Coastal Plan Small Stream Swamp target community for this site.
2. Please describe what happened to change the credit shapefiles and amounts in the table from Mitigation Plan (was this just surveying update)?
3. Please paste Table 3 into the report so that it is legible. Currently, this is very blurry in the report.
4. It appears that the A2 0-100' feature should be updated to show 294,108 SF in the asset table (looks like the 101-200' may have accidentally been lumped). Please update.

Electronic Comments:

- Submit the excel table/ buffer calculation tool that was revised from Mitigation Plan.
- Submit a planted area shapefile or confirm that the entire conservation area (credit) was planted.
- Submit the Autocad file for the as-built if available.

Once the changes are complete, send me the final draft version. You can invoice once that deliverable is resubmitted.

Thanks for you work,

LHCrocker.

Lindsay Crocker
Eastern Regional Supervisor
NC DEQ Division of Mitigation Services
217 West Jones St., Raleigh, NC 27603
919.594.3910
lindsay.crocker@ncdenr.gov

BASELINE MONITORING REPORT

MAPLE SWAMP BUFFER MITIGATION SITE

Edgecombe County, NC
NCDEQ Contract No. 200208-01
DMS ID No. 100189

Tar-Pamlico River Basin
HUC 03020102

Prepared For:

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

Prepared By:

1328 DeKalb Ave NE
Atlanta, GA 30307
404.840.2697

This Baseline Monitoring Plan has been written in conformance with the requirements of the following:

- 15A NCAC 02B.0295 Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers.
- 15A NCAC 02B.0703 Nutrient Offset Credit Trading

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

Contributing Staff

Michael Beinenson, Eco Terra
Principal-in-Charge

Scott Frederick, Eco Terra/SWE
Project Manager

Robert Bentley, Eco Terra
Construction Oversight

Kirk Port, AE, LLC
Monitoring

TABLE OF CONTENTS

APPENDICES

1.0 Mitigation Project Summary

The Maple Swamp Buffer Mitigation Site (Site, Project, or Project Site) is a buffer restoration project located approximately 2.0 miles northeast of Leggett off NC Hwy 97 E in Edgecombe County, NC (Appendix 1: Figure 1). The Project Site comprises approximately 8.13 acres of a 356-acre tract situated along an unnamed tributary (UT) to Maple Swamp that drains into Fishing Creek. The project is located within North Carolina Division of Mitigation Services (NCDMS) identified Habitat, Hydrology, and Water Quality Targeted Resource Areas (TRA). Maple Swamp is defined as Water Supply (WS-IV) and Nutrient Sensitive Waters (NSW) according to the NC Department of Environmental Quality (NCDEQ) within the Tar-Pamlico River basin hydrologic unit code (HUC) 03020102060010 and Subasin 03-03-02. According to the as-built survey and DWR Buffer Mitigation Calculation Tool v3 (updated August 2020), the Site is expected to generate 294,366.000 buffer mitigation units (BMU), offset 989.329 pounds of nitrogen, and offset 63.316 pounds of phosphorus (Appendix 1: Table 4).

NW view at Project origin (June 2021)

The Maple Swamp Mitigation Site will reduce future sediment and nutrient loading into Fishing Creek watershed and the Tar-Pamlico River downstream. It will also improve terrestrial habitats along this stream by establishing a riparian corridor and allowing the land to convert to forested communities. The surrounding area is primarily agricultural fields. The project restored forested riparian buffers and adjacent riparian areas to a maximum of approximately 100 feet from the top of bank of the streams and removed rotating crops and fertilizer inputs. Areas designated for nutrient offset within 50 linear feet of the top of bank were planted similarly. The restored Tar-Pamlico riparian buffer and adjacent riparian areas will filter runoff from the surrounding farm fields and provide shading to improve stream temperatures and aquatic habitat. Invasive vegetation will be treated as needed within the project area to promote native vegetation.

1.1 Project Goals

The project goals and objectives described below are consistent with those of the NCDMS, and the specific goals outlined in the 2018 Tar-Pamlico RBRP. As proposed, the Maple Swamp Buffer Mitigation Project will further help NCDMS to meet these goals. The major goals of the proposed buffer restoration project are to address agricultural runoff,

including nutrients and sediment, protect the project site in perpetuity, and restore terrestrial habitat.

1.2 Existing Site Conditions

The Project Site is located within one parcel (~356 acres) currently used for row crop agriculture rotations. Adjacent land use is in row crop agriculture and little vegetated buffer exists along the length of the UT to Maple Swamp stream within the Project Site. Periodic erosion and sediment-laden runoff is entering the channels from these areas during crop rotations. Historical aerials denote that land uses at the Project Site have been in agriculture since at least 1976. The UT is mapped on the 2013 US Geological Survey's (USGS) Draughn and Tarboro Quadrangles (Figure 1) and on the Natural Resources Conservation Service's (NRCS) 1979 Edgecombe County Soil Survey as a stream channel. UT (A2) meets the definition of at least intermittent per the NCDWR On-Site Determination for Applicability to the Tar-Pamlico Buffer Rules Letter and deemed suitable for buffer and nutrient offset credits per the NCDWR Site Viability for Buffer Mitigation Letter. (Appendix A). UT (A1) is classified as a ditch. Two unbuffered ditches enter the Project on the right bank. Diffuse flow into the project is required and credit deductions from these unbuffered ditches are accounted for in the credit calculations in accordance with the NCDWQ Buffer Interpretation/Clarification #2008-019 Memorandum (August 19, 2008).

2.0 Determination of Credits

Riparian buffer and adjacent riparian area restoration was accomplished in accordance with the Consolidated Buffer Mitigation Rule (15A NCAC 02B .0295) and the Nutrient Offset Credit Trading Rule (15A NCAC 02B .0703). All areas within 100+ linear feet of the top of bank of subject streams as measure from the top of bank landward were be planted and devoted to generating riparian buffer mitigation credits. Areas designated for nutrient offset within 50 linear feet of the top of bank were planted similarly. Mitigation credits generated are found in Table 3 and Figure 2 in Appendix 1 and are based upon the as-built survey (Appendix 3) and DWR Buffer Mitigation Calculation Tool v3 (updated August 2020) (Appendix 1). Small differences in credits were determined during the as-built survey resulting in a slight increase in riparian buffer credits and slight decrease in nutrient offset credits. This was due to initial GIS mapping inconsistentcies.

3.0 Baseline Summary

The Project construction was completed in early February 2022, following mitigation plan approval. Eco Terra and supporting team members successfully planted and restored the proposed areas dedicated for riparian buffer and adjacent riparian area restoration with high quality native trees, shrubs, and herbaceous vegetation.

3.1 Site Preparation

All requests to prepare the site per the NCDWR Site Viability for Buffer Mitigation and Nutrient Offset Letter (Date: May 14, 2021) were addressed. In addition, 5 short pipes relieving farm path drainage were removed and stabilized with vegetation. Temporary and permanent seed mix was installed in any disturbed soil areas following disturbance and planted with native trees to secure sediment from entering surface waters. No invasive species were noted for herbicide treatment prior to construction. No disking or tilling was necessary to prepare the site or remove any historic plow pan in the soil.

3.2 Riparian Area Restoration Activities

Restoration of the riparian areas involved planting bare root one to two-year-old trees in designated planting zones, specific to soil and Site conditions, and in accordance with the Mitigation Plan. A combination of machine and manual planting techniques were used depending on site conditions. Approximately 6,600 stems (812 stems/ac) were planted within the riparian areas designated for restoration. Differences in stem density and quantities occurred relative to the proposed planting list in the Mitigation Plan due to plant availability at the time. Two additional appropriate species for a Coastal Plain Small Stream Swamp (blackwater subtype), swamp chestnut oak (*Quercus michauxii*) and bald cypress (*Taxodium distichum*) were planted. Planted tree species quantities and densities are found in Appendix 1: Table 1.

In accordance with 15A NCAC 02B .0295, a sufficient density of stems was planted to achieve 260 trees/ac at the end of a minimum five-year project monitoring period whereby no one tree species planted was greater than 50% of the planted stems, and a minimum of four native tree species were planted. In total, ten tree species were selected and planted specific to soil type, landscape position, soil wetness, community type, and reference forest stands nearby. Initial vegetation management post-planting included specific preemergent herbicide band application over planted trees for herbaceous competition that may compete with planted stems, conducted by a North Carolina licensed applicator. In accordance with the Mitigation Plan, temporary and permanent seed was planted within the easement to help establish herbaceous cover, protect the soil, and sequester nutrients in the newly estbalished riparian buffer and other riparian areas. Temporary and permanent seed mixtures planted included Foxtail millet (*Setaria italica*) and Indiangrass (*Sorgastrum nutans*), switchgrass (*Panicum virgatum*), and big bluestem (*Andropogon gerardii*), respectively.

4.0 Annual Monitoring and Performance Criteria

The Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers (15A NCAC 02B .0295) and RFP 16-20200208 set forth specific performance criteria for the successful development and close-out of the Maple Swamp Buffer Mitigation Site. Performance criteria monitoring includes standardized vegetation plot establishment and annual monitoring for planted stems including individual plot photo documentation, overall site photo documentation, biannual visual assessments for project status and easement integrity including herbaceous and/or invasive species competition, stem mortality, stand health, incidental damage from agricultural equipment, and stem loss or damage from natural causes such as fire, disease, or animal predation. Figure 3 (Appendix 1) illustrates the location of project easement, permanent vegetation plots/photo points, as well as overall site photo points.

4.1 Vegetation

Six permanent vegetation plots were established according to the most recent Carolina Vegetation Survey (CVS) protocol within the restored buffer area. Representative vegetation plots were established at a minimum density of 2% of the planted area. Specifically, vegetation monitoring was obtained for all plots according to Level 1-2 protocols from the CVS-EEP Protocol for Recording Vegetation V4.2 (2008) manual. Baseline, or monitoring year zero (MY0) vegetation stem data is included in Appendix 5, Table 4.

4.2 Photo Reference Stations

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

4.3 Visual Assessments

Additional observations were made of site conditions and vegetation conditions outside of monitoring plots. Overall, the implementation and planting of the project resulted in a full stocking of native tree species. A biannual visual assessment will be made in order to appropriately monitor changing site conditions and address any issues to ensure Site success and performance criteria are met in subsequent monitoring years. Any Site

problems will be noted and discussed in the annual reports, addressed in a remedial action plan if necessary, and monitored biannually to ensure performance criteria are met following any remedial action.

4.4 Annual Reporting Performance Criteria

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

4.5 Maintenance and Contingency Plans

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

5.0 References

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

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

N.C. Department of Water Quality Methodology for Determining Nutrient Reductions Associated with Riparian Buffer Establishment. 1998.

N.C. Department of Water Quality Buffer Interpretation/Clarification #2008-019 Memorandum August 19, 2008.

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

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

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

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

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

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

APPENDIX 1

FIGURES AND TABLES

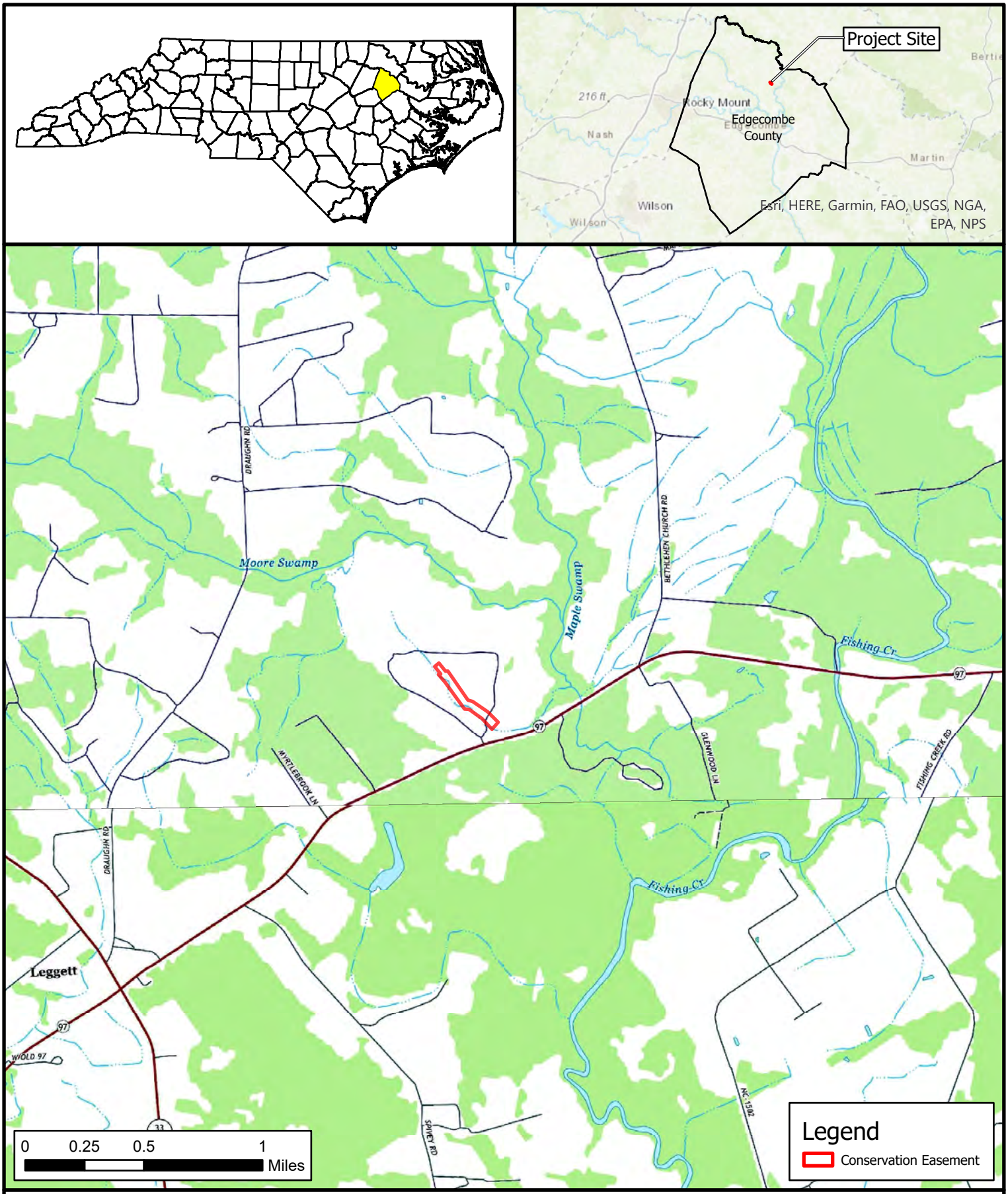


Figure 1: Vicinity
Maple Swamp Buffer Mitigation Site
Tar-Pamlico 03020102
Edgecombe County, North Carolina
March 2022

2013 USGS Topographic Quadrangles: Tarboro & Draughn

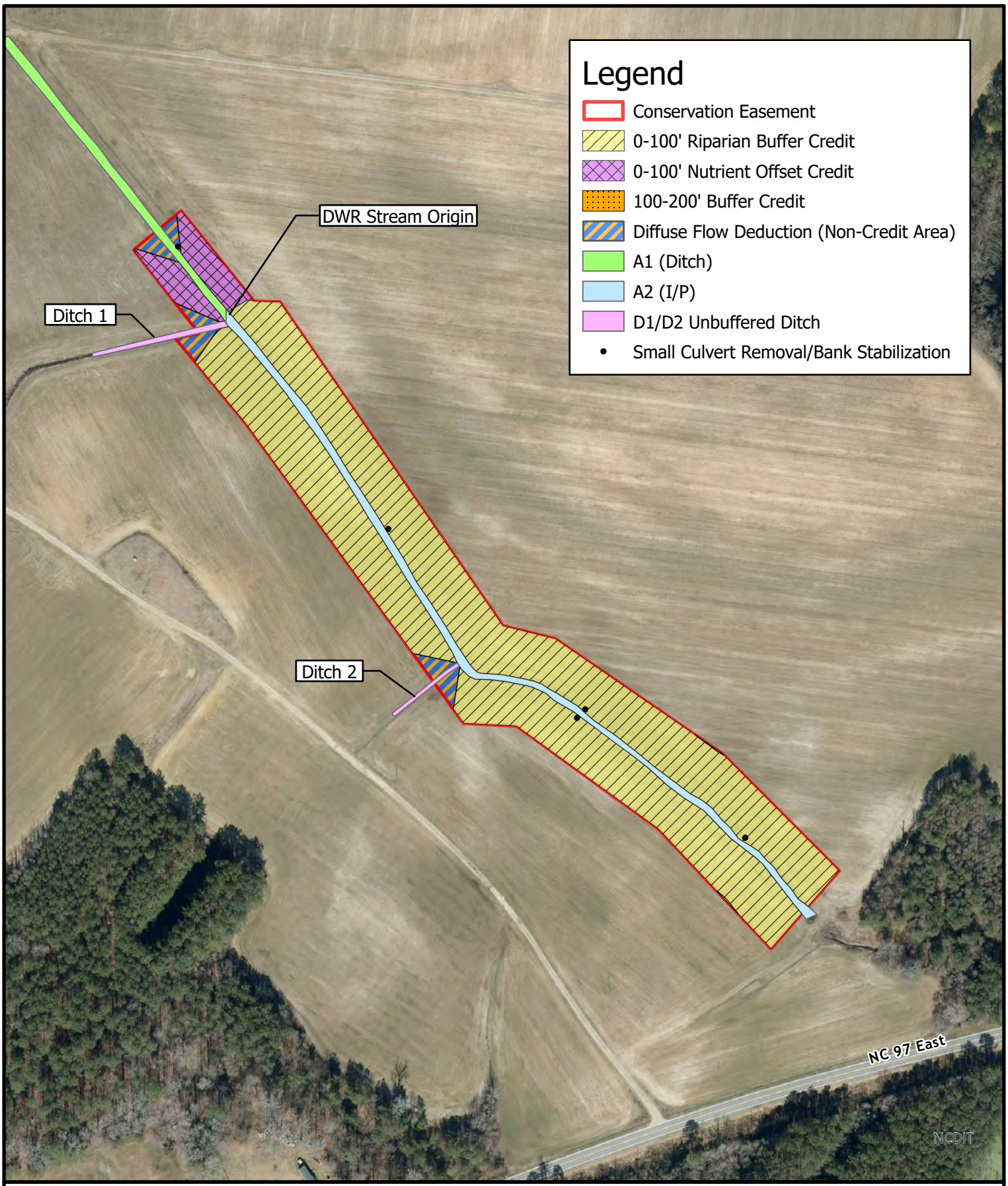
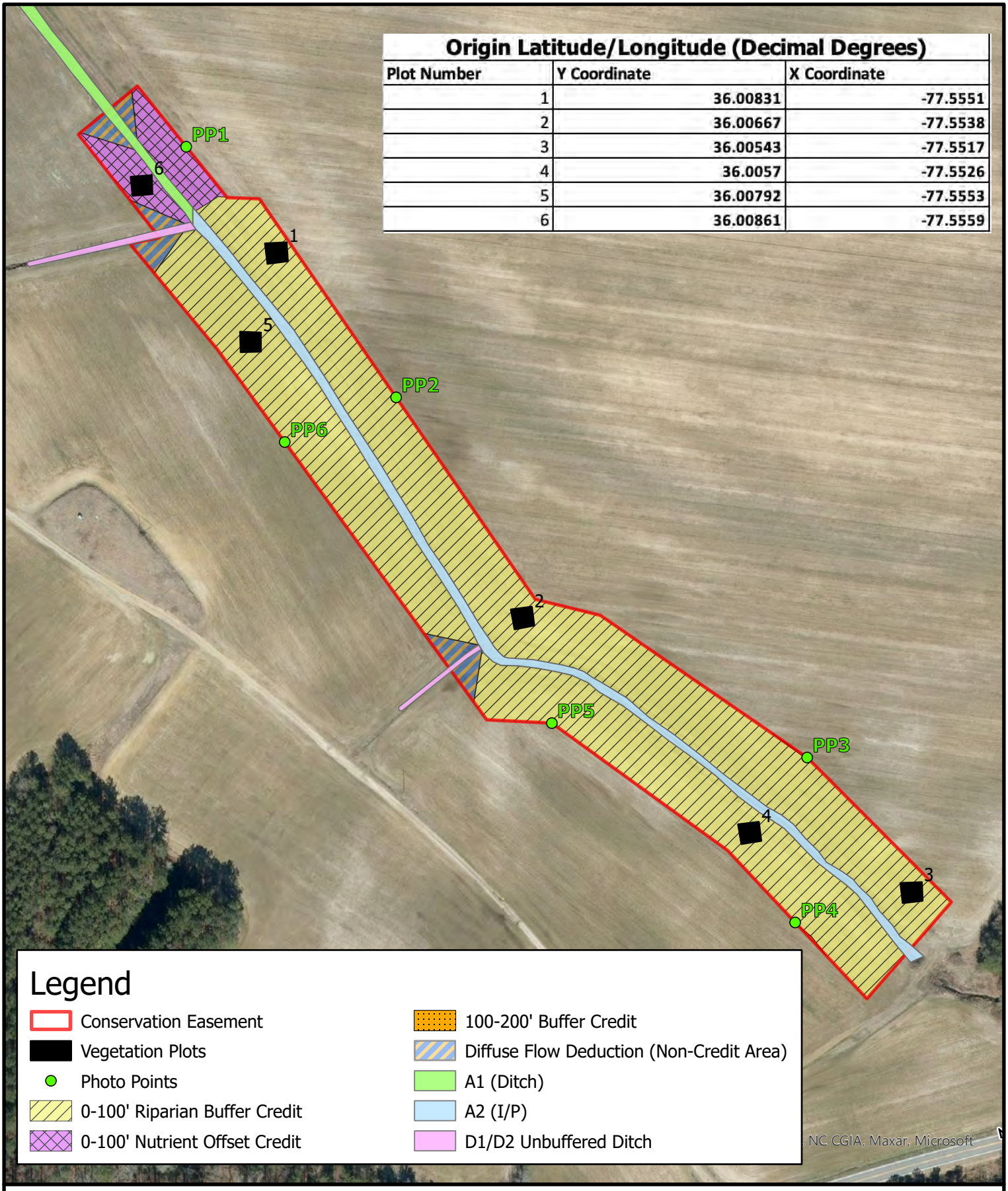


Figure 2: Project Component/Asset Map
Maple Swamp Buffer Mitigation Site
Tar-Pamlico 03020102
Edgecombe County, North Carolina
March 2022

NC Onemap Latest Orthoimagery

N
W E
S

0 125 250 500
Feet



Origin Latitude/Longitude (Decimal Degrees)

Plot Number	Y Coordinate	X Coordinate
1	36.00831	-77.5551
2	36.00667	-77.5538
3	36.00543	-77.5517
4	36.0057	-77.5526
5	36.00792	-77.5553
6	36.00861	-77.5559

ecoterra

Figure 3: Monitoring Components
Maple Swamp Buffer Mitigation Site
Tar-Pamlico 03020102
Edgecombe County, North Carolina
March 2022
NC Onemap Latest Orthoimagery

N W E S

0 100 200 400 Feet

Table 1: Project Planted Stems
Maple Swamp Buffer Mitigation Site
DMS ID No. 100189
DWR Project No. 2021-0614v2
Monitoring Year 0 – 2022

Scientific Name	Common Name	Quantity	%
Betula nigra	River birch	900	14%
Diospyros virginiana	Persimmon	300	5%
Fraxinus pennsylvanica	Green ash	200	3%
Liriodendron tulipifera	Yellow Poplar	200	3%
Quercus michauxii	Swamp chestnut oak	1000	15%
Quercus nigra	Water oak	1000	15%
Quercus phellos	Willow oak	1000	15%
Quercus shumardii	Shumard oak	500	8%
Quercus lyrata	Laurel oak	1000	15%
Taxodidium distichum	Bald cypress	500	8%
		6600	100%

Table 2: Buffer Project Attributes
Maple Swamp Buffer Mitigation Site
DMS ID No. 100189
DWR Project No. 2021-0614v2
Monitoring Year 0 – 2022

Project Name	Maple Swamp Buffer Mitigation Site
Hydrologic Unit Code	03020102
River Basin	Tar-Pamlico
Geographic Location (decimal degrees)	36.008912, -77.556057
Site Protection Instrument (BK, PG)	1750/176-186
Types of Credits	Riparian Buffer (294,193.140) Nutrient Offset (983.044 lbs N) Nutrient Offset (63.316 lbs P)
Mitigation Plan Date	September 2021
Initial Planting Date	February 2022
Baseline Report Date	April 2022
MY1 Report Date	November 2022
MY2 Report Date	November 2023
MY3 Report Date	November 2024
MY4 Report Date	November 2025
MY5 Report Date	November 2026
Close out Report Date/Visit	May 2027

Table 3: Buffer Project Components and Assets
Maple Swamp Buffer Mitigation Site
DMS ID No. 100189
DWR Project No. 2021-0614v2
Monitoring Year 0 – 2022

Table 3. Maple Swamp Buffer Mitigation Site, DMS No: 100189, Project Credits: 294,193.140 BMU, 983.044 lbs N, 63.316 lbs P

Tar-Pamlico 03020102	Project Area
19.16394	N Credit Conversion Ratio (ft^2/pound)
297.54099	P Credit Conversion Ratio (ft^2/pound)

Credit Type	Location	Subject? (enter NO if ephemeral or ditch [1])	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (ft^2)	Total (Creditable) Area of Buffer Mitigation (ft^2)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Convertible to Riparian Buffer?	Riparian Buffer Credits	Convertible to Nutrient Offset?	Delivered Nutrient Offset: N (lbs)	Delivered Nutrient Offset: P (lbs)
Buffer	Rural	Yes	I / P	Restoration	0-100	A2	294,108	294,108	1	100%	1.00000	N/A	294,108.000	Yes	15,346.948	988.462
Nutrient Offset	Rural	No	Ditch	Restoration	0-100	A1	18,839	18,839	1	100%	1.00000	No	—	Yes	983.044	63.316
Buffer	Rural	Yes	Ditch	Restoration	0-100	Ditch 2 (diffused flow reduction)	4,356	0	1	100%		No	—	No	—	—
Buffer	Rural	No	Ditch	Restoration	0-100	Ditch 1 (diffused flow reduction)	4,356	0	1	100%		No	—	No	—	—
Nutrient Offset	Rural	No	Ditch	Restoration	0-50	A1 (diffused flow reduction)	4,356	0	1	100%		No	—	No	—	—
Buffer	Rural	Yes	I / P	Restoration	101-200	A2	258	258	1	33%	3.03030	N/A	85.140	Yes	13.463	0.867
													—		—	—
													—		—	—
													—		—	—
													—		—	—
													—		—	—
													—		—	—
													—		—	—
													—		—	—
													—		—	—
													—		—	—
													—		—	—
													—		—	—
						Totals (ft2):	326,273	313,205					294,193.140		16,343.455	1,052.645
						Total Buffer (ft2):	303,078	294,366								
						Total Nutrient Offset (ft2):	23,195	N/A								

Total Ephemeral Area (ft^2) for Credit:	0	0
Total Eligible Ephemeral Area (ft^2):	75,770	0.0% Ephemeral Reaches as % TABM
Total Eligible for Preservation (ft^2):	101,026	0.0% Preservation as % TABM

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 (ft^2)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits
	Rural	Yes	I / P		0-100				10	100%		—
	Rural	Yes	Ephemeral		0-100				10	100%		—
												—
												—
												—
						Preservation Area Subtotals (ft^2):	0	0				

TOTAL AREA OF BUFFER MITIGATION (TABM)			
Mitigation Totals		Square Feet	Credits
Restoration:		294,366	294,193.140
Enhancement:		0	0.000
Preservation:		0	0.000
Total Riparian Buffer:		294,366	294,193.140
TOTAL NUTRIENT OFFSET MITIGATION			
Mitigation Totals		Square Feet	Credits
Nutrient Offset:	Nitrogen:	23,195	983.044
	Phosphorus:		63.316

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

APPENDIX 2

DWR CORRESPONDENCE

ROY COOPER
Governor
DIONNE DELLI-GATTI
Secretary
S. DANIEL SMITH
Director

NORTH CAROLINA
Environmental Quality

April 1, 2021

DWR Project # 20210614
Edgecombe County

RKW Properties, LLC
J. Rodney Williford
PO BOX 429
Bethel, NC 27812
(*via email to jamey@ecoterra.com*)

This letter replaces one dated March 30, 2021
Subject: On-Site Determination for Applicability to the Tar-Pam Buffer Rules (15A NCAC 02B .0734)
Project Name: Maple Swamp Buffer Mitigation Site
Address / Location: East of Leggett, NC at approximately 36.006997 -77.554086
Determination Date: March 30, 2021 **Staff**: Rick Trone

Mr. O'Shaughnessey,
On March 30, 2021, Rick Trone of the Division of Water Resources conducted an on-site review of features located on the subject property at the request of Eco Terra to determine the applicability to the Tar-Pamlico Riparian Area Protection Rules (15A NCAC 02B .0734).

The enclosed map(s) depict the feature(s) evaluated. This information is also summarized in the table below. Streams that are considered "Subject" have been located on the most recently published NRCS Soil Survey of Edgecombe County and/or the most recent copy of the USGS Topographic (at 1:24,000 scale) map(s), have been located on the ground at the site, and possess characteristics that qualify them to be at least intermittent streams. Features that are considered "Not Subject" have been determined to not be at least intermittent or not present on the property or not depicted on the required maps.

This determination only addresses the applicability to the buffer rules and does not approve any activity within buffers or within waters of the state. There may be other streams or features located on the property that do not appear on the maps referenced above. Any of the features on the site may be considered jurisdictional according to the US Army Corps of Engineers and subject to the Clean Water Act.

The following table addresses the features rated during the DWR site visit:

Feature ID	Type[1]	Subject	Start @	Stop @	Depicted on Soil Survey	Depicted on USGS Topo
A1	E/D		Approximately 36.010133 -77.556984/outside project boundary	A2/confluence with Ditch 1	X	
A2	I/P	X	Approximately 36.008485 -77.555506	Outside project boundary	X	
D1	D		Outside project boundary	Feature A2		
D2	D		Outside project boundary	Feature A2		

(1) E = Ephemeral, I = Intermittent, P = Perennial, NP = Not Present, NE=Not Evaluated, D = Ditch

This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by the DWR may request a determination by the Director. An appeal request must be made within sixty (60) calendar days of the date of this letter to the Director in writing.

If sending via U.S. Postal Service:	*If sending via delivery service (UPS, FedEx, etc.)*
DWR 401 & Buffer Permitting Branch Supervisor 1617 Mail Service Center Raleigh, NC 27699-1617	DWR 401 & Buffer Permitting Branch Supervisor 512 N Salisbury St. Raleigh, NC 27604

This determination is final and binding as detailed above unless an appeal is requested **within sixty (60) calendar days**.

This letter only addresses the features on the subject property and within the proposed project easement and does not approve any activity within buffers or within waters of the state. If you have any additional questions or require additional information, please contact Rick Trone at (919) 707-3631 or rick.trone@ncdenr.gov. This determination is subject to review as provided in Articles 3 & 4 of G.S. 150B.

Sincerely,

DocuSigned by:
Paul Wojoski
949D91BA53EF4E0...

Paul Wojoski, Supervisor
401 & Buffer Permitting Branch

Enclosures: USGS Topographical Map, NRCS Soil Survey, Site Map

cc: Jamey O'Shaughnessey, EcoTerra (via email)
401 & Buffer Permitting Branch files

Map Provided by EcoTerra

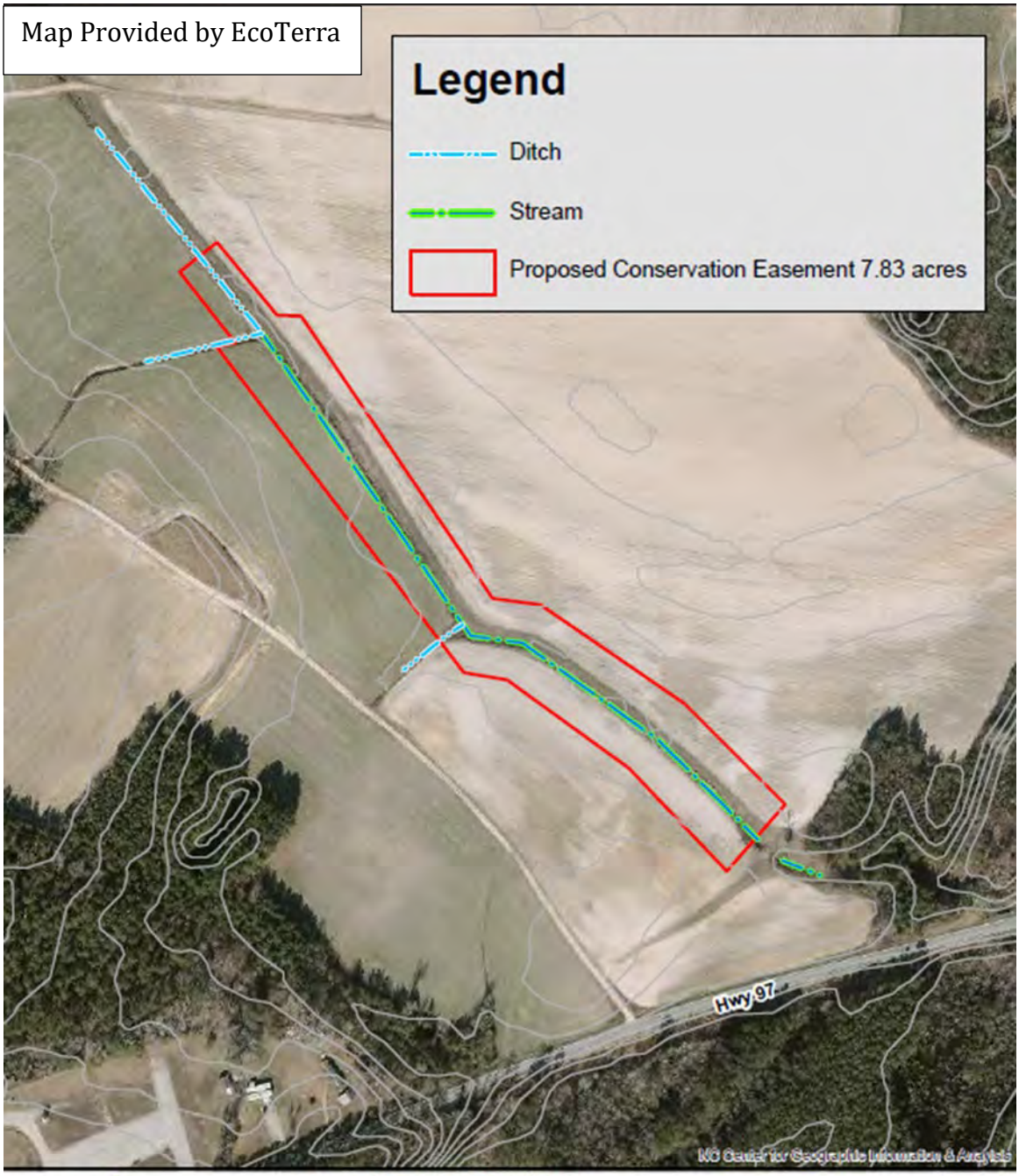


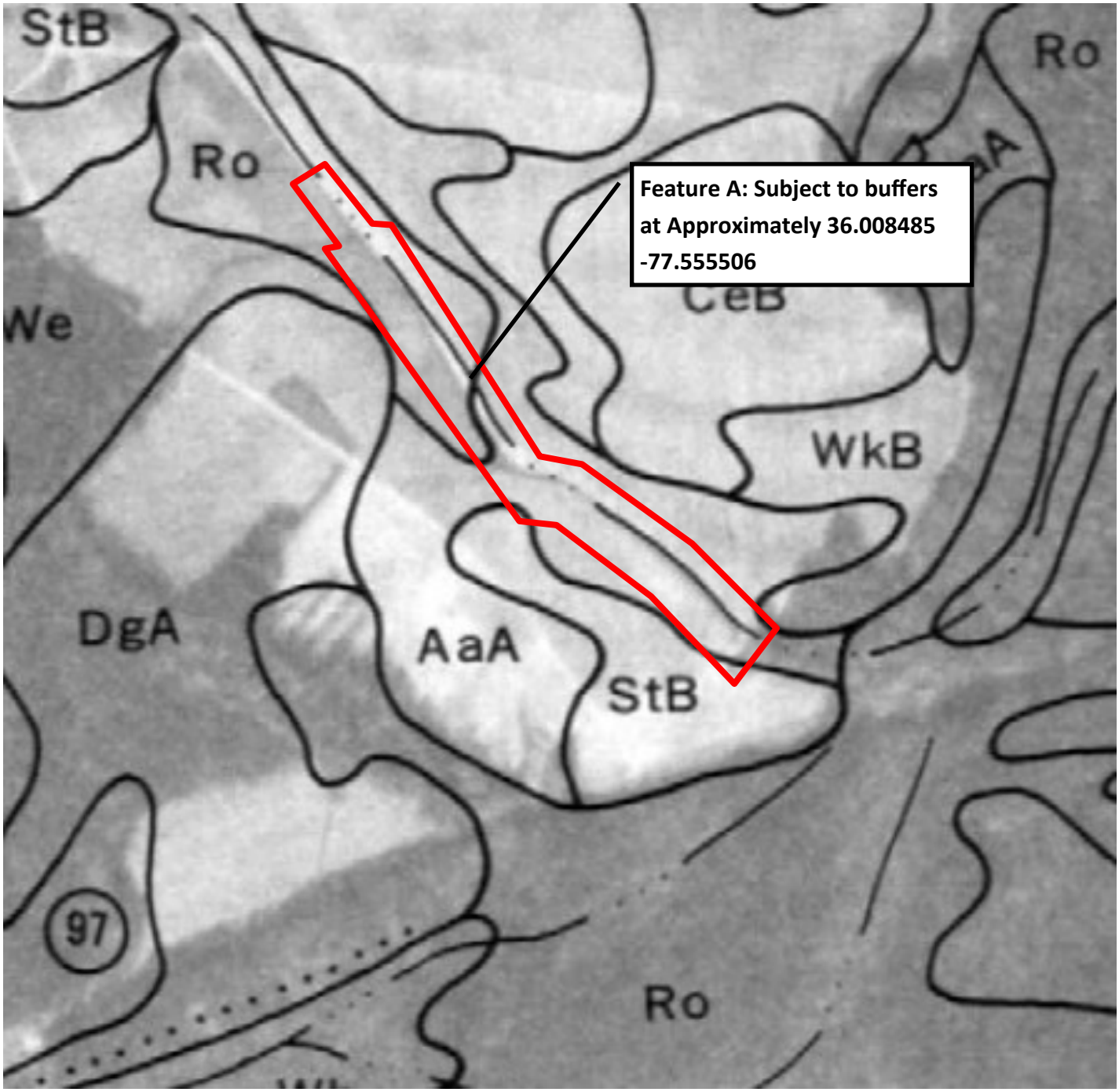
Figure 2 Existing Conditions
Maple Swamp Buffer Mitigation Site
Tar-Pam 03020102
Edgecombe County, North Carolina
October 2020
NC Onemap 2017 Aerial

300 150 0 300
Feet

N

Maple Swamp Buffer Mitigation Site

Edgecombe County, NC-DWR Project # 20210614



NRCS Soil Survey Sheet 7

Edgecombe Co NC 1974

Legend:

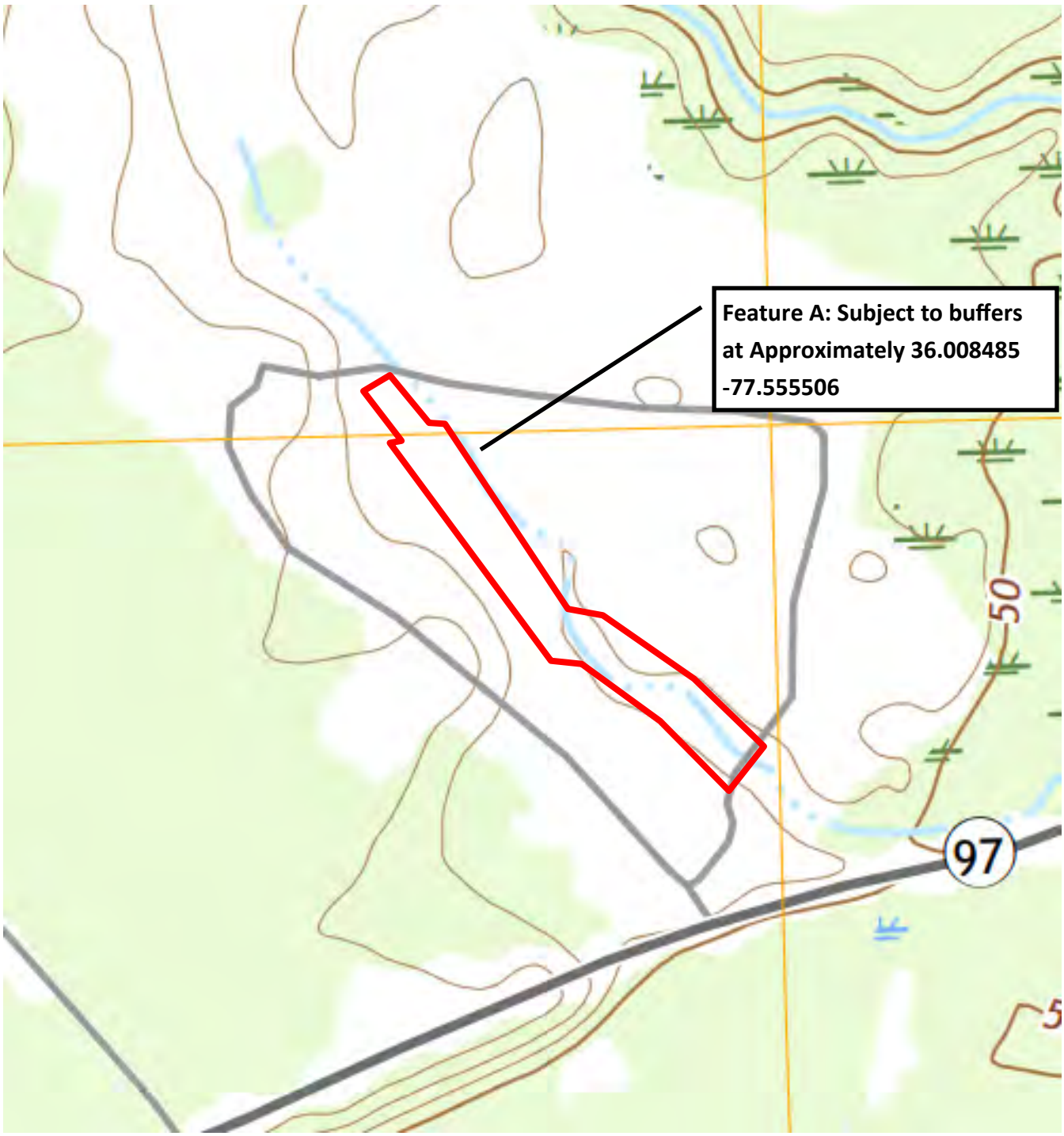
-project boundary

:: Locations are approximate and are provided for reference only ::

N

Maple Swamp Buffer Mitigation Site

Edgecombe County, NC-DWR Project # 20210617



USGS Topographical Map

Draughn Quadrangle 2019

Legend:

-project boundary

:: Locations are approximate and are provided for reference only ::

N

ROY COOPER
Governor
DIONNE DELLI-GATTI
Secretary
S. DANIEL SMITH
Director

NORTH CAROLINA
Environmental Quality

May 14, 2021

Jamey O'Shaughnessey
Eco Terra Partners, LLC
(via electronic mail: Jamey@ecoterra.com)

Re: Site Viability for Buffer Mitigation & Nutrient Offset –Maple Swamp Site
Near 36.006997 -77.554086 off NC Hwy 97, Leggett, NC
Tar-Pamlico 03020102
Edgecombe County

Dear Mr. O'Shaughnessey,

On March 31, 2021, Katie Merritt, with the Division of Water Resources (DWR), received a request from you on behalf of Eco Terra Partners, LLC (Eco Terra) for a site visit near the above-referenced site in the Tar-Pamlico River Basin within the 8-digit Hydrologic Unit Code 03020102. The site visit was to determine the potential for riparian buffer mitigation and nutrient offset within a proposed Easement Boundary, which is more accurately shown in the attached maps labeled "Figure 2 Existing Conditions Maple Swamp Mitigation Site" (Figure 2), prepared by Eco Terra. On May 7, 2021, Ms. Merritt performed a site assessment of the subject site. Staff with Eco Terra were also present.

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

Feature	Classification onsite	[1]Subject to Buffer Rule	Riparian Land uses adjacent to Feature (0-200')	Buffer Credit Viable	[3]Nutrient Offset Viable	[4,5]Mitigation Type Determination w/in riparian areas
A1	Ditch >3' depth	No	Non-forested agricultural fields	No	Yes	**Restoration Site** per 15A NCAC 02B .0295 (n)
A2	Stream	Yes	Non-forested agricultural fields	Yes	Yes	**Restoration Site** per 15A NCAC 02B .0295 (n)

Feature	Classification onsite	[1]Subject to Buffer Rule	Riparian Land uses adjacent to Feature (0-200')	Buffer Credit Viable	[3]Nutrient Offset Viable	[4,5]Mitigation Type Determination w/in riparian areas
D1	Ditch >3' depth	No	Non-forested agricultural fields	No	Yes	**Restoration Site** per 15A NCAC 02B .0295 (n)
D2	Ditch >3' depth	No	Non-forested agricultural fields	No	Yes	**Restoration Site** per 15A NCAC 02B .0295 (n)

[1]Subjectivity calls for the features were determined by DWR in correspondence dated May 6, 2021 (DWR# 2021-0614) 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]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.

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

[4]Determinations made for this Site are determined based on the proposal provided in maps and figures submitted with the request.

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

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

Determinations provided in the table above were made using a proposed easement boundary showing proposed mitigation areas shown in Figure 2. The map representing the proposal for the site are attached to this letter and are initialed by Ms. Merritt on May 14, 2021. Substantial changes to the proposed easement boundary could affect the Site's potential to generate buffer and nutrient offset credits.

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

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

This viability assessment will expire on May 14, 2023 or upon approval of a mitigation plan by the DWR, whichever comes first. This letter should be provided in any nutrient offset, buffer, stream or wetland mitigation plan for this Site.

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

Sincerely,

DocuSigned by:
Paul Wojoski
949D91BA53EF4E0...

Paul Wojoski, Supervisor
401 and Buffer Permitting Branch

PW/kym
Attachments: Figure 2 Existing Conditions Maple Swamp Mitigation Site
cc: File Copy (Katie Merritt)

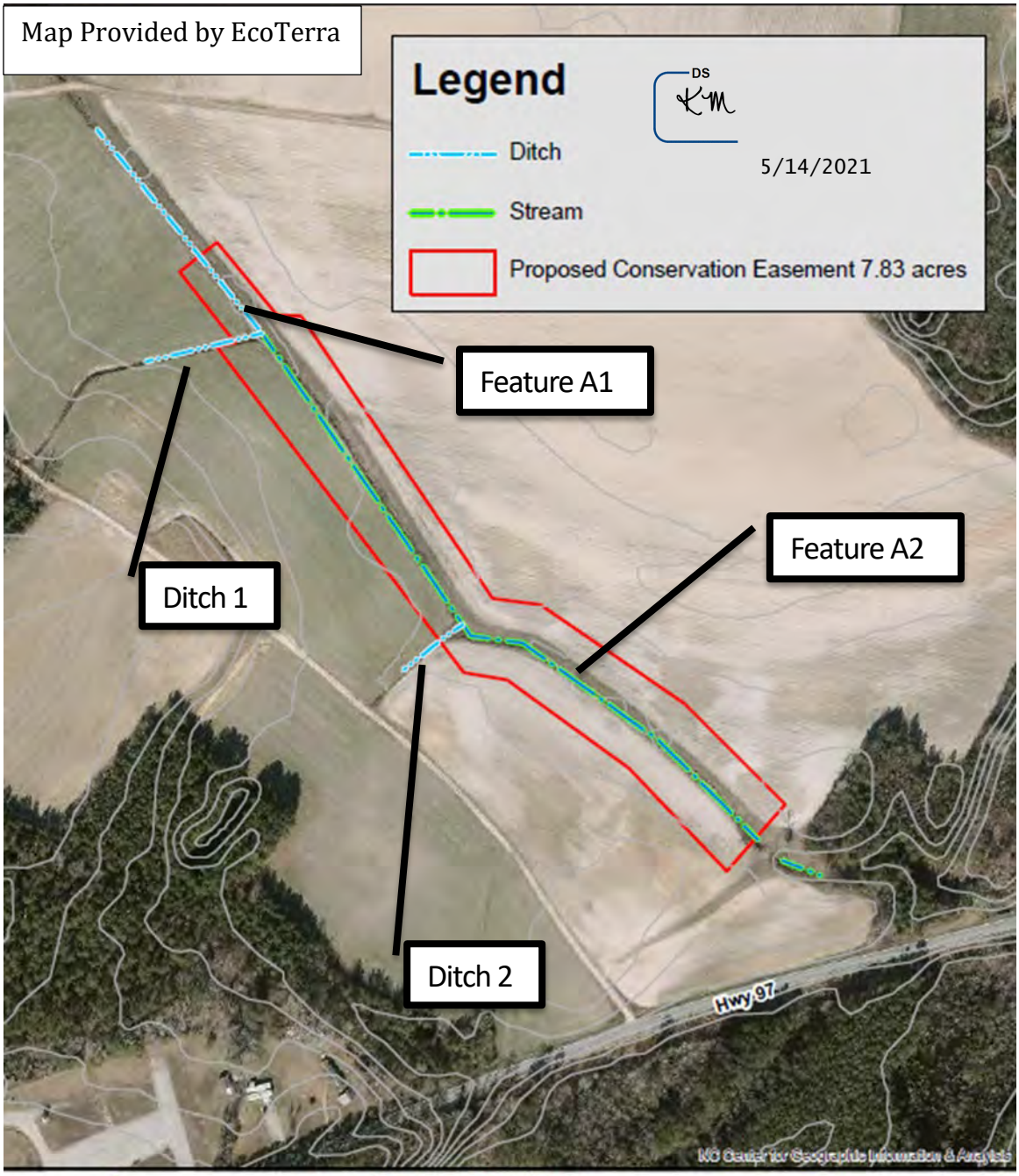


Figure 2 Existing Conditions
Maple Swamp Buffer Mitigation Site
Tar-Pam 03020102
Edgecombe County, North Carolina
October 2020
NC Onemap 2017 Aerial

300 150 0 300
Feet

N

APPENDIX 3

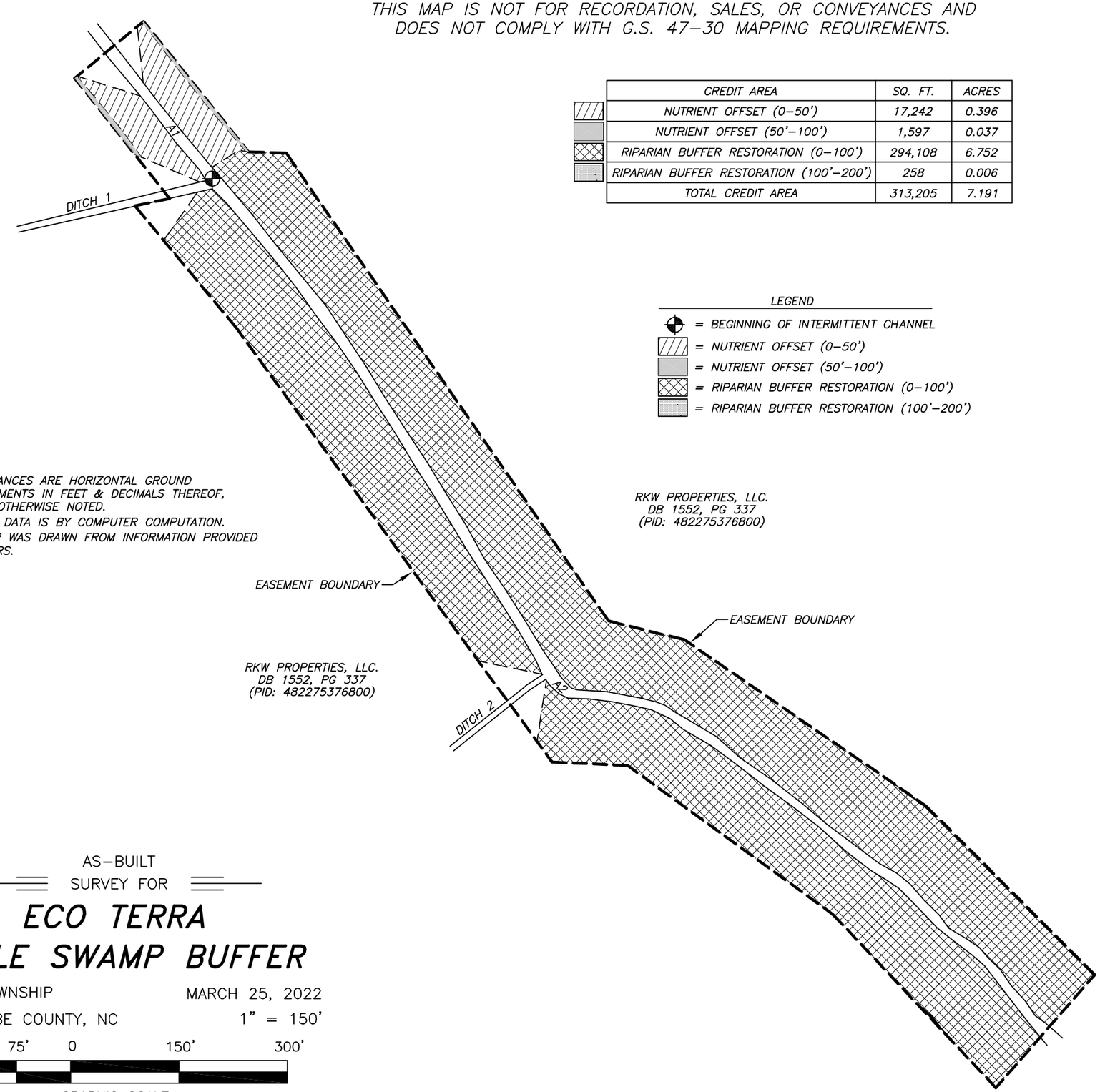
AS-BUILT SURVEY

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

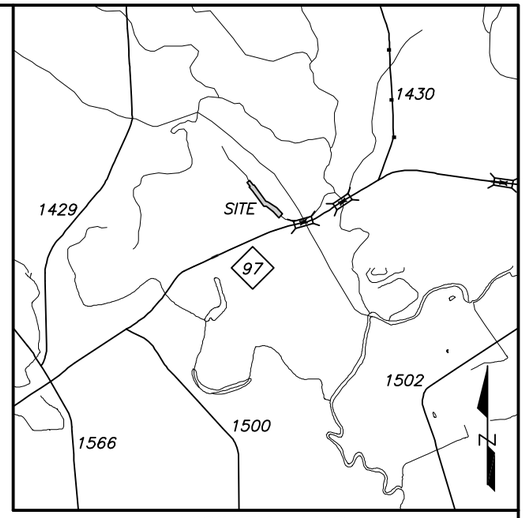
CREDIT AREA	SQ. FT.	ACRES
NUTRIENT OFFSET (0–50')	17,242	0.396
NUTRIENT OFFSET (50'–100')	1,597	0.037
RIPARIAN BUFFER RESTORATION (0–100')	294,108	6.752
RIPARIAN BUFFER RESTORATION (100'–200')	258	0.006
TOTAL CREDIT AREA	313,205	7.191

LEGEND

= BEGINNING OF INTERMITTENT CHANNEL
= NUTRIENT OFFSET (0–50')
= NUTRIENT OFFSET (50'–100')
= RIPARIAN BUFFER RESTORATION (0–100')
= RIPARIAN BUFFER RESTORATION (100'–200')



NAD 83/2011



VICINITY MAP
(NOT TO SCALE)

NOTES:
1. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
2. ACREAGE DATA IS BY COMPUTER COMPUTATION.
3. THIS MAP WAS DRAWN FROM INFORMATION PROVIDED BY OTHERS.

I, CHRISTOPHER K. PADERICK, AS A DULY REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF NORTH CAROLINA, CERTIFY THAT THIS BUFFER MAP WAS DRAWN UNDER MY SUPERVISION, IS AN ACCURATE AND COMPLETE REPRESENTATION OF WHAT WAS CONSTRUCTED IN THE FIELD. THAT THE EASEMENT BOUNDARY IS BASED ON PLAT CABINET 13, SLIDE 217, RECORDED IN THE EDGECOMBE COUNTY REGISTER OF DEEDS OFFICE, AND THAT THE BUFFER AREAS SHOWN ARE CALCULATED FROM AS–BUILT CONDITIONS (INFORMATION PROVIDED BY OTHERS) EXCEPT WHERE OTHERWISE NOTED HEREON. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 25th DAY OF MARCH, 2022.

L–4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LANDSURVEYOR CHRISTOPHER K. PADERICK

AS–BUILT
SURVEY FOR

ECO TERRA
MAPLE SWAMP BUFFER

NO. 5 TOWNSHIP
EDGECOMBE COUNTY, NC

MARCH 25, 2022
1" = 150'

150' 75' 0 150' 300'
GRAPHIC SCALE

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
908 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252–522–2500 FAX: 252–522–4747

FIRM LIC. # P–0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20220075
SURVEYED BY: OTHERS	DATE: 3/25/2022
SCALE: 1" = 150'	DRAWING NAME: 20220075

APPENDIX 4

SITE PHOTOGRAPHS

Photo-points

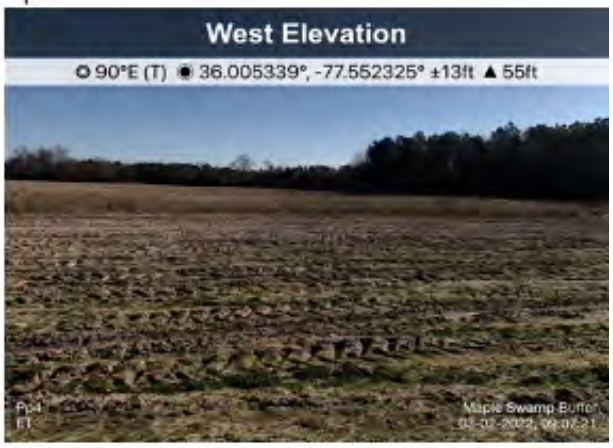
Photo-Points
Maple Swamp Buffer Mitigation Site
DMS ID No. 100189
DWR Project No. 2021-0614v2

Baseline 2022

Pp1

Pp2

Pp3



Pp4

Pp5

Pp6

APPENDIX 5

MONITORING PLOT DATA
MONITORING PLOT PHOTOGRAPHS

Table 4: Planted and Total Stems
Maple Swamp Buffer Mitigation Site
DMS ID No. 100189
DWR Project No. 2021-0614v2
Monitoring Year 0 – 2022

			Current Plot Data (MY0-2022)						Annual Summary
Scientific Name	**Common Name**	**Species Type**	**MP1**	**MP2**	**MP3**	**MP4**	**MP5**	**MP6**	**MY0 (2022)**
Betula nigra	Birch, River	Tree	3		1	1	3	2	10
Fraxinus pennsylvanica	Ash, Green	Tree			1	1			2
Liriodendron tulipifera	Poplar, Yellow	Tree			3				3
Quercus laurifolia	Oak, Laurel	Tree	1	2	1	2		3	9
Quercus michauxii	Oak, Swamp Chestnut	Tree	6	6	7	2	6	2	29
Quercus nigra	Oak, Water	Tree	2	3	1	3	4		13
Quercus phellos	Oak, Willow	Tree				4	5	7	16
Quercus shumardii	Oak, Shumard	Shrub Tree	3	1		5	4	4	17
Taxodium distichum	Cypress, Bald	Tree	1	2	3		3	2	11
		Stem count	16	14	17	18	25	20	110
		Size (acres)	0.02	0.02	0.02	0.02	0.02	0.02	0.15
		Species count	6	5	7	7	6	6	9
		Vigor	4	4	4	4	4	4	4
		Height (cm)	46.2	46.3	47.5	39.3	45.5	52.7	46.2
		Stems/acre	647	567	688	728	1012	809	742

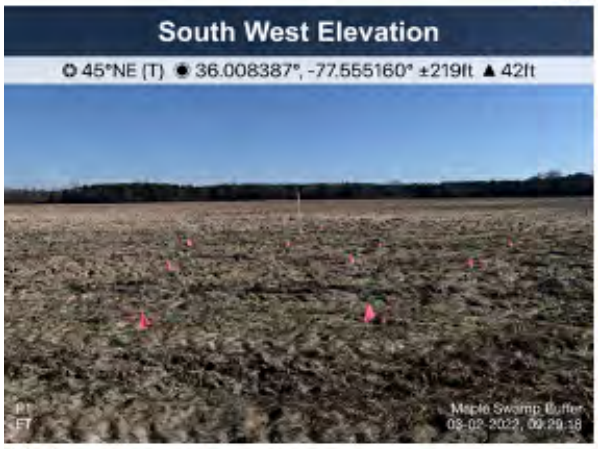
Color for Density

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%

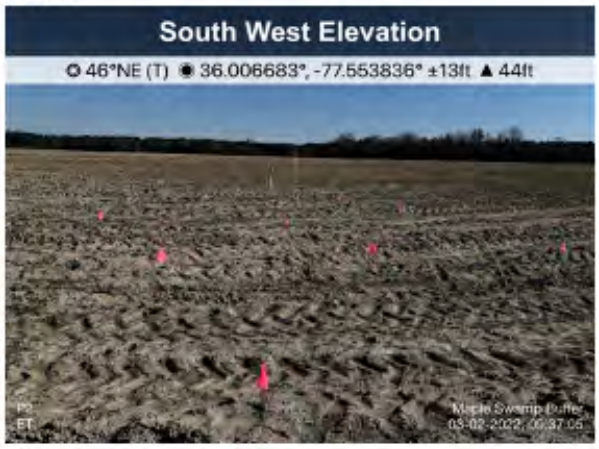
Monitoring Plot Photos

Monitoring Plots
Maple Swamp Buffer Mitigation Site
DMS ID No. 100189
DWR Project No. 2021-0614v2

Baseline 2022



MP1



MP2

MP3

MP4

MP5

MP6

Site post construction (February 2022)