



**MONITORING YEAR 2
ANNUAL BUFFER REPORT
Final**

SASSARIYA SWAMP MITIGATION SITE

Johnston County, NC
NCDEQ Contract No. 7425
DMS ID No. 100040
DWR Project No. 2018-0198
RFP No. 16-007279

Neuse River Basin
HUC 03020201

Data Collection Period: September 2022
Draft Submission Date: October 31, 2022
Final Submission Date: January 9, 2023

PREPARED FOR:



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

PREPARED BY:



Wildlands Engineering, Inc.
312 West Millbrook Road, Suite 225
Raleigh, NC 27609

Jason Lorch
jlorch@wildlandseng.com
Phone: (919) 851-9986

SASSARIXA SWAMP MITIGATION SITE
Monitoring Year 2 Buffer Report

TABLE OF CONTENTS

Section 1: PROJECT OVERVIEW 1

 1.1 Project Summary..... 1

 1.2 Project Goals and Objectives 1

 1.3 Monitoring Year 2 Data Assessment..... 2

 1.3.1 Vegetative Assessment 2

 1.3.2 Vegetation Areas of Concern 3

 1.4 Monitoring Year 2 Summary 3

Section 2: REFERENCES 4

APPENDICES

Appendix 1 General Figures and Tables

Figure 1 Vicinity Map

Figure 2 Service Area Map

Figure 3 Project Component / Asset Map

Table 1a Mitigation Credits

Table 1b Total Area of Buffer and Nutrient Offset Mitigation

Table 2 Project Activity and Reporting History

Table 3 Project Contact Table

Table 4 Project Information and Attributes

Table 5 Adjacent Forested Areas Existing Tree and Shrub Species

Table 6 Planted Tree Species

Appendix 2 Visual Assessment Data

Figure 4-4c Monitoring Plan View Maps

Table 7 Vegetation Condition Assessment Table

Vegetation Plot Photographs

Overview Photographs

Appendix 3 Vegetation Plot Data

Table 8 Vegetation Plot Data

Table 9 Vegetation Performance Standards Summary Table



Section 1: PROJECT OVERVIEW

1.1 Project Summary

Wildlands Engineering, Inc. (Wildlands) implemented a full delivery project at the Sassarixa Swamp Mitigation Site (Site) for the North Carolina Department of Environmental Quality (NCDEQ) Division of Mitigation Services (DMS). A conservation easement comprised of 65.06 acres along Sassarixa Creek and seven unnamed tributaries to Sassarixa Creek, along with six unnamed tributaries to Black Creek in the Neuse River Basin are included in the project. A total of 55.26 acres (2,407,138 ft²) of riparian buffer have been restored, enhanced, or preserved and are expected to generate 1,080,282.590 riparian buffer credits, with potential to convert some buffer credits to nutrient offset credits dependent on the need. The Site is located approximately six miles southwest of Smithfield and five miles north of Four Oaks (Figure 1). Project information and attributes are described in Table 4 located in Appendix 1. The Site drains to Holts Lake, which is a recreational lake classified as Nutrient Sensitive Waters (NSW). Holts Lake then drains to the Neuse River, which is a water supply for the City of Goldsboro.

Work at the Site was planned, designed, and constructed per the Sassarixa Swamp Mitigation Site – Riparian Buffer Mitigation Plan (Wildlands, 2020) and the Consolidated Buffer Mitigation Rule 15A NCAC 02B .0295 (effective November 1, 2015). The purpose of the riparian buffer restoration is to provide riparian buffer credits to compensate for buffer impacts within the Hydrologic Unit Code 03020201. The service area for the riparian buffer credits is depicted in Figure 2. The mitigation credits generated from the Site are included in Table 1 and illustrated in Figure 3 located in Appendix 1.

1.2 Project Goals and Objectives

The project includes several adjacent properties that have been owned and operated as a livestock farm by a single family since 1850, where livestock are continually rotated through all fields (with access to their associated streams). The western portion of the project includes Sassarixa Creek and seven unnamed tributaries to Sassarixa Creek (T1, T1A, T1B, T1C, T1D, T2, and T3) (Figure 2). The eastern portion of the site contains six unnamed tributaries to Black Creek (T4, T5, T5A, T5B, T5C, and T6). A review of historic aerials from 1950 to 2012, showed that onsite streams have existed in their approximate locations with very little change to riparian zones since 1950. Two alterations to the Site visible from aerial photography are the addition of the pond on T2 between 1964 and 1973, and the addition of the large pond below T5A, T5B, and T5C, between 1950 and 1961.

The Site is located in a new Targeted Local Watershed (TLW) that is not described in the 2010 Neuse River Basin Restoration Priorities (RBRP) Plan. The TLW was added in the 2015 Neuse 01 Cataloging Unit (CU) Update because there were more water quality issues than assets. The Site addresses the TLW stressors of agricultural land use/animal operations and the lack of protected riparian areas. The project will also address key CU wide restoration goals for the Neuse River 03020201 described in the RBRP (NC DWR 2009). Specific enhancements to water quality and ecological processes are outlined below:

- Decrease nutrient levels - Nutrient input will be decreased by filtering runoff from the agricultural fields through restored native buffer zones. The off-site nutrient input will also be absorbed on-site by dispersing flood flows through native vegetation, thereby reducing nutrient inputs to waters of the Neuse River Basin.
- Exclude cattle from project streams. - Install fencing around project areas adjacent to cattle pastures.
- Decrease water temperature and increase dissolved oxygen concentrations - Establishment and maintenance of riparian buffers will create additional long-term shading of the channel flow to reduce thermal pollution.



- Restore and enhance native floodplain vegetation - Plant native tree species in the riparian zone where they are currently insufficient.
- Permanently protect the Site from harmful uses - Establish a conservation easement on the Site. Protect aquatic habitat; by protecting water supply waters.

The 65.06-acre Site is protected with a permanent conservation easement. Of the 65.06 acres, Neuse riparian buffer credits were generated by restoring 10.03 acres, enhancing 34.41 acres, and preserving 10.82. No buffer credit will be generated from the remaining 9.80 acres. In general, riparian buffer restoration area widths on streams extend out to 50 feet from top of bank on each side of the stream channel. Figure 3 and Table 1 in Appendix 1 detail the buffer credit generation.

1.3 Monitoring Year 2 Data Assessment

The Mitigation Plan (Wildlands, 2019) was submitted and accepted by DMS in November 2019. Construction activities by Land Mechanic Designs, Inc. were completed in January 2021, while tree planting by Bruton Natural Systems, Inc. was completed in March 2021. The baseline as-built survey was completed by Kee Mapping and Surveying in February 2021. Refer to Appendix 1 for detailed project activity, history, contact information, and watershed/site background information.

Vegetative performance for buffer restoration areas will be in accordance with 15A NCAC 02B .0295(n)(2)(B), and (n)(4) (effective November 1, 2015). To meet success criteria, areas generating buffer mitigation credits shall include a minimum of four native hardwood tree species, where no one species is greater than 50 percent of stems, and shall have a survival of at least 260 planted stems per acre at the end of the required five-year monitoring period. For monitoring to be completed and buffer credit to be awarded, NCDWR must provide written approval of successful revegetation of buffer restoration areas. Year 2 monitoring (MY2) was conducted to assess the condition of the vegetation in September 2022.

1.3.1 Vegetative Assessment

The quantity of monitoring vegetation plots was determined in accordance with the Wilmington District Stream and Wetland Compensatory Mitigation Update (NCIRT, 2016) such that at least 2 percent of the Site is encompassed in monitoring plots. A total of 10 vegetation plots (each 100 square meters) were established within the conservation easement boundaries. The plot corners have been marked and are recoverable either through field identification or with the use of a GPS unit. Reference photographs are taken at the origin looking diagonally across the plot to the opposite corner on an annual basis. Trees will be marked annually with flagging tape. Species composition, vigor, height, density, and survival rates will be evaluated by plot on an annual basis. The extent of invasive species coverage will also be monitored and controlled as necessary.

The MY2 vegetation monitoring was completed in September 2022, resulting in an average survival of 437 planted stems per acre. The Site is exceeding the final requirement of 260 stems per acre, with 9 of the 10 plots individually exceeding this requirement. The planted stem mortality was approximately 23% of the baseline stem count (566 stems per acre) in March 2021. There is an average of 10 stems per plot. Vegetation plot 1 is not on track to meet the final success requirement with 162 stems per acre. Mortality is contributed to competition from dense herbaceous grass and a dry spring when the trees were originally planted in 2021. Refer to Appendix 2 for the vegetation condition assessment table, monitoring plan view maps, vegetation plot and overview photographs. Appendix 3 contains vegetation plot data and vegetation plot performance summary table.



1.3.2 Vegetation Areas of Concern

A supplemental planting occurred in the Sassarixa Swamp II Nutrient Offset and Buffer Mitigation Bank Parcel along UT6 in February 2022. After planting was complete, Wildlands realized the planting overextended into the Sassarixa Swamp Mitigation Site easement by 0.22 acres. The supplementally planted species were the same from the approved Mitigation Plan.

A 0.55-acre are of supplemental planting will occur in the winter of 2022/2023 to supplement the tree mortality that was assessed along T1 (Figure 4a). This area and any new species not included in the approved Mitigation Plan (Wildlands, 2019) and is currently under review by the IRT.

A follow up invasive treatment occurred in March 2022 on 11.99 acres (Figure 4a) along the lower half of Sassarixa Creek to treat the Chinese privet (*Ligustrum sinense*) that resprouted from the original treatment during construction. A combination of methods included foliar and cut stump applications. The Site will continue to be monitored for invasive species and follow up treatments will occur if necessary.

Kudzu (*Pueraria montana*) has been established outside of the Site along the farm path leading up to T5a (Figure 4c). As a preventative measure to ensure Kudzu does not become established on Site. Wildlands received permission from the landowner to treat the Kudzu along the farm path in July 2022. Follow up treatments will be scheduled in the upcoming years.

1.4 Monitoring Year 2 Summary

Overall, the Site has exceeded the required vegetation success criteria for MY2. Vegetation plot 1 is not on track to meet the final success criteria. A replanting is planned for the winter of 2022/2023 to accommodate for tree mortality along T1. The Sassarixa Swamp II easement was replanted in February 2022. While replanting, the boundary expanded beyond originally outlined and extended into the DMS portion of the easement. A follow up treatment of the Chinese privet resprouts along Sassarixa Creek occurred in March 2022. As a preventative measure, Kudzu was treated outside the easement in July 2022. The rest of the Site's vegetation layer established quickly and is greatly reducing the amount of nutrients and sediment entering the project streams.

Summary information/data related to the performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information, formerly found in these reports, can be found in the Mitigation Plan (Wildlands, 2019) available on DMS's website. All raw data supporting the tables and figures in the appendices are available from DMS upon request.



Section 2: REFERENCES

- Breeding, R. 2010. Neuse River Basin Restoration Priorities. North Carolina Ecosystem Enhancement Program.
- Natural Resources Conservation Service (NRCS), 2011. Web Soil Survey.
- 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 Water Resources (NCDWR). 2000. 15A NCAC 02B .0233 Neuse River Basin: Nutrient Sensitive Waters Management Strategy: Protection and Maintenance of Existing Riparian Buffers.
- North Carolina Department of Environmental Quality, Division of Water Resources (NCDWR). 2015. 15A NCAC 02B .0295 Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers.
- North Carolina Department of Environmental Quality, Division of Water Resources (NCDWR). 2011. Surface Water Classifications.
- North Carolina Interagency Review Team (NCIRT). 2016. Wilmington District Stream and Wetland Compensatory Mitigation Update.
- Wildlands Engineering, Inc. (2019). Sassarixa Swamp Mitigation Site – Riparian Buffer Mitigation Plan. North Carolina Department of Environmental Quality, Division of Mitigation Services (NCDMS), Raleigh, NC.



APPENDIX 1. GENERAL FIGURES AND TABLES

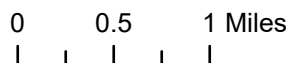
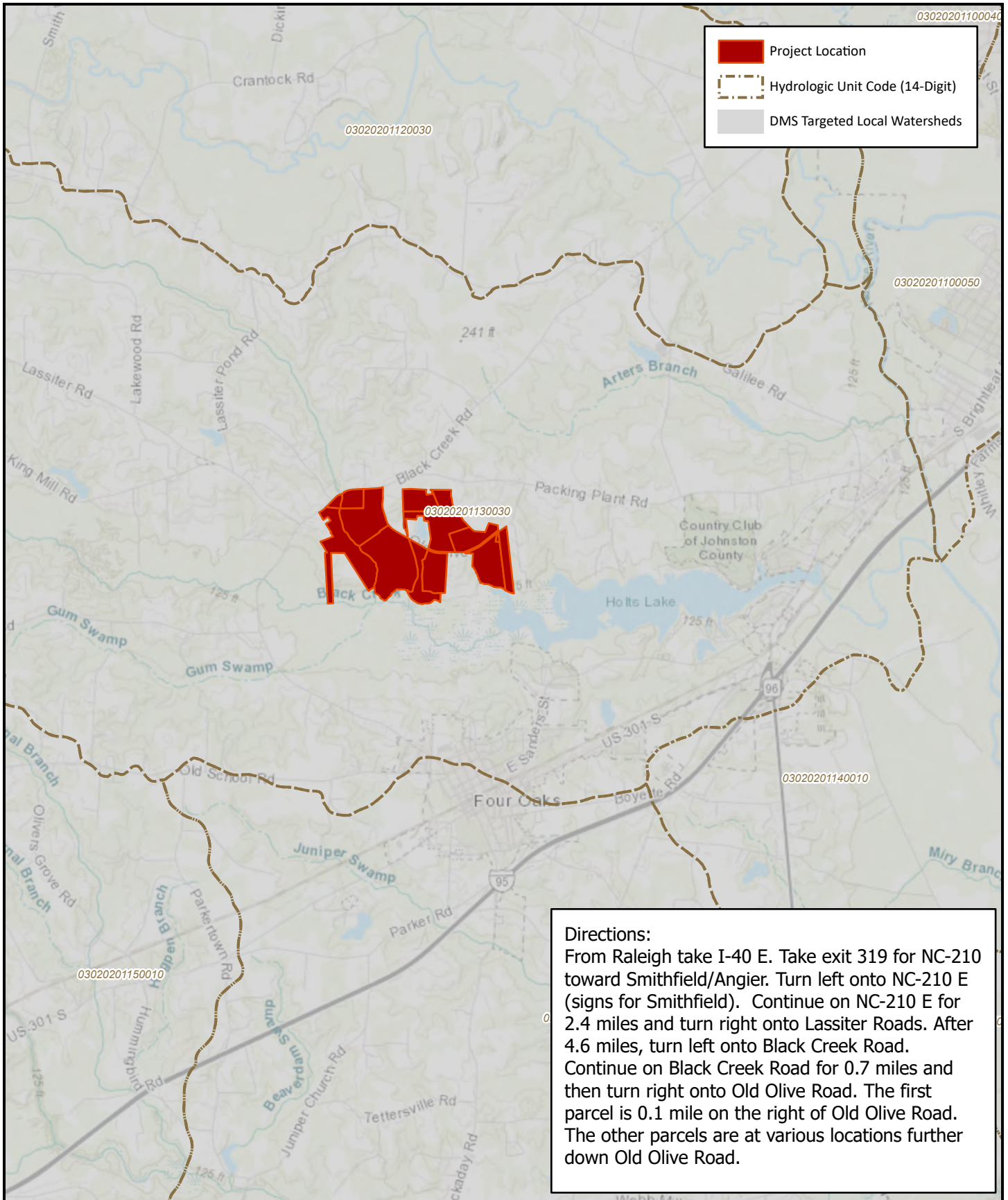
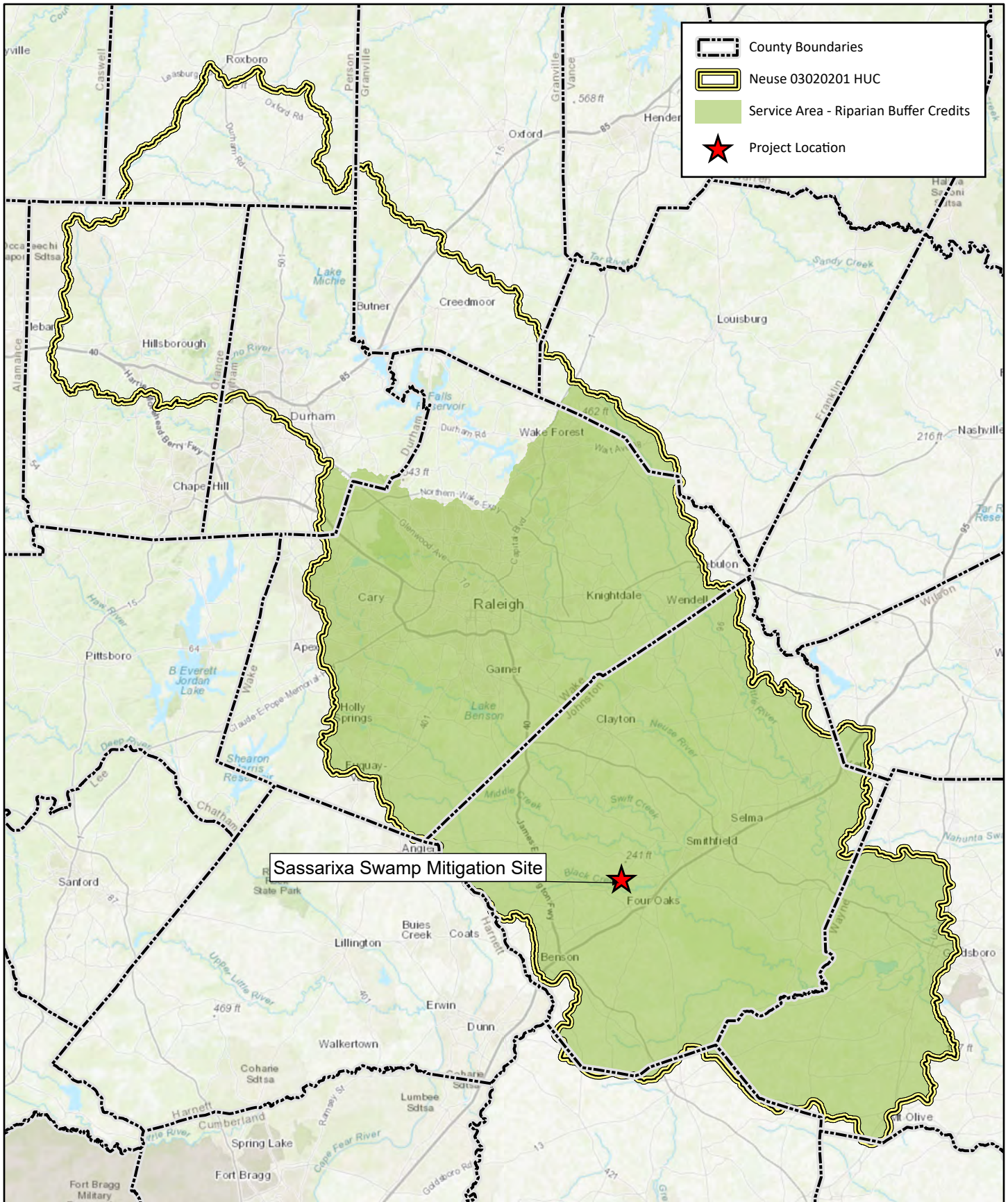


Figure 1. Vicinity Map
 Sassarixa Swamp Mitigation Site
 Monitoring Year 2 - 2022
 Neuse River Basin 03020201

Johnston County, NC



Sassarixa Swamp Mitigation Site

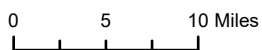
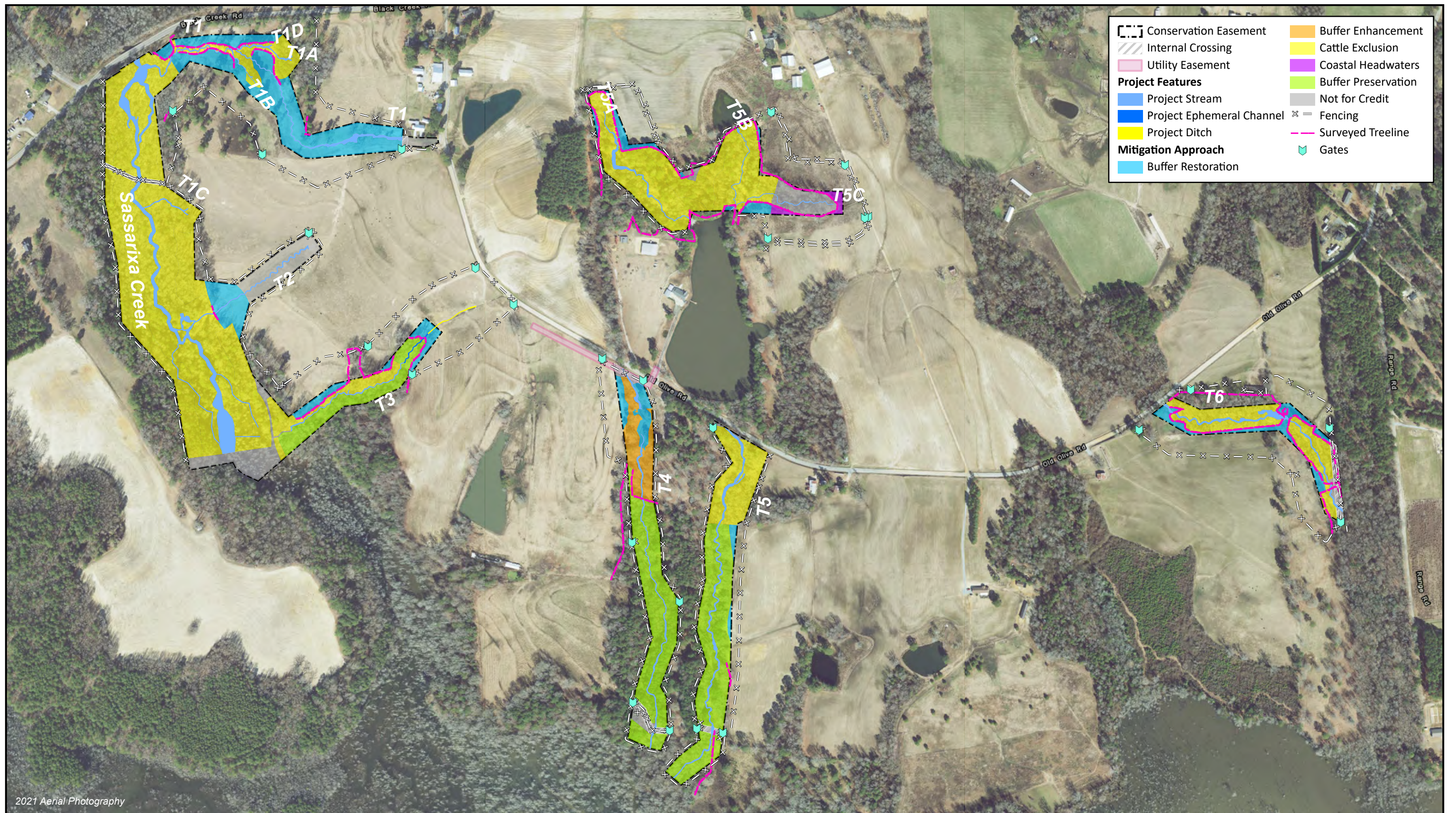


Figure 2. Service Area Map
 Sassarixa Swamp Mitigation Site
 Monitoring Year 2 - 2022
 Neuse River Basin 03020201



2021 Aerial Photography



0 500 1,000 Feet

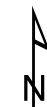


Figure 3. Project Component / Asset Map
 Sassarixa Swamp Mitigation Site
 Monitoring Year 2 - 2022
 Neuse River Basin (03020201)

Johnston County, NC

Table 1a. Mitigation Credits
 Sassarixa Swamp Mitigation Site
 Monitoring Year 2 - 2022

Neuse 03020201 - Outside Falls Lake			Project Area													
#N/A			N Credit Conversion Ratio (ft ² /pound)													
#N/A			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	0-50	T4	3,667	3,667	1	100%	1.00000	Yes	3,667.000	No	—	—
Buffer	Rural	Yes	I / P	Restoration	0-100	T1, T1A, T1B, T2, T4, T5, T5A, T5B, T6	356,716	356,716	1	100%	1.00000	Yes	356,716.000	Yes	18,613.918	—
Buffer	Rural	Yes	I / P	Restoration	101-200	T2, T4, T5A, T5B	48,375	48,375	1	33%	3.03030	Yes	15,963.766	Yes	2,524.272	—
Buffer	Rural	No	Ephemeral	Restoration	0-100	T3	15,114	15,114	1	100%	1.00000	Yes	15,114.000	Yes	788.669	—
Buffer	Rural	Yes	Coastal Headwater	Restoration	0-100	T5C	13,073	13,073	1	100%	1.00000	Yes	13,073.000	No	—	—
Buffer	Rural	Yes	I / P	Enhancement	0-50	T4	217	217	2	100%	2.00000	Yes	108.500	Yes	11.323	—
Buffer	Rural	Yes	I / P	Enhancement	0-100	T4	59,812	59,812	2	100%	2.00000	Yes	29,906.000	Yes	3,121.070	—
Buffer	Rural	Yes	I / P	Enhancement	101-200	T4	3,129	3,129	2	33%	6.06061	Yes	516.285	Yes	163.275	—
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	20-29	Sassarixa Creek, T5	735	735	2	75%	2.66667	Yes	275.625	No	—	—
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	0-50	Sassarixa Creek, T5, T6	6,000	6,000	2	100%	2.00000	Yes	3,000.000	No	—	—
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	0-100	Sassarixa Creek, T1, T1A, T1B, T1C, T2, T3, T5, T5A, T5B, T6	1,070,780	1,070,780	2	100%	2.00000	Yes	535,390.000	No	—	—
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	101-200	Sassarixa Creek, T1A, T2, T3, T5, T5A, T5C	358,197	358,197	2	33%	6.06061	Yes	59,102.467	No	—	—
Totals (ft2):							1,935,815	1,935,815				1,032,832.642	25,222.527		—	
Total Buffer (ft2):							1,935,815	1,935,815								
Total Nutrient Offset (ft2):							0	N/A								

Total Ephemeral Area (ft²) for Credit:	20,358	20,358	
Total Eligible Ephemeral Area (ft²):	601,785	0.8%	Ephemeral Reaches as % TABM
Total Eligible for Preservation (ft²):	645,272	18.3%	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
Buffer	Rural	Yes	I / P	Preservation	20-29	T4	750	750	10	75%	13.33333	56.250
	Rural	Yes	I / P		0-50	T4, T5	1,847	1,847	10	100%	10.00000	184.700
	Rural	Yes	I / P		0-100	T3, T4, T5	460,676	460,676	10	100%	10.00000	46,067.600
	Rural	Yes	I / P		101-200	T4	2,806	2,806	10	33%	30.30303	92.598
	Rural	No	Ephemeral		0-100	T3	5,244	5,244	5	100%	5.00000	1,048.800
Preservation Area Subtotals (ft²):							471,323	471,323				

Table 1b. Total Area of Buffer and Nutrient Offset Mitigation

Sassarixa Swamp Mitigation Site

Monitoring Year 2 - 2022

TOTAL AREA OF BUFFER MITIGATION (TABM)			
Mitigation Totals		Square Feet	Credits
Restoration:		436,945	404,533.766
Enhancement:		1,498,870	628,298.876
Preservation:		471,323	47,449.948
Total Riparian Buffer:		2,407,138	1,080,282.590
TOTAL NUTRIENT OFFSET MITIGATION			
Mitigation Totals		Square Feet	Credits
Nutrient Offset:	Nitrogen:	0	0.000
	Phosphorus:		0.000

Table 2. Project Activity and Reporting History

Sassarixa Swamp Mitigation Site

Monitoring Year 2 - 2022

Activity or Deliverable	Data Collection Complete	Task Completion or Deliverable Submission
Project Instituted	NA	January 2018
Mitigation Plan Approved	November 2019	November 2019
Construction (Grading) Completed	NA	January 2021
Planting Completed	NA	March 2021
Baseline Monitoring Document (Year 0)	March 2021	July 2021
Easement Encroachment		July 2021
Year 1 Monitoring	September 2021	December 2021
UT6 Supplemental Planting		February 2022
Year 2 Monitoring	September 2022	December 2022
Year 3 Monitoring	2023	December 2023
Year 4 Monitoring	2024	December 2024
Year 5 Monitoring	2025	December 2025

Table 3. Project Contact Table

Sassarixa Swamp Mitigation Site

Monitoring Year 2 - 2022

Designer Angela Allen, PE	Wildlands Engineering, Inc. 312 West Millbrook Road, Suite 225 Raleigh, NC 27609 919.851.9986
Construction Contractor	Land Mechanic Designs, Inc. 126 Circle G Lane Willow Spring, NC 27592
Monitoring Performers Monitoring, POC	Wildlands Engineering, Inc. Jason Lorch 919.851.9986

Table 4. Project Information and Attributes

Sassarixa Swamp Mitigation Site

Monitoring Year 2 - 2022

Project Information	
Project Name	Sassarixa Swamp Mitigation Site
County	Johnston County
Project Coordinates (latitude and longitude)	35° 28' 19.75" N, 78° 26' 9.60" W
Project Area (acres)	65.06
Planted Acreage (acres of woody stems planted)	13.03
Project Watershed Summary Information	
Physiographic Province	Rolling Coastal Plains
River Basin	Neuse River
USGS Hydrologic Unit 8-digit	03020201
USGS Hydrologic Unit 14-digit	03020201130030
DWR Sub-basin	03-04-04
Project Drainage Area (acres)	5,024
Project Drainage Area Percentage of Impervious Area	0.9%
CGIA Land Use Classification	66% agriculture, 27% forested, 7% developed

Table 5. Adjacent Forested Areas Existing Tree and Shrub Species

Sassarixa Swamp Mitigation Site

Monitoring Year 2 - 2022

Common Name	Scientific Name	Wetland Indicator Status
Red Maple	<i>Acer rubrum</i>	FAC
Sweet Gum	<i>Liquidambar styraciflua</i>	FAC
Sycamore	<i>Platanus occidentalis</i>	FACW
Ironwood	<i>Carpinus caroliniana</i>	FAC
Water Oak	<i>Quercus nigra</i>	FAC
Willow Oak	<i>Quercus phellos</i>	FACW
Black Willow	<i>Salix nigra</i>	OBL
Tulip Poplar	<i>Liriodendron tulipifera</i>	FACU

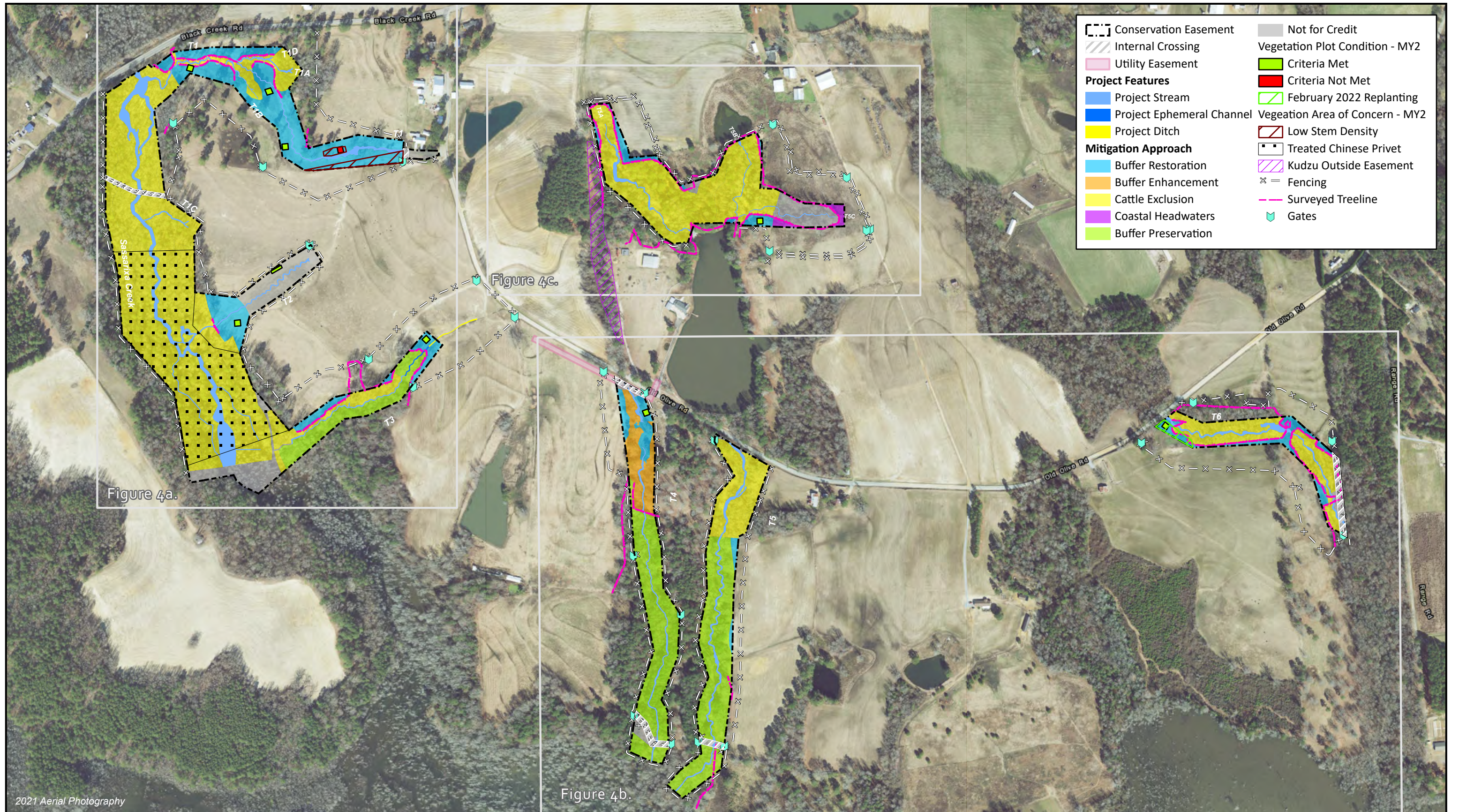
Table 6. Planted Tree Species

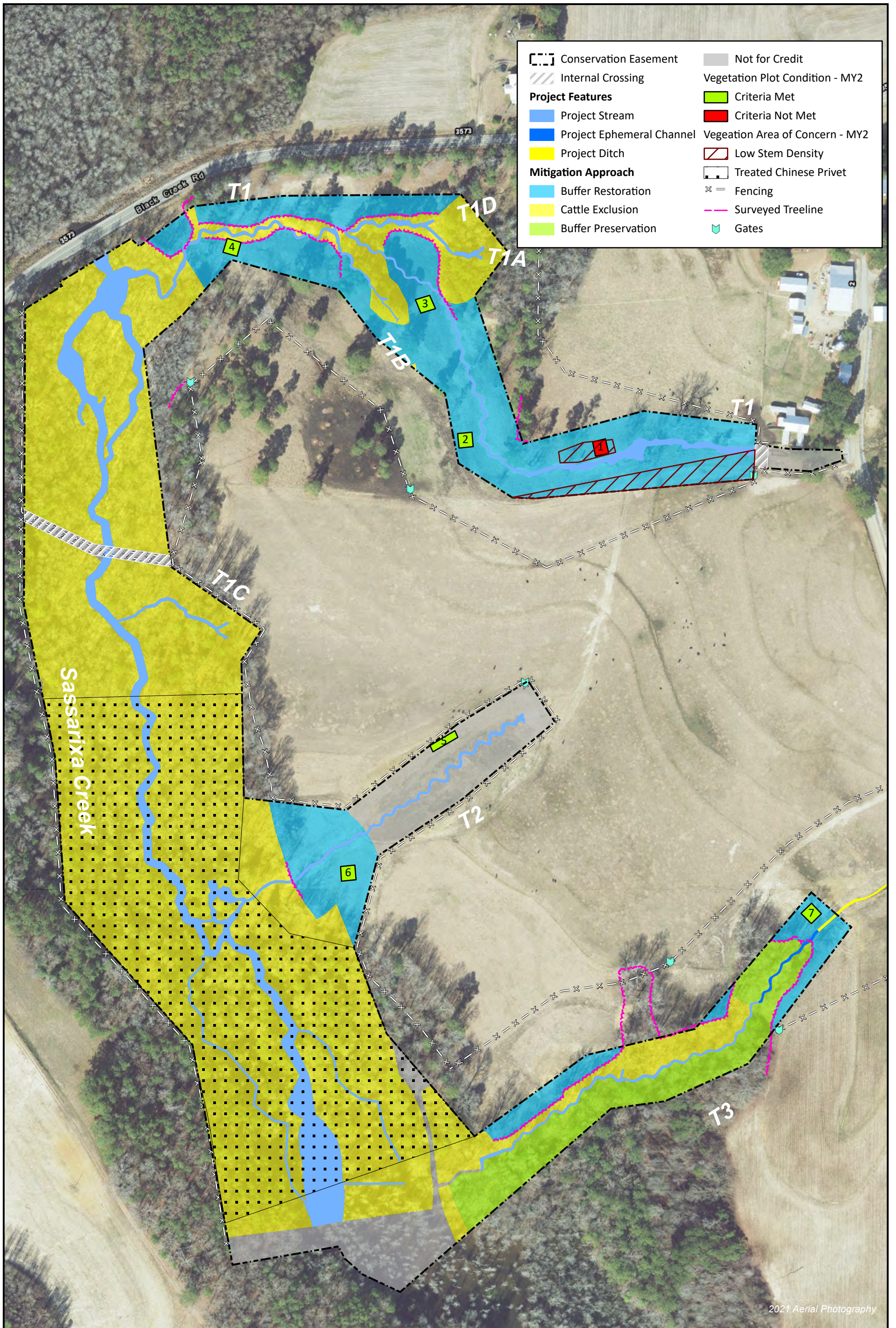
Sassarixa Swamp Mitigation Site

Monitoring Year 2 - 2022

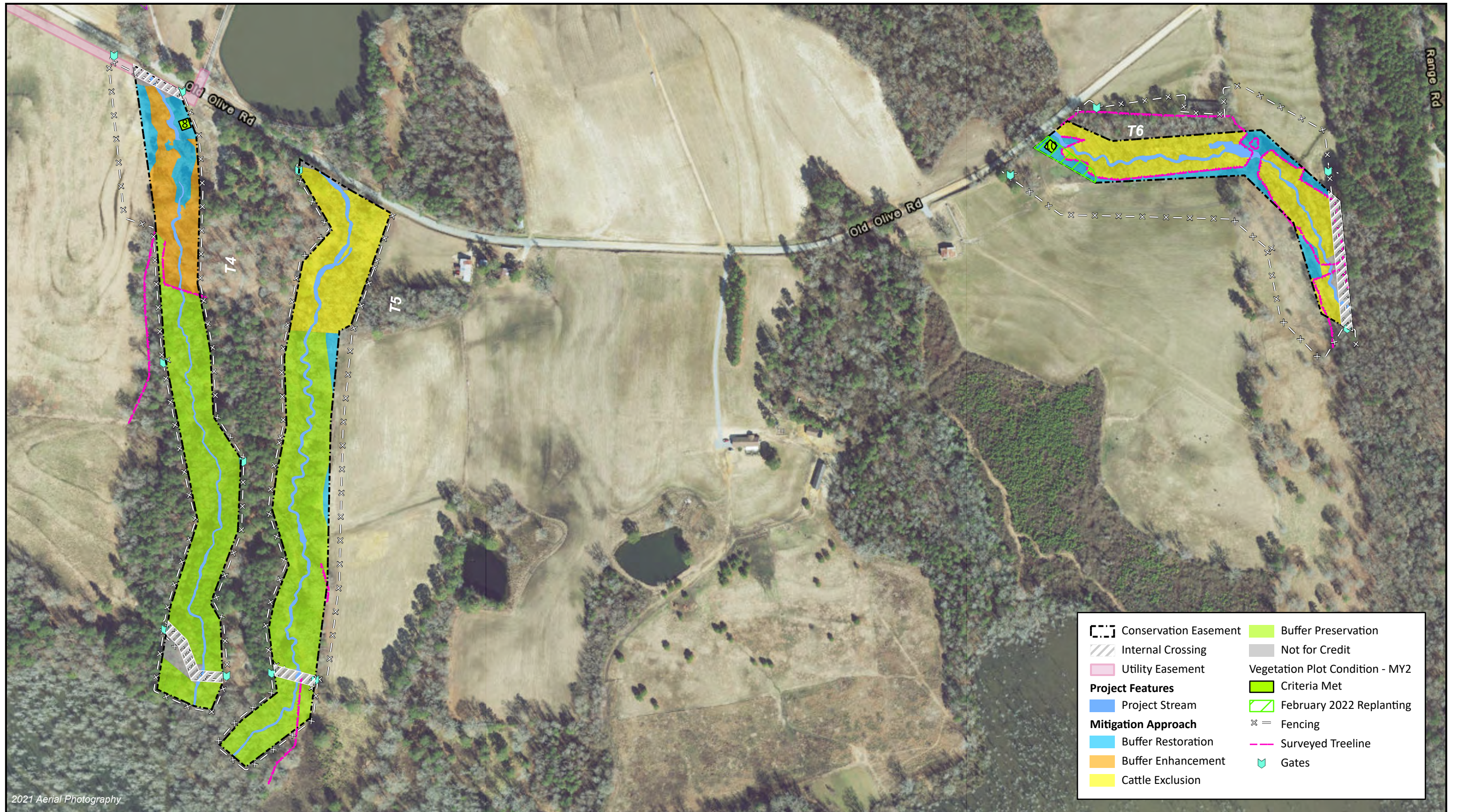
Common Name	Scientific Name	Number Planted	% of Total
Willow Oak	<i>Quercus phellos</i>	1,379	14.3%
Sycamore	<i>Platanus occidentalis</i>	1,907	19.8%
River Birch	<i>Betula nigra</i>	1,907	19.8%
Water Oak	<i>Quercus nigra</i>	551	5.7%
Swamp Chestnut Oak	<i>Quercus michauxii</i>	1,396	14.5%
Eastern Cottonwood	<i>Populus deltoides</i>	540	5.6%
Box Elder	<i>Acer negundo</i>	1,350	14.0%
Sweetbay Magnolia	<i>Magnolia virginiana</i>	463	4.8%
Cherrybark Oak	<i>Quercus pagoda</i>	66	0.7%
American Elm	<i>Ulmus alata</i>	33	0.3%
Black Willow	<i>Salix nigra</i>	55	0.6%

APPENDIX 2. VISUAL ASSESSMENT DATA





2021 Aerial Photography



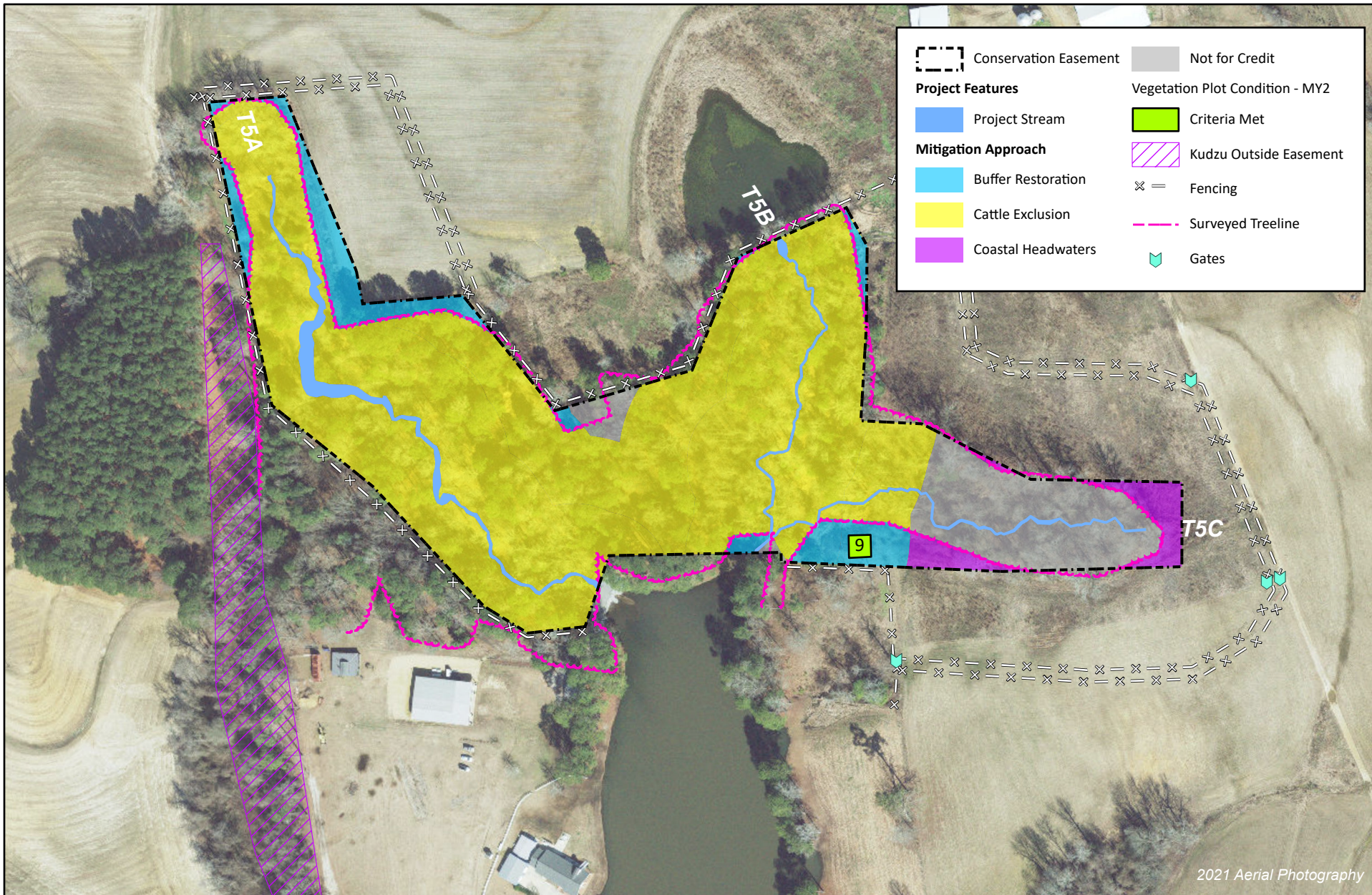


Table 7. Vegetation Condition Assessment Table

Sassarixa Swamp Mitigation Site
 DMS Project No. 100040
 Monitoring Year 2 - 2022

Planted Acreage 13.03

Vegetation Category	Definitions	Mapping Threshold (ac)	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material.	0.10	0	0%
Low Stem Density Areas	Woody stem densities clearly below target levels based on current MY stem count criteria.	0.10	0.55	4%
Total			0.55	4%
Areas of Poor Growth Rates	Planted areas where average height is not meeting current MY Performance Standard.	0.10	0	0%
Cumulative Total			0.55	4%

Easement Acreage 65.06

Vegetation Category	Definitions	Mapping Threshold (ac)	Combined Acreage	% of Easement Acreage
Invasive Areas of Concern	Invasives may occur outside of planted areas and within the easement and will therefore be calculated against the total easement acreage. Include species with the potential to directly outcompete native, young, woody stems in the short-term or community structure for existing communities. Invasive species included in summation above should be identified in report summary.	0.10	11.99	18%
Easement Encroachment Areas	Encroachment may be point, line, or polygon. Encroachment to be mapped consists of any violation of restrictions specified in the conservation easement. Common encroachments are mowing, cattle access, vehicular access. Encroachment has no threshold value as will need to be addressed regardless of impact area.	none	0 acres	

*Invasive removal occurred in March 2022.

VEGETATION PLOT PHOTOGRAPHS



FIXED VEG PLOT 1 (9/9/2022)



FIXED VEG PLOT 2 (9/9/2022)



FIXED VEG PLOT 3 (9/9/2022)



FIXED VEG PLOT 4 (9/9/2022)



FIXED VEG PLOT 5 (9/9/2022)



FIXED VEG PLOT 6 (9/9/2022)





FIXED VEG PLOT 7 (9/9/2022)



FIXED VEG PLOT 8 (9/2/2022)



FIXED VEG PLOT 9 (9/9/2022)



FIXED VEG PLOT 10 (9/9/2022)



OVERVIEW PHOTOGRAPHS



Sassarixa Swamp Mitigation Site

Appendix 2: Visual Assessment Data - Overview Photographs



Sassarixa Swamp Mitigation Site

Appendix 2: Visual Assessment Data - Overview Photographs



Sassarixa Swamp Mitigation Site

Appendix 2: Visual Assessment Data - Overview Photographs

APPENDIX 3. VEGETATION PLOT DATA

Table 8. Vegetation Plot Data

Sassarixa Swamp Mitigation Site

Monitoring Year 2 - 2022

Planted Acreage	13.03
Date of Initial Plant	2021-03-05
Date(s) of Supplemental Plant(s)	2022-02-28
Date of Current Survey	2022-09-09
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 F		Veg Plot 2 F		Veg Plot 3 F		Veg Plot 4 F		Veg Plot 5 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Acer negundo	boxelder	Tree	FAC	1	1			1	1	1	1	1	1
	Betula nigra	river birch	Tree	FACW	2	2			4	4	1	1	2	2
	Magnolia virginiana	sweetbay	Tree	FACW			1	1			1	1	1	1
	Platanus occidentalis	American sycamore	Tree	FACW			1	1	4	4	2	2	4	4
	Populus deltoides	eastern cottonwood	Tree	FAC			3	3			1	1	1	1
	Quercus michauxii	swamp chestnut oak	Tree	FACW	1	1			2	2	3	3	1	1
	Quercus nigra	water oak	Tree	FAC			1	1			1	1		
	Quercus phellos	willow oak	Tree	FACW			1	1	3	3	3	3	2	2
Sum	Performance Standard				4	4	7	7	14	14	13	13	12	12
Mitigation Plan Performance Standard	Current Year Stem Count					4		7		14		13		12
	Stems/Acre					162		283		567		526		486
	Species Count					3		5		5		8		7
	Dominant Species Composition (%)					50		43		29		23		33
	Average Plot Height (ft.)					5		4		5		3		5
Post Mitigation Plan Performance Standard	Current Year Stem Count					4		7		14		13		12
	Stems/Acre					162		283		567		526		486
	Species Count					3		5		5		8		7
	Dominant Species Composition (%)					50		43		29		23		33
	Average Plot Height (ft.)					5		4		5		3		5
% Invasives					0		0		0		0		0	

Table 8. Vegetation Plot Data

Sassarixa Swamp Mitigation Site

Monitoring Year 2 - 2022

Planted Acreage	13.03
Date of Initial Plant	2021-03-05
Date(s) of Supplemental Plant(s)	2022-02-28
Date of Current Survey	2022-09-09
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F		Veg Plot 9 F		Veg Plot 10 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Acer negundo	boxelder	Tree	FAC	2	2	1	1	1	1	1	1	1	1
	Betula nigra	river birch	Tree	FACW	2	2	2	2	1	1	2	2	2	2
	Magnolia virginiana	sweetbay	Tree	FACW	1	1	1	1	1	1	1	1	2	2
	Platanus occidentalis	American sycamore	Tree	FACW	2	2	3	3	2	2	4	4	3	3
	Populus deltoides	eastern cottonwood	Tree	FAC			1	1						
	Quercus michauxii	swamp chestnut oak	Tree	FACW	3	3	3	3	2	2	1	1	5	5
	Quercus nigra	water oak	Tree	FAC			1	1						
	Quercus phellos	willow oak	Tree	FACW	3	3	1	1	2	2			1	1
Sum	Performance Standard				13	13	13	13	9	9	9	9	14	14
Mitigation Plan Performance Standard	Current Year Stem Count					13		13		9		9		14
	Stems/Acre					526		526		364		364		567
	Species Count					6		8		6		5		6
	Dominant Species Composition (%)					23		23		22		44		36
	Average Plot Height (ft.)					2		4		4		3		3
Post Mitigation Plan Performance Standard	% Invasives					0		0		0		0		0
	Current Year Stem Count					13		13		9		9		14
	Stems/Acre					526		526		364		364		567
	Species Count					6		8		6		5		6
	Dominant Species Composition (%)					23		23		22		44		36
Average Plot Height (ft.)					2		4		4		3		3	
% Invasives					0		0		0		0		0	

Table 9. Vegetation Performance Standards Summary Table

Sassarixa Swamp Mitigation Site

Monitoring Year 2 - 2022

	Veg Plot 1 F				Veg Plot 2 F				Veg Plot 3 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2	162	5	3	0	283	4	5	0	567	5	5	0
Monitoring Year 1	364	2	6	0	243	2	3	0	607	3	6	0
Monitoring Year 0	567	3	8	0	445	2	5	0	607	2	6	0
	Veg Plot 4 F				Veg Plot 5 F				Veg Plot 6 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2	526	3	8	0	486	5	7	0	526	2	6	0
Monitoring Year 1	567	2	8	0	486	3	7	0	526	2	6	0
Monitoring Year 0	607	2	8	0	486	3	7	0	567	3	6	0
	Veg Plot 7 F				Veg Plot 8 F				Veg Plot 9 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2	526	4	8	0	364	4	6	0	364	3	5	0
Monitoring Year 1	567	3	8	0	567	3	7	0	607	3	7	0
Monitoring Year 0	567	2	8	0	567	3	7	0	648	2	7	0
	Veg Plot 10 F											
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives								
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2	567	3	6	0								
Monitoring Year 1	891	2	8	0								
Monitoring Year 0	607	2	8	0								