

MONITORING YEAR 3 ANNUAL REPORT
Final

February 2024

SASSARIXA SWAMP MITIGATION SITE
Johnston County, NC
Neuse River Basin
HUC 03020201
DMS Project No. 100040
DMS Contract No. 7425
DMS RFP No. 16-007279
USACE Action ID No. 2018-00432
DWR Project No. 2018-0198

Data Collection Dates: January-November 2023

PREPARED FOR:

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

February 7, 2024

Jeremiah Dow
Project Management Supervisor – Eastern Region
North Carolina DEQ Division of Mitigation Services
217 West Jones Street, Raleigh, NC 27603

RE: DMS Comments on the MY3 Report
Sassarixa Swamp, Project ID #100040, DMS Contract 7425

Dear Mr. Dow:

We have reviewed the comments on the Monitoring Year 3 Report for the above referenced project dated December 19, 2023 and have revised the report based on these comments. The revised documents are submitted with this letter. Below are responses to each of your comments. For your convenience, the comments are reprinted with our response in italics.

Stream Report:

1. Section 2.2 – incomplete sentence in second paragraph reads “Chinese privet in MY4.” Please correct.
   Response: *The incomplete sentence was removed.*

2. The meeting minutes from the May 18, 2023 IRT site visit indicate that a piping log sill on T3 was observed and would be manually repaired. Was this work completed?
   Response: *The piping log sill on T3 naturally sealed itself by the time Wildlands stewardship team was going to manually repair it. Wildlands has completed various site walks since then and has not observed any additional piping.*

If you have any questions, please contact me by phone (919) 851-9986, or by email (jlorch@wildlandseng.com).
Sincerely,

Jason Lorch, *Monitoring Coordinator*

PREPARED BY:

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SASSARIXA SWAMP MITIGATION SITE
Monitoring Year 3 Annual Report

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

Section 1: PROJECT OVERVIEW

The Sassarixa Swamp Mitigation Site (Site) is located in Johnston County, approximately six miles southwest of Smithfield and five miles north of Four Oaks. The Site drains to Holts Lake, which drains to the Neuse River. Holts Lake is a recreational lake classified as a Nutrient Sensitive Water (NSW) and the Neuse River is a water supply for the City of Goldsboro. Table 3 presents information related to the project attributes.

1.1 Project Quantities and Credits

The Site is located on 10 parcels under 7 different landowners and a conservation easement was recorded on 65.06 acres. Mitigation work within the Site included restoration, enhancement II, and preservation of perennial and intermittent stream channels. Table 1 below shows stream credits by reach and the total amount of stream credits expected at closeout.

Table 1: Project Quantities and Credits

PROJECT MITIGATION QUANTITIES							
Project Segment	**Mitigation Plan Footage**	**As-Built Footage**	**Mitigation Category**	**Restoration Level**	**Mitigation Ratio (X:1)**	**Credits**	**Comments**
Stream							
Sassarixa Creek R1-R3	2,631	2,631	Warm	EII	2.5	1,052.400	Ford Crossing, Fencing Out Livestock
T1 R1	570	570	Warm	EII	2.5	228.000	Bank Stabilization, Fencing Out Livestock
T1 R2	824	810	Warm	R	1.0	824.000	Full Channel Restoration, Fencing Out Livestock
T1 R3	509	507	Warm	R	1.0	509.000	Full Channel Restoration, Fencing Out Livestock
T1 R4	252	252	Warm	EII	2.5	100.800	Fencing Out Livestock
T1A	358	356	Warm	EII	2.5	143.200	Fencing Out Livestock
T1B	275	276	Warm	EII	2.5	110.000	Fencing Out Livestock
T1C	307	307	Warm	EII	2.5	122.800	Fencing Out Livestock
T2	1,010	1,006	Warm	R	1.0	1,010.000	Pond Removal, Fencing Out Livestock
T3 R1	1,053	1,041	Warm	R	1.0	1,053.000	Full Channel Restoration, Fencing Out Livestock
T3 R2	61	61	Warm	P	10.0	6.100	Conservation Easement
T4 R1	206	206	Warm	EII	2.5	82.400	Ford Crossing, Fencing Out Livestock
T4 R2	398	399	Warm	EII	2.5	159.200	Bank Stabilization, Fencing Out Livestock
T4 R3	1,509	1,510	Warm	P	10.0	150.900	Culvert Crossing, Conservation Easement
T5 R1	670	642	Warm	EII	2.5	268.000	Bank Stabilization
T5 R2	885	874	Warm	R	1.0	885.000	Full Channel Restoration, Fencing Out Livestock

PROJECT MITIGATION QUANTITIES							
Project Segment	**Mitigation Plan Footage**	**As-Built Footage**	**Mitigation Category**	**Restoration Level**	**Mitigation Ratio (X:1)**	**Credits**	**Comments**
Stream							
T5 R3	965	961	Warm	EII	4.0	241.250	Culvert Crossing, Bank Stabilization
T5A	1,026	1,018	Warm	EII	2.5	410.400	Bank Stabilization, Fencing Out Livestock
T5B	580	580	Warm	EII	2.5	232.000	Fencing Out Livestock
T5C[1]	588	588	Warm	EII	2.5	235.200	Fencing Out Livestock
T6 R1	381	383	Warm	R	1.0	381.000	Full Channel Restoration, Fencing Out Livestock
T6 R2	1,035	1,037	Warm	EII	2.5	414.000	Culvert Crossing, Bank Stabilization. Fencing Out Livestock
					Total:	**8,618.650**	

1. T5C Credited using the Headwater Stream guidance method of the valley length.

Blue = **Restoration**	Orange = **Enhancement II**	Green = **Preservation**

Restoration Level	**Stream**		
	Warm	**Cool**	**Cold**
Restoration	4,662.000		
Enhancement I	--		
Enhancement II	3,799.650		
Preservation	157.000		
Totals	**8,618.650**		
Total Stream Credit	**8,618.650**		

1.2 Project Goals and Objectives

The project is intended to provide numerous ecological benefits. Table 2 below describes expected outcomes to water quality and ecological processes and provides project goals and objectives.

Table 2: Goals, Performance Criteria, and Functional Improvements

Goal	Objective/ Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
Improve the stability of stream channels.	Construct stream channels that will maintain stable cross-sections, patterns, and profiles over time.	Reduce sediment inputs from bank erosion. Reduce shear stress on channel boundary.	ER stays over 2.2 and BHR below 1.2 with visual assessments showing progression towards stability.	Cross-section monitoring will be assessed during MY1, MY2, MY3, MY5, and MY7 and visual inspections will be assessed annually.	Cross-section surveys show the channels are stable. Visual observations indicate the majority of channels are performing as intended. An additional cross-section was added to determine if the upper third of T2 is transitioning into a linear wetland
Improve in-stream habitat.	Install habitat features such as constructed riffles, lunker logs, and brush toes into restored/enhanced streams. Add woody materials to channel beds. Construct pools of varying depth.	Increase and diversify available habitats for macroinvertebrates, fish, and amphibians leading to colonization and increase in biodiversity over time.	There is no required performance standard for this metric.	N/A	N/A
Reconnect channels with floodplains to allow a natural flooding regime.	Reconstruct stream channels with designed bankfull dimensions and depth based on reference reach data. Remove pond above T2.	Allow more frequent flood flows to disperse on the floodplain.	Four bankfull events in separate years within monitoring period. 30 consecutive days of flow for intermittent channels.	Crest gauges and/or pressure transducers recording flow elevations.	Bankfull event documented on T1 R3, T2, and T5 R2 during MY3; T3 R1 did not meet during MY3. Greater than 30 consecutive days of flow recorded on all intermittent streams during MY3.

Goal	Objective/ Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
Restore and enhance native floodplain and streambank vegetation.	Plant native tree and understory species in riparian zones and plant native shrub and herbaceous species on streambanks.	Reduce sediment inputs from bank erosion and runoff. Increase nutrient cycling and storage in floodplain. Provide riparian habitat. Add a source of LWD and organic material to stream.	Survival rate of 320 stems per acre at MY3, 260 planted stems per acre at MY5, and 210 stems per acre at MY7. Height requirement is 7 feet at MY5 and 10 feet at MY7.	One hundred square meter vegetation plots are placed on 2% of the planted area of the Site and monitored during MY1, MY2, MY3, MY5, and MY7.	9 out of 11 vegetation plots have a planted stem density greater than 320 stems per acre. A small supplemental planting occurred along T1 in February 2023.
Permanently protect the project Site from harmful uses.	Establish conservation easements on the Site.	Protect the Site from encroachment on the riparian corridor and direct impact to streams and wetlands.	Prevent easement encroachment.	Visually inspect the perimeter of the Site to ensure no easement encroachment is occurring.	No easement encroachments.

1.3 Project Attributes

The project includes several adjacent properties that have been owned and operated as a livestock farm by a single family since 1850, where livestock were continually rotated through all fields with access to the project streams. Based on aerial photos from 1950 to 2012 onsite streams have existed in their approximate locations with very little change to riparian buffer extents since 1950. Two alterations to the Site visible from historical aerial photography were 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. According to the landowners, in the 1960's and early 1970's a hog yard was located at the upstream end of T4 and T5, where the streams were diverted to make a hog wallow area. The hogs were moved to a hog house in the early 1970's, however goats, horses, and cattle had continuous access to this portion of the site until Hurricane Matthew struck in September 2016. The floods from the storm destroyed much of the fencing around T4 and T5 and livestock have been rotated in other fields since that time while fencing was being repaired. Other portions of the site had not seen significant changes in land use with livestock or crop rotations from existing activities. Table 3 below and Table 9 in Appendix C present additional information on pre-restoration conditions.

Table 3: Project Attributes

PROJECT INFORMATION			
Project Name	Sassarixa Swamp Mitigation Site	County	Johnston County
Project Area (acres)	65.06	Project Coordinates	35.472153, -78.436000
PROJECT WATERSHED SUMMARY INFORMATION			
Physiographic Province	Rolling Coastal Plain	River Basin	Neuse River
USGS HUC 8-digit	03020201	USGS HUC 14-digit	03020201130030
DWR Sub-basin	03-04-04	Land Use Classification	66% agriculture, 27% forested, 7% developed
Project Drainage Area (acres)	5,024	Percentage of Impervious Area	0.9%

RESTORATION TRIBUTARY SUMMARY INFORMATION					
Parameters	**T1**	**T2**	**T3**	**T5**	**T6**
Pre-project length (feet)	2,202	348	1,098	2,544	1,342
Post-project (feet)	2,155	1,010	1,114	2,553	1,451
Valley confinement (Confined, moderately confined, unconfined)	Unconfined	Moderately Confined to Unconfined			
Drainage area (acres)	45	25	26	41.25	38.25
Perennial, Intermittent, Ephemeral	Intermittent		Perennial		
DWR Water Quality Classification	C, NSW			B, NSW	
Dominant Stream Classification (existing)	G5	G5	B5/G5	E5	G5/E5
Dominant Stream Classification (proposed)	C5b/E5b	C5b/E5b	C5b/E5b	C5/E5	C5/E5
Dominant Evolutionary class (Simon) if applicable	Stage III	Stage IV		Stage III	Stage IV

REGULATORY CONSIDERATIONS			
Parameters	**Applicable?**	**Resolved?**	**Supporting Documentation**
Water of the United States - Section 404	Yes	Yes	USACE Nationwide Permit No. 27 and DWQ 401 Water Quality Certification No. 4134.
Water of the United States - Section 401	Yes	Yes	
Endangered Species Act	Yes	Yes	Categorical Exclusion in Mitigation Plan (Wildlands, 2019)
Historic Preservation Act	Yes	Yes	
Coastal Zone Management Act (CZMA or CAMA)	N/A	N/A	N/A
Essential Fisheries Habitat	N/A	N/A	N/A

Section 2: MONITORING YEAR 3 DATA ASSESSNENT

Annual monitoring and site visits were conducted during MY3 to assess the condition of the project. The vegetation and stream success criteria for the Site follow the approved success criteria presented in the Mitigation Plan (Wildlands, 2019). Performance criteria for vegetation, stream, and hydrologic assessment are located in Section 1.2 Table 2: Goals, Performance Criteria, and Functional Improvements. Methodology for annual monitoring is presented in the MY0 Annual Report (Wildlands, 2021).

2.1 Vegetative Assessment

The MY3 vegetative survey was completed in September 2023. Vegetation monitoring resulted in a stem density range of 243 to 567 planted stems per acre and the average stem density was 427 planted stems per acre. Out of the eleven vegetation plots, nine met the success criteria of 320 stems per acres, while vegetation plots 1 and 2 have 283 and 243 stems per acres, respectively. Mortality is contributed to competition from dense herbaceous grass and a dry spring when the trees were originally planted in 2021. Refer to Appendix A for Vegetation Plot Photographs and the Vegetation Condition Assessment Table and Appendix B for Vegetation Plot Data.

There were a significant number of mature hardwood trees that were left untouched from construction. A visual site assessment in September 2022 indicated that some mature trees are starting to decline after construction. Further observations throughout 2023 did not show a significant change in the condition of the mature hardwoods left onsite. Planted trees and volunteer species are growing throughout the Site and starting to fill in an understory that will eventually become a mature hardwood forest.

2.2 Vegetation Areas of Concern and Management

Approximately 0.55 acres along T1 was identified as an area of low stem density in MY2. A supplemental planting of the area was approved in MY2 and conducted in February 2023 (Figure 1a). The supplementally planted species were the same from the approved Mitigation Plan (Table 7b). Ring sprays were completed throughout the supplementally planted area and soil amendments were applied locally to replanted trees to reduce competition and aid in planted stem success. Ring sprays and soil amendments will be competed in MY4 in the supplementally planted areas as well as any areas where the herbaceous vegetation is affecting tree growth.

An invasive species treatment was completed in May 2023 to address a dense population of Chinese privet (*Ligustrum sinense*) along Sassarixa Creek Reach 3 and scattered stems throughout the remainder of the Site. A combination of methods included foliar and cut stump applications. Approximately 4.97 acres at the downstream reach of Sassarixa Creek was treated and may require additional treatment in MY4 if resprouting occurs. The Site will continue to be monitored for invasive species and follow up treatments will occur if necessary.

A dense stand of sweetgum (*Liquidambar styraciflua*) and loblolly pine (*Pinus taeda*) covering approximately 0.70 acres became established along T1 and T1B. This area was treated, and individuals of both species were thinned in May 2023 by brush cutting. The Site will continue to be monitored for additional dense populations of sweetgum and loblolly pine and follow up treatments will occur if necessary.

2.3 Stream Assessment

Morphological surveys for MY3 were conducted in March 2023. All streams within the Site are stable and functioning as designed. All 10 cross-sections at the Site show little to no change in the bankfull area and width-to-depth ratio, and bank height ratios are less than 1.2. Refer to Appendix A for the Visual

Stream Morphology Stability Assessment Table and Stream Photographs. Refer to Appendix C for Stream Geomorphology Data.

2.4 Stream Areas of Concern and Management

Due to concern over the upper third of T2 appearing to be turning into a linear wetland, the NCIRT requested that an additional cross-section be installed at the upstream end of T2. During and immediately following construction of the Site, sediment entered the top of T2 and began accumulating in the channel. This allowed in-stream vegetation to become established, which resulted in channel constriction and flow restriction. The additional cross-section (XS 11) was installed in May 2023 and a cross-section survey was taken to document geomorphology of the channel before being raked out. At the end of June 2023, approximately 545 linear feet of channel was raked out to remove in-stream vegetation and sediment (Figure 1a). An additional cross-section survey was completed immediately after the stream was raked out, and then again four months later. While the cross-sectional area experienced little change between the initial survey on May 31, 2023, and when it was resurveyed on July 20, 2023 after the raking, the max depth increased. The third survey on November 14, 2023, indicated minimal changes in cross-sectional area, bankfull elevations, thalweg elevation, and max depth. This indicates that the stream stable and moving sediment through the system. The upper third of T2 will continue to be monitored for further sediment accumulation or vegetation growth in the channel.

2.5 Hydrology Assessment

By the end of MY7, four bankfull events must have occurred in separate years within the restoration reaches. At least one bankfull event was recorded on all stream restoration reaches except T3 Reach 1. While a bankfull event was not recorded on the T2 flow gauge, evidence of a bankfull event was visually observed and documented. The hydrologic success criterion for bankfull events has been partially met in MY3.

In addition, the presence of baseflow must be documented on restored intermittent reaches (T1 Reach 2, T2 and T3 Reach 1) for a minimum of 30 consecutive days during a normal precipitation year. In-stream flow gauges equipped with pressure transducers were installed to monitor continuity of baseflow. All intermittent reaches in MY3 exceeded baseflow success criteria. The maximum consecutive days ranged from 45 days to 75 days. Refer to Appendix 5 for hydrologic data.

2.6 Wetland Assessment

One groundwater gauge was installed and monitored within an existing wetland zone along T3 at a location requested by North Carolina Division of Water Resources. The purpose of the gauge is to assess potential effects to wetland hydrology from the construction of the restored stream channel through this area. The results of this monitoring are not tied to any success criteria. Results from the groundwater gauge, during MY3, show that the existing wetland maintained free groundwater within 12 inches of the ground surface for 39.1% of the defined growing season (March 1 to November 16).

2.7 Monitoring Year 3 Summary

Overall, the Site has met the success criteria for MY3. Nine out of eleven veg plots are on track to meet the MY3 interim success criteria. A supplemental planting on 0.55 acres was completed in February 2023 to accommodate for tree mortality along T1. Some mature trees that were avoided during construction were starting to decline in 2022, however their condition was stable in 2023 and a new understory layer is continuing to establish. An approximately 4.97 acre dense stand of Chinese privet along Sassarixa Creek Reach 3, as well as scattered stems throughout the remainder of the Site were treated in May 2023. Chinese privet throughout the Site will continue to be monitored and treated as necessary. The upper reach of T2 was raked to clear excessive sedimentation and vegetation from the channel and

continue to be monitored for changes in channel condition and dimension. Bankfull events were documented on all stream restoration reaches except T1 Reach 3, partially fulfilling the final bankfull hydrologic success requirement. Greater than 30 days of consecutive flow were recorded on monitored intermittent stream reaches T1 Reach 2, T2, and T3 Reach 1 fulfilling MY3 success requirement. The Site boundary was walked, and fences are in good condition and are keeping livestock out, and all crossings are stable and in good condition. Overall, the Site is meeting its goals of preventing excess nutrients and sediment from entering the Neuse River tributaries and is on track to meet final success criteria.

Summary information and data related to the performance of various project and monitoring elements can be found in the tables and figures in the report appendices. All raw data supporting the tables and figures in the appendices are available from DMS upon request.

Section 3: REFERENCES

Breeding, R. 2010. Neuse River Basin Restoration Priorities 2010. NCEEP, NC

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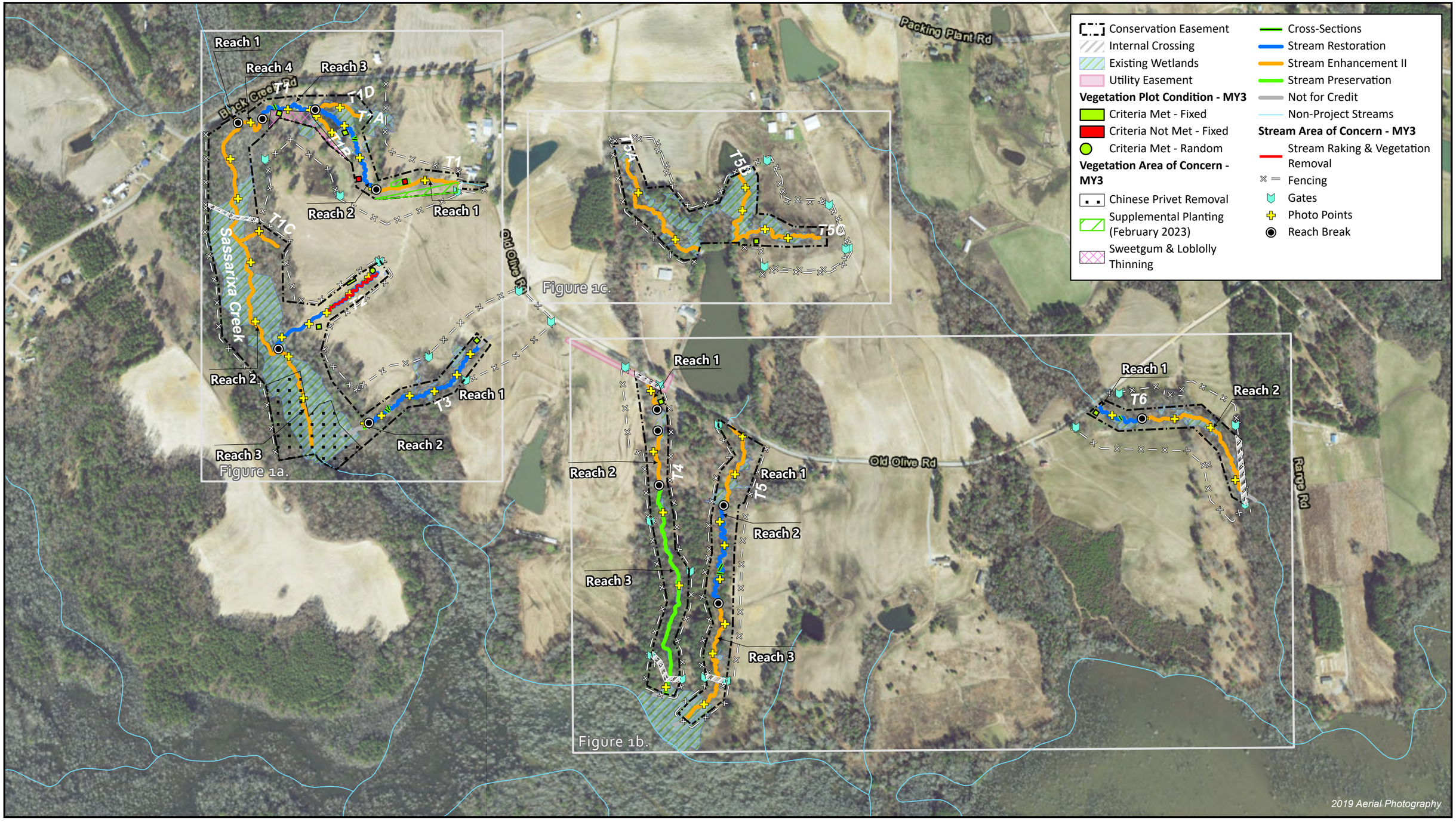

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Figure 1. Current Condition Plan View Key
Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

Johnston County, NC

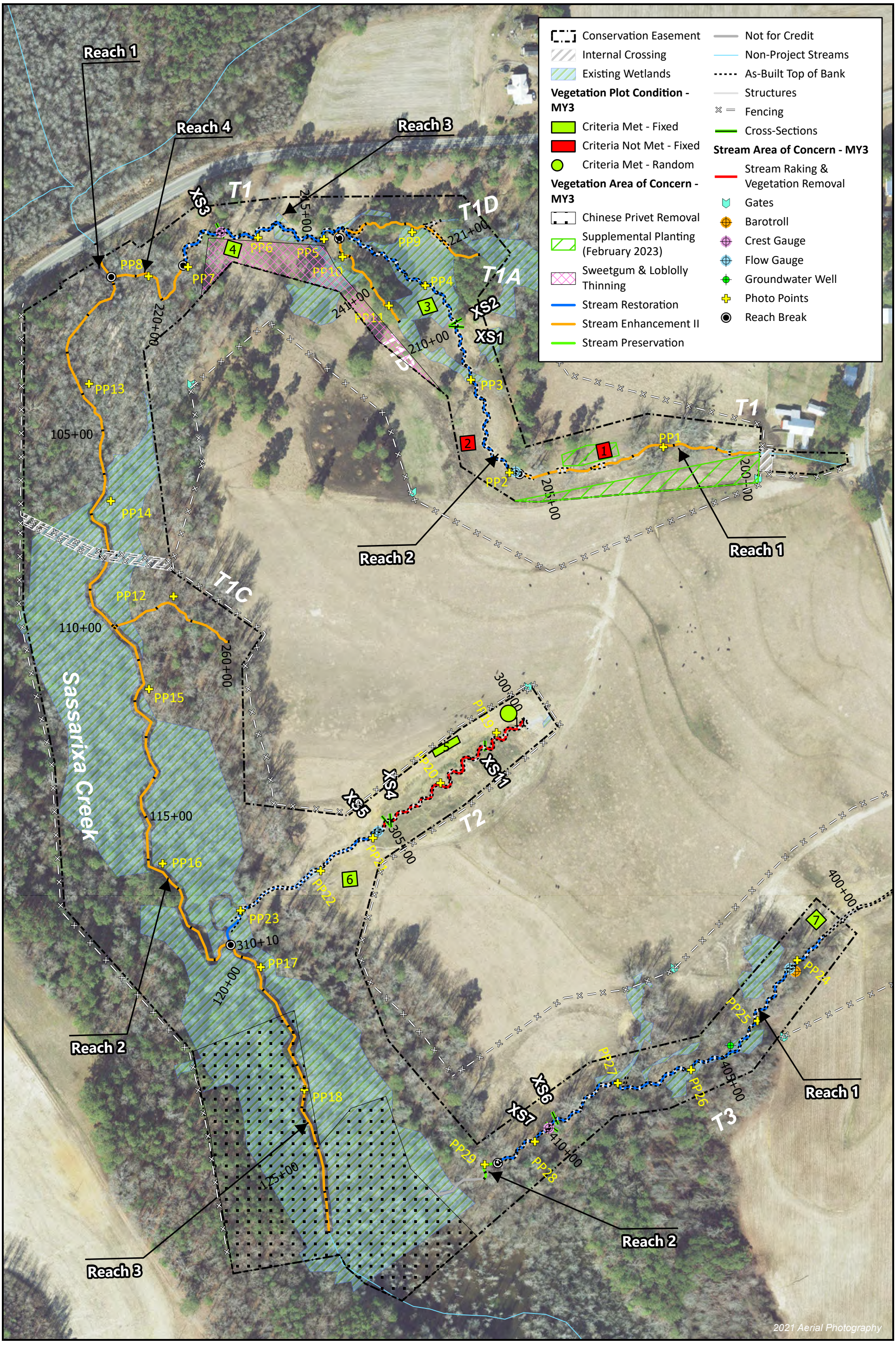
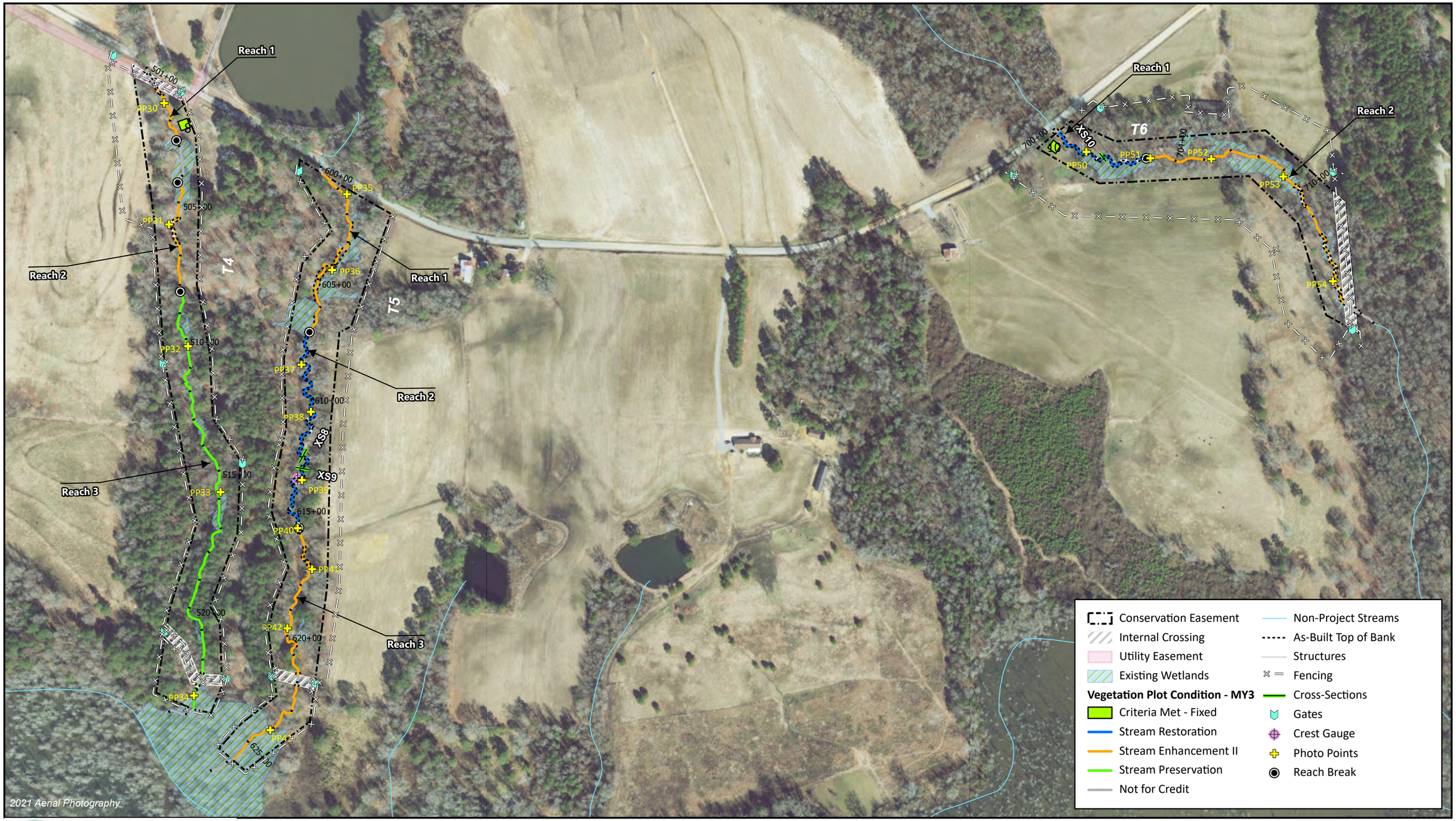


Figure 1a. Current Condition Plan View
Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

Johnston County, NC



WILDLANDS ENGINEERING

0 300 600 Feet

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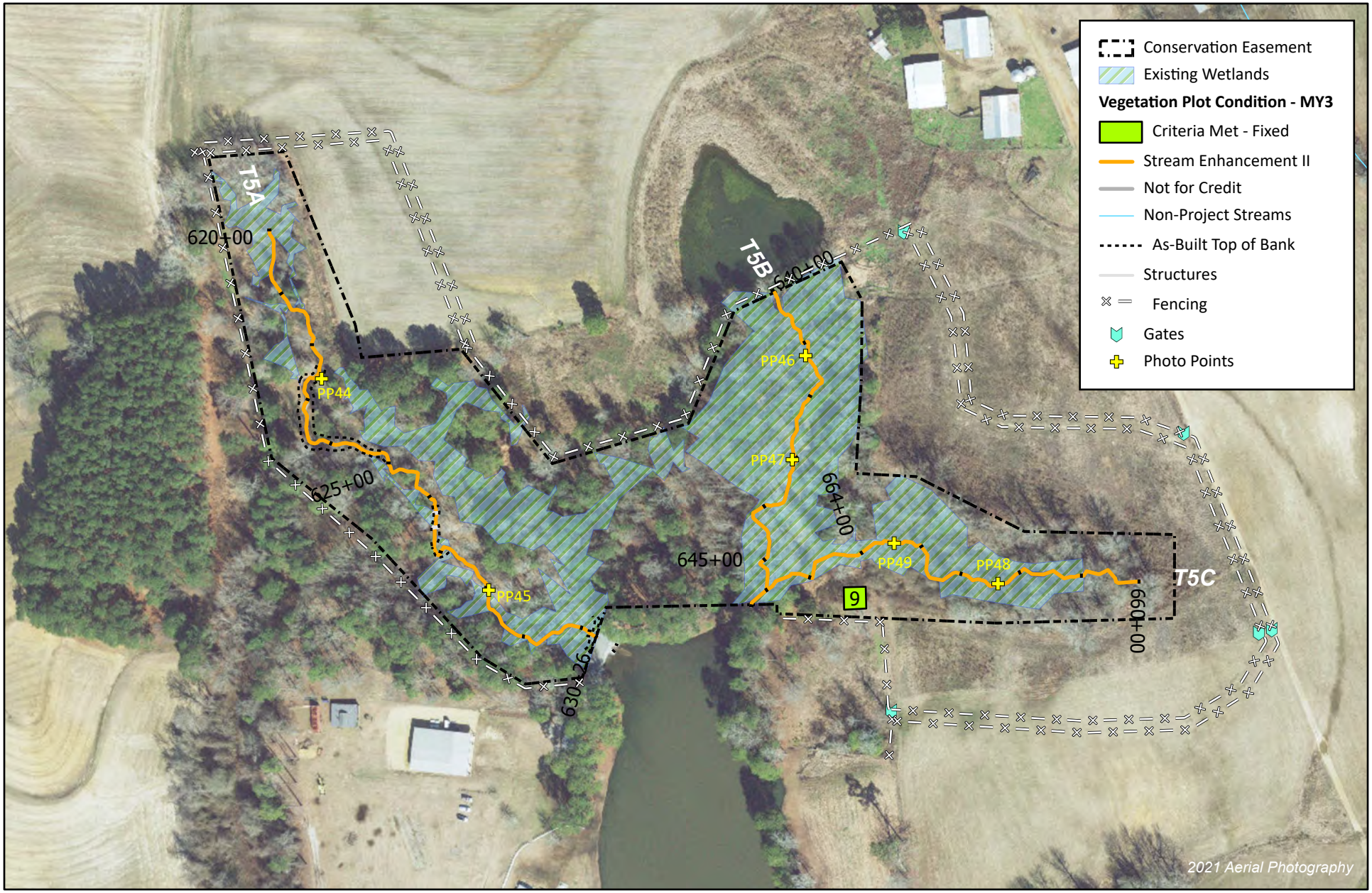
Figure 1b. Current Condition Plan View
Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

Johnston County, NC



WILDLANDS ENGINEERING

0 100 200 Feet

N

Figure 1c. Current Condition Plan View
Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

Johnston County, NC

APPENDIX A. VISUAL ASSESSMENT DATA

Table 4. Visual Stream Morphology Stability Assessment Table

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

T1 R2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	810
					Assessed Bank Length	1,620
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	0	0		N/A
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	27	27		100%

Visual assessment was completed on 11/14/2023.

T1 R3

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	507
					Assessed Bank Length	1,014
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	0	0		N/A
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	14	14		100%

Visual assessment was completed on 11/14/2023.

Table 4. Visual Stream Morphology Stability Assessment Table

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

T2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	1,006
					Assessed Bank Length	2,012
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	34	34		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	18	18		100%

Visual assessment was completed on 11/14/2023.

T3 R1

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	1,041
					Assessed Bank Length	2,082
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	0	0		N/A
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	30	30		100%

Visual assessment was completed on 11/14/2023.

Table 4. Visual Stream Morphology Stability Assessment Table

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

T5 R2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	874
					Assessed Bank Length	1,748
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	0	0		N/A
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	20	20		100%

Visual assessment was completed on 11/14/2023.

T6 R1

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	383
					Assessed Bank Length	766
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	0	0		N/A
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	5	5		100%

Visual assessment was completed on 11/14/2023.

Table 5. Vegetation Condition Assessment Table
Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

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%**

*Supplemental planting occurred in February 2023.

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	4.97*	8%
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 Encroachments Noted/ 0 Ac	

*Chinese privet (*Ligustrum sinense*) resprouted throughout an existing mautre canopy forest along Sassarixa Creek and was treated March 2023.

STREAM PHOTOGRAPHS

	
PHOTO POINT 1 T1 R1 – upstream *(2/7/2023)*	**PHOTO POINT 1 T1 R1 – downstream *(2/7/2023)***
	
PHOTO POINT 2 T1 R2 – upstream *(2/7/2023)*	**PHOTO POINT 2 T1 R2 – downstream *(2/7/2023)***
	
PHOTO POINT 3 T1 R2 – upstream *(2/7/2023)*	**PHOTO POINT 3 T1 R2 – downstream *(2/7/2023)***

PHOTO POINT 4 T1 R2 – upstream *(2/7/2023)*

PHOTO POINT 4 T1 R2 – downstream *(2/7/2023)*

PHOTO POINT 5 T1 R3 – upstream *(2/7/2023)*

PHOTO POINT 5 T1 R3 – downstream *(2/7/2023)*

PHOTO POINT 6 T1 R3 – upstream *(2/7/2023)*

PHOTO POINT 6 T1 R3 – downstream *(2/7/2023)*

PHOTO POINT 7 T1 R3 – upstream *(2/7/2023)*

PHOTO POINT 7 T1 R4 – downstream *(2/7/2023)*

PHOTO POINT 8 T1 R4 – upstream *(2/7/2023)*

PHOTO POINT 8 T1 R4 – downstream *(2/7/2023)*

PHOTO POINT 9 T1A – upstream *(2/7/2023)*

PHOTO POINT 9 T1A – downstream *(2/7/2023)*

PHOTO POINT 10 T1B – upstream *(2/7/2023)*

PHOTO POINT 10 T1B – downstream *(2/7/2023)*

PHOTO POINT 11 T1B – upstream *(2/7/2023)*

PHOTO POINT 11 T1B – downstream *(2/7/2023)*

PHOTO POINT 12 T1C – upstream *(2/7/2023)*

PHOTO POINT 12 T1C – downstream *(2/7/2023)*

PHOTO POINT 13 Sassarixa Creek R2 – upstream *(2/7/2023)*

PHOTO POINT 13 Sassarixa Creek R2 – downstream *(2/7/2023)*

PHOTO POINT 14 Sassarixa Creek R2 – upstream *(2/7/2023)*

PHOTO POINT 14 Sassarixa Creek R2 – downstream *(2/7/2023)*

PHOTO POINT 15 Sassarixa Creek R2 – upstream *(2/7/2023)*

PHOTO POINT 15 Sassarixa Creek R2 – downstream *(2/7/2023)*

PHOTO POINT 16 Sassarixa Creek R2 – upstream *(5/31/2023)*

PHOTO POINT 16 Sassarixa Creek R2 – downstream *(5/31/2023)*

PHOTO POINT 17 Sassarixa Creek R3 – upstream *(2/7/2023)*

PHOTO POINT 17 Sassarixa Creek R3 – downstream *(2/7/2023)*

PHOTO POINT 18 Sassarixa Creek R3 – upstream *(5/31/2023)*

PHOTO POINT 18 Sassarixa Creek R3 – downstream *(5/31/2023)*

	
PHOTO POINT 19 T2 – upstream *(2/7/2023)*	**PHOTO POINT 19 T2 – downstream *(2/7/2023)***
	
PHOTO POINT 20 T2 – upstream *(2/7/2023)*	**PHOTO POINT 20 T2 – downstream *(2/7/2023)***
	
PHOTO POINT 21 T2 – upstream *(2/7/2023)*	**PHOTO POINT 21 T2 – downstream *(2/7/2023)***

	
PHOTO POINT 22 T2 – upstream *(2/7/2023)*	**PHOTO POINT 22 T2 – downstream *(2/7/2023)***
	
PHOTO POINT 23 T2 – upstream *(2/7/2023)*	**PHOTO POINT 23 T2 – downstream *(2/7/2023)***
	
PHOTO POINT 24 T3 R1 – upstream *(2/7/2023)*	**PHOTO POINT 24 T3 R1 – downstream *(2/7/2023)***

PHOTO POINT 25 T3 R1 – upstream *(2/7/2023)*

PHOTO POINT 25 T3 R1 – downstream *(2/7/2023)*

PHOTO POINT 26 T3 R1 – upstream *(2/7/2023)*

PHOTO POINT 26 T3 R1 – downstream *(2/7/2023)*

PHOTO POINT 27 T3 R1 – upstream *(2/7/2023)*

PHOTO POINT 27 T3 R1 – downstream *(2/7/2023)*

	
PHOTO POINT 28 T3 R1 – upstream *(2/7/2023)*	**PHOTO POINT 28 T3 R1 – downstream *(2/7/2023)***
	
PHOTO POINT 29 T3 R2 – upstream *(2/7/2023)*	**PHOTO POINT 29 T3 R2 – downstream *(2/7/2023)***
	
PHOTO POINT 30 T4 R1 – upstream *(2/7/2023)*	**PHOTO POINT 30 T4 R1 – downstream *(2/7/2023)***

PHOTO POINT 31 T4 R2 – upstream *(2/7/2023)*

PHOTO POINT 31 T4 R2 – downstream *(2/7/2023)*

PHOTO POINT 32 T4 R3 – upstream *(2/7/2023)*

PHOTO POINT 32 T4 R3 – downstream *(2/7/2023)*

PHOTO POINT 33 T4 R3 – upstream *(2/7/2023)*

PHOTO POINT 33 T4 R3 – downstream *(2/7/2023)*

PHOTO POINT 34 T4 R3 – upstream *(2/7/2023)*

PHOTO POINT 34 T4 R3 – downstream *(2/7/2023)*

PHOTO POINT 35 T5 R1 – upstream *(2/7/2023)*

PHOTO POINT 35 T5 R1 – downstream *(2/7/2023)*

PHOTO POINT 36 T5 R1 – upstream *(2/7/2023)*

PHOTO POINT 36 T5 R1 – downstream *(2/7/2023)*

PHOTO POINT 37 T5 R2 – upstream *(2/7/2023)*

PHOTO POINT 37 T5 R2 – downstream *(2/7/2023)*

PHOTO POINT 38 T5 R2 – upstream *(2/7/2023)*

PHOTO POINT 38 T5 R2 – downstream *(2/7/2023)*

PHOTO POINT 39 T5 R2 – upstream *(2/7/2023)*

PHOTO POINT 39 T5 R2 – downstream *(2/7/2023)*

	
PHOTO POINT 40 T5 R2 – upstream *(2/7/2023)*	**PHOTO POINT 40 T5 R3 – downstream *(2/7/2023)***
	
PHOTO POINT 41 T5 R3 – upstream *(2/7/2023)*	**PHOTO POINT 41 T5 R3 – downstream *(2/7/2023)***
	
PHOTO POINT 42 T5 R3 – upstream *(2/7/2023)*	**PHOTO POINT 42 T5 R3 – downstream *(2/7/2023)***

PHOTO POINT 43 T5 R3 – upstream *(2/7/2023)*

PHOTO POINT 43 T5 R3 – downstream *(2/7/2023)*

PHOTO POINT 44 T5A – upstream *(2/7/2023)*

PHOTO POINT 44 T5A – downstream *(2/7/2023)*

PHOTO POINT 45 T5A – upstream *(2/7/2023)*

PHOTO POINT 45 T5A – downstream *(2/7/2023)*

	
PHOTO POINT 46 T5B – upstream *(2/7/2023)*	**PHOTO POINT 46 T5B – downstream *(2/7/2023)***
	
PHOTO POINT 47 T5B – upstream *(2/7/2023)*	**PHOTO POINT 47 T5B – downstream *(2/7/2023)***
	
PHOTO POINT 48 T5C – upstream *(2/7/2023)*	**PHOTO POINT 48 T5C – downstream *(2/7/2023)***

PHOTO POINT 49 T5C – upstream *(2/7/2023)*

PHOTO POINT 49 T5C – downstream *(2/7/2023)*

PHOTO POINT 50 T6 R1 – upstream *(2/7/2023)*

PHOTO POINT 50 T6 R1 – downstream *(2/7/2023)*

PHOTO POINT 51 T6 R2 – upstream *(2/7/2023)*

PHOTO POINT 51 T6 R2 – downstream *(2/7/2023)*

	
PHOTO POINT 52 T6 R2 – upstream *(2/7/2023)*	**PHOTO POINT 52 T6 R2 – downstream *(2/7/2023)***
	
PHOTO POINT 53 T6 R2 – upstream *(2/7/2023)*	**PHOTO POINT 53 T6 R2 – downstream *(2/7/2023)***
	
PHOTO POINT 54 T6 R2 – upstream *(2/7/2023)*	**PHOTO POINT 54 T6 R2 – downstream *(2/7/2023)***

STREAM CROSSING PHOTOGRAPHS

Sassarixa Creek Reach 2 – Looking Upstream *(11/14/2023)*

Sassarixa Creek Reach 2 – Looking Downstream *(11/14/2023)*

T1 Reach 1 – Looking Upstream *(11/14/2023)*

T1 Reach 1 – Looking Downstream *(11/14/2023)*

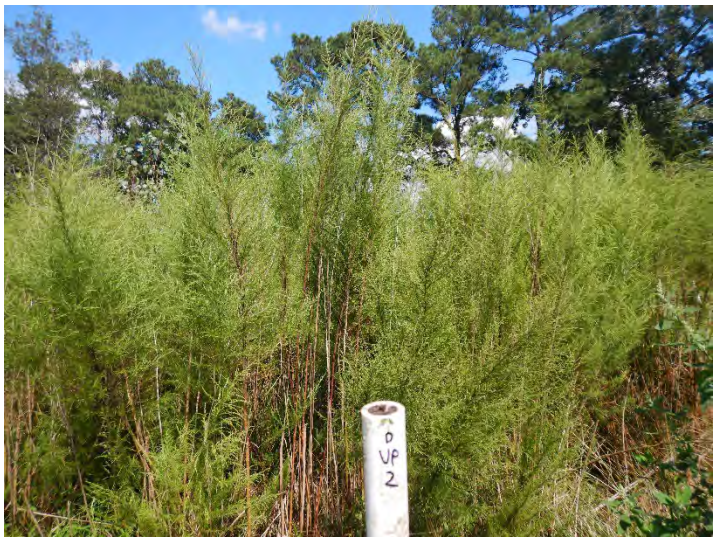
T4 Reach 3 – Looking Upstream *(11/14/2023)*

T4 Reach 3 – Looking Downstream *(11/14/2023)*

	
T5 Reach 3 – Looking Upstream *(11/14/2023)*	**T5 Reach 3 – Looking Downstream** *(11/14/2023)*
	
T6 Reach 2 – Looking Upstream *(11/14/2023)*	**T6 Reach 2 – Looking Downstream** *(11/14/2023)*

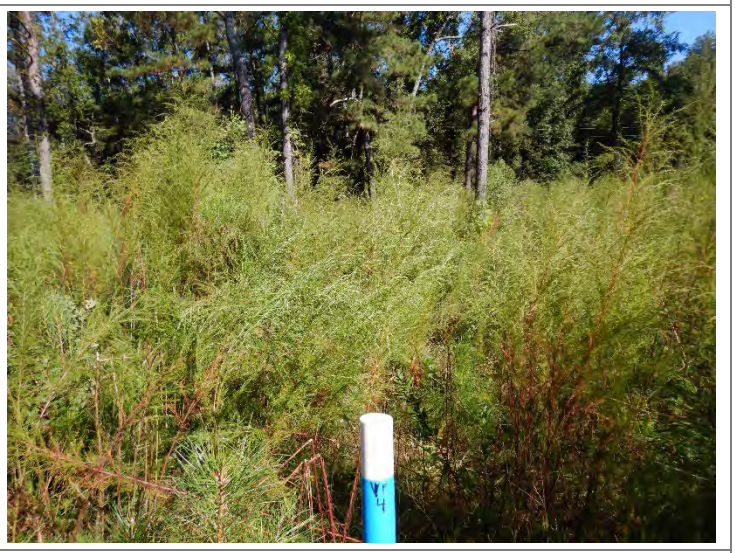
VEGETATION PLOT PHOTOGRAPHS

FIXED VEG PLOT 1 *(9/14/2023)*



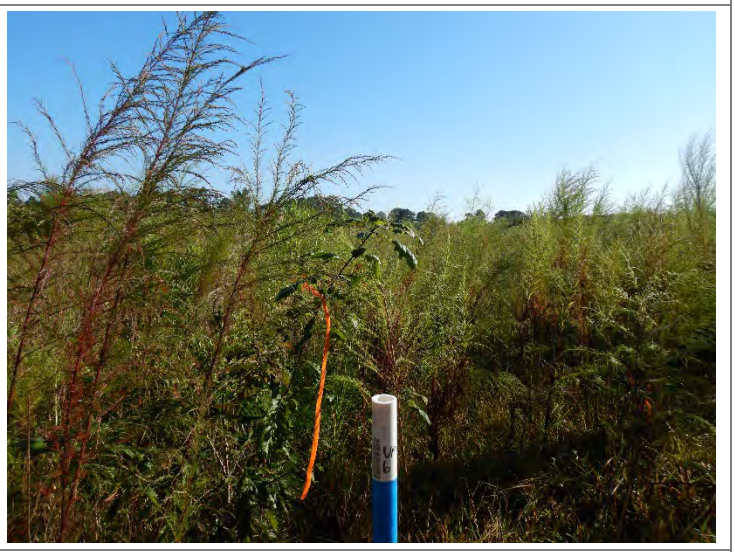
FIXED VEG PLOT 2 *(9/14/2023)*

FIXED VEG PLOT 3 *(9/19/2023)*



FIXED VEG PLOT 4 *(9/19/2023)*

FIXED VEG PLOT 5 *(9/19/2023)*



FIXED VEG PLOT 6 *(9/19/2023)*

FIXED VEG PLOT 7 *(9/19/2023)*

FIXED VEG PLOT 8 *(9/19/2023)*

FIXED VEG PLOT 9 *(9/19/2023)*

FIXED VEG PLOT 10 *(9/20/2023)*

RANDOM VEG PLOT 11 *(9/20/2023)*

APPENDIX B. VEGETATION PLOT DATA

Table 6. Vegetation Plot Data
Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

Planted Acreage	13.03
Date of Initial Plant	2021-03-05
Date(s) of Supplemental Plant(s)	2023-02-13
Date of Current Survey	2023-09-21
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	1	1	4	4	2	2	3	3
	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			1	1		
	Quercus phellos	willow oak	Tree	FACW	1	1			3	3	3	3	2	2
Sum				Performance Standard	7	7	6	6	14	14	13	13	11	11
Post Mitigation Plan Species	*Liquidambar styraciflua*	*sweetgum*	*Tree*	*FAC*										
Sum				Proposed Standard	7	7	6	6	14	14	13	13	11	11
Mitigation Plan Performance Standard				Current Year Stem Count		7		6		14		13		11
				Stems/Acre		283		243		567		526		445
				Species Count		6		4		5		8		7
				Dominant Species Composition (%)		29		50		29		23		27
				Average Plot Height (ft.)		2		3		3		1		3
				% Invasives		0		0		0		0		0
Post Mitigation Plan Performance Standard				Current Year Stem Count		7		6		14		13		11
				Stems/Acre		283		243		567		526		445
				Species Count		6		4		5		8		7
				Dominant Species Composition (%)		29		50		29		23		27
				Average Plot Height (ft.)		2		3		3		1		3
				% Invasives		0		0		0		0		0

Table 6. Vegetation Plot Data
Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

Planted Acreage	13.03
Date of Initial Plant	2021-03-05
Date(s) of Supplemental Plant(s)	2023-02-13
Date of Current Survey	2023-09-21
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		Veg Plot 11 R
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Total
Species Included in Approved Mitigation Plan	*Acer negundo*	boxelder	Tree	FAC	2	2	1	1	1	1	1	1			1
	Betula nigra	river birch	Tree	FACW	2	2	2	2	1	1	2	2	1	1	
	Magnolia virginiana	sweetbay	Tree	FACW	1	1	1	1	1	1			2	2	1
	Platanus occidentalis	American sycamore	Tree	FACW	2	2	3	3	2	2	4	4	2	2	6
	Populus deltoides	eastern cottonwood	Tree	FAC			1	1							2
	Quercus michauxii	swamp chestnut oak	Tree	FACW	3	3	3	3	2	2	1	1	3	3	
	Quercus nigra	water oak	Tree	FAC			1	1							4
	Quercus phellos	willow oak	Tree	FACW	3	3	1	1	1	1			1	1	
Sum				Performance Standard	13	13	13	13	8	8	8	8	9	9	14
Post Mitigation Plan Species	*Liquidambar styraciflua*	*sweetgum*	*Tree*	*FAC*											*1*
Sum				Proposed Standard	13	13	13	13	8	8	8	8	9	9	14
Mitigation Plan Performance Standard				Current Year Stem Count		13		13		8		8		9	14
				Stems/Acre		526		526		324		324		364	567
				Species Count		6		8		6		4		5	5
				Dominant Species Composition (%)		23		23		25		50		33	40
				Average Plot Height (ft.)		1		2		2		2		1	1
				% Invasives		0		0		0		0		0	0
Post Mitigation Plan Performance Standard				Current Year Stem Count		13		13		8		8		9	14
				Stems/Acre		526		526		324		324		364	567
				Species Count		6		8		6		4		5	5
				Dominant Species Composition (%)		23		23		25		50		33	40
				Average Plot Height (ft.)		1		2		2		2		1	1
				% Invasives		0		0		0		0		0	0

Table 7a. Vegetation Performance Standards Summary Table

Sassarixa Swamp Mitigation Site

DMS Project No. 100040

Monitoring Year 3 - 2023

	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	283	2	6	0	243	3	4	0	567	3	5	0
Monitoring Year 2	324	1	6	0	283	1	5	0	567	2	5	0
Monitoring Year 1	364	1	6	0	243	1	3	0	607	1	6	0
Monitoring Year 0	567	1	8	0	445	1	5	0	607	1	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	526	1	8	0	445	3	7	0	526	1	6	0
Monitoring Year 2	526	1	8	0	486	2	7	0	526	1	6	0
Monitoring Year 1	567	1	8	0	486	1	7	0	526	1	6	0
Monitoring Year 0	607	1	8	0	486	1	7	0	567	1	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	526	2	8	0	324	2	6	0	324	2	4	0
Monitoring Year 2	526	1	8	0	364	1	6	0	364	1	5	0
Monitoring Year 1	567	1	8	0	567	1	7	0	607	1	7	0
Monitoring Year 0	567	1	8	0	567	1	7	0	648	1	7	0
	Veg Plot 10 F				**Veg Plot Group 11 R**							
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives				
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3	364	1	5	0	567	1	5	0				
Monitoring Year 2	567	1	6	0	486	1	7	0				
Monitoring Year 1	891	1	8	0	486	1	8	0				
Monitoring Year 0	607	1	8	0	648	1	8	0				

*Each monitoring year represents a different plot for the random vegetation plot "groups". Random plots are denoted with an R, and fixed plots with an F.

Table 7b. Supplementally Planted Tree Species and Quantities

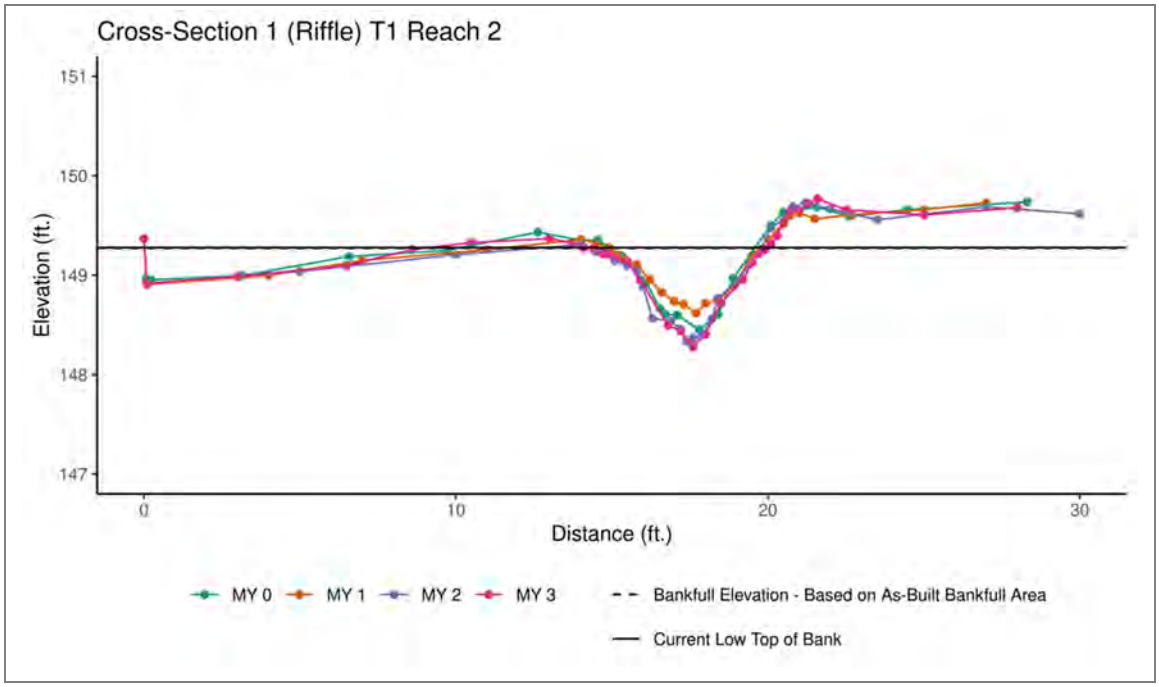
Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

Scientific Name	Common Name	Number Planted	% of Total	Type
Quercus phellos	Willow Oak	367	15%	Bare Root
Platanus occidentalis	Sycamore	490	20%	Bare Root
Betula nigra	River Birch	490	20%	Bare Root
Quercus michauxii	Swamp Chestnut Oak	367	15%	Bare Root
Quercus nigra	Water Oak	172	7%	Bare Root
Acer negundo	Box Elder	245	10%	Bare Root
Populus deltoides	Eastern Cottonwood	172	7%	Bare Root
Magnolia virginiana	Sweetbay Mangolina	147	6%	Bare Root
	Total	**2,450**	**100%**	

* A total area of 8.51 acres were supplemented with trees in February 2023 along T1, the ditch above T3, T4, T5A, and T5C. Of that, 0.55 acres were within the Sassarixa Swamp Mitigation Site along T1.

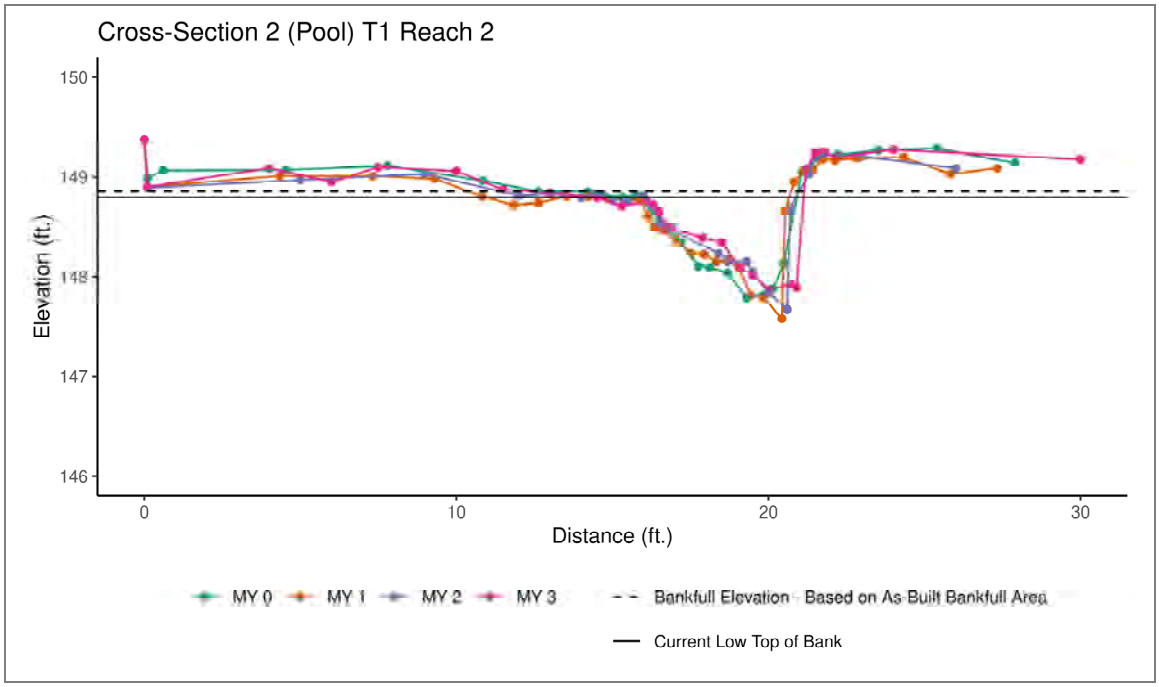
APPENDIX C. Stream Geomorphology Data

Cross-Section Plots



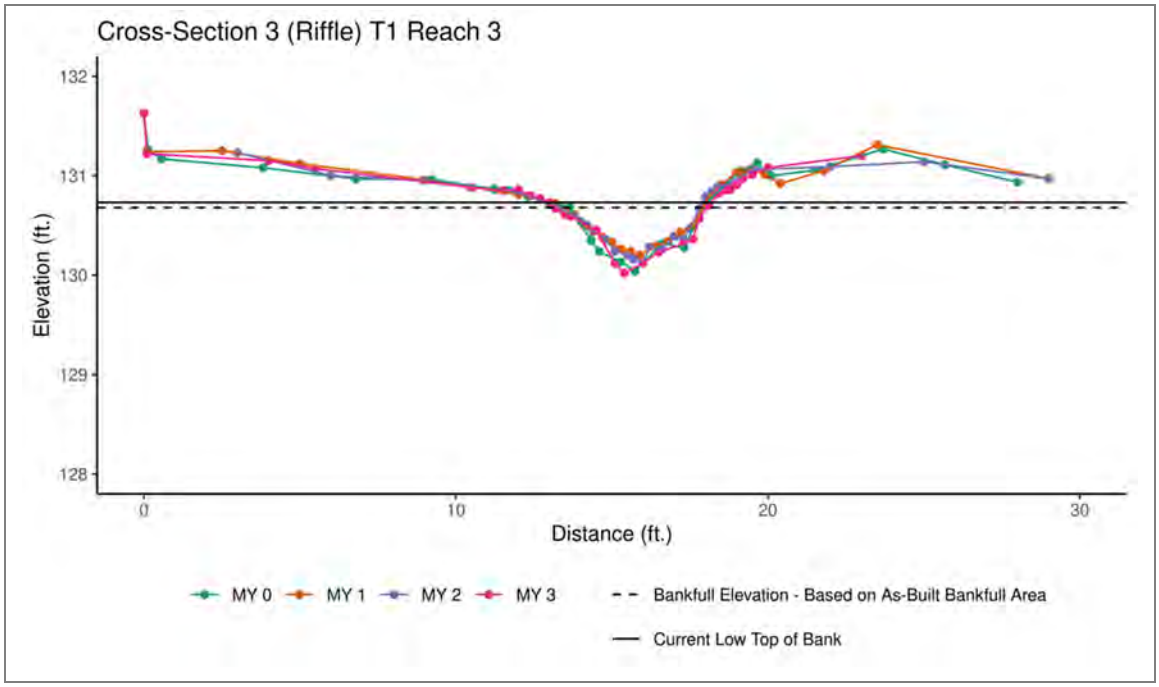
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	149.35	149.41	149.28	149.27		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.93	1.03	1.01		
Thalweg Elevation	148.45	148.62	148.34	148.28		
LTOB Elevation	149.35	149.36	149.31	149.28		
LTOB Max Depth	0.90	0.74	0.97	1.00		
LTOB Cross-Sectional Area	2.47	2.16	2.63	2.51		

Downstream *(03/07/2023)*



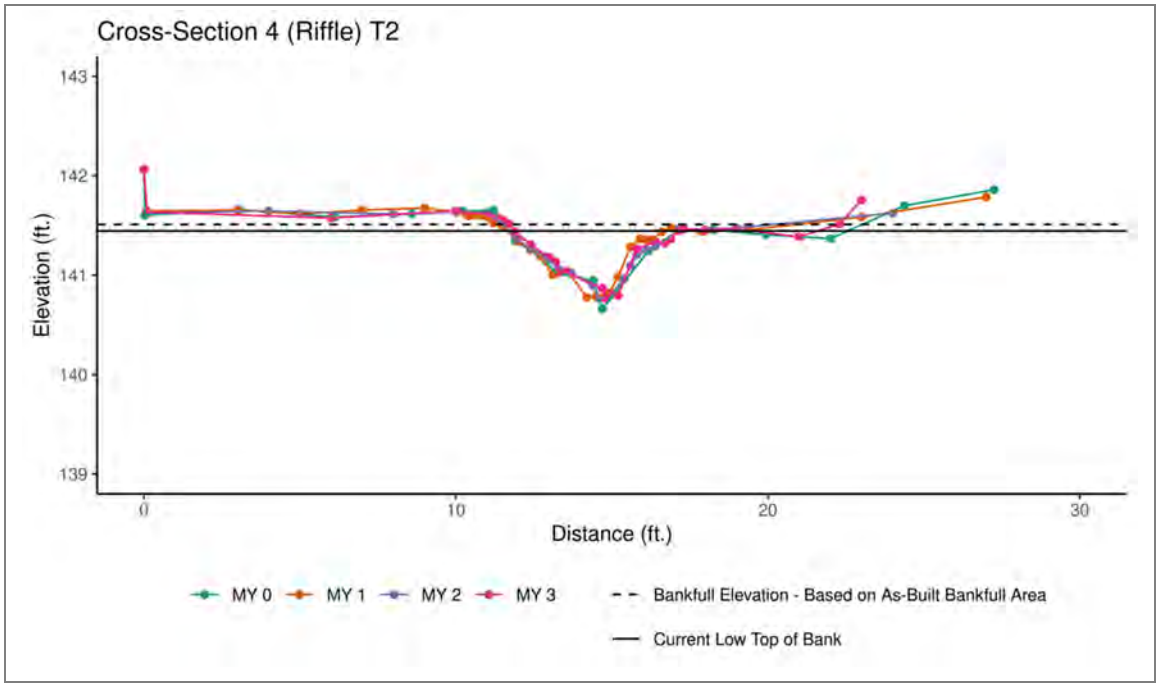
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	147.78	147.58	147.67	147.87		
LTOB Elevation	148.82	148.77	148.83	148.79		
LTOB Max Depth	1.04	1.19	1.16	0.92		
LTOB Cross-Sectional Area	3.20	2.84	2.91	2.79		

Downstream *(03/07/2023)*



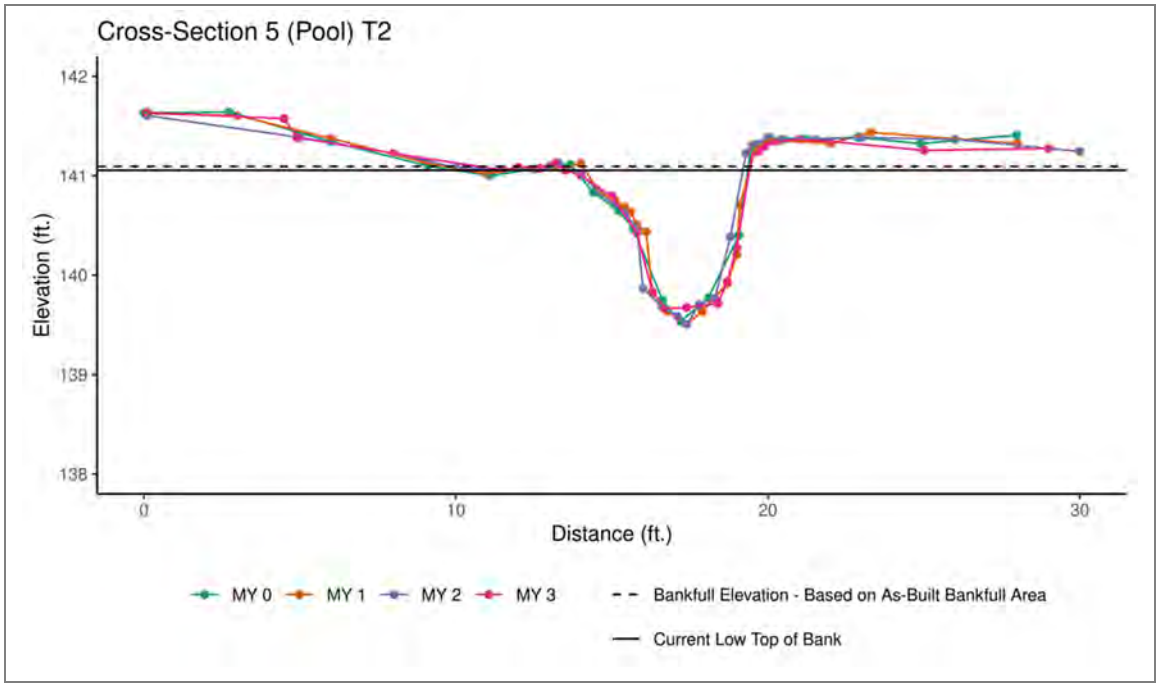
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	130.69	130.77	130.75	130.68		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.91	0.94	1.08		
Thalweg Elevation	130.04	130.24	130.12	130.02		
LTOB Elevation	130.69	130.72	130.71	130.73		
LTOB Max Depth	0.64	0.48	0.59	0.71		
LTOB Cross-Sectional Area	1.67	1.45	1.50	1.93		

Downstream *(03/07/2023)*



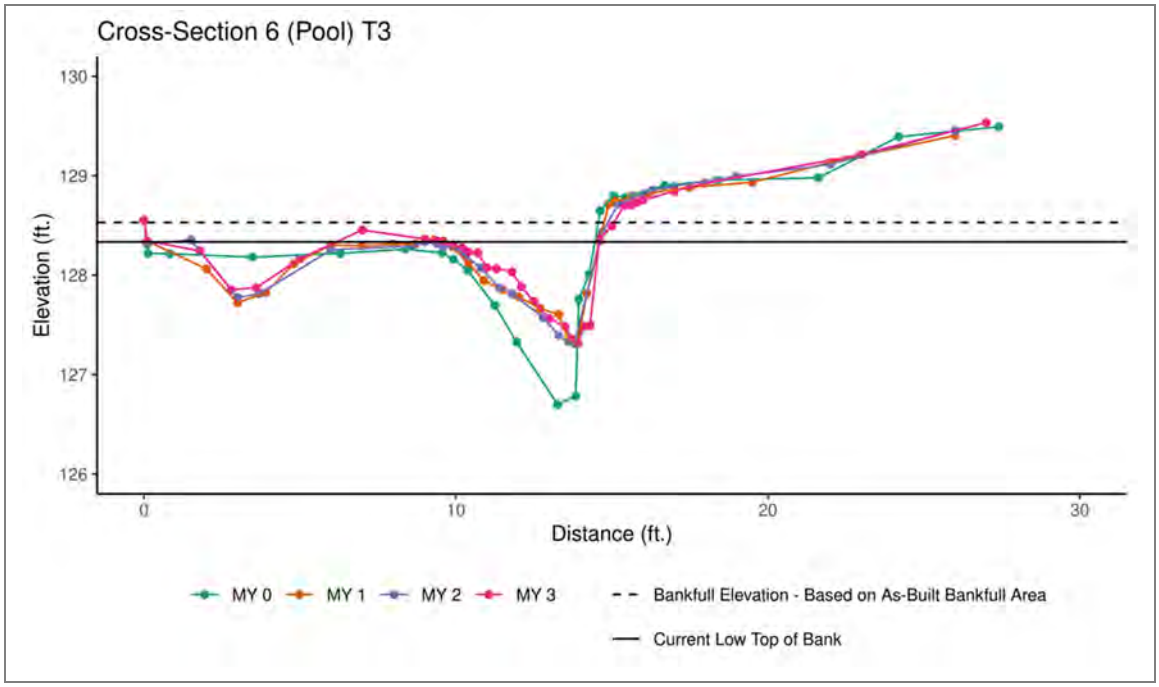
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	141.46	141.52	141.49	141.51		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.94	0.95	0.91		
Thalweg Elevation	140.66	140.78	140.77	140.77		
LTOB Elevation	141.46	141.47	141.46	141.45		
LTOB Max Depth	0.80	0.69	0.69	0.68		
LTOB Cross-Sectional Area	1.99	1.76	1.80	1.65		

Downstream *(03/07/2023)*



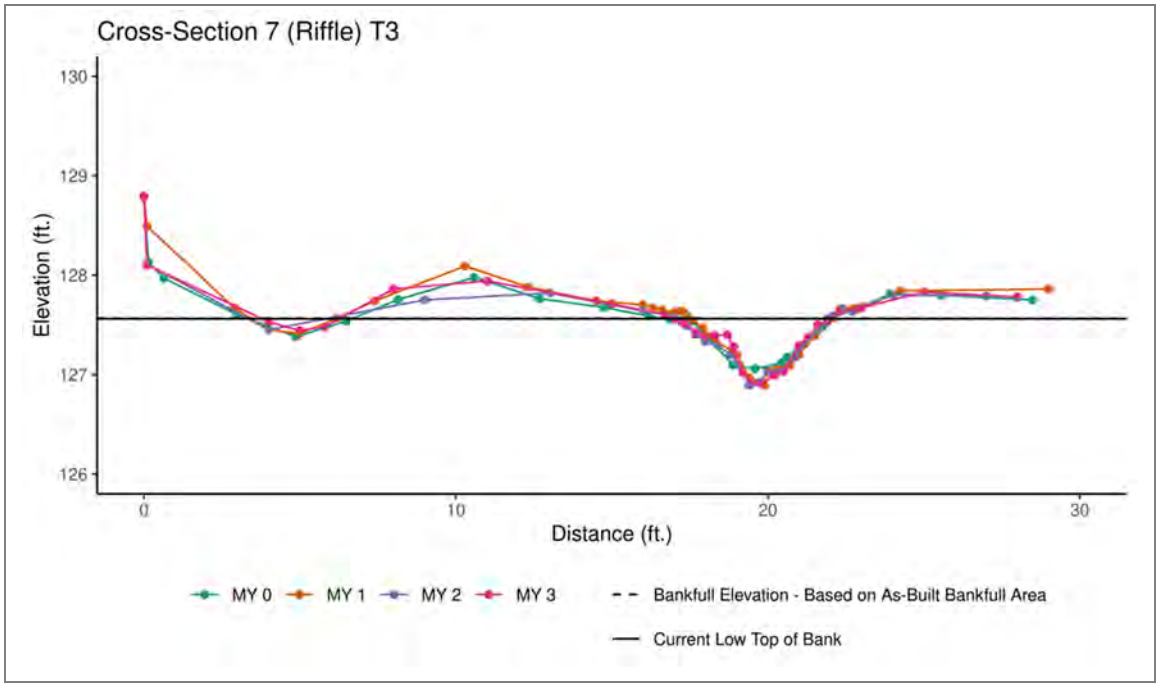
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	139.53	139.50	139.51	139.67		
LTOB Elevation	141.12	141.10	141.07	141.06		
LTOB Max Depth	1.58	1.60	1.56	1.39		
LTOB Cross-Sectional Area	4.88	4.82	4.57	4.65		

Downstream *(03/07/2023)*



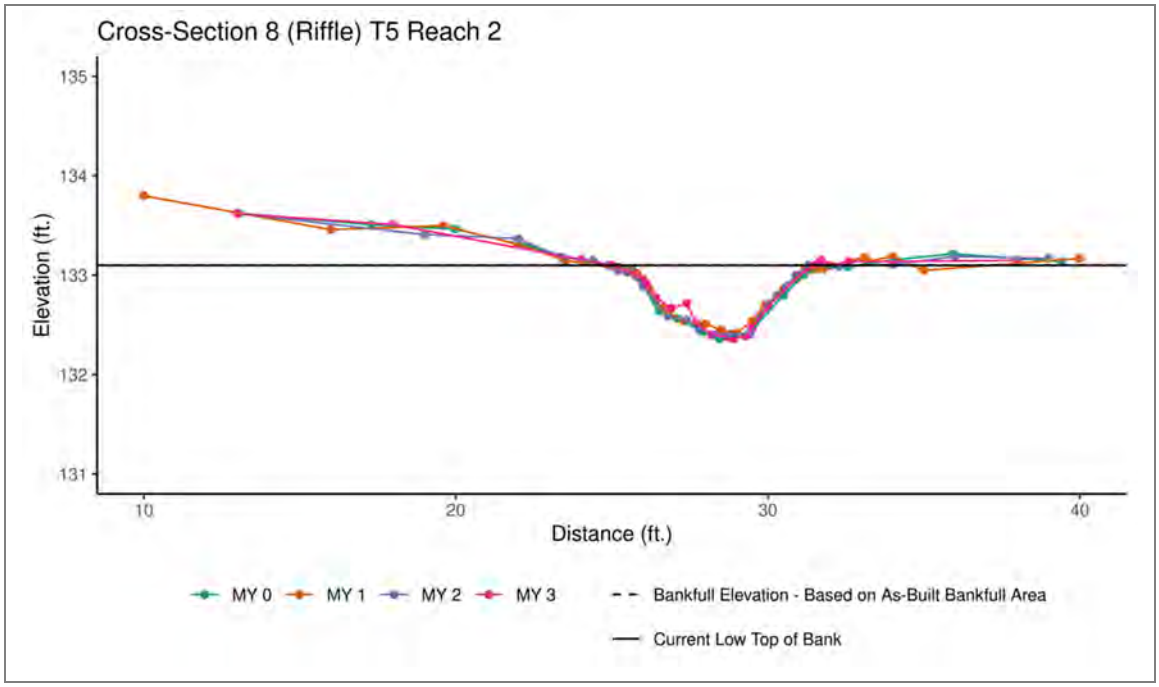
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	126.70	127.32	127.31	127.31		
LTOB Elevation	128.16	128.35	128.31	128.33		
LTOB Max Depth	1.46	1.03	1.00	1.02		
LTOB Cross-Sectional Area	3.25	2.57	2.40	2.27		

Downstream *(03/07/2023)*



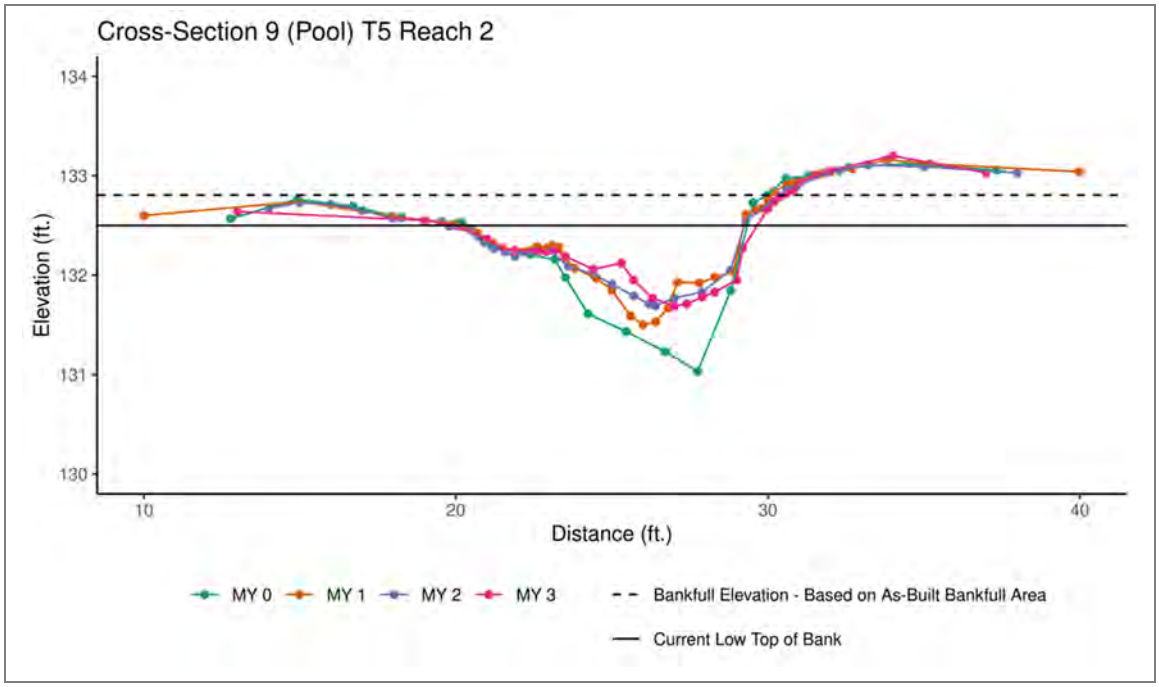
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	127.58	127.56	127.54	127.57		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	1.10	1.09	0.99		
Thalweg Elevation	127.06	126.89	126.89	126.91		
LTOB Elevation	127.58	127.63	127.59	127.56		
LTOB Max Depth	0.52	0.74	0.70	0.65		
LTOB Cross-Sectional Area	1.50	1.82	1.77	1.48		

Downstream *(03/07/2023)*



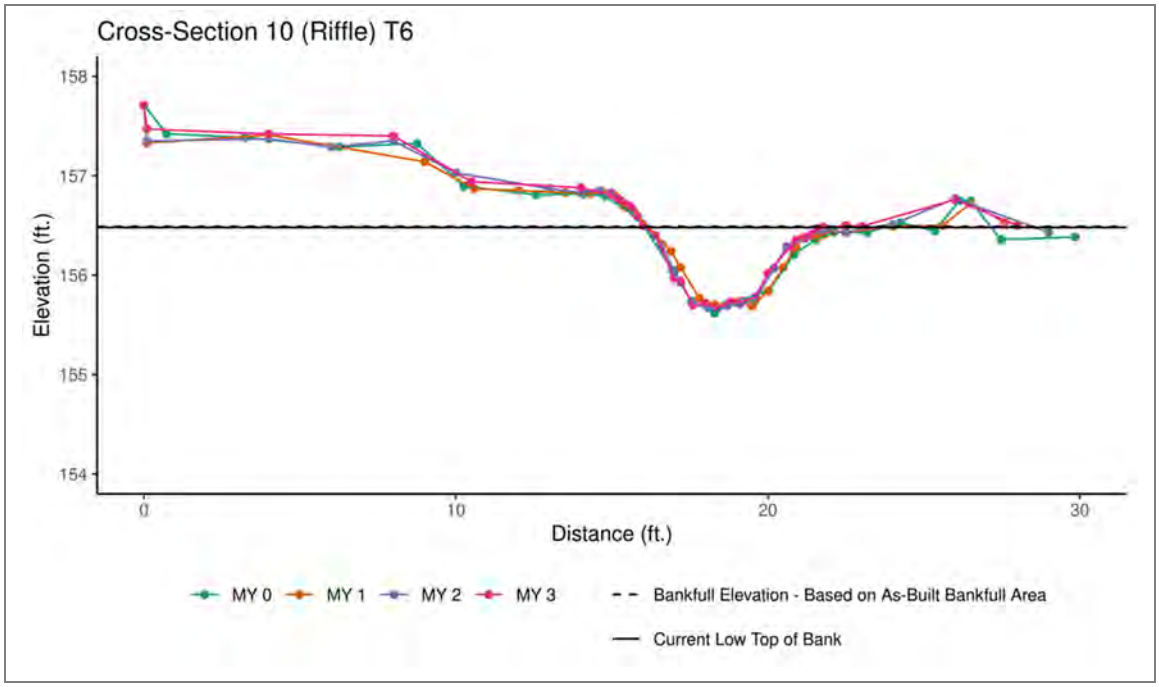
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	133.06	133.12	133.08	133.10		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.85	1.02	1.00		
Thalweg Elevation	132.36	132.42	132.40	132.36		
LTOB Elevation	133.06	133.02	133.10	133.10		
LTOB Max Depth	0.70	0.60	0.70	0.74		
LTOB Cross-Sectional Area	2.49	1.95	2.60	2.48		

Downstream *(03/07/2023)*



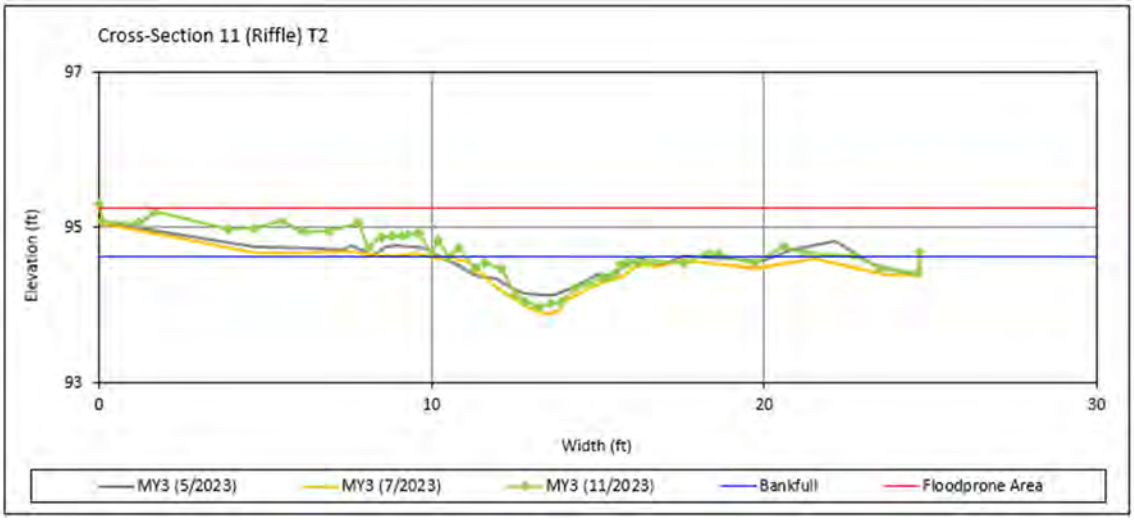
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	131.03	131.50	131.69	131.69		
LTOB Elevation	132.53	132.46	132.55	132.50		
LTOB Max Depth	1.50	0.96	0.86	0.81		
LTOB Cross-Sectional Area	6.97	3.86	4.66	4.02		

Downstream *(03/07/2023)*



	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	156.43	156.50	156.48	156.49		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.88	0.96	0.99		
Thalweg Elevation	155.62	155.69	155.67	155.67		
LTOB Elevation	156.43	156.40	156.45	156.48		
LTOB Max Depth	0.81	0.71	0.78	0.81		
LTOB Cross-Sectional Area	2.69	2.20	2.51	2.64		

Downstream *(03/07/2023)*



	MY3 (5/31/2023)	MY3 (7/20/2023)	MY3 (11/14/2023)	MY4	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	94.62	94.52	94.57			
Bank Height Ratio - Based on AB-Bankfull Area	1.00	1.00	1.00			
Thalweg Elevation	94.13	93.88	93.98			
LTOB Elevation	94.62	94.52	94.57			
LTOB Max Depth	0.49	0.64	0.60			
LTOB Cross-Sectional Area	1.69	1.68	1.69			

Downstream *(07/20/2023)*

Table 8. Baseline Stream Data Summary

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

	PRE-EXISTING CONDITIONS			DESIGN		MONITORING BASELINE (MY0)		
Parameter	**T1 R2**							
Riffle Only	**Min**	**Max**	**n**	**Min**	**Max**	**Min**	**Max**	**n**
Bankfull Width (ft)	3.4		1	3.6		5.2		1
Floodprone Width (ft)	8		1	>7.9		200		1
Bankfull Mean Depth (ft)	1		1	0.3		0.4		1
Bankfull Max Depth (ft)	0.7		1	0.4	0.5	0.9		1
Bankfull Cross Sectional Area (ft^2)	2.5		1	1.2		2.5		1
Width/Depth Ratio	4.9		1	11.0		11.0		1
Entrenchment Ratio	2.2		1	>2.2		34.6		1
Bank Height Ratio	3.0		1	1.0	1.2	1.0		1
Max particle size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	G5			C5b/E5b		C5b/E5b		
Bankfull Discharge (cfs)	8.8			3.0		9.0		
Sinuosity	1.20			1.20		1.20		
Water Surface Slope (ft/ft)	0.0190	0.0300	2	0.0250	0.0410	0.0322		
Other	---			---		---		
Parameter	**T1 R3**							
Riffle Only	**Min**	**Max**	**n**	**Min**	**Max**	**Min**	**Max**	**n**
Bankfull Width (ft)	3.4		1	4.2		4.3		1
Floodprone Width (ft)	8		1	>9.2		90		1
Bankfull Mean Depth (ft)	1		1	0.4		0.4		1
Bankfull Max Depth (ft)	0.7		1	0.4	0.6	0.6		1
Bankfull Cross Sectional Area (ft^2)	2.5		1	1.5		1.7		1
Width/Depth Ratio	4.9		1	12.0		11.1		1
Entrenchment Ratio	2.2		1	>2.2		21.9		1
Bank Height Ratio	3.0		1	1.0	1.2	1.0		1
Max particle size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	G5			C5/E5		C5/E5		
Bankfull Discharge (cfs)	8.8			3.5		4.3		
Sinuosity	1.20			1.20		1.20		
Water Surface Slope (ft/ft)	0.0190	0.0300	2	0.0092	0.0250	0.0181		
Other	---			---		---		

Table 8. Baseline Stream Data Summary

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

	PRE-EXISTING CONDITIONS			DESIGN		MONITORING BASELINE (MY0)		
Parameter	**T2**							
Riffle Only	**Min**	**Max**	**n**	**Min**	**Max**	**Min**	**Max**	**n**
Bankfull Width (ft)	3		1	4.2		5.6		1
Floodprone Width (ft)	4		1	>9.2		75		1
Bankfull Mean Depth (ft)	0.5		1	0.4		0.4		1
Bankfull Max Depth (ft)	0.6		1	0.5		0.8		1
Bankfull Cross Sectional Area (ft^2)	1.5		1	1.5		2.0		1
Width/Depth Ratio	6		1	12.0		15.7		1
Entrenchment Ratio	1.2		1	>2.2		13.4		1
Bank Height Ratio	6.5		1	1.0	1.2	1.0		1
Max particle size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	G5			C5b/E5b		C5b/E5b		
Bankfull Discharge (cfs)	5.4			2.0		4.3		
Sinuosity	1.14			1.40		1.40		
Water Surface Slope (ft/ft)	0.0290		1	0.0051	0.0064	0.0147		
Other	---			---		---		
Parameter	**T3 R1**							
Riffle Only	**Min**	**Max**	**n**	**Min**	**Max**	**Min**	**Max**	**n**
Bankfull Width (ft)	3.2	4.2	2	3.6		4.7		1
Floodprone Width (ft)	5	24	2	>7.9		35		1
Bankfull Mean Depth (ft)	0.42	0.5	2	0.3		0.3		1
Bankfull Max Depth (ft)	0.7	0.56	2	0.4	0.5	0.5		1
Bankfull Cross Sectional Area (ft^2)	1.7		2	1.0		1.5		1
Width/Depth Ratio	6.4	10	2	12.0		14.8		1
Entrenchment Ratio	1.1	7.1	2	>2.2		7.4		1
Bank Height Ratio	2.7	7.0	2	1.0	1.2	1.0		1
Max particle size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	B5/G5			C5/E5b		C5/E5b		
Bankfull Discharge (cfs)	6.2	6.9	2	2.5		4.5		
Sinuosity	1.16			1.20		1.20		
Water Surface Slope (ft/ft)	0.0340		1	0.0280	0.0330	0.0312		
Other	---			---		---		

Table 8. Baseline Stream Data Summary

Sassarixa Swamp Mitigation Site

DMS Project No. 100040

Monitoring Year 3 - 2023

	PRE-EXISTING CONDITIONS			DESIGN		MONITORING BASELINE (MY0)		
Parameter	**T5 R2**							
Riffle Only	**Min**	**Max**	**n**	**Min**	**Max**	**Min**	**Max**	**n**
Bankfull Width (ft)	3.1		1	5.6		5.9		1
Floodprone Width (ft)	27		1	>11		170		1
Bankfull Mean Depth (ft)	1.1		1	0.5		0.4		1
Bankfull Max Depth (ft)	1.4		1	0.6	0.8	0.7		1
Bankfull Cross Sectional Area (ft^2)	3.5		1	2.7		2.5		1
Width/Depth Ratio	2.8		1	12.0		14.0		1
Entrenchment Ratio	8.7		1	>2.2		16.9		1
Bank Height Ratio	1.6		1	1.0	1.2	1.0		1
Max particle size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	E5			C5/E5		C5/E5		
Bankfull Discharge (cfs)	10.9			6.0		5.4		
Sinuosity	1.20			1.40		1.40		
Water Surface Slope (ft/ft)	0.0120		1	0.0086	0.0170	0.0111		
Other	---			---		---		
Parameter	**T6 R1**							
Riffle Only	**Min**	**Max**	**n**	**Min**	**Max**	**Min**	**Max**	**n**
Bankfull Width (ft)	4.1		1	6.4		6.0		1
Floodprone Width (ft)	7		1	>14		90		1
Bankfull Mean Depth (ft)	1.1		1	0.41		0.4		1
Bankfull Max Depth (ft)	1.5		1	0.5	0.7	0.8		1
Bankfull Cross Sectional Area (ft^2)	4.4		1	3.3		2.7		1
Width/Depth Ratio	3.7		1	12.0		13.3		1
Entrenchment Ratio	1.7		1	>2.2		15.1		1
Bank Height Ratio	2.0		1	1.0	1.2	1.0		1
Max particle size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	G5			C5/E5		C5/E5		
Bankfull Discharge (cfs)	12.8			5.5		5.9		
Sinuosity	1.10			1.20		1.20		
Water Surface Slope (ft/ft)	0.0086		1	0.0049	0.0150	0.0107		
Other	---			---		---		

Table 9. Cross-Section Morphology Monitoring Summary

Sassarixa Swamp Mitigation Site

DMS Project No. 100040

Monitoring Year 3 - 2023

	T1 Reach 2												T1 Reach 3						T2					
	Cross-Section 1 (Riffle)						Cross-Section 2 (Pool)						Cross-Section 3 (Riffle)						Cross-Section 4 (Riffle)					
	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	149.35	149.41	149.28	149.27			N/A	N/A	N/A	N/A			130.69	130.77	130.75	130.68			141.46	141.52	141.49	141.51		
Bank Height Ratio - Based on AB Bankfull[1] Area	1.00	0.93	1.03	1.01			N/A	N/A	N/A	N/A			1.00	0.91	0.94	1.08			1.00	0.94	0.95	0.91		
Thalweg Elevation	148.45	148.62	148.34	148.28			147.78	147.58	147.67	147.87			130.04	130.24	130.12	130.02			140.66	140.79	140.77	140.77		
LTOB[2] Elevation	149.35	149.36	149.31	149.28			148.82	148.77	148.83	148.79			130.69	130.72	130.71	130.73			141.46	141.48	141.46	141.45		
LTOB[2] Max Depth (ft)	0.90	0.74	0.97	1.00			1.04	1.19	1.16	0.92			0.64	0.48	0.59	0.71			0.80	0.69	0.69	0.68		
LTOB[2] Cross Sectional Area (ft^2)	2.47	2.16	2.63	2.51			3.20	2.84	2.91	2.79			1.67	1.45	1.50	1.93			1.99	1.76	1.80	1.65		

	T2						T3 Reach 1												T5 Reach 2					
	Cross-Section 5 (Pool)						Cross-Section 6 (Pool)						Cross-Section 7 (Riffle)						Cross-Section 8 (Riffle)					
	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A			127.58	127.56	127.54	127.57			133.06	133.12	133.08	133.10		
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A			1.00	1.10	1.09	0.99			1.00	0.85	1.02	1.00		
Thalweg Elevation	139.53	139.51	139.51	139.67			126.70	127.32	127.31	127.31			127.06	126.89	126.89	126.91			132.36	132.42	132.40	132.36		
LTOB[2] Elevation	141.12	141.11	141.07	141.06			128.16	128.35	128.31	128.33			127.58	127.63	127.59	127.56			133.06	133.02	133.10	133.10		
LTOB[2] Max Depth (ft)	1.58	1.60	1.56	1.39			1.46	1.03	1.00	1.02			0.52	0.74	0.70	0.65			0.70	0.60	0.70	0.74		
LTOB[2] Cross Sectional Area (ft^2)	4.88	4.82	4.57	4.65			3.25	2.57	2.40	2.27			1.50	1.82	1.77	1.48			2.49	1.95	2.60	2.48		

	T5 Reach 2						T6 Reach 1					
	Cross-Section 9 (Pool)						Cross-Section 10 (Riffle)					
	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	N/A	N/A	N/A	N/A			156.43	156.50	156.48	156.49		
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A	N/A	N/A	N/A			1.00	0.88	0.96	0.99		
Thalweg Elevation	131.03	131.50	131.69	131.69			155.62	155.69	155.67	155.67		
LTOB[2] Elevation	132.53	132.46	132.55	132.50			156.43	156.40	156.45	156.48		
LTOB[2] Max Depth (ft)	1.50	0.96	0.86	0.81			0.81	0.71	0.78	0.81		
LTOB[2] Cross Sectional Area (ft^2)	6.97	3.86	4.66	4.02			2.69	2.20	2.51	2.64		

[1]Bank Height Ratio (BHR) takes the As-built bankful area as the basis for adjusting each subsequent years bankfull elevation.

[2]LTOB Area and Max depth - These are based on the LTOB elevation for each years survey (The same elevation used for the LTOB in the BHR calculation). Area below the LTOB elevation will be used and tracked for each year as above. The difference between the LTOB elevation and the thalweg elevation (same as in the BHR calculation) will be recroded and tracked above as LTOB max depth.

Table 9. Cross-Section Morphology Monitoring Summary

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

	T2					
	Cross-Section 11 (Riffle)					
	MY3* (5/31/2023)	MY3* (7/20/2023)	MY3* (11/14/2023)	MY4	MY5	MY7
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	94.61	94.52	94.62			
Bank Height Ratio - Based on AB Bankfull[1] Area	1.00	1.00	1.00			
Thalweg Elevation	94.13	93.88	93.98			
LTOB[2] Elevation	94.62	94.52	94.62			
LTOB[2] Max Depth (ft)	0.50	0.64	0.60			
LTOB[2] Cross Sectional Area (ft^2)	2.00	1.68	1.50			

* An additional cross-section on the upper reach of T2 was requested by the NCIRT to monitor sedimentation and vegetation accumulating within the channel. The cross-section was installed in May 2023. The cross-section was surveyed to establish baseline conditions before vegetation and sedimentation were raked out to clear the stream. The cross-section was then surveyed after raking was completed, and then surveyed again 6 months later to observe any changes in channel stability.

[1]Bank Height Ratio (BHR) takes the As-built bankful area as the basis for adjusting each subsequent years bankfull elevation.

[2]LTOB Area and Max depth - These are based on the LTOB elevation for each years survey (The same elevation used for the LTOB in the BHR calculation). Area below the LTOB elevation will be used and tracked for each year as above. The difference between the LTOB elevation and the thalweg elevation (same as in the BHR calculation) will be recroded and tracked above as LTOB max depth.

APPENDIX D. Hydrology Data

Table 10. Bankfull Events

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

Reach	MY1 (2021)	MY2 (2022)	MY3 (2023)*	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
T1 Reach 3	2/16/2021 7/28/2021	3/12/2022 5/23/2022 9/10/2022 12/27/2022	6/22/2023				
T2	7/27/2021 10/9/2021	N/A	6/30/2023[1]				
T3 Reach 1	7/28/2021	1/18/2022 12/27/2022	N/A				
T5 Reach 2	1/24/2021 7/28/2021	9/10/2022	8/15/2023				

* Data was collected 1/1/2023 to 11/14/2023. Data from the remainder of MY3 will be updated in MY4.

1. Bankfull event recorded based on visual observations

Table 11. Rainfall Summary

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

	MY1 (2021)	MY2 (2022)	MY3 (2023)	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
Annual Precip Total	34.14	28.44	38.24*				
WETS 30th Percentile	44.35	44.67	44.91				
WETS 70th Percentile	52.31	52.62	52.91				
Normal	L	L	*				

Annual Precipitation Source: **Smithfield** Station, Johnston County, NC, State Climate Office (Approximately 6 miles northeast of the Site).

30 Year Average Precipitation Source: **Smithfield** Station, Johnston County, NC, AgCIS (Approximately 6 miles northeast of the Site).

*Annual precipitation total was collected up until 11/14/2023. Data will be updated in MY4.

BANKFULL EVENTS
VISUAL OBSERVATIONS

	
T2 *(6/30/2023)*	**T2** *(6/30/2023)*

Table 12. Groundwater Gauge Summary

Sassarixa Swamp Mitigation Site

DMS Project No. 100040

Monitoring Year 3 - 2023

Gauge	Max. Consecutive Hydroperiod (Percentage)						
	MY1 (2021)	MY2 (2022)	MY3 (2023)*	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
1	**124 Days (47.5%)**	**96 Days (36.8%)**	**102 Days (39.1%)**				

Performance Standard: **None**

WETS Station: **Smithfield 2 North**

Growing Season: **3/1/2023 to 11/16/2023 (260 Days)**

*Data was collected from 3/1/2023 to 11/14/2023 (258 Days).

Groundwater Gauge Plot

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

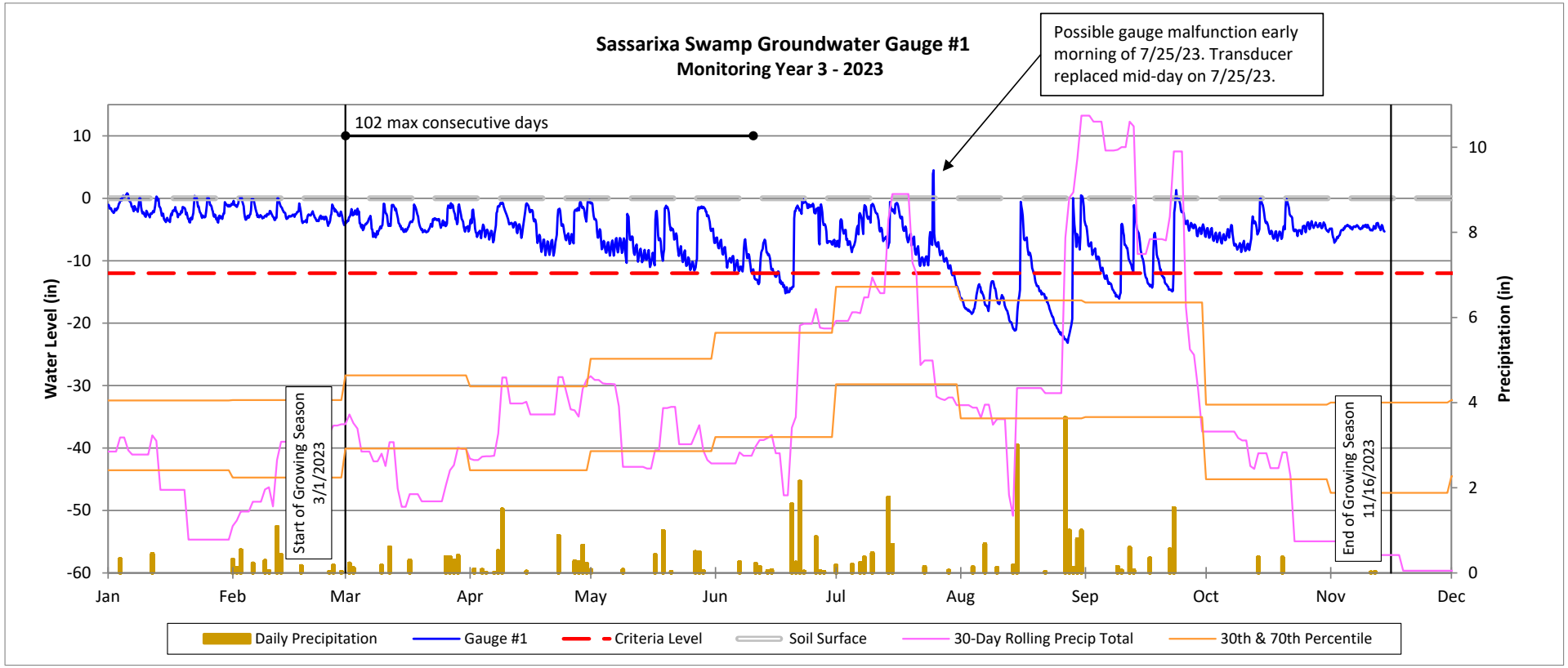


Table 13. Recorded In-Stream Flow Events Summary

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

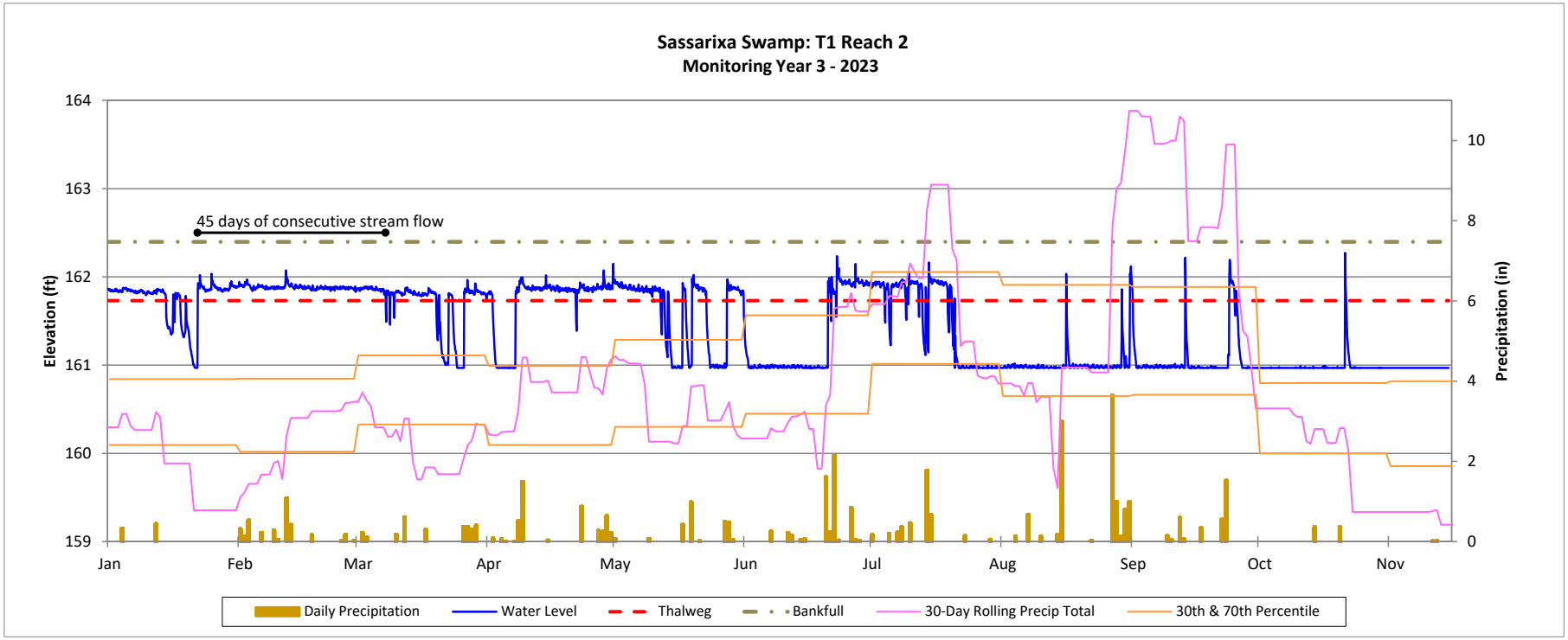
Reach	Max Consecutive Days/Total Days Meeting Success Criteria*						
	MY1 (2021)	MY2 (2022)	MY3 (2023)**	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
T1 Reach 2	44 Days/ 122 Days	86 Days/ 147Days	45 Days/ 152 Days				
T2	103 Days/ 192 Days	87 Days/ 156 Days	75 Days/ 169 Days				
T3 Reach 1	108 Days/ 190 Days	63 Days/ 130 Days	54 Days/ 158 Days				

*Success criteria is 30 consecutive days of flow.

**Data was colleted through 11/14/2023. Data will be updated in MY4.

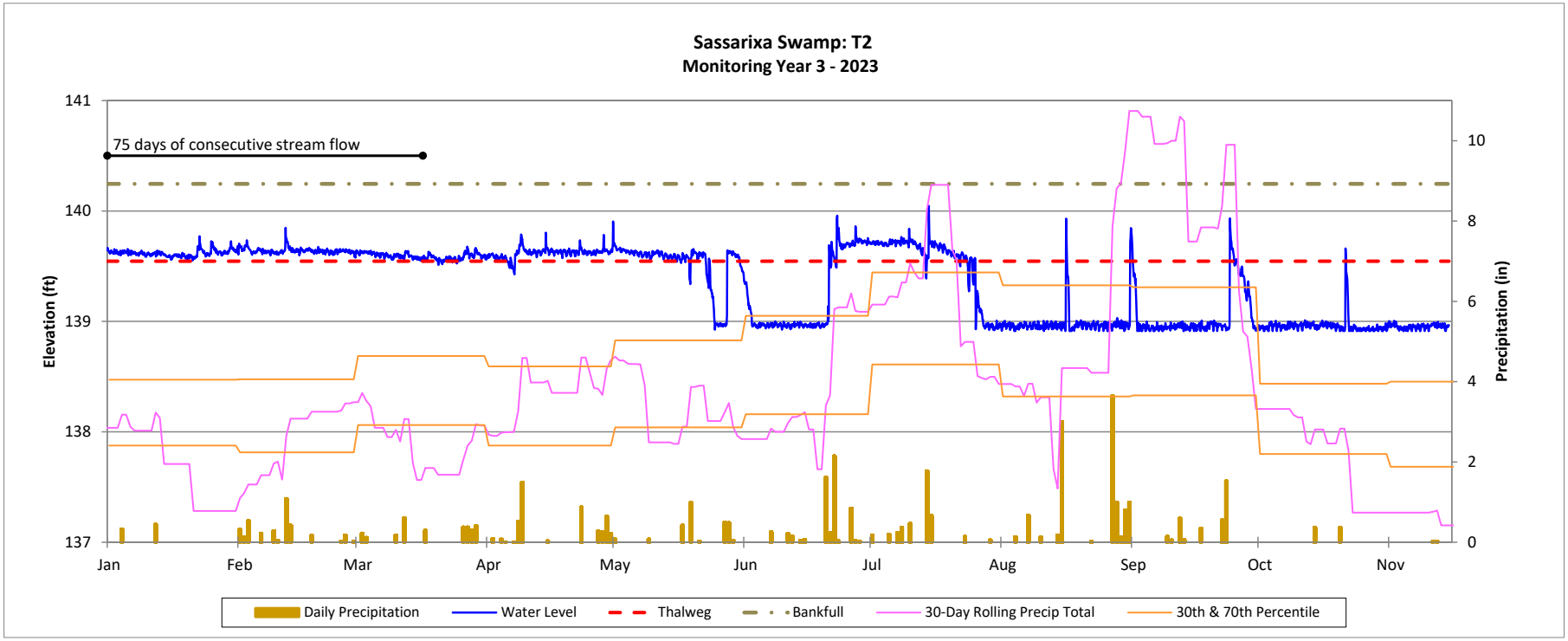
Recorded In-Stream Flow Events Plot

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023



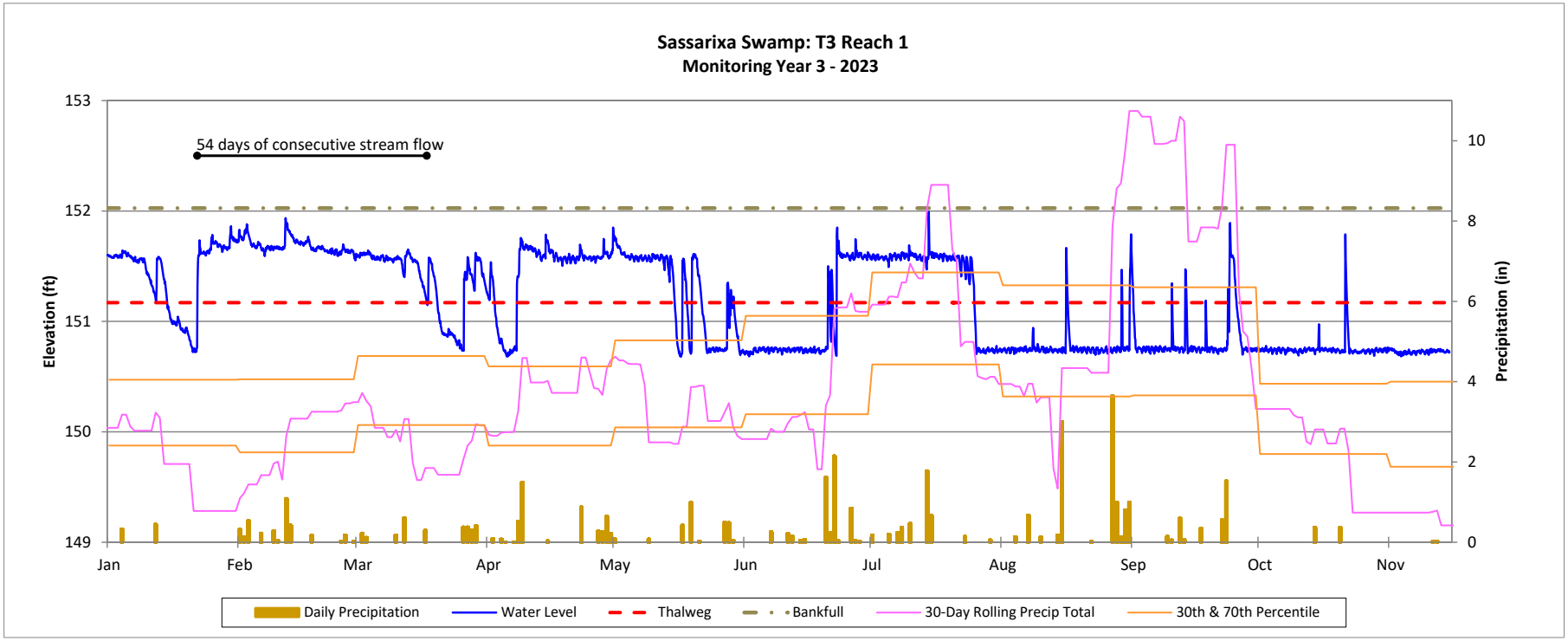
Recorded In-Stream Flow Events Plot

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023



Recorded In-Stream Flow Events Plot

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023



APPENDIX E. Project Timeline and Contact Info

Table 14. Project Activity and Reporting History

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

Activity or Deliverable		Data Collection Complete	Task Completion or Deliverable Submission
Project Instituted		NA	January 2018
Mitigation Plan Approved		NA	November 2019
Construction (Grading) Completed		NA	January 2021
Planting Completed		NA	March 2021
As-Built Survey Completed		NA	Febuary 2021
Baseline Monitoring Document (Year 0)	Stream Survey	January 2021	April 2021
	Vegetation Survey	March 2021	
	Easement Encroachment	July 2021	
	In-Stream Vegetation Treatment	September 2021	
Year 1 Monitoring	Stream Survey	July 2021	December 2021
	Vegetation Survey	September 2021	
Year 2 Monitoring	Supplemental Planting	February 2022	December 2022
	Stream Survey	March 2022	
	Invasive Species Treatment	March - July 2022	
	Vegetation Survey	September 2022	
Year 3 Monitoring	Supplemental Planting	February 2023	December 2023
	Stream Survey	March 2023	
	Sweetgum & Loblolly Thinning	May 2023	
	Invasive Species Treatment	May 2023	
	Instaled XS 11	May 2023	
	Sediment Removal Along T2	June 2023	
	Vegetation Survey	September 2023	
Year 4 Monitoring			December 2024
Year 5 Monitoring	Stream Survey	2025	December 2025
	Vegetation Survey	2025	
Year 6 Monitoring			December 2026
Year 7 Monitoring	Stream Survey	2027	December 2027
	Vegetation Survey	2027	

Table 15. Project Contact Table

Sassarixa Swamp Mitigation Site
DMS Project No. 100040
Monitoring Year 3 - 2023

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

APPENDIX F. Additional Documentation

MEETING MINUTES

MEETING: MY2 IRT Site Visit
Sassarixa Swamp Mitigation Site
Neuse River Basin 03020201; Johnston County, NC
NCDMS Project No. 100040
USACE ID: SAW-2018-00432
NCDEQ Contract No. 7425

DATE: *On-site Meeting:* Thursday, May 18, 2023
Meeting Notes Distributed: Friday, May 19, 2023

Attendees
Kim Browning, USACE
Casey Haywood, USACE
Jeremiah Dow, NC Division of Mitigation Services
Emily Dunnigan, NC Division of Mitigation Services
Angela Allen, Wildlands Engineering
Carolyn Lanza, Wildlands Engineering
Andrew Radecki, Wildlands Engineering

Meeting Notes

- T2
  - The upper third of T2 has sediment accumulated in the channel due to erosion from the valely side slopes during construction. The IRT is concerned this segment will eventually trend towards a linear wetland. Wildlands will install one riffle cross-section along the upper third of T2 to show signs of stream stability. After the cross-section is installed and surveyed, Wildlands will remove the instream vegetation and sediment deposition from the erosion and then continue to monitor the cross-section in subsequent monitoring years. Wildlands will also plant several container trees in the current bare areas around the BMP to prevent further erosion.
  - The IRT gave suggestions that in future areas where rock is utilized to stabilize an erosive slope that it's preferable that rock be more embedded into the ground.
  - The IRT is not concerned with flow along T2 and a flow gauge is not needed in the upper third of the stream.
- T3
  - Wildlands will manually repair the one log sill that was piping.
  - Overall, the IRT was happy with the stability of T3.
- Vegetation

- Overall, the IRT was happy with the vegetation being established across the Site. The IRT would like Wildlands to be mindful of the area surrounding Vegetation Plot 2, since that was the only plot not meeting MY3 success criteria.