YEAR 5 ANNUAL MONITORING REPORT
FINAL
Year 6 Post Planting
UT to Falls Lake (McDaniel Farm)
Riparian Buffer and Nutrient Offset Mitigation Project
Durham County, North Carolina
NC Division of Mitigation Services Project #: 95389

Neuse River Basin
03020201

DWR #: 2015-0634

Mitigation Services
ENVIRONMENTAL QUALITY

Prepared for and by:
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Division of Mitigation Services
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Appendices

1.0 PROJECT SUMMARY

NC Division of Mitigation Services (DMS) implemented the **UT to Falls Lake (McDaniel Farm) Project** (Project) to fulfill riparian buffer mitigation needs in the Neuse 03020201 Catalog Unit and nutrient offset mitigation needs in the Upper Falls Lake Watershed in accordance with the NC Division of Water Resources (DWR) Temporary Buffer Mitigation Rule (15A NCAC 02B .0295) effective October 24, 2014.

This project site is located off Benny Ross Road in Durham County approximately 7.5 miles east of the City of Durham and is within the Upper Falls Lake Watershed (Appendix B, Figure 1). The site is within the Lick Creek watershed (HU 3020201050030) which is comprised of sub-watersheds draining to Lick Creek, its tributary Rocky Branch, Laurel Creek, and unnamed tributaries to Falls Lake. Falls Lake is a drinking water supply watershed with additional nutrient restrictions regulated by the North Carolina Division of Water Resources. The site is in NC DWR's 03-04-01 sub-basin.

Riparian buffer mitigation activities occur along the Project from top of bank and extending out to 200 feet, resulting in a maximum of 9.67 acres (421,385 ft^2) of riparian buffer and/or nutrient offset mitigation through planting and preservation of 10.86 acres of forested buffer easement along the main unnamed tributary to Falls Lake and several water conveyances that flow to UT to Falls Lake. Refer to Appendix A, Table 1 for project mitigation components and Appendix B, Figure 2 for the project component/asset map. Due to the site's location within the Upper Falls Lake Watershed, nutrient offset mitigation from this site can only be provided to offset impacts from development within the Falls Lake Watershed. In addition, riparian buffer mitigation from this site can be used to offset permitted impacts according to the Temporary Rule (15A NCAC 02B .0295) effective October 24, 2014.

The following goals of this riparian buffer/nutrient offset mitigation project are to address stressors identified in the Project watershed through the restoration of riparian buffers along the UT and its conveyances.

- Removing nonpoint sources of pollution associated with agricultural activities
- Reducing sedimentation onsite and downstream

The success of these goals are based on the following objectives;

- Removal of horses and goats from riparian areas;
- Reducing the application of agricultural materials into and adjacent to streams;
- Establishing a vegetative buffer adjacent to streams to treat surface runoff, which may contain pollutants such as sediment and/or agricultural pollutants from the adjacent landscape;
- Reducing bank erosion associated with a lack of vegetative cover; and
- Planting a diverse hardwood vegetative buffer adjacent to Site tributaries.

Project restoration activities were completed in March 2016. Refer to Appendix A, Tables 2, 3 and 4 for detailed project activity, reporting history, project contact information and project baseline information and attributes.

Directions to the Project from Raleigh: Take US 70 West/Glenwood Avenue toward Durham. Turn Right on NC 50 North/Creedmoor Road. Exit onto NC 98 West. Turn Right onto Southview Road and follow to T intersection. Turn Right onto Baptist Road. Turn right onto Benny Ross Road Site. Travel approximately 0.3 mile to gate on the left. Access is by foot through the gate and 50 ft. access easement See Appendix D, As-Built Sheets). Coordinates: 35.998142, -78.742794

2.0 PERFORMANCE STANDARDS

Performance standards were established for native forest development and diffuse flow through the riparian buffer in accordance with DWR's Administrative Code 15A NCAC 02B.0295 (Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers) (NCDWR 2014 Temporary Rule). Performance standards are dependent upon the density and survival of characteristic forest species. After five years of monitoring, an average density of 260 woody stems per acre must be surviving and diffuse flow maintained.

3.0 MONITORING PLAN

3.1 Reporting

Annual monitoring data will be reported following DMS's Riparian Buffer and Nutrient Offset Buffer Annual Monitoring Report Template (ver. 1.0) dated Feb. 2, 2014. The monitoring report shall provide a project data chronology and assist in decision making regarding project close-out. The following table outlines monitoring requirements and parameters for this project.

Required	Parameter	Quantity	Frequency	Notes
Yes	Vegetation	Quantity and location of vegetation plots will be determined by Division of Mitigation Services	Annual	Vegetation will be monitored for a period of five years or until success criteria are met. During years 2, 3 and 5 random plots will be used. Visual monitoring of the site will be done all five years
Yes	Project boundary		Annual	Locations of fence damage, vegetation damage, boundary encroachments, etc. will be mapped

3.2 Vegetation Monitoring

To monitor the vegetation at this site, the NC Division of Mitigation Services will use a combination of visual monitoring and random vegetation plots. Visual monitoring will be conducted during all five years of monitoring to assess vegetative cover, diffuse flow and easement integrity. DMS will monitor ten (10) rotating, random 1,500 square foot vegetation plots in years 2, 3, and 5 to assess vegetative success representative of the entire mitigation area from top of bank to 200 feet from each tributary/conveyance. These ten (10) plots will provide coverage of 3% of the site each year used. In each sample plot, monitoring parameters will include species composition and density. As it was done for the baseline data collection, the vegetation plots will be randomly selected using a grid and random number generator or similar method for each of the monitoring years 2, 3 and 5. Visual observations of the percent cover of shrub and herbaceous species, diffuse flow and easement integrity will be documented by photograph and site visits.

Monitoring of site restoration efforts will be performed for five years or until performance standards are met. The first annual monitoring assessment (MY1) was completed in the fall of 2016. The vegetation will be monitored for a total of five years, with the final monitoring activities concluding in 2021. The close-out for the Project will be conducted in 2022 given that the performance criteria has been met.

4.0 MAINTENANCE AND CONTINGENCY PLAN

DMS shall monitor the site and conduct a physical inspection of the site a minimum of once per year throughout the post-construction monitoring period until performance standards are met. These site inspections may identify site components and features that require routine maintenance. Routine maintenance should be expected most often in the first two years following site construction and may include the following:

Component/Feature	Maintenance through project close-out	Remedial Measures
Vegetation	Vegetation shall be maintained to ensure survival. Routine vegetation maintenance and repair activities may include supplemental planting. The site will also be evaluated to ensure diffuse flow is still occurring.	Any remedial activities performed will be documented in the annual monitoring reports.
Site Boundary	Site boundaries shall be identified in the field to ensure clear distinction between the mitigation site and adjacent properties. Boundaries may be identified by fence, marker, bollard, post, tree-blazing, or other means as allowed by site conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as needed basis.	Any remedial activities performed will be documented in the annual monitoring reports.

5.0 YEAR 5 MONITORING

Based on the results of Year 2 annual monitoring, and DMS's efforts to contract with a new planting contractor to replant the Project and treat invasive vegetation, DMS did not conduct annual monitoring in 2018. The replanting of the site was completed in late February 2019. A list of species planted during the replant of the site is provided in Appendix C. Invasive treatments were last completed in August 2021. Species treated included Lespedeza. Additional treatment will be done as needed.

Year 5 annual monitoring (MY5) was conducted in November 2021. MY5 monitoring activities included stem counts using ten (10) rotating, random 1,200 square foot vegetation plots. Other monitoring activities included visual monitoring of the project verifying the presence or absence of invasive species; checking the integrity of the easement and fencing; and taking photographs at the established photo points.

Three (3) of the ten (10) transects met the success criteria of 260 stems per acre for planted stems. Four (4) of the plots that did not meet the 260 stem/acre success criteria had 254 stems/acre. In addition, monitoring was not performed in 2018 so this was the 6th year of monitoring activities since planting the site, and one would expect the stems/acre to continue to decrease as trees mature and outcompete other planted stems. With volunteer species counted (excluding Loblolly pine)

every veg transect except VT2 would meet the 260 stems/acre success criteria with densities ranging from 182 stems/acre (VT2) to 835 stems/acre (VT8 & VT9). The average across the site with volunteers minus Loblolly is 541 stems/acre. Please see Appendix C for veg tables.

The fence installed along the easement boundary is functioning as intended and all installed signage is still in place.

DMS secured a new planting contractor, TerraVista Landscape Management (TerraVista), to treat invasive vegetation and replant approximately 3.27 acres of low stem density area within the easement. TerraVista began the supplemental planting on December 16, 2020 and completed the work on January 4, 2021. To maximize survivability of stems in the poor site soils, TerraVista dug 10" deep holes by hand with shovels and backfilled with 50/50 mix. Planted stems were at least 24" in height and 0.5" in caliper size. Planted species included Persimmon (*Diospyros virginiana*) and Sycamore (*Platanus occidentalis*). TerraVista was contracted to conduct independent, random vegetation transect monitoring to ensure survival of at least 300 stems per acre in the supplemental planting zones. The results of TerraVista's 2021 monitoring are included in Appendix C.

TerraVista collected random veg transect (ten 100m^2 plots) data within the areas that were replanted in 2020/2021 (Appendix C). Results of the TerraVista transect data indicate that the replanted areas were well above the final success criteria and averaged 996 planted stems/acre. However, the TerraVista data was collected in July of 2020 while the DMS random veg transect data was collected four (4) months later in November. DMS data indicates far fewer stems/acre indicating potentially high stem mortality between summer and late fall. Data collected in 2021 by TerraVista and DMS will further clarify how the latest supplemental planting area is performing.

APPENDIX A

BACKGROUND TABLES

Table 1: Project Mitigation Components
UT to Falls Lake (McDaniel Farm) DMS Project #95389

Mitigation Components*										
Project Component	Existing Buffer SF	Restored Buffer SF	Creditable Buffer SF	Restortion Level	Mitigation Ratio (X:1)	Riparian Buffer Mitigation Credits (SF)		Nutrient Offset Credits Nitrogen (lbs)	Nutrient Offset Credits Phosphous (lbs)	Notes/Comments
Buffer										
Riparian Buffer TOB-50' (Reaches A1, A2 & B) Subject Rural	0	49,393	49,393	R	1	49,393	**OR**	2,577.48	166.00	Restored riparian buffer for buffer or Nutrient Offset credit
Riparian Buffer 51-100' (Reaches A1, A2 & B) Subject Rural	0	82,083	82,083	R	1	82,083	**OR**	4,283.35	275.87	Restored riparian buffer for buffer or Nutrient Offset credit
Riparian Buffer 101-200' (Reaches A1, A2 & B) Subject Rural	0	149,557	149,557	R	1			7,804.36	502.64	Restored riparian buffer for Nutrient Offset credit only
Riparian Buffer TOB-200' Non-Subject Rural	0	72,392	72,392	R	1			3,777.65	243.30	Restored riparian buffer for Nutrient Offset credit only
Riparian Buffer TOB-100' (Reaches A1, A2 & B) Subject Rural	64,826	0	64,826	P	10	6,483				Preserved Riparain Buffer for Buffer Credit only
Riparian Buffer 101-200' (Reach A2) Subject Rural	3,134	0	3,134	P	20	157				Preserved Riparian Buffer for Buffer Credit only. Area in this zone is less than 10% of total Buffer Mitigation area. 20:1 ratio = 10:1 factoring in 50% reduction for preservation on a Subject Non-Urban stream.
		Totals	**421,385**			**138,115**		**18,442.85**	**1,187.82**	
*All assets and credits generated in accordance withDWR Temporary Buffer Mitigation Rule (15A NCAC 02B .0295) effective October 24, 2014.										

Length and Area Summations by Mitigation Category					
	Stream	Riparian Wetland		Non-riparian Wetland	Creditable Buffer
Restoration Level	(linear feet)	(acres)		(acres)	(square feet)
		Riverine	Non-Riverine		
Restoration					353,425
Enhancement					
Enhancement I					
Enhancement II					
Creation					
Preservation					67,960
High Quality Pres					

Overall Assets Summary	
Asset Category	**Overall Credits**
Buffer[1]	**138,115**
Nutrient Offset Nitrogen (lbs/ac/30 yr)	**18,442.85**
Nutrient Offset Phosphorus (lbs/ac/30 yr)	**1,187.82**

[1] Pursuant to 15A NCAC 02B .0295(n)(1) (2014 Temporary Rule), buffer mitigation credit used for buffer credit will not be used for nutrient offset credit

Table 2. Project Activity and Reporting History
UT to Falls Lake (McDaniel Farm) DMS Project #95389

Activity or Deliverable	Data Collection Complete	Completion or Delivery
Institution Date	NA	Jun-13
404 permit date	NA	NA
Restoration Plan	Jul-15	Sep-15
Final Design – Construction Plans	Jul-15	Sep-15
Construction	NA	Mar-16
Planting	Mar-16	Mar-16
Mitigation Plan / As-built (Year 0 Monitoring – baseline)	May-16	Jun-16
Year 1 Monitoring	Oct-16	Oct-16
Year 2 Monitoring	Oct-17	Oct-17
Invasive Treatment	NA	Oct-19
Site Replant	NA	Feb-19
Invasive Treatment	NA	Jun-19
Year 3 Monitoring	Sep-19	Sep-19
Year 4 Monitoring	Aug-20	Aug-20
Year 5 Monitoring		

Table 3. Project Contacts Table
UT to Falls Lake (McDaniel Farm) DMS Project #95389

Designer	**NC Division of Mitigation Services**
	217 W Jones Street, Raleigh, NC 27603
Jeff Schaffer, DMS	(919) 707-8308
Construction Contractor	**Wright Contracting, LLC**
	PO Box 545, Siler City, NC 27344
Andrew Dimmette	(704) 219-0486
Initial Planting Contractor	**Bruton Natural Systems, Inc.**
	PO Box 1197, Fremont, NC 27830
Charlie Bruton	(919) 242-6555
Supplemental Planting & Invasive Contractor	**Terravista Landscape Management**
	7213 Becky Cir., Raleigh, NC 27615
Jennifer Barnhill	(919) 791-7840
Monitoring Performers	**NC Division of Mitigation Services**
	217 W Jones Street, Raleigh, NC 27603
Jeremiah Dow, DMS	(919) 707-8308

Table 4: Project Attributes Table

UT to Falls Lake (McDaniel Farm) DMS Project #95389

Project Information			
Project Name	UT to Falls Lake (McDaniel Farm)		
County	Durham		
Project Area (acres)	10.86		
Project Coordinates (latitude and longitude)	35.998142, -78.742794		
Planted Acreage (Acres of Woody Stems Planted)	10.86		
Project Watershed Summary Information			
Physiographic Province			
River Basin	Neuse		
USGS Hydrologic Unit 8-digit 3020201	USGS Hydrologic Unit 14-digit	03020201050030	
DWR Sub-basin	03-04-01		
Project Drainage Area (acres)	21.5		
Project Drainage Area Percentage of Impervious Area	< 5%		
CGIA Land Use Classification	Majority Forested, some pasture		
Regulatory Considerations			
Parameters	**Applicable?**	**Resolved?**	**Supporting Docs?**
Water of the United States - Section 404	No		
Water of the United States - Section 401	No		
Endangered Species Act	No		
Historic Preservation Act	No		
Coastal Zone Management Act (CZMA or CAMA)	No		
FEMA Floodplain Compliance	No		
Essential Fisheries Habitat	No		

APPENDIX B

VISUAL ASSESSMENT DATA

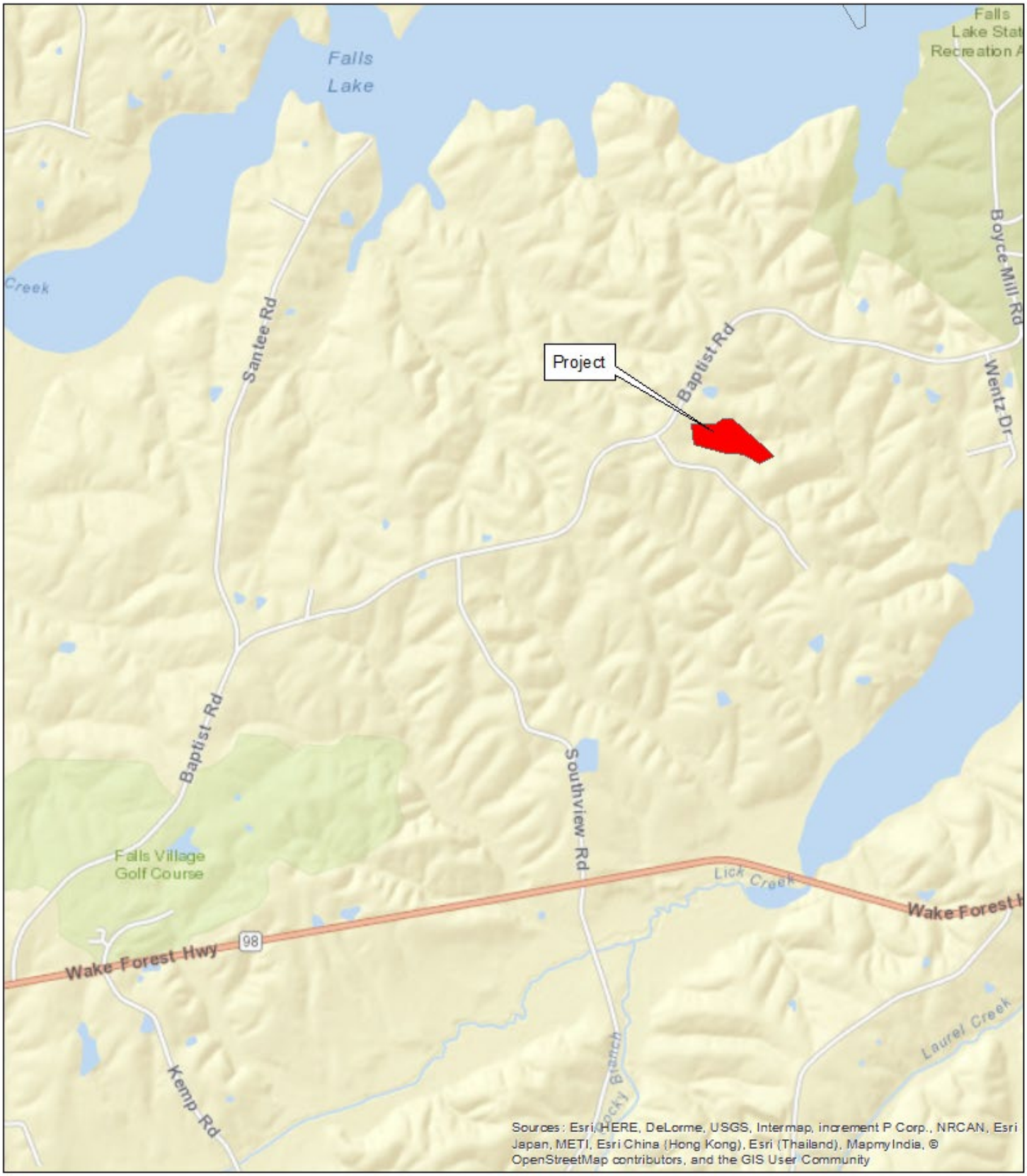
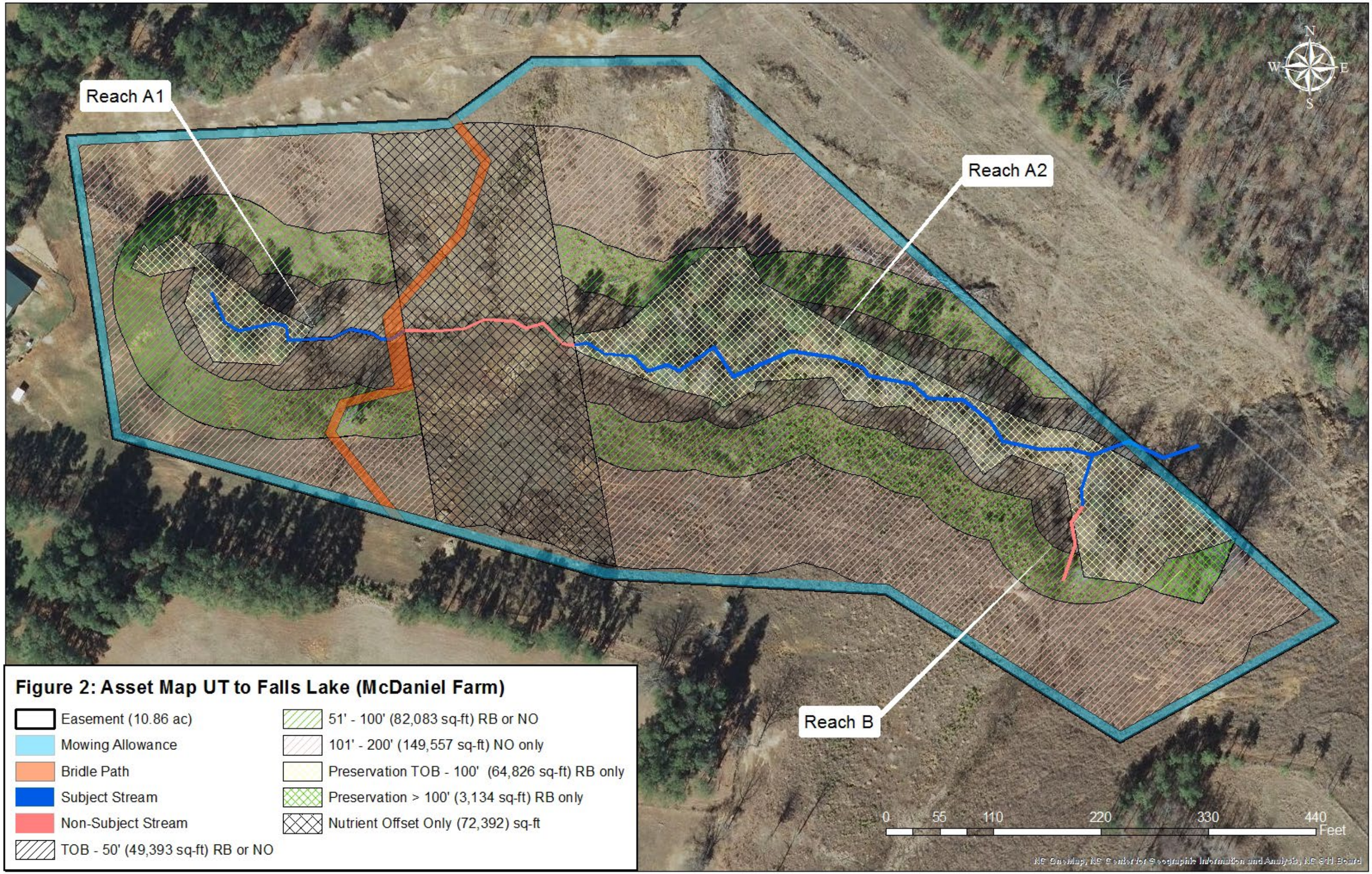
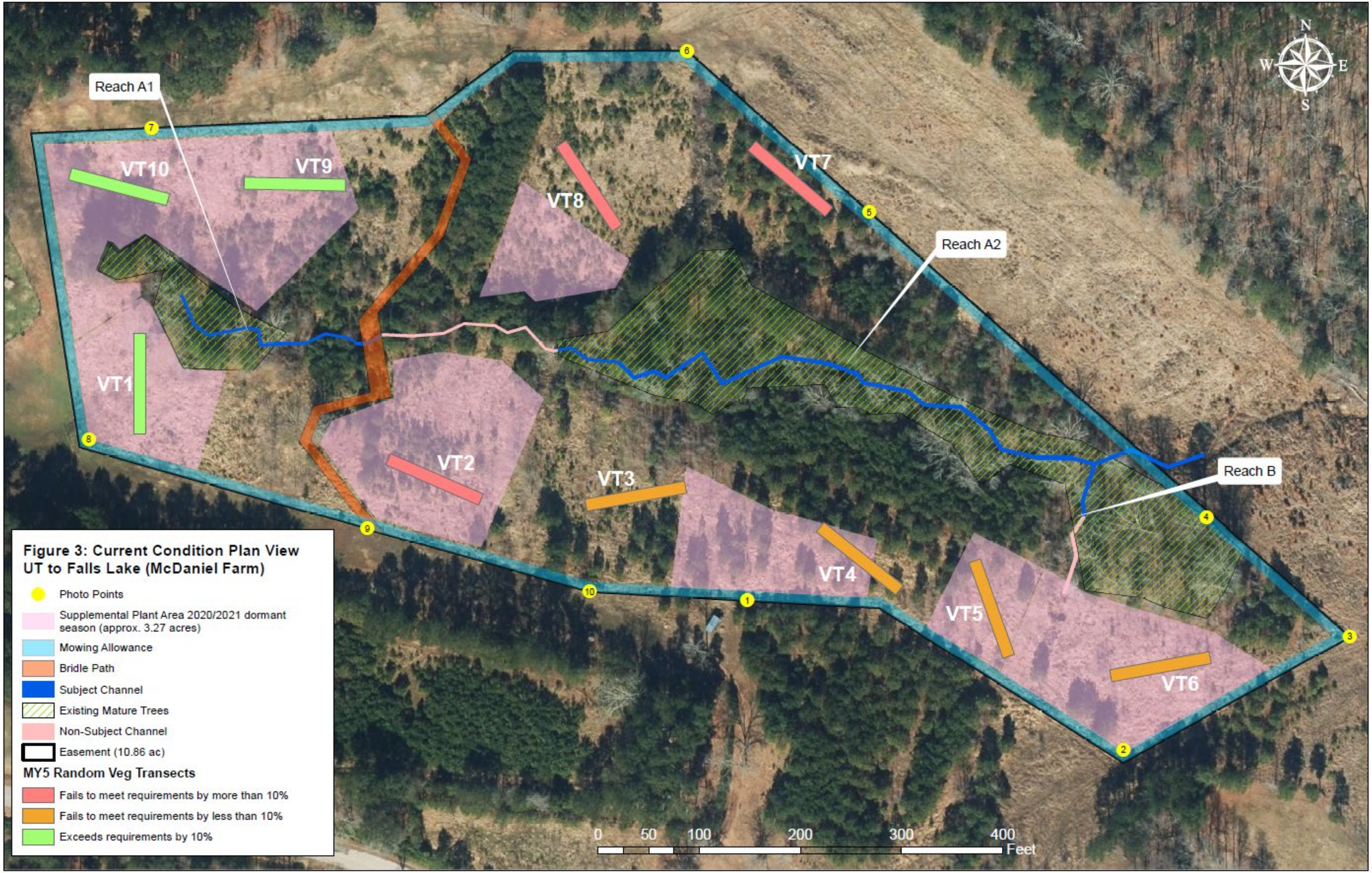


FIGURE 1
Project Location Map
UT TO FALLS LAKE (McDANIEL FARM)
Durham County, NC

0 0.25 0.5 0.75 1 Miles

N W E S


Reach A1
Reach A2
Reach B
N
W
E
S
0
55
110
220
330
440
Feet
NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board
Figure 2: Asset Map UT to Falls Lake (McDaniel Farm)
Easement (10.86 ac)
Mowing Allowance
Bridle Path
Subject Stream
Non-Subject Stream
TOB - 50' (49,393 sq-ft) RB or NO
51' - 100' (82,083 sq-ft) RB or NO
101' - 200' (149,557 sq-ft) NO only
Preservation TOB - 100' (64,826 sq-ft) RB only
Preservation > 100' (3,134 sq-ft) RB only
Nutrient Offset Only (72,392) sq-ft


Reach A1
Reach A2
Reach B
VT1
VT2
VT3
VT4
VT5
VT6
VT7
VT8
VT9
VT10
N
W
E
S
0 50 100 200 300 400
Feet
Figure 3: Current Condition Plan View
UT to Falls Lake (McDaniel Farm)
Photo Points
Supplemental Plant Area 2020/2021 dormant season (approx. 3.27 acres)
Mowing Allowance
Bridle Path
Subject Channel
Existing Mature Trees
Non-Subject Channel
Easement (10.86 ac)
MY5 Random Veg Transects
Fails to meet requirements by more than 10%
Fails to meet requirements by less than 10%
Exceeds requirements by 10%

Site Photos

Photo Point 1

Photo Point 1

Photo Point 1

Photo Point 2

Photo Point 2

Photo Point 3

Photo Point 3

Photo Point 3

Photo Point 4

Photo Point 4

Photo Point 4

Photo Point 5

Photo Point 5

Photo Point 5

Photo Point 6

Photo Point 6

Photo Point 6

Photo Point 7

Photo Point 7

Photo Point 7

Photo Point 8

Photo Point 8

Photo Point 8

Photo Point 9

Photo Point 9

Photo Point 9

Photo Point 10

Photo Point 10

Photo Point 10

Table 5: Vegetation Condition Assessment
UT to Falls Lake (McDaniel Farm) DMS Project #95389
Planted Acreage **10.86**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	Pattern and Color	0	0.00	0.0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres	Pattern and Color	4	2.01	18.5%
			Total	4	0.00	0.0%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acres	Pattern and Color	0	0.00	0.0%
			Cumulative Total	4	2.01	18.5%

Easement Acreage **10.86**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Easement Acreage
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	1000 SF	Pattern and Color	0	0.00	0.0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	Pattern and Color	0	0.00	0.0%

1 = Enter the planted acreage within the easement. This number is calculated as the easement acreage minus any existing mature tree stands that were not subject to supplemental planting of the understory, the channel acreage, crossings or any other elements not directly planted as part of the project effort.

2 = The acreage within the easement boundaries.

3 = Encroachment may occur within or outside of planted areas and will therefore be calculated against the overall easement acreage. In the event a polygon is cataloged into items 1, 2 or 3 in the table and is the result of encroachment, the associated acreage should be tallied in the relevant item (i.e., item 1,2 or 3) as well as a parallel tally in item 5.

4 = Invasives may occur in or out of planted areas, but still within the easement and will therefore be calculated against the overall easement acreage. Invasives of concern/interest are listed below. The list of high concern spcies are those with the potential to directly outcompete native, young, woody stems in the short-term (e.g. monitoring period or shortly thereafter) or affect the community structure for existing, more established tree/shrub stands over timeframes that are slightly longer (e.g. 1-2 decades). The low/moderate concern group are those species that generally do not have this capacity over the timeframes discussed and therefore are not expected to be mapped with regularity, but can be mapped, if in the judgement of the observer their coverage, density or distribution is suppressing the viability, density, or growth of planted woody stems. Decisions as to whether remediation will be needed are based on the integration of risk factors by EEP such as species present, their coverage, distribution relative to native biomass, and the practicality of treatment. For example, even modest amounts of Kudzu or Japanese Knotweed early in the projects history will warrant control, but potentially large coverages of Microstegium in the herb layer will not likley trigger control because of the limited capacities to impact tree/shrub layers within the timeframes discussed and the potential impacts of treating extensive amounts of ground cover. Those species with the "watch list" designator in gray shade are of interest as well, but have yet to be observed across the state with any frequency. Those in *red italics* are of particular interest given their extreme risk/threat level for mapping as points where isolated specimens are found, particularly ealry in a projects monitoring history. However, areas of discreet, dense patches will of course be mapped as polygons. The symbology scheme below was one that was found to be helpful for symbolzing invasives polygons, particulalry for situations where the conditon for an area is somewhere between isolated specimens and dense, discreet patches. In any case, the point or polygon/area feature can be symbolized to describe things like high or low concern and species can be listed as a map inset, in legend items if the number of species are limited or in the narrative section of the executive

APPENDIX C

Vegetation Plot Data

DMS MY5 Random Veg Transects

Table 6a: Planted Tree Species
UT to Falls Lake (McDaniel Farm) DMS Project #95389

Scientific Name	Common Name	Number Planted	% of Total
Acer rubrum	Red Maple	1,000	17.5%
Fraxinus pennsylvanica	Green Ash	1,000	17.5%
Platanus occidentalis	Sycamore	1,000	17.5%
Betula nigra	River birch	1,000	17.5%
Ulmus americana	American Elm	1,000	17.5%
Hamamelis virginiana	Witch hazel	700	12.3%
Total		**5,700**	**100%**

Table 6b: Supplemental Planted Tree Species (2018)

Scientific Name	Common Name	Number	% of
Liriodendron tulipefera	Tulip poplar	700	15.6%
Fraxinus pennsylvanica	Green Ash	700	15.6%
Platanus occidentalis	Sycamore	600	13.3%
Betula nigra	River birch	600	13.3%
Diosypros virginiana	Persimmon	600	13.3%
Nyssa sylvatica	Black gum	600	13.3%
Cercis Canadensis	Red bud	700	15.6%
Total		**4,500**	**100.0%**

Table 6c: Supplemental Planted Tree Species (Dec. 2020)

Scientific Name	Common Name	% of
Platanus occidentalis	Sycamore	50.0%
Diosypros virginiana	Persimmon	50.0%

Table 7: Planted and Total Stems - MY4
UT to Falls Lake (McDaniel Farm) DMS Project #95389

			Current Year (MY5)																				Annual Means											
			VT1		VT2		VT3		VT4		VT5		VT6		VT7		VT8		VT9		VT10		MY5 (2021)		MY4 (2020)		MY3 (2019)		MY2 (2017)		MY1 (2016)		MY0 (2016)	
Scientific Name	Common Name	Type	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T
Acer rubrum	Red Maple	Tree																											2	2	3	3	26	26
Fraxinus pennsylvanica	Green Ash	Tree									1	1											1	1	3	3	13	13	7	7	3	3	24	24
Platanus occidentalis	Sycamore	Tree	6	6	1	1	2	2	6	6	1	1					3	3	7	7	8		34	26	20	20	18	18	12	12	25	25	26	26
Betula nigra	River birch	Tree																									13	13	5	5	24	24	32	32
Ulmus americana	American Elm	Tree							1						1	1							2	1	9	9	9	9	6	6	17	17	35	35
Hamamelis virginiana	Witch hazel	Tree																									43	43	9	9	19	19	28	28
Liriodendron tulipefera	Tulip poplar	Tree																																
Diosypros virginiana	Persimmon	Tree	2	2	1	1					4	4	1	1	1	1							9	9	28	28	14	18						
Nyssa sylvatica	Black gum	Tree					5	5			1	1	6	6	2	2	1	1	9	9			24	24	47	47								
Cercis Canadensis	Red bud	Tree																																
Pinus taeda	Loblolly pine	Tree		4		25		26		4		3		18		16		25		27		22		170		217		165		81		46		29
Liquidambar styraciflua	Sweet gum	Tree		1		2		6		2		3		8		16		18		12		2		70		36		62		85		64		38
Salix nigra	Black Willow	Tree																														2		
Chamaecyparis thyoides	Atlantic White Cedar	Tree		1		1		1		1						2		1		2				9		4		2		2		1		
Quercus spp.	Oak	Tree																								1				1		1		
	Unknown	Tree														1								1		1				4		8		1
Stem count			8	14	2	30	7	40	7	13	7	13	7	33	4	39	4	48	16	57	8	24	70	311	107	366	110	343	41	214	91	213	171	239
Plot size (acres)			0.028		0.028		0.028		0.028		0.028		0.028		0.028		0.028		0.028		0.028		0.275		0.344		0.344		0.344		0.344		0.344	
Species Count			2	5	2	5	2	5	2	4	4	6	2	4	3	7	2	5	2	5	1	2	5	9	5	10	6	9	6	11	6	12	6	9
Stems per ACRE			290	508	73	1,089	254	1,452	254	472	254	472	254	1,198	145	1,416	145	1,742	581	2,069	290	871	254	1,129	311	1,064	319	996	119	621	264	618	581	1016

Type = Tree, Shrub, Livestake
P = Planted
T = Total

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

Warranty Inspection Report

TerraVista Landscape Management, LLC

July 2, 2021

Transect 1

Species	Existing	New
Maple		
Sycamore	15	18
Willow		
Loblolly Pine	20	
Short Needle Pine	2	
Sweet Gum	2	
Cedar	1	
Elm		
Persimmon		2

Transect 2

Species	Existing	New
Maple	2	
Sycamore	10	15
Willow		
Loblolly Pine	29	
Short Needle Pine		
Sweet Gum		
Cedar	3	
Elm	4	
Persimmon		1

Transect 3

Species	Existing	New
Maple	4	
Sycamore	3	8
Willow	1	
Loblolly Pine	8	
Short Needle Pine		
Sweet Gum		
Cedar	1	
Elm	2	
Persimmon		2

Transect 4

Species	Existing	New
Maple	1	
Sycamore	10	11
Willow	1	
Loblolly Pine	24	
Short Needle Pine	1	
Sweet Gum	1	
Cedar	2	
Elm	1	
Persimmon		1

Warranty Inspection Report

TerraVista Landscape Management, LLC

July 2, 2021

Transect 5

Species	Existing	New
Maple		
Sycamore	3	9
Willow		
Loblolly Pine	2	
Short Needle Pine		
Sweet Gum	2	
Cedar	2	
Elm		
Persimmon		2

Transect 6

Species	Existing	New
Maple	5	
Sycamore	8	10
Willow		
Loblolly Pine	16	
Short Needle Pine	4	
Sweet Gum	6	
Cedar	3	
Elm	4	
Persimmon		1

Transect 7

Species	Existing	New
Maple		
Sycamore		7
Willow		
Loblolly Pine	5	
Short Needle Pine		
Sweet Gum		
Cedar		
Elm	1	
Persimmon		3

Transect 8

Species	Existing	New
Maple	5	
Sycamore	8	13
Willow		
Loblolly Pine	23	
Short Needle Pine	4	
Sweet Gum	3	
Cedar	6	
Elm	4	
Persimmon	3	4

Warranty Inspection report

TerraVista Landscape Management, LLC

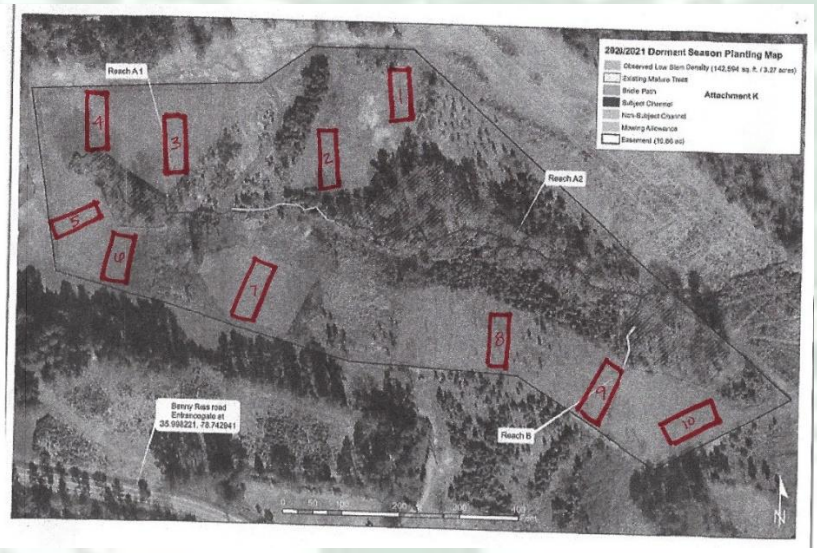
July 2, 2021

Transect 9

Species	Existing	New
Maple	1	
Sycamore	5	16
Willow		
Loblolly Pine	17	
Short Needle Pine	2	
Sweet Gum		
Cedar		
Elm		
Persimmon		7

Transect 10

Species	Existing	New
Maple		
Sycamore	3	15
Willow		
Loblolly Pine	9	
Short Needle Pine		
Sweet Gum		
Cedar		
Elm	3	
Persimmon		4



NC DEQ Bid# 16-UTF-20200914

Supplemental Planting, Warranty & Invasive Mgmt for UT to Falls Lake (McDaniel Farm) – DMS #95389

07-19-2021

*All transects were approximately 100 sq meters. Stem p/acre density has been achieved and on target according to RFP.

WARRANTY INSPECTION REPORT - TerraVista Landscape Management, LLC

UT to Falls Lake (McDaniel Farm) DMS Project #95389

			Current Year (MY5)																				Annual Means	
			VT1		VT2		VT3		VT4		VT5		VT6		VT7		VT8		VT9		VT10		MY5 (2021)	
Scientific Name	Common Name	Type	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T
Acer rubrum	Red Maple	Tree			2	2	4	4	1	1			5	5			5	5	1	1			18	18
Fraxinus pennsylvanica	Green Ash	Tree																						
Platanus occidentalis	Sycamore	Tree	33	33	25	25	11	11	21	21	12	12	18	18	7	7	21	21	21	21	18	18	187	187
Betula nigra	River birch	Tree																						
Ulmus americana	American Elm	Tree			4	4	2	2	1	1			4	4	1	1	4	4			3	3	19	19
Hamamelis virginiana	Witch hazel	Tree																						
Liriodendron tulipefera	Tulip poplar	Tree																						
Diosypros virginiana	Persimmon	Tree	1	1	1	1	2	2	1	1	2	2	1	1	3	3			7	7	4	4	22	22
Nyssa sylvatica	Black gum	Tree																						
Cercis Canadensis	Red bud	Tree																						
Pinus taeda	Loblolly pine	Tree		20		29		8		24		2		16		5		23		17		9		153
Liquidambar styraciflua	Sweet gum	Tree		2						1		2		6				3						14
Salix nigra	Black Willow	Tree																						
Chamaecyparis thyoides	Atlantic White Cedar	Tree		1		4		1		2		2		3				6						19
Quercus spp.	Oak	Tree																						
	Unknown	Tree		2				1		2				4				4		2				15
		Stem count	34	59	32	65	19	29	24	53	14	20	28	57	11	16	30	66	29	48	25	34	246	447
		Plot size (acres)	0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.247	
		Species Count	2	6	4	6	4	7	4	8	2	5	4	8	3	4	3	7	3	5	3	4	4	8
		Stems per ACRE	1,376	2,388	1,295	2,630	769	1,174	971	2,145	567	809	1,133	2,307	445	647	1,214	2,671	1,174	1,942	1,012	1,376	996	1,809

Type = Tree, Shrub, Livestake
P = Planted
T = Total

Color for Density

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