

MONITORING YEAR 1 ANNUAL REPORT

Final

Running Dog Mitigation Site

Union County, NC
NCDEQ Contract No. 210202-01
DMS ID No. 100210
DWR No. 2022-0550v1

Yadkin River Basin
Goose Creek Watershed
HUC 03040105

RFP #:16-20200302 (Issued 12/1/2020)

Data Collection Period: August 2023 - October 2023
Final Submission Date: December 2023

PREPARED FOR:



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

PREPARED BY:



Wildlands Engineering, Inc.
1430 South Mint Street, Suite 104
Charlotte, NC 28203
Phone: (704) 332-7754



December 13, 2023

Mr. Kelly Phillips
Project Manager
NCDEQ – Division of Mitigation Services
610 East Center Ave., Suite 301
Mooresville, NC 28115

RE: Draft Monitoring Year 1 Report Comments
Running Dog Mitigation Site, Union County
Yadkin River Basin, Goose Creek Watershed HUC 03040105
DMS Project ID No. 100210 / DWR No. 2022-0550v1

Dear Mr. Phillips:

Wildlands Engineering, Inc. (Wildlands) has reviewed the Division of Mitigation Services (DMS) comments from the Draft Monitoring Year 1 Report for the Running Dog buffer mitigation site that were received on December 4, 2023. The report has been updated to reflect those comments. The Final Monitoring Year 1 Report (MY1) is included. DMS' comments are listed below in **bold**. Wildlands' responses to DMS' comments are noted in *italics*.

DMS' comment: 5 Results of Year 1 Monitoring: Add discussion for each work item performed during project construction. Include description of the performance of the stabilization measures and condition of the graded areas.

Wildlands' response: The herbaceous vegetation has become established and live stakes are growing on the erosional areas on UT1 that were stabilized during project construction. There are no signs of further erosion. Wildlands does not anticipate any further action needed in these areas. See section 5.2 for further discussion.

DMS' comment: 5.1 Vegetative Success: Add discussion to provide details of the live stake survival and overall condition.

Wildlands' response: The majority of live stakes that were planted in the small areas along UT1 had leafed out in the summer and successfully rooted in the bankside. See Section 5.2 for further discussion.

DMS' comment: DMS Site Inspection 11/28/23: The overall site condition looked good during the inspection. The only noted issue concerned damage to some of the conservation easement signs and a few of the witness posts. Multiple signs were damaged at some point during MY1; likely from the operation of agricultural equipment on the adjacent row crops. Please ensure the easement is adequately marked and any damaged signs/posts repaired. Installation of supplemental marking may be necessary to provide improved visibility.

Wildlands' response: The damaged signs/posts will be repaired, and additional signs will be installed throughout the site this winter. The landowner has been notified of the issue and Wildlands will continue to monitor the site for easement encroachment issues. See Section 5.2 for an additional discussion about easement boundary inspections.



As requested, Wildlands has included two (2) hard copies of the final report and a full final electronic submittal of the support files. A copy of the DMS comment letter and our response letter have been included inside the front cover of each report's hard copy, as well. Please let me know if you have any further questions.

Sincerely,

Andrea S. Eckardt

Andrea S. Eckardt
Ecological Assessment Team Leader
aeckardt@wildlandseng.com

Running Dog Mitigation Site
Monitoring Year 1 Annual Report

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Section 1: PROJECT OVERVIEW

1.1 Project Description

The Running Dog Mitigation Site (Site) is located in Union County approximately ten miles east of Charlotte (Figure 1). The Site involves buffer restoration on three unnamed tributaries and three ephemeral channels that flow to Goose Creek. The Site was completed for buffer mitigation credits within the Service Area of the Goose Creek Watershed – Cataloging Unit 03040105 of the Yadkin River Basin in accordance with the Consolidated Buffer Mitigation Rules (15A NCAC 02B .0295). See Figure 2 for the Service Area of the Site. The Site is expected to generate 644,736.100 riparian buffer credits.

The project is located within the Yadkin River Hydrologic Unit Code (HUC) 03040105030020 and NCDWR Subbasin 03-07-12 and is also within a Targeted Resource Area (TRA) for hydrology, water quality, and habitat. Project streams flow approximately 1,000 feet to their confluence with Goose Creek, which flows to the Rocky River. According to the 2012 Goose Creek and Crooked Creek Local Watershed Plan – Phase III (LWP), the Goose Creek watershed is “one of only three watersheds in North Carolina to still support the Carolina heelsplitter (*Lasmigona decorata*), a federally and state endangered freshwater mussel.” According to the report, improving and protecting the health of the streams in the Goose Creek watershed was identified as critical in the continued existence of the Carolina heelsplitter. The riparian buffer restoration project supports that goal of improved stream health by addressing the primary watershed stressors outlined in the Goose Creek LWP: sediment and bacteria from agricultural sources and increased peak flows and runoff volumes. The project also addresses nutrient inputs, thermal pollution, and lack of riparian canopy.

Prior to planting, the buffer restoration area was occupied by agricultural fields, mainly used to produce corn, wheat and/or soybeans. During construction, invasive species treatments to control Japanese Honeysuckle and Chinese Privet in the enhancement and preservation areas were completed. Along UT1, small erosional rills were graded and seeded while live stakes and coir matting were installed to provide long term bank stabilization. Additionally, a regionally appropriate native seed mix was applied throughout the Site to provide long term soil stabilization. The seed mix list can be found in the Mitigation Plan (Wildlands, 2023).

Tables 2 in Appendix 1 provide more detailed watershed and Site background information for this project. Project history, location, and design are presented in the Running Dog Baseline Monitoring Report (Wildlands, 2023).

1.2 Project Goals and Objectives

The major goals of the riparian restoration project are to provide ecological and water quality enhancements to the Yadkin River Basin by creating a functional riparian corridor and restoring the riparian area.

This buffer restoration project has addressed the Site’s functional stressors with objectives that are expected to reduce sediment and nutrient loading, provide and improve terrestrial and in-stream habitats, and improve stream and bank stability. The restored floodplain will assist in filtering sediment from the surrounding agricultural fields during high rainfall events. The establishment of riparian areas will create shading to minimize thermal heating. Finally, invasive vegetation will be treated, and the newly planted native vegetation will provide cover and food for wildlife. Specific enhancements to water quality and ecological processes are outlined in the table below.

Site Functional Stressors	Functional Uplift Potential	Site Goal	Site Objective
Water Quality: Sediment	Significant sources of sediment include eroding channels, streams, and adjacent agricultural fields. Sediment will be captured by deposition on restored floodplain areas where native vegetation will slow overland flow velocities. Planted vegetation will help stabilize streams and ephemeral channels.	Reduce sediment input from adjacent agricultural fields.	Reduce sediment inputs to waters of Goose Creek.
Water Quality: Nutrients	Nutrient input will be decreased by filtering runoff from the agricultural fields through restored native vegetation. The off-site nutrient input will also be absorbed on-site by filtering flood flows through restored floodplain areas, where flood flows can disperse through native vegetation.	Reduce nutrient input from adjacent agricultural fields.	Reduce nutrient inputs to waters of Goose Creek.
Water Quality: Fecal Coliform	These pollutants will be reduced by converting cropland fertilized with chicken litter to forest and filtering runoff from the adjacent fields and poultry farm through the planted vegetated buffers.	Restrict the application of animal waste in the conservation easement and reduce fecal coliform input from adjacent agricultural fields.	Reduce fecal coliform inputs to waters of Goose Creek.
Water Quality: Other (Temperature)	Planted riparian trees will shade the project features as they mature, reducing thermal pollution.	Decrease water temperature and increase dissolved oxygen concentrations in the Site streams.	Improve water quality of Goose Creek through a reduction of thermal pollution.
Hydrology: Non-Diffuse Flow	Diffuse flow will be maintained throughout the conservation easement area where possible, thereby reducing erosion and filtering of nutrients into the project features.	Create diffuse-flow discharge through the reforested riparian area.	Reduce erosion and filter nutrients into waters of Goose Creek through diffuse flow.
Habitat: Lack of Riparian Canopy	The existing land use of the riparian buffer of the project features is agriculture. The project will include replanting of riparian zones with native vegetation.	Riparian areas will be restored by planting native vegetation.	Convert agricultural fields to forested riparian buffers along all Site streams and ephemeral channels.

Section 2: DETERMINATION OF CREDITS

Mitigation credits are presented in Table 1 and Figure 3 in Appendix 1 and are based upon the as-built survey included in the Running Dog Baseline Monitoring Report (Wildlands, 2023).

Section 3: PERFORMANCE CRITERIA AND MONITORING PROTOCOLS

The performance criteria for the Site follows approved performance criteria presented in the Running Dog Mitigation Plan (Wildlands, 2023), the NC DMS Riparian Buffer and Nutrient Offset Buffer Baseline

& Annual Monitoring Report Template, Version 2.0 (May 2017) and the Consolidated Buffer Mitigation Rule (15A NCAC 02B .0295).

The buffer restoration project has been assigned specific performance criteria components for vegetation. Performance criteria will be evaluated throughout the five-year post-construction monitoring or until performance criteria have been met. An outline of the performance criteria and monitoring components are described below.

Section 4: ANNUAL MONITORING AND REPORTING

Annual monitoring and semi-annual site visits will be conducted to assess the condition of the finished project. The extent of invasive species coverage will also be monitored and treated as necessary throughout the required monitoring period. Complete monitoring reports will be prepared in the fall of each monitoring year (MY) and submitted to DMS by December 1st of the same year. Annual monitoring reports will be based on the above referenced DMS Template (May 2017).

4.1 Vegetation Success Criteria and Monitoring Protocol

In monitoring year 3, the interim vegetative requirement is 320 stems per acre. The final vegetative success criteria will be the survival of 260 stems per acre in the riparian corridor at the end of monitoring year 5. The final performance standard shall include a minimum of four native hardwood tree and shrub species, where no one species is greater than 50 percent of stems. Native hardwood and shrub volunteer species may be included to meet the final performance standard of 260 stems per acre after being established for at least two years. Annual vegetation monitoring follows the CVS-EEP Level 1 & 2 Protocol for vegetative collection (Lee et. al., 2008) while data processing follows the NC DMS Vegetation Data Entry Tool and Vegetation Plot Data Table (NCDMS, 2020).

A total of twelve (12) vegetation monitoring quadrants were established within the project easement area using standard 10 meter by 10 meter vegetation monitoring plots. Plots were randomly established within planted portions of the riparian buffer areas to capture the heterogeneity of the designed vegetative communities. The plot corners have been marked and are recoverable either through field identification or with the use of a GPS unit. Planted stems will be flagged to aid in their identification in subsequent monitoring years. Reference photographs of the vegetation plots are taken annually from the origin looking diagonally across the plot to the opposite corner.

Vegetation plot locations are depicted on the Current Condition Plan View (CCPV) Map (Figure 4) in Appendix 2. Photos depicting the current conditions of the vegetation plots for MY1 are also presented in Appendix 2.

4.2 Overview Site Photographs

Photographs will be taken of the project area once a year to visually document stability for five years following construction. A drone will be used to document the project's overall vegetative growth and ground cover. Overview site photographs are shown in Appendix 2.

4.3 Visual Assessments

Visual assessments should support the specific performance standards for each metric as described above. Visual assessments will be performed within the Site on a semi-annual basis during the five-year monitoring period. Problem areas with vegetative health will be noted (e.g. low stem density, vegetation mortality, invasive species, and/or encroachment). Areas of concern will be mapped, photographed, and accompanied by a written description in the annual monitoring report. Problem areas will be re-evaluated during each subsequent visual assessment.

Section 5: RESULTS OF YEAR 1 MONITORING

During MY1 vegetative assessment a discrepancy was noted with one of the planted species. Some northern red oak (*Quercus rubra*) species which were an unapproved bare root species were mislabeled and bundled with swamp chestnut oak (*Quercus michauxii*) an approved bare root species. Due to this error, the northern red oak stems were planted in the riparian buffer as if they, too, were swamp chestnut oak. Therefore, since all the stems of the two species were labeled the same and bundled together, the exact number of each species could not be determined. After the vegetative plot assessment was finished for MY1, it was noted that there were no swamp chestnut oak stems planted within any of the vegetation monitoring plots; however, during the Site's visual assessment of the riparian buffer, swamp chestnut oak stems were found planted on the Site. DWR was contacted on 10/6/2023 and 10/17/2023 about the vegetation discrepancy and requested the addition of northern red oak to the Site's planting list. Refer to Table 5 in Appendix 1 for the planted tree species, and Appendix 4 for the NC DWR correspondence.

5.1 Vegetative Success

The MY1 vegetative survey was completed in October 2023. Vegetation monitoring resulted in a stem density range of 405 to 769 planted stems per acre and volunteers that were identified for inclusion after two years of establishment. The number of different species per plot for both planted and volunteer species ranges from 6 to 9. All 12 vegetation plots exceed the interim requirement of 320 stems per acre, and herbaceous cover is becoming well established throughout the site. Volunteer woody species consist of American elm (*Ulmus americana*), boxelder (*Acer negundo*), and persimmon (*Diospyros virginiana*). Though boxelder volunteers are dominant in a few of the vegetation plots, competition among all the species as they mature should limit any monocultures from forming; however, during the monitoring period, Wildlands will continue to monitor species variability and dominance throughout the Site and address monocultures, if needed. Refer to Appendix 2 for visual assessment data and vegetation plot photographs, and Appendix 3 for vegetation plot data.

5.2 Vegetative Areas of Concern and Parcel Maintenance

A visual assessment was conducted throughout the Site on 10/2/2023, and no areas of invasive species in need of maintenance, areas of low vegetative growth, or areas of easement encroachment. As previously mentioned in Section 5.1, herbaceous and woody vegetation are becoming well established. Currently there are a few areas noted, vegetation plots (VP) 2, 6, and 7, where boxelder consists of over 50% of the recorded vegetation, but as previously mentioned, it is anticipated that competition among the species should limit the formation of monocultures during the monitoring period. Wildlands will continue to monitor, and adaptive measures will be implemented as needed.

The live stakes that were planted on UT1 to stabilize the erosional areas during construction are thriving. Leaf emergence was observed from the majority of live stakes and are successfully rooting into the banksides alongside herbaceous vegetation. There are no signs of further erosion. Wildlands does not anticipate any further action needed in these areas.

Additional adaptive measures will be developed, or appropriate remedial actions will be implemented if the Site or a specific component of the Site fails to achieve the success criteria outlined in the Mitigation Plan. Site maintenance will be performed to correct any identified problems on the Site that have a high likelihood of affecting project success. Such items include but are not limited to excess tree mortality caused by fire, flooding, drought, or insects. Any actions implemented will be designed to achieve the success criteria and will include a work schedule and updated monitoring criteria, as directed by NC DWR.



A full easement boundary inspection will be conducted every monitoring year. In MY1, damaged easement signs from agricultural activities were observed. Wildlands will repair any damaged signs and add additional markings along the boundaries where encroachment has occurred. The landowner has been notified of the easement encroachment, and Wildlands will continue to monitor the easement boundaries.

5.3 Conclusions

All 12 vegetation plots exceed the MY3 interim requirement of 320 planted stems per acre. The Site is on track to meet the final vegetative success criteria of a stem density of 260 stems per acre and a species diversity of at least four native tree or shrub species. Desirable volunteer tree species are thriving, and herbaceous cover is well established throughout the site. The monitoring data shows positive trends in vegetation establishment and this trajectory is expected to continue.



Section 6: REFERENCES

15A NCAC 02B .0295

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

North Carolina Division of Mitigation Services (DMS). 2022. DMS Protection Mechanism Guidance and Deliverables. Raleigh, NC. April 5, 2022.

North Carolina Division of Mitigation Services (DMS). 2017. Riparian Buffer and Nutrient Offset Buffer Baseline & Annual monitoring Report Template (Version 2.0, 05-2017). Raleigh, North Carolina.

Merrit, Katie. 2023. Reply email to Wildlands about a planted species approval. NC Division of Water Resources (DWR), Raleigh, NC. October X, 2023.

North Carolina Ecosystem Enhancement Program (NCEEP), Tetra Tech, CCoG, 2012. Goose Creek and Crooked Creek Local Watershed Plan. Retrieved from: https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed_Planning/Yadkin_River_Basin/Goose_Crooked/Final_WAR_with%20Appendix_021413.pdf

Suggs, Kristi. 2023. Email to NCDWR about planted species approval. Wildlands, Charlotte, NC. October 6, 2023.

Wildlands Engineering, Inc. 2023. Running Dog Mitigation Site Baseline Monitoring Report. DMS, Charlotte, NC. July 2023.

Wildlands Engineering, Inc. 2023. Running Dog Mitigation Plan. DMS, Charlotte, NC. January 2023.



APPENDIX 1. General Figures and Tables

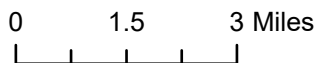
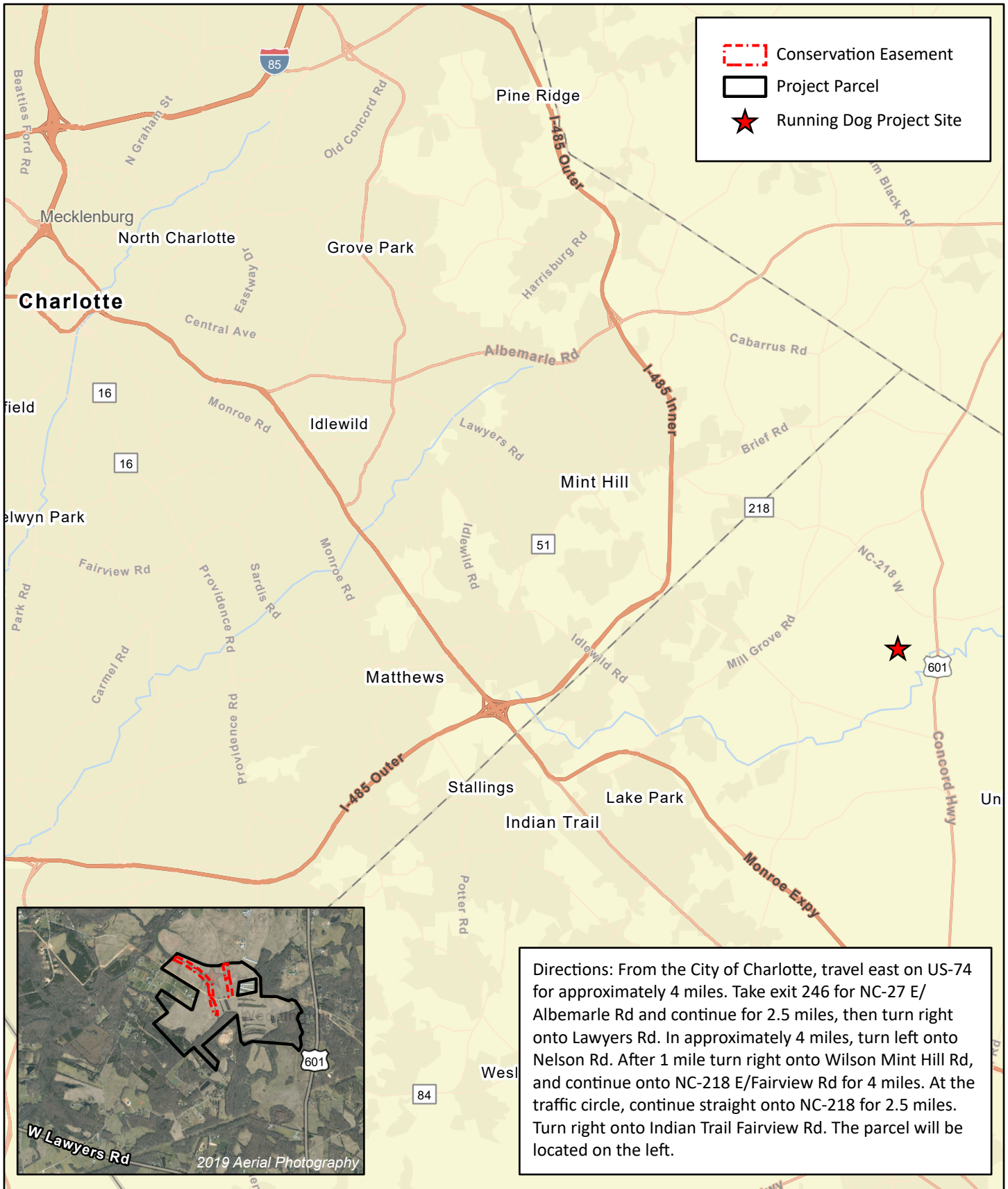
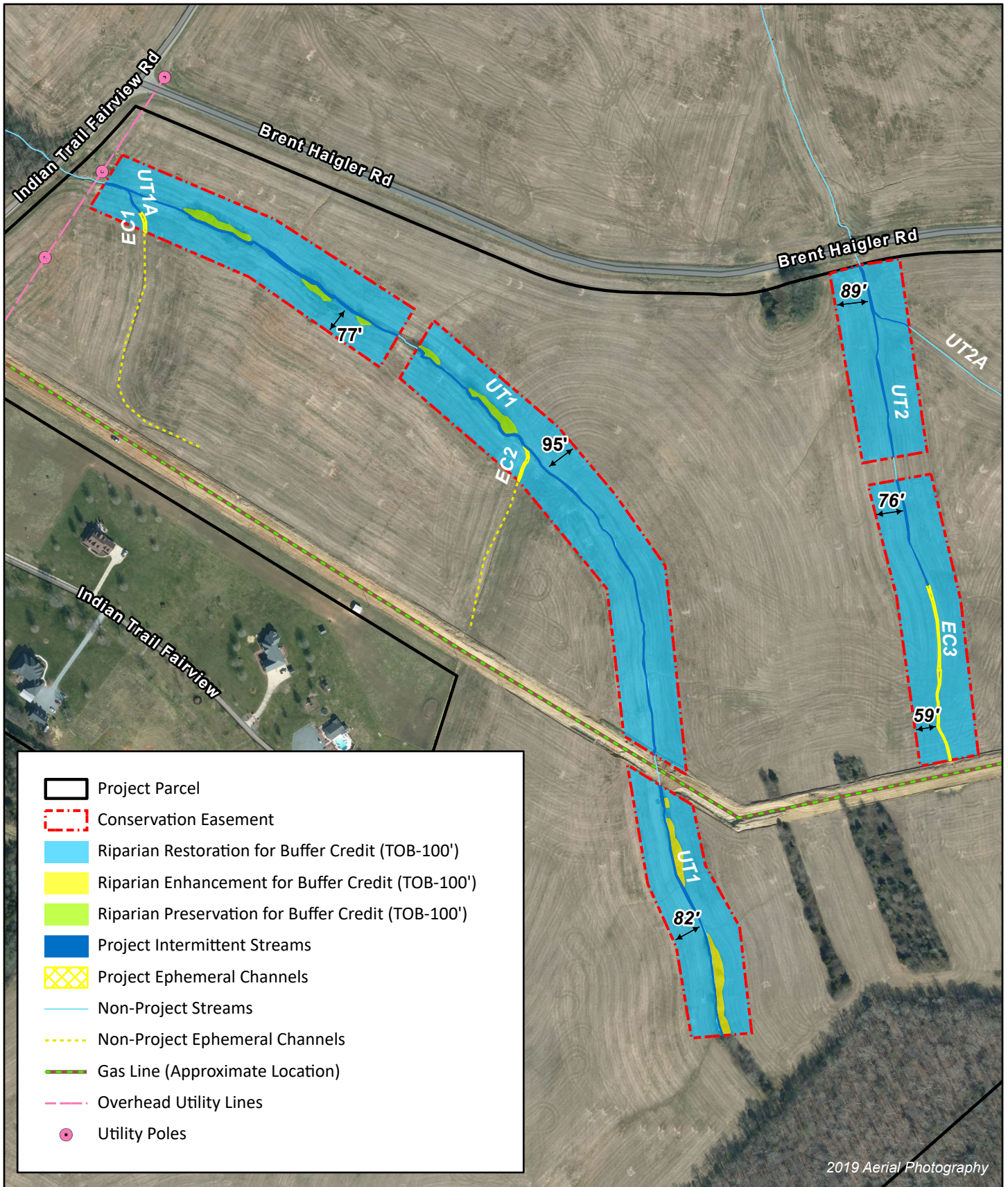


Figure 1. Project Vicinity Map
 Running Dog Mitigation Site
 Monitoring Year 1 (MY1) Annual Report
 Yadkin River Basin (03040105)



0 175 350 Feet



Figure 3. Project Component/Asset Map
 Running Dog Mitigation Site
 Monitoring Year 1 (MY1) Annual Report
 Yadkin River Basin (03040105)

Table 1. Buffer Project Areas and Assets Table

Running Dog Mitigation Site

Monitoring Year 1 - 2023

DMS Project No. 100210

Yadkin - Goose Creek				Project Area													
N/A				N Credit Conversion Ratio (ft ² /pound)													
N/A				P Credit Conversion Ratio (ft ² /pound)													
Credit Type	Location	Subject? (enter NO if ephemeral or ditch)	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (ft ²)	Total (Creditable) Area of Buffer Mitigation (ft ²)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Convertible to Riparian Buffer?	Riparian Buffer Credits	Convertible to Nutrient Offset?	Delivered Nutrient Offset: N (lbs)	Delivered Nutrient Offset: P (lbs)	
Buffer	Rural	Yes	I / P	Restoration	0-100	UT1	433,059	433,059	1	100%	1.00000	Yes	433,059.000	No	N/A	N/A	
Buffer	Rural	Yes	I / P	Enhancement	0-100	UT1	9,109	9,109	2	100%	2.00000	Yes	4,554.500	No	N/A	N/A	
Buffer	Rural	Yes	I / P	Restoration	0-100	UT2	133,825	133,825	1	100%	1.00000	Yes	133,825.000	No	N/A	N/A	
Buffer	Rural	No	Ephemeral	Restoration	0-100	EC3	72,317	72,317	1	100%	1.00000	Yes	72,317.000	No	N/A	N/A	
Totals (ft²):							648,310	648,310									643,755.500
Total Buffer (ft²):							648,310	648,310									
Total Nutrient Offset (ft²):							0	N/A									

Total Ephemeral Area (ft²) for Credit:	72,317	72,317
Total Eligible Ephemeral Area (ft²):	164,529	11.0%
Total Eligible for Preservation (ft²):	216,103	1.1%

Ephemeral Reaches as % TABM

Preservation as % TABM

Enter Preservation Credits Below

Credit Type	Location	Subject?	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (sf)	Total (Creditable) Area for Buffer Mitigation (ft ²)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits
Buffer	Rural	Yes	I / P	N/A	0-100	UT1	9,806	9,806	10	100%	10.00000	980.600
Preservation Area Subtotals (ft²):							9,806	9,806				

TOTAL AREA OF BUFFER MITIGATION (TABM)		
Mitigation Totals	Square Feet	Credits
Restoration:	566,884	566,884.000
Restoration-Ephemeral:	72,317	72,317.000
Enhancement:	9,109	4,554.500
Preservation:	9,806	980.600
Other Streams & Ephemeral Channels:	29,139	0.000
Total Riparian Buffer:	687,255	644,736.100
TOTAL NUTRIENT OFFSET MITIGATION		
Mitigation Totals	Square Feet	Credits
Nutrient Offset:	Nitrogen:	0
	Phosphorus:	0.000

Table 2. Activity and Reporting History Table

Running Dog Mitigation Site

Monitoring Year 1 - 2023

DMS Project No. 100210

Activity or Report	Data Collection Complete	Completion or Scheduled Delivery
Mitigation Plan Date	---	January 2023
Bare Roots Planting	---	March 2023
As-Built & Baseline Monitoring Document	March 2023	June 2023
Year 1 Monitoring Report Date	October 2023	November 2023
Year 2 Monitoring Report Date	2024	December 2024
Year 3 Monitoring Report Date	2025	December 2025
Year 4 Monitoring Report Date	2026	December 2026
Year 5 Monitoring Report Date	2027	December 2027

Table 3. Project Contact Table

Running Dog Mitigation Site

Monitoring Year 1 - 2023

DMS Project No. 100210

Designers	Wildlands Engineering, Inc. 1430 South Mint Street, Suite 104 Charlotte, NC 28203 704.332.7754
Project Manager (POC)	Andrea Eckardt, 704.332.7754, Ext. 101
Planting Contractor	Bruton Natural Systems, Inc. 150 Old Black Creek Rd Freemont, NC 27830
Nursery Stock Suppliers	Dykes & Son Nursery 825 Maude Etter Rd. McMinnville, TN 37110
Monitoring Performers (POC)	Wildlands Engineering, Inc. Kristi Suggs, 704.332.7754, Ext. 110

Table 4. Project Information and Attributes Table

Running Dog Mitigation Site

Monitoring Year 1 - 2023

DMS Project No. 100210

Project Information	
Project Name	Running Dog Mitigation Site
USGS Hydrologic Unit 14-digit	03040105030020
River Basin	Goose Creek Watershed – Yadkin River Basin
Project Coordinates (latitude and longitude)	35.130655, -80.549511
Total Credits (BMU)	644,736.100
Site Protection Instrument (DB, PG)	08655, 0368
Types of Credits	Riparian Buffer

Table 5. Planted Tree Species Table

Running Dog Mitigation Site

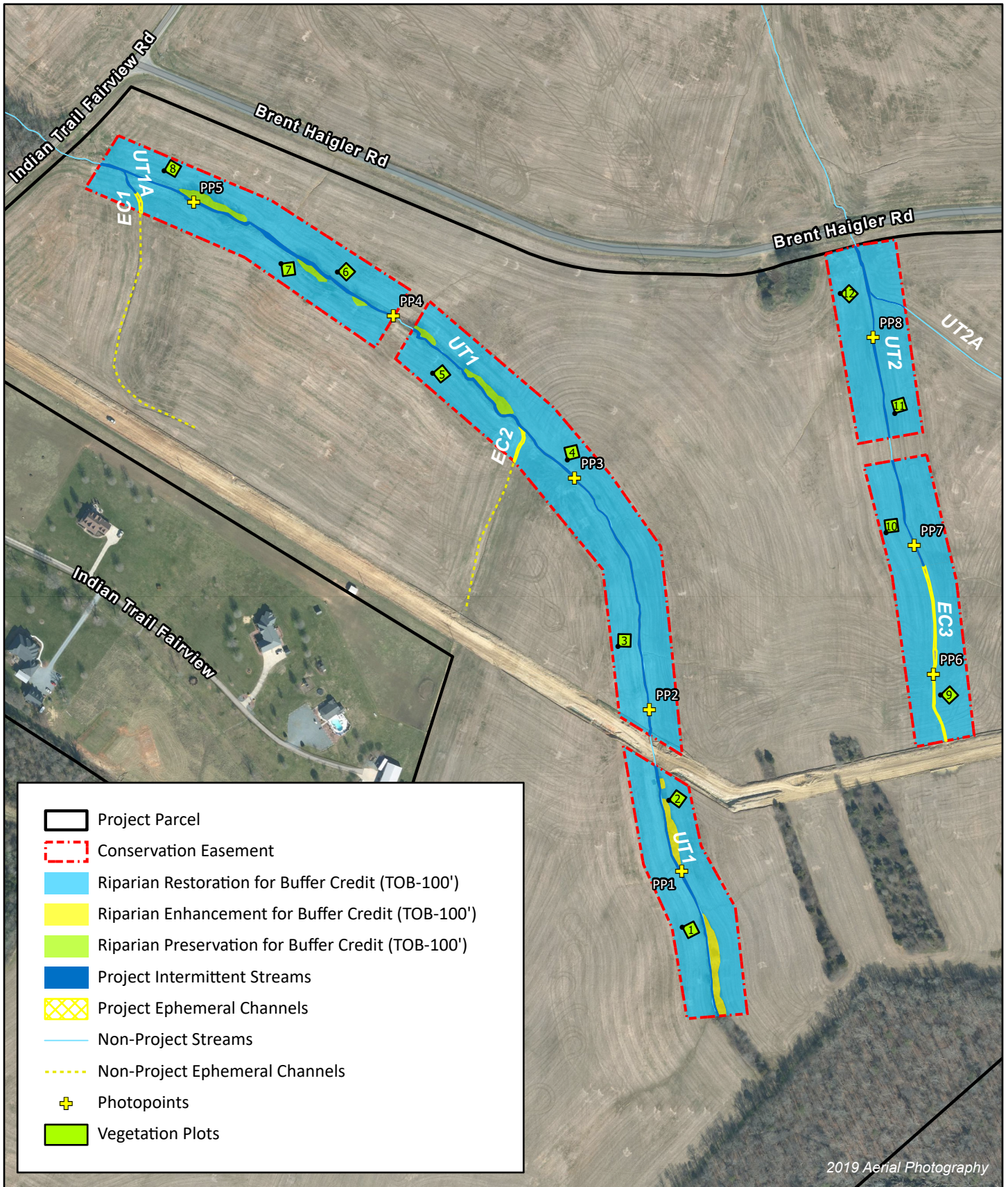
Monitoring Year 1 - 2023

DMS Project No. 100210

Common Name	Scientific Name	Number Planted	% of Total
River birch	<i>Betula nigra</i>	1,427	15%
Swamp chestnut oak ¹	<i>Quercus michauxii</i>	1,427	15%
Northern red oak ¹	<i>Quercus rubra</i>		
Willow oak	<i>Quercus phellos</i>	1,427	15%
Sycamore	<i>Platanus occidentalis</i>	1,237	13%
American elm	<i>Ulmus americana</i>	1,142	12%
Boxelder	<i>Acer negundo</i>	951	10%
Persimmon	<i>Diospyros virginiana</i>	951	10%
Elderberry	<i>Sambucus canadensis</i>	476	5%
Black cherry	<i>Prunus serotina</i>	476	5%
Live Stakes			
Common Name	Scientific Name	Number Planted	% of Total
Black Willow	<i>Salix nigra</i>	50	20%
Silky Willow	<i>Salix sericea</i>	100	40%
Silky Dogwood	<i>Cornus amomum</i>	100	40%

¹Northern red oak stems were inadvertently mislabeled, bundled, and planted as swamp chestnut oak during the post-construction buffer planting in March 2023; therefore, the number of planted stems of each species is unknown. During the MY1 vegetative data collection, Wildlands noticed the discrepancy and requested the addition of northern red oak to the Site's planting list. See Section 5.0 in the MY1 report for additional information about the planting error.

APPENDIX 2. Visual Assessment Data



0 175 350 Feet



Figure 4. Current Condition Plan View Map
 Running Dog Mitigation Site
 Monitoring Year 1 (MY1) Annual Report
 Yadkin River Basin (03040105)

Table 6. Vegetation Condition Assessment Table

Running Dog Mitigation Site
 DMS Project No. 100210
Monitoring Year 1 - 2023

Planted Acreage 14.67

Vegetation Category	Definitions	Mapping Threshold (Ac)	Number of Polygons	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material.	0.1	0	0	0%
Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1	0	0	0%
Total			0	0	0%
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 Ac	0	0	0%
Cumulative Total			0	0	0%

Date last assessed: 10/2/2023

Easement Acreage 15.78

Vegetation Category	Definitions	Mapping Threshold (SF)	Number of Polygons	Combined Acreage	% of Easement Acreage
Invasive Areas of Concern	Areas of points (if too small to render as polygons at map scale).	1,000	0	0	0%
Easement Encroachment Areas	Areas of points (if too small to render as polygons at map scale).	none	0	0	0%

Date last assessed: 10/2/2023

SITE OVERVIEW PHOTOGRAPHS



PP1 – UT1 LOOKING UPSTREAM (10/2/2023)



PP1 – UT1 LOOKING DOWNSTREAM (10/2/2023)



PP2 – UT1 LOOKING UPSTREAM (10/2/2023)



PP2 – UT1 LOOKING DOWNSTREAM (10/2/2023)



PP3 – UT1 UPSTREAM (10/2/2023)



PP3 – UT1 LOOKING DOWNSTREAM (10/2/2023)





PP4 – UT1 LOOKING UPSTREAM (10/2/2023)



PP4 – UT1 LOOKING DOWNSTREAM (10/2/2023)



PP5 – UT1 LOOKING UPSTREAM (10/2/2023)



PP5 – UT1 LOOKING DOWNSTREAM (10/2/2023)



PP6 – EC3 LOOKING UPSTREAM (10/2/2023)



PP6 – EC3 LOOKING DOWNSTREAM (10/2/2023)





PP7 – UT2 LOOKING UPSTREAM (10/2/2023)



PP7 – UT2 LOOKING DOWNSTREAM (10/2/2023)



PP8 – UT2 LOOKING UPSTREAM (10/2/2023)



PP8 – UT2 LOOKING DOWNSTREAM (10/2/2023)



VEGETATION PLOT PHOTOGRAPHS



VEG PLOT 1 (10/2/2023)



VEG PLOT 2 (10/2/2023)



VEG PLOT 3 (10/2/2023)



VEG PLOT 4 (10/2/2023)



VEG PLOT 5 (10/2/2023)



VEG PLOT 6 (10/2/2023)





VEG PLOT 7 (10/2/2023)



VEG PLOT 8 (10/2/2023)



VEG PLOT 9 (10/2/2023)



VEG PLOT 10 (10/2/2023)



VEG PLOT 11 (10/2/2023)



VEG PLOT 12 (10/2/2023)



APPENDIX 3. Vegetation Plot Data

Table 7. Vegetation Plot Criteria Attainment Table

Running Dog Mitigation Site

DMS Project No. 100210

Monitoring Year 1 - 2023

Plot	Success Criteria Met *	Tract Mean
Vegetation Plot 1	Yes	100%
Vegetation Plot 2	Yes	
Vegetation Plot 3	Yes	
Vegetation Plot 4	Yes	
Vegetation Plot 5	Yes	
Vegetation Plot 6	Yes	
Vegetation Plot 7	Yes	
Vegetation Plot 8	Yes	
Vegetation Plot 9	Yes	
Vegetation Plot 10	Yes	
Vegetation Plot 11	Yes	
Vegetation Plot 12	Yes	

*Success Criteria Met is based on the MY3 interim vegetative requirement of 320 stems per acre.

Table 8a. Planted and Total Stem Counts Table

Running Dog Mitigation Site

DMS Project No. 100210

Monitoring Year 1 - 2023

Planted Acreage	14.67
Date of Initial Plant	2023-03-29
Date(s) of Supplemental Plant(s)	NA
Date(s) Mowing	NA
Date of Current Survey	2023-10-02
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/ Shrub	Indicator Status	Veg Plot 1 F ⁴		Veg Plot 2 F		Veg Plot 3 F ⁴		Veg Plot 4 F ⁴		Veg Plot 5 F ⁴		Veg Plot 6 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	<i>Acer negundo</i>	boxelder	Tree	FAC	1	1	1	3	1	1	1	1			3	5
	<i>Betula nigra</i>	river birch	Tree	FACW			1	1			3	3	1	1	1	1
	<i>Diospyros virginiana</i>	common persimmon	Tree	FAC	2	2	2	2	1	3	2	2	2	2	1	1
	<i>Platanus occidentalis</i>	American sycamore	Tree	FACW			2	2	4	4	3	3	2	2	3	3
	<i>Prunus serotina</i>	black cherry	Tree	FACU					2	2			1	1	1	1
	<i>Quercus phellos</i>	willow oak	Tree	FAC	2	2	2	2	1	1	1	1	2	2		
	<i>Quercus rubra</i>	northern red oak	Tree	FACU	3	3	1	1	2	2	2	2	1	1		
	<i>Sambucus canadensis</i>	American black elderberry	Tree	FACU	1	1	1	1					1	1	1	1
	<i>Ulmus americana</i>	American elm	Tree	FACW	3	4	2	3		1	2	2	4	6	2	2
Sum	Performance Standard				12	13	12	15	11	14	14	14	14	16	12	14
Mitigation Plan Performance Standard	Current Year Stem Count					13		15		14		14		16		14
	Stems/Acre					526		607		567		567		648		567
	Species Count					6		8		7		7		8		7
	Dominant Species Composition (%)					31		20		29		21		38		36
	Average Plot Height (ft.)					2		3		3		3		3		4
	% Invasives					0		0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					13		15		14		14		16		14
	Stems/Acre					526		607		567		567		648		567
	Species Count					6		8		7		7		8		7
	Dominant Species Composition (%)					31		20		29		21		38		36
	Average Plot Height (ft.)					2		3		3		3		3		4
	% Invasives					0		0		0		0		0		0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.

2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded), species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).

3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

4). Species identifications were corrected from the previous monitoring year.

Table 8b. Planted and Total Stem Counts Table

Running Dog Mitigation Site

DMS Project No. 100210

Monitoring Year 1 - 2023

Planted Acreage	14.67
Date of Initial Plant	2023-03-29
Date(s) of Supplemental Plant(s)	NA
Date(s) Mowing	NA
Date of Current Survey	2023-10-02
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/ Shrub	Indicator Status	Veg Plot 7 F ⁴		Veg Plot 8 F ⁴		Veg Plot 9 F ⁴		Veg Plot 10 F ⁴		Veg Plot 11 F ⁴		Veg Plot 12 F ⁴	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Acer negundo	boxelder	Tree	FAC	2	5	1	5	2	2	2	2				
	Betula nigra	river birch	Tree	FACW	1	1			2	2			1	1		
	Diospyros virginiana	common persimmon	Tree	FAC	2	3	2	2			2	2	2	2	2	3
	Platanus occidentalis	American sycamore	Tree	FACW	3	3	2	2	2	2	2	2	2	2	2	2
	Prunus serotina	black cherry	Tree	FACU	1	1					1	1	1	1	1	1
	Quercus phellos	willow oak	Tree	FAC			3	3	1	1	4	4	1	1	1	1
	Quercus rubra	northern red oak	Tree	FACU	2	2	3	3			1	1	3	3	4	4
	Sambucus canadensis	American black elderberry	Tree	FACU	1	1	1	1	1	1					1	1
Ulmus americana	American elm	Tree	FACW	2	3	3	3	2	2	1	1	2	2	1	1	
Sum	Performance Standard				14	19	15	19	10	10	13	13	12	12	12	13
Mitigation Plan Performance Standard	Current Year Stem Count					19		19		10		13		12		13
	Stems/Acre					769		769		405		526		486		526
	Species Count					8		7		6		7		7		7
	Dominant Species Composition (%)					26		26		20		31		25		31
	Average Plot Height (ft.)					4		3		3		2		2		2
	% Invasives					0		0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					19		19		10		13		12		13
	Stems/Acre					769		769		405		526		486		526
	Species Count					8		7		6		7		7		7
	Dominant Species Composition (%)					26		26		20		31		25		31
	Average Plot Height (ft.)					4		3		3		2		2		2
	% Invasives					0		0		0		0		0		0

- 1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
- 2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded), species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
- 3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.
- 4). Species identifications were corrected from the previous monitoring year.

Table 9. Vegetation Performance Standards Summary Table

Running Dog Mitigation Site

DMS Project No. 100210

Monitoring Year 1 - 2023

Vegetation Performance Standards Summary Table												
	Veg Plot 1 F				Veg Plot 2 F				Veg Plot 3 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	526	2	6	0	607	3	8	0	567	3	7	0
Monitoring Year 0	567	2	7	0	607	2	9	0	607	2	8	0
	Veg Plot 4 F				Veg Plot 5 F				Veg Plot 6 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	567	3	7	0	648	3	8	0	567	4	7	0
Monitoring Year 0	607	3	8	0	648	2	9	0	688	3	8	0
	Veg Plot 7 F				Veg Plot 8 F				Veg Plot 9 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	769	4	8	0	769	3	7	0	405	3	6	0
Monitoring Year 0	688	3	9	0	607	2	7	0	607	2	8	0
	Veg Plot 10 F				Veg Plot 11 F				Veg Plot 12 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	526	2	7	0	486	2	7	0	526	2	7	0
Monitoring Year 0	648	2	8	0	648	2	8	0	567	2	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 10. Vegetation Height Data Table

Running Dog Mitigation Site

DMS Project No. 100210

Monitoring Year 1 - 2023

Plot	Scientific Name	Common Name	X (m)	Y (m)	Height (Ft)	Vigor
1	<i>Quercus rubra</i> ¹	Northern red oak	0.3	8.3	2.0	4
1	<i>Quercus rubra</i> ¹	Northern red oak	4.2	8.6	1.9	4
1	<i>Ulmus americana</i>	American elm	3.6	6.7	3.1	4
1	<i>Quercus phellos</i>	Willow oak	3.1	4.9	1.4	4
1	<i>Diospyros virginiana</i>	Common persimmon	2.6	2.9	2.5	4
1	<i>Acer negundo</i>	Boxelder	2.0	1.0	1.4	4
1	<i>Betula nigra</i>	River birch	5.3	0.5	Dead	0
1	<i>Ulmus americana</i>	American elm	6.0	2.2	1.0	4
1	<i>Betula nigra</i>	River birch	8.8	4.0	Missing	
1	<i>Ulmus americana</i>	American elm	7.6	6.1	2.1	4
1	<i>Quercus rubra</i> ¹	Northern red oak	8.4	7.9	1.2	4
1	<i>Diospyros virginiana</i>	Common persimmon	8.8	9.5	2.2	4
1	<i>Quercus phellos</i>	Willow oak	9.7	2.5	0.6	4
1	<i>Sambucus canadensis</i>	American black elderberry	9.0	0.5	0.4	4
1	<i>Ulmus americana</i>	American elm	3.5	9.1	1.7	4
2	<i>Prunus serotina</i>	Black cherry	1.0	6.1	Dead	0
2	<i>Diospyros virginiana</i>	Common persimmon	2.4	7.6	1.9	4
2	<i>Betula nigra</i>	River birch	3.7	9.3	2.4	4
2	<i>Quercus rubra</i> ¹	Northern red oak	8.8	9.8	1.7	4
2	<i>Quercus phellos</i>	Willow oak	7.6	8.5	1.7	4
2	<i>Platanus occidentalis</i>	American sycamore	6.6	7.1	4.4	4
2	<i>Diospyros virginiana</i>	Common persimmon	5.6	5.7	3.0	4
2	<i>Acer negundo</i>	Boxelder	4.4	4.3	4.2	4
2	<i>Quercus phellos</i>	Willow oak	3.2	3.2	1.7	4
2	<i>Sambucus canadensis</i>	American black elderberry	2.0	1.8	1.8	4
2	<i>Ulmus americana</i>	American elm	0.9	0.6	2.0	4
2	<i>Platanus occidentalis</i>	American sycamore	5.6	0.9	6.6	4
2	<i>Ulmus americana</i>	American elm	7.1	2.1	2.2	4
2	<i>Sambucus canadensis</i>	American black elderberry	8.3	3.6	Dead	0
2	<i>Acer negundo</i>	Boxelder	9.4	5.0	Dead	0
2	<i>Acer negundo</i>	Boxelder	5.4	5.2	3.9	4
2	<i>Acer negundo</i>	Boxelder	4.5	4.2	3.9	4
2	<i>Ulmus americana</i>	American elm	4.7	3.5	2.9	4

¹Species identifications were corrected from the previous monitoring year.

Table 10. Vegetation Height Data Table

Running Dog Mitigation Site

DMS Project No. 100210

Monitoring Year 1 - 2023

Plot	Scientific Name	Common Name	X (m)	Y (m)	Height (Ft)	Vigor
3	<i>Betula nigra</i>	River birch	3.7	0.8	Dead	0
3	<i>Prunus serotina</i>	Black cherry	5.3	0.7	2.8	4
3	<i>Prunus serotina</i>	Black cherry	7.2	0.5	1.5	4
3	<i>Betula nigra</i>	River birch	8.9	0.5	Dead	0
3	<i>Sambucus canadensis</i>	American black elderberry	9.0	4.1	Dead	0
3	<i>Platanus occidentalis</i>	American sycamore	7.6	4.1	5.6	4
3	<i>Acer negundo</i>	Boxelder	6.2	4.1	4.3	4
3	<i>Quercus rubra</i> ¹	Northern red oak	4.5	3.6	2.2	4
3	<i>Betula nigra</i>	River birch	2.4	3.5	Dead	0
3	<i>Platanus occidentalis</i>	American sycamore	0.8	3.2	3.7	4
3	<i>Platanus occidentalis</i>	American sycamore	0.6	7.1	5.7	4
3	<i>Quercus rubra</i> ¹	Northern red oak	2.7	7.6	1.6	4
3	<i>Diospyros virginiana</i>	Common persimmon	4.9	8.2	2.1	4
3	<i>Quercus phellos</i>	Willow oak	6.6	8.3	1.8	4
3	<i>Platanus occidentalis</i>	American sycamore	8.6	8.3	5.5	4
3	<i>Diospyros virginiana</i>	Common persimmon	9.5	3.5	2.1	4
3	<i>Diospyros virginiana</i>	Common persimmon	9.4	3.4	2.1	4
3	<i>Ulmus americana</i>	American elm	1.6	7.9	3.2	4
4	<i>Ulmus americana</i>	American elm	4.0	0.8	3.2	4
4	<i>Betula nigra</i>	River birch	5.7	1.3	3.6	4
4	<i>Platanus occidentalis</i>	American sycamore	7.3	1.6	4.4	4
4	<i>Acer negundo</i>	Boxelder	9.3	3.0	3.4	4
4	<i>Platanus occidentalis</i>	American sycamore	9.1	7.8	2.1	4
4	<i>Ulmus americana</i>	American elm	7.5	6.9	3.0	4
4	<i>Prunus serotina</i>	Black cherry	5.9	6.0	Dead	0
4	<i>Betula nigra</i>	River birch	4.4	5.2	3.3	4
4	<i>Diospyros virginiana</i>	Common persimmon	2.9	4.2	3.1	4
4	<i>Quercus rubra</i> ¹	Northern red oak	1.6	3.2	1.6	4
4	<i>Diospyros virginiana</i>	Common persimmon	0.3	2.1	2.3	4
4	<i>Betula nigra</i>	River birch	0.6	6.8	1.2	4
4	<i>Platanus occidentalis</i>	American sycamore	2.0	7.7	2.7	4
4	<i>Quercus phellos</i>	Willow oak	3.7	8.5	0.7	4
4	<i>Quercus rubra</i> ¹	Northern red oak	5.2	9.1	1.9	4

¹Species identifications were corrected from the previous monitoring year.

Table 10. Vegetation Height Data Table

Running Dog Mitigation Site

DMS Project No. 100210

Monitoring Year 1 - 2023

Plot	Scientific Name	Common Name	X (m)	Y (m)	Height (Ft)	Vigor
5	<i>Prunus serotina</i>	Black cherry	1.1	0.6	2.3	4
5	<i>Ulmus americana</i>	American elm	0.8	2.3	2.8	4
5	<i>Diospyros virginiana</i>	Common persimmon	0.6	4.3	2.9	4
5	<i>Ulmus americana</i>	American elm	0.4	6.3	3.6	4
5	<i>Ulmus americana</i>	American elm	0.4	8.2	2.6	4
5	<i>Quercus phellos</i>	Willow oak	3.8	8.2	Dead	0
5	<i>Platanus occidentalis</i>	American sycamore	3.7	6.4	4.7	4
5	<i>Sambucus canadensis</i>	American black elderberry	4.0	4.6	2.5	4
5	<i>Quercus phellos</i>	Willow oak	4.5	2.5	1.3	4
5	<i>Betula nigra</i>	River birch	5.0	0.8	3.5	4
5	<i>Acer negundo</i>	Boxelder	8.8	0.3	Dead	0
5	<i>Platanus occidentalis</i>	American sycamore	8.4	2.0	3.8	4
5	<i>Ulmus americana</i>	American elm	8.0	4.0	2.7	4
5	<i>Diospyros virginiana</i>	Common persimmon	7.6	6.0	2.8	4
5	<i>Quercus phellos</i>	Willow oak	7.5	7.8	0.5	4
5	<i>Quercus rubra</i> ¹	Northern red oak	7.6	9.4	2.5	4
5	<i>Ulmus americana</i>	American elm	6.8	4.0	1.9	4
5	<i>Ulmus americana</i>	American elm	1.1	1.1	2.1	4
6	<i>Acer negundo</i>	Boxelder	1.9	1.2	5.9	4
6	<i>Quercus phellos</i>	Willow oak	1.7	3.3	Dead	0
6	<i>Platanus occidentalis</i>	American sycamore	1.7	5.2	4.6	4
6	<i>Acer negundo</i>	Boxelder	1.5	7.2	3.6	4
6	<i>Betula nigra</i>	River birch	1.3	9.2	6.4	4
6	<i>Sambucus canadensis</i>	American black elderberry	5.0	9.9	0.8	4
6	<i>Prunus serotina</i>	Black cherry	5.3	8.8	Dead	0
6	<i>Betula nigra</i>	River birch	5.4	6.8	Missing	
6	<i>Platanus occidentalis</i>	American sycamore	5.6	4.5	4.0	4
6	<i>Prunus serotina</i>	Black cherry	5.7	2.3	3.3	4
6	<i>Diospyros virginiana</i>	Common persimmon	5.8	0.4	3.4	4
6	<i>Ulmus americana</i>	American elm	9.4	0.8	1.2	4
6	<i>Ulmus americana</i>	American elm	9.3	2.5	3.0	4
6	<i>Acer negundo</i>	Boxelder	9.2	4.0	5.1	4
6	<i>Platanus occidentalis</i>	American sycamore	9.1	5.8	5.1	4
6	<i>Betula nigra</i>	River birch	9.0	7.6	Dead	0
6	<i>Quercus phellos</i>	Willow oak	8.8	9.5	Dead	0
6	<i>Acer negundo</i>	Boxelder	5.4	6.1	3.0	4
6	<i>Acer negundo</i>	Boxelder	3.0	1.4	3.4	4

¹Species identifications were corrected from the previous monitoring year.

Table 10. Vegetation Height Data Table

Running Dog Mitigation Site

DMS Project No. 100210

Monitoring Year 1 - 2023

Plot	Scientific Name	Common Name	X (m)	Y (m)	Height (Ft)	Vigor
7	<i>Sambucus canadensis</i>	American black elderberry	0.5	2.8	1.9	4
7	<i>Quercus rubra</i> ¹	Northern red oak	1.8	1.5	2.0	4
7	<i>Quercus rubra</i> ¹	Northern red oak	3.1	0.4	1.9	4
7	<i>Diospyros virginiana</i>	Common persimmon	8.2	0.2	3.5	4
7	<i>Acer negundo</i>	Boxelder	6.8	1.6	5.3	4
7	<i>Ulmus americana</i>	American elm	5.4	3.0	2.4	4
7	<i>Betula nigra</i>	River birch	3.9	4.6	Dead	0
7	<i>Prunus serotina</i>	Black cherry	2.5	6.0	4.5	4
7	<i>Platanus occidentalis</i>	American sycamore	1.3	7.4	5.8	4
7	<i>Ulmus americana</i>	American elm	0.1	8.5	3.7	4
7	<i>Quercus phellos</i>	Willow oak	4.2	9.7	Dead	0
7	<i>Platanus occidentalis</i>	American sycamore	5.3	8.6	4.3	4
7	<i>Acer negundo</i>	Boxelder	6.5	7.3	4.3	4
7	<i>Betula nigra</i>	River birch	7.9	6.0	2.0	4
7	<i>Diospyros virginiana</i>	Common persimmon	9.1	4.7	2.5	4
7	<i>Platanus occidentalis</i>	American sycamore	9.9	3.4	3.4	4
7	<i>Quercus phellos</i>	Willow oak	9.5	9.1	Dead	0
7	<i>Acer negundo</i>	Boxelder	7.3	7.7	4.7	4
7	<i>Ulmus americana</i>	American elm	7.5	7.9	3.0	4
7	<i>Acer negundo</i>	Boxelder	2.5	9.5	4.9	4
7	<i>Acer negundo</i>	Boxelder	9.2	9.2	5.4	4
7	<i>Diospyros virginiana</i>	Common persimmon	0.8	0.3	2.2	4
8	<i>Quercus phellos</i>	Willow oak	2.4	1.4	1.7	4
8	<i>Platanus occidentalis</i>	American sycamore	2.2	3.4	5.0	4
8	<i>Ulmus americana</i>	American elm	2.2	5.3	2.7	4
8	<i>Platanus occidentalis</i>	American sycamore	2.4	7.3	5.0	4
8	<i>Quercus rubra</i> ¹	Northern red oak	2.6	9.2	1.7	4
8	<i>Quercus rubra</i> ¹	Northern red oak	5.9	9.0	2.0	4
8	<i>Acer negundo</i>	Boxelder	5.5	7.0	3.8	4
8	<i>Sambucus canadensis</i>	American black elderberry	5.5	5.4	2.4	4
8	<i>Ulmus americana</i>	American elm	5.4	3.4	2.8	4
8	<i>Diospyros virginiana</i>	Common persimmon	5.4	1.3	3.1	4
8	<i>Quercus phellos</i>	Willow oak	8.1	0.8	0.7	4
8	<i>Ulmus americana</i>	American elm	8.1	2.8	3.0	4
8	<i>Quercus rubra</i> ¹	Northern red oak	8.2	4.8	2.3	4
8	<i>Diospyros virginiana</i>	Common persimmon	8.5	7.2	3.6	4
8	<i>Quercus phellos</i>	Willow oak	8.5	9.1	1.9	4
8	<i>Acer negundo</i>	Boxelder	2.2	1.9	2.7	4
8	<i>Acer negundo</i>	Boxelder	8.0	2.9	3.7	4
8	<i>Acer negundo</i>	Boxelder	9.3	4.0	2.5	4
8	<i>Acer negundo</i>	Boxelder	2.2	3.9	2.1	4

¹Species identifications were corrected from the previous monitoring year.

Table 10. Vegetation Height Data Table

Running Dog Mitigation Site

DMS Project No. 100210

Monitoring Year 1 - 2023

Plot	Scientific Name	Common Name	X (m)	Y (m)	Height (Ft)	Vigor
9	<i>Acer negundo</i>	Boxelder	0.5	4.1	Dead	0
9	<i>Betula nigra</i>	River birch	1.3	5.7	Dead	0
9	<i>Ulmus americana</i>	American elm	2.7	7.5	2.4	4
9	<i>Betula nigra</i>	River birch	3.6	9.2	3.1	4
9	<i>Platanus occidentalis</i>	American sycamore	8.2	9.9	4.0	4
9	<i>Quercus rubra</i> ¹	Northern red oak	7.3	8.1	Dead	0
9	<i>Ulmus americana</i>	American elm	6.4	6.8	2.1	4
9	<i>Quercus phellos</i>	Willow oak	5.2	5.0	3.1	4
9	<i>Acer negundo</i>	Boxelder	4.3	3.3	2.4	4
9	<i>Betula nigra</i>	River birch	3.4	1.7	0.4	4
9	<i>Sambucus canadensis</i>	American black elderberry	2.4	0.4	1.9	4
9	<i>Prunus serotina</i>	Black cherry	7.1	1.1	Dead	0
9	<i>Platanus occidentalis</i>	American sycamore	8.1	2.9	4.1	4
9	<i>Betula nigra</i>	River birch	8.9	4.6	Dead	0
9	<i>Acer negundo</i>	Boxelder	9.9	6.3	2.6	4
10	<i>Quercus phellos</i>	Willow oak	3.8	0.3	0.4	4
10	<i>Platanus occidentalis</i>	American sycamore	5.5	0.3	Dead	0
10	<i>Prunus serotina</i>	Black cherry	7.1	0.5	2.3	4
10	<i>Quercus phellos</i>	Willow oak	8.9	0.4	3.1	4
10	<i>Diospyros virginiana</i>	Common persimmon	9.0	3.8	2.6	4
10	<i>Platanus occidentalis</i>	American sycamore	7.3	3.7	4.6	4
10	<i>Ulmus americana</i>	American elm	5.6	3.7	2.3	4
10	<i>Betula nigra</i>	River birch	3.8	3.4	Dead	0
10	<i>Acer negundo</i>	Boxelder	2.0	3.4	2.3	4
10	<i>Platanus occidentalis</i>	American sycamore	0.2	3.2	3.7	4
10	<i>Quercus rubra</i> ¹	Northern red oak	0.0	7.3	2.3	4
10	<i>Quercus phellos</i>	Willow oak	1.8	7.6	1.8	4
10	<i>Diospyros virginiana</i>	Common persimmon	3.8	7.7	2.0	4
10	<i>Acer negundo</i>	Boxelder	5.7	7.6	1.4	4
10	<i>Betula nigra</i>	River birch	7.6	7.5	Dead	0
10	<i>Quercus phellos</i>	Willow oak	9.5	7.5	1.8	4

¹Species identifications were corrected from the previous monitoring year.

Table 10. Vegetation Height Data Table

Running Dog Mitigation Site

DMS Project No. 100210

Monitoring Year 1 - 2023

Plot	Scientific Name	Common Name	X (m)	Y (m)	Height (Ft)	Vigor
11	<i>Diospyros virginiana</i>	Common persimmon	1.0	2.0	2.0	4
11	<i>Platanus occidentalis</i>	American sycamore	3.0	2.0	4.4	4
11	<i>Quercus phellos</i>	Willow oak	5.0	1.8	0.9	4
11	<i>Betula nigra</i>	River birch	7.9	1.7	Dead	0
11	<i>Quercus rubra</i> ¹	Northern red oak	9.1	1.9	1.5	4
11	<i>Betula nigra</i>	River birch	9.6	5.6	Dead	0
11	<i>Sambucus canadensis</i>	American black elderberry	7.8	5.6	Dead	0
11	<i>Quercus phellos</i>	Willow oak	5.5	5.5	Dead	0
11	<i>Platanus occidentalis</i>	American sycamore	3.6	5.6	3.1	4
11	<i>Betula nigra</i>	River birch	1.8	5.7	3.3	4
11	<i>Ulmus americana</i>	American elm	0.4	5.8	2.6	4
11	<i>Quercus rubra</i> ¹	Northern red oak	0.3	9.4	2.0	4
11	<i>Diospyros virginiana</i>	Common persimmon	2.6	9.4	2.1	4
11	<i>Prunus serotina</i>	Black cherry	4.9	9.5	2.6	4
11	<i>Quercus rubra</i> ¹	Northern red oak	7.3	9.5	1.6	4
11	<i>Ulmus americana</i>	American elm	9.2	9.5	2.6	4
12	<i>Betula nigra</i>	River birch	0.4	5.9	Dead	0
12	<i>Platanus occidentalis</i>	American sycamore	1.0	7.7	2.7	4
12	<i>Diospyros virginiana</i>	Common persimmon	1.4	9.4	2.2	4
12	<i>Quercus rubra</i> ¹	Northern red oak	5.8	8.6	1.3	4
12	<i>Prunus serotina</i>	Black cherry	4.9	7.1	2.7	4
12	<i>Betula nigra</i>	River birch	4.4	5.4	Dead	0
12	<i>Sambucus canadensis</i>	American black elderberry	3.5	3.8	2.1	4
12	<i>Quercus rubra</i> ¹	Northern red oak	2.6	2.0	2.0	4
12	<i>Ulmus americana</i>	American elm	2.1	1.1	2.8	4
12	<i>Quercus rubra</i> ¹	Northern red oak	8.2	1.0	2.0	4
12	<i>Diospyros virginiana</i>	Common persimmon	7.1	2.5	2.8	4
12	<i>Quercus rubra</i> ¹	Northern red oak	8.0	4.0	fee	4
12	<i>Platanus occidentalis</i>	American sycamore	8.1	5.5	4.2	4
12	<i>Quercus phellos</i>	Willow oak	8.4	7.1	3.0	4
12	<i>Diospyros virginiana</i>	Common persimmon	3.7	9.4	1.0	4

¹Species identifications were corrected from the previous monitoring year.

APPENDIX 4. Correspondence

Stephanie Erickson

From: Kristi Suggs
Sent: Tuesday, October 17, 2023 3:09 PM
To: Merritt, Katie
Cc: Phillips, Kelly D; Paul Wiesner (paul.wiesner@ncdenr.gov); Andrea Eckardt; Stephanie Erickson
Subject: RE: Running Dog Site - Buffer Mitigation (DWR No. 2022-0550v1 / NCDEQ Contract No. 210202-01)

Hi Katie,

We are finalizing the Running Dog MY1 report for submittal to DMS, so I wanted to follow-up on the email that I sent on Friday Oct. 6th about the planting discrepancy. Currently, we are including *Quercus rubra* (northern red oak) in the monitoring vegetation plots as an approved species for buffer planting, and that the number of the stems documented in the "Planted Tree Species Table" consists of a mix of both *Quercus michauxii* (swamp chestnut oak) and *Q. rubra*, per the email chain below. If we do not hear from you or someone at NC DWR by the end of the day, Friday, October 20, 2023, we will assume that our documentation is acceptable, and we will finalize the submittal to DMS for the draft review. However, if this documentation is found to be unacceptable, please let us know how you would like for us to document the planting discrepancy. Thank you!!

Kristi

Kristi Suggs | Senior Environmental Scientist

O: 704.332.7754 x110 M: 704.579.4828

[Wildlands Engineering, Inc.](#)

1430 S. Mint St, Suite 104

Charlotte, NC 28203

From: Kristi Suggs
Sent: Friday, October 6, 2023 12:32 PM
To: Merritt, Katie <katie.merritt@ncdenr.gov>
Cc: Phillips, Kelly D <Kelly.Phillips@deq.nc.gov>; Paul Wiesner (paul.wiesner@ncdenr.gov) <paul.wiesner@ncdenr.gov>; Andrea Eckardt <aeckardt@wildlandseng.com>; Stephanie Erickson <serickson@wildlandseng.com>
Subject: Running Dog Site - Buffer Mitigation (DWR No. 2022-0550v1 / NCDEQ Contract No. 210202-01)

Hi Katie,

I hope that you are doing well. I have a question/request about a planted woody tree species at the Running Dog Buffer Mitigation Site (DWR No. 2022-0550v1 / NCDEQ Contract No. 210202-01). We were out at the Site this week conducting the vegetation plot inventory and found a discrepancy with one of the planted species. It seems that the planting contractor mislabeled and planted some *Quercus rubra* (Northern red oak) stems in lieu of *Quercus michauxii* (Swamp chestnut oak). Unfortunately, we were unable to catch this issue during the baseline monitoring field work because there were no leaves on the bare root stems during the field data collection. Please note that this discrepancy did not include all of the *Q. michauxii* stems. There are some *Q. michauxii* planted on the Site, but no *Q. michauxii* were planted within the monitoring vegetation plots. Therefore, since all the bareroots that were bundled together were labeled as *Q. michauxii*, we are not sure of the quantity that was planted of each species. We only know that there was a total of 1,427 stems in the bundle. If *Q. rubra* is approved for inclusion, we will update and document the species approval the MY1 report and update Table 5 (Planted Tree Species Table) to reflect the addition of *Q. rubra*. Table 5 will be updated as follows:

Common Name	Scientific Name	Number Planted	% of Total
Swamp chestnut oak	<i>Quercus michauxii</i>	1,427	15%
Northern red oak	<i>Quercus rubra</i>		

If *Q. rubra* is not approved for inclusion, please let us know how you would like for us to proceed.

Thank you!!

Kristi

Kristi Suggs | *Senior Environmental Scientist*

O: 704.332.7754 **x110 M:** 704.579.4828

[Wildlands Engineering, Inc.](#)

1430 S. Mint St, Suite 104

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