

MY4 FINAL MONITORING REPORT
Burnetts Chapel Mitigation Site-Phase II

Guilford County, NC
Randleman Lake Watershed
Cape Fear River Basin
HUC 03030003

DMS Project No. 100045
DMS Contract No. 7430
DMS RFP No. 16-007242
DWR Project Number 2011-0841

Data Collection Period: September 2022
Submission Date: November 2022



PREPARED FOR:



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



December 16, 2022

ATTN: Ms. Lindsay Crocker
Eastern Regional Supervisor
Division of Mitigation Services
217 West Jones St.
Raleigh, NC 27603

RE: Burnetts Chapel Mitigation Site - Phase II - MY4 Report Comments
Cape Fear River Basin – HU# 03030003, Guilford County
DMS Project No. 100045
DMS Contract No. 7430
DMS RFP No. 16-007242
DWR Project No. 2011-0841

Dear Ms. Crocker,

Thank you for your comments in the letter dated November 28, 2022 referencing the Burnetts Chapel Mitigation Site Monitoring Year 4 (MY4) Report. Wildlands Engineering, Inc. (Wildlands) has reviewed these comments and our responses are noted below.

- This report is approved as submitted. However, it should be noted that there are no height requirements in the riparian buffer program, and that the buffer rule requires 260 stems per acre (not planted stems per acre). Additionally, the provider manipulated results of vegetation success to match IRT vegetative success rather than typical DWR success. DMS suggests that the provider use success to represent requirements in DWR rule for future (MY5 report) because this was criteria set by DWR at project inception, and it sets precedent for future more strenuous success criteria.*

Wildlands Response: As suggested, Wildlands will make the corrections to the vegetation assessment for the MY5 report next year. The average height of the stems is included as additional information and not as criteria. Counting all of the planted stems in vegetation plot 5 would produce an average density of 324 stems per acre; all plots would then be meeting the DWR success criteria. The total average stem density for the site is 944 stems per acre at the end of MY4, as previously noted in Table 8.

Enclosed, please find one (1) hard copy and one (1) electronic pdf of the Final Monitoring Report on USB along with all of the digital files.

Please contact me at 704-332-7754x101 or at aeckardt@wildlandseng.com if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Andrea S. Eckardt".

Andrea Eckardt
Ecological Assessment Team Leader

BURNETTS CHAPEL MITIGATION SITE-PHASE II
Monitoring Year 4 Annual Report

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Section 1: PROJECT OVERVIEW

1.1 Project Description

The Burnetts Chapel Mitigation Site-Phase II (Site) is a buffer restoration project located approximately three miles west of the Town of Pleasant Garden and four miles south of the City of Greensboro in Guilford County, NC (Figure 1). The Site is comprised of 7.50 acres along several unnamed tributaries to the Randleman Reservoir (Figure 2). The Site is surrounded by fields that are used for agriculture and is immediately adjacent to Phase I of the Burnetts Chapel Mitigation Project, which was successfully completed by Wildlands in 2017 for the North Carolina Division of Environmental Quality (NCDEQ) Division of Mitigation Services (DMS). The project expands the Phase I riparian buffer area from 50 feet to 100 to 200 feet on five of the original project streams and channels. The Site is expected to generate 280,577.321 riparian buffer credits.

The Site is located within the Cape Fear River Basin Hydrologic Unit Code (HUC) 03030003-010050 and the North Carolina Department of Water Resources (NCDWR) Sub-basin 03-06-08. Five unnamed tributaries on the Site flow into the Randleman Reservoir (Reaches B1-B5). These water bodies are classified as WS-IV, as the Randleman Reservoir is a major source of drinking water for the region.

This buffer restoration project will reduce sediment and nutrient loading and improve terrestrial habitat. The area surrounding the streams proposed for restoration is primarily open agricultural fields. Restoring the vegetative buffer on the areas up to 200 feet from the streams will remove the hay fields and fertilizer inputs within the project area. The restored floodplain areas will filter sediment-laden farm runoff during rainfall events. The establishment of riparian buffers will create shading to minimize thermal pollution. Finally, invasive vegetation will be treated within the project area as needed and the proposed native vegetation will provide cover and food for wildlife.

Tables 1 and 2 in Appendix A provide more detailed watershed and Site background information for this project.

1.2 Project Goals and Objectives

The major goals of the proposed buffer restoration project are to provide ecological and water quality enhancements to the Randleman Reservoir watershed of the Cape Fear River Basin by creating a functional riparian corridor and restoring the riparian buffer. Specific enhancements to water quality and ecological processes are outlined below.

Goals	Objectives
Decrease nutrient levels	Nutrient input will be decreased by filtering runoff from the agricultural fields through restored native buffer zones. The off-site nutrient input will also be absorbed on-site by dispersing flood flows through native vegetation.
Decrease sediment input	Sediment from off-site sources will be deposited on restored floodplain areas where native vegetation will slow overland flow velocities.
Create appropriate terrestrial habitat	Buffer areas will be restored by removing invasive vegetation and planting native vegetation.
Permanently protect the Site from harmful uses.	A conservation easement will be established on the Site.

1.3 Project History

On March 26, 2018, NCDWR conducted on-site determinations to review features and land use within the project boundary. The resulting NCDWR site viability letter and map confirming the Site as suitable for riparian buffer mitigation is located in Appendix A. NCDWR also approved the five project reaches as appropriate for buffer mitigation as related to the rules set forth in the Randleman Lake Water Supply Watershed: Mitigation Program for Protection and Maintenance of Existing Riparian Buffers (15A NCAC 02B .0252). The on-site determination approval letter from NCDWR is also included in Appendix A.

The final mitigation plan was submitted and accepted by the NC DMS in September 2018. Planting activities were completed by Bruton Natural Systems, Inc. in March 2019. The baseline monitoring and as-built survey were completed in May 2019. There were no significant deviations reported in the project elements in comparison to the design plans. Tables 1 and 2 in Appendix A provides more detailed project activity, history, and contact information for this project.

1.4 Project Location

The Site is located (Center of project 35.944022 N and -79.845255 W) in Guilford County, NC approximately three miles west of the Town of Pleasant Garden and four miles south of the City of Greensboro) within the Cape Fear River Basin (HUC 03030003-010050) and the NCDWR Sub-basin 03-06-08. Directions to the project are as follows: Traveling south on I-73 from Greensboro, take Exit 94 for Old Randleman Road. Turn right onto Old Randleman Road. Travel 0.5 miles and take a slight right onto Kivett Drive. Continue on Kivett Drive for 0.7 miles and take a left onto Drake Road. Continue on Drake Road for 1.7 miles and turn left onto Burnetts Chapel Road. The project parcel will be on the right approximately 0.1 miles down Burnetts Chapel Road. Enter the Site via the gravel driveway. The property location is depicted on the Vicinity Map (Figure 1), which is located in Appendix A.

1.5 Project Design

The Wildlands Team restored high quality riparian buffers along several unnamed tributaries on the Site. The project design ensured that no adverse impacts to wetlands or existing riparian buffers occurred. Figure 2 illustrates the conceptual design for the Site. Detailed descriptions of the proposed restoration activity follow in Sections 1.5.1 through 1.5.2. General site and buffer photographs are included in Appendix B.

1.5.1 Riparian Area Restoration Activities

Prior to planting, the buffer restoration area was used as agricultural fields. These areas were tilled with a chisel plow to reduce soil compaction prior to planting. The fields within the project area contained only a few invasive species; therefore, only some selective spot herbicide treatments were required. The Site's ephemeral channels were located fully within the conservation easement area and were completely buffered as part of the project; therefore, no land disturbance to maintain diffuse flow was required.

The revegetation plan for the buffer restoration area included permanent seeding, planting bare root trees, live stakes, and herbaceous plugs. These revegetation efforts were coupled with the select treatment of invasive species to control their population. The specific species composition planted was selected based on the desired community type, observation of occurrence of species in riparian buffers adjacent to the Site, and best professional judgement on species establishment and anticipated site conditions in the early years following project implementation. The total number of tree species planted across the buffer areas are as follows: tulip poplar (*Liriodendron tulipifera*) 450 stems, willow oak (*Quercus phellos*) 900 stems, American sycamore (*Platanus occidentalis*) 900 stems, river birch (*Betula nigra*) 900 stems, green ash (*Fraxinus pennsylvanica*) 900 stems, and swamp chestnut oak (*Quercus*

michauxii) 450 stems. In total, 4,500 stems were planted across the buffer areas of the Site resulting in a planting density of 608 stems per acre. Trees were planted at a density sufficient to meet the performance standards outlined in the Rule 15A NCAC 02B .0295 of 260 trees per acre at the end of five years. No one tree species planted was greater than 50% of the established stems. An appropriate seed mix was applied as necessary to provide temporary ground cover for soil stabilization and reduction of sediment loss during rain events in disturbed areas. This was followed by an appropriate permanent seed mixture. Planting was completed on March 16, 2019.

Vegetation management and herbicide applications were implemented as needed during tree establishment in the restoration areas to prevent establishment of invasive species that could compete with the planted native species.

1.5.2 Riparian Area Preservation Activities

No work was done in the buffer preservation areas, as allowed under 15A NCAC 02B .0295(o). The preservation area will be protected in perpetuity under a conservation easement.

Section 2: DETERMINATION OF CREDITS

In addition to buffer restoration on subject streams, per the Consolidated Buffer Mitigation Rules (15A NCAC 02B 0.0295 (o)), alternative mitigation is proposed on the Site in the form of buffer restoration on ephemeral channels and preservation of forested buffer on subject streams. The proposed project is in compliance with these rules in the following ways:

Buffer Restoration on Ephemeral Channels (15A NCAC 02B 0.0295(o)(7)):

- NCDWR performed an evaluation of the Site (Phase I in 2011 and Phase II in 2018) and identified the perennial, intermittent, and ephemeral channels on the property.
- The mitigation area on the Site's ephemeral channels is located completely within their drainage areas.
- The ephemeral channels are directly connected to intermittent or perennial stream channels and will be protected under the same contiguous easement boundary.
- The mitigation area on the ephemeral channels is less than 25% of the total buffer mitigation area on the Site (Table 1, Appendix A).

Preservation on Subject Streams (15A NCAC 02B .0295 (o)(5)):

- The buffer width is at least 30 feet from the stream.
- The area meets the requirements of 15A NCAC 02R 0.0403(c)(7), (8), and (11) with no known structures, infrastructure, hazardous substances, solid waste, or encumbrances within the mitigation boundary.
- Preservation mitigation is being requested on no more than 25% of the total buffer mitigation area (Table 1, Appendix A).

Mitigation credits are presented in Table 1 and Figure 2 in Appendix A and are based upon the as-built survey included in the Burnetts Chapel Mitigation Site-Phase II Baseline Monitoring Report (2019).

Section 3: PERFORMANCE CRITERIA AND MONITORING PROTOCOLS

The performance criteria for the Site follows approved performance criteria presented in Burnetts Chapel Mitigation Site-Phase II Mitigation Plan (Wildlands Engineering, Inc., 2018), the NC DMS Riparian Buffer and Nutrient Offset Buffer Baseline & Annual Monitoring Report Template, Version 2.0 (May 2017) and the Consolidated Buffer 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. The monitoring period will extend for five years beyond the completion of construction or until performance criteria have been met. An outline of the performance criteria and monitoring components are described below.

3.1 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 (five years). Complete monitoring reports will be prepared in the fall of each monitoring year and submitted to DMS. Annual monitoring reports will be based on the above referenced DMS Template (May 2017).

3.2 Vegetation Success Criteria and Monitoring Protocol

The final vegetative success criteria will be the survival of 260 planted stems per acre in the riparian corridor at the end of the required monitoring period (Monitoring Year (MY) 5). The final performance standard shall include a minimum of four native hardwood tree species or four native hardwood tree and native shrub species, where no one species is greater than 50 percent of stems. Native hardwood and native shrub volunteer species may be included to meet the final performance standard of 260 stems per acre. Performance criteria will be evaluated throughout the five-year post-construction monitoring or until performance criteria have been met. Annual vegetation monitoring will follow the CVS-EEP Level 1 & 2 Protocol for Recording Vegetation (2008).

A total of six (6) 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. 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 Conditions Plan View (CCPV) Map (Figure 3) in Appendix B. Photos depicting the current conditions of the vegetation plots for MY4 are also presented in Appendix B.

3.3 Photo Reference Stations

Photographs will be taken within the project area once a year to visually document stability for five years following construction. A total of eight (8) permanent markers were established and located with GPS equipment so that the same locations and view directions on the Site are photographed each year. Photo reference locations are depicted on the Integrated CCPV map (Figure 3) in Appendix B. Photos depicting the current conditions of the conservation easement for MY4 are also presented in Appendix B.

3.4 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 4: RESULTS OF YEAR 4 MONITORING

4.1 Vegetative Success

The six vegetation plots were sampled in September 2022 towards the end of the growing season. A reference photo was taken from the southwest corner of each plot, which can be found in Appendix B. Total numbers of tree species identified within the monitoring plots as well as density and composition are summarized in Table 8. The field data sheets are also in Appendix C.

The MY4 vegetation monitoring resulted in an average stem density of 472 planted stems per acre, which exceeds the final stem density requirement of at least 260 stems per acre by the end of MY5. This also represents a stem survival rate of 78% since the MY0 planting. Stem densities within individual monitoring plots ranged from 243 to 607 planted stems per acre. The *Q. michauxii* in VP5 made up more than 50% of the total stems, so the PnoLS stem count was lowered to three stems (50% of the plot's total stem count) which resulted in a stem density of 243 stems per acre for plot 5. Average stem height increased 35 cm since last year and now averages 142 cm. In MY4, the number of different species planted per plot ranged from three to six with a Site total of seven planted species, which exceeds the species diversity criteria of a minimum of four native hardwood species. With the inclusion of desirable volunteer species such as persimmon (*Diospyros virginiana*), black walnut (*Juglans nigra*), northern red oak (*Quercus rubra*), and American elm (*Ulmus americana*), the total species diversity increases to eleven native species. Plots one through five met or exceeded the MY5 species diversity criteria. VP6 only had three species. For the Site as a whole, no one planted species represented more than 50% of the total planted species. Volunteer species were noted as present, but not included in the monitoring assessment vegetative success results for MY4.

Species diversity throughout the site, as well as within the monitoring plots, will likely increase in subsequent monitoring years with the continued introduction of volunteer species. Please refer to Appendix C for vegetation plot data and vegetation plot photographs. The Site is on track to meet its final success criteria.

4.2 Vegetative Problem Areas

An assessment of the vegetation condition was conducted throughout the site. Similar to last year, there were no bare or encroachment areas, and only 0.1 acres with a low visual stem density. Vegetative areas of concern continue to be minimal and are not negatively affecting the overall vegetative success of the Site. These areas are outlined below, presented in Table 6, and are depicted in Figure 3 of Appendix B.

4.2.1 Invasive Species

There was a small patch of tree of heaven (*Ailanthus altissima*) and Japanese honeysuckle (*Lonicera japonica*) in the western portion of the project; it was cut and treated with an herbicide in September of 2022 and was removed from the MY4 CCPV map (Figure 3). Pine tree saplings were growing in the eastern portion of the easement; these were cut down by hand to facilitate the growth of the targeted hardwood community. Several Callery pears (*Pyrus calleryana*) were growing throughout the easement; these trees were cut by hand and treated with an herbicide. Approximately 1.2 acres of Johnsongrass that were identified within the easement last year continue to persist but have not expanded in size. Spot herbicide treatments were applied around the base of the trees in April 2021 to reduce the competition from *S. halepense* and allow the trees to grow and shade out the grass. Based on visual assessments and the vegetation plot data, Johnsongrass is not affecting tree survival or the success of the planted stems. Since Johnsongrass is listed as a species of low/moderate concern and is not suppressing the viability, density, or growth of the planted woody stems, it is not shown on the CCPV

map. Invasive species populations will continue to be monitored and spot herbicide treatments will be conducted as needed during the appropriate time of year.

4.2.2 Bare, Low Stem Density, & Poor Growth Rate Areas

There is an area of low stem density along Reach B4 that consists of less than 0.1 acres; however, the area's herbaceous cover is dense and thriving. It is likely that this area's stem density will increase throughout the monitoring period by way of resprouts and the continued introduction of volunteer species; therefore, no additional planting is needed at this time. Wildlands will continue to monitor this area for the emergence of woody species.

4.3 Parcel Maintenance

Adaptive measures will be developed, or appropriate remedial actions will be implemented in the event that the Site or a specific component of the Site fails to achieve the success criteria outlined in the Site's 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.

Early in 2022, it was noticed that narrow areas of mowing had occurred across the site. These swaths extended only 6-12-inches into the easement and were not substantial enough to cut any of the trees close to the boundary. Horse tape and 15 additional easement signs were added to better demarcate portions of the boundary. The boundary tape and signs were still up in September and the issue is considered resolved. Wildlands will continue to monitor the Site for additional encroachment areas.

4.4 Conclusions

Vegetation is thriving across the Site and is exceeding most of the performance standards. Monitoring Year 4 data shows an average density of 472 planted stems per acre across all vegetation plots, which is almost double the final criteria. Five of the six plot meet the final stem density criteria, and five plots meet the species diversity criteria. Herbaceous cover is well established throughout the site. The trees are doing well with an average stem height of 4.7 feet and appear largely unaffected by the Johnsongrass. As with the previous year, monitoring data shows positive trends in vegetation establishment and this trajectory is expected to continue.

Section 5: REFERENCES

15A NCAC 02B .0252

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-lev1-5.pdf>

North Carolina Ecosystem Enhancement Program. 2009. Cape Fear River Basin Restoration Priorities 2009. http://www.nceep.net/services/lwps/cape_fear/RBRP%20Cape%20Fear%202008.pdf

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. https://ncdenr.s3.amazonaws.com/s3fs-public/Mitigation%20Services/Document%20Management%20Library/Guidance%20and%20Template%20Documents/RB_NO_Base_Mon_Template_2.0_2017_5.pdf

North Carolina Interagency Review Team. 2016. Wilmington District Stream and Wetland Compensatory Mitigation Update. October 24, 2016.

Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina, 3rd approx. North Carolina Natural Heritage Program, Raleigh, North Carolina.

United States Army Corps of Engineers (USACE), 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.

Wildlands Engineering, Inc. 2018. Burnetts Chapel Mitigation Site-Phase II Mitigation Plan. DMS, Raleigh, NC. September 28, 2018.

Wildlands Engineering, Inc. 2019. Burnetts Chapel Mitigation Site-Phase II Baseline Monitoring Report. DMS, Raleigh, NC. May 16, 2019.

Wildlands Engineering, Inc. 2021. Burnetts Chapel Mitigation Site-Phase II Monitoring Year 3 Annual Report. DMS, Raleigh, NC. November 2021.

APPENDIX A. General Tables and Figures

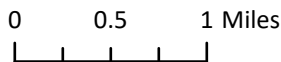
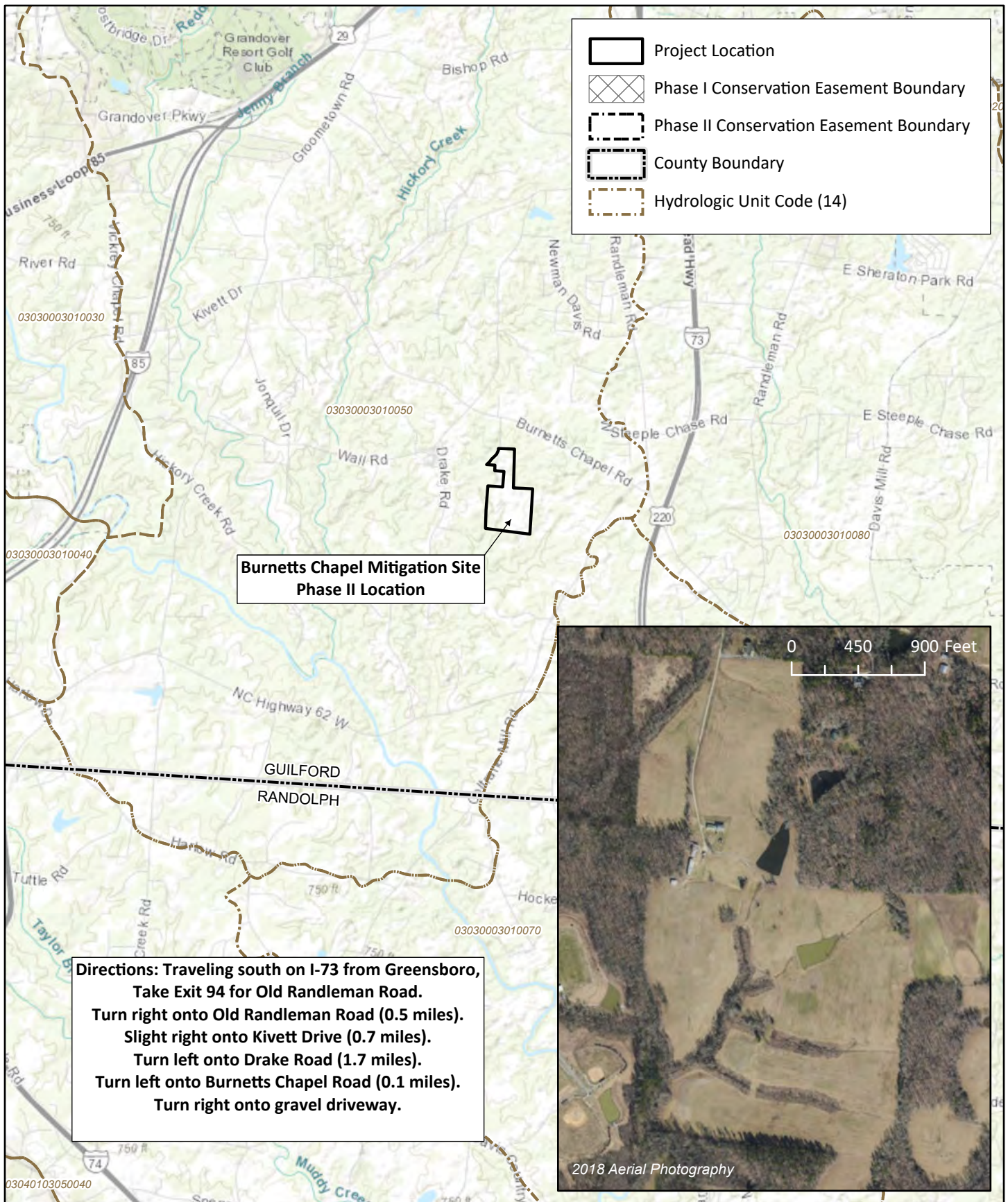


Figure 1 Project Vicinity Map
 Burnetts Chapel Mitigation Site - Phase II
 2022 Monitoring Report (MY4)
 Cape Fear River Basin (03030003)
 Guilford County, NC

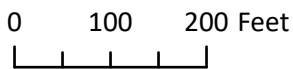
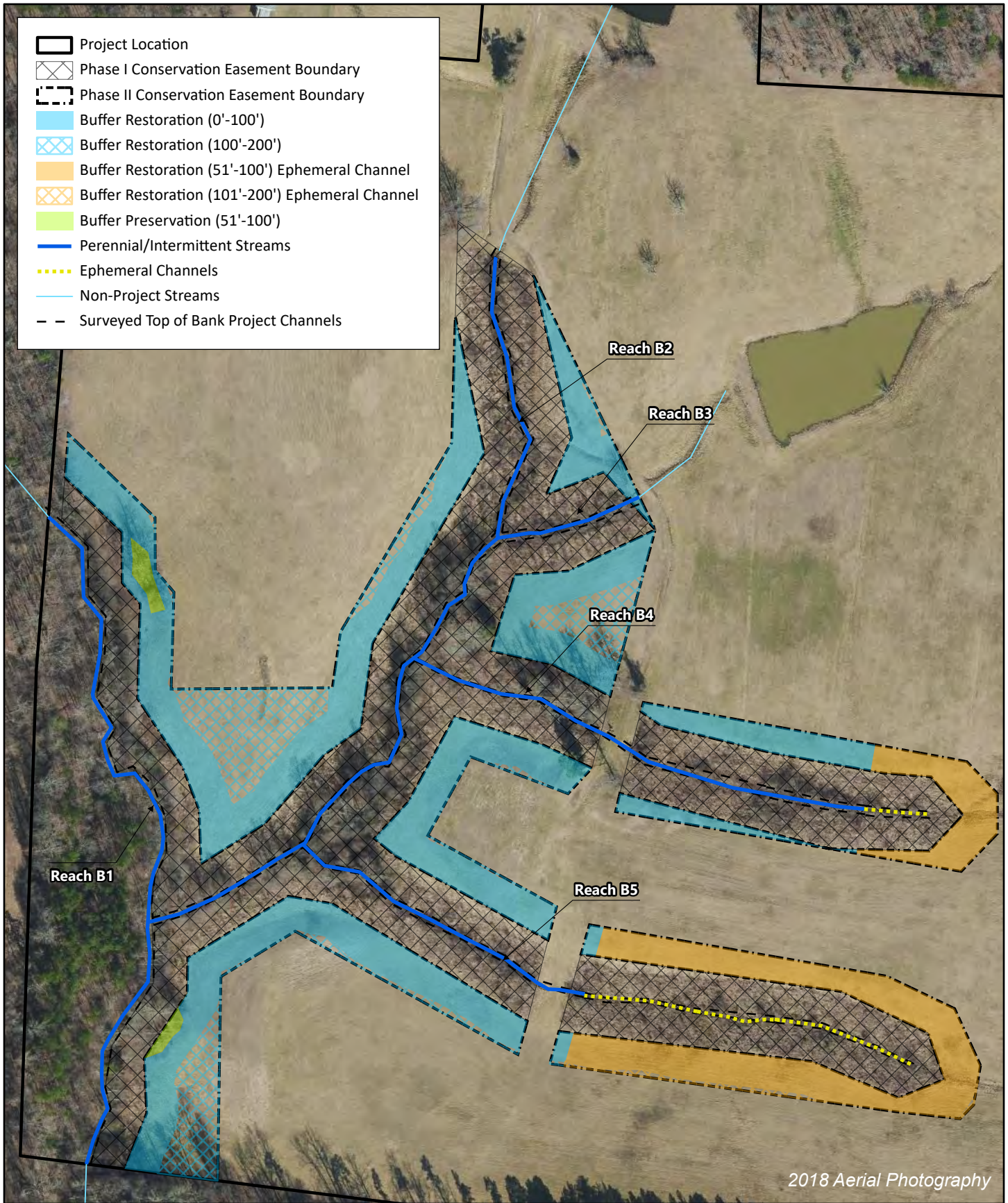


Figure 2 Project Component/Asset Map
 Burnetts Chapel Mitigation Site - Phase II
 2022 Monitoring Report (MY4)
 Cape Fear River Basin (03030003)

Guilford County, NC

Table 1. Buffer Project Areas and Assets

Burnetts Chapel Mitigation Site - Phase II

DMS Project No. 100045

Monitoring Year 4 - 2022

RIPARIAN BUFFER (15A NCAC 02B.0295)

Location	Jurisdictional Streams	Method	Feature Name	Min-Max Buffer Width (ft)	Total Area (sf)	Creditable Area (sf)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits	Convertible to Nutrient Offset (Yes or No)
Rural or Urban	Subject or Nonsubject	Restoration	~	20-29	--	--	1	75%	1.33333	--	--
Rural or Urban	Subject or Nonsubject	Restoration	Ephemeral	0-100	70,473	70,473	1	100%	1.00000	70,473.000	No
Rural or Urban	Subject or Nonsubject	Restoration	Streams	0-100	188,792	188,792	1	100%	1.00000	188,792.000	No
Rural or Urban	Subject or Nonsubject	Restoration	Ephemeral	101-200	2,837	2,837	1	33%	3.03030	936.211	No
Rural or Urban	Subject or Nonsubject	Restoration	Streams	101-200	60,573	60,573	1	33%	3.03030	19,989.110	No
Rural or Urban	Subject or Nonsubject	Enhancement	~	20-29	--	--	2	75%	2.66667	--	--
Rural or Urban	Subject or Nonsubject	Enhancement	~	0-100	--	--	2	100%	2.00000	--	--
Rural or Urban	Subject or Nonsubject	Enhancement	~	101-200	--	--	2	33%	6.06061	--	--
SUBTOTALS						322,675				280,190.321	

ELIGIBLE PRESERVATION AREA						107,558						
Location	Jurisdictional Streams	Method	Feature Name	Min-Max Buffer Width (ft)	Total Area (sf)	Creditable Area (sf)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits		
Rural	Subject	Preservation	~	20-29	--	--	10	75%	13.33333	--		
Rural	Subject	Preservation	Streams	0-100	3,870	3,870	10	100%	10.00000	387.000		
Rural	Subject	Preservation	~	101-200	--	--	10	33%	30.30303	--		
Rural	Nonsubject	Preservation	~	20-29	--	--	5	75%	6.66667	--		
Rural	Nonsubject	Preservation	~	0-100	--	--	5	100%	5.00000	--		
Rural	Nonsubject	Preservation	~	101-200	--	--	5	33%	15.15152	--		
Urban	Subject or Nonsubject	Preservation	~	20-29	--	--	3	75%	4.00000	--		
Urban	Subject or Nonsubject	Preservation	~	0-100	--	--	3	100%	3.00000	--		
Urban	Subject or Nonsubject	Preservation	~	101-200	--	--	3	33%	9.09091	--		
SUBTOTALS						3,870				387.000		
TOTALS						326,545				280,577.321		

Table 2. Project Activity and Reporting History

Burnetts Chapel Mitigation Site - Phase II

DMS Project No. 100045

Monitoring Year 4 - 2022

Activity or Report	Data Collection Complete	Completion or Scheduled Delivery
Mitigation Plan	-	September 2019
Bare roots plantings	-	March 2019
Baseline Monitoring (Year 0)	April 2019	May 2019
Year 1 Monitoring	October 2019	November 2019
Invasive Species Treatment	July 2020	
Year 2 Monitoring	September 2020	November 2020
Invasive Species Treatment	April 2021	
Year 3 Monitoring	September 2021	November 2021
Boundary Monitoring	March 2022	
Invasive Species Treatment	September 2022	
Year 4 Monitoring	September 2022	November 2022
Year 5 Monitoring		

Table 3. Project Contact Table

Burnetts Chapel Mitigation Site - Phase II

DMS Project No. 100045

Monitoring Year 4 - 2022

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	Wildlands Engineering, Inc.
Monitoring (POC)	Kristi Suggs, 704.332.7754, Ext. 110

Table 4. Project Information and Attributes

Burnetts Chapel Mitigation Site - Phase II

DMS Project No. 100045

Monitoring Year 4 - 2022

Project Name	Burnetts Chapel Mitigation Site – Phase II
Hydrologic Unit Code	03030003010050
River Basin	Cape Fear
Geographic Location (Lat, Long)	35° 56' 46.0"N, 79° 50' 44.2"W
Site Protection Instrument (DB, PG)	8127 / 2755
Total Credits (BMU)	280,577.321
Types of Credits	Riparian Buffer

Table 5. Monitoring Components Summary

Burnetts Chapel Mitigation Site - Phase II

DMS Project No. 100045

Monitoring Year 4 - 2022

Parameter	Monitoring Feature	Quantity/Length by Reach					Frequency
		B1	B2	B3	B4	B5	
Vegetation	CVS Level 1 & 2	6					Annual
Visual Assessment		Y	Y	Y	Y	Y	Semi-Annual
Exotic and Nuisance Vegetation		Y	Y	Y	Y	Y	Semi-Annual
Project Boundary		Y	Y	Y	Y	Y	Semi-Annual
Reference Photos	Photographs	8					Annual



ROY COOPER
Governor
 MICHAEL S. REGAN
Secretary
 LINDA CULPEPPER
Interim Director

March 27, 2018

DWR ID# 2011-0841v2
 Guilford County

Wildlands Engineering, Inc.
 Attn: Andrea Eckardt
 1430 South Mint Street Suite 104
 Charlotte, NC
 (via electronic mail: aekardt@wildlandseng.com)

Re: Site Viability for Buffer Mitigation & Nutrient Offset – Burnetts Chapel Phase II Site
 1323 Burnetts Chapel Road, Greensboro, NC
 Randleman Lake Watershed

Dear Ms. Eckardt

On March 26, 2018, Katie Merritt, with the Division of Water Resources (DWR), assisted you and staff with Division of Mitigation Services (DMS) at the proposed Burnetts Chapel Mitigation Site (Site) in Greensboro, NC. The Site is located in the Randleman Lake WS of the Cape Fear River Basin within the 8-digit Hydrologic Unit Code 03030003. The Site is being proposed as part of a full-delivery buffer mitigation project for the DMS (RFP # 16-007242). At your request, on March 26, 2018, Ms. Merritt performed an onsite assessment of riparian land uses adjacent to streams onsite, which are shown on the attached map labeled “Site Map”. This site is adjacent to an existing DMS full-delivery buffer mitigation site known as “Burnetts Chapel Mitigation Site” (DWR# 2011-0841) where fifty-foot riparian buffers were restored.

Ms. Merritt’s evaluation of the features onsite and their associated mitigation determination for the riparian areas are provided in the table below. This evaluation was made from 51’ out to 200’ from the top of bank from each feature for buffer mitigation pursuant to 15A NCAC 02B .0295 (effective November 1, 2015).

<u>Feature</u>	<u>Classification</u>	<u>¹Subject to Buffer Rule</u>	<u>Riparian Land uses adjacent to Feature (51-200')</u>	<u>Buffer Credit Viable</u>	<u>²Nutrient Offset Viable at 2,273 lbs/acre</u>	<u>Mitigation Type Determination w/in riparian areas</u>
B1	Stream	Yes	Hay crop fields	Yes	N/A	Fields - Restoration Site per 15A NCAC 02B .0295 (n)
B2	Stream	Yes	Hay crop fields	Yes	N/A	Fields - Restoration Site per 15A NCAC 02B .0295 (n)
B3	Stream	Yes	Hay crop fields	Yes	N/A	Fields - Restoration Site per 15A NCAC 02B .0295 (n)
B4 Above DWR 2011 flag (green)	Wetland / Swale	No	N/A	No	N/A	N/A

Burnetts Chapel Phase II Site
Wildlands
March 27, 2018

<u>Feature</u>	<u>Classification</u>	<u>¹Subject to Buffer Rule</u>	<u>Riparian Land uses adjacent to Feature (51-200')</u>	<u>Buffer Credit Viable</u>	<u>²Nutrient Offset Viable at 2,273 lbs/acre</u>	<u>Mitigation Type Determination w/in riparian areas</u>
B4 At DWR 2011 flag	Ephemeral	No	Hay crop fields	Yes ⁴	N/A	Fields - Restoration Site per 15A NCAC 02B .0295 (o)(7) <i>Must meet additional requirements under .0295 (o)(7) to be viable for buffer mitigation</i>
B4 At DWR 2010 flag	Stream	Yes	Hay crop fields	Yes	N/A	Fields - Restoration Site per 15A NCAC 02B .0295 (n)
B5 Above DWR 2011 flag (green)	Wetland / Swale	No	N/A	No	N/A	N/A
B5 At DWR 2011 flag	Ephemeral	No	Hay crop fields	Yes ⁴	N/A	Fields - Restoration Site per 15A NCAC 02B .0295 (o)(7) <i>Must meet additional requirements under .0295 (o)(7) to be viable for buffer mitigation</i>
B5 At DWR 2010 flag	Stream	Yes	Hay crop fields	Yes	N/A	Fields - Restoration Site per 15A NCAC 02B .0295 (n)

¹Subjectivity calls for the features were determined by DWR in correspondence dated March 27, 2018 using the 1:24,000 scale quadrangle topographic map prepared by USGS and the most recent printed version of the soil survey map prepared by the NRCS

² NC Division of Water Resources - Methodology and Calculations for determining Nutrient Reductions associated with Riparian Buffer Establishment

³The area of preservation credit within a buffer mitigation site shall comprise of no more than 25 percent (25%) of the total area of buffer mitigation per 15A NCAC 0295 (o)(5) and 15A NCAC 0295 (o)(4). Site cannot be a Preservation only site to comply with this rule.

⁴The area of the mitigation site on ephemeral channel shall comprise no more than 25 percent (25%) of the total area of buffer mitigation per 15A NCAC 02B .0295 (o)(7).


The attached map (Site Map) showing the project site and features was provided by Wildlands Engineering and was initialed by Ms. Merritt on March 27, 2018. This letter should be provided in any future stream, wetland, buffer and/or nutrient offset mitigation plans for this Site.

This letter does not constitute an approval of this site to generate mitigation credits. Pursuant to 15A NCAC 02B .0295, a mitigation proposal and a mitigation plan shall be submitted to DWR for written approval **prior** to conducting any mitigation activities in riparian areas and/or surface waters for buffer mitigation credit. Pursuant to 15A NCAC 02B .0240, a proposal regarding a proposed nutrient load-reducing measure for nutrient offset credit shall be submitted to DWR for approval prior to any mitigation activities in riparian areas and/or surface waters.

All vegetative plantings, performance criteria and other mitigation requirements for riparian restoration, enhancement and preservation must follow the requirements in 15A NCAC 02B .0295 to be eligible for buffer and/or nutrient offset mitigation credits. For any areas depicted as not being viable for nutrient offset credit above, one could propose a different measure, along with supporting calculations and sufficient detail to support estimates of load reduction, for review by the DWR to determine viability for nutrient offset in accordance with 15A NCAC 02B .0240. For any areas generating wetland mitigation credit, no buffer or nutrient offset credit can be generated.

This viability assessment will expire on March 27, 2020 or upon the submittal of an As-Built Report to the DWR, whichever comes first. Please contact Katie Merritt at (919)-807-6371 if you have any questions regarding this correspondence.

Sincerely,

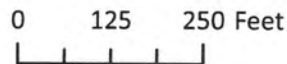
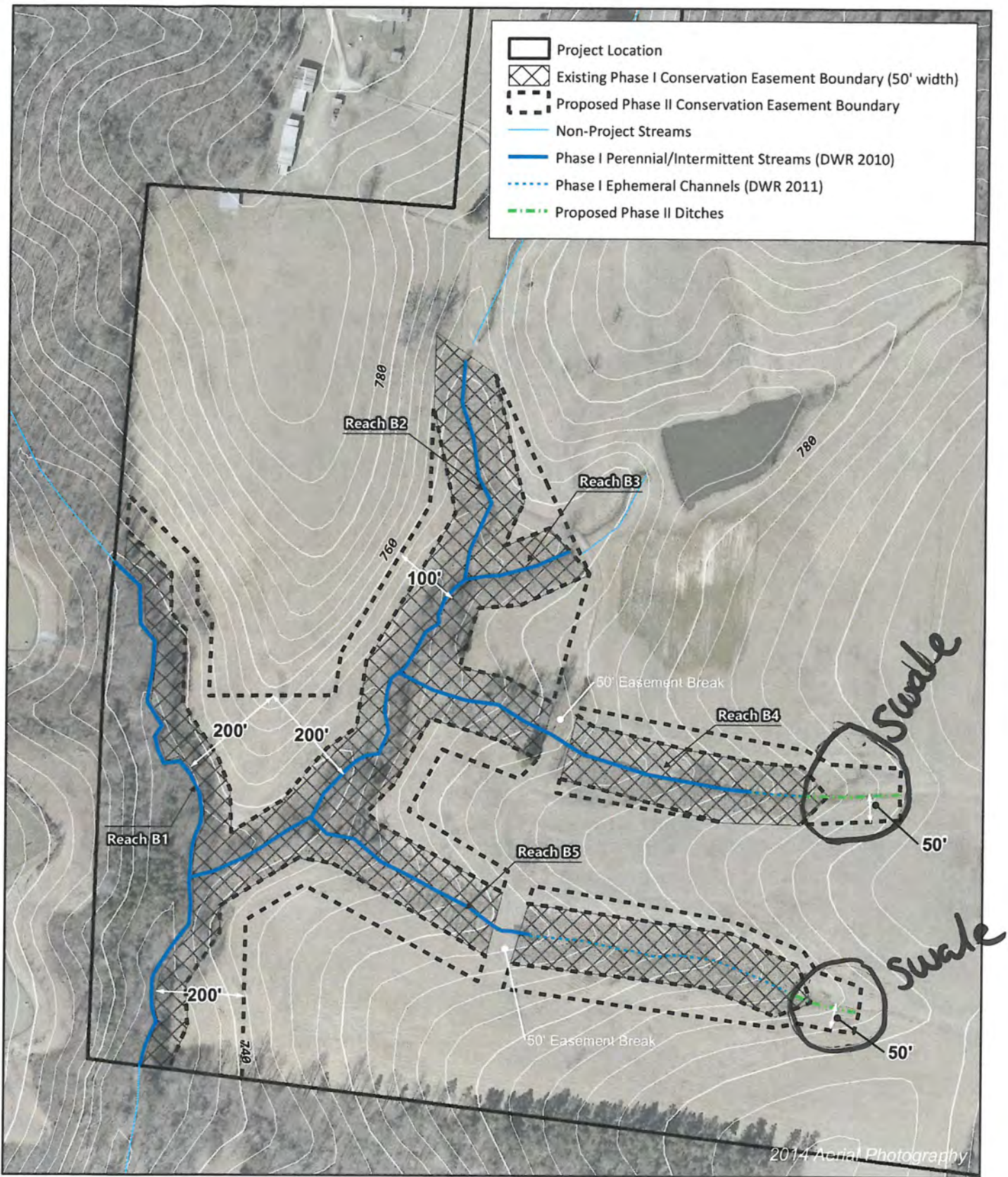


Karen Higgins, Supervisor
401 and Buffer Permitting Branch

KAH/km

Attachments: Site Map

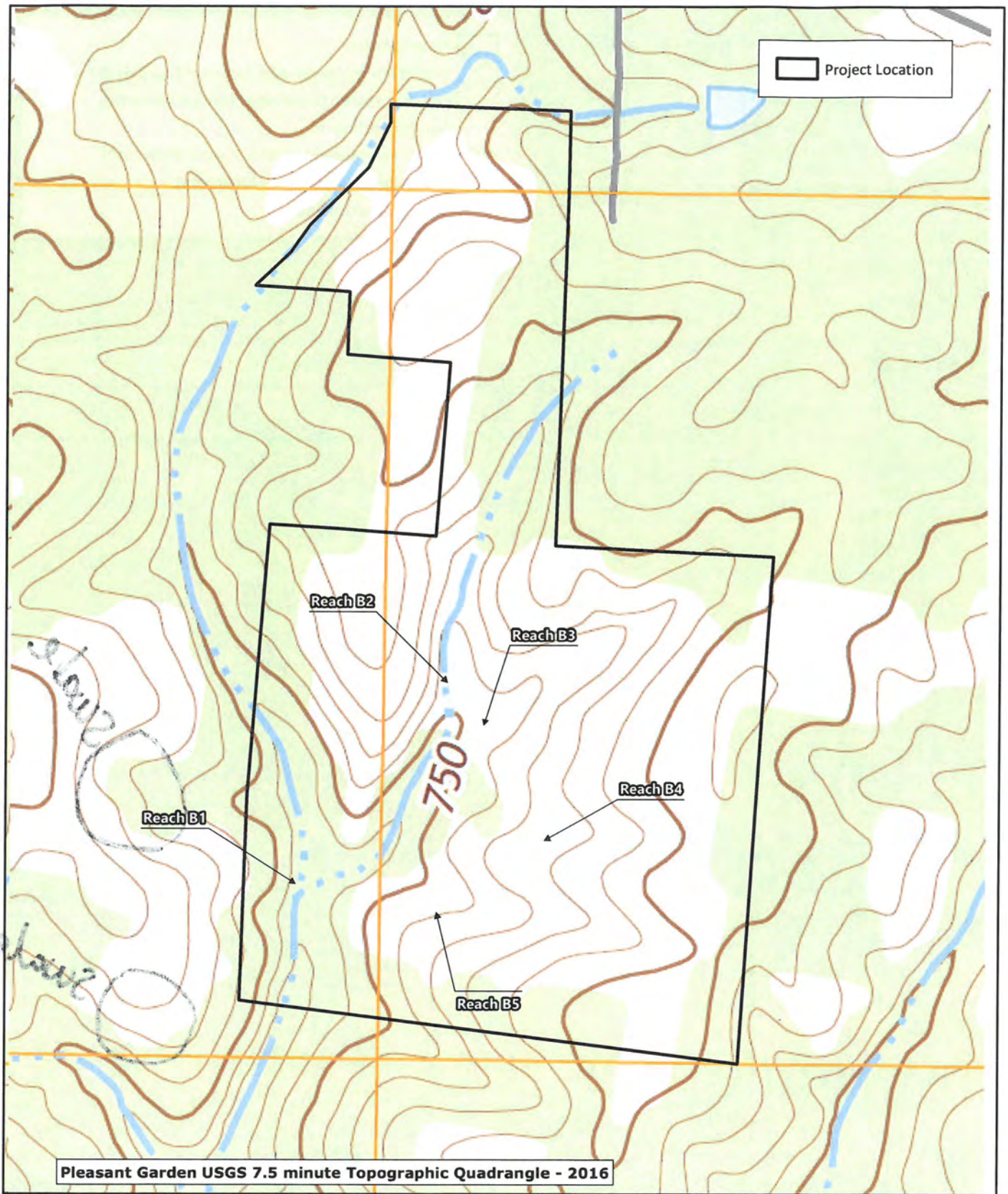
cc: File Copy (Katie Merritt)
DMS - Jeff Schaffer (via electronic mail)



Site Map
 Burnetts Chapel Mitigation Site - Phase II
 Cape Fear River Basin (03030003)

Guilford County, NC

Handwritten: KRM 3/27/18





ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Interim Director

March 27, 2018

Andrea Eckardt
Wildlands Engineering Inc.
1430 South Mint Street, Suite 104
Charlotte NC 28203

Subject: On-Site Determination for Applicability to the Randleman Lake Buffer Rules (15A NCAC 2B .0250)

Subject Property: Burnett's Chapel Mitigation Site, 1323 Burnetts Chapel Rd, Greensboro NC
Guilford County
DWR# 2011-0841

Dear Ms. Eckardt:

On March 26, 2018, at your request, Sue Homewood conducted an on-site determination to review features located on the subject project for stream determinations with regards to the above noted state regulations. Katie Merritt with the Division of Water Resources (Division) was also present during the site visit.

During the site visit the upper portions of Reach B4 and Reach B5, as shown in green on the attached map, were reviewed. Both areas were representative of vegetated swales and had characteristics of wetlands and were therefore were determined not to be subject to the Randleman Buffer Rules as stated above.

The owner (or future owners) should notify the Division (and other relevant agencies) of this decision in any future correspondences concerning this property. This on-site determination shall expire five (5) years from the date of this letter.

Landowners or affected parties that dispute a determination made by the Division or Delegated Local Authority that a surface water exists and that it is subject to the buffer rule may request a determination by the Director. A request for a determination by the Director shall be referred to the Director in writing c/o 401 & Buffer Permitting Branch, 1650 Mail Service Center, Raleigh, NC 27699-1650. Individuals that dispute a determination by the Division or Delegated Local Authority that "exempts" surface water from the buffer rule may ask for an adjudicatory hearing. You must act within 60 days of the date that you receive this letter. Applicants are hereby notified that the 60-day statutory appeal time does not start until the affected party (including downstream and adjacent landowners) is notified of this decision. The Division recommends that the applicant conduct this notification in order to be certain that third party appeals are made in a timely manner. To ask for a hearing, send a written petition, which conforms to Chapter 150B of the North Carolina General Statutes to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. This determination is final and binding unless you ask for a hearing within 60 days.

This letter only addresses the applicability to the buffer rules and does not approve any activity within Waters of the United States or Waters of the State or their associated buffers. If you have any additional questions or require additional information, please contact me at 336-776-9693 or sue.homewood@ncdenr.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Sue Homewood". The signature is fluid and cursive, with a large loop at the end.

Sue Homewood
Winston-Salem Regional Office

Enclosures: USGS Topo Map
Wildlands Features Map

Cc: Rick & Val Ingram, 1323 Burnetts Chapel Rd, Greensboro NC 27406
Katie Merritt, DWR (via email)
DWR, Winston-Salem Regional Office

APPENDIX B. Visual Assessment Data

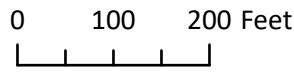
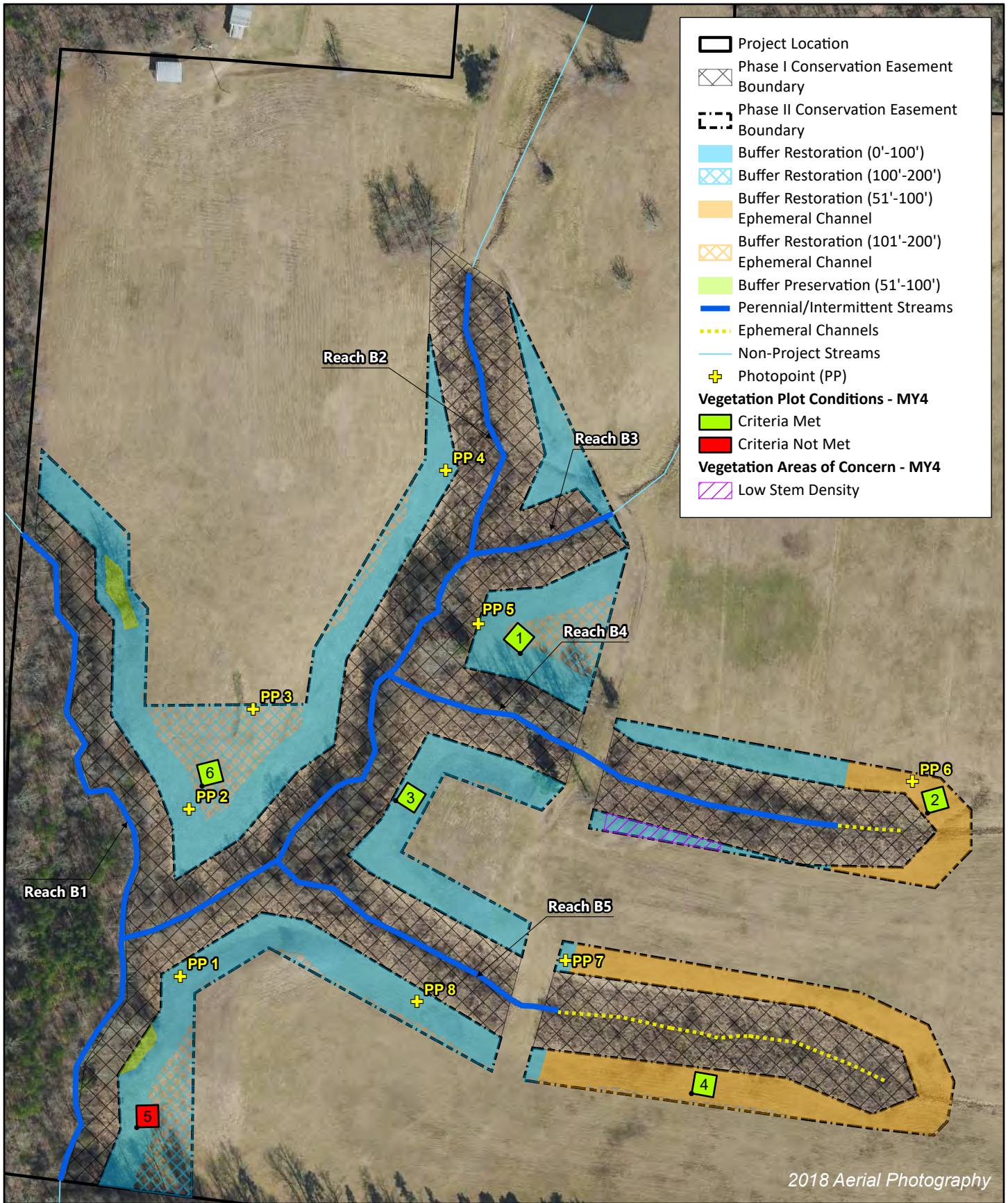


Figure 3 Current Conditions Plan View
 Burnetts Chapel Mitigation Site - Phase II
 2022 Monitoring Report (MY4)
 Cape Fear River Basin (03030003)

Guilford County, NC

Table 6. Vegetation Condition Assessment Table

Burnetts Chapel Mitigation Site - Phase II

DMS Project No. 100045

Monitoring Year 4 - 2022

Planted Acreage 7.4

Vegetation Category	Definitions	Mapping Threshold (acres)	Number of Polygons	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material	0.1	0	0.0	0%
Low Stem Density Areas¹	Woody stem densities clearly below target levels based on MY5 stem count criteria.	0.1	1	0.1	1%
Total			1	0.0	1%
Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.0	0	0.0	0%
Cumulative Total			1	0.0	1%

Easement Acreage 7.5

Vegetation Category	Definitions	Mapping Threshold (SF)	Number of Polygons	Combined Acreage	% of Planted Acreage
Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	1,000	0	0.0	0%
Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	0	0.0	0%

¹Acreage calculated from vegetation plots monitored for site and visual assessment during the site walk.

Burnetts Chapel Mitigation Site – Phase II

Monitoring Year 4

Buffer and Site Condition Photographs



Photo Point 1 – Looking upstream B2 and B5 (09/08/2022)



Photo Point 1 – Looking downstream B1 (09/08/2022)



Photo Point 2 – Looking upstream B1 (09/08/2022)



Photo Point 2 – Looking downstream to B1-B2 confluence (09/08/2022)



Photo Point 3 – Looking upstream B2 (09/08/2022)



Photo Point 3 – Looking downstream B2 (09/08/2022)



Photo Point 4 – Looking upstream B2 (09/08/2022)



Photo Point 4 – Looking downstream B2 (09/08/2022)



Photo Point 5 – Looking upstream B3 (09/08/2022)



Photo Point 5 – Looking downstream to B2-B4 confluence (09/08/2022)



Photo Point 6 – Looking upstream across top of B4 (09/08/2022)



Photo Point 6 – Looking downstream B4 (09/08/2022)



Photo Point 7 – Looking upstream B5 (09/08/2022)



Photo Point 7 – Looking downstream B5 (09/08/2022)



Photo Point 8 – Looking upstream B5 (09/08/2022)



Photo Point 8 – Looking downstream B5 (09/08/2022)

Burnetts Chapel Mitigation Site – Phase II

Monitoring Year 4

Vegetation Plot Photographs



Vegetation Plot 1 (09/08/2022)



Vegetation Plot 2 (09/08/2022)



Vegetation Plot 3 (09/08/2022)



Vegetation Plot 4 (09/08/2022)



Vegetation Plot 5 (09/08/2022)



Vegetation Plot 6 (09/08/2022)

APPENDIX C. Vegetation Plot Data

Table 7. Vegetation Plot Criteria Attainment

Burnetts Chapel Mitigation Site - Phase II

DMS Project No. 100045

Monitoring Year 4 - 2022

Plot	Success Criteria Met (Y/N)	Tract Mean
1	Y	83%
2	Y	
3	Y	
4	Y	
5	N	
6	Y	

Table 8. Planted and Total Stem Count

Burnetts Chapel Mitigation Site - Phase II
 DMS Project No. 100045
 Monitoring Year 4 - 2022

			Current Plot Data (MY4 2022)																	
Scientific Name	Common Name	Species Type	Vegetation Plot 1			Vegetation Plot 2			Vegetation Plot 3			Vegetation Plot 4			Vegetation Plot 5			Vegetation Plot 6		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS ²	P-all	T	PnoLS	P-all	T
<i>Acer rubrum</i>	Red Maple	Tree									2									
<i>Betula nigra</i>	River Birch, Red Birch	Tree	5	5	5	6	6	6	4	4	4	4	4	4	1	1	1			
<i>Diospyros virginiana</i>	American Persimmon, Possumwood	Tree									1									
<i>Fraxinus pennsylvanica</i>	Green Ash, Red Ash	Tree	1	1	1	1	1	1	3	3	3	4	4	4	1	1	1			
<i>Juglans nigra</i>	Black Walnut	Tree									1									
<i>Juniperus virginiana</i>	Red Cedar	Tree											2							
<i>Liquidambar styraciflua</i>	Sweet Gum, Red Gum	Tree			35						2		5						1	
<i>Liriodendron tulipifera</i>	Tulip Poplar	Tree	1	1	16						1		1				3	3	3	
<i>Platanus occidentalis</i>	Sycamore, Plane-tree	Tree	2	2	2	3	3	3	1	1	1	2	2	2	1	1	1	3	3	3
<i>Quercus alba</i>	White Oak	Tree							1	1	1									
<i>Quercus michauxii</i>	Basket Oak, Swamp Chestnut Oak	Tree	4	4	4	4	4	4	1	1	1	2	2	2	3	5	5			
<i>Quercus phellos</i>	Willow Oak	Tree	2	2	2				2	2	2	2	2	2				3	3	3
<i>Quercus rubra</i>	Northern Red Oak	Tree						1												
<i>Ulmus americana</i>	American Elm	Tree											1							
Stem count			15	15	65	14	14	15	12	12	19	14	14	23	6	8	8	9	9	10
size (ares)			1			1			1			1			1			1		
size (ACRES)			0.0247			0.0247			0.0247			0.0247			0.0247			0.0247		
Species count			6	6	7	4	4	5	6	6	11	5	5	9	4	4	4	3	3	4
Stems per ACRE			607	607	2630	567	567	607	486	486	769	567	567	931	243	324	324	364	364	405

			Annual Means																	
Scientific Name	Common Name	Species Type	MY4 (2022)			MY3 (2021)			MY2 (2020) ¹			MY1 (2019)			MY0 (2019)					
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T			
<i>Acer rubrum</i>	Red Maple	Tree			2															
<i>Betula nigra</i>	River Birch, Red Birch	Tree	20	20	20	20	20	20	19	19	19	20	20	20	20	20	20			
<i>Diospyros virginiana</i>	American Persimmon, Possumwood	Tree			1			1			1			1						
<i>Fraxinus pennsylvanica</i>	Green Ash, Red Ash	Tree	10	10	10	10	10	10	10	10	10	10	10	10	11	11	11			
<i>Juglans nigra</i>	Black Walnut	Tree			1			1			1									
<i>Juniperus virginiana</i>	Red Cedar	Tree			2															
<i>Liquidambar styraciflua</i>	Sweet Gum, Red Gum	Tree			43			20			22									
<i>Liriodendron tulipifera</i>	Tulip Poplar	Tree	4	4	21	4	4	15	4	4	16	8	8	8	9	9	9			
<i>Platanus occidentalis</i>	Sycamore, Plane-tree	Tree	12	12	12	12	12	12	12	12	12	13	13	13	13	13	13			
<i>Quercus alba</i>	White Oak	Tree	1	1	1	1	1	1	1	1	1	1	1	1						
<i>Quercus michauxii</i>	Basket Oak, Swamp Chestnut Oak	Tree	14	16	16	16	16	16	16	16	16	18	18	18	20	20	20			
<i>Quercus phellos</i>	Willow Oak	Tree	9	9	9	10	10	10	10	10	10	13	13	13	17	17	17			
<i>Quercus rubra</i>	Northern Red Oak	Tree			1															
<i>Ulmus americana</i>	American Elm	Tree			1															
Stem count			70	72	140	73	73	106	72	72	108	83	83	84	90	90	90			
size (ares)			6			6			6			6			6					
size (ACRES)			0.1483			0.1483			0.1483			0.1483			0.1483					
Species count			7	7	14	7	7	10	7	7	10	7	7	8	6	6	6			
Stems per ACRE			472	486	944	492	492	715	486	486	728	560	560	567	607	607	607			

1 - MY2 stem counts corrected based on data sheets; 19 river birch and 12 sycamore counted during MY2; overall total unchanged.
 2 - VP5 had 5 Q. michauxii for a total of 8 planted stems; this number was reduced to 3 stems since any species can't make up more than 50% of the total plot's stem count.

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%
 Volunteers included

PnoLS: Number of planted stems excluding live stakes
 P-All: Number of planted stems including live stakes
 T: Total stems

Burnetts Chapel Mitigation Site – Phase II (MY4)

Vegetation Monitoring Data Sheets

Plots 1-6

Sampled:

09/08/2022

Notes:

Party:

JT	Jeff Turner
SE	Stephanie Erickson
HR	Henry Reed
DD	Dom Dixon

Abbreviations for Approved Planted Stems:

Be.ni.	<i>Betula nigra</i>	River birch
Fr.pe.	<i>Fraxinus pennsylvanica</i>	Green ash
Li.tu.	<i>Liriodendron tulipifera</i>	Tulip poplar
Pl.oc.	<i>Platanus occidentalis</i>	American sycamore
Qu.mi.	<i>Quercus michauxii</i>	Swamp chestnut oak
Qu.ph.	<i>Quercus phellos</i>	Willow oak

Abbreviations for Natural Woody Stems:

Di.vi.	<i>Diospyros virginiana</i>	American Persimmon
Ju. ni.	<i>Juglans nigra</i>	Eastern black walnut
Ju.vi.	<i>Juniperus virginiana</i>	Red Cedar
Li.st.	<i>Liquidambar styraciflua</i>	Sweetgum
Qu.al.	<i>Quercus alba</i>	White Oak

Plot (continued): 10045-01-VP1				Sep 2021 Data			THIS YEAR'S DATA								
ID	Species	map char	source	X (m)	Y (m)	ddh (mm)	Height (cm)	DBH (cm)	ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Vegetation Monitoring Data (VMD) Datasheet

Please fill in any missing data and correct any errors.

Plot 10045-01-VP1				Party:		Role:		Date last planted:			
VMD Year (1-5): <input type="text" value="4"/>		Date: <input type="text" value="9/8/22"/> - <input type="text" value="1/1"/>		JT				New planting date m/yy? <input type="text" value="1"/>			
Taxonomic Standard:				SE				<input type="checkbox"/> Check box if plot was not sampled, specify reason below <div style="border: 1px solid black; height: 50px; width: 100%;"></div>			
Taxonomic Standard DATE:				HR							
Latitude or UTM-N: <input type="text" value="35 94385"/>		Datum: <input type="text" value="NAD83/W"/>		DD							
Longitude or UTM-E: <input type="text" value="-79 84587"/>		UTM Zone: <input type="text" value="17"/>									
Coordinate Accuracy (m): <input type="text" value="10"/>		X-Axis bearing (deg): <input type="text" value="50.36"/>									
Plot Dimensions: X: <input type="text" value="10"/>		Y: <input type="text" value="10"/>		<input type="checkbox"/> Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X)							

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Sep 2021 Data		Vigor*	THIS YEAR'S DATA				
						Height 1cm*	DBH 1 cm		Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*
1	Quercus michauxii	(c)	R	0.4	0.4	165.0	0.0	<input checked="" type="checkbox"/>	213	1	<input type="checkbox"/>	4	
2	Platanus occidentalis	(f)	R	5.0	0.4	135.0	2.0	<input type="checkbox"/>	350	2	<input type="checkbox"/>	1	
3	Betula nigra	(k)	R	9.6	0.4	67.0		<input checked="" type="checkbox"/>	62		<input type="checkbox"/>		deer
4	Quercus michauxii	(i)	R	9.6	2.4	90.0		<input type="checkbox"/>	154	0	<input type="checkbox"/>		
5	Quercus phellos	(j)	R	5.2	2.5	40.0		<input checked="" type="checkbox"/>	69		<input type="checkbox"/>		
6	Betula nigra	(a)	R	0.3	2.4	83.0		<input checked="" type="checkbox"/>	84		<input type="checkbox"/>		
7	Platanus occidentalis	(d)	R	0.4	4.6	230.0	1.0	<input type="checkbox"/>	400	3	<input type="checkbox"/>		
8	Fraxinus pennsylvanica	(g)	R	5.0	4.9	155.0	0.0	<input type="checkbox"/>	275	2	<input type="checkbox"/>		
9	Quercus phellos	(n)	R	9.8	5.0	53.0		<input checked="" type="checkbox"/>	93		<input type="checkbox"/>		
10	Quercus michauxii	(o)	R	9.9	7.5	100.0		<input type="checkbox"/>	157	0	<input type="checkbox"/>		
11	Betula nigra	(h)	R	5.0	7.3	54.0		<input checked="" type="checkbox"/>	66		<input type="checkbox"/>		
12	Quercus michauxii	(b)	R	0.3	6.7	87.0		<input checked="" type="checkbox"/>	110		<input type="checkbox"/>		
13	Liriodendron tulipifera	(e)	R	0.5	9.6	194.0	1.0	<input type="checkbox"/>	300	3	<input type="checkbox"/>		
14	Betula nigra	(i)	R	5.0	9.8	32.0		<input checked="" type="checkbox"/>	44		<input type="checkbox"/>		
15	Betula nigra	(m)	R	9.6	9.7	46.0		<input checked="" type="checkbox"/>	70		<input type="checkbox"/>	4	

stems: 15 New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:**
 1-mildew
 3-yr 1: Broken stem | yr3: deer
 5-yr 1: Broken stem | yr3: deer
 6-Broken stem
 9-deer
 11-yr 1: Broken stem | yr3: deer
 12-mildew
 14-Broken stem
 15-yr 1: Broken stem | yr3: deer

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown
 *VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing
 *DAMAGE: REMoval, CUT, MOWing, BEA Ver, DEER, RODents, INSEcts, GAME, LIVESTock, Other/Unknown ANIMAL, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROught, STORM, HURRICane, DISeased, VINE Strangulation, UNKNown, specify other.
 *HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.
 p. 1
 Printed in the CVS Entry Tool ver. 2.5.0

Plot (continued): 10045-01-VP1				Sep 2021 Data			THIS YEAR'S DATA								
ID	Species	map char	source	X (m)	Y (m)	ddh (mm)	Height (cm)	DBH (cm)	ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

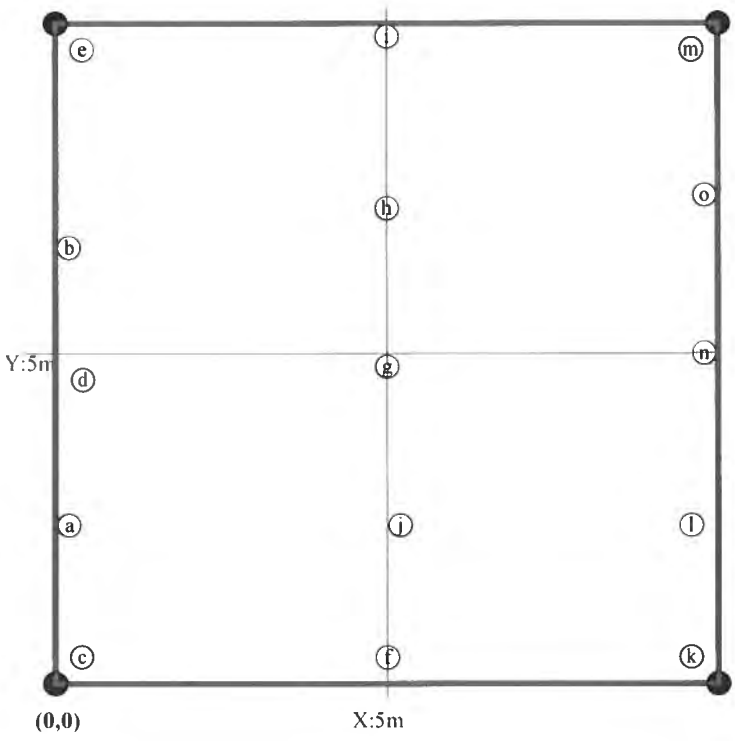
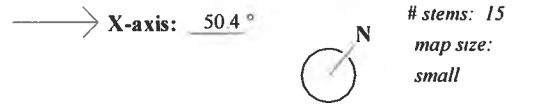
Natural Woody Stems - tallied by species										
Explanation of cut-off & subsampling**:										
Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): <input type="checkbox"/> 10cm <input type="checkbox"/> 50cm <input type="checkbox"/> 100cm <input type="checkbox"/> 137cm										
Species Name	Sub-seed	SEEDLINGS — HEIGHT CLASSES			SAPLINGS — DBH			TREES — DBH		
		10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	Sub-Sapl	0-1 cm	1-2.5	2.5-5-	5-	=10 (write DBH)
L: st.	—		10		—	10	15			
L: tu	—		15		—					
	—				—					
	—				—					
	—				—					
	—				—					
	—				—					

**Required if cut-off >10cm or subsample > 100%

1
 2
 3
 4
 5
 6
 7
 8
 9
 10

Form WS2, ver 9 1

Map of stems on plot 10045-01-VP1



*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INsects, GAME, LIVESTock, Other/Unknown

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Printed in the CVS Entry Tool ver. 2.5.0

Vegetation Monitoring Data (VMD) Datasheet

Please fill in any missing data and correct any errors.

Plot 10045-01-VP2

VMD Year (1-5): Date: -

Taxonomic Standard: _____

Taxonomic Standard DATE: _____

Latitude or UTM-N: Datum: (dec deg or m)

Longitude or UTM-E: UTM Zone:

Coordinate Accuracy (m): X-Axis bearing (deg):

Plot Dimensions: X: Y: Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X)

Party: Role: _____

Date last planted: _____

New planting date m/yy? Check box if plot was not

Notes: sampled, specify reason below

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Sep 2021 Data		THIS YEAR'S DATA					
						Height 1cm*	DBH 1 cm	Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
16	Betula nigra	(a)	R	0.5	0.5	40.0	<input checked="" type="checkbox"/>	46		<input type="checkbox"/>	4		
17	Betula nigra	(f)	R	4.8	0.6	69.0	<input checked="" type="checkbox"/>	73		<input checked="" type="checkbox"/>	1	Dieback	
18	Fraxinus pennsylvanica	(j)	R	9.5	0.5	180.0	DBH!! <input checked="" type="checkbox"/>	20	1	<input type="checkbox"/>			
19	Quercus michauxii	(k)	R	9.5	2.4	91.0	<input checked="" type="checkbox"/>	55		<input type="checkbox"/>		Dieback	
20	Betula nigra	(g)	R	4.8	2.2	62.0	<input checked="" type="checkbox"/>	61		<input type="checkbox"/>		Dieback	
21	Betula nigra	(b)	R	0.5	1.9	43.0	<input checked="" type="checkbox"/>	42		<input type="checkbox"/>		deer	
22	Platanus occidentalis	(c)	R	0.5	4.5	105.0	DBH? <input type="checkbox"/>	157	0	<input type="checkbox"/>			
24	Betula nigra	(l)	R	9.7	5.3	61.0	<input checked="" type="checkbox"/>	75		<input type="checkbox"/>			
25	Platanus occidentalis	(m)	R	9.7	7.5	163.0	1.0 <input type="checkbox"/>	253	1	<input type="checkbox"/>			
26	Betula nigra	(h)	R	4.8	6.7	45.0	<input checked="" type="checkbox"/>	46		<input type="checkbox"/>		deer	
27	Quercus michauxii	(d)	R	0.5	6.3	64.0	<input type="checkbox"/>	78		<input type="checkbox"/>			
28	Quercus michauxii	(e)	R	0.4	9.5	77.0	<input type="checkbox"/>	106		<input type="checkbox"/>			
29	Platanus occidentalis	(i)	R	4.8	9.4	165.0	0.0 <input type="checkbox"/>	110		<input type="checkbox"/>	↓		
30	Quercus michauxii	(n)	R	9.6	9.5	75.0	<input checked="" type="checkbox"/>	84		<input type="checkbox"/>	4		

stems: 14 New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:**

- 16-Broken stem
- 17-Broken stem
- 18-stripped bark
- 19-Broken stem
- 20-Broken stem
- 21-Broken stem
- 24-Broken stem
- 26-Broken stem
- 30-Insects, Broken stem

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown p. 3

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing

*DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSeCTS, GAME, LIVESTock, Other/Unknown ANIMAL, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROught, STORM, HURRICane, DISeased, VINE Strangulation, UNKNOwn, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Printed in the CVS Entry Tool ver. 2.5.0

Plot (continued): 10045-01-VP2				Sep 2021 Data			THIS YEAR'S DATA								
ID	Species	map char	source	X (m)	Y (m)	ddh (mm)	Height (cm)	DBH (cm)	ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): 10cm 50cm 100cm 137cm

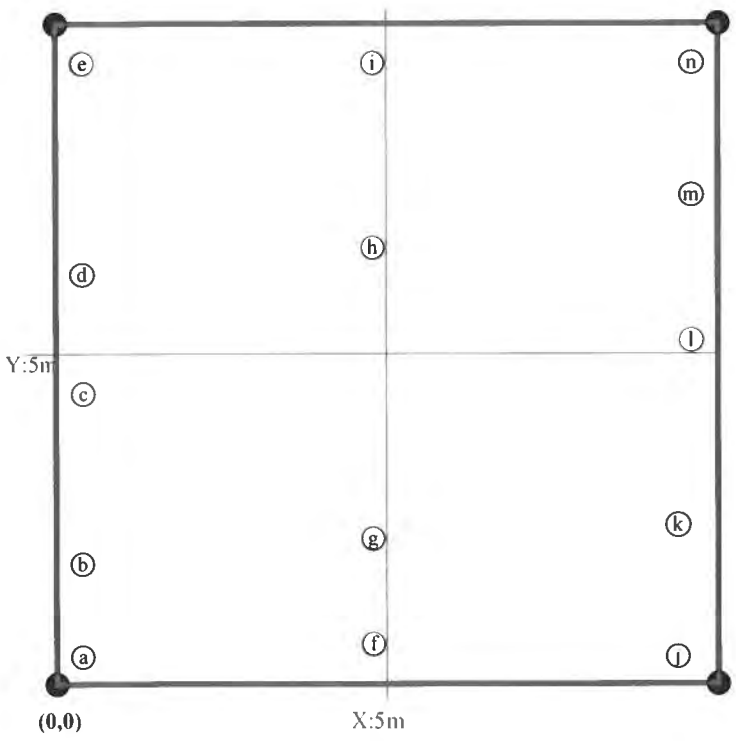
Species Name	Sub-Seed	SEEDLINGS — HEIGHT CLASSES			SAPLINGS — DBH			TREES — DBH		
		10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	0-1 cm	1-2.5	2.5-5-	5-10	=10 (write DBH)	
Qu. ru.		1								

**Required if cut-off >10cm or subsample ? 100%

Form WS2, ver 9.1

Map of stems on plot 10045-01-VP2 # stems: 14
map size: small

X-axis: 15.1°



*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown p. 4

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing

*DAMAGE: REMOval, CUT, MOWing, BEAVer, DEER, RODents, INSEcts, GAME, LIVESTock, Other/Unknown ANIMAL, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUGHT, STORM, HURRICane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Printed in the CVS Entry Tool ver. 2.5.0

Vegetation Monitoring Data (VMD) Datasheet

Please fill in any missing data and correct any errors.

Plot 10045-01-VP3 Party: JT Role: SE Date last planted: 1
 VMD Year (1-5): 4 Date: 9/8/22 - 1/1
 Taxonomic Standard: _____
 Taxonomic Standard DATE: _____
 Latitude or UTM-N: 35 943236 Datum: NAD83/W
 (dec deg. or m) Longitude or UTM-E: -79 846504 UTM Zone: 17
 Coordinate Accuracy (m): _____ X-Axis bearing (deg): 328.89
 Plot Dimensions: X: 10 Y: 10 Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X)

New planting date m/yy? 1
 Check box if plot was not
 Notes: sampled, specify reason below

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Sep 2021 Data		Notes	THIS YEAR'S DATA					
						Height 1cm*	DBH 1 cm		Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes
31	Quercus phellos	(a)	R	0.5	0.5	65.0			143	0		4		
32	Platanus occidentalis	(e)	R	2.4	0.5	200.0	1.0		300	2		1		
33	Quercus alba	(g)	R	4.9	0.5	95.0		<input checked="" type="checkbox"/>	83					
34	Betula nigra	(i)	R	7.1	0.4	40.0			8		<input checked="" type="checkbox"/>			
35	Betula nigra	(l)	R	9.4	0.5	44.0			36					
36	Quercus michauxii	(m)	R	9.6	4.9	168.0	0.0	<input checked="" type="checkbox"/>	220	1		✓		
37	Quercus phellos	(j)	R	7.1	4.7	65.0		<input checked="" type="checkbox"/>	114			4		
38	Quercus phellos	(h)	R	5.1	4.6	16.0			M			-		
39	Betula nigra	(f)	R	2.6	4.6	100.0			98			4		
40	Fraxinus pennsylvanica	(b)	R	0.5	4.5	88.0		<input checked="" type="checkbox"/>	74					
41	Fraxinus pennsylvanica	(c)	R	0.4	9.6	137.0	0.0		189	1				
42	Fraxinus pennsylvanica	(d)	R	2.3	9.5	147.0	0.0		231	1		✓		
44	Betula nigra	(k)	R	7.2	9.7	100.0		<input checked="" type="checkbox"/>	95			4		deer

stems: 13 New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

***Notes by ID:** 33-Mislabeled MY0 as Q. mich.
 36-Broken stem
 37-Broken stem
 40-yr1: Insect damage | yr3: deer
 44-yr1: Insect damage | yr3: deer

*SOURCE: Tr=Transplant, L=Live stake, B=Burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown p. 5
 *VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing
 *DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSEcts, GAME, LIVESTock, Other/Unknown
 ANIMAL, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUGHT, STORM, HURRICane, DISeased, VINE
 Strangulation, UNKNown, specify other.
 *HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m. Printed in the CVS Entry Tool ver. 2.5.0

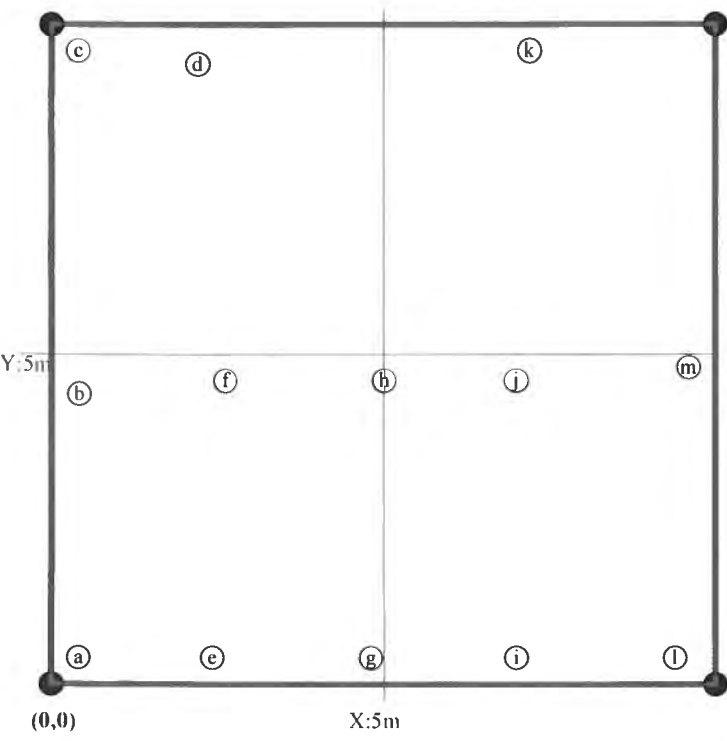
Plot (continued): 10045-01-VP3				Sep 2021 Data			THIS YEAR'S DATA						
ID	Species	map char	source X (m) Y (m)	ddh (mm)	Height (cm)	DBH (cm)	ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species										
Explanation of cut-off & subsampling**:										
Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): <input type="checkbox"/> 10cm <input type="checkbox"/> 50cm <input type="checkbox"/> 100cm <input type="checkbox"/> 137cm										
Species Name	Sub-Seed	SEEDLINGS — HEIGHT CLASSES			SAPLINGS — DBH			TREES — DBH		
		10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	Sub-Sapl	0-1 cm	1-2.5	2.5-	5-	=10 (write DBH)
Ju. ni.	—			1	—					
D. v.	—				—			1		
Li tu	—	1			—					
Ac. ru	—	11			—					
Li st	—	1	1		—					
	—				—					
	—				—					

**Required if cut-off >10cm or subsample ? 100%. ●1 ●●2 ●●●3 ●●●●4 ●●●●●5 ●●●●●●6 ●●●●●●●7 ●●●●●●●●8 ●●●●●●●●●9 ●●●●●●●●●●10 Form WS2, ver 9.1

Map of stems on plot 10045-01-VP3

X-axis: 329° # stems: 13
 map size: small



*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown p. 6
 *VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing. *DAMAGE: REMOval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown ANIMAl, Human TRAMpled, Site Too DRY, FLOOD, DROUght, STORM, HURRricane, DISeased, VINE Strangulation, UNKNown, specify other.
 *HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m. Printed in the CVS Entry Tool ver. 2.5.0

Vegetation Monitoring Data (VMD) Datasheet

Please fill in any missing data and correct any errors.

Plot 10045-01-VP4 Party: JT Role: SE Date last planted: 1
 VMD Year (1-5): 4 Date: 9/8/22 - 1/1 New planting date m/yy? 1
 Taxonomic Standard: _____
 Taxonomic Standard DATE: _____
 Latitude or UTM-N: 35 942042 Datum: NAD83/W
 (dec deg or m) -79 844988 UTM Zone: 17
 Longitude or UTM-E: _____
 Coordinate Accuracy (m): _____ X-Axis bearing (deg): 352.6
 Plot Dimensions: X: 10 Y: 10 Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X)

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Sep 2021 Data		NON VIGOR	THIS YEAR'S DATA				
						Height 1cm*	DBH 1 cm		Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*
47	Platanus occidentalis	(g)	R	5.3	0.4	290.0	2.0	<input type="checkbox"/>	400	3	<input type="checkbox"/>	4	
48	Betula nigra	(n)	R	9.6	0.5	65.0		<input checked="" type="checkbox"/>	69		<input type="checkbox"/>		
49	Fraxinus pennsylvanica	(k)	R	9.5	2.5	155.0	0.0	<input checked="" type="checkbox"/>	230	1	<input type="checkbox"/>		
50	Fraxinus pennsylvanica	(h)	R	5.2	2.6	82.0		<input type="checkbox"/>	96		<input type="checkbox"/>		
51	Quercus michauxii	(d)	R	0.6	2.5	155.0	0.0	<input type="checkbox"/>	186	1	<input type="checkbox"/>		
52	Quercus phellos	(a)	R	0.5	5.1	41.0		<input type="checkbox"/>	81		<input type="checkbox"/>		
53	Betula nigra	(i)	R	5.2	5.1	73.0		<input checked="" type="checkbox"/>	58		<input checked="" type="checkbox"/>		
54	Fraxinus pennsylvanica	(l)	R	9.4	5.1	65.0		<input type="checkbox"/>	85		<input type="checkbox"/>		
55	Fraxinus pennsylvanica	(j)	R	9.3	7.5	30.0		<input checked="" type="checkbox"/>	24		<input checked="" type="checkbox"/>		
56	Quercus michauxii	(e)	R	5.1	7.5	90.0		<input type="checkbox"/>	114		<input type="checkbox"/>		
57	Betula nigra	(b)	R	0.4	7.5	53.0		<input checked="" type="checkbox"/>	60		<input type="checkbox"/>		
58	Platanus occidentalis	(c)	R	0.5	9.5	190.0	1.0	<input type="checkbox"/>	230	1	<input type="checkbox"/>		
59	Betula nigra	(f)	R	5.1	9.5	60.0		<input checked="" type="checkbox"/>	59		<input type="checkbox"/>	↓	
60	Quercus phellos	(m)	R	9.5	9.6	72.0		<input type="checkbox"/>	83		<input type="checkbox"/>	4	

stems: 14 New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1cm*	DBH 1 cm	Vigor*	Damage*	Notes

*Notes by ID: 48-deer
 49-Insect damage
 53-Broken stem
 55-few leaves
 57-Broken stem
 59-yr1: Broken stem | yr3: deer

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown p. 7
 *VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing *DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSects, GAME, LIVESTock, Other/Unknown
 ANIMAL, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRICane, DISEased, VINE Strangulation, UNKNown, specify other.
 *HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m. Printed in the CVS Entry Tool ver. 2.5.0

Plot (continued): **10045-01-VP4**

Sep 2021 Data

THIS YEAR'S DATA

ID Species

map source X Y
char (m) (m)

ddh Height DBH
(mm) (cm) (cm)

NON

ddh Height DBH Re- Vigor* Damage* Notes
(mm) (cm) (cm) sprout

Natural Woody Stems - tallied by species

Explanation of cut-off & subsampling**:

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right.): 10cm 50cm 100cm 137cm

Species Name	Sub-Seed	SEEDLINGS — HEIGHT CLASSES			SAPLINGS — DBH			TREES — DBH		
		10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	Sub-Sapl	0-1 cm	1-2.5	2.5-5-	=10 (write DBH)	
Ul am.	—				—					
L: st.	—				—					
red cedar (Juvi)	—				—					
L: tu	—				—					
	—				—					
	—				—					
	—				—					
	—				—					

**Required if cut-off >10cm or subsample ? 100%

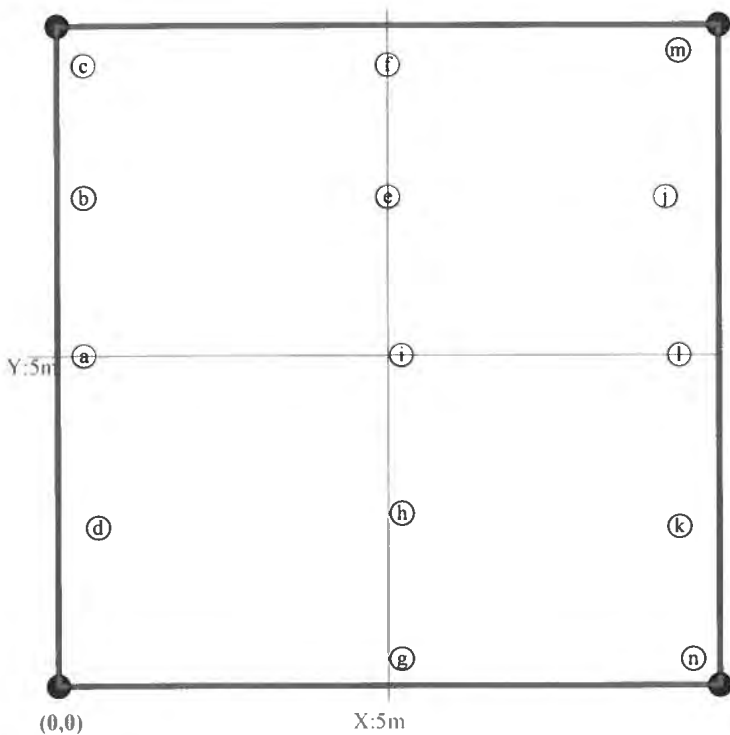


Form WS2, ver 9.1

Map of stems on plot **10045-01-VP4**

X-axis: 353°

stems: 14
map size: small



*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown

*VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing

*DAMAGE: REMOval, CUT, MOWing, BEAVer, DEER, RODents, INSEcts, GAME, LIVESTock, Other/Unknown ANIMAL, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRICane, DISeased, VINE Strangulation, UNKNown, specify other.

*HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Vegetation Monitoring Data (VMD) Datasheet

Please fill in any missing data and correct any errors.

Plot 10045-01-VP5 Party: JT SE Role: Date last planted:
 VMD Year (1-5): 4 Date: 9/8/22 - 1/1/22
 Taxonomic Standard:
 Taxonomic Standard DATE:
 Latitude or UTM-N: 35 941879 Datum: NAD83/W
 Longitude or UTM-E: -79 847799 UTM Zone: 17
 Coordinate Accuracy (m): X-Axis bearing (deg): 209
 Plot Dimensions: X: 10 Y: 10 Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X)
 Notes: sampled, specify reason below

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Sep 2021 Data		THIS YEAR'S DATA				
						Height 1cm*	DBH 1cm	Height 1cm*	DBH 1cm	Re-sprout	Vigor*	Damage*
62	Quercus michauxii	c	R	2.5	0.4	137.0	DBH? <input type="checkbox"/>	205	1		4	
66	Quercus michauxii	g	R	9.5	5.1	157.0	0.0 <input type="checkbox"/>	223	1			
67	Fraxinus pennsylvanica	e	R	7.3	5.1	112.0	DBH? <input checked="" type="checkbox"/>	118				
68	Quercus michauxii	d	R	4.6	5.2	81.0	<input type="checkbox"/>	105				
70	Quercus michauxii	a	R	0.5	5.3	129.0	DBH? <input type="checkbox"/>	141	0			
71	Quercus michauxii	b	R	0.6	9.5	84.0	<input type="checkbox"/>	84				
74	Betula nigra	f	R	7.7	9.5	64.0	<input checked="" type="checkbox"/>	65			↓	
75	Platanus occidentalis	h	R	9.6	9.5	240.0	1.0 <input type="checkbox"/>	550	4		4	

stems: 8 New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1cm*	DBH 1cm	Vigor*	Damage*	Notes

*Notes by ID: 67-deer
74-yr1. Broken stem | yr3 deer

Natural Woody Stems - tallied by species Explanation of cut-off & subsampling**

Height Cut-Off (All stems shorter than this are ignored. If >10cm, explain why to the right): 10cm 50cm 100cm 137cm

Species Name	Sub-Seed	SEEDLINGS — HEIGHT CLASSES			SAPLINGS — DBH		TREES — DBH		
		10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	0-1 cm	1-2.5	2.5-	5-	=10 (write DBH)

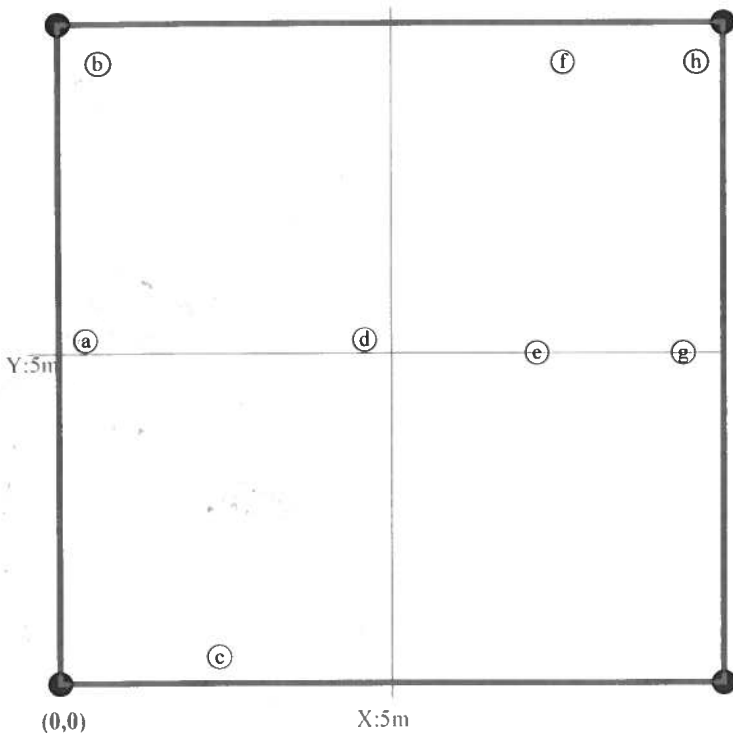
**Required if cut-off >10cm or subsample? 100%. Form WS2, ver 9.1

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown p. 9
 *VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing
 *DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSEcts, GAME, LIVESTock, Other/Unknown ANIMAL, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROught, STORM, HURRICane, DISeased, VINE Strangulation, UNKNOwn, specify other.

Map of stems on plot 10045-01-VP5

→ X-axis: 2.09°

stems: 8
map size:
small



*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown p. 10
 *VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing
 *DAMAGE: REMOval, CUT, MOWing, BEAVer, DEER, RODents, INSEcts, GAME, LIVESTock, Other/Unknown
 ANIMAL, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUGHT, STORM, HURRICane, DISeased, VINE
 Strangulation, UNKNown, specify other.
 *HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m.

Vegetation Monitoring Data (VMD) Datasheet

Please fill in any missing data and correct any errors.

Plot 10045-01-VP6 Party: _____ Role: _____ Date last planted: _____
 VMD Year (1-5): Date: -
 Taxonomic Standard: _____
 Taxonomic Standard DATE: _____
 Latitude or UTM-N: Datum:
 Longitude or UTM-E: UTM Zone:
 Coordinate Accuracy (m): _____ X-Axis bearing (deg):
 Plot Dimensions: X: Y: Plot has reverse orientation for X and Y axis (Y is 90 degrees to the right of X)
 New planting date m/yy? Check box if plot was not
 Notes: sampled, specify reason below

ID	Species Name	Map char	Source*	X 0.1m	Y 0.1m	Sep 2021 Data		NOTES	THIS YEAR'S DATA						
						Height 1cm*	DBH 1 cm		Height 1cm*	DBH 1 cm	Re-sprout	Vigor*	Damage*	Notes	
76	Quercus phellos	(a)	R	0.4	0.4	57.0		<input checked="" type="checkbox"/>	63				4		
78	Liriodendron tulipifera	(e)	R	5.0	0.3	168.0	1.0	<input type="checkbox"/>	210	1					
79	Platanus occidentalis	(g)	R	7.6	0.4	168.0	1.0	<input type="checkbox"/>	240	2					
81	Quercus phellos	(b)	R	0.4	4.8	47.0		<input checked="" type="checkbox"/>	58						
82	Quercus phellos	(d)	R	2.2	4.8	38.0		<input type="checkbox"/>	25		<input checked="" type="checkbox"/>				
83	Liriodendron tulipifera	(f)	R	5.0	4.7	194.0	1.0	<input type="checkbox"/>	55		<input checked="" type="checkbox"/>			deer broke in half	
86	Liriodendron tulipifera	(c)	R	0.4	9.5	61.0		<input type="checkbox"/>	59						
89	Platanus occidentalis	(h)	R	7.6	9.5	190.0	1.0	<input type="checkbox"/>	225	2			↓		
90	Platanus occidentalis	(i)	R	9.4	9.5	220.0	1.0	<input type="checkbox"/>	350	3			4		

stems: 9 New Stems, not included last year, but are obviously planted. If more space needed, use blank PWS (Planted Woody Stems) Form:

Species Name	Source*	X (m)	Y (m)	Height 1 cm*	DBH 1 cm	Vigor*	Damage*	Notes

*Notes by ID: 76-Broken stem
81-Broken stem

*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown p. 11
 *VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing
 *DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSEcts, GAME, LIVESTock, Other/Unknown
 ANIMal, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRICane, DISeased, VINE
 Strangulation, UNKNown, specify other.
 *HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m. Printed in the CVS Entry Tool ver. 2.5.0

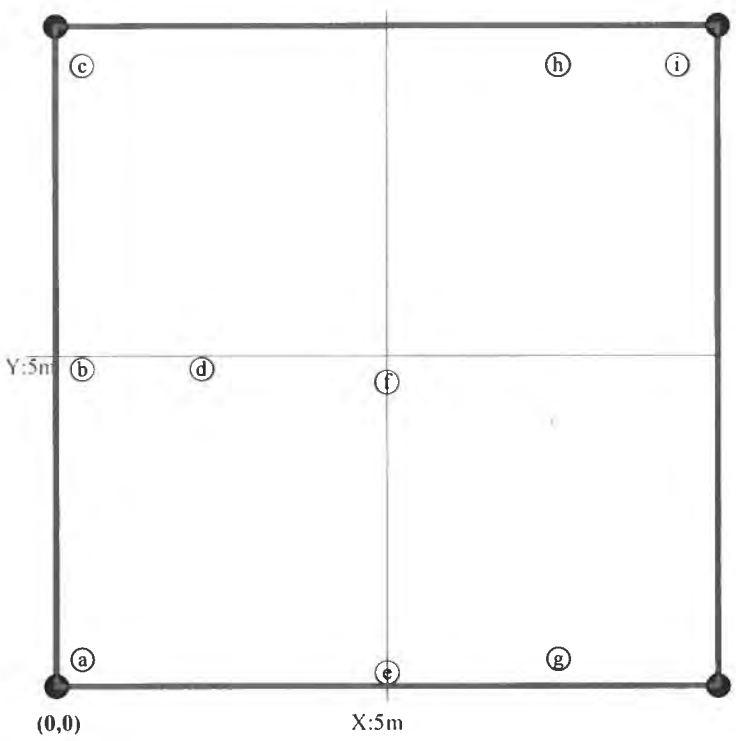
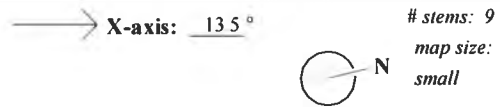
Plot (continued): 10045-01-VP6				Sep 2021 Data			THIS YEAR'S DATA						
ID	Species	map char	source X (m) Y (m)	ddh (mm)	Height (cm)	DBH (cm)	ddh (mm)	Height (cm)	DBH (cm)	Re-sprout	Vigor*	Damage*	Notes

Natural Woody Stems - tallied by species										
Species Name	Sub-Seed	SEEDLINGS — HEIGHT CLASSES			SAPLINGS — DBH			TREES — DBH		
		10 cm-50 cm	50 cm-100 cm	100 cm-137 cm	Sub-Sapl	0-1 cm	1-2.5	2.5-5-	5-	=10 (write DBH)
List			1							

Explanation of cut-off & subsampling**:
 10cm 50cm 100cm 137cm

**Required if cut-off >10cm or subsample ? 100%
 ●1 ●2 ●3 ●4 ●5 ●6 ●7 ●8 ●9 ●10 Form WS2, ver 9.1

Map of stems on plot 10045-01-VP6



*SOURCE: Tr=Transplant, L=Live stake, B=Ball and burlap, P=Potted, Tu=Tubling, R=bare Root, M=Mechanically, U=Unknown p. 12
 *VIGOR: 4=excellent, 3=good, 2=fair, 1=unlikely to survive year, 0=dead, M=missing
 *DAMAGE: REMoval, CUT, MOWing, BEAVer, DEER, RODents, INSEcts, GAME, LIVESTock, Other/Unknown ANIMAL, Human TRAMpled, Site Too WET, Site Too DRY, FLOOD, DROUght, STORM, HURRricane, DISeased, VINE Strangulation, UNKNown, specify other.
 *HEIGHT PRECISION drops to 10cm if >2.5m and 50cm if >4m. Printed in the CVS Entry Tool ver. 2.5.0