

BURNETTS CHAPEL BUFFER MITIGATION SITE

Guilford County, NC

DENR Contract 003996

NCEEP Project Number 95009

Monitoring Year 2 Annual Report

FINAL

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BURNETTS CHAPEL BUFFER MITIGATION SITE

Monitoring Year 2 Annual Report

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1.0 Executive Summary

The Burnetts Chapel Buffer Mitigation Site, hereafter referred to as the Site, is located within the Randleman Regional Reservoir watershed (North Carolina Division of Water Quality (NCDWQ) Subbasin 03-06-08) of the Cape Fear River Basin (USGS Hydrologic Unit Code 03030003010050). The Site is located in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998) approximately three miles west of the Town of Pleasant Garden and four miles south of the City of Greensboro in Guilford County, NC. The Site has historically been forested or used for agricultural purposes. The current property owner has confirmed that the Site has been farmed for more than 100 years and has included activities such as crop production, livestock pastures, and timber. The project is surrounded by fields that are alternately used for cattle and crop production.

The Deep River is the primary river in this HUC which flows into the Randleman Reservoir. The project site streams are direct tributaries to the Randleman Regional Reservoir. The newly created reservoir is a regional water supply and stream buffer protection rules are in place throughout the watershed. (<http://portal.ncdenr.org/web/wq/swp/ws/401/riparianbuffers/rules>). The Site is comprised of two areas on one parcel of land along three (3) perennial streams (Reaches A, B1 and B2) and four intermittent streams (Reaches B2, B3, B4, and B5) that drain to the Randleman Reservoir. At the downstream limits of the project, the drainage area is 366 acres (0.6 square mile).

The NCDWQ assigns best usage classifications to State Waters that reflect water quality conditions and potential resource usage. Deep River is classified as Class WS-IV; Critical Area (CA) waters. Class WS-IV waters are used as sources of water supply for drinking or food processing purposes where a more restrictive WS-I, WS-II, or WS-III classification is not feasible. These waters are also protected for Class C uses such as secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, and agriculture. WS-IV waters are generally in moderately to highly-developed watersheds or Protected Areas. This portion flowing into the Randleman Regional Reservoir is located within the Critical Area or area within ½ mile of a water supply.

A conservation easement has been recorded to protect the 12.0 acres of riparian corridor resources in perpetuity. Directions and a map of the Site are provided in Figure 1.

1.1 Project Goals and Objectives

Prior to construction activities, the primary watershed stressor was the lack of a vegetated buffer and subsequent moderate stream incision from agricultural maintenance activities. Some reaches (A and B1) exhibited only moderate incision with stable bedform and stream banks throughout, while other reaches (B2) exhibited stable geomorphic conditions with no active bed incision or bank erosion. The riparian zones within these areas were maintained in the past and mowed on an annual basis resulting in varying buffer widths. The smaller intermittent channels with small upstream ephemeral channels are located entirely within

existing open pasture. These reaches (B3, B4, and B5) entirely lacked suitable woody riparian species and were dominated by various grass and sedge species. As a result of the aforementioned land activities, the Site had poor water quality due to sediment and nutrient pollution and poor in-stream habitat due to lack of riparian vegetation and lack of in-stream bed diversity.

Tables 1-4 in Appendix 1 presents detailed information for pre and post restoration conditions.

The primary objectives of the project were to remove harmful nutrients from creek flow, reduce pollution of creek by excess sediment, restore the terrestrial habitat, and improve aesthetics. These goals were achieved by restoring 9.2 acres and preserving 1.5 acres of riparian buffer.

The project restoration activities completed provides 9.2 buffer mitigation units (BMUs) in the Cape Fear River Basin (Table 1, Appendix 1). As part of the parcel preparation, two small surface water impoundments, located on Reaches B4 and B5, were removed in order to allow for stable stream channels to be constructed and for these areas to qualify for buffer restoration credit. Riparian stream buffers were planted and restored to the dominant natural plant community that exists within the project watershed. This natural community within and adjacent to the project easement is classified as Piedmont Bottomland Forest and was determined based on existing canopy and herbaceous species (Schafale and Weakley, 1990). Plant and seed materials were installed on stream banks out to the project easement limits. These areas were planted with bare root trees and a seed mixture of permanent herbaceous vegetation ground cover.

The goals of the Site address water quality improvements identified in the Cape Fear River Basin Restoration Priorities Report and include the following:

- Remove harmful nutrients from creek flow;
- Reduce pollution of creek by excess sediment;
- Restore terrestrial habitat; and
- Improve aesthetics.

The following project objectives were established to meet these goals:

- Riparian areas will be fenced off from adjacent agricultural activities and runoff will be filtered through buffer zones. Flood flows will be filtered through restored riparian areas, where flood flow will spread through native vegetation. Vegetation will be planted to uptake excess nutrients.
- Streambanks will be further stabilized by increased woody root mass in the banks. Storm flow containing grit and fine sediment will be filtered through restored riparian buffer areas, where flow will spread through native vegetation.
- The establishment and maintenance of riparian buffers will create long-term shading of the channel bed, reducing thermal heating and improving aquatic habitat.

- Adjacent buffer and riparian habitats will be restored with native vegetation and invasive species will be treated as part of the project. Native vegetation will provide cover and food for terrestrial creatures.

1.2 Monitoring Year 2 Data Assessment

The final mitigation plan was submitted and accepted by the North Carolina Ecosystem Enhancement Program (NCEEP) in February 2012. Grading activities were completed by the landowner in December 2011. Planting activities were completed by Bruton Natural Systems, Inc. in March 2012. The baseline monitoring and as-built survey were completed in April 2012. There were no significant deviations reported in the project elements in comparison to the design plans. Appendix 1 provides more detailed project activity, history, contact information, and watershed/site background information for this project.

The buffer restoration success criteria for the Site follows the approved success criteria presented in the NCEEP Mitigation Plan Guidance (Version 2.0, 10/01/2010). Annual monitoring was conducted to assess the condition of the finished project in July 2013.

1.2.1 Vegetative Assessment

A total of 22 vegetation plots 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 at the origin looking diagonally across the plot to the opposite corner were taken. The final vegetative success criteria will be the survival of 320 planted stems per acre in the buffer corridor at the end of year five (5) of the monitoring period. The extent of invasive species coverage will also be monitored and controlled as necessary.

The monitoring year 2 (MY2) vegetative survey was completed in July 2013. The annual vegetation monitoring resulted in an average stem density of 544 stems per acre, which is 29% less than the baseline (MY0) density recorded (763 stems/acre) in April 2012. There was an average of 13 stems per plot compared to 16 stems per plot in MY1 and 19 stems per plot in MY0. The MY2 interim requirement of 320 stems/acre was not met in vegetation plot 17, which is in an area graded after the removal of a dam. Small patches of Johnson Grass (*Sorghum halepense*) was observed within the Site. Spot treatment of Johnson grass with herbicide is planned for the upcoming year to prevent the grass from further spreading. Please refer to Appendix 2 for vegetation plot photographs and visual assessment data and Appendix 3 for vegetation plot data.

1.3 Monitoring Summary

Overall, the Site has met the required buffer mitigation success criteria for MY2. Although one plot did not meet the MY2 success criteria, the average stem density of the Site is greater than

the required MY2 success criteria. Continual maintenance checks on the Site and spot treatment with herbicide is planned for the upcoming monitoring.

Summary information/data and statistics related to performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the Mitigation Plan documents available on NCEEP's website. All raw data supporting the tables and figures in the appendices is available from NCEEP upon request.

2.0 Methodology

Vegetation monitoring protocols followed the Carolina Vegetation Survey-NCEEP Level 2 Protocol (Lee et al., 2006).

3.0 References

Lee, Michael T., Peet, Robert K., Steven D., Wentworth, Thomas R. 2006. CVS-EEP Protocol for Recording Vegetation Version 4.0. Retrieved from <http://www.nceep.net/business/>

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 Department of Agriculture (USDA), 2009. Natural Resources Conservation Service, Soil Survey Geographic (SSURGO) database for Guilford County, North Carolina. <http://SoilDataMart.nrcs.usda.gov>

United States Geological Survey (USGS), 1998. North Carolina Geology. <http://www.geology.enr.state.nc.us/usgs/carolina.htm>

Weakley, A.S. 2008. *Flora of the Carolinas, Virginia, Georgia, Northern Florida, and Surrounding Areas* (Draft April 2008). University of North Carolina at Chapel Hill: Chapel Hill, NC.

Wildlands Engineering, Inc. 2012. Burnetts Chapel Buffer Mitigation Site Mitigation Plan. NCEEP, Raleigh, NC.

Wildlands Engineering, Inc. 2012. Burnetts Chapel Buffer Mitigation Site Baseline Monitoring Document and As-Built Baseline Report. NCEEP, Raleigh, NC.

APPENDIX 1. General Tables and Figures

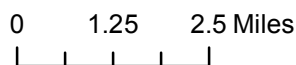
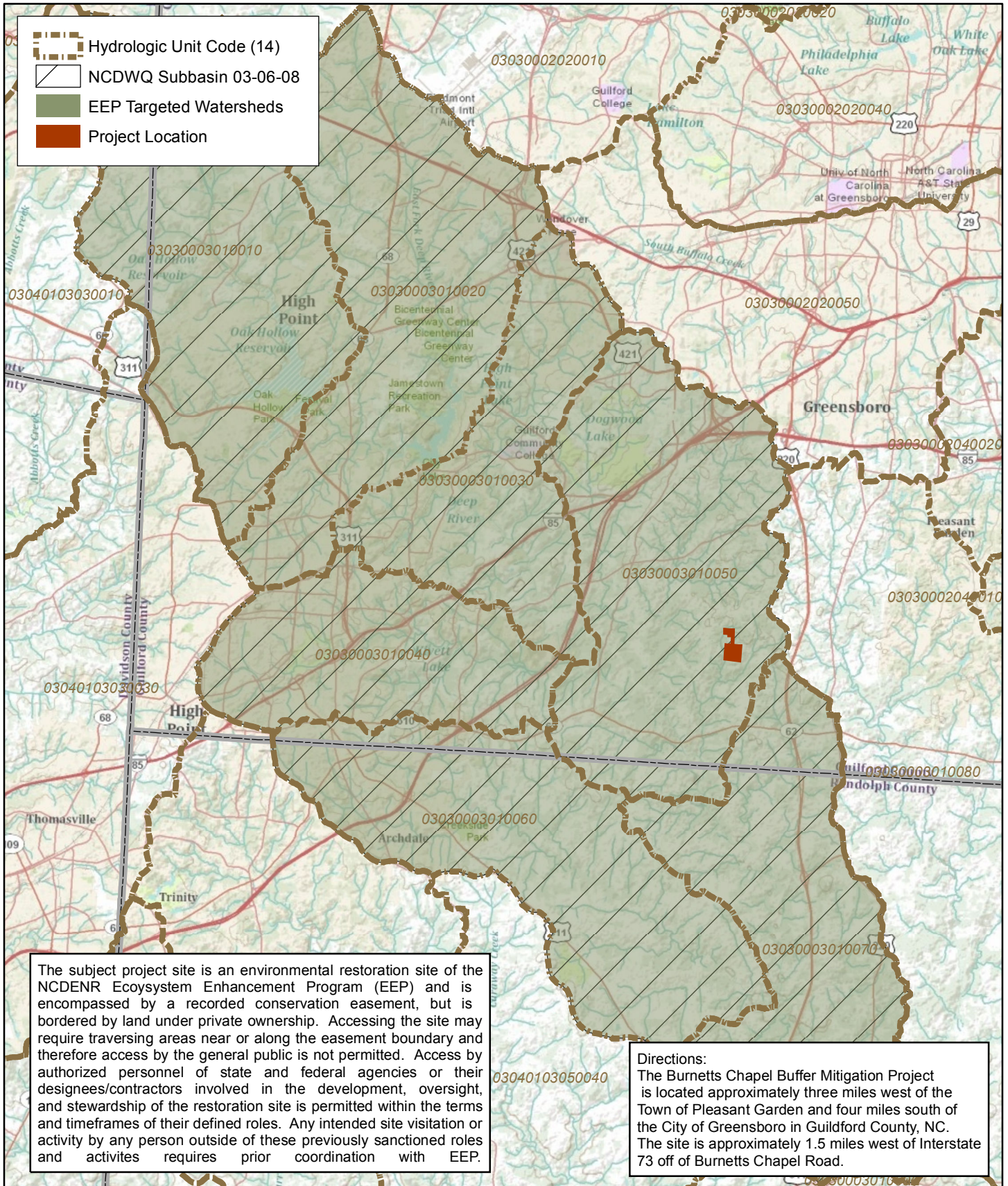


Figure 1 Project Vicinity Map
 Burnetts Chapel Buffer Mitigation Site
 NCEP Project Number 95009
 Monitoring Year 2

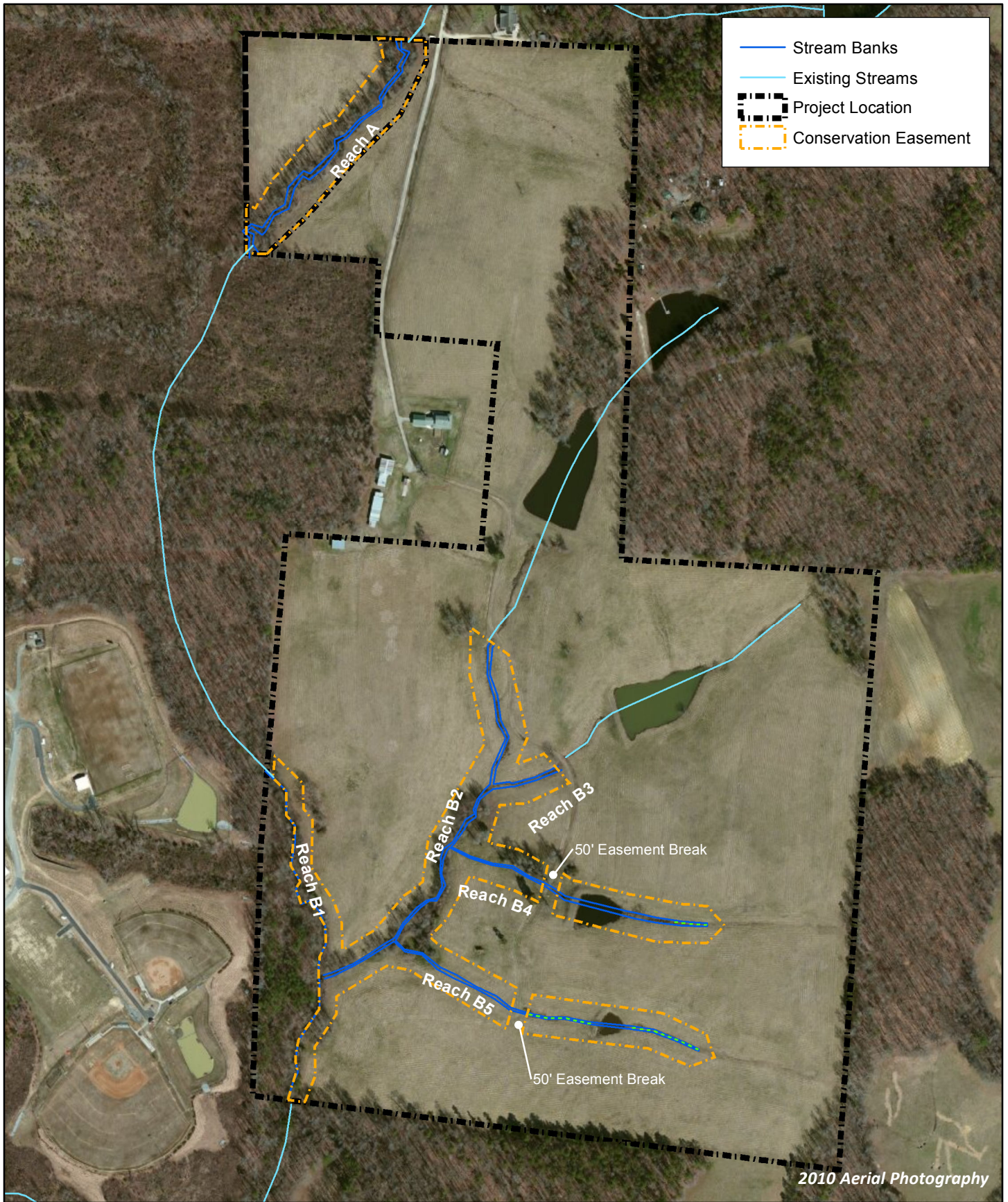
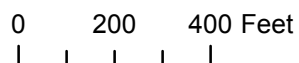


Figure 2 Project Component/Asset Map
 Burnetts Chapel Buffer Mitigation Site
 NCEP Project Number 95009
 Monitoring Year 2



**Table 1. Project Components and Mitigation Credits
Burnetts Chapel Buffer Mitigation Site (NCEP Project No.95009)
Monitoring Year 1**

Mitigation Credits									
Type	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
	R	RE	R	RE	R	RE			
Totals	N/A	N/A	N/A	N/A	N/A	N/A	9.2	N/A	N/A
Project Components									
Reach ID	Stationing/ Location	Existing Footage (LF)	Approach	Restoration or Restoration Equivalent	Area	(acres)	Mitigation Ratio		
Reach A	Area A		N/A	Restoration	1.5		1:1		
Reach B1	Area B		N/A	Restoration	0.7		1:1		
Reach B2	Area B		N/A	Restoration	2.7		1:1		
Reach B3	Area B		N/A	Restoration	0.4		1:1		
Reach B4	Area B		N/A	Restoration	1.7		1:1		
Reach B5	Area B		N/A	Restoration	2.2		1:1		
Component Summation									
Restoration Level	Stream feet	(linear)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)	Buffer (square feet)	Upland (acres)		
			Riverine	Non-Riverine					
Restoration						400,752			
Enhancement									
Enhancement I									
Enhancement II									
Creation									
Preservation									
High Quality Preservation									
BMP Elements									
Elements	Location		Purpose/Function		Notes				

BR = Bioretention Cell; S F= Sand Filter; SW = Stormwater Wetland; WDP = Wet Detention Pond; DDP = Dry Detention Pond; FS = Filter Strip; S = Grassed Swale; LS = Level Spreader; NI = Natural Infiltration Area; FB = Forested Buffer

**Table 2. Project Activity and Reporting History
Burnetts Chapel Buffer Mitigation Site (NCEEP Project No.95009)
Monitoring Year 1**

Activity or Report	Date Collection Complete	Completion or Delivery
Mitigation Plan	December 2011	February 2012
Final Design - Construction Plans	December 2011	February 2012
Construction*	January 2012	January 2012
Temporary S&E mix applied to entire project area**	January 2012	January 2012
Permanent seed mix applied to reach/segments	January 2012	January 2012
Containerized and B&B plantings for reach/segments	March 2012	March 2012
Baseline Monitoring Document (Year 0 Monitoring - baseline)	April 2012	June 2012
Year 1 Monitoring	September 2012	December 2012
Year 2 Monitoring	June 2013	August 2013
Year 3 Monitoring	2014	December 2014
Year 4 Monitoring	2015	December 2015
Year 5 Monitoring	2016	December 2016

*Grading of existing ponds was completed in January

**Seed and mulch is added as each section of construction is completed.

**Table 3. Project Contacts Table
Burnetts Chapel Buffer Mitigation Site (NCEEP Project No.95009)
Monitoring Year 1**

Designer	Wildlands Engineering, Inc. 5605 Chapel Hill Road, Suite 122 Raleigh, NC 27604 919.851.9986
Daniel Taylor	
Construction Contractor	Landowner 1323 Burnetts Chapel Road Greensboro, NC 27403
Richard L. Ingram	
Planting Contractor	Bruton Natural Systems, Inc. PO Box 1197 Freemont, NC 27830 919.242.6555
Charlie Bruton	
Seeding Contractor	Bruton Natural Systems, Inc. PO Box 1197 Freemont, NC 27830 919.242.6555
Charlie Bruton	
Seed Mix Sources	Mellow Marsh Farm
Nursery Stock Suppliers	Arborgen Dykes and Son Nursery NC Forestry Service, Claridge Nursery
Monitoring Performers	Wildlands Engineering, Inc. Kirsten Y. Gimbert 704.332.7754, ext. 110
Vegetation Monitoring, POC	

**Table 4. Project Baseline Information and Attributes
Burnetts Chapel Buffer Mitigation Site (NCEEP Project No.95009)
Monitoring Year 1**

Project Information						
Project Name	Burnett's Chapel Buffer Mitigation Site					
County	Guilford					
Project Area (acres)	12					
Project Coordinates (latitude and longitude)	35° 56' 46.0"N, 79° 50' 44.2"W					
Project Watershed Summary Information						
Physiographic Province	Carolina Slate Belt of the Piedmont					
River Basin	Cape Fear					
USGS Hydrologic Unit 8-digit	03030003					
USGS Hydrologic Unit 14-digit	03030003010050					
DWQ Sub-basin	03-06-08					
Project Drainage Area (acres)	366					
Project Drainage Area Percentage of Impervious Area	3%					
CGIA Land Use Classification	52% Forest Land, 41% Cultivated Land, 7% Institutional					
Reach Summary Information						
Parameters	Reach A	Reach B1	Reach B2	Reach B3	Reach B4	Reach B5
Length of reach (linear feet) - Post-Restoration	699	1,025	1,653	768	475	800
Drainage area (acres)	94	366	99	33	12	10
NCDWQ stream identification score	31	41	24.25/	23.25	19.75	22.75
NCDWQ Water Quality Classification	WS-IV; CA, C					
Morphological Description (stream type)	Perennial	Perennial	Int./Per.	Intermittent	Int./ Ephem.	Int./ Ephem.
Evolutionary trend (Simon's Model) - Pre- Restoration	N/A	N/A	N/A	N/A	N/A	N/A
Underlying mapped soils	Ch	HeC	HeC	VaD	HeC	EnB
Drainage class	Poorly-drained	Mod. well-drained	Mod. well-drained	Well-drained	Mod. well-drained	Well-drained
Soil Hydric status	Yes	No	No	No	No	Yes
Slope	0-2%	6-10%	6-10%	10-15%	6-10%	2-6%
FEMA classification	no regulated floodplain					
Native vegetation community	Bottom-land forest					
Percent composition of exotic invasive vegetation - Post-Restoration	0%					
Regulatory Considerations						
Regulation	Applicable?	Resolved?	Supporting Documentation			
Waters of the United States - Section 404	X	X	Burnetts Chapel Buffer Mitigation Plan; USACE Nationwide Permit No.27 and DWQ 401 Water Quality			
Waters of the United States - Section 401	X	X				
Division of Land Quality (Dam Safety)	N/A	N/A	N/A			
Endangered Species Act	X	X	Burnetts Chapel Buffer Mitigation Plan; studies found "no effect" (letter from USFWS)			
Historic Preservation Act	X	X	Burnetts Chapel Buffer Mitigation Plan; No historic resources were found to be impacted (letter from SHPO)			
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	N/A	N/A	N/A			
FEMA Floodplain Compliance	N/A	N/A	N/A			
Essential Fisheries Habitat	N/A	N/A	N/A			

U= Unknown

APPENDIX 2. Visual Assessment Data

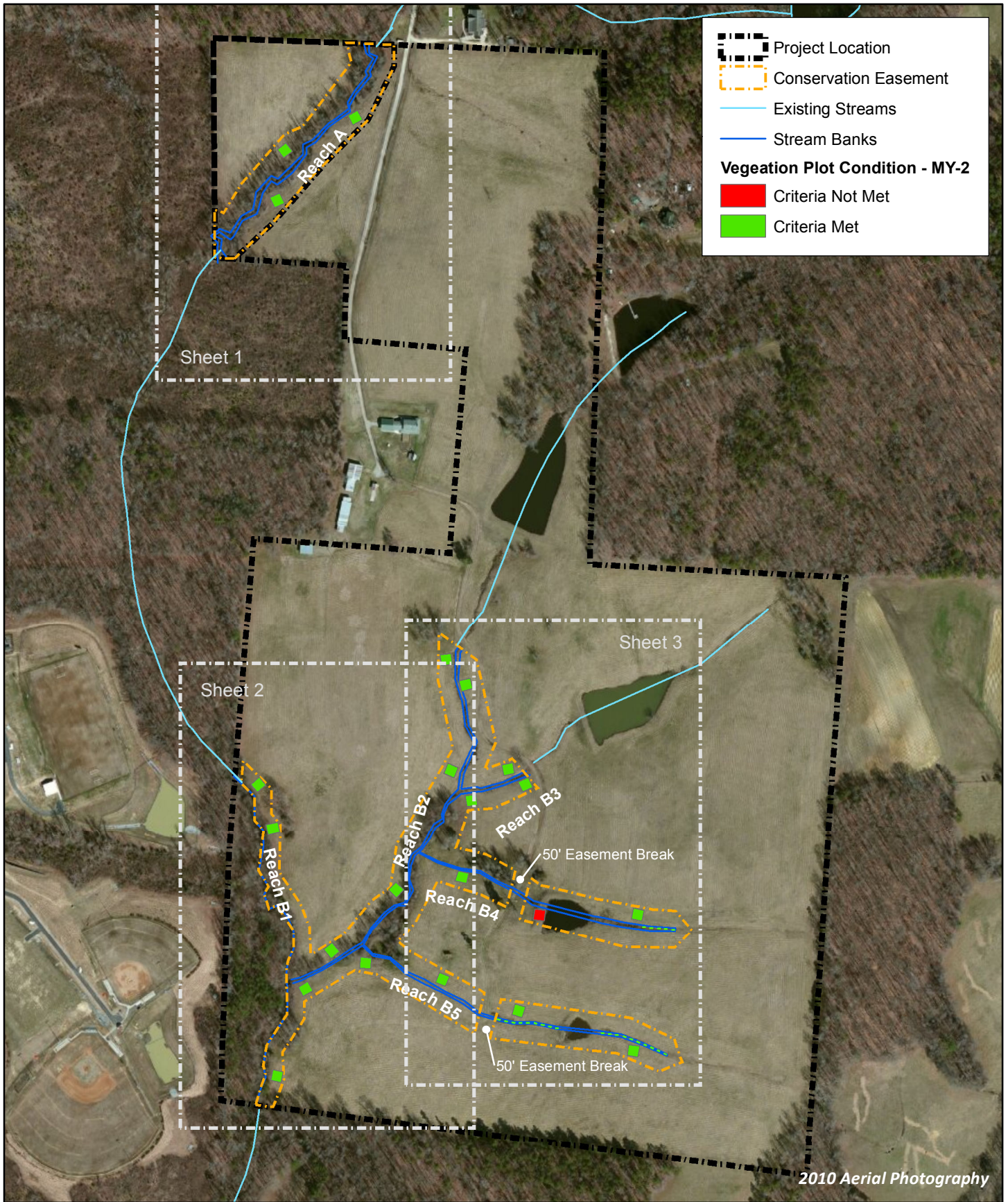


Figure 3.0 Integrated Current Condition Plan View (Key)

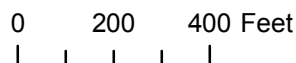
Burnetts Chapel Buffer Mitigation Site
NCEEP Project Number 95009

Monitoring Year 2

Guilford County, NC



WILDLANDS
ENGINEERING





WILDLANDS
ENGINEERING

0 75 150 Feet

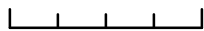


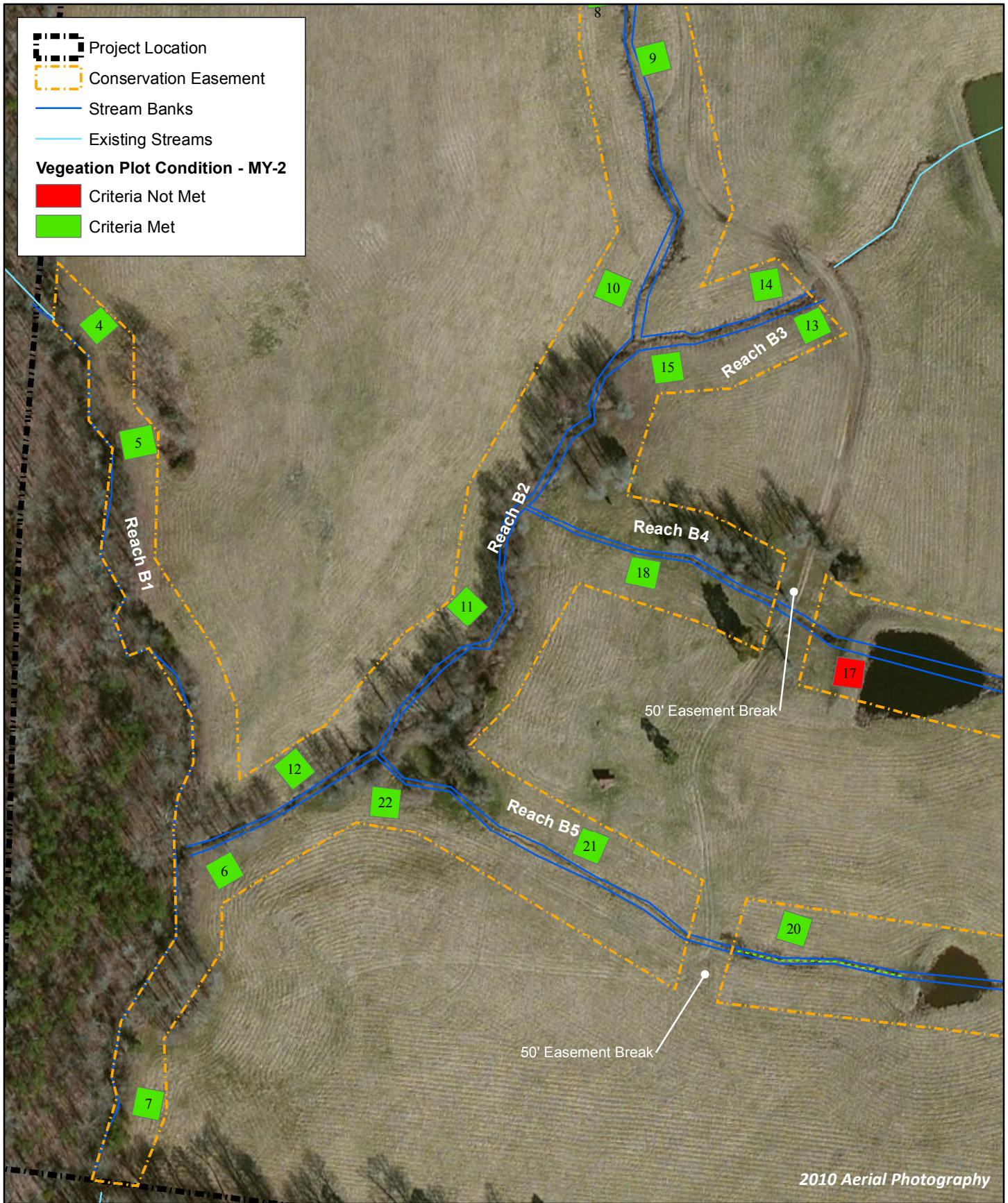
Figure 3.1 Integrated Current Condition Plan View
(Sheet 1 of 3)

Burnetts Chapel Buffer Mitigation Site

NCEEP Project Number 95009

Monitoring Year 2

Guilford County, NC



WILDLANDS
ENGINEERING

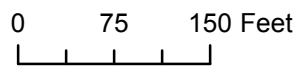


Figure 3.2 Integrated Current Condition Plan View
(Sheet 2 of 3)

Burnetts Chapel Buffer Mitigation Site

NCEP Project Number 95009

Monitoring Year 2

Guilford County, NC

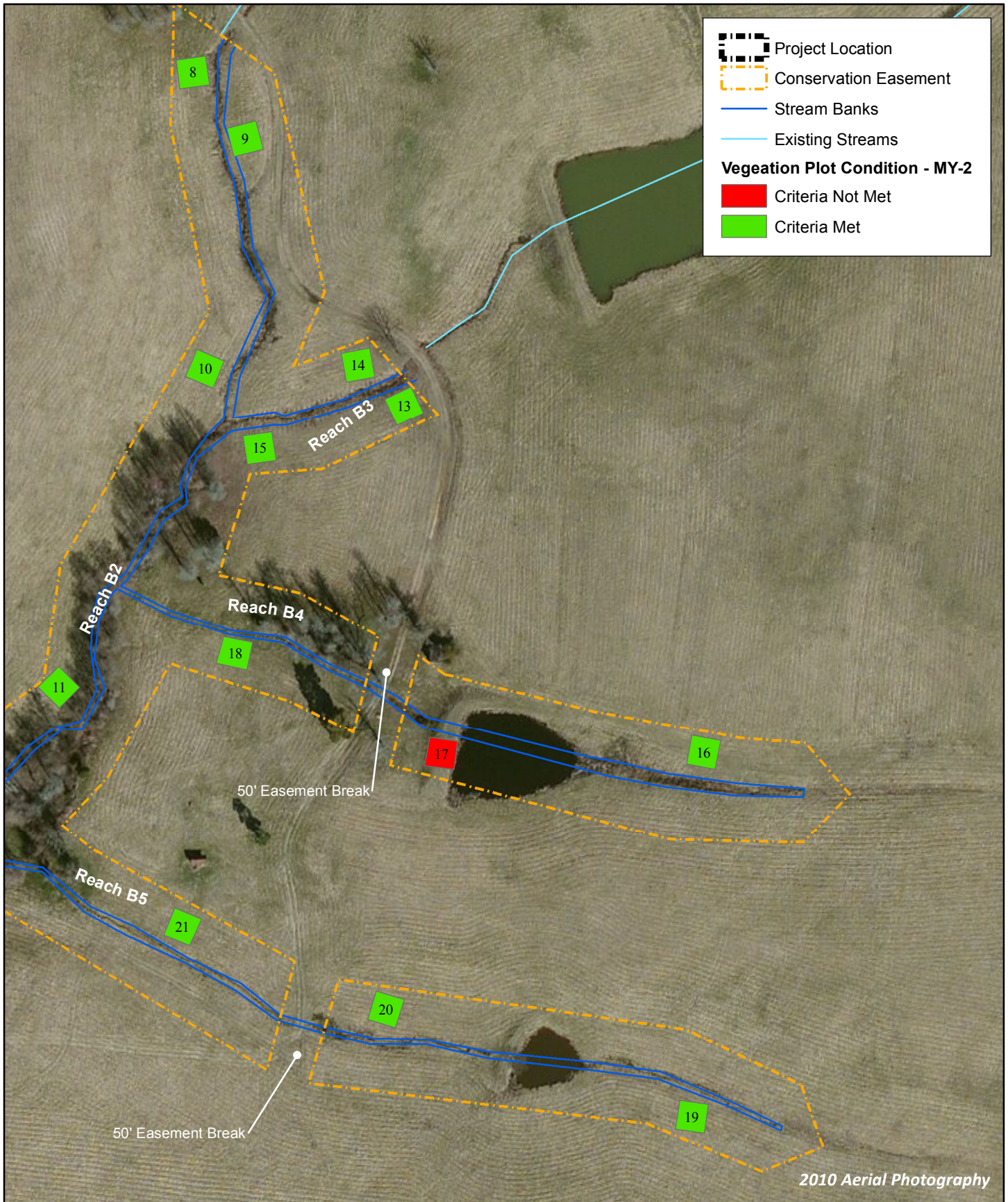
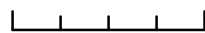


Figure 3.3 Integrated Current Condition Plan View
 (Sheet 3 of 3)
 Burnetts Chapel Buffer Mitigation Site
 NCEP Project Number 95009
 Monitoring Year 2
 Guilford County, NC



WILDLANDS
ENGINEERING

0 75 150 Feet



**Table 5. Vegetation Condition Assessment Table
 Burnett's Chapel Buffer Mitigation Site (NCEEP Project No. 95009)
 Monitoring Year 2**

Planted Acreage 9.2

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	0.00%
Low Stem Density Areas[^]	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1	1	0.02	0.3%
Total			1	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 acres	1	0.02	0.3%
Cumulative Total			1	0.0	1%

Easement Acreage 12

Vegetation Category	Definitions	Mapping Threshold (SF)	Number of Polygons	Combined Acreage	% of Planted Acreage
Invasive Areas of Concern¹	Areas of points (if too small to render as polygons at map scale).	1000	N/A	N/A	5%
Easement Encroachment Areas	Areas of points (if too small to render as polygons at map scale).	none	0	0	0%

¹Approximately 5% of the planted acreage is covered with invasive species that are individually less than 1000 ft². See section 1.2 for details.

Vegetation Photographs



Vegetation Plot 1 (07/24/2013)



Vegetation Plot 2 (07/24/2013)



Vegetation Plot 3 (07/24/2013)



Vegetation Plot 4 (07/24/2013)



Vegetation Plot 5 (07/24/2013)



Vegetation Plot 6 (07/24/2013)



Vegetation Plot 7 (07/24/2013)



Vegetation Plot 8 (07/24/2013)



Vegetation Plot 9 (07/24/2013)



Vegetation Plot 10 (07/24/2013)



Vegetation Plot 11 (07/24/2013)



Vegetation Plot 12 (07/24/2013)



Vegetation Plot 13 (07/24/2013)



Vegetation Plot 14 (07/24/2013)



Vegetation Plot 15 (07/24/2013)



Vegetation Plot 16 (07/24/2013)



Vegetation Plot 17 (07/24/2013)



Vegetation Plot 18 (07/24/2013)



Vegetation Plot 19 (07/24/2013)



Vegetation Plot 20 (07/24/2013)



Vegetation Plot 21 (07/24/2013)



Vegetation Plot 22 (07/24/2013)

APPENDIX 3. Vegetation Plot Data

**Table 6. Vegetation Plot Criteria Attainment
 Burnett's Chapel Buffer Mitigation Site (NCEEP Project No. 95009)
 Monitoring Year 2**

Plot	Criteria Met (Y/N)	Tract Mean
1	Y	95%
2	Y	
3	Y	
4	Y	
5	Y	
6	Y	
7	Y	
8	Y	
9	Y	
10	Y	
11	Y	
12	Y	
13	Y	
14	Y	
15	Y	
16	Y	
17	N	
18	Y	
19	Y	
20	Y	
21	Y	
22	Y	

**Table 7. CVS Vegetation Plot Metadata
 Burnett's Chapel Buffer Mitigation Site (NCEEP Project No. 95009)
 Monitoring Year 2**

Report Prepared By	Alea Tuttle
Date Prepared	7/29/2013 13:04
database name	<i>Burnetts Chapel MY2_cvs-eep-entrytool-v2.3.0.mdb</i>
database location	<i>Q:\ActiveProjects\005-02130 Burnett's Chapel Buffer Mitigation Site\Monitoring\Monitoring Year 2\Vegetation Assessment</i>
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT-----	
Metadata	<i>Description of database file, the report worksheets, and a summary of project(s) and project data.</i>
Plots	<i>Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.</i>
Stem Count by Plot and Spp	<i>A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.</i>
PROJECT SUMMARY-----	
Project Code	95009
project Name	Burnetts Chapel Mitigation Site
Description	Buffer Mitigation
length (ft)	
stream-to-edge width (ft)	
area (sq m)	
Required Plots (calculated)	22
Sampled Plots	22

**Table 8. Planted and Total Stem Counts
Burnett's Chapel Mitigation Site
EEP Project No. 95009
Monitoring Year 2**

Scientific Name	Common Name	Species Type	Current Plot Data (MY2 2013)														
			95009-WEI-0001			95009-WEI-0002			95009-WEI-0003			95009-WEI-0004			95009-WEI-0005		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	river birch	Tree	2	2	2				1	1	1	1	1	1	1	1	1
Carpinus caroliniana	American hornbeam	Tree	1	1	1							1	1	1			
Cephalanthus occidentalis	common buttonbush	Shrub															
Fraxinus pennsylvanica	green ash	Tree							1	1	1	1	1	1	2	2	2
Liquidambar styraciflua	sweetgum	Tree															
Liriodendron tulipifera	tuliptree	Tree				9	9	9	5	5	5						
Platanus occidentalis	American sycamore	Tree	7	7	7	4	4	4	5	5	5	9	9	9	5	5	5
Quercus michauxii	swamp chestnut oak	Tree	1	1	1	1	1	1									
Quercus phellos	willow oak	Tree							1	1	1	1	1	1			
Quercus rubra	northern red oak	Tree				1	1	1				1	1	1	2	2	2
Stem count			11	11	11	15	15	15	13	13	13	14	14	14	10	10	10
size (ares)			1			1			1			1			1		
size (ACRES)			0.02			0.02			0.02			0.02			0.02		
Species count			4	4	4	4	4	4	5	5	5	6	6	6	4	4	4
Stems per ACRE			445	445	445	607	607	607	526	526	526	567	567	567	405	405	405

MY0 & MY1 data are updated from the previously published reports because it now contains automated CVS data

Color for Density

Exceeds requirements by 10%
Exceeds requirements, but by less than 10%
Fails to meet requirements, by less than 10%
Fails to meet requirements by more than 10%
Volunteer species included in total

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes

T: Total Stems

**Table 8. Planted and Total Stem Counts
Burnett's Chapel Mitigation Site
EEP Project No. 95009
Monitoring Year 2**

		Current Plot Data (MY2 2013)															
Scientific Name	Common Name	Species Type	95009-WEI-0006			95009-WEI-0007			95009-WEI-0008			95009-WEI-0009			95009-WEI-0010		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	river birch	Tree	1	1	1	2	2	2				1	1	1	3	3	3
Carpinus caroliniana	American hornbeam	Tree															
Cephalanthus occidentalis	common buttonbush	Shrub												1			1
Fraxinus pennsylvanica	green ash	Tree	3	3	3	1	1	1	6	6	6				4	4	4
Liquidambar styraciflua	sweetgum	Tree												12			
Liriodendron tulipifera	tuliptree	Tree							10	10	10	1	1	1			
Platanus occidentalis	American sycamore	Tree	2	2	2	4	4	4				4	4	4			
Quercus michauxii	swamp chestnut oak	Tree	1	1	1							2	2	2	2	2	2
Quercus phellos	willow oak	Tree	1	1	1	2	2	2				2	2	2	2	2	2
Quercus rubra	northern red oak	Tree				1	1	1				7	7	7			
Stem count			8	8	8	10	10	10	16	16	16	17	17	30	11	11	12
size (ares)			1			1			1			1			1		
size (ACRES)			0.02			0.02			0.02			0.02			0.02		
Species count			5	5	5	5	5	5	2	2	2	6	6	8	4	4	5
Stems per ACRE			324	324	324	405	405	405	647	647	647	688	688	1214	445	445	486

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Color for Density

Exceeds requirements by 10%
Exceeds requirements, but by less than 10%
Fails to meet requirements, by less than 10%
Fails to meet requirements by more than 10%
Volunteer species included in total

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes

T: Total Stems

**Table 8. Planted and Total Stem Counts
Burnett's Chapel Mitigation Site
EEP Project No. 95009
Monitoring Year 2**

Scientific Name	Common Name	Species Type	Current Plot Data (MY2 2013)														
			95009-WEI-0011			95009-WEI-0012			95009-WEI-0013			95009-WEI-0014			95009-WEI-0015		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	river birch	Tree	2	2	2				1	1	1	1	1	1	1	1	1
Carpinus caroliniana	American hornbeam	Tree	1	1	1							1	1	1			
Cephalanthus occidentalis	common buttonbush	Shrub															
Fraxinus pennsylvanica	green ash	Tree	3	3	3	10	10	10									
Liquidambar styraciflua	sweetgum	Tree															
Liriodendron tulipifera	tuliptree	Tree	1	1	1												
Platanus occidentalis	American sycamore	Tree	9	9	9	1	1	1	2	2	2	6	6	6	2	2	2
Quercus michauxii	swamp chestnut oak	Tree	1	1	1				4	4	4	6	6	6	9	9	9
Quercus phellos	willow oak	Tree	1	1	1				3	3	3				6	6	6
Quercus rubra	northern red oak	Tree				5	5	5	2	2	2	1	1	1	2	2	2
Stem count			18	18	18	16	16	16	12	12	12	15	15	15	20	20	20
size (ares)			1			1			1			1			1		
size (ACRES)			0.02			0.02			0.02			0.02			0.02		
Species count			7	7	7	3	3	3	5	5	5	5	5	5	5	5	5
Stems per ACRE			728	728	728	647	647	647	486	486	486	607	607	607	809	809	809

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**Table 8. Planted and Total Stem Counts
Burnett's Chapel Mitigation Site
EEP Project No. 95009
Monitoring Year 2**

			Current Plot Data (MY2 2013)														
Scientific Name	Common Name	Species Type	95009-WEI-0016			95009-WEI-0017			95009-WEI-0018			95009-WEI-0019			95009-WEI-0020		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	river birch	Tree							2	2	2				2	2	2
Carpinus caroliniana	American hornbeam	Tree										5	5	5	3	3	3
Cephalanthus occidentalis	common buttonbush	Shrub															
Fraxinus pennsylvanica	green ash	Tree	4	4	4	2	2	2	5	5	5				2	2	2
Liquidambar styraciflua	sweetgum	Tree															
Liriodendron tulipifera	tuliptree	Tree	1	1	1	2	2	2	1	1	1				4	4	4
Platanus occidentalis	American sycamore	Tree	7	7	7	3	3	3	3	3	3	3	3	3	1	1	1
Quercus michauxii	swamp chestnut oak	Tree										1	1	1			
Quercus phellos	willow oak	Tree							3	3	3	5	5	5	2	2	2
Quercus rubra	northern red oak	Tree															
Stem count			12	12	12	7	7	7	14	14	14	14	14	14	14	14	14
size (ares)			1			1			1			1			1		
size (ACRES)			0.02			0.02			0.02			0.02			0.02		
Species count			3	3	3	3	3	3	5	5	5	4	4	4	6	6	6
Stems per ACRE			486	486	486	283	283	283	567	567	567	567	567	567	567	567	567

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**Table 8. Planted and Total Stem Counts
Burnett's Chapel Mitigation Site
EEP Project No. 95009
Monitoring Year 2**

Scientific Name	Common Name	Species Type	Current Plot Data (MY2 2013)						Annual Means								
			95009-WEI-0021			95009-WEI-0022			MY2 (2013)			MY1 (9/2012)			MY0 (4/2012)		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	river birch	Tree				4	4	4	25	25	25	37	37	37	76	76	76
Carpinus caroliniana	American hornbeam	Tree	1	1	1				13	13	13	31	31	31	43	43	43
Cephalanthus occidentalis	common buttonbush	Shrub									2						
Fraxinus pennsylvanica	green ash	Tree	5	5	5	2	2	2	51	51	51	52	52	52	51	51	51
Liquidambar styraciflua	sweetgum	Tree									12						
Liriodendron tulipifera	tuliptree	Tree	6	6	6	1	1	1	41	41	41	44	44	44	53	53	53
Platanus occidentalis	American sycamore	Tree				9	9	9	86	86	86	98	98	98	106	106	106
Quercus michauxii	swamp chestnut oak	Tree							28	28	28	30	30	30	28	28	28
Quercus phellos	willow oak	Tree	1	1	1				30	30	30	32	32	32	23	23	23
Quercus rubra	northern red oak	Tree							22	22	22	25	25	25	35	35	35
Stem count			13	13	13	16	16	16	296	296	310	349	349	349	415	415	415
size (ares)			1			1			22			22			22		
size (ACRES)			0.02			0.02			0.54			0.54			0.54		
Species count			4	4	4	4	4	4	8	8	10	8	8	8	8	8	8
Stems per ACRE			526	526	526	647	647	647	544	544	570	642	642	642	763	763	763

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