BEAMON'S RUN BUFFER AND WETLAND RESTORATION SITE (BARNHILL FARM) MONITORING REPORT (2012)

Greene County, North Carolina
EEP Project No. 24

Prepared for:
North Carolina Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 27699-1652

Status of Plan: Final
Project Planted: 2000
Data Collected: October 2012
Submission Date: November 2012

Monitoring Firm:

Stantec Consulting Services Inc.
801 Jones Franklin Road, Suite 300
Raleigh, NC 27606

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EXECUTIVE SUMMARY

The purpose of Beamon's Run Riparian Wetland and Buffer Restoration project is to improve water quality by providing a more ecologically effective and efficient riparian buffer. The establishment and protection of a vegetated buffer along the floodplain of any stream provides a number of benefits, which include streambank stability from mature root systems, in-stream shade from the overhanging leaf canopy, organic detritus that fuels food chains, habitat and travel corridors for native wildlife species, and filtering of sediments and other potential pollutants from surface and subsurface flow (NCSRI, 2003). The natural riparian buffer along the project's section of Beamon's Run had been disturbed by past agricultural practices and portions of it had been used as a tire dump. The tires and associated debris were removed and the buffer was planted with native wetland species to restore functionality to the buffer. The primary objective of the project was to protect and improve water quality by removing and transforming pollutants with buffers and wetlands.

The goals as listed in the NC Wetlands Restoration Program (WRP) Project Summary were to:

1. Restore agricultural land to riparian buffer to increase removal of nutrients

2. Improve wildlife habitat

The conservation easement of the project is made up of two tracts: Tract A encompasses 47.53 acres along the right bank of Beamon's Run (including a 2.11 acre open pit area); Tract B encompasses 32.38 acres along the left bank of Contentnea Creek. Beamon's Run is a warm water stream in the Neuse River Basin of the Coastal Plain region in Greene County, North Carolina. Site investigation and design services were provided by PBS&J, Inc. The records available at this time indicated that construction and the bulk of the planting at the site occurred over the winter of 2000. Using the 2000 as-built plan, areas that did not appear to contain any of the planted species, were outside the 200' buffer limit, or exhibited a much older mature plant community were excluded from the monitoring effort. Based on the revised areas, the project consists of 10.001 acres of Neuse River riparian buffer restoration, 195 feet of streambank stabilization, and 0.15 acres of wetland restoration.

No monitoring plan was originally prepared for this site and no monitoring program began at this site when construction was completed. NCSU staff from the Biological and Agricultural Engineering Department and the Water Resources Research Institute made an initial monitoring visit on October 14, 2003. They compiled the first monitoring report submitted in March of 2004. In 2009, Stantec began monitoring the site's vegetation. Monitoring in 2012 revealed that 6 of the 12 plots (50%) of plots meet planted success requirements, however, 92% of the plots have >320 planted and volunteer native hardwood stems per acre. It is difficult to discern the exact reasons for poor planted species survival in the vegetation plots and elsewhere on the site since it has been 12 years since vegetation installation.

During the previous monitoring field visit conducted in August 2011, several beaver dams were observed on-site near vegetation plots 3, 8A, and 12A. Despite the presence of the beaver dams no recent signs of beaver activity were observed in the vegetation plots; in fact areas that previously exhibited extensive beaver damage have rebounded considerably in 2012. Plants that were resprouting from stumps as well as numerous small saplings of desired species were observed. It was also noted during the annual monitoring that vegetation in areas that had been previously mowed and/or sprayed prior to 2009 are continuing to

regenerate, and additional mowing and/or spraying has not occurred in 2012. There was an ATV path observed inside the conservation easement between vegetation plots 6 and 5.

The annual vegetation monitoring occurred on October 17th, 2012 and found that little change has occurred since the previous monitoring visit in August 2011. The beaver dams are still in place near vegetation plots 3, 8A, and 12A with no recent beaver damage in the vegetation plots. Wind damage previously documented in the 2011 monitoring report was still evident particularly in vegetation plot 7. The two planted species affected by a windblown tree have survived and are growing without incident. Common invasive species onsite still include *Lespedeza* and Japanese honeysuckle but have not expanded since 2011 and do not seem to be a major concern for desirable vegetation establishment. *Ligustrum sinense* was also observed in 2012 near vegetation plot 2. *Lespedeza* occurs along the field edges while Japanese honeysuckle is prevalent across the entire site. A few areas, particularly in the eastern portions of the site, the honeysuckle is dense and could cause problems in the future. Currently the invasive vegetation is not affecting planted woody vegetation. It is recommended that the invasive vegetation continue to be monitored for potential issues in the future.

Credit is not being sought for the stream stabilization or wetland restoration conducted for the project. Therefore, as per NCEEP, no stream assessment or hydrologic monitoring took place at the Beamon's Run Buffer and Wetland Restoration Site.

Summary information/data related to the occurrence of items such as beaver or encroachment 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 Baseline Monitoring Report (formerly Mitigation Plan) and in the Mitigation Plan (formerly Restoration Plan) documents available on NCEEP's website. All raw data supporting the tables and figures in the appendices is available from NCEEP upon request.

1.0 Methodology

Vegetation onsite was first visually assessed to determine the general areas of viable planted vegetation. Using the 2000 as-built plan, areas that did not appear to contain any of the planted species, were outside the 200' buffer limit, or exhibited a much older mature plant community were excluded from the monitoring effort. These areas are shown on the maps in Appendix B. The 200' buffer was taken from the normal edge of the surface water.

Twelve vegetative sample plots were randomly selected using GIS and established within the project easement in 2009. The plots were quantitatively monitored during the 2012 growing season on October 17th, 2012. Species composition, density, and survival were observed during the site visit. The Carolina Vegetation Survey (CVS, 2008) methodology was utilized for vegetative monitoring. Level 2 (planted and natural stems) methodology was completed on all monitored plots. It must be noted that due to the age of the planted species, in some plots, it was difficult to distinguish planted species from volunteers during the 2009 monitoring effort. However, best professional judgment along with knowledge of project planting zones by species enabled vegetation data to be collected. The planted vegetation zones included oak mix, longleaf pine, river birch, and cypress.

The vegetative success criteria are based on the North Carolina rule 15A NCAC 2B 0242 *Neuse River Basin: Nutrient Sensitive Waters Management Strategy: Mitigation Program for Protection and Maintenance of Existing Riparian Buffers* (2000). The final vegetative success criteria will be the survival of 320 planted native hardwood stems per acre after 5 years. As per NCEEP, the cypress wetland area was only monitored for vegetation within the 200' riparian buffer, and not wetland hydrology. Streams were also not monitored as part of this project.

Beginning in 2011 under new guidance from NCEEP, softwood trees are no longer included in woody stem counts for planted and volunteer species.

2.0 References

Lee, Michael T., R. K. Peet, S. D. Roberts, and T. R. Wentworth. 2008. *CVS-EEP Protocol for Recording Vegetation, Version 4.2* (http://cvs.bio.unc.edu/methods.htm).

NCEEP. 2010. *Procedural Guidance and Content Requirements for EEP Monitoring Reports*. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. Version 1.3 January 15, 2010.

NCSRI. 2003. *Stream Restoration – A Natural Channel Design Handbook*. North Carolina Stream Restoration Institute. Raleigh, NC.

NC Administrative Code: 15A NCAC 2B 0242, *Neuse River Basin: Nutrient Sensitive Waters Management Strategy: Mitigation Program for Protection and Maintenance of Existing Riparian Buffers,* Raleigh, NC. 2000.

Appendix A. Project Vicinity Map and Background Tables

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N

Stantonsburg

Wilson County

Greene County

Apple Rd (SR 1229)

264

Walstonsburg

111

122

58

91

Contentnea Creek

Pelleber Rd (SR 1235)

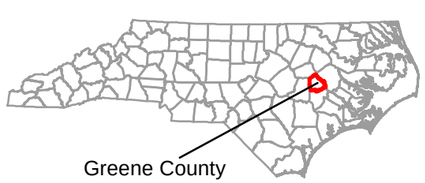
Speight's Bridge Rd (SR 1225)

Beamon's Run

Beamon's Farm Rd (SR 1222)

Project Site

*The subject property is an environmental restoration site of the NCDENR EEP and is encompassed by a recorded conservation easement, but is bordered by land under private ownership. Therefore access by the general public is not permitted. Access by authorized personnel of state and federal agencies or their deesignees/contractors involved in the development, monitoring and stewardship of the restoration site is permitted within the terms and timeframes of their defined, pre-approved roles. Any intended site visitation or activity by any person outside of these pervious sanctioned activities/roles requires prior coordination with EEP.



Directions: From Raleigh, follow US 264 East toward Wilson. Take exit 49 and turn right onto NC 58 South toward Wilson. Travel approximately 5.2 miles on NC 58. This will take you into Stantonsburg. You will continue through Stantonsburg, and after traveling 4 miles past Stantonsburg, turn left onto Speight's Bridge Road (SR 1225). Travel approximately 3.5 miles down SR 1225 and turn right on a farm path before you approach Beamon's Farm Rd. The farm path is behind a brick ranch style house close to SR 1225.

Roads

Hydrography

Municipal Boundaries

Project Site

1 0.5 0 1 Miles

Figure 1 - Location Map

Beamon's Run Wetland and Buffer Restoration Project
EEP Project Number 24
Greene County, NC

Monitoring Report
November, 2012

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Table 1a. Project Components								
Beamon's Run Buffer and Wetland Restoration Site/EEP Project No. 24								
Reach ID	**Existing Feet/Acres**	**Type**	**Approach**	**Footage or Acreage**	**Stationing**	**Mitigation Ratio**	**Mitigation Units**	**Comment**
Riverine Wetland Restoration (ac)	0.15	R	Prepare and plant wetland areas	0.15				Cypress community near Contentnea Creek. Credit not being sought for wetland restoration.
Neuse Riparian Buffer Restoration (lf)	10.00	R	Prepare and plant buffers	10		1:1	10.00	Within 200' buffer along both Beamon's Run and Contentnea Creek
Streambank Stabilization (lf)	195	S	Construction and installation of brush mattresses for bank stabilization	195				In three areas along both Beamon's Run and Contentnea Creek. Credit not being sought for stream stabilization.

R = Restoration
S = Stabilization

Table 1b. Component Summations							
Beamon's Run Buffer and Wetland Restoration Site/EEP Project No. 24							
Restoration Level	Stream (lf)	Riparian Wetland (Ac)		Non-Riparian (Ac)	Upland (Ac)	Buffer (Ac)	BMP
		Riverine	Non-Riverine				
Restoration						10.00	
Enhancement							
Enhancement I							
Enhancement II							
Creation							
Preservation							
HQ Preservation							
Totals						**10.00**	BMP Count
MU Totals						**10.00**	
	= Non-Applicable						

Table 2. Project Activity and Reporting History		
Beamon's Run Buffer and Wetland Restoration Site/EEP Project No. 24		
Activity or Deliverable	**Data Collection Complete**	**Completion or Delivery**
Restoration Plan	unknown	unknown
Final Design - 90%	unknown	unknown
Construction	2000	2000
Temporary S&E mix applied to entire project area	2000	2000
Permanent seed mix applied to entire project area	2000	2000
Bare Root Seedling Installation	2000	2000
Mitigation Plan / As-built (Year 0 Monitoring - baseline)	May, 2000	May, 2000
Final Report	unknown	unknown
Monitoring Report (NCSU)	Mar, 2004	Mar, 2004
Monitoring Report (Stantec) 2009	Dec, 2009	Dec, 2009
Monitoring Report (Stantec) 2010	Oct, 2010	Nov, 2010
Monitoring Report (Stantec) 2011	Aug, 2011	Nov, 2011
Monitoring Report (Stantec) 2012	Oct, 2012	Nov, 2012

Table 3. Project Contacts Table	
Beamon's Run Buffer and Wetland Restoration Site/EEP Project No. 24	
Designer	PBS&J 1616 East Millbrook Road Suite 310 Raleigh, NC 27609
Construction Contractor	unknown
Planting Contractor	unknown
Seeding Contractor	unknown
Seed Mix Sources	unknown
Nursery Stock Suppliers	Denton's Nursery (longleaf) 3535 NC 42 West Wilson, NC 27893
	NC Division of Forest Resources (bare roots) 762 Claridge Nursery Road Goldsboro, NC 27530
Monitoring Performers (2003)	NCSU BAE Dept & Water Quality Group Campus Box 7637 Raleigh NC 27695 (919) 515-8240
Monitoring Performers (2009 - 2012)	Stantec Consulting Services, Inc. 801 Jones Franklin Road, Ste 300 Raleigh, NC 27606
Vegetation Monitoring POC	Larry Hobbs (919)851-6866 Alex Baldwin (919)851-6866

Table 4 . Project Attribute Table	
Beamon's Run Buffer and Wetland Restoration Site/EEP Project No. 24	
Project County	Greene
Physiographic Region	Coastal Plain
Ecoregion	Southeastern Floodplains and Low Terraces
Project River Basin	Neuse
USGS HUC for Project (14 digit)	03020203050010
NCDWQ Sub-basin for Project	03-04-07
Within Extent of EEP Watershed Plan?	No
WRC Class (Warm, Cool, Cold)	Warm
% of project easement fenced or demarcated	Field edges demarcated
Beaver activity observed during design phase?	Unknown
Restoration Component Attribute Table	
	Buffer, Wetland, and Stream
Drainage Area	8.5 sq mi
Stream Order	3rd order
Restored length (feet)	N/A
Perennial or Intermittent	Perennial
Watershed type (Rural, Urban, Developing, etc)	Rural
NCDWQ AU/Index number	27-86-13
NCDWQ Classification	C SW NSW
303d listed?	No
Upstream of a 303d listed segment?	No
Reasons for 303d listing or stressor	N/A
Total acreage of easement	79.9
Total vegetated acreage within the easement	79.9
Total planted acreage as part of the restoration	24.5
Rosgen classification of pre-existing	N/A
Rosgen classification of As-built	N/A
Valley type	N/A
Valley slope	N/A
Valley side slope range	N/A
Valley toe slope range	N/A
Cowardin Classification	PFO1A - Palustrine, Forested, Broad-leaved deciduous, temp. flooded (dominant classification)
Trout waters designation	N/A
Species of concern, endangered etc.? (Y/N)	Unknown
Dominant soil series characteristics	
Series	Kenansville fine sand
Depth	>72 inches
Clay %	7
K	0.1
T	5 tons/acre/year

Appendix B. Visual Assessment

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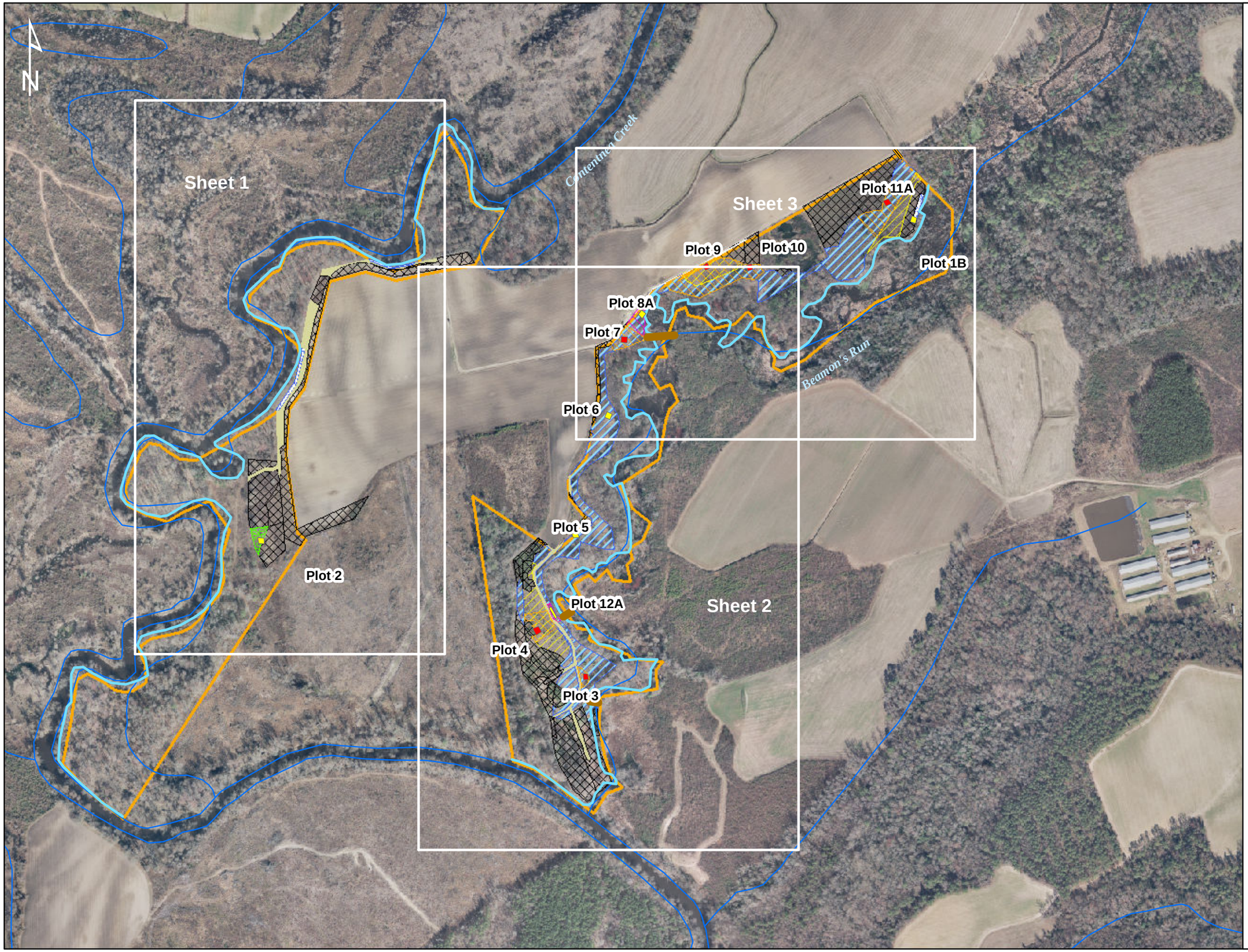

Figure 2 - Overview

Current Condition Plan View

Beamon's Run Wetland and
Buffer Restoration Project
EEP Project 24
Greene County, North Carolina

November 2012

- Stream Edge
- Streams
- Gate
- Conservation Easement
- Current Beaver Dams

Veg Plots

- Failing <320 stems/ac
- Succesful >320 stems/ac

Plantings

- Poor Growth Rates or Vigor
- Low Stem Density
- Sprayed Area (2011)
- Excluded*
- Cypress
- Long leaf pine
- River birch
- Oak Mix
- Previously Mowed (<2009)

*Excluded areas include: mature forest, active farm, loblolly pines, not planted, and >200 ft from streams

0 200 400 800 Feet

Ecosystem Enhancement Program

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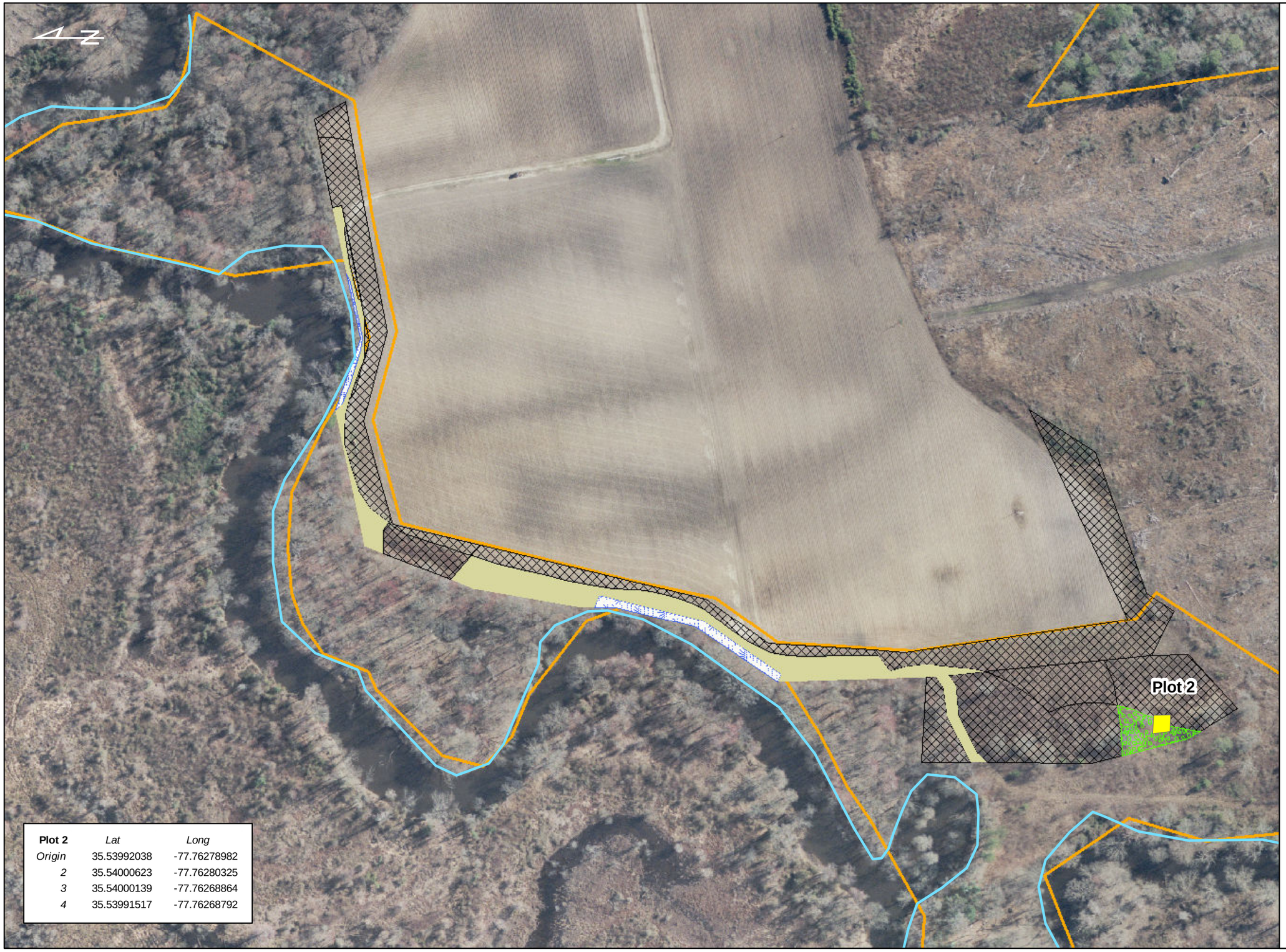

Plot 2	Lat	Long
Origin	35.53992038	-77.76278982
2	35.54000623	-77.76280325
3	35.54000139	-77.76268864
4	35.53991517	-77.76268792

Figure 2 - Sheet 1

Current Condition Plan View

Beamon's Run Wetland and Buffer Restoration Project
EEP Project # 24
Greene County, North Carolina

Monitoring Report
November 2012

Stream Edge
Conservation Easement

Veg Plots

Successful >320 stems/ac

Plantings

Excluded*
Cypress
River birch
Regenerating vegetation, mowed previous to 2009

*Excluded areas include: mature forest, active farm, loblolly pines, not planted, and >200 ft from streams

0 75 150 300 Feet

Ecosystem Enhancement Program

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Plot 5	Lat	Long
Origin	35.540002	-77.757186
2	35.540030	-77.757093
3	35.539946	-77.757163
4	35.539950	-77.757055

Plot 12A	Lat	Long
Origin	35.538791	-77.757472
2	35.538948	-77.757575
3	35.538920	-77.757609
4	35.538766	-77.757502

Plot 4	Lat	Long
Origin	35.538581	-77.757753
2	35.538662	-77.757808
3	35.538628	-77.757907
4	35.538533	-77.757846

Plot 3	Lat	Long
Origin	35.537874	-77.757014
2	35.537870	-77.756921
3	35.537956	-77.756940
4	35.537961	-77.757019

Coordinates for Plots 6-10 shown on sheet 3

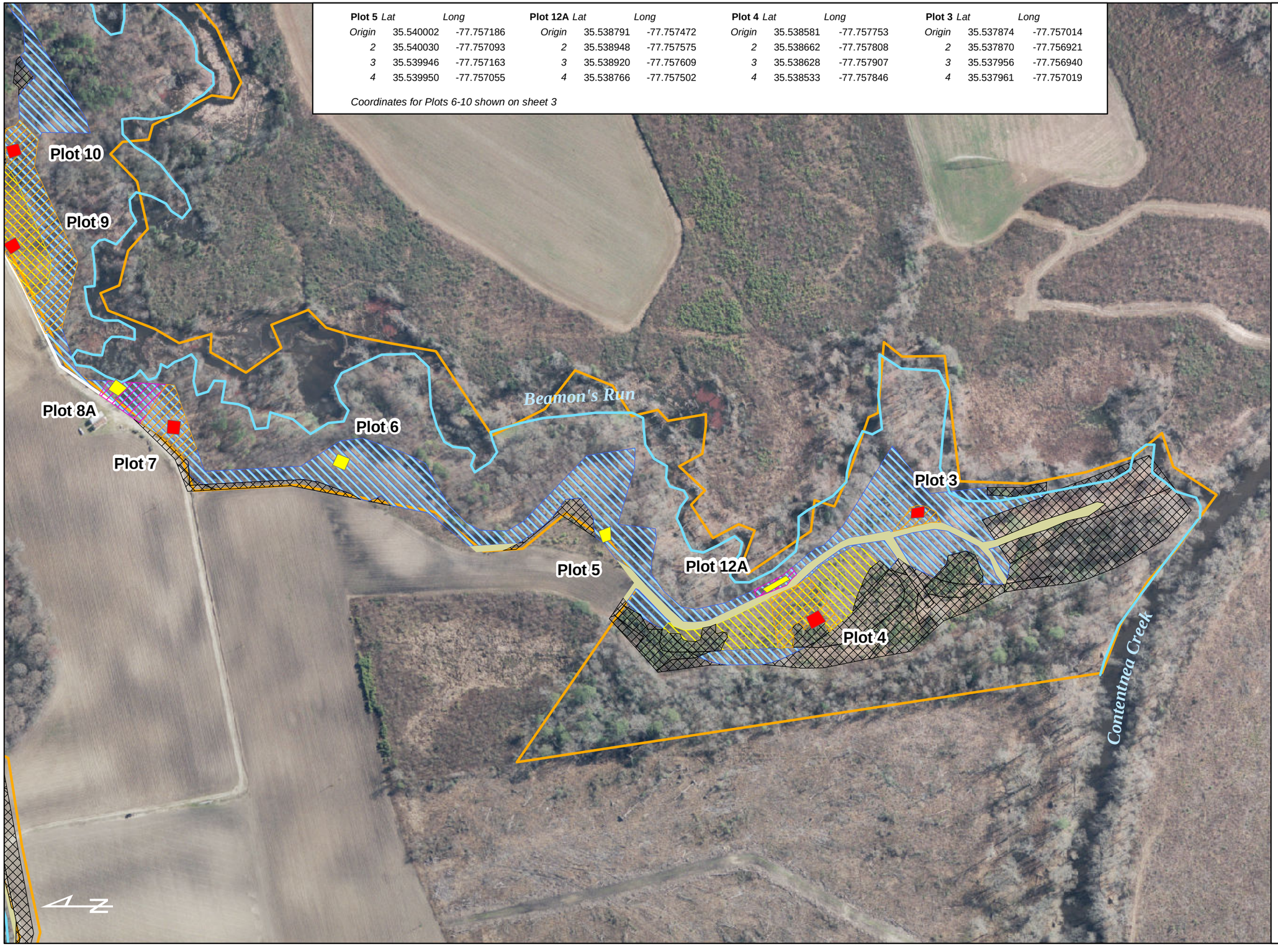

Figure 2 - Sheet 2

Current Condition Plan View

Beamon's Run Wetland and Buffer Restoration Project
EEP Project Number 24
Greene County, North Carolina

Monitoring Report
November 2012

- Stream Edge
- Conservation Easement

Veg Plots

- Failing <320 stems/ac
- Successful >320 stems/ac

Plantings

- Poor Growth Rates or Vigor
- Low Stem Density
- Sprayed Area (2011)
- Excluded*
- Long leaf pine
- Oak Mix
- Regenerating vegetation, mowed previous to 2009

*Excluded areas include: mature forest, active farm, loblolly pines, not planted, and >200 ft from streams

0 75 150 300 Feet

Ecosystem Enhancement Program

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Plot 6	Lat	Long
Origin	35.541784	-77.756530
2	35.541704	-77.756575
3	35.541668	-77.756479
4	35.541747	-77.756438
Plot 7	*Lat*	*Long*
Origin	35.542795	-77.756267
2	35.542784	-77.756161
3	35.542870	-77.756147
4	35.542877	-77.756256
Plot 8A	*Lat*	*Long*
Origin	35.543196	-77.755950
2	35.543136	-77.755883
3	35.543210	-77.755814
4	35.543262	-77.755894

Plot 9	Lat	Long
Origin	35.543828	-77.754738
2	35.543863	-77.754653
3	35.543943	-77.754707
4	35.543894	-77.754791
Plot 10	*Lat*	*Long*
Origin	35.543836	-77.753893
2	35.543916	-77.753917
3	35.543896	-77.754013
4	35.543814	-77.753983
Plot 11A	*Lat*	*Long*
Origin	35.544844	-77.751455
2	35.544811	-77.751551
3	35.544735	-77.751502
4	35.544775	-77.751400

Plot 1B	Lat	Long
Origin	35.544557	-77.750951
2	35.544589	-77.751036
3	35.544500	-77.751071
4	35.544479	-77.750975

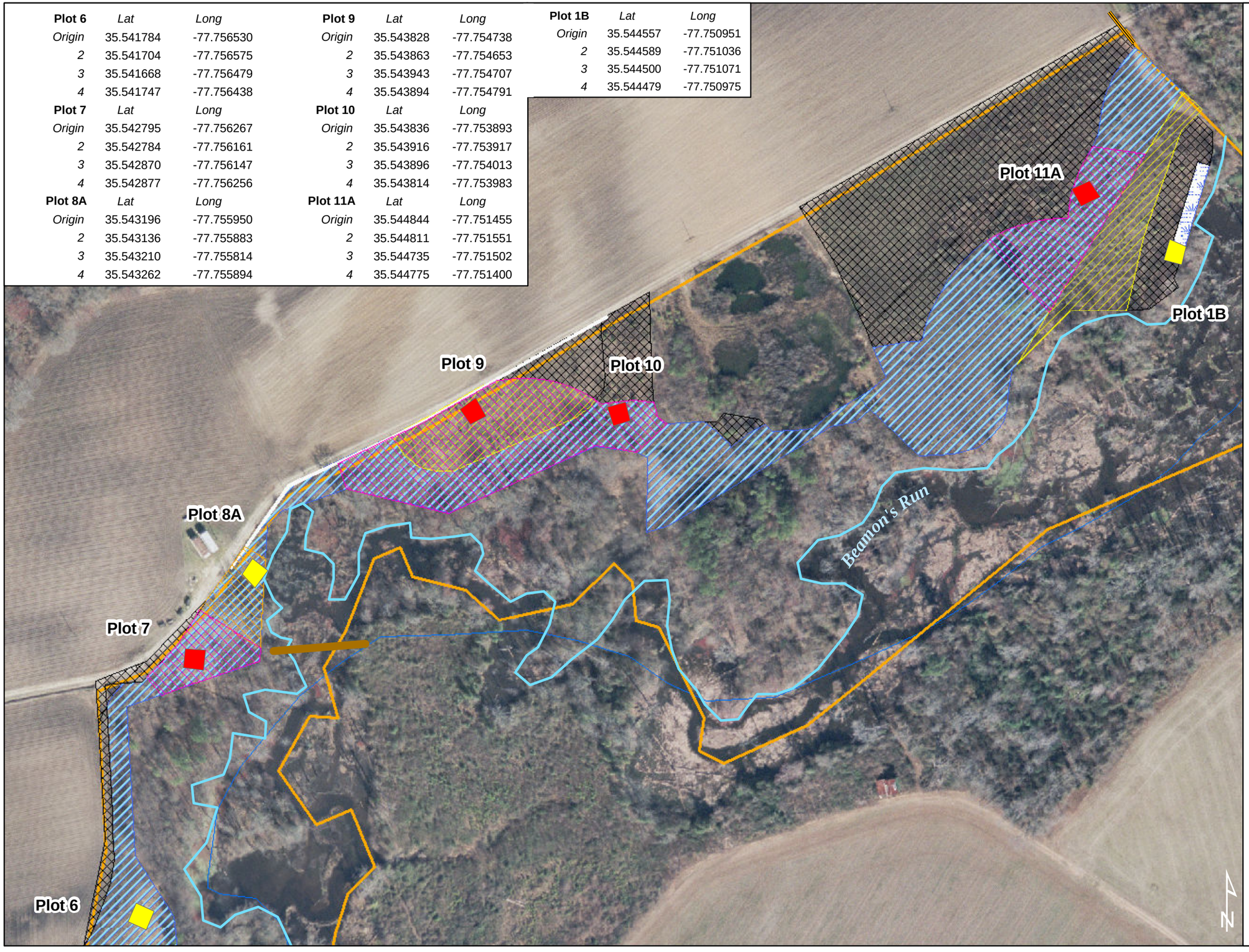

Figure 2 - Sheet 3

Current Condition Plan View

Beamon's Run Wetland and Buffer Restoration Site
EEP Project # 24
Greene County, North Carolina

Monitoring Report
November 2012

- Stream Edge
- Streams
- Gate
- Conservation Easement
- Current Beaver Dam

Veg Plots

- Failing <320 stems/ac
- Successful >320 stems/ac

Plantings

- Poor Growth Rates or Vigor
- Low Stem Density
- Sprayed Area (2011)
- Excluded*
- Long leaf pine
- River birch
- Oak Mix

*Excluded areas include: mature forest, active farm, loblolly pines, not planted, and >200 ft from streams

Note:
The area on this sheet depicted in the planting plan as river birch is actually bigger than originally shown. The entirety of Plot 1B is planted with River Birch.

0 75 150 300 Feet

Ecosystem Enhancement Program

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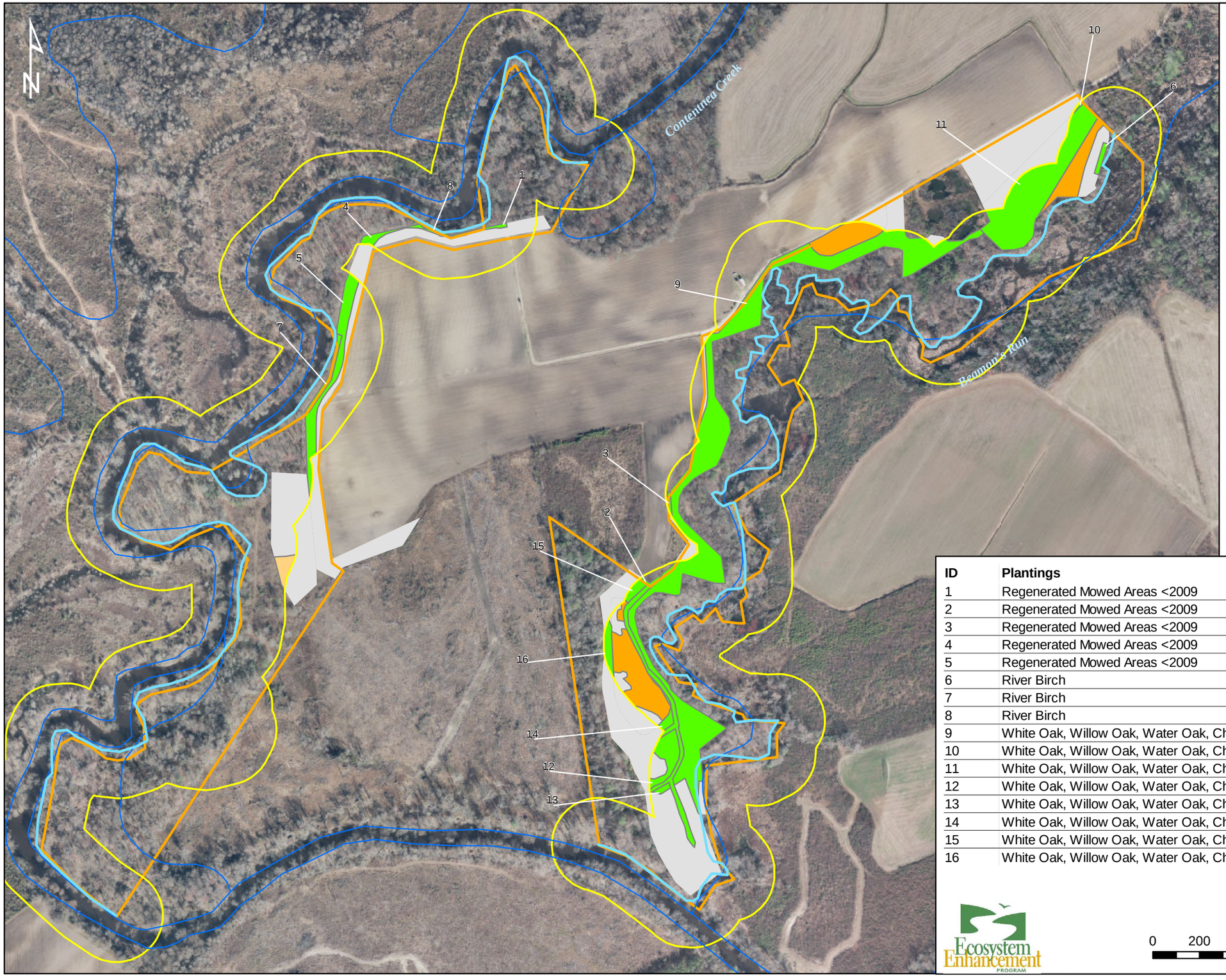

Figure 3 - Overview

Asset Map

Beamon's Run Wetland and
Buffer Restoration Project
EEP Project 24
Greene County, North Carolina

November 2012

- 200ft Buffer
- Stream Edge
- Streams
- Easement Boundary
- Original Planting Areas (Excluded*)
- Neuse Riparian Buffer Credit (10.001 ac)

Excluded Planted Softwoods

- Cypress (0.153 ac)
- Long Leaf Pine (2.152 ac)

*Excluded areas include: mature forest, active farm, loblolly pines, not planted, and >200 ft from streams

ID	Plantings	Area (ac)
1	Regenerated Mowed Areas <2009	0.080305
2	Regenerated Mowed Areas <2009	0.611223
3	Regenerated Mowed Areas <2009	0.030871
4	Regenerated Mowed Areas <2009	0.114178
5	Regenerated Mowed Areas <2009	0.718204
6	River Birch	0.063724
7	River Birch	0.137185
8	River Birch	0.035717
9	White Oak, Willow Oak, Water Oak, Chestnut Oak, Yellow Poplar, and Green Ash	5.440725
10	White Oak, Willow Oak, Water Oak, Chestnut Oak, Yellow Poplar, and Green Ash	0.014959
11	White Oak, Willow Oak, Water Oak, Chestnut Oak, Yellow Poplar, and Green Ash	2.037628
12	White Oak, Willow Oak, Water Oak, Chestnut Oak, Yellow Poplar, and Green Ash	0.349979
13	White Oak, Willow Oak, Water Oak, Chestnut Oak, Yellow Poplar, and Green Ash	0.037572
14	White Oak, Willow Oak, Water Oak, Chestnut Oak, Yellow Poplar, and Green Ash	0.086365
15	White Oak, Willow Oak, Water Oak, Chestnut Oak, Yellow Poplar, and Green Ash	0.089948
16	White Oak, Willow Oak, Water Oak, Chestnut Oak, Yellow Poplar, and Green Ash	0.152871

Ecosystem Enhancement Program

0 200 400 800 Feet

Stantec

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Table 6. Vegetation Condition Assessment					
Beamon's Run Buffer and Wetland Restoration Site/EEP Project No. 24					
Planted acreage	16.9				
Vegetation Category	**Definitions**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Planted Acreage**
1. Bare Areas (2011 sprayed areas)	Very limited cover of woody material	Magenta polygon	1	0.06	0.4%
2. Low Stem Density	Woody stem densities below target levels for stem count success criteria	Orange hatched polygons	5	2.52	14.9%
3. Low Stem Density	Mowed areas prior to 2009	Beige polygons	4	1.64	9.7%
		Total	10	4.22	25.0%
4. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year	Pink hatched polygons	2	0.27	1.6%
		Total	12	4.49	26.6%
Easement acreage	79.9				
Vegetation Category	**Definitions**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Planted Acreage**
5. Invasive areas of concern		None	0	0	0.0%

Vegetation Plot Photos

Photo Station 1 – Vegetation Plot 1B

Photo Station 2 – Vegetation Plot 2

Photo Station 3 – Vegetation Plot 3

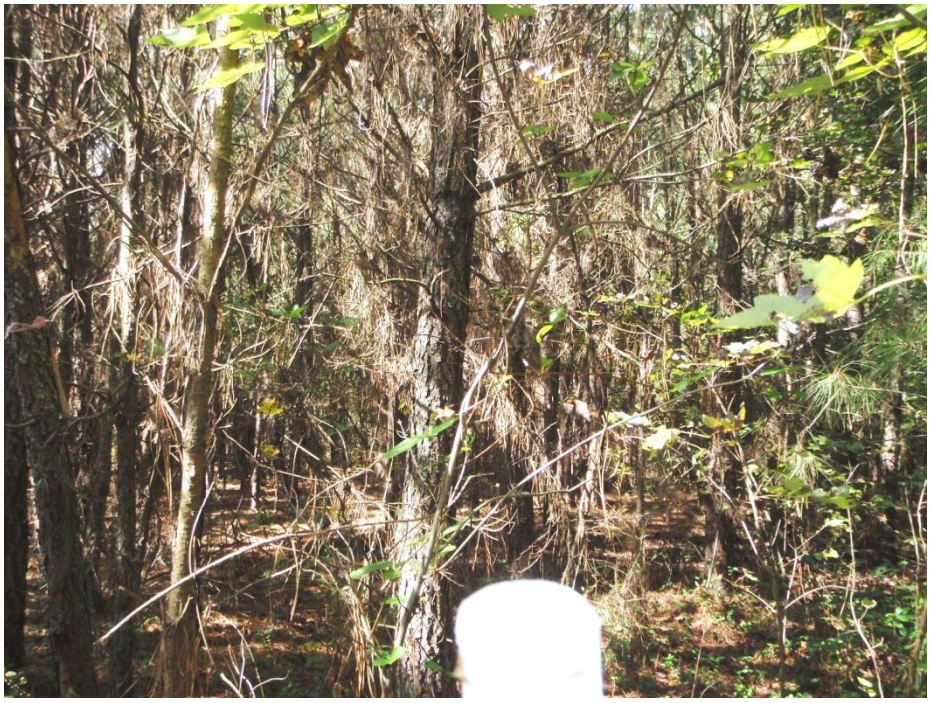

Photo Station 4 – Vegetation Plot 4

Photo Station 5 – Vegetation Plot 5

Photo Station 6 – Vegetation Plot 6

Photo Station 7 – Vegetation Plot 7

Photo Station 8 – Vegetation Plot 8A

Photo Station 9 – Vegetation Plot 9

Photo Station 10 – Vegetation Plot 10

Photo Station 11 – Vegetation Plot 11A

Photo Station 12 – Vegetation Plot 12A

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Appendix C. Vegetation Plot Data

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Table 7. Veg Plot Criteria Attainment		
Beamon's Run Buffer and Wetland Restoration Site/EEP Project No. 24		
Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
VP1B	Y (688)	50%
VP2	Y (364)	
VP3	N (202)	
VP4	N (0)	
VP5	Y (445)	
VP6	Y (526)	(331 stems/acre)
VP7	N (81)	
VP8A	Y (567)	
VP9	N (0)	
VP10	N (162)	
VP11A	N (81)	
VP12A	Y (728)	

Table 8. CVS Vegetation Plot Metadata	
Beamon's Run Buffer and Wetland Restoration Site/EEP Project No. 24	
Report Prepared By	Alex Baldwin
Date Prepared	10/29/2012 15:41
database name	STantec_Beamon2012_cvs-eep-entrytool-v2.3.1.mdb
database location	U:\175613003\Beamon\project\site_data\cvs
computer name	BALDWINA-SP1
file size	60592128
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
ALL Stems by Plot and spp	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.
PROJECT SUMMARY----------	
Project Code	24
project Name	Beamon's Run Restoration Project
Description	
River Basin	Neuse
length(ft)	
stream-to-edge width (ft)	
area (sq m)	
Required Plots (calculated)	
Sampled Plots	12

Table 9. CVS Stem Count Total and Planted by Plot and Species

Beamon's Run Buffer and Wetland restoration Site/EEP Project No. 24

Current Plot Data (MY11 2012)

Scientific Name	Common Name	Species Type	E24-01-0001B			E24-01-0002			E24-01-0003			E24-01-0004		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo	**boxelder**	**Tree**												
Acer rubrum	**red maple**	**Tree**			54						2			33
Baccharis	baccharis	Shrub			1									
Baccharis halimifolia	eastern baccharis	Shrub												
Betula nigra	**river birch**	**Tree**	17	17	29									
Carpinus	**hornbeam**	**Tree**												
Carpinus caroliniana	**American hornbeam**	**Tree**			1									1
Chamaecyparis thyoides	Atlantic white cedar	Softwood Tree												
Crataegus	**hawthorn**	**Tree**						5			1			
Crataegus monogyna	**oneseed hawthorn**	**Tree**												
Fraxinus pennsylvanica	**green ash**	**Tree**				2	2	5						
Ilex decidua	possumhaw	shrub									1			
Ilex opaca	**American holly**	**Tree**			5									2
Ligustrum sinense	Chinese privet	Exotic			1			7						1
Liquidambar styraciflua	**sweetgum**	**Tree**			12									17
Liriodendron tulipifera	**tuliptree**	**Tree**			3									
Mimosa	sensitive plant	Exotic												
Morella cerifera	wax myrtle	shrub			1									
Nyssa	**tupelo**	**Tree**												
Nyssa biflora	**swamp tupelo**	**Tree**												
Nyssa sylvatica	**blackgum**	**Tree**												
Pinus palustris	longleaf pine	Softwood Tree												
Pinus taeda	loblolly pine	Softwood Tree												
Prunus serotina	**black cherry**	**Tree**												
Quercus alba	**white oak**	**Tree**						3	2	2	2			1
Quercus falcata	**southern red oak**	**Tree**												
Quercus lyrata	**overcup oak**	**Tree**												
Quercus michauxii	**swamp chestnut oak**	**Tree**												
Quercus montana	**rock chestnut oak**	**Tree**												
Quercus nigra	**water oak**	**Tree**						2						1
Quercus phellos	**willow oak**	**Tree**			4	7	7	12	3	3	5			
Quercus rubra	**northern red oak**	**Tree**												
Salix nigra	**black willow**	**Tree**												
Toxicodendron radicans	eastern poison ivy	Vine												
Unknown		Shrub or Tree												
Vaccinium	blueberry	Shrub												
Totals		**Stem count**	17	17	111	9	9	34	5	5	11	0	0	53
		size (ares)	1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02		
		Species count	1	1	10	2	2	6	2	2	5	0	0	7
		Stems per ACRE	688	688	4492	364.2	364.2	1376	202.3	202.3	445.2	0	0	2145
Riparian Buffer Success Criteria		**Stem count**	17	17	108	9	9	27	5	5	10	0	0	55
		size (ares)	1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02		
		Species count	1	1	7	2	2	5	2	2	4	0	0	6
		Stems per ACRE	688	688	4371	364.2	364.2	1093	202.3	202.3	404.7	0	0	2226

Scientific Name	E24-01-0005			E24-01-0006			E24-01-0007			E24-01-0008A		
	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo												
Acer rubrum			12			1			1			9
Baccharis						4						
Baccharis halimifolia												
Betula nigra						6						
Carpinus												
Carpinus caroliniana												
Chamaecyparis thyoides												
Crataegus												
Crataegus monogyna												
Fraxinus pennsylvanica	1	1	2							7	7	8
Ilex decidua			15			1						
Ilex opaca			1			2						
Ligustrum sinense												
Liquidambar styraciflua			8			1			3			37
Liriodendron tulipifera												
Mimosa									1			
Morella cerifera												
Nyssa												1
Nyssa biflora												
Nyssa sylvatica												
Pinus palustris												
Pinus taeda												
Prunus serotina												
Quercus alba	7	7	55	4	4	4	2	2	2	1	1	1
Quercus falcata												
Quercus lyrata												
Quercus michauxii				6	6	6						
Quercus montana												
Quercus nigra										5	5	7
Quercus phellos	3	3	9	3	3	3				1	1	1
Quercus rubra						38						
Salix nigra												
Toxicodendron radicans												
Unknown												
Vaccinium												
Totals – **Stem count**	8	8	77	10	10	18	2	2	6	13	13	63
size (ares)	1			1			1			1		
size (ACRES)	0.02			0.02			0.02			0.02		
Species count	3	3	7	3	3	9	1	1	4	4	4	7
Stems per ACRE	323.7	323.7	3116	404.7	404.7	728.4	80.94	80.94	242.8	526.1	526.1	2550
Riparian Buffer Success Criteria – **Stem count**	11	11	87	13	13	61	2	2	6	14	14	64
size (ares)	1			1			1			1		
size (ACRES)	0.02			0.02			0.02			0.02		
Species count	3	3	6	3	3	8	1	1	3	4	4	7
Stems per ACRE	445.2	445.2	3521	526.1	526.1	2469	80.94	80.94	242.8	566.6	566.6	2590

Scientific Name	E24-01-0009			E24-01-0010			E24-01-0011A			E24-01-0012A		
	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo												
Acer rubrum			1			11			10			5
Baccharis									4			
Baccharis halimifolia												
Betula nigra												
Carpinus												
Carpinus caroliniana						2						12
Chamaecyparis thyoides												
Crataegus												
Crataegus monogyna												
Fraxinus pennsylvanica									1			1
Ilex decidua												6
Ilex opaca									6			2
Ligustrum sinense												
Liquidambar styraciflua			3			25			8			5
Liriodendron tulipifera									1			
Mimosa			1									
Morella cerifera									1			
Nyssa												
Nyssa biflora												
Nyssa sylvatica												
Pinus palustris	3	3	3									
Pinus taeda												
Prunus serotina												1
Quercus alba				1	1	3	2	2	2	1	1	1
Quercus falcata												
Quercus lyrata												
Quercus michauxii			2									
Quercus montana												
Quercus nigra			1	2	2	2				16	16	38
Quercus phellos			2	1	1	1				1	1	3
Quercus rubra												1
Salix nigra						1						
Toxicodendron radicans												
Unknown												
Vaccinium												
Totals – **Stem count**	3	3	10	3	3	41	2	2	22	17	17	51
size (ares)	1			1			1			1		
size (ACRES)	0.02			0.02			0.02			0.02		
Species count	1	1	7	3	3	6	1	1	8	3	3	10
Stems per ACRE	121.4	121.4	404.7	121.4	121.4	1659	80.94	80.94	890.3	688	688	2064
Riparian Buffer Success Criteria – **Stem count**	0	0	9	4	4	45	2	2	28	18	18	69
size (ares)	1			1			1			1		
size (ACRES)	0.02			0.02			0.02			0.02		
Species count	0	0	5	3	3	7	1	1	6	3	3	10
Stems per ACRE	0	0	364.2	161.9	161.9	1821	80.94	80.94	1133	728.4	728.4	2792

Annual Means

Scientific Name	MY11 (2012)			MY10 (2011)			MY9 (2010)			MY8 (2009)		
	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo									1			1
Acer rubrum			139			279			159			713
Baccharis			9									
Baccharis halimifolia						7			17			22
Betula nigra	17	17	35	17	17	23	17	17	66	17	17	52
Carpinus												1
Carpinus caroliniana			16			11			12			9
Chamaecyparis thyoides						2						
Crataegus			6						4			5
Crataegus monogyna						5						
Fraxinus pennsylvanica	10	10	17	11	11	13	11	11	13	11	11	13
Ilex decidua			23			26			27			19
Ilex opaca			18			14			11			9
Ligustrum sinense			9			3			4			3
Liquidambar styraciflua			119			125			107			116
Liriodendron tulipifera			4			5			4			5
Mimosa			2			1						
Morella cerifera			2			3			3			2
Nyssa			1									
Nyssa biflora									1			1
Nyssa sylvatica						1						
Pinus palustris	3	3	3	4	4	5	4	4	6	4	4	4
Pinus taeda						80			57			56
Prunus serotina			1			1			2			1
Quercus alba	20	20	74	20	20	57	21	21	72	20	20	78
Quercus falcata												1
Quercus lyrata									1			
Quercus michauxii	6	6	8	6	6	8	6	6	8			1
Quercus montana										6	6	6
Quercus nigra	23	23	51	22	22	62	22	22	37	24	24	31
Quercus phellos	19	19	40	20	20	56	20	20	36	20	20	38
Quercus rubra			39			43			49			46
Salix nigra			1			1			1			2
Toxicodendron radicans												300
Unknown						1						
Vaccinium						1						
Totals – **Stem count**	79	79	461	80	80	676	81	81	555	76	76	1099
size (ares)	12			12			12			12		
size (ACRES)	0.30			0.30			0.30			0.30		
Species count	7	7	20	7	7	22	7	7	22	7	7	24
Stems per ACRE	266.4	266.4	1555	269.8	269.8	2280	273.2	273.2	1872	256.3	256.3	3706
Riparian Buffer Success Criteria – **Stem count**	95	95	569	96	96	705	97	97	584	98	98	1129
size (ares)	12			12			12			12		
size (ACRES)	0.30			0.30			0.30			0.30		
Species count	6	6	16	6	6	17	6	6	18	6	6	20
Stems per ACRE	320.4	320.4	1919	323.7	323.7	2378	327.1	327.1	1969	330.5	330.5	3807

***Bolded** hardwood tree species are counted toward riparian buffer success criteria.

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%

PnoLS = Planted excluding livestakes
P-all = All planted stems including livestakes
T = All planted and natural recruit stems including livestakes
Total includes natural recruit stems

Appendix D. Stream Survey Data

No stream assessment took place at the Beamon's Run Buffer and Wetland Restoration Site

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Appendix E. Hydrology Data

No hydrologic monitoring took place at the Beamon's Run Buffer and Wetland Restoration Site.