MONITORING YEAR 4 ANNUAL REPORT
Final

LOFLIN DAIRY BUFFER MITIGATION SITE
Randolph County, NC
NCDEQ Contract No. 003995
NCDMS ID No. 95008

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EXECUTIVE SUMMARY

The Loflin Dairy Buffer Mitigation Site, hereafter referred to as the Site, is located within the Randleman Reservoir watershed of the Cape Fear River Basin. On-site stream channels are unnamed tributaries to Bob Branch, which drains to the Randleman Regional Reservoir. The Site is located in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998) approximately six miles southeast of the intersection of Interstate 85 and Highway 311 in Randolph County, NC. Directions and a map of the Site are provided in Figure 1 (Appendix 1). The Site has historically been used for agricultural purposes, and is surrounded by fields that are alternately used for cattle and crop production. A conservation easement has been recorded to protect 9.8 acres of riparian corridor resources in perpetuity. The project is being completed to provide buffer mitigation units (BMUs) in the Cape Fear River Basin, and will include 9.1 acres in buffer restoration. The remaining protected acreage is buffer preservation not sought for credit. See Table 1 (Appendix 1) for a summary of project components and mitigation credits. A map of the conservation easement and project reaches is provided in Figure 2 (Appendix 1).

The goals of the Site address water quality improvements identified in the Cape Fear River Basin Restoration Priorities Report (RBRP) (NCEEP, 2009) 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 in the Loflin Dairy Buffer Mitigation Site Mitigation Plan (2012) to meet the RBRP goals:

- 9.1 acres of riparian area 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;
- Stream bank erosion which contributes sediment load to the creek will be greatly reduced, if not eliminated, in the project area. Eroding streambanks will be stabilized by increased woody root mass in banks and reducing channel incision. 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; and
- 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.

Overall, the Site has met the required buffer mitigation success criteria for the fourth year of annual monitoring (MY4). Although three vegetation plots (4, 6, and 15) did not meet the MY4 success criteria, the average stem density of the Site is greater than the required MY4 success criteria. Areas with Johnson grass (*Sorghum halepense*) and patches of other invasive species observed in MY4 will be treated and maintained as needed throughout the monitoring period to ensure minimal advancement occurs within the Site.

APPENDICES

1.0 PROJECT OVERVIEW

The Loflin Dairy Buffer Mitigation Site, hereafter referred to as the Site, is located within the Randleman Regional Reservoir watershed (North Carolina Division of Water Resources (NCDWR) Subbasin 03-06-08) of the Cape Fear River Basin (United States Geological Survey (USGS) Hydrologic Unit Code (HUC) 03030003010060). On-site stream channels are unnamed tributaries to Bob Branch (NCDWR Index No. 17-9.6-(1)) which drains to the Randleman Regional Reservoir. The Site is located in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998) approximately six miles southeast of the intersection of Interstate 85 and Highway 311 in Randolph County, NC. Directions and a map of the Site are provided in Figure 1 (Appendix 1).

The Site is surrounded by fields that are alternately used for cattle and crop production. The Site is comprised of two areas (Area A and B) on one parcel of land along several unnamed tributaries and ephemeral ditches to Bob Branch. A map of the conservation easement and project reaches is provided in Figure 2 (Appendix 1). The Site has historically been used for agricultural purposes. The current property owner has confirmed that Area A was used as an active dairy farm since 1947 and Area B has been surrounded by agricultural fields since the late 1920s. Bob Branch is a direct tributary to the Randleman Regional Reservoir. The reservoir is a regional water supply and stream buffer protection rules are in place throughout the watershed. At the downstream limits of the project, Area A has a drainage area of 18 acres (0.03 square miles) and Area B has a drainage area of 59 acres (0.09 square miles).

The NCDWR assigns best usage classifications to State Waters that reflect water quality conditions and potential resource usage. Bob Branch is classified as Class WS-IV 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 one-half mile of a water supply

A conservation easement has been recorded to protect 9.8 acres of riparian corridor resources in perpetuity. The project is being completed to provide buffer mitigation units (BMUs) in the Cape Fear River Basin and will include 9.1 acres of buffer restoration. The remaining protected acreage is buffer preservation not sought for credit. See Table 1 (Appendix 1) for a summary of project components and mitigation credits.

1.1 Project Goals and Objectives

Prior to construction activities, the primary watershed stressor was the lack of a vegetated buffer and nutrient runoff from adjacent agricultural maintenance activities. The riparian zones within these areas were maintained and mowed on an annual basis resulting in varying buffer widths and densities. The riparian zones were also actively sprayed due to their locations in an active row crop field and cattle pasture. A concentrated flow of cattle waste drained directly to several of the tributaries located adjacent to the dairy farm. Although there is no immediate evidence of increased development within the project site's watersheds; the new NC Highway 311 corridor has been constructed immediately downstream of the project area. This new highway corridor may increase development pressure on the project's watersheds and this area of Randolph County in the future. The restored riparian buffer areas within the Site will aid in protecting water quality and endangered species habitat within the Deep River

watershed by filtering runoff from adjacent agricultural practices and restoring terrestrial habitat. The Deep River watershed is an important component of the Randleman Regional Reservoir in this part of the state. 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). Tables 1-4 in Appendix 1 present detailed information for pre and post restoration conditions.

The goals of the Site address water quality improvements identified in the Cape Fear River Basin Restoration Priorities Report (RBRP) (NCEEP, 2009) 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 in the Loflin Dairy Buffer Mitigation Site Mitigation Plan (2012) to meet the RBRP goals:

- 9.1 acres of riparian area 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;
- Stream bank erosion which contributes sediment load to the creek will be greatly reduced, if not eliminated, in the project area. Eroding streambanks will be stabilized by increased woody root mass in banks and reducing channel incision. 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; and
- 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 4 Data Assessment

The final mitigation plan was submitted and accepted by the North Carolina Department of Mitigation Services (NCDMS) in February 2012. Grading activities were completed by the landowner in March 2012. 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). Biannual monitoring was conducted to assess the Site conditions in April and July 2015.

1.2.1 Vegetative Assessment

A total of 16 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 stream 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 with the as-built and during annual monitoring. 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 (MY5) of the monitoring period. Along with the stem density requirement, the final planted vegetation community must also include at least two different planted species to be considered successful. The extent of invasive species coverage will also need to be monitored and controlled as necessary.

The MY4 average stem density for the Site is 405 stems per acre, which is 53% of the baseline (MY0) density recorded (764 stems per acre) in April 2012. There is an average of 10 stems per plot in MY4 compared to 10 stems per plot in MY3, 11 stems per plot in MY2, 13 stems per plot in MY1 and 19 stems per plot in MY0. Of the 16 plots, 13 met the success criteria required for MY4. Vegetation plots 4, 6 and 15 did not meet the MY4 success criteria due to insufficient stem density. In addition, while Plot 15 does not meet the requirement of having at least two different planted species, natural woody stems do add some diversity to the stratum. Vegetation Plots 4, 6 and 15 had a high initial mortality rate in MY1 and MY2, but stem death has tapered off with no mortality in MY4. The majority of remaining stems have excellent growth and vigor scores. While plot 6 did not meet the interim success criteria, this plot is on track to meet the final mitigation success requirements with the inclusion of volunteer species.

Areas of Johnson grass (*Sorghum halepense)* were noted onsite. Other invasive plants including Japanese honeysuckle (*Lonicera japonica*), Chinese privet *(Ligustrum sinense)*, and morning glory (*Ipomea sp.*) were observed as well. Spot treatment of invasive plants with herbicide is planned for the current year to control these species and prevent 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 Year 4 Summary

Overall, the Site has met the required buffer mitigation success criteria for MY4. Although three vegetation plots (4, 6 and 15) did not meet the MY4 success criteria, the average stem density of the Site is greater than the required MY4 success criteria. The areas of Johnson grass and patches of other invasive species observed in MY4 will be treated and maintained as needed throughout the monitoring period.

Summary information/data related to the 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 NCDMS's website. All raw data supporting the tables and figures in the appendices are available from NCDMS upon request.

2.0 METHODOLOGY

Vegetation monitoring protocols followed the Carolina Vegetation Survey-NCEEP Level Two Protocol (Lee et al., 2008).

3.0 REFERENCES

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 Ecosystem Enhancement Program. 2010. NCEEP Mitigation Plan Guidance (Version 2.0, 10/01/2010). http://portal.ncdenr.org/c/document_library/get_file?p_l_id=1169848&folderId=7135626&name=DLFE-53356.pdf

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 Randolph County, North Carolina. http://SoilDataMart.nrcs.usda.gov

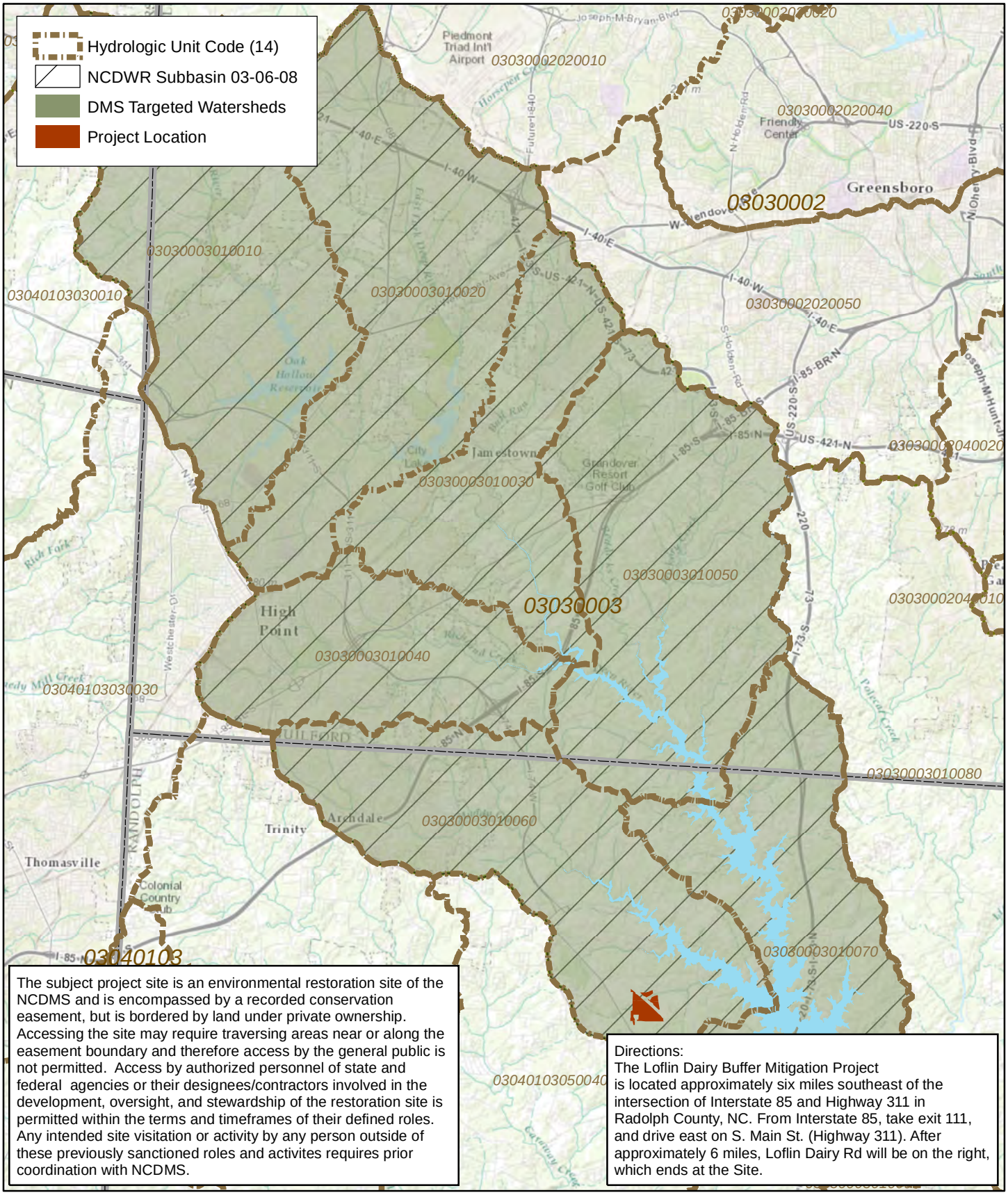
United States Geological Survey (USGS), 1998. North Carolina Geology. http://www.geology.enr.state.nc.us/usgs/carolina.htm

Weakley, A.S. 2010. *Flora of the Carolinas, Virginia, Georgia, Northern Florida, and Surrounding Areas* University of North Carolina at Chapel Hill: Chapel Hill, NC.

Wildlands Engineering, Inc. 2012. Loflin Dairy Buffer Mitigation Site Mitigation Plan. NCDMS, Raleigh, NC.

Wildlands Engineering, Inc. 2012. Loflin Dairy Buffer Mitigation Site Baseline Monitoring Document and As-Built Baseline Report. NCDMS, Raleigh, NC.

APPENDIX 1. General Tables and Figures



The subject project site is an environmental restoration site of the NCDMS and is encompassed by a recorded conservation easement, but is bordered by land under private ownership. Accessing the site may require traversing areas near or along the easement boundary and therefore access by the general public is not permitted. Access by authorized personnel of state and federal agencies or their designees/contractors involved in the development, oversight, and stewardship of the restoration site is permitted within the terms and timeframes of their defined roles. Any intended site visitation or activity by any person outside of these previously sanctioned roles and activites requires prior coordination with NCDMS.

Directions:
The Loflin Dairy Buffer Mitigation Project is located approximately six miles southeast of the intersection of Interstate 85 and Highway 311 in Radolph County, NC. From Interstate 85, take exit 111, and drive east on S. Main St. (Highway 311). After approximately 6 miles, Loflin Dairy Rd will be on the right, which ends at the Site.

0 1.25 2.5 Miles

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Figure 1 Project Vicinity Map
Loflin Dairy Buffer Mitigation Site
NCDMS Project Number 95008
Monitoring Year 4

Randolph County, NC

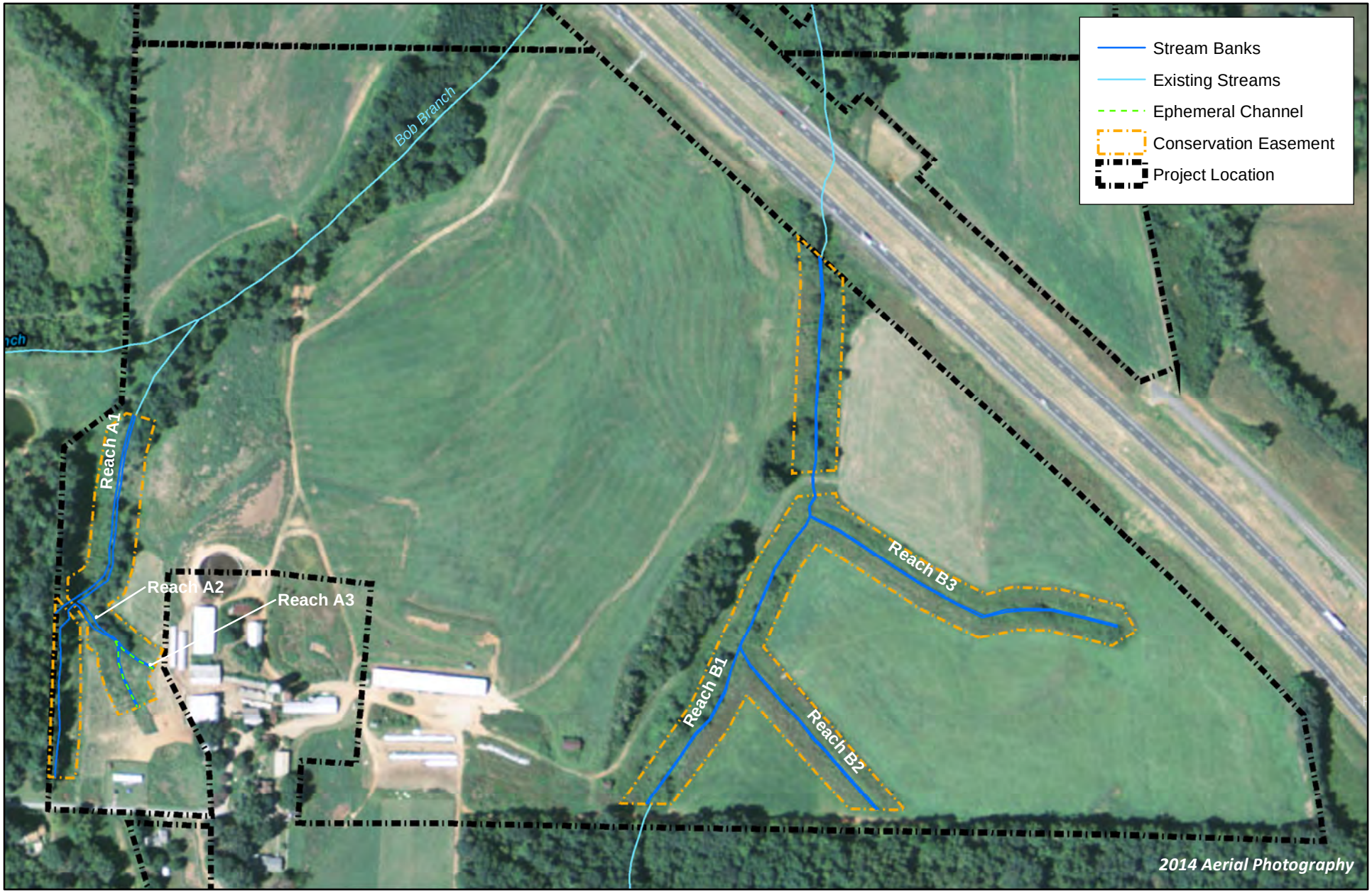

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Figure 2. Project Component/Asset Map
Loflin Dairy Buffer Mitigation Site
NCDMS Project Number 95008
Monitoring Year 4

Randolph County, NC

Table 1. Project Components and Mitigation Credits
Loflin Dairy Buffer Mitigation Site (NCDMS Project No.95008)
Monitoring Year 4

Mitigation Credits									
	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offet	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	N/A	N/A	N/A	N/A	N/A	N/A	9.1	N/A	N/A

Project Components						
Reach ID	Stationing/ Location	Exisitng Footage (LF)	Approach	Restoration or Restoration Equivalent	Area (acres)	Mitigation Ratio
Reach A1	Area A		N/A	Restoration	1.7	1:1
Reach A2	Area A		N/A	Restoration	0.7	1:1
Reach B1	Area B		N/A	Restoration	3.6	1:1
Reach B2	Area B		N/A	Restoration	1.1	1:1
Reach B3	Area B		N/A	Restoration	2.0	1:1

Component Summation						
Restoration Level	Stream (linear feet)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)	Buffer (square feet)	Upland (acres)
		Riverine	Non-Riverine			
Restoration					396,396	
Enhancement						
Enhancement I						
Enhancement II						
Creation						
Preservation						
DWQ stream identification s						

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
Loflin Dairy Buffer Mitigation Site (NCDMS Project No.95008)
Monitoring Year 4

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	Sept 2012	December 2012
Year 2 Monitoring	July 2013	August 2013
Year 3 Monitoring	July 2014	December 2014
Year 4 Monitoring	July 2015	December 2015
Year 5 Monitoring	2016	December 2016

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

Table 3. Project Contact Table
Loflin Dairy Buffer Mitigation Site (NCDMS Project No.95008)
Monitoring Year 4

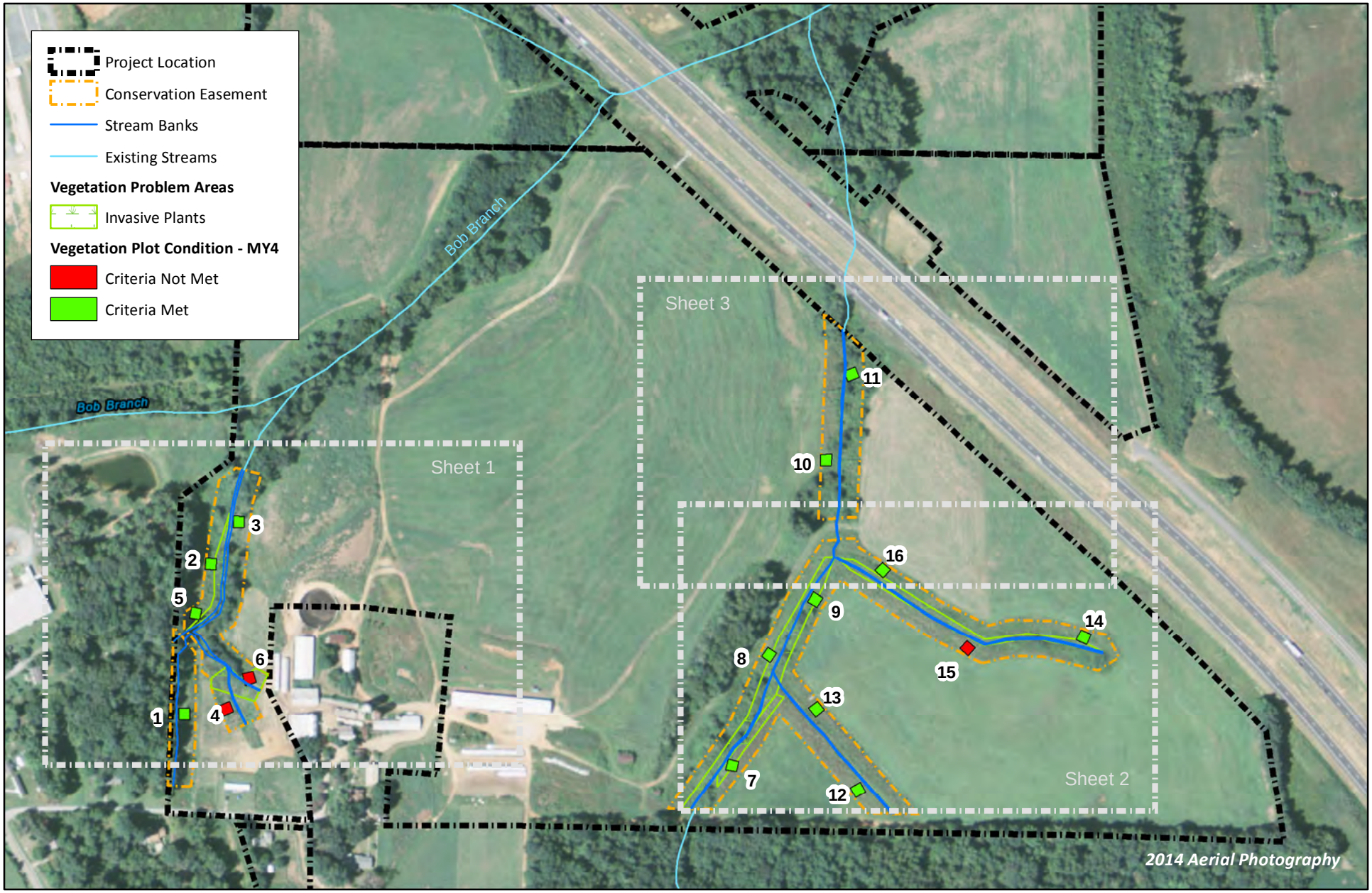
NCDWR stream identification score	**Wildlands Engineering, Inc.**
Daniel Taylor	312 West Millbrook Road, Suite 225 Raleigh, NC 27609 919.851.9986
Construction Contractor	**Landowner**
Clifford W. Loflin	2409 Loflin Dairy Road Sophia, NC 27350
Planting Contractor	**Bruton Natural Systems, Inc.**
Charlie Bruton	PO Box 1197 Freemont, NC 27830 919.242.6555
Seeding Contractor	**Bruton Natural Systems, Inc.**
Charlie Bruton	PO Box 1197 Freemont, NC 27830 919.242.6555
Seed Mix Sources	**Mellow Marsh Farm**
Nursery Stock Suppliers	**Arborgen** **Dykes and Son Nursery** **NC Forestry Service, Claridge Nursery**
Monitoring Performers	**Wildlands Engineering, Inc.**
Vegetation Monitoring, POC	Kirsten Y. Gimbert 704.332.7754, ext. 110

Table 4. Project Baseline Information and Attributes
Loflin Dairy Buffer Mitigation Site (NCDMS Project No.95008)
Monitoring Year 4

Project Information		
Project Name	Loflin Dairy Buffer Mitigation Site	
County	Randolph	
Project Area (acres)	9.8	
Project Coordinates (latitude and longitude)	35° 50' 44.082"N, 79° 52' 22.487"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	03030003010060	
NCDWR Sub-basin	03-06-08	
	Area A	**Area B**
Project Drainiage Area (acres)	18	59
Project Drainage Area Percentage of Impervious Area	<1%	
CGIA Land Use Classification	82% Cultivated Land and 18% Forested Land	45% Cultivated Land, 40% Forested Land, 10% Residential, and 5 % Commercial
Reach Summary Information		
Parameters	**Area A**	**Area B**
Length of reach (linear feet) - Post-Restoration	Reach A1 : 917 Reach A2 : 155 Reach A2(ephem):180 Reach A3 : 120	Reach B1 : 1489 Reach B2 : 866 Reach B3 : 486
Valley classification	N/A	N/A
Drainage area (acres)	Reach A1 : 61 Reach A2 : 6.5 Reach A3 : 1.0	Reach B1 : 230 Reach B2 : 26 Reach B3 : 22
NCDWR stream identification score	Reach A1 : 24/ 34.5 Reach A2 : 23.25 Reach A3 : N/A	Reach B1 : 27.25/ 35.5 Reach B2 : 20.75 Reach B3 : 22.75
NCDWR Water Quality Classification	WS-IV, C	
Morphological Desription (stream type)	Reach A1 – Per. / Int. Reach A2 – Int. / Ephemeral Ditch Reach A3- Ephemeral Ditch	Reach B1 – Per. / Int. Reach B2 – Int. Reach B3 – Int.
Evolutionary trend (Simon's Model) - Pre- Restoration	N/A	N/A
Underlying mapped soils	Wynott-Enon complex	Mecklenburg loam, 8-15% slopes; Mecklenburg clay loam, 2-8% slopes
Drainage class	well drained	well drained
Soil Hydric status	No	No
Slope	8-15%	2-8%
FEMA classification	no regulated floodplain	
Native vegetation community	Piedmont 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	N/A	N/A	N/A
Waters of the United States - Section 401	N/A	N/A	N/A
Endangered Species Act	X	X	Loflin Dairy Buffer Mitigation Plan; studies found "no effect" (letter from USFWS)
Historic Preservation Act	X	X	Loflin Diary 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

APPENDIX 2. Visual Assessment Data



0 200 400 800 Feet

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Figure 3.0 Integrated Current Condition Plan View (Key)
Loflin Dairy Buffer Mitigation Site
NCDMS Project Number 95008
Monitoring Year 4

Randolph County, NC

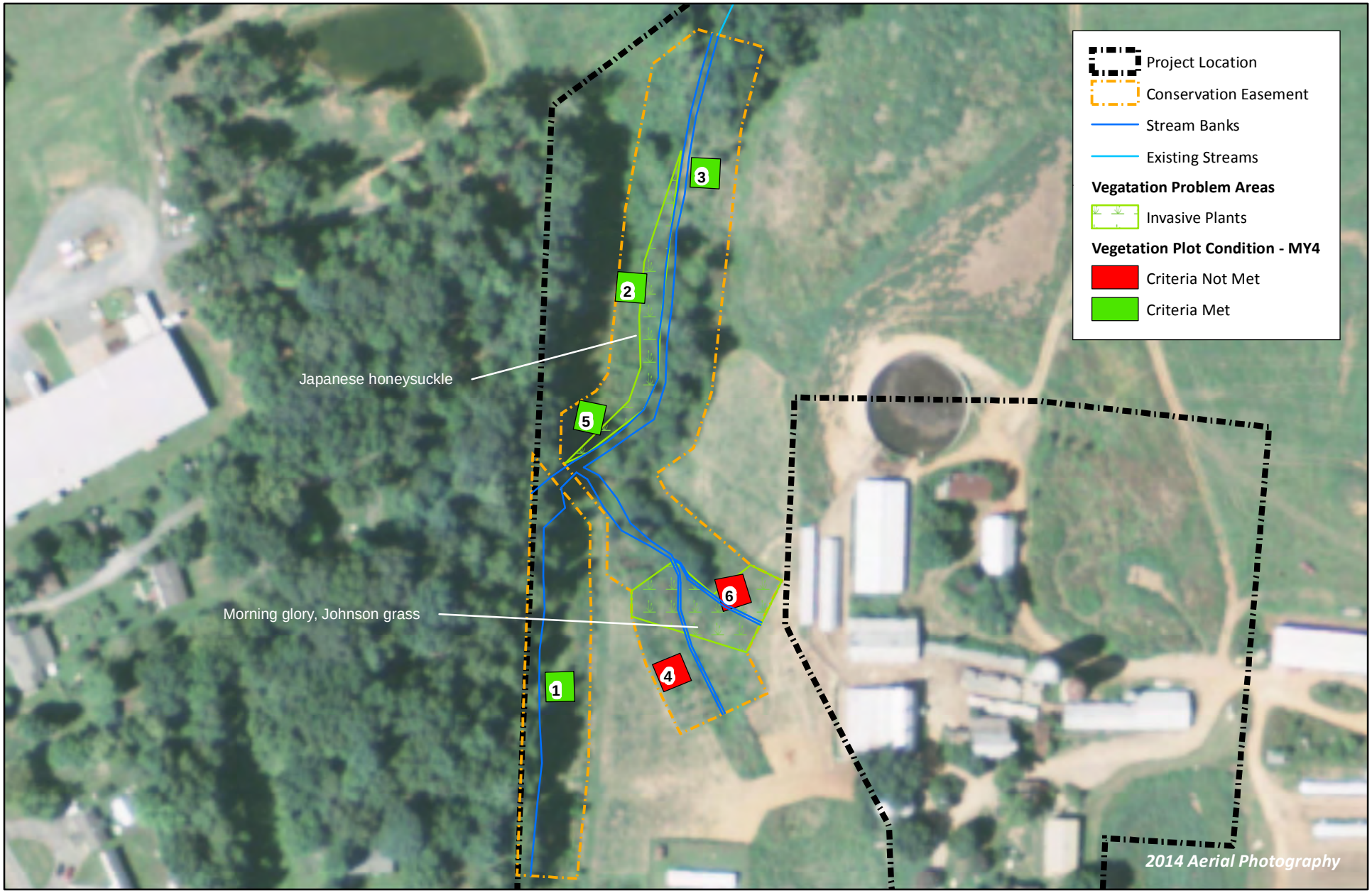

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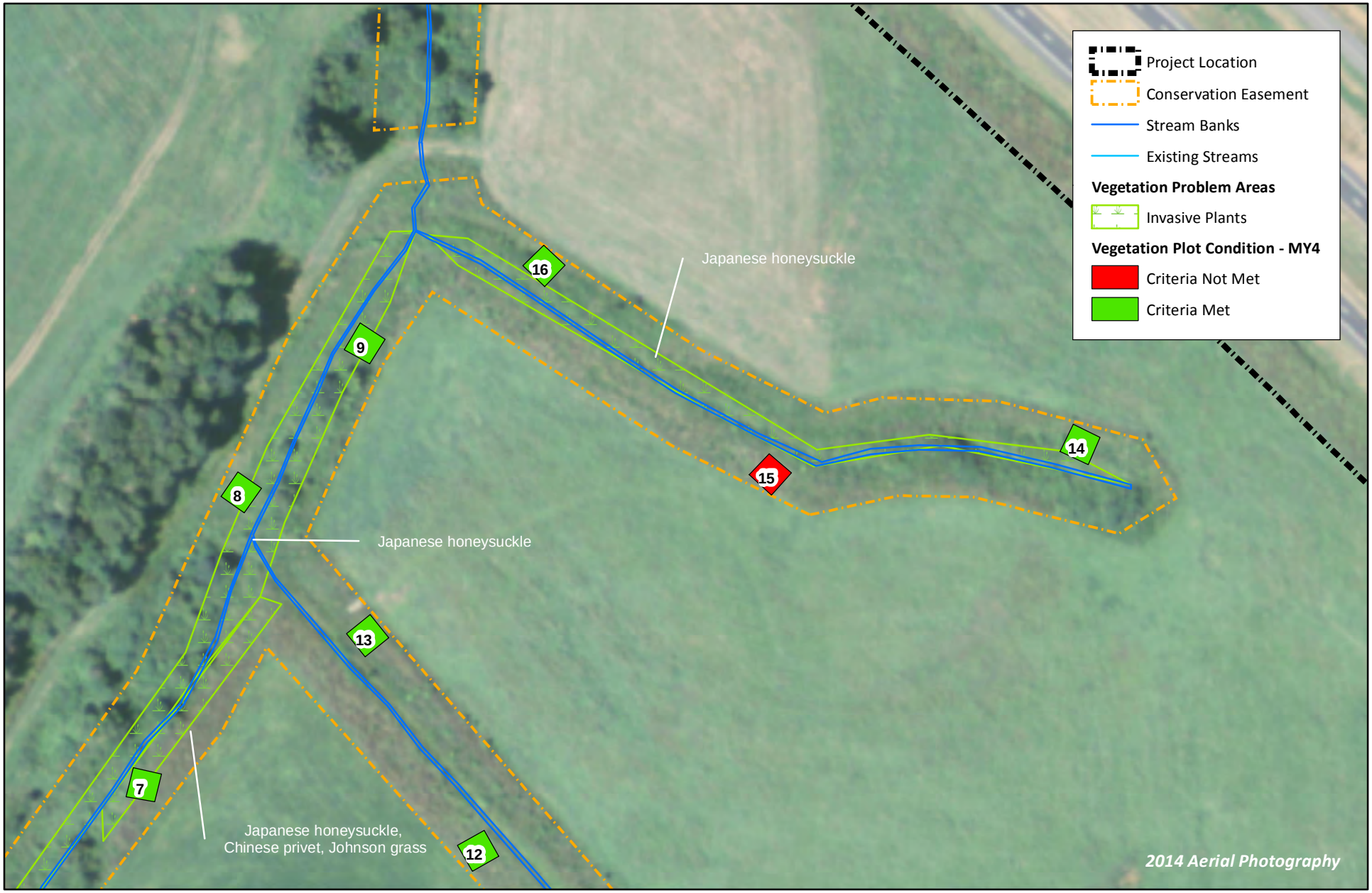
Figure 3.1 Integrated Current Condition Plan View
(Sheet 1 of 3)
Loflin Dairy Buffer Mitigation Site
NCDMS Project Number 95008
Monitoring Year 4

Randolph County, NC



WILDLANDS ENGINEERING

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Figure 3.2 Integrated Current Condition Plan View
(Sheet 2 of 3)
Loflin Dairy Buffer Mitigation Site
NCDMS Project Number 95008
Monitoring Year 4

Randolph County, NC

WILDLANDS ENGINEERING

0 75 150 300 Feet

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Figure 3.3 Integrated Current Condition Plan View
(Sheet 3 of 3)
Loflin Dairy Buffer Mitigation Site
NCDMS Project Number 95008
Monitoring Year 4

Randolph County, NC

Table 5. Vegetation Condition Assessment Table
Loflin Dairy Buffer Mitigation Site (NCDMS Project No. 95008)
Monitoring Year 4

Planted Acreage **9.1**

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%
Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1	3	0.6	7%
		Total	**3**	**0.6**	**7%**
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	0	0	0%
		Cumulative Total	**3**	**0.6**	**7%**

Easement Acreage **9.8**

Vegetation Category	Definitions	Mapping Threshold (SF)	Number of Polygons	Combined Acreage	% of Planted Acreage
Invasive Areas of Concern	Areas of points (if too small to render as polygons at map scale).	1000	5	1.6	18%
Easement Encroachment Areas	Areas of points (if too small to render as polygons at map scale).	none	0	0	0%

Vegetation Photographs

	
Vegetation Plot 1 (07/06/2015)	Vegetation Plot 2 (07/06/2015)
	
Vegetation Plot 3 (07/06/2015)	Vegetation Plot 4 (07/06/2015)
	
Vegetation Plot 5 (07/06/2015)	Vegetation Plot 6 (07/06/2015)

	
Vegetation Plot 7 (07/06/2015)	Vegetation Plot 8 (07/06/2015)
	
Vegetation Plot 9 (07/06/2015)	Vegetation Plot 10 (07/06/2015)
	
Vegetation Plot 11 (07/06/2015)	Vegetation Plot 12 (07/06/2015)

	
Vegetation Plot 13 (07/06/2015)	Vegetation Plot 14 (07/06/2015)
	
Vegetation Plot 15 (07/06/2015)	Vegetation Plot 16 (07/06/2015)

APPENDIX 3. Vegetation Plot Data

Table 6. Vegetation Plot Criteria Attainment
Loflin Dairy Buffer Mitigation Site (NCDMS Project No. 95008)
Monitoring Year 4

Plot	MY4 Success Criteria Met (Y/N)	Tract Mean
1	Y	81%
2	Y	
3	Y	
4	N	
5	Y	
6	N	
7	Y	
8	Y	
9	Y	
10	Y	
11	Y	
12	Y	
13	Y	
14	Y	
15	N	
16	Y	

Table 7. CVS Vegetation Plot Metadata
Loflin Dairy Buffer Mitigation Site (NCDMS Project No. 95008)
Monitoring Year 4

Report Prepared By	Alea Tuttle
Date Prepared	7/14/2015 16:29
database name	*Loflin Dairy MY4 cvs-eep-entrytool-v2.3.1.mdb*
database location	*Q:\ActiveProjects\005-02131 Loflin Dairy Buffer Mitigation Site\Monitoring\Monitoring Year 4\Vegetation Assessment*
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	*Description of database file, the report worksheets, and a summary of project(s) and project data.*
Plots	*Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.*
Stem Count 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	95008
project Name	Loflin Dairy Mitigation Site
Description	Buffer Mitigation
length (ft)	
stream-to-edge width (ft)	
area (sq m)	
Required Plots (calculated)	16
Sampled Plots	16

Table 8. Planted and Total Stem Counts
Loflin Dairy Mitigation Site (NCDMS Project No. 95008)
Monitoring Year 4

			Current Plot Data (MY4 2015)																														
			95008-WEI-0001			95008-WEI-0002			95008-WEI-0003			95008-WEI-0004			95008-WEI-0005			95008-WEI-0006			95008-WEI-0007			95008-WEI-0008			95008-WEI-0009			95008-WEI-0010			95008-WEI-0011		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree															1																	
Betula nigra	river birch	Tree				2	2	2							2	2	2				1	1	1				1	1	1				1	1	1
Carpinus caroliniana	American hornbeam	Tree													2	2	2													3	3	3			
Carya	hickory	Tree																																
Celtis laevigata	sugarberry	Tree									2																							
Diospyros virginiana	common persimmon	Tree									8																							
Fraxinus pennsylvanica	green ash	Tree	7	7	7	5	5	5	5	5	7				2	2	3	1	1	1	4	4	4	8	8	8	4	4	4	1	1	1			
Juglans nigra	black walnut	Tree	1	1	4						4																					1		
Liquidambar styraciflua	sweetgum	Tree						4									1			5														
Liriodendron tulipifera	tuliptree	Tree	2	2	2			1	1	1	1						1	4	4	4	2	2	2	1	1	1	1	1	1	1	1	1			
Nyssa sylvatica	blackgum	Tree																																
Platanus occidentalis	American sycamore	Tree				2	2	2	2	2	2	4	4	4	3	3	4				6	6	6				5	5	5				8	8	8
Quercus michauxii	swamp chestnut oak	Tree										1	1	1										1	1	1	2	2	2				1	1	1
Quercus phellos	willow oak	Tree				4	4	4	1	1	1							1	1	1	1	1	1				1	1	1	4	4	4	5	5	5
Quercus rubra	northern red oak	Tree										1	1	1	1	1	1																1	1	1
Salix nigra	black willow	Tree																																
Salix sericea	silky willow	Shrub																								3								
Sambucus canadensis	Common Elderberry	Shrub																																
Ulmus alata	winged elm	Tree						3			1												1											
		Stem count	10	10	13	13	13	21	9	9	26	6	6	6	10	10	15	6	6	11	14	14	15	10	10	13	14	14	14	9	9	10	16	16	16
		size (ares)	1			1			1			1			1			1			1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02		
		Species count	3	3	3	4	4	7	4	4	8	3	3	3	5	5	8	3	3	4	5	5	6	3	3	4	6	6	6	4	4	5	5	5	5
		Stems per ACRE	405	405	526	526	526	850	364	364	1052	243	243	243	405	405	607	243	243	445	567	567	607	405	405	526	567	567	567	364	364	405	647	647	647

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

Color Coding for Table

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
Loflin Dairy Mitigation Site (NCDMS Project No. 95008)
Monitoring Year 4

			Current Plot Data (MY4 2015)																Annual Summary											
			95008-WEI-0012			95008-WEI-0013			95008-WEI-0014			95008-WEI-0015			95008-WEI-0016			MY4 (2015)			MY3 (2014)			MY2 (2013)			MY1 (2012)			MY0 (2012)		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree																		1												
Betula nigra	river birch	Tree	2	2	2	2	2	2				4	4	4				15	15	15	14	14	14	16	16	16	27	27	27	95	95	95
Carpinus caroliniana	American hornbeam	Tree	1	1	1				4	4	4							10	10	10	9	9	9	12	12	12	23	23	23	18	18	18
Carya	hickory	Tree																					3			1						
Celtis laevigata	sugarberry	Tree																		2			1									
Diospyros virginiana	common persimmon	Tree												1			2			11			4									
Fraxinus pennsylvanica	green ash	Tree	2	2	2	6	6	6	8	8	8				3	3	4	56	56	60	57	57	60	57	57	57	61	61	61	62	62	62
Juglans nigra	black walnut	Tree																1	1	9												
Liquidambar styraciflua	sweetgum	Tree																		10			6									
Liriodendron tulipifera	tuliptree	Tree																12	12	14	11	11	12	12	12	12	17	17	17	30	30	30
Nyssa sylvatica	blackgum	Tree																					1									
Platanus occidentalis	American sycamore	Tree	2	2	2				1	1	1			1	5	5	5	38	38	40	38	38	38	39	39	39	42	42	42	50	50	50
Quercus michauxii	swamp chestnut oak	Tree																5	5	5	6	6	6	7	7	7	11	11	11	7	7	7
Quercus phellos	willow oak	Tree	2	2	2													19	19	19	21	21	21	24	24	24	24	24	24	19	19	19
Quercus rubra	northern red oak	Tree				1	1	1										4	4	4	5	5	5	6	6	6	12	12	12	21	21	21
Salix nigra	black willow	Tree																					12									
Salix sericea	silky willow	Shrub																		3												
Sambucus canadensis	Common Elderberry	Shrub									4									4												
Ulmus alata	winged elm	Tree																		5			3									
Stem count			9	9	9	9	9	9	13	13	17	4	4	6	8	8	11	160	160	212	161	161	195	173	173	174	217	217	217	302	302	302
size (ares)			1			1			1			1			1			16			16			16			16			16		
size (ACRES)			0.02			0.02			0.02			0.02			0.02			0.40			0.40			0.40			0.40			0.40		
Species count			5	5	5	3	3	3	3	3	4	1	1	3	2	2	3	9	9	16	8	8	15	8	8	9	8	8	8	8	8	8
Stems per ACRE			364	364	364	364	364	364	526	526	688	162	162	243	324	324	445	405	405	536	407	407	493	438	438	440	549	549	549	764	764	764

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