

**Coon Creek Riparian Buffer and Nutrient Offset Mitigation Project
2017 Monitoring Report
Monitoring Year 4 of 5**

**Granville County, North Carolina
Tar-Pamlico River Basin
USGS Hydrologic Unit 03020101**

**NCDMS Project No. 95807
NCDMS Contract No. 5153
DWR-13-0689**



Submitted to:

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

2017 Monitoring Report – Year 4 of 5

Project Construction Completed: 2014
Data Collection for Monitoring Year 4 of 5
Report Submitted: January 2018

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2017 Monitoring Report
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Tar-Pamlico River Basin**

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1.0 MITIGATION PROJECT SUMMARY

The Coon Creek Riparian Buffer and Nutrient Offset Mitigation Project (the Project) site is located in Granville County in the Tar-Pamlico River Basin (Figure 1: Vicinity Map). Much of the Tar-Pamlico River Basin has a history of nutrient stressor issues. Coon Creek is located within the NC Division of Mitigation Services' (NCDMS) Fishing Creek Local Watershed Plan to address agricultural stressors and identify potential restoration opportunities. As part of the larger Tar-Pamlico River Basin, Coon Creek is located in U.S. Geological Survey (USGS) hydrologic unit code (HUC) 03020101020010, which is identified in the 2010 Tar-Pamlico River Basin Restoration Priorities Report as a Targeted Local Watershed (TLW) to promote nutrient and sediment reduction in agricultural areas by restoring and preserving wetlands, streams, and riparian buffers. Projects that reduce sediment impacts and re-establish riparian buffers are a top priority for the Fishing Creek Watershed.

The Project established 30.19 acres of buffer easement along four unnamed tributaries (UT1 through UT4) to Coon Creek, including along Crews Farm Lake, an in-line impoundment (Figure 2: Project Component), and will result in a maximum of 359,996 ft² of riparian buffer mitigation and 631,826 ft² nutrient offset. Riparian mitigation activities begin at the top-of-bank and generally extend out to 100 ft, and nutrient offset mitigation activities begin at 100 ft and extend out to 200 ft.

Monitoring Year 4 (MY 4) has been completed for the Project, and 96 percent of the monitoring plots are meeting or exceeding success criteria (Appendix B: CVS Vegetation Monitoring Output Tables). Of the monitoring plots meeting or exceeding success criteria, only one fails to meet requirements by more than 10% of the minimum success threshold (Appendix B: CVS Vegetation Monitoring Output Tables). Minimal remedial action is currently required. Overall, the Project is in very good condition.

Table 1 below shows the timeline of completed and future project activities.

Table 1: Project Activity and Reporting History

Activity or Deliverable	Data Collection Complete	Completion or Delivery
Institution Date	Mar-13	N/A
Categorical Exclusion	Jul-13	Jul-13
Mitigation Plan	Sep-13	Nov-13
Final Design – Planting Plans	Nov-13	Nov-13
Planting	Jan -14	Feb -14
As-built (Year 0 Monitoring - baseline)	Feb-14	May-14
Year 1 Monitoring	Sept-14	Nov-14
Year 2 Monitoring	Sept-15	Dec-15
Year 3 Monitoring	Oct-16	Dec-16
Year 4 Monitoring	Sept-17	Jan-18
Year 5 Monitoring	TBD	TBD

2.0 ANNUAL MONITORING

2.1 METHODS

Annual monitoring of the parameters listed below were conducted and reported using the Riparian Buffer and Nutrient Offset Buffer Annual Monitoring Report Template (ver. 1.0; NCDMS, 2014).

Table 2: Monitoring Efforts

Required	Parameter	Quantity	Frequency	Notes
X	Vegetation	23 Plots (2.5% of Planted Area)	Annual	Monitoring of vegetation using the CVS-NCDMS Level 1 and 2 protocols
X	Exotic and nuisance vegetation		Annual	Identify location of exotic and nuisance vegetation
X	Project Boundary		Semi-annual	Map locations of vegetation damage, boundary encroachments, etc.

To assess whether the vegetation performance standards are achieved, the Carolina Vegetation Survey (CVS)-NCDMS Protocol for Recording Vegetation Version 4.2 (Lee *et al.*, 2008) is used to perform annual Level 2 monitoring of 23 plots distributed across the planted area (Figure 3: Year 4 Monitoring Results). These plots are placed throughout the re-established buffer to get a representative sample of planted vegetation. MY 4 monitoring was conducted in September 2017, and the final year of vegetation monitoring data will be collected between June 1 and September 31, 2018. Individual plot data are provided to NCDMS and CVS following CVS-NCDMS guidance.

Each corner of the vegetation plots is marked with steel electrical metallic tubing (EMT) driven into the ground and capped. Pink flagging was used to mark the counted stems, orange flagging was used to mark the southwest vegetation plot corner pins, and blue flagging was used to mark the other three corners.

General visual vegetation monitoring was also performed in MY 4. This inspection was used to assess potential problems such as poor stem density areas, areas of poor growth rate/poor vigor, bare areas, and problematic invasive species.

Vegetation plots were photographed from a consistent location at the southwest corner of each plot, facing diagonal to the northeast corner (Appendix A).

Stem counts from the vegetation plots were compiled in an Access database (Appendix B). The measure of vegetative success for the site will be the survival of at least 320 planted hardwood stems per acre at the end of the fifth monitoring year.

2.2 RESULTS AND DISCUSSION

Monitoring activities were conducted successfully, and overall the site is in very good condition. In February and March 2016, the O'Brien & Gere/EEE team performed supplemental planting in several areas within the easement here reduced stem counts were observed in MY2. These areas were supplemented with 716 bare root seedlings and 265 36-inch plants, consisting of either a wetland or upland mix of plants, as appropriate. Species planted were consistent with the original planting plan as described in the Mitigation Plan.

The upland mix consisted of:

- 30% *Diospyros virginiana*
- 20% *Nyssa sylvatica*
- 30% *Quercus phellos*
- 20% *Quercus nigra*

The wetland mix consisted of:

- 30% *Quercus michauxii*
- 25% *Quercus nigra*
- 30% *Platanus occidentalis*
- 5% *Acer rubrum*
- 10% *Betula nigra*

Data collected in MY3 indicated that the supplemental planting succeeded in raising the stem count in the targeted areas for that monitoring year. Based on observations made during MY4, the planted stems continue to thrive.

Vegetation plot data were collected on September 13 and 14, 2017. Of the 23 plots sampled, 22 plots met or exceeded the success criteria. Of these, one plot exceeded the success criteria by less than 10% (Figure 3: Year 4 Monitoring Results and Appendix B: CVS Vegetation Monitoring Output Tables). Vegetation plot 17 did not meet success criteria for planted stems, but by only one stem. However, volunteer hardwood stems in vegetation plot 17 elevate stem abundance above the 320 stems per acre minimum threshold (Appendix B: CVS Vegetation Monitoring Output Tables). This is consistent with MY3 results.

Chinese privet (*Ligustrum sinense*), Lespedeza (*Lespedeza cuneata*), hairy jointgrass (*Arthraxon hispidus*), and multiflora rose (*Rosa multiflora*) were seen sporadically throughout the site; however, these occurrences were isolated, and do not appear to be compromising planted stem success. Plot 10 and the area around it has moderately thick growth of Japanese honeysuckle (*Lonicera japonica*), but it does not appear to be a problem at this time. However, this area will be monitored over the coming year and will be addressed if the density becomes detrimental to the re-establishment of woody stems. We will re-evaluate mid-season during MY5, and should the honeysuckle density become such that woody stem growth and vigor is negatively impacted, OBG/EEE will develop a treatment plan to eradicate the infestation before year end monitoring.

Grading into the easement was observed between Vegetation Monitoring Plot 9 and 12. This does not appear to have impacted planted stems or contributed sediment to the project stream. The grading appears to have been done by the landowner to address a drainage problem on the farm road at the edge of the easement. OBG/EEE will work with the landowner to adequately reach a solution, and the area within the easement returned to original grade and re-seeded with an appropriate native species seed mix.

2.3 MAINTENANCE AND MANAGEMENT

The site is monitored annually, and physical inspection of the site is conducted twice per year throughout the post-construction monitoring period, or until performance standards are met. During MY 4, vegetation monitoring was conducted on September 13 and 14, 2017, and a physical inspection was conducted on March 16, 2017. Maintenance planned for the coming year includes the following:

Table 3: Maintenance Activities

Component/Feature	Maintenance Activities
Vegetation	Invasive plant species will be monitored during annual monitoring efforts. We will re-evaluate mid-season during MY5, and should the honeysuckle density become such that woody stem growth and vigor is negatively impacted, OBG/EEE will develop a treatment plan to eradicate the infestation before year end monitoring.
Site Boundary	Disturbed, damaged, or destroyed boundary markers will be repaired and/or replaced on an as needed basis. Gullies will be monitored and remediated as appropriate. The graded area into the easement near Plots 9 and 12 will be repaired and monitored.
Ford Crossing	The ford crossings within the site will be maintained by the landowner and only as allowed by the Conservation Easement.
Irrigation Access	The mobile irrigation equipment access point to Crews Farm Lake will be maintained by the landowner and only as allowed by the Conservation Easement.

3.0 REGULATORY CONSIDERATIONS

3.1 PROJECT COMPONENTS AND MITIGATION CREDITS

Table 4: Project Components and Mitigation Credits

Component Summation		
Restoration Level	Buffer (square ft)	Nutrient Offset (square ft)
0 to 50 feet from TOB	187,216	N/A
50 to 100 feet from TOB	172,780	N/A
100 to 200 feet from TOB	N/A	631,826
Total Restoration	359,996	631,826

Credit determination for this riparian restoration site follows North Carolina Tar-Pamlico Basin rule 15A NCAC 02B.0260, effective August 1, 2000 and the Nutrient Offset Payments Rule 15A NCAC 02B.0240, amended effective September 1, 2010.

Methodology used for determining nutrient offset credits from riparian restoration is the *NC Division of Water Resources—Methodology and Calculations for Determining the Nutrient Reductions Associated With Riparian Buffer Establishment*.

Mitigation Credits			
Type	Riparian Buffer Restoration	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Totals	359,996 ft ² (8.3 acres)	631,826 ft ² (32,970.70 lbs)	631,826 ft ² (2,123.49 lbs)

Project Components					
Project Component or Reach ID	Stationing/ Location	Approach (PI, PII, etc.)	Restoration or Restoration Equivalent	Restoration Acreage	Mitigation Ratio
UT1 and UT2	North of Winding Oak Rd	Planting	Buffer Restoration	5.2	1:1
		Planting	Nutrient Offset Restoration	7.3	1:1
UT1 and UT3	South of Winding Oak Rd	Planting	Buffer Restoration	0.8	1:1
		Planting	Nutrient Offset Restoration	1.0	1:1
UT4 and Crews Farm Lake	South of Winding Oak Rd	Planting	Buffer Restoration	2.2	1:1
		Planting	Nutrient Offset Restoration	6.2	1:1

3.2 SUMMARY

Mitigation activities to date have been successful. This Project is currently on track to provide the credits described in the table above.

4.0 REFERENCES

Lee, Michael T., R. K. Peet, S. D. Roberts, and T. R. Wentworth. 2008. CVS-NCDMS Protocol for Recording Vegetation, Version 4.2 Available URL: <http://cvs.bio.unc.edu/methods.htm>. [Date Accessed: 14 October 2013].

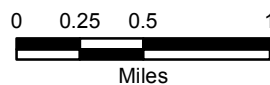


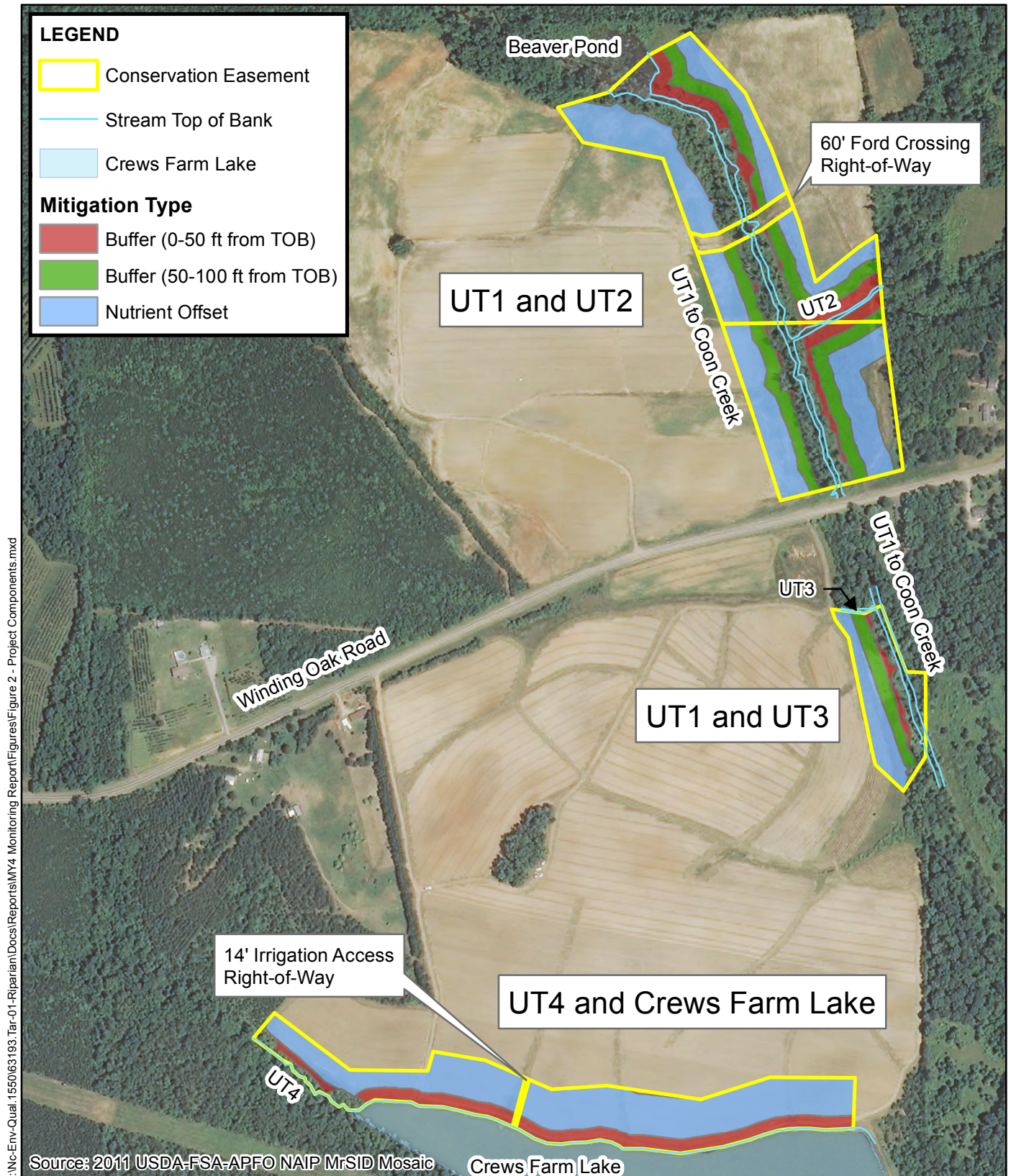
LEGEND

 Project Area

NCDMS FULL DELIVERY PROJECT #95807
COON CREEK RIPARIAN BUFFER AND
NUTRIENT OFFSET MITIGATION PROJECT
GRANVILLE COUNTY, NC

VICINITY MAP





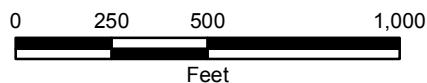
I:\Nc-Env-Qual\1550\63193_Tar-01-Riparian\Docs\Reports\MY4_Monitoring Report\Figures\Figure 2 - Project Components.mxd

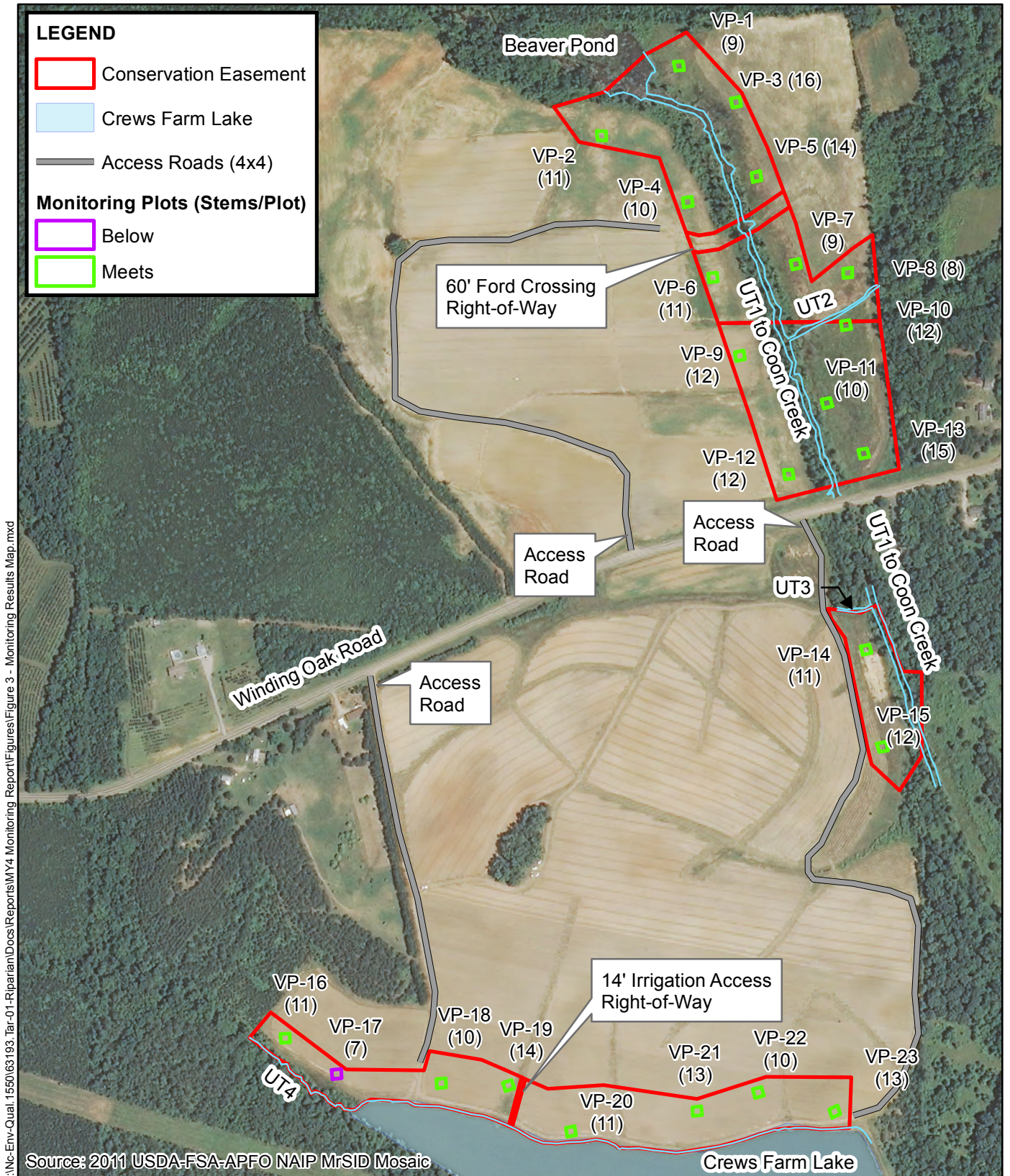
NCDMS FULL DELIVERY PROJECT #95807
 COON CREEK RIPARIAN BUFFER AND
 NUTRIENT OFFSET MITIGATION PROJECT
 GRANVILLE COUNTY, NC

PROJECT COMPONENTS



12/18/17
63193





I:\Nc-Env-Qual\1550163193_Tar-01-Riparian\Docs\Reports\MY4 Monitoring Report\Figures\Figure 3 - Monitoring Results Map.mxd

NCDMS FULL DELIVERY PROJECT #95807
 COON CREEK RIPARIAN BUFFER AND
 NUTRIENT OFFSET MITIGATION PROJECT
 GRANVILLE COUNTY, NC

VP-1 (11) Vegetation Plot (MY3 Stem Count)

YEAR 4 MONITORING RESULTS




12/18/17
63193




YEAR 4 MONITORING PHOTOGRAPHS

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 1	Date 9/14/17		
DESCRIPTION Vegetation Monitoring Plot and Photo Point 1, view northeast from southwest corner.			


Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 2	Date 9/13/17		
Description Vegetation Monitoring Plot and Photo Point 2, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 3	Date 9/14/17		
Description Vegetation Monitoring Plot and Photo Point 3, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 4	Date 9/13/17		
Description Vegetation Monitoring Plot and Photo Point 4, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 5	Date 9/14/17		
Description Vegetation Monitoring Plot and Photo Point 5, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 6	Date 09/13/17		
Description Vegetation Monitoring Plot and Photo Point 6, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 7	Date 9/14/17	 <p>vp 07 from sw corner</p>	
Description Vegetation Monitoring Plot and Photo Point 7, view northeast from southwest corner.			


Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 8	Date 9/14/17	 <p>vp 08 from sw corner</p>	
Description Vegetation Monitoring Plot and Photo Point 8, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 9	Date 9/13/17	 <p>vp 09 sw corner</p>	
Description Vegetation Monitoring Plot and Photo Point 9, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 10	Date 9/14/17	 <p>vp 10 10m sw corner</p>	
Description Vegetation Monitoring Plot and Photo Point 10, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 11	Date 9/14/17		
Description Vegetation Monitoring Plot and Photo Point 11, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 12	Date 9/13/17		
Description Vegetation Monitoring Plot and Photo Point 12, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 13	Date 9/14/17	<p>vp 13 from sw corner</p> 	
Description Vegetation Monitoring Plot and Photo Point 13, view northeast from southwest corner.			


Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 14	Date 9/13/17	<p>vp-14 sw corner</p> 	
Description Vegetation Monitoring Plot and Photo Point 14, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 15	Date 9/13/17		
Description Vegetation Monitoring Plot and Photo Point 15, view northeast from southwest corner.			


Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 16	Date 9/13/17		
Description Vegetation Monitoring Plot and Photo Point 16, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 17	Date 9/13/17	 <p>vp-17 sw corner</p>	
Description Vegetation Monitoring Plot and Photo Point 17, view northeast from southwest corner.			


Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 18	Date 9/13/17		
Description Vegetation Monitoring Plot and Photo Point 18, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 19	Date 9/13/17		
Description Vegetation Monitoring Plot and Photo Point 19, view northeast from southwest corner.			


Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 20	Date 9/14/17		
Description Vegetation Monitoring Plot and Photo Point 20, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 21	Date 9/14/17		
Description Vegetation Monitoring Plot and Photo Point 21, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 22	Date 9/14/17		
Description Vegetation Monitoring Plot and Photo Point 22, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 23	Date 9/14/17	 <p>vp 23 from sw corner</p>	
Description Vegetation Monitoring Plot and Photo Point 23, view northeast from southwest corner.			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 24	Date 9/13/17	 <p>grading into easement between vp 9 and 12</p>	
Description Grading into the easement between Vegetation Monitoring Plot 9 and 12 (Photo 1 of 2).			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 25	Date 9/13/17		
Description Grading into the easement between Vegetation Monitoring Plot 9 and 12 (Photo 2 of 2).			

Client Name NCDMS		Site Location Granville County	Project No. 95807
Photo No. 26	Date 9/13/17		
Description Vegetation Monitoring Plot 10 invaded by Japanese honeysuckle (<i>Lonicera japonica</i>).			

EPP Project Code 95807. Project Name: Coon Creek Riparian Buffer and Nutrient Offset Mitigation Project

		Current Plot Data (MY4 2017)																									
Scientific Name	Common Name	Species Type	95807-01-0001			95807-01-0002			95807-01-0003			95807-01-0004			95807-01-0005			95807-01-0006			95807-01-0007			95807-01-0008			
			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													1			
Asimina triloba	pawpaw	Tree	1	1	1																						
Betula nigra	river birch	Tree						1	1	1	1		1	3	3	3											
Carpinus caroliniana	American hornbeam	Tree	1	1	3									1	1	1						1	1	1			
Carya	hickory	Tree																									
Carya alba	mockernut hickory	Tree											1														
Carya glabra	pignut hickory	Tree																									
Celtis occidentalis	common hackberry	Tree									1																
Cercis canadensis	eastern redbud	Tree											1	1	1				1	1	1						
Cornus florida	flowering dogwood	Tree				2	2	2					3	3	3												
Diospyros virginiana	common persimmon	Tree			1	1	1	1					3	3	3				2	2	2						
Fraxinus pennsylvanica	green ash	Tree			21			34			21			20			98			3			14			53	
Gleditsia triacanthos	honeylocust	Tree																									
Juglans nigra	black walnut	Tree																									
Juniperus virginiana	eastern redcedar	Tree						2																			
Liquidambar styraciflua	sweetgum	Tree			25			43			13			4		6						50				19	
Liriodendron tulipifera	tuliptree	Tree							1	1	1			2										1	1	3	
Nyssa sylvatica	blackgum	Tree				4	4	4					2	2	2				3	3	3	2	2	2	3	3	3
Pinus taeda	loblolly pine	Tree																									
Platanus occidentalis	American sycamore	Tree	7	7	21											1	1	3							1	1	13
Prunus serotina	black cherry	Tree																									
Quercus falcata	southern red oak	Tree							2	2	2	1	1	1				3	3	3	2	2	2	1	1	1	
Quercus michauxii	swamp chestnut oak	Tree	1	1	1				2	2	2				6	6	6							1	1	1	
Quercus nigra	water oak	Tree	2	2	2	4	4	4	3	3	3				2	2	2	2	2	2	4	4	4	1	1	1	
Quercus phellos	willow oak	Tree							6	6	6															1	
Salix nigra	black willow	Tree																									
Ulmus alata	winged elm	Tree																									
Ulmus americana	American elm	Tree																									
Ulmus rubra	slippery elm	Tree			3												4						4			5	
		Stem count	12	12	78	11	11	91	15	15	51	10	10	38	13	13	123	11	11	14	9	9	78	8	8	100	
		size (ares)	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			
		Species count	5	5	9	4	4	8	6	6	10	5	5	10	5	5	8	5	5	6	4	4	8	6	6	10	
		Stems per ACRE	485.6	485.6	3157	445.2	445.2	3683	607	607	2064	404.7	404.7	1538	526.1	526.1	4978	445.2	445.2	566.6	364.2	364.2	3157	323.7	323.7	4047	

EEP Project Code 95807. Project Name: Coon Creek Riparian Buffer and Nutrient Offset Mitigation Project

			Current Plot Data (MY4 2017)																								
Scientific Name	Common Name	Species Type	95807-01-0009			95807-01-0010			95807-01-0011			95807-01-0012			95807-01-0013			95807-01-0014			95807-01-0015			95807-01-0016			
			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									5				1	1	1			1							
Asimina triloba	pawpaw	Tree				3	3	4	1	1	1																
Betula nigra	river birch	Tree									1	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	
Carpinus caroliniana	American hornbeam	Tree				3	3	3														1	1	1			
Carya	hickory	Tree																									
Carya alba	mockernut hickory	Tree																									
Carya glabra	pignut hickory	Tree																									
Celtis occidentalis	common hackberry	Tree																									
Cercis canadensis	eastern redbud	Tree	1	1	1																				1	1	1
Cornus florida	flowering dogwood	Tree	2	2	2																				3	3	3
Diospyros virginiana	common persimmon	Tree	4	4	4				1	1	1										1	1	1	2	2	2	
Fraxinus pennsylvanica	green ash	Tree									13						7		5							7	
Gleditsia triacanthos	honeylocust	Tree																									
Juglans nigra	black walnut	Tree																									
Juniperus virginiana	eastern redcedar	Tree			2																						
Liquidambar styraciflua	sweetgum	Tree			5			33			1						3		18			2				18	
Liriodendron tulipifera	tuliptree	Tree				2	2	2	2	2	2				1	1	1				1	1	1	1	1	1	1
Nyssa sylvatica	blackgum	Tree	2	2	2																						
Pinus taeda	loblolly pine	Tree																									47
Platanus occidentalis	American sycamore	Tree				1	1	3	4	4	6	3	3	3	2	2	2	2	2	23			1				
Prunus serotina	black cherry	Tree																									
Quercus falcata	southern red oak	Tree	1	1	1																				2	2	2
Quercus michauxii	swamp chestnut oak	Tree				2	2	2				4	4	4	4	4	4	7	7	7	4	4	4				
Quercus nigra	water oak	Tree	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2								2	2	2
Quercus phellos	willow oak	Tree																			3	3	3				
Salix nigra	black willow	Tree																					53				
Ulmus alata	winged elm	Tree																									
Ulmus americana	American elm	Tree																									
Ulmus rubra	slippery elm	Tree									9																
Stem count			12	12	19	12	12	48	9	9	40	11	11	11	12	12	33	11	11	109	12	12	15	11	11	83	
size (ares)			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			
Species count			6	6	8	6	6	7	5	5	10	4	4	4	6	6	10	3	3	7	6	6	8	6	6	9	
Stems per ACRE			485.6	485.6	768.9	485.6	485.6	1942	364.2	364.2	1619	445.2	445.2	445.2	485.6	485.6	1335	445.2	445.2	4411	485.6	485.6	607	445.2	445.2	3359	

EEP Project Code 95807. Project Name: Coon Creek Riparian Buffer and Nutrient Offset Mitigation Project

			Current Plot Data (MY4 2017)																				
Scientific Name	Common Name	Species Type	95807-01-0017			95807-01-0018			95807-01-0019			95807-01-0020			95807-01-0021			95807-01-0022			95807-01-0023		
			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																					
Asimina triloba	pawpaw	Tree																					
Betula nigra	river birch	Tree																					
Carpinus caroliniana	American hornbeam	Tree																					
Carya	hickory	Tree																					
Carya alba	mockernut hickory	Tree																					
Carya glabra	pignut hickory	Tree																					
Celtis occidentalis	common hackberry	Tree																					
Cercis canadensis	eastern redbud	Tree										1	1	1									
Cornus florida	flowering dogwood	Tree																					
Diospyros virginiana	common persimmon	Tree				1	1	1	7	7	7				3	3	3	2	2	2	1	1	1
Fraxinus pennsylvanica	green ash	Tree			24			8			8												
Gleditsia triacanthos	honeylocust	Tree																					
Juglans nigra	black walnut	Tree																		1	1	1	
Juniperus virginiana	eastern redcedar	Tree			1											1						1	
Liquidambar styraciflua	sweetgum	Tree			32			2			2									2			
Liriodendron tulipifera	tuliptree	Tree	2	2	2	1	1	2	1	1	2	2	2	2	1	1	1	1	1	1	3	3	4
Nyssa sylvatica	blackgum	Tree				2	2	2	4	4	4	3	3	3	2	2	2	2	2	2	3	3	3
Pinus taeda	loblolly pine	Tree			35			10			3		8			4			6			4	
Platanus occidentalis	American sycamore	Tree			2			1			1												
Prunus serotina	black cherry	Tree																					
Quercus falcata	southern red oak	Tree	2	2	2							4	4	4	1	1	1	1	1	1	1	1	1
Quercus michauxii	swamp chestnut oak	Tree																					
Quercus nigra	water oak	Tree	3	3	3	5	5	5	2	2	2	1	1	1	6	6	6	3	3	3	4	4	4
Quercus phellos	willow oak	Tree																					
Salix nigra	black willow	Tree																					
Ulmus alata	winged elm	Tree																					
Ulmus americana	American elm	Tree																					
Ulmus rubra	slippery elm	Tree																					
	Stem count		7	7	101	9	9	31	14	14	29	11	11	19	13	13	18	9	9	17	13	13	19
	size (ares)		1			1			1			1			1			1			1		
	size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02			0.02		
	Species count		3	3	8	4	4	8	4	4	8	5	5	6	5	5	7	5	5	7	6	6	8
	Stems per ACRE		283.3	283.3	4087	364.2	364.2	1255	566.6	566.6	1174	445.2	445.2	768.9	526.1	526.1	728.4	364.2	364.2	688	526.1	526.1	768.9

EEP Project Code 95807. Project Name: Coon Creek Riparian Buffer and Nutrient Offs

Scientific Name	Common Name	Species Type	Annual Means														
			MY4 (2017)			MY3 (2016)			MY2 (2015)			MY1 (2014)			MY0 (2014)		
			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	1	9	1	1	32			4			2			
Asimina triloba	pawpaw	Tree	5	5	6	5	5	5	5	5	5	6	6	6	24	24	24
Betula nigra	river birch	Tree	13	13	16	13	13	14									
Carpinus caroliniana	American hornbeam	Tree	7	7	9	8	8	10	8	8	9	9	9	9	10	10	10
Carya	hickory	Tree						2									
Carya alba	mockernut hickory	Tree			1									2			
Carya glabra	pignut hickory	Tree									4						
Celtis occidentalis	common hackberry	Tree			1												
Cercis canadensis	eastern redbud	Tree	5	5	5	5	5	5	5	5	5	8	8	8	13	13	13
Cornus florida	flowering dogwood	Tree	10	10	10	11	11	11	15	15	15	17	17	17	25	25	25
Diospyros virginiana	common persimmon	Tree	28	28	29	29	29	30	27	27	29	31	31	31	40	40	40
Fraxinus pennsylvanica	green ash	Tree			336			298			240			72			
Gleditsia triacanthos	honeylocust	Tree						1									
Juglans nigra	black walnut	Tree	1	1	1	1	1	1				1	1	1	4	4	4
Juniperus virginiana	eastern redcedar	Tree			7			5									
Liquidambar styraciflua	sweetgum	Tree			278			258			203			40			
Liriodendron tulipifera	tuliptree	Tree	20	20	27	21	21	30	23	23	30	30	30	33	49	49	49
Nyssa sylvatica	blackgum	Tree	32	32	32	33	33	33	35	35	35	35	35	35	27	27	27
Pinus taeda	loblolly pine	Tree			117			144			30						
Platanus occidentalis	American sycamore	Tree	21	21	79	21	21	85	15	15	69	12	12	52	16	16	16
Prunus serotina	black cherry	Tree									1						
Quercus falcata	southern red oak	Tree	21	21	21	21	21	21	20	20	20	25	25	25	23	23	23
Quercus michauxii	swamp chestnut oak	Tree	31	31	31	32	32	32	20	20	20	20	20	20	24	24	24
Quercus nigra	water oak	Tree	51	51	51	50	50	50	48	48	48	53	53	53	63	63	63
Quercus phellos	willow oak	Tree	9	9	10	10	10	17			4						
Salix nigra	black willow	Tree			53			119			66			36			
Ulmus alata	winged elm	Tree			3			15			16			19			
Ulmus americana	American elm	Tree									25						
Ulmus rubra	slippery elm	Tree			33			48									
	Stem count		255	255	1165	261	261	1266	221	221	878	247	247	461	318	318	318
	size (ares)		23			23			23			23			23		
	size (ACRES)		0.57			0.57			0.57			0.57			0.57		
	Species count		15	15	24	15	15	24	11	11	21	12	12	18	12	12	12
	Stems per ACRE		448.7	448.7	2050	459.2	459.2	2228	388.9	388.9	1545	434.6	434.6	811.1	559.5	559.5	559.5

Coon Creek Riparian Buffer and Nutrient Offset Mitigation Project (#95807)

Year 4 (13-Sep-2017 to 14-Sep-2017)

Vegetation Plot Summary Information

Plot #	Riparian Buffer Stems ¹	Stream/ Wetland Stems ²	Live Stakes	Invasives	Volunteers ³	Total ⁴	Unknown Growth Form
1	12	n/a	0	0	66	78	0
2	11	n/a	0	0	80	91	0
3	15	n/a	0	0	36	51	0
4	10	n/a	0	0	28	38	0
5	13	n/a	0	0	110	123	0
6	11	n/a	0	0	3	14	0
7	9	n/a	0	0	69	78	0
8	8	n/a	0	0	92	100	0
9	12	n/a	0	0	7	19	0
10	12	n/a	0	0	36	48	0
11	9	n/a	0	0	31	40	0
12	11	n/a	0	0	0	11	0
13	12	n/a	0	0	21	33	0
14	11	n/a	0	0	98	109	0
15	12	n/a	0	0	3	15	0
16	11	n/a	0	0	72	83	0
17	7	n/a	0	0	94	101	0
18	9	n/a	0	0	22	31	0
19	14	n/a	0	0	15	29	0
20	11	n/a	0	0	8	19	0
21	13	n/a	0	0	5	18	0
22	9	n/a	0	0	8	17	0
23	13	n/a	0	0	6	19	0

Wetland/Stream Vegetation Totals

(per acre)

Plot #	Stream/ Wetland		Total ⁴	Success Criteria
	Stems ²	Volunteers ³		Met?
1	n/a	2671	3157	
2	n/a	3237	3683	
3	n/a	1457	2064	
4	n/a	1133	1538	
5	n/a	4452	4978	
6	n/a	121	567	
7	n/a	2792	3157	
8	n/a	3723	4047	
9	n/a	283	769	
10	n/a	1457	1942	
11	n/a	1255	1619	
12	n/a	0	445	
13	n/a	850	1335	
14	n/a	3966	4411	
15	n/a	121	607	
16	n/a	2914	3359	
17	n/a	3804	4087	
18	n/a	890	1255	
19	n/a	607	1174	
20	n/a	324	769	
21	n/a	202	728	
22	n/a	324	688	
23	n/a	243	769	
Project Avg	n/a	1601	2050	

Riparian Buffer Vegetation Totals

(per acre)

Plot #	Riparian Buffer	Success Criteria
	Stems ¹	Met?
1	486	Yes
2	445	Yes
3	607	Yes
4	405	Yes
5	526	Yes
6	445	Yes
7	364	Yes
8	324	Yes
9	486	Yes
10	486	Yes
11	364	Yes
12	445	Yes
13	486	Yes
14	445	Yes
15	486	Yes
16	445	Yes
17	283	No
18	364	Yes
19	567	Yes
20	445	Yes
21	526	Yes
22	364	Yes
23	526	Yes
Project Avg	449	Yes

Stem Class characteristics

¹Buffer Stems Native planted hardwood trees. Does NOT include shrubs. No pines. No vines.

²Stream/Wetland Stems Native planted woody stems. Includes shrubs, does NOT include live stakes. No vines

³Volunteers Native woody stems. Not planted. No vines.

⁴Total Planted + volunteer native woody stems. Includes live stakes. Excl. exotics. Excl. vines.

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%