

**As-built Baseline Monitoring Report  
Hofler Property**

DMS Project ID #: 95355  
DMS Contract #: 004628  
USACE AID# SAW-2012-01393  
Gates County, North Carolina  
Submitted July 21, 2015



NC Department of Environment and Natural Resources  
Division of Mitigation Services  
1652 Mail Service Center  
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**Submitted by:**  
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# Table of Contents

1.0: Project Summary.....	1
1.1: Project Goals.....	1
1.2: Project Success Criteria .....	1
1.3: Pre-existing Site Conditions .....	1
1.4: Mitigation Components .....	2
1.5: Design Approach .....	2
1.6: Construction and Planting Timeline .....	2
1.7: Post-Construction Mitigating Factors .....	2
1.8: Figure 1 – As-built Vicinity Map .....	2
Appendix A: Background Tables.....	3
Appendix B: CCPV and As-built Photos.....	7
Appendix C: Vegetation Plot As-built Data .....	13

## **1.0: PROJECT SUMMARY**

### **1.1: Project Goals**

The project goals of the Hofler property per the approved mitigation plan are as follows:

- Reduce sediment and nutrient loading from agricultural runoff
- Improve downstream anadromous fish habitat and onsite wildlife habitat
- Restore groundwater and surface water hydrology in heavily ditched areas
- Restore natural drainage patterns where appropriate

### **1.2: Project Success Criteria**

Wetland hydrology data must consistently document the appropriate hydroperiod has been restored for all areas proposed for wetland mitigation. The targeted hydroperiod for the Hofler Property is 6% or greater. Planted vegetation will be considered successful if at least 320 three year-old planted stems/acre are present after year three. At year five, density must be no less than 260 five year-old planted stems/acre. At year 7, density must be no less than 210 seven year-old planted stems/acre. Additionally, planted vegetation must average 10 feet in height in each plot at year 7. Per the recommendations of the NCIRT, the following understory species were incorporated in the planting schedule on the condition they be exempted from the minimum 10-foot height criterion and exempted from the calculation of average height as a measure of that success criterion: Button bush (*C. occidentalis*), Sweet bay (*M. virginiana*), Wax myrtle (*M. cerifera*), and Laurel oak (*Q. laurifolia*). These species will be included in the calculations for the survival criterion. All vegetative monitoring will follow CVS-EEP Protocol for Recording Vegetation-Version 4.0.

Additionally, the project will strive to establish a variety of hydrologic regimes ranging from shallow inundated areas to intermittently saturated conditions, restoring diffuse flow patterns through what will ultimately be a forested wetland. The successful establishment of these conditions, mimicking nearby reference wetlands will help determine the overall success of the project.

### **1.3: Pre-existing Site Conditions**

The Hofler property consists of +/- 345 acres, of which 27 acres of which had been designated for this project. The site consisted of a rectangular tract of land primarily being used for cotton and small grain production. The prior converted wetlands on the site had been extensively ditched and drained, lowering the local water table and diminishing aquatic habitat and water quality. The site drained from south to north to an unnamed tributary of Lassiter Swamp and Bennets Creek upstream of Merchants Mill Pond. The project site along with the surrounding areas has undergone expansive hydrologic alterations and excessive sediment and nutrient inputs from agricultural production resulting in overall water quality degradation. Figure 1 and Table 4 contain additional information project regarding location and attributes.

## **1.4: Mitigation Components**

The proposed mitigation components are 23 acres of non-riparian wetland restoration with a credit ratio of 1:1 (Restoration:WMU), please refer to Table 1 for more information.

## **1.5: Design Approach**

A natural design approach focused on mimicking nearby wetlands, including non-riparian hardwood flats and swamp forests both in hydrologic regime and vegetative diversity. Grading was specifically formulated to provide storage for overland flow while creating densely vegetated plots interspersed with shallow diffuse flows. All of these features contribute to nutrient and sediment attenuation, improving downstream habitat and promoting diversity of ecological communities. The reference area for this project is a nearby pine/hardwood flat with the same soils and topography and similar hydrologic function.

## **1.6: Construction and Planting Timeline**

Construction commenced on August 12<sup>th</sup>, 2014 with the installation of recommended erosion control practices and was completed on Oct. 14<sup>th</sup>, 2014. Planting was officially concluded on May 6<sup>th</sup>, 2015 (Table 2).

The construction sequence was as follows:

1. Removal and stockpiling of topsoil.
2. Subsoil graded to proposed elevations and interior ditches filled.
3. Stockpiled topsoil regraded to complete wetland grading.
4. Ditch plugs constructed to finish on site earthwork.
5. As-built survey completed.
6. Wetlands ripped and seeded after As-built along with the plugs and buffer areas
7. Easement boundary signage and monitoring wells installed along with vegetative monitoring plots.
8. Trees were planted in late April and early May of 2015.

## **1.7: Post-Construction Mitigating Factors**

The only major setback occurred from September 4- 9<sup>th</sup> when 3.5” of rain fell on site causing a paused in construction. These rains completely flooded the project, which was 85% completed at the time. Restoration activities finally resumed on Sept. 22 and were completed a few weeks later.

## **1.8: Figure 1 – As-built Vicinity Map**

See Appendix B. Vicinity Map is part of the CCPV

## **Appendix A: Background Tables**

Table 1. Project Components and Mitigation Credits								
Hofler Project #95355, Contract #004628								
Mitigation Credit Summations								
	Stream	Riparian Wetland	Non-riparian Wetland	Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset		
Overall Credit			23					
Project Components								
Project Component - or- Reach	Stationing	Existing Footage or Acreage	Restoration Footage or Acreage	Restoration Level	Restoration or Rest. Equiv.	Mitigation Ratio	Mitigation Credits	Notes
Wetland 1		23	23		Restoration	1:1	23	
Length and Area Summations								
Restoration Level	Stream (Linear Feet)	Riparian Wetland (acres)		Non-riparian Wetland (acres)	Buffer (square feet)	Upland (acres)		
		Riverine	Non-Riverine					
Restoration			23					
Enhancement								
Enhancement I								
Enhancement II								
Creation								
Preservation								
High Quality Preservation								

<b>Table 2. Project Activity and Reporting History Hofler Property Wetland Mitigation Project #95355</b>		
<b>Activity, Deliverable or Milestone</b>	<b>Data Collection Complete</b>	<b>Actual Completion or Delivery</b>
Project Institution	N/A	May-12
Mitigation Plan	May 2014	July 2014
Permits Issued	May 2014	July 2014
Final Design Construction Plans	May 2014	July 2014
Construction	N/A	October 2014
Temporary S & E mix applied to entire project area	N/A	N/A
Permanent seed mix applied to entire project area	N/A	October 2014
Containerized and BR Planting over entire project area	N/A	May 2015
Baseline Monitoring Document (Year 0 Monitoring-baseline)	May 2015	Sept. 2015
Year 1 monitoring		
Year 2 monitoring		
Year 3 monitoring		
Year 4 monitoring		
Year 5 monitoring		

<b>Table 3. Project Contacts Hofler Property Wetland Mitigation Project #95355</b>	
<b>Designer</b> Primary Project design POC	Ecotone, Inc. Scott McGill (410) 420-2600 2120 High Point Rd, Forest Hill, MD 21050
<b>Construction Contractor</b> Construction contractor POC	Jennings Land Development Rodney Jennings (252) 202-6954 156 Trotman Rd. Camden, NC 2791
<b>Planting Contractor</b> Planting contractor POC	Carolina Silvics, Inc. Mary-Margaret McKinney (252-482-8491) 908 Indian Trail Road Edenton, NC 27932
<b>Seeding Contractor</b> Seed planting contractor POC	Woods, Water and Wildlife, Inc. Ed Temple (252) 333-0249 P. O. Box 176, Fairfield, NC 27826
<b>Seed mix sources</b>	Earnst Conservation Seeds, LLP, Meadville, PA
<b>Nursery stock suppliers</b>	Carolina Silvics (from various sources)
<b>Monitoring Performers</b> Wetland and Vegetation POC	Woods, Water and Wildlife, Inc. Ashby Brown (757) 651-3162 P. O. Box 176, Fairfield, NC 27826

<b>Table 4. Project Information and Attributes</b>			
Project name		HOFLER PROPERTY	
County		GATES	
Project Area (ac)		27.0 AC	
Project Coordinates (Lat and Long)		+36° 25' 48.44", -76° 39' 10.91"	
<b>4.1 Project Watershed Summary Information</b>			
Physiographic province		INNER COASTAL PLAIN	
River basin		CHOWAN RIVER BASIN	
USGS Hydrologic Unit 8-digit	03010203	USGS Hydrologic Unit 14-digit	03010203040040
DWQ Sub-basin		BENNETTS CREEK LOCAL WATERSHED	
Project Drainage Area (acres)		103.8	
Project Drainage Area Percentage of Impervious Area		5%	
CGIA Land Use Classification		2.01.01.07 Annual Row Crop Rotation	
<b>4.2 Wetland Summary Information</b>			
Parameters	Wetland 1	Wetland 2	Wetland 3
Size of Wetland (acres)	23.0		
Wetland Type (non-riparian, riparian riverine or riparian non-riverine)	Non-riparian		
Mapped Soil Series	BnA & PnA		
Drainage Class	Poorly drained & very poorly drained		
Soil Hydric Status	Hydric		
Source of Hydrology	Surface and Ground		
Hydrologic Impairment	44.8' to 155.2'		
Native Vegetation Community			
Percent Composition of Exotic Invasive Vegetation	N/A		
<b>4.3 Regulatory Considerations</b>			
Regulation	Applicable?	Resolved?	Supporting Documents
Waters of the United States – Section 404	Y	Y	
Waters of the United States – Section 401	Y	Y	
Endangered Species Act	N	Y	
Historic Preservation Act	N	Y	
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	N	Y	
FEMA Floodplain Compliance	N	Y	
Essential Fisheries Habitat	N	Y	

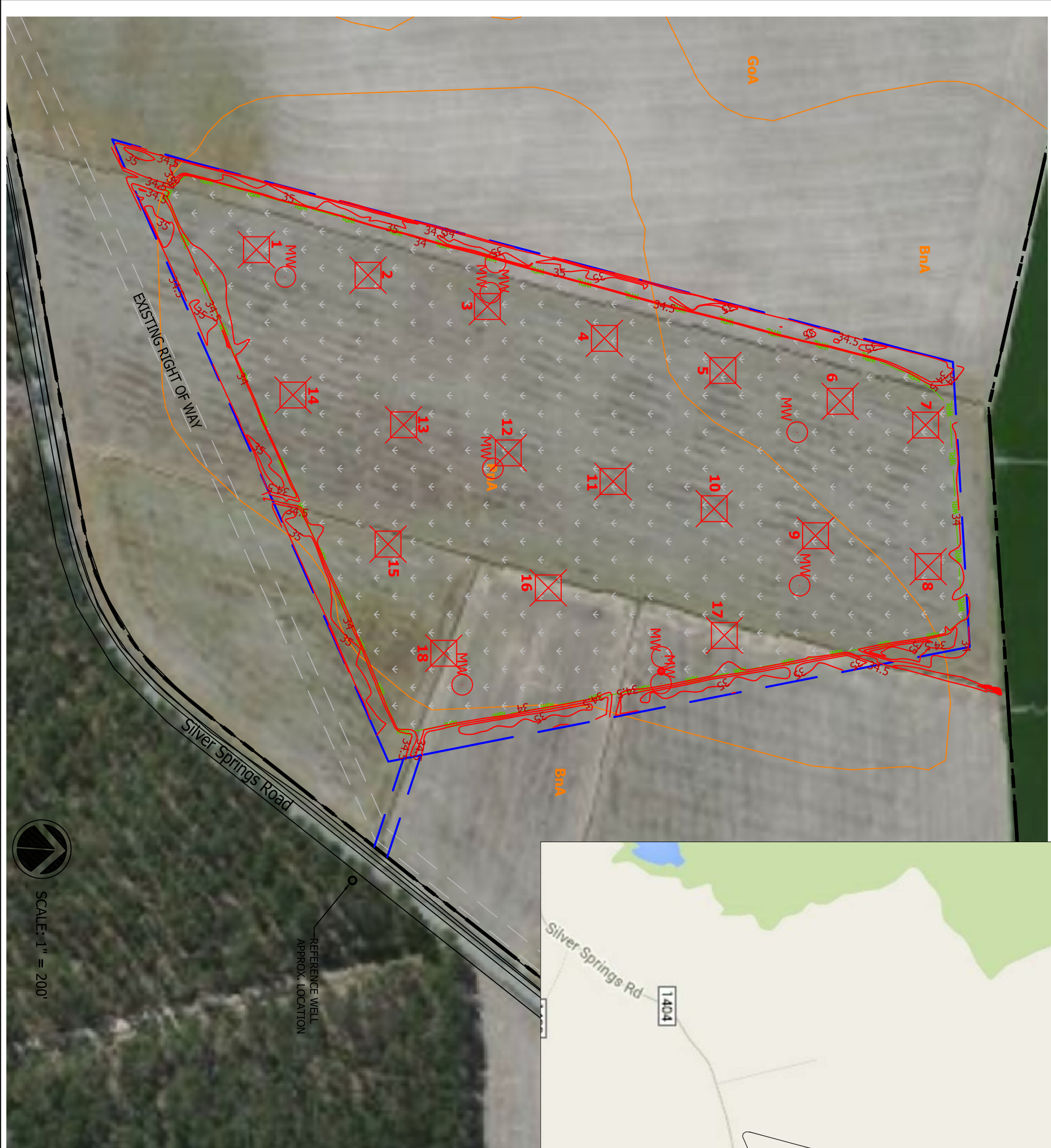


## **Appendix B:**

### **Current Condition Plan View**

#### **As-built Photos**

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for insertion of CCPV drawing.**



The site can be accessed by heading south on Route 32 from the town of Sunbury then taking a right onto Silver Springs Road. The project is located on the right side, approximately 2 miles west of the intersection with Route 32.

VICINITY MAP  
SCALE: 1" = 1500'

MAPPED SOILS	
BnA	Bladen loam, 0-3% slopes
PnA	Pantego fine sandy loam, 0-2% slopes

LEGEND

- PROPERTY BOUNDARY: - - - - -
- SOILS: BnA (orange line)
- EXISTING ROADS: ————
- PROJECT BOUNDARY: - - - - -
- EXISTING R.O.W.: - - - - -
- PROPOSED DITCH PLUG INLETS/OUTLETS: 34 ⊕
- NON-RIPARIAN PLANTING AREA: [Green box with arrows]
- AS-BUILT CONTOURS (1' AND 0.5'): 34 (red line)
- SURVEYED CONSERVATION EASEMENT: ————
- AS-BUILT MONITORING WELLS: MW (circle with cross)
- AS-BUILT VEGETATIVE MONITORING PLOTS (10m x 10m): [Red square with cross]

SCALE: 1" = 200'

	<h3>HOFLER PROPERTY</h3> <p>CCPV 23.0 NON-RIPARIAN WMU'S GATES CO., NC EEP PROJECT ID: 95355 EEP CONTRACT #: 004628</p>	<p><b>ALBEMARLE RESTORATIONS, LLC</b></p> <p>WETLAND RESTORATION, STREAM RESTORATION, &amp; WILDLIFE HABITAT CREATION</p> <p>P.O. BOX 176 • FAIRFIELD, NC 27826 (252) 333-0249 • FAX (252) 926-9983</p>												
	<table border="1"> <thead> <tr> <th>DATE</th> <th>DESCRIPTION</th> <th>REV. BY</th> </tr> </thead> <tbody> <tr> <td>FEB. 2014</td> <td>INTER COMMENTS</td> <td>WV</td> </tr> <tr> <td>APRIL 2014</td> <td>INTER COMMENTS</td> <td>CKA</td> </tr> <tr> <td>JAN 2015</td> <td>AMENDMENT</td> <td>CH</td> </tr> </tbody> </table>	DATE	DESCRIPTION	REV. BY	FEB. 2014	INTER COMMENTS	WV	APRIL 2014	INTER COMMENTS	CKA	JAN 2015	AMENDMENT	CH	<p>DESIGNED: JBM DRAWN: WV PROJECT NO: 1270 DATE: AUGUST 2013 SHEET: CCPV</p>
DATE	DESCRIPTION	REV. BY												
FEB. 2014	INTER COMMENTS	WV												
APRIL 2014	INTER COMMENTS	CKA												
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**Photo 1:** Photo of wetland area pre-construction



**Photo 2:** Disking site to remove vegetation prior to construction



**Photo 3:** Removal of subsoil during construction



**Photo 4:** Redistribution of topsoil and final grading



**Photos 5&6:** Completed ditch plugs after construction



**Photo 7:**

prior to tree planting to break up clay

Subsoiling site



**Photo 8:** Planted trees and wetland hydrology, July 2015.

## **Appendix C: Vegetation Plot As-built Data**



**Planted and Total Stem Counts (Stems and Species by Plot with Annual Means)**

Species	Common Name	Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	AB Mean
Quercus phellos	Willow Oak	Tree	3	3			1		4	5	4	2	2	1			1		4		1.67
Quercus bicolor	Swamp White Oak	Tree	2	3	1			4	2	1	1	4	2		3	4	1	2	1	2	1.83
Quercus nigra	Water Oak	Tree	2	1	4	2	1	1		2			3	4	3	3	4	2	2		1.89
Taxodium distichum	Bald Cypress	Tree	1		1		1	3	1	2	3	3		2	4	2	3	1	2	6	1.94
Quercus michauxii	Swamp Chestnut Oak	Tree	4	4	5	4	5	3	2	1	2	1	4	3	2	3	4	5	2	4	3.22
Cephalanthus occidentalis	Button Bush	Shrub				4		2						2				1			0.50
Magnolia virginiana	Sweet Bay	Tree			1	2	3	1				1							1		0.50
Myrica cerifera	Wax Myrtle	Shrub		1		3			2	2	3	2	1					1			0.83
Quercus laurifolia	Laurel Oak	Tree			1		1			1			1			1		1			0.33
Type = Shrub or Tree No live stakes on this project	Plot Area (acres)		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.025
	Species Count		5	5	6	5	6	6	5	7	5	6	6	5	4	5	5	7	6	3	5.39
	Stem Count		12	12	13	15	12	14	11	14	13	13	13	12	12	13	13	13	12	12	12.72
	Stems/Acre		480	480	520	600	480	560	440	560	520	520	520	480	480	520	520	520	480	480	509

<b>Hofler Planting Schedule - 23 Acres</b>					
<b>Quantity</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Containerized</b>	<b>Bare Root</b>	<b>Spacing</b>
1,100	Willow Oak	Quercus phellos	1 gallon		11X8
1,000	Willow Oak	Quercus phellos		2' - 4'	11X8
350	Swamp White Oak	Quercus bicolor	3 gallon		11X8
650	Swamp White Oak	Quercus bicolor	1 gallon		11X8
1,300	Swamp White Oak	Quercus bicolor		2' - 4'	11X8
670	Water Oak	Quercus nigra	3 gallon		11X8
330	Water Oak	Quercus nigra	1 gallon		11X8
700	Water Oak	Quercus nigra		2' - 4'	11X8
1,250	Bald Cypress	Taxodium distichum	1 gallon		11X8
800	Bald Cypress	Taxodium distichum		2' - 4'	11X8
1,250	Swamp Chestnut Oak	Quercus michauxii	1 gallon		11X8
1,300	Swamp Chestnut Oak	Quercus michauxii		2' - 4'	11X8
500	Button Bush	Cephalanthus occidentalis		as available	11X8
500	Sweet Bay	Magnolia virginiana		as available	11X8
500	Wax Myrtle	Myrica cerifera		as available	11X8
500	Laurel Oak	Quercus laurifolia	tublings		11X8
<b>12,700</b>	<b>Total Stems</b>				
<b>552</b>	<b>Stems per Acre</b>				
Row spacing 11 feet on center, tree spacing within rows 8 feet on center					