



SUPPLEMENTAL CLOSEOUT REPORT

FINAL

BYRDS CREEK MITIGATION SITE

Person County, NC

NCDEQ Contract 003987

DMS Project Number 95020

USACE Action ID Number 2012-00230

NCDWR Project Number 2012-0102

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PREPARED FOR:



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Section 1: Introduction

This information is provided to address concerns from the Interagency Review Team (IRT) during the Byrds Creek Mitigation Site closeout walk. In March 2019, Wildlands submitted a closeout report for Byrds Creek and completed the closeout site walk on March 28, 2019. While the site has met success criteria and was on track to closeout at the end of monitoring year 5, fifteen bankfull events occurred on Byrds Creek from October 2018 to March 2019 (including two caused by Hurricanes). These events knocked over floodplain vegetation and caused areas of isolated streambank erosion. To ensure the site is stable and will be able to handle such events, the IRT requested bank stabilization in the damaged areas, live stake planting where needed, and additional tree planting on the floodplain in areas of low stem density.

Section 2: Supplemental Vegetation Planting

Following comments by the IRT in March 2019, Wildlands Engineering contracted Native Roots, LLC to plant black willow (*Salix nigra*) live stakes along Byrds Creek in areas that contained few surviving live stakes. Live stakes were planted at 3 foot spacing along pools and 6 foot spacing along riffles of Byrds Creek (Figure 1).

Three hundred trees were planted throughout a total of 3.09 acres with low stem density (Figure 1). All planted trees were three-gallon container stock and approximately five feet tall. Species included sycamore (*Platanus occidentalis*), river birch (*Betula nigra*), green ash (*Fraxinus pennsylvanica*), willow oak (*Quercus phellos*), and tulip poplar (*Liriodendron tulipifera*).

In November 2019, eight 100 square meter vegetation plots and one 50 square meter plot was surveyed by Wildlands Engineering staff (Figure 1). Plots were randomly located within the areas of supplemental planting. All trees within the plots were identified and measured, including volunteer species. Stem density ranged from 526 trees per acre (Random Vegetation Plot 4) to 4,128 stems per acre (Random Vegetation Plot 1). All random vegetation plots exceeded the required 260 stems per acre at year 5. For more information on species and stem counts, refer to Table 1 and random vegetation plot photographs in Appendix 1.

Section 3: Supplemental Stream Stabilization

During August 2019 one bend on Byrds Creek Reach 1 and three isolated areas along West Branch were repaired using an excavator. The outside of a bend along Byrds Creek Reach 1 (enhancement II) had scoured the previous fall/winter during several large storm events, including two hurricanes. The bank along this bend was graded, matted, sod mats were installed, and live stakes were planted. On West Branch (enhancement II), three areas experienced bank scour on the outside of bends. These areas were lined with rock, filled with dirt, and planted with live stakes. These repairs were stable during January of 2020. Photographs of the repaired areas are in Appendix 1.

Section 4: Conclusion

In summary, three hundred containerized trees were planted throughout 3.09 acres with low stem density, and live stakes were replanted along the majority of Byrds Creek. Random vegetation plot data and visual observation indicate stem density is well above the 260 stems per acre minimum and herbaceous vegetation is abundant. Isolated streambank erosion has been stabilized through grading, sod mat installation, and live stake planting. All IRT concerns have been addressed and Wildlands believes the Byrds Creek Mitigation Site is stable and ready for closeout.



APPENDIX 1

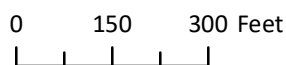
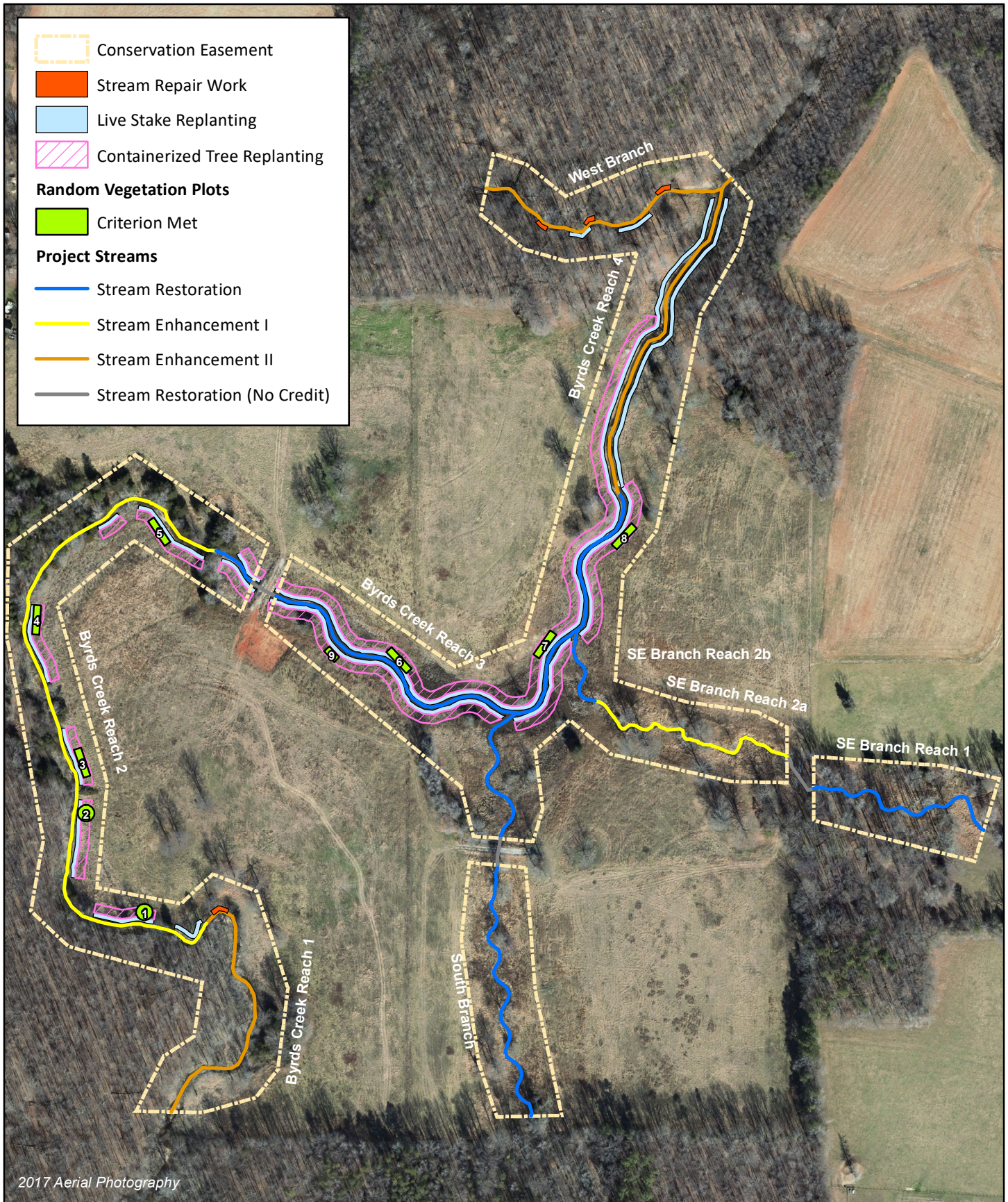


Figure 1. Supplemental Closeout Map
Byrds Creek Mitigation Site
DMS Project No. 95020

Person County, NC

Table 1. Project Components and Mitigation Credits

Byrds Creek Mitigation Site
DMS Project No. 95020

Mitigation Credits									
	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	5,371	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Project Components									
Reach ID	As-Built Stationing / Location (LF)	Existing Footage (LF) / Acreage (Ac)	Approach	Restoration or Restoration Equivalent	Restoration Footage (LF) / Acreage (Ac)	Mitigation Ratio	Credits (SMU / WMU)		
Streams									
BC1	10+00-16+43	643	N/A	Enhancement Level II	643	2.5:1	257		
BC2	16+43-32+89	1,630	N/A	Enhancement Level I	1,646	1.5:1	1,097		
BC3	32+89-34+05 34+64-47+55	1,368	Priority 1	Restoration	1,407	1:1	1,407		
BC4	47+55-55+51	796	N/A	Enhancement Level II	796	2.5:1	318		
SB1	60+00-66+48 67+08-70+69	976	Priority 1	Restoration	1,009	1:1	1,009		
SE1	80+00-84+85	916	Priority 1	Restoration	485	1:1	485		
SE2a	85+88-91+24	524	N/A	Enhancement Level I	536	1.5:1	357		
SE2b	91+24-93+19	50	Priority 1	Restoration	195	1:1	195		
WB1	100+00-106+11	611	N/A	Enhancement Level II	611	2.5:1	244		
Component Summation									
Restoration Level	Stream (linear feet)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)	Buffer (square feet)	Upland (acres)			
		Riverine	Non-Riverine						
Restoration	3,096	-	-	-	-	-			
Enhancement		-	-	-	-	-			
Enhancement I	2,182								
Enhancement II	2,050								
Creation		-	-	-					
Preservation		-	-	-					
High Quality Preservation		-	-	-					

Table 2. Random Vegetation Plots: Stem Density of Re-planted Areas

Byrds Creek Mitigation Site

DMS Project No. 95020

			Current Plot Data (2019)									
Scientific Name	Common Name	Species Type	Random VP 1		Random VP 2		Random VP 3		Random VP 4		Random VP 5	
			Te	Total	Te	Total	Te	Total	Te	Total	Te	Total
<i>Acer negundo</i>	Boxelder	Tree					2	2				
<i>Acer rubrum</i>	Red Maple	Tree	4	4	2	2					2	2
<i>Betula nigra</i>	River Birch	Tree	50	50			1	1	2	2	1	1
<i>Carpinus caroliniana</i>	American Hornbeam	Tree	1	1								
<i>Fagus grandifolia</i>	American Beech	Tree										
<i>Fraxinus pennsylvanica</i>	Green Ash	Tree			1	1	2	2	2	2	6	6
<i>Juglans nigra</i>	Black Walnut	Tree					2	2	2	2		
<i>Juniperus virginiana</i>	Eastern Red Cedar	Tree	4	4							4	4
<i>Liquidambar styraciflua</i>	Sweet Gum	Tree	15	15			1	1	1	1	57	57
<i>Liriodendron tulipifera</i>	Tulip Poplar	Tree	11	11	8	8	1	1	1	1		
<i>Pinus taeda</i>	Loblolly Pine	Tree	1	1								
<i>Platanus occidentalis</i>	Sycamore	Tree	1	1	1	1	3	3	5	5	1	1
<i>Prunus serotina</i>	Black Cherry	Tree	2	2								
<i>Quercus michauxii</i>	Swamp Chestnut Oak	Tree										
<i>Quercus rubra</i>	Northern Red Oak	Tree									1	1
<i>Quercus phellos</i>	Willow Oak	Tree	10	10	1	1	3	3			3	3
<i>Ulmus alata</i>	Winged Elm	Tree	1	1	7	7						
<i>Ulmus americana</i>	American Elm	Tree	3	3								
Stem count			103	102	20	20	15	15	13	13	75	75
size (ares)			1		1		1		1		1	
size (ACRES)			0.02		0.02		0.02		0.02		0.02	
Species count			12	11	6	6	8	8	6	6	8	8
Stems per ACRE			4,168	4,128	809	809	607	607	526	526	3,035	3,035

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%

Te - Number of stems including pines

Total - Number of stems excluding pines

Table 2. Random Vegetation Plots: Stem Density of Re-plant

Byrds Creek Mitigation Site

DMS Project No. 95020

Scientific Name	Common Name	Species Type	Current Plot Data (2019)								Annual Means	
			Random VP 6		Random VP 7		Random VP 8		Random VP 9		MY5 (2019)	
			Te	Total	Te	Total	Te	Total	Te	Total	Te	Total
<i>Acer negundo</i>	Boxelder	Tree									2	2
<i>Acer rubrum</i>	Red Maple	Tree	1	1			4	4	1	1	14	14
<i>Betula nigra</i>	River Birch	Tree	1	1			3	3			58	58
<i>Carpinus caroliniana</i>	American Hornbeam	Tree									1	1
<i>Fagus grandifolia</i>	American Beech	Tree					1	1			1	1
<i>Fraxinus pennsylvanica</i>	Green Ash	Tree	6	6	2	2			1	1	20	20
<i>Juglans nigra</i>	Black Walnut	Tree					1	1			5	5
<i>Juniperus virginiana</i>	Eastern Red Cedar	Tree	3	3			9	9	2	2	22	22
<i>Liquidambar styraciflua</i>	Sweet Gum	Tree	40	40	7	7	32	32	12	12	165	165
<i>Liriodendron tulipifera</i>	Tulip Poplar	Tree	1	1	1	1	4	4			27	27
<i>Pinus taeda</i>	Loblolly Pine	Tree	1	1			3	3			5	5
<i>Platanus occidentalis</i>	Sycamore	Tree	4	4	2	2	2	2	12	12	31	31
<i>Prunus serotina</i>	Black Cherry	Tree									2	2
<i>Quercus michauxii</i>	Swamp Chestnut Oak	Tree			2	2					2	2
<i>Quercus rubra</i>	Northern Red Oak	Tree	3	3							4	4
<i>Quercus phellos</i>	Willow Oak	Tree	4	4	2	2			2	2	25	25
<i>Ulmus alata</i>	Winged Elm	Tree									8	8
<i>Ulmus americana</i>	American Elm	Tree									3	3
Stem count			64	63	16	16	59	56	30	30	395	388
size (ares)			1		1		1		0.5		8.5	
size (ACRES)			0.02		0.02		0.02		0.01		0.21	
Species count			10	9	6	6	9	8	6	6	18	18
Stems per ACRE			2,590	2,550	647	647	2,388	2,266	2,428	2,428	1,881	1,847

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%

Te - Number of stems including pines

Total - Number of stems excluding pines

RANDOM VEGETATION PLOT PHOTOGRAPHS



RANDOM VEG PLOT 1 (11/14/2019)



RANDOM VEG PLOT 2 (11/14/2019)



RANDOM VEG PLOT 3 (11/14/2019)



RANDOM VEG PLOT 4 (11/14/2019)



RANDOM VEG PLOT 5 (11/14/2019)



RANDOM VEG PLOT 6 (11/14/2019)



RANDOM VEG PLOT 7 (11/14/2019)



RANDOM VEG PLOT 8 (11/14/2019)



RANDOM VEG PLOT 9 (11/14/2019)

STREAM REPAIR PHOTOGRAPHS



Byrds Creek Reach 1 (2/28/2019)



Byrds Creek Reach 1 (12/12/2019)



WEST BRANCH (11/20/2018)



WEST BRANCH (1/22/2020)



WEST BRANCH (11/20/2018)



WEST BRANCH (1/22/2020)





WEST BRANCH (11/20/2018)



WEST BRANCH (1/22/2020)

