

# **Annual Monitoring Report**

Monitoring Year 3 of 7

**FINAL**

Pee Dee Stream Restoration Project

NCDMS Contract No.: 004644

NCDMS Project No.: 95350

Montgomery County, NC

Data Collected: January – September 2017

Date Submitted: January 2018



Submitted to:

**North Carolina Division of Mitigation Services**

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January 26, 2018

Harry Tsomides  
NC DEQ Division of Mitigation Services  
5 Ravenscroft Drive, Suite 102  
Asheville, NC 28801

RE: Pee Dee Stream Restoration Site: MY3 Monitoring Report (NCDMS ID 95350)

Listed below are comments provided by DMS on January 9, 2018 regarding the Pee Dee Stream Restoration Site: Year 3 Monitoring Report and RES' responses.

### **Vegetation – general**

While mapped invasives have decreased somewhat since 2016 as the result of 2017 treatment (3.5 to 2.3 acres), invasive vegetation (mostly privet) is still significant. Please indicate in more detail, or describe a plan for how and when this will be addressed in the near and far term. [Invasive treatments will continue as needed throughout the monitoring period. Treatments will consist of cutting and spraying invasive plants during the growing season. This statement has been added to the report.](#)

There was some field discussion last year of a supplemental planting with 3-gallon container plants following invasive treatment, if the treatment results in damage or mortality to existing stems. This was to be determined by RES in conjunction with the invasives treatment. If any replanting has occurred or is expected, please describe. [Excessive planted stem mortality has yet to be observed from invasive treatment. All vegetation plots are well above the interim success criteria. RES will assess the situation again in MY4.](#)

### **Hydrology – general**

During the February 2017 field meeting, additional hydrology monitoring was discussed along reaches where poor hydrology was observed in stream sections near the former ponds where silting had resulted in the lack of a well-defined channel, or a channel form that was dry. This was apparent in two areas; (1) along sections of Enhancement I and Restoration of Thompson Reach 1, and (2) the enhancement I section along Dale Reach 1 (about 100 linear feet where flow went subsurface). Has any thought been given or monitoring device action taken to address hydrology concerns along these upper sections? While site crest gages are reflecting bank full events, the gages are located in the lower third of each reach. Narrative should summarize any 'ponded' or potentially non-jurisdictional sections on the Pee Dee project reaches.

[RES will complete NCDWR stream determination forms on reaches in question. Additional stream flow gauges can be installed on reaches with scores below 30 points.](#)



## Project Credits / Table 1

During the 2017 credit release process (2016 / MY02 for the project), credits associated with streams located above and/or within the pond beds were withheld due to concerns with channel development and lack of woody vegetation. RES should either submit an adaptive management plan (AMP) to the IRT to address these concerns or acknowledge a project value/credit reduction. Please indicate whether or not RES plans to submit an AMP.

RES plans to submit an AMP following on-site IRT meeting in 2018. The AMP will address the pond bed and any additional regulatory concerns. This has been added to the report in Section 1.3.

Subsequent RES calculations of the “pond bed” credits were as follows:

### Pee Dee – Thompson Creek 1

EI Above Pond: STA 100+7 to 102+50 (243 LF of 1.5:1, 162 SMUs)

Restoration Above Pond: STA 102+50 to 103+87 (137 LF of 1:1, 137 SMUs)

Restoration in Pond Bottom: STA 103+87 to 105+40 (153 LF of 1:1, 153 SMUs)

Total SMUs: 452 above and within pond bed withheld from 2016 Monitoring Year Release

*Note - DMS will be withholding payment for these “at risk” unreleased pond bed credits for this monitoring year. If the IRT acknowledges that these credits are valid and will be released at a later date, DMS will revised future contract payments. The 2017 credit release process also required that the project revert to approved mitigation plan assets.*

Please replace the asset table (Table 1) in the current monitoring report with the one from the approved mitigation plan. Then add a footnote similar to this: “\*Credit calculations were originally calculated along the as-built thalweg and updated to be calculated along stream centerlines for Monitoring Year 3 after discussions with NC IRT stemming from the April 3, 2017 Credit Release Meeting.”

Done.

In addition, Table 1 should have the following:

(a) “Creditable footage” column following the Restoration footage column, indicating creditable footage to reflect adjustments due to reversion to mitigation plan credits, pond bed or non-jurisdictional adjustments, crossings, etc;

(b) “Credits” column calculated by applying the credit ratio to the “Creditable footage” column, SMU to the nearest tenth SMU

(c) “Notes” column at the far right (suggest move to landscape format) indicating adjustments due (a) or other relevant information;

Please re-calculate project SMU following mitigation plan reversion (- 95.33 SMU) and pond bed credit removal (-452 SMU).

Done. The re-calculated project SMU is 5,956.3.

## Formatting / Other edits

When CCPV is folded out, the Jerry Branch map appears upside down; also cross section tables, etc. Even though this is not a problem in the digital PDF, sheets should not appear upside down when the hard copy report is read.

Landscape printing issues have been corrected in the Final Report.



It would be helpful to show major station breaks on the CCPVs.

Done.

Section 1.3 table summations should be to the nearest tenth SMU.

Done.

Cross sections / cross section tables – A couple of methods are currently being utilized to calculate the BHR from year to year. To compare subsequent monitoring years to the as-built condition one can hold the bankfull depth static (denominator) while allowing the low TOB max depth (numerator) to vary. Another method that has been proposed and is being evaluated is to hold the as-built cross sectional area static within each years new cross section and allow that to determine the maximum bankfull depth for each year. However if there are large changes in the W/D ratio, either method can make for somewhat distorted BHR values depending upon the direction and magnitude of the change in the W/D ratio. Please update the calculations to reflect changes observed in the overlays and explain in detail as a table footnote how the calculations were made. Be prepared to defend the method used for credit release and justify through context whether or not any changes observed in a cross section represent an issue.

BHR was calculated on all riffle cross sections using the baseline bankfull elevation. All BHR fell on or below the 1.2 threshold.

Final hard copies should be spiral or t-slot bound.

Done.

Margin formatting should be properly left-justified (see 2016 report).

Done.

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## **1.0 PROJECT SUMMARY**

### **1.1. Goals and Objectives**

The project goals address stressors identified in the TLW and include the following:

- Improve water quality within the restored channel reaches and downstream watercourses by reducing sediment and nutrient inputs and increasing dissolved oxygen levels
- Improve local aquatic and terrestrial ecological function via stream shading, habitat complexities, and organic/woody material introduction
- Improve aquatic and benthic macroinvertebrate habitat and associated stream bed form
- Improve site hydrology and attenuate flood flows on-site and downstream
- Provide approximately 18.6 acres of riparian area restoration with a native plant community
- Protect stream and riparian improvements with livestock best management practices
- Protect the site in perpetuity with a permanent conservation easement

The project goals will be addressed through the following project objectives:

- Implement Priority I or II restoration of 5,992 feet of stream and enhancement of 625 feet of stream
- Implement appropriate changes in dimension, pattern and/or profile to create geomorphologically stable conditions along project area reaches
- Modify degraded stream channels to enable proper sediment transport capacity and improved stream bed character
- Construct a floodplain bench that is accessible at the proposed bankfull channel elevation.
- Remove a major impoundment
- Integrate in-stream structures and native bank vegetation
- Plant native woody and herbaceous riparian vegetation with a minimum width of 50 feet from the edge of the restored channels
- Eradicate invasive, exotic or undesirable plant species
- Install cattle exclusion fencing, two new wells, two new cattle drinking stations, and upgrade eight existing cattle drinking stations

### **1.2. Success Criteria**

The success criteria for the Pee Dee Stream Restoration Site follows accepted and approved success criteria presented in the USACE Stream Mitigation Guidelines and subsequent NCDMS and agency guidance. Specific success criteria components are presented below.

#### **1.2.1. Stream Restoration**

**Dimension** – Cross-section measurements should indicate little change from the as-built cross-sections. If changes do occur, they will be evaluated to determine whether the adjustments are associated with increased stability or whether they indicate movement towards an unstable condition.

**Pattern and Profile** – Measurements and calculated values should indicate stability with little deviation from as-built conditions and established morphological ranges for the restored stream type. Pool depths may vary from year to year, but the majority should maintain depths sufficient to be observed as distinct features in the profile. The pools should maintain their depth with flatter water surface slopes, while the riffles should remain shallower and steeper. Pattern measurements will not be collected unless conditions seem to indicate that a detectable change appears to have occurred based on profile and/or dimension measurements.



**Substrate** – Calculated D<sub>50</sub> and D<sub>84</sub> values should indicate coarser size class distributions of bed materials in riffles and finer size class distributions in pools. The majority of riffle pebble counts should indicate maintenance or coarsening of substrate distributions. Generally, it is anticipated that the bed material will coarsen over time.

**Sediment Transport** – Depositional features should be consistent with a stable stream that is effectively managing its sediment load. Point bar and inner berm features, if present, should develop without excessive encroachment of the channel. Isolated development of robust (i.e. comprised of coarse material and/or vegetation actively diverting flow) mid-channel or lateral bars will be acceptable. Likewise, development of a higher number of mid-channel or lateral bars that are minor in terms of their permanency such that profile measurements do not indicate systemic aggradation will be acceptable, but trends in the development of robust mid-channel or alternating bar features will be considered a destabilizing condition and may require intervention or have success implications.

### 1.2.2. Surface Water Hydrology

Monitoring of stream surface water stages should indicate recurrence of bankfull flows on average every 1 to 2 years. At a minimum, throughout the monitoring period, the surface water stage should achieve bankfull or greater elevations at least twice. The bankfull events must occur during separate monitoring years.

### 1.2.3. Vegetation

Riparian vegetation monitoring shall be conducted for a minimum of seven years to ensure that success criteria are met per USACE guidelines. Accordingly, success criteria will consist of a minimum survival of 320 stems per acre by the end of the Year 3 monitoring period, a minimum of 260 stems per acre at the end of Year 5, and a minimum of 210 stems per acre in Year 7. If monitoring indicates either that the specified survival rate is not being met or the development of detrimental conditions (i.e., invasive species, diseased vegetation), appropriate corrective actions will be developed and implemented.

## 1.3. Project Setting and Background

The Pee Dee Stream Restoration Site (Site) encompasses approximately 21.0 acres of predominately agricultural land and includes three tributaries to Clarks Creek – Thompson Creek, Dale Branch, and Jerry Branch. The Site is located in the Yadkin River Watershed (NCDWR sub-basin 03-07-10 and HUC 03040104020020) approximately 1 mile south of the town of Pee Dee, NC in Montgomery County (**Figure 1**). Clarks Creek is listed as Class C water (NCDWR) and flows into the Pee Dee River. The Site is located within a NCDMS targeted local watershed.

Following 2016 monitoring the NCIRT requested a review of the differential between the Approved Mitigation Plan and Baseline Monitoring Report. The table below details the discrepancies by reach. The primary cause of increased baseline SMUs is survey methodology (thalweg vs. centerline). The Mitigation Plan lengths were based on centerline. Other causes of increased SMUs include field adjustments during construction and the design assumption of the channel pattern after pond removal. Credits for the stream reaches associated with the pond removal will be held until a later date. The new SMU total for this site is 5,956.3 (**Table 1**).

Reach	Mitigation Type	Proposed Length (LF)*	Mitigation Ratio	Proposed SMUs	Baseline SMUs
Thompson Creek 1	Enhancement I	401	1.5:1	166.7	162
Thompson Creek 1-2	P1 Restoration	504	1:1	1,314	1349
Dale Branch 1	Enhancement I	1,369	1.5:1	250	250
Dale Branch 2-5	P1 Restoration	3,440	1:1	2,955	2,993
Jerry Branch	P1 Restoration	1,852	1:1	1,670	1,691
Hudson Branch	P1 Restoration	707	1:1	52.6	59
<b>Total</b>		<b>8,273</b>		<b>6,408.3</b>	<b>6,504.0</b>

\*The contracted amount of credits for this Site is 6,138 SMUs

## 1.4. Project Performance

Monitoring Year 3 (MY3) data was collected from January to September 2017. Monitoring activities included visual assessment of all reaches and the surrounding easement, 16 permanent photo stations, 14 permanent vegetation monitoring plots, 22 cross-sections, 12 pebble counts, and 6 bank pin arrays.

Summary information/data related to the occurrence of items such as beaver or easement 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 the NCDMS website (<http://portal.ncdenr.org/web/eep>). All raw data supporting the tables and figures in the appendices is available from NCDMS upon request.

### 1.4.1. Vegetation

Visual assessment of the easement (**Appendix B - Table 6, Figure 2**) indicates that herbaceous vegetation has become well established throughout the project. Data collection from the 14 permanent vegetation monitoring plots was conducted during September 2017. Summary tables and photographs associated with MY3 monitoring efforts are located in **Appendix C**. Monitoring data collected during MY3 indicate that all vegetation monitoring plots have met the MY3 interim success criteria of 320 planted stems per acre. Stem densities ranged from 364 to 1,052 stems per acre with a mean of 642 stems per acre across all plots. A total of 18 woody plant species were documented within the monitoring plots. When volunteer stems are included, densities ranged between 526 and 11,736 stems per acre with a mean of 2,339 stems per acre across all plots. Invasive exotic vegetation has been identified throughout the Site as Chinese privet (*Lingustrum sinense*). Invasive species treatments were administered in MY3 and invasive exotic vegetation coverage has decreased to about 2.29 acres (**Table 6, Figure 2**). Treatments will continue throughout the monitoring period and will consist of cutting and spraying during the growing season.

### 1.4.2. Stream Geomorphology

Visual assessment of the stream was performed to document signs of channel instability, such as eroding banks, structural instability, or excessive sedimentation. No indication of instability was observed during the visual assessment (**Table 5 and Figure 2**). Structures are intact and performing as designed.

Geomorphic data for MY3 was collected during June 2017. Summary tables and cross-section plots related to stream morphology are located in **Appendix D**. MY3 stream morphology data indicate that, in general, the stream is stable and lacking in any significant change.

Substrate monitoring was also performed during MY3. Riffle  $D_{50}$  ranged from medium gravel to very coarse gravel on Jerry Branch, fine gravel to coarse gravel on Dale Branch, and very coarse gravel on Thompson Branch. Substrate will be monitored in future years for shifts in particle size composition. Overall, documented shifts in stream morphology were minimal, and do not exceed expectations between MY2 and MY3. The project is meeting success criteria with regards to channel dimensions as well as substrate particle size distributions, and sediment transport.

### 1.4.3. Stream Hydrology

Since project completion in April 2015 five bankfull events have been documented on both Jerry and Thompson Branch and four on Dale Branch. One bankfull event was recorded in MY3 and that was on Thompson Branch. (**Table 13**). The project has received multiple heavy precipitation events with no degradation to the channel or structures. Stream reaches located above and in the old pond bed have not been performing as designed. RES is developing an adaptive management plan in coordination with the IRT for how to address the pond bed and any additional regulatory concerns.

## **2.0 METHODS**

Visual assessments of the project were performed at the beginning and end of the monitoring year. Permanent photo station photos were collected during vegetation monitoring. Additional vegetation or stream problem areas within the project area were photo-documented. Geomorphic measurements were taken using a Topcon GTS-312 Total Station. Three-dimensional coordinates associated with cross-section and profile data were collected in the field and geo-referenced (NAD83 State Plane feet FIPS 3200). Morphological data was limited to 22 cross-sections.

Survey data was imported into CAD, ArcGIS, and Excel for data processing and analysis. Channel substrate was characterized using a Wolman Pebble Count as outlined in Harrelson et al. (1994) and processed using Microsoft Excel.

Vegetation success is being monitored using 14 permanent monitoring plots. Vegetation monitoring followed CVS-EEP Level 1 Protocol for MY1 and is following Level 2 Protocol Version 4.2 for monitoring years 2-7 (Lee et al. 2008). Level 2 Protocol includes analysis of species composition and density of planted species. Data is processed using the CVS data entry tool. In the field, the four corners of each plot were permanently marked with rebar and photos of each plot taken from the origin each monitoring year.

Precipitation data was reported from the NCCRONOS station Uwharrie (Troy) up until its failure in June 2017. Precipitation data is now reported from the NCCRONOS station Albemarle 5.1 SSE. Three crest gauges were installed to document bankfull events, one each on Jerry, Dale, and Thompson branches.

During quarterly visits to the site, the height of the corkline was recorded and cross-referenced with known bankfull elevations at each crest gauge.

### **3.0 REFERENCES**

Harrelson, Cheryl, C. Rawlins and J. Potyondy. 1994. Stream Channel Reference Sites: An Illustrated Guide to Field Technique. Gen. Tech. Rep. RM-245. Rocky Mountain Forest and Range Experiment Station. USDA Forest Service. Fort Collins, Colorado

Lee, M.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>; accessed November 2008.

Appendix A  
General Tables and Figures

Table 1. Project Components and Mitigation Credits										
Pee Dee Stream Restoration Site										
Mitigation Credits										
	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen	Phosphorous Nutrient Offset	
	R	RE	R	RE	R	RE	Nutrient Offset			
Type	R	RE	R	RE	R	RE				
Totals	5,956.3						-	-	-	
Project Components										
Project Component -or- Reach ID	Stationing/Location		Existing Footage/Acreage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	Restoration Footage or Acreage <sup>1</sup>	Creditable Footage	Mitigation Ratio	Credits <sup>3</sup>	Notes
Thompson Creek 1	100+0 - 102 + 50		250	PI	EI	250	0	1.5	0	Adjustments due to pond
Thompson Creek 1 - 2	102+50 - 115+64		1,346	PI	R	1,314	1,029	1	1,029	Adjustments due to pond
Dale Branch 1	200+00 - 203+75		375	PI	EI	375	375	1.5	250	
Dale Branch 2 - 5	203+75 - 234+50		2,407	PI	R	2,955	2,955	1	2,955	
Jerry Branch	300+00 - 317+30		1,832	PI	R	1,670	1,670	1	1,670	
Hudson Branch	403+05 - 403+58		53	PI	R	52.6	52.6	1	52.6	
Component Summation										
Restoration Level	Stream	Riparian Wetland		Non-riparian Wetland	Buffer	Upland				
	(linear feet)	(acres)		(acres)	(square feet)	(acres)				
		Riverine	Non-Riverine							
Restoration	5,706.3	-	-	-	-	-				
Enhancement	-	-	-	-	-	-				
Enhancement I	250	-	-	-	-	-				
Enhancement II	-	-	-	-	-	-				
Creation	-	-	-	-	-	-				
Preservation	-	-	-	-	-	-				
High Quality Preservation	-	-	-	-	-	-				
BMP Elements										
Element <sup>2</sup>	Location	Purpose/Function		Notes						
FB	Entire Site	Protect Stream								

<sup>1</sup>Restoration footage accounts for crossings and exclusions.

<sup>2</sup>BR = Bioretention Cell; SF = 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

<sup>3</sup>Credit calculations were originally calculated along the as-built thalweg and updated to be calculated along stream centerlines for Monitoring Year 3 after discussions with NC IRT stemming from the April 3, 2017 Credit Release Meeting.

**Table 2. Project Activity and Reporting History  
Pee Dee Stream Restoration Site**

<b>Activity or Report</b>	<b>Data Collection Complete</b>	<b>Completion or Delivery</b>
Mitigation Plan	Dec - 2013	Dec - 2013
Final Design - Construction Plans	N/A	Jan - 2014
Construction	N/A	April - 2015
Temporary S&E Mix Applied to Entire Project Area	N/A	April - 2015
Live Stakes and Bare Root Plantings for Entire Project Area	N/A	April - 2015
Baseline Monitoring Document (Year 0 Monitoring - Baseline)	April - 2015	July 2015
Year 1 Monitoring	Oct - 2015	Dec - 2015
Year 2 Monitoring	Jan - 2016	Oct - 2016
Year 3 Monitoring	Stream: June - 2017	Nov - 2017
	Vegetation: Sept - 2017	
Year 3 Invasive Species Treatment	---	June - 2017
Year 4 Monitoring		
Year 5 Monitoring		
Year 6 Monitoring		
Year 7 Monitoring		

<b>Table 3. Project Contacts</b>	
<b>Pee Dee Stream Restoration Site</b>	
<b>Prime Contractor</b>	Resource Environmental Solutions, LLC 302 Jefferson Street; Suite 110 Raleigh, North Carolina 27605 David Godley (919) 209-1053
<b>Designer</b>	Wolf Creek Engineering 12-1/2 Wall St., Suite C Asheville, North Carolina 28801 Grant Ginn (828) 449-1930 ext 102
<b>Construction Contractor</b>	Northstate Environmental 2889 Lowery Street Winston Salem, North Carolina 27101 Darrell Westmoreland (336) 725-2010
<b>Seeding Contractor</b>	Northstate Environmental 2889 Lowery Street Winston Salem, North Carolina 27101 Darrell Westmoreland (336) 725-2010
<b>Planting Contractor</b>	Resource Environmental Solutions, LLC 302 Jefferson Street; Suite 110 Raleigh, North Carolina 27605 David Godley (919) 209-1053
<b>As-built Surveys</b>	Kee Mapping and Surveying PO Box 2566 Asheville, North Carolina 28802 Phillip B. Key (828) 575-9021
<b>Seeding Mix Source</b>	Green Resource 5204 Highgreen Court Colfax, NC 27235 (336) 855-6363
<b>Bare Root Seedlings</b>	ArborGen Inc. 2011 Broadbank Court Ridgeville, SC 29472 (888) 888-7158
	North Carolina Forest Service 762 Claridge Nursery Road Goldsboro, NC 27350 (888) 628-7337
<b>Live Stakes</b>	Bear Duck Farms, LLC 105 Dobbs Place Goldsboro, NC 27350
<b>Monitoring Performers (Y0-Y2) 2015 - 2016</b>	Equinox Environmental 37 Haywood St. Asheville, North Carolina 28802 Drew Alderman (828) 253-6856
<b>Monitoring Performers (Y3) 2017</b>	Resource Environmental Solutions, LLC 302 Jefferson Street; Suite 110 Raleigh, North Carolina 27605 Ryan Medic (919) 741-6268



Table 4. Project Baseline Information and Attributes				
Project Information				
Project Name	Pee Dee Stream Restoration			
County	Montgomery County			
Project Area (acres)	21			
Project Coordinates (latitude and longitude)	35°15'26.95" N, 80°01'47.83" W			
Project Watershed Summary Information				
Physiographic Province	Piedmont			
River Basin	Yadkin			
USGS Hydrologic Unit 8-digit	03040104	USGS Hydrologic Unit 14-Digit	03040104020020	
DWQ Sub-basin	03-07-10			
Project Drainage Area (acres)	286			
Project Drainage Area Percentage of Impervious Area	<10%			
CGIA Land Use Classification	2.01.03 Hay and Pasture Land			
Reach Summary Information				
Parameters	Thompson Creek	Dale Branch	Jerry Branch	Hudson Branch
Length of reach (linear feet)	1,596	2,782	1,832	56
Valley classification (Rosgen)	II	II	II	II
Drainage area (acres)	102	58	83	19
NCDWQ stream identification score	30.5	34	30.5	21.5
NCDWQ Water Quality Classification	C	C	C	C
Morphological Description (stream type) (Rosgen)	B4	B4	B4	B4
Evolutionary trend (Rosgen)	IV	IV	IV	IV
Underlying mapped soils	GoE, BeC2, BaC2	GoE, CnA	GoE, BaC2, BaB2	BaC2
Drainage class	Well-drained	Well-drained	Well-drained	Well-drained
Soil Hydric status	Non-Hydric	Non-Hydric	Non-Hydric	Non-Hydric
Slope	2%	2%	2%	2%
FEMA classification	N/A	N/A	N/A	N/A
Native vegetation community	Agricultural	Agricultural	Agricultural	Agricultural
Percent composition of exotic invasive vegetation	5%	5%	5%	5%
Wetland Summary Information				
Parameters	-	-	-	-
Size of Wetland (acres)	-	-	-	-
Wetland Type (non-riparian, riparian riverine or riparian non-riverine)	-	-	-	-
Mapped Soil Series	-	-	-	-
Drainage class	-	-	-	-
Soil Hydric Status	-	-	-	-
Source of Hydrology	-	-	-	-
Hydrologic Impairment	-	-	-	-
Native vegetation community	-	-	-	-
Percent composition of exotic invasive vegetation	-	-	-	-
Regulatory Considerations				
Regulation	Applicable?	Resolved?	Supporting Documentation	
Waters of the United States – Section 404	Yes	Yes	NWP	
Waters of the United States – Section 401	Yes	Yes	401 Certification	
Endangered Species Act	N/A		ERTR	
Historic Preservation Act	N/A		ERTR	
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	N/A			
FEMA Floodplain Compliance	N/A			
Essential Fisheries Habitat	N/A		ERTR	

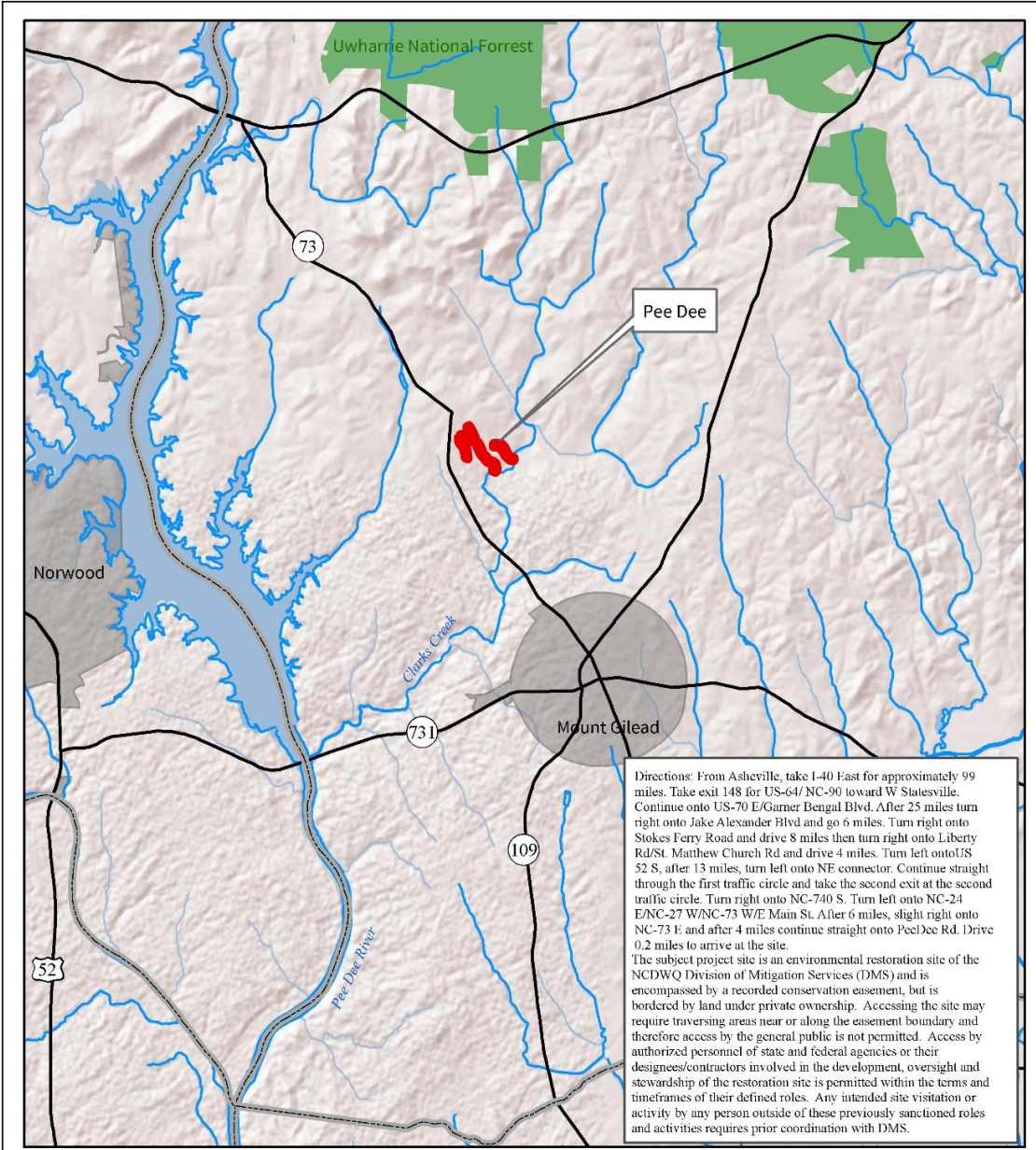
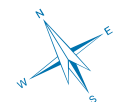


Figure 1: Vicinity Map  
 Pee Dee Stream Restoration Site  
 Project No. 95350  
 Montgomery County, North Carolina

Notes: Conservation Easement from Key Mapping & Survey, P.A.



1 inch = 350 feet

**Figure 2**

**Pee Dee Stream  
Restoration Project  
MY3 2017**

**Current Conditions  
Overview Map**

Date: 11/1/2017

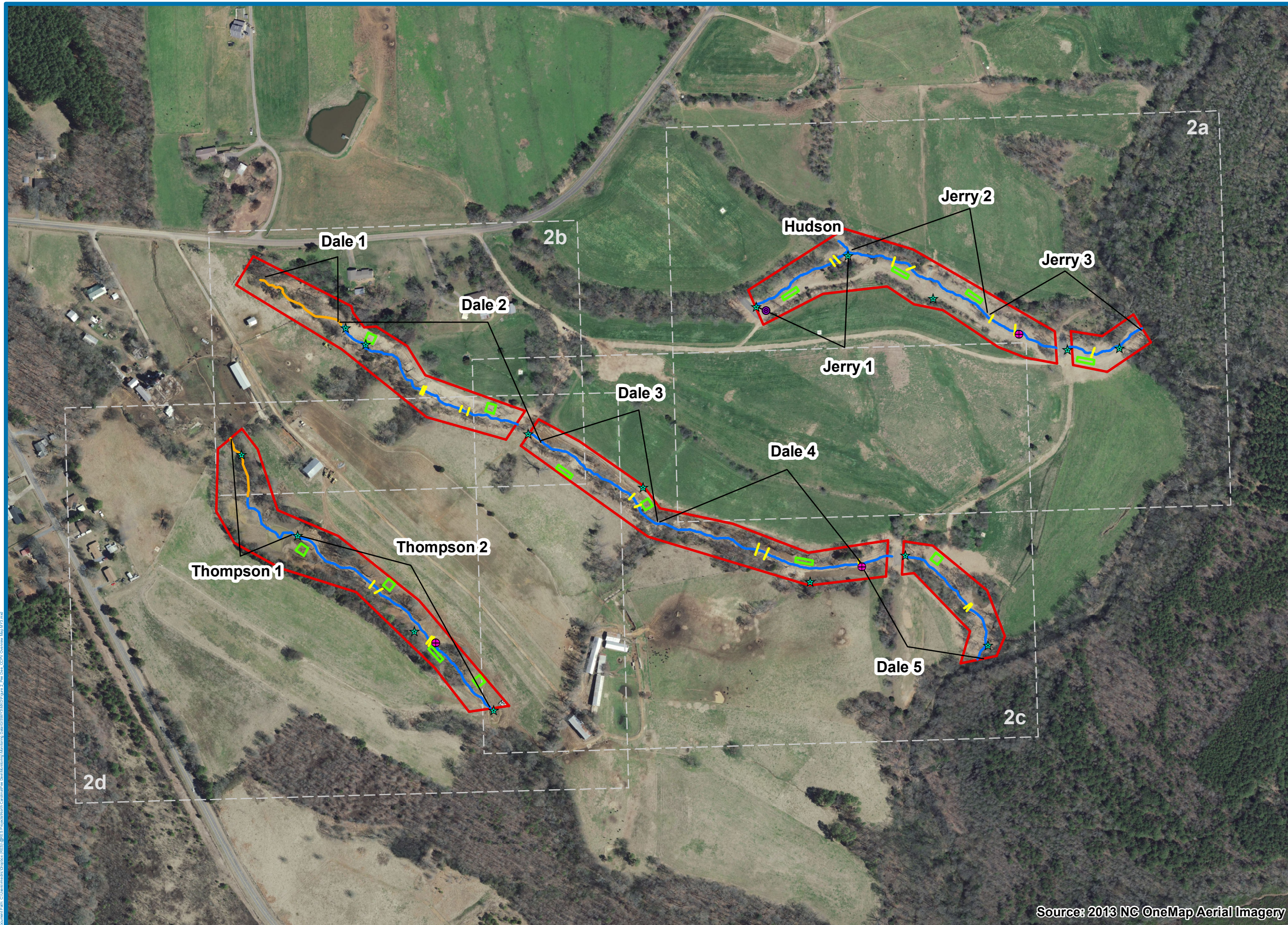
Drawn by: RTM

**LEGEND**

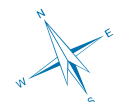
- Conservation Easement
- Vegetation Plot
- Cross Section
- Photo Station
- Crest Gauge
- Rain Gauge
- Restoration
- Enhancement I

**Riparian Buffer Conditions**

Invasive Species	Target Community		
	Present	Marginal	Absent
Absent	No Fill		
Present			
Common			



Source: 2013 NC OneMap Aerial Imagery



1 inch = 150 feet

**Figure 2a**

**Pee Dee Stream  
Restoration Project  
MY3 2017**

**Current Conditions  
Plan View Map**

Date: 1/26/2018

Drawn by: RTM

**LEGEND**

- ★ Photo Station
- ▭ Conservation Easement
- ⊕ Crest Gauge
- ⊙ Rain Gauge
- Stream Structure
- Cross Section
- Restoration
- Enhancement I
- Top of Bank

**Vegetation Plot Success**

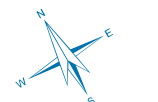
■ Met



**Riparian Buffer Conditions**

Invasive Species	Target Community		
	Present	Marginal	Absent
Absent	No Fill	Yellow	Red
Present	Yellow	Green	Red
Common	Red	Green	Red

Source: 2013 NC OneMap Aerial Imagery



1 inch = 100 feet

**Figure 2b**

**Pee Dee Stream  
Restoration Project  
MY3 2017**

**Current Conditions  
Plan View Map**

Date: 1/26/2018

Drawn by: RTM

**LEGEND**

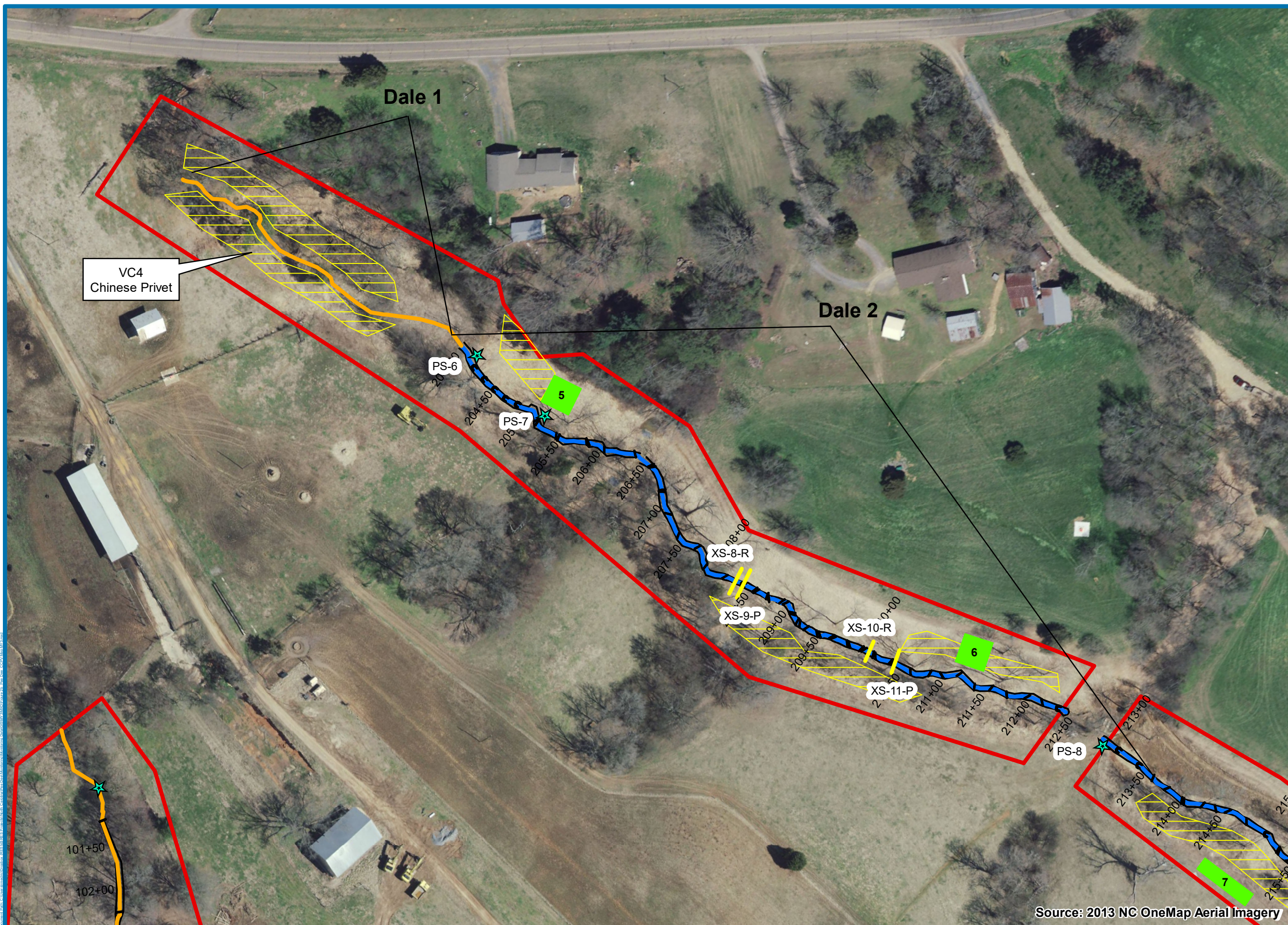
- ▭ Conservation Easement
- ⊕ Crest Gauge
- ⊙ Rain Gauge
- ★ Photo Station
- Cross Section
- Stream Structure
- Top of Bank
- Restoration
- Enhancement I

**Vegetation Plot Success**

- Met

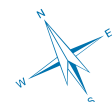
**Riparian Buffer Conditions**

Invasive Species	Target Community		
	Present	Marginal	Absent
Absent	No Fill		
Present			
Common			



Source: 2013 NC OneMap Aerial Imagery

Downloaded from the following source: https://www.nc.gov/ncosm/arcgis/rest/services/OneMap/MapServer/info/legend



1 inch = 150 feet

**Figure 2c**

**Pee Dee Stream  
Restoration Project  
MY3 2017**

**Current Conditions  
Plan View Map**

Date: 1/26/2018

Drawn by: RTM

**LEGEND**

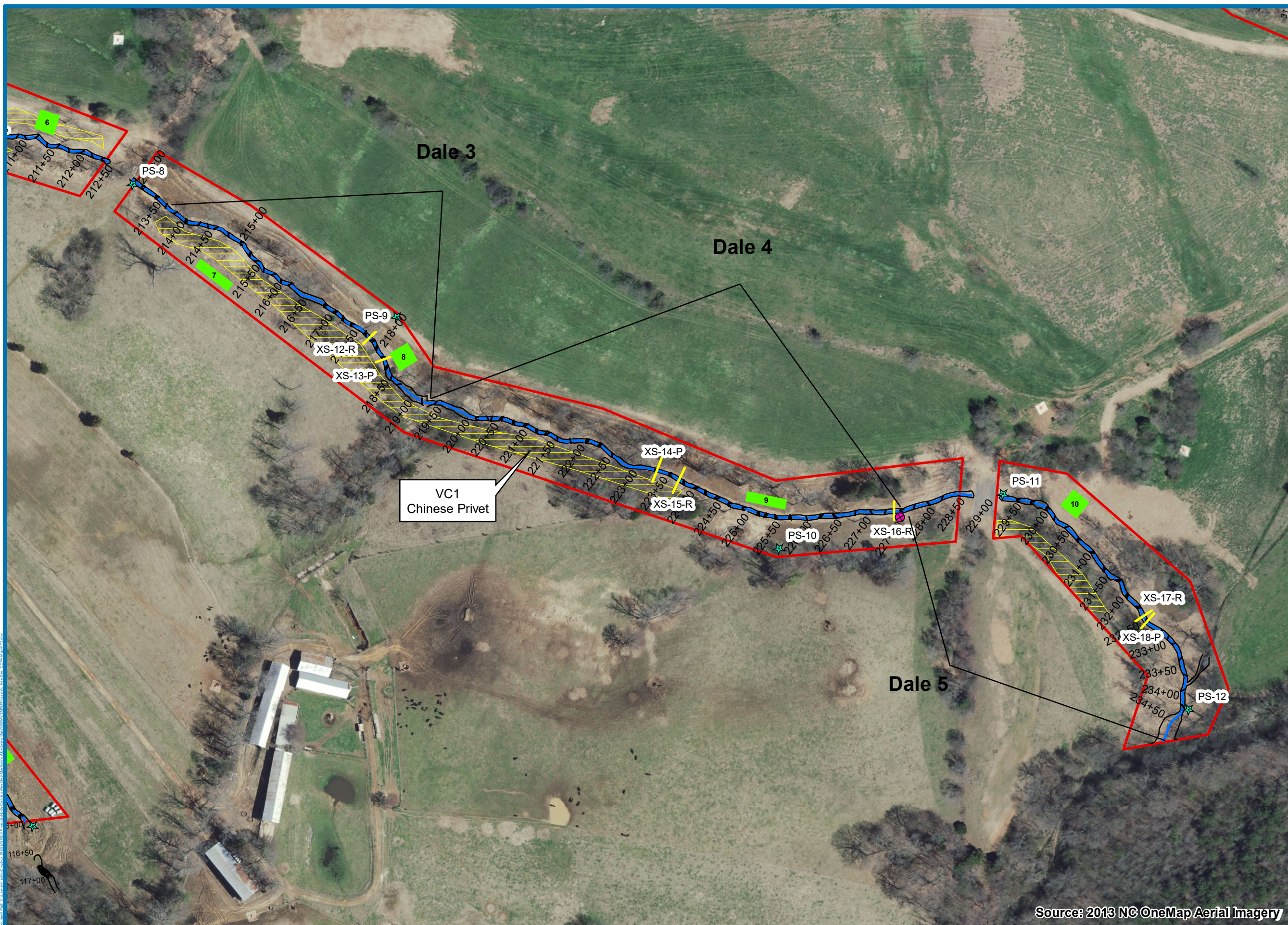
- ▭ Conservation Easement
- ⊕ Crest Gauge
- ⊙ Rain Gauge
- ★ Photo Station
- Cross Section
- Stream Structure
- Restoration
- Enhancement I
- Top of Bank

**Vegetation Plot Success**

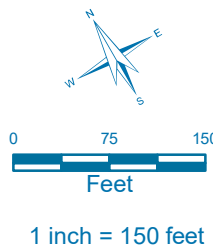
- Met

**Riparian Buffer Conditions**

Invasive Species	Target Community		
	Present	Marginal	Absent
Absent	No Fill		
Present			
Common			



Source: 2013 NC OneMap Aerial Imagery



**Figure 2d**  
**Pee Dee Stream**  
**Restoration Project**  
**MY3 2017**  
**Current Conditions**  
**Plan View Map**

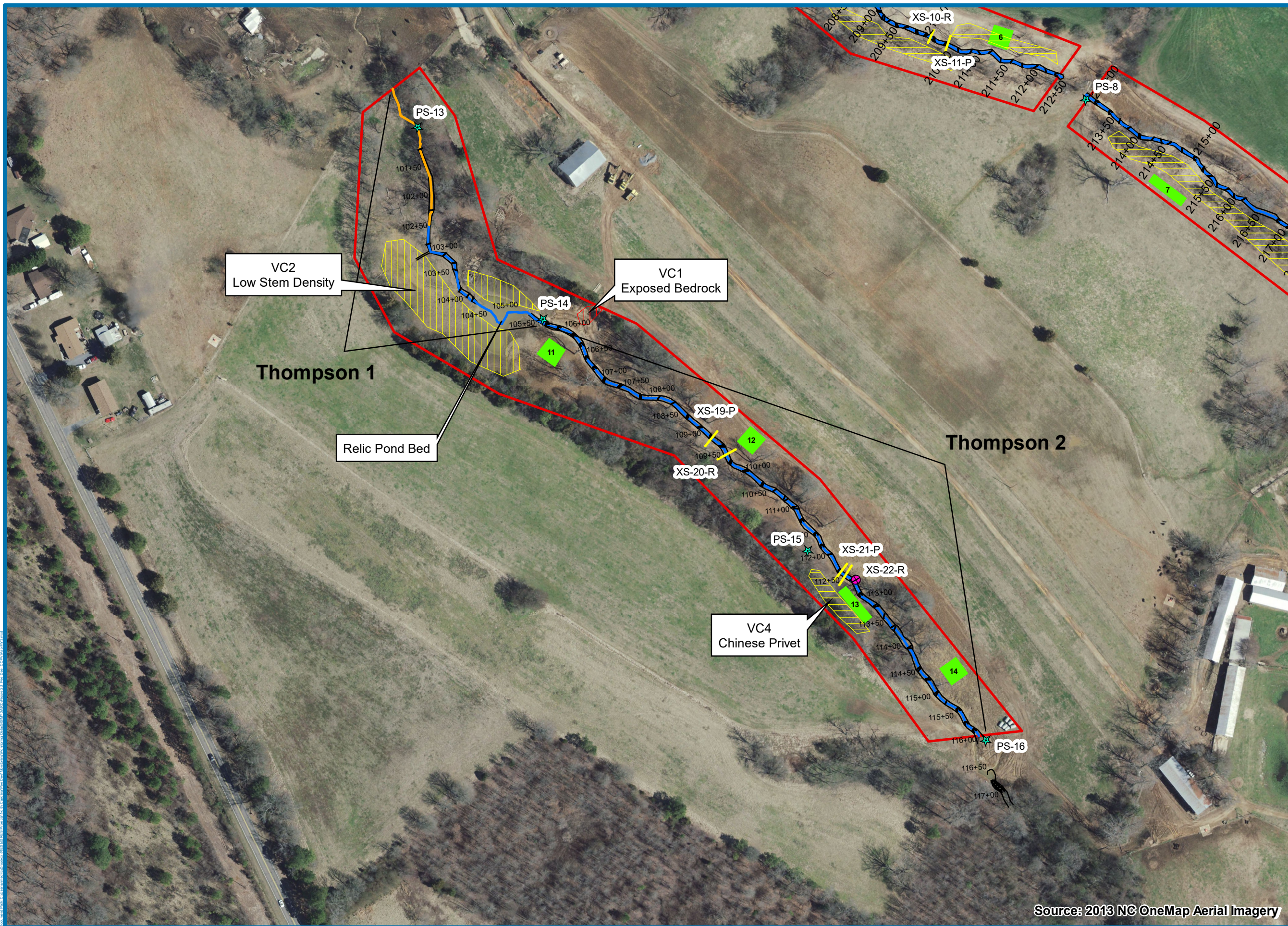
Date: 1/26/2018 Drawn by: RTM

**LEGEND**

- ▭ Conservation Easement
- ⊕ Crest Gauge
- ⊙ Rain Gauge
- Cross Section
- ★ Photo Station
- Stream Structure
- Top of Bank
- Restoration
- Enhancement I
- Vegetation Plot Success**
- Met

**Riparian Buffer Conditions**

		Target Community		
		Present	Marginal	Absent
Invasive Species	Absent	No Fill	<span style="background-color: yellow;">■</span>	<span style="background-color: red;">■</span>
	Present	<span style="background-color: yellow;">■</span>	<span style="background-color: red;">■</span>	<span style="background-color: red;">■</span>
	Common	<span style="background-color: red;">■</span>	<span style="background-color: red;">■</span>	<span style="background-color: red;">■</span>



Source: 2013 NC OneMap Aerial Imagery

Appendix B  
Visual Assessment Data



**Table 5. Visual Stream Morphology Stability Assessment  
Pee Dee Stream Restoration Site - Jerry Branch  
Assessed Length 1,832 feet**

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	1. <u>Aggradation</u> - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. <u>Degradation</u> - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. <u>Texture/Substrate</u> - Riffle maintains coarser substrate.	90	90			100%			
	3. Meander Pool Condition	1. <u>Depth</u> Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	90	90			100%			
		2. <u>Length</u> appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	90	90			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander bend (Glide).	90	90			100%			
2. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does <b>NOT</b> include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
	<b>Totals</b>				0	0	100%	N/A	N/A	N/A
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	91	91			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	91	91			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	91	91			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does <b>NOT</b> exceed 15%.	91	91			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	91	91			100%			

**Table 5 cont'd. Visual Stream Morphology Stability Assessment  
Pee Dee Stream Restoration Site - Dale Branch  
Assessed Length 2,782 feet**

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	1. <u>Aggradation</u> - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. <u>Degradation</u> - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. <u>Texture/Substrate</u> - Riffle maintains coarser substrate.	120	120			100%			
	3. Meander Pool Condition	1. <u>Depth</u> Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	119	119			100%			
		2. <u>Length</u> appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	119	119			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander bend (Glide).	119	119			100%			
2. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does <b>NOT</b> include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
	<b>Totals</b>					0	0	100%	N/A	N/A
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	122	122			N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	122	122			N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	122	122			N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does <b>NOT</b> exceed 15%.	122	122			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	122	122			N/A			

**Table 5 cont'd. Visual Stream Morphology Stability Assessment  
Pee Dee Stream Restoration Site - Thompson Branch  
Assessed Length 1,596 feet**

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	1. <u>Aggradation</u> - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. <u>Degradation</u> - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. <u>Texture/Substrate</u> - Riffle maintains coarser substrate.	50	50			100%			
	3. Meander Pool Condition	1. <u>Depth</u> Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	50	50			100%			
		2. <u>Length</u> appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	50	50			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander bend (Glide).	50	50			100%			
2. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does <b>NOT</b> include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
	<b>Totals</b>				0	0	100%	N/A	N/A	N/A
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	51	51			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	51	51			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	51	51			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does <b>NOT</b> exceed 15%.	51	51			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	51	51			100%			

**Table 6. Vegetation Condition Assessment  
Pee Dee Stream Restoration Site  
Planted Acreage 21.0**

<b>Vegetation Category</b>	<b>Definitions</b>	<b>CCPV Depiction</b>	<b>Number of Polygons</b>	<b>Combined Acreage</b>	<b>% of Planted Acreage</b>
<b>1. Bare Areas</b>	Very limited cover of both woody and herbaceous material.	Red Vertical Hatch	1	0.02	0%
<b>2. Low Stem Density Areas</b>	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	Yellow Vertical Hatch	2	0.50	2%
<b>Totals</b>			3	0.52	2%
<b>3. Areas of Poor Growth Rates or Vigor</b>	Areas with woody stems of a size class that are obviously small given the monitoring year.	N/A	0	0.00	0%
<b>Cumulative Totals</b>			3	0.52	2%
<b>Easement Acreage 21.0 acres</b>					
<b>Vegetation Category</b>	<b>Definitions</b>	<b>CCPV Depiction</b>	<b>Number of Polygons</b>	<b>Combined Acreage</b>	<b>% of Easement Acreage</b>
<b>4. Invasive Areas of Concern</b>	Areas or points (if too small to render as polygons at map scale).	Horizontal Hatch (Red - Dense/Yellow - Present)	16	2.29	11%
<b>5. Easement Encroachment Areas</b>	Areas or points (if too small to render as polygons at map scale).	N/A	0	0.00	0%

**MY3 – 2017 Photo Station Photos**



Jerry Branch – Permanent Photo Station 1  
Station 300+25 - Downstream  
September 20, 2017



Jerry Branch – Permanent Photo Station 2  
Station 305+04 – Upstream  
September 20, 2017



Jerry Branch – Permanent Photo Station 2  
Station 305+04 - Downstream  
September 20, 2017



Hudson Branch – Permanent Photo Station 2  
Station 305+04 – Looking Upstream from Confluence with Jerry Branch  
September 20, 2017



Jerry Branch – Permanent Photo Station 3  
Looking North Northwest/Upstream Jerry Branch  
September 20, 2017



Jerry Branch – Permanent Photo Station 4  
Station 304+80 – Upstream  
September 20, 2017



Jerry Branch – Permanent Photo Station 4  
Station 304+80 – Downstream  
September 20, 2017



Jerry Branch – Permanent Photo Station 5  
Station 316+95 – Upstream  
September 20, 2017





Dale Branch – Permanent Photo Station 6  
Station 204+15 – Upstream  
September 21, 2017



Dale Branch – Permanent Photo Station 7  
Station 205+15 – Upstream  
September 21, 2017



Dale Branch – Permanent Photo Station 8  
Station 212+95 – Upstream  
September 21, 2017



Dale Branch – Permanent Photo Station 8  
Station 212+95 – Downstream  
September 21, 2017



Dale Branch – Permanent Photo Station 9  
Looking North-Northwest – Upstream Dale  
September 21, 2017



Dale Branch – Permanent Photo Station 9  
Looking South-Southeast- Downstream  
September 21, 2017



Dale Branch – Permanent Photo Station 10  
Looking North-Northeast – Upstream  
September 21, 2017



Dale Branch – Permanent Photo Station 10  
Looking South-Southwest – Downstream  
September 21, 2017



Dale Branch – Permanent Photo Station 11  
Station 229+20 – Upstream  
September 21, 2017



Dale Branch – Permanent Photo Station 11  
Station 229+20 – Downstream  
September 21, 2017



Dale Branch – Permanent Photo Station 12  
Station 234+25 – Upstream  
September 21, 2017



Dale Branch – Permanent Photo Station 12  
Station 234+25 – Downstream  
September 21, 2017



Thompson Branch – Permanent Photo Station 13  
Station 101+15 – Downstream  
September 20, 2017



Thompson Branch – Permanent Photo Station 14  
Station 105+25 – Upstream  
September 20, 2017



Thompson Branch – Permanent Photo Station 14  
Station 105+25 – Downstream



Thompson Branch – Permanent Photo Station 15  
Station 115+50 – Upstream  
September 20, 2017





Thompson Branch – Permanent Photo Station 15  
Station 111+50 – Downstream  
September 20, 2017



Thompson Branch – Permanent Photo Station 16  
Station 115+85 – Upstream  
September 20, 2017

# Appendix C

## Vegetation Plot Data

**Table 7. MY3 Vegetation Plot Criteria Attainment**

<b>Plot #</b>	<b>Stream Stems/Acre</b>	<b>Volunteers Stems/Acre</b>	<b>Total Stems/Acre</b>	<b>Success Criteria Met?</b>	<b>Average Tree Height (cm)*</b>
<b>1</b>	1052	931	1983	Yes	378
<b>2</b>	809	3683	4492	Yes	449
<b>3</b>	647	121	769	Yes	208
<b>4</b>	567	2145	2711	Yes	96
<b>5</b>	486	202	688	Yes	223
<b>6</b>	567	445	1012	Yes	167
<b>7</b>	445	81	526	Yes	81
<b>8</b>	526	202	728	Yes	179
<b>9</b>	850	10886	11736	Yes	295
<b>10</b>	364	971	1335	Yes	331
<b>11</b>	769	1052	1821	Yes	443
<b>12</b>	688	2914	3602	Yes	406
<b>13</b>	526	81	607	Yes	531
<b>14</b>	688	40	728	Yes	555
<b>Project Avg</b>	<b>642</b>	<b>1697</b>	<b>2339</b>	<b>Yes</b>	<b>309</b>

\* Only the tallest eight trees were averaged, as this is the amount that represents 320 stems/acre.

**Table 8. CVS Vegetation Plot Metadata  
Cedar Creek Stream and Wetland Restoration Site**

<b>Report Prepared By</b>	Matt DeAngelo
<b>Date Prepared</b>	9/25/2017 14:25
<b>database name</b>	Pee Dee MY3 2017 CVS.mdb
<b>database location</b>	C:\Users\mdeangelo\Dropbox (RES)\@RES Projects\North Carolina\Pee Dee\Monitoring\Monitoring Data\MY3_2017\Vegetation Data
<b>computer name</b>	DESKTOP-F4AI5MT
<b>file size</b>	65540096
<b>DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT</b>	
<b>Metadata</b>	Description of database file, the report worksheets, and a summary of project(s) and project data.
<b>Proj, planted</b>	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
<b>Proj, total stems</b>	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.
<b>Plots</b>	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
<b>Vigor</b>	Frequency distribution of vigor classes for stems for all plots.
<b>Vigor by Spp</b>	Frequency distribution of vigor classes listed by species.
<b>Damage</b>	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
<b>Damage by Spp</b>	Damage values tallied by type for each species.
<b>Damage by Plot</b>	Damage values tallied by type for each plot.
<b>Planted Stems by Plot and Spp</b>	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
<b>ALL Stems by Plot and spp</b>	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.
<b>PROJECT SUMMARY</b>	
<b>Project Code</b>	95350
<b>project Name</b>	Pee Dee
<b>Description</b>	
<b>River Basin</b>	
<b>length(ft)</b>	
<b>stream-to-edge width (ft)</b>	
<b>area (sq m)</b>	
<b>Required Plots (calculated)</b>	
<b>Sampled Plots</b>	14



**MY3 – 2017 Vegetation Plot Photos**



Pee Dee - Vegetation Monitoring Plot 1  
September 20, 2017



Pee Dee - Vegetation Monitoring Plot 2  
September 20, 2017



Pee Dee - Vegetation Monitoring Plot 3  
September 20, 2017



Pee Dee - Vegetation Monitoring Plot 4  
September 20, 2017



Pee Dee - Vegetation Monitoring Plot 5  
September 21, 2017

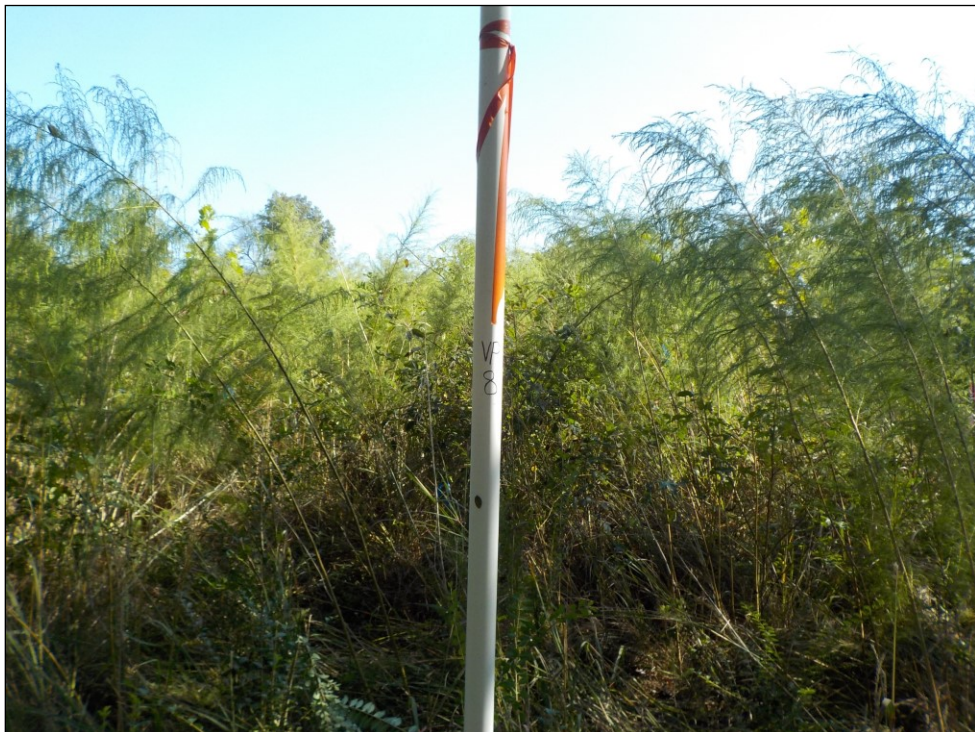


Pee Dee - Vegetation Monitoring Plot 6  
September 21, 2017





Pee Dee - Vegetation Monitoring Plot 7  
September 21, 2017



Pee Dee - Vegetation Monitoring Plot 8  
September 21, 2017



Pee Dee - Vegetation Monitoring Plot 9  
September 21, 2017



Pee Dee - Vegetation Monitoring Plot 10  
September 21, 2017



Pee Dee - Vegetation Monitoring Plot 11  
September 20, 2017



Pee Dee - Vegetation Monitoring Plot 12  
September 20, 2017



Pee Dee - Vegetation Monitoring Plot 13  
September 20, 2017



Pee Dee - Vegetation Monitoring Plot 14  
September 20, 2017

Appendix D  
Stream Geomorphology Data

**Table 10. Baseline Stream Data Summary**  
**Pee Dee Stream Restoration Site - Jerry Branch 1 (430 feet)**

Parameter	Regional Curve			Pre-Existing Condition							Reference Reach Data							Design			As-Built/ Baseline						
	LL	UL	Eq.	Min	Mean	Med	Max	SD	N	Min	Mean	Med	Max	SD	N	Min	Mean	Max	Min	Mean	Med	Max	SD	N			
<b>Dimension &amp; Substrate - Riffle</b>																											
Bankfull Width (ft)	-	-	3.79	3.5	5.3	5.3	7.0	2.5	2	9.8	11.7	-	13.1	-	-	-	7.9	-	8.1	8.1	8.1	8.1	-	1			
Floodprone Width (ft)				3.3	6.2	6.2	9.0	4.0	2	16.0	18.0	-	21	-	-	-	-	-	31.8	31.8	31.8	31.8	-	1			
Bankfull Mean Depth (ft)	-	-	0.64	0.6	0.6	0.6	0.6	0.0	2	0.5	0.62	-	0.8	-	-	-	0.42	-	0.5	0.5	0.5	0.5	-	1			
Bankfull Max Depth (ft)				0.7	0.8	0.8	0.9	0.1	2	0.8	0.9	-	1.2	-	-	-	0.65	-	1.0	1.0	1.0	1.0	-	1			
Bankfull Cross Sectional Area (ft <sup>2</sup> )			3.5	2.0	2.9	2.9	3.8	1.3	2	5.4	7.3	-	8	-	-	-	3.3	-	3.7	3.7	3.7	3.7	-	1			
Width/Depth Ratio				6.0	9.4	9.4	12.8	4.8	2	12.3	18.8	-	19.6	-	-	-	18.6	-	17.7	17.7	17.7	17.7	-	1			
Entrenchment Ratio				0.5	1.6	1.6	2.6	1.5	2	1.4	1.5	-	1.8	-	-	-	2.5	-	3.9	3.9	3.9	3.9	-	1			
Bank Height Ratio				2.4	7.7	7.7	12.9	7.4	2	0.9	1	-	1.4	-	-	-	1.0	-	1.0	1.0	1.0	1.0	-	1			
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-			
<b>Profile</b>																											
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	2.6	6.2	6.2	16.4	2.8	26			
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	-	0.003	-	0.001	0.010	0.009	0.026	0.008	26		
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	2.3	5.9	5.4	16.0	2.9	26			
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	-	-	0.7	1.5	1.5	2.3	0.4	26			
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	-	-	22.5	-	6.1	15.0	14.2	27.8	5.1	25	
<b>Pattern</b>																											
Channel Belt Width (ft)				-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	-	14.0	19.2	19.2	24.4	7.3	2			
Radius of Curvature (ft)				-	-	-	-	-	-	18.0	-	-	-	-	12.0	-	17.0	-	11.6	13.6	13.1	16.5	2.2	4			
Re: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	1.7	1.6	2.0	0.3	2			
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23.8	44.4	47.1	55.0	11.9	6			
Meander Width Ratio				-	-	-	-	-	-	1.8	-	-	-	-	-	-	2	-	1.7	2.4	2.4	3.0	0.9	2			
<b>Substrate, Bed and Transport Parameters</b>																											
Ri% / Ru% / P% / G% / S%				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
SC% / Sa% / G% / C% / B% / Be%				-	-	-	-	-	-	-	4%	2%	49%	38%	1%	6%	-	-	-	-	-	42%	0%	40%	7%	11%	
d16 / d35 / d50 / d84 / d95 / d <sup>95</sup> / d <sup>99</sup> (mm)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Reach Shear Stress (Competency) lb/ft <sup>2</sup>				-	-	-	-	-	-	-	-	-	0.562	-	-	-	-	-	-	-	-	-	-	-			
Max Part Size (mm) Mobilized at Bankfull				-	-	-	-	-	-	-	-	-	947	-	-	-	-	-	32	-	-	-	-	-			
Stream Power (Transport Capacity) W/m <sup>2</sup>				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<b>Additional Reach Parameters</b>																											
Drainage Area (mi <sup>2</sup> )				-	-	-	0.07	-	-	-	-	-	0.42	-	-	-	-	-	-	-	-	-	-	-			
Impervious Cover Estimate (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Rosgen Classification				-	-	-	-	-	-	-	-	-	B4c	-	-	-	-	-	B4	-	-	-	-	B4			
Bankfull Velocity (fps)				-	-	-	-	-	-	-	-	-	3.8	-	-	-	-	-	-	-	-	-	-	-			
Bankfull Discharge (cfs)			13.12	-	-	-	G	-	-	-	-	-	28.0	-	-	-	-	-	13	-	-	-	-	-			
Valley Length (ft)				-	-	-	-	-	-	-	-	-	260.0	-	-	-	-	-	406	-	-	-	-	-			
Channel Thalweg Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	435	-	-	-	-	430			
Sinuosity				-	-	-	-	-	-	-	-	-	1.50	-	-	-	-	-	1.0	-	-	-	-	1.06			
Water Surface Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.037	-	-	-	-	0.0265			
Bankfull Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0267			
Bankfull Floodplain Area (acres)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Proportion Over Wide (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Entrenchment Class (ER Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Incision Class (BHR Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
BEHI				-	-	-	24.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Channel Stability or Habitat Metric				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Biological or Other				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			

- Information unavailable.  
N/A - Item does not apply.  
Non-Applicable.

**Table 10 cont'd. Baseline Stream Data Summary  
Pee Dee Stream Restoration Site - Jerry Branch 2 (625 feet)**

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline							
	LL	UL	Eq.	Min	Mean	Med	Max	SD	N	Min	Mean	Med	Max	SD	N	Min	Mean	Max	Min	Mean	Med	Max	SD	N		
<b>Dimension &amp; Substrate - Riffle</b>																										
Bankfull Width (ft)	-	-	4.78	3.5	6.0	6.6	8.0	2.3	3	9.8	11.7	-	13.1	-	-	-	7.1	-	7.1	7.1	7.1	7.1	-	1		
Floodprone Width (ft)				2.5	10.8	15.0	15.0	7.2	2	16.0	18.0	-	21	-	-	-	-	-	16.0	16.0	16.0	16.0	-	1		
Bankfull Mean Depth (ft)	-	-	0.76	0.4	0.6	0.7	0.8	0.2	3	0.5	0.62	-	0.8	-	-	-	0.53	-	0.4	0.4	0.4	0.4	-	1		
Bankfull Max Depth (ft)				0.5	0.7	0.8	1.0	0.2	3	0.8	0.9	-	1.2	-	-	-	0.75	-	0.7	0.7	0.7	0.7	-	1		
Bankfull Cross Sectional Area (ft <sup>2</sup> )		5.1		2.4	2.7	2.7	3.0	0.3	3	5.4	7.3	-	8	-	-	-	3.7	-	3.1	3.1	3.1	3.1	-	1		
Width/Depth Ratio				4.6	15.2	14.6	26.3	10.9	3	12.3	18.8	-	19.6	-	-	-	13.4	-	16.4	16.4	16.4	16.4	-	1		
Entrenchment Ratio				0.7	1.6	1.9	2.3	0.8	3	1.4	1.5	-	1.8	-	-	-	3.5	-	2.3	2.3	2.3	2.3	-	1		
Bank Height Ratio				1.0	3.5	1.5	7.9	3.8	3	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	-	1		
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-		
<b>Profile</b>																										
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	3.1	9.0	8.7	26.5	4.5	29		
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	-	0.002	-	0.005	0.019	0.018	0.042	0.010	29	
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	2.3	4.8	4.7	7.8	1.5	31		
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	-	-	1.13	0.9	1.5	1.5	2.2	0.3	29	
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	-	-	21.7	-	12.0	18.0	16.8	36.2	5.1	30
<b>Pattern</b>																										
Channel Belt Width (ft)				-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	-	13.4	20.3	22.4	25.6	5.1	6		
Radius of Curvature (ft)				-	-	-	-	-	-	18.0	-	-	-	-	-	11.0	-	17.0	12.1	13.4	12.7	16.5	1.8	5		
Re: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	1.9	1.8	2.3	0.2	2		
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.5	30.0	30.6	38.1	6.6	6		
Meander Width Ratio				-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	1.9	2.9	3.2	3.6	0.7	6			
<b>Substrate, Bed and Transport Parameters</b>																										
R% / Ru% / P% / G% / S%																									47% / 0% / 27% / 12% / 14 %	
SC% / Sa% / G% / C% / B% / Be%																										4% / 2% / 49% / 38% / 1% / 6%
d16 / d35 / d50 / d84 / d95 / d <sub>90</sub> / d <sub>95</sub> / d <sub>90</sub> (mm)																										--/5/6/13/22
Reach Shear Stress (Competency) lb/ft <sup>2</sup>																										0.562
Max Part Size (mm) Mobilized at Bankfull																										947
Stream Power (Transport Capacity) W/m <sup>2</sup>																										-
<b>Additional Reach Parameters</b>																										
Drainage Area (mi <sup>2</sup> )																										0.42
Impervious Cover Estimate (%)																										-
Rosgen Classification																										B4c
Bankfull Velocity (fps)																										3.8
Bankfull Discharge (cfs)																										19.35
Valley Length (ft)																										260.0
Channel Thalweg Length (ft)																										-
Sinuosity																										1.50
Water Surface Slope (ft/ft)																										1.1
Bankfull Slope (ft/ft)																										0.024
Bankfull Floodplain Area (acres)																										0.024
Proportion Over Wide (%)																										-
Entrenchment Class (ER Range)																										-
Incision Class (BHR Range)																										-
BEHI																										26.67
Channel Stability or Habitat Metric																										-
Biological or Other																										-

- Information unavailable.  
N/A - Item does not apply.  
Non-Applicable.

**Table 10 cont'd. Baseline Stream Data Summary  
Pee Dee Stream Restoration Site - Jerry Branch 3 (636 feet)**

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
	LL	UL	Eq.	Min	Mean	Med	Max	SD	N	Min	Mean	Med	Max	SD	N	Min	Mean	Max	Min	Mean	Med	Max	SD	N
<b>Dimension &amp; Substrate - Riffle</b>																								
Bankfull Width (ft)	-	-	4.95	-	4.0	-	-	-	1	9.8	11.7	-	13.1	-	-	-	7.3	-	7.2	7.3	7.3	7.4	0.141	2
Floodprone Width (ft)	-	-	-	-	6.5	-	-	-	1	16.0	18.0	-	21	-	-	-	-	-	24.7	29.3	29.3	33.8	6.435	2
Bankfull Mean Depth (ft)	-	-	0.78	-	0.9	-	-	-	1	0.5	0.62	-	0.8	-	-	-	0.54	-	0.4	0.4	0.4	0.4	0	2
Bankfull Max Depth (ft)	-	-	-	-	1.1	-	-	-	1	0.8	0.9	-	1.2	-	-	-	0.77	-	0.8	0.9	0.9	0.9	0.071	2
Bankfull Cross Sectional Area (ft <sup>2</sup> )	-	-	5.4	-	3.3	-	-	-	1	5.4	7.3	-	8	-	-	-	4.0	-	3.0	3.2	3.2	3.3	0.212	2
Width/Depth Ratio	-	-	-	-	4.8	-	-	-	1	12.3	18.8	-	19.6	-	-	-	13.5	-	16.6	17.2	17.2	17.7	0.778	2
Entrenchment Ratio	-	-	-	-	1.6	-	-	-	1	1.4	1.5	-	1.8	-	-	-	3.4	-	3.4	4.0	4.0	4.6	0.849	2
Bank Height Ratio	-	-	-	-	2.9	-	-	-	1	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	0.0	2
d50 (mm)	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Profile</b>																								
Riffle Length (ft)	-	-	-	-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	3.1	9.0	8.7	26.5	4.5	29
Riffle Slope (ft/ft)	-	-	-	-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.002	-	0.005	0.019	0.018	0.042	0.010	29
Pool Length (ft)	-	-	-	-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	2.3	4.8	4.7	7.8	1.5	31
Pool Max Depth (ft)	-	-	-	-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	1.15	-	0.9	1.5	1.5	2.2	0.3	29
Pool Spacing (ft)	-	-	-	-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	23.9	-	12.0	18.0	16.8	36.2	5.1	30
<b>Pattern</b>																								
Channel Belt Width (ft)	-	-	-	-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	20.0	24.2	26.0	26.5	3.6	3
Radius of Curvature (ft)	-	-	-	-	-	-	-	-	-	18.0	-	-	-	-	12.0	-	17.0	-	9.2	12.1	10.6	17.0	2.8	7
Rc: Bankfull Width (ft)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	1.7	1.5	2.3	0.4	1
Meander Wavelength (ft)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.1	43.9	44.8	54.4	8.1	6
Meander Width Ratio	-	-	-	-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	2.7	3.3	3.6	3.6	0.5	3	
<b>Substrate, Bed and Transport Parameters</b>																								
Ri% / Ru% / P% / G% / S%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60%	0%	21%	10%	9%	-
SC% / Sa% / G% / C% / B% / Be%	-	-	-	-	-	-	-	-	-	-	4%	2%	49%	38%	1%	6%	-	-	-	-	-	-	-	-
d16 / d35 / d50 / d84 / d95 / d <sup>p</sup> / d <sup>p</sup> (mm)	-	-	-	-	-	-	-	-	-	-	5/6/13/22	-	14 / 36 / 52 / 110 / 170 / - / -	-	-	-	-	-	-	-	-	-	-	-
Reach Shear Stress (Competency) lb/ft <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	-	0.562	-	-	-	-	-	-	-	-	-	-	-
Max Part Size (mm) Mobilized at Bankfull	-	-	-	-	-	-	-	-	-	-	-	-	947	-	-	32	-	-	-	-	-	-	-	-
Stream Power (Transport Capacity) W/m <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Additional Reach Parameters</b>																								
Drainage Area (mi <sup>2</sup> )	-	-	-	-	-	-	-	-	-	-	-	-	0.42	-	-	-	-	-	-	-	-	-	-	-
Impervious Cover Estimate (%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rosgen Classification	-	-	-	-	-	-	-	-	-	-	G	-	B4c	-	-	B4	-	-	-	-	-	B4	-	-
Bankfull Velocity (fps)	-	-	-	-	-	-	-	-	-	-	-	-	3.8	-	-	-	-	-	-	-	-	-	-	-
Bankfull Discharge (cfs)	-	-	20.49	-	-	-	-	-	-	-	-	-	28.0	-	-	20	-	-	-	-	-	-	-	-
Valley Length (ft)	-	-	-	-	-	-	-	-	-	-	-	-	260.0	-	-	624	-	-	-	-	-	-	-	-
Channel Thalweg Length (ft)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	670	-	-	-	-	-	636	-	-
Sinuosity	-	-	-	-	-	-	-	-	-	-	-	-	1.50	-	-	1.00	-	-	-	-	-	1.02	-	-
Water Surface Slope (ft/ft)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0240	-	-	-	-	-	0.0235	-	-
Bankfull Slope (ft/ft)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0239	-	-
Bankfull Floodplain Area (acres)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proportion Over Wide (%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Entrenchment Class (ER Range)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Incision Class (BHR Range)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BEHI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Channel Stability or Habitat Metric	-	-	-	-	-	-	-	-	-	-	21.4	-	-	-	-	-	-	-	-	-	-	-	-	-
Biological or Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Information unavailable.

N/A - Item does not apply.

Non-Applicable.



**Table 10 cont'd. Baseline Stream Data Summary  
Pee Dee Stream Restoration Site - Hudson Branch (59 feet)**

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline <sup>1</sup>					
Dimension & Substrate - Riffle	LL	UL	Eq.	Min	Mean	Med	Max	SD	N	Min	Mean	Med	Max	SD	N	Min	Mean	Max	Min	Mean	Med	Max	SD	N
Bankfull Width (ft)	-	-	2.63	-	4.5	-	-	-	1	9.8	11.7	-	13.1	-	-	-	7.3	-						
Floodprone Width (ft)				-	8.0	-	-	-	1	16.0	18.0	-	21	-	-	-	-	-						
Bankfull Mean Depth (ft)	-	-	0.49	-	0.5	-	-	-	1	0.5	0.62	-	0.8	-	-	-	0.34	-						
Bankfull Max Depth (ft)				-	0.7	-	-	-	1	0.8	0.9	-	1.2	-	-	-	0.52	-						
Bankfull Cross Sectional Area (ft <sup>2</sup> )	2.0			-	2.1	-	-	-	1	5.4	7.3	-	8	-	-	-	2.1	-						
Width/Depth Ratio				-	9.5	-	-	-	1	12.3	18.8	-	19.6	-	-	-	18.7	-						
Entrenchment Ratio				-	1.8	-	-	-	1	1.4	1.5	-	1.8	-	-	-	4.8	-						
Bank Height Ratio				-	3.6	-	-	-	1	0.9	1	-	1.4	-	-	-	-	-						
d50 (mm)				-	-	-	-	-	-	52	-	-	-	-	-	-	-	-						
<b>Profile</b>																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	8.89	10.2	10.2	11.5	1.86	2	
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.003	-	0.017	0.017	0.018	0.001	2	
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	5.4	7.33	7.1	9.51	2.07	3	
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	0.77	-	1.37	1.77	1.82	2.14	0.39	3
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	15.9	-	11.5	16.6	16.6	21.8	7.26	2
<b>Pattern</b>																								
Channel Belt Width (ft)				-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	10.2	10.2	10.2	10.2	-	1	
Radius of Curvature (ft)				-	-	-	-	-	-	18.0	-	-	-	-	9.0	-	14.0	-	-	-	-	-	-	
Re: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Meander Width Ratio				-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	1.4	1.4	1.4	1.4	-	1	
<b>Substrate, Bed and Transport Parameters</b>																								
R% / Ru% / P% / G% / S%																								
SC% / Sa% / G% / C% / B% / Be%																								
d16 / d35 / d50 / d84 / d95 / d <sub>95</sub> / d <sub>90</sub> / d <sub>50</sub> (mm)																								
Reach Shear Stress (Competency) lb/ft <sup>2</sup>																								
Max Part Size (mm) Mobilized at Bankfull																								
Stream Power (Transport Capacity) W/m <sup>2</sup>																								
<b>Additional Reach Parameters</b>																								
Drainage Area (mi <sup>2</sup> )																								
Impervious Cover Estimate (%)																								
Rosgen Classification																								
Bankfull Velocity (fps)																								
Bankfull Discharge (cfs)																								
Valley Length (ft)																								
Channel Thalweg Length (ft)																								
Sinuosity																								
Water Surface Slope (ft/ft)																								
Bankfull Slope (ft/ft)																								
Bankfull Floodplain Area (acres)																								
Proportion Over Wide (%)																								
Entrenchment Class (ER Range)																								
Incision Class (BHR Range)																								
BEHI																								
Channel Stability or Habitat Metric																								
Biological or Other																								

- Information unavailable.

N/A - Item does not apply.

Non-Applicable.

<sup>1</sup>This reach limited to visual assessment since it is less than 500 feet

**Table 10 cont'd. Baseline Stream Data Summary  
Pee Dee Stream Restoration Site - Dale Branch 1 (250 feet)**

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline <sup>1</sup>						
	LL	UL	Eq.	Min	Mean	Med	Max	SD	N	Min	Mean	Med	Max	SD	N	Min	Mean	Max	Min	Mean	Med	Max	SD	N	
<b>Dimension &amp; Substrate - Riffle</b>																									
Bankfull Width (ft)	-	-	2.63	4.8	7.1	8.0	8.5	2.0	3	9.8	11.7	-	13.1	-	-	-	6.3	-							
Floodprone Width (ft)				7.0	15.0	18.0	20.0	7.0	2	16.0	18.0	-	21	-	-	-	-	-							
Bankfull Mean Depth (ft)	-	-	0.49	0.4	0.5	0.5	0.6	0.1	3	0.5	0.62	-	0.8	-	-	-	0.34	-							
Bankfull Max Depth (ft)				0.5	0.6	0.6	0.7	0.1	3	0.8	0.9	-	1.2	-	-	-	0.52	-							
Bankfull Cross Sectional Area (ft <sup>2</sup> )			2.0	2.5	2.9	2.9	3.4	0.5	3	5.4	7.3	-	8	-	-	-	2.1	-							
Width/Depth Ratio				8.0	18.4	21.4	25.7	9.2	3	12.3	18.8	-	19.6	-	-	-	18.7	-							
Entrenchment Ratio				1.5	2.0	2.1	2.5	0.5	3	1.4	1.5	-	1.8	-	-	-	5.6	-							
Bank Height Ratio				1.0	1.8	1.2	3.1	1.2	3	0.9	1	-	1.4	-	-	-	-	-							
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-							
<b>Profile</b>																									
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-							
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	-	-							
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-							
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	0.77	-							
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	20.5	-							
<b>Pattern</b>																									
Channel Belt Width (ft)				-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	-							
Radius of Curvature (ft)				-	-	-	-	-	-	18.0	-	-	-	-	-	9.0	-	14.0							
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Meander Width Ratio				-	-	-	-	-	-	1.8	-	-	-	-	-	-	4	-							
<b>Substrate, Bed and Transport Parameters</b>																									
R <sub>p</sub> % / Ru% / P% / G% / S%				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
SC% / Sa% / G% / C% / B% / Be%				-	-	-	-	-	-	4%	2%	49%	38%	1%	6%	-	-	-							
d16 / d35 / d50 / d84 / d95 / d <sub>90</sub> / d <sub>95</sub> / d <sub>98</sub> (mm)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Reach Shear Stress (Competency) lb/ft <sup>2</sup>				-	-	-	-	-	-	-	-	-	0.562	-	-	-	-	-							
Max Part Size (mm) Mobilized at Bankfull				-	-	-	-	-	-	-	-	-	947	-	-	-	32	-							
Stream Power (Transport Capacity) W/m <sup>2</sup>				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
<b>Additional Reach Parameters</b>																									
Drainage Area (mi <sup>2</sup> )				-	-	-	-	-	-	-	-	-	0.42	-	-	-	-	-							
Impervious Cover Estimate (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Rosgen Classification				-	-	-	-	-	-	C	-	-	B4c	-	-	-	B4	-							
Bankfull Velocity (fps)				-	-	-	-	-	-	-	-	-	3.8	-	-	-	-	-							
Bankfull Discharge (cfs)			7.13	-	-	-	-	-	-	-	-	-	28.0	-	-	-	7	-							
Valley Length (ft)				-	-	-	-	-	-	-	-	-	260.0	-	-	-	-	-							
Channel Thalweg Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	375	-							
Sinuosity				-	-	-	-	-	-	-	-	-	1.50	-	-	-	1.20	-							
Water Surface Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	0.0390	-							
Bankfull Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Bankfull Floodplain Area (acres)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Proportion Over Wide (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Entrenchment Class (ER Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Incision Class (BHR Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
BEHI				-	-	-	-	-	-	-	-	-	25.64	-	-	-	-	-							
Channel Stability or Habitat Metric				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Biological or Other				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							

- Information unavailable.  
N/A - Item does not apply.

Non-Applicable.

<sup>1</sup>This reach received minor bank work with no adjustments to profile. No cross-sections set in this reach.

**Table 10 cont'd. Baseline Stream Data Summary  
Pee Dee Stream Restoration Site - Dale Branch 2 (920 feet)**

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design <sup>1</sup>			As-Built / Baseline					
	LL	UL	Eq.	Min	Mean	Med	Max	SD	N	Min	Mean	Med	Max	SD	N	Min	Mean	Max	Min	Mean	Med	Max	SD	N
<b>Dimension &amp; Substrate - Riffle</b>																								
Bankfull Width (ft)	-	-	2.98	-	5.0	-	-	-	1	9.8	11.7	-	13.1	-	-	-	5.4	-	6.4	6.7	6.7	7.0	0.42	2
Floodprone Width (ft)	-	-	-	-	7.0	-	-	-	1	16.0	18.0	-	21	-	-	-	-	-	15.1	19.5	19.5	23.9	6.22	2
Bankfull Mean Depth (ft)	-	-	0.54	-	0.6	-	-	-	1	0.5	0.62	-	0.8	-	-	-	0.37	-	0.3	0.3	0.3	0.3	0	2
Bankfull Max Depth (ft)	-	-	-	-	0.7	-	-	-	1	0.8	0.9	-	1.2	-	-	-	0.56	-	0.5	0.6	0.6	0.7	0.14	2
Bankfull Cross Sectional Area (ft <sup>2</sup> )	2.4			-	2.8	-	-	-	1	5.4	7.3	-	8	-	-	-	2.0	-	1.8	1.9	1.9	2.0	0.14	2
Width/Depth Ratio	-	-	-	-	9.0	-	-	-	1	12.3	18.8	-	19.6	-	-	-	14.6	-	22.6	23.6	23.6	24.6	1.41	2
Entrenchment Ratio	-	-	-	-	1.4	-	-	-	1	1.4	1.5	-	1.8	-	-	-	8.2	-	2.4	2.9	2.9	3.4	0.71	2
Bank Height Ratio	-	-	-	-	7.9	-	-	-	1	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	0.0	2
d50 (mm)	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Profile</b>																								
Riffle Length (ft)	-	-	-	-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	3.2	10.1	9.0	21.3	4.8	28
Riffle Slope (ft/ft)	-	-	-	-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.003	-	0.007	0.027	0.027	0.046	0.011	28
Pool Length (ft)	-	-	-	-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	1.5	3.2	2.9	9.6	1.6	29
Pool Max Depth (ft)	-	-	-	-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	0.84	-	1.1	1.6	1.4	2.8	0.5	28
Pool Spacing (ft)	-	-	-	-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	20.7	-	9.4	19.7	19.3	31.4	4.9	28
<b>Pattern</b>																								
Channel Belt Width (ft)	-	-	-	-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	-	18.0	20.6	19.0	24.4	3.1	5
Radius of Curvature (ft)	-	-	-	-	-	-	-	-	-	18.0	-	-	-	-	10.0	-	15.0	8.2	13.8	14.7	16.7	3.4	5	5
Re: Bankfull Width (ft)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	2.1	2.2	2.5	0.5	5
Meander Wavelength (ft)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33.1	38.9	39.6	41.5	3.1	6
Meander Width Ratio	-	-	-	-	-	-	-	-	-	1.8	-	-	-	-	-	4	-	2.7	3.1	2.8	3.6	0.9	6	6
<b>Substrate, Bed and Transport Parameters</b>																								
R% / Ru% / P% / G% / S%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50%/ 7%/ 16%/ 10%/ 17%	-	-	-	-	-
SC% / Sa% / G% / C% / B% / Be%	-	-	-	-	-	-	-	-	-	4%	2% / 49% / 38% / 1% / 6%	-	-	-	-	-	-	-	-	-	-	-	-	-
d16 / d35 / d50 / d84 / d95 / d <sub>90</sub> / d <sub>95</sub> (mm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reach Shear Stress (Competency) lb/ft <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.562	-	-	-	-	-
Max Part Size (mm) Mobilized at Bankfull	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	947	32	-	-	-	-
Stream Power (Transport Capacity) W/m <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Additional Reach Parameters</b>																								
Drainage Area (mi <sup>2</sup> )	-	-	-	-	-	-	-	-	-	0.04	-	-	-	-	-	-	-	-	0.42	-	-	-	-	-
Impervious Cover Estimate (%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rosgen Classification	-	-	-	-	-	-	-	-	-	G	-	-	-	-	-	-	-	B4c	B4	-	-	-	B4	-
Bankfull Velocity (fps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.8	-	-	-	-	-
Bankfull Discharge (cfs)	-	-	8.77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28.0	9	-	-	-	-
Valley Length (ft)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	896	-	-	-	-	-
Channel Thalweg Length (ft)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	975	-	-	-	920	-
Sinuosity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.50	1.00	-	-	1.03	-
Water Surface Slope (ft/ft)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0420	-	-	-	0.029	-
Bankfull Slope (ft/ft)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.028	-
Bankfull Floodplain Area (acres)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proportion Over Wide (%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Entrenchment Class (ER Range)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Incision Class (BHR Range)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BEHI	-	-	-	-	-	-	-	-	-	25.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Channel Stability or Habitat Metric	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biological or Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

<sup>1</sup>Based on average design values for Subreaches 2b-2c  
- Information unavailable.  
N/A - Item does not apply.  
Non-Applicable.

**Table 10 cont'd. Baseline Stream Data Summary  
Pee Dee Stream Restoration Site - Dale Branch 3 (559 feet)**

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
	LL	UL	Eq.	Min	Mean	Med	Max	SD	N	Min	Mean	Med	Max	SD	N	Min	Mean	Max	Min	Mean	Med	Max	SD	N
<b>Dimension &amp; Substrate - Riffle</b>																								
Bankfull Width (ft)	-	-	3.28	3.0	3.3	3.3	3.6	0.4	2	9.8	11.7	-	13.1	-	-	-	7.2	-	7.3	7.3	7.3	7.3	-	1
Floodprone Width (ft)				9.0	12.0	12.0	15.0	4.2	2	16.0	18.0	-	21	-	-	-	-	-	18.5	18.5	18.5	18.5	-	1
Bankfull Mean Depth (ft)	-	-	0.58	0.6	0.7	0.7	0.7	0.1	2	0.5	0.62	-	0.8	-	-	-	0.39	-	0.3	0.3	0.3	0.3	-	1
Bankfull Max Depth (ft)				0.7	0.8	0.8	0.9	0.1	2	0.8	0.9	-	1.2	-	-	-	0.59	-	0.7	0.7	0.7	0.7	-	1
Bankfull Cross Sectional Area (ft <sup>2</sup> )			2.8	3.0	3.6	3.6	4.1	0.8	2	5.4	7.3	-	8	-	-	-	2.8	-	2.5	2.5	2.5	2.5	-	1
Width/Depth Ratio				8.8	10.4	10.4	11.9	2.2	2	12.3	18.8	-	19.6	-	-	-	18.7	-	21.1	21.1	21.1	21.1	-	1
Entrenchment Ratio				1.5	2.0	2.0	2.5	0.7	2	1.4	1.5	-	1.8	-	-	-	4.2	-	2.5	2.5	2.5	2.5	-	1
Bank Height Ratio				1.6	1.9	1.9	2.2	0.4	2	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	-	1
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Profile</b>																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	0.5	12.6	10.7	60.6	10.9	24
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.008	-	0.005	0.026	0.025	0.061	0.014	24
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	1.3	3.3	2.9	9.0	1.5	23
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	0.89	-	0.8	1.3	1.3	1.7	0.2	23
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	21.9	-	13.3	21.0	18.5	63.1	10.1	23
<b>Pattern</b>																								
Channel Belt Width (ft)				-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	-	17.8	26.7	27.9	33.4	7.4	4
Radius of Curvature (ft)				-	-	-	-	-	-	18.0	-	-	-	-	11.0	-	16.0	-	8.7	10.2	9.8	12.1	1.4	6
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.4	1.3	1.7	0.2	1
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29.6	39.9	37.4	55.7	10.0	6
Meander Width Ratio				-	-	-	-	-	-	1.8	-	-	-	-	-	-	2	-	2.4	3.7	3.8	4.6	1.0	4
<b>Substrate, Bed and Transport Parameters</b>																								
R <sup>3</sup> % / Ru% / P% / G% / S%				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62%	0%	16%	11%	11%	
SC% / Sa% / G% / C% / B% / Be%				-	-	-	-	-	-	4%	2%	49%	38%	1%	6%	-	-	-	-	-	-	-	-	-
d16 / d35 / d50 / d84 / d95 / d <sub>90</sub> / d <sub>95</sub> (mm)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reach Shear Stress (Competency) lb/ft <sup>2</sup>				-	-	-	-	-	-	-	-	-	0.562	-	-	-	-	-	-	-	-	-	-	-
Max Part Size (mm) Mobilized at Bankfull				-	-	-	-	-	-	-	-	-	947	-	-	-	32	-	-	-	-	-	-	-
Stream Power (Transport Capacity) W/m <sup>2</sup>				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Additional Reach Parameters</b>																								
Drainage Area (mi <sup>2</sup> )				-	-	-	0.05	-	-	-	-	-	0.42	-	-	-	-	-	-	-	-	-	-	-
Impervious Cover Estimate (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rosgen Classification				-	-	-	G	-	-	-	-	-	B4c	-	-	-	B4	-	-	-	-	-	B4	-
Bankfull Velocity (fps)				-	-	-	-	-	-	-	-	-	3.8	-	-	-	-	-	-	-	-	-	-	-
Bankfull Discharge (cfs)			10.3	-	-	-	-	-	-	-	-	-	28.0	-	-	-	10	-	-	-	-	-	-	-
Valley Length (ft)				-	-	-	-	-	-	-	-	-	260.0	-	-	-	531	-	-	-	-	-	-	-
Channel Thalweg Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	550	-	-	-	-	-	559	-
Sinuosity				-	-	-	-	-	-	-	-	-	1.50	-	-	-	1.0	-	-	-	-	-	1.05	-
Water Surface Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	0.027	-	-	-	-	-	0.024	-
Bankfull Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.026	-
Bankfull Floodplain Area (acres)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proportion Over Wide (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Entrenchment Class (ER Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Incision Class (BHR Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BEHI				-	-	-	20.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Channel Stability or Habitat Metric				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biological or Other				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Information unavailable.  
Non-Applicable.

**Table 10 cont'd. Baseline Stream Data Summary  
Pee Dee Stream Restoration Site - Dale Branch 4 (835 feet)**

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
	LL	UL	Eq.	Min	Mean	Med	Max	SD	N	Min	Mean	Med	Max	SD	N	Min	Mean	Max	Min	Mean	Med	Max	SD	N
<b>Dimension &amp; Substrate - Riffle</b>																								
Bankfull Width (ft)	-	-	4.01	5.5	6.0	6.0	6.5	0.7	2	9.8	11.7	-	13.1	-	-	-	6.1	-	6.3	6.4	6.4	6.5	0.14	2
Floodprone Width (ft)				6.5	7.8	7.8	9.0	1.8	2	16.0	18.0	-	21	-	-	-	-	-	22.0	33.1	33.1	44.2	15.7	2
Bankfull Mean Depth (ft)	-	-	0.67	0.8	0.8	0.8	0.8	0.0	2	0.5	0.62	-	0.8	-	-	-	0.47	-	0.3	0.4	0.4	0.5	0.14	2
Bankfull Max Depth (ft)				1.0	1.0	1.0	1.0	0.0	2	0.8	0.9	-	1.2	-	-	-	0.67	-	0.7	0.8	0.8	0.9	0.14	2
Bankfull Cross Sectional Area (ft <sup>2</sup> )			3.9	4.1	4.6	4.6	5.0	0.6	2	5.4	7.3	-	8	-	-	-	2.9	-	1.9	2.5	2.5	3.1	0.85	2
Width/Depth Ratio				7.3	7.9	7.9	8.4	0.8	2	12.3	18.8	-	19.6	-	-	-	13.0	-	13.8	17.4	17.4	21.0	5.09	2
Entrenchment Ratio				1.2	1.3	1.3	1.4	0.1	2	1.4	1.5	-	1.8	-	-	-	4.1	-	3.5	5.2	5.2	6.8	2.33	2
Bank Height Ratio				3.3	3.5	3.5	3.7	0.3	2	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	0.0	2
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Profile</b>																								
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	7.8	17.8	14.5	68.7	12.3	31
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.002	-	0.003	0.018	0.016	0.048	0.009	31
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	1.5	3.2	2.9	12.5	2.1	30
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	1.01	-	0.1	1.4	1.4	2.1	0.3	33
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	19.6	-	14.4	26.0	22.2	77.4	13.7	31
<b>Pattern</b>																								
Channel Belt Width (ft)				-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	-	16.7	18.7	18.0	22.2	2.5	4
Radius of Curvature (ft)				-	-	-	-	-	-	18.0	-	-	-	-	-	9.0	-	14.0	9.3	13.1	13.6	16.4	2.9	6
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	2.1	2.1	2.6	0.5	2
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.4	45.9	39.9	62.7	12.5	6
Meander Width Ratio				-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	2.6	2.9	2.8	3.5	0.4	4	
<b>Substrate, Bed and Transport Parameters</b>																								
R <sub>p</sub> % / Ru% / P% / G% / S%				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	68%/ 0%/ 12%/ 8%/ 11%	-	-	-	-	-
SC% / Sa% / G% / C% / B% / Be%				-	-	-	-	-	-	4%	2% / 49% / 38% / 1% / 6%	-	-	-	-	-	-	-	-	-	-	-	-	-
d16 / d35 / d50 / d84 / d95 / d <sub>p</sub> / d <sub>sp</sub> (mm)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reach Shear Stress (Competency) lb/ft <sup>2</sup>				-	-	-	-	-	-	-	-	-	0.562	-	-	-	-	-	-	-	-	-	-	-
Max Part Size (mm) Mobilized at Bankfull				-	-	-	-	-	-	-	-	-	947	-	-	-	32	-	-	-	-	-	-	-
Stream Power (Transport Capacity) W/m <sup>2</sup>				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Additional Reach Parameters</b>																								
Drainage Area (mi <sup>2</sup> )				-	-	-	0.08	-	-	-	-	-	0.42	-	-	-	-	-	-	-	-	-	-	-
Impervious Cover Estimate (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rosgen Classification				-	-	-	G	-	-	-	-	-	B4c	-	-	-	-	-	B4	-	-	-	-	B4
Bankfull Velocity (fps)				-	-	-	-	-	-	-	-	-	3.8	-	-	-	-	-	-	-	-	-	-	-
Bankfull Discharge (cfs)			14.45	-	-	-	-	-	-	-	-	-	28.0	-	-	-	-	-	14	-	-	-	-	-
Valley Length (ft)				-	-	-	-	-	-	-	-	-	260.0	-	-	-	-	-	810	-	-	-	-	-
Channel Thalweg Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	825	-	-	-	-	835
Sinuosity				-	-	-	-	-	-	-	-	-	1.50	-	-	-	-	-	1.00	-	-	-	-	1.03
Water Surface Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.028	-	-	-	-	0.024
Bankfull Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.020
Bankfull Floodplain Area (acres)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proportion Over Wide (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Entrenchment Class (ER Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Incision Class (BHR Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BEHI				-	-	-	24.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Channel Stability or Habitat Metric				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biological or Other				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Information unavailable.

N/A - Item does not apply.

Non-Applicable.

**Table 10 cont'd. Baseline Stream Data Summary  
Pee Dee Stream Restoration Site - Dale Branch 5 (679 feet)**

Parameter	Regional Curve			Pre-Existing Condition							Reference Reach Data							Design <sup>1</sup>			As-Built / Baseline					
	LL	UL	Eq.	Min	Mean	Med	Max	SD	N	Min	Mean	Med	Max	SD	N	Min	Mean	Max	Min	Mean	Med	Max	SD	N		
<b>Dimension &amp; Substrate - Riffle</b>																										
Bankfull Width (ft)	-	-	4.2	-	8.0	-	-	-	1	9.8	11.7	-	13.1	-	-	-	6.4	-	7.1	7.1	7.1	7.1	-	1		
Floodprone Width (ft)				-	9.0	-	-	-	1	16.0	18.0	-	21	-	-	-	-	-	23.9	23.9	23.9	23.9	-	1		
Bankfull Mean Depth (ft)	-	-	0.7	-	0.8	-	-	-	1	0.5	0.62	-	0.8	-	-	-	0.49	-	0.5	0.5	0.5	0.5	-	1		
Bankfull Max Depth (ft)				-	1.0	-	-	-	1	0.8	0.9	-	1.2	-	-	-	0.69	-	0.7	0.7	0.7	0.7	-	1		
Bankfull Cross Sectional Area (ft <sup>2</sup> )	4.2			-	5.0	-	-	-	1	5.4	7.3	-	8	-	-	-	3.1	-	3.3	3.3	3.3	3.3	-	1		
Width/Depth Ratio				-	12.9	-	-	-	1	12.3	18.8	-	19.6	-	-	-	13.1	-	15.2	15.2	15.2	15.2	-	1		
Entrenchment Ratio				-	1.1	-	-	-	1	1.4	1.5	-	1.8	-	-	-	3.1	-	3.4	3.4	3.4	3.4	-	1		
Bank Height Ratio				-	2.6	-	-	-	1	0.9	1	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	-	1		
d50 (mm)				-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<b>Profile</b>																										
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	7.2	18.3	20.3	25.1	6.0	11		
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.002	-	0.005	0.022	0.024	0.044	0.011	11		
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	1.8	3.0	3.1	4.0	0.7	12		
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	1.04	-	1.1	1.5	1.4	2.2	0.4	11		
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	29.9	-	12.1	26.4	28.4	35.2	6.8	11		
<b>Pattern</b>																										
Channel Belt Width (ft)				-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	-	13.2	15.3	15.6	17.1	1.9	3		
Radius of Curvature (ft)				-	-	-	-	-	-	18.0	-	-	-	-	7.0	-	12.0	-	8.7	14.1	15.6	16.7	3.6	4		
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	2.0	2.2	2.4	0.5	2		
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47.9	56.4	54.8	67.7	7.2	6		
Meander Width Ratio				-	-	-	-	-	-	1.8	-	-	-	-	-	2	-	-	1.9	2.2	2.2	2.4	0.3	3		
<b>Substrate, Bed and Transport Parameters</b>																										
Ri <sup>3</sup> % / Ru% / P% / G% / S%				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	68%	0%	12%	13%	7%			
SC% / Sa% / G% / C% / B% / Be%				-	-	-	-	-	-	4%	2%	49%	38%	1%	6%											
d16 / d35 / d50 / d84 / d95 / di <sup>3</sup> / di <sup>3</sup> (mm)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	36	52	110	170	-		
Reach Shear Stress (Competency) lb/ft <sup>2</sup>				-	-	-	-	-	-	-	-	0.562	-	-	-	-	-	-	-	-	-	-	-	-		
Max Part Size (mm) Mobilized at Bankfull				-	-	-	-	-	-	-	-	947	-	-	-	-	32	-	-	-	-	-	-	-		
Stream Power (Transport Capacity) W/m <sup>2</sup>				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<b>Additional Reach Parameters</b>																										
Drainage Area (mi <sup>2</sup> )				-	0.09	-	-	-	-	0.42	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Impervious Cover Estimate (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Rosgen Classification				-	F	-	-	-	-	B4c	-	-	-	-	-	B4	-	-	-	-	B4	-	-	-		
Bankfull Velocity (fps)				-	-	-	-	-	-	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bankfull Discharge (cfs)	15.73			-	-	-	-	-	-	28.0	-	-	-	-	-	16	-	-	-	-	-	-	-	-		
Valley Length (ft)				-	-	-	-	-	-	260.0	-	-	-	-	-	695	-	-	-	-	-	-	-	-		
Channel Thalweg Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	725	-	-	-	-	-	679	-	-		
Sinuosity				-	-	-	-	-	-	1.50	-	-	-	-	-	1.0	-	-	-	-	-	0.977	-	-		
Water Surface Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	0.023	-	-	-	-	-	0.024	-	-		
Bankfull Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.024	-	-		
Bankfull Floodplain Area (acres)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Proportion Over Wide (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Entrenchment Class (ER Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Incision Class (BHR Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
BEHI				-	23.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Channel Stability or Habitat Metric				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Biological or Other				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

<sup>1</sup>Values taken from Subreach 5b

- Information unavailable.

Non-Applicable.

**Table 10 con't. Baseline Stream Data Summary  
Pee Dee Stream Restoration Site - Thompson Branch 1 (530 feet)**

Parameter	Regional Curve			Pre-Existing Condition					Reference Reach Data					Design			As-Built / Baseline								
	LL	UL	Eq.	Min	Mean	Med	Max	SD	N	Min	Mean	Med	Max	SD	N	Min	Mean	Max	Min	Mean	Med	Max	SD	N	
<b>Dimension &amp; Substrate - Riffle</b>																									
Bankfull Width (ft)	-	-	4.6	-	5.0	-	-	-	1	9.8	11.7	-	13.1	-	-	-	8.8	-	-	-	-	-	-	-	
Floodprone Width (ft)				-	20.0	-	-	-	1	16.0	18.0	-	21.0	-	-	-	-	-	-	-	-	-	-	-	
Bankfull Mean Depth (ft)	-	-	0.7	-	1.0	-	-	-	1	0.5	0.6	-	0.8	-	-	-	0.48	-	-	-	-	-	-	-	
Bankfull Max Depth (ft)				-	1.3	-	-	-	1	0.8	0.9	-	1.2	-	-	-	0.73	-	-	-	-	-	-	-	
Bankfull Cross Sectional Area (ft <sup>2</sup> )			4.8	-	4.6	-	-	-	1	5.4	7.3	-	8.0	-	-	-	4.2	-	-	-	-	-	-	-	
Width/Depth Ratio				-	5.5	-	-	-	1	12.3	18.8	-	19.6	-	-	-	18.6	-	-	-	-	-	-	-	
Entrenchment Ratio				-	4.0	-	-	-	1	1.4	1.5	-	1.8	-	-	-	3.4	-	-	-	-	-	-	-	
Bank Height Ratio				-	1.2	-	-	-	1	0.9	1.0	-	1.4	-	-	-	-	-	-	-	-	-	-	-	
d50 (mm)				-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Profile</b>																									
Riffle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	44.7	44.7	44.7	44.7	-	1	
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	-	-	0.006	0.006	0.006	0.006	-	1	
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	9.6	20.6	17.0	35.0	11.6	6	
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	-	-	1.1	1.6	2.0	1.9	2.3	0.3	7
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	-	-	28.6	11.0	22.3	18.3	36.5	11.2	6
<b>Pattern</b>																									
Channel Belt Width (ft)				-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	-	19.0	26.1	22.9	36.4	9.1	3	
Radius of Curvature (ft)				-	-	-	-	-	-	18.0	-	-	-	-	13.0	-	19.0	12.3	13.1	13.2	13.7	0.7	3		
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	1.5	1.5	1.6	0.1	1	
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60.7	94.7	81.4	155.2	44.0	4	
Meander Width Ratio				-	-	-	-	-	-	1.8	-	-	-	-	-	-	3	-	2.2	3.0	2.6	4.1	1.0	3	
<b>Substrate, Bed and Transport Parameters</b>																									
Ri% / Ru% / P% / G% / S%				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25%	0%	69%	0%	6%		
SC% / Sa% / G% / C% / B% / Be%				-	-	-	-	-	-	4%	2%	49%	38%	1%	6%										
d16 / d35 / d50 / d84 / d95 / di <sup>8</sup> / di <sup>95</sup> (mm)				-	4 / 6 / 8	-	15 / 24			14 / 36 / 52 / 110 / 170	-	-	-	-	-	-	-	-							
Reach Shear Stress (Competency) lb/ft <sup>2</sup>				-	-	-	-	-	-	-	-	0.562													
Max Part Size (mm) Mobilized at Bankfull				-	-	-	-	-	-	-	-	947					37								
Stream Power (Transport Capacity) W/m <sup>2</sup>				-	-	-	-	-	-	-	-	-					-								
<b>Additional Reach Parameters</b>																									
Drainage Area (mi <sup>2</sup> )				-	0.11					0.42															
Impervious Cover Estimate (%)				-	-					-															
Rosgen Classification				-	G					B4c					B4								B4		
Bankfull Velocity (fps)				-	-					-		3.8			-										
Bankfull Discharge (cfs)			18.2	-	-					-		28.0			18										
Valley Length (ft)				-	-					-		260.0			294										
Channel Thalweg Length (ft)				-	-					-		-			511								530		
Sinuosity				-	-					-		1.50			1.0								1.06		
Water Surface Slope (ft/ft)				-	-					-		-			0.030								0.031		
Bankfull Slope (ft/ft)				-	-					-		-			-								0.030		
Bankfull Floodplain Area (acres)				-	-					-		-			-										
Proportion Over Wide (%)				-	-					-		-			-										
Entrenchment Class (ER Range)				-	-					-		-			-										
Incision Class (BHR Range)				-	-					-		-			-										
BEHI				-	30.9					-		-			-										
Channel Stability or Habitat Metric				-	-					-		-			-										
Biological or Other				-	-					-		-			-										

- Information unavailable.  
Non-Applicable.

**Table 10 cont'd. Baseline Stream Data Summary  
Pee Dee Stream Restoration Site - Thompson Branch 2 (1,061 feet)**

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
	LL	UL	Eq.	Min	Mean	Med	Max	SD	N	Min	Mean	Med	Max	SD	N	Min	Mean	Max	Min	Mean	Med	Max	SD	N
<b>Dimension &amp; Substrate - Rifle</b>																								
Bankfull Width (ft)	-	-	5.11	7.0	7.7	7.0	9.0	1.2	3	9.8	11.7	-	13.1	-	-	-	7.5	-	7.5	7.6	7.6	7.6	0.07	2
Floodprone Width (ft)				9.0	14.7	15.0	20.0	5.5	2	16.0	18.0	-	21.0	-	-	-	-	-	31.1	32.7	32.7	34.3	2.26	2
Bankfull Mean Depth (ft)	-	-	0.8	0.9	0.9	0.9	1.0	0.1	3	0.5	0.6	-	0.8	-	-	-	0.6	-	0.6	0.6	0.6	0.6	0	2
Bankfull Max Depth (ft)				1.1	1.1	1.1	1.2	0.1	3	0.8	0.9	-	1.2	-	-	-	0.78	-	1.1	1.2	1.2	1.2	0.07	2
Bankfull Cross Sectional Area (ft <sup>2</sup> )			5.6	5.7	6.7	6.0	8.4	1.5	3	5.4	7.3	-	8.0	-	-	-	4.2	-	4.2	4.3	4.3	4.3	0.07	2
Width/Depth Ratio				8.1	8.8	8.5	9.7	0.8	3	12.3	18.8	-	19.6	-	-	-	13.5	-	13.3	13.4	13.4	13.4	0.07	2
Entrenchment Ratio				1.3	2.0	1.7	2.9	0.8	3	1.4	1.5	-	1.8	-	-	-	4.0	-	4.1	4.3	4.3	4.5	0.28	2
Bank Height Ratio				1.4	2.2	2.4	2.9	0.8	3	0.9	1.0	-	1.4	-	-	-	-	-	1.0	1.0	1.0	1.0	0.0	2
d50 (mm)				-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Profile</b>																								
Rifle Length (ft)				-	-	-	-	-	-	4.0	14.0	-	30.0	-	-	-	-	-	10.0	15.8	15.2	25.4	3.9	32
Rifle Slope (ft/ft)				-	-	-	-	-	-	0.017	0.027	-	0.059	-	-	-	0.008	-	0.005	0.014	0.013	0.023	0.005	32
Pool Length (ft)				-	-	-	-	-	-	7.0	13.0	-	30.0	-	-	-	-	-	1.8	5.0	4.6	18.3	3.0	32
Pool Max Depth (ft)				-	-	-	-	-	-	1.8	1.9	-	2.7	-	-	-	1.17	-	1.4	2.1	2.0	2.6	0.3	32
Pool Spacing (ft)				-	-	-	-	-	-	18.0	39.0	-	53.0	-	-	-	26.2	-	19.5	27.5	25.9	54.0	7.4	32
<b>Pattern</b>																								
Channel Belt Width (ft)				-	-	-	-	-	-	21.0	-	-	-	-	-	-	-	14.4	22.4	19.5	37.8	8.2	6	
Radius of Curvature (ft)				-	-	-	-	-	-	18.0	-	-	-	-	12.0	-	18.0	10.5	18.3	18.5	25.9	6.7	4	
Rc: Bankfull Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	2.4	2.5	3.5	0.9	2		
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	34.3	48.7	50.5	60.9	9.8	6	
Meander Width Ratio				-	-	-	-	-	-	1.8	-	-	-	-	-	3	-	2.2	3.0	2.6	4.1	1.0	3	
<b>Substrate, Bed and Transport Parameters</b>																								
Ri% / Ru% / P% / G% / S%				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57%	0%	18%	11%	14%	
SC% / Sa% / G% / C% / B% / Be%				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
d16 / d35 / d50 / d84 / d95 / di <sup>90</sup> / di <sup>95</sup> (mm)				4	6	8	15	24	14	36	52	110	170	-	-	-	-	-	-	-	-	-	-	
Reach Shear Stress (Competency) lb/ft <sup>2</sup>				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Max Part Size (mm) Mobilized at Bankfull				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stream Power (Transport Capacity) W/m <sup>2</sup>				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Additional Reach Parameters</b>																								
Drainage Area (mi <sup>2</sup> )				-	-	-	0.14	-	-	-	-	-	0.42	-	-	-	-	-	-	-	-	-	-	
Impervious Cover Estimate (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Rosgen Classification				-	-	-	G	-	-	-	-	-	B4c	-	-	B4	-	-	-	B4	-	-	-	
Bankfull Velocity (fps)				-	-	-	-	-	-	-	-	-	3.8	-	-	-	-	-	-	-	-	-	-	
Bankfull Discharge (cfs)			21.6	-	-	-	-	-	-	-	-	-	28.0	-	-	22	-	-	-	-	-	-	-	
Valley Length (ft)				-	-	-	-	-	-	-	-	-	260.0	-	-	1,010	-	-	-	-	-	-	-	
Channel Thalweg Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	1,150	-	-	-	-	1,061	-	-	
Sinuosity				-	-	-	-	-	-	-	-	-	1.50	-	-	1.1	-	-	-	-	1.05	-	-	
Water Surface Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	0.020	-	-	-	-	0.020	-	-	
Bankfull Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	0.022	-	-	-	-	0.022	-	-	
Bankfull Floodplain Area (acres)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Proportion Over Wide (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Entrenchment Class (ER Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Incision Class (BHR Range)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BEHI				-	-	-	29.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Channel Stability or Habitat Metric				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Biological or Other				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

- Information unavailable.  
Non-Applicable.



**Appendix D. Table 11a. - Monitoring Data - Dimensional Morphology Summary**

**(Dimensional Parameters - Cross Sections)**

**Pee Dee Stream Restoration Site - Jerry Branch**

	Reach 1 Cross-Section 1 Pool								Reach 1 Cross-Section 2 Riffle								Reach 2 Cross-Section 3 Pool							Reach 2 Cross-Section 4 Riffle								
Dimension	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Record elevation (datum) used	320.1	320.1	320.1	320.1					319.6	319.6	319.6	319.6					312.9	312.9	312.9	312.9					310.6	310.6	310.6	310.6				
Bankfull Width (ft)	9.1	8.3	8.3	8.2					8.1	7.0	6.7	6.9					7.8	8.1	8.1	9.8					7.1	7.2	7.2	7.7				
Floodprone Width (ft)	>25	>25	>25	>25					>30	>30	>30	>30					>30	>30	>30	>30					>25	>25	>25	>25				
Bankfull Mean Depth (ft)	0.9	0.8	0.8	0.8					0.5	0.3	0.4	0.4					1.1	1.0	1.1	1.0					0.4	0.4	0.4	0.3				
Bankfull Max Depth (ft)	1.7	1.3	1.2	1.2					1.0	0.5	0.6	0.6					2.3	2	2.2	2.1					0.7	0.6	0.6	0.6				
Bankfull Cross Sectional Area (ft <sup>2</sup> )	8.5	6.8	6.9	6.6					3.7	2.4	2.6	2.7					8.3	7.7	8.7	9.4					3.1	3.0	2.7	2.6				
Bankfull Width/Depth Ratio	9.8	10.1	9.9	10.1					17.7	20.3	17.5	17.6					7.4	8.4	7.6	10.2					16.4	17	19.4	22.6				
Bankfull Entrenchment Ratio <sup>1</sup>	>2.7	>3.0	>3.0	N/A					>3.7	>4.3	>4.5	4.0					>3.8	>3.7	>3.7	N/A					>3.5	>3.5	>3.5	3.2				
Bankfull Bank Height Ratio	1.0	1.0	1.0	N/A					1.0	1.0	1.0	1.0					1.0	1.0	1.0	N/A					1.0	1.0	1.0	0.9				
d50 (mm)	N/A	N/A	N/A	N/A					N/A	0.2	0.062	12.0					N/A	N/A	N/A	N/A					N/A	22	5.2	12.0				
	Reach 3 Cross-Section 5 Pool								Reach 3 Cross-Section 6 Riffle								Reach 3 Cross-Section 7 Riffle															
Dimension	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7								
Record elevation (datum) used	301.7	301.7	301.7	301.7					298.8	298.8	298.8	298.8					290.2	290.2	290.2	290.2												
Bankfull Width (ft)	8.1	9.2	9.7	9.4					7.4	7.5	7.3	6.9					7.2	6.7	6.4	6.2												
Floodprone Width (ft)	>25	>25	>25	>25					>30	>30	>30	>30					>25	>25	>25	>25												
Bankfull Mean Depth (ft)	1.0	0.7	0.7	0.7					0.4	0.4	0.4	0.4					0.4	0.3	0.4	0.4												
Bankfull Max Depth (ft)	1.8	1.3	1.3	1.4					0.9	0.6	0.6	0.6					0.8	0.5	0.5	0.5												
Bankfull Cross Sectional Area (ft <sup>2</sup> )	7.9	6.3	6.8	6.9					3.3	3.3	2.9	2.4					3.0	2.3	2.4	2.2												
Bankfull Width/Depth Ratio	8.3	13.3	13.7	13.0					16.6	16.7	18.7	19.4					17.7	19.4	17.0	17.4												
Bankfull Entrenchment Ratio <sup>1</sup>	>3.1	>2.7	>2.6	N/A					>4.1	>4.0	>4.1	4.4					>3.4	>3.7	>3.9	4.0												
Bankfull Bank Height Ratio	N/A	N/A	N/A	N/A					1.0	1.0	1.0	1.0					1.0	1.0	1.0	0.9												
d50 (mm)	N/A	N/A	N/A	N/A					N/A	5.5	14.0	52.0					N/A	34.0	15.0	27.0												

N/A - Information Not Available

<sup>1</sup> MY0 Bankfull Entrenchment Ratios Updated to Reflect Calculated Values

**Appendix D. Table 11a. cont'd - Monitoring Data - Dimensional Morphology Summary**

**(Dimensional Parameters - Cross Sections)**

**Pee Dee Stream Restoration Site - Dale Branch**

	Reach 2 Cross-Section 8 Riffle								Reach 2 Cross-Section 9 Pool								Reach 2 Cross-Section 10 Riffle								Reach 2 Cross-Section 11 Pool							
Dimension	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Record elevation (datum) used	354.94	354.94	354.94	354.94					354.7	354.7	354.7	354.7					348.1	348.1	348.1	348.1					347.4	347.4	347.4	347.4				
Bankfull Width (ft)	7.0	7.3	7.2	6.5					7.7	8.0	8.1	7.7					6.4	6.2	6.2	6.5					7.6	8	8.3	9.4				
Floodprone Width (ft)	>25	>25	>25	>25					>25	>25	>25	>25					>25	>25	>25	>25					>20	>20	>20	>20				
Bankfull Mean Depth (ft)	0.3	0.2	0.3	0.2					0.6	0.6	0.6	0.6					0.3	0.3	0.3	0.3					0.8	0.7	0.7	0.7				
Bankfull Max Depth (ft)	0.7	0.5	0.5	0.5					1.7	1.5	1.7	1.5					0.5	0.5	0.5	0.6					1.6	1.2	1.3	1.3				
Bankfull Cross Sectional Area (ft <sup>2</sup> )	2.0	1.7	2.0	1.6					4.8	4.8	5.0	5					1.8	1.6	1.7	1.8					6.1	5.9	6.0	6.7				
Bankfull Width/Depth Ratio	24.6	30.6	26.0	26.9					12.3	13.5	13.3	11.8					22.6	23.7	21.7	23.4					9.5	10.9	11.5	13.3				
Bankfull Entrenchment Ratio <sup>1</sup>	>3.6	>3.4	>3.5	3.9					>3.1	>3.1	>3.1	N/A					>3.9	>4.0	>4.1	3.9					>2.6	>2.5	>2.4	N/A				
Bankfull Bank Height Ratio	1.0	1.0	1.0	0.9					1.0	1.0	1.0	N/A					1.0	1.0	1.0	0.9					1.0	1.0	1.0	N/A				
d50 (mm)	N/A	8.0	8.3	7.1					N/A	N/A	N/A	N/A					N/A	19	4.3	25.0					N/A	N/A	N/A	N/A				
	Reach 3 Cross-Section 12 Riffle								Reach 3 Cross-Section 13 Pool								Reach 4 Cross-Section 14 Pool								Reach 4 Cross-Section 15 Riffle							
Dimension	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Record elevation (datum) used	327.8	327.8	327.8	327.8					326.1	326.1	326.1	326.1					315.3	315.3	315.3	315.3					314.1	314.1	314.1	314.1				
Bankfull Width (ft)	7.3	7.1	7.1	7.8					7.8	7.6	7.7	8.3					6.7	7.2	7.0	5.8					6.5	6.2	6.5	6.8				
Floodprone Width (ft)	>20	>20	>20	>20					>20	>20	>20	>20					>30	>30	>30	>30					>40	>40	>40	>40				
Bankfull Mean Depth (ft)	0.3	0.3	0.4	0.4					0.5	0.5	0.4	0.4					0.9	0.6	0.7	0.8					0.5	0.5	0.5	0.5				
Bankfull Max Depth (ft)	0.7	0.6	0.8	0.8					1.3	1.1	1.0	0.9					2.0	1.0	1.3	1.3					0.9	0.8	0.8	0.8				
Bankfull Cross Sectional Area (ft <sup>2</sup> )	2.5	2.2	2.7	3.1					3.9	3.5	3.0	3.7					6.2	4.3	5.2	4.9					3.1	2.9	3.0	3.2				
Bankfull Width/Depth Ratio	21.1	23.1	18.7	19.3					15.7	16.7	19.7	18.5					7.1	12.1	9.5	7.0					13.8	13.2	14.2	14.7				
Bankfull Entrenchment Ratio <sup>1</sup>	>2.8	>2.8	>2.8	2.6					>2.6	>2.6	>2.6	N/A					>4.5	>4.2	>4.3	N/A					>6.1	>6.5	>6.2	5.9				
Bankfull Bank Height Ratio	1.0	1.0	1.0	0.5					1.0	1.0	1.0	N/A					1.0	1.0	1.0	N/A					1.0	1.0	1.0	1.0				
d50 (mm)	N/A	2.1	4.4	8.0					N/A	N/A	N/A	N/A					N/A	N/A	N/A	N/A					N/A	16.0	5.8	12.0				
	Reach 4 Cross-Section 16 Riffle								Reach 5 Cross-Section 17 Riffle								Reach 5 Cross-Section 18 Pool															
Dimension	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7								
Record elevation (datum) used	303.5	303.5	303.5	303.5					286.8	286.8	286.8	286.8					286.6	286.6	286.6	286.6												
Bankfull Width (ft)	6.3	7.2	7.6	6.7					7.1	7.9	7.9	9.1					7.2	8.0	7.7	7.4												
Floodprone Width (ft)	>25	>25	>25	>25					>25	>25	>25	>25					>25	>25	>25	>25												
Bankfull Mean Depth (ft)	0.3	0.3	0.4	0.3					0.5	0.5	0.5	0.4					0.8	0.7	0.7	0.7												
Bankfull Max Depth (ft)	0.7	0.6	0.7	0.7					0.7	0.8	0.8	0.8					1.7	1.5	1.4	1.4												
Bankfull Cross Sectional Area (ft <sup>2</sup> )	1.9	2.3	2.7	2.2					3.3	3.8	3.9	4.1					5.9	5.8	5.6	5.3												
Bankfull Width/Depth Ratio	21.0	23.0	20.9	19.9					15.2	16.2	16.3	20.6					8.7	11.0	10.7	10.4												
Bankfull Entrenchment Ratio <sup>1</sup>	>4.0	>3.5	>3.3	3.8					>3.5	>3.2	>3.2	2.7					>3.5	>3.1	>3.2	N/A												
Bankfull Bank Height Ratio	1.0	1.0	1.0	0.9					1.0	1.0	1.0	1.2					1.0	1.0	1.0	N/A												
d50 (mm)	N/A	26.0	4.7	16.0					N/A	33.0	16.0	32.0					N/A	N/A	N/A	N/A												

**Appendix D. Table 11a. cont'd - Monitoring Data - Dimensional Morphology Summary**

**(Dimensional Parameters - Cross Sections)**

**Pee Dee Stream Restoration Site -Thompson Branch**

	Reach 2 Cross-Section 19 Pool								Reach 2 Cross-Section 20 Riffle								Reach 2 Cross-Section 21 Pool								Reach 2 Cross-Section 22 Riffle							
Dimension	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Record elevation (datum) used	364.1	364.1	364.1	364.1					363.2	363.2	363.2	363.2					356.0	356.0	356.0	356.0					356.0	356.0	356.0	356.0				
Bankfull Width (ft)	8.4	9.2	9.2	7.8					7.5	7.7	7.6	8.4					8.6	9.1	9.2	10.2					7.6	7.7	7.7	7.8				
Floodprone Width (ft)	>30	>30	>30	>30					>30	>30	>30	>30					>30	>30	>30	>30					>30	>30	>30	>30				
Bankfull Mean Depth (ft)	1.0	0.9	0.8	1.0					0.6	0.6	0.6	0.6					1.0	0.8	0.8	0.8					0.6	0.6	0.6	0.6				
Bankfull Max Depth (ft)	2.1	1.7	1.5	1.5					1.2	0.9	0.9	0.9					2.3	1.7	1.7	1.6					1.1	1.0	1.1	1.1				
Bankfull Cross Sectional Area (ft <sup>2</sup> )	8.8	8.1	7.0	7.7					4.2	4.4	4.4	4.8					8.5	7.5	7.8	8					4.3	4.4	4.4	4.4				
Bankfull Width/Depth Ratio	8.0	10.4	12.1	8.0					13.3	13.5	13.0	14.5					8.7	10.9	10.9	12.9					13.4	13.5	13.5	13.8				
Bankfull Entrenchment Ratio <sup>1</sup>	>3.6	>3.3	>3.3	N/A					>4.0	>3.9	>3.9	3.6					>3.5	>3.3	>3.2	N/A					>3.9	>3.9	>3.9	3.9				
Bankfull Bank Height Ratio	1.0	1.0	1.0	N/A					1.0	1.0	1.0	1.0					1.0	1.0	1.0	N/A					1.0	1.0	1.0	1.0				
d50 (mm)	N/A	N/A	N/A	N/A					N/A	0.2	9.9	47.0					N/A	N/A	N/A	N/A					N/A	29.0	30.0	53.0				

N/A - Information Not Available

<sup>1</sup> MY0 Bankfull Entrenchment Ratios Updated to Reflect Calculated Values









**Table 11b cont'd. Monitoring Data - Stream Reach Data Summary  
Pee Dee Stream Restoration Site - Thompson Branch 2 (1,061 feet)**

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7											
	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n						
Bankfull Width (ft)	7.5	7.6	7.6	7.6	0.1	2	7.7	7.7	7.7	7.7	0.0	2	7.6	7.7	7.7	7.7	0.1	2	7.8	8.1	8.1	8.4	0.4	2																														
Floodprone Width (ft)	31.1	32.7	32.7	34.3	2.3	2	30.0	30.0	30.0	30.0	0.0	2	30.0	30.0	30.0	30.0	0.0	2	30.0	30.0	30.0	30.0	0.0	2																														
Bankfull Mean Depth (ft)	0.6	0.6	0.6	0.6	0.0	2	0.6	0.6	0.6	0.6	0.0	2	0.6	0.6	0.6	0.6	0.0	2	0.6	0.6	0.6	0.6	0.0	2																														
Bankfull Max Depth (ft)	1.1	1.2	1.2	1.2	0.1	2	0.9	1.0	1.0	1.0	0.1	2	0.9	1.0	1.0	1.1	0.1	2	0.9	1.0	1.0	1.1	0.1	2																														
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	4.2	4.3	4.3	4.3	0.1	2	4.4	4.4	4.4	4.4	0.0	2	4.4	4.4	4.4	4.4	0.0	2	4.4	4.6	4.6	4.8	0.3	2																														
Width/Depth Ratio	13.3	13.4	13.4	13.4	0.1	2	13.5	13.5	13.5	13.5	0.0	2	13.0	13.3	13.3	13.5	0.4	2	13.8	14.2	14.2	14.5	0.5	2																														
Entrenchment Ratio	4.1	4.3	4.3	4.5	0.3	2	3.9	3.9	3.9	3.9	0.0	2	3.9	3.9	3.9	3.9	0.0	2	3.6	3.8	3.8	3.9	0.2	2																														
Bank Height Ratio	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2	1.0	1.0	1.0	1.0	0.0	2																														
<b>Profile</b>																																																						
Riffle Length (ft)	10.0	15.8	15.2	25.4	3.9	32																																																
Riffle Slope (ft/ft)	0.005	0.014	0.013	0.023	0.005	32																																																
Pool Length (ft)	1.8	5.0	4.6	18.3	3.0	32																																																
Pool Max Depth (ft)	1.4	2.1	2.0	2.6	0.3	32																																																
Pool Spacing (ft)	19.5	27.5	25.9	54.0	7.4	32																																																
<b>Pattern</b>																																																						
Channel Belt Width (ft)	14.4	22.4	19.5	37.8	8.2	6																																																
Radius of Curvature (ft)	10.5	18.3	18.5	25.9	6.7	4																																																
Rc: Bankfull Width (ft/ft)	1.4	2.4	2.5	3.5	0.9	3																																																
Meander Wavelength (ft)	34.3	48.7	50.5	60.9	9.8	6																																																
Meander Width Ratio	2.2	3.0	2.6	4.1	1.0	3																																																
<b>Additional Reach Parameters</b>																																																						
Rosgen Classification	B4																																																					
Channel Thalweg Length (ft)	1,061																																																					
Sinuosity (ft)	1.05																																																					
Water Surface Slope (Channel) (ft/ft)	0.020																																																					
Bankfull Slope (ft/ft)	0.022																																																					
Ri% / Ru% / P% / G% / S%	57%	0%	18%	11%	14%																																																	

N/A - Information does not apply.

Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step

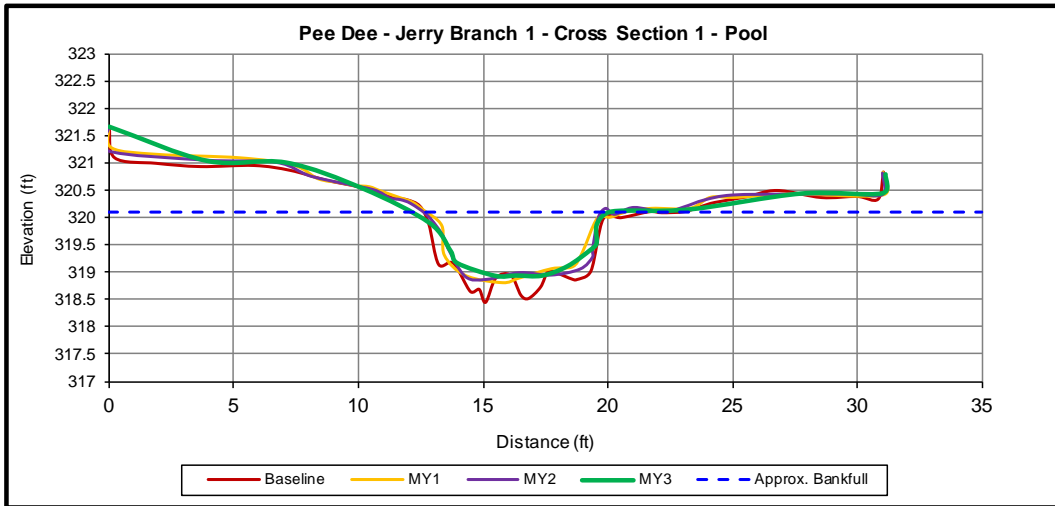




Upstream



Downstream



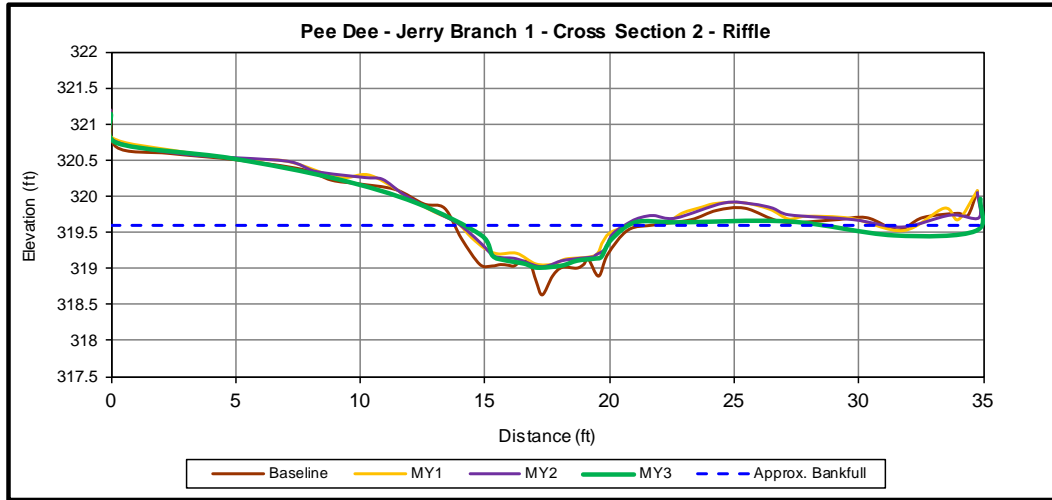
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	9.1	8.3	8.3	8.2	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	0.9	0.8	0.8	0.8	-	-	-	-
Bankfull Max Depth (ft)	1.7	1.3	1.2	1.2	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	8.5	6.8	6.9	6.6	-	-	-	-
Width/Depth Ratio	9.8	10.1	9.9	10.1	-	-	-	-
Entrenchment Ratio	2.7	3.0	3.0	N/A	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	N/A	-	-	-	-



Upstream



Downstream



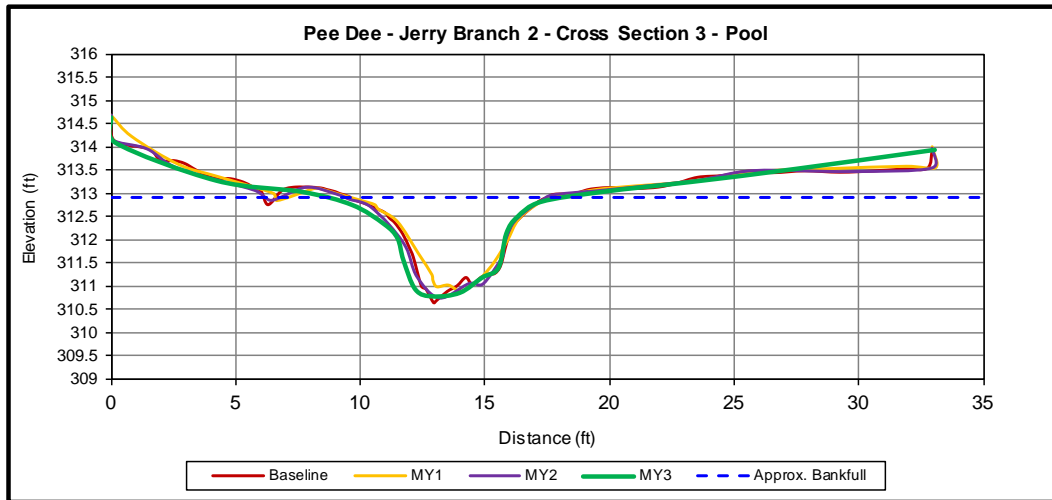
<b>DIMENSIONS SUMMARY</b>	<b>MY0</b>	<b>MY1</b>	<b>MY2</b>	<b>MY3</b>	<b>MY4</b>	<b>MY5</b>	<b>MY6</b>	<b>MY7</b>
Bankful Width (ft)	8.1	7.0	6.7	6.9	-	-	-	-
Floodprone Width (ft)	30.0	30.0	30.0	30.0	-	-	-	-
Bankfull Mean Depth (ft)	0.5	0.3	0.4	0.4	-	-	-	-
Bankfull Max Depth (ft)	1.0	0.5	0.6	0.6	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	3.7	2.4	2.6	2.7	-	-	-	-
Width/Depth Ratio	17.7	20.3	17.5	17.6	-	-	-	-
Entrenchment Ratio	3.7	4.3	4.5	4.0	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-



Upstream



Downstream



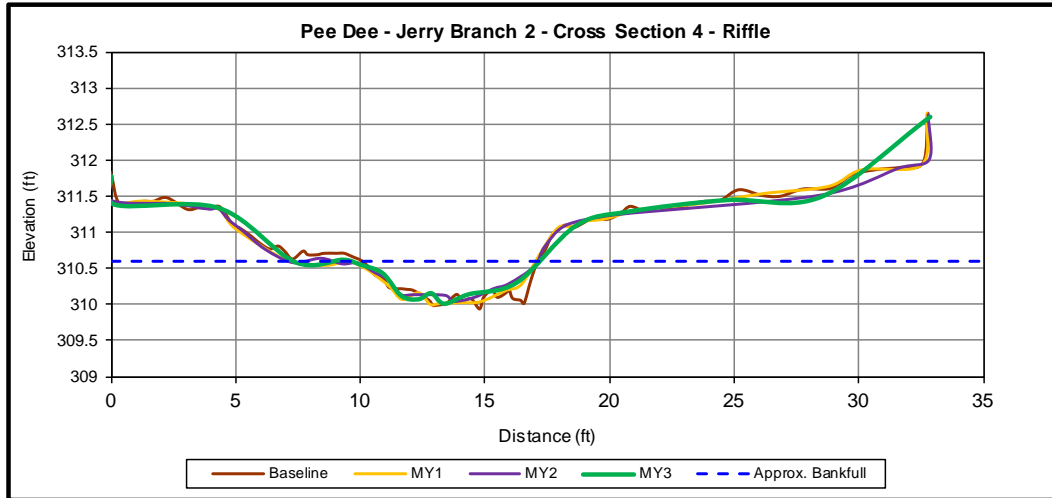
<b>DIMENSIONS SUMMARY</b>	<b>MY0</b>	<b>MY1</b>	<b>MY2</b>	<b>MY3</b>	<b>MY4</b>	<b>MY5</b>	<b>MY6</b>	<b>MY7</b>
Bankful Width (ft)	7.8	8.1	8.1	9.8	-	-	-	-
Floodprone Width (ft)	30.0	30.0	30.0	30.0	-	-	-	-
Bankfull Mean Depth (ft)	1.1	1.0	1.1	1.0	-	-	-	-
Bankfull Max Depth (ft)	2.3	2.0	2.2	2.1	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	8.3	7.7	8.7	9.4	-	-	-	-
Width/Depth Ratio	7.4	8.4	7.6	10.2	-	-	-	-
Entrenchment Ratio	3.8	3.7	3.7	N/A	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	N/A	-	-	-	-



Upstream



Downstream



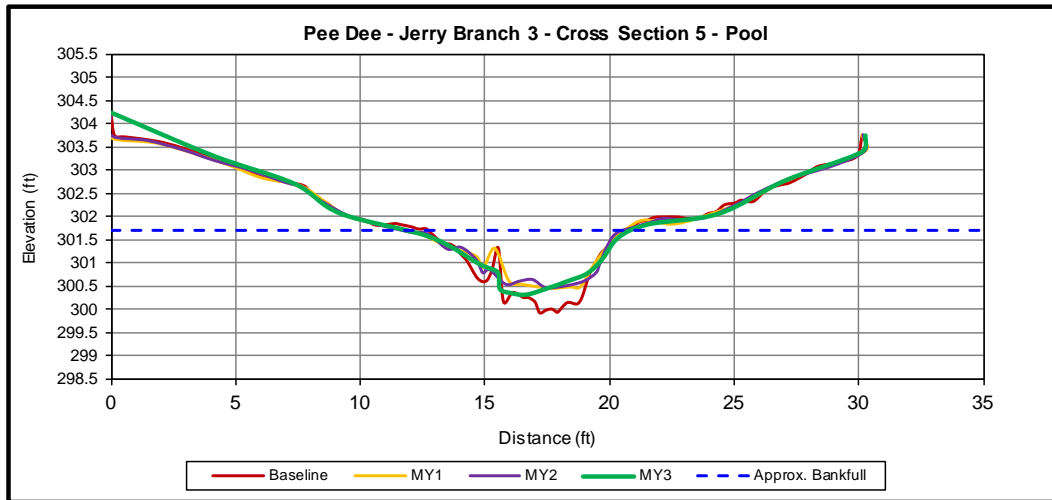
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	7.1	7.2	7.2	7.7	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.4	0.4	0.3	-	-	-	-
Bankfull Max Depth (ft)	0.7	0.6	0.6	0.6	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	3.1	3.0	2.7	2.6	-	-	-	-
Width/Depth Ratio	16.4	17.0	19.4	22.6	-	-	-	-
Entrenchment Ratio	3.5	3.5	3.5	3.2	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	0.9	-	-	-	-



Upstream



Downstream



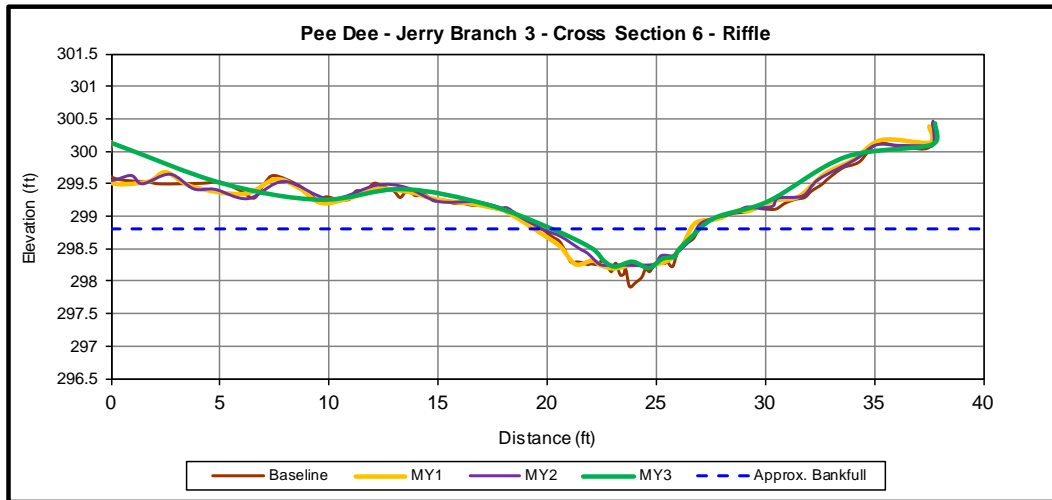
<b>DIMENSIONS SUMMARY</b>	<b>MY0</b>	<b>MY1</b>	<b>MY2</b>	<b>MY3</b>	<b>MY4</b>	<b>MY5</b>	<b>MY6</b>	<b>MY7</b>
Bankfull Width (ft)	8.1	9.2	9.7	9.4	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	1.0	0.7	0.7	0.7	-	-	-	-
Bankfull Max Depth (ft)	1.8	1.3	1.3	1.4	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	7.9	6.3	6.8	6.9	-	-	-	-
Width/Depth Ratio	8.3	13.2	13.7	13.0	-	-	-	-
Entrenchment Ratio	3.1	2.7	2.6	N/A	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	N/A	-	-	-	-



Upstream



Downstream



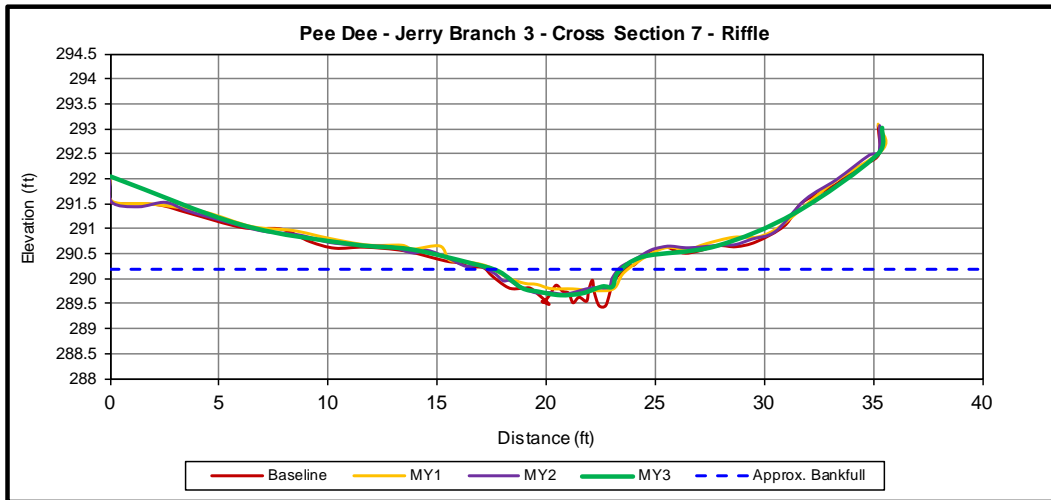
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	7.4	7.5	7.3	6.9	-	-	-	-
Floodprone Width (ft)	30.0	30.0	30.0	30.0	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.4	0.4	0.4	-	-	-	-
Bankfull Max Depth (ft)	0.9	0.6	0.6	0.6	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	3.3	3.3	2.9	2.4	-	-	-	-
Width/Depth Ratio	16.6	16.7	18.7	19.4	-	-	-	-
Entrenchment Ratio	4.1	4.0	4.1	4.4	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-



Upstream



Downstream



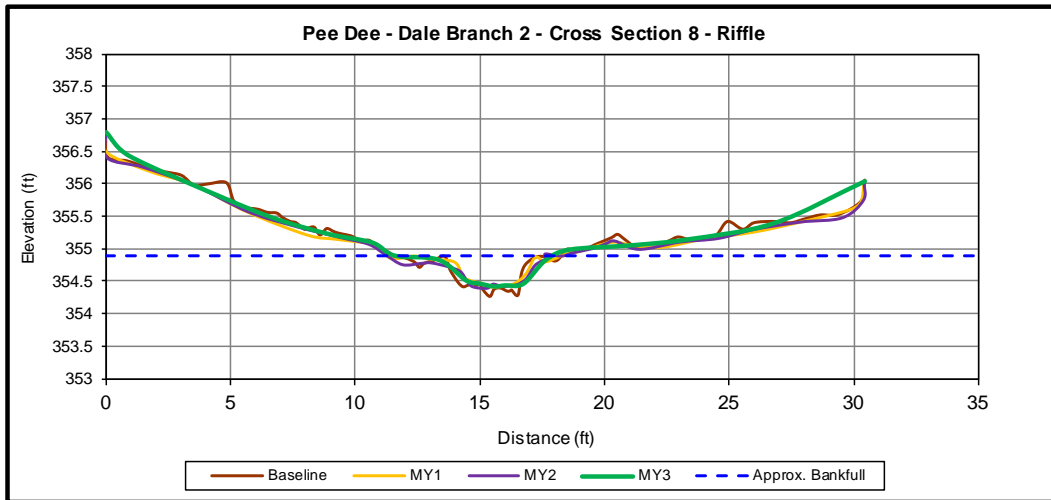
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	7.2	6.7	6.4	6.2	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.3	0.4	0.4	-	-	-	-
Bankfull Max Depth (ft)	0.8	0.5	0.5	0.5	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	3.0	2.3	2.4	2.2	-	-	-	-
Width/Depth Ratio	17.7	19.4	17.0	17.4	-	-	-	-
Entrenchment Ratio	3.4	3.7	3.9	4.0	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	0.9	-	-	-	-



Upstream



Downstream



DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankfull Width (ft)	7.0	7.3	7.2	6.5	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	0.3	0.2	0.3	0.2	-	-	-	-
Bankfull Max Depth (ft)	0.7	0.5	0.5	0.5	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	2.0	1.7	2.0	1.6	-	-	-	-
Width/Depth Ratio	24.6	30.6	26.0	26.9	-	-	-	-
Entrenchment Ratio	3.6	3.4	3.5	3.9	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	0.9	-	-	-	-

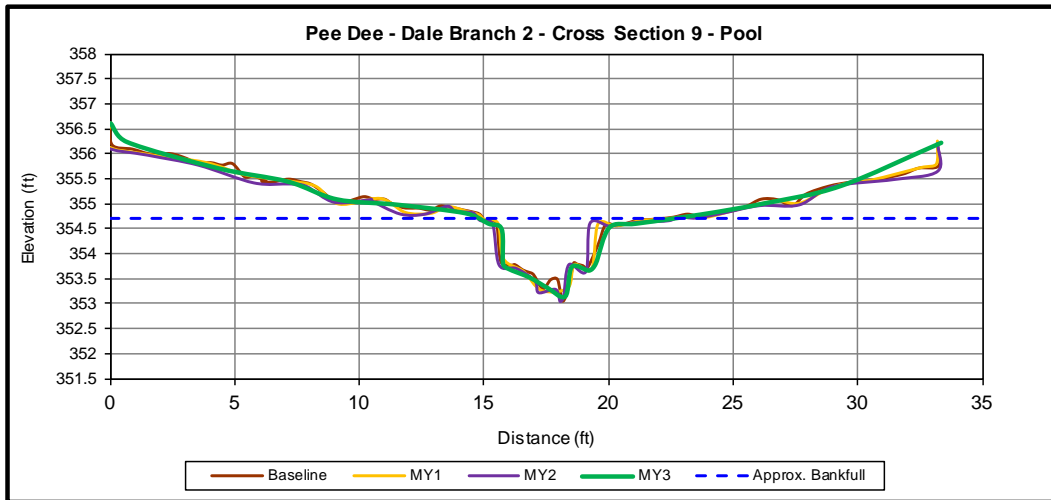




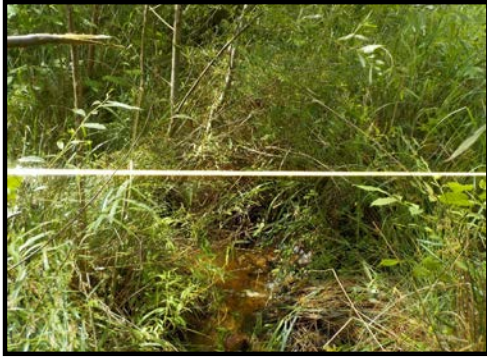
Upstream



Downstream



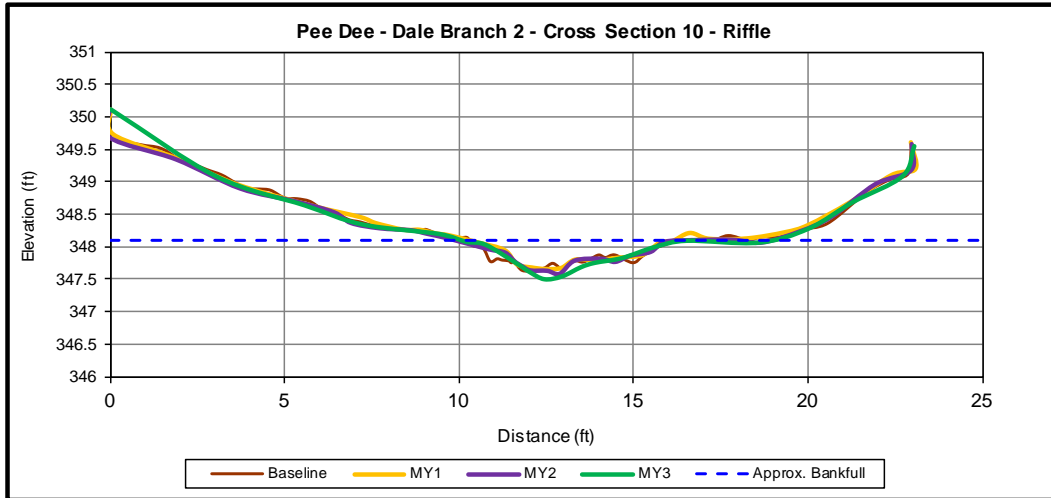
<b>DIMENSIONS SUMMARY</b>	<b>MY0</b>	<b>MY1</b>	<b>MY2</b>	<b>MY3</b>	<b>MY4</b>	<b>MY5</b>	<b>MY6</b>	<b>MY7</b>
Bankful Width (ft)	7.7	8.0	8.1	7.7	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	0.6	0.6	0.6	0.6	-	-	-	-
Bankfull Max Depth (ft)	1.7	1.5	1.7	1.5	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	4.8	4.8	5.0	5.0	-	-	-	-
Width/Depth Ratio	12.3	13.5	13.3	11.8	-	-	-	-
Entrenchment Ratio	3.3	3.1	3.1	N/A	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	N/A	-	-	-	-



Upstream



Downstream



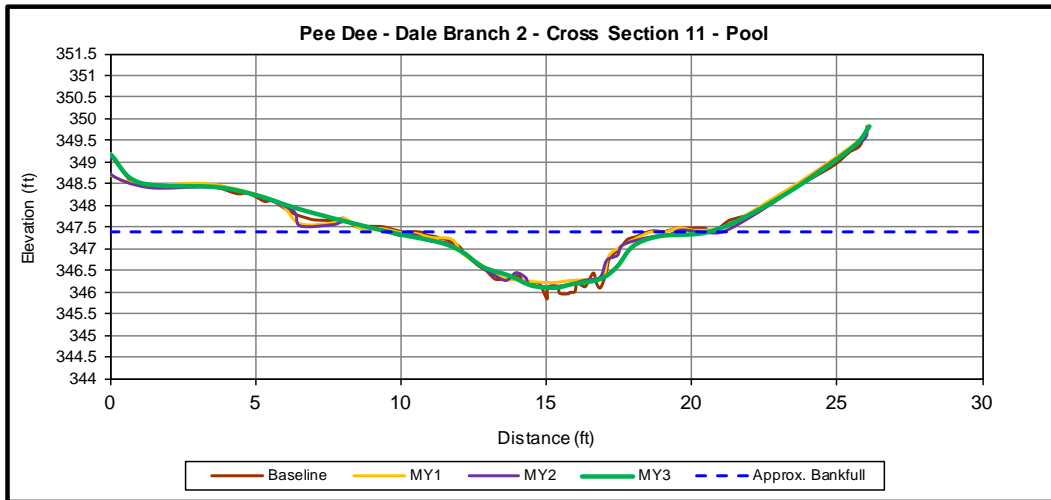
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	6.4	6.2	6.2	6.5	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	0.3	0.3	0.3	0.3	-	-	-	-
Bankfull Max Depth (ft)	0.5	0.5	0.5	0.6	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	1.8	1.6	1.7	1.8	-	-	-	-
Width/Depth Ratio	22.6	23.7	21.7	23.4	-	-	-	-
Entrenchment Ratio	3.9	4.0	4.1	3.9	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	0.9	-	-	-	-



Upstream



Downstream



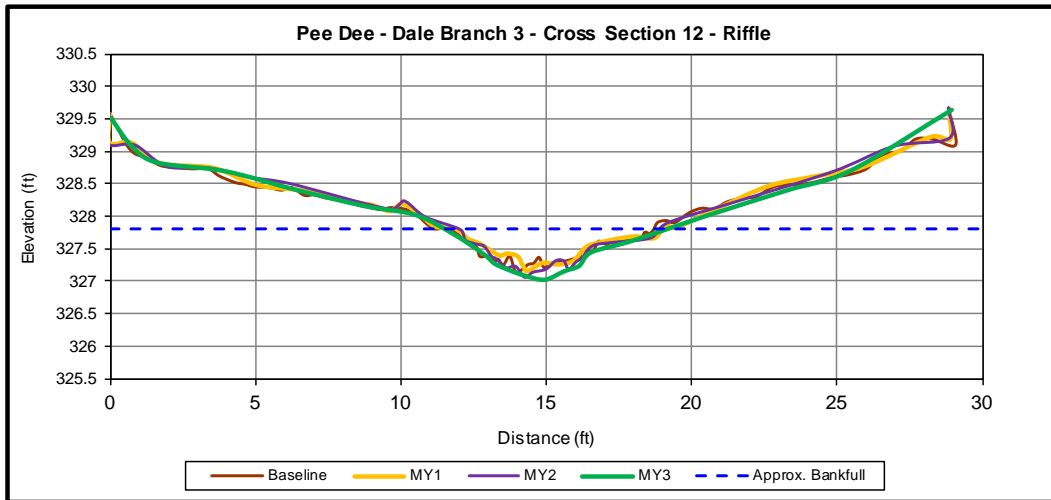
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	7.6	8.0	8.3	9.4	-	-	-	-
Floodprone Width (ft)	20.0	20.0	20.0	20.0	-	-	-	-
Bankfull Mean Depth (ft)	0.8	0.7	0.7	0.7	-	-	-	-
Bankfull Max Depth (ft)	1.6	1.2	1.3	1.3	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	6.1	5.9	6.0	6.7	-	-	-	-
Width/Depth Ratio	9.5	10.9	11.5	13.3	-	-	-	-
Entrenchment Ratio	2.6	2.5	2.4	N/A	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	N/A	-	-	-	-



Upstream



Downstream



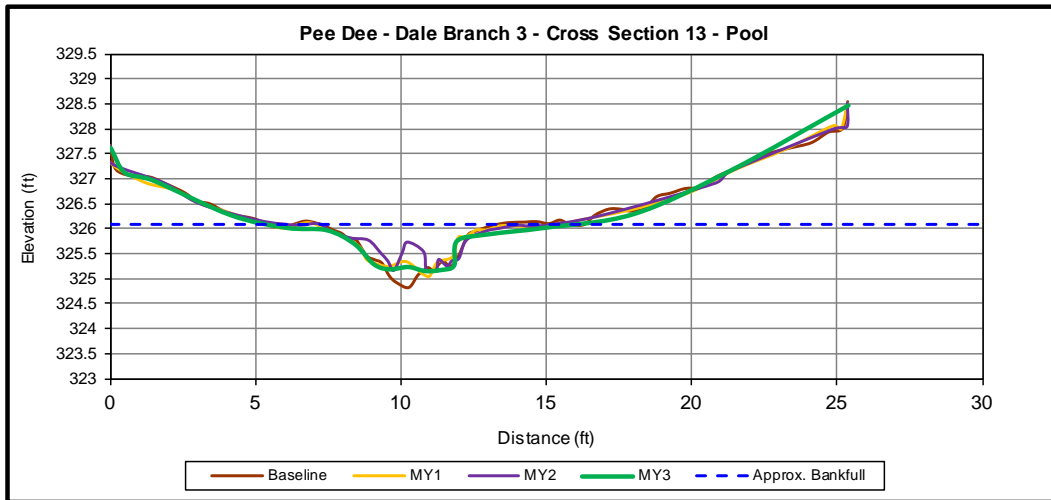
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankfull Width (ft)	7.3	7.1	7.1	7.8	-	-	-	-
Floodprone Width (ft)	20.0	20.0	20.0	20.0	-	-	-	-
Bankfull Mean Depth (ft)	0.3	0.3	0.4	0.4	-	-	-	-
Bankfull Max Depth (ft)	0.7	0.6	0.8	0.8	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	2.5	2.2	2.7	3.1	-	-	-	-
Width/Depth Ratio	21.1	23.1	18.7	19.3	-	-	-	-
Entrenchment Ratio	2.8	2.8	2.8	2.6	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	0.5	-	-	-	-



Upstream



Downstream



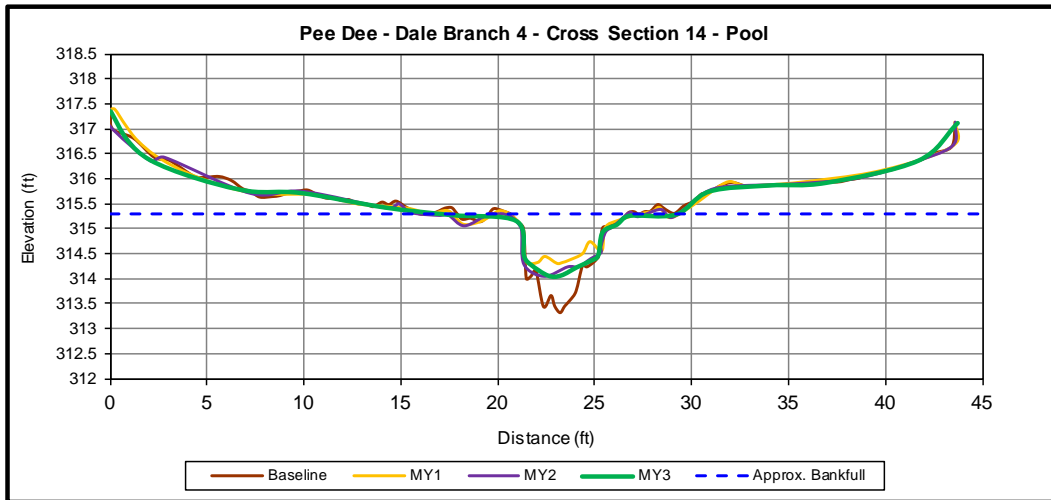
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	7.8	7.6	7.7	8.3	-	-	-	-
Floodprone Width (ft)	20.0	20.0	20.0	20.0	-	-	-	-
Bankfull Mean Depth (ft)	0.5	0.5	0.4	0.4	-	-	-	-
Bankfull Max Depth (ft)	1.3	1.1	1.0	0.9	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	3.9	3.5	3.0	3.7	-	-	-	-
Width/Depth Ratio	15.7	16.7	19.7	18.5	-	-	-	-
Entrenchment Ratio	2.6	2.6	2.6	N/A	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	N/A	-	-	-	-



Upstream



Downstream



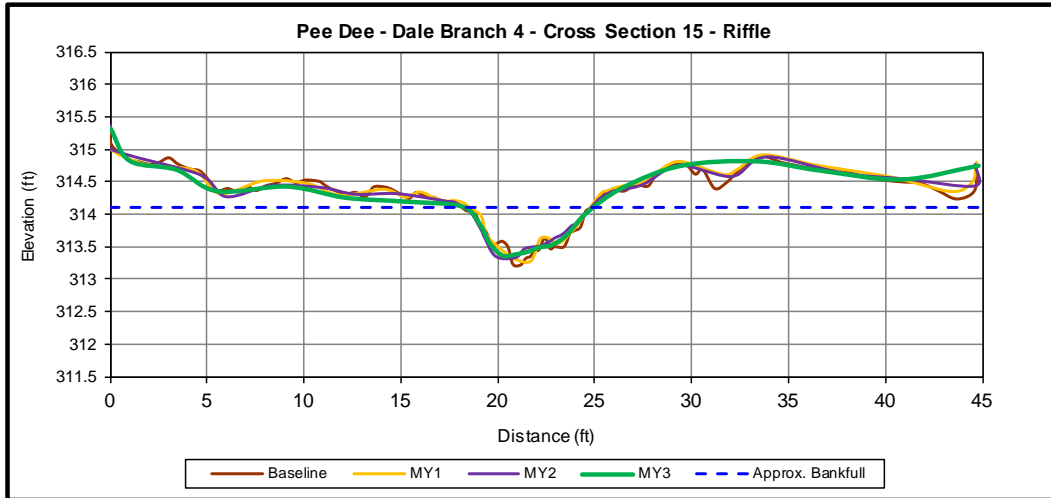
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	6.7	7.2	7.0	5.8	-	-	-	-
Floodprone Width (ft)	30.0	30.0	30.0	30.0	-	-	-	-
Bankfull Mean Depth (ft)	0.9	0.6	0.7	0.8	-	-	-	-
Bankfull Max Depth (ft)	2.0	1.0	1.3	1.3	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	6.2	4.3	5.2	4.9	-	-	-	-
Width/Depth Ratio	7.1	12.1	9.5	7.0	-	-	-	-
Entrenchment Ratio	4.5	4.2	4.3	N/A	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	N/A	-	-	-	-



Upstream



Downstream



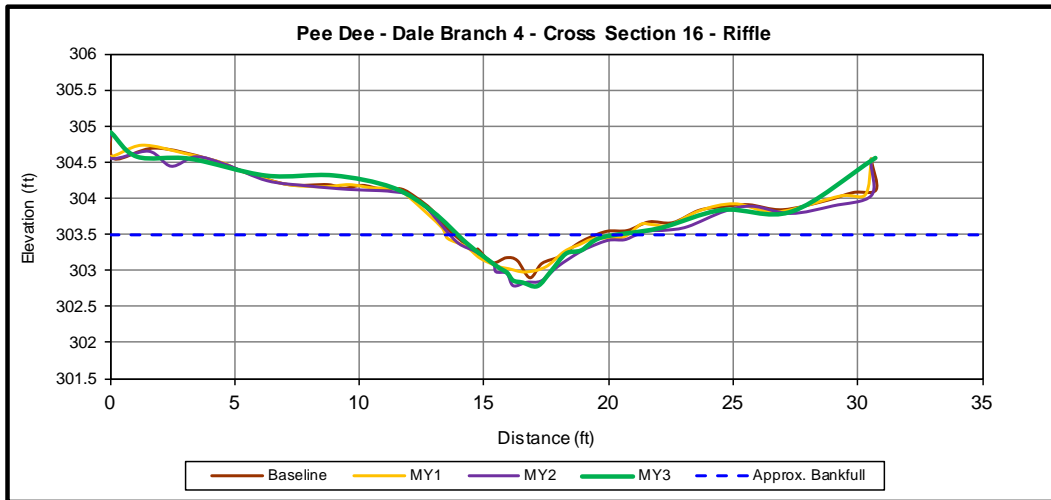
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	6.5	6.2	6.5	6.8	-	-	-	-
Floodprone Width (ft)	40.0	40.0	40.0	40.0	-	-	-	-
Bankfull Mean Depth (ft)	0.5	0.5	0.5	0.5	-	-	-	-
Bankfull Max Depth (ft)	0.9	0.8	0.8	0.8	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	3.1	2.9	3.0	3.2	-	-	-	-
Width/Depth Ratio	13.8	13.2	14.2	14.7	-	-	-	-
Entrenchment Ratio	6.1	6.5	6.2	5.9	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-



Upstream



Downstream



DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	6.3	7.2	7.6	6.7	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	0.3	0.3	0.4	0.3	-	-	-	-
Bankfull Max Depth (ft)	0.7	0.6	0.7	0.7	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	1.9	2.3	2.7	2.2	-	-	-	-
Width/Depth Ratio	21.0	23.0	20.9	19.9	-	-	-	-
Entrenchment Ratio	4.0	3.5	3.3	3.8	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	0.9	-	-	-	-

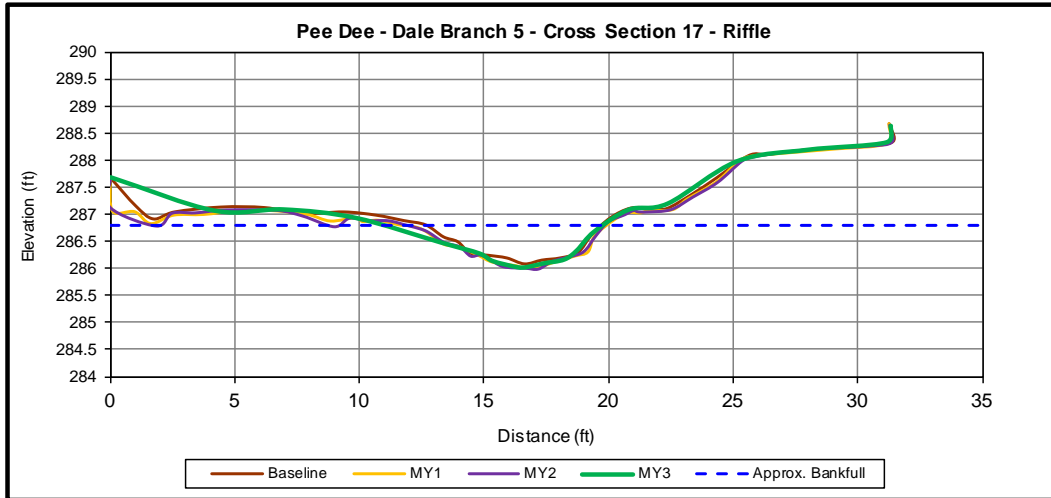




Upstream



Downstream



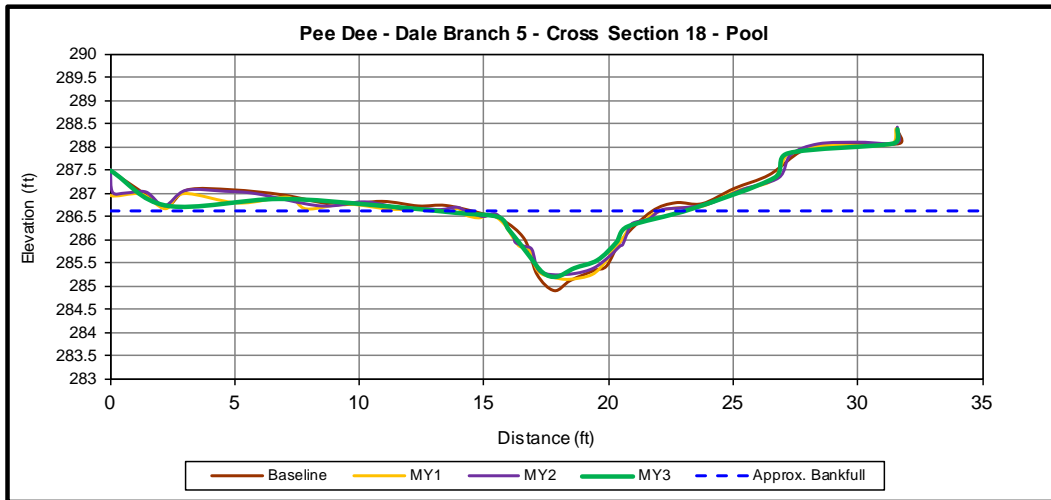
<b>DIMENSIONS SUMMARY</b>	<b>MY0</b>	<b>MY1</b>	<b>MY2</b>	<b>MY3</b>	<b>MY4</b>	<b>MY5</b>	<b>MY6</b>	<b>MY7</b>
Bankful Width (ft)	7.1	7.9	7.9	9.1	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	0.5	0.5	0.5	0.4	-	-	-	-
Bankfull Max Depth (ft)	0.7	0.8	0.8	0.8	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	3.3	3.8	3.9	4.1	-	-	-	-
Width/Depth Ratio	15.2	16.2	16.3	20.6	-	-	-	-
Entrenchment Ratio	3.5	3.2	3.2	2.7	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.2	-	-	-	-



Upstream



Downstream



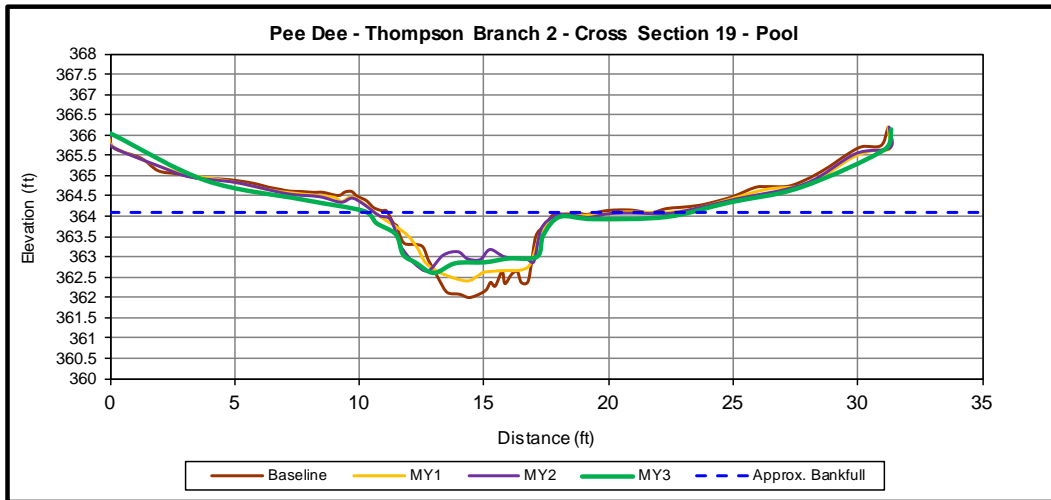
<b>DIMENSIONS SUMMARY</b>	<b>MY0</b>	<b>MY1</b>	<b>MY2</b>	<b>MY3</b>	<b>MY4</b>	<b>MY5</b>	<b>MY6</b>	<b>MY7</b>
Bankful Width (ft)	7.2	8.0	7.7	7.4	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	0.8	0.7	0.7	0.7	-	-	-	-
Bankfull Max Depth (ft)	1.7	1.5	1.4	1.4	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	5.9	5.8	5.6	5.3	-	-	-	-
Width/Depth Ratio	8.7	11.0	10.7	10.4	-	-	-	-
Entrenchment Ratio	3.5	3.1	3.2	N/A	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	N/A	-	-	-	-



Upstream



Downstream



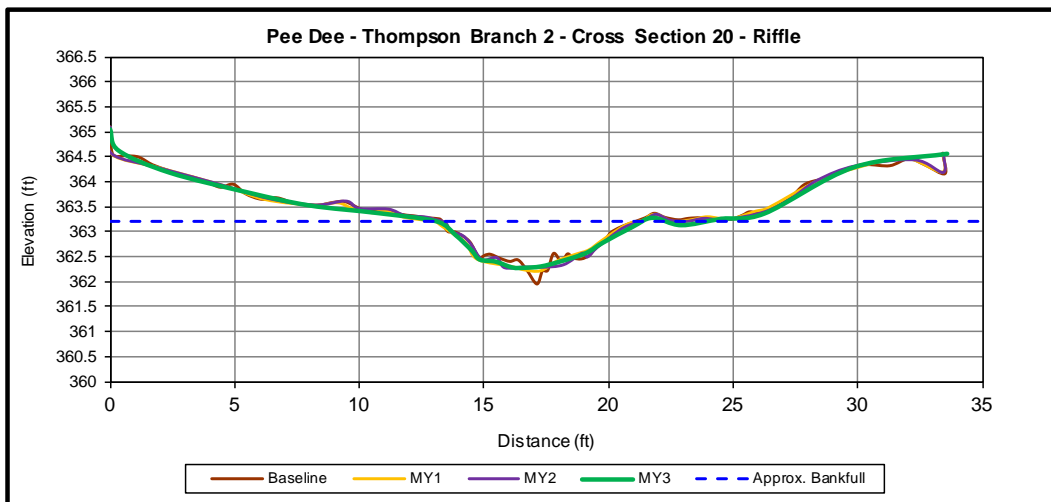
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	8.4	9.2	9.2	7.8	-	-	-	-
Floodprone Width (ft)	30.0	30.0	30.0	30.0	-	-	-	-
Bankfull Mean Depth (ft)	1.0	0.9	0.8	1.0	-	-	-	-
Bankfull Max Depth (ft)	2.1	1.7	1.5	1.5	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	8.8	8.1	7.0	7.7	-	-	-	-
Width/Depth Ratio	8.0	10.4	12.1	8.0	-	-	-	-
Entrenchment Ratio	3.6	3.3	3.3	N/A	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	N/A	-	-	-	-



Upstream



Downstream



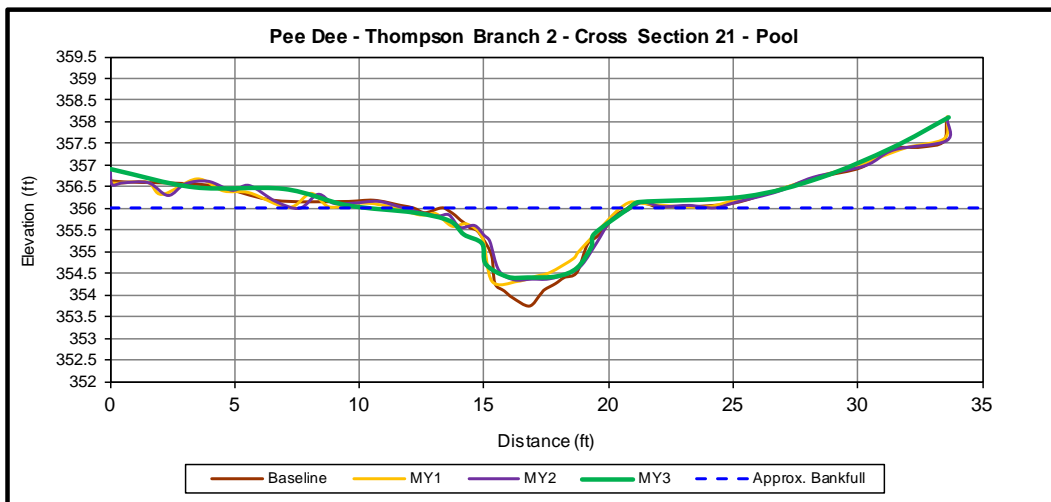
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	7.5	7.7	7.6	8.4	-	-	-	-
Floodprone Width (ft)	30.0	30.0	30.0	30.0	-	-	-	-
Bankfull Mean Depth (ft)	0.6	0.6	0.6	0.6	-	-	-	-
Bankfull Max Depth (ft)	1.2	0.9	0.9	0.9	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	4.2	4.4	4.4	4.8	-	-	-	-
Width/Depth Ratio	13.3	13.5	13.0	14.5	-	-	-	-
Entrenchment Ratio	4.0	3.9	3.9	3.6	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-



Upstream



Downstream



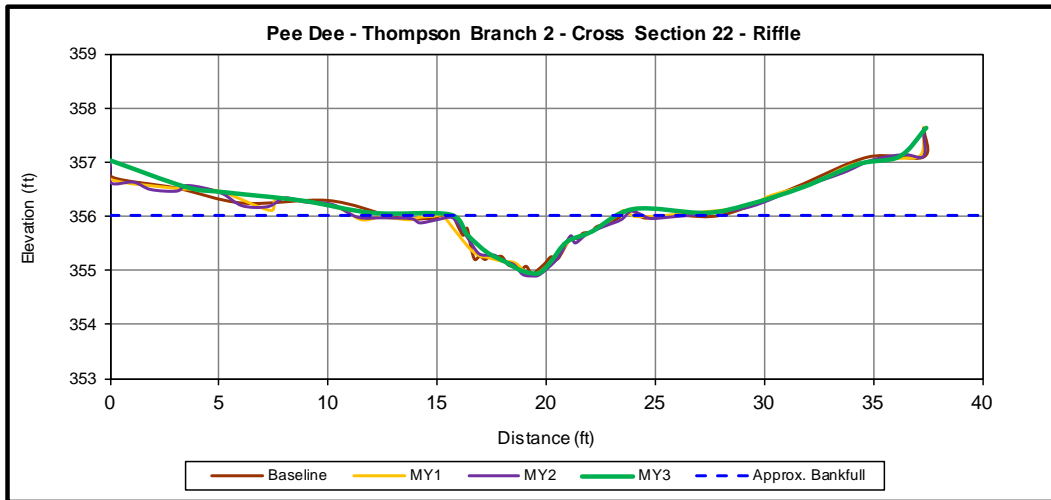
DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	8.6	9.1	9.2	10.2	-	-	-	-
Floodprone Width (ft)	30.0	30.0	30.0	30.0	-	-	-	-
Bankfull Mean Depth (ft)	1.0	0.8	0.8	0.8	-	-	-	-
Bankfull Max Depth (ft)	2.3	1.7	1.7	1.6	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	8.5	7.5	7.8	8.0	-	-	-	-
Width/Depth Ratio	8.7	10.9	10.9	12.9	-	-	-	-
Entrenchment Ratio	3.5	3.3	3.2	N/A	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	N/A	-	-	-	-



Upstream



Downstream



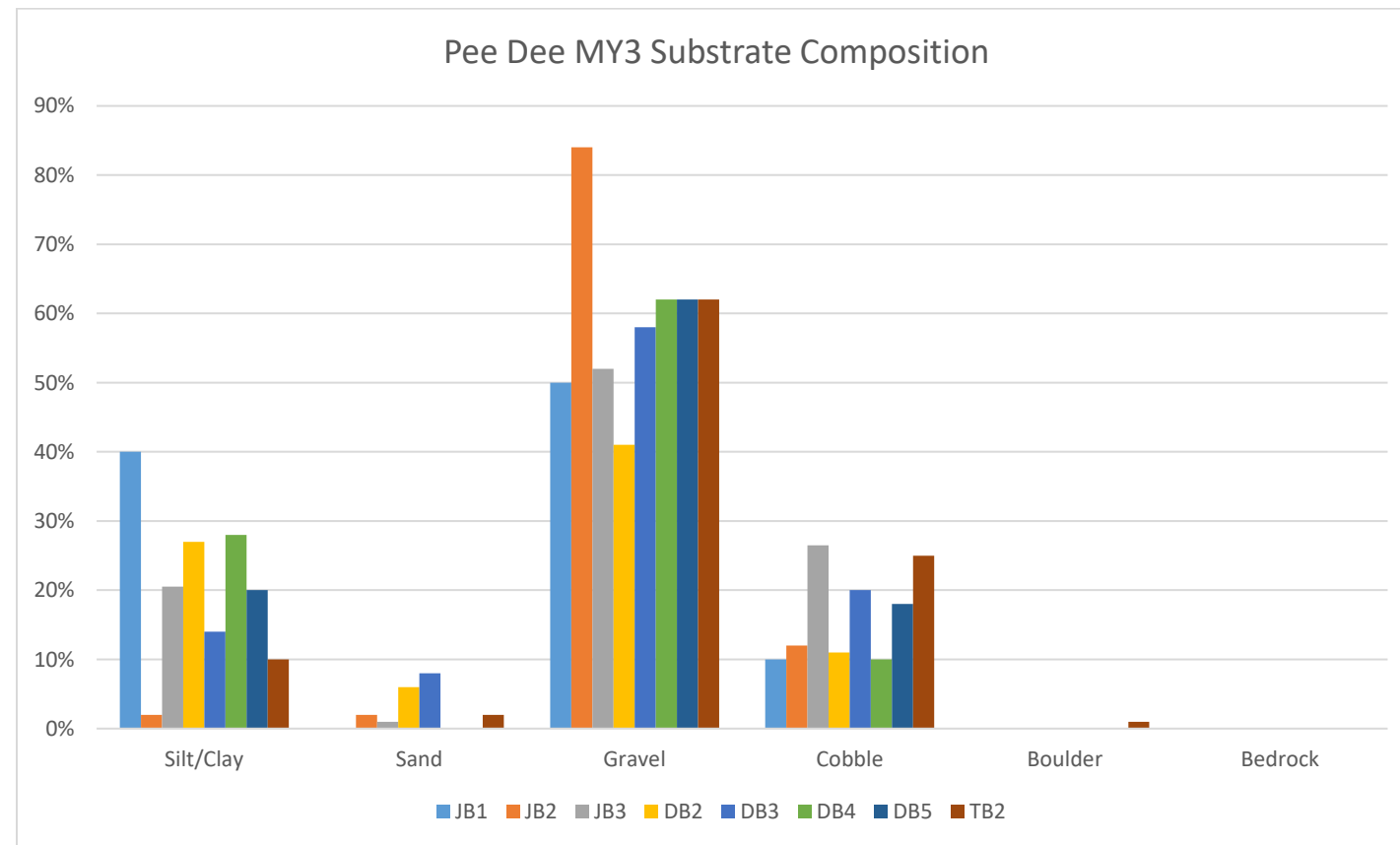
<b>DIMENSIONS SUMMARY</b>	<b>MY0</b>	<b>MY1</b>	<b>MY2</b>	<b>MY3</b>	<b>MY4</b>	<b>MY5</b>	<b>MY6</b>	<b>MY7</b>
Bankful Width (ft)	7.6	7.7	7.7	7.8	-	-	-	-
Floodprone Width (ft)	30.0	30.0	30.0	30.0	-	-	-	-
Bankfull Mean Depth (ft)	0.6	0.6	0.6	0.6	-	-	-	-
Bankfull Max Depth (ft)	1.1	1.0	1.1	1.1	-	-	-	-
Bankfull Cross-Sectional Area (ft <sup>2</sup> )	4.3	4.4	4.4	4.4	-	-	-	-
Width/Depth Ratio	13.4	13.5	13.5	13.8	-	-	-	-
Entrenchment Ratio	3.9	3.9	3.9	3.9	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

**Table 12. Pebble Count Data Summary**

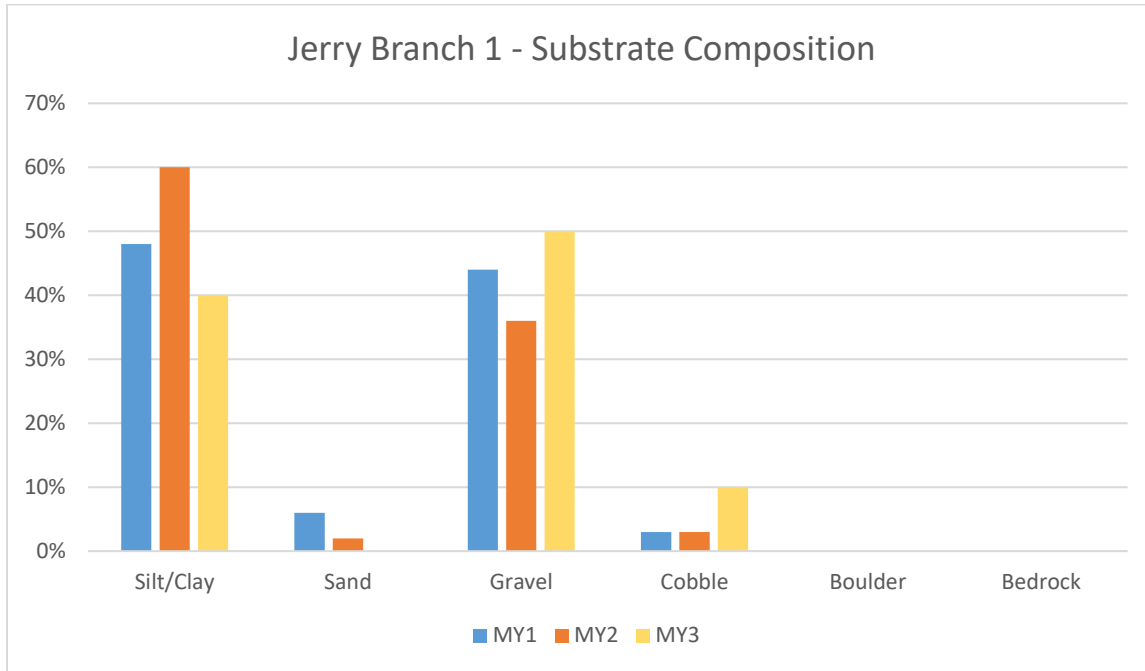
Stream Reach	MY1 - 2015		MY2 - 2016		MY3 - 2017		MY4 - 2018		MY5 - 2019		MY6 - 2020		MY7 - 2021	
	Pebble Count		Pebble Count		Pebble Count		Pebble Count		Pebble Count		Pebble Count		Pebble Count	
	D <sub>50</sub> (mm)	D <sub>84</sub> (mm)	D <sub>50</sub> (mm)	D <sub>84</sub> (mm)	D <sub>50</sub> (mm)	D <sub>84</sub> (mm)	D <sub>50</sub> (mm)	D <sub>84</sub> (mm)	D <sub>50</sub> (mm)	D <sub>84</sub> (mm)	D <sub>50</sub> (mm)	D <sub>84</sub> (mm)	D <sub>50</sub> (mm)	D <sub>84</sub> (mm)
Jerry Branch 1	0.2	34	0.062	5.2	12	58								
Jerry Branch 2	22	44	5.2	9.6	12	30								
Jerry Branch 3	20	44	15	51	40	76								
Dale Branch 2	14	45	6.3	32	16	51								
Dale Branch 3	2.1	13	4.4	30	8	80								
Dale Branch 4	21	44	5	37	14	71								
Dale Branch 5	33	60	16	41	32	69								
Thompson Branch 2	15	51	20	51	50	95								

**Charts 1-9. MY3 Stream Reach Substrate Composition Charts**

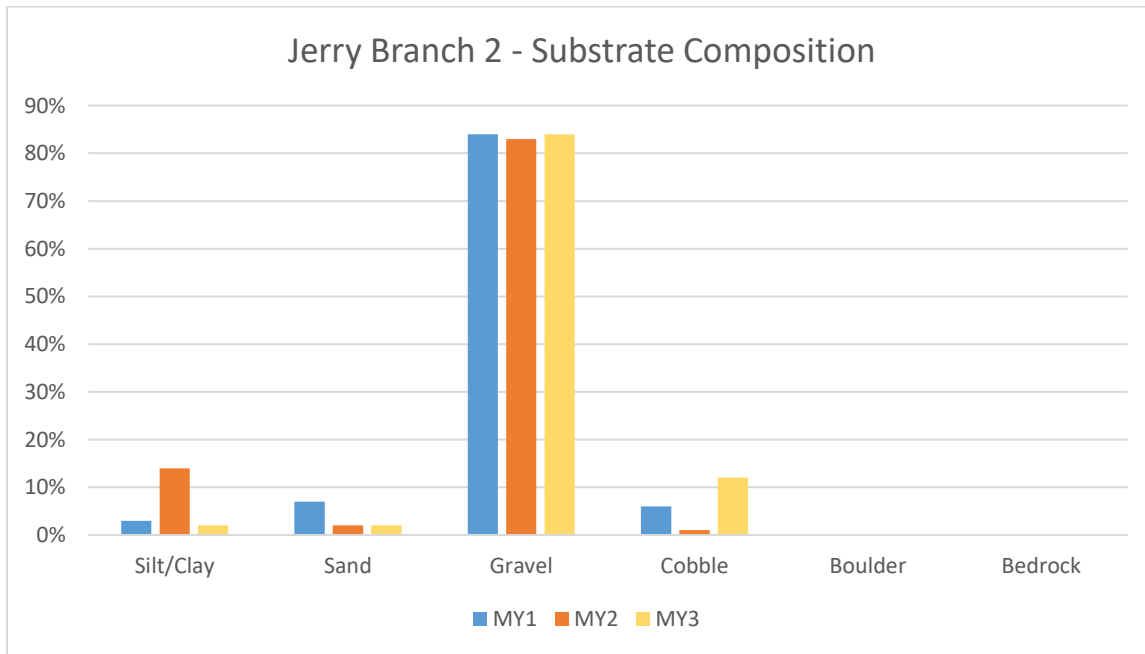
**Chart 1.**



**Chart 2.**

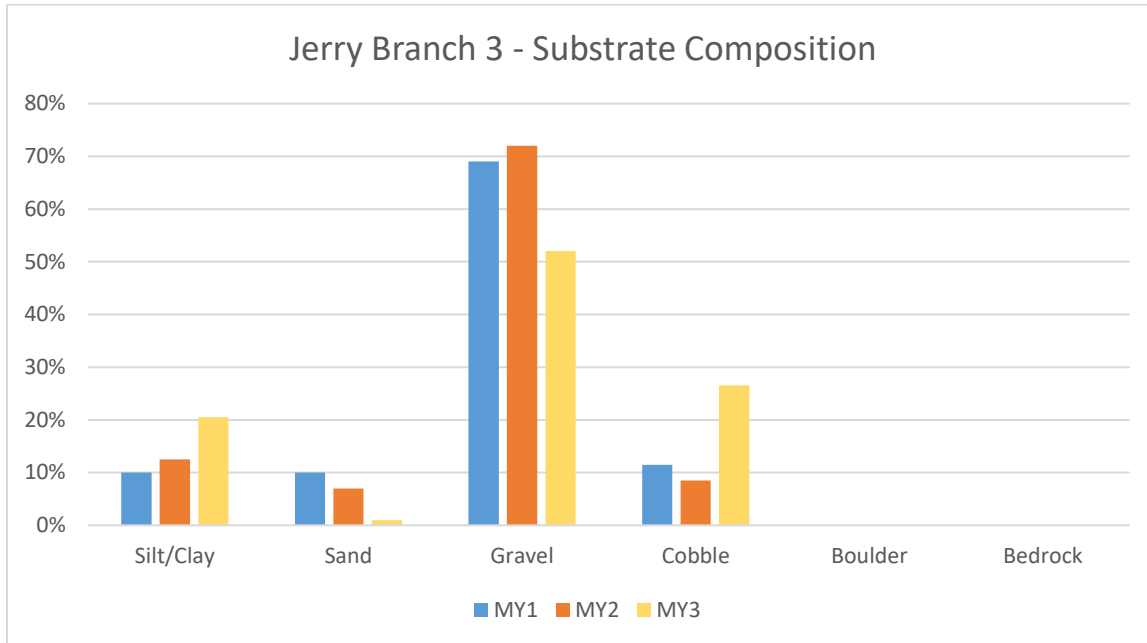


**Chart 3.**

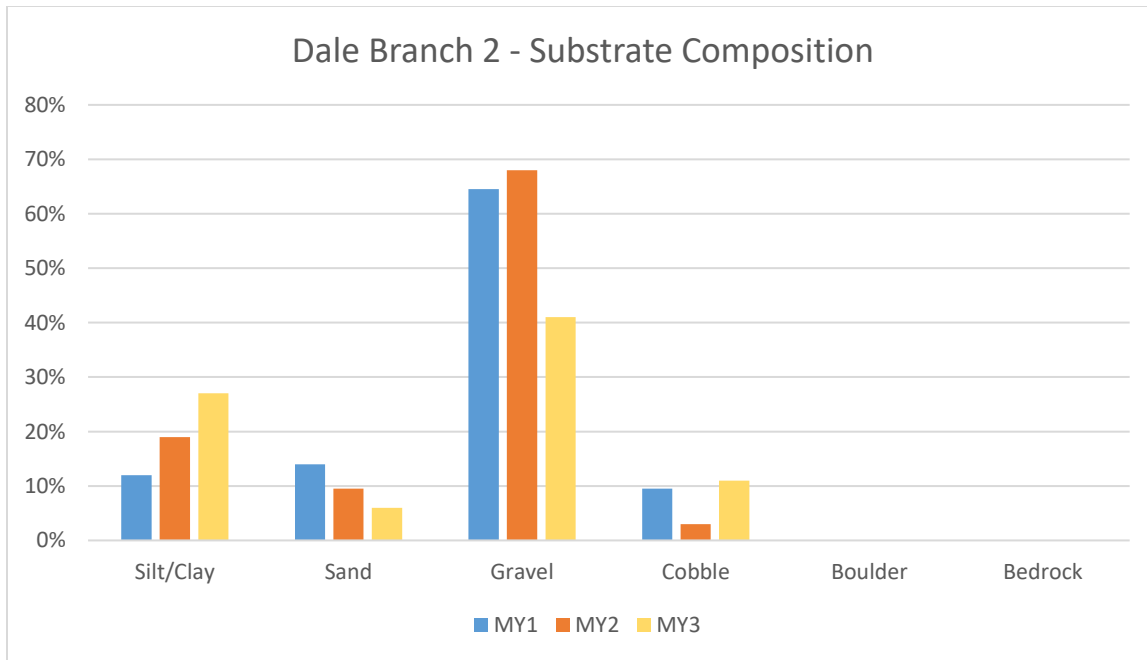




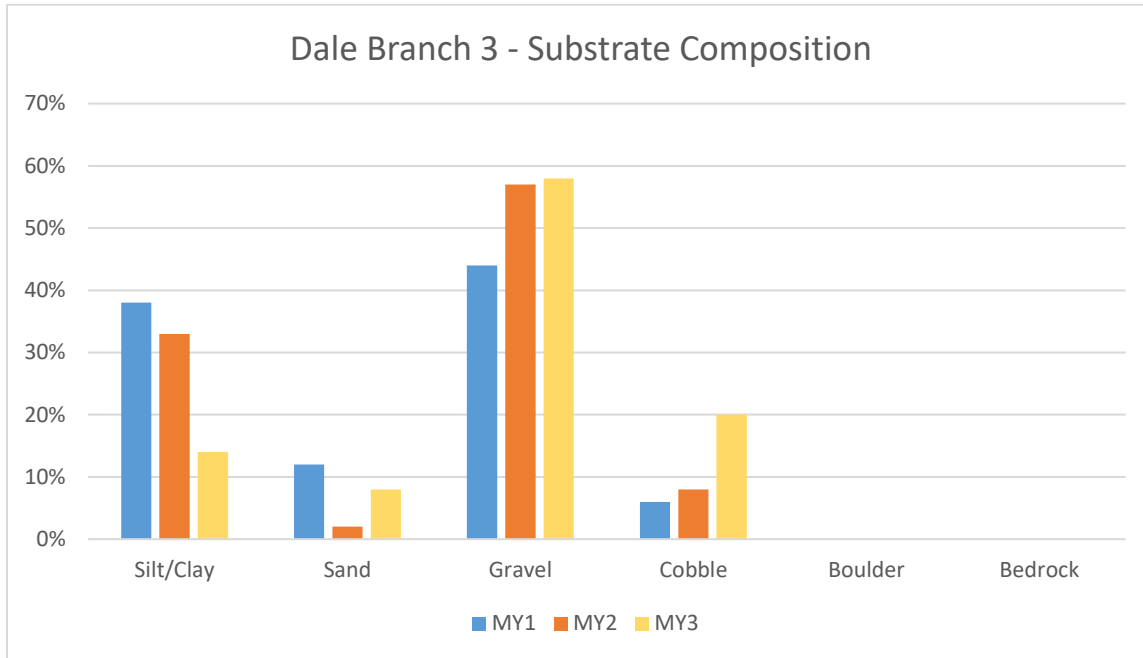
**Chart 4.**



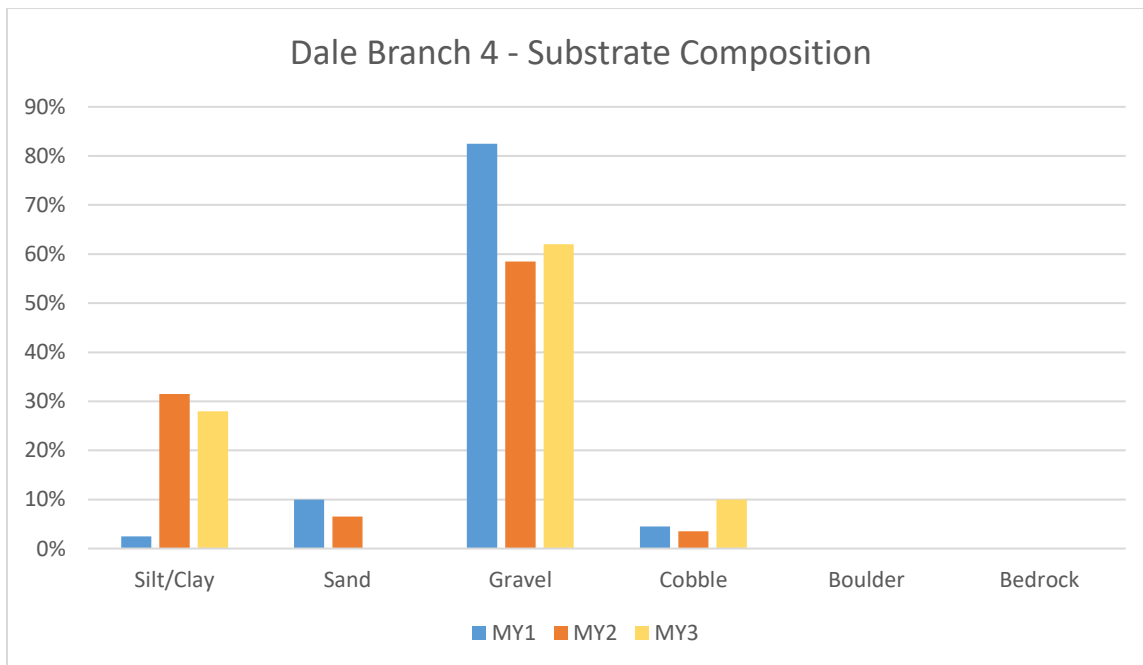
**Chart 5.**



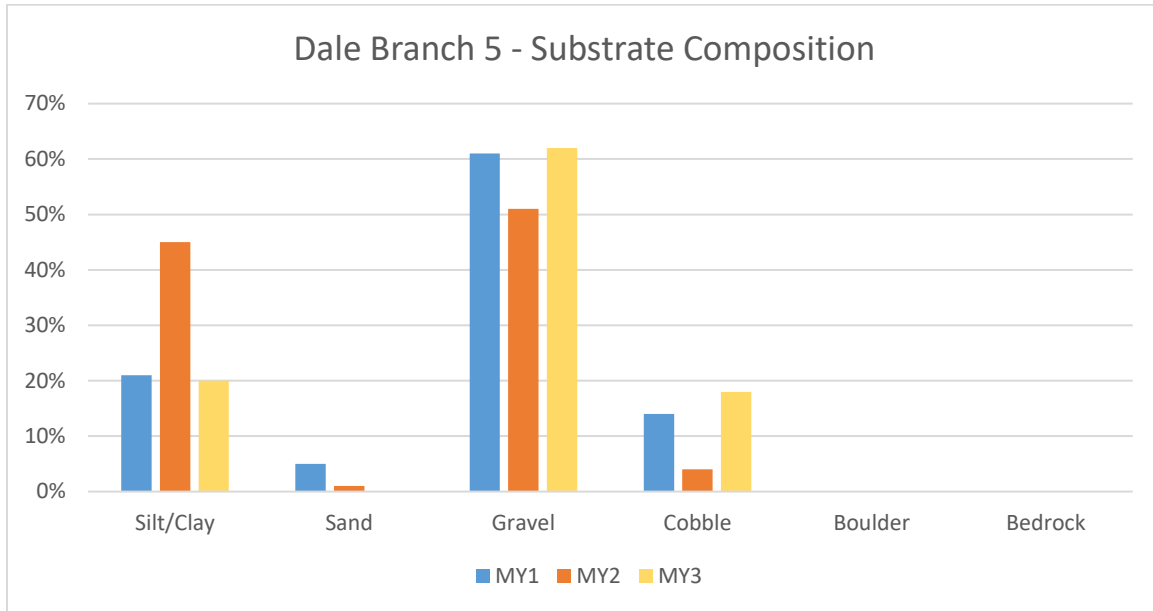
**Chart 6.**



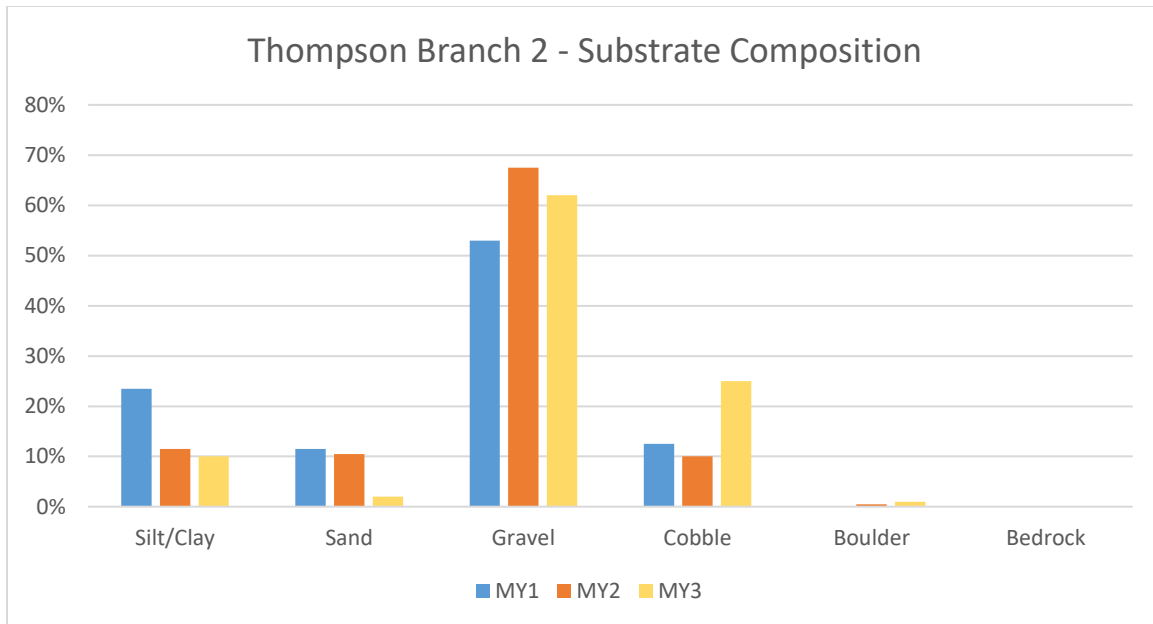
**Chart 7.**



**Chart 8.**



**Chart 9.**



**Table 13. Pee Dee Bank Pin Array Summary**

<b>Bank Pin Location</b>	<b>Position</b>	<b>Year 1 Reading (mm)</b>	<b>Year 2 Reading (mm)</b>	<b>Year 3 Reading (mm)</b>
Cross Section 1	Upstream	0.0	0.0	0.0
	At Cross Section	0.0	0.0	0.0
	Downstream	0.0	6.35	0.00
Cross Section 5	Upstream	0.0	0.0	0.0
	At Cross Section	0.0	0.0	0.0
	Downstream	0.0	0.0	0.0
Cross Section 13	Upstream	0.0	0.0	0.0
	At Cross Section	0.0	0.0	0.0
	Downstream	0.0	0.0	0.0
Cross Section 18	Upstream	0.0	0.0	0.0
	At Cross Section	19.1	0.0	0.0
	Downstream	0.0	0.0	0.0
Cross Section 19	Upstream	12.7	0.0	0.0
	At Cross Section	6.4	19.05	0.0
	Downstream	0.00	19.05	0.0
Cross Section 21	Upstream	0.0	0.0	0.0
	At Cross Section	0.0	0.0	0.0
	Downstream	0.0	50.8	0.0

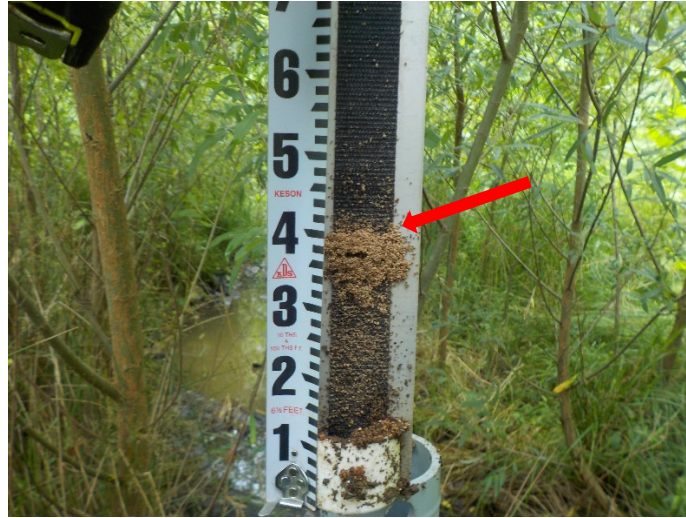
# Appendix E

## Hydrology Data

**Table 14. Verification of Bankfull Events**

Reach	Method	Number of Bankfull Events	Maximum Bankfull Height (ft.)
Jerry Branch	Crest Gauge	0	N/A
Dale Branch	Crest Gauge	0	N/A
Thompson Branch	Crest Gauge	1	0.4

**Photo Verification of Bankfull Events**



Crest Gauge @ Thompson Branch – 0.4 ft. (Est. Date of Occurrence: 6/5/2017)

**Table 15. 2017 Rainfall Summary**

Month	Average	Normal Limits		Station Precipitation	On-Site Auto Rain Gauge
		30 Percent	70 Percent		
January	4.07	2.74	4.87	1.30	3.82
February	3.41	2.47	4.03	1.40	1.42
March	4.28	3.05	5.07	2.77	1.77
April	3.15	1.86	3.82	3.40	4.12
May	3.61	2.54	4.28	6.13	2.62
June	4.34	2.56	5.27	4.58	1.21
July	4.84	3.08	5.83	2.48	1.51
August	4.50	2.89	5.42	1.85	1.59
September	4.48	2.26	5.48	2.97	1.30*
October	3.75	2.19	4.53	---	---
November	3.34	1.98	4.05	---	---
December	3.66	2.52	4.35	---	---
<b>Total</b>	47.43	30.14	57.00	26.88	18.06

\*On-site rain data reported up until September 20, 2017

**Note:** Station Data up until June 2017 from NCCRONOS Uwharrie (Troy) station then the NCCRONOS Albemarle 5.1 SSE station. Normal Limits and Average data provided by the NRCS Jackson Springs WETS Table.

Chart 10. 2017 Precipitation Data for Pee Dee Site

