Annual Monitoring Report

Monitoring Year 3 of 5

FINAL

Project Name: Junes Branch Stream Restoration
NCDMS Contract No.: 003979
NCDMS Project No.: 95027

Jackson County, NC
Data Collected: January 2016 - December 2016
Date Submitted: December 2016

Submitted to:

North Carolina Division of Mitigation Services

NCDEQ-DMS, 1652 Mail Service Center Raleigh NC 27699-1652

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Prepared for:

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balance through proper planning

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Contents

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1.0 PROJECT SUMMARY

1.1. Goals

The project goals address stressors identified in the Targeted Local Watershed (TLW) and include the following:

- Improve water quality within the restored channel reaches and downstream watercourses through:
  - reducing turbidity by stabilizing existing stream banks and altering stream channel dimension, pattern and profile
  - reducing nutrient loads and fecal coliform bacteria from adjacent agricultural fields by fencing the riparian area to keep livestock out of the stream and restoring a wooded riparian buffer
- Improve local aquatic and terrestrial habitat and diversity within the restored channels and their vicinity through:
  - reducing water temperatures by planting native vegetation in the riparian zone and creating shade
  - improving habitat complexity by restoring the stream profile to stable riffle/pool and step/pool complexes
  - improving terrestrial habitat by excluding livestock and creating a riparian buffer comprised of native plant species
  - improving aquatic habitat by establishing tree canopy to provide organic material such as woody debris and leaf packs to stream
  - removing invasive exotic species and planting native vegetation in the riparian buffer
- Improve flood flow attenuation on-site and downstream through:
  - raising the bed or creating bankfull benches to allow for overbank flows every 1-2 years and improve the connection to the active floodplain

1.2. Success Criteria

1.2.1. Morphological Parameters and Channel Stability

Restored and enhanced streams shall be in compliance with the standards set forth in the USACE 2003 Stream Mitigation Guidelines and should demonstrate morphologic stability to be considered successful. Stability does not equate to an absence of change, but rather to sustainable rates of change or stable patterns of variation. Restored streams often demonstrate some level of initial adjustment in the several months that follow construction and some change/variation subsequent to that is also to be expected. However, the observed change should not be unidirectional such that it represents a robust trend. If some trend is evident, it should be very modest or indicate migration to a stable form.

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 channel profile and/or cross-section dimension measurements.

Substrate - Calculated D_{50} and D_{84} values should indicate coarser size class distribution of bed materials in riffles and finer size class distribution 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.

Surface Water Hydrology - Monitoring of stream surface water stages should indicate recurrence of a bankfull flow 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.

1.2.2. Vegetation

Riparian vegetation monitoring shall be conducted for a minimum of five years to ensure that success criteria are met per USACE (2003) guidelines. Accordingly, success criteria will consist of a minimum survival of 320 stems per acre by the end of the Year 3 monitoring period and a minimum of 260 stems per acre at the end of Year 5. 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 Junes Branch Restoration Site (Site) is located in central Jackson County approximately 2 miles east of Sylva, NC (Figure 1). The site encompasses 5.8 acres of formerly agricultural land and includes portions of Bumgarner Branch and three unnamed tributaries that, for purposes of the project, are referred to as Junes Branch, Higdon Branch, and Doris Branch. The Site is located within the Little Tennessee River Basin, United States Geological Survey (USGS) 14-digit Hydrologic Unit 06010203020010, and the North Carolina Division of Environmental Quality (NCDEQ) sub basin 04-04-02. The site watershed is characteristic of the Blue Ridge region with moderate rainfall with annual precipitation averaging 52.9 inches. Elevation within the site ranges from 2,200 feet at the northwestern extent, to 2,150 feet along Junes Branch. The drainage area of Bumgarner Branch at the downstream end of the Site is 1.03 square miles (668 acres). Land use within the watershed is predominately forested (68%) with the remaining land use composed of low-density residential (21%) and agricultural (11%). Additional information regarding project setting and background is found in the Final Mitigation Plan (EBX 2013).

1.4. Project Approach

Channel restoration involving improved pattern, dimension, and longitudinal profile was completed on all four stream reaches. A Priority I approach was applied to all four reaches of the project (Rosgen 1996; NCSRI 2004).

1.5. Project Performance

Monitoring Year 3 (MY3) data was collected from July through December 2016. Monitoring included the following activities: visual assessment of all reaches and the surrounding easement, collection of photos at fourteen permanent photo stations, documentation of vegetation at eight permanent monitoring plots, surveying of 3,050 feet of longitudinal profile and fifteen cross-sections, and conducting pebble counts at eight riffles.

Generally, visual assessment of the project as a whole indicates that the streams are performing as desired and, with the exception of two small bare areas, vegetation is well established throughout the easement. Summary tables and photos taken at the permanent photo stations associated with the visual assessment are presented in Appendix B. Visual assessment of the stream was performed to document signs of instability, such as eroding banks, in-stream structural instability, or excessive sedimentation. No indication of instability was observed (Table 5 and Figure 2). Structures are intact and performing as designed. Herbaceous vegetation has become well established in both the wetland fringes along the stream as well as upland areas. Planted stems are becoming well established; however, two bare areas totaling 0.07 acre were noted along the Junes Branch reach (Table 6, Figure 2). These areas will be monitored in future site visits for woody recruitment and the establishment of herbaceous vegetation.

Three additional permanent vegetation monitoring plots, one on Bumgarner Branch and two on Junes Branch, were added during MY3. These vegetation monitoring plots were installed to capture planted stems located on the western/right descending bank of both reaches. Monitoring of the permanent vegetation monitoring plots (n = 8) was completed during June 2016. Summary tables and photographs associated with MY3 vegetation monitoring can be found in Appendix C. Vegetation data for MY3 indicate that all vegetation monitoring plots, except plot 2, are on track to meet the MY3 interim success criteria of 320 stems per acre. Low planted stem densities at plot 2 can be attributed to thick herbaceous vegetation and a large density of recruited black willows (*Salix nigra*) outcompeting the planted stems. While vegetation plot 2 is not meeting success criteria for planted stems, with recruits, the stem density is 2,347 stems/ acre, far exceeding the MY3 interim success criteria of 320 stems per acre. Stem densities ranged from 243 to 971 stems per acre with a mean of 647 stems per acre across all plots. A total of 14 species were documented within the monitoring plots. When volunteer stems are included, densities ranged between 728 and 2,388 stems per acre with a mean of 1,351 stems per acre across all plots.

Geomorphic data for MY3 was collected from August through December 2016. Summary tables, cross-section plots, and longitudinal profiles related to stream morphology are located in Appendix D. Significant changes in the cross-section data between MY2 and MY3 were limited to cross-sections 3, 6, 7, and 13 (Appendix B, Table 11a). Riffle cross-section 3, where downcutting of the channel was evident in MY1 has begun to stabilize, however the maximum water depth still increased by 0.2 feet from MY2 to MY3. Deposits of fine material and increased vegetation caused the formation of an inner berm on the left descending bank of cross-section 6, decreasing bankfull width, maximum depth and cross-sectional area by 1.7 feet, 0.2 foot, and 1.3 feet, respectively. Deposits of finer material in pools led to a significant decrease in maximum pool depth at cross-sections 7 and 13 over the last two monitoring years.

Generally, longitudinal profile data (Appendix B, Table 11b) indicated relatively little change in riffle and pool dimensions between MY2 and MY3. Bumgarner Branch I showed a decrease in riffle length of 2.0 feet, from 17.5 feet to 15.5 feet, and a decrease in pool maximum depth of 0.4 foot to 1.9 feet. An increase in sediment deposition has caused a slight flattening of the riffle slope from 0.028 (ft/ft) to 0.022 (ft/ft). Bumgarner Branch II dimensions remained relatively similar to the MY2 dimensions; however, pool maximum depths have decreased by 0.3 foot to 2.2 feet. The upper end of Junes Branch saw an influx of fine sediment flattening the riffle profiles and filling in some of the pools. No other major

changes were noted in the Junes Branch profile. Increased vegetation and drought conditions at the Site has led to deposition of fine sediment within Higdon Branch. Pool maximum depths have decreased from 1.4 feet to 1.0 foot between MY2 and MY3. This influx of sediment also caused a flattening of the water surface slope from 0.0184 (ft/ft) to 0.0162 (ft/ft). Aggradation within the upper portion of Higdon Branch has transitioned approximately the first 100 feet of stream to a linear wetland. This area still maintains hydrologic function, but riffle/ pool features have become difficult to decipher. Considering the drought conditions this year, RES will monitor this area during MY4 site visits to determine if any remedial work is warranted. Doris Branch also displayed a decrease in pool maximum depth from 1.2 feet to 0.9 foot between MY2 and MY3. As with Higdon Branch, aggradation can be seen throughout the Doris Branch reach, especially in pools. RES will also monitor this area during MY4 to determine if any remedial work is warranted. Assessment of recent aerial imagery within the watershed does not identify any off-site sediment sources affecting Junes Branch, Higdon Branch, or Doris Branch. However, it is expected that the unstable streams located upstream of the Site are contributing a considerable amount of sediment to the project. Considering the easements' close proximity to the road, runoff from the Fairview Road is another expected cause of sedimentation within the reaches. Especially the upper portions of Junes Branch and Higdon Branch.

Substrate monitoring was also performed during MY3. Riffle D_{50} has decreased between MY2 and MY3. The average D_{50} fell into the fine sand to very coarse sand size class for Bumgarner I, fine gravel for Bumgarner II, silt/clay to fine gravel for Junes Branch, silt/clay for Higdon Branch, and silt/clay for Doris Branch. The shift towards finer particle size classes throughout the project is likely due to fine sediment being transported into the project area from upstream and dropping out of the water column during the falling limb of high flow events. Additionally, the dense herbaceous vegetation throughout all reaches increases entrapment of fine material during high flows. As woody vegetation continues to establish, herbaceous vegetation density in and near the channel will decrease, allowing more efficient transport of finer particle size classes during high flows. A gravel and cobble layer is still present under a layer of finer silts and sand at all riffles assessed during pebble counts. Substrate will be monitored in future years for shifts in size composition.

Overall, documented shifts in stream morphology do not exceed expectations between MY2 and MY3 as the constructed stream adjusts to conditions at the site. The project is meeting success criteria regarding stable dimension, pattern, and profile as well as substrate composition and sediment transport.

Two bankfull events were recorded on Bumgarner Branch II during MY3. One during a January site visit and another during a June site visit. A bankfull event was also recorded on Junes Branch during a June site visit (Appendix E, Table 12). This is the third bankfull event for Burmgarner II and the first for Junes Branch since construction was completed in June 2014.

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 DMS's website. All raw data supporting the tables and figures in the appendices is available from DMS upon request.

2.0 METHODS

Visual assessment of the Junes Branch restoration site was performed at the beginning of the monitoring period. Permanent photostation photos were collected during the initial visual assessment. Vegetation or

stream problem areas occurring outside of the monitoring stations were documented with additional photographs.

Geomorphic measurements were taken during low flow conditions using a Nikon® NPR 332 Total Station. Three-dimensional coordinates associated with cross-sections and longitudinal profiles were collected in the field and geo-referenced (NAD83 State Plane feet FIPS 3200). Morphological data was limited to 15 cross-sections, and 3,050 feet of longitudinal profile. Survey data were imported into CAD, ArcGIS®, and Microsoft Excel® for data processing and analysis. Channel substrate was characterized using a Wolman Pebble Count outlined in the Harrelson et al (1994) and processed using Microsoft Excel.

Vegetation success is being monitored at 8 permanent monitoring plots. Vegetation monitoring follows the CVS-EEP Level 2 Protocol for Recording Vegetation, Version 4.2 (Lee et al. 2008) and includes analysis of composition and density of planted species. Data are 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 are taken from the origin each monitoring year.

Precipitation data were collected using an Onset® HOBO® Data Logging Rain Gauge. Bankfull events were documented with crest gauges. 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

EBX (Environmental Banc and Exchange). 2013. Junes Branch Stream Restoration, Final Mitigation Plan, Jackson County, North Carolina. NCEEP Project No. 95027.

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.

NCSRI (North Carolina Stream Restoration Institute). 2004. Stream Restoration: A Natural Channel Design Handbook. North Carolina Stream Restoration Institute and North Carolina Sea Grant. Raleigh. http://www.bae.ncsu.edu/programs/extension/wqg/srp/guidebook.html

Rosgen, D. 1996. Applied River Morphology. Wildland Hydrology. Pagosa Springs, Colorado.

USACE (U.S. Army Corps of Engineers). 2003. Stream Mitigation Guidelines. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, North Carolina Wildlife Resources Commission, North Carolina Department of Environment and Natural Resources-Division of Water Quality. Wilmington District.

Appendix A
General Tables and Figures

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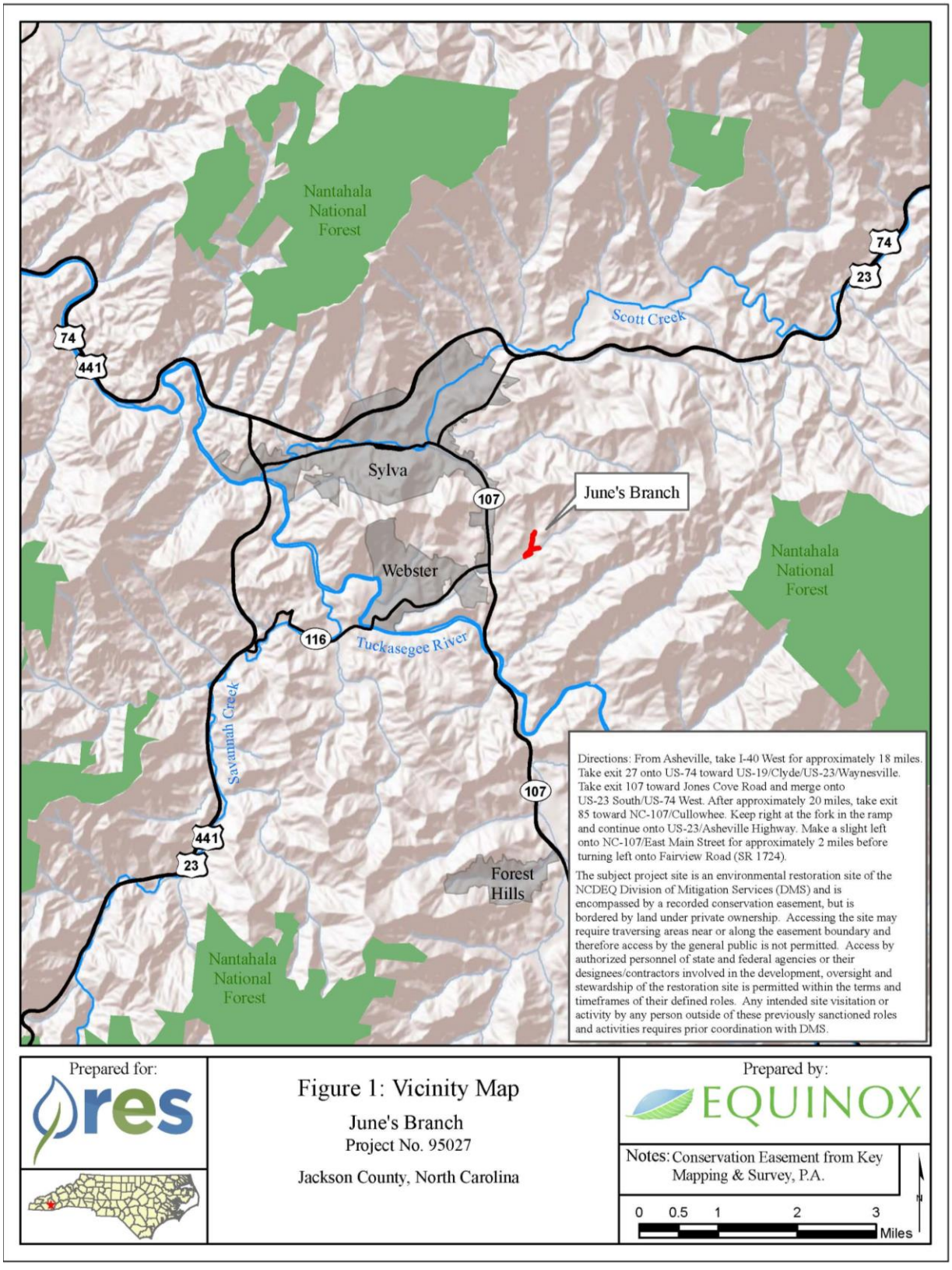
Nantahala National Forest
Scott Creek
74
23
74
441
Sylva
107
June's Branch
Webster
Nantahala National Forest
116
Tuckasegee River
Savannah Creek
107
441
23
Forest Hills
Nantahala National Forest
Directions: From Asheville, take I-40 West for approximately 18 miles. Take exit 27 onto US-74 toward US-19/Clyde/US-23/Waynesville. Take exit 107 toward Jones Cove Road and merge onto US-23 South/US-74 West. After approximately 20 miles, take exit 85 toward NC-107/Cullowhee. Keep right at the fork in the ramp and continue onto US-23/Asheville Highway. Make a slight left onto NC-107/East Main Street for approximately 2 miles before turning left onto Fairview Road (SR 1724).
The subject project site is an environmental restoration site of the NCDEQ Division of Mitigation Services (DMS) and is encompassed by a recorded conservation easement, but is bordered by land under private ownership. Accessing the site may require traversing areas near or along the easement boundary and therefore access by the general public is not permitted. Access by authorized personnel of state and federal agencies or their designees/contractors involved in the development, oversight and stewardship of the restoration site is permitted within the terms and timeframes of their defined roles. Any intended site visitation or activity by any person outside of these previously sanctioned roles and activities requires prior coordination with DMS.
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Figure 1: Vicinity Map
June's Branch
Project No. 95027
Jackson County, North Carolina
Prepared by:
EQUINOX
Notes: Conservation Easement from Key Mapping & Survey, P.A.
0 0.5 1 2 3
Miles

Table 1. Project Components and Mitigation Credits
Junes Branch / Project Number 95027

Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	**3,162**	-	-	-	-	-	-	-	-

Project Components

Project Component -or- Reach ID	Stationing/Location	Existing Footage/Acreage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	Restoration Footage or Acreage	Mitigation Ratio
Bumgarner Branch I	100+21 - 107+49	610	PI	R	631	1:1
Bumgarner Branch II	107+49 - 112+92	550	PI	R	501	1:1
June's Branch	200+97 - 215+77	1,311	PI	R	1,374	1:1
Higdon Branch	300+45 - 304+27	530	PI	R	376	1:1
Doris Branch	400+00 - 402+88	260	PI	R	280	1:1

Component Summation

Restoration Level	Stream (linear feet)	Riparian Wetland (acres)		Non-riparian Wetland (acres)	Buffer (square feet)	Upland (acres)
		Riverine	Non-Riverine			
Restoration	3,162	-	-	-	-	-
Enhancement	-	-	-	-	-	-
Enhancement I	-	-	-	-	-	-
Enhancement II	-	-	-	-	-	-
Creation	-	-	-	-	-	-
Preservation	-	-	-	-	-	-
High Quality Preservation	-	-	-	-	-	-

BMP Elements

Element	Location	Purpose/Function	Notes
FB	Entire Site	Protect Stream	

[1]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

Table 2. Project Activity and Reporting History Junes Branch / Project Number 95027		
Activity or Report	**Data Collection Complete**	**Completion or Delivery**
Mitigation Plan	Aug-12	April-2013
Final Design - Construction Plans	N/A	April-2013
Construction	N/A	June-2014
Temporary S&E Mix Applied to Entire Project Area		May-14
Permanent Seed Mix Applied		May-14
Containerized and B&B Plantings		May-14
Baseline Monitoring Document (Year 0 Monitoring - Baseline)	July-2014	July-2014
Year 1 Monitoring	Jan - 2015	Feb - 2015
Year 2 Monitoring	Nov - 2015	Nov - 2015
Year 3 Monitoring	Dec - 2016	Dec - 2016
Year 4 Monitoring		
Year 5 Monitoring		

Table 3. Project Contacts	
Junes Branch Stream Restoration Site – Project # 95027	
Prime Contractor	Resource Environmental Solutions, LLC 302 Jefferson St., Suite 110 Raleigh, North Carolina 27605 Brian Hockett (919) 209-1061
Designer	Wolf Creek Engineering 12-1/2 Wall St., Suite C Asheville, North Carolina 28801 Grant Ginn (828) 449-1930 ext 102
Construction Contractor	Northstate Environmental 2889 Lowery Street Winston Salem, North Carolina 27101 Darrell Westmoreland (336) 725-2010
Planting Contractor	Northstate Environmental 2889 Lowery Street Winston Salem, North Carolina 27101 Darrell Westmoreland (336) 725-2010
As-built Surveys	Kee Mapping and Surveying PO Box 2566 Asheville, North Carolina 28802 Phillip B. Key (828) 575-9021
Seeding Mix Source	Green Resource 5204 Highgreen Court Colfax, North Carolina 27235 (336) 855-6363
Bare Root Seedlings	Dykes & Son Nursery 825 Maude Etter Road McMinnville, Tennessee (931) 668-8833
Live Stakes	Foggy Mountain Nursery 797 Helton Creek Road Lansing, North Carolina 28643 (336) 384-5323
Monitoring Performers (Y0-MY3) 2014 - 2016	Equinox 37 Haywood St. Asheville, North Carolina 28801 Drew Alderman (828) 253-6856

Table 4. Project Baseline Information and Attributes					
Junes Branch Stream Restoration Site – Project # 95027					
Project Information					
Project Name	Junes Branch				
County	Jackson County				
Project Area (acres)	5.8 ac.				
Project Coordinates (latitude and longitude)	35.357378° N; 83.191391° W				
Project Watershed Summary Information					
Physiographic Province	Blue Ridge				
River Basin	Little Tennessee				
USGS Hydrologic Unit 8-digit	06010203	USGS Hydrologic Unit 14-digit	6010203020010		
DWQ Sub-basin	4/4/2002				
Project Drainage Area (acres)	668				
Project Drainage Area Percentage of Impervious Area	<5%				
CGIA Land Use Classification	2.01.03 Hay and Pasture Land				
Reach Summary Information					
Parameters	**Bumgarner Br. I**	**Bumgarner Br. II**	**Junes Br.**	**Higdon Br.**	**Doris Br.**
Length of reach (linear feet)	610	550	1,311	530	260
Valley classification (Rosgen)	II	II	II	II	II
Drainage area	0.93	1.03	0.23	0.08	0.01
NCDWQ stream identification score	40	40	38	38	29.5
NCDWQ Water Quality Classification	C	C	-	-	-
Morphological Description (stream type) (Rosgen)	E	G	G	E	G
Evolutionary trend (Rosgen)	C	F	F	E	G
Underlying mapped soils	CwA, WtB	CwA, WtB	WtB	CwA	CwA
Drainage class	Somewhat Poorly Drained- Mod. Well Drained	Somewhat Poorly Drained- Mod. Well Drained	Mod. Well Drained	Somewhat Poorly Drained	Somewhat Poorly Drained
Soil Hydric status	Non-Hydric	Non-Hydric	Non-Hydric	Non-Hydric	Non-Hydric
Slope	2.20%	2.20%	2.30%		
FEMA classification	N/A	N/A	N/A	N/A	N/A
Native vegetation community	Agricultural	Agricultural	Agricultural	Agricultural	Agricultural
Percent composition of exotic invasive vegetation	30%	30%	30%	40%	40%
Wetland Summary Information					
Parameters	**Wetland 1**	**Wetland 2**			
Size of Wetland (acres)	0.03	0.13			
Wetland Type (non-riparian, riparian riverine or riparian non-riverine)	Riparian Non-Riverine	Riparian Non-Riverine			
Mapped Soil Series	CwA	CwA			
Drainage class	Somewhat Poorly Drained	Somewhat Poorly Drained			
Soil Hydric Status	Hydric	Hydric			
Source of Hydrology	Seep	Seep			
Hydrologic Impairment	None	Dredging/Ditching			
Native vegetation community	Scrub-Shrub	Forested			
Percent composition of exotic invasive vegetation	2%	42%			
Regulatory Considerations					
Regulation	**Applicable?**		**Resolved?**	**Supporting Documentation**	
Waters of the United States – Section 404	Yes		Resolved	Action ID #2012-01101	
Waters of the United States – Section 401	Yes		Resolved	NCDWR Project # 20120748	
Endangered Species Act	No		Yes	ERTR	
Historic Preservation Act	No		Yes	ERTR	
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	No		N/A		
FEMA Floodplain Compliance	N/A		N/A		
Essential Fisheries Habitat	N/A		N/A		

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Appendix B
Visual Assessment Data

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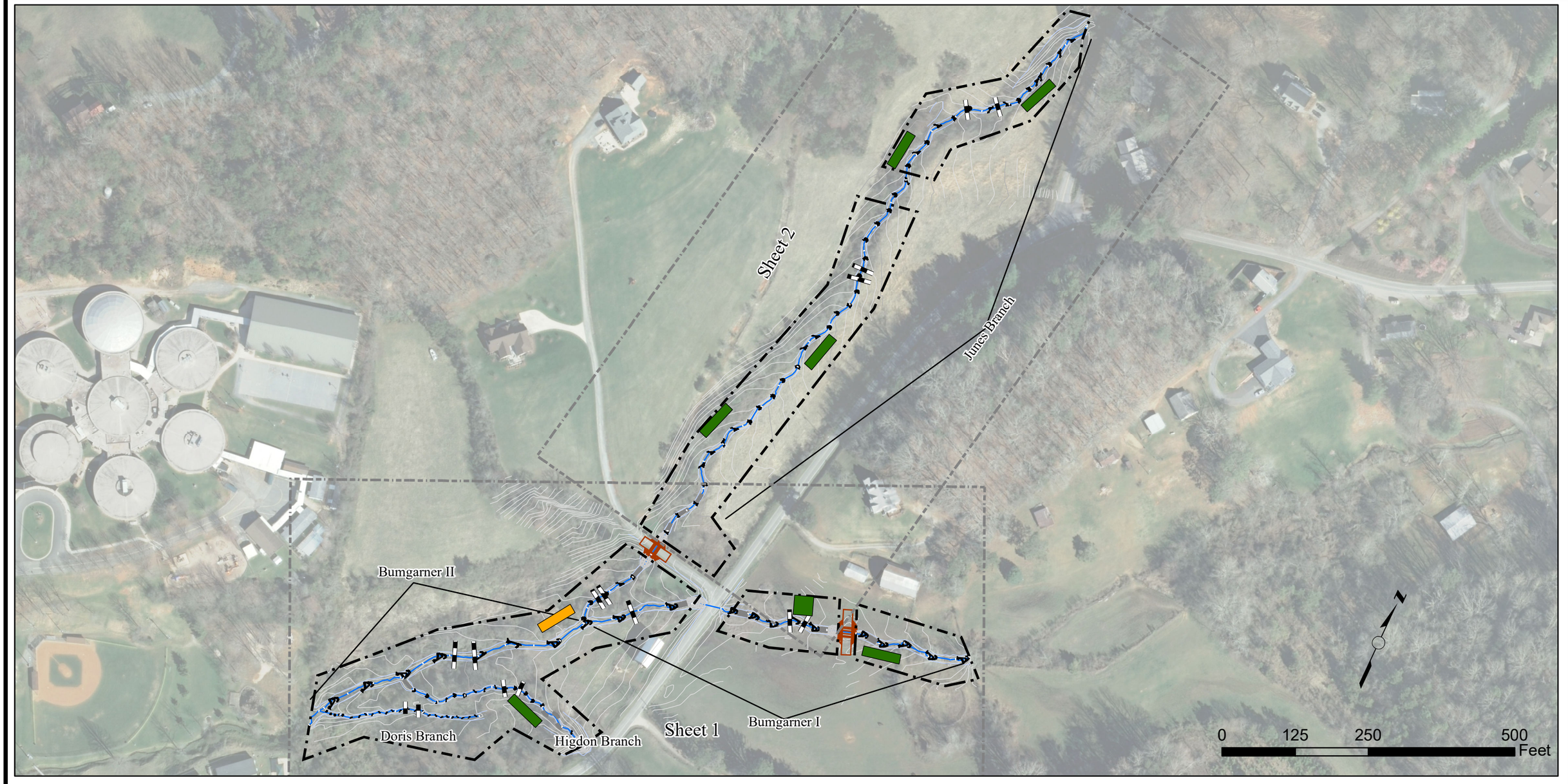
Figure 2. Integrated Current Condition Plan View Draft



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Junes Branch Stream Restoration Project
Monitoring Year 3
Sylva, Jackson County, NC
NCDMS Contract No. 003979
NCDMS Project No.: 95027
December 2016
Overview

Cross-Section
Thalweg
Top of Bank
Contour- Major
Contour- Minor
Easement
Sheet Boundary

Vegetation Plot Success
Criteria Met
Criteria Unmet

Hook-Log Run
Hook Run
Boulder-Arch
Boulder-Arch with Log
Armored Riffle

Log Vane with Hook
Log Sill
Log Sill no Baffle
Brush Toe

Notes:
1) Baseline Data Provided by Kee Mapping
2) Orthoimagery provided by NCOneMap (2010)

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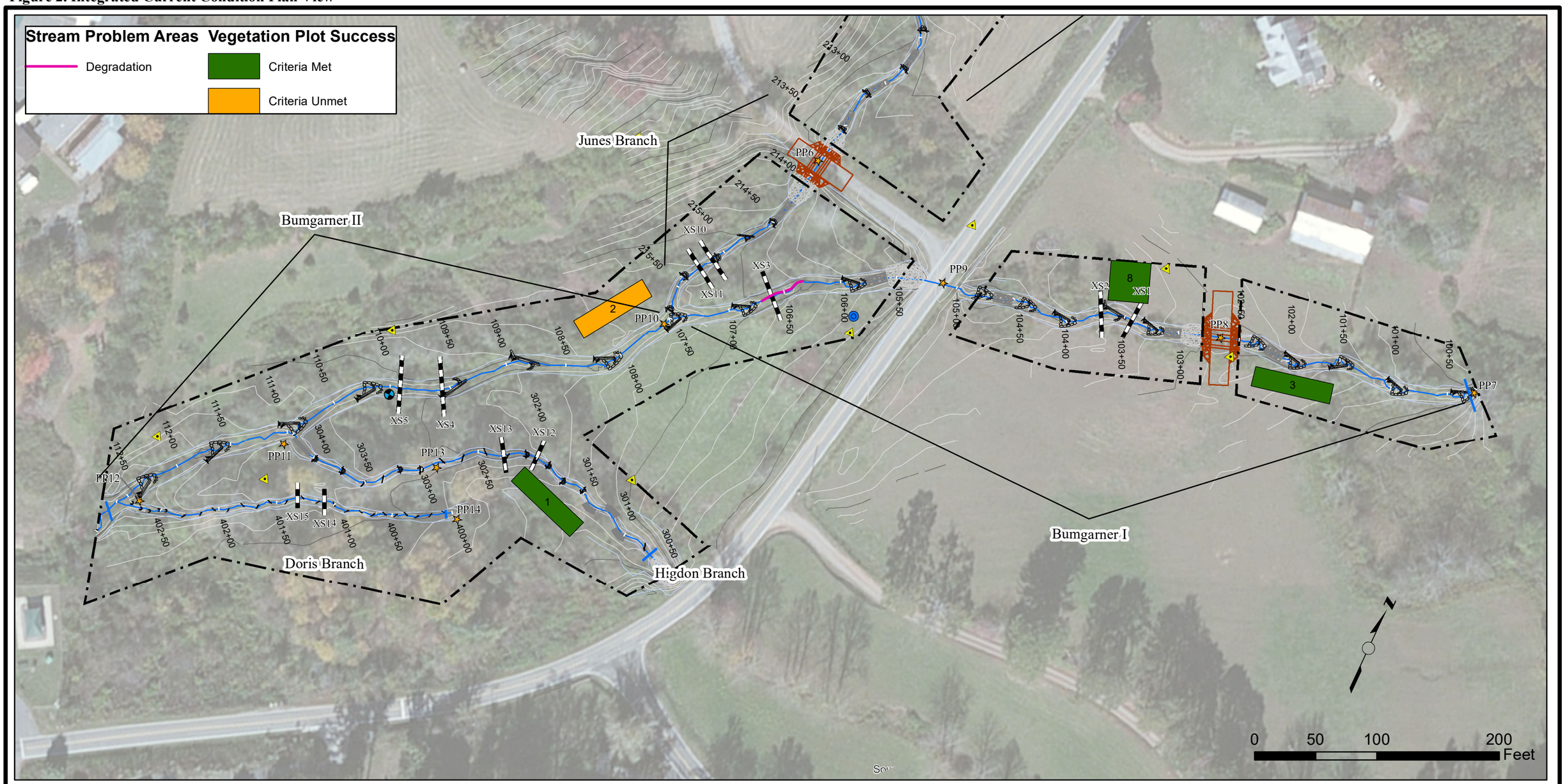
Figure 2. Integrated Current Condition Plan View



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Junes Branch Stream Restoration Project
Monitoring Year 3
Sylva, Jackson County, NC
NCDMS Contract No. 003979
NCDMS Project No.: 95027
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Sheet 1 of 2

- Rain Gauge
- Crest Gauge
- Photo Point
- Control Point
- Cross-Section
- Long Pro Begin/End
- Thalweg
- Top of Bank
- Contour- Major
- Contour- Minor
- Easement
- Hook-Log Run
- Hook Run
- Boulder-Arch
- Boulder-Arch with Log
- Armored Riffle
- Log Vane with Hook
- Log Sill
- Log Sill no Baffle
- Brush Toe

Notes:
1) Baseline Data Provided by Kee Mapping
2) ArcGis World Imagery Layer

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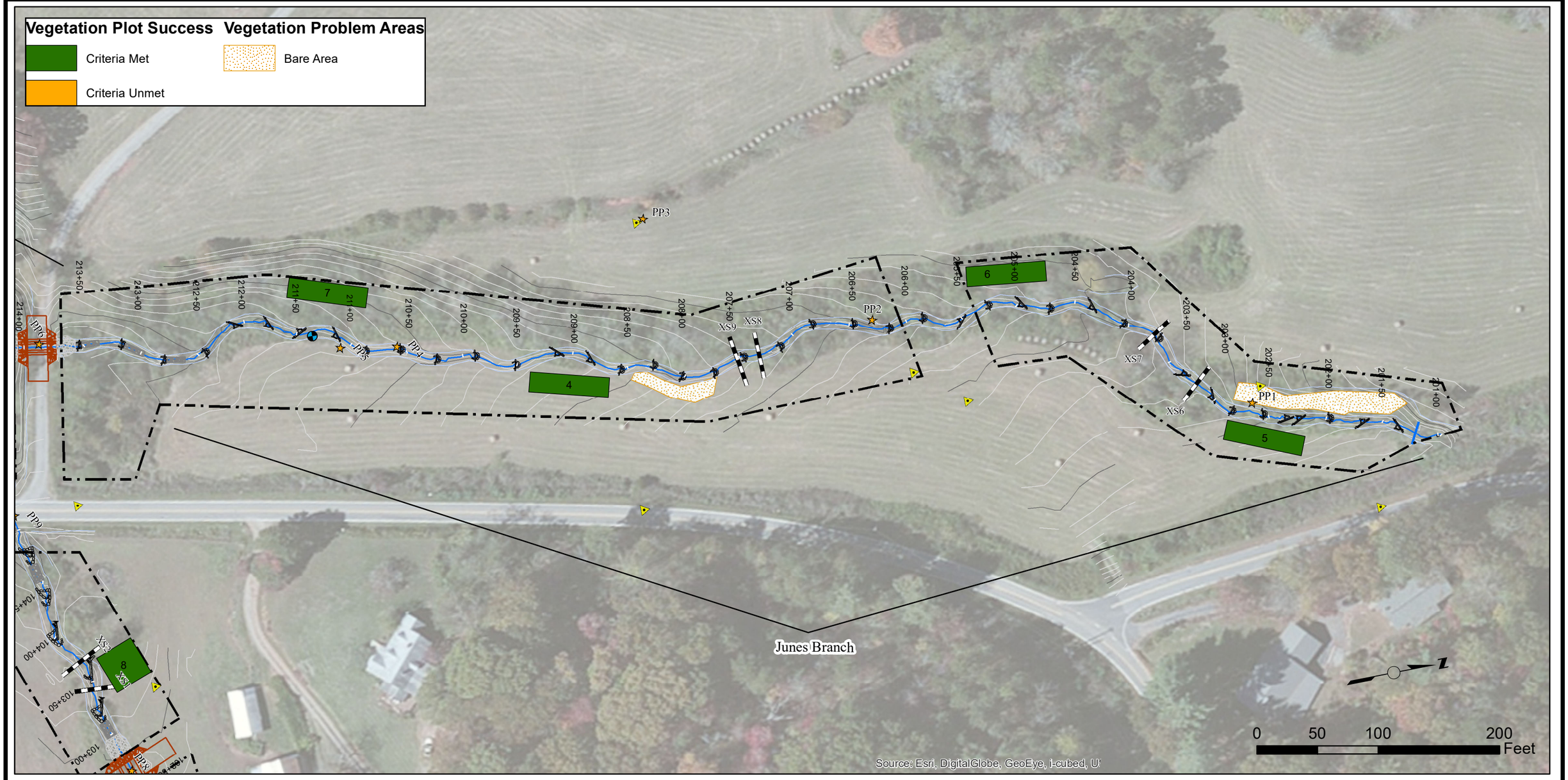
Figure 2. Integrated Current Condition Plan View



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Junes Branch Stream Restoration Project
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Sheet 2 of 2

- Rain Gauge
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- Log Sill no Baffle
- Brush Toe

Notes:
1) Baseline Data Provided by Kee Mapping
2) ArcGis World Imagery Layer

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Table 5. Visual Stream Morphology Stability Assessment
Junes Branch / Project No. 95027 - Bumgarner Branch I
Assessed Length 631 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. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. Degradation - Evidence of downcutting.			1	37	94%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	13	13			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	13	13			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	N/A	N/A			N/A			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	13	13			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	12	12			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 NOT 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
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	14	14			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	14	14			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	14	14			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	14	14			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	14	14			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Junes Branch / Project No. 95027 - Bumgarner Branch II
Assessed Length 543 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. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	7	7			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	8	8			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	2	2			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	8	8			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	8	8			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 NOT 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
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	7	7			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	7	7			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	7	7			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	7	7			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	7	7			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment Junes Branch / Project No. 95027 - Junes Branch Assessed Length 1,375 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. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	45	45			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	45	45			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	N/A	N/A			N/A			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	45	45			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	45	45			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 NOT 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
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	45	45			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	45	45			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	45	45			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	45	45			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	45	45			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment Junes Branch / Project No. 95027 - Higdon Branch Assessed Length 376 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. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	18	18			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	18	18			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	3	3			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	18	18			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	18	18			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 NOT 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
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	15	15			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	15	15			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	15	15			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	15	15			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	15	15			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment Junes Branch / Project No. 95027 - Doris Branch Assessed Length 288 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. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars).			0	0	100%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	23	23			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	23	23			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	N/A	N/A			N/A			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	23	23			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	23	23			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 NOT 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
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	23	23			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	23	23			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	23	23			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	23	23			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	23	23			100%			

N/A - Item does not apply.

Table 6. Vegetation Condition Assessment Junes Branch / Project No. 95027					
Planted Acreage: 5.81					
Vegetation Category	**Definitions**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Planted Acreage**
1. Bare Areas	Very limited cover of both woody and herbaceous material.	N/A	2	0.07	1%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	N/A	0	0.00	0%
		Totals	2	0.07	1%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	N/A	0	0.00	0%
		Cumulative Totals	2	0.07	1%
Easement Acreage: 5.81					
Vegetation Category	**Definitions**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Easement Acreage**
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	Cross Hatch (Red - Dense/Yellow - Present)	0	0.00	0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	N/A	0	0.00	0%

N/A - Item does not apply.

Junes Branch – Permanent Photo Station 1
Station 202+60 - Downstream

Junes Branch – Permanent Photo Station 1
Station 202+60 - Upstream

Junes Branch – Permanent Photo Station 2
Station 206+30 - Downstream

Junes Branch – Permanent Photo Station 2
Station 206+30 - Upstream

Junes Branch – Permanent Photo Station 3
Looking South/Downstream Junes Branch

Junes Branch – Permanent Photo Station 3
Looking North/Upstream - Upstream

Junes Branch – Permanent Photo Station 4
Station 210+60 - Downstream

Junes Branch – Permanent Photo Station 4
Station 210+60 - Upstream

Junes Branch – Permanent Photo Station 5
Station 211+10 - Upstream

Junes Branch – Permanent Photo Station 6
Station 214+00 - Downstream

Junes Branch – Permanent Photo Station 6
Station 214+00 - Upstream

Bumgarner Branch I – Permanent Photo Station 7
Station 100+21 - Downstream

Bumgarner Branch I – Permanent Photo Station 8
Station 102+70 - Downstream

Bumgarner Branch I – Permanent Photo Station 8
Station 102+70- Upstream

Bumgarner Branch I – Permanent Photo Station 9
Station 105+25 - Downstream

Bumgarner Branch I – Permanent Photo Station 9
Station 105+25 – Upstream

Bumgarner Branch I – Permanent Photo Station 10
Looking Upstream from Confluence with Junes Branch

Junes Branch – Permanent Photo Station 10
Looking Upstream from Confluence with Bumgarner Branch

Bumgarner Branch II – Permanent Photo Station 11
Looking Upstream from Confluence with Higdon Branch

Higdon Branch – Permanent Photo Station 11
Looking Upstream from Confluence with Bumgarner Branch II

Bumgarner Branch II – Permanent Photo Station 12
Looking Upstream from Confluence with Doris Branch

Doris Branch – Permanent Photo Station 12
Looking Upstream from Confluence with Bumgarner Branch II

Higdon Branch – Permanent Photo Station 13
Station 302+80 - Downstream

Higdon Branch – Permanent Photo Station 13
Station 302+80 - Upstream

Doris Branch – Permanent Photo Station 14
Station 400+00 - Downstream

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Appendix C
Vegetation Plot Data

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Table 7. Vegetation Plot Criteria Attainment		
Junes Branch / Project No. 95027		
Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
1	Yes	88%
2	No	
3	Yes	
4	Yes	
5	Yes	
6	Yes	
7	Yes	
8	Yes	

Junes Branch - Vegetation Monitoring Plot 1
June 8, 2016

Junes Branch - Vegetation Monitoring Plot 2
June 8, 2016

Junes Branch - Vegetation Monitoring Plot 3
June 8, 2016

Junes Branch - Vegetation Monitoring Plot 4
June 8, 2016

Junes Branch - Vegetation Monitoring Plot 5
June 8, 2016

Junes Branch - Vegetation Monitoring Plot 6
June 8, 2016

Junes Branch - Vegetation Monitoring Plot 7
June 8, 2016

Junes Branch - Vegetation Monitoring Plot 8
June 8, 2016

Table 8. CVS Vegetation Metadata Junes Branch / Project No. 95027	
Report Prepared By	Drew Alderman
Date Prepared	6/10/2016 16:15
database name	Equinox_2016_A_Junes.mdb
database location	Z:\ES\NRI&M\EBX Monitoring\Junes\MY3-2016\Data\Veg
computer name	FIELD-PC
file size	61181952
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	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.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
ALL Stems by Plot and spp	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
PROJECT SUMMARY----------	
Project Code	95027
project Name	Junes Branch
Description	
River Basin	Little Tennessee
length(ft)	
stream-to-edge width (ft)	
area (sq m)	
Required Plots (calculated)	
Sampled Plots	8

Table 9. Planted and Total Stem Counrt (Species by Plot) Junes Branch / Project No. 95027																											
			Current Plot Data (MY3 2016)																								
		Species	Plot 1			Plot 2			Plot 3			Plot 4			Plot 5			Plot 6			Plot 7			Plot 8		
Scientific Name	Common Name	Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Alnus serrulata	Hazel Alder	Shrub									1							7	7	7	5	5	5	1	1	1
Betula nigra	River Birch	Tree	4	4	4						1	1	1	1			1	1	1	1	3	3	3			
Carpinus caroliniana var. caroliniana	Coastal American Hornbeam	Tree										3	3	3	1	1	1									
Cornus amomum	Silky Dogwood	Shrub															1			14			32			
Cornus florida	Flowering Dogwood	Tree										2	2	2												
Diospyros virginiana	Common Persimmon	Tree															2				1	1	1	2	2	2
Fraxinus pennsylvanica	Green Ash	Tree	10	10	10				2	2	2	5	5	7	5	5	5	1	1	1				2	2	2
Hamamelis virginiana var. virginiana	American Witchhazel	Tree	1	1	1										1	1	1				1	1	1			
Juglans nigra	Black Walnut	Tree			2									1	1	1	1									
Liriodendron tulipifera	Tuliptree	Tree																								
Liriodendron tulipifera var. tulipifera	Tulip-tree, Yellow Poplar, Whitewood	Tree										1	1	1	3	3	3	7	7	7	6	6	6			
Platanus occidentalis	American Sycamore	Tree																								
Platanus occidentalis var. occidentalis	Sycamore, Plane-tree	Tree	1	1	1	5	5	5	7	7	12	2	2	3			1	6	6	6	7	7	7	15	15	15
Prunus cerasus	Sour Cherry	Exotic																					2			
Prunus serotina var. serotina	Black Cherry	Tree													2	2	2									
Quercus	Oak	Tree	1	1	1							1	1	1												
Quercus michauxii	Swamp Chestnut Oak	Tree	1	1	1																					
Quercus phellos	Willow Oak	Tree																2	2	2						
Quercus rubra var. rubra	Northern Red Oak	Tree				1	1	1																		
Salix nigra	Black Willow	Tree						52			17												2			2
Sambucus canadensis	Common Elderberry	Shrub																								
Unknown		Shrub or Tree																								
Vitis aestivalis	Summer Grape	Vine																								
Vitis rotundifolia	Muscadine	Vine																								
	Stem count		18	18	20	6	6	58	9	9	33	15	15	19	13	13	18	24	24	38	23	23	59	20	20	22
	size (ares)		1			1			1			1			1			1			1			1		
	size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02		
	Species count		6	6	7	2	2	3	2	2	5	7	7	8	6	6	10	6	6	7	6	6	9	4	4	5
	Stems per ACRE		728	728	809	243	243	2,347	364	364	1,335	607	607	769	526	526	728	971	971	1,538	931	931	2,388	809	809	890

[1]PnoLS: No livestakes included in tally; P-all: All planted stems included in tally; T: Total stems including recruitment.

Color Key

Exceeds requirements by 10%
Exceeds requirements, but by less than 10%
Fails to meet requirements, by less than 10%
Fails to meet requirements by more than 10%
Recruit Stems

Table 9 Cont'd. Planted and Total Stem Count (Annual Mean) Junes Branch / Project No. 95027														
			Annual Means											
		Species	MY3 (2016)			MY2 (2015)			MY1 (2015)			MY0 (2014)		
Scientific Name	Common Name	Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Alnus serrulata	Hazel Alder	Shrub	13	13	14			3						
Betula nigra	River Birch	Tree	9	9	11	5	5	17	6	6	6	11	11	11
Carpinus caroliniana var. caroliniana	Coastal American Hornbeam	Tree	4	4	4	5	5	5	5	5	5	4	4	4
Cornus amomum	Silky Dogwood	Shrub			47			2						
Cornus florida	Flowering Dogwood	Tree	2	2	2	3	3	3	3	3	3	3	3	3
Diospyros virginiana	Common Persimmon	Tree	3	3	5			3						
Fraxinus pennsylvanica	Green Ash	Tree	25	25	27	20	20	26	20	20	20	21	21	21
Hamamelis virginiana var. virginiana	American Witchhazel	Tree	3	3	3	3	3	3	5	5	5	5	5	5
Juglans nigra	Black Walnut	Tree	1	1	4	1	1	3	1	1	1	1	1	1
Liriodendron tulipifera	Tuliptree	Tree						4						
Liriodendron tulipifera var. tulipifera	Tulip-tree, Yellow Poplar, Whitewood	Tree	17	17	17	4	4	4	6	6	6	7	7	7
Platanus occidentalis	American Sycamore	Tree						20						
Platanus occidentalis var. occidentalis	Sycamore, Plane-tree	Tree	43	43	50	16	16	16	17	17	17	17	17	17
Prunus cerasus	Sour Cherry	Exotic			2									
Prunus serotina var. serotina	Black Cherry	Tree	2	2	2	2	2	2	1	1	1	3	3	3
Quercus	Oak	Tree	2	2	2	4	4	4	6	6	6	6	6	6
Quercus michauxii	Swamp Chestnut Oak	Tree	1	1	1									
Quercus phellos	Willow Oak	Tree	2	2	2			1						
Quercus rubra var. rubra	Northern Red Oak	Tree	1	1	1	2	2	2	6	6	6	5	5	5
Salix nigra	Black Willow	Tree			73			50			78			
Sambucus canadensis	Common Elderberry	Shrub						2						
Unknown		Shrub or Tree										4	4	4
Vitis aestivalis	Summer Grape	Vine						1						
Vitis rotundifolia	Muscadine	Vine						1						
		Stem count	128	128	267	65	65	172	76	76	154	87	87	87
		size (ares)	8			5			5			5		
		size (ACRES)	0.20			0.12			0.12			0.12		
		Species count	15	15	18	11	11	21	11	11	12	12	12	12
		Stems per ACRE	647	647	1,351	526	526	1,392	615	615	1,246	704	704	704

[1]PnoLS: No livestakes included in tally; P-all: All planted stems included in tally; T: Total stems including recruitment.

Color Key

Exceeds requirements by 10%
Exceeds requirements, but by less than 10%
Fails to meet requirements, by less than 10%
Fails to meet requirements by more than 10%
Recruit Stems

Appendix D
Stream Geomorphology Data

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Table 11a. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters - Cross-Sections) Junes Branch / Project No. 95027 - Bumgarner I (631 feet)																		
	Cross-Section 1 Riffle						Cross-Section 2 Pool						Cross-Section 3 Riffle					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	2,153.11	2,153.11	2,153.11	2,153.11			2,152.68	2,152.68	2,152.68	2,152.68			2,145.60	2,145.60	2,145.60	2,145.60		
Bankfull Width (ft)	13.3	13.4	12.7	12.9			13.4	13.1	13.2	12.7			15.8	16.8	16.3	18.0		
Floodprone Width (ft)	>79	>79	>79	>79			>124	>124	>124	124			>42	>42	>42	>42		
Bankfull Mean Depth (ft)	0.9	0.8	0.8	0.7			1.5	1.1	0.9	0.9			0.8	0.9	0.9	0.9		
Bankfull Max Depth (ft)	1.5	1.3	1.3	1.4			2.9	1.9	2.1	2.0			1.2	1.7	1.9	2.1		
Bankfull Cross Sectional Area (ft^2)	11.7	11.3	10.2	9.6			20.6	14.0	12.2	11.3			12.2	14.5	14.8	15.8		
Bankfull Width/Depth Ratio	15.2	15.8	15.8	17.2			8.7	12.3	14.3	14.4			20.4	19.4	18.0	20.5		
Bankfull Entrenchment Ratio	>5.9	>5.9	>6.2	6.1			>9.3	>9.5	>9.4	>9.7			>2.7	>2.5	>2.6	>2.3		
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.1			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0		
d50 (mm)	N/A	27	0.67	1.5			N/A	N/A	N/A	N/A			N/A	16	0.68	0.24		

N/A - Item does not apply.

Table 11a cont'd. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters - Cross-Sections) Junes Branch / Project No. 95027 - Bumgarner II (543 feet)												
	Cross-Section 4 Pool						Cross-Section 5 Riffle					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	2,140.17	2,140.17	2,140.17	2,140.17			2,139.81	2,139.81	2,139.81	2,139.81		
Bankfull Width (ft)	16.5	16.1	16.5	15.2			16.3	15.7	16.2	16.0		
Floodprone Width (ft)	>50	>50	>50	>50			>48	>48	>48	>48		
Bankfull Mean Depth (ft)	1.4	1.2	1.1	1.2			0.7	0.9	0.8	0.9		
Bankfull Max Depth (ft)	2.6	2.4	2.5	2.3			1.2	1.3	1.3	1.4		
Bankfull Cross Sectional Area (ft^2)	23.0	18.9	18.5	17.9			11.9	13.4	12.6	13.7		
Bankfull Width/Depth Ratio	11.9	13.7	14.8	12.8			22.2	18.4	20.8	18.6		
Bankfull Entrenchment Ratio	>3.0	>3.1	>3.0	>3.3			>3.0	>3.1	>3	>3.0		
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0		
d50 (mm)	N/A	N/A	N/A	N/A			N/A	25	4.9	4.3		

N/A - Item does not apply.

Table 11a cont'd. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters - Cross-Sections) Junes Branch / Project No. 95027 - Junes (1,375 feet)																		
	Cross-Section 6 Riffle						Cross-Section 7 Pool						Cross-Section 8 Riffle					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	2,172.66	2,172.66	2,172.66	2,172.66			2,171.35	2,171.35	2,171.35	2,171.35			2,163.28	2,163.28	2,163.28	2,163.28		
Bankfull Width (ft)	8.6	8.8	8.0	6.3			8.2	8.8	7.8	8.3			9.6	10.8	10.6	10.6		
Floodprone Width (ft)	>94	>94	>94	>94			>111	>111	>111	>111			>53	>53	>53	>53		
Bankfull Mean Depth (ft)	0.4	0.5	0.4	0.3			1.0	0.7	0.6	0.4			0.7	0.6	0.5	0.5		
Bankfull Max Depth (ft)	0.7	0.9	0.7	0.5			2.1	1.6	1.3	1.0			1.2	1.1	1.0	1.2		
Bankfull Cross Sectional Area (ft^2)	3.7	4.1	3.0	1.7			8.6	6.1	4.8	3.7			6.4	6.4	5.7	5.6		
Bankfull Width/Depth Ratio	19.7	18.9	21.7	23.0			7.9	12.7	12.7	18.8			14.3	18.2	19.8	20.0		
Bankfull Entrenchment Ratio	>11.0	>10.7	>11.7	>14.8			>13.5	>12.6	>14.2	>13.4			>5.5	>4.9	>5.0	>5.0		
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0		
d50 (mm)	N/A	1.4	0.13	0.062			N/A	N/A	N/A	N/A			N/A	4.7	0.65	0.062		

N/A - Item does not apply.

Table 11a cont'd. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters - Cross-Sections) Junes Branch / Project No. 95027 - Junes (1,375 feet)																		
	Cross-Section 9 Pool						Cross-Section 10 Pool						Cross-Section 11 Riffle					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	2,162.64	2,162.64	2,162.64	2,162.64			2,144.35	2,144.35	2,144.35	2,144.35			2,143.99	2,143.99	2,143.99	2,143.99		
Bankfull Width (ft)	10.5	11.1	10.1	9.8			11.0	10.9	11.0	10.3			9.8	9.0	8.6	9.2		
Floodprone Width (ft)	>56	>56	>56	>56			>39	>39	>39	>39			>38	>38	>38	>38		
Bankfull Mean Depth (ft)	1.0	0.8	0.7	0.9			0.8	0.7	0.7	0.7			0.6	0.6	0.6	0.6		
Bankfull Max Depth (ft)	2.0	1.8	1.6	2.0			1.7	1.5	1.5	1.5			1.2	1.0	1.2	1.3		
Bankfull Cross Sectional Area (ft^2)	10.5	8.4	7.5	8.4			9.0	7.9	7.6	7.6			5.8	5.2	5.2	5.7		
Bankfull Width/Depth Ratio	10.4	14.7	13.7	11.5			13.4	15.0	16.1	14.1			16.5	15.9	14.1	14.7		
Bankfull Entrenchment Ratio	>5.3	>5	>5.5	>5.7			>3.5	>3.5	>3.5	>3.8			>3.9	>4.2	>4.4	>4.1		
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.1		
d50 (mm)	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A			N/A	12	0.21	4.3		

N/A - Item does not apply.

Table 11a. cont'd. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters - Cross-Sections) Junes Branch / Project No. 95027 -Higdon Branch (376 feet)												
	Cross-Section 12 Riffle						Cross-Section 13 Pool					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	2,140.85	2,140.85	2,140.85	2,140.85			2,140.14	2,140.14	2,140.14	2,140.14		
Bankfull Width (ft)	6.6	8.1	7.0	7.7			8.0	7.2	7.0	7.0		
Floodprone Width (ft)	>40	>40	>40	>40			>30	>30	>30	>30		
Bankfull Mean Depth (ft)	0.4	0.3	0.3	0.3			0.7	0.6	0.3	0.3		
Bankfull Max Depth (ft)	0.7	0.7	0.9	0.7			1.7	1.1	0.5	0.4		
Bankfull Cross Sectional Area (ft^2)	2.5	2.6	2.4	2.1			5.9	4.0	2.1	1.9		
Bankfull Width/Depth Ratio	17.6	24.7	20.6	28.8			10.8	13.0	23.9	25.5		
Bankfull Entrenchment Ratio	>6.0	>4.9	>5.6	>5.2			>3.7	>4.1	>4.2	>4.3		
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.1		
d50 (mm)	N/A	15	0.13	0.062			N/A	N/A	N/A	N/A		

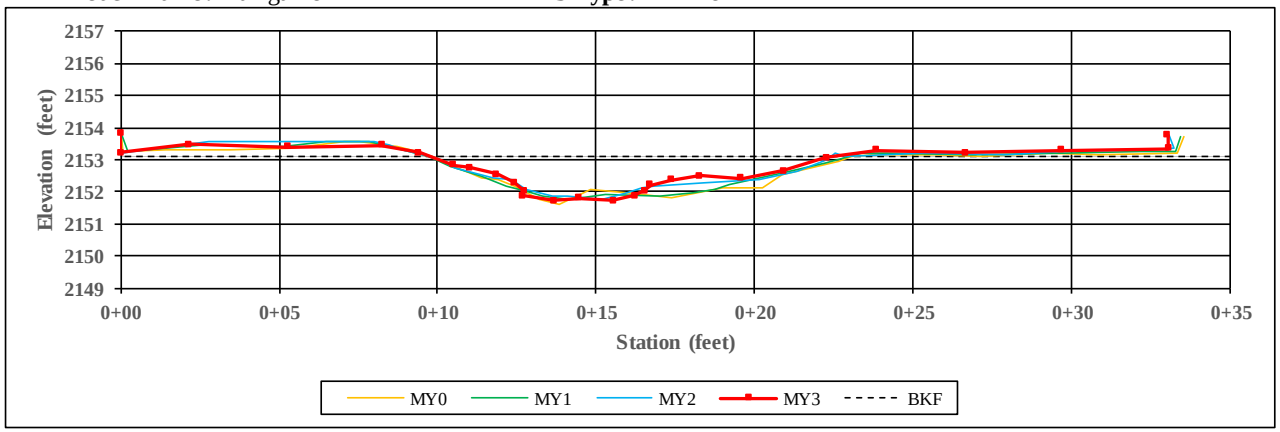
N/A - Item does not apply.

Table 11a. cont'd Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters - Cross-Sections) Junes Branch / Project No. 95027 -Doris Branch (288 feet)												
	Cross-Section 14 Riffle						Cross-Section 15 Pool					
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**
Record Elevation (datum) Used	2,138.93	2,138.93	2,138.93	2,138.93			2,138.74	2,138.74	2,138.74	2,138.74		
Bankfull Width (ft)	6.2	6.6	6.9	7.3			11.6	11.7	11.9	12.4		
Floodprone Width (ft)	>23	>23	>23	>23			>21	>21	>21	>21		
Bankfull Mean Depth (ft)	0.4	0.4	0.3	0.3			0.8	0.7	0.6	0.5		
Bankfull Max Depth (ft)	0.7	0.7	0.7	0.7			2.3	1.7	1.4	1.2		
Bankfull Cross Sectional Area (ft^2)	2.3	2.4	1.9	2.1			9.4	8.3	7.4	6.5		
Bankfull Width/Depth Ratio	16.7	18.2	25.7	25.9			14.3	16.5	19.1	23.6		
Bankfull Entrenchment Ratio	>3.8	>3.5	>3.4	>3.2			>1.8	>1.8	>1.8	>1.7		
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0			1.0	1.0	1.0	1.0		
d50 (mm)	N/A	0.062	0.062	0.062			N/A	N/A	N/A	N/A		

N/A - Item does not apply.

Project Name: Junes Branch **XS Number:** 1 **Station:** 103+31

Reach Name: Bumgarner 1 **XS Type:** Riffle



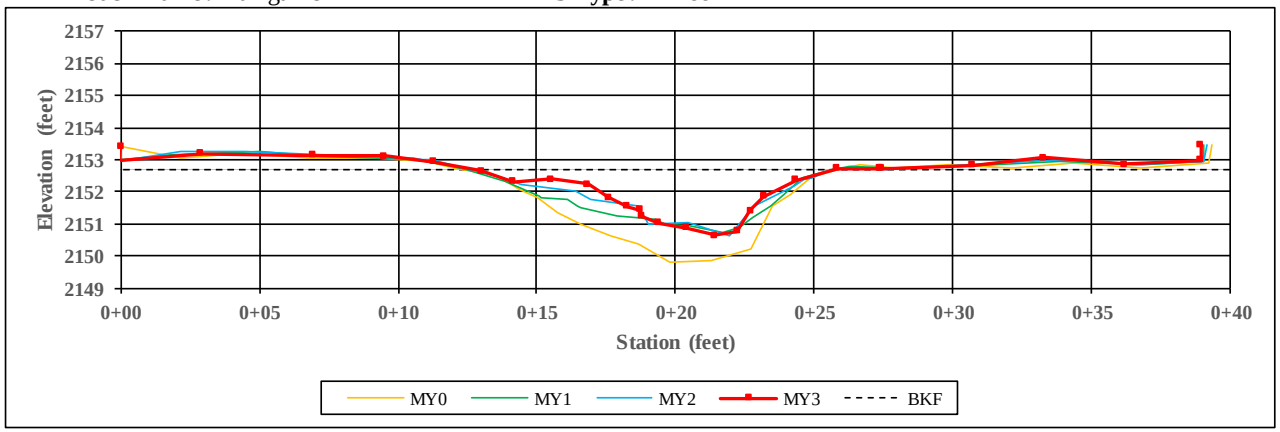
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	13.3	13.4	12.7	12.9	-	-	-	-
Floodprone Width (ft)	79.0	79.0	79.0	79.0	-	-	-	-
Bankfull Mean Depth (ft)	0.9	0.8	0.8	0.7	-	-	-	-
Bankfull Max Depth (ft)	1.5	1.3	1.3	1.4	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	11.7	11.3	10.2	9.6	-	-	-	-
Width/Depth Ratio	15.2	15.8	15.8	17.2	-	-	-	-
Entrenchment Ratio	5.9	5.9	6.2	6.1	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.1	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 2 **Station:** 103+56

Reach Name: Bumgarner 1 **XS Type:** Pool



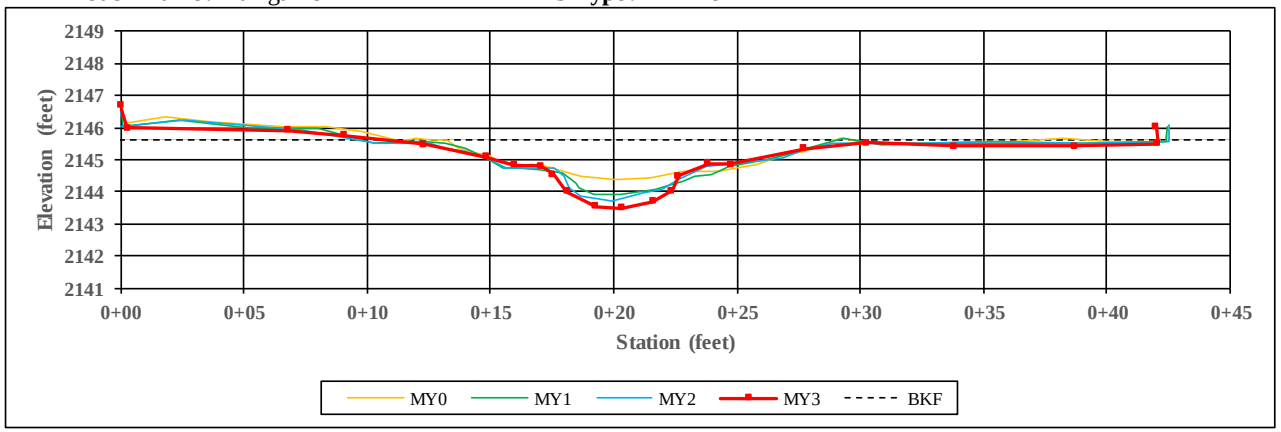
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	13.4	13.1	13.2	12.7	-	-	-	-
Floodprone Width (ft)	124.0	124.0	124.0	124.0	-	-	-	-
Bankfull Mean Depth (ft)	1.5	1.1	0.9	0.9	-	-	-	-
Bankfull Max Depth (ft)	2.9	1.9	2.1	2.0	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	20.6	14.0	12.2	11.3	-	-	-	-
Width/Depth Ratio	8.7	12.3	14.3	14.4	-	-	-	-
Entrenchment Ratio	9.3	9.5	9.4	9.7	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 3 **Station:** 106+36

Reach Name: Bumgarner 1 **XS Type:** Riffle



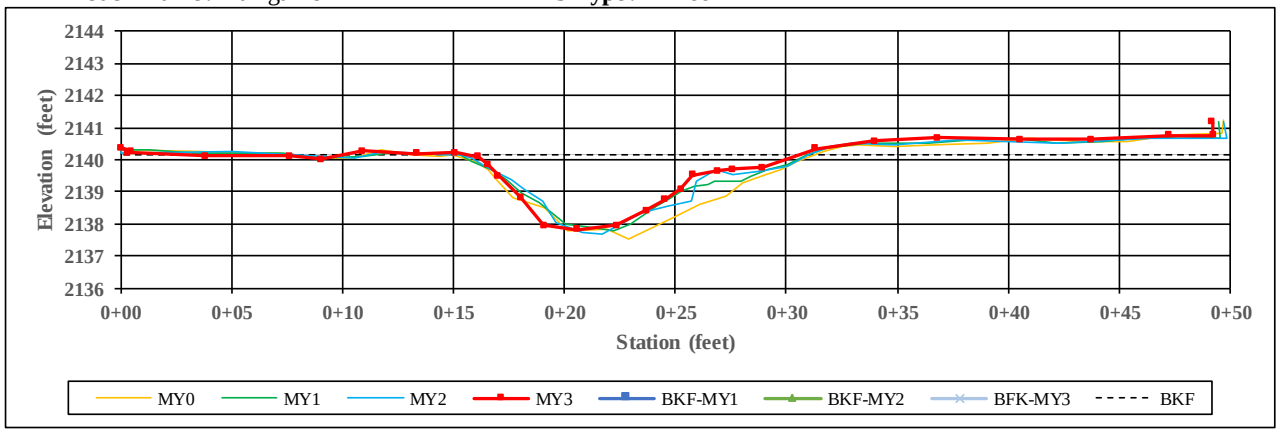
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	15.8	16.8	16.3	18.0	-	-	-	-
Floodprone Width (ft)	42.0	42.0	42.0	42.0	-	-	-	-
Bankfull Mean Depth (ft)	0.8	0.9	0.9	0.9	-	-	-	-
Bankfull Max Depth (ft)	1.2	1.7	1.9	2.1	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	12.2	14.5	14.8	15.8	-	-	-	-
Width/Depth Ratio	20.4	19.4	18.0	20.5	-	-	-	-
Entrenchment Ratio	2.7	2.5	2.6	2.3	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 4 **Station:** 109+24

Reach Name: Bumgarner 2 **XS Type:** Pool



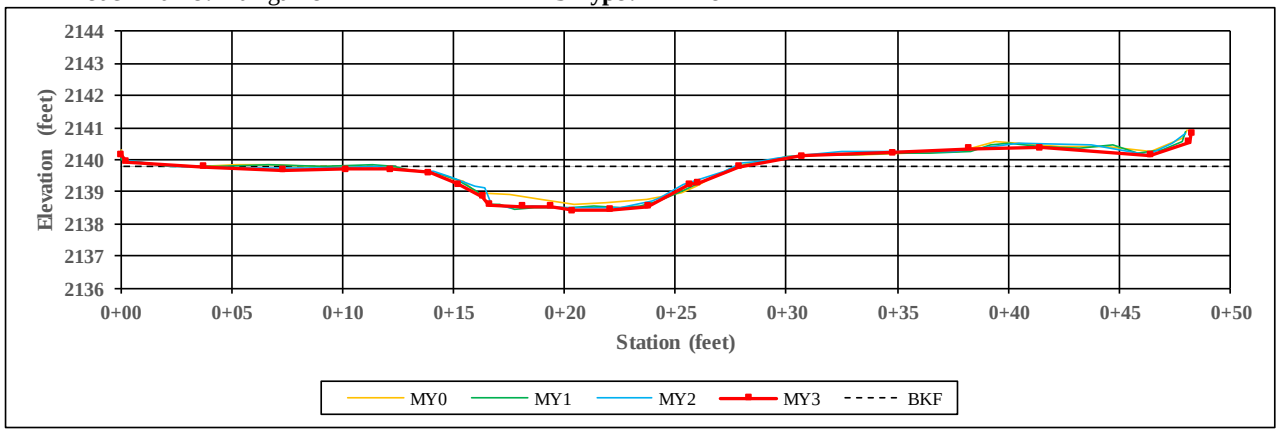
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	16.5	16.1	16.5	15.2	-	-	-	-
Floodprone Width (ft)	50.0	50.0	50.0	50.0	-	-	-	-
Bankfull Mean Depth (ft)	1.4	1.2	1.1	1.2	-	-	-	-
Bankfull Max Depth (ft)	2.6	2.4	2.5	2.3	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	23.0	18.9	18.5	17.9	-	-	-	-
Width/Depth Ratio	11.9	13.7	14.8	12.8	-	-	-	-
Entrenchment Ratio	3.0	3.1	3.0	3.3	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 5 **Station:** 109+58

Reach Name: Bumgarner 2 **XS Type:** Riffle



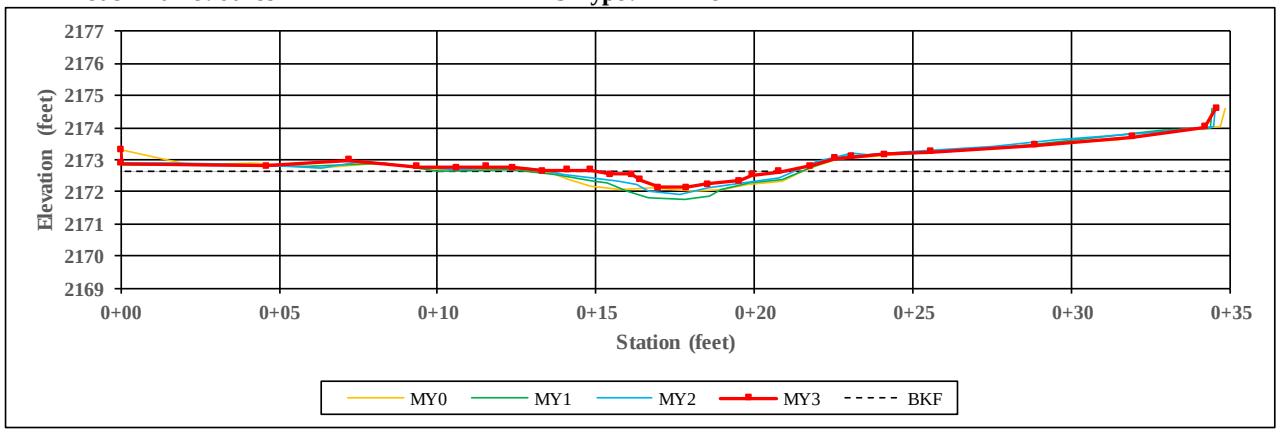
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	16.3	15.7	16.2	16.0	-	-	-	-
Floodprone Width (ft)	48.0	48.0	48.0	48.0	-	-	-	-
Bankfull Mean Depth (ft)	0.7	0.9	0.8	0.9	-	-	-	-
Bankfull Max Depth (ft)	1.2	1.3	1.3	1.4	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	11.9	13.4	12.6	13.7	-	-	-	-
Width/Depth Ratio	22.2	18.4	20.8	18.6	-	-	-	-
Entrenchment Ratio	3.0	3.1	3.0	3.0	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 6 **Station:** 202+94

Reach Name: Junes **XS Type:** Riffle



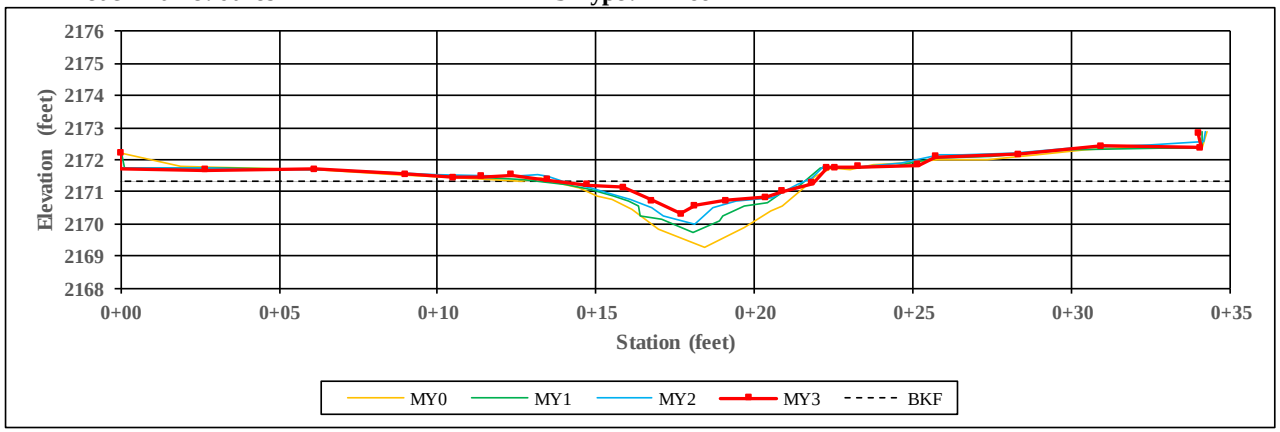
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	8.6	8.8	8.0	6.3	-	-	-	-
Floodprone Width (ft)	94.0	94.0	94.0	94.0	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.5	0.4	0.3	-	-	-	-
Bankfull Max Depth (ft)	0.7	0.9	0.7	0.5	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	3.7	4.1	3.0	1.7	-	-	-	-
Width/Depth Ratio	19.7	18.9	21.7	23.0	-	-	-	-
Entrenchment Ratio	11.0	10.7	11.7	14.8	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 7 **Station:** 203+50

Reach Name: Junes **XS Type:** Pool



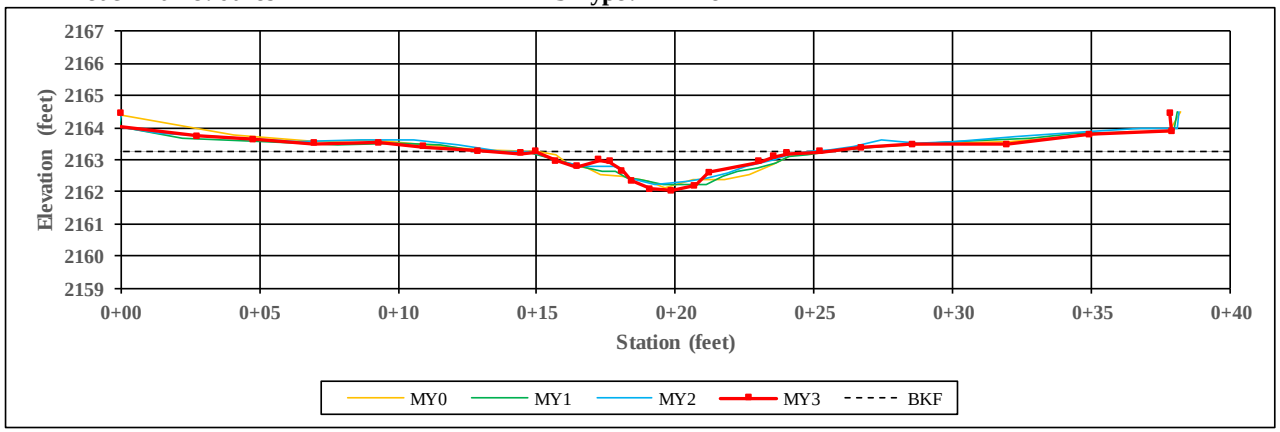
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	8.2	8.8	7.8	8.3	-	-	-	-
Floodprone Width (ft)	111.0	111.0	111.0	111.0	-	-	-	-
Bankfull Mean Depth (ft)	1.0	0.7	0.6	0.4	-	-	-	-
Bankfull Max Depth (ft)	2.1	1.6	1.3	1.0	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	8.6	6.1	4.8	3.7	-	-	-	-
Width/Depth Ratio	7.9	12.7	12.7	18.8	-	-	-	-
Entrenchment Ratio	13.5	12.6	14.2	13.4	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 8 **Station:** 206+99

Reach Name: Junes **XS Type:** Riffle



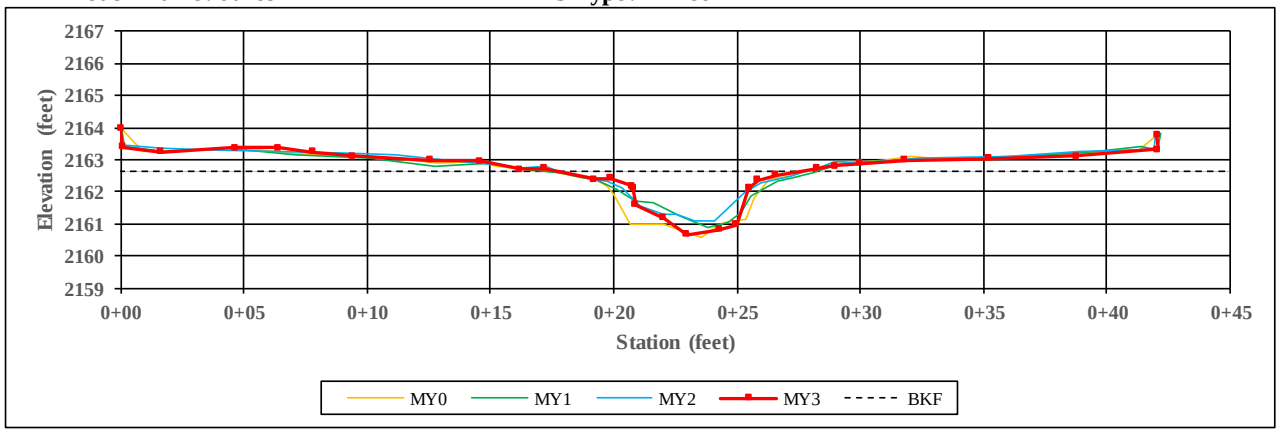
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	9.6	10.8	10.6	10.6	-	-	-	-
Floodprone Width (ft)	53.0	53.0	53.0	53.0	-	-	-	-
Bankfull Mean Depth (ft)	0.7	0.6	0.5	0.5	-	-	-	-
Bankfull Max Depth (ft)	1.2	1.1	1.0	1.2	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	6.4	6.4	5.7	5.6	-	-	-	-
Width/Depth Ratio	14.3	18.2	19.8	20.0	-	-	-	-
Entrenchment Ratio	5.5	4.9	5.0	5.0	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 9 **Station:** 207+18

Reach Name: Junes **XS Type:** Pool



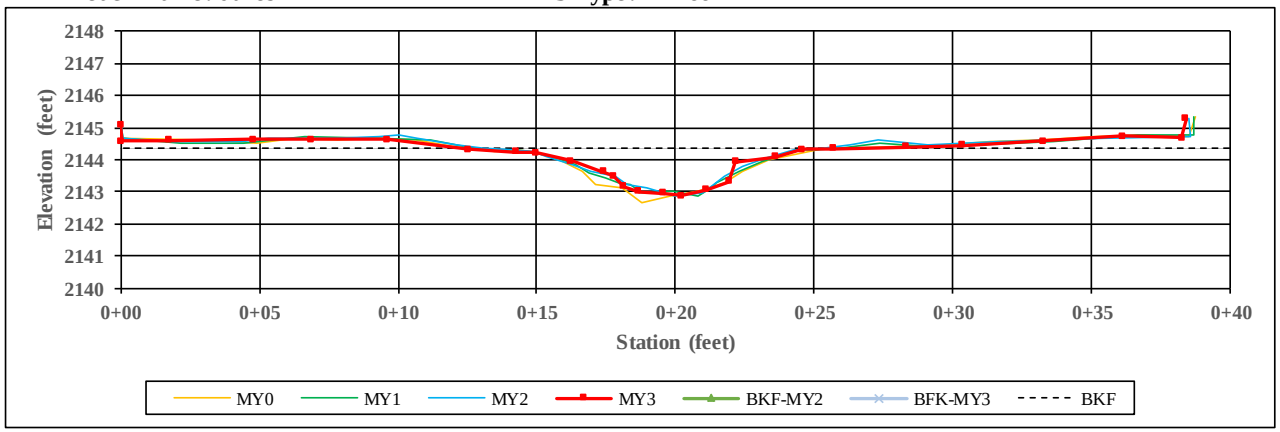
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	10.5	11.1	10.1	9.8	-	-	-	-
Floodprone Width (ft)	56.0	56.0	56.0	56.0	-	-	-	-
Bankfull Mean Depth (ft)	1.0	0.8	0.7	0.9	-	-	-	-
Bankfull Max Depth (ft)	2.0	1.8	1.6	2.0	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	10.5	8.4	7.5	8.4	-	-	-	-
Width/Depth Ratio	10.4	14.7	13.7	11.5	-	-	-	-
Entrenchment Ratio	5.3	5.0	5.5	5.7	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 10 **Station:** 214+53

Reach Name: Junes **XS Type:** Pool



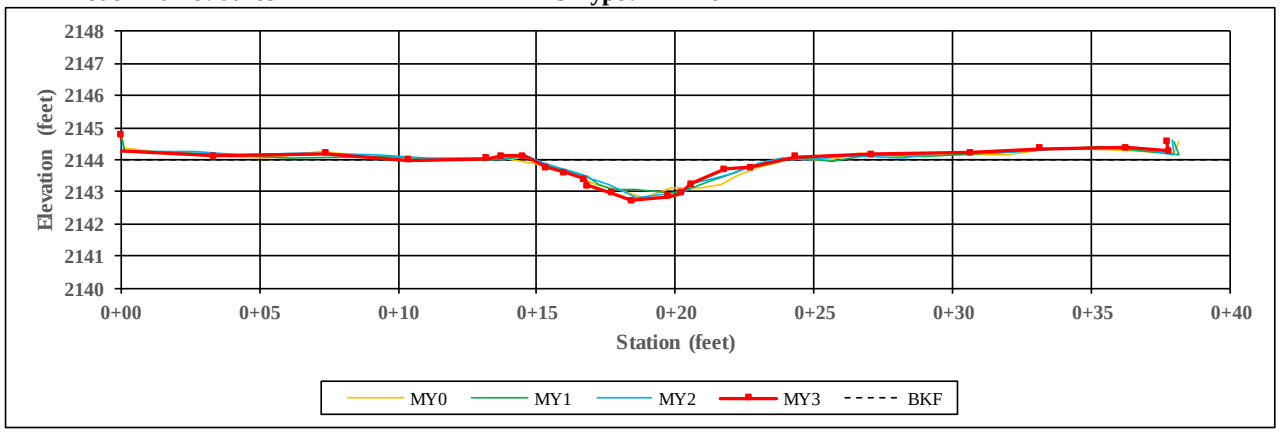
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	11.0	13.2	11.0	10.3	-	-	-	-
Floodprone Width (ft)	39.0	39.0	39.0	39.0	-	-	-	-
Bankfull Mean Depth (ft)	0.8	0.7	0.7	0.7	-	-	-	-
Bankfull Max Depth (ft)	1.7	1.5	1.5	1.5	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	9.0	7.9	7.6	7.6	-	-	-	-
Width/Depth Ratio	13.4	15.0	16.1	14.1	-	-	-	-
Entrenchment Ratio	3.5	3.5	3.5	3.8	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 11 **Station:** 214+65

Reach Name: Junes **XS Type:** Riffle



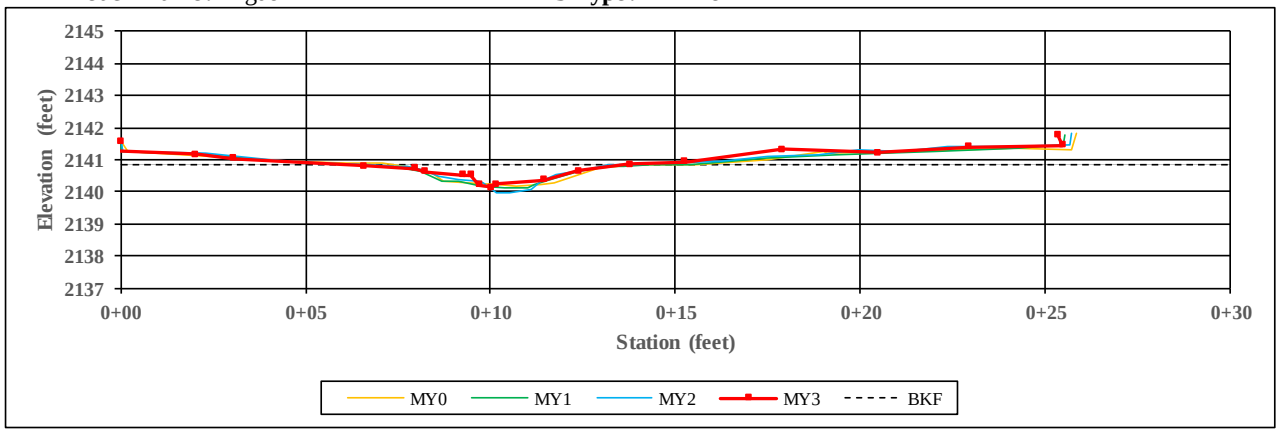
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	9.8	9.0	8.6	9.2	-	-	-	-
Floodprone Width (ft)	38.0	38.0	38.0	38.0	-	-	-	-
Bankfull Mean Depth (ft)	0.6	0.6	0.6	0.6	-	-	-	-
Bankfull Max Depth (ft)	1.2	1.0	1.2	1.3	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	5.8	5.2	5.2	5.7	-	-	-	-
Width/Depth Ratio	16.5	15.9	14.1	14.7	-	-	-	-
Entrenchment Ratio	3.9	4.2	4.4	4.1	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.1	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 12 **Station:** 301+99

Reach Name: Higdon **XS Type:** Riffle



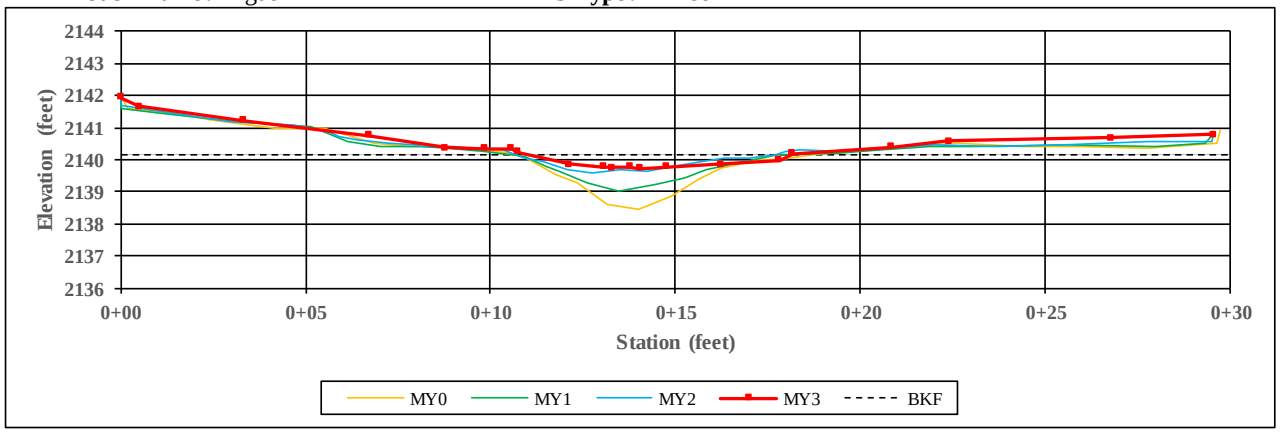
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	6.6	8.1	7.0	7.7	-	-	-	-
Floodprone Width (ft)	40.0	40.0	40.0	40.0	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.3	0.3	0.3	-	-	-	-
Bankfull Max Depth (ft)	0.7	0.7	0.9	0.7	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	2.5	2.6	2.4	2.1	-	-	-	-
Width/Depth Ratio	17.6	24.7	20.6	28.8	-	-	-	-
Entrenchment Ratio	6.0	4.9	5.6	5.2	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 13 **Station:** 302+26

Reach Name: Higdon **XS Type:** Pool



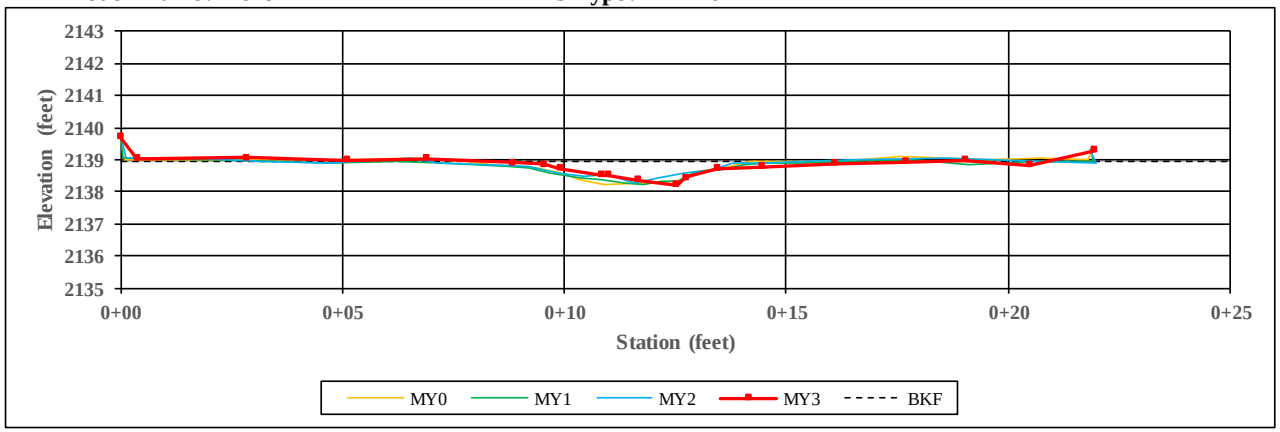
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	8.0	7.2	7.0	7.0	-	-	-	-
Floodprone Width (ft)	30.0	30.0	30.0	30.0	-	-	-	-
Bankfull Mean Depth (ft)	0.7	0.6	0.3	0.3	-	-	-	-
Bankfull Max Depth (ft)	1.7	1.1	0.5	0.4	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	5.9	4.0	2.1	1.9	-	-	-	-
Width/Depth Ratio	10.8	13.0	23.9	25.5	-	-	-	-
Entrenchment Ratio	3.7	4.1	4.2	4.3	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.1	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 14 **Station:** 401+12

Reach Name: Doris **XS Type:** Riffle



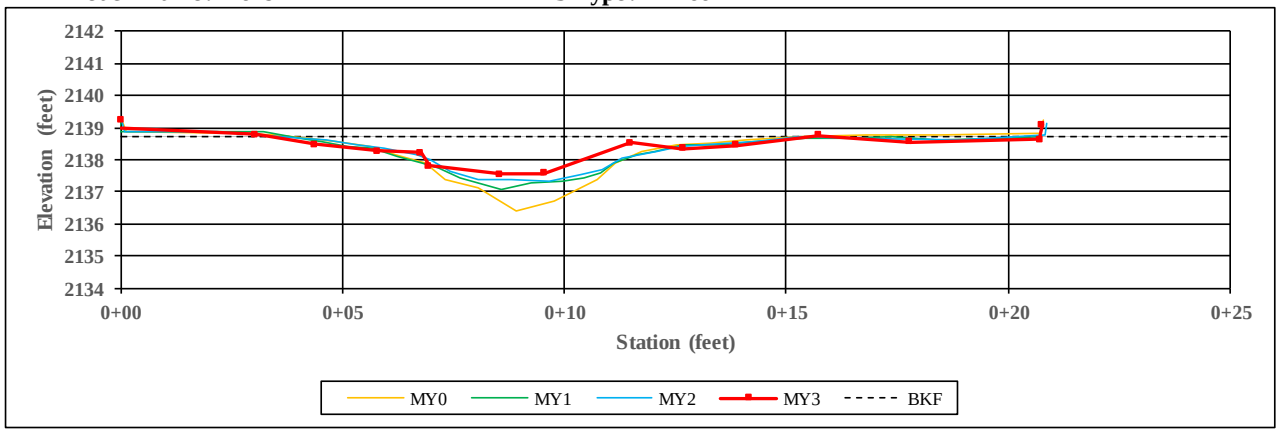
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	6.2	6.6	6.9	7.3	-	-	-	-
Floodprone Width (ft)	23.0	23.0	23.0	23.0	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.4	0.3	0.3	-	-	-	-
Bankfull Max Depth (ft)	0.7	0.7	0.7	0.7	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	2.3	2.4	1.9	2.1	-	-	-	-
Width/Depth Ratio	16.7	18.2	25.7	25.9	-	-	-	-
Entrenchment Ratio	3.8	3.5	3.4	3.2	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Junes Branch **XS Number:** 15 **Station:** 401+35

Reach Name: Doris **XS Type:** Pool



CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5		
Bankful Width (ft)	11.6	11.7	11.9	12.4	-	-	-	-
Floodprone Width (ft)	21.0	21.0	21.0	21.0	-	-	-	-
Bankfull Mean Depth (ft)	0.8	0.7	0.6	0.5	-	-	-	-
Bankfull Max Depth (ft)	2.3	1.7	1.4	1.2	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	9.4	8.3	7.4	6.5	-	-	-	-
Width/Depth Ratio	14.3	16.5	19.1	23.6	-	-	-	-
Entrenchment Ratio	1.8	1.8	1.8	1.7	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Table 11b. Monitoring Data - Stream Reach Data Summary
Junes Branch / Project No. 95027 - Bumgarner I (631 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5					
Dimension & Substrate - Riffle	**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)	13.3	14.6	14.6	15.8	N/A	2	13.4	15.5	15.5	17.6	3.0	2	12.7	14.5	14.5	16.3	2.5	2	12.9	15.4	15.4	18.0	3.6	2												
Floodprone Width (ft)	>42	>61	>61	>79	N/A	2	>42	>61	>61	>79	26.2	2	>42	>61	>61	>79	26.2	2	>42	>60	>60	>79	26.2	2												
Bankfull Mean Depth (ft)	0.8	0.9	0.9	0.9	N/A	2	0.8	0.8	0.8	0.8	0	2	0.8	0.9	0.9	0.9	0.1	2	0.7	0.8	0.8	0.9	0.1	2												
Bankfull Max Depth (ft)	1.2	1.4	1.4	1.5	N/A	2	1.3	1.5	1.5	1.7	0.3	2	1.3	1.6	1.6	1.9	0.4	2	1.4	1.7	1.7	2.1	0.5	2												
Bankfull Cross-Sectional Area (ft^2)	11.7	12.0	12.0	12.2	N/A	2	11.3	16.4	16.4	21.4	7.1	2	10.2	12.5	12.5	14.8	3.3	2	9.6	12.7	12.7	15.8	4.3	2												
Width/Depth Ratio	15.2	17.8	17.8	20.4	N/A	2	15.8	18.6	18.6	21.4	4.0	2	15.8	16.9	16.9	18.0	1.6	2	17.2	18.9	18.9	20.5	2.3	2												
Entrenchment Ratio	>2.7	>4.3	>4.3	>5.9	N/A	2	>2.4	>4.15	>4.15	>5.9	2.5	2	>2.6	>4.4	>4.4	>6.2	2.5	2	>2.3	>4.2	>4.2	>6.1	2.7	2												
Bank Height Ratio	1.0	1.0	1.0	1.0	N/A	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	1.1	1.0	1.1	0.1	2												
Profile																																				
Riffle Length (ft)	0.5	13.7	14.4	23.0	7.4	14	10.5	17.0	14.5	25.6	5.7	11	11.4	17.5	14.9	26.6	6.1	11	9.4	15.5	12.4	27.3	6.3	11												
Riffle Slope (ft/ft)	0.016	0.061	0.039	0.251	0.063	14	0.019	0.030	0.027	0.055	0.010	11	0.017	0.028	0.025	0.040	0.009	11	0.007	0.022	0.021	0.042	0.012	11												
Pool Length (ft)	5.2	10.2	9.2	22.5	4.3	12	5.0	7.6	7.3	13.4	2.2	12	5.4	7.7	7.0	12.9	2.1	12	4.9	9.2	8.1	19.1	3.7	12												
Pool Max Depth (ft)	2.1	2.8	2.8	3.6	0.5	14	1.9	2.5	2.4	3.7	0.5	14	1.9	2.3	2.2	2.7	0.3	14	1.5	1.9	1.9	2.6	0.3	14												
Pool Spacing (ft)	24.2	45.2	44.1	60.3	10.3	11	25.3	41.8	41.1	59.9	11.9	11	28.8	41.4	37.6	57.5	10.3	11	23.6	41.3	36.3	56.6	10.9	11												
Pattern																																				
Channel Belt Width (ft)	24.5	25.3	25.3	26.2	N/A	2																														
Radius of Curvature (ft)	41.6	48.3	41.6	60.1	10.3	3																														
Rc: Bankfull Width (ft/ft)	2.8	3.3	2.9	4.1	0.7	3																														
Meander Wavelength (ft)	69.8	81.7	75.9	105.4	16.6	4																														
Meander Width Ratio	1.9	2.0	2.0	2.1	N/A	2																														
Additional Reach Parameters																																				
Rosgen Classification	Bc						B						B						B																	
Channel Thalweg Length (ft)	728						713						704						703																	
Sinuosity (ft)	1.09						1.09						1.07						1.06																	
Water Surface Slope (Channel) (ft/ft)	0.0233						0.0243						0.0247						0.0247																	
Bankfull Slope (ft/ft)	0.0235						0.0245						0.0250						0.0254																	
Ri% / Ru% / P% / G% / S%	37%	32%	24%	7%	0%		38%	34%	19%	9%	0%		40%	35%	19%	7%	0%		35%	36%	23%	6%	0%													
SC% / SA% / G% / C% / B% / Be%*																																				
d16 / d35 / d50 / d84 / d95 (mm)																																				
% of Reach with Eroding Banks																																				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step
SC = Silt-Clay / SA = Sand / G = Gravel / C = Cobble / B = Boulder / Be = Bedrock
- Information unavailable

Table 11b. Monitoring Data - Stream Reach Data Summary
Junes Branch / Project No. 95027 - Bumgarner II (543 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5					
Dimension & Substrate - Riffle	**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)	-	16.3	-	-	N/A	1	-	15.7	-	-	N/A	1	-	16.2	-	-	N/A	1	-	16.0	-	-	N/A	1												
Floodprone Width (ft)	-	>47	-	-	N/A	1	-	>48	-	-	N/A	1	-	>48	-	-	N/A	1	-	>48	-	-	N/A	1												
Bankfull Mean Depth (ft)	-	0.7	-	-	N/A	1	-	0.9	-	-	N/A	1	-	0.8	-	-	N/A	1	-	0.9	-	-	N/A	1												
Bankfull Max Depth (ft)	-	1.2	-	-	N/A	1	-	1.3	-	-	N/A	1	-	1.3	-	-	N/A	1	-	1.4	-	-	N/A	1												
Bankfull Cross-Sectional Area (ft^2)	-	11.9	-	-	N/A	1	-	13.4	-	-	N/A	1	-	12.6	-	-	N/A	1	-	13.7	-	-	N/A	1												
Width/Depth Ratio	-	22.2	-	-	N/A	1	-	18.4	-	-	N/A	1	-	20.8	-	-	N/A	1	-	18.6	-	-	N/A	1												
Entrenchment Ratio	-	>3	-	-	N/A	1	-	>3.1	-	-	N/A	1	-	>3.0	-	-	N/A	1	-	>3.0	-	-	N/A	1												
Bank Height Ratio	-	1.0	-	-	N/A	1	-	1.0	-	-	N/A	1	-	1.0	-	-	N/A	1	-	1.0	-	-	N/A	1												
Profile																																				
Riffle Length (ft)	3.1	29	32.3	38.6	12	7	27.2	34.5	34.5	42.0	5.5	6	26.5	32.9	32.3	42.0	5.9	6	27.9	33.1	30.6	43.2	5.7	6												
Riffle Slope (ft/ft)	0.016	0.026	0.020	0.064	0.017	7	0.015	0.017	0.016	0.021	0.002	6	0.013	0.017	0.015	0.024	0.005	6	0.008	0.015	0.016	0.017	0.004	6												
Pool Length (ft)	12.1	17.8	19.2	22.4	4	7	9.1	13.9	12.7	25.2	5.6	7	7.9	14.6	14.0	20.1	4.1	7	10.1	17.2	15.9	24.7	5.1	7												
Pool Max Depth (ft)	2.3	2.9	3.1	3.4	0.4	7	2.2	2.7	2.7	3.2	0.4	7	2.1	2.6	2.7	3.0	0.3	7	1.9	2.3	2.2	2.6	0.3	7												
Pool Spacing (ft)	61.5	70.2	69.9	80.2	6	6	60.7	66.7	66.4	74.5	5.1	6	59.0	67.6	67.7	75.8	5.7	6	60.3	67.8	68.4	76.6	6.1	6												
Pattern																																				
Channel Belt Width (ft)	25.4	28.0	26.2	26.2	3.8	3																														
Radius of Curvature (ft)	39.5	54.4	54.4	69.3	N/A	2																														
Rc: Bankfull Width (ft/ft)	3.1	4.3	4.3	5.5	N/A	2																														
Meander Wavelength (ft)	109.3	123.2	65.2	134.6	12.8	3																														
Meander Width Ratio	2.0	2.2	2.1	2.6	0.3	3																														
Additional Reach Parameters																																				
Rosgen Classification	Bc						Bc						Bc						Bc																	
Channel Thalweg Length (ft)	543						522						526						536																	
Sinuosity (ft)	1.07						1.06						1.07						1.08																	
Water Surface Slope (Channel) (ft/ft)	0.0140						0.0151						0.0166						0.0164																	
Bankfull Slope (ft/ft)	0.0152						0.0154						0.0145						0.0154																	
Ri% / Ru% / P% / G% / S%	45%	18%	28%	8%	0%		50%	16%	24%	10%	0%		48%	18%	25%	10%	0%		47%	18%	28%	7%	0%													
SC% / SA% / G% / C% / B% / Be%*																																				
d16 / d35 / d50 / d84 / d95 (mm)																																				
% of Reach with Eroding Banks																																				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step
SC = Silt-Clay / SA = Sand / G = Gravel / C = Cobble / B = Boulder / Be = Bedrock
- Information unavailable

Table 11b. Monitoring Data - Stream Reach Data Summary
Junes Branch / Project No. 95027 - Junes Branch (1,375 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n[1]**	**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)	8.6	9.3	9.6	9.8	0.6	3	8.8	9.6	9.0	10.8	1.1	3	8.0	9.1	8.6	10.6	1.4	3	6.3	8.7	9.2	10.6	2.17	3												
Floodprone Width (ft)	>38	>62	>53	>94	29.2	3	>38	>62	>53	>94	29.0	3	>38	>62	>53	>94	29.0	3	>38	>62	>53	>94	29	3												
Bankfull Mean Depth (ft)	0.4	0.6	0.6	0.7	0.2	3	0.5	0.5	0.6	0.6	0.1	3	0.4	0.5	0.5	0.6	0.1	3	0.3	0.5	0.5	0.6	0.2	3												
Bankfull Max Depth (ft)	0.7	1.0	1.2	1.2	0.3	3	0.9	1.0	1.0	1.1	0.1	3	0.7	1.0	1.0	1.2	0.3	3	0.5	1.0	1.2	1.3	0.4	3												
Bankfull Cross-Sectional Area (ft^2)	3.7	5.3	5.8	6.4	1.4	3	4.1	5.2	5.2	6.4	1.2	3	3.0	4.6	5.2	5.7	1.4	3	1.7	4.4	5.6	5.7	2.3	3												
Width/Depth Ratio	14.3	16.8	16.5	19.7	2.7	3	15.9	17.7	18.2	18.9	1.6	3	14.1	18.5	19.8	21.7	4.0	3	14.7	19.2	20.0	23.0	4.2	3												
Entrenchment Ratio	>3.9	>6.8	>5.5	>11	3.7	3	>4.2	>6.6	>4.9	>10.7	3.6	3	>4.4	>7.0	>5.0	>11.7	4.1	3	>4.1	>8.0	>5.0	>14.8	5.9	3												
Bank Height Ratio	1.0	1.0	1.0	1.0	0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.0	0.0	3	1.0	1.0	1.0	1.1	0.1	3												
Riffle Length (ft)	7.8	14.9	14.4	33.7	4.1	44	4.9	13.8	14.1	20.5	3.5	43	5.6	13.6	13.8	20.9	3.4	43	6.2	16.2	16.2	26.9	5.0	43												
Riffle Slope (ft/ft)	0.007	0.029	0.030	0.052	0.010	44	0.007	0.030	0.032	0.049	0.010	43	0.014	0.034	0.031	0.093	0.014	43	0.004	0.031	0.028	0.081	0.016	43												
Pool Length (ft)	4.7	10.7	10.4	19.5	3.0	42	1.6	7.8	7.6	14.8	2.9	43	3.7	9.7	9.7	14.5	2.7	43	3.1	8.8	9.0	13.8	2.3	43												
Pool Max Depth (ft)	1.3	1.9	1.9	3.2	0.4	44	1.0	2.1	2.0	3.8	0.6	43	0.8	2.0	2.0	3.6	0.6	44	0.9	2.0	1.9	3.5	0.6	45												
Pool Spacing (ft)	12.3	30.0	30.5	42.1	6.2	41	19.7	29.8	31.5	38.2	5.4	40	11.9	29.0	30.0	38.6	6.4	41	9.1	29.1	28.9	40.7	7.4	41												
Pattern																																				
Channel Belt Width (ft)	18.5	19.7	20.1	21.0	1.5	3																														
Radius of Curvature (ft)	31.9	35.8	36.7	38.9	3.6	3																														
Rc: Bankfull Width (ft/ft)	3.3	3.7	3.8	4.0	0.4	3																														
Meander Wavelength (ft)	53.7	67.1	61.4	88.3	12.5	6																														
Meander Width Ratio	1.9	2.1	2.1	2.2	0.2	3																														
Additional Reach Parameters																																				
Rosgen Classification	Bc						B						B						B																	
Channel Thalweg Length (ft)	1,480						1,427[2]						1,414						1,424																	
Sinuosity (ft)	1.1						1.1						1.1						1.1																	
Water Surface Slope (Channel) (ft/ft)	0.0231						0.0245						0.0271						0.0261																	
Bankfull Slope (ft/ft)	0.0246						0.0248						0.0272						0.0263																	
Ri% / Ru% / P% / G% / S%	50%	0%	34%	9%	7%		47%	0%	26%	18%	9%		46%	0%	33%	13%	8%		55%	0%	30%	8%	7%													
SC% / SA% / G% / C% / B% / Be%*																																				
d16 / d35 / d50 / d84 / d95 (mm)																																				
% of Reach with Eroding Banks																																				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step
SC = Silt-Clay / SA = Sand / G = Gravel / C = Cobble / B = Boulder / Be = Bedrock
- Information unavailable
[1]Number of riffle cross-sections mis-reported in baseline; Corrected value included here.
[2]Variation in channel thalweg length due to differences in length of monitored longitudinal profile from as-built.

Table 11b. Monitoring Data - Stream Reach Data Summary
Junes Branch / Project No. 95027 - Higdon Branch (376 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5					
Dimension & Substrate - Riffle	**Min**	**Mean[1]**	**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)	-	8.0	-	-	N/A	1	-	8.1	-	-	N/A	1	-	7.0	-	-	N/A	1	-	7.7	-	-	N/A	1												
Floodprone Width (ft)	-	>40	-	-	N/A	1	-	>40	-	-	N/A	1	-	>39	-	-	N/A	1	-	40.0	-	-	N/A	1												
Bankfull Mean Depth (ft)	-	0.4	-	-	N/A	1	-	0.3	-	-	N/A	1	-	0.3	-	-	N/A	1	-	0.3	-	-	N/A	1												
Bankfull Max Depth (ft)	-	0.7	-	-	N/A	1	-	0.7	-	-	N/A	1	-	0.9	-	-	N/A	1	-	0.7	-	-	N/A	1												
Bankfull Cross-Sectional Area (ft^2)	-	2.5	-	-	N/A	1	-	2.6	-	-	N/A	1	-	2.4	-	-	N/A	1	-	2.1	-	-	N/A	1												
Width/Depth Ratio	-	17.6	-	-	N/A	1	-	24.7	-	-	N/A	1	-	20.6	-	-	N/A	1	-	28.8	-	-	N/A	1												
Entrenchment Ratio	-	>6	-	-	N/A	1	-	>4.9	-	-	N/A	1	-	>5.6	-	-	N/A	1	-	5.2	-	-	N/A	1												
Bank Height Ratio	-	1.0	-	-	N/A	1	-	1.0	-	-	N/A	1	-	1.0	-	-	N/A	1	-	1.1	-	-	N/A	1												
Profile																																				
Riffle Length (ft)	2.5	7.7	7.6	15	2.9	13	6.5	9.8	9.1	15.6	2.9	13	4.9	8.9	8.4	14.8	2.8	13	3.4	11.2	10.8	17.6	4.0	13												
Riffle Slope (ft/ft)	0.002	0.021	0.017	0.047	0.012	13	0.007	0.021	0.019	0.040	0.011	13	0.006	0.019	0.016	0.036	0.009	13	0.004	0.021	0.020	0.046	0.011	13												
Pool Length (ft)	4.6	8.1	8.4	11	1.8	14	2.5	6.1	6.3	9.1	1.7	14	2.5	5.6	5.5	8.2	1.8	14	1.6	4.5	3.3	10.6	2.5	14												
Pool Max Depth (ft)	1.3	1.7	1.7	2	0.2	13	1.2	1.5	1.4	2.0	0.3	12	1.2	1.4	1.4	1.7	0.2	14	0.6	1.0	1.0	1.5	0.2	14												
Pool Spacing (ft)	13.1	18.6	17.5	26.6	3.8	13	14.6	20.3	19.0	31.2	4.5	12	12.7	18.8	18.3	25.8	3.5	13	13.8	18.9	18.7	24.4	3.3	13												
Pattern																																				
Channel Belt Width (ft)	9.1	10.6	10.6	12.1	2.1	2																														
Radius of Curvature (ft)	16.2	19.7	20.1	22.9	3.4	3																														
Rc: Bankfull Width (ft/ft)	2.0	2.5	2.5	2.9	0.4	3																														
Meander Wavelength (ft)	11.8	31.1	31.5	39.5	9.3	7																														
Meander Width Ratio	1.1	1.3	1.3	1.5	N/A	2																														
Additional Reach Parameters																																				
Rosgen Classification	Bc						Bc						Bc						Bc																	
Channel Thalweg Length (ft)	382						370						368						369																	
Sinuosity (ft)	1.06						1.05						1.06						1.05																	
Water Surface Slope (Channel) (ft/ft)	0.020						0.0191						0.0184						0.0162																	
Bankfull Slope (ft/ft)	0.018						0.0156						0.0153						0.0164																	
Ri% / Ru% / P% / G% / S%	42%	1%	47%	7%	2%		51%	5%	34%	11%	0%		46%	6%	31%	15%	2%		58%	4%	25%	13%	2%													
SC% / SA% / G% / C% / B% / Be%*																																				
d16 / d35 / d50 / d84 / d95 (mm)																																				
% of Reach with Eroding Banks																																				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step
SC = Silt-Clay / SA = Sand / G = Gravel / C = Cobble / B = Boulder / Be = Bedrock
[1]Corrected Values
- Information unavailable

Table 11b. Monitoring Data - Stream Reach Data Summary
Junes Branch / Project No. 95027 - Doris Branch (288 feet)

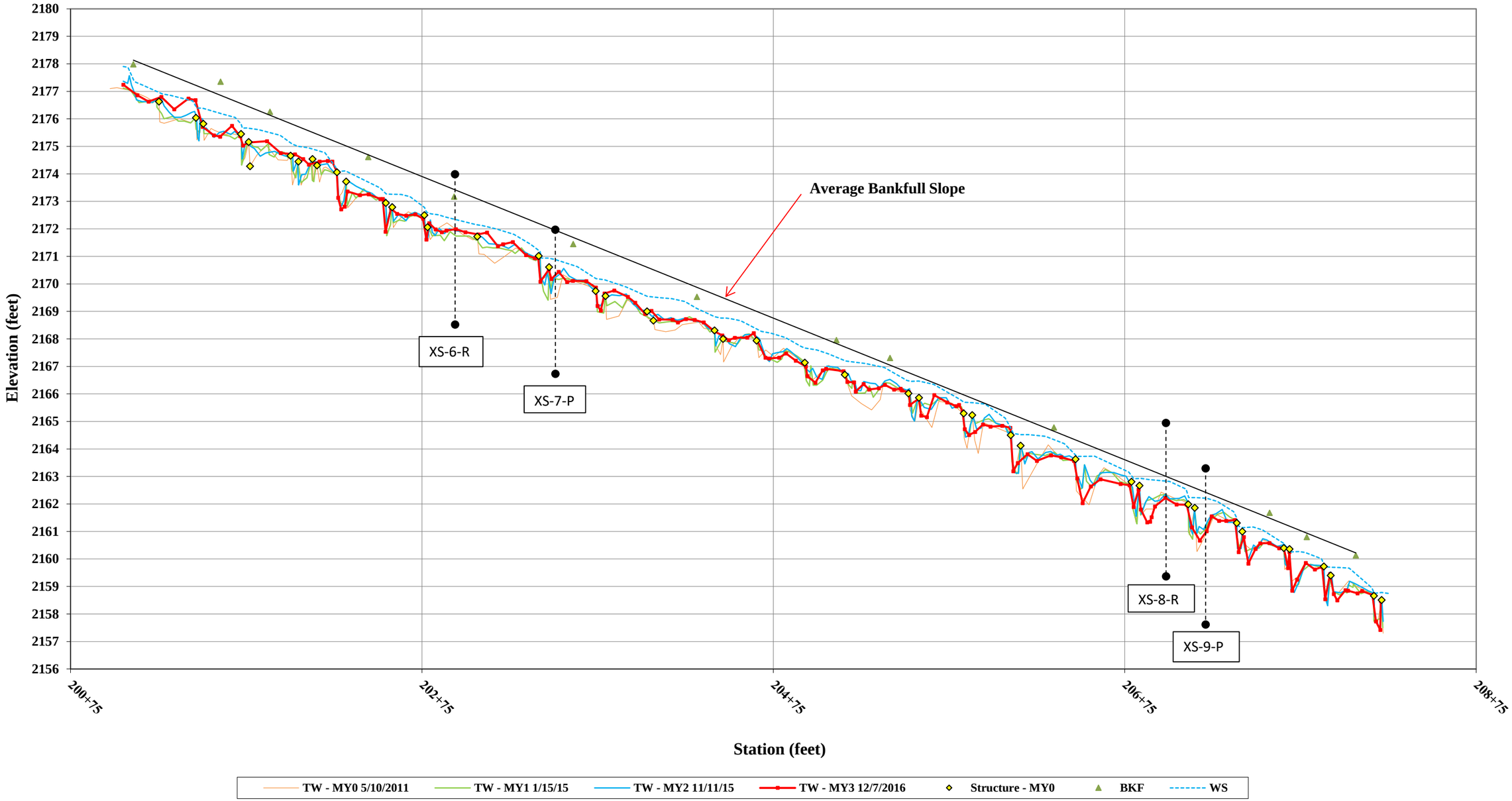
Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5					
Dimension & Substrate - Riffle	**Min**	**Mean[1]**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)	-	6.2	-	-	N/A	1	-	6.6	-	-	N/A	1	-	6.9	-	-	N/A	1	-	7.3	-	-	N/A	1												
Floodprone Width (ft)	-	>23	-	-	N/A	1	-	>23	-	-	N/A	1	-	>23	-	-	N/A	1	-	23.0	-	-	N/A	1												
Bankfull Mean Depth (ft)	-	0.4	-	-	N/A	1	-	0.4	-	-	N/A	1	-	0.3	-	-	N/A	1	-	0.3	-	-	N/A	1												
Bankfull Max Depth (ft)	-	0.7	-	-	N/A	1	-	0.7	-	-	N/A	1	-	0.7	-	-	N/A	1	-	0.7	-	-	N/A	1												
Bankfull Cross-Sectional Area (ft^2)	-	2.3	-	-	N/A	1	-	2.4	-	-	N/A	1	-	1.9	-	-	N/A	1	-	2.1	-	-	N/A	1												
Width/Depth Ratio	-	16.7	-	-	N/A	1	-	18.2	-	-	N/A	1	-	25.7	-	-	N/A	1	-	25.9	-	-	N/A	1												
Entrenchment Ratio	-	>3.8	-	-	N/A	1	-	>3.5	-	-	N/A	1	-	>3.4	-	-	N/A	1	-	3.2	-	-	N/A	1												
Bank Height Ratio	-	1.0	-	-	N/A	1	-	1.0	-	-	N/A	1	-	1.0	-	-	N/A	1	-	1.0	-	-	N/A	1												
Profile																																				
Riffle Length (ft)	2.5	6.1	6.3	11.4	2.5	18	3.7	6.5	6.5	11.3	2.0	18	3.6	6.3	6.1	9.3	1.9	18	3.2	6.3	5.8	11.9	2.4	18												
Riffle Slope (ft/ft)	0.011	0.022	0.013	0.036	0.008	18	0.002	0.023	0.020	0.055	0.014	18	0.004	0.026	0.027	0.056	0.014	18	0.004	0.022	0.022	0.044	0.013	18												
Pool Length (ft)	2.4	3.7	3.5	6.6	1	19	2.5	3.8	3.8	5.3	0.8	19	2.5	3.8	3.6	7.3	1.1	19	2.0	3.7	3.4	6.8	1.3	19												
Pool Max Depth (ft)	1.2	1.6	1.6	2.3	0.3	18	0.7	1.1	1.1	1.5	0.2	19	0.6	1.2	1.2	1.8	0.3	19	0.6	0.9	0.9	1.3	0.2	19												
Pool Spacing (ft)	7.2	12.4	12.6	19.9	2.9	18	7.5	12.4	13.3	18.4	3.0	18	7.6	12.4	12.9	18.5	3.0	18	8.6	12.6	12.2	18.8	2.9	18												
Pattern																																				
Channel Belt Width (ft)	9.4	9.9	10.0	10.3	0.5	3																														
Radius of Curvature (ft)	7.9	12.0	12.0	16.1	5.8	2																														
Rc: Bankfull Width (ft/ft)	3.1	4.3	4.3	5.5	N/A	2																														
Meander Wavelength (ft)	16.6	22.6	24.5	27.1	4.5	6																														
Meander Width Ratio	2.0	2.1	2.1	2.2	0.1	3																														
Additional Reach Parameters																																				
Rosgen Classification	Bc						Bc						Bc						Bc																	
Channel Thalweg Length (ft)	288						274						274						278																	
Sinuosity (ft)	1.06						1.06						1.06						1.08																	
Water Surface Slope (Channel) (ft/ft)	0.018						0.019						0.020						0.019																	
Bankfull Slope (ft/ft)	0.018						0.020						0.020						0.020																	
Ri% / Ru% / P% / G% / S%	48%	8%	31%	12%	1%		51%	6%	32%	11%	0%		49%	7%	31%	11%	2%		49%	13%	31%	7%	1%													
SC% / SA% / G% / C% / B% / Be%*																																				
d16 / d35 / d50 / d84 / d95 (mm)																																				
% of Reach with Eroding Banks																																				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

N/A - Information does not apply.
Ri = Riffle / Ru = Run / P = Pool / G = Glide / S = Step
SC = Silt-Clay / SA = Sand / G = Gravel / C = Cobble / B = Boulder / Be = Bedrock
[1]Corrected Values
- Information unavailable

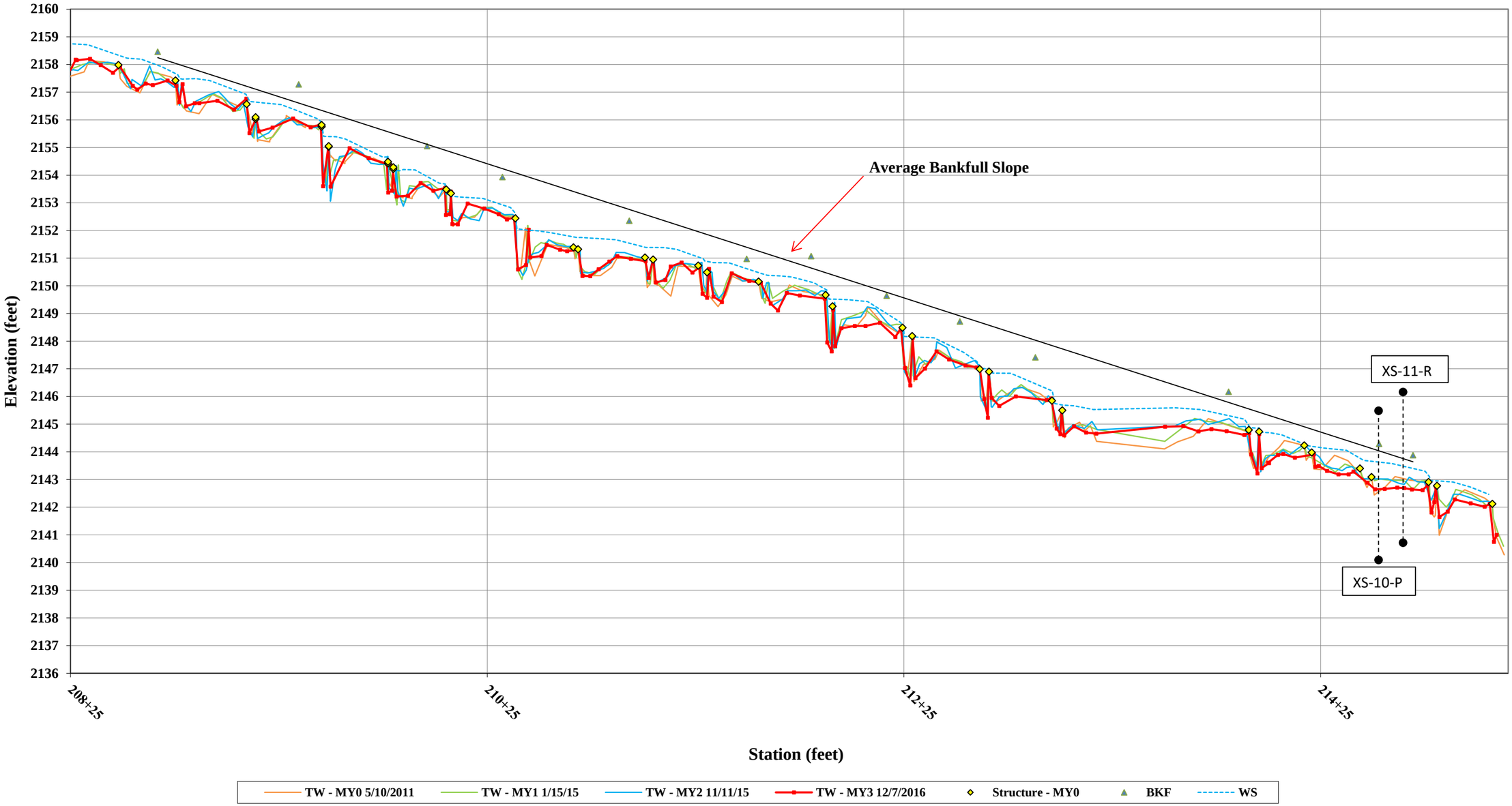
Bumgarner Branch I
Longitudinal Profile
Staioning 100+37 to 107+27

Bumgarner Branch II
Longitudinal Profile
Staioning 107+27 to 112+35

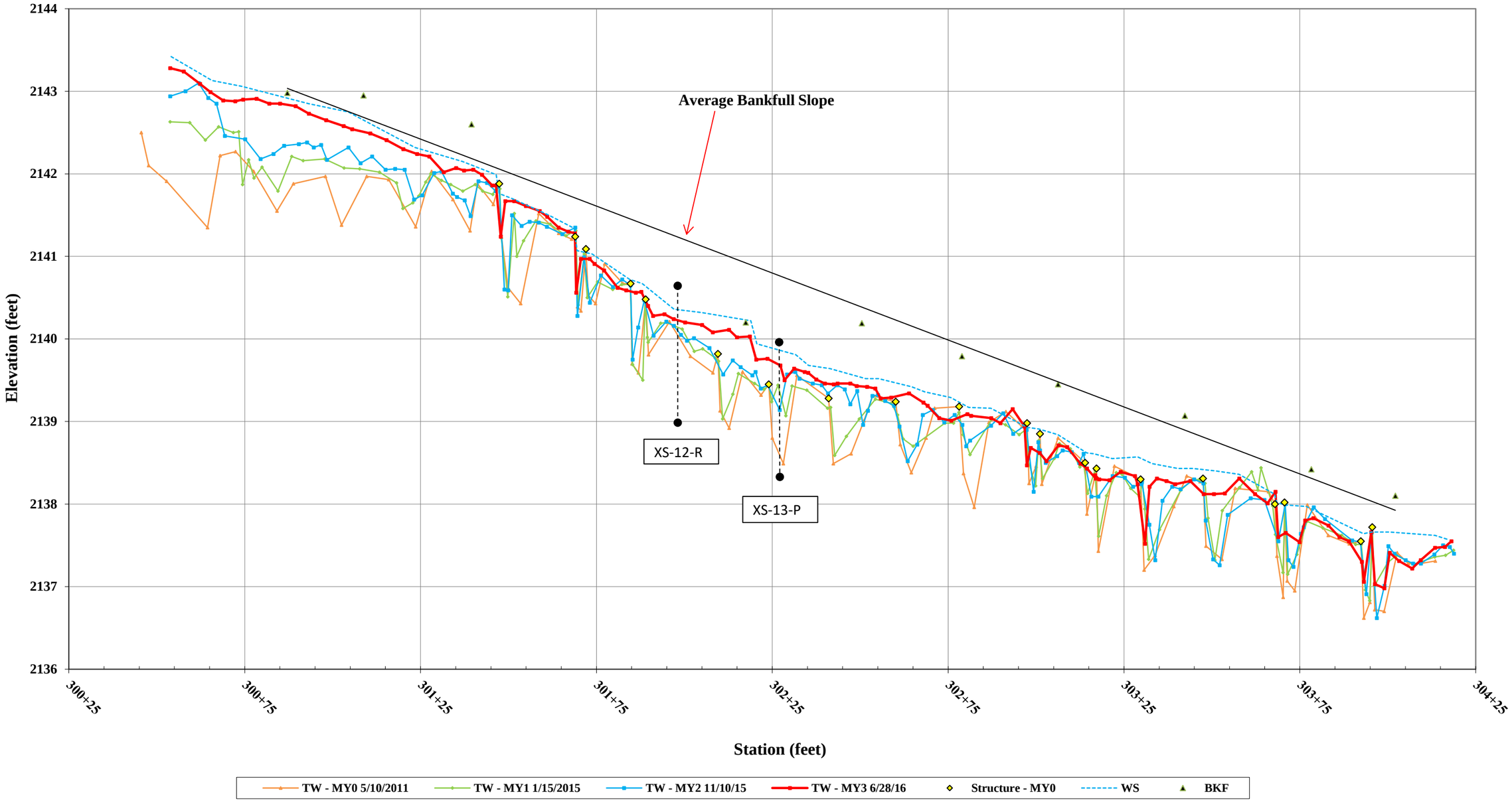
Junes Branch - Sheet 1
Longitudinal Profile
Staioning 200+97 to 215+15



Junes Branch - Sheet 2
Longitudinal Profile
Staioning 200+97 to 215+15



Hidgon Branch
Longitudinal Profile
Staioning 300+46 to 304+22



Doris Branch
Longitudinal Profile
Staioning 400+00 to 402+82

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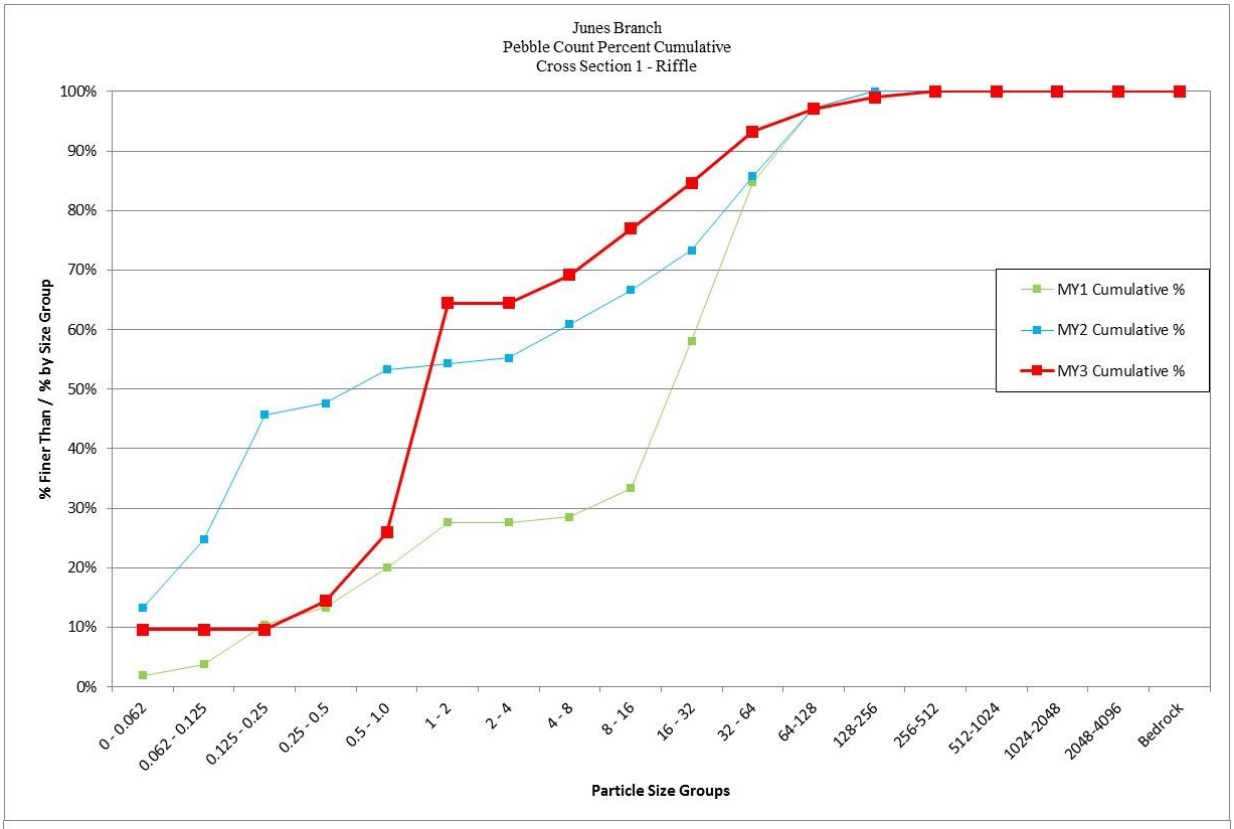
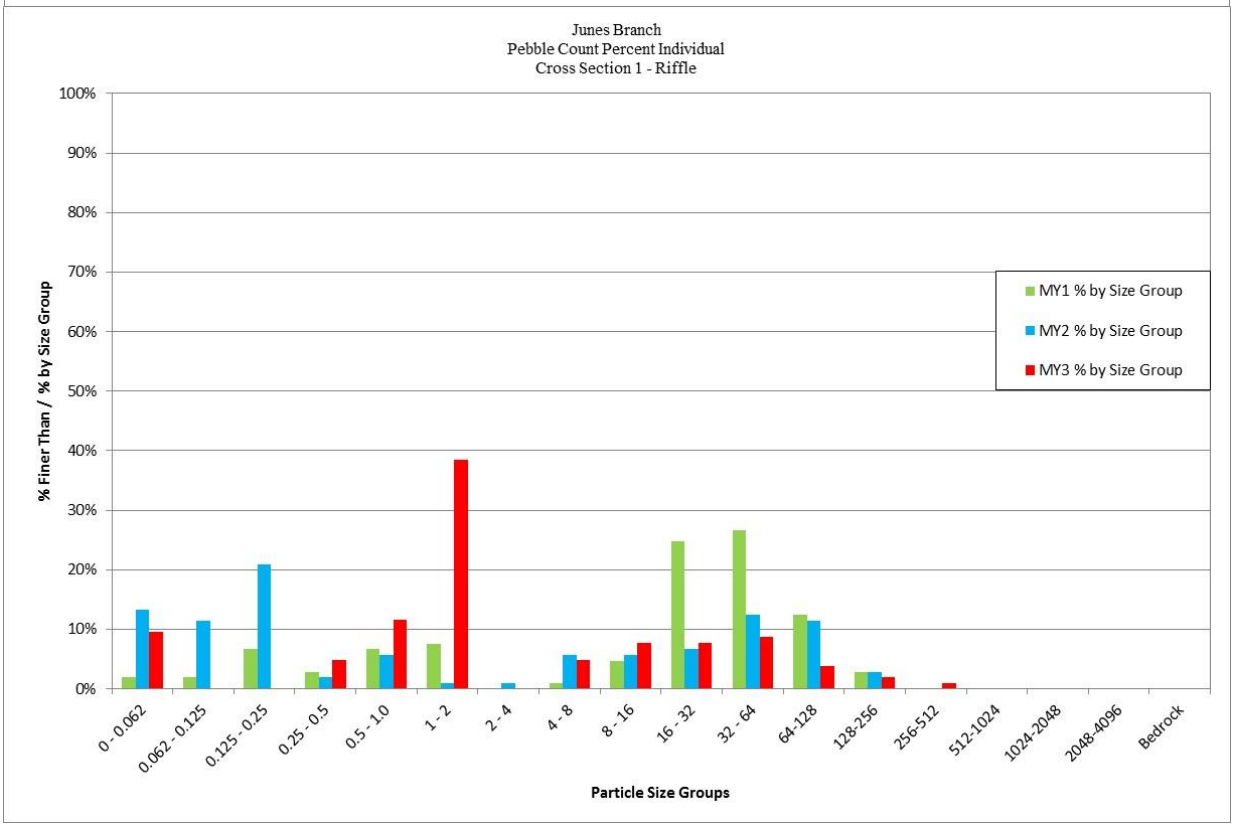
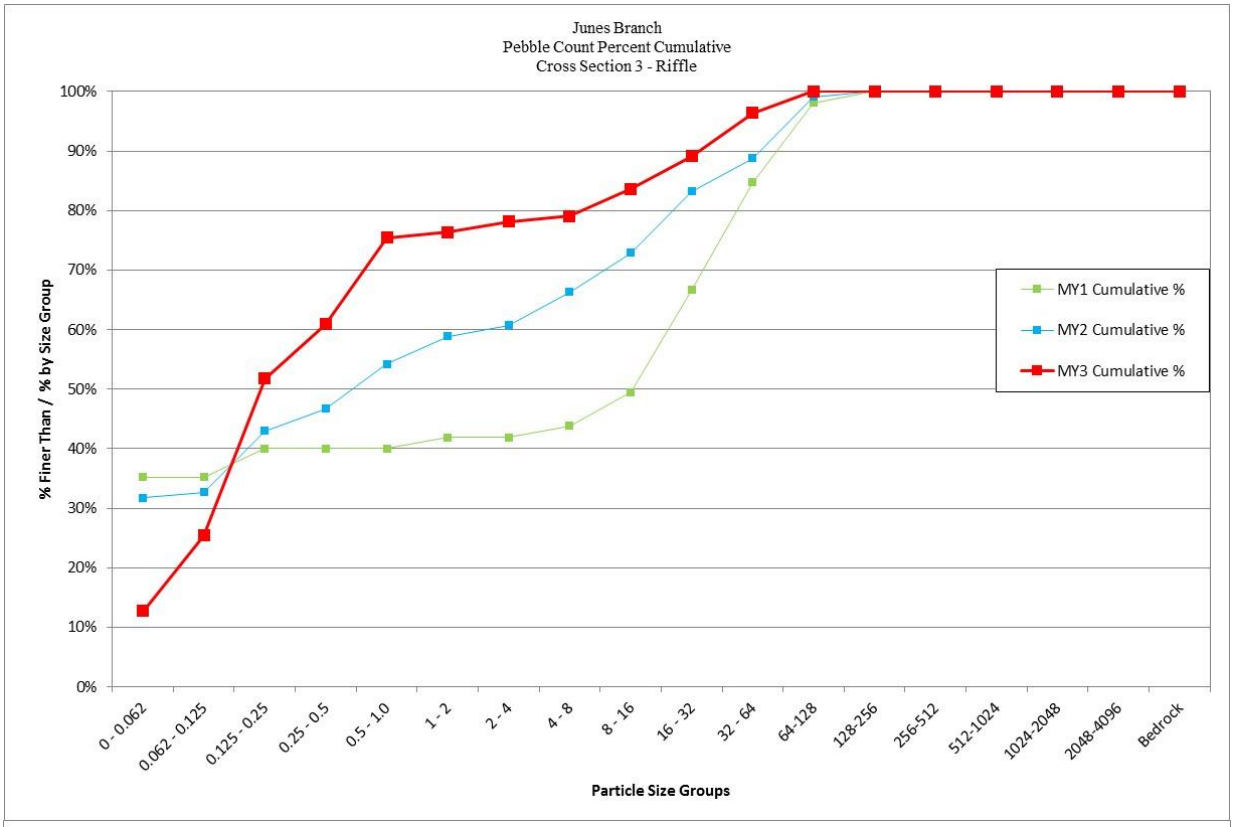
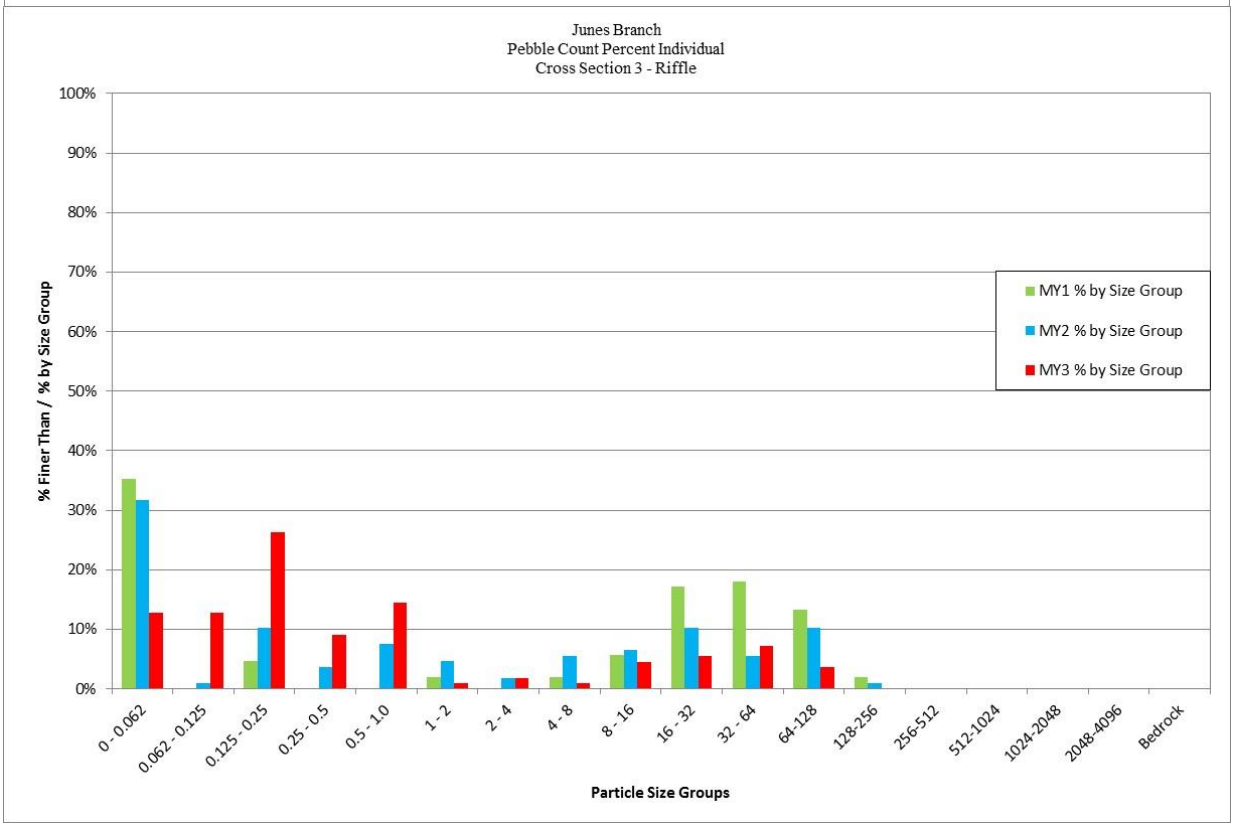
Junes Branch			
Cross Section 1 - Riffle			
Monitoring Year - 2016; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	10	9.6%	10%
0.062 - 0.125	0	0.0%	10%
0.125 - 0.25	0	0.0%	10%
0.25 - 0.5	5	4.8%	14%
0.5 - 1.0	12	11.5%	26%
1 - 2	40	38.5%	64%
2 - 4	0	0.0%	64%
4 - 8	5	4.8%	69%
8 - 16	8	7.7%	77%
16 - 32	8	7.7%	85%
32 - 64	9	8.7%	93%
64-128	4	3.8%	97%
128-256	2	1.9%	99%
256-512	1	1.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**104**	**100%**	**100%**
		Summary Data	
		D50	**1.5**
		D84	**30**
		D95	**87**


Junes Branch
Pebble Count Percent Cumulative
Cross Section 1 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

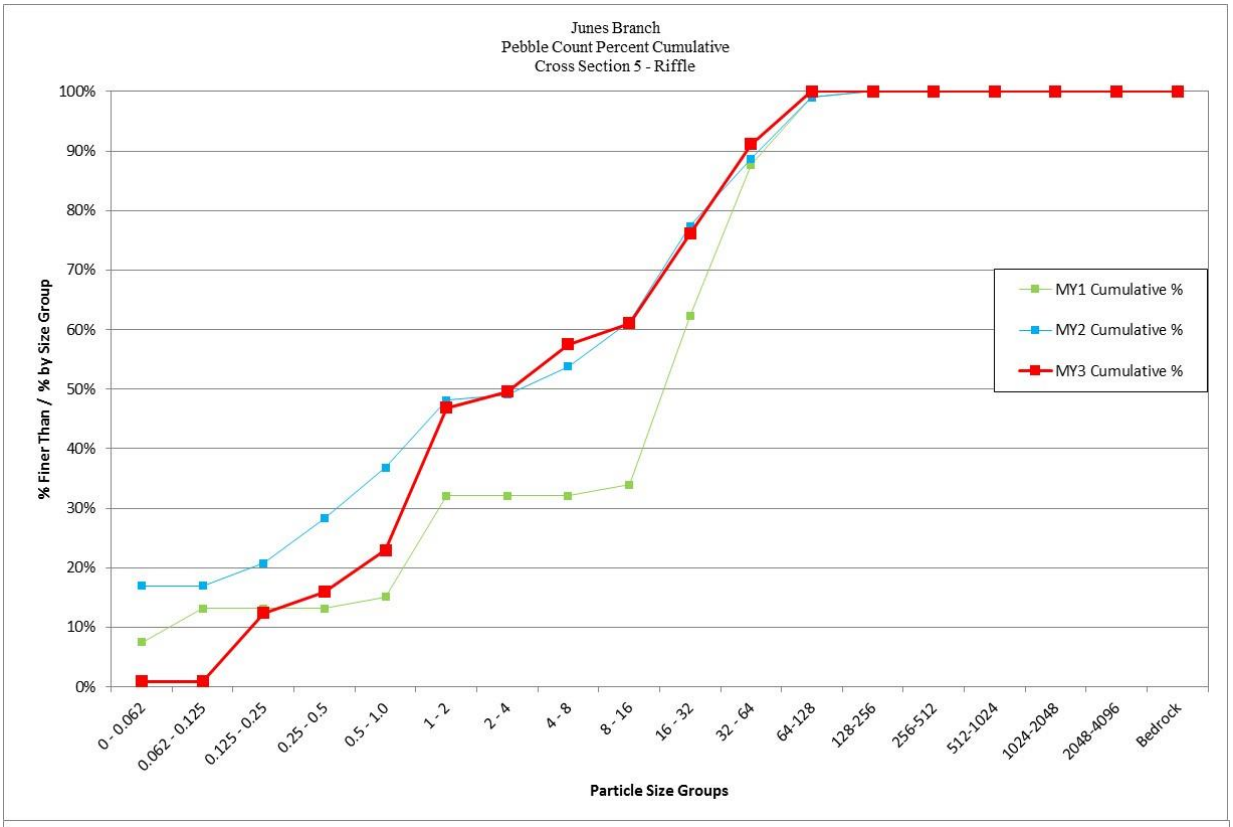

Junes Branch
Pebble Count Percent Individual
Cross Section 1 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

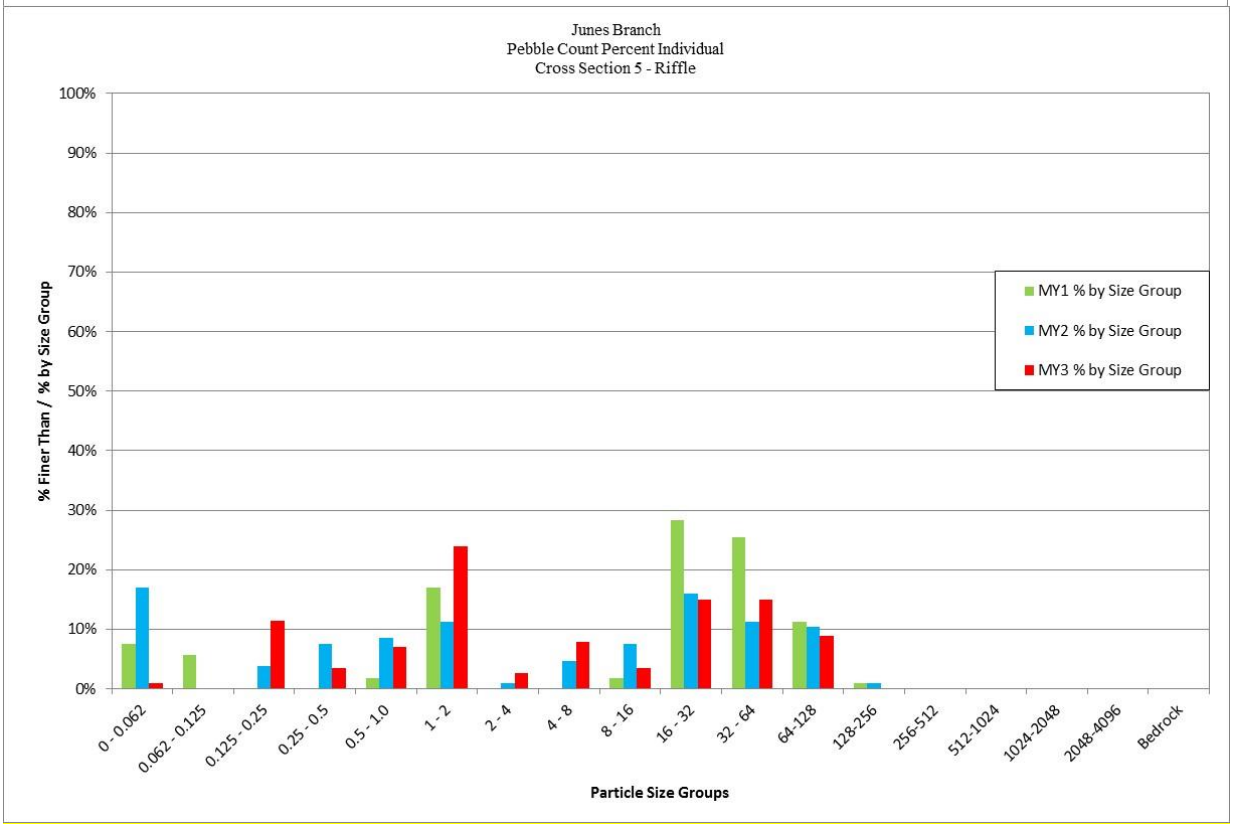
Junes Branch			
Cross Section 3 - Riffle			
Monitoring Year - 2016; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	14	12.7%	13%
0.062 - 0.125	14	12.7%	25%
0.125 - 0.25	29	26.4%	52%
0.25 - 0.5	10	9.1%	61%
0.5 - 1.0	16	14.5%	75%
1 - 2	1	0.9%	76%
2 - 4	2	1.8%	78%
4 - 8	1	0.9%	79%
8 - 16	5	4.5%	84%
16 - 32	6	5.5%	89%
32 - 64	8	7.3%	96%
64-128	4	3.6%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**110**	**100%**	**100%**
		Summary Data	
		D50	**0.24**
		D84	**17**
		D95	**49**


Junes Branch
Pebble Count Percent Cumulative
Cross Section 3 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

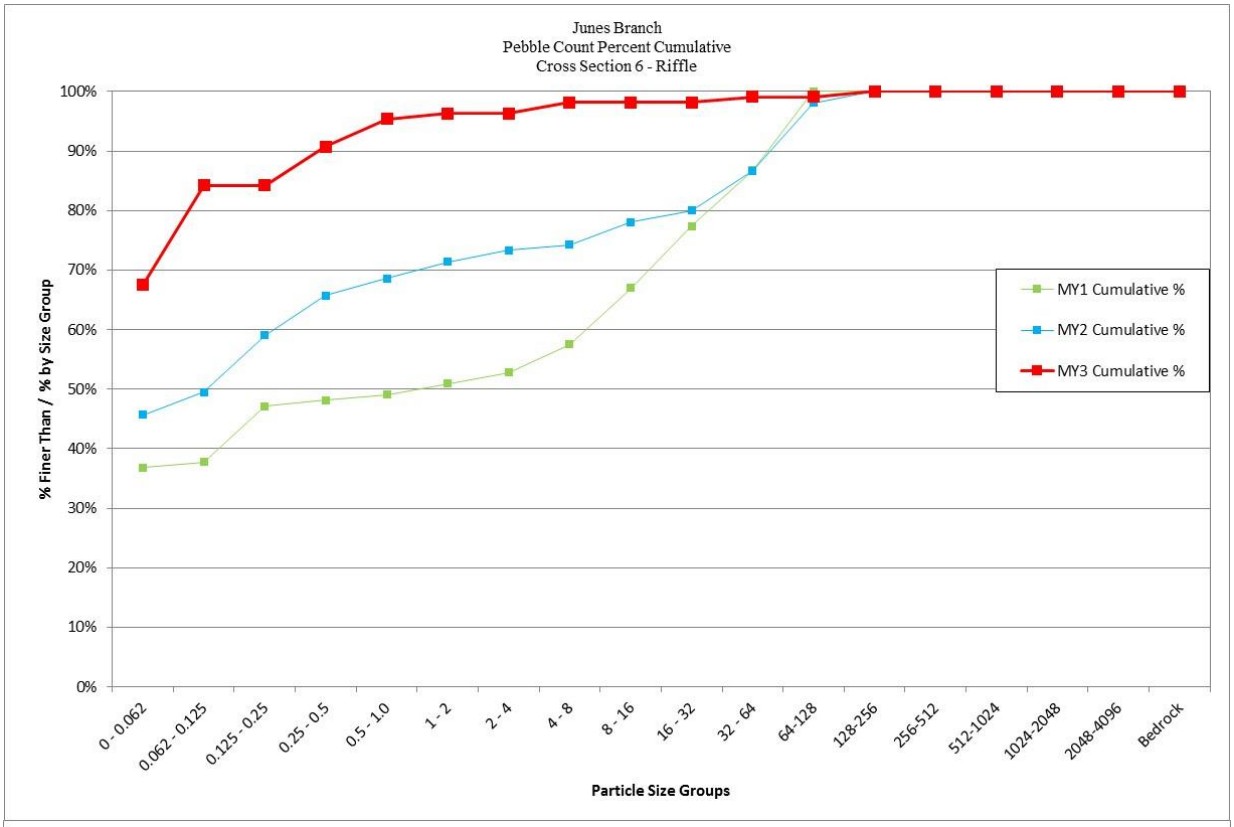

Junes Branch
Pebble Count Percent Individual
Cross Section 3 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

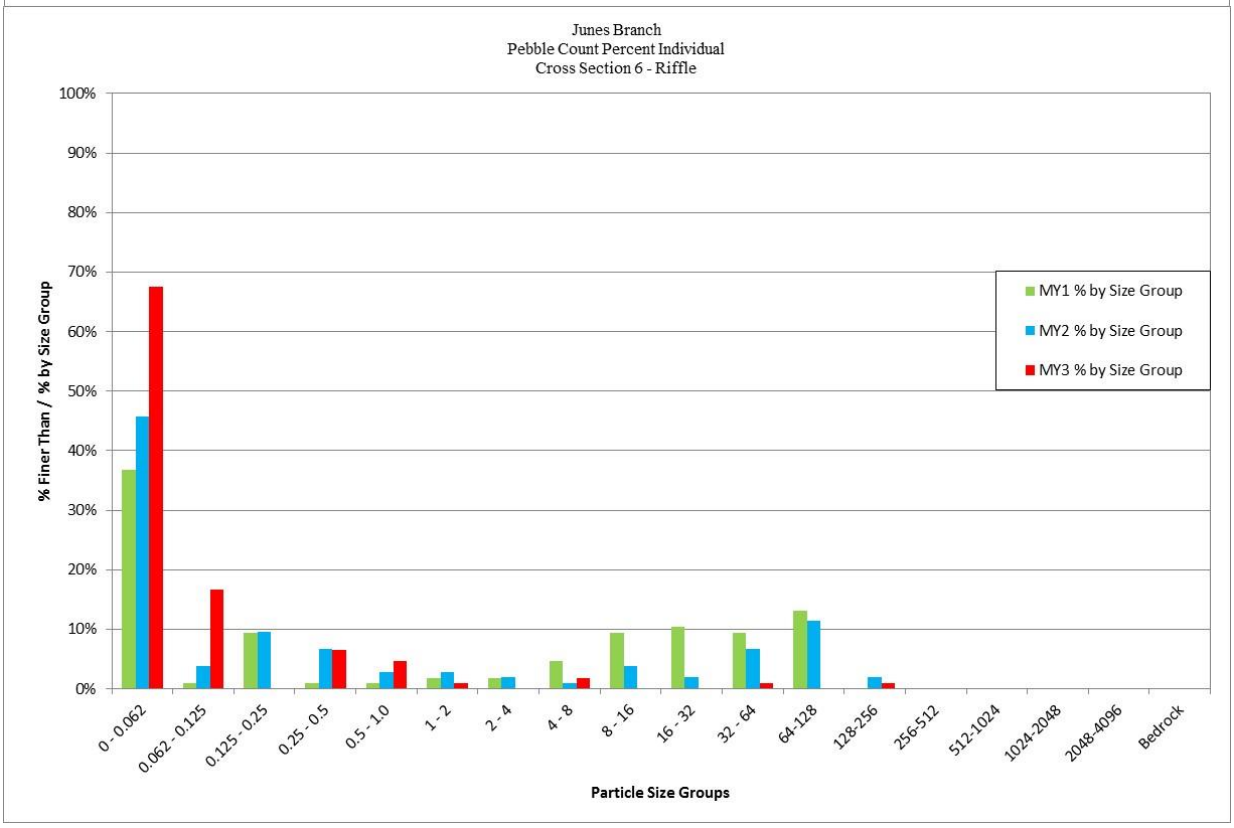
Junes Branch			
Cross Section 5 - Riffle			
Monitoring Year - 2016; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	1	0.9%	1%
0.062 - 0.125	0	0.0%	1%
0.125 - 0.25	13	11.5%	12%
0.25 - 0.5	4	3.5%	16%
0.5 - 1.0	8	7.1%	23%
1 - 2	27	23.9%	47%
2 - 4	3	2.7%	50%
4 - 8	9	8.0%	58%
8 - 16	4	3.5%	61%
16 - 32	17	15.0%	76%
32 - 64	17	15.0%	91%
64-128	10	8.8%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**113**	**100%**	**100%**
		Summary Data	
		D50	**4.3**
		D84	**45**
		D95	**82**


Junes Branch
Pebble Count Percent Cumulative
Cross Section 5 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

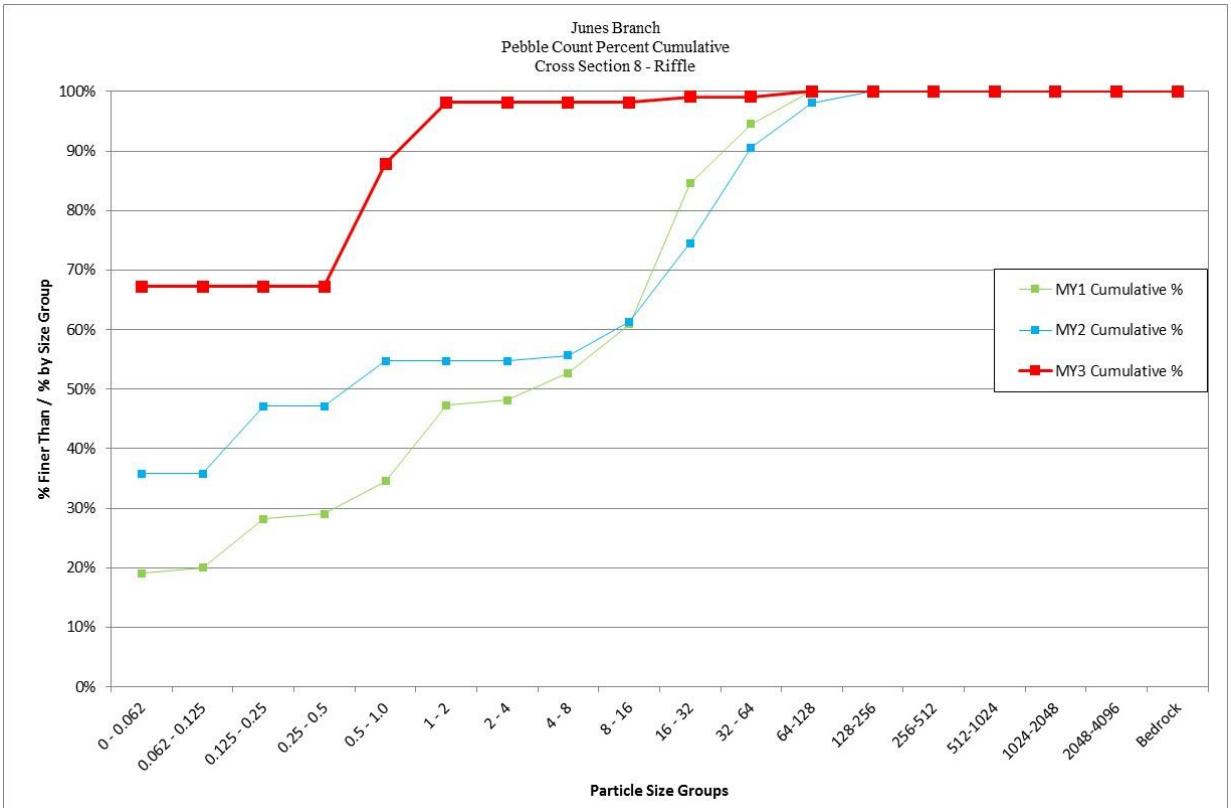

Junes Branch
Pebble Count Percent Individual
Cross Section 5 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

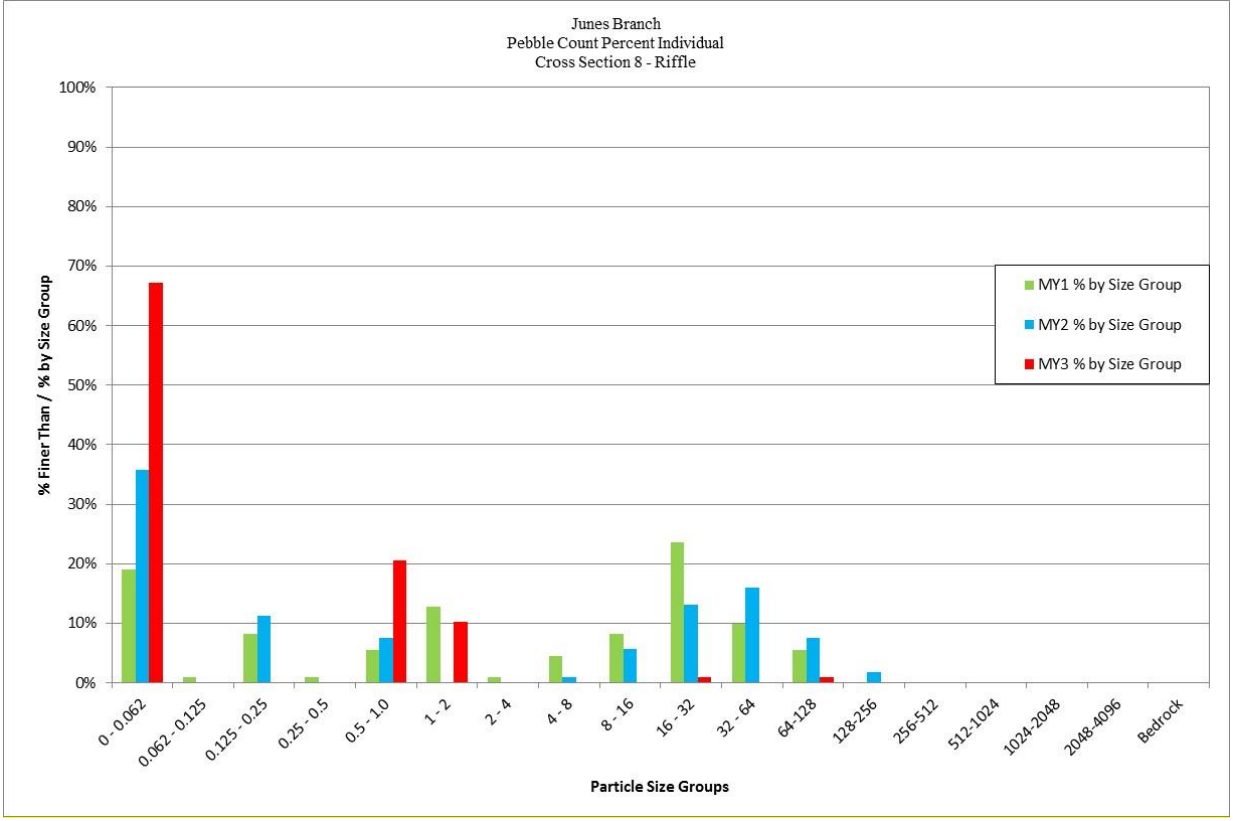
Junes Branch			
Cross Section 6 - Riffle			
Monitoring Year - 2016; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	73	67.6%	68%
0.062 - 0.125	18	16.7%	84%
0.125 - 0.25	0	0.0%	84%
0.25 - 0.5	7	6.5%	91%
0.5 - 1.0	5	4.6%	95%
1 - 2	1	0.9%	96%
2 - 4	0	0.0%	96%
4 - 8	2	1.9%	98%
8 - 16	0	0.0%	98%
16 - 32	0	0.0%	98%
32 - 64	1	0.9%	99%
64-128	0	0.0%	99%
128-256	1	0.9%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**108**	**100%**	**100%**
		Summary Data	
		D50	**0.062**
		D84	**0.12**
		D95	**0.95**


Junes Branch
Pebble Count Percent Cumulative
Cross Section 6 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

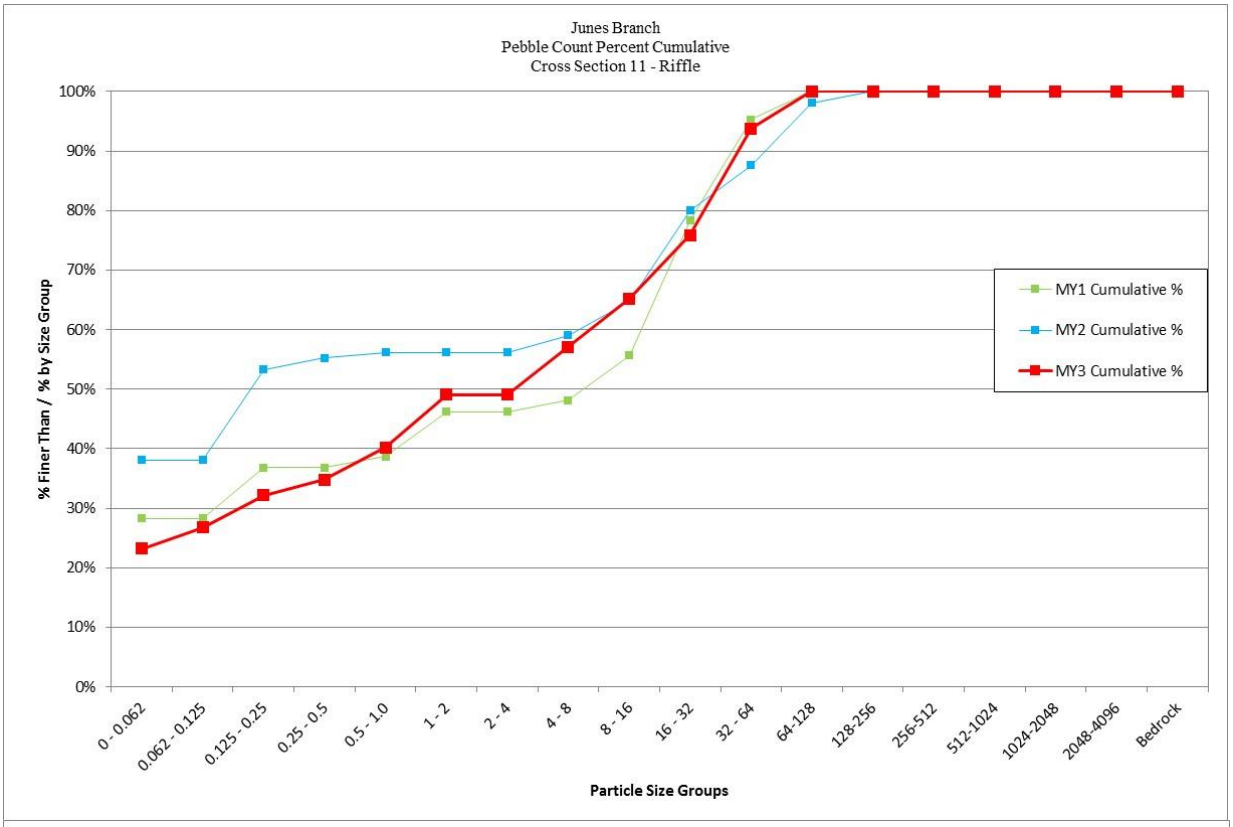

Junes Branch
Pebble Count Percent Individual
Cross Section 6 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

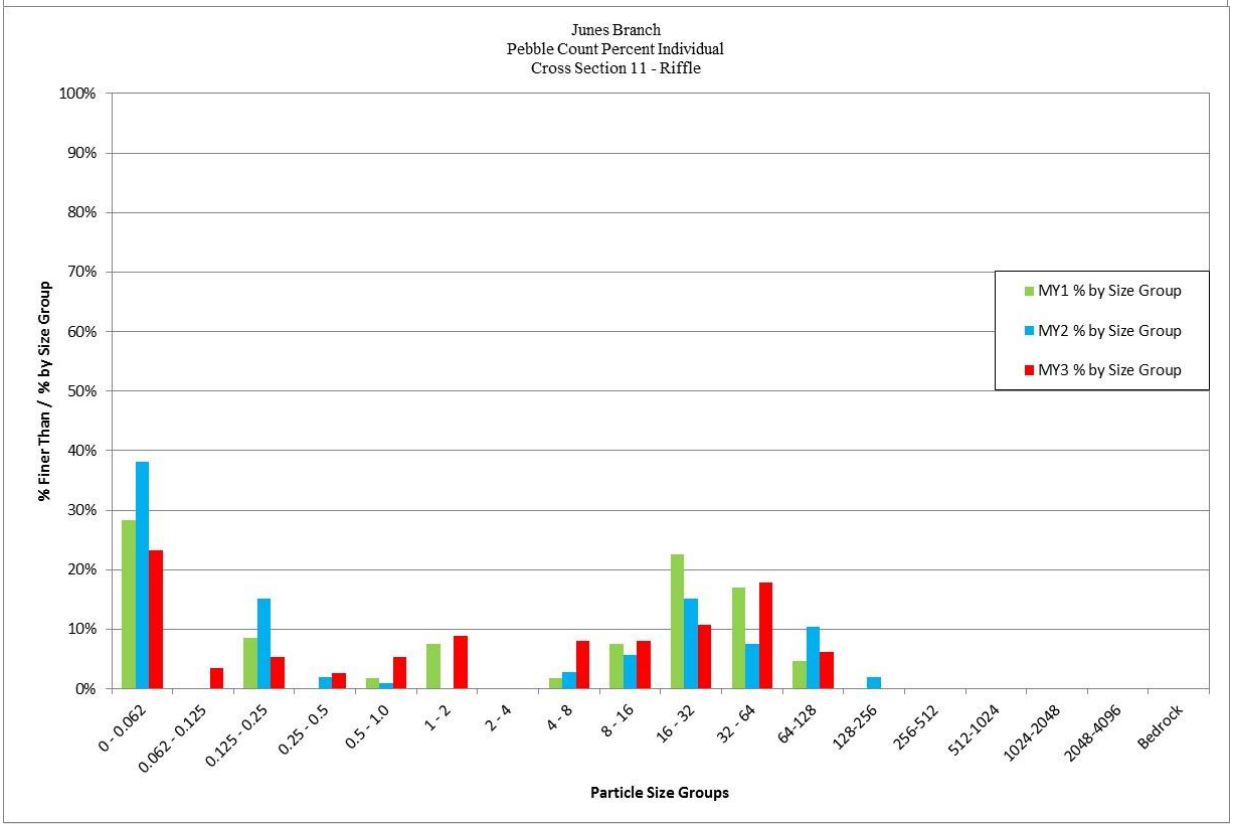
Junes Branch			
Cross Section 8 - Riffle			
Monitoring Year - 2016; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	72	67.3%	67%
0.062 - 0.125	0	0.0%	67%
0.125 - 0.25	0	0.0%	67%
0.25 - 0.5	0	0.0%	67%
0.5 - 1.0	22	20.6%	88%
1 - 2	11	10.3%	98%
2 - 4	0	0.0%	98%
4 - 8	0	0.0%	98%
8 - 16	0	0.0%	98%
16 - 32	1	0.9%	99%
32 - 64	0	0.0%	99%
64-128	1	0.9%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**107**	**100%**	**100%**
		Summary Data	
		D50	**0.062**
		D84	**0.88**
		D95	**1.6**


Junes Branch
Pebble Count Percent Cumulative
Cross Section 8 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

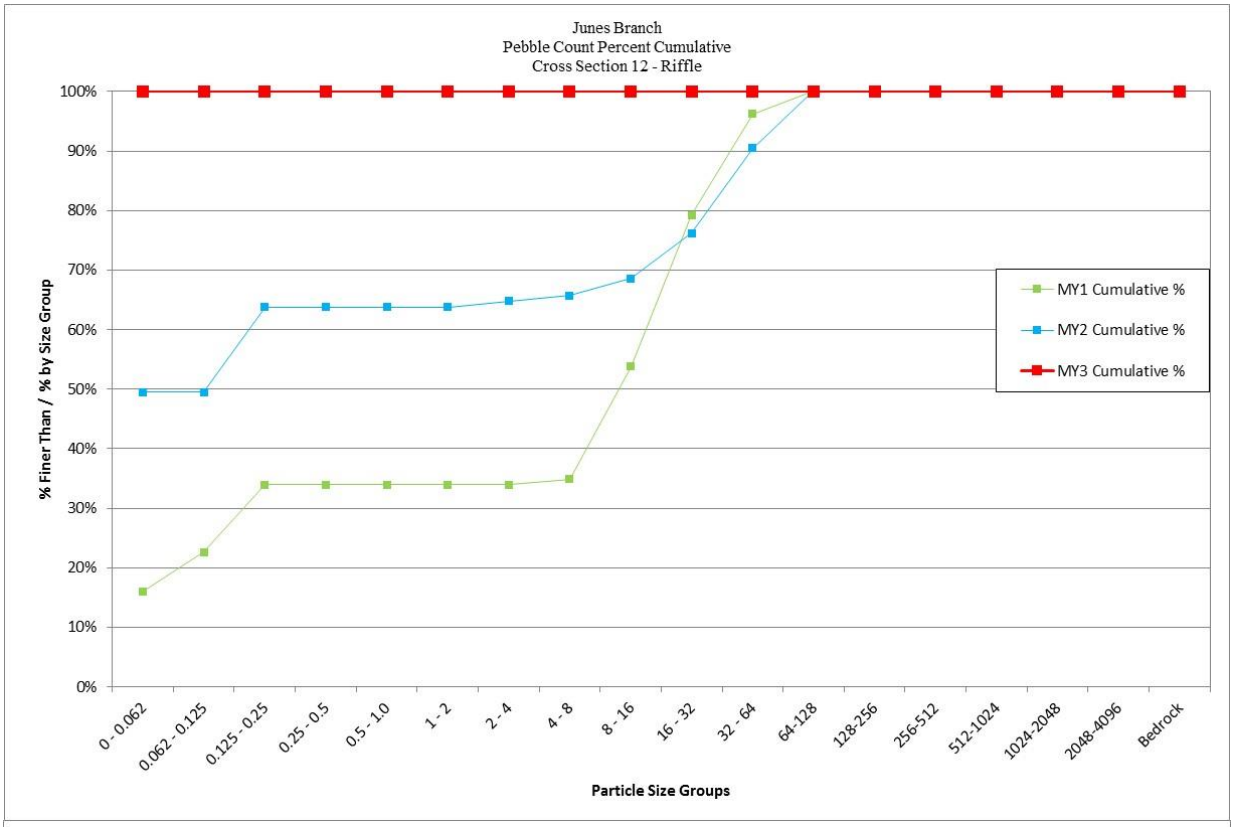

Junes Branch
Pebble Count Percent Individual
Cross Section 8 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

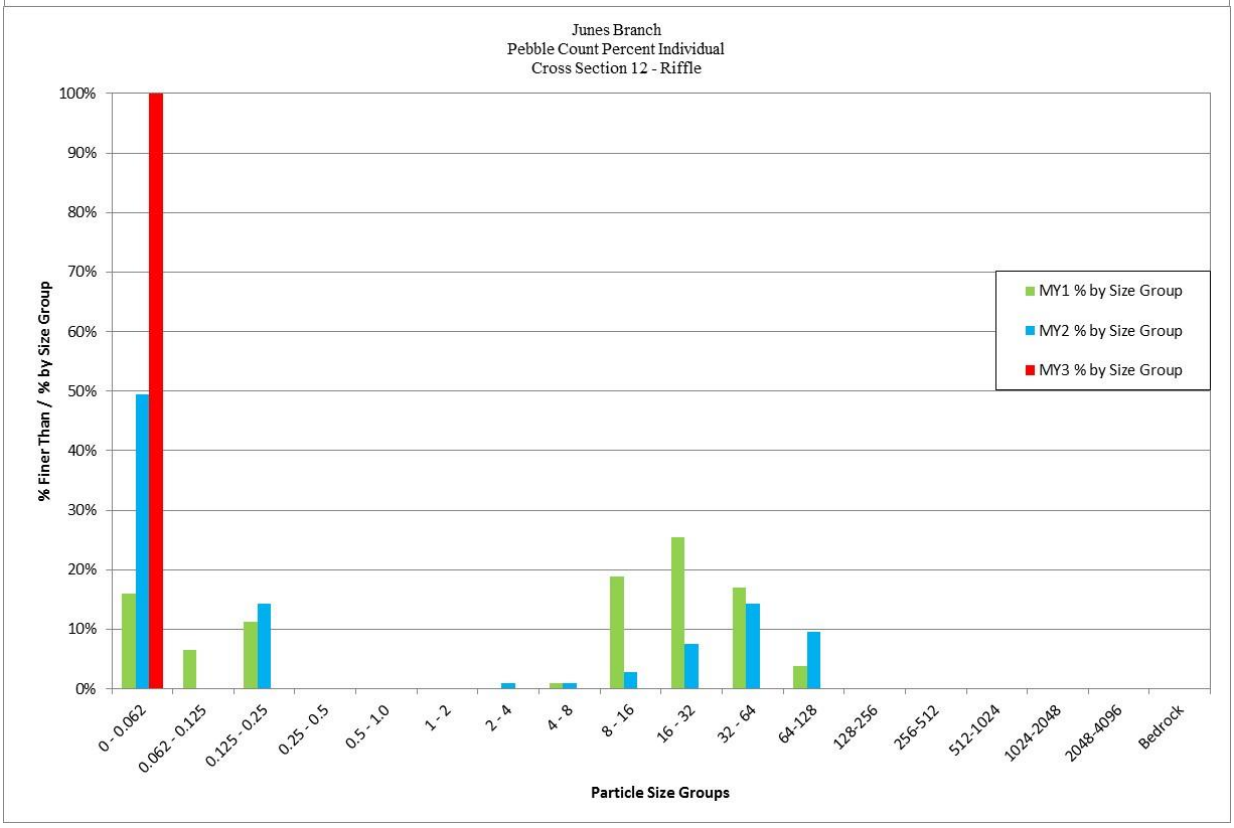
Junes Branch			
Cross Section 11 - Riffle			
Monitoring Year - 2016; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	26	23.2%	23%
0.062 - 0.125	4	3.6%	27%
0.125 - 0.25	6	5.4%	32%
0.25 - 0.5	3	2.7%	35%
0.5 - 1.0	6	5.4%	40%
1 - 2	10	8.9%	49%
2 - 4	0	0.0%	49%
4 - 8	9	8.0%	57%
8 - 16	9	8.0%	65%
16 - 32	12	10.7%	76%
32 - 64	20	17.9%	94%
64-128	7	6.3%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**112**	**100%**	**100%**
		Summary Data	
		D50	**4.3**
		D84	**50**
		D95	**69**


Junes Branch
Pebble Count Percent Cumulative
Cross Section 11 - Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

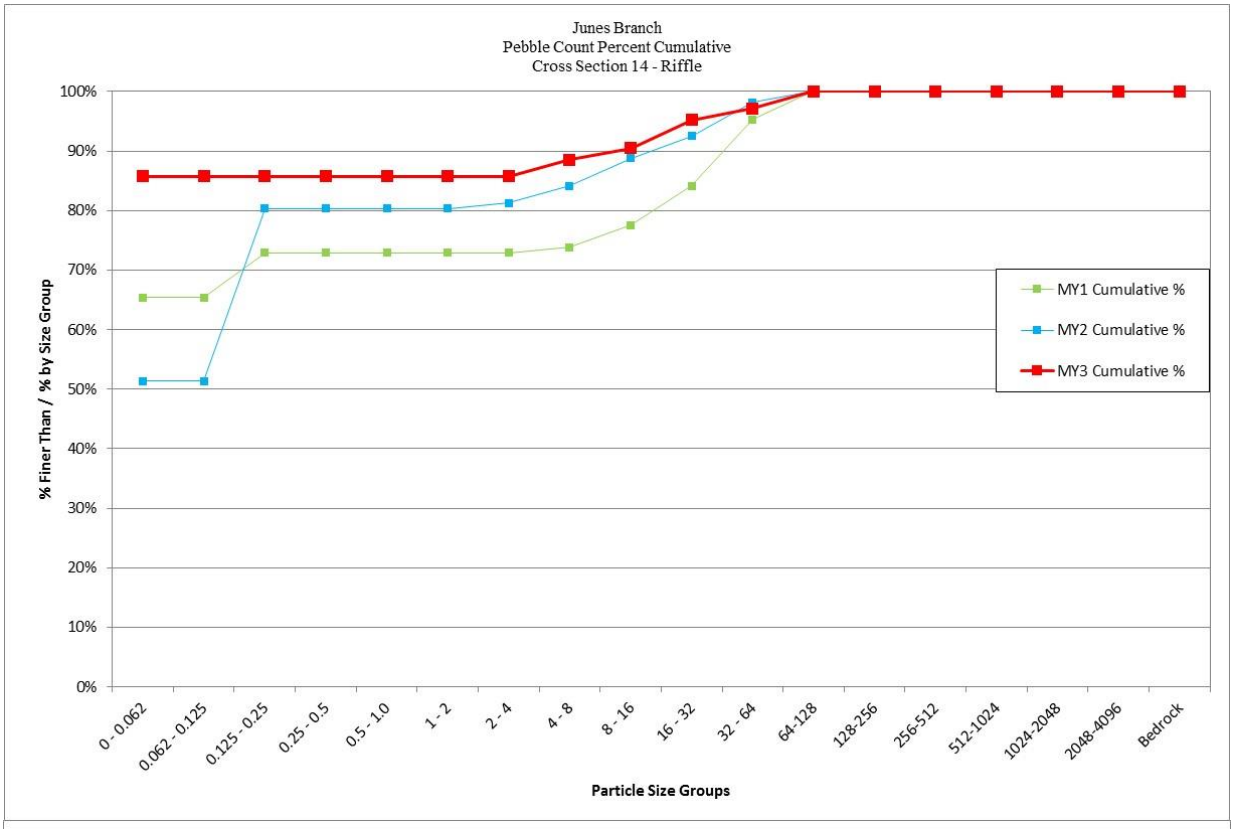

Junes Branch
Pebble Count Percent Individual
Cross Section 11 - Riffle
% Finer Than / % by Size Group
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

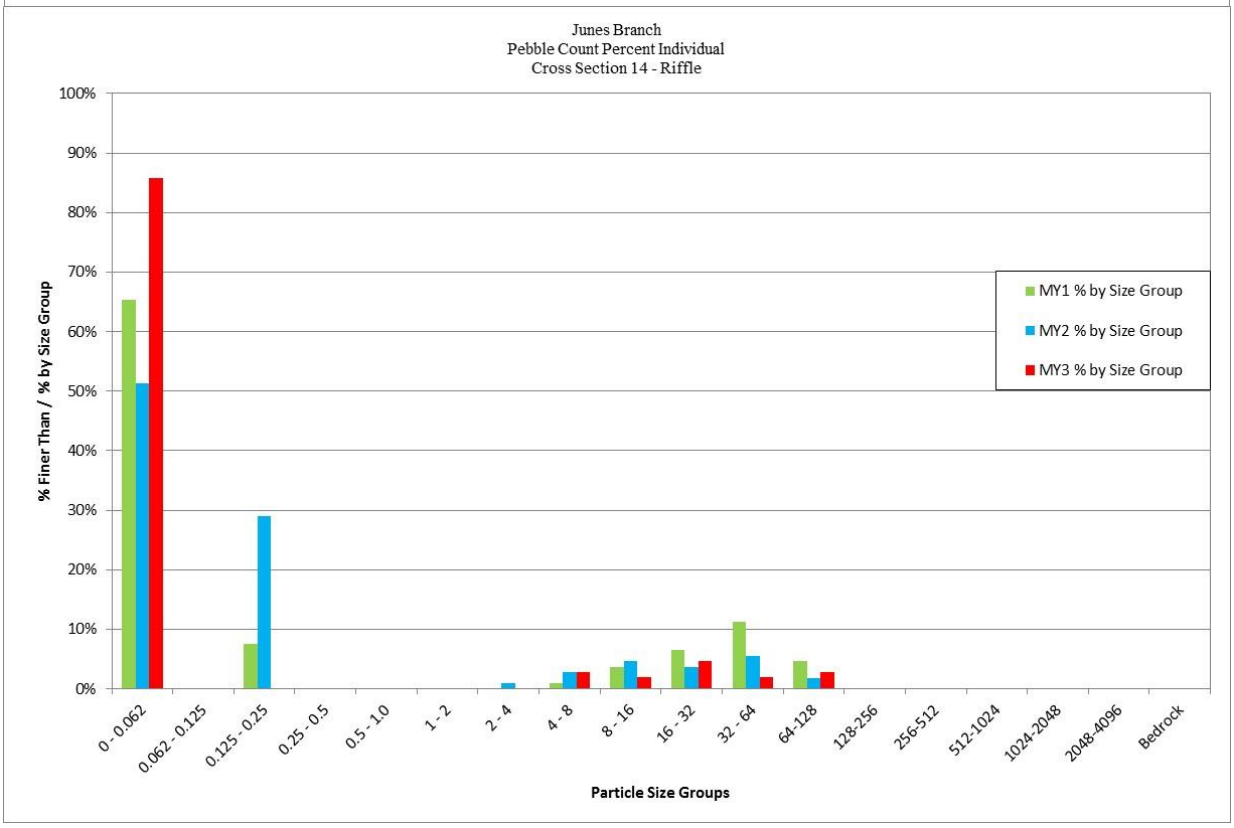
Junes Branch			
Cross Section 12 - Riffle			
Monitoring Year - 2016; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	105	100.0%	100%
0.062 - 0.125	0	0.0%	100%
0.125 - 0.25	0	0.0%	100%
0.25 - 0.5	0	0.0%	100%
0.5 - 1.0	0	0.0%	100%
1 - 2	0	0.0%	100%
2 - 4	0	0.0%	100%
4 - 8	0	0.0%	100%
8 - 16	0	0.0%	100%
16 - 32	0	0.0%	100%
32 - 64	0	0.0%	100%
64-128	0	0.0%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**105**	**100%**	**100%**
		Summary Data	
		D50	**0.062**
		D84	**0.062**
		D95	**0.062**


Junes Branch
Pebble Count Percent Cumulative
Cross Section 12 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups


Junes Branch
Pebble Count Percent Individual
Cross Section 12 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

Junes Branch			
Cross Section 14 - Riffle			
Monitoring Year - 2016; MY3			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	90	85.7%	86%
0.062 - 0.125	0	0.0%	86%
0.125 - 0.25	0	0.0%	86%
0.25 - 0.5	0	0.0%	86%
0.5 - 1.0	0	0.0%	86%
1 - 2	0	0.0%	86%
2 - 4	0	0.0%	86%
4 - 8	3	2.9%	89%
8 - 16	2	1.9%	90%
16 - 32	5	4.8%	95%
32 - 64	2	1.9%	97%
64-128	3	2.9%	100%
128-256	0	0.0%	100%
256-512	0	0.0%	100%
512-1024	0	0.0%	100%
1024-2048	0	0.0%	100%
2048-4096	0	0.0%	100%
Bedrock	0	0.0%	100%
Total	**105**	**100%**	**100%**
		Summary Data	
		D50	**0.062**
		D84	**0.062**
		D95	**31**


Junes Branch
Pebble Count Percent Cumulative
Cross Section 14 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 Cumulative %
MY2 Cumulative %
MY3 Cumulative %
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups


Junes Branch
Pebble Count Percent Individual
Cross Section 14 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
MY2 % by Size Group
MY3 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

Appendix E
Hydrologic Data

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Table 12. Verification of Bankfull Events Junes Branch / Project No. 95027				
Bumgarner II				
Date of Data Collection	**Date of Occurrence**	**Method**	**Feet Above Bankfull Elevation**	**Photo # (if available)**
7/28/2015	Unknown	Crest Gauge	0.10	MY2 E- Submission
1/11/2016	Unknown	Crest Gauge	0.23	1
6/23/2016	Unknown	Crest Gauge	0.23	2
Junes Branch				
Date of Data Collection	**Date of Occurrence**	**Method**	**Feet Above Bankfull Elevation**	**Photo # (if available)**
6/23/2016	Unknown	Crest Gauge	0.66	3

Photo Verification of Bankfull Events

Photo 1: Bumgarner I Bankfull Event 1/11/2016

Photo 2: Bumgarner I Bankfull Event 6/23/2016

Photo 3: Junes Branch Bankfull Event 6/23/2016

Figure 3. Daily Precipitation Totals for the Junes Branch Restoration Project

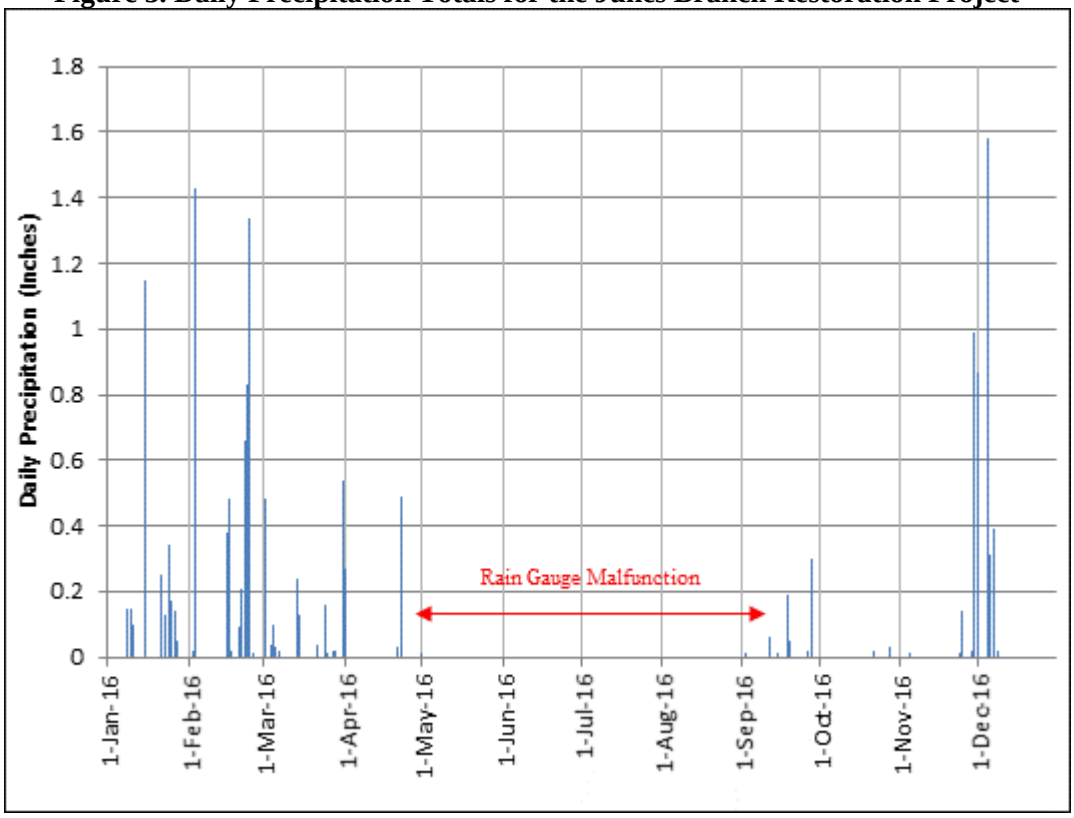

Figure 4. Monthly Precipitation Data Compared to Average, 30th, and 70th Percentiles for Jackson County