Annual Monitoring Report

Monitoring Year 1 of 7

FINAL

Poplin Ridge Stream Restoration Project
NCDMS Contract No.: 004672
NCDMS Project No.: 95359

Union County, NC
Data Collected: October – December 2015
Date Submitted: January 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:

302 Jefferson Street, Suite 110
Raleigh, North Carolina 27605

Prepared by:

EQUINOX

balance through proper planning

37 Haywood Street, Suite 100
Asheville, North Carolina 28801

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Contents

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1.0 PROJECT SUMMARY

1.1. Goals and Objectives

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

- Nutrient removal,
- Sediment removal,
- Reducing runoff from animal operations,
- Filtration of runoff, and
- Improved aquatic and terrestrial habitat.

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

- Establishing riparian buffer areas adjacent to CAFOs.
- Converting active farm fields to forested buffers,
- Stabilization of eroding stream banks,
- Reduction in streambank slope,
- Restoration of riparian buffer bottomland hardwood habitats, and
- Construction of in-stream structures designed to improve bedform diversity and trap detritus.

1.2. Success Criteria

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

1.2.1. Stream Restoration

Bankfull Events - Two bankfull flow events must be documented within the seven-year monitoring period. The two bankfull events must occur in separate years. Otherwise, stream monitoring will continue until two bankfull events have been documented in separate years. Bankfull events will be documented using crest gauges, auto-logging crest gauges, photographs, and visual assessments for evidence of debris wrack lines.

Cross-Sections - There should be little change in as-built cross-section. If changes do take place, they should be evaluated to determine if they represent a movement toward a less stable condition, or minor changes that represent an increase in stability.

Bank Pin Arrays - Bank pin arrays will be used as a supplemental method to monitor erosion on selected meander bends. Bank pin exposure will be recorded at each monitoring event.

Digital Image Stations- Digital images will be used to subjectively evaluate channel aggradation or degradation, bank erosion, success of riparian vegetation, and effectiveness of erosion control measures. Longitudinal images should indicate the absence of developing bars within the channel or an excessive increase in channel depth. Lateral images should not indicate excessive erosion or continuing degradation of banks over time. A series of images over time should indicate successional maturation of riparian vegetation.

1.2.2.Vegetation

Interim measures of vegetative success for the site will be the survival of at least 320 three year old trees per acre at the end of Year 3 and 260 five-year old trees per acre at the end of Year-5. The final vegetative success criteria will be the survival of 210 trees per acre at the end of Year 7.

1.3. Project Setting and Background

The Poplin Ridge Stream Restoration Site (Site) encompasses approximately 27.17 acres, of which 4.69 acres are wooded and the remaining 22.48 acres are agricultural fields and pastures. The western and eastern systems, UT1 and UT2 respectively, consist of unnamed tributaries to the East Fork of Stewarts Creek. UT1 is divided into seven reaches and UT2 is divided into five reaches. The Site is located within the Yadkin River Watershed (NCDWR sub basin 03-07-14 and HUC 03040105070050) in Union County, North Carolina, approximately six miles north of Monroe. The Site is located within the Stewarts Creek Watershed, a NCDMS targeted local watershed.

1.4. Project Performance

Monitoring Year 1 (MY1) data was collected from October to December 2015. Monitoring activities included visual assessment of all reaches and the surrounding easement, 17 permanent photo stations, 13 permanent vegetation monitoring plots, 29 cross-sections, and 15 pebble counts.

Summary information and 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 the Mitigation Plan) and in the Mitigation Plan (formerly the Restoration Plan) documents available on NCDMS' website (http://deq.nc.gov/about/divisions/mitigation-services). All raw data supporting the tables and figures in the appendices is available from NCDMS upon request.

1.4.1.Vegetation

Visual assessment of the site indicates that herbaceous vegetation has become well established; however, three bare areas covering a total of 0.04 acres were associated with recent high-flow events that scoured parts of the floodplain (Table 6, Figure 2). Growth rate, vigor, and planted woody stem density outside of the permanent vegetation monitoring plots were was difficult to assess during leaf-off conditions occurring during the monitoring period. These will be assessed during leaf-on conditions in MY2. Low density and bare areas will be replanted during the spring of 2016. Additionally, eight areas of invasive-exotic vegetation covering a total of 1.81 acres were noted within the easement (Table 6, Figure 2). A majority of the invasive-exotic vegetation was previously cut privet that is now re-sprouting. Treatment of these areas is scheduled for MY2 (2016).

Monitoring of permanent vegetation plots (n = 13) was completed during October 2015. Summary tables and photographs associated with MY1 monitoring can be found in Appendix C. With the exception of Plots 2 and 10, MY1 monitoring data indicates that all vegetation monitoring plots are on track to meet the MY3 interim success criteria of 320 planted stems per acre. Planted stem densities among the plots were found to range from 0 to 1,093 planted stems per acre with a mean of 663 stems per acre across all plots. When volunteer stems are included, densities ranged between 121 and 1,821 total stems per acre with a mean of 753 stems per acre across all plots. A total of 18 plant species were documented within the monitoring plots. Low stem densities in plots 2 and 10 are likely attributed to a combination of landscape position and a dry summer following planting.

1.4.2. Stream Geomorphology

Visual assessment of the stream channel was performed in order to document signs of instability, such as eroding banks, structural instability, or excessive sedimentation. Areas of bank scour, bed aggradation, and bed degradation were noted on reaches UT1-2, UT 1-B, and UT2-A (Table 5 and Figure 2). One stressed structure was noted on UT2-A at STA 4+00, near the confluence of UT2-A and UT2-2. This structure is considered stressed due to one dislodged boulder at the invert; however, the structure is still holding grade and providing habitat. It is likely that high flows post-construction affected the structure. Due to the position of the dislodged boulder, it is anticipated that the structure will stabilize with time. RES will monitor the structure during future visits to assess the integrity of the structure and the need for any repair. All other structures are intact and performing as designed.

Geomorphic data for MY1 was collected during October 2015. Cross-section plots and summary tables related to stream morphology are located in Appendix D. The MY1 stream morphology data indicate that, in general, the stream is stable. Several small changes were noted in the cross-section dimensions; however, these are relatively minor and do not exceed expected adjustments in channel form, particularly for the first year of monitoring. Deposits of fine material led to decrease in channel depths of 0.1 to 0.3 feet at a majority of cross-sections. At riffle cross-section XS-4, deposition along the left descending bank decreased the bankfull width by 2.2 feet, causing a reduction in the W/D ratio and cross-sectional area. The only other noticeable changes to take place at cross-sections between baseline conditions and MY1 were located within the restored section of the pond in Reach UT2-2. Settling within the pond has led to an increase in bankfull widths at XS-1 and XS-2, which subsequently led to increased W/D ratios and max depth.

Bank pin arrays indicate that slight erosion occurred during MY1 at array numbers 4, 5, and 6 at the rate of 0.37 feet/year, 0.31 feet/year, and 0.24 feet/year respectively. Bank pin array data will be collected and analyzed in future monitoring years to monitor any trends of bank erosion.

Substrate monitoring was performed during MY1. Pebble count D_{50} fell into the medium gravel range for UT1-1, silt to very coarse sand for UT1-2, coarse gravel for UT1-3, coarse sand to fine gravel for UT1-4, fine sand for UT1-A, coarse gravel for UT1-B, medium gravel for UT1-C, and silt to very fine sand for UT2-3, UT2-4, and UT2-A. The channel substrate will be monitored in future years for shifts in particle size distributions.

Overall, documented shifts in stream morphology do not exceed expectations between MY0 and MY1 as the newly reconstructed stream adjusts to conditions at the site. The project is meeting success criteria regarding stable dimension as well as substrate and sediment transport.

1.4.3.Stream Hydrology

Since project completion in April 2015, two bankfull events have been recorded on both UT1 and UT2. Based on water level logger data (Table 13, Figure 3), the dates of the two events were 8/19/2015 and 10/3/2015.

2.0 METHODS

For MY1, visual assessments were performed during the morphologic and vegetation data collection, and at the end of the monitoring year. For future monitoring years, visual assessment of the project will be performed at the beginning and end of the monitoring year. Permanent photo station photos were also collected during the morphologic and vegetation collection; however, for future monitoring year's permanent photo station photos will be taken during the initial visual assessment during leaf-off

conditions. Photos of vegetation or stream problem areas not revealed in the permanent photo station images also were taken.

Geomorphic measurements were taken during low flow conditions using a Nikon NPR 332 Total Station. Three-dimensional coordinates associated with each cross-section data were collected in the field and geo-referenced (NAD83 State Plane feet FIPS 3200). Morphological data was limited to 29 cross-sections. Survey data were imported into CAD, ArcGIS, and Excel for data processing and analysis. Channel substrate was characterized using a Wolman Pebble Count as outlined in Harrelson et al. (1994) and processed using Microsoft Excel.

Vegetation success is being monitored at 13 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 species composition and density of planted specimens. Data is processed using the CVS data entry tool. In the field, the four corners of each plot were permanently marked with rebar and photos of each plot are taken from the origin each monitoring year.

Precipitation data was collected using an Onset HOBO Data Logging Rain Gauge. Bankfull events were documented with manual and auto logging crest gauges, which were installed within each of the following reaches - UT1-2, UT1-4, and UT2-3. Crest gauge data will be downloaded during quarterly site visits. The three auto logging crest gauges are Onset HOBO Water Level Data Loggers. The data recorded from the HOBO Water Level Data Loggers are processed using HOBOware and analyzed using Microsoft Excel. The height of the cork line was recorded and cross-referenced with known bankfull elevations at each manual crest gauge.

3.0 REFERENCES

Environmental Banc & Exchange. 2014. Poplin Ridge Stream Restoration Project Final Mitigation Plan. North Carolina Ecosystems Enhancement Program, Raleigh.

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation. Version 4.2. http://cvs.bio.unc.edu/methods.htm; accessed November 2008.

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

Appendix A
General Tables and Figures

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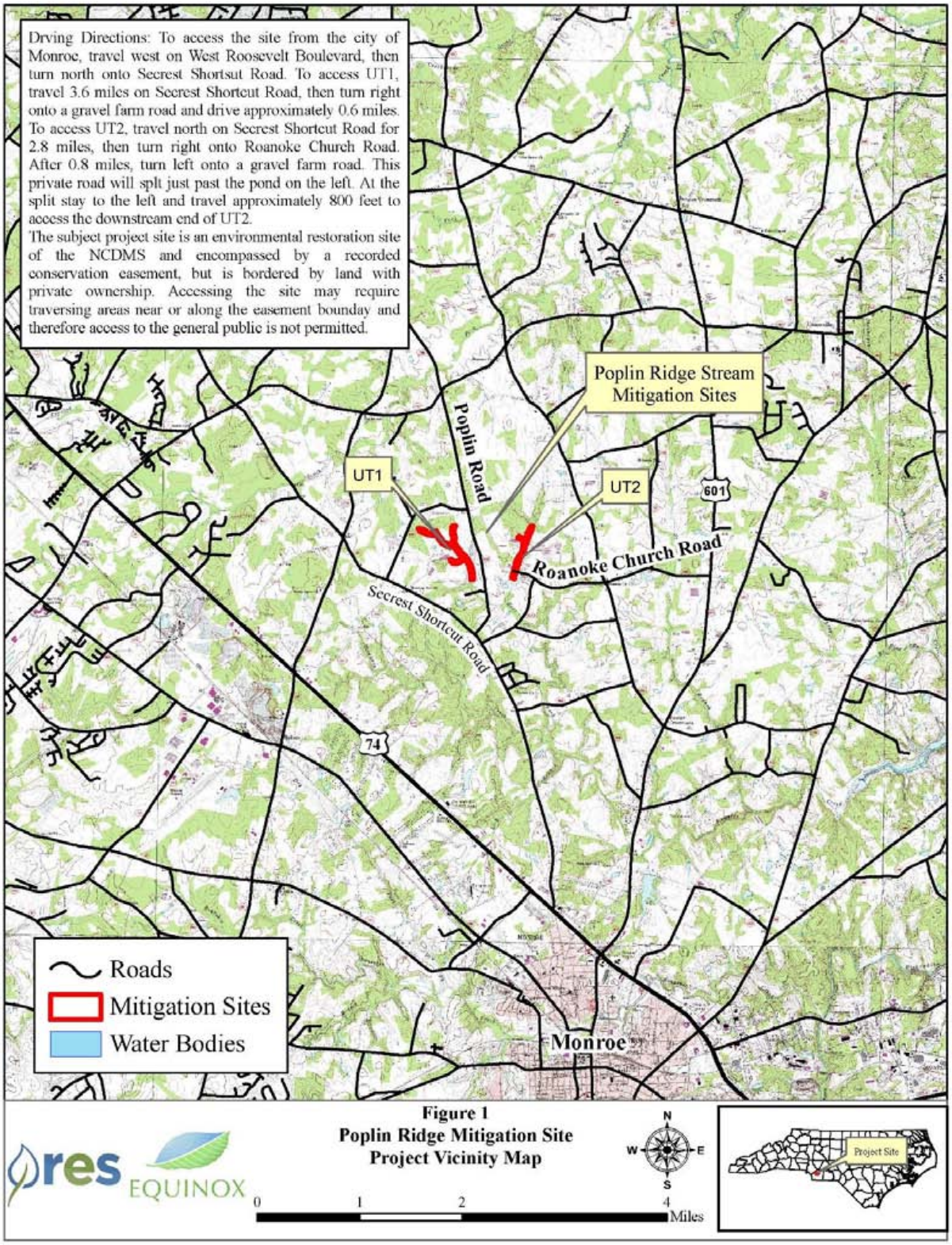
Drving Directions: To access the site from the city of Monroe, travel west on West Roosevelt Boulevard, then turn north onto Secrest Shortsut Road. To access UT1, travel 3.6 miles on Secrest Shortcut Road, then turn right onto a gravel farm road and drive approximately 0.6 miles. To access UT2, travel north on Secrest Shortcut Road for 2.8 miles, then turn right onto Roanoke Church Road. After 0.8 miles, turn left onto a gravel farm road. This private road will splt just past the pond on the left. At the split stay to the left and travel approximately 800 feet to access the downstream end of UT2.
The subject project site is an environmental restoration site of the NCDMS and encompassed by a recorded conservation easement, but is bordered by land with private ownership. Accessing the site may require traversing areas near or along the easement bounday and therefore access to the general public is not permitted.
Poplin Ridge Stream Mitigation Sites
Poplin Road
UT1
UT2
601
Roanoke Church Road
Secrest Shortcut Road
74
Monroe
Roads
Mitigation Sites
Water Bodies
res
EQUINOX
Figure 1
Poplin Ridge Mitigation Site
Project Vicinity Map
N
W
E
S
0
1
2
4
Miles
Project Site

Table 1. Project Components and Mitigation Credits
Poplin Ridge Stream Restoration Project

Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	6,127	238	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Project Components

Project Component -or- Reach ID	As-Built Stationing/Location (LF)	Existing Footage/Acreage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	Restoration Footage or Acreage	Mitigation Ratio	SMUs
UT1-1	1+20 to 6+92	572	Preservation	RE	572	1 : 5	114
UT1-1	6+92 to 12+58	566	EI	R	566	1 : 1.5	377
UT1-2	12+58 to 24+96	1,284	PI	R	1,178	1 : 1	1,178
UT1-3	24+96 to 34+50	833	PI	R	893	1 : 1	893
UT1-4	34+50 to 46+73	1,252	EI	R	1,223	1 : 1.5	815
UT1-A	0+73 to 2+89	197	EI	R	216	1 : 1.5	144
UT1-B	0+09 to 6+29	620	Preservation	RE	620	1 : 5	124
UT1-B	6+90 to 11+45	512	EI	R	455	1 : 1.5	303
UT1-C	1+21 to 10+01	883	EI	R	880	1 : 1.5	586
UT2-1	0+00 to 4+90	490	EII	R	490	1 : 2.5	196
UT2-2	4+90 to 13+97	875	PI	R	847	1 : 1	847
UT2-3	13+97 to 19+18	495	PI	R	521	1 : 1.5	347
UT2-4	19+18 to 22+07	270	PI	R	257	1 : 1	257
UT2-A	0+45 to 5+06	365	EII	R	461	1 : 2.5	184

Component Summation

Restoration Level	Stream (linear feet)	Riparian Wetland (acres)		Non-riparian Wetland (acres)	Buffer (square feet)	Upland (acres)
		Riverine	Non-Riverine			
Restoration	3,696					
Enhancement I	3,340					
Enhancement II	951					
Creation						
Preservation	1,192					
High Quality Preservation						

BMP Elements

Element	Location	Purpose/Function	Notes
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BMP Elements

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 Poplin Ridge Stream Restoration Project		
Activity or Report	**Data Collection Complete**	**Completion or Delivery**
Mitigation Plan	NA	Jul-14
Final Design – Construction Plans	NA	Oct-14
Construction Completed	Apr-15	Apr-15
Site Planting Completed	Apr-15	Apr-15
Baseline Monitoring Document (Year 0 Monitoring – baseline)	Apr-15	Jul-15
Year 1 Monitoring	Dec - 15	Jan - 16
Year 2 Monitoring		
Year 3 Monitoring		
Year 4 Monitoring		
Year 5 Monitoring		
Year 6 Monitoring		
Year 7 Monitoring		

Table 3. Project Contacts Table Poplin Ridge Stream Restoration Project	
Designer	WK Dickson and Co., Inc. 720 Corporate Center Drive Raleigh, NC 27607 (919) 782-0495 Frasier Mullen, PE
Construction Contractor	Wright Contracting PO Box 545 Siler City, NC 27344 (919) 663-0810 Joseph Wright
Planting Contractor	Resource Environmental Solutions, LLC 302 Jefferson Street, Suite 110 Raleigh, NC 27605 (919) 209-1061 David Godley
Seeding Contractor	Wright Contracting PO Box 545 Siler City, NC 27344 (919) 663-0810 Joseph Wright
Seed Mix Sources	Green Resource
Nursery Stock Suppliers	Arbogen, NC Forestry Services Nursery
Full Delivery Provider Project Manager:	Resource Environmental Solutions, LLC 302 Jefferson Street, Suite 110 Raleigh, NC 27605 (919) 209-1061 Daniel Ingram
Monitoring Performers (MY0) Project Manager:	Resource Environmental Solutions, LLC 302 Jefferson Street, Suite 110 Raleigh, NC 27605 (919) 209-1061 Brian Hockett, PLS
Monitoring Performers (MY1) Project Manager:	Equinox 37 Haywwod Street, Suite 100 Asheville, NC 28801 Hunter Terrell (828) 253-6856

Table 4. Project Information Poplin Ridge Stream Restoration Project						
Project Name	Poplin Ridge Stream Restoration Project					
County	Union					
Project Area (acres)	27.17					
Project Coordinates (latitude and longitude)	UT1: 35° 03' 15.97" N 80° 34' 21.64" W					
	UT2: 35° 03' 17.99" N 80° 33' 46.77" W					
Project Watershed Summary Information						
Physiographic Province	Piedmont					
River Basin	Yadkin					
USGS Hydrologic Unit 8-digit	3040105					
USGS Hydrologic Unit 14-digit	03040105070050					
DWQ Sub-basin	03-07-14					
Project Drainage Area (acres)	UT1: 1.14 square miles (728 acres)					
	UT2: 1.35 square miles (861 acres)					
Project Drainage Area Percentage of Impervious Area	UT1: 8%					
	UT2: 5%					
CGIA Land Use Classification	developed (open space, low density, med. density, high density), cultivated crops, pasture/hay, deciduous forest, evergreen forest					
Reach Summary Information						
Parameters	**UT1-R1**	**UT1-R2**	**UT1-R3**	**UT1-R4**	**UT1-A**	**UT1-B**
Length of reach (linear feet)	1,138	1,178	893	1,223	216	1,075
Valley Classification	VIII	VIII	VIII	VIII	VIII	VIII
Drainage area (acres)	136	248	384	728	88	120
NCDWQ stream identification score	35	22.5	30	31	35	35
NCDWQ Water Quality Classification	WS-III	WS-III	WS-III	WS-III	WS-III	WS-III
Morphological Description (stream type)	E4	E4	E4	C4	E4	E4/C4
Evolutionary trend	Stage I	Stage II	Stage II	Stage V	Stage I	Stage I/III
Underlying mapped soils	CmB	CmB, TbB2	CmB, TbB2	ChA	CmB	CmB
Drainage class	mod. well	mod. well; well	mod. well; well	somewhat poorly	mod. well	mod. well
Soil Hydric status	Not Hydric	Not Hydric	Not Hydric	Partially Hydric	Not Hydric	Not hydric
Slope	0.48%	0.70%	0.40%	0.50%	1.20%	1.80%
FEMA classification	N/A	N/A	N/A	Zone AE	N/A	N/A
Native vegetation community	mixed hardwood forest, cultivated	cultivated	cultivated	cultivated	cultivated	mixed hardwood forest, cultivated
Percent composition of exotic invasive vegetation	10%	0%	0%	0%	5%	15%

Table 4 Cont'd. Project Information Poplin Ridge Stream Restoration Project						
Reach Summary Information						
Parameters	**UT1-C**	**UT2-R1**	**UT2-R2**	**UT2-R3**	**UT2-R4**	**UT2-A**
Length of reach (linear feet)	880	490	847	521	257	461
Valley Classification	VIII	VIII	VIII	VIII	VIII	VIII
Drainage area (acres)	250	631	726	792	861	49
NCDWQ stream identification score	35	33.5	33.5	22.5	33.5	33.5
NCDWQ Water Quality Classification	WS-III	WS-III	WS-III	WS-III	WS-III	WS-III
Morphological Description (stream type)	E4	C4c	N/A	E4	E4	C4
Evolutionary trend	Stage IV	Stage VI	N/A	Stage II	Stage II	Stage IV
Underlying mapped soils	TbB2	ChA	ChA	ChA, BaB	ChA	ChA, CmA
Drainage class	well	somewhat poorly	somewhat poorly	somewhat poorly; well	somewhat poorly	somewhat poorly; mod. well
Soil Hydric status	Not Hydric	Partially Hydric	Partially Hydric	Partially Hydric	Partially Hydric	Not Hydric
Slope	0.80%	0.27%	0.10%	0.57%	0.31%	1.30%
FEMA classification	N/A	Zone AE	Zone AE	Zone AE	Zone AE	N/A
Native vegetation community	cultivated	woody cover, cultivated	cultivated	cultivated	cultivated	cultivated
Percent composition of exotic invasive vegetation	0%	20%	0%	0%	0%	0%
Regulatory Considerations						
Regulation	**Applicable?**		**Resolved?**		**Supporting Documentation**	
Waters of the United States - Section 404	Yes		Yes		SAW-2012-01079	
Waters of the United States - Section 401	Yes		Yes		DWR# 13-1087	
Endangered Species Act	Yes		Yes		USFWS (Corr. Letter)	
Historic Preservation Act	Yes		Yes		SHPO (Corr. Letter)	
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No		N/A		N/A	
FEMA Floodplain Compliance	Yes		Yes		EEP Floodplain Requirements Checklist	
Essential Fisheries Habitat	No		N/A		N/A	

Appendix B
Visual Assessment Data

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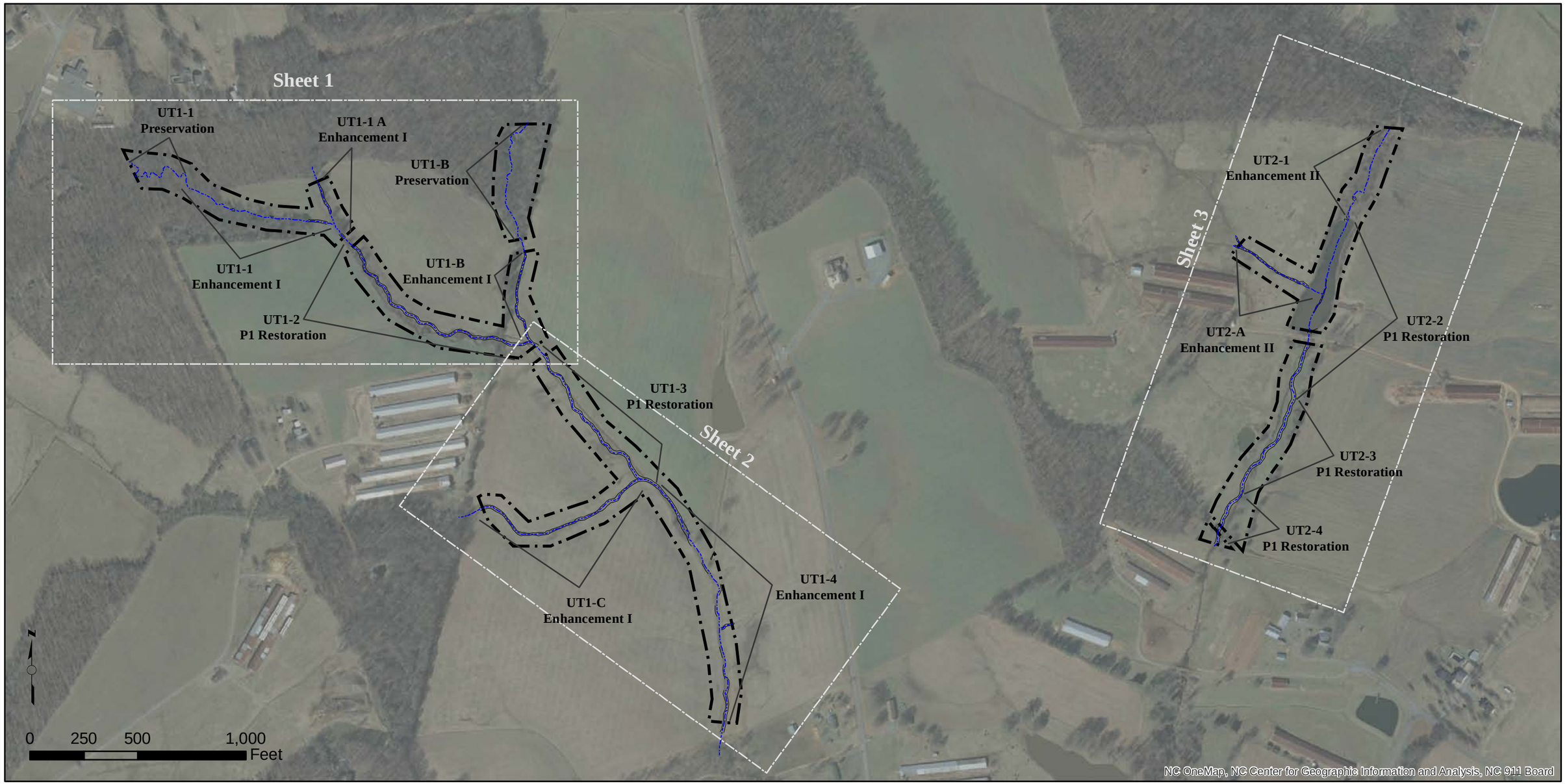

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Figure 2. Current Condition Plan View
Poplin Ridge Stream Restoration Project
Union County, North Carolina
NCDMS Contract No. 004672
NCDMS Project No.: 95359
December 2015
Project Overview

Thalweg
Top of Bank
Easement
Sheet Boundary

Notes:
1) This is not a survey and should not be construed as such.

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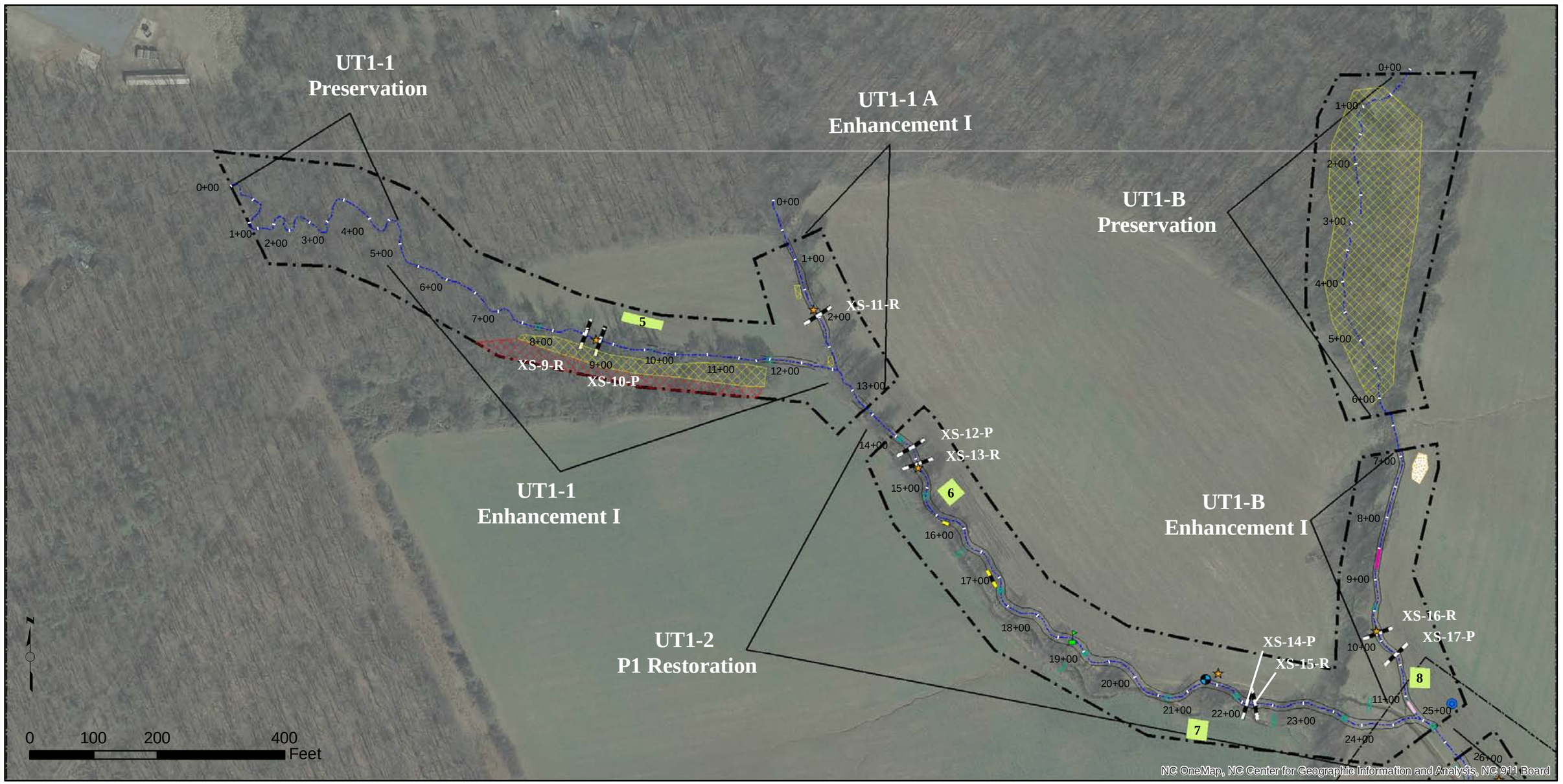

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Figure 2. Current Condition Plan View
Poplin Ridge Stream Restoration Project
Union County, North Carolina
NCDMS Contract No. 004672
NCDMS Project No.: 95359
December 2015
Sheet 1 of 3

- Bankpin Array
- Gauge
- Structures
- Crest Gauge
- Photo Points
- Cross-Section
- Thalweg
- Top of Bank
- Easement

Vegetation Plot Success
- Criteria Met
- Criteria Not Met

Vegetation Problem Areas
- Bare Area

Invasive-Exotic Vegetation
- Present
- Dense

Stream Problem Areas
- Aggradation
- Degradation
- Bank Erosion

Notes:
1) This is not a survey and should not be construed as such.

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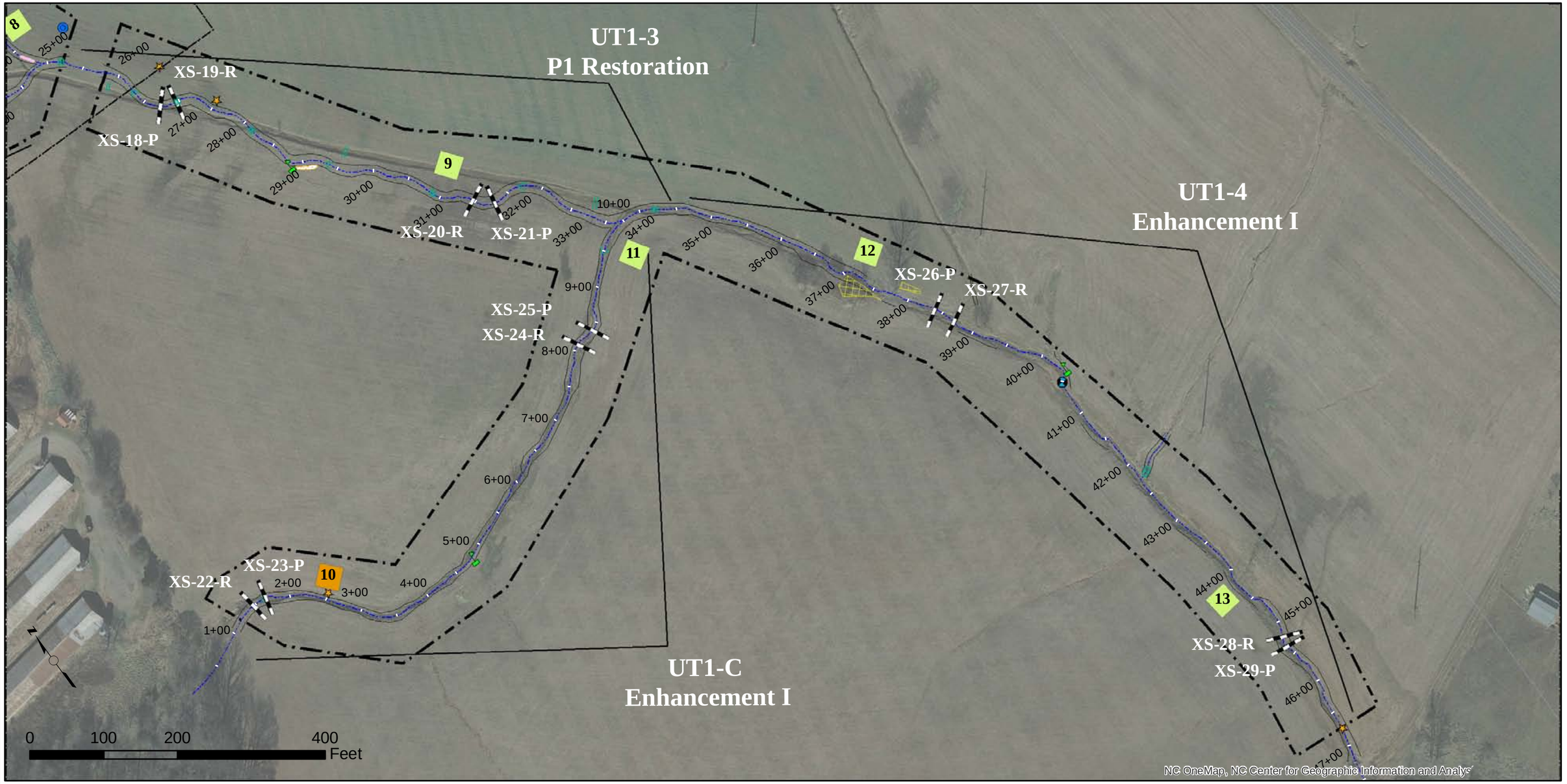

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Figure 2. Current Condition Plan View
Poplin Ridge Stream Restoration Project
Union County, North Carolina
NCDMS Contract No. 004672
NCDMS Project No.: 95359
December 2015
Sheet 2 of 3

- Bankpin Array
- Gauge
- Structures
- Crest Gauge
- Photo Points
- Cross-Section
- Thalweg
- Top of Bank
- Easement

Vegetation Plot Success
- Criteria Met
- Criteria Not Met

Vegetation Problem Areas
- Bare Area

Invasive-Exotic Vegetation
- Present

Stream Problem Areas
- Aggradation

Notes:
1) This is not a survey and should not be construed as such.

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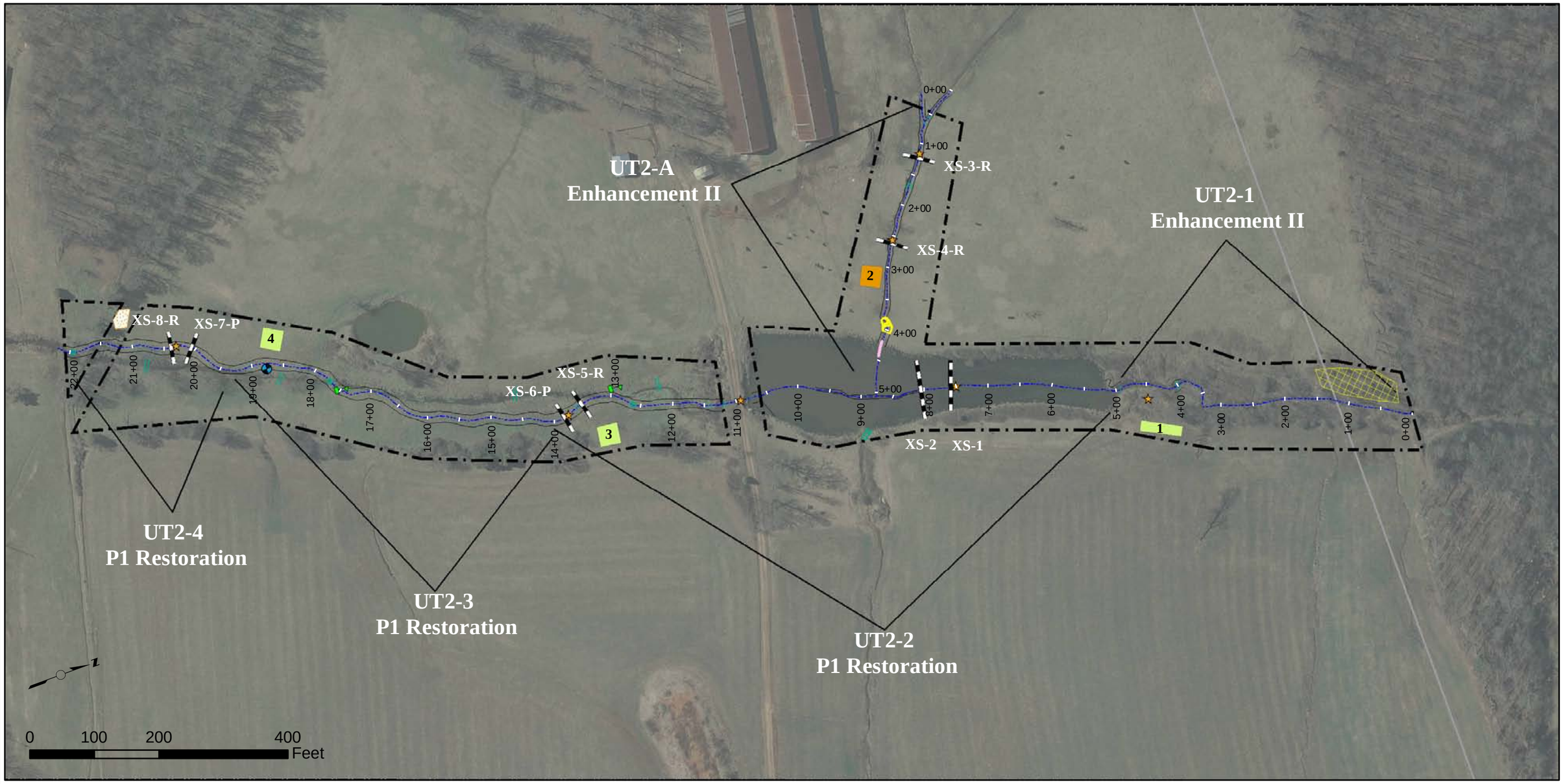

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Figure 2. Current Condition Plan View
Poplin Ridge Stream Restoration Project
Union County, North Carolina
NCDMS Contract No. 004672
NCDMS Project No.: 95359
December 2015
Sheet 3 of 3

- Bankpin Array
- Gauge
- Structures
- Crest Gauge
- Photo Points
- Cross-Section
- Thalweg
- Top of Bank
- Easement

Vegetation Plot Success
- Criteria Met
- Criteria Not Met

Vegetation Problem Areas
- Bare Area

Invasive-Exotic Vegetation
- Present

Stream Problem Areas
- Aggradation
- Stressed Structure

Notes:
1) This is not a survey and should not be construed as such.

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Table 5. Visual Stream Morphology Stability Assessment
Poplin Ridge Stream Restoration Site - UT1-1 - Enhancement I
Assessed Length 566 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.	-	-			-			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	-	-			-			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	-	-			-			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	-	-			-			
		2. Thalweg centering at downstream of meander bend (Glide).	-	-			-			
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.	N/A	N/A			N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	N/A	N/A			N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	N/A	N/A			N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

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

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Poplin Ridge Stream Restoration Site - UT1-2 - P1 Restoration
Assessed Length 1,178 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.	26	26			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	25	25			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	25	25			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	25	25			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	25	25			100%			
2. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			2	40	98%	0	0	98%
	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	2	40	98%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	3	3			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	3	3			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	3	3			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	3	3			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	3	3			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment Poplin Ridge Stream Restoration Site - UT1-3 - P1 Restoration Assessed Length 893 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).	18	18			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.	3	3			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	3	3			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	3	3			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	3	3			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	3	3			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Poplin Ridge Stream Restoration Site - UT1-4 - Enhancement I
Assessed Length 1,223 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.	-	-			-			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	-	-			-			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	-	-			-			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	-	-			-			
		2. Thalweg centering at downstream of meander bend (Glide).	-	-			-			
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.	N/A	N/A			N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	N/A	N/A			N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	N/A	N/A			N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

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

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Poplin Ridge Stream Restoration Site - UT1-A - Enhancement I
Assessed Length 216 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.	-	-			-			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	-	-			-			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	-	-			-			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	-	-			-			
		2. Thalweg centering at downstream of meander bend (Glide).	-	-			-			
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.	N/A	N/A			N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	N/A	N/A			N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	N/A	N/A			N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

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

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Poplin Ridge Stream Restoration Site - UT1-B - Enhancement I
Assessed Length 455 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).			1	18	96%			
		2. Degradation - Evidence of downcutting.			1	30	93%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	11	11			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	11	11			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	11	11			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	11	11			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	11	11			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.	1	1			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	1	1			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	1	1			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	1	1			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	1	1			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment Poplin Ridge Stream Restoration Site - UT1-C - Enhancement I Assessed Length 880 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.	14	14			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).	13	13			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	13	13			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	13	13			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.	2	2			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	2	2			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	2	2			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	2	2			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	2	2			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Poplin Ridge Stream Restoration Site - UT2-1 - Enhancement II
Assessed Length 490 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.	-	-			-			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	-	-			-			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	-	-			-			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	-	-			-			
		2. Thalweg centering at downstream of meander bend (Glide).	-	-			-			
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.	2	2			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	2	2			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	2	2			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	2	2			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	2	2			100%			

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

Table 5 cont'd. Visual Stream Morphology Stability Assessment Poplin Ridge Stream Restoration Site - UT2-2 - P1 Restoration Assessed Length 847 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.	5	5			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	5	5			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	5	5			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	5	5			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	5	5			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.	2	2			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	2	2			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	2	2			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	2	2			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	2	2			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment Poplin Ridge Stream Restoration Site - UT2-3 - P1 Restoration Assessed Length 521 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.	8	8			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).	8	8			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.	3	3			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	3	3			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	3	3			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	3	3			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	3	3			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Poplin Ridge Stream Restoration Site - UT2-4 - P1 Restoration
Assessed Length 257 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.	4	4			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6).	5	5			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstream riffle).	5	5			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	5	5			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	5	5			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.	N/A	N/A			N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	N/A	N/A			N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	N/A	N/A			N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Poplin Ridge Stream Restoration Site - UT2-A - Enhancement II
Assessed Length 461 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).			1	23	95%			
		2. Degradation - Evidence of downcutting.			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate.	10	10			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).	13	13			100%			
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run).	13	13			100%			
		2. Thalweg centering at downstream of meander bend (Glide).	13	13			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.	4	5			80%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	5	5			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	5	5			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	5	5			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	5	5			100%			

N/A - Item does not apply.

Table 6. Vegetation Condition Assessment Poplin Ridge Stream Restoration Site					
Planted Acreage : 22.5					
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	3	0.04	0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	N/A	0	0.05	0%
		Totals	3	0.09	0%
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	3	0.09	0%
Easement Acreage : 27.1					
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)	8	1.81	7%
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.

Project Reach UT1-1 – Permanent Photo Station 1
Station 8+53 – Looking Upstream

Project Reach UT1-2 – Permanent Photo Station 2
Station 14+58 – Looking Upstream at Crossing

Project Reach UT1-2 – Permanent Photo Station 3
Station 21+50 – Looking Upstream

Project Reach UT1-3 – Permanent Photo Station 4
Station 26+50 – Looking Upstream at Crossing

Project Reach UT1-3 – Permanent Photo Station 5
Station 27+50 – Looking Downstream

Project Reach UT1-4 – Permanent Photo Station 6
Station 47+20 – Looking Upstream

Project Reach UT1-A - Permanent Photo Station 7
Station 2+00 – Looking Downstream

Project Reach UT1-B – Permanent Photo Station 8
Station 9+86 – Looking Downstream

Project Reach UT1-C – Permanent Photo Station 9
Station 2+50 – Looking Upstream

Project Reach UT2-1 – Permanent Photo Station 10
Station 4+50 – Looking Upstream

Project Reach UT2-2– Permanent Photo Station 11
Station 11+00 – Looking Upstream at Pond Bottom

Project Reach UT2-2 – Permanent Photo Station 12
Station 11+00 – Looking Downstream

Project Reach UT2-2 – Permanent Photo Station 13
Station 7+59 – Looking Downstream

Project Reach UT2-3 – Permanent Photo Station 14
Station 13+83 – Looking Downstream

Project Reach UT2-4 – Permanent Photo Station 15
Station 20+39 – Looking Downstream

Project Reach UT2-A – Permanent Photo Station 16
Station 1+22 – Looking Upstream

Project Reach UT2-A – Permanent Photo Station 17
Station 2+62 – Looking Downstream

Appendix C
Vegetation Plot Data

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Table 7. Vegetation Plot Criteria Attainment		
Poplin Ridge Stream Restoration Site		
Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
1	Yes	85%
2	No	
3	Yes	
4	Yes	
5	Yes	
6	Yes	
7	Yes	
8	Yes	
9	Yes	
10	No	
12	Yes	
13	Yes	

Table 8. CVS Vegetation Plot Metadata Poplin Ridge Stream Resotration Site	
Report Prepared By	Drew Alderman
Date Prepared	12/21/2015 8:46
database name	Poplin_Ridge_95359_MY1_CVS_Vegetation.mdb
database location	Z:\ES\NRI&M\EBX Monitoring\Poplin_Ridge\Poplin Ridge- MY1-2015\Data\Veg
computer name	FIELD-PC
file size	62697472
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	95359
project Name	Poplin Ridge Stream Restoration Project
Description	
River Basin	Yadkin-Pee Dee
length(ft)	
stream-to-edge width (ft)	
area (sq m)	
Required Plots (calculated)	
Sampled Plots	13

Table 9. Total Planted Stem Counts (Species by Plot)
Poplin Ridge Stream Restoration Site

			Current Plot Data (MY1 2015)																																		
			Plot 1			Plot 2			Plot 3			Plot 4			Plot 5			Plot 6			Plot 7			Plot 8			Plot 9			Plot 10			Plot 11			Plot 12			Plot 13		
Scientific Name	Common Name	Species 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	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Asimina triloba	Pawpaw	Tree																									3	3	3							1	1	1	1	1	1
Betula nigra	River birch	Tree	3	3	3				3	3	3										1	1	1																2	2	2
Carya	Hickory	Tree												1																											
Celtis occidentalis	Common hackberry	Tree															3														1						2				
Diospyros virginiana	Common persimmon	Tree									1																														
DONTKNOW: unsure record																																								
Fraxinus pennsylvanica	Green ash	Tree																																		1				
Liquidambar styraciflua	Sweetgum	Tree															7																								
Liriodendron tulipifera	Tuliptree	Tree				1	1	1	1	1	1				1	1	1																					4	4	4
Nyssa sylvatica	Blackgum	Tree										3	3	3																										
Platanus occidentalis	American sycamore	Tree										2	2	2	3	3	3	3	3	3	5	5	5									1	1	1	3	3	3	3	3	3
Populus deltoides	Eastern cottonwood	Tree																												3										2
Quercus	Oak	Tree				1	1	1				1	1	1	11	11	11	7	7	7	1	1	1	1	1	1	2	2	2				4	4	4	2	2	2	1	1	1
Quercus alba	White oak	Tree																									1	1	1												
Quercus falcata	Southern red oak	Tree													2	2	2							1	1	1	1	1	1												
Quercus michauxii	Swamp chestnut oak	Tree							1	1	1							1	1	1	1	1	1															1	1	1
Quercus nigra	Water oak	Tree	16	16	16				4	4	4	18	18	18				1	1	1	7	7	7	6	6	6							5	5	5	4	4	4	8	8	8
Quercus phellos	Willow oak	Tree	2	2	2				8	8	8	3	3	3	10	10	10	10	10	10	2	2	2	1	1	1	2	2	2				5	5	5	2	2	2	1	1	1
Quercus rubra	Northern red oak	Tree				1	1	1									8				3	3	3										1	1	1	2	2	2	1	1	1
Quercus velutina	Black oak	Tree																						1	1	1							2	2	2	1	1	1	2	2	2
Stem count			21	21	21	3	3	3	17	17	18	27	27	28	27	27	45	22	22	22	20	20	20	10	10	10	9	9	9	0	0	4	18	18	18	15	15	18	24	24	26
size (ares)			1			1			1			1			1			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			0.02			0.02			0.02			0.02			0.02		
Species count			3	3	3	3	3	3	5	5	6	5	5	6	5	5	8	5	5	5	7	7	7	5	5	5	5	5	5	0	0	2	6	6	6	7	7	9	10	10	11
Stems per ACRE			850	850	850	121	121	121	688	688	728	1,093	1,093	1,133	1,093	1,093	1,821	890	890	890	809	809	809	405	405	405	364	364	364	0	0	162	728	728	728	607	607	728	971	971	1,052

Table 9. Total Planted Stem Counts (Annual Means)
Poplin Ridge Stream Restoration Site

			Annual Means					
			MY1 (2015)			MY0 (2015)		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T
Asimina triloba	Pawpaw	Tree	5	5	5	21	21	21
Betula nigra	River birch	Tree	9	9	9	27	27	27
Carya	Hickory	Tree			1			
Celtis occidentalis	Common hackberry	Tree			6			
Diospyros virginiana	Common persimmon	Tree			1			
DONTKNOW: unsure record						7	7	7
Fraxinus pennsylvanica	Green ash	Tree			1			
Liquidambar styraciflua	Sweetgum	Tree			7			
Liriodendron tulipifera	Tuliptree	Tree	7	7	7	34	34	34
Nyssa sylvatica	Blackgum	Tree	3	3	3			
Platanus occidentalis	American sycamore	Tree	20	20	20	26	26	26
Populus deltoides	Eastern cottonwood	Tree			5			
Quercus	Oak	Tree	31	31	31	126	126	126
Quercus alba	White oak	Tree	1	1	1	9	9	9
Quercus falcata	Southern red oak	Tree	4	4	4	10	10	10
Quercus michauxii	Swamp chestnut oak	Tree	4	4	4	8	8	8
Quercus nigra	Water oak	Tree	69	69	69	22	22	22
Quercus phellos	Willow oak	Tree	46	46	46	50	50	50
Quercus rubra	Northern red oak	Tree	8	8	16			
Quercus velutina	Black oak	Tree	6	6	6			
Stem count			213	213	242	340	340	340
size (ares)			13			13		
size (ACRES)			0.32			0.32		
Species count			13	13	19	11	11	11
Stems per ACRE			663	663	753	1,058	1,058	1,058

Color for Density
- Exceeds requirements by 10%
- Exceeds requirements, but by less than 10%
- Fails to meet requirements, by less than 10%
- Fails to meet requirements by more than 10%
- Recruit Stems

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

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Poplin Ridge - Vegetation Monitoring Plot 1
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 2
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 3
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 4
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 5
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 6
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 7
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 8
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 9
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 10
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 11
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 12
October 21, 2015

Poplin Ridge - Vegetation Monitoring Plot 13
October 21, 2015

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Appendix D
Stream Geomorphology Data

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Table 10 - Morphological Parameters Summary (Reach UT1)

Project Name/Number: Poplin Ridge Stream Restoration Project

	Reference Reach		Existing									Design				As-Built MY0			
			UT1-R1	UT1-R1	UT1-R2	UT1-R3	UT1-R4	UT1-A	UT1-B	UT1-B	UT1-C	UT1-R2		UT1-R3		UT1-R2		UT1-R3	
			Pres.	Enh. I	Rest.	Rest.	Enh. I	Enh. I	Pres.	Enh. I	Enh. I	Rest.		Rest.		Rest.		Rest.	
Feature	Riffle	Pool	Riffle	Riffle	Riffle	Riffle	Riffle	Riffle	Riffle	Riffle	Riffle	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool
Drainage Area (ac)	426	426	136	136	248	384	728	88	120	120	250	248		384		248		384	
NC Regional Curve Discharge (cfs)	69		31	31	47	64	100	22	28	28	47	47		64		47		64	
Design/Approx. Bankfull Discharge (cfs)	50		22	22	35	55	65	20	15	30	50	35		52		35		52	
Dimension																			
BF Width (ft)	13.7	15.0	7.9	7.5	9.9	12.8	17.5	6.9	11.2	6.0	10.0	11.8	12.8	13.6	14.8	12.95	14.85	15.35	15.15
Floodprone Width (ft)	>50	NA	>50	>50	>50	>50	>50	>50	>50	>50	>40	>50	NA	>50	>50	>50	>50	>50	NA
BF Cross Sectional Area (ft^2)	18.1	23.4	10.1	10.4	14.2	22.2	21.9	6.8	6.1	5.5	10.0	14.5	19.9	18.8	26.9	17.3	19.15	22.4	21.45
BF Mean Depth (ft)	1.4	1.6	1.3	1.4	1.4	1.7	1.2	1.0	0.5	0.9	1.0	1.2	1.6	1.4	1.8	1.3	1.25	1.45	1.45
BF Max Depth (ft)	1.7	2.7	2.0	1.8	2.0	2.4	2.3	1.4	1.0	1.1	1.3	1.8	2.4	1.9	2.8	2.1	2.35	2.25	2.55
Width/Depth Ratio	9.8	9.6	6.2	5.4	7.0	7.4	14.0	6.9	20.4	6.6	10.0	9.8	8.2	9.9	8.1	9.7	11.65	10.5	10.75
Entrenchment Ratio	>2.2	NA	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	NA	>2.2	NA	>2.2	>2.2	>2.2	>2.2
Wetted Perimeter (ft)	14.9	16.8	10.4	9.1	11.6	14.5	19.0	8.2	11.8	7.5	11.1	12.6	14	14.7	16.2	13.9	15.95	16.35	16.4
Hydraulic Radius (ft)	1.2	1.4	1.0	1.1	1.2	1.5	1.2	0.8	0.5	0.7	0.9	1.1	1.4	1.4	1.7	1.25	1.15	1.4	1.3
Substrate																			
D16 (mm)	2.8		0.062	0.062	0.062	2	3	0.062	2	3	2	2		2		0.062		1.7	
D50 (mm)	11.0		0.062	16.0	2	8	25	0.1	29	12	11	8		8		0.062		25	
D84 (mm)	16.0		0.062	63.0	7	25	51	0.4	60	27	45	25		25		26		60	
Pattern																			
	Min	**Max**	**Med**	---	---	---	---	---	---	---	---	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Channel Beltwidth (ft)	26.3	55.5	37.3	---	---	---	---	---	---	---	---	38	57	44	65	35	60	42	65
Radius of Curvature (ft)	13.5	103.3	41.2	---	---	---	---	---	---	---	---	18	89	20	103	15	75	17	80
Radius of Curvature Ratio	1.0	7.6	3.0	---	---	---	---	---	---	---	---	1.5	7.6	1.5	7.6	1.5	7.6	1.5	7.6
Meander Wavelength (ft)	49.4	66.0	59.7	---	---	---	---	---	---	---	---	38	57	44	65	35	52	37	56
Meander Width Ratio	3.6	4.8	4.4	---	---	---	---	---	---	---	---	3.2	4.8	3.2	4.8	2.7	4.0	2.7	4.3
Profile																			
	Min	**Max**	**Med**	---	---	---	---	---	---	---	---	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Riffle Length (ft)	6	18	9	---	---	---	---	---	---	---	---	5	16	6	18	6	18	7	22
Riffle Slope (%)	1.1	3.4	2.3	---	---	---	---	---	---	---	---	1.1	3.4	1.1	3.4	1.0	3.6	1.0	3.7
Run Length (ft)	7	15	8	---	---	---	---	---	---	---	---	6	13	7	15	6	15	8.0	18.0
Run Slope (%)	4.8	11.5	8.2	---	---	---	---	---	---	---	---	4.8	11.5	4.8	11.5	4.6	12.0	5.0	11.0
Glide Length (ft)	5	13	9	---	---	---	---	---	---	---	---	4	11	5	13	4	12	6.0	13.2
Glide Slope (%)	4.8	9.2	7.0	---	---	---	---	---	---	---	---	4.8	9.2	4.8	9.2	4.7	10.0	5.0	10.9
Pool Length (ft)	5	42	15	---	---	---	---	---	---	---	---	4	36	5	42	6	42	8.0	50.0
Pool Slope (%)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.1	2.5	1.1	2.4
Pool-to-Pool Spacing (ft)	18.0	64.0	30.0	---	---	---	---	---	---	---	---	16	55	18	64	20	60	20	70
Additional Reach Parameters																			
Valley Length (ft)	279		622	534	1173	731	1294	264	573	434	908	---		---		1,070		1,115	
Channel Length (ft)	318		716	541	1197	738	1340	270	618	449	921	---		---		1,178		1,223	
Sinuosity	1.14		1.2	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.1		1.1		1.1		1.1	
Water Surface Slope (ft/ft)	0.0048		NA	NA	NA	0.003	0.004	NA	NA	NA	NA	---		---		NA		NA	
Channel Slope (ft/ft)	0.0047		0.0048	0.011	0.007	0.004	0.005	0.012	0.012	0.018	0.008	0.0059		0.0046		0.0066		0.0041	
Rosgen Classification	E4		E4	E4	E4	E4	C4	E5	C4	E4	E4	E4		E4		E4		E4	

Table 10 Cont'd - Morphological Parameters Summary (Reach UT2)

Project Name/Number: Poplin Ridge Stream Restoration Project

	Reference Reach		Existing					Design				As-Built MY0			
			UT2-R1	UT2-R2	UT2-R3	UT2-R4	UT2-A	UT1-R2		UT1-R3/R4		UT1-R2		UT1-R3/R4	
			Enh. II	Rest.	Rest.	Rest.	Enh. II	Rest.		Rest.		Rest.		Rest.	
Feature	Riffle	Pool	Riffle	Pond	Riffle	Riffle	Riffle	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool
Drainage Area (ac)	426	426	634	723	742	864	51	723		864		723		864	
NC Regional Curve Discharge (cfs)	69							100		113		100		113	
Design/Approx. Bankfull Discharge (cfs)	50		---	---	---	---	---	52		70		52		70	
Dimension															
BF Width (ft)	13.7	15.0	25.6	---	16.2	12.1	6.1	17.2	18.6	18.2	19.6	21	19.6	17.4	21.1
Floodprone Width (ft)	>50	NA	>50	---	>50	>50	>50	>50	NA	>50	NA	>50	>50	>50	>50
BF Cross Sectional Area (ft^2)	18.1	23.4	19.6	---	22.4	12.6	3.0	31.5	42	34.8	47.6	26.5	32.6	30.8	34.4
BF Mean Depth (ft)	1.4	1.6	0.8	---	1.4	1.0	0.5	1.8	2.3	1.9	2.4	1.3	1.7	1.8	1.6
BF Max Depth (ft)	1.7	2.7	1.7	---	2.6	1.6	1.2	2.5	3.5	2.6	3.8	2.2	3.1	2.5	3.5
Width/Depth Ratio	9.8	9.6	33.5	---	11.8	11.6	12.2	9.4	8.2	9.5	8.1	16.6	11.7	9.8	12.9
Entrenchment Ratio	>2.2	NA	>2.2	---	>2.2	>2.2	>2.2	>2.2	NA	>2.2	NA	>2.2	>2.2	>2.2	>2.2
Wetted Perimeter (ft)	14.9	16.8	26.2	---	17.9	13.1	7.0	18.5	20.3	19.5	21.5	21.7	21.2	18.5	22.9
Hydraulic Radius (ft)	1.2	1.4	0.7	---	1.3	1.0	0.4	1.7	2.1	1.8	2.2	1.2	1.5	1.7	1.5
Substrate															
D16 (mm)	2.8		0.062	---	0.062	1.5	0.062	1.5		1.5		0.062		0.062	
D50 (mm)	11.0		0.062	---	0.062	7.8	0.062	7.8		7.8		0.062		28	
D84 (mm)	16.0		0.72	---	4.8	15.0	0.57	15		15		24		61	
Pattern															
	Min	**Max**	**Med**	---	---	---	---	---	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Channel Beltwidth (ft)	26	56	37	---	---	---	---	---	55	83	58	87	67	101	56	84
Radius of Curvature (ft)	13	103	41	---	---	---	---	---	26	130	27	138	32	160	26	132
Radius of Curvature Ratio	1.0	7.6	3.0	---	---	---	---	---	1.5	7.6	1.5	7.6	1.5	7.6	1.5	7.6
Meander Wavelength (ft)	49	66	60	---	---	---	---	---	55	83	58	87	67	101	56	84
Meander Width Ratio	1.9	4.1	2.7	---	---	---	---	---	3.2	4.8	3.2	4.8	3.2	4.8	3.2	4.8
Profile															
	Min	**Max**	**Med**	---	---	---	---	---	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Riffle Length (ft)	6	18	9						8	23	8	24	9.0	25.0	8.2	26.5
Riffle Slope (%)	1.1	3.4	2.3	---	---	---	---	---	1.1	3.4	1.1	3.4	1.1	3.6	1.2	3.8
Run Length (ft)	7	15	8						9	19	9	20	11.0	17.0	10.2	21.0
Run Slope (%)	4.8	11.5	8.2	---	---	---	---	---	4.8	11.5	4.8	11.5	4.2	12.0	3.8	11.2
Glide Length (ft)	5	13	9						6	16	7	17	6.2	18.2	7.5	16.3
Glide Slope (%)	4.8	9.2	7.0	---	---	---	---	---	4.8	9.2	4.8	9.2	5.1	9.6	4.8	9.1
Pool Length (ft)	5	42	15						6	53	7	56	7.8	47.0	8.5	60.0
Pool Slope (%)	---	---	---	---	---	---	---	---	---	---	---	---	3.5	10.0	4.1	10.1
Pool-to-Pool Spacing (ft)	18.0	64.0	30.0	---	---	---	---	---	23	81	24	85	18.0	90.0	20.5	92.0
Additional Reach Parameters															
Valley Length (ft)	279		410	641	779	1015	427	---		---		785		710	
Channel Length (ft)	318		443	641	781	1032	437	---		---		847		778	
Sinuosity	1.14		1.1	1.0	1.0	1.0	1.0	1.1		1.1		1.08		1.1	
Water Surface Slope (ft/ft)	0.0048		NA	NA	NA	0.0027	NA	---		---		---		---	
Channel Slope (ft/ft)	0.0047		0.0027	0.001	0.0057	0.0031	0.013	0.0029		0.0028		0.0061		0.002	
Rosgen Classification	E4		C5c	NA	E5	E4	C5	E4		E4		E4		E4	

Table 11a. - Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters – Cross Sections)
Poplin Ridge Stream Restoration Project

	Cross Section 1 Reach UT2-2							Cross Section 2 Reach UT2-2							Cross Section 3 (Riffle) Reach UT2-A							Cross Section 4 (Riffle) Reach UT2-A							Cross Section 5 (Run) Reach UT2-2						
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**
Record elevation (datum) used	577.24	577.24						577.10	577.10						586.40	586.40						585.00	585.00						576.32	576.32					
Bankfull Width (ft)	3.2	5.5						3.0	5.6						8.2	8.0						11.0	8.8						21.0	21.8					
Floodprone Width (ft)	>17.2	>17.2						>15.2	>15.2						>50	>50						>44.4	>44.4						>50	>50					
Bankfull Mean Depth (ft)	0.5	0.7						0.4	0.5						1.0	0.8						0.7	0.6						1.3	1.2					
Bankfull Max Depth (ft)	0.9	1.4						0.6	1.3						1.7	1.5						1.3	1.1						2.2	2.2					
Bankfull Cross Sectional Area (ft^2)	0.6	3.7						1.1	2.7						7.9	6.7						7.4	5.0						26.5	25.3					
Bankfull Width/Depth Ratio	6.4	8.2						7.9	11.5						8.5	9.5						16.4	15.6						16.6	18.8					
Bankfull Entrenchment Ratio	>2.2	>3.1						>2.2	>2.7						>2.2	>6.3						>2.2	>5.0						>2.2	>2.3					
Bankfull Bank Height Ratio	1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0					

	Cross Section 6 (Pool) Reach UT2-2							Cross Section 7 (Pool) Reach UT2-4							Cross Section 8 (Riffle) Reach UT2-4							Cross Section 9 (Riffle) Reach UT1-1							Cross Section 10 (Pool) Reach UT1-1						
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**
Record elevation (datum) used	576.48	576.48						575.00	575.00						575.01	575.01						602.06	602.06						602.28	602.28					
Bankfull Width (ft)	19.6	19.1						21.1	19.8						17.4	17.1						11.7	11.4						15.2	14.7					
Floodprone Width (ft)	>50	>50						>50	>50						>50	>50						>50	>50						>50	>50					
Bankfull Mean Depth (ft)	1.7	1.6						1.6	1.6						1.8	1.7						1.1	1.1						1.4	1.3					
Bankfull Max Depth (ft)	3.1	3.0						3.5	3.4						2.5	2.4						1.8	1.8						2.6	2.5					
Bankfull Cross Sectional Area (ft^2)	32.6	30.0						34.4	32.0						30.8	28.4						13.0	12.1						21.0	19.8					
Bankfull Width/Depth Ratio	11.7	12.2						12.9	12.2						9.8	10.3						10.4	10.7						11.1	10.9					
Bankfull Entrenchment Ratio	>2.2	>2.6						>2.2	>2.5						>2.2	>2.9						>2.2	>4.4						>2.2	>3.4					
Bankfull Bank Height Ratio	1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0					

	Cross Section 11 (Riffle) Reach UT1-A							Cross Section 12 (Pool) Reach UT1-2							Cross Section 13 (Riffle) Reach UT1-2							Cross Section 14 (Pool) Reach UT1-2							Cross Section 15 (Riffle) Reach UT1-2						
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**
Record elevation (datum) used	599.06	599.06						596.26	596.26						595.97	595.97						591.21	591.21						591.48	591.48					
Bankfull Width (ft)	10.0	10.2						17.4	17.4						12.5	12.2						12.3	12.0						13.4	12.9					
Floodprone Width (ft)	>50	>50						>50	>50						>50	>50						>50	>50						>50	>50					
Bankfull Mean Depth (ft)	1.0	1.0						1.4	1.3						1.2	1.2						1.1	1.0						1.4	1.3					
Bankfull Max Depth (ft)	1.7	1.6						2.5	2.4						1.9	1.9						2.2	2.0						2.3	2.2					
Bankfull Cross Sectional Area (ft^2)	10.5	10.1						24.4	21.8						15.6	14.4						13.9	11.9						19.0	17.3					
Bankfull Width/Depth Ratio	9.6	10.3						12.4	13.9						10.0	10.4						10.9	12.1						9.4	9.7					
Bankfull Entrenchment Ratio	>2.2	>4.9						>2.2	>2.9						>2.2	>4.1						>2.2	>4.2						>2.2	>3.9					
Bankfull Bank Height Ratio	1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0					

Table 11a. Cont'd - Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters – Cross Sections)
Poplin Ridge Stream Restoration Project

	Cross Section 16 (Riffle) Reach UT1-B							Cross Section 17 (Pool) Reach UT1-B							Cross Section 18 (Pool) Reach UT1-3							Cross Section 19 (Riffle) Reach UT1-3							Cross Section 20 (Riffle) Reach UT1-3						
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**
Record elevation (datum) used	591.84	591.84						590.93	590.93						588.03	588.03						588.19	588.19						586.15	586.15					
Bankfull Width (ft)	11.7	10.8						14.2	13.1						14.5	14.3						15.2	15.1						15.5	16.1					
Floodprone Width (ft)	>50	>50						>50	>50						>50	>50						>50	>50						>50	>50					
Bankfull Mean Depth (ft)	1.1	1.0						0.7	0.6						1.5	1.4						1.5	1.4						1.4	1.3					
Bankfull Max Depth (ft)	1.8	1.7						1.4	1.3						2.6	2.6						2.4	2.1						2.1	2.1					
Bankfull Cross Sectional Area (ft^2)	12.3	11.2						10.2	8.5						21.5	19.6						23.0	21.8						21.9	20.9					
Bankfull Width/Depth Ratio	11.2	10.4						19.7	20.2						9.8	10.4						10.1	10.5						11.0	12.4					
Bankfull Entrenchment Ratio	>2.2	>4.6						>2.2	>3.8						>2.2	>3.5						>2.2	>3.3						>2.2	>3.1					
Bankfull Bank Height Ratio	1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0					

	Cross Section 21 (Pool) Reach UT1-3							Cross Section 22 (Riffle) Reach UT1-C							Cross Section 23 (Pool) Reach UT1-C							Cross Section 24 (Riffle) Reach UT1-C							Cross Section 25 (Pool) Reach UT1-C						
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**
Record elevation (datum) used	585.60	585.60						592.04	592.04						591.80	591.80						586.30	586.30						585.80	585.80					
Bankfull Width (ft)	15.8	15.0						13.2	12.5						14.6	14.0						14.2	13.8						12.0	11.1					
Floodprone Width (ft)	>50	>50						>50	>50						>50	>50						>46.6	>46.6						>50	>50					
Bankfull Mean Depth (ft)	1.4	1.3						1.3	1.1						1.3	1.1						1.0	0.9						1.3	1.3					
Bankfull Max Depth (ft)	2.5	2.4						1.9	1.6						2.1	1.9						1.7	1.6						2.3	2.1					
Bankfull Cross Sectional Area (ft^2)	21.4	19.1						16.8	13.6						19.1	14.8						14.0	12.2						15.5	14.3					
Bankfull Width/Depth Ratio	11.7	11.8						10.4	11.5						11.1	13.3						14.3	15.6						9.4	8.6					
Bankfull Entrenchment Ratio	>2.2	>3.3						>2.2	>4.0						>2.2	>3.6						>2.2	>3.4						>2.2	>4.5					
Bankfull Bank Height Ratio	1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0					

	Cross Section 26 (Pool) Reach UT1-4							Cross Section 27 (Riffle) Reach UT1-4							Cross Section 28 (Riffle) Reach UT1-4							Cross Section 29 (Pool) Reach UT1-4													
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**MY+**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	MY+
Record elevation (datum) used	581.70	581.70						582.15	582.15						579.70	579.70						579.80	579.80												
Bankfull Width (ft)	14.8	14.1						16.5	15.9						15.9	15.4						20.3	20.8												
Floodprone Width (ft)	>47	>47						>50	>50						>50	>50						>50	>50												
Bankfull Mean Depth (ft)	1.2	1.2						1.3	1.2						1.5	1.4						1.6	1.4												
Bankfull Max Depth (ft)	2.1	2.1						2.1	1.9						2.6	2.5						3.1	2.9												
Bankfull Cross Sectional Area (ft^2)	17.6	16.2						21.5	18.3						24.2	21.7						33.2	30.0												
Bankfull Width/Depth Ratio	12.5	12.3						12.7	13.8						10.4	10.9						12.5	14.4												
Bankfull Entrenchment Ratio	>2.2	>3.3						>2.2	>3.1						>2.2	>3.3						>2.2	>2.4												
Bankfull Bank Height Ratio	1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0												

Table 11b. Monitoring Data - Stream Reach Data Summary
Poplin Ridge Stream Restoration Project - UT1-2 (1,178 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
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**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)	-	12.95	-	-	-	-	12.2	12.6	12.6	12.9	0.5	2																																				
Floodprone Width (ft)	-	>50	-	-	-	-	50.0	50.0	50.0	50.0	0.0	2																																		
Bankfull Mean Depth (ft)	-	1.3	-	-	-	-	1.2	1.3	1.3	1.3	0.1	2																																		
Bankfull Max Depth (ft)	-	2.1	-	-	-	-	1.9	2.1	2.1	2.2	0.2	2																																		
Bankfull Cross-Sectional Area (ft^2)	-	17.3	-	-	-	-	14.4	15.9	15.9	17.3	2.1	2																																		
Width/Depth Ratio	-	9.7	-	-	-	-	9.7	10.1	10.1	10.4	0.5	2																																		
Entrenchment Ratio	-	>2.2	-	-	-	-	3.9	4.0	4.0	4.1	0.1	2																																		
Bank Height Ratio	-	1.0	-	-	-	-	1.0	1.0	1.0	1.0	0.0	2																																		
Profile																																															
Riffle Length (ft)	6.0	-	-	18.0	-	-																																									
Riffle Slope (ft/ft)	0.010	-	-	0.036	-	-																																									
Pool Length (ft)	6.0	-	-	42.0	-	-																																									
Pool Max Depth (ft)	-	-	-	-	-	-																																								
Pool Spacing (ft)	20.0	-	-	60.0	-	-																																								
Pattern																																															
Channel Belt Width (ft)	35.0	-	-	60.0	-	-																																								
Radius of Curvature (ft)	15.0	-	-	75.0	-	-																																								
Rc: Bankfull Width (ft/ft)	1.50	-	-	7.60	-	-																																							
Meander Wavelength (ft)	35.0	-	-	52.0	-	-																																								
Meander Width Ratio	2.7	-	-	4.0	-	-																																								
Additional Reach Parameters																																															
Rosgen Classification	E4																																														
Channel Thalweg Length (ft)	1,178																																														
Sinuosity (ft)	1.1																																														
Water Surface Slope (Channel) (ft/ft)	-																																													
Bankfull Slope (ft/ft)	0.0066																																														
Ri% / Ru% / P% / G% / S%	-	-	-	-	-																																									

- Information Unavailable.

N/A - Information does not apply.

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

Table 11b Cont'd. Monitoring Data - Stream Reach Data Summary
Poplin Ridge Stream Restoration Project - UT1-3 (893 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
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**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)	-	15.35	-	-	-	-	15.1	15.6	15.6	16.1	0.7	2																																				
Floodprone Width (ft)	-	>50	-	-	-	-	50.0	50.0	50.0	50.0	0.0	2																																		
Bankfull Mean Depth (ft)	-	1.45	-	-	-	-	1.3	1.4	1.4	1.4	0.1	2																																		
Bankfull Max Depth (ft)	-	2.25	-	-	-	-	2.1	2.1	2.1	2.1	0.0	2																																		
Bankfull Cross-Sectional Area (ft^2)	-	22.4	-	-	-	-	20.9	21.4	21.4	21.8	0.6	2																																		
Width/Depth Ratio	-	10.50	-	-	-	-	10.5	11.5	11.5	12.4	1.3	2																																		
Entrenchment Ratio	-	>2.2	-	-	-	-	3.1	3.2	3.2	3.3	0.1	2																																		
Bank Height Ratio	-	1.0	-	-	-	-	1.0	1.0	1.0	1.0	0.0	2																																		
Profile																																															
Riffle Length (ft)	7.0	-	-	22.0	-	-																																									
Riffle Slope (ft/ft)	0.010	-	-	0.037	-	-																																									
Pool Length (ft)	8.0	-	-	50.0	-	-																																									
Pool Max Depth (ft)	-	-	-	-	-	-																																								
Pool Spacing (ft)	20.0	-	-	70.0	-	-																																								
Pattern																																															
Channel Belt Width (ft)	42.0	-	-	65.0	-	-																																								
Radius of Curvature (ft)	17.0	-	-	80.0	-	-																																								
Rc: Bankfull Width (ft/ft)	1.50	-	-	7.60	-	-																																							
Meander Wavelength (ft)	37.0	-	-	56.0	-	-																																								
Meander Width Ratio	2.7	-	-	4.3	-	-																																								
Additional Reach Parameters																																															
Rosgen Classification	E4																																														
Channel Thalweg Length (ft)	893																																														
Sinuosity (ft)	1.1																																														
Water Surface Slope (Channel) (ft/ft)	-																																													
Bankfull Slope (ft/ft)	0.004																																														
Ri% / Ru% / P% / G% / S%	-	-	-	-	-																																									

- Information Unavailable.

N/A - Information does not apply.

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

Table 11b Cont'd. Monitoring Data - Stream Reach Data Summary
Poplin Ridge Stream Restoration Project - UT2-2 (847 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
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**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)	-	21.0	-	-	-	-	21.8	21.8	21.8	21.8	N/A	1																																				
Floodprone Width (ft)	-	>50	-	-	-	-	50.0	50.0	50.0	50.0	N/A	1																																		
Bankfull Mean Depth (ft)	-	1.3	-	-	-	-	1.2	1.2	1.2	1.2	N/A	1																																		
Bankfull Max Depth (ft)	-	2.2	-	-	-	-	2.2	2.2	2.2	2.2	N/A	1																																		
Bankfull Cross-Sectional Area (ft^2)	-	26.5	-	-	-	-	25.3	25.3	25.3	25.3	N/A	1																																		
Width/Depth Ratio	-	16.6	-	-	-	-	18.8	18.8	18.8	18.8	N/A	1																																		
Entrenchment Ratio	-	>2.2	-	-	-	-	2.3	2.3	2.3	2.3	N/A	1																																		
Bank Height Ratio	-	1.0	-	-	-	-	1.0	1.0	1.0	1.0	N/A	1																																		
Profile																																															
Riffle Length (ft)	9.0	-	-	25.0	-	-																																									
Riffle Slope (ft/ft)	0.0	-	-	0.036	-	-																																									
Pool Length (ft)	7.8	-	-	47.0	-	-																																									
Pool Max Depth (ft)	-	-	-	-	-	-																																								
Pool Spacing (ft)	18.0	-	-	90.0	-	-																																								
Pattern																																															
Channel Belt Width (ft)	67.0	-	-	101.0	-	-																																								
Radius of Curvature (ft)	32.0	-	-	160.0	-	-																																								
Rc: Bankfull Width (ft/ft)	1.50	-	-	7.60	-	-																																							
Meander Wavelength (ft)	67.0	-	-	101.0	-	-																																								
Meander Width Ratio	3.2	-	-	4.8	-	-																																								
Additional Reach Parameters																																															
Rosgen Classification	E4																																														
Channel Thalweg Length (ft)	847																																													
Sinuosity (ft)	1.08																																													
Water Surface Slope (Channel) (ft/ft)	-																																												
Bankfull Slope (ft/ft)	0.0061																																													
Ri% / Ru% / P% / G% / S%	-	-	-	-	-																																								

- Information Unavailable.

N/A - Information does not apply.

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

Table 11b Cont'd. Monitoring Data - Stream Reach Data Summary
Poplin Ridge Stream Restoration Project - UT2-3/4 (521 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5						MY - 6						MY - 7					
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**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)	-	17.4	-	-	-	-	17.1	17.1	17.1	17.1	N/A	1																																				
Floodprone Width (ft)	-	>50	-	-	-	-	50.0	50.0	50.0	50.0	N/A	1																																		
Bankfull Mean Depth (ft)	-	1.8	-	-	-	-	1.7	1.7	1.7	1.7	N/A	1																																		
Bankfull Max Depth (ft)	-	2.5	-	-	-	-	2.4	2.4	2.4	2.4	N/A	1																																		
Bankfull Cross-Sectional Area (ft^2)	-	30.8	-	-	-	-	28.4	28.4	28.4	28.4	N/A	1																																		
Width/Depth Ratio	-	9.8	-	-	-	-	10.3	10.3	10.3	10.3	N/A	1																																		
Entrenchment Ratio	-	>2.2	-	-	-	-	2.9	2.9	2.9	2.9	N/A	1																																		
Bank Height Ratio	-	1.0	-	-	-	-	1.0	1.0	1.0	1.0	N/A	1																																		
Profile																																															
Riffle Length (ft)	8.2	-	-	26.5	-	-																																									
Riffle Slope (ft/ft)	0.012	-	-	0.038	-	-																																									
Pool Length (ft)	8.5	-	-	60.0	-	-																																									
Pool Max Depth (ft)	-	-	-	-	-	-																																								
Pool Spacing (ft)	20.5	-	-	92.0	-	-																																								
Pattern																																															
Channel Belt Width (ft)	56.0	-	-	84.0	-	-																																								
Radius of Curvature (ft)	32.0	-	-	160.0	-	-																																								
Rc: Bankfull Width (ft/ft)	1.5	-	-	7.6	-	-																																							
Meander Wavelength (ft)	56.0	-	-	84.0	-	-																																								
Meander Width Ratio	3.2	-	-	4.8	-	-																																								
Additional Reach Parameters																																															
Rosgen Classification	E4																																														
Channel Thalweg Length (ft)	778																																													
Sinuosity (ft)	1.1																																													
Water Surface Slope (Channel) (ft/ft)	N/A																																												
Bankfull Slope (ft/ft)	0.002																																												
Ri% / Ru% / P% / G% / S%	-	-	-	-	-																																								

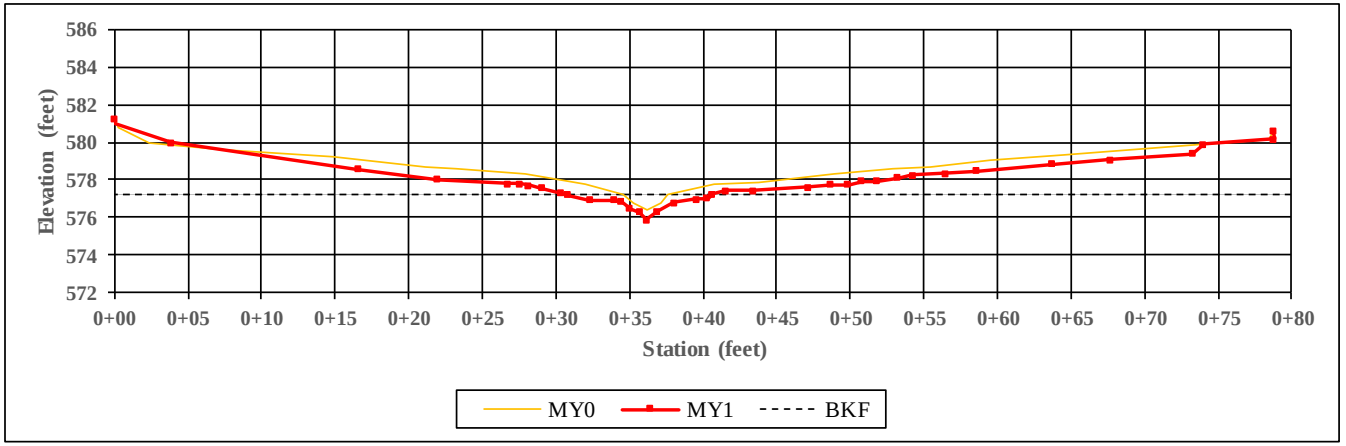
- Information Unavailable.

N/A - Information does not apply.

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

Project Name: Poplin Ridge **XS Number:** 1 **Station:** 7+59

Reach Name: UT2-2 **XS Type:** RU



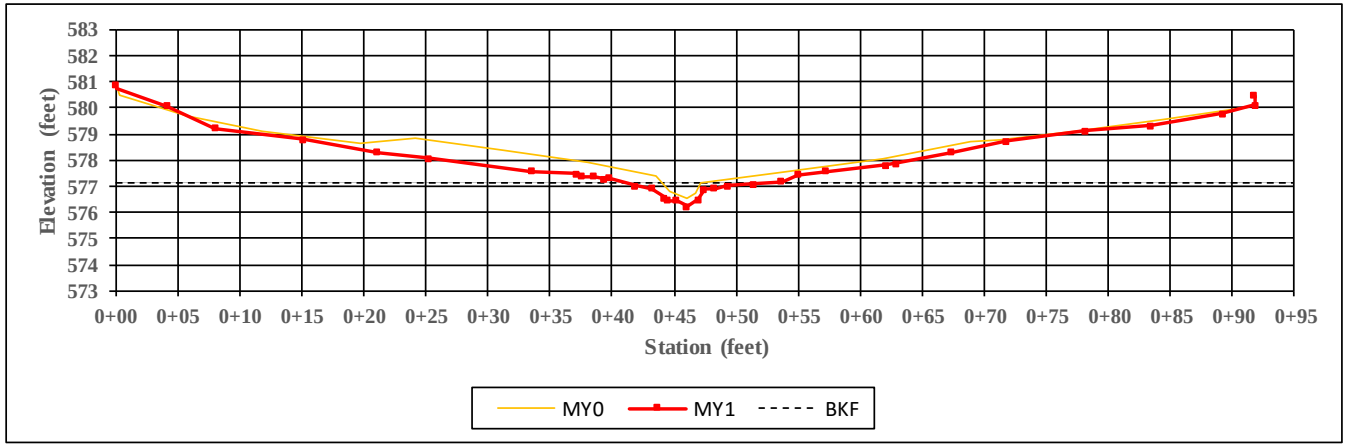
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	3.2	5.5						
Floodprone Width (ft)	17.2	17.2						
Bankfull Mean Depth (ft)	0.5	0.7						
Bankfull Max Depth (ft)	0.9	1.4						
Bankfull Cross-Sectional Area (ft2)	1.6	3.7						
Width/Depth Ratio	6.4	8.2						
Entrenchment Ratio	5.3	3.1						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 2 **Station:** 8+05

Reach Name: UT2-2 **XS Type:** RU



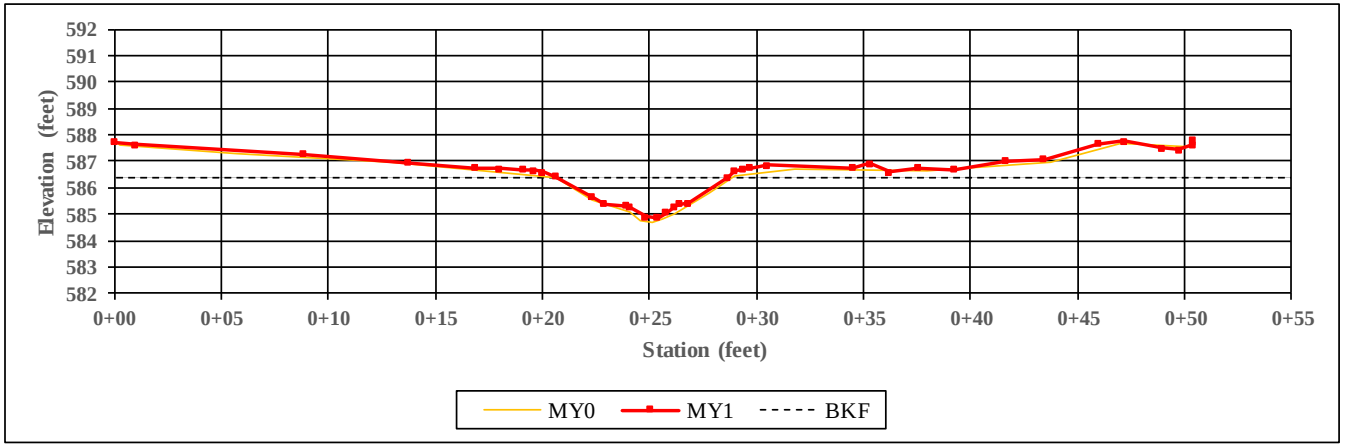
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	3.0	5.6						
Floodprone Width (ft)	15.2	15.2						
Bankfull Mean Depth (ft)	0.4	0.5						
Bankfull Max Depth (ft)	0.6	0.9						
Bankfull Cross-Sectional Area (ft2)	1.1	2.7						
Width/Depth Ratio	7.9	11.5						
Entrenchment Ratio	5.1	2.7						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 3 **Station:** 1+22

Reach Name: UT2-A **XS Type:** Riffle



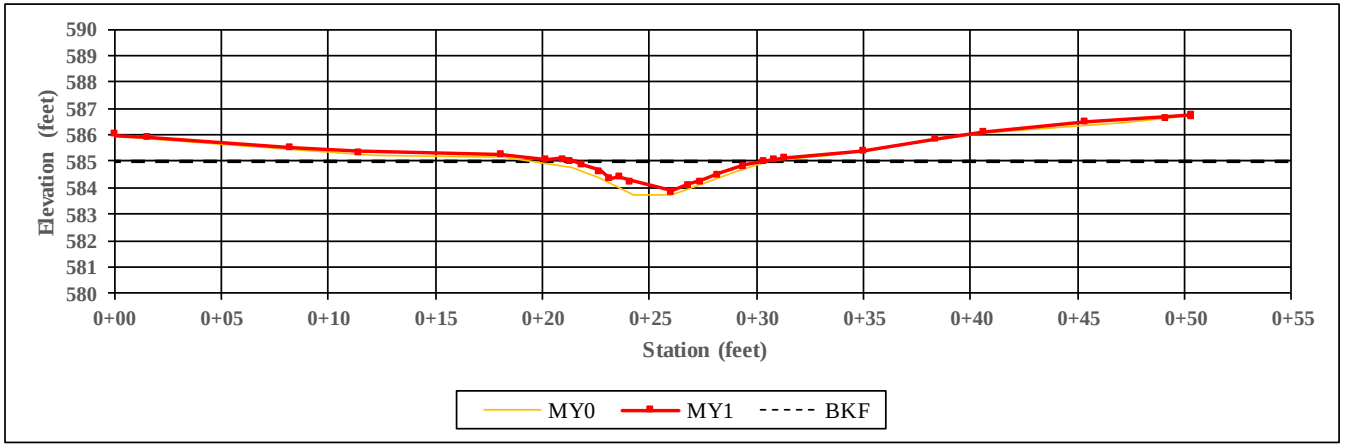
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	8.2	8.0						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.0	0.8						
Bankfull Max Depth (ft)	1.7	1.5						
Bankfull Cross-Sectional Area (ft^2)	7.9	6.7						
Width/Depth Ratio	8.5	9.5						
Entrenchment Ratio	6.1	6.3						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 4 **Station:** 2+62

Reach Name: UT2-A **XS Type:** Riffle



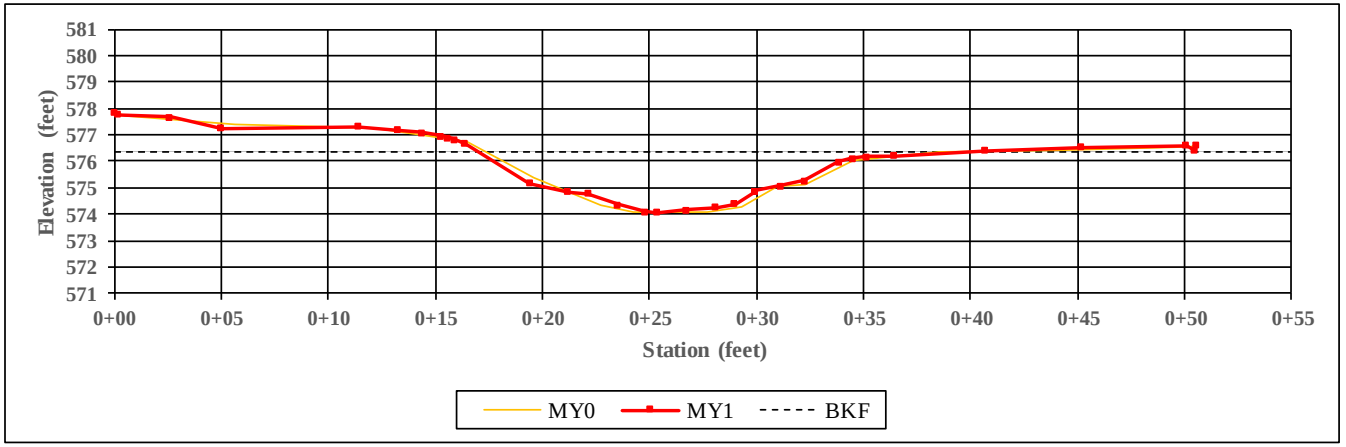
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	11.0	8.8						
Floodprone Width (ft)	44.4	44.4						
Bankfull Mean Depth (ft)	0.7	0.6						
Bankfull Max Depth (ft)	1.3	1.1						
Bankfull Cross-Sectional Area (ft^2)	7.4	5.0						
Width/Depth Ratio	16.4	15.6						
Entrenchment Ratio	4.0	5.0						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 5 **Station:** 13+48

Reach Name: UT2-2 **XS Type:** Run



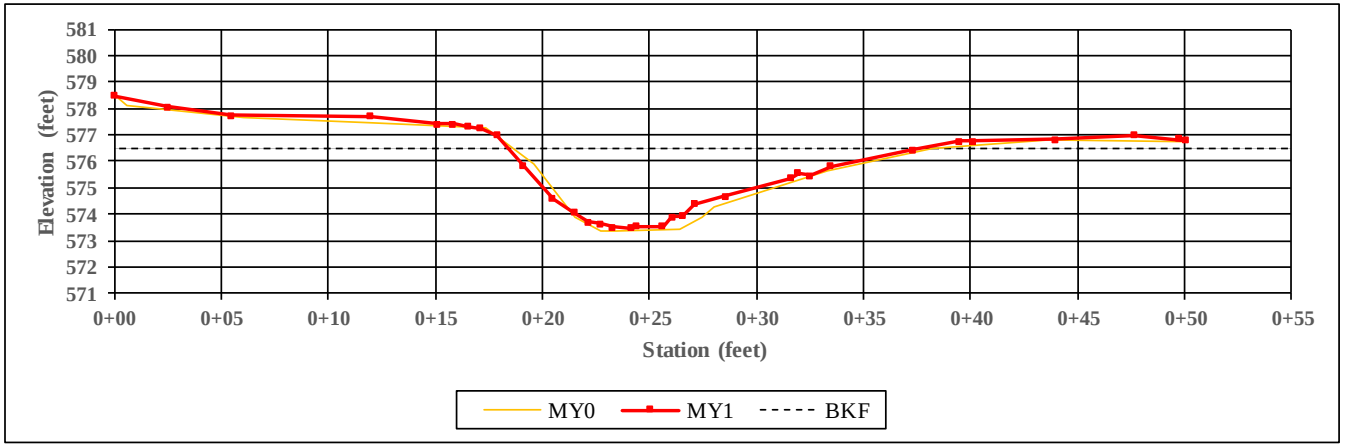
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	21.0	21.8						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.3	1.2						
Bankfull Max Depth (ft)	2.2	2.2						
Bankfull Cross-Sectional Area (ft^2)	26.5	25.3						
Width/Depth Ratio	16.6	18.8						
Entrenchment Ratio	2.4	2.3						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 6 **Station:** 13+83

Reach Name: UT2-2 **XS Type:** Pool



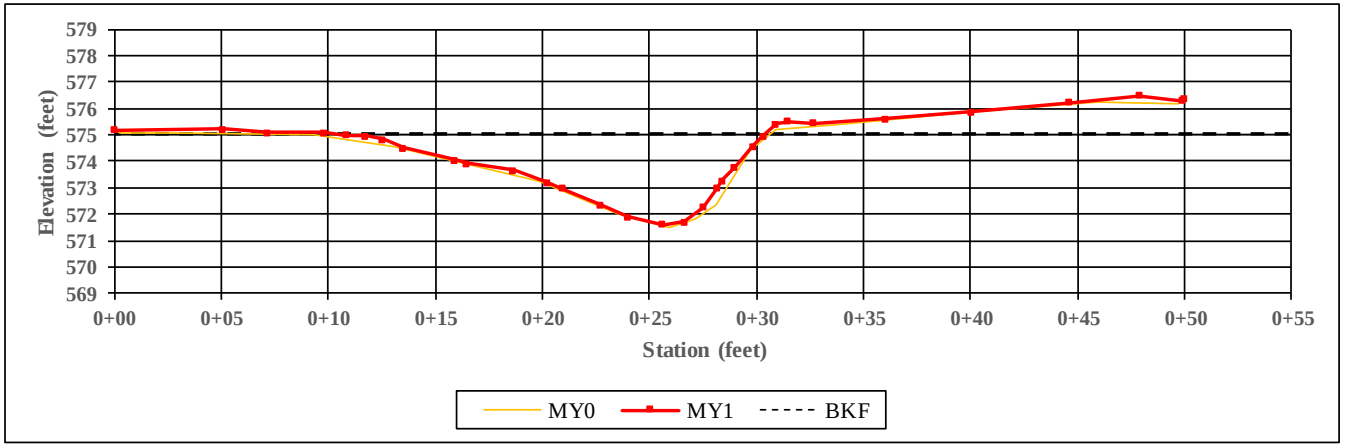
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	19.6	19.1						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.7	1.6						
Bankfull Max Depth (ft)	3.1	3.0						
Bankfull Cross-Sectional Area (ft^2)	32.6	30.0						
Width/Depth Ratio	11.7	12.2						
Entrenchment Ratio	2.6	2.6						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 7 **Station:** 20+06

Reach Name: UT2-4 **XS Type:** Pool



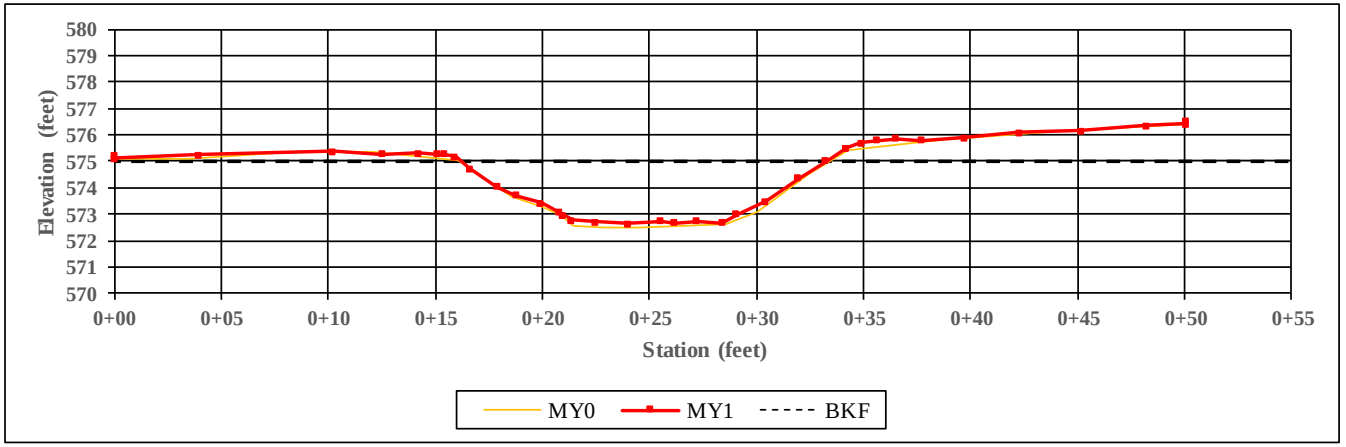
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	21.1	19.8						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.6	1.6						
Bankfull Max Depth (ft)	3.5	3.4						
Bankfull Cross-Sectional Area (ft^2)	34.4	32.0						
Width/Depth Ratio	12.9	12.2						
Entrenchment Ratio	2.4	2.5						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 8 **Station:** 20+39

Reach Name: UT2-4 **XS Type:** Riffle



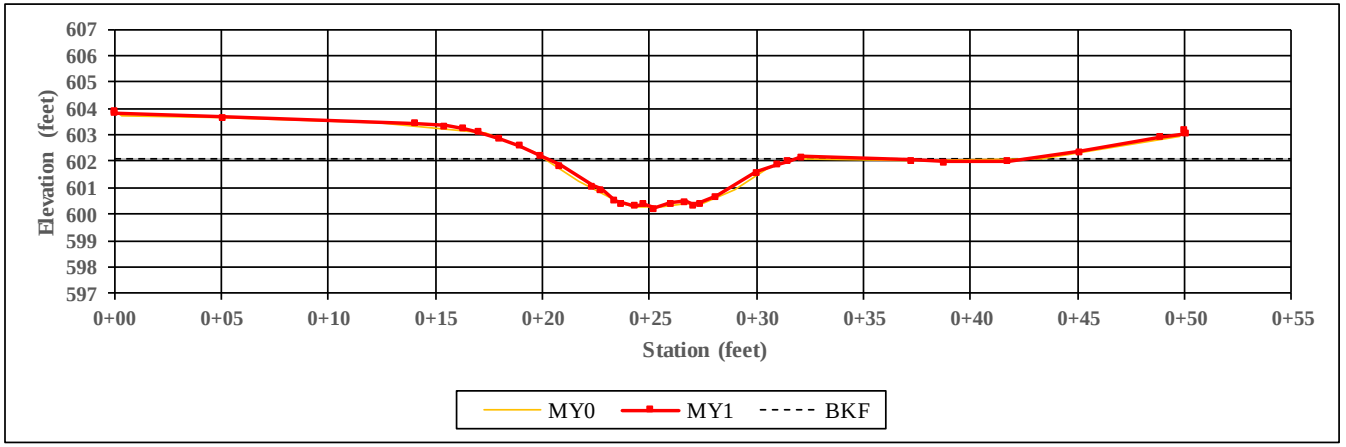
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	17.4	17.1						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.8	1.7						
Bankfull Max Depth (ft)	2.5	2.4						
Bankfull Cross-Sectional Area (ft^2)	30.8	28.4						
Width/Depth Ratio	9.8	10.3						
Entrenchment Ratio	2.9	2.9						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 9 **Station:** 8+53

Reach Name: UT1-1 **XS Type:** Riffle



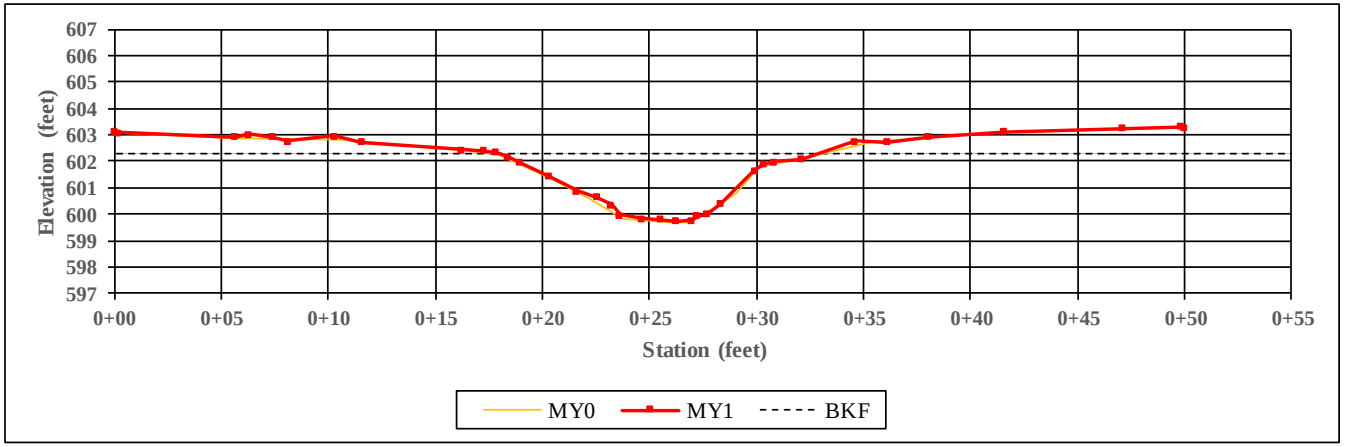
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	11.7	11.4						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.1	1.1						
Bankfull Max Depth (ft)	1.8	1.8						
Bankfull Cross-Sectional Area (ft^2)	13.0	12.1						
Width/Depth Ratio	10.4	10.7						
Entrenchment Ratio	4.3	4.4						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 10 **Station:** 8+78

Reach Name: UT1-1 **XS Type:** Pool



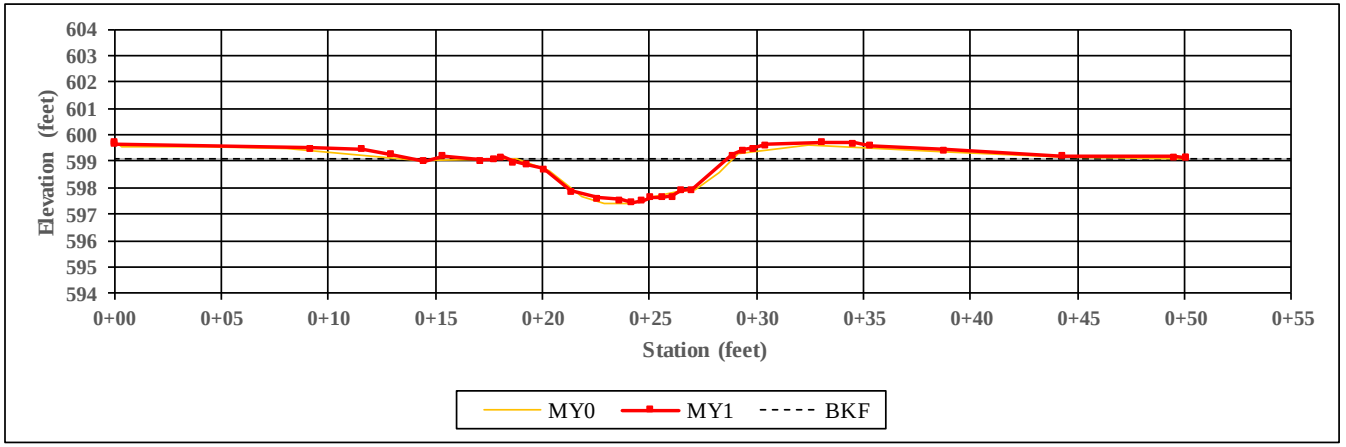
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	15.2	14.7						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.4	1.3						
Bankfull Max Depth (ft)	2.6	2.5						
Bankfull Cross-Sectional Area (ft^2)	21.0	19.8						
Width/Depth Ratio	11.1	10.9						
Entrenchment Ratio	3.3	3.4						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 11 **Station:** 1+95

Reach Name: UT1-A **XS Type:** Riffle



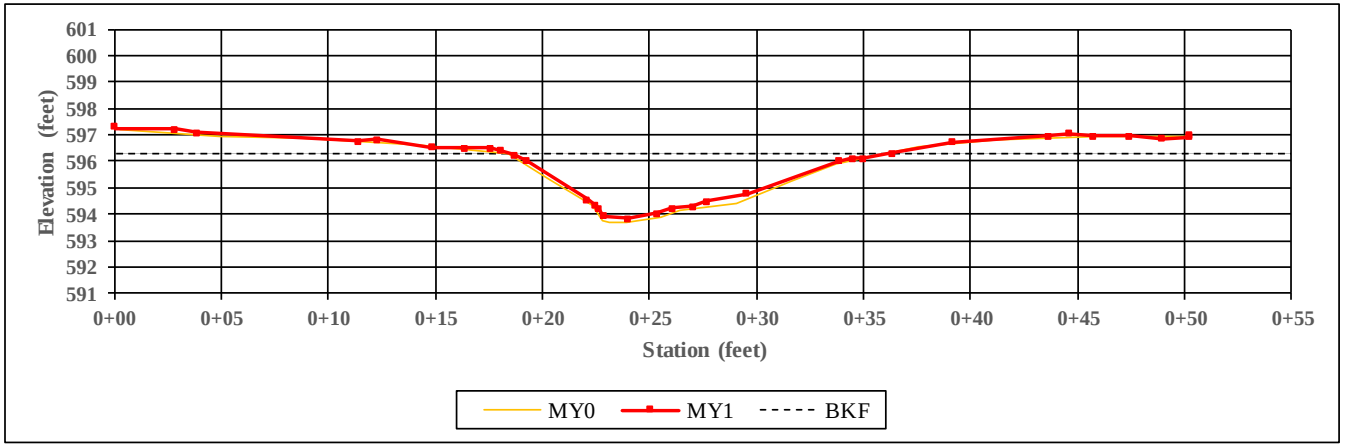
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	10.0	10.2						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.0	1.0						
Bankfull Max Depth (ft)	1.7	1.6						
Bankfull Cross-Sectional Area (ft^2)	10.5	10.1						
Width/Depth Ratio	9.6	10.3						
Entrenchment Ratio	5.0	4.9						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 12 **Station:** 14+30

Reach Name: UT1-A **XS Type:** Pool



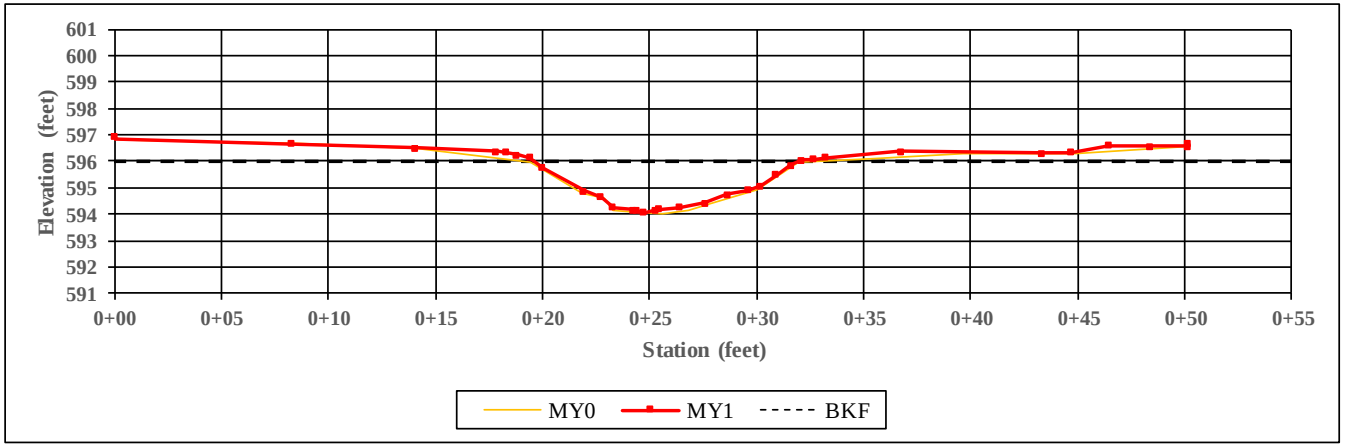
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	17.4	17.4						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.4	1.3						
Bankfull Max Depth (ft)	2.5	2.4						
Bankfull Cross-Sectional Area (ft^2)	24.4	21.8						
Width/Depth Ratio	12.4	13.9						
Entrenchment Ratio	2.9	2.9						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 13 **Station:** 14+58

Reach Name: UT1-2 **XS Type:** Riffle



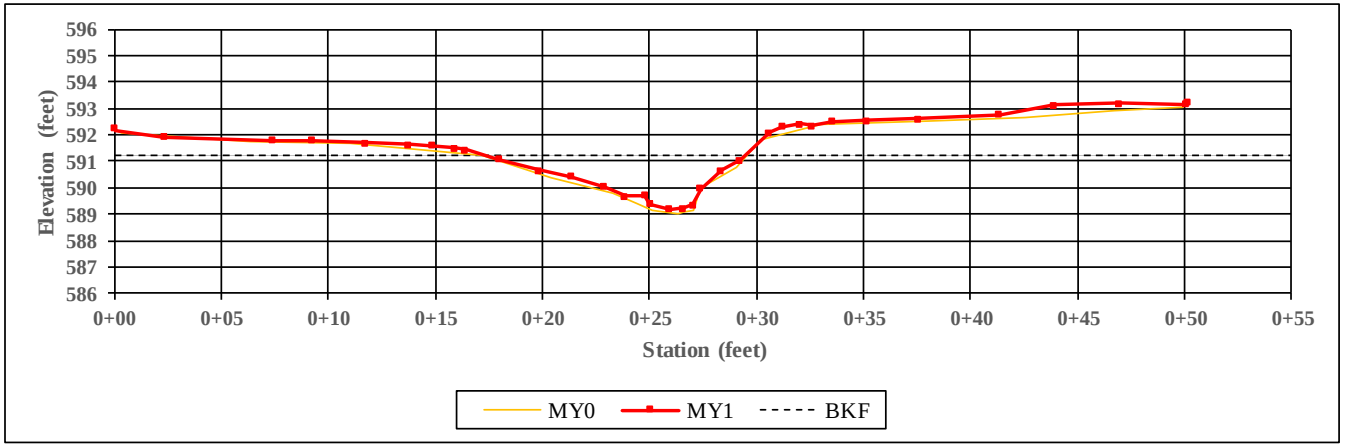
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	12.5	12.2						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.2	1.2						
Bankfull Max Depth (ft)	1.9	1.9						
Bankfull Cross-Sectional Area (ft^2)	15.6	14.4						
Width/Depth Ratio	10.0	10.4						
Entrenchment Ratio	4.0	4.1						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 14 **Station:** 22+08

Reach Name: UT1-2 **XS Type:** Pool



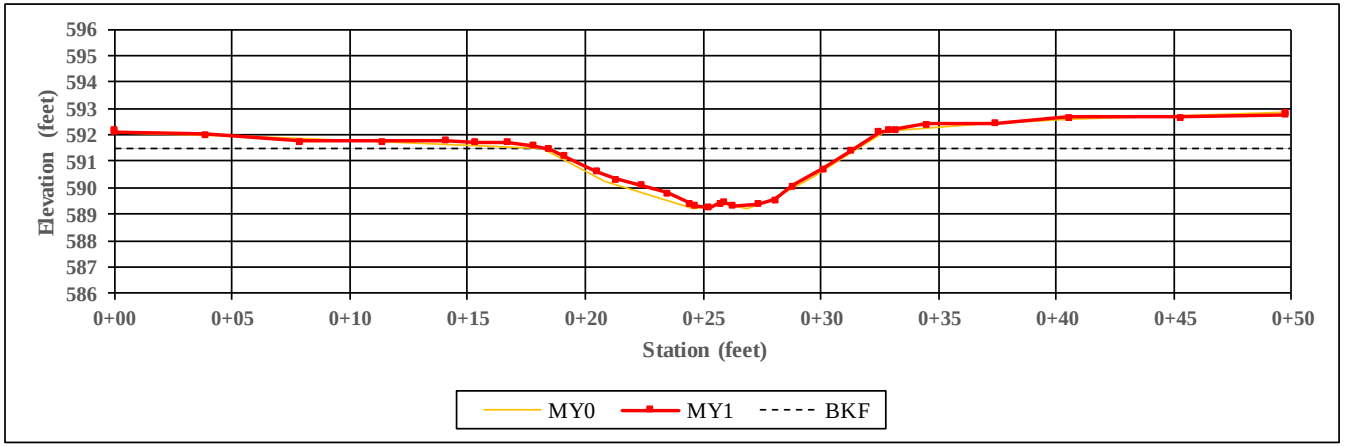
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	12.3	12.0						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.1	1.0						
Bankfull Max Depth (ft)	2.2	2.0						
Bankfull Cross-Sectional Area (ft^2)	13.9	11.9						
Width/Depth Ratio	10.9	12.1						
Entrenchment Ratio	4.1	4.2						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 15 **Station:** 22+21

Reach Name: UT1-2 **XS Type:** Riffle



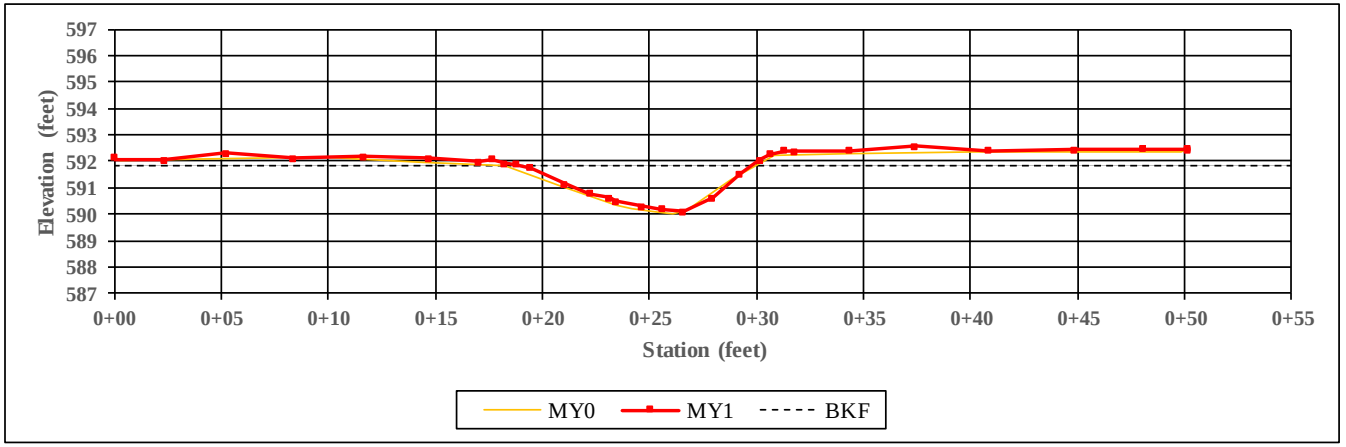
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	13.4	12.9						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.4	1.3						
Bankfull Max Depth (ft)	2.3	2.2						
Bankfull Cross-Sectional Area (ft^2)	19.0	17.3						
Width/Depth Ratio	9.4	9.7						
Entrenchment Ratio	3.7	3.9						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 16 **Station:** 9+86

Reach Name: UT1-B **XS Type:** Riffle



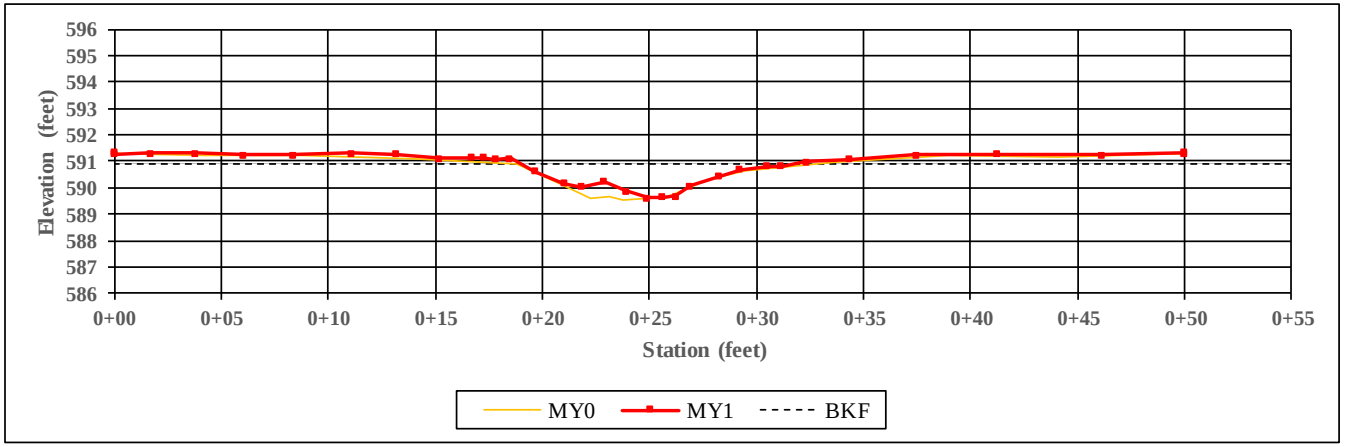
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	11.7	10.8						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.1	1.0						
Bankfull Max Depth (ft)	1.8	1.7						
Bankfull Cross-Sectional Area (ft^2)	12.3	11.2						
Width/Depth Ratio	11.2	10.4						
Entrenchment Ratio	4.3	4.6						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 17 **Station:** 10+32

Reach Name: UT1-B **XS Type:** Pool



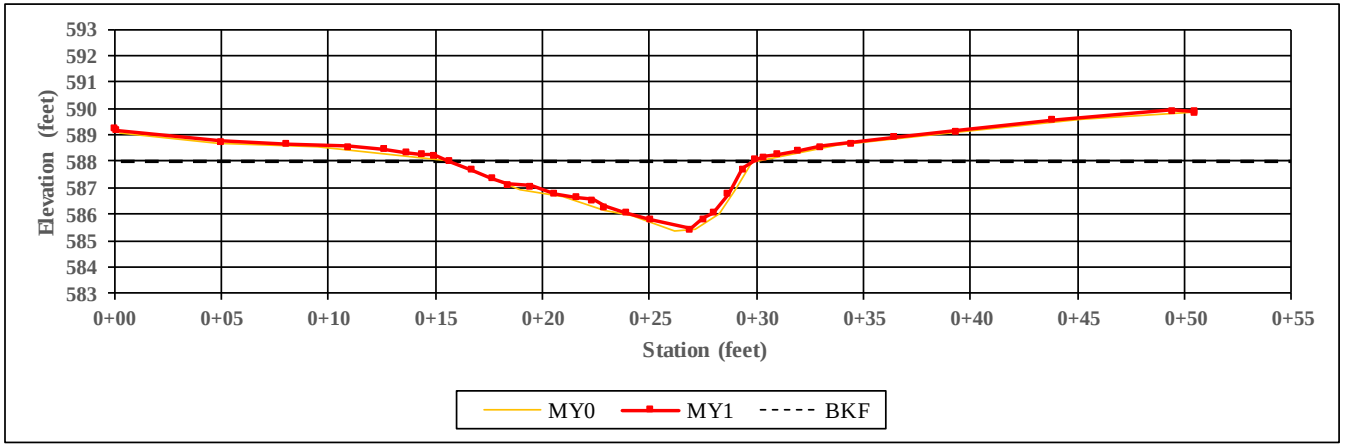
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	14.2	13.1						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	0.7	0.6						
Bankfull Max Depth (ft)	1.4	1.3						
Bankfull Cross-Sectional Area (ft^2)	10.2	8.5						
Width/Depth Ratio	19.7	20.2						
Entrenchment Ratio	3.5	3.8						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 18 **Station:** 25+97

Reach Name: UT1-3 **XS Type:** Pool



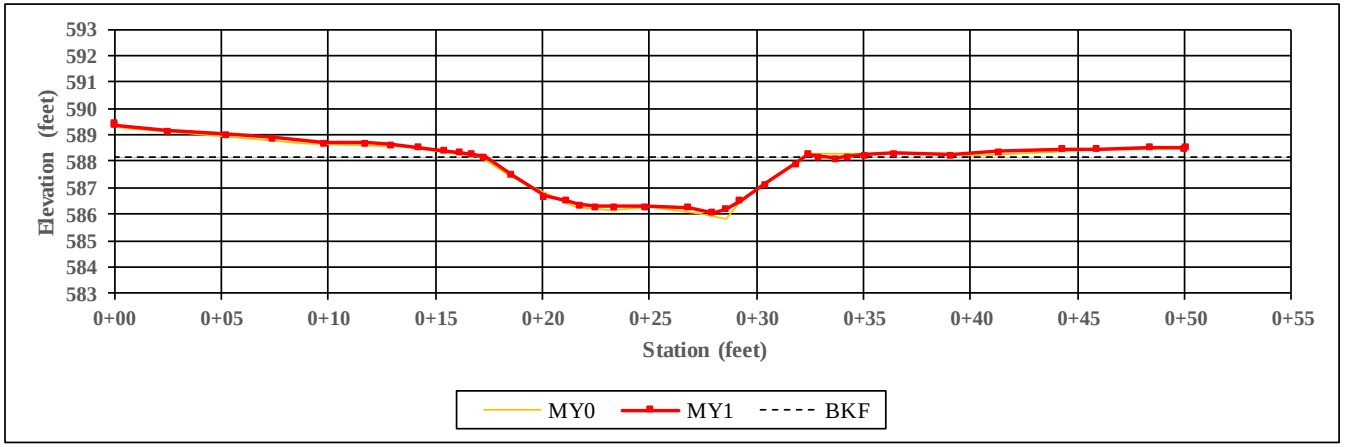
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	14.5	14.3						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.5	1.4						
Bankfull Max Depth (ft)	2.6	2.6						
Bankfull Cross-Sectional Area (ft^2)	21.5	19.6						
Width/Depth Ratio	9.8	10.4						
Entrenchment Ratio	3.4	3.5						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 19 **Station:** 26+73

Reach Name: UT1-3 **XS Type:** Riffle



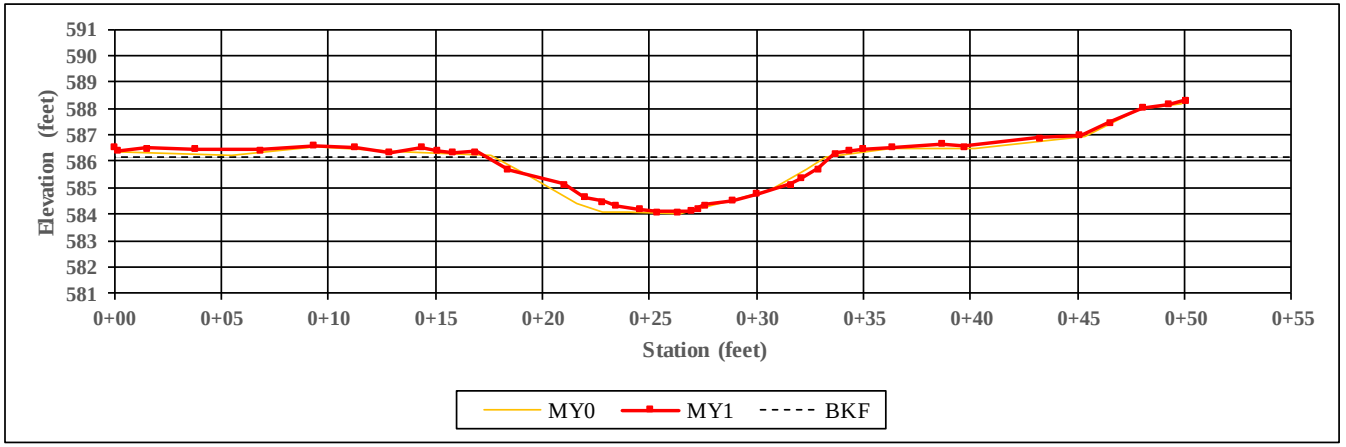
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	15.2	15.1						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.5	1.4						
Bankfull Max Depth (ft)	2.4	2.1						
Bankfull Cross-Sectional Area (ft^2)	23.0	21.8						
Width/Depth Ratio	10.1	10.5						
Entrenchment Ratio	3.3	3.3						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 20 **Station:** 30+13

Reach Name: UT1-3 **XS Type:** Riffle



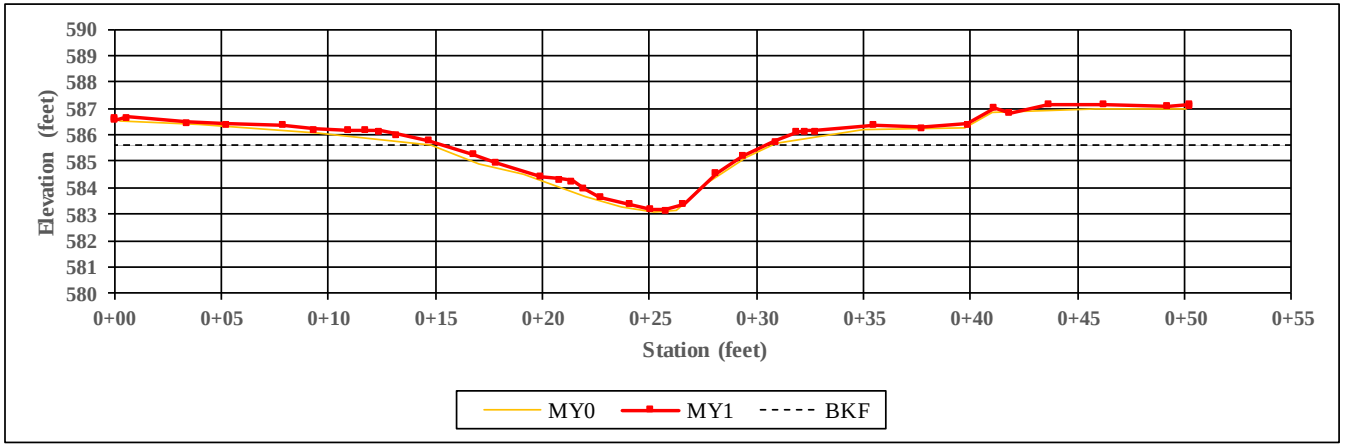
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	15.5	16.1						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.4	1.3						
Bankfull Max Depth (ft)	2.1	2.1						
Bankfull Cross-Sectional Area (ft^2)	21.9	20.9						
Width/Depth Ratio	11.0	12.4						
Entrenchment Ratio	3.2	3.1						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 21 **Station:** 31+77

Reach Name: UT1-3 **XS Type:** Pool



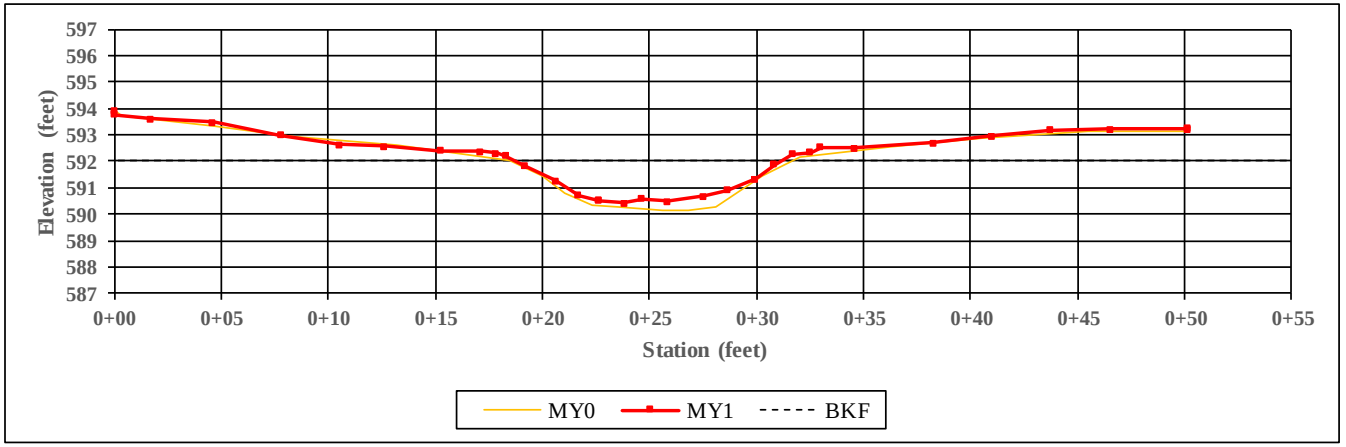
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	15.8	15.0						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.4	1.3						
Bankfull Max Depth (ft)	2.5	2.4						
Bankfull Cross-Sectional Area (ft^2)	21.4	19.1						
Width/Depth Ratio	11.7	11.8						
Entrenchment Ratio	3.2	3.3						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 22 **Station:** 1+46

Reach Name: UT1-C **XS Type:** Riffle



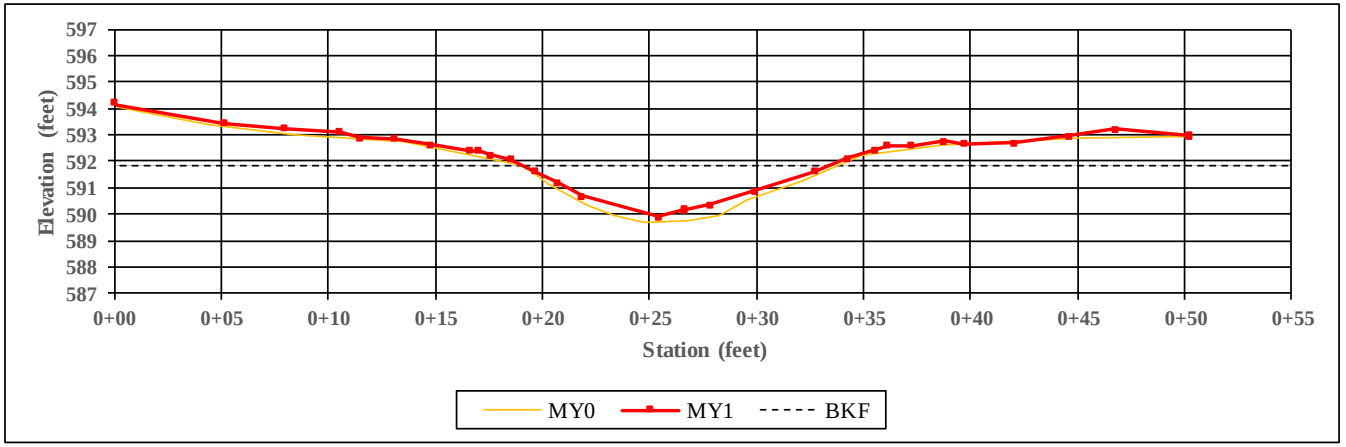
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	13.2	12.5						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.3	1.1						
Bankfull Max Depth (ft)	1.9	1.6						
Bankfull Cross-Sectional Area (ft^2)	16.8	13.6						
Width/Depth Ratio	10.4	11.5						
Entrenchment Ratio	3.8	4.0						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 23 **Station:** 1+66

Reach Name: UT1-C **XS Type:** Pool



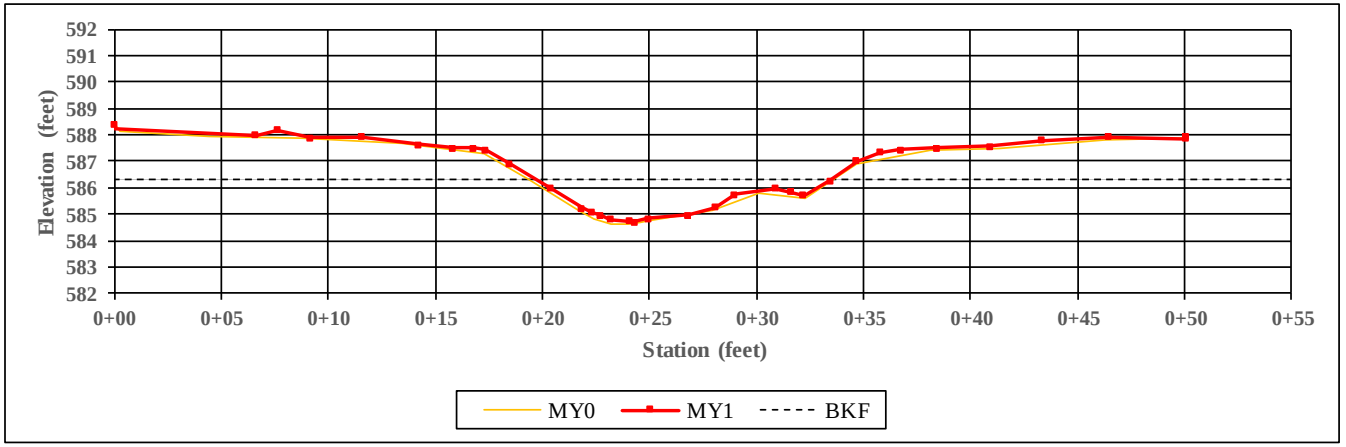
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	14.6	14.0						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.3	1.1						
Bankfull Max Depth (ft)	2.1	1.9						
Bankfull Cross-Sectional Area (ft^2)	19.1	14.8						
Width/Depth Ratio	11.1	13.3						
Entrenchment Ratio	3.4	3.6						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 24 **Station:** 8+16

Reach Name: UT1-C **XS Type:** Riffle



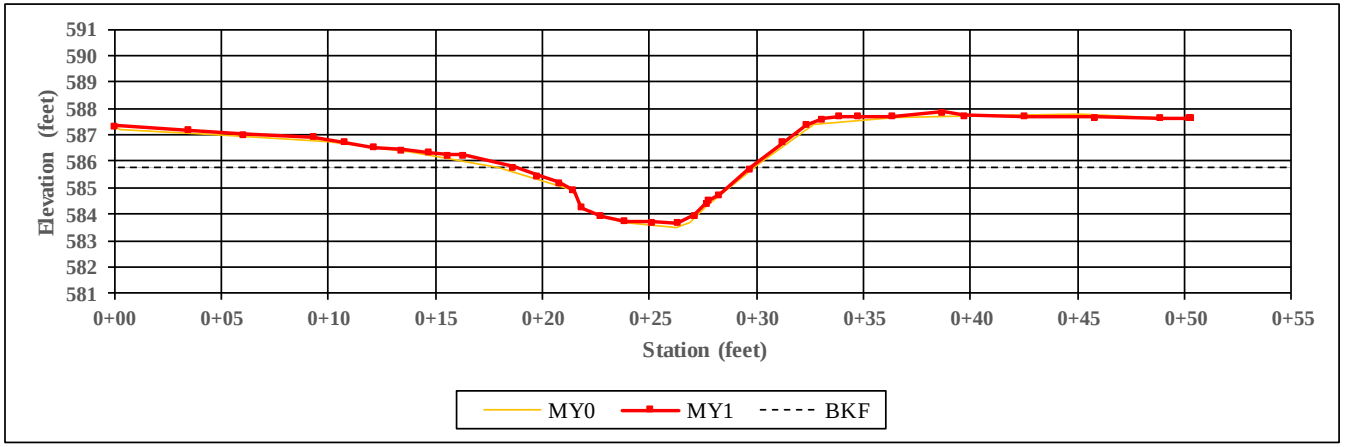
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	14.2	13.8						
Floodprone Width (ft)	46.6	46.6						
Bankfull Mean Depth (ft)	1.0	0.9						
Bankfull Max Depth (ft)	1.7	1.6						
Bankfull Cross-Sectional Area (ft^2)	14.0	12.2						
Width/Depth Ratio	14.3	15.6						
Entrenchment Ratio	3.3	3.4						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 25 **Station:** 8+39

Reach Name: UT1-C **XS Type:** Pool



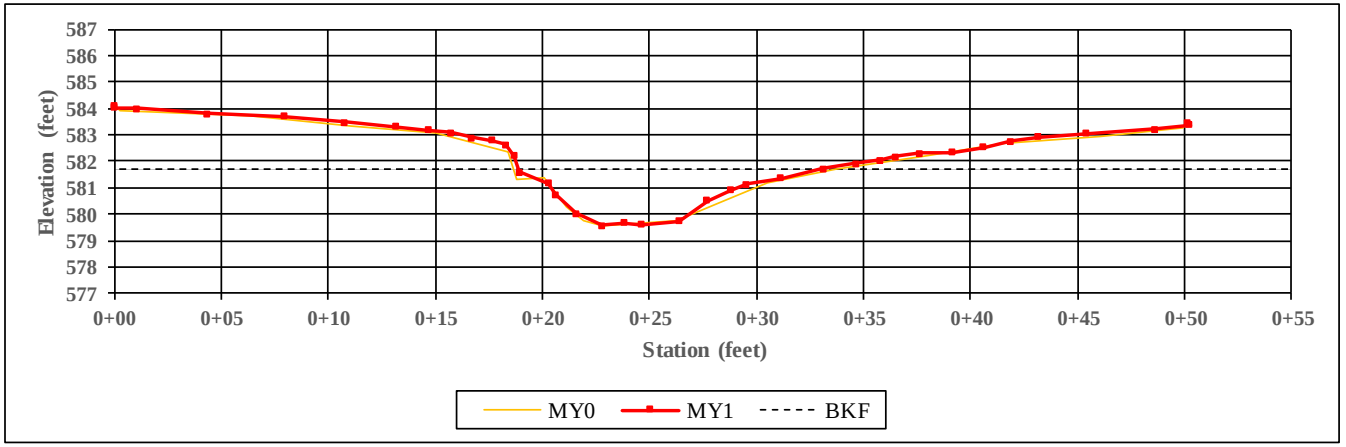
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	12.0	11.1						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.3	1.3						
Bankfull Max Depth (ft)	2.3	2.1						
Bankfull Cross-Sectional Area (ft^2)	15.5	14.3						
Width/Depth Ratio	9.4	8.6						
Entrenchment Ratio	4.2	4.5						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 26 **Station:** 38+38

Reach Name: UT1-4 **XS Type:** Pool



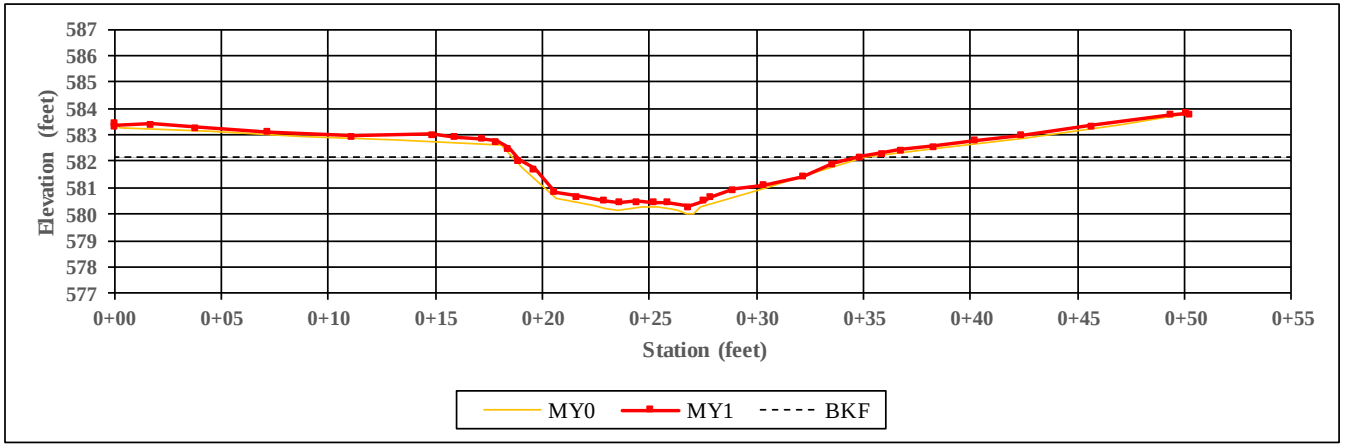
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	14.8	14.1						
Floodprone Width (ft)	47.0	47.0						
Bankfull Mean Depth (ft)	1.2	1.2						
Bankfull Max Depth (ft)	2.1	2.1						
Bankfull Cross-Sectional Area (ft^2)	17.6	16.2						
Width/Depth Ratio	12.5	12.3						
Entrenchment Ratio	3.2	3.3						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 27 **Station:** 38+69

Reach Name: UT1-4 **XS Type:** Riffle



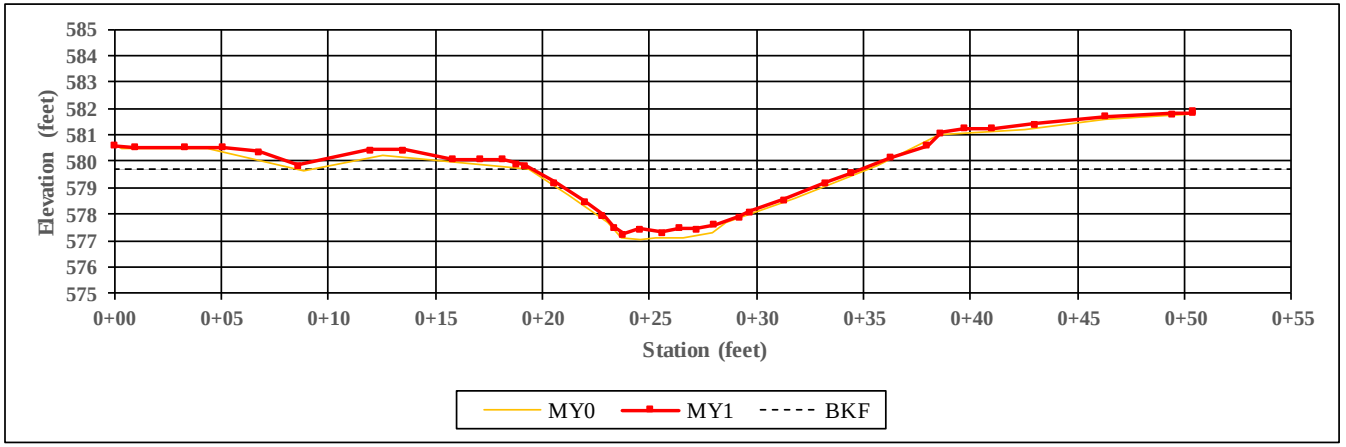
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	16.5	15.9						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.3	1.2						
Bankfull Max Depth (ft)	2.1	1.9						
Bankfull Cross-Sectional Area (ft^2)	21.5	18.3						
Width/Depth Ratio	12.7	13.8						
Entrenchment Ratio	3.0	3.1						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 28 **Station:** 45+20

Reach Name: UT1-4 **XS Type:** Riffle



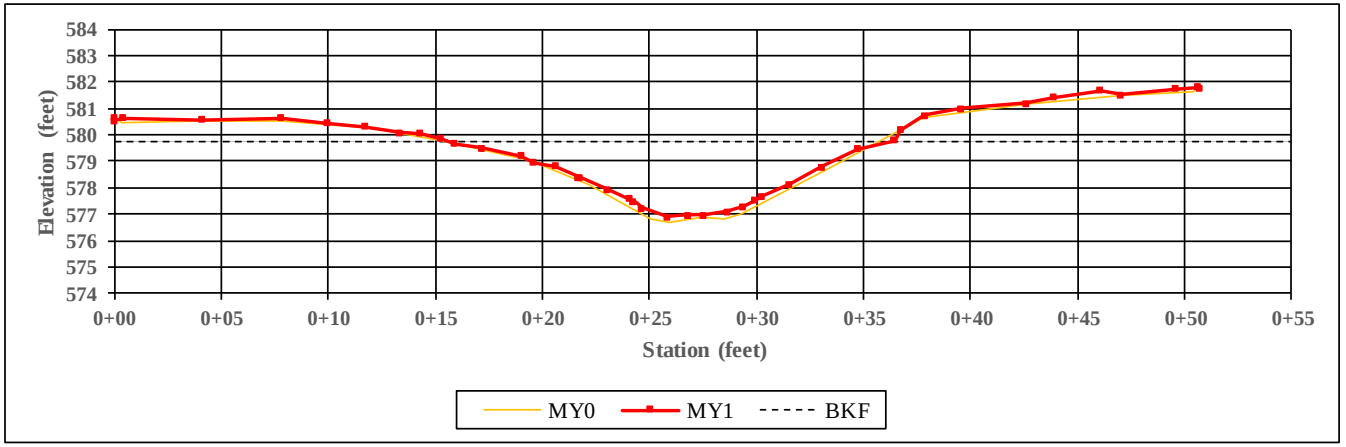
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	15.9	15.4						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.5	1.4						
Bankfull Max Depth (ft)	2.6	2.5						
Bankfull Cross-Sectional Area (ft^2)	24.2	21.7						
Width/Depth Ratio	10.4	10.9						
Entrenchment Ratio	3.1	3.3						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

Right Descending Bank

Project Name: Poplin Ridge **XS Number:** 29 **Station:** 45+36

Reach Name: UT1-4 **XS Type:** Pool

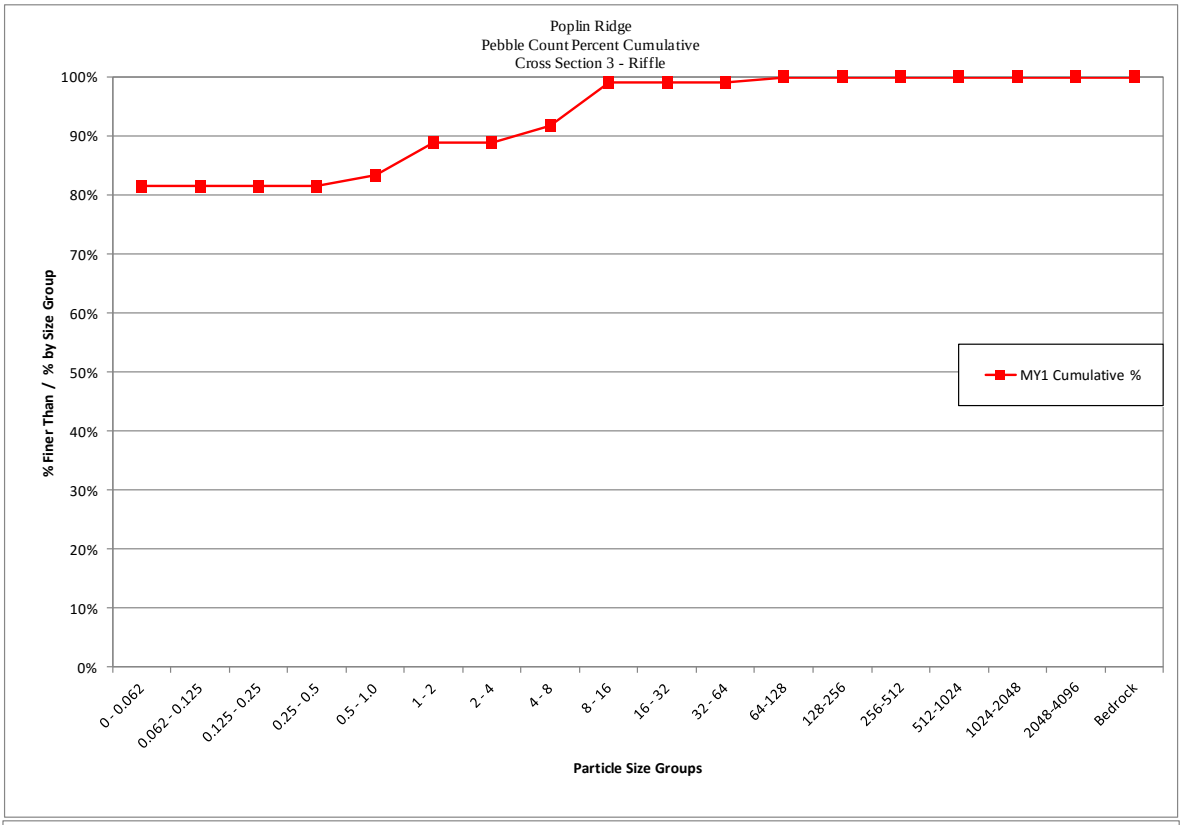


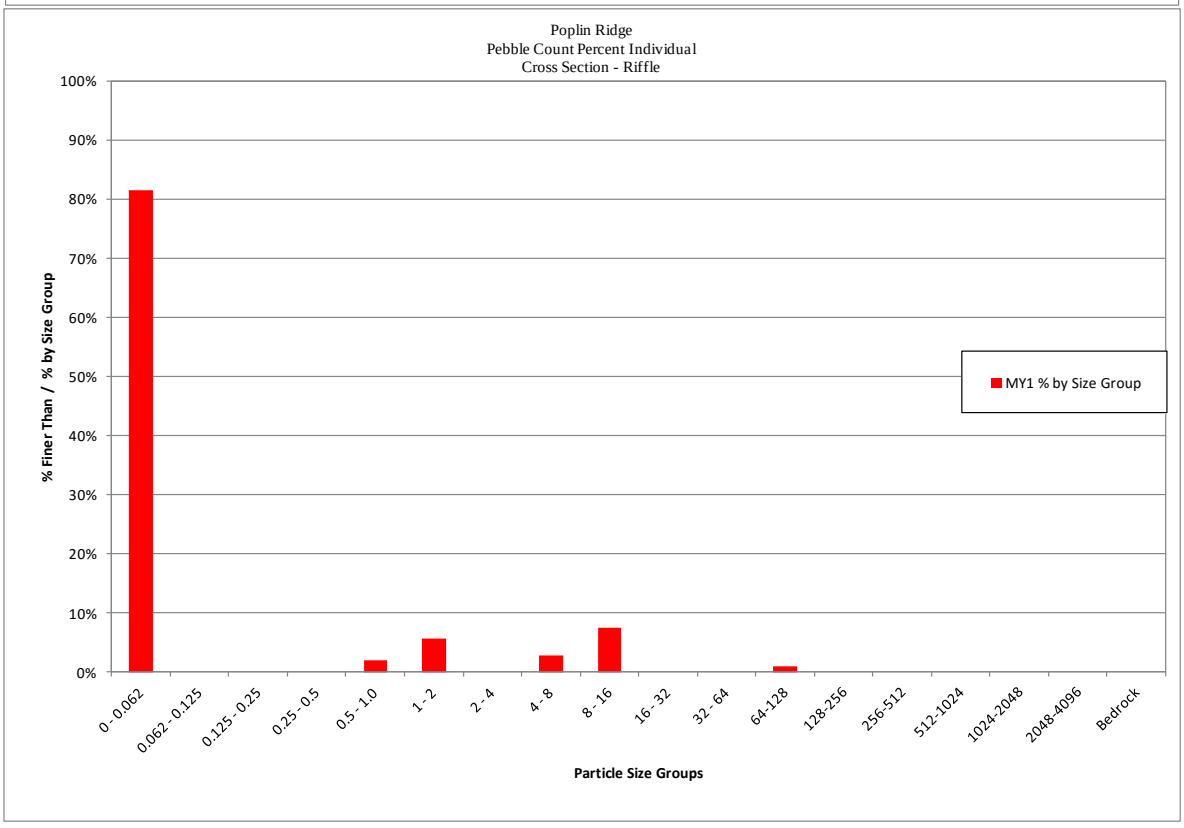
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	20.3	20.8						
Floodprone Width (ft)	50.0	50.0						
Bankfull Mean Depth (ft)	1.6	1.4						
Bankfull Max Depth (ft)	3.1	2.9						
Bankfull Cross-Sectional Area (ft^2)	33.2	30.0						
Width/Depth Ratio	12.5	14.4						
Entrenchment Ratio	2.5	2.4						
Bank Height Ratio	1.0	1.0						

Left Descending Bank

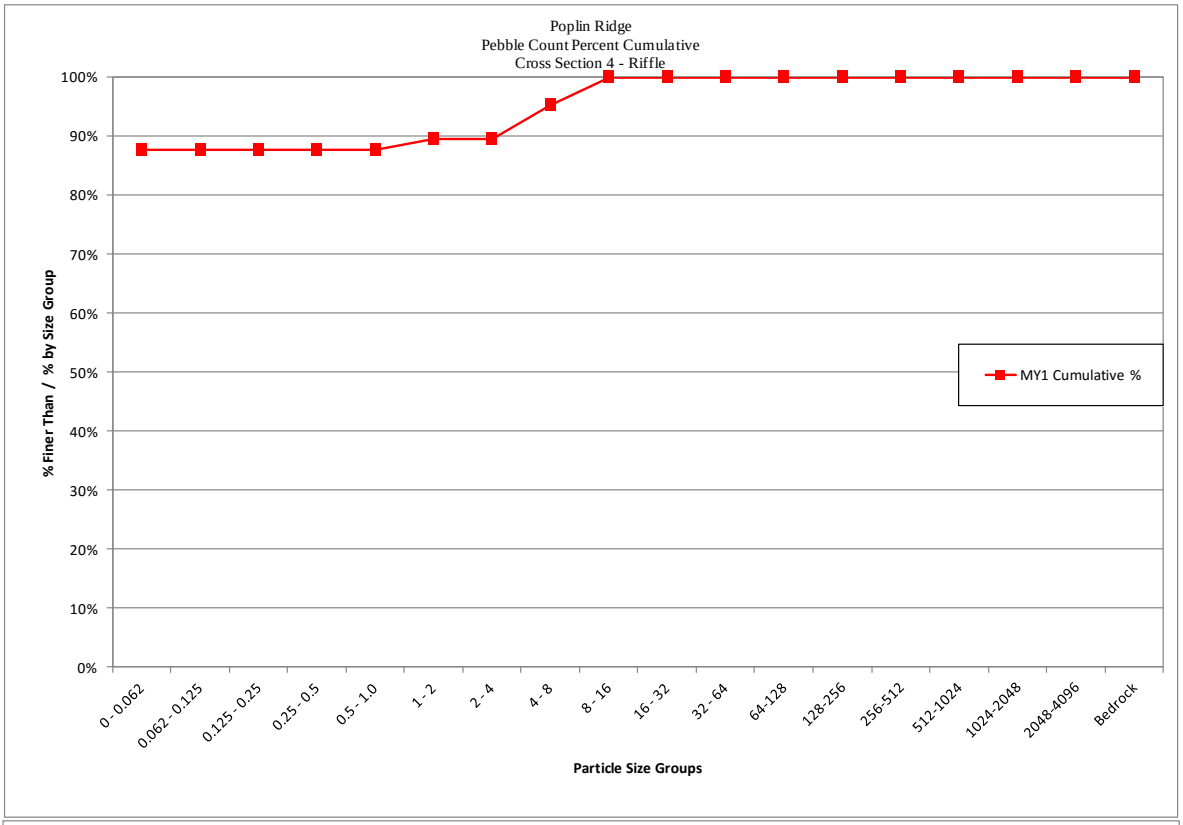
Right Descending Bank

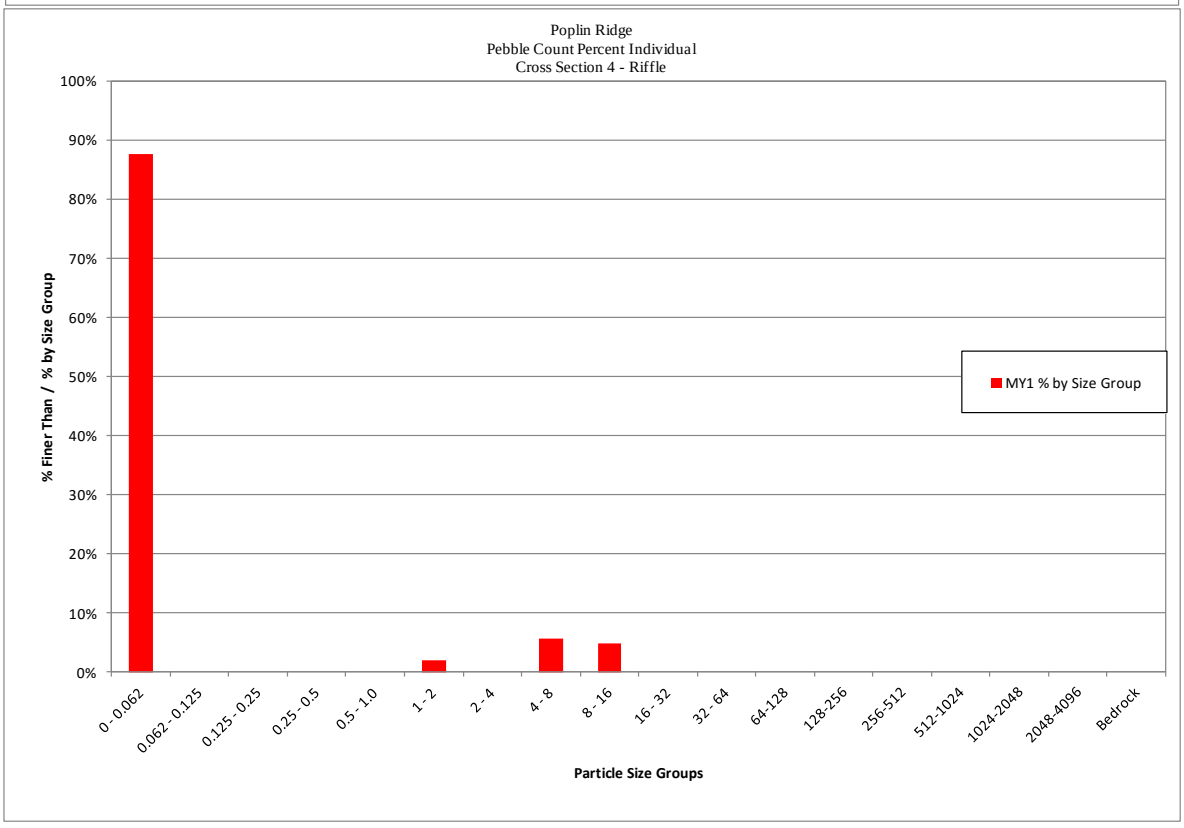
Poplin Ridge			
Cross Section 3 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	88	81.5%	81%
0.062 - 0.125	0	0.0%	81%
0.125 - 0.25	0	0.0%	81%
0.25 - 0.5	0	0.0%	81%
0.5 - 1.0	2	1.9%	83%
1 - 2	6	5.6%	89%
2 - 4	0	0.0%	89%
4 - 8	3	2.8%	92%
8 - 16	8	7.4%	99%
16 - 32	0	0.0%	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	**108**	**100%**	**100%**
		Summary Data	
		D50	**0.062**
		D84	**1.1**
		D95	**12**


Poplin Ridge
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 %
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

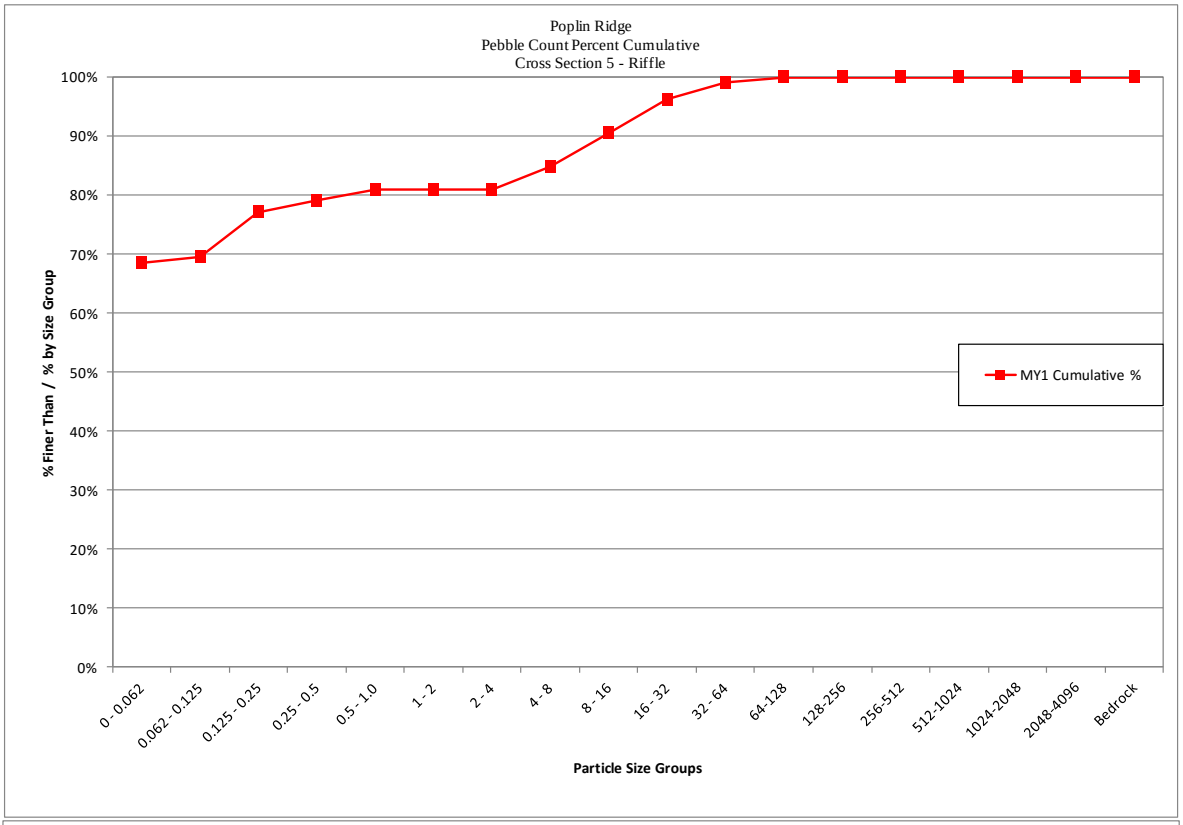

Poplin Ridge
Pebble Count Percent Individual
Cross Section - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048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

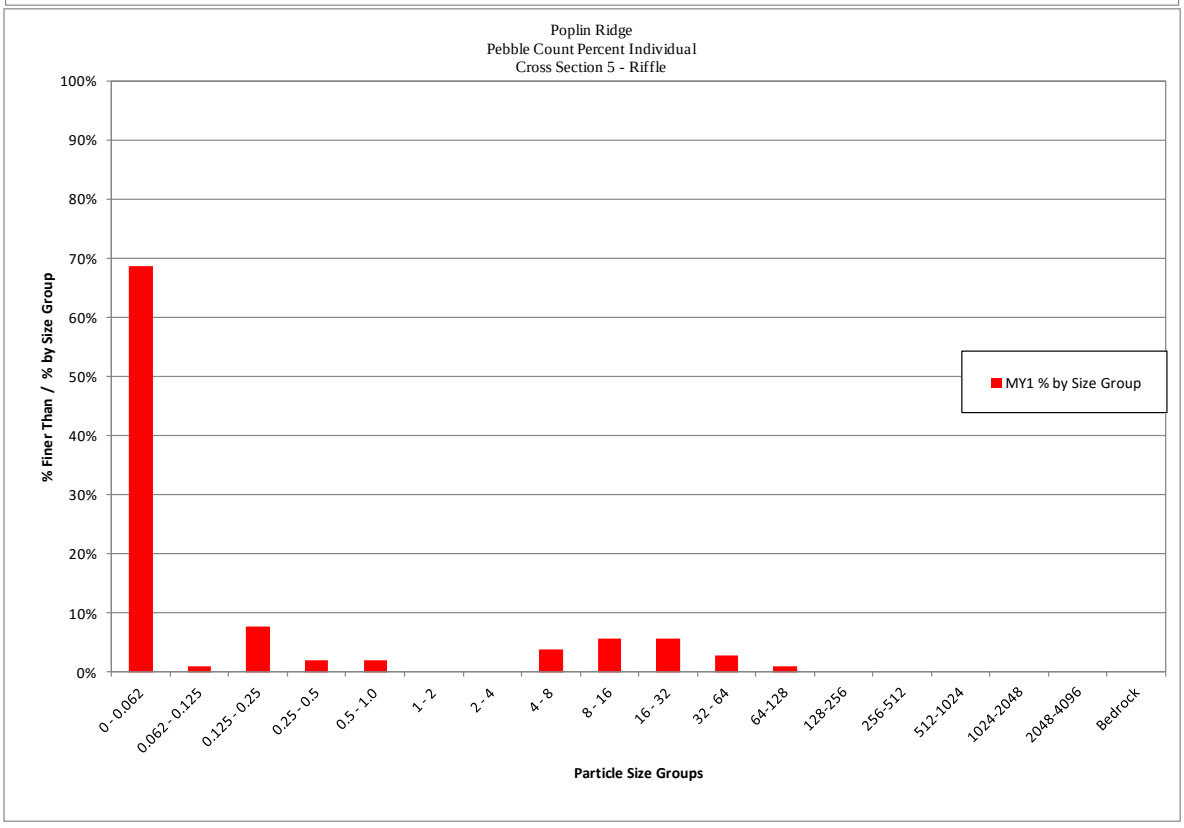
Poplin Ridge			
Cross Section 4 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	92	87.6%	88%
0.062 - 0.125	0	0.0%	88%
0.125 - 0.25	0	0.0%	88%
0.25 - 0.5	0	0.0%	88%
0.5 - 1.0	0	0.0%	88%
1 - 2	2	1.9%	90%
2 - 4	0	0.0%	90%
4 - 8	6	5.7%	95%
8 - 16	5	4.8%	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	**7.9**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 4 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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

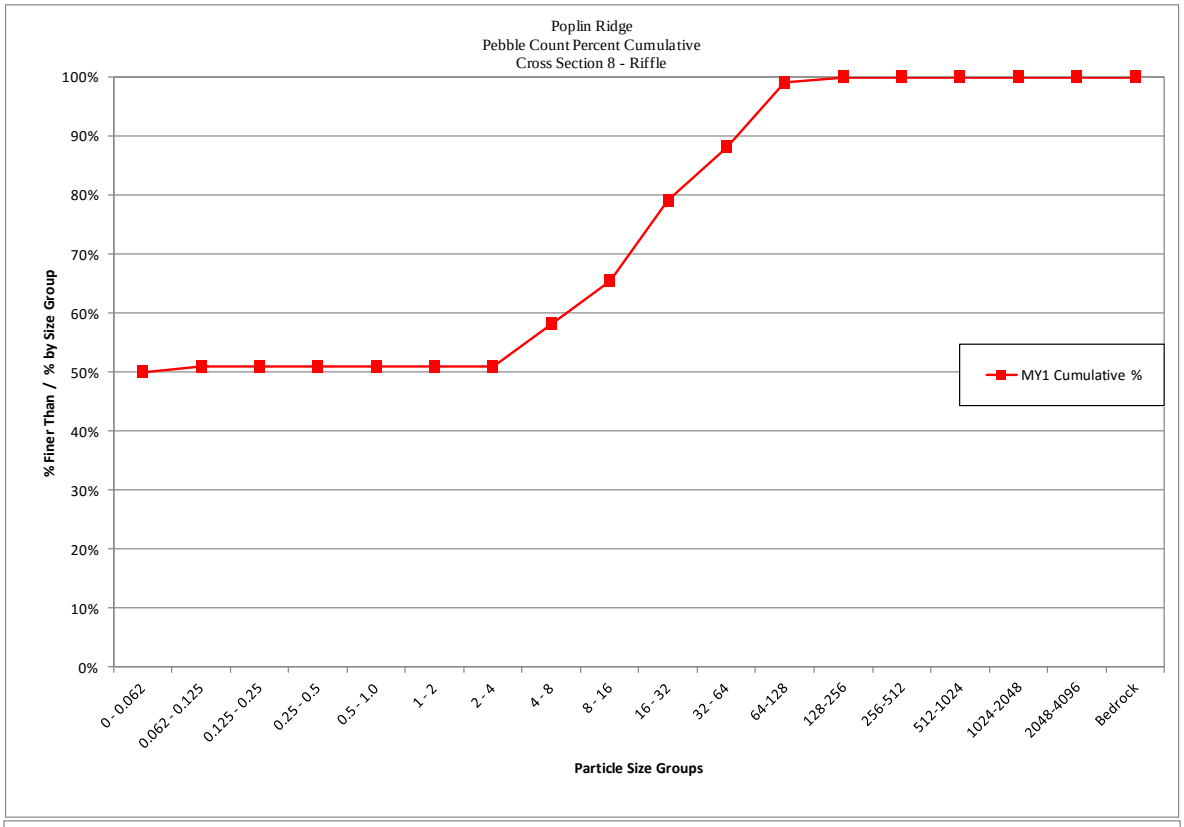

Poplin Ridge
Pebble Count Percent Individual
Cross Section 4 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048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

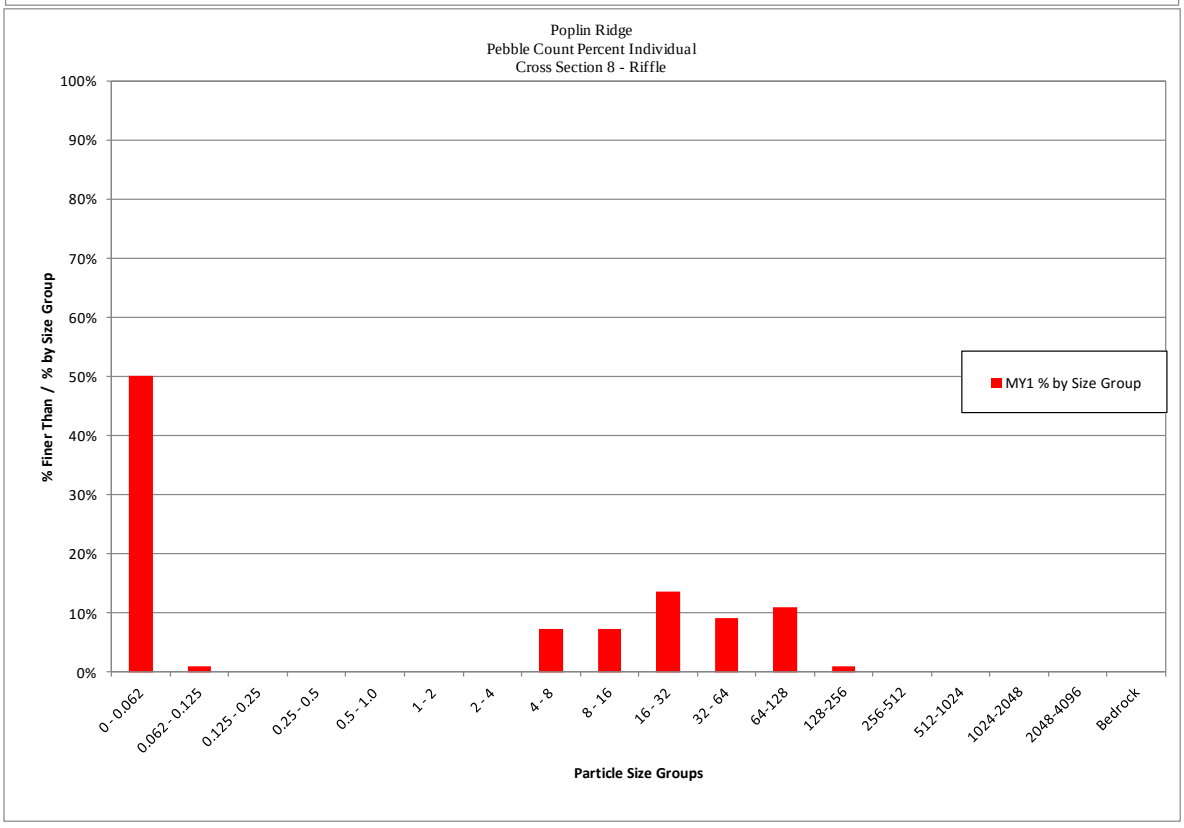
Poplin Ridge			
Cross Section 5 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	72	68.6%	69%
0.062 - 0.125	1	1.0%	70%
0.125 - 0.25	8	7.6%	77%
0.25 - 0.5	2	1.9%	79%
0.5 - 1.0	2	1.9%	81%
1 - 2	0	0.0%	81%
2 - 4	0	0.0%	81%
4 - 8	4	3.8%	85%
8 - 16	6	5.7%	90%
16 - 32	6	5.7%	96%
32 - 64	3	2.9%	99%
64-128	1	1.0%	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	**6.4**
		D95	**22**


Poplin Ridge
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 %
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

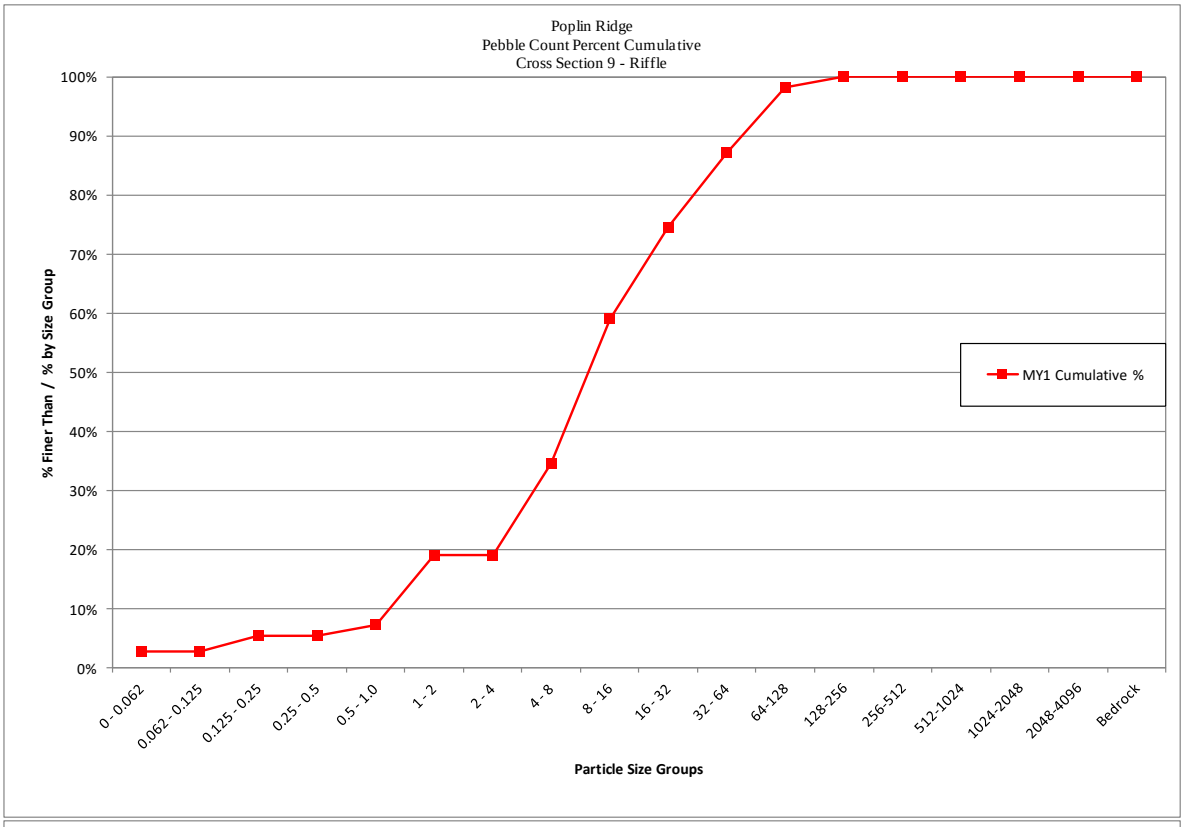

Poplin Ridge
Pebble Count Percent Individual
Cross Section 5 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048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

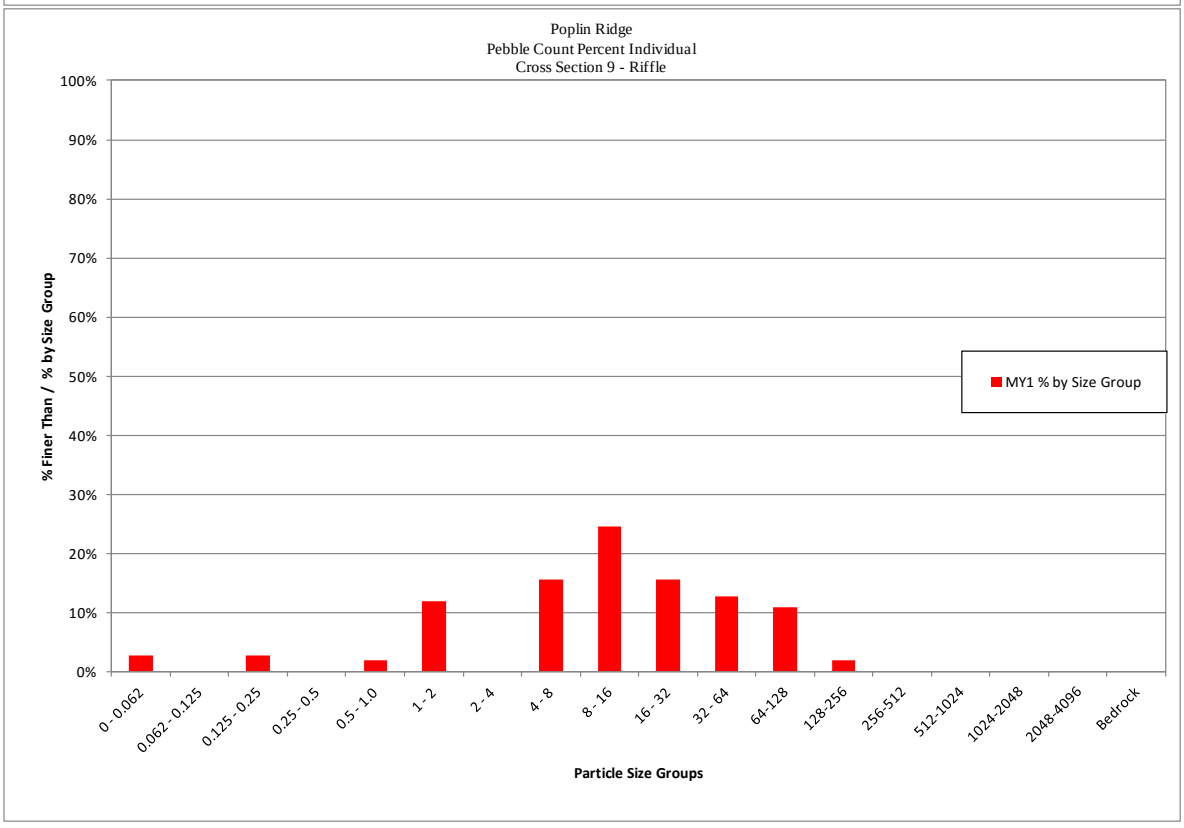
Poplin Ridge			
Cross Section 8 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	55	50.0%	50%
0.062 - 0.125	1	0.9%	51%
0.125 - 0.25	0	0.0%	51%
0.25 - 0.5	0	0.0%	51%
0.5 - 1.0	0	0.0%	51%
1 - 2	0	0.0%	51%
2 - 4	0	0.0%	51%
4 - 8	8	7.3%	58%
8 - 16	8	7.3%	65%
16 - 32	15	13.6%	79%
32 - 64	10	9.1%	88%
64-128	12	10.9%	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	**110**	**100%**	**100%**
		Summary Data	
		D50	**0.062**
		D84	**42**
		D95	**85**


Poplin Ridge
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 %
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

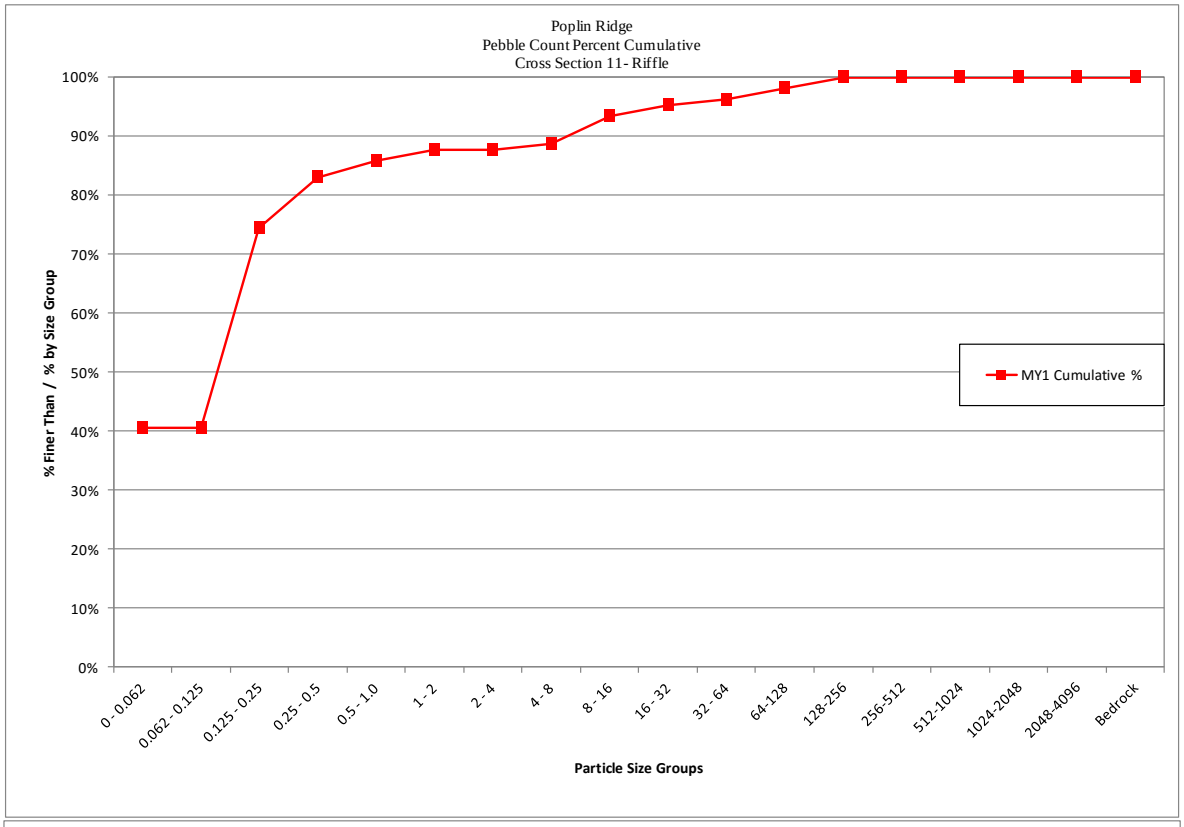

Poplin Ridge
Pebble Count Percent Individual
Cross Section 8 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048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

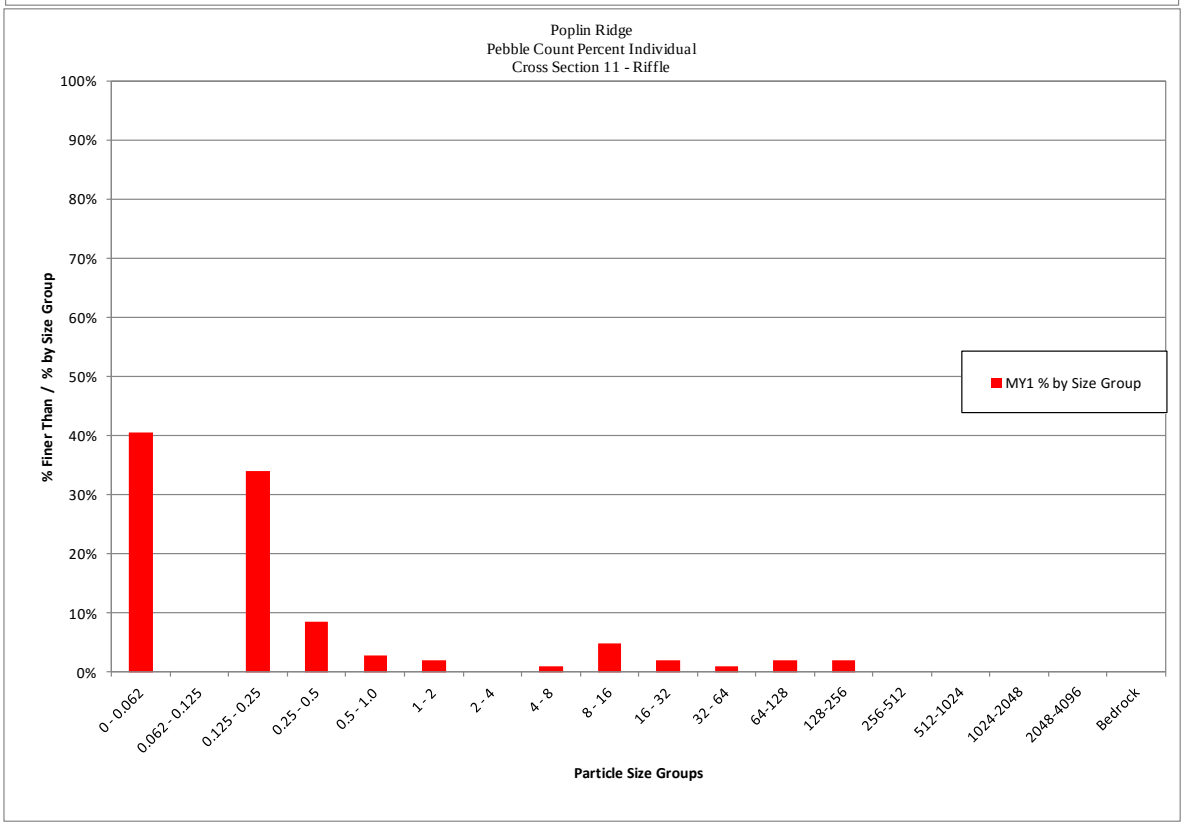
Poplin Ridge			
Cross Section 9 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	3	2.7%	3%
0.062 - 0.125	0	0.0%	3%
0.125 - 0.25	3	2.7%	5%
0.25 - 0.5	0	0.0%	5%
0.5 - 1.0	2	1.8%	7%
1 - 2	13	11.8%	19%
2 - 4	0	0.0%	19%
4 - 8	17	15.5%	35%
8 - 16	27	24.5%	59%
16 - 32	17	15.5%	75%
32 - 64	14	12.7%	87%
64-128	12	10.9%	98%
128-256	2	1.8%	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	**13**
		D84	**43**
		D95	**110**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 9 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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

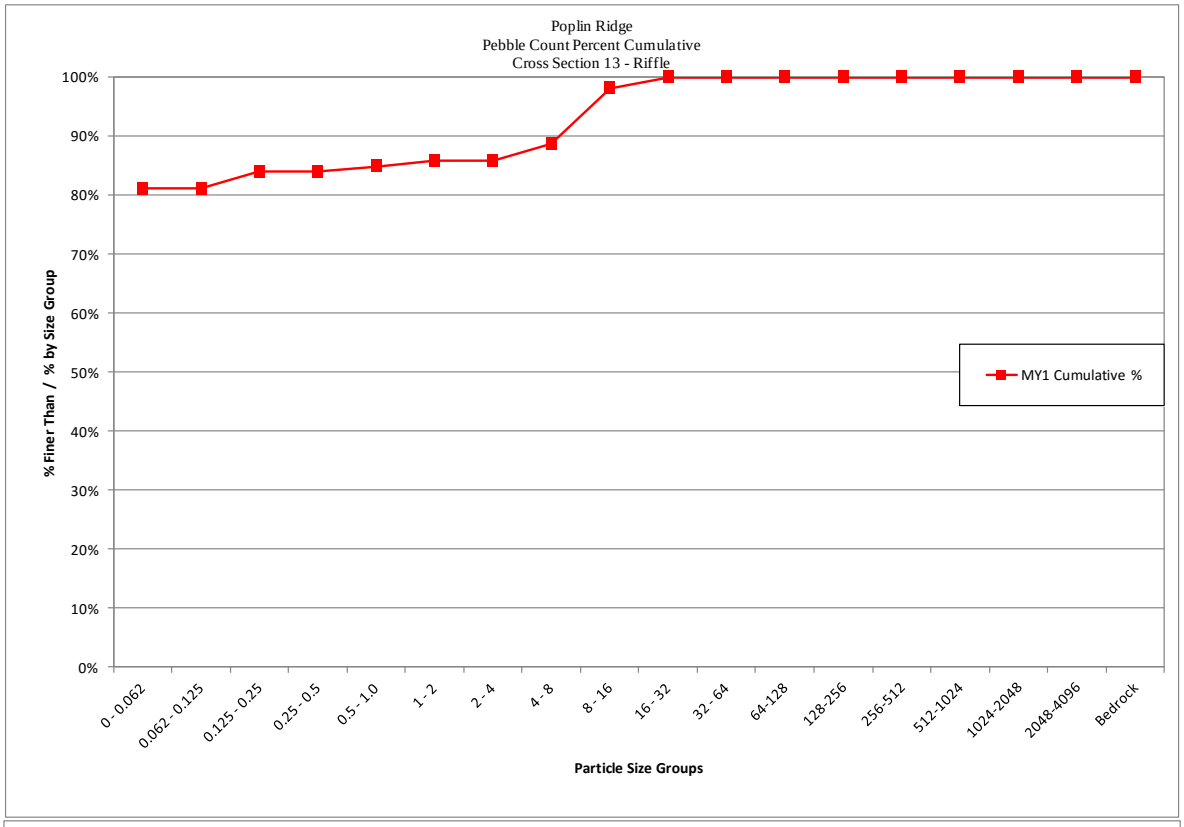

Poplin Ridge
Pebble Count Percent Individual
Cross Section 9 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

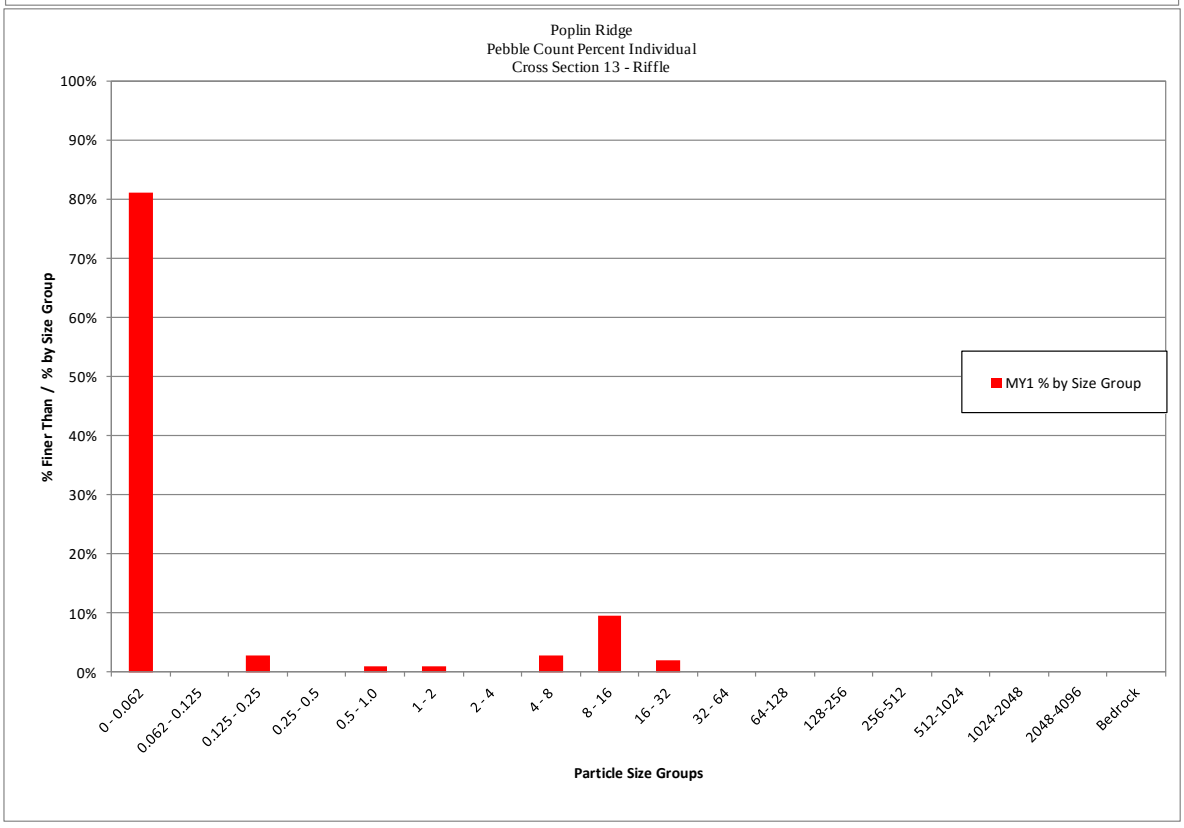
Poplin Ridge			
Cross Section 11 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	43	40.6%	41%
0.062 - 0.125	0	0.0%	41%
0.125 - 0.25	36	34.0%	75%
0.25 - 0.5	9	8.5%	83%
0.5 - 1.0	3	2.8%	86%
1 - 2	2	1.9%	88%
2 - 4	0	0.0%	88%
4 - 8	1	0.9%	89%
8 - 16	5	4.7%	93%
16 - 32	2	1.9%	95%
32 - 64	1	0.9%	96%
64-128	2	1.9%	98%
128-256	2	1.9%	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	**106**	**100%**	**100%**
		Summary Data	
		D50	**0.15**
		D84	**0.64**
		D95	**30**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 11- Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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

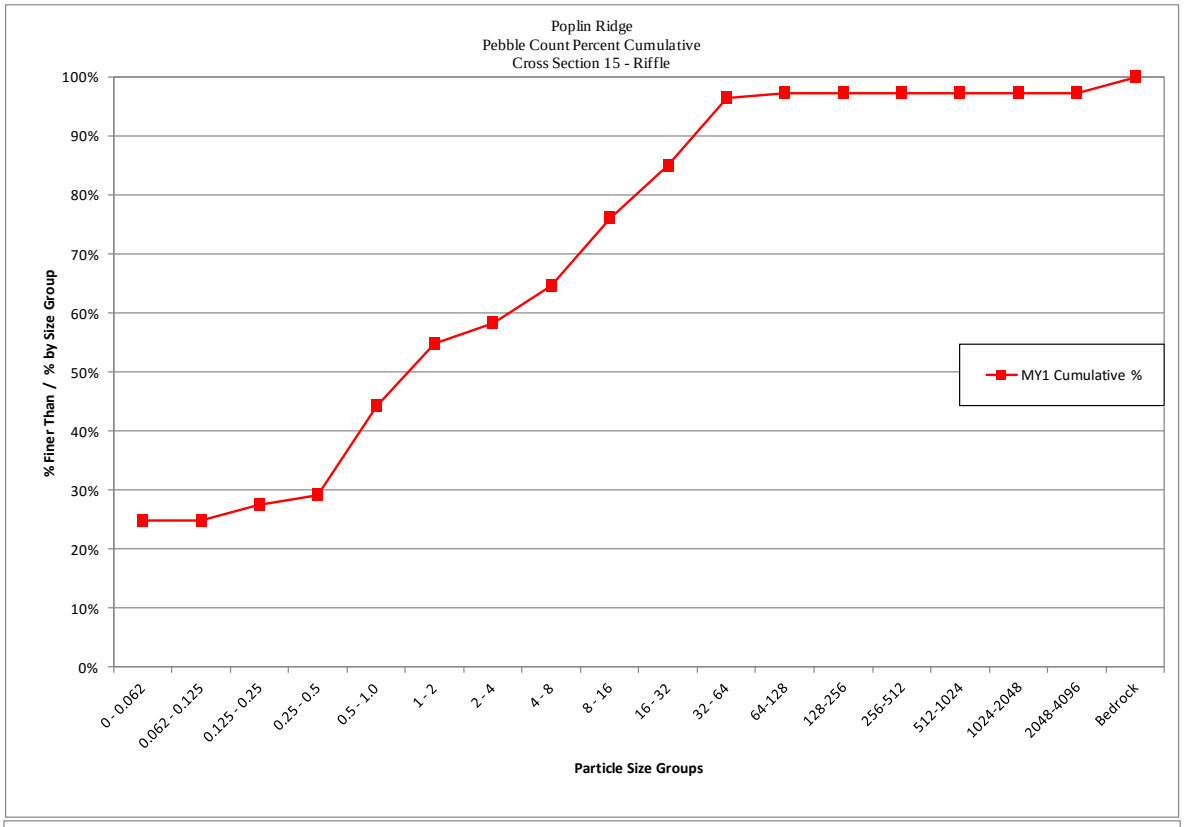

Poplin Ridge
Pebble Count Percent Individual
Cross Section 11 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048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

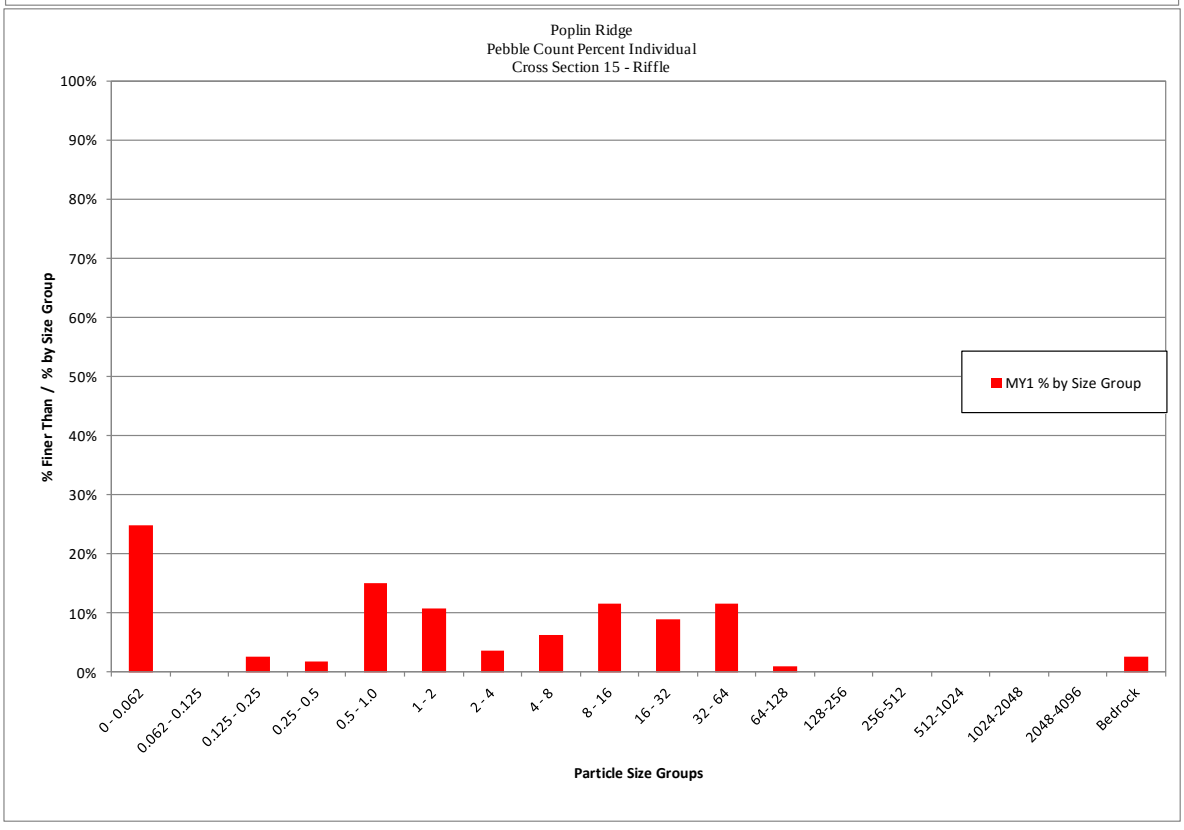
Poplin Ridge			
Cross Section 13 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	86	81.1%	81%
0.062 - 0.125	0	0.0%	81%
0.125 - 0.25	3	2.8%	84%
0.25 - 0.5	0	0.0%	84%
0.5 - 1.0	1	0.9%	85%
1 - 2	1	0.9%	86%
2 - 4	0	0.0%	86%
4 - 8	3	2.8%	89%
8 - 16	10	9.4%	98%
16 - 32	2	1.9%	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	**106**	**100%**	**100%**
		Summary Data	
		D50	**0.062**
		D84	**0.51**
		D95	**12**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 13 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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

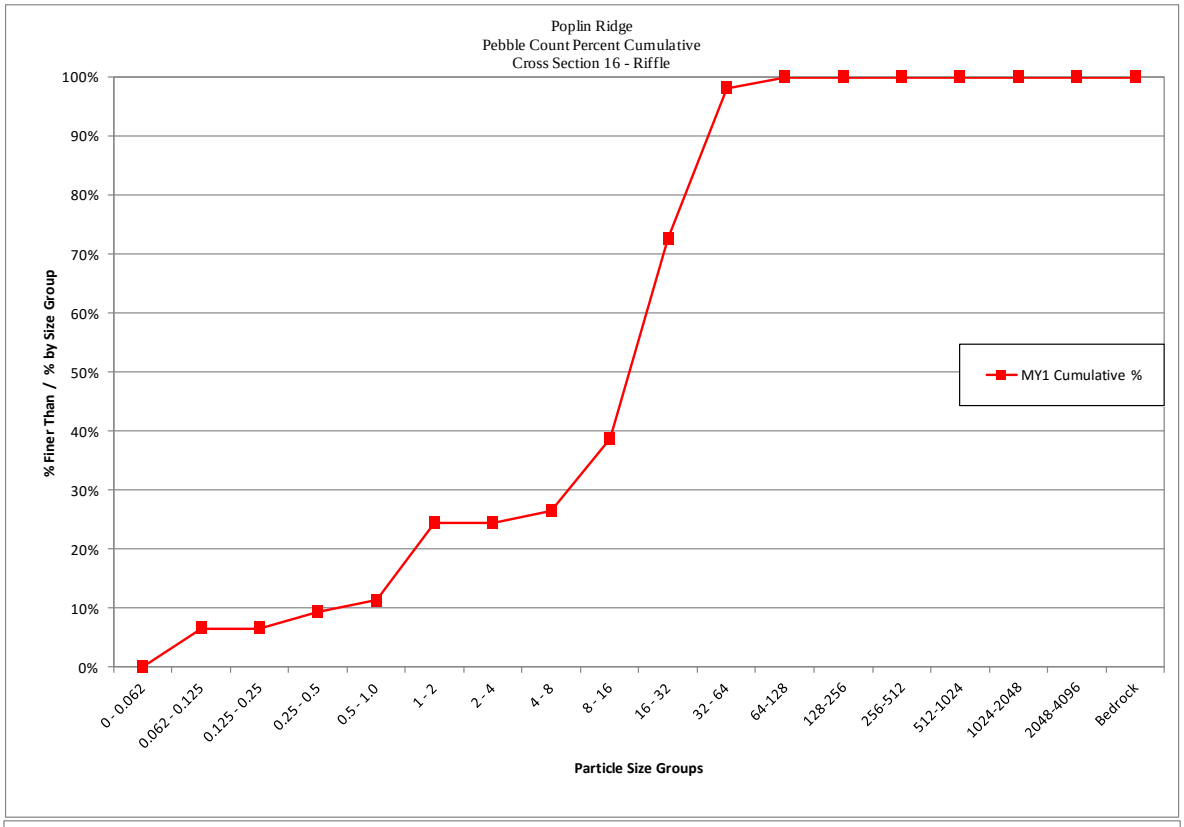

Poplin Ridge
Pebble Count Percent Individual
Cross Section 13 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

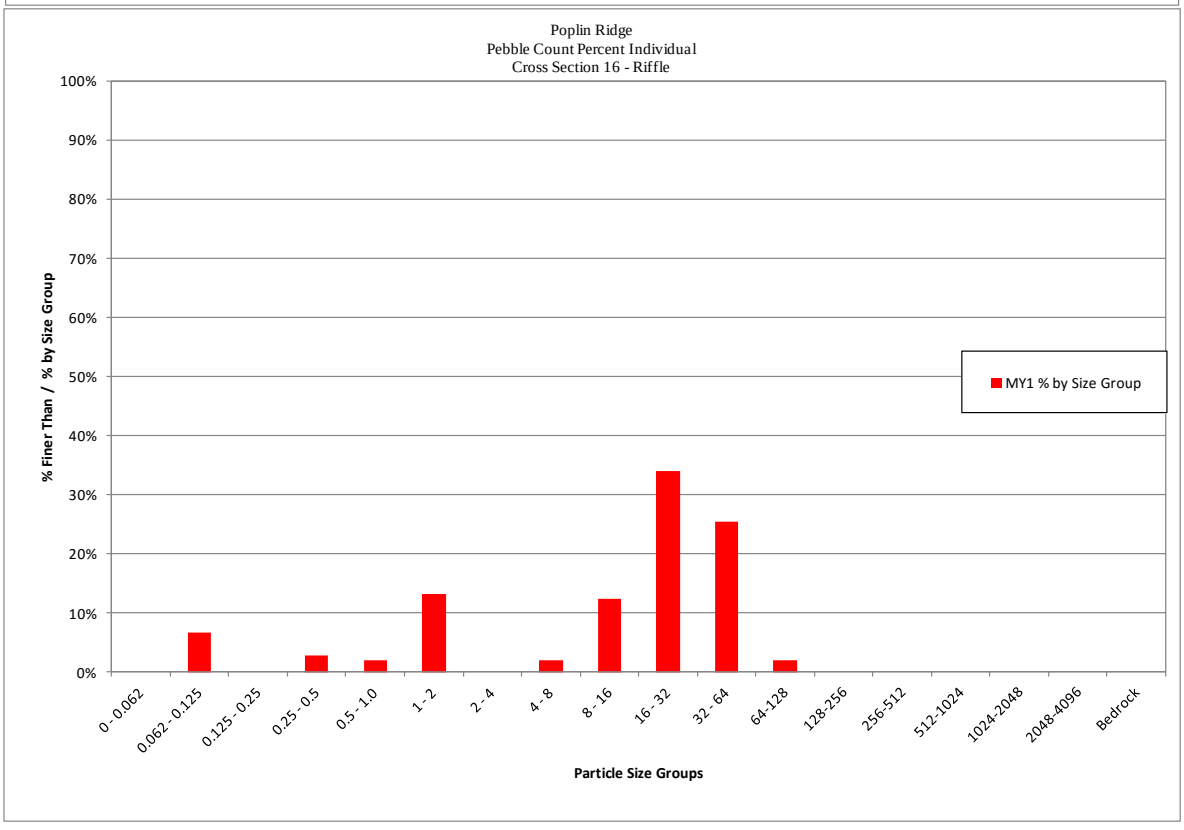
Poplin Ridge			
Cross Section 15 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	28	24.8%	25%
0.062 - 0.125	0	0.0%	25%
0.125 - 0.25	3	2.7%	27%
0.25 - 0.5	2	1.8%	29%
0.5 - 1.0	17	15.0%	44%
1 - 2	12	10.6%	55%
2 - 4	4	3.5%	58%
4 - 8	7	6.2%	65%
8 - 16	13	11.5%	76%
16 - 32	10	8.8%	85%
32 - 64	13	11.5%	96%
64-128	1	0.9%	97%
128-256	0	0.0%	97%
256-512	0	0.0%	97%
512-1024	0	0.0%	97%
1024-2048	0	0.0%	97%
2048-4096	0	0.0%	97%
Bedrock	3	2.7%	100%
Total	**113**	**100%**	**100%**
		Summary Data	
		D50	**1.3**
		D84	**24**
		D95	**43**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 15 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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

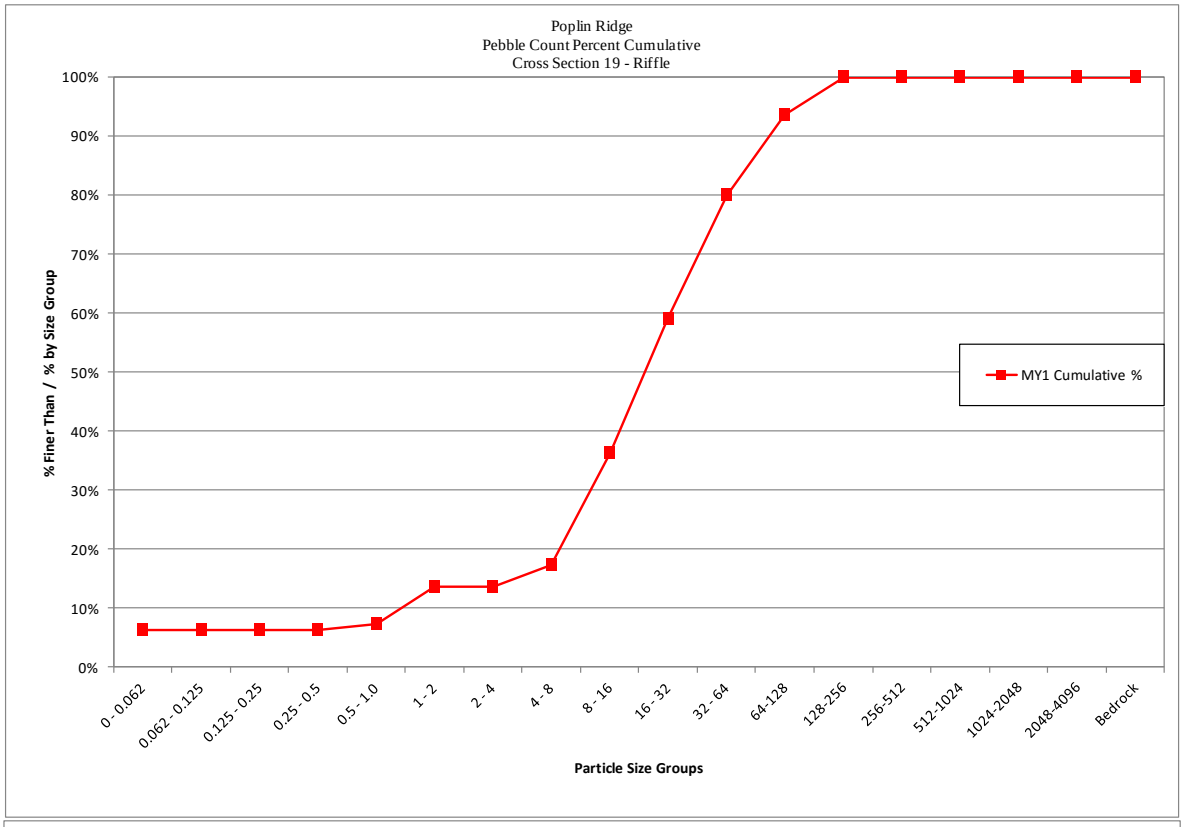

Poplin Ridge
Pebble Count Percent Individual
Cross Section 15 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

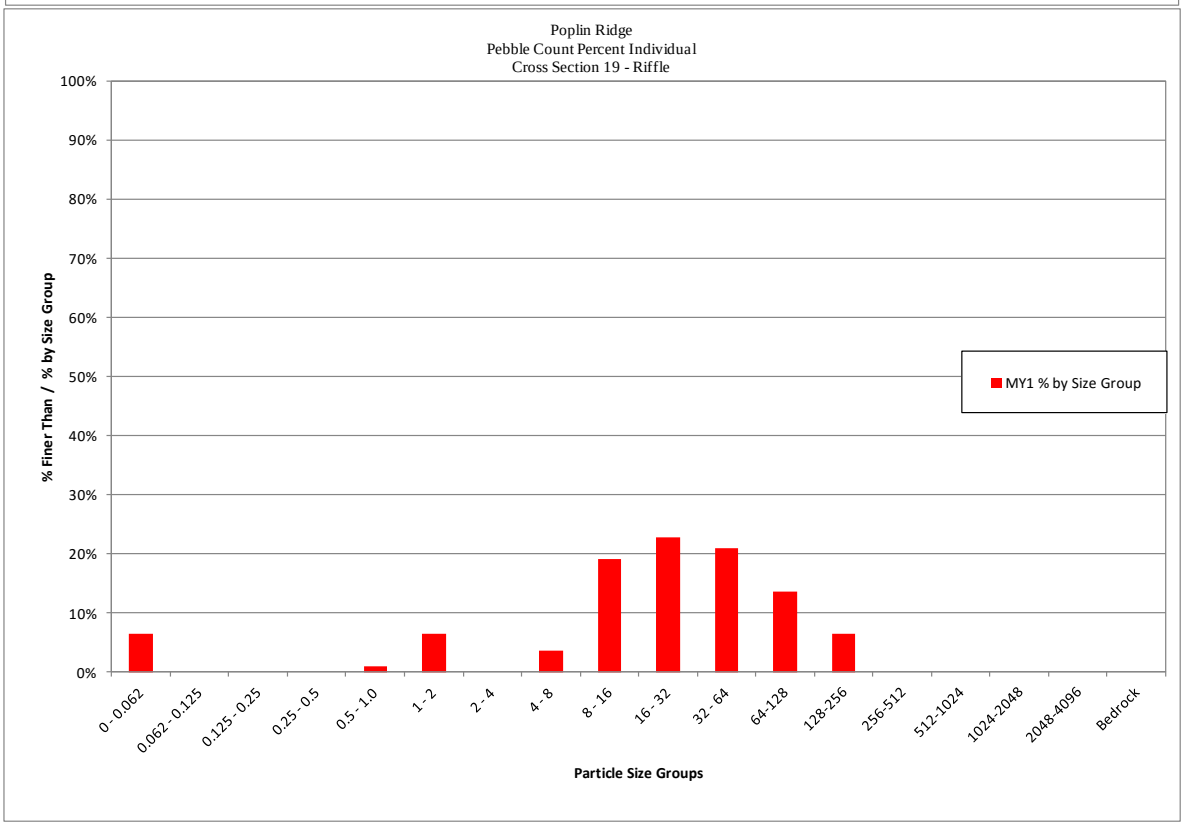
Poplin Ridge			
Cross Section 16 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	0	0.0%	0%
0.062 - 0.125	7	6.6%	7%
0.125 - 0.25	0	0.0%	7%
0.25 - 0.5	3	2.8%	9%
0.5 - 1.0	2	1.9%	11%
1 - 2	14	13.2%	25%
2 - 4	0	0.0%	25%
4 - 8	2	1.9%	26%
8 - 16	13	12.3%	39%
16 - 32	36	34.0%	73%
32 - 64	27	25.5%	98%
64-128	2	1.9%	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	**106**	**100%**	**100%**
		Summary Data	
		D50	**23**
		D84	**42**
		D95	**58**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 16 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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

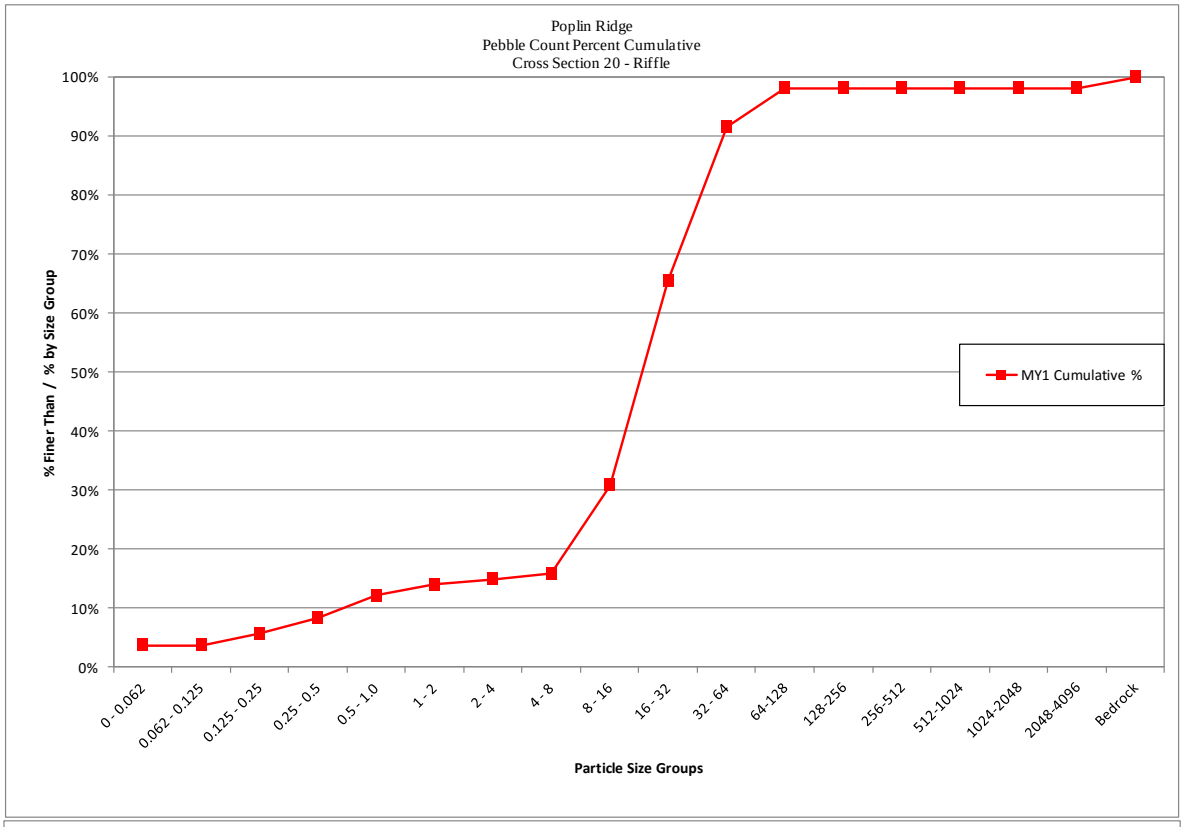

Poplin Ridge
Pebble Count Percent Individual
Cross Section 16 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048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

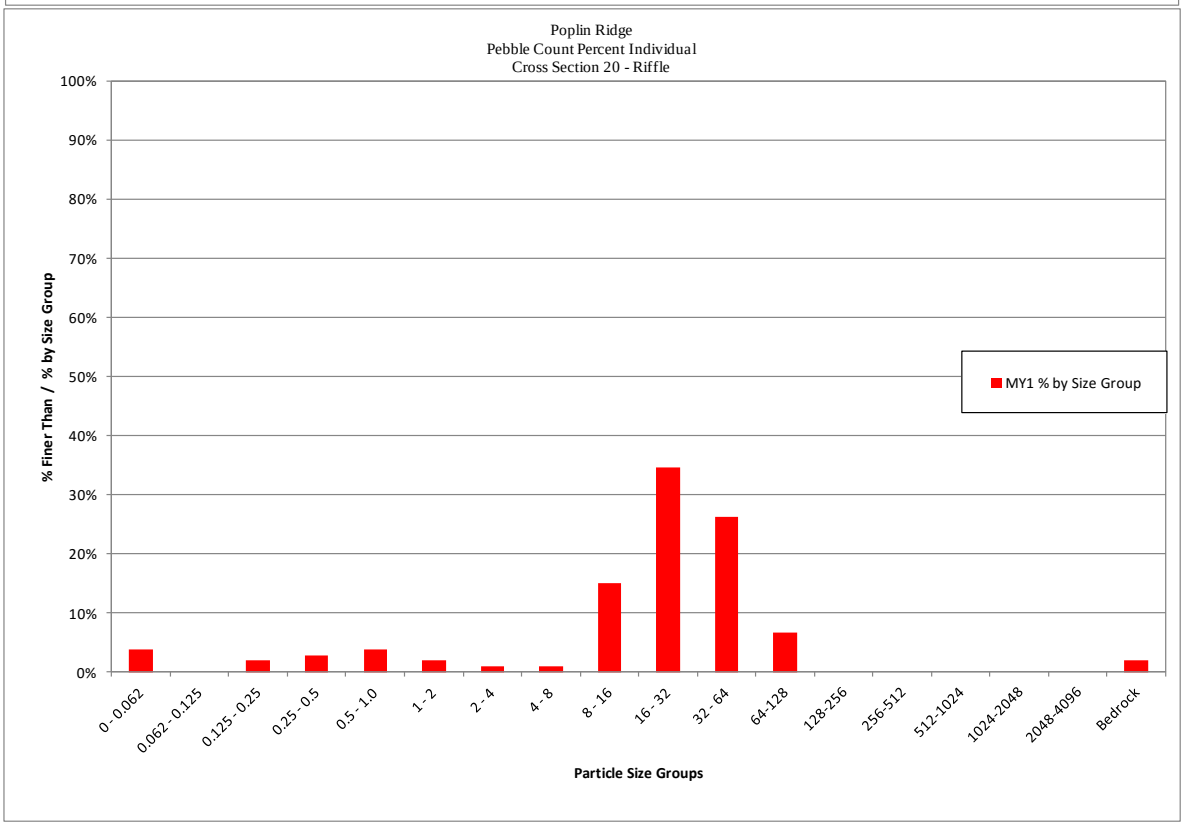
Poplin Ridge			
Cross Section 19 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	7	6.4%	6%
0.062 - 0.125	0	0.0%	6%
0.125 - 0.25	0	0.0%	6%
0.25 - 0.5	0	0.0%	6%
0.5 - 1.0	1	0.9%	7%
1 - 2	7	6.4%	14%
2 - 4	0	0.0%	14%
4 - 8	4	3.6%	17%
8 - 16	21	19.1%	36%
16 - 32	25	22.7%	59%
32 - 64	23	20.9%	80%
64-128	15	13.6%	94%
128-256	7	6.4%	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	**24**
		D84	**77**
		D95	**150**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 19 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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

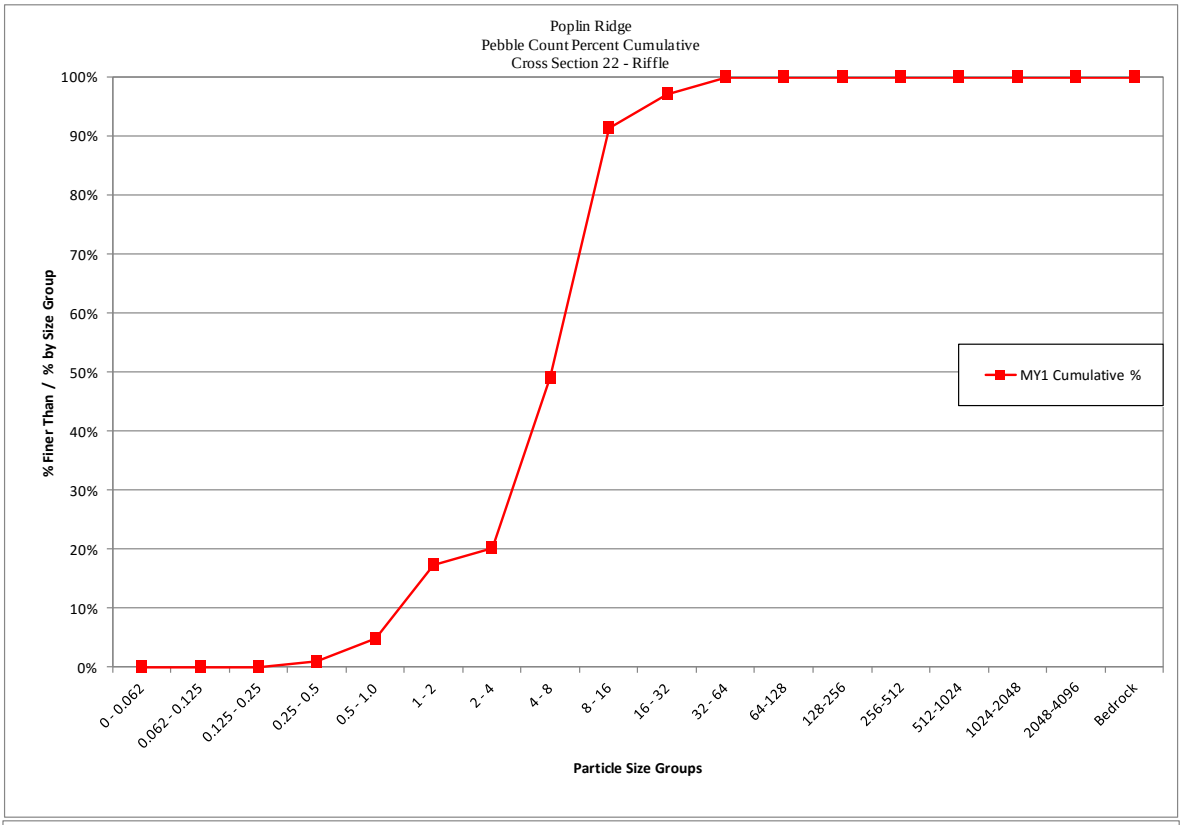

Poplin Ridge
Pebble Count Percent Individual
Cross Section 19 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

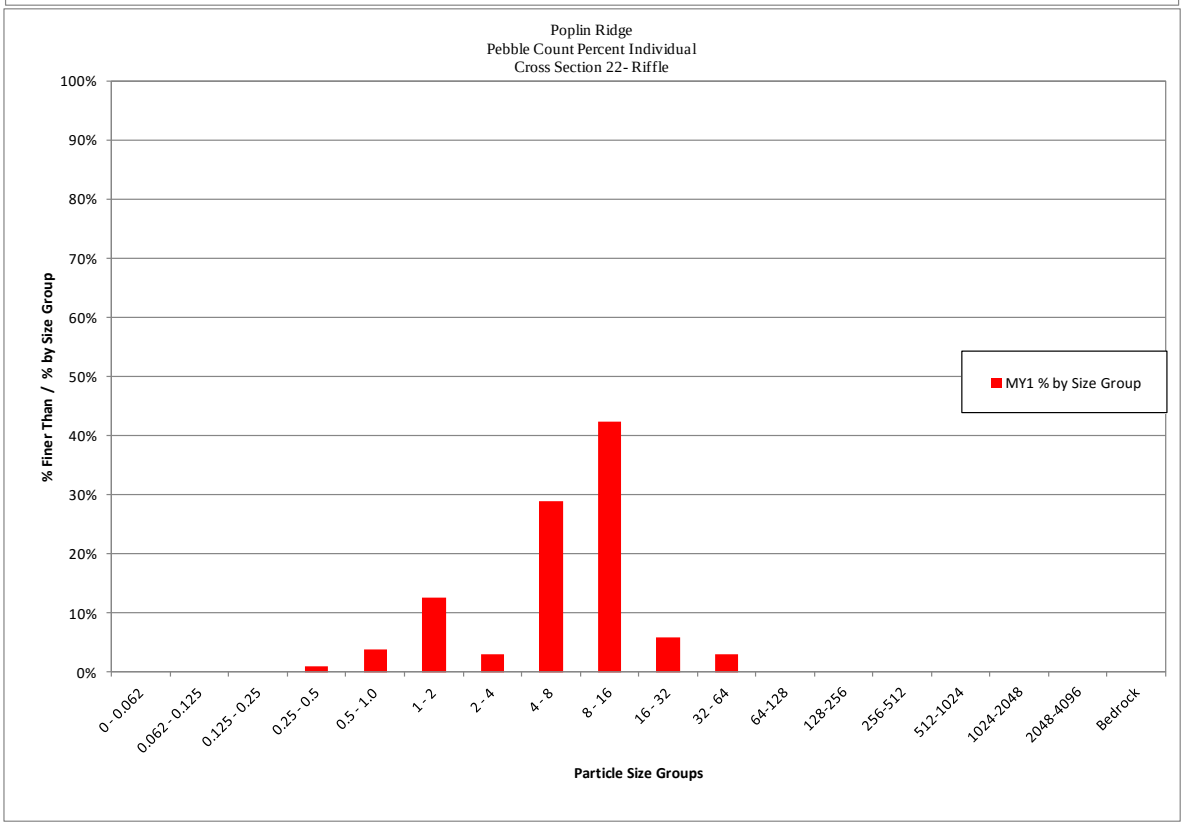
Poplin Ridge			
Cross Section 20 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	4	3.7%	4%
0.062 - 0.125	0	0.0%	4%
0.125 - 0.25	2	1.9%	6%
0.25 - 0.5	3	2.8%	8%
0.5 - 1.0	4	3.7%	12%
1 - 2	2	1.9%	14%
2 - 4	1	0.9%	15%
4 - 8	1	0.9%	16%
8 - 16	16	15.0%	31%
16 - 32	37	34.6%	65%
32 - 64	28	26.2%	92%
64-128	7	6.5%	98%
128-256	0	0.0%	98%
256-512	0	0.0%	98%
512-1024	0	0.0%	98%
1024-2048	0	0.0%	98%
2048-4096	0	0.0%	98%
Bedrock	2	1.9%	100%
Total	**107**	**100%**	**100%**
		Summary Data	
		D50	**23**
		D84	**48**
		D95	**70**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 20 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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

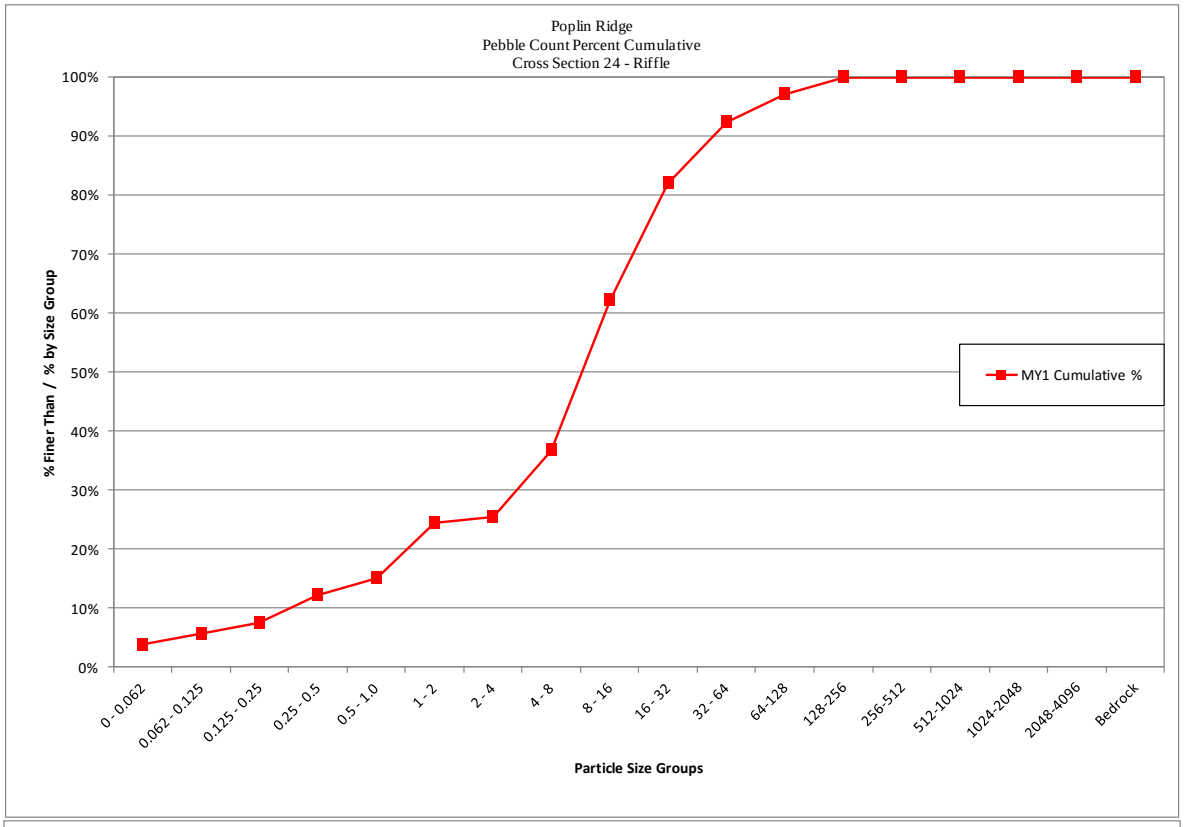

Poplin Ridge
Pebble Count Percent Individual
Cross Section 20 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048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

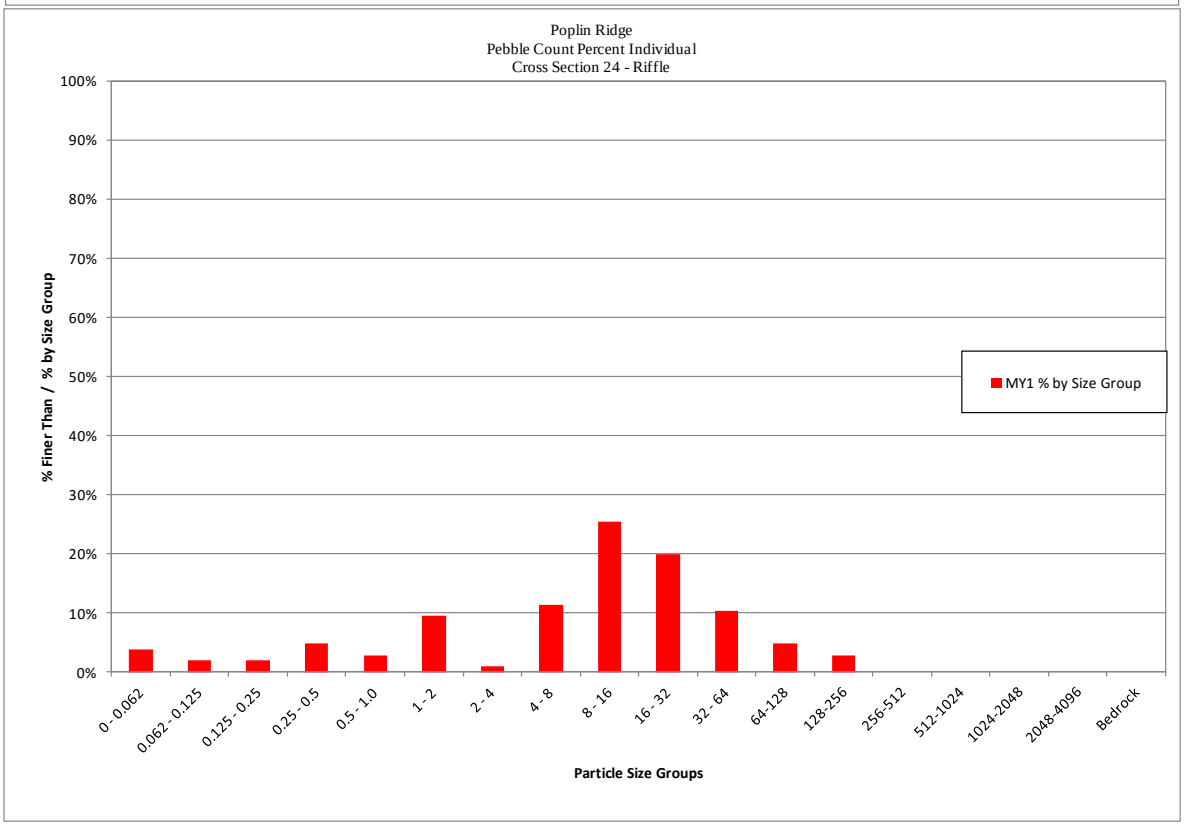
Poplin Ridge			
Cross Section 22 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	0	0.0%	0%
0.062 - 0.125	0	0.0%	0%
0.125 - 0.25	0	0.0%	0%
0.25 - 0.5	1	1.0%	1%
0.5 - 1.0	4	3.8%	5%
1 - 2	13	12.5%	17%
2 - 4	3	2.9%	20%
4 - 8	30	28.8%	49%
8 - 16	44	42.3%	91%
16 - 32	6	5.8%	97%
32 - 64	3	2.9%	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	**104**	**100%**	**100%**
		Summary Data	
		D50	**8.1**
		D84	**13**
		D95	**24**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 22 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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

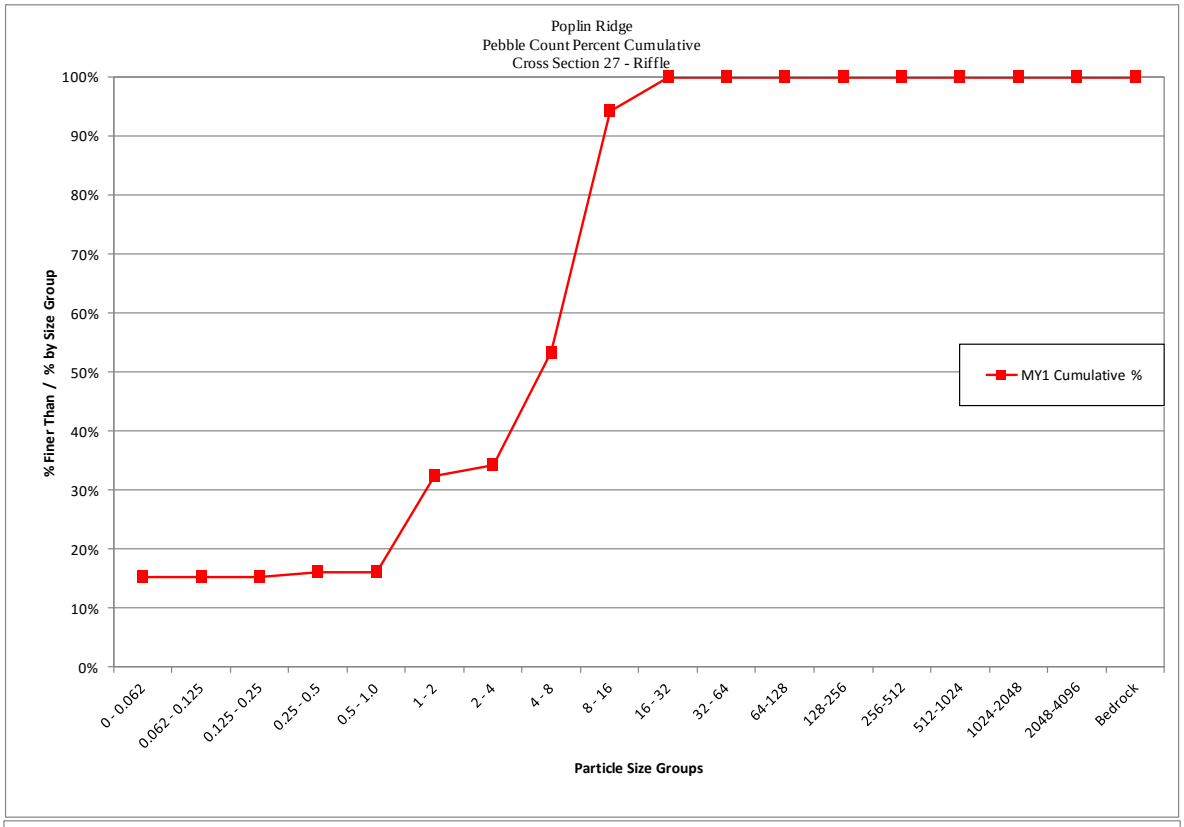

Poplin Ridge
Pebble Count Percent Individual
Cross Section 22- Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

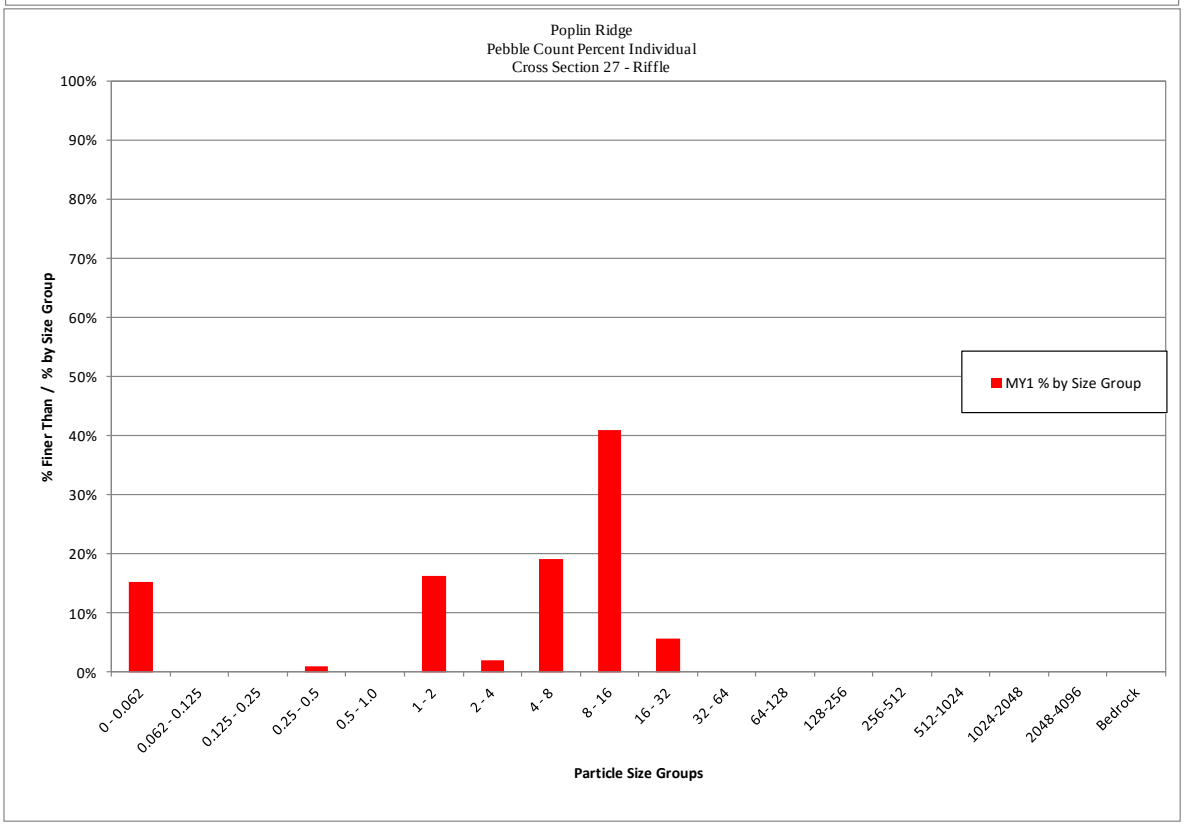
Poplin Ridge			
Cross Section 24 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	4	3.8%	4%
0.062 - 0.125	2	1.9%	6%
0.125 - 0.25	2	1.9%	8%
0.25 - 0.5	5	4.7%	12%
0.5 - 1.0	3	2.8%	15%
1 - 2	10	9.4%	25%
2 - 4	1	0.9%	25%
4 - 8	12	11.3%	37%
8 - 16	27	25.5%	62%
16 - 32	21	19.8%	82%
32 - 64	11	10.4%	92%
64-128	5	4.7%	97%
128-256	3	2.8%	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	**106**	**100%**	**100%**
		Summary Data	
		D50	**11**
		D84	**35**
		D95	**77**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 24 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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

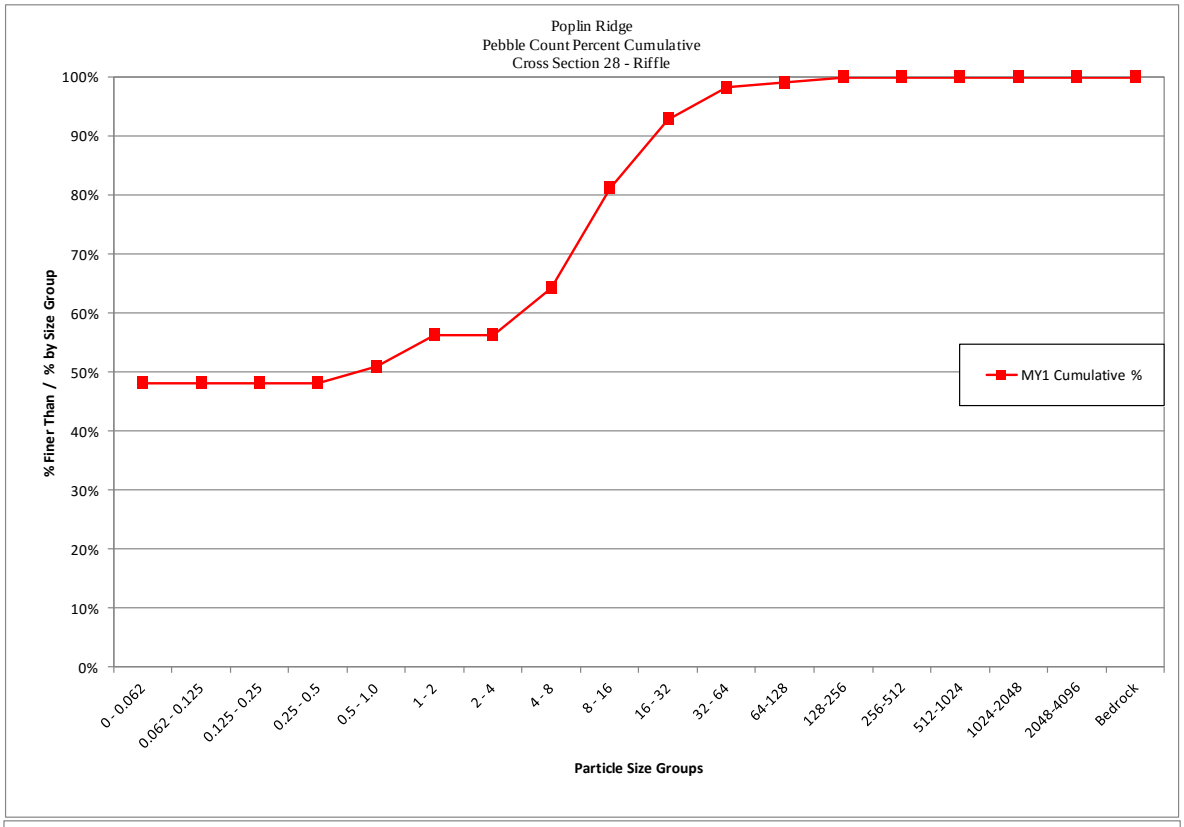

Poplin Ridge
Pebble Count Percent Individual
Cross Section 24 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

Poplin Ridge			
Cross Section 27 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	16	15.2%	15%
0.062 - 0.125	0	0.0%	15%
0.125 - 0.25	0	0.0%	15%
0.25 - 0.5	1	1.0%	16%
0.5 - 1.0	0	0.0%	16%
1 - 2	17	16.2%	32%
2 - 4	2	1.9%	34%
4 - 8	20	19.0%	53%
8 - 16	43	41.0%	94%
16 - 32	6	5.7%	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	**7.2**
		D84	**13**
		D95	**17**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 27 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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


Poplin Ridge
Pebble Count Percent Individual
Cross Section 27 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % 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

Poplin Ridge			
Cross Section 28 - Riffle			
Monitoring Year - 2015; MY1			
Bed Surface Material Particle Size Class (mm)	**Number**	**% Individual**	**% Cumulative**
0 - 0.062	54	48.2%	48%
0.062 - 0.125	0	0.0%	48%
0.125 - 0.25	0	0.0%	48%
0.25 - 0.5	0	0.0%	48%
0.5 - 1.0	3	2.7%	51%
1 - 2	6	5.4%	56%
2 - 4	0	0.0%	56%
4 - 8	9	8.0%	64%
8 - 16	19	17.0%	81%
16 - 32	13	11.6%	93%
32 - 64	6	5.4%	98%
64-128	1	0.9%	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	**112**	**100%**	**100%**
		Summary Data	
		D50	**0.79**
		D84	**18**
		D95	**47**


Poplin Ridge
Pebble Count Percent Cumulative
Cross Section 28 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 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

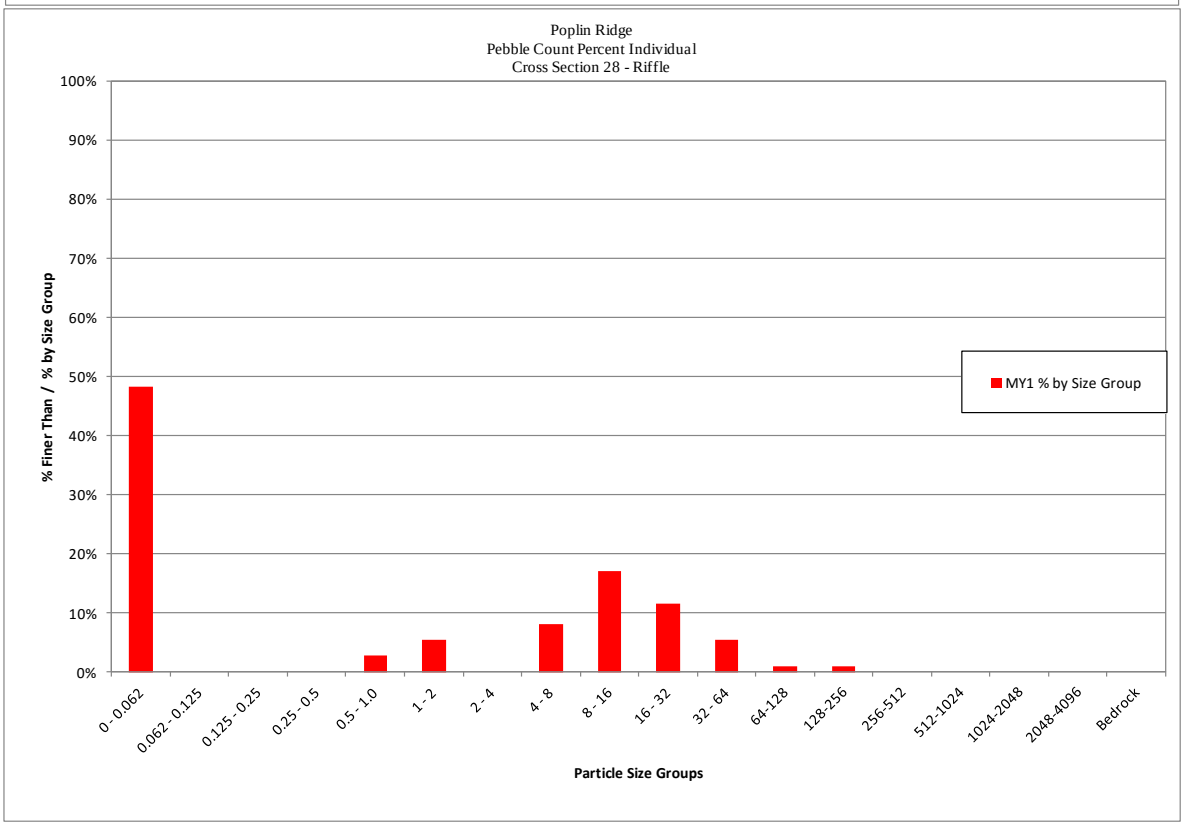

Poplin Ridge
Pebble Count Percent Individual
Cross Section 28 - Riffle
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% Finer Than / % by Size Group
MY1 % by Size Group
0 - 0.062
0.062 - 0.125
0.125 - 0.25
0.25 - 0.5
0.5 - 1.0
1 - 2
2 - 4
4 - 8
8 - 16
16 - 32
32 - 64
64-128
128-256
256-512
512-1024
1024-2048
2048-4096
Bedrock
Particle Size Groups

Table 12. Bank Pin Arrays Poplin Ridge Stream Restoration Site					
Array # and Reach	Length of Exposed Pin (mm)				
	Upper	Middle	Lower	Average Rate[1] (mm/yr)	Rate (ft/yr)
1 - Reach UT2-2	0	0[B]	0[B]	0	0.00
2 - Reach UT2-3	0	0	0	0	0.00
3 - Reach UT1-2	0	0[B]	0[B]	0.0	0.00
4 - Reach UT1-3	44.5	92.3	31.8	112.4	0.37
5 - Reach UT1-C	0	0	139.7	93.1	0.31
6 - Reach UT1-4	0	0	108.0	72	0.24

0[B]= Buried Bank Pin

[1] Rate based on 6 month span since installation and data collection

Appendix E
Hydrologic Data

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Table 13. Verification of Bankfull Events Poplin Ridge Stream Restoration Site				
Date of Data Collection	**Date of Occurrence**	**Method**	**Feet Above Bankfull Elevation**	**Photo # (if available)**
UT1-2				
10/14/2015	8/19/2015	Automated Crest Gauge	0.5	
UT1-4				
10/15/2015	8/19/2015	Automated Crest Gauge	2.0	
10/15/2015	10/3/2015	Automated Crest Gauge	1.0	
UT2-3				
10/13/2015	8/19/2015	Automated Crest Gauge	4.3	
10/13/2015	10/3/2015	Automated Crest Gauge	1.2	

Figure 3. Poplin Ridge Water Level Logger Chart

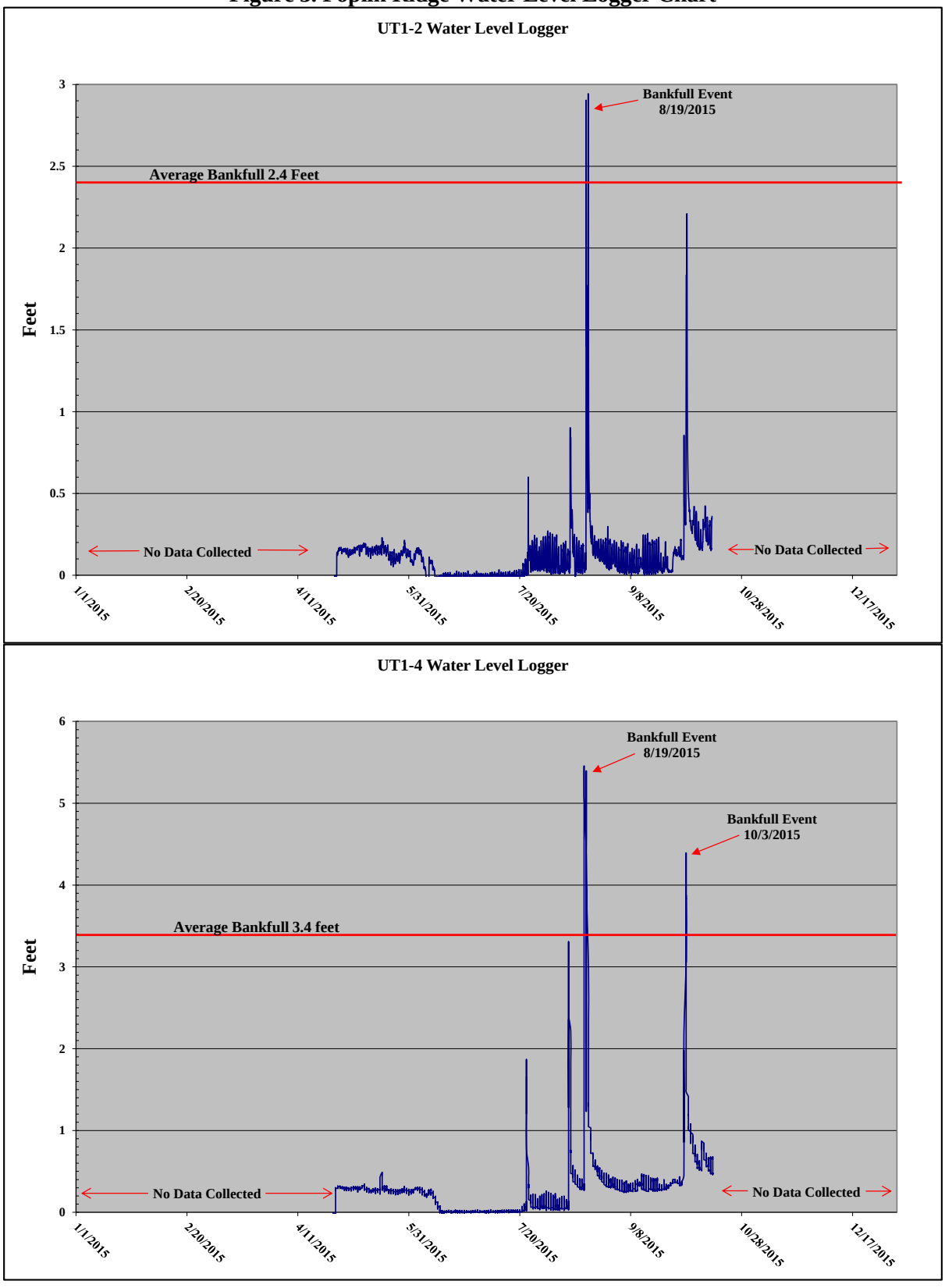

Figure 3 Cont'd. Poplin Ridge Water Level Logger Chart

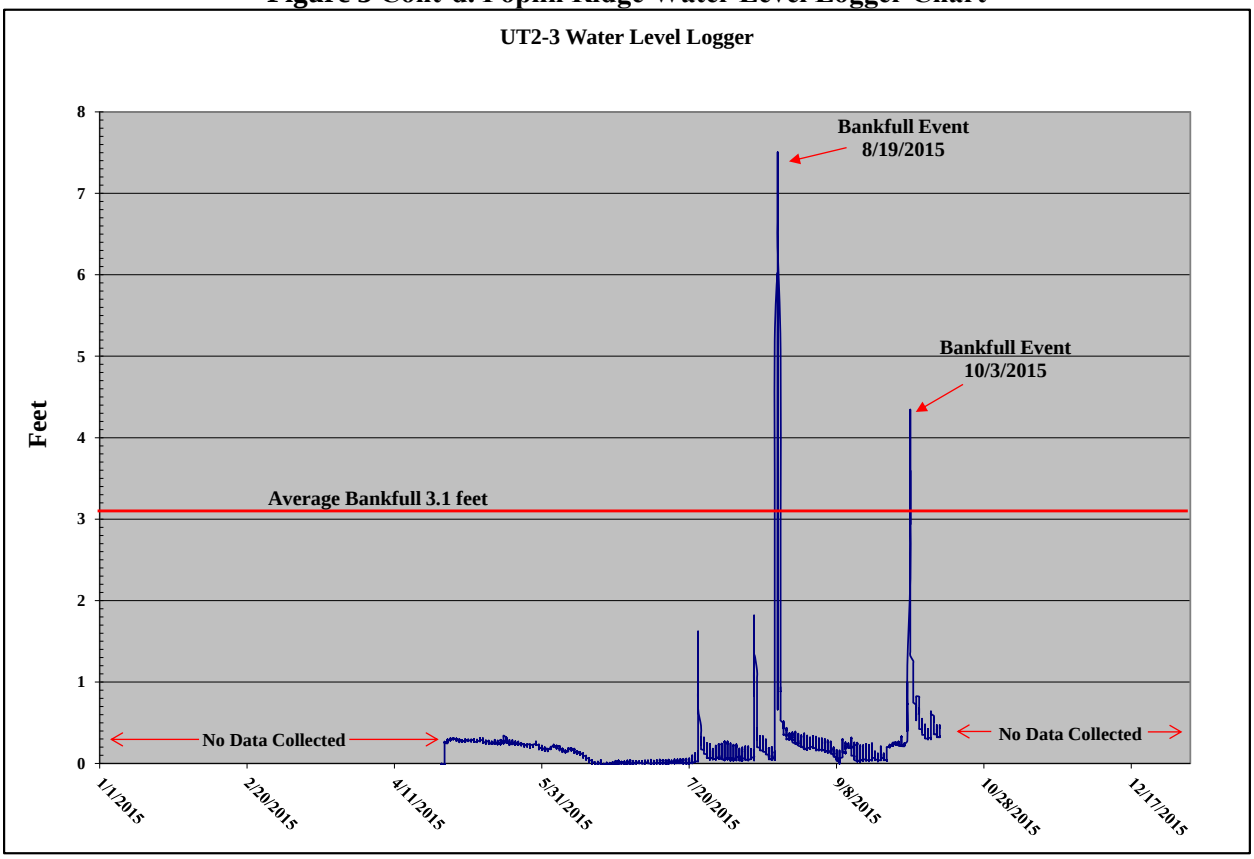

Figure 4. Daily Precipitation Totals for Monroe, NC (CRONOS Station 315771/ Monroe 2 Se)

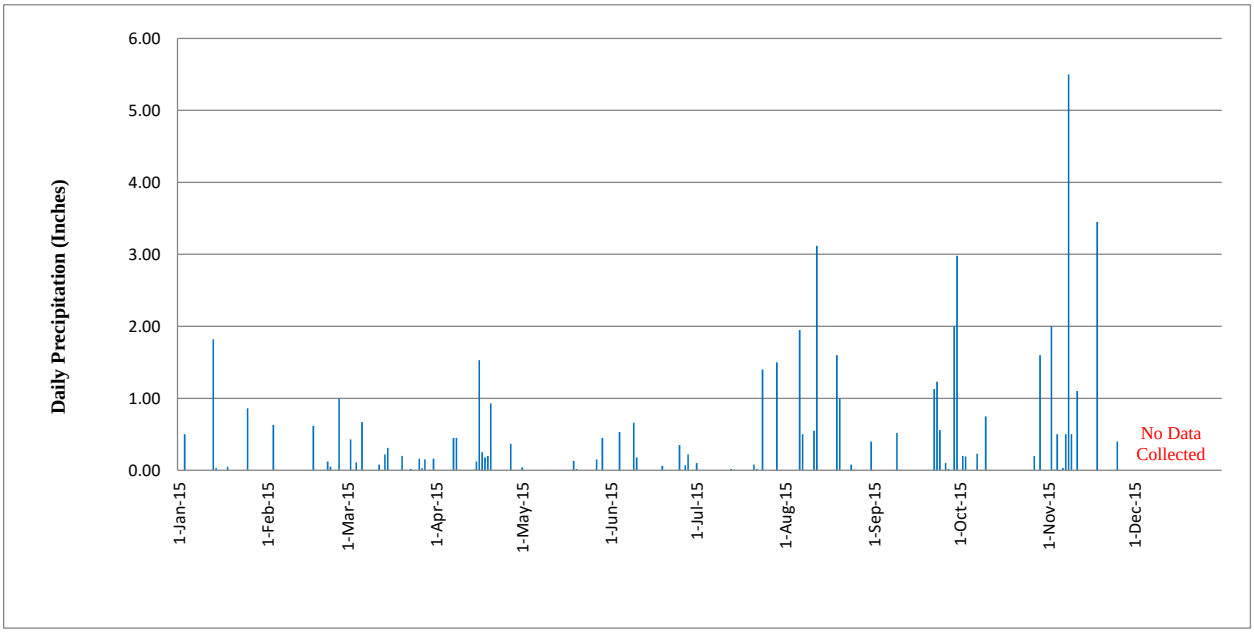

Figure 5. Monthly Precipitation Data Compared to Average. 30th and 70th, Percentiles for Union County