Annual Monitoring Report

Final

Little Pine Creek II

Monitoring Year 3 of 7

NCDMS Project No. 856
DWR Project No. 20090048 (v.2)
Contract No. LP082819
USACE Action ID: SAW-2009-00591
Alleghany County, North Carolina
Data Collected: April 2022 – October 2022
Date Submitted: November 2022

Prepared for:

NCDEQ-Division of Mitigation Services
1652 Mail Service Center
Raleigh NC 27699-1652

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EQUINOX
balance through proper planning

Harry Tsomides
Project Manager
NCDEQ-DMS Asheville Regional Office
2090 U.S. 70 Highway

Subject: Draft MY3 Monitoring Report
Little Pine Creek II Mitigation Project, Alleghany County
DMS ID No. 856 – DEQ Contract # LP082819

Mr. Tsomides,

On December 7, 2022 Equinox was provided with comments on the MY3 Report for the Little Pine Creek II Site. Below are the original comments and Equinox responses (**in RED**).

- *Please add assessment dates for each visual assessment table.* Dates added
- *Please footnote sources below the rain and precipitation data tables (give approximate distance from the site for offsite).* Footnote added
- *Table 2 – Project activities – please list invasives treatments done in 2022.* Added Text.
- *Problem area photos are shown for STA 118+00 (bank erosion) but not mapped on the CCPV.* Feature added to the CCPV.
- *Photo of problem area (L. bank slump) mapped at 110+25 seems to be missing - please double check and add if necessary.* Additional photos included in the Report.
- *As a reminder, monitoring providers are responsible for checking the easement integrity across the project site for encroachments, missing markers, fence breaks, etc. Please confirm that the site was checked and what the results are.* The site was walked in its entirety during the MY3 Initial site assessment. No areas of concern were identified during the site walk.
- *Please indicate in the report text that DMS has plans to initiate a focused stream problem area repair and limited supplemental planting in 2023.* Added Text.

DIGITAL SUPPORT FILES

- *Please ensure in future submission that the gauge data uses the same labels as indicted on the CCPV (ex. SG1, SG2).* Gage data references checked for consistency in electronic files and report

The Equinox project manager for this project is Mr. Danvey Walsh. His contact is as follows:

Sincerely,

Danvey Walsh
Environmental Scientist Equinox
37 Haywood Street
Asheville, NC 28801
Office: 828-253-6856 ext. 201
Fax: 828-253-8256

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Prepared by:

37 Haywood Street, Suite 100

Asheville, NC 28801

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1.0 PROJECT SUMMARY

1.1. Project Setting and Background

The Site is located in eastern Alleghany County, NC, approximately eight miles east of the Town of Sparta, NC and approximately four miles south of the Virginia border. The Site is within the New River Basin; 14-digit Hydrologic Unit Code (HUC) 05050001030030 and located in the Blue Ridge Belt of the Blue Ridge Province (USGS, 1998), (Figure 1).

The Site is located within a TLW in the New River RBRP plan (NCDENR, 2009), and is identified in the Little River and Brush Creek LWP Project Atlas (NCDENR, 2007). Numerous stressors were identified including heavily grazed buffers, livestock access to streams, eroded stream banks, land-disturbing activities on steep slopes, and storm water runoff. The LWP Project Atlas identified the Little Pine Creek II Stream and Wetland Restoration Project (LPC1-04, LPC1-W10) as a stream and wetland restoration opportunity with the potential to improve water quality, habitat, and hydrology within the Brush Creek watershed. Tables 1-4 in Appendix A present the project details.

1.2. Goals and Objectives

The following goals are outlined in the Final Mitigation Plan, and include:

- Restore riparian buffers
- Exclude cattle
- Stabilize eroding banks
- Construct stream channels that are laterally and vertically stable
- Improve stream habitat
- Improve channel and floodplain connectivity
- Permanently protect the project site from harmful uses

The following project objectives are proposed for accomplishing the goals as outlined in the Final Mitigation Plan:

- Plant native tree and understory species in the riparian zone.
- Install fencing along the conservation easement and cattle pasture boundaries
- Reconstruct stream channels with stable dimensions, add bank revetments and in-stream structures to protect restored/enhanced streams.
- Construct stream channels that will maintain a stable pattern and profile considering the hydrologic and sediment inputs to the system, landscape setting and the watershed condition.
- Install habitat features such as constructed riffles and brush toed into restored/enhanced streams, add woody materials to channel bed, and construct pools of varying depth.
- Reconstruct stream channels with bankfull at or near the floodplain elevation and bank height ratios ranging from 1.0- 1.1.
- Establish a conservation easement on the site.

1.3. Restoration Type and Approach

The project includes six restoration reaches; three Priority 1 (P1) reaches on Little Pine Creek, one Priority 2 (P2) reach on Tributary A, one P1 reach on Tributary B, and one P1 reach on Tributary C. The preservation portion of the Site includes Tributaries D, E, and F. The wetland portion of the LPC II Site includes three wetland zones. Wetland 1 is a riparian, non-riverine wetland enhancement zone. Wetland 2A is a riparian, non-riverine wetland enhancement zone. Wetland 2B is preservation only.

1.4. Project Components and Success Criteria

The LPC II Site is expected to provide 3,195 SMUs and 1.484 WMUs. The components and mitigation credits Project credits reflect those approved as part of the March 13, 2020 Little Pine Creek II-Project As-Built Update and Mitigation Plan Addendum (downward adjustment), Appendix F. Refer to the Project Assets Map (Figure 2) for the stream and wetland features and Table 1 and 4 for the project components, assets, and mitigation credit information for the LPC II Site (Appendix A).

The initial credit release for LPC II was received on April 3, 2020.

1.5. Project Performance

1.5.1 Vegetation

Visual assessment of vegetation indicates that the herbaceous vegetation is well established throughout the project. MY3 stems/acre and ranged from 202 to 607 planted stems per acre. Twelve (12) species were documented within the vegetation monitoring plots. A supplemental planting of 1450, 18-24" bare root seedlings was conducted on February 9, 2021. Species planted included tulip poplar (*Liriodendron tulipifera*), swamp chestnut oak (*Quercus michauxii*), river birch (*Betula nigra*), sycamore (*Platanus occidentalis)*, and water oak (*Quercus nigra*).

Monitoring of both permanent (n=8) and random vegetation plots (n = 4) was completed in October 2022. Summary tables and photographs associated with MY3 vegetation monitoring are located in Appendix B and Appendix C. MY3 monitoring data indicates that all but vegetation plots, 2, 4, and 6 were meeting the MY3 interim success criteria of 320 planted stems per acre (Table 7 and 8, Appendix C.) Vegetation plots #2 and 6 both occur in the wetland enhancement areas and as a result planted stems have been subject to increased competition from herbaceous vegetation. Plot #4 has sufficient stem densities but fails the performance standards based upon the dominant species exceeding the 50th percentile.

Vegetation problem areas and bare areas continue to shrink along the right descending bank of Little Pine Creek Reach 2A. These areas were still present in MY3, but occur below mapping threshold (Problem area photos, Appendix B).

Areas of exotic vegetation are depicted within the CCPV (n=12). Multiflora rose (*Rosa multiflora*), Oriental bittersweet (*Celastrus orbiculatus*) and Japanese honeysuckle (*Lonicera japonica*) were the dominant observed species. Pockets of cat tail (*Typha latifolia*) identified in MY2 have been treated and appeared under control during the MY3 October assessment. Invasive vegetation was identified in low density, scattered pockets along the easement boundary of LPC Reach 2A and 2B. The two most contiguous areas of invasives noted within the CCPV occur in Reach 2A and 2B. The largest area of invasives in Reach 2a contains a significant density of oriental bittersweet. The larger patch of invasives in Reach 2B was predominantly multifloral rose along the non-creditable reach and into Wetland 2B. The location and

density of invasive vegetation will continue to be monitored in future site visits. The site has a contract for invasive vegetation management through MY7(2026).

1.5.2 Geomorphology

Visual assessment of the stream channel was performed to document signs of instability, such as eroding banks, structural instability, or excessive sedimentation. Reaches 1 and portions of Reach 2A continue to experience overbank deposition (Cross Section figures, Tables 11a and b, Appendix D). The floodplain erosion noted in MY1 at the left descending bank of Cross-section 1 continues to remain stable into MY3 (Cross-section graphics and photos, Appendix D). The transverse riffle near STA 101+50 identified in MY1 has shifted back perpendicular to the channel and is no longer contributing increased stress to the left descending bank. These areas will continue to be monitored for any changes in stability.

Geomorphic data for MY1 was collected during October 2022. Summary tables and cross-section data plots related to stream morphology can be found in Appendix D. Cross-sectional dimensions remained relatively stable between baseline conditions and MY3 monitoring efforts. Sediment deposition and bank building was not as evident in MY3 as it had been in previous monitoring years. Cross-sections 3, 8, 12, and 13 showed evidence of bank forming through aggradation or sediment transport. No indication of instability at cross-sections was noted in MY3 (Appendix D, Cross-Section overlays, Tables 11a and b).

One exposed structure (113+30) and 6 areas of bank scour or slumping (100+10, 110+20, 118+00, 121+00, 121+75, and 406+26) were identified at the LPC II Project in MY3. At Stations 113+30 - 113+60 the toe logs of an outer bend structure have been exposed and there is an area of bank slump immediately downstream. Bank scour noted at Stations 100+10 and 110+20 were identified in MY2 and have neither improved nor worsened in MY3. At Station 118+00 the outside bend has notable scour and bank slump. The second area of instability (Station 121+00) has a similar amount of scour along the outer bend leading to the confluence with Trib D. At the final problem area (Stations 121+75) in Reach 2b, the bank at the first set of log-drop structures has a significant amount of scour. A concentrated area of scour was noted on the left descending bank at the confluence of Trib C and the LPCII Reach 2A/B (CCPV and Table 5, Appendix B). The site will continue to be monitored for signs of instability.

Division of mitigation services has plans to initiate focused stream problem area repair and limited supplemental planting in 2023.

No areas of encroachment or fence failure were observed during the assessment. The next site visit is planned for spring 2023.

1.5.3 Hydrology

Since project completion in late 2019, fifteen bankfull events have been documented on the LPC II site (Table 12, Appendix E). Fifteen have been recorded on Little Pine Creek, two at Tributary A, six events were recorded at the Tributary C, and two at Tributary B. Based on precipitation and stage recorder data the MY3 events were recorded over 5 days: June 12th, July 23^{rd,} 2022, August 18th, August 19th, October 9th, 2022.

Groundwater data from both wetland gages met established criteria during MY2. Wetland Gage 1 at Wetland 1 recorded 165 consecutive days (98.2%) during the MY3 growing season. Wetland Gage 2 at Wetland 2 recorded 101 consecutive days (60%). Hydrology will continue to be monitored throughout the life of the project.

2.0 METHODS

2.1 Geomorphology

Geomorphic measurements were taken during low flow conditions using a Nikon NPR 332 Total Station. Three-dimensional coordinates associated with cross-section data were collected in the field and geo-referenced (NAD83 State Plane feet FIPS 3200). Morphological data were collected at 13 cross-sections. Survey data was imported into CAD, ArcGIS, and Microsoft Excel for data processing and analysis.

2.2 Vegetation

Vegetation success in MY3 was monitored at 8 permanent monitoring plots in conjunction with 4 random vegetation plots. Permanent vegetation plot monitoring follows the CVS-EEP Level 2 Protocol for Recording Vegetation, version 4.2 (Lee et al. 2008). Data was processed using the NC DMS vegetation tool. In the field, the four corners of each permanent plot were permanently marked with metal t-posts and PVC pipe. Photos of each plot were taken from the plot origin each monitoring year. Random vegetation plots were monitored as per Section V of the Wilmington District Stream and Wetland Compensatory Mitigation Update (USACE 2016). Data is processed analogous to the CVS data entry tool. In the field, the origin corners of each plot were temporarily marked.

2.3 Hydrology

Two crest gages, two continuous stage recorders, two groundwater gages, a rain gauge, and precipitation data from NCSCO station Sparta 2 Se (318158) were used to monitor, meteorological, surface, and groundwater within the site. Additionally, visual observations of bankfull event indicators will be documented throughout the project. Data will be recorded and reported through subsequent monitoring reports.

3.0 REFERENCES

Harrelson, Cheryl C., Rawlins, C. L., Potyondy, John, P., (1994) Stream Channel Reference Sites: An illustrated guide to field technique.

Lee, Michael 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)

NCDENR. 2009. New River Basin Restoration Priorities. Retrieved from http://deq.nc.gov/about/divisions/mitigation-services/dms-planning/watershed-planning-documents/new-river-basin

NCDENR. 2007. Little River & Brush Creek Local Watershed Plan (LWP) Project Atlas. Retrieved from http://deq.nc.gov/about/divisions/mitigation-services/dms-planning/watershed-planning-documents/new-river-basin

NCDENR. 2021. DMS Veg Table Production Tool, Version 3/25/2022. Retrieved from https://ncdms.shinyapps.io/Veg_Table_Tool/.

Turner Land Surveying. 2019. As-Built Survey of Little Pine Creek II Stream and Wetland Restoration Project. Prepared for North Carolina Department of Environmental Quality, Division of Mitigation Services.

United States Army Corps of Engineers (USACE), 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.

United States Army Corps of Engineers (USACE), 2016. Wilmington District Stream and Wetland Compensatory Mitigation Update (October 24, 2016). USACE, NCDENR- DWQ, USEPA, NCWRC.

Wildlands Engineering. 2019. Restoration Plan Addendum – Little Pine Creek II Restoration Project Prepared for North Carolina Department of Environmental Quality, Division of Mitigation Services. DMS Project No. 856

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Appendix A
Background Tables

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Table 1. Project Mitigation Assets and Components Little Pine Creek II Stream and Wetland Mitigation Site/Project No. 856								
Project Segment	Mitigation Plan Footage or Acreage*	As-Built Centerline Footage or Acreage^	Mitigation Category	Restoration Level	Mitigation Ratio (X:1)	Mitigation Plan Credits*		Comments
Reach 1	530	517	Cold	R	1:1	517.000		20' LF Not-credited due to OHW ROW, minor change in as-built length
Reach 2A	1,512	1,476	Cold	R	1:1	1,476.000		Began farther downstream due to cattle crossing; 30' LF Not-credited due to OHW ROW
Reach 2B	321	334	Cold	R	1:1	334.000		Additional 13' LF at end of project
Tributary A	86	82	Cold	R	1:1	82.000		Sinuosity less than design; confluence with Reach 2A farther upstream than proposed
Tributary B	104	78	Cold	R	1:1	78.000		Confluence with Reach 2A farther upstream than proposed
Tributary C	578	577	Cold	R	1:1	577.000		
Tributary D	655	655	Cold	P	5:1	131.000		
Tributary E	50	50	Cold	P	5:1	10.000		Not-credited due to poor as-built condition
Tibutary F	153	153	Cold	P	5:1	30.600		Not-credited due to poor as-built condition
Wetland 1	0.32	0.322	R	E	2:1	0.161		
Wetland 2A	0.88	0.878	R	E	2:1	0.439		
Wetland 2B	4.42	4.420	R	P	5:1	0.884		

* Mitigation plan footage accounts for breaks in conservation easements and are based on design stream stationing and taken from the approved mitigation plan.

^ Based on centerline calculations from the as-built survey, accounts for breaks in conservation easement and utility right-of-ways.

Project Credits

	Stream			Riparian Wetland		Non-Rip	Coastal
Restoration Level	Warm	Cool	Cold	Riverine	Non-Riv	Wetland	Marsh
Restoration	-	-	3,064	-	-	-	-
Re-establishment				-	-	-	-
Rehabilitation				-	-	-	-
Enhancement				-	0.600	-	-
Enhancement I	-	-	-				
Enhancement II	-	-	-				
Creation				-	-	-	-
Preservation	-	-	131	-	0.884	-	
Total Credits[%]	**-**	**-**	**3,195**	**-**	**1.484**	**-**	**-**

[%] Project credits reflect the sum of credits consistent with as-built condition.

Total Stream Credit **3,195.000**

Total Wetland Credit **1.484**

Wetland Mitigation Category

CM	Coastal Marsh
R	Riparian
NR	Non-Riparian

Restoration Level

HQP	High Quality Preservation
P	Preservation
E	Wetland Enhancement - Veg and Hydro
EII	Stream Enhancement II
EI	Stream Enhancement I
C	Wetland Creation
RH	Wetland Rehabilitation - Veg and Hydro
REE	Wetland Re-establishment Veg and Hydro
R	Restoration

Table 2. Project Activity and Reporting History Little Pine Creek II Stream and Wetland Mitigation Site/Project No.856			
Activity or Report		Data Collection Complete	Completion or Delivery
Project Institution Date (Contract Date)		-	Dec-2007
Restoration Plan		-	Jan-2016
Construction (substantial construction complete 05/21/19)		-	May-2019
Planting		-	Apr-2019
As-built – MY0	Stream Survey	Jan-2020	Mar-2020
	Vegetation Survey	Nov-2019	Mar-2020
Monitoring Year-1	Stream Survey	Oct-20	Dec-20
	Vegetation Survey	Oct-20	Dec-20
Monitoring Year-2	Supplimental Planting		Feb-21
	Stream Survey	Oct-21	Dec-21
	Vegetation Survey	Oct-21	Dec-21
Monitoring Year-3	Initial Site Assessement	Apr-22	May-22
	Invasive treatment	Apr-22	Sep-22
	Invasive treatment	June-22	
	Invasive treatment	Sept-22	
	Stream Survey	Oct-22	Nov-22
	Vegetation Survey	Oct-22	Nov-22

Table 3. Project Contacts Table Little Pine Creek II Stream and Wetland Mitigation Site/Project No. 856	
Designer Primary project design POC	Wildland Engineering, Inc / 1430 South Mint St #104 Charlotte NC 282013 Jeff Keaton / 919.851.9986
Construction Contractor Construction contractor POC	Wright Contracting / 453 Silk Hope Liberty Rd Siler City, NC 27344 Ross Kennedy/336.736.4585
Survey Contractor Survey contractor POC	Turner Surveying / P.O. Box 148 Swannanoa, NC 28778 David Turner/ 919.827.0745
Planting Contractor Planting contractor POC	Carolina Silvics 908 Indian Trail Rd, Edenton, NC 27932 Mary Margaret McKinney 252.482.8491
Seeding Contractor Contractor point of contact	Wright Contracting / 453 Silk Hope Liberty Rd Siler City, NC 27344 Ross Kennedy/336.736.4585
Seed Mix Sources	Green Resource, LLC
Nursery Stock Suppliers	Mellow Marsh Farm
Monitoring Performers	Equinox / 37 Haywood St Suite 100 Asheville NC 28801
Stream Monitoring POC	Danvey Walsh/828.253.6856
Vegetation Monitoring POC	Owen Carson/828.253.6856
Wetland Monitoring POC	Danvey Walsh/828.506.6856

Table 4. Project Baseline Information and Attributes

Project Information

Project Name	Little Pine Creek II Stream and Wetland Mitigation Site
County	Alleghany
Project Area (acres)	14.61
Project Coordinates (latitude and longitude)	36.5069° N, -80.9878° W

Project Watershed Summary Information

Physiographic Province		Blue Ridge	
River Basin		New River	
USGS Hydrologic Unit 8-digit	5050001	USGS Hydrologic Unit 14-digit	5050001030030
DWR Sub-basin		05-07-03	
Project Drainage Area (acres)		3.34	
Project Drainage Area Percentage of Impervious Area		< 1%	
CGIA Land Use Classification		Pasture/Hay	

Reach Summary Information

Parameters	Little Pine Creek Reach 1	Little Pine Creek 2A	Little Pine Creek 2B	Tributary A	Tributary B	Tributary C	Tributary D	Tributary E	Tributary F
Length of Reach (linear feet) ^	533	1,506	334	82	77	577	899	50	153
Valley Confinement (Rosgen)	VI	VI	VI	VI	VI	VI	VI	VI	VI
Drainage area (miles^2)	2.93	3.31	3.34	0.39	0.26	0.11	0.13	0.04	0.05
Perrenial, Intermittent, Ephemeral	Perrenial	Perrenial	Perrenial	Perrenial	Perrenial	Perrenial	Perrenial	Perrenial	Perrenial
NCDWR Water Quality Classification	C	C	C	C	C	C	C	C	C
Stream Classification (existing)	C	C	C	C	C	G	C	C	C
Stream Classification (proposed)	C	C	C	C	C	C	C	C	C
FEMA classification	-	-	-	-	-	-	-	-	-

Wetland Summary Information

Parameters	Wetland 1	Wetland 2A	Wetland 2B
Size of Wetland (acres)	0.32	0.88	4.42
Wetland Type (non-riparian, riparian riverine or riparian non-riverine)	Riparian	Riparian	Riparian
Mapped Soil Series	Alluvial land, wet (nikwasi)	Alluvial land, wet (nikwasi)	Alluvial land, wet (nikwasi)
Drainage class	Very Poorly	Very Poorly	Very Poorly
Soil Hydric Status	Hydric	Hydric	Hydric
Source of Hydrology	Spring	Spring	Spring
Hydrologic Impairment	Agriculture/ Livestock Grazing	Agriculture/ Livestock Grazing	Agriculture/ Livestock Grazing
Native vegetation community	Mountain Bottomland Forest	Mountain Bottomland Forest	Mountain Bottomland Forest
Percent composition of exotic invasive vegetation	0%	0%	0%

Regulatory Considerations

Regulation	Applicable?	Resolved?	Supporting Documentation
Waters of the United States – Section 404	Yes	Yes	Jurisdictional Determination
Waters of the United States – Section 401	Yes	Yes	Jurisdictional Determination
Endangered Species Act	Yes	Yes	ERTR
Historic Preservation Act	No	N/A	ERTR
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	Yes	Yes	Yes
Essential Fisheries Habitat	No	N/A	N/A

^ Based on actual thalweg calculations from the as-built survey, accounts for breaks in conservation easement and utility right-of-ways.

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Appendix B
Visual Assessment Data

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Reach 1
Trib A
Wetland 1
Reach 2A
Reach 2A
Trib B
Reach 2B
Trib D
Trib C
Wetland 2B
Wetland 2A
NC Center for Geographic Information & Analysis

Mitigation Services
ENVIRONMENTAL QUALITY

Little Pine Creek II
Alleghany County, NC
Overview Sheet

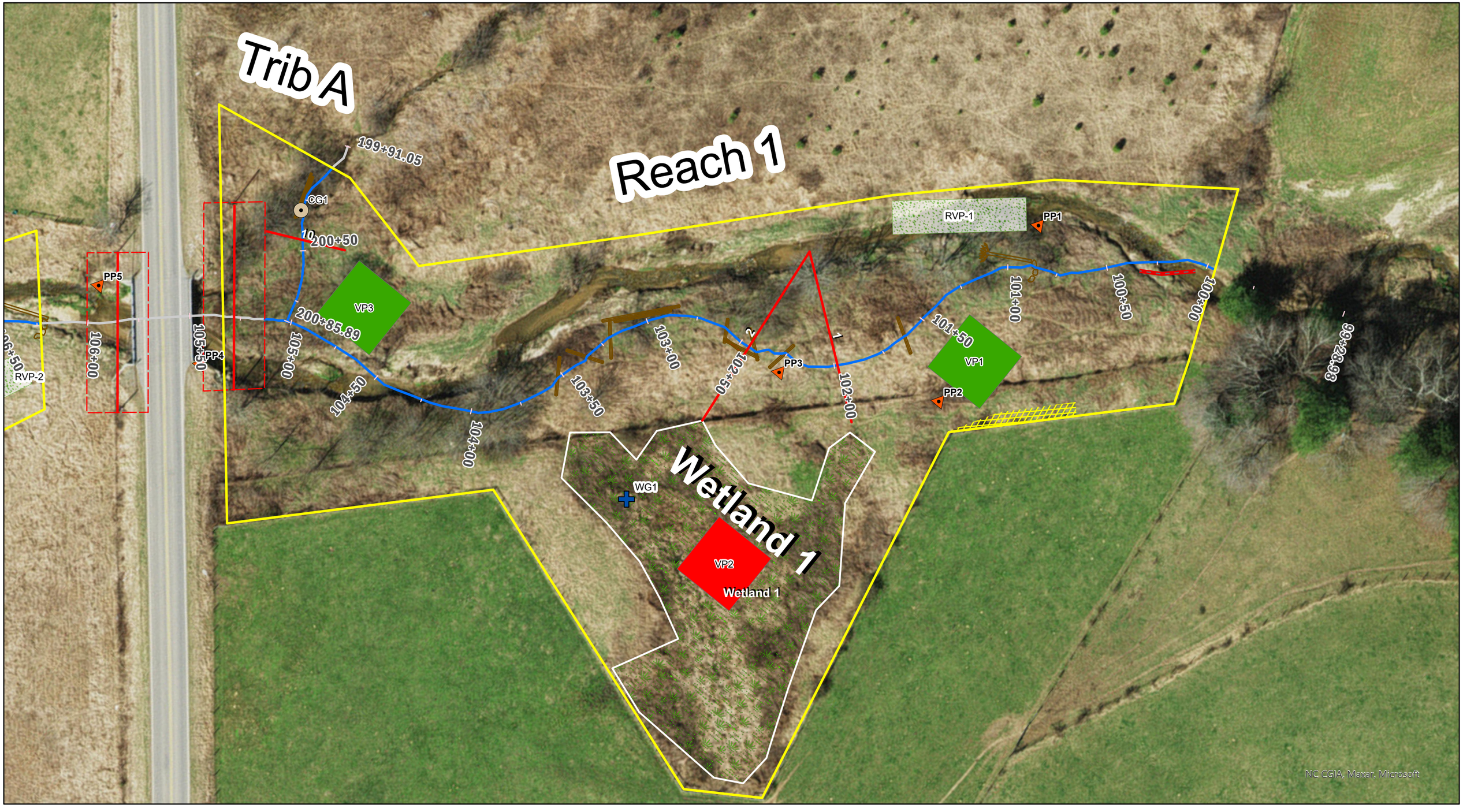
Conservation Easement
ReachBreak
OHW
Utility Easement

Streams
Non-Credit
Preservation
Restoration

Wetlands
Enhancement
Preservation
Vernal Pool

N

0 125 250 500 Feet



Mitigation Services
ENVIRONMENTAL QUALITY

CCPV MY3
Little Pine Creek II
Alleghany County, NC

Sheet 1 of 3

LPCII Easement
OHW
Utility Easement
Photopoints

Hydrology
Type
Crest gauge
Wetland gauge
Criteria
Meeting

Cross Sections

Permanent Vegetation Plot
Criteria
Failing
Meeting

Random Vegetation Plot
Criteria
Meeting

Streams
Non-Credit
Restoration

Bank Erosion

Invasive Problem Areas
Density
Present

Wetlands
Enhancement

N

0 25 50 100 Feet

CCPV MY3
Little Pine Creek II
Alleghany County, NC

Sheet 2 of 3

Mitigation Services
ENVIRONMENTAL QUALITY

LPCII Easement
OHW
Utility Easement
Vernal Pool
Photopoints

Hydrology
Type
Crest gauge
Stream gauge
Wetland gauge
Criteria
Meeting

Cross Sections
Permanent Vegetation Plot
Criteria
Failing
Meeting

Random Vegetation Plot
Criteria
Meeting
Streams
Non-Credit
Preservation
Restoration

Bank Erosion
Invasive Problem Areas
Density
Present
Wetlands
Enhancement
Preservation

N

0 50 100 200
Feet

Mitigation Services
ENVIRONMENTAL QUALITY

CCPV MY3
Little Pine Creek II
Alleghany County, NC

Sheet 3 of 3

- LPCII Easement
- Vernal Pool
- Photopoints
- Cross Sections

Permanent Vegetation Plot Criteria
- Meeting

Random Vegetation Plot Criteria
- Meeting

Streams
- Non-Credit
- Preservation
- Restoration
- Bank Erosion

Invasive Problem Areas
Density
- Present

Wetlands
- Preservation

N

0 37.5 75 150 Feet

Table 5. Visual Stream Morphology Stability Assessment
Little Pine Creek II Stream and Wetland Mitigation Site - Little Pine Creek Reach 1 - Restoration (P2)
Assessed Length 533 feet (Assessed April 22 and October 18, 2022)

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. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			1	28	94%	0	0	94%
	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	1	28	94%	N/A	N/A	N/A
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	19	19			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	19	19			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	19	19			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	19	19			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	19	19			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Little Pine Creek II Stream and Wetland Mitigation Site - Little Pine Creek Reach 2a - Restoration (P1)
Assessed Length 1506 feet (Assessed April 22 and October 18, 2022)

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. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			4	73	95%	0	0	95%
	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	4	73	95%	N/A	N/A	N/A
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	21	22			95%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	22	22			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	22	22			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	22	22			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	22	22			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Little Pine Creek II Stream and Wetland Mitigation Site - Little Pine Creek Reach 2b - Restoration (P1)
Assessed Length 334 feet (Assessed April 22 and October 18, 2022)

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. 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.			1	9	97%	N/A	N/A	N/A
				Totals	1	9	97%	N/A	N/A	N/A
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	12	12			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	12	12			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	12	12			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	11	12			92%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	12	12			100%			

N/A - Item does not apply.

Table 5 cont'd. Visual Stream Morphology Stability Assessment
Little Pine Creek II Stream and Wetland Mitigation Site - Trib A - Restoration (P2)
Assessed Length 82 feet (Assessed April 22 and October 18, 2022)

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. 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
2. 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
Little Pine Creek II Stream and Wetland Mitigation Site - Trib B - Restoration (P1)
Assessed Length 77 feet (Assessed April 22 and October 18, 2022)

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. 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
2. 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
Little Pine Creek II Stream and Wetland Mitigation Site - Trib C - Restoration (P1)
Assessed Length 577 feet (Assessed April 22 and October 18, 2022)

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. Bank	1. Scoured / Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			1	6	99%	0	0	99%
	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	1	6	99%	N/A	N/A	N/A
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	42	42			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	42	42			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	42	42			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	42	42			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	42	42			100%			

N/A - Item does not apply.

Table 6. Vegetation Condition Assessment Little Pine Creek II Stream and Wetland Mitigation Site						
Planted Acreage: 7.7 (Assessed April 22, and October 18, 2022)						
Vegetation Category	**Definitions**	**Mapping Threshold**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Planted Acreage**
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	n/a	0	0	0.00%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres		0	0	0.00%
			Total	0	0	0.00%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acres	n/a	0	0	0.00%
			Cumulative Total	0	0	0.00%
Easement Acreage:	**14**					
Vegetation Category	**Definitions**	**Mapping Threshold**	**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).	1000 SF		12	0.47	3.36%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	n/a	0	0	0.00%

Permanent Vegetation Plot Photos

Vegetation Monitoring Plot 1

Vegetation Monitoring Plot 2

Vegetation Monitoring Plot 3

Vegetation Monitoring Plot 4

Vegetation Monitoring Plot 5

Vegetation Monitoring Plot 6

Vegetation Monitoring Plot 7

Vegetation Monitoring Plot 8

Permanent Photo Stations

Little Pine Creek II – Permanent Photo Station 1, Looking Upstream

Little Pine Creek II – Permanent Photo Station 2a, Looking Upstream

Little Pine Creek II – Permanent Photo Station 2b, Looking Downstream

Little Pine Creek II – Permanent Photo Station 3a, Looking Downstream

Little Pine Creek II – Permanent Photo Station 3b, Looking Upstream

Little Pine Creek II – Permanent Photo Station 4a, Looking Upstream

Little Pine Creek II – Permanent Photo Station 4b, Little Pine Creek confluence with Trib A

Little Pine Creek II – Permanent Photo Station 5, Looking Downstream

Little Pine Creek II – Permanent Photo Station 6a, Looking Upstream

Little Pine Creek II – Permanent Photo Station 6b, Looking Downstream

Little Pine Creek II – Permanent Photo Station 7a, Looking Northeast

Little Pine Creek II – Permanent Photo Station 7b, Looking East

Little Pine Creek II – Permanent Photo Station 7c, Looking Southwest

Little Pine Creek II – Permanent Photo Station 8a, Looking over vernal pool

Little Pine Creek II – Permanent Photo Station 8b, Looking Downstream

Little Pine Creek II – Permanent Photo Station 9a, Looking Upstream

Little Pine Creek II – Permanent Photo Station 9b, Looking Downstream

Little Pine Creek II – Permanent Photo Station 10a, Looking Upstream

Little Pine Creek II – Permanent Photo Station 10b, Looking Downstream

Little Pine Creek II – Permanent Photo Station 11a, Looking Upstream Trib D

Little Pine Creek II – Permanent Photo Station 11b, Looking Downstream

Little Pine Creek II – Permanent Photo Station 11c, Looking North

Little Pine Creek II – Permanent Photo Station 12a, Looking Downstream

Little Pine Creek II – Permanent Photo Station 12b, Looking Upstream

Little Pine Creek II – Permanent Photo Station 13a, Confluence with Trib B

Little Pine Creek II – Permanent Photo Station 13b, Looking Downstream

Little Pine Creek II – Permanent Photo Station 14a, Looking at floodplain pool

Little Pine Creek II – Permanent Photo Station 14b, Looking Upstream

Little Pine Creek II – Permanent Photo Station 14c, Looking North

Problem Area Photos

Little Pine Creek II Reach 1– Bank Erosion Station 100+10

Little Pine Creek II Reach 1– Bank Erosion Station 110+20

Little Pine Creek II Reach 2A – Exposed structure Station 113+30

Little Pine Creek II Reach 2A – Slump Bank Station 113+60

Little Pine Creek II Reach 2A – Bank Erosion 118+00, facing downstream

Little Pine Creek II Reach 2A –Bank Erosion Station 118+00 facing left descending bank

Little Pine Creek II Reach 2A – Bank Erosion 121+00, facing downstream

Little Pine Creek II Reach 2B –Bank Erosion Station 121+75 facing left descending bank

Little Pine Creek II Reaches 2A/B – Example Residual Bare Areas.

Appendix C
Vegetation Plot Data

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https://ncdms.shinyapps.io/Veg_Table_Tool/

Table 7. Vegetation Plot Data

Planted Acreage	7.7
Date of Initial Plant	2019-04-30
Date(s) of Supplemental Plant(s)	2021-02-09
Date(s) Mowing	n/a
Date of Current Survey	2022-10-17
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 F		Veg Plot 2 F		Veg Plot 3 F		Veg Plot 4 F		Veg Plot 5 F		Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F		Veg Plot 9 R	Veg Plot 10 R	Veg Plot 11 R	Veg Plot 12 R
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Total	Total	Total	Total
Species Included in Approved Mitigation Plan	Acer rubrum	red maple	Tree	FAC	1	1											2	2	1	1	2		7	3
	Alnus serrulata	hazel alder	Tree	OBL																			1	
	Betula nigra	river birch	Tree	FACW			1	1	3	3	6	6	3	3	1	1	2	2	1	1	4	5	4	5
	Cornus amomum	silky dogwood	Shrub	FACW	1	1	2	2	1	1			1	1	1	1								
	Fraxinus americana	white ash	Tree	FACU																		2		
	Fraxinus pennsylvanica	green ash	Tree	FACW	5	5			4	4	1	1	3	3					2	2		2	1	4
	Ilex verticillata	common winterberry	Tree	FACW											1	1								
	Liriodendron tulipifera	tuliptree	Tree	FACU	1	1													1	1			1	1
	Nyssa sylvatica	blackgum	Tree	FAC	1	1											1	1	1	1				
	Platanus occidentalis	American sycamore	Tree	FACW	5	5	3	3	5	5	1	1			2	2	3	3	5	5	5	5	1	1
	Quercus michauxii	swamp chestnut oak	Tree	FACW							1	1							1	1			1	1
	Salix nigra	black willow	Tree	OBL	1	1							2	2										
Sum	Performance Standard				15	15	6	6	13	13	9	9	9	9	5	5	8	8	12	12	11	14	16	15
Mitigation Plan Performance Standard	Current Year Stem Count					15		6		13		9		9		5		8		12	11	14	16	15
	Stems/Acre					607		243		526		283		364		202		324		486	445	567	648	607
	Species Count					7		3		4		4		4		4		4		7	3	4	7	6
	Dominant Species Composition (%)					33		50		38		67		33		40		38		42	45	36	44	33
	Average Plot Height (ft.)					5		3		6		6		4		1		3		3	5	8	2	4
	% Invasives					0		0		0		0		0		0		0		0	0	0	0	0
Post Mitigation Plan Performance Standard	Current Year Stem Count					15		6		13		9		9		5		8		12	11	14	16	15
	Stems/Acre					607		243		526		283		364		202		324		486	445	567	648	607
	Species Count					7		3		4		4		4		4		4		7	3	4	7	6
	Dominant Species Composition (%)					33		50		38		67		33		40		38		42	45	36	44	33
	Average Plot Height (ft.)					5		3		6		6		4		1		3		3	5	8	2	4
	% Invasives					0		0		0		0		0		0		0		0	0	0	0	0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 8. Vegetation Performance Standards Summary Table

	Veg Plot 1 F				Veg Plot 2 F				Veg Plot 3 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3	607	5	7	0	243	3	3	0	526	6	4	0
Monitoring Year 2	445	2	4	0	162	3	2	0	445	4	4	0
Monitoring Year 1	81	2	2	0	81	3	2	0	405	3	4	0
Monitoring Year 0	445	2	5	0	81	3	1	0	162	2	3	0
	Veg Plot 4 F				**Veg Plot 5 F**				**Veg Plot 6 F**			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3	283	6	4	0	364	4	4	0	202	1	4	0
Monitoring Year 2	243	4	3	0	324	3	4	0	202	2	4	0
Monitoring Year 1	121	3	2	0	162	2	3	0	81	2	2	0
Monitoring Year 0	243	2	3	0	283	2	3	0	121	2	3	0
	Veg Plot 7 F				**Veg Plot 8 F**				**Veg Plot Group 1 R**			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3	324	3	4	0	486	3	7	0	445	5	3	0
Monitoring Year 2	283	2	3	0	445	2	7	0				
Monitoring Year 1	243	2	3	0	162	1	3	0				
Monitoring Year 0	243	2	3	0	364	1	4	0				
	Veg Plot Group 2 R				**Veg Plot Group 3 R**				**Veg Plot Group 4 R**			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3	567	8	4	0	648	2	7	0	607	4	6	0
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0												

*Each monitoring year represents a different plot for the random vegetation plot "groups". Random plots are denoted with an R, and fixed plots with an F.

Table 9. Vegetation Plot Criteria Attainment
LPCII Stream and Wetland Mitigation Site

Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
VP1	Yes	75.0%
VP2	No	
VP3	Yes	
VP4	No*	
VP5	Yes	
VP6	No	
VP7	Yes	
VP8	Yes	
RVP1	Yes	
RVP2	Yes	
RVP3	Yes	
RVP4	Yes	

*Performance standard not met based upon dominant species criteria.

Appendix D
Stream Geomorphology Data

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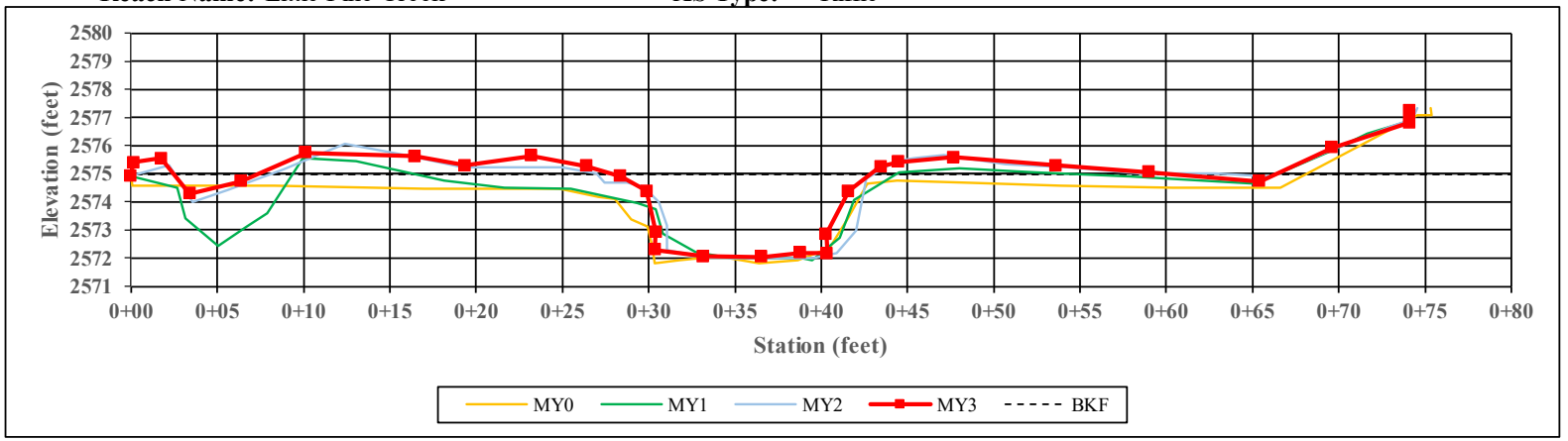
Project Name: LPC II **XS Number:** 1 **Station:** 100+77

Reach Name: Little Pine Creek **XS Type:** Riffle



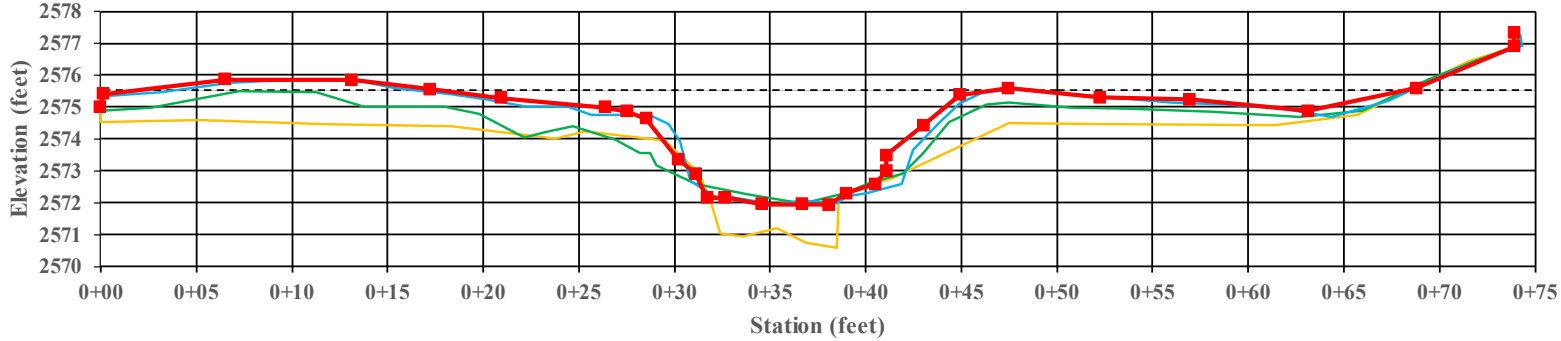
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	25.5	12.6	13.8	14.9	-	-	-	-
Floodprone Width (ft)	100.0	100.0	100.0	100.0	-	-	-	-
Bankfull Mean Depth (ft)	1.2	2.7	2.2	2.1	-	-	-	-
Bankfull Max Depth (ft)	2.7	3.3	2.7	2.9	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	31.6	34.5	29.8	31.6	-	-	-	-
Width/Depth Ratio	20.6	4.6	6.4	7.0	-	-	-	-
Entrenchment Ratio	3.9	8.0	7.2	6.7	-	-	-	-
Bank Height Ratio	1.1	0.8	1.2	1.2	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: LPC II **XS Number:** 2 **Station:** 100+91

Reach Name: Little Pine Creek **XS Type:** Pool



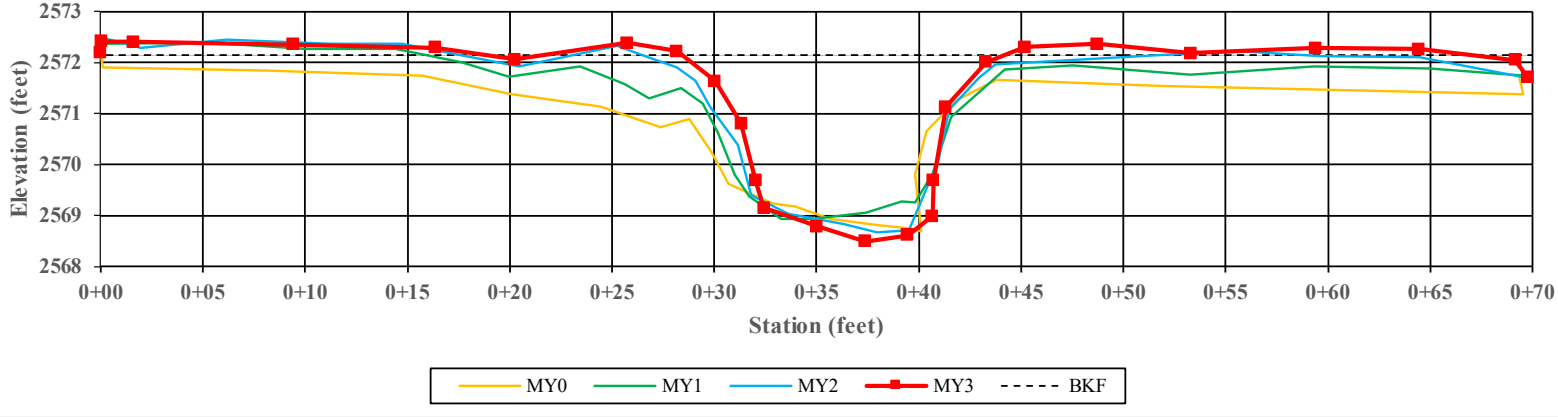
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	23.7	20.9	14.1	15.5	-	-	-	-
Floodprone Width (ft)	70.0	70.0	70.0	70.0	-	-	-	-
Bankfull Mean Depth (ft)	1.8	1.8	2.6	2.7	-	-	-	-
Bankfull Max Depth (ft)	4.0	2.8	3.2	3.6	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	42.3	37.3	36.3	42.3	-	-	-	-
Width/Depth Ratio	13.3	11.7	5.5	5.7	-	-	-	-
Entrenchment Ratio	3.0	3.4	5.0	4.5	-	-	-	-
Bank Height Ratio	1.0	0.8	0.8	0.8	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: LPC II **XS Number:** 3 **Station:** 107+50

Reach Name: Little Pine Creek **XS Type:** Pool



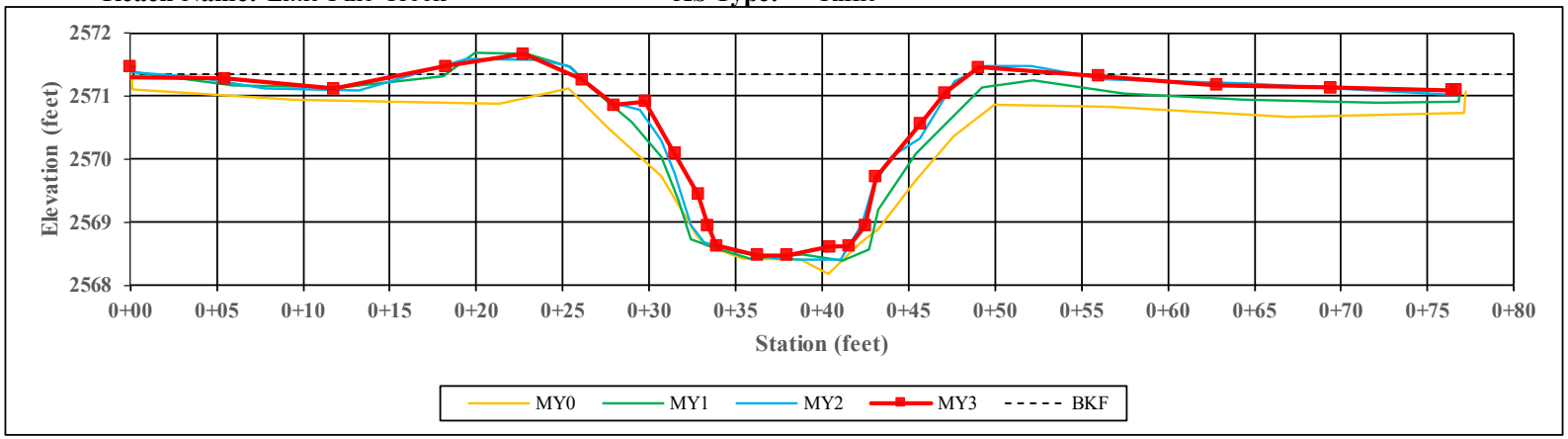
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	27.0	24.0	14.8	14.9	-	-	-	-
Floodprone Width (ft)	100.0	100.0	100.0	100.0	-	-	-	-
Bankfull Mean Depth (ft)	1.3	1.4	2.1	2.3	-	-	-	-
Bankfull Max Depth (ft)	3.0	3.0	3.2	3.7	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	34.3	34.2	31.5	34.3	-	-	-	-
Width/Depth Ratio	21.3	16.8	6.9	6.4	-	-	-	-
Entrenchment Ratio	3.7	4.2	6.8	6.7	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: LPC II **XS Number:** 4 **Station:** 108+69

Reach Name: Little Pine Creek **XS Type:** Riffle



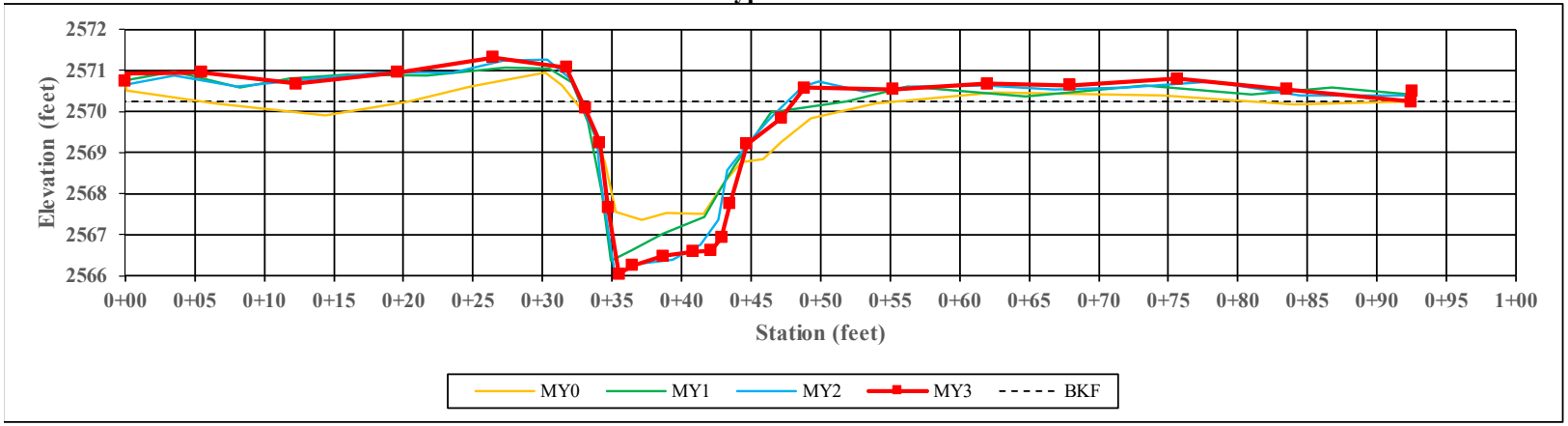
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	21.3	22.5	21.1	21.0	-	-	-	-
Floodprone Width (ft)	100.0	100.0	100.0	100.0	-	-	-	-
Bankfull Mean Depth (ft)	1.7	1.8	1.7	1.7	-	-	-	-
Bankfull Max Depth (ft)	2.7	2.8	2.8	2.9	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	36.4	41.0	36.8	36.4	-	-	-	-
Width/Depth Ratio	12.5	12.4	12.1	12.1	-	-	-	-
Entrenchment Ratio	4.7	4.4	4.7	4.8	-	-	-	-
Bank Height Ratio	1.1	1.1	1.1	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: LPC II **XS Number:** 5 **Station:** 109+64

Reach Name: Little Pine Creek **XS Type:** Pool



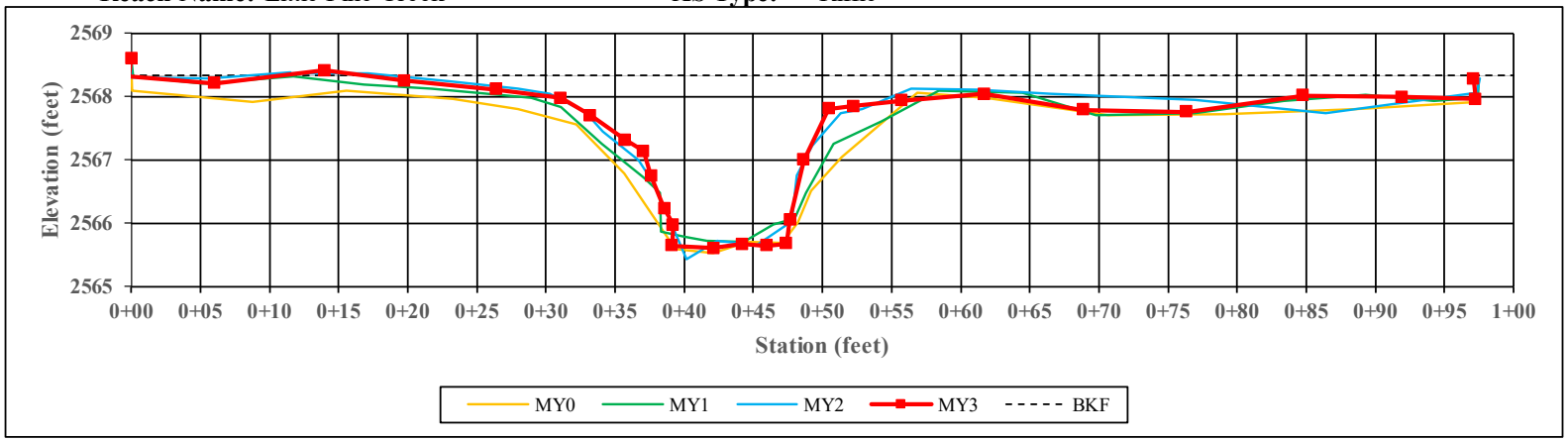
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	22.2	30.4	16.1	14.1	-	-	-	-
Floodprone Width (ft)	100.0	100.0	100.0	100.0	-	-	-	-
Bankfull Mean Depth (ft)	1.7	1.3	2.8	2.7	-	-	-	-
Bankfull Max Depth (ft)	3.1	4.2	4.8	4.2	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	37.9	40.1	45.7	37.9	-	-	-	-
Width/Depth Ratio	13.0	23.0	5.6	5.2	-	-	-	-
Entrenchment Ratio	4.5	3.3	6.2	7.1	-	-	-	-
Bank Height Ratio	1.1	1.0	1.1	1.1	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: LPC II **XS Number:** 6 **Station:** 112+81

Reach Name: Little Pine Creek **XS Type:** Riffle



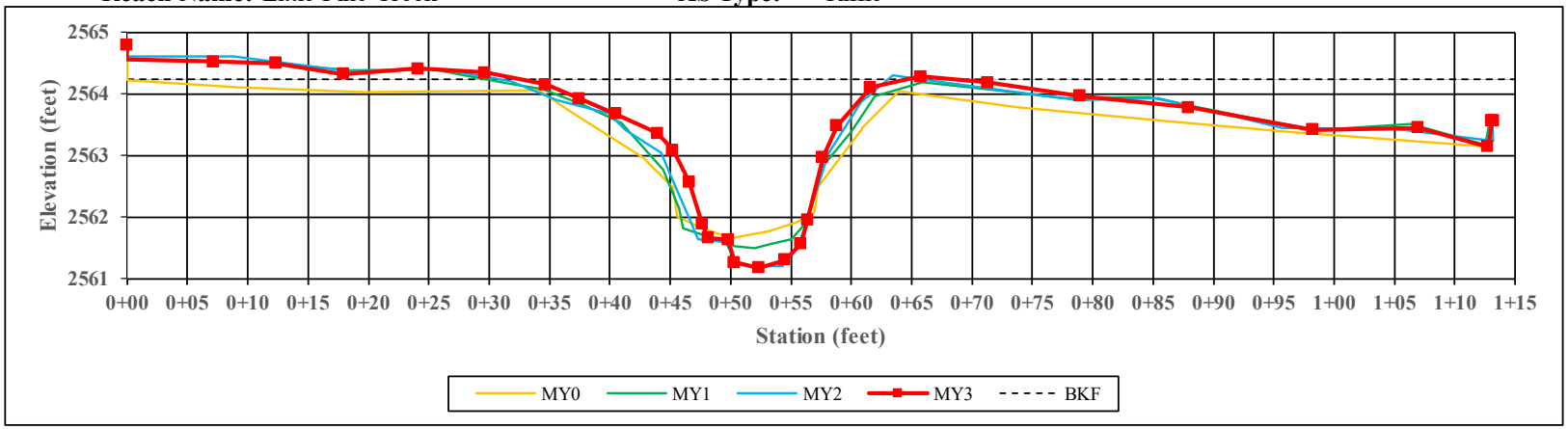
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	40.4	28.5	18.9	24.6	-	-	-	-
Floodprone Width (ft)	100.0	100.0	100.0	100.0	-	-	-	-
Bankfull Mean Depth (ft)	0.9	1.3	1.3	1.5	-	-	-	-
Bankfull Max Depth (ft)	2.6	2.4	2.3	2.7	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	37.4	35.7	24.2	37.4	-	-	-	-
Width/Depth Ratio	43.6	22.7	14.8	16.2	-	-	-	-
Entrenchment Ratio	2.5	3.5	5.3	4.1	-	-	-	-
Bank Height Ratio	1.0	1.0	0.9	0.9	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: LPC II **XS Number:** 7 **Station:** 117+00

Reach Name: Little Pine Creek **XS Type:** Riffle



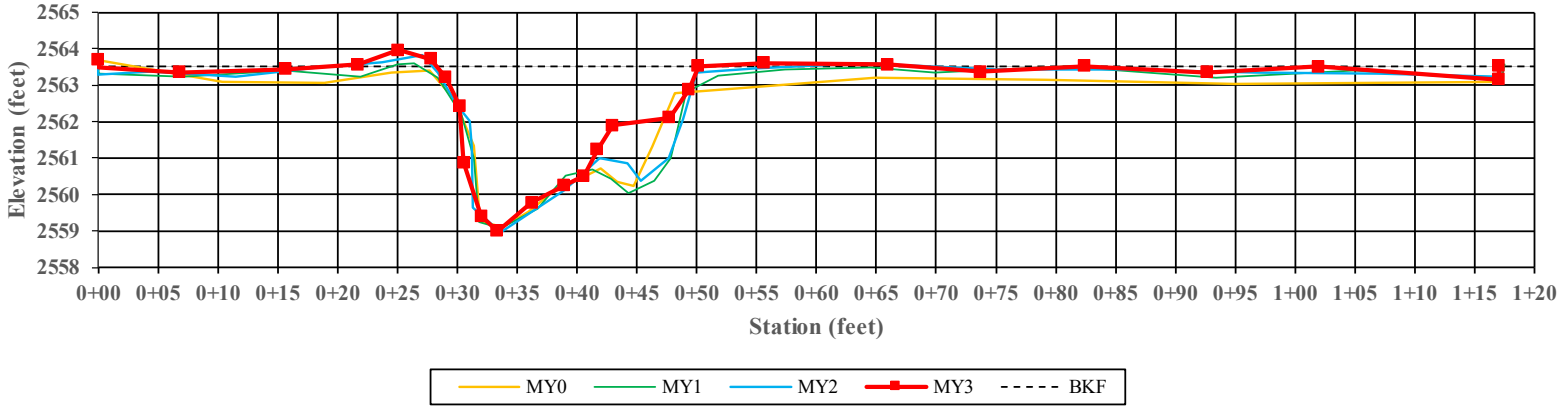
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	29.7	23.6	21.0	26.9	-	-	-	-
Floodprone Width (ft)	100.0	100.0	100.0	100.0	-	-	-	-
Bankfull Mean Depth (ft)	1.3	1.3	1.6	1.5	-	-	-	-
Bankfull Max Depth (ft)	2.4	2.3	2.7	3.1	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	39.2	31.4	33.0	39.2	-	-	-	-
Width/Depth Ratio	22.5	17.7	13.3	18.5	-	-	-	-
Entrenchment Ratio	3.4	4.2	4.8	3.7	-	-	-	-
Bank Height Ratio	1.0	1.2	1.0	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: LPC II **XS Number:** 8 **Station:** 117+79

Reach Name: Little Pine Creek **XS Type:** Pool



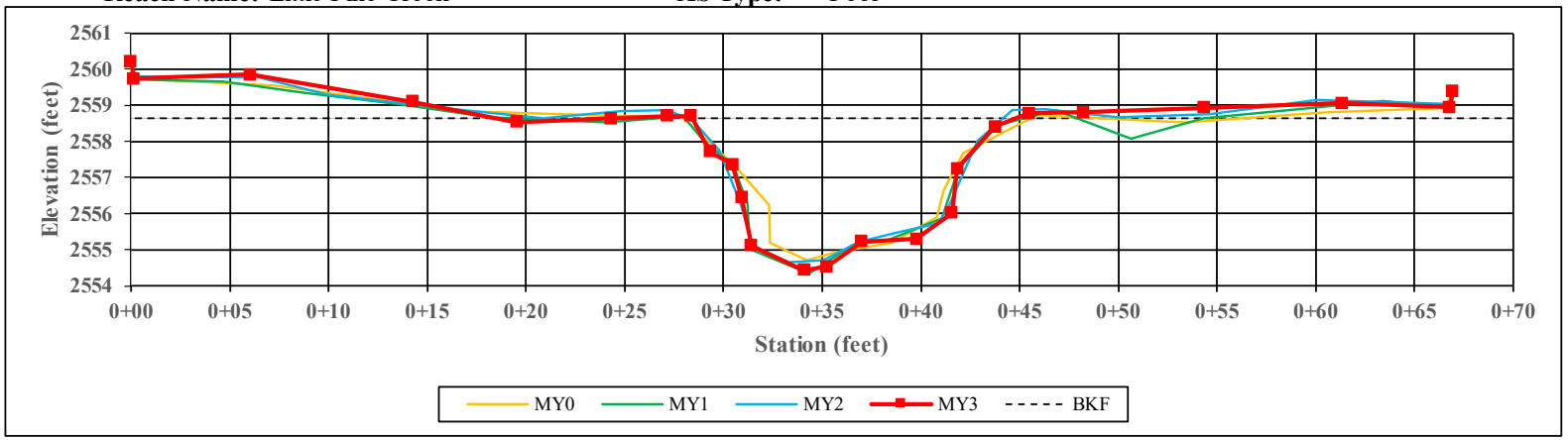
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	22.8	23.4	18.9	20.3	-	-	-	-
Floodprone Width (ft)	100.0	100.0	100.0	100.0	-	-	-	-
Bankfull Mean Depth (ft)	2.3	2.5	3.0	2.6	-	-	-	-
Bankfull Max Depth (ft)	4.1	4.2	4.4	4.5	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	52.8	58.2	56.6	53.2	-	-	-	-
Width/Depth Ratio	9.9	9.4	6.3	7.8	-	-	-	-
Entrenchment Ratio	4.4	4.3	5.3	4.9	-	-	-	-
Bank Height Ratio	1.0	1.0	0.9	1.0	-	-	-	-

Left Descending Bank

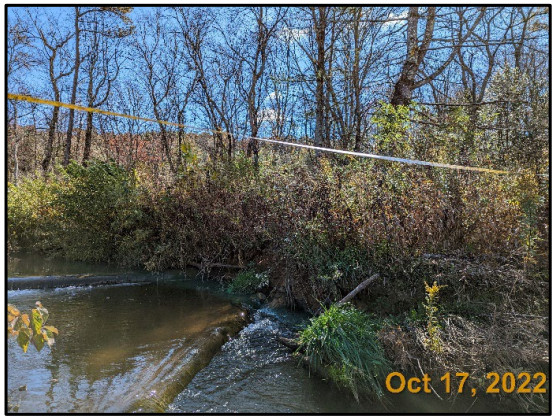
Right Descending Bank

Project Name: LPC II **XS Number:** 9 **Station:** 122+77

Reach Name: Little Pine Creek **XS Type:** Pool



CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	36.7	25.7	14.3	14.4	-	-	-	-
Floodprone Width (ft)	100.0	100.0	100.0	100.0	-	-	-	-
Bankfull Mean Depth (ft)	1.2	1.9	3.1	2.9	-	-	-	-
Bankfull Max Depth (ft)	4.1	4.5	4.2	4.2	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	42.3	47.9	44.2	42.3	-	-	-	-
Width/Depth Ratio	31.9	13.8	4.7	4.9	-	-	-	-
Entrenchment Ratio	2.7	3.9	7.0	6.9	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.0	-	-	-	-

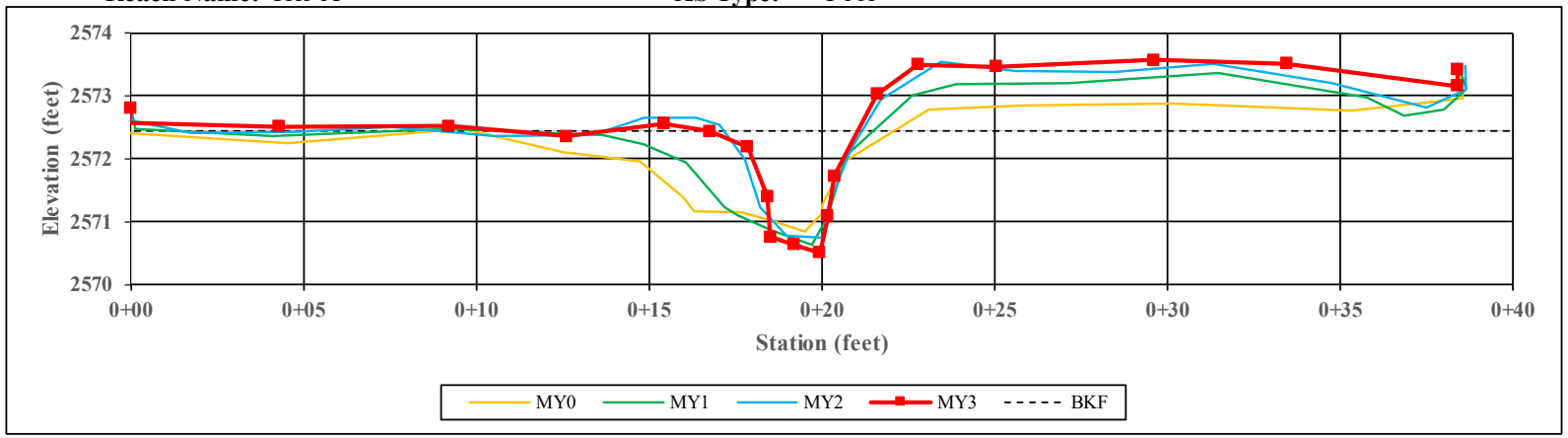


Left Descending Bank

Right Descending Bank

Project Name: LPC II **XS Number:** 10 **Station:** 200+31

Reach Name: Trib A **XS Type:** Pool



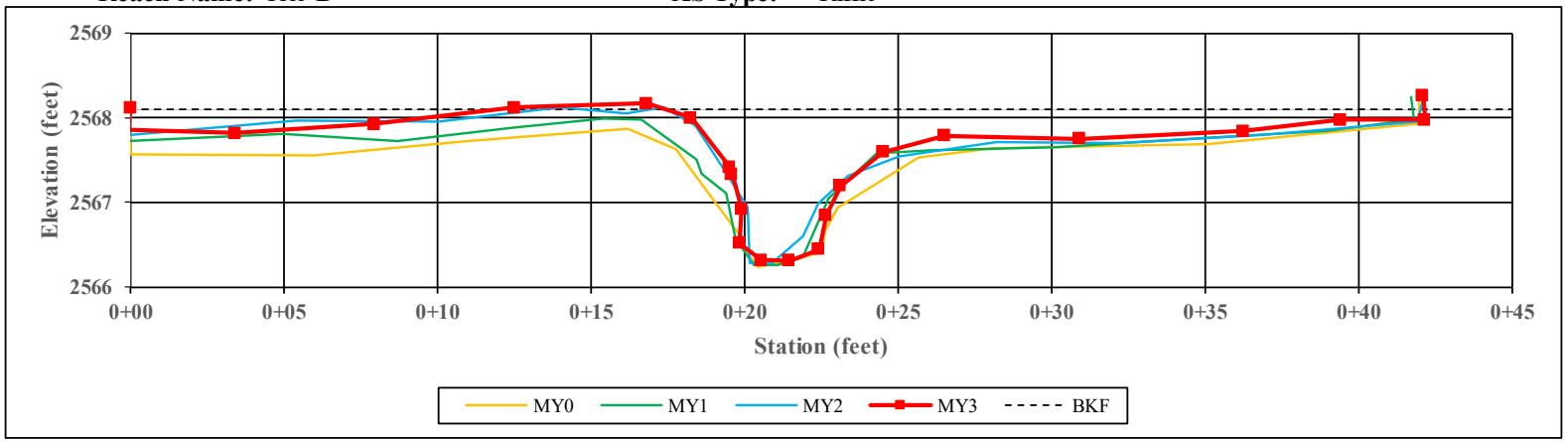
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	12.6	7.0	3.8	3.6	-	-	-	-
Floodprone Width (ft)	40.0	40.0	40.0	40.0	-	-	-	-
Bankfull Mean Depth (ft)	0.7	0.9	1.2	1.1	-	-	-	-
Bankfull Max Depth (ft)	1.6	1.7	1.8	1.9	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	9.2	6.1	4.4	3.8	-	-	-	-
Width/Depth Ratio	17.4	8.0	3.3	3.4	-	-	-	-
Entrenchment Ratio	3.2	5.7	10.5	11.0	-	-	-	-
Bank Height Ratio	1.2	0.9	0.7	1.1	-	-	-	-

Left Descending Bank

Downstream

Project Name: LPC II **XS Number:** 11 **Station:** 300+45

Reach Name: Trib B **XS Type:** Riffle



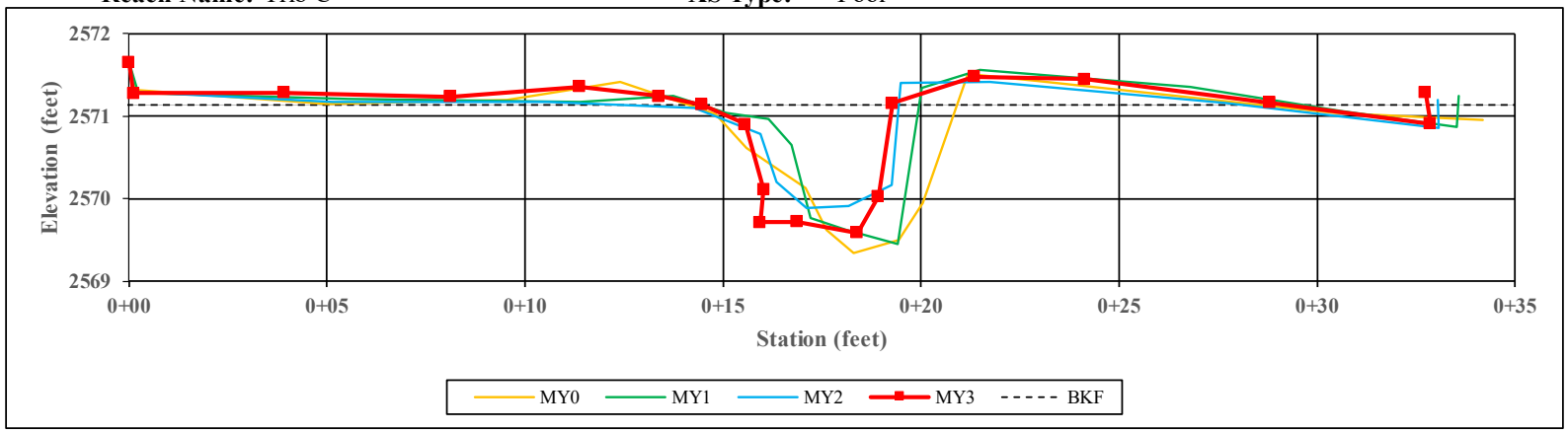
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	10.6	5.9	4.0	5.0	-	-	-	-
Floodprone Width (ft)	30.0	30.0	30.0	30.0	-	-	-	-
Bankfull Mean Depth (ft)	0.6	0.8	1.1	1.3	-	-	-	-
Bankfull Max Depth (ft)	1.4	1.4	1.6	1.8	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	6.5	4.6	4.6	6.5	-	-	-	-
Width/Depth Ratio	17.1	7.5	3.5	3.8	-	-	-	-
Entrenchment Ratio	2.8	5.1	7.4	6.0	-	-	-	-
Bank Height Ratio	1.1	0.8	0.6	0.8	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: LPC II **XS Number:** 12 **Station:** 402+52

Reach Name: Trib C **XS Type:** Pool



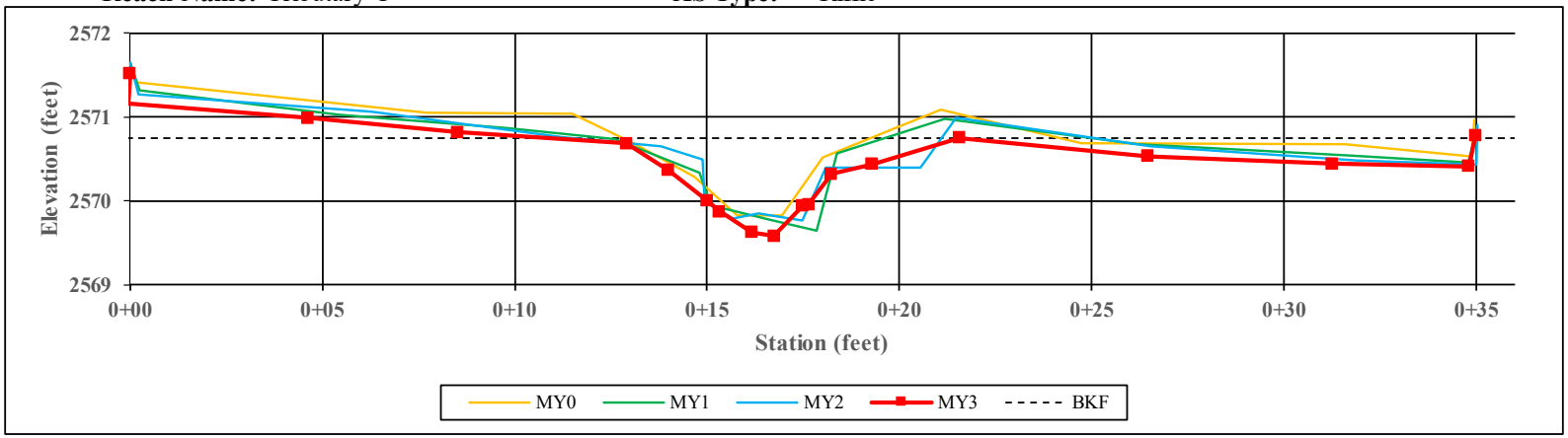
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	8.7	4.3	2.2	4.8	-	-	-	-
Floodprone Width (ft)	40.0	40.0	40.0	40.0	-	-	-	-
Bankfull Mean Depth (ft)	1.0	0.9	1.0	1.0	-	-	-	-
Bankfull Max Depth (ft)	2.1	1.6	1.2	1.6	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	8.7	3.7	2.3	4.8	-	-	-	-
Width/Depth Ratio	8.7	5.0	2.1	4.8	-	-	-	-
Entrenchment Ratio	4.6	9.3	18.1	8.3	-	-	-	-
Bank Height Ratio	1.0	0.7	0.3	1.1	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: LPC II **XS Number:** 13 **Station:** 402+75

Reach Name: Tributary C **XS Type:** Riffle



CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	9.3	5.4	5.7	5.3	-	-	-	-
Floodprone Width (ft)	40.0	40.0	40.0	40.0	-	-	-	-
Bankfull Mean Depth (ft)	0.6	0.6	0.5	0.7	-	-	-	-
Bankfull Max Depth (ft)	1.2	1.0	0.9	1.2	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	5.3	3.2	3.1	4.0	-	-	-	-
Width/Depth Ratio	16.4	9.3	10.5	7.1	-	-	-	-
Entrenchment Ratio	4.3	7.4	7.1	7.6	-	-	-	-
Bank Height Ratio	1.0	1.0	0.7	0.9	-	-	-	-

Left Descending Bank

Right Descending Bank

Table 10. Baseline Stream Data Summary
Little Pine Creek II Mitigation Site - Little Pine Creek Reach 1 (533 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)				-	23.7	-	-	-	1	16.4	-	-	21.4	-	2	-	24.0	-	-	25.5	-	-	-	1
Floodprone Width (ft)				-	100+	-	-	-	1	70.0	-	-	200	-	2	-	>50	-	-	100.0	-	-	-	1
Bankfull Mean Depth (ft)				-	1.9	-	-	-	1	1.9	-	-	2.1	-	2	-	1.7	-	-	1.2	-	-	-	1
Bankfull Max Depth (ft)				-	3.4	-	-	-	1	2.5	-	-	3.1	-	2	-	2.5	-	-	2.7	-	-	-	1
Bankfull Cross Sectional Area (ft^2)				-	45.6	-	-	-	1	18.0	-	-	27.2	-	2	-	41.3	-	-	31.6	-	-	-	1
Width/Depth Ratio				-	12.3	-	-	-	1	12.0	-	-	14.0	-	2	-	14.0	-	-	20.6	-	-	-	1
Entrenchment Ratio				-	4.1+	-	-	-	1	>2.2	-	-	>2.3	-	2	-	>2.2	-	-	3.9	-	-	-	1
Bank Height Ratio				-	1.4	-	-	-	1	1.0	-	-	1.1	-	2	-	1.0	-	-	1.1	-	-	-	1
d50 (mm)				-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-				36.4	58.4	52.5	80.1	19.8	12
Riffle Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	0.006	0.010	0.013	0.003	0.004	0.004	0.005	0.001	12
Pool Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-				16.4	25.0	26.5	32.2	6.0	5
Pool Max Depth (ft)				-	-	-	-	-	-	-	-	-	-	-	-				2.6	4.2	4.5	5.4	1.1	5
Pool Spacing (ft)				-	-	-	-	-	-	-	-	-	-	-	-	36.0	87.0	138.0	66.1	105.5	107.1	128.2	25.3	5
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	46.0	-	53.0	35.4	46.0	47.9	52.6	6.8	4
Radius of Curvature (ft)				-	-	-	-	-	-	-	-	-	-	-	-	48.0	-	96.0	51.0	55.0	54.0	60.0	3.7	3
Rc: Bankfull Width (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	2.0	-	4.0	2.0	2.2	2.2	2.4	0.1	3
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	168.0	-	288.0	160.0	170.0	170.0	180.0	7.5	2
Meander Width Ratio				-	-	-	-	-	-	-	-	-	-	-	-	2.0	-	5.0	1.4	1.8	1.9	2.1	0.3	4
Substrate, Bed and Transport Parameters																								
Reach Shear Stress (Competency) lb/ft^2				-						-						0.74			-					
Max Part Size (mm) Mobilized at Bankfull				-						-						122			-					
Stream Power (Transport Capacity) W/m^2				-						-						-			-					
Additional Reach Parameters																								
Drainage Area (mi^2)				2.57						2.4; 6.8						2.93			2.93					
Rosgen Classification				C						E4; C4						C4			C4					
Bankfull Velocity (fps)				-						5.1						3.4			-					
Bankfull Discharge (cfs)				-						224						140			-					
Valley Length (ft)				-						-						-			-					
^Channel Thalweg Length (ft)				-						-						-			-					
Sinuosity				-						1.1						1.09			1.09					
Water Surface Slope (ft/ft)				-						-						-			0.004					
Bankfull Slope (ft/ft)				-						0.01						-			0.005					
Bankfull Floodplain Area (acres)				-						-						-								
% of Reach with Eroding Banks				-						-						-								
Channel Stability or Habitat Metric				-						-						-								
Biological or Other				-						-						-								

- Information unavailable.

Non-Applicable.

^ Channel Centerline (ft): Based on stream centerline stationing from design stream stationing; accounts for breaks in conservation easement and utility right-of-ways.

Table 10. Baseline Stream Data Summary
Little Pine Creek II Mitigation Site - Little Pine Creek Reach 2A (1,506 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)				-	31.9	-	-	-	1	16.4	-	-	21.4	-	2	-	24.0	-	21.3	24.8	23.5	29.7	3.5	3
Floodprone Width (ft)				-	106+	-	-	-	1	70.0	-	-	200	-	2	-	>53	-	100.0	100.0	100.0	100.0	0.0	3
Bankfull Mean Depth (ft)				-	1.9	-	-	-	1	1.9	-	-	2.1	-	2	-	1.6	-	1.3	1.5	1.6	1.7	0.2	3
Bankfull Max Depth (ft)				-	3.4	-	-	-	1	2.5	-	-	3.1	-	2	-	2.3	-	2.4	2.5	2.5	2.7	0.1	3
Bankfull Cross Sectional Area (ft^2)				-	45.6	-	-	-	1	18.0	-	-	27.2	-	2	-	39.3	-	36.4	37.6	37.4	39.2	1.2	3
Width/Depth Ratio				-	12.3	-	-	-	1	12.0	-	-	14.0	-	2	-	14.6	-	12.5	16.6	14.7	22.5	4.3	3
Entrenchment Ratio				-	4.1+	-	-	-	1	>2.2	-	-	>2.3	-	2	-	>2.2	-	3.4	4.1	4.3	4.7	0.5	3
Bank Height Ratio				-	1.4	-	-	-	1	1.0	-	-	1.1	-	2	-	1.0	-	1.0	1.0	1.0	1.1	0.1	3
d50 (mm)				-	72.0	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-		
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-				22.1	50.4	52.3	86.9	18.7	12
Riffle Slope (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	0.004	-	0.06	0.006	0.016	0.014	0.030	0.007	12
Pool Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-				14.0	56.6	53.9	109.4	26.4	16
Pool Max Depth (ft)				-	-	-	-	-	-	-	-	-	-	-	-				1.6	4.6	4.1	7.3	1.6	16
Pool Spacing (ft)				-	-	-	-	-	-	-	-	-	-	-	-	36	-	168	35.0	122.6	124.9	215.4	49.9	15
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	-	-	-	-	-	48.0	-	120.0	52.5	86.4	86.2	109.4	15.8	8
Radius of Curvature (ft)				-	-	-	-	-	-	-	-	-	-	-	-	48.0	-	96.0	54.2	63.6	61.5	78.8	8.3	7
Rc: Bankfull Width (ft/ft)				-	-	-	-	-	-	-	-	-	-	-	-	2.0	-	4.0	2.2	2.6	2.5	3.2	0.3	7
Meander Wavelength (ft)				-	-	-	-	-	-	-	-	-	-	-	-	168	-	288	172.9	242.1	232.3	301.3	39.6	8
Meander Width Ratio				-	-	-	-	-	-	-	-	-	-	-	-	2	-	5.0	2.1	3.5	3.5	4.4	0.6	8
Substrate, Bed and Transport Parameters																								
Reach Shear Stress (Competency) lb/ft^2				-						-						0.74			-					
Max Part Size (mm) Mobilized at Bankfull				-						-						122			-					
Stream Power (Transport Capacity) W/m^2				-						-						-			-					
Additional Reach Parameters																								
Drainage Area (mi^2)				3.31						4.4						3.31			3.31					
Rosgen Classification				C/F						E4/C4						C4			4					
Bankfull Velocity (fps)				-						5.1						4.5			-					
Bankfull Discharge (cfs)				-						224						170.0			-					
Valley Length (ft)				-						-						-			1,840					
^Channel Thalweg Length (ft)				-						-						-			1,479					
Sinuosity				-						1.1						1.23			1.24					
Water Surface Slope (ft/ft)				-						-						0.013			0.010					
Bankfull Slope (ft/ft)				-						-						0.011			0.010					
Bankfull Floodplain Area (acres)				-						-						-								
% of Reach with Eroding Banks				-						-						-								
Channel Stability or Habitat Metric				-						-						-								
Biological or Other				-						-						-								

- Information unavailable.

Non-Applicable.

^ Channel Centerline (ft): Based on stream centerline stationing from design stream stationing; accounts for breaks in conservation easement and utility right-of-ways.

Table 10. Baseline Stream Data Summary
Little Pine Creek II Mitigation Site - Little Pine Creek Reach 2B (334 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)	-	-	-	-	31.9	-	-	-	1	16.4	-	-	21.4	-	2	-	24.0	-						
Floodprone Width (ft)				-	106+	-	-	-	1	70.0	-	-	>200	-	2	-	>53	-						
Bankfull Mean Depth (ft)				-	1.9	-	-	-	1	1.9	-	-	2.1	-	2	-	1.6	-						
Bankfull Max Depth (ft)				-	3.4	-	-	-	1	2.5	-	-	3.1	-	2	-	2.3	-						
Bankfull Cross Sectional Area (ft^2)		-		-	45.6	-	-	-	1	18.0	-	-	27.2	-	2	-	39.3	-						
Width/Depth Ratio				-	12.3	-	-	-	1	12.0	-	-	14.0	-	2	-	14.6	-						
Entrenchment Ratio				-	4.1+	-	-	-	1	>2.2	-	-	>2.3	-	2	-	>2.2	-						
Bank Height Ratio				-	1.4	-	-	-	1	1.0	-	-	1.1	-	2	-	1.0	-						
d50 (mm)				-	72.0	-	-	-	1	-	-	-	-	-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-				36.9	50.2	50.2	63.5	18.8	2
Riffle Slope (ft/ft)				-	-	-	-	-	-	-	0.024		-	-	-	0.004	-	0.06	0.02	0.02	0.00	0.02	-	2
Pool Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-				14.0	54.6	47.5	109.4	43.4	4
Pool Max Depth (ft)				-	-	-	-	-	-	-	3.1	-	-	-	-				6.2	6.7	6.7	7.3	0.5	4
Pool Spacing (ft)				-	-	-	-	-	-	-	224	-	-	-	-	36	-	168	35.0	90.2	96.3	133.2	46.6	4
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	-	105.0	-	-	-	-	48.0	-	120.0	-	83.5	-	-	-	1
Radius of Curvature (ft)				-	-	-	-	-	-	76.7	-	-	133.8	-	-	48.0	-	96.0	-	70.9	-	-	-	1
Rc: Bankfull Width (ft/ft)				-	-	-	-	-	-	2.5	-	-	4.36	-	-	2.0	-	4.0	-	2.9	-	-	-	1
Meander Wavelength (ft)				-	-	-	-	-	-	-	350	-	-	-	-	168	-	288	-	256.3	-	-	-	1
Meander Width Ratio				-	-	-	-	-	-	-	3.2	-	-	-	-	2	-	5.0	-	3.4	-	-	-	1
Substrate, Bed and Transport Parameters																								
Reach Shear Stress (Competency) lb/ft^2						-						-				0.74					-			
Max Part Size (mm) Mobilized at Bankfull						-						-				122					-			
Stream Power (Transport Capacity) W/m^2						-						-				-					-			
Additional Reach Parameters																								
Drainage Area (mi^2)						3.34						4.4				3.34					3.34			
Rosgen Classification						C/F						E4/C4				C4					C4			
Bankfull Velocity (fps)						-						5.1				4.5					-			
Bankfull Discharge (cfs)						-						224				170					-			
Valley Length (ft)						-						-				-					282			
^Channel Thalweg Length (ft)						-						-				-					334			
Sinuosity						-						1.1				1.23					1.18			
Water Surface Slope (ft/ft)						-						-				0.013					0.017			
Bankfull Slope (ft/ft)						-						-				0.011					0.010			
Bankfull Floodplain Area (acres)						-						-				-								
% of Reach with Eroding Banks						-						-				-								
Channel Stability or Habitat Metric						-						-				-								
Biological or Other						-						-				-								

- Information unavailable.

Non-Applicable.

^ Channel Centerline (ft): Based on stream centerline stationing from design stream stationing; accounts for breaks in conservation easement and utility right-of-ways.

Table 10. Baseline Stream Data Summary
Little Pine Creek II Mitigation Site - Little Pine Creek Tributary A (82 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)				-	6.6	-	-	-	1	6.2	6.8	-	12.6	5.8	3	-	9.5	-						
Floodprone Width (ft)				-	61.1	-	-	-	1	14.3	23.7	-	46.3	22.7	3	-	>18	-						
Bankfull Mean Depth (ft)				-	1.6	-	-	-	1	0.05	0.8	-	0.7	0.16	3	-	0.72	-						
Bankfull Max Depth (ft)				-	2.2	-	-	-	1	0.8	1.0	-	1.03	0.02	3	-	1.1	-						
Bankfull Cross Sectional Area (ft^2)				-	10.5	-	-	-	1	3.8	3.1	-	5.1	2.05	3	-	6.8	-						
Width/Depth Ratio				-	4.1	-	-	-	1	9.1	12.7	-	24.3	11.7	3	-	13.2	-						
Entrenchment Ratio				-	9.3	-	-	-	1	1.3	4.3	-	7.5	3.25	3	-	>2.2	-						
Bank Height Ratio				-	1.0	-	-	-	1	1.0	1.6	-	2.1	0.55	3	-	1.0	-						
d50 (mm)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.8	25.2	25.2	34.5	13.3	2
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.04	-	-	0.05	-	2	0.018	-	0.032	0.011	0.017	0.017	0.023	0.008	2
Pool Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.4	7.8	7.8	8.2	0.6	2
Pool Max Depth (ft)				-	-	-	-	-	-	0.7	1.7	1.9	2.5	0.7	4	-	1.1	-	1.7	1.7	1.7	1.7	0.0	2
Pool Spacing (ft)				-	-	-	-	-	-	15.8	61.4	78	90.5	32.7	3	14	-	67	-	15.3	-	-	-	1
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	19.0	-	-	26.0	-	2	19.0		77.0	10.1	12.0	12.0	13.9	1.9	2
Radius of Curvature (ft)				-	-	-	-	-	-	22.0	-	-	66.0	-	2	19.0	-	43.0	-	21.4	-	-	-	1
Rc: Bankfull Width (ft/ft)				-	-	-	-	-	-	2.65	-	-	8.75	-	2	2.0	-	4.0	-	1.9	-	-	-	1
Meander Wavelength (ft)				-	-	-	-	-	-	55	-	-	140	-	2	77	-	124	-	51.1	-	-	-	1
Meander Width Ratio				-	-	-	-	-	-	7.3	-	-	18.6	-	2	2.0		5.0	-	4.6	-	-	-	1
Substrate, Bed and Transport Parameters																								
Reach Shear Stress (Competency) lb/ft^2							-						-				-					-		
Max Part Size (mm) Mobilized at Bankfull							-						-				-					-		
Stream Power (Transport Capacity) W/m^2							-						-				-					-		
Additional Reach Parameters																								
Drainage Area (mi^2)							0.37						0.051; 0.12				0.38					0.38		
Rosgen Classification							E						B4/C4; A/B4				C					C5		
Bankfull Velocity (fps)							-						-				3.7					-		
Bankfull Discharge (cfs)							-						-				28.0					-		
Valley Length (ft)							-						-				-					78		
^Channel Thalweg Length (ft)							-						-				-					82		
Sinuosity							-						-				1.06					1.04		
Water Surface Slope (ft/ft)							-						-				-					0.013		
Bankfull Slope (ft/ft)							-						-				-					0.007		
Bankfull Floodplain Area (acres)							-						-				-							
% of Reach with Eroding Banks							-						-				-							
Channel Stability or Habitat Metric							-						-				-							
Biological or Other							-						-				-							

- Information unavailable.

Non-Applicable.

^ Channel Centerline (ft): Based on stream centerline stationing from design stream stationing; accounts for breaks in conservation easement and utility right-of-ways.

Table 10. Baseline Stream Data Summary
Little Pine Creek II Mitigation Site - Little Pine Creek Tributary B (77 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)				-	-	-	-	-	-	6.2	6.8	-	12.6	5.8	2	-	11.0	-	-	10.6	-	-	-	1
Floodprone Width (ft)				-	-	-	-	-	-	14.3	23.7	-	46.3	22.7	2	-	>18	-	-	30.0	-	-	-	1
Bankfull Mean Depth (ft)				-	-	-	-	-	-	0.05	0.8	-	0.7	0.16	2	-	0.8	-	-	0.6	-	-	-	1
Bankfull Max Depth (ft)				-	-	-	-	-	-	0.8	1.0	-	1.03	0.02	2	-	1.1	-	-	1.4	-	-	-	1
Bankfull Cross Sectional Area (ft^2)				-	-	-	-	-	-	3.8	3.1	-	5.1	2.05	2	-	8.5	-	-	6.5	-	-	-	1
Width/Depth Ratio				-	-	-	-	-	-	9.1	12.7	-	24.3	11.7	2	-	14.3	-	-	17.1	-	-	-	1
Entrenchment Ratio				-	-	-	-	-	-	1.3	4.3	-	7.5	3.25	2	-	>2.2	-	-	2.8	-	-	-	1
Bank Height Ratio				-	-	-	-	-	-	1.0	1.6	-	2.1	0.55	2	-	1.0	-	-	1.1	-	-	-	1
d50 (mm)				-	-	-	-	-	-		-	-		-	-	-	-	-	-	-	-	-	-	
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.4	21.0	21.0	22.6	2.3	2
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.04	-	-	0.05	-	2	0.008	-	0.015	0.005	0.015	0.015	0.025	0.014	2
Pool Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.19	9.16	9.16	14.1	7.04	2
Pool Max Depth (ft)				-	-	-	-	-	-	0.7	1.7	1.9	2.5	0.7	4	-	1.1	-	1.1	1.4	1.4	1.7	0.4	2
Pool Spacing (ft)				-	-	-	-	-	-	15.8	61.4	78	90.5	32.7	3	17	-	77	-	32.5	-	-	-	1
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	19.0	-	-	26.0	-	2	22.0	-	77.0	-	5.5	-	-	-	1
Radius of Curvature (ft)				-	-	-	-	-	-	22.0	-	-	66.0	-	2	22.0	-	44.0	21.8	24.6	-	27.3	-	2
Rc: Bankfull Width (ft/ft)				-	-	-	-	-	-	2.65	-	-	8.75	-	2	2.0	-	4.0	2.1	2.4	-	2.6	-	2
Meander Wavelength (ft)				-	-	-	-	-	-	55	-	-	140	-	2	77	-	132	-	-	-	-	-	-
Meander Width Ratio				-	-	-	-	-	-	7.3	-	-	18.6	-	2	2.0	-	5.0	-	-	-	-	-	-
Substrate, Bed and Transport Parameters																								
Reach Shear Stress (Competency) lb/ft^2				-						-						-			-					
Max Part Size (mm) Mobilized at Bankfull				-						-						-			-					
Stream Power (Transport Capacity) W/m^2				-						-						-			-					
Additional Reach Parameters																								
Drainage Area (mi^2)				0.11						0.051; 0.12						0.26			0.26					
Rosgen Classification				-						B4/C4; A/B4						C			C5					
Bankfull Velocity (fps)				-						-						2.5			-					
Bankfull Discharge (cfs)				-						-						21.0			-					
Valley Length (ft)				-						-						-			75.6					
* Channel Thalweg Length (ft)				-						-						-			77.8					
^ Channel Centerline (ft)				-						-						-			-					
Sinuosity				-						-						1.09			1.03					
Water Surface Slope (ft/ft)				-						-						-			0.015					
Bankfull Slope (ft/ft)				-						-						-			0.008					
Bankfull Floodplain Area (acres)				-						-						-								
% of Reach with Eroding Banks				-						-						-								
Channel Stability or Habitat Metric				-						-						-								
Biological or Other				-						-						-								

- Information unavailable.

Non-Applicable.

* Channel Thalweg Length (ft): Based on actual thalweg calculations from the as-built survey, accounts for breaks in conservation easement and utility right-of-ways.

^ Channel Centerline (ft): Based on stream centerline stationing from design stream stationing; accounts for breaks in conservation easement and utility right-of-ways.

Table 10. Baseline Stream Data Summary
Little Pine Creek II Mitigation Site - Little Pine Creek Tributary C (577 feet)

Parameter	Regional Curve			Pre-Existing Condition						Reference Reach Data						Design			As-Built / Baseline					
Dimension & Substrate - Riffle	**LL**	**UL**	**Eq.**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Med**	**Max**	**SD**	**N**
Bankfull Width (ft)				-	8.0	-	-	-	1	6.2	6.8	-	12.6	5.8	2	-	6.5	-	-	9.3	-	-	-	1
Floodprone Width (ft)				-	16.9	-	-	-	1	14.3	23.7	-	46.3	22.7	2	-	>13	-	-	40.0	-	-	-	1
Bankfull Mean Depth (ft)				-	0.9	-	-	-	1	0.05	0.8	-	0.7	0.16	2	-	0.5	-	-	0.6	-	-	-	1
Bankfull Max Depth (ft)				-	1.6	-	-	-	1	0.8	1.0	-	1.03	0.02	2	-	0.7	-	-	1.2	-	-	-	1
Bankfull Cross Sectional Area (ft^2)				-	7.1	-	-	-	1	3.8	3.1	-	5.1	2.05	2	-	3.1	-	-	5.3	-	-	-	1
Width/Depth Ratio				-	8.9	-	-	-	1	9.1	12.7	-	24.3	11.7	2	-	13.7	-	-	16.4	-	-	-	1
Entrenchment Ratio				-	2.1	-	-	-	1	1.3	4.3	-	7.5	3.25	2	-	>2.2	-	-	4.3	-	-	-	1
Bank Height Ratio				-	2.0	-	-	-	1	1.0	1.6	-	2.1	0.55	2	-	1.0	-	-	1.0	-	-	-	1
d50 (mm)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Profile																								
Riffle Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.4	24.3	20.2	52.9	13.4	13
Riffle Slope (ft/ft)				-	-	-	-	-	-	0.04	-	-	0.05	-	2	0.023	-	0.042	0.005	0.021	0.010	0.042	0.013	13
Pool Length (ft)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.5	12.3	12.4	21.1	5.7	15
Pool Max Depth (ft)				-	-	-	-	-	-	0.7	1.7	1.9	2.5	0.7	4	-	0.7	-	0.6	1.5	1.3	2.6	0.8	15
Pool Spacing (ft)				-	-	-	-	-	-	15.8	61.4	78	90.5	32.7	3	10.0	-	46.0	15.7	33.3	28.1	56.6	14.1	14
Pattern																								
Channel Belt Width (ft)				-	-	-	-	-	-	19.0	-	-	26.0	-	2	13.0	-	46.0	13.3	24.2	23.8	32.1	4.9	13
Radius of Curvature (ft)				-	-	-	-	-	-	22.0	-	-	66.0	-	2	13.0	-	26.0	9.3	14.3	13.3	25.8	4.0	13
Rc: Bankfull Width (ft/ft)				-	-	-	-	-	-	2.65	-	-	8.75	-	2	2.0	-	4.0	1.0	1.5	1.4	2.8	0.4	13
Meander Wavelength (ft)				-	-	-	-	-	-	55	-	-	140	-	2	46	-	78	44.3	59.0	58.7	75.5	11.0	8
Meander Width Ratio				-	-	-	-	-	-	7.3	-	-	18.6	-	2	2.0	-	5.0	1.4	2.5	2.5	3.5	0.6	13
Substrate, Bed and Transport Parameters																								
Reach Shear Stress (Competency) lb/ft^2				-						-						-			-					
Max Part Size (mm) Mobilized at Bankfull				-						-						-			-					
Stream Power (Transport Capacity) W/m^2				-						-						-			-					
Additional Reach Parameters																								
Drainage Area (mi^2)				0.11						0.051; 0.12						0.11			0.11					
Rosgen Classification				G						B4/C4; A/B4						C			C					
Bankfull Velocity (fps)				-						-						2.9			-					
Bankfull Discharge (cfs)				-						-						10.0			-					
Valley Length (ft)				-						-						-			1,616					
* Channel Thalweg Length (ft)				-						-						-			577					
^ Channel Centerline (ft)				-						-						-			-					
Sinuosity				-						-						1.23			1.31					
Water Surface Slope (ft/ft)				-						-						-			0.022					
Bankfull Slope (ft/ft)				-						-						-			0.021					
Bankfull Floodplain Area (acres)				-						-						-								
% of Reach with Eroding Banks				-						-						-								
Channel Stability or Habitat Metric				-						-						-								
Biological or Other				-						-						-								

- Information unavailable.

Non-Applicable.

* Channel Thalweg Length (ft): Based on actual thalweg calculations from the as-built survey, accounts for breaks in conservation easement and utility right-of-ways.

^ Channel Centerline (ft): Based on stream centerline stationing from design stream stationing; accounts for breaks in conservation easement and utility right-of-ways.

Table 11a. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters – Cross Sections)
Little Pine Creek II Stream and Wetland Mitigation Site

	Cross Section 1 (Riffle) Little Pine Creek Reach 1								Cross Section 2 (Pool) Little Pine Creek Reach 1								Cross Section 3 (Pool) Little Pine Creek Reach 2A							
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record Elevation (datum) Used	2574.7	2575.2	2574.7	2575.0					2574.5	2574.8	2575.1	2575.5					2571.7	2571.9	2571.9	2572.1				
Low Bank Height Elevation (datum) Used	2574.7	2574.5	2575.2	2575.4					2574.5	2574.4	2574.8	2575.0					2571.7	2571.9	2572.0	2572.3				
Bankfull Width (ft)	25.5	12.6	13.8	14.9					23.7	20.9	14.1	15.5					28.0	24.0	14.8	14.9				
Floodprone Width (ft)	100.0	100.0	100.0	100.0					70.0	70.0	70.0	70.0					100.0	100.0	100.0	100.0				
Bankfull Mean Depth (ft)	1.2	2.7	2.2	2.1					1.8	1.8	2.6	2.7					1.3	1.4	2.1	2.3				
Bankfull Max Depth (ft)	2.7	3.3	2.7	2.9					4.0	2.8	3.2	3.6					3.1	3.0	3.2	3.7				
Bankfull Cross Sectional Area (ft^2)	31.6	34.5	29.8	31.6					42.3	37.3	36.3	42.3					36.7	34.2	31.5	34.3				
Bankfull Width/Depth Ratio	20.6	4.6	6.4	7.0					13.3	11.7	5.5	5.7					21.4	16.8	6.9	6.4				
Bankfull Entrenchment Ratio	3.9	8.0	7.2	6.7					3.0	3.4	5.0	4.5					3.6	4.2	6.8	6.7				
Bankfull Bank Height Ratio	1.1	0.8	1.2	1.2					1.0	0.8	0.8	0.8					1.0	1.0	1.0	1.0				
Low Top of Bank Depth (ft)	2.8	2.5	3.2	3.4					3.9	2.4	2.8	3.1					3.1	3.0	3.3	3.8				

	Cross Section 4 (Riffle) Little Pine Creek Reach 2A								Cross Section 5 (Pool) Little Pine Creek Reach 2A								Cross Section 6 (Riffle) Little Pine Creek Reach 2A							
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record Elevation (datum) Used	2571.1	2571.2	2571.2	2571.3					2570.9	2570.6	2570.8	2570.3					2567.6	2567.6	2567.3	2567.8				
Low Bank Height Elevation (datum) Used	2571.1	2571.2	2571.5	2571.5					2570.9	2570.6	2570.7	2570.6					2567.6	2567.6	2567.5	2567.5				
Bankfull Width (ft)	21.3	22.5	21.1	21.0					22.2	30.4	16.1	14.1					40.4	28.5	18.9	24.6				
Floodprone Width (ft)	100.0	100.0	100.0	100.0					100.0	100.0	100.0	100.0					100.0	100.0	100.0	100.0				
Bankfull Mean Depth (ft)	1.7	1.8	1.7	1.7					1.7	1.3	2.8	2.7					1.6	1.3	1.3	1.5				
Bankfull Max Depth (ft)	2.7	2.8	2.8	2.9					3.1	4.2	4.8	4.2					2.5	2.4	2.3	2.7				
Bankfull Cross Sectional Area (ft^2)	36.4	41.0	36.8	36.4					37.9	40.1	45.7	37.9					37.4	35.7	24.2	37.4				
Bankfull Width/Depth Ratio	12.5	12.4	12.1	12.1					13.0	23.0	5.6	5.2					14.7	22.7	14.8	16.2				
Bankfull Entrenchment Ratio	4.7	4.4	4.7	4.8					4.5	3.3	6.2	7.1					4.3	3.5	5.3	4.1				
Bankfull Bank Height Ratio	1.1	1.1	1.1	1.0					1.1	1.0	1.1	1.1					1.0	1.0	0.9	0.9				
Low Top of Bank Depth (ft)	2.9	2.8	3.1	3.0					3.6	4.2	4.7	4.5					2.6	2.4	2.6	2.4				

	Cross Section 7 (Riffle) Little Pine Creek Reach 2A								Cross Section 8 (Pool) Little Pine Creek Reach 2A								Cross Section 9 (Pool) Little Pine Creek Reach 2B							
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record Elevation (datum) Used	2564.1	2563.8	2563.9	2564.2					2563.4	2563.3	2563.4	2563.5					2558.8	2558.9	2558.9	2558.7				
Low Bank Height Elevation (datum) Used	2564.1	2564.2	2563.9	2564.3					2563.4	2563.4	2563.4	2563.5					2558.8	2558.7	2558.9	2558.7				
Bankfull Width (ft)	29.7	23.6	21.0	26.9					24.4	23.4	18.9	20.3					36.7	25.7	14.3	14.4				
Floodprone Width (ft)	100.0	100.0	100.0	100.0					100.0	100.0	100.0	100.0					100.0	100.0	100.0	100.0				
Bankfull Mean Depth (ft)	1.3	1.3	1.6	1.5					2.2	2.5	3.0	2.6					1.2	1.9	3.1	2.9				
Bankfull Max Depth (ft)	2.4	2.3	2.7	3.1					4.1	4.2	4.4	4.5					4.1	4.5	4.2	4.2				
Bankfull Cross Sectional Area (ft^2)	39.2	31.4	33.0	39.2					53.2	58.2	56.6	53.2					42.3	47.9	44.2	42.3				
Bankfull Width/Depth Ratio	22.5	17.7	13.3	18.5					11.2	9.4	6.3	7.8					31.9	13.8	4.7	4.9				
Bankfull Entrenchment Ratio	3.4	4.2	4.8	3.7					4.1	4.3	5.3	4.9					2.7	3.9	7.0	6.9				
Bankfull Bank Height Ratio	1.0	1.0	0.9	1.0					1.0	1.1	1.0	1.0					1.0	1.0	1.0	1.0				
Low Top of Bank Depth (ft)	2.4	2.7	2.7	3.1					4.3	4.4	4.4	4.5					4.1	4.3	4.2	4.3				

	Cross Section 10 (Pool) Tributary A								Cross Section 11 (Riffle) Tributary B								Cross Section 12 (Pool) Tributary C							
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record Elevation (datum) Used	2572.8	2572.4	2572.5	2572.4					2567.9	2567.6	2567.9	2568.1					2571.4	2571.0	2571.1	2571.1				
Low Bank Height Elevation (datum) Used	2572.8	2572.4	2572.7	2572.6					2567.9	2567.6	2567.5	2567.8					2571.4	2571.2	2571.1	2571.2				
Bankfull Width (ft)	12.6	7.0	3.8	3.6					10.6	5.9	4.0	5.0					8.7	4.3	2.2	4.8				
Floodprone Width (ft)	40.0	40.0	40.0	40.0					30.0	30.0	30.0	30.0					40.0	40.0	40.0	40.0				
Bankfull Mean Depth (ft)	0.7	0.9	1.2	1.1					0.6	0.8	1.1	1.3					1.0	0.9	1.0	1.0				
Bankfull Max Depth (ft)	1.6	1.7	1.8	1.9					1.4	1.4	1.6	1.8					2.1	1.6	1.2	1.6				
Bankfull Cross Sectional Area (ft^2)	9.2	6.1	4.4	3.8					6.5	4.6	4.6	6.5					8.7	3.7	2.3	4.8				
Bankfull Width/Depth Ratio	17.4	8.0	3.3	3.4					17.1	7.5	3.5	3.8					8.7	5.0	2.1	4.8				
Bankfull Entrenchment Ratio	3.2	5.7	10.5	11.0					2.8	5.1	7.4	6.0					4.6	9.3	18.1	8.3				
Bankfull Bank Height Ratio	1.2	0.9	0.7	1.1					1.1	0.8	0.6	0.8					1.0	0.7	0.3	1.1				
Low Top of Bank Depth (ft)	1.9	1.7	1.9	2.0					1.6	1.3	1.3	1.5					2.1	1.8	1.2	1.2				

	Cross Section 13 (Riffle) Tributary C							
Dimension	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record Elevation (datum) Used	2571.1	2570.7	2570.6	2570.7				
Low Bank Height Elevation (datum) Used	2571.1	2571.0	2570.6	2570.7				
Bankfull Width (ft)	9.3	5.4	5.7	5.3				
Floodprone Width (ft)	40.0	40.0	40.0	40.0				
Bankfull Mean Depth (ft)	0.6	0.6	0.5	0.7				
Bankfull Max Depth (ft)	1.2	1.0	0.9	1.2				
Bankfull Cross Sectional Area (ft^2)	5.3	3.2	3.1	4.0				
Bankfull Width/Depth Ratio	16.4	9.3	10.5	7.1				
Bankfull Entrenchment Ratio	4.3	7.4	7.1	7.6				
Bankfull Bank Height Ratio	1.0	1.0	0.7	0.9				
Low Top of Bank Depth (ft)	1.3	1.3	0.9	1.1				

Table 11b. Monitoring Data - Stream Reach Data Summary
LPCII - Little Pine Creek Reach 1 (533 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 5						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**
Bankfull Width (ft)	-	25.5	-	-	-	1	-	12.6	-	-	-	1	-	13.8	-	-	-	1	-	14.9	-	-	-	1												
Floodprone Width (ft)	-	100.0	-	-	-	1	-	100.0	-	-	-	1	-	100.0	-	-	-	1	-	100.0	-	-	-	1												
Bankfull Mean Depth (ft)	-	1.2	-	-	-	1	-	2.7	-	-	-	1	-	2.2	-	-	-	1	-	2.1	-	-	-	1												
Bankfull Max Depth (ft)	-	2.7	-	-	-	1	-	3.3	-	-	-	1	-	2.7	-	-	-	1	-	2.9	-	-	-	1												
Bankfull Cross-Sectional Area (ft^2)	-	31.6	-	-	-	1	-	34.5	-	-	-	1	-	29.8	-	-	-	1	-	31.6	-	-	-	1												
Width/Depth Ratio	-	20.6	-	-	-	1	-	4.6	-	-	-	1	-	6.4	-	-	-	1	-	7.0	-	-	-	1												
Entrenchment Ratio	-	3.9	-	-	-	1	-	8.0	-	-	-	1	-	7.2	-	-	-	1	-	6.7	-	-	-	1												
Bank Height Ratio	-	1.1	-	-	-	1	-	0.8	-	-	-	1	-	1.2	-	-	-	1	-	1.2	-	-	-	1												
Profile																																				
Riffle Length (ft)	36.4	58.4	52.5	80.1	19.8	12																														
Riffle Slope (ft/ft)	0.003	0.004	0.004	0.005	0.001	12																														
Pool Length (ft)	16.4	25.0	26.5	32.2	6.0	5																														
Pool Max Depth (ft)	2.6	4.2	4.5	5.4	1.1	5																														
Pool Spacing (ft)	66.1	105.5	107.1	128.2	25.3	5																														
Pattern																																				
Channel Belt Width (ft)	35.4	46.0	47.9	52.6	6.8	4																														
Radius of Curvature (ft)	51.0	55.0	54.0	60.0	3.7	3																														
Rc: Bankfull Width (ft/ft)	2.0	2.2	2.2	2.4	0.1	3																														
Meander Wavelength (ft)	160.0	170.0	170.0	180.0	7.5	2																														
Meander Width Ratio	1.4	1.8	1.9	2.1	0.3	4																														
Additional Reach Parameters																																				
Rosgen Classification	C4																																			
Channel Thalweg Length (ft)	533																																			
Sinuosity (ft)	1.11																																			
Water Surface Slope (Channel) (ft/ft)	0.004																																			
Bankfull Slope (ft/ft)	0.005																																			
Ri% / Ru% / P% / G% / S%	50%	10%	21%	19%	0%																															

- 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
Little Pine Creek II - Little Pine Creek Reach 2A (1,506 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 5						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**
Bankfull Width (ft)	21.3	24.8	23.5	29.7	3.5	3	22.5	24.9	23.6	28.5	3.20	3	18.9	20.3	21.0	21.1	1.2	3	21.0	24.2	24.6	26.9	3.0	3												
Floodprone Width (ft)	100.0	100.0	100.0	100.0	0.0	3	100	100	100	100	0.00	3	100	100	100	100	0.0	3	100.0	100.0	100.0	100.0	0.0	3												
Bankfull Mean Depth (ft)	1.3	1.5	1.6	1.7	0.2	3	1.3	1.5	1.3	1.8	0.31	3	1.3	1.5	1.6	1.7	0.2	3	1.5	1.6	1.5	1.7	0.1	3												
Bankfull Max Depth (ft)	2.4	2.5	2.5	2.7	0.1	3	2.3	2.5	2.4	2.8	0.29	3	2.3	2.6	2.7	2.8	0.3	3	2.7	2.9	2.9	3.1	0.2	3												
Bankfull Cross-Sectional Area (ft^2)	36.4	37.6	37.4	39.2	1.2	3	31.4	36.1	35.7	41.0	4.79	3	24.2	31.3	33.0	36.8	6.5	3	36.4	37.7	37.4	39.2	1.4	3												
Width/Depth Ratio	12.5	16.6	14.7	22.5	4.3	3	12.4	17.6	17.7	22.7	5.18	3	12.1	13.4	13.3	14.8	1.3	3	12.1	15.6	16.2	18.5	3.2	3												
Entrenchment Ratio	3.4	4.1	4.3	4.7	0.5	3	3.5	4.1	4.2	4.4	0.49	3	4.7	4.9	4.8	5.3	0.3	3	3.7	4.2	4.1	4.8	0.5	3												
Bank Height Ratio	1.0	1.0	1.0	1.1	0.1	3	1.0	1.0	1.0	1.1	0.06	3	0.9	1.0	0.9	1.1	0.1	3	0.9	1.0	1.0	1.0	0.1	3												
Profile																																				
Riffle Length (ft)	22.1	50.4	52.3	86.9	18.7	12																														
Riffle Slope (ft/ft)	0.006	0.016	0.014	0.030	0.007	12																														
Pool Length (ft)	14.0	56.6	53.9	109.4	26.4	16																														
Pool Max Depth (ft)	1.6	4.6	4.1	7.3	1.6	16																														
Pool Spacing (ft)	35.0	122.6	124.9	215.4	49.9	15																														
Pattern																																				
Channel Belt Width (ft)	52.5	86.4	86.2	109.4	15.8	8																														
Radius of Curvature (ft)	54.2	63.6	61.5	78.8	8.3	7																														
Rc: Bankfull Width (ft/ft)	2.2	2.6	2.5	3.2	0.3	7																														
Meander Wavelength (ft)	172.9	242.1	232.3	301.3	39.6	8																														
Meander Width Ratio	2.1	3.5	3.5	4.4	0.6	8																														
Additional Reach Parameters																																				
Rosgen Classification	C4																																			
Channel Thalweg Length (ft)	1,506																																			
Sinuosity (ft)	1.24																																			
Water Surface Slope (Channel) (ft/ft)	0.0099																																			
Bankfull Slope (ft/ft)	0.0082																																			
Ri% / Ru% / P% / G% / S%	32%	3%	48%	16%	0%																															

- 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
Little Pine Creek II - Little Pine Creek Reach 2B (334 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 5						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**
Bankfull Width (ft)																																				
Floodprone Width (ft)																																				
Bankfull Mean Depth (ft)																																				
Bankfull Max Depth (ft)																																				
Bankfull Cross-Sectional Area (ft^2)																																				
Width/Depth Ratio																																				
Entrenchment Ratio																																				
Bank Height Ratio																																				
Profile																																				
Riffle Length (ft)	36.9	50.2	50.2	63.5	18.8	2																														
Riffle Slope (ft/ft)	0.02	0.02	0.01	0.02	N/A	2																														
Pool Length (ft)	14.0	54.6	47.5	109.4	43.4	4																														
Pool Max Depth (ft)	6.2	6.7	6.7	7.3	0.5	4																														
Pool Spacing (ft)	35.0	90.2	96.3	133.2	46.6	4																														
Pattern																																				
Channel Belt Width (ft)	-	83.5	-	-	-	1																														
Radius of Curvature (ft)	-	70.9	-	-	-	1																														
Rc: Bankfull Width (ft/ft)	-	2.9	-	-	-	1																														
Meander Wavelength (ft)	-	256.3	-	-	-	1																														
Meander Width Ratio	-	3.4	-	-	-	1																														
Additional Reach Parameters																																				
Rosgen Classification	C4																																			
Channel Thalweg Length (ft)	334																																			
Sinuosity (ft)	1.18																																			
Water Surface Slope (Channel) (ft/ft)	0.017																																			
Bankfull Slope (ft/ft)	0.010																																			
Ri% / Ru% / P% / G% / S%	33%	4%	45%	19%	0%																															

- 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
LPC II - Trib A (82 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 5						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**
Bankfull Width (ft)																																				
Floodprone Width (ft)																																				
Bankfull Mean Depth (ft)																																				
Bankfull Max Depth (ft)																																				
Bankfull Cross-Sectional Area (ft^2)																																				
Width/Depth Ratio																																				
Entrenchment Ratio																																				
Bank Height Ratio																																				
Profile																																				
Riffle Length (ft)	15.8	25.2	25.2	34.5	13.3	2																														
Riffle Slope (ft/ft)	0.011	0.017	0.017	0.023	0.008	2																														
Pool Length (ft)	7.4	7.8	7.8	8.2	0.6	2																														
Pool Max Depth (ft)	1.7	1.7	1.7	1.7	0.0	2																														
Pool Spacing (ft)	15.3	15.3	15.3	15.3	N/A	1																														
Pattern																																				
Channel Belt Width (ft)	10.1	12.0	12.0	13.9	1.9	2																														
Radius of Curvature (ft)	9.8	11.0	11.0	12.2	1.2	2																														
Rc: Bankfull Width (ft/ft)	0.9	1.0	1.0	1.1	0.1	2																														
Meander Length (ft)	51.1	51.1	51.1	51.1	N/A	1																														
Meander Length Ratio (L_m/W_{bkf}) (ft)	4.6	4.6	4.6	4.6	N/A	1																														
Additional Reach Parameters																																				
Rosgen Classification	C5																																			
Channel Thalweg Length (ft)	82																																			
Sinuosity (ft)	1.04																																			
Water Surface Slope (Channel) (ft/ft)	0.0130																																			
Bankfull Slope (ft/ft)	0.0070																																			
Ri% / Ru% / P% / G% / S%	61%	11%	19%	9%	0%																															

- 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
LPC II - Trib B (77 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 5						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**
Bankfull Width (ft)	-	10.6	-	-	-	1	-	5.9	-	-	-	1	-	4.0	-	-	-	1	-	5.0	-	-	-	1												
Floodprone Width (ft)	-	30.0	-	-	-	1	-	30	-	-	-	1	-	30	-	-	-	1	-	30	-	-	-	1												
Bankfull Mean Depth (ft)	-	0.6	-	-	-	1	-	0.8	-	-	-	1	-	1.1	-	-	-	1	-	1.3	-	-	-	1												
Bankfull Max Depth (ft)	-	1.4	-	-	-	1	-	1.4	-	-	-	1	-	1.6	-	-	-	1	-	1.8	-	-	-	1												
Bankfull Cross-Sectional Area (ft^2)	-	6.5	-	-	-	1	-	4.6	-	-	-	1	-	4.6	-	-	-	1	-	6.5	-	-	-	1												
Width/Depth Ratio	-	17.1	-	-	-	1	-	7.5	-	-	-	1	-	3.5	-	-	-	1	-	3.8	-	-	-	1												
Entrenchment Ratio	-	2.8	-	-	-	1	-	5.1	-	-	-	1	-	7.4	-	-	-	1	-	6.0	-	-	-	1												
Bank Height Ratio	-	1.1	-	-	-	1	-	0.8	-	-	-	1	-	0.6	-	-	-	1	-	0.8	-	-	-	1												
Profile																																				
Riffle Length (ft)	19.4	21.0	21.0	22.6	2.3	2																														
Riffle Slope (ft/ft)	0.005	0.015	0.015	0.025	0.014	2																														
Pool Length (ft)	4.2	9.2	9.2	14.1	7.0	2																														
Pool Max Depth (ft)	1.1	1.4	1.4	1.7	0.4	2																														
Pool Spacing (ft)	-	32.5	-	-	-	1																														
Pattern																																				
Channel Belt Width (ft)	-	5.5	-	-	-	1																														
Radius of Curvature (ft)	21.8	24.6	-	27.3	-	2																														
Rc: Bankfull Width (ft/ft)	2.1	2.4	-	2.6	-	2																														
Meander Length (ft)	-	-	-	-	-	-																														
Meander Length Ratio (L_m/W_{bkf}) (ft)	-	-	-	-	-	-																														
Additional Reach Parameters																																				
Rosgen Classification	C5																																			
Channel Thalweg Length (ft)	78																																			
Sinuosity (ft)	1.03																																			
Water Surface Slope (Channel) (ft/ft)	0.0150																																			
Bankfull Slope (ft/ft)	0.0080																																			
Ri% / Ru% / P% / G% / S%	54%	6%	24%	16%	0%																															

- 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
LPC II - Trib C (577 feet)

Parameter	Baseline						MY - 1						MY - 2						MY - 3						MY - 4						MY - 5					
Dimension & Substrate - Riffle	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**	**Min**	**Mean**	**Med**	**Max**	**SD**	**n**
Bankfull Width (ft)	-	9.3	-	-	-	1	-	5.4	-	-	-	1	-	5.7	-	-	-	1	-	5.3	-	-	-	1												
Floodprone Width (ft)	-	40.0	-	-	-	1	-	40.0	-	-	-	1	-	40	-	-	-	1	-	40.0	-	-	-	1												
Bankfull Mean Depth (ft)	-	0.6	-	-	-	1	-	0.6	-	-	-	1	-	0.5	-	-	-	1	-	0.7	-	-	-	1												
Bankfull Max Depth (ft)	-	1.2	-	-	-	1	-	1.0	-	-	-	1	-	0.9	-	-	-	1	-	1.2	-	-	-	1												
Bankfull Cross-Sectional Area (ft^2)	-	5.3	-	-	-	1	-	3.2	-	-	-	1	-	3.1	-	-	-	1	-	4.0	-	-	-	1												
Width/Depth Ratio	-	16.4	-	-	-	1	-	9.3	-	-	-	1	-	10.5	-	-	-	1	-	7.1	-	-	-	1												
Entrenchment Ratio	-	4.3	-	-	-	1	-	7.4	-	-	-	1	-	7.1	-	-	-	1	-	7.6	-	-	-	1												
Bank Height Ratio	-	1.0	-	-	-	1	-	1.0	-	-	-	1	-	0.7	-	-	-	1	-	0.9	-	-	-	1												
Profile																																				
Riffle Length (ft)	9.4	24.3	20.2	52.9	13.4	13																														
Riffle Slope (ft/ft)	0.005	0.021	0.010	0.042	0.013	10																														
Pool Length (ft)	3.5	12.3	12.4	21.1	5.7	15																														
Pool Max Depth (ft)	0.6	1.5	1.3	2.6	0.8	17																														
Pool Spacing (ft)	15.7	33.3	28.1	56.6	14.1	14																														
Pattern																																				
Channel Belt Width (ft)	13.3	24.2	23.8	32.1	4.9	13																														
Radius of Curvature (ft)	9.3	14.3	13.3	25.8	4.0	13																														
Rc: Bankfull Width (ft/ft)	1.0	1.5	1.4	2.8	0.4	13																														
Meander Wavelength (ft)	44.3	59.0	58.7	75.5	11.0	8																														
Meander Width Ratio	1.4	2.5	2.5	3.5	0.6	13																														
Additional Reach Parameters																																				
Rosgen Classification	C4																																			
Channel Thalweg Length (ft)	577																																			
Sinuosity (ft)	1.31																																			
Water Surface Slope (Channel) (ft/ft)	0.022																																			
Bankfull Slope (ft/ft)	0.021																																			
Ri% / Ru% / P% / G% / S%	54%	7%	31%	6%	2%																															

- Information Unavailable

N/A - Information does not apply.

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

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Appendix E
Hydrologic Data

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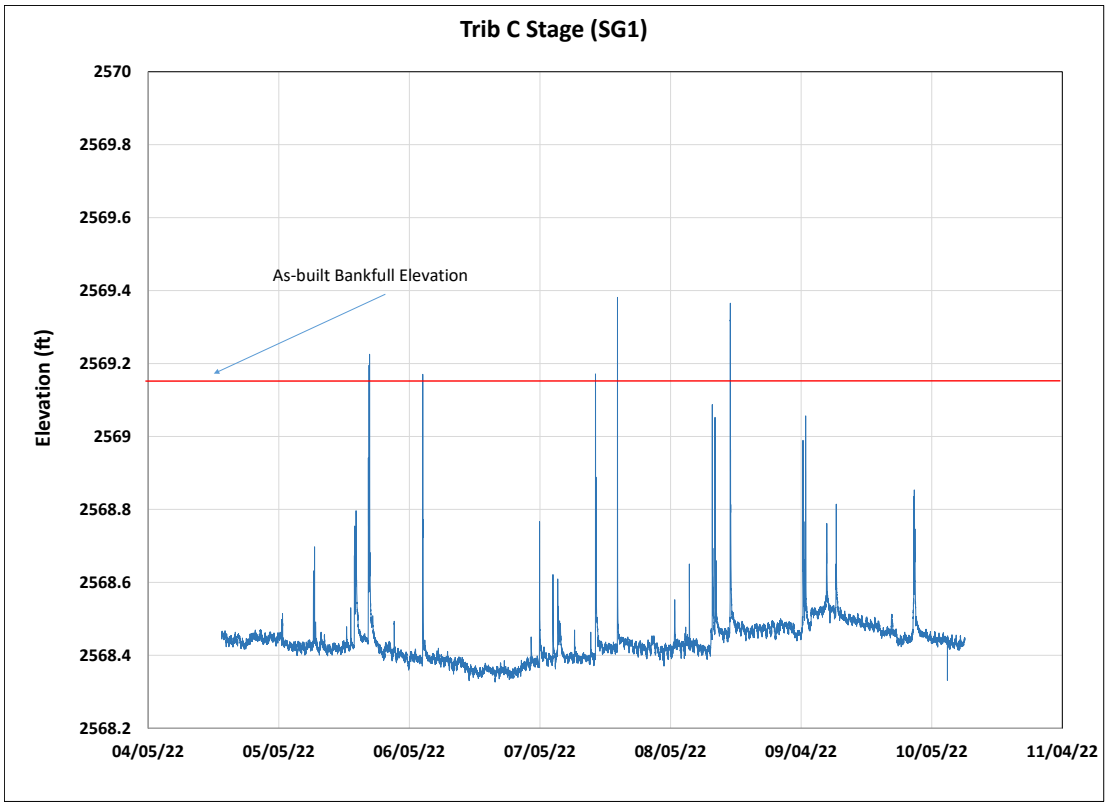
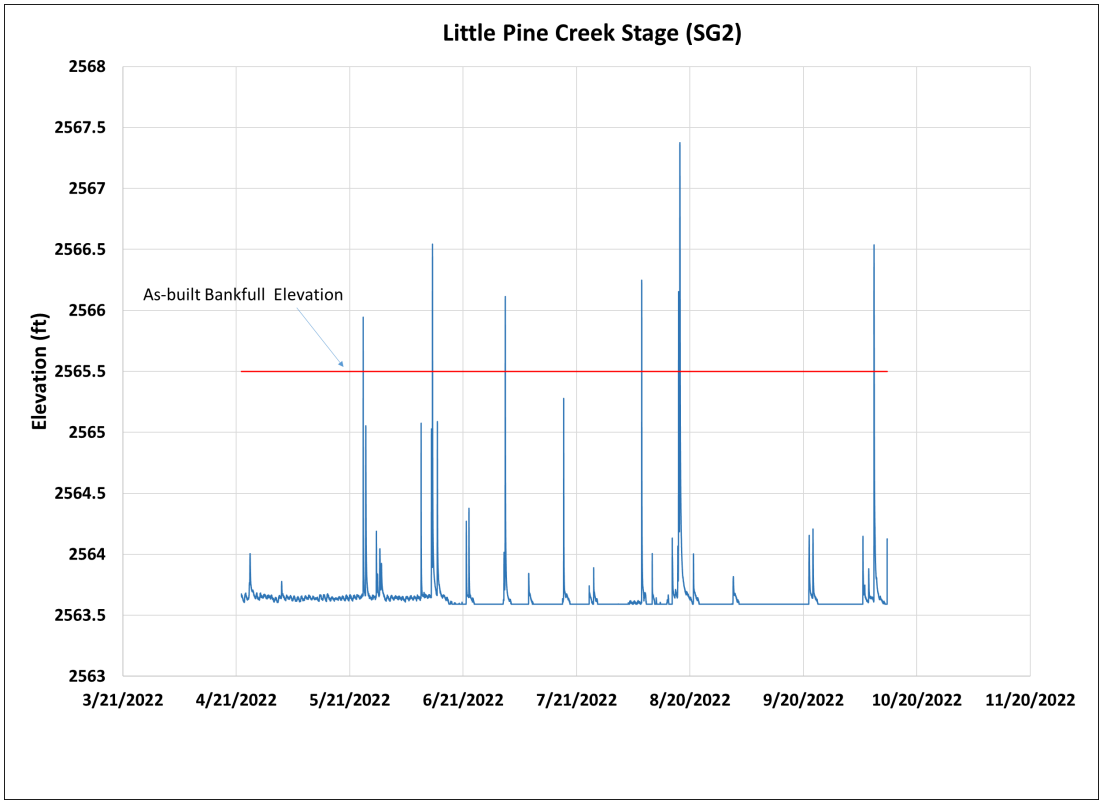
1. Tributary A Crest Gage.

Table 12. Verification of Bankfull Events Little Pine Creek II Stream and Wetland Mitigation Site/Project No 856.				
Reach	**Date of Data Collection**	**+Approximate Date of Occurrence**	**Method**	**Photo # (if available)**
LPC Reach 1	4/7/2020	Unknown	Wrack Lines	n/a
	10/6/2020	Unknown	Wrack Lines	n/a
	10/11/2020	Unknown	Wrack Lines	n/a
LPC Reach 2A	10/6/2020	1/12/2020	Stage Recorder	n/a
	10/6/2020	1/24/2020	Stage Recorder	n/a
	4/7/2020	2/7/2020	Stage Recorder/Wrack Lines	n/a
	7/10/2020	4/13/2020	Stage Recorder/Wrack Lines	n/a
	10/6/2020	4/29/2020	Stage Recorder	n/a
	10/6/2020	*5/21/2020	Stage Recorder	n/a
	10/12/2021	5/25/2021	Stage Recorder	n/a
	10/12/2021	6/12/2021	Stage Recorder	n/a
	10/12/2021	7/2/2021	Stage Recorder	n/a
	10/12/2021	8/7/2021	Stage Recorder	n/a
	10/12/2021	8/18/2021	Stage Recorder	n/a
	10/12/2021	10/9/2021	Stage Recorder	n/a
	10/18/2022	6/12/2022	Stage Recorder	n/a
	10/18/2022	8/19/2022	Stage Recorder	n/a
	10/18/2022	10/9/2022	Stage Recorder	n/a
Tributary A	10/11/2021	Unknown	Wrack Lines	n/a
	10/17/2022	Suspected 8/18/2022	Crest Gage	1
Tributary B	10/6/2020	5/21/2020	Crest Gage	n/a
	10/11/2021	Unknown	Crest Gage	n/a
Tributary C	10/6/2020	1/12/2020	Stage Recorder	n/a
	10/6/2020	5/21/2020	Stage Recorder	n/a
	10/6/2020	7/19/2020	Stage Recorder	n/a
	10/12/2021	8/18/2021	Stage Recorder	n/a
	10/18/2022	7/23/2022	Stage Recorder	n/a
	10/18/2022	8/19/2022	Stage Recorder	n/a

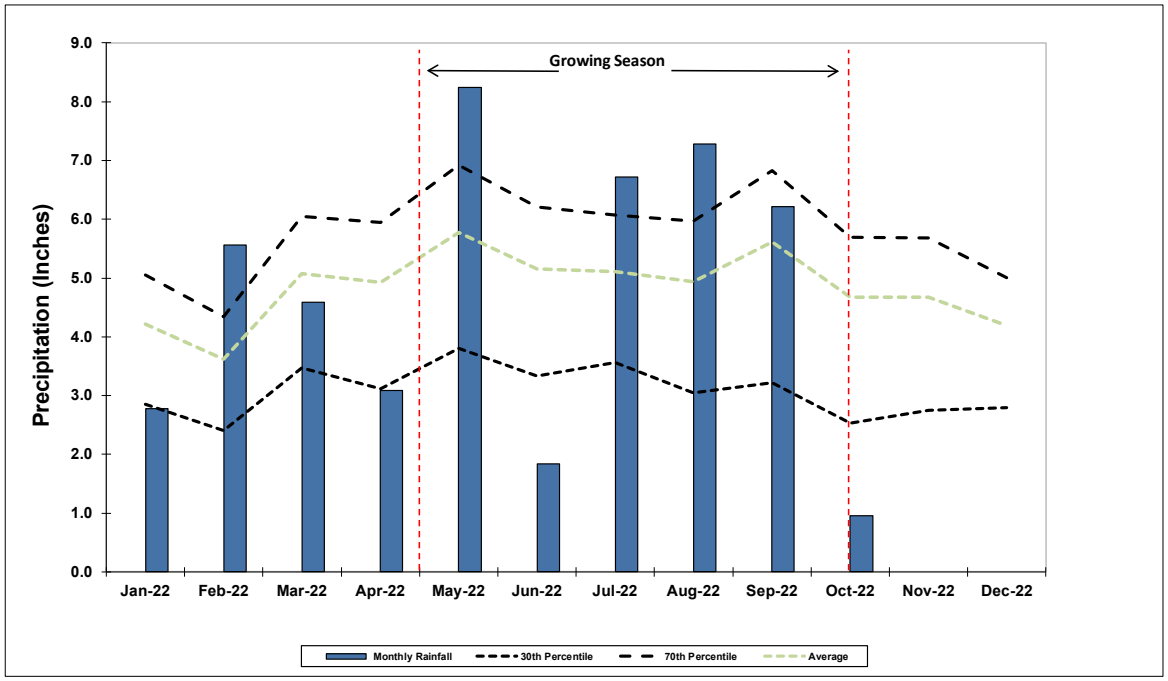
*Stage recorder buried during this event.

+ The multiple listed dates for 2021 and 2022 are based on precipitation and stage recorder data from January thru October.


Trib C Stage (SG1)
Elevation (ft)
2570
2569.8
2569.6
2569.4
2569.2
2569
2568.8
2568.6
2568.4
2568.2
As-built Bankfull Elevation
04/05/22
05/05/22
06/05/22
07/05/22
08/05/22
09/04/22
10/05/22
11/04/22

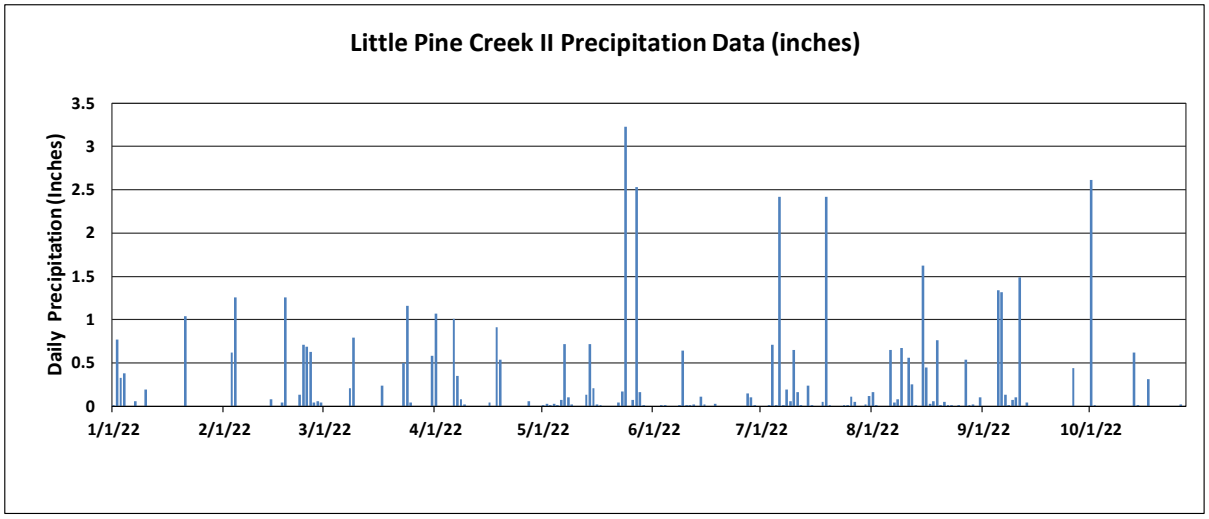

Little Pine Creek Stage (SG2)
Elevation (ft)
2568
2567.5
2567
2566.5
2566
2565.5
2565
2564.5
2564
2563.5
2563
As-built Bankfull Elevation
3/21/2022
4/21/2022
5/21/2022
6/21/2022
7/21/2022
8/20/2022
9/20/2022
10/20/2022
11/20/2022

Little Pine Creek II Stream and Wetland Mitigation Site Precipitation Graphic



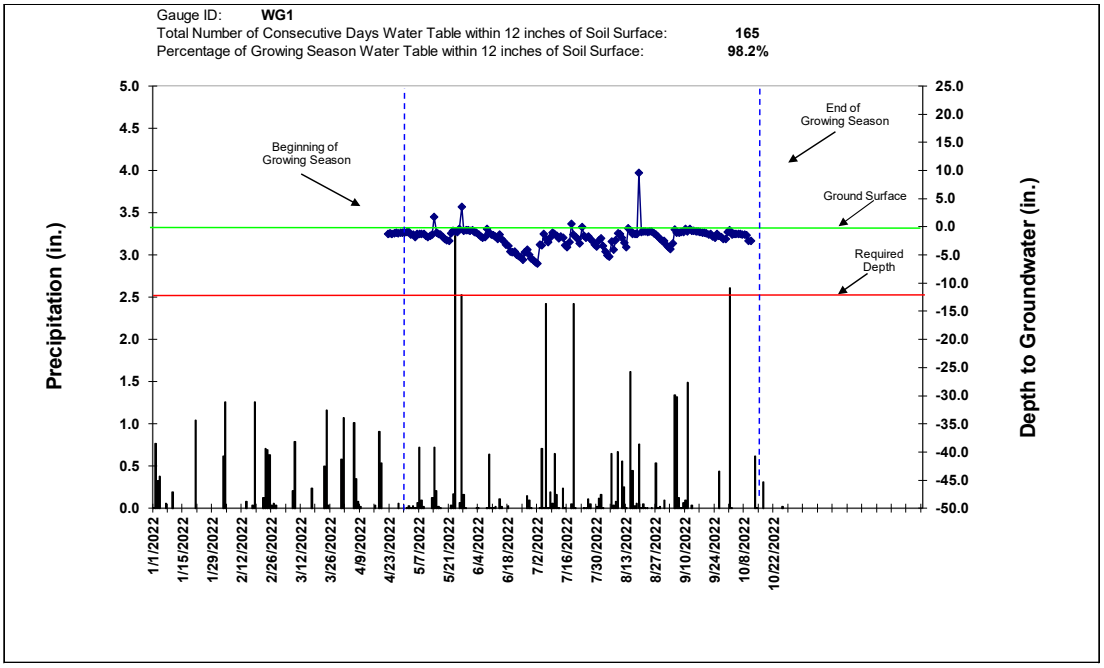
Data used in this graphic was retrieved from NCSCO Station Sparta 2 Se (318158) located 6.2 miles WSW.

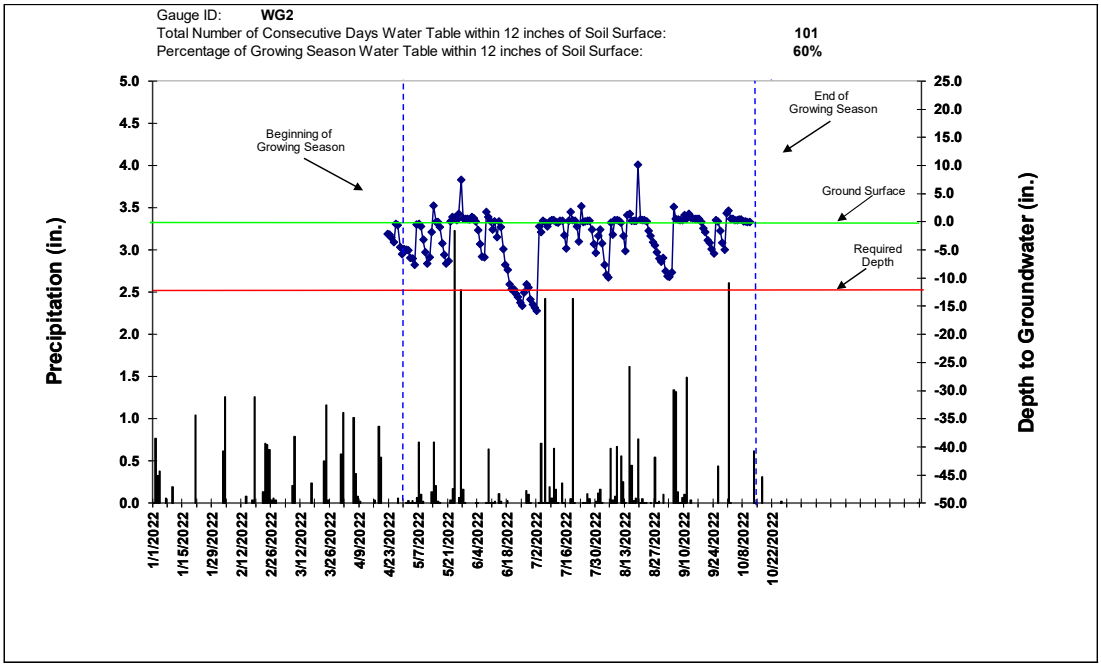
Monthly Rain Gauge Data Little Pine Creek II Stream and Wetland Mitigation Site				
Month	**Monthly Rainfall**	**30th Percentile**	**70th Percentile**	**Average**
Jan-22	2.78	2.85	5.05	4.22
Feb-22	5.56	2.4	4.34	3.62
Mar-22	4.59	3.47	6.05	5.07
Apr-22	3.09	3.12	5.94	4.93
May-22	8.24	3.8	6.92	5.77
Jun-22	1.84	3.33	6.21	5.16
Jul-22	6.72	3.56	6.07	5.11
Aug-22	7.28	3.05	5.97	4.94
Sep-22	6.22	3.22	6.83	5.61
Oct-22	0.96	2.53	5.69	4.67
Nov-22	-	2.75	5.68	4.67
Dec-22	-	2.79	5.01	4.19
Total	47.28	36.87	69.76	57.96



Data used in this graphic was retrieved from NCSCO Station Sparta 2 Se (318158) located 6.2 miles WSW.

Little Pine Creek II Stream and Wetland Mitigation Site Groundwater Monitoring Well Graphics





Appendix F
Other

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Equinox Environmental Consultation and Design
Herbicide Log - Little Pine Creek II

Date	Start / End Time	Certified Applicator #	Target Species	Herbicide	Concentration (%)	Volume Herbicide Concentration Used (oz)	Volume Mixture Used (gal)	Weather (Temp/Wind)	Site Notes
4/22/2022	9:00 am - 2:00 pm	026-29539	Multiflora rose (*Rosa multiflora*); Asian bittersweet (*Celastrus orbiculatus*);	Glyphosate	4.00%	75 oz.	15 gal.	sunny, mild, calm	Treated foliage of ROMU along perimeter of upper CE area;ROMU/CEOR treatment in preservation wetland; cut stem on climbing vines.
6/17/2022	10:00-2:00 pm	026-29539	Cattails (*Typha latifolia*)	Glyphosate	4.00%	40 oz.	8 gal.	sunny, hot, calm	Treated foliage in discrete locations where cattails are beginning to form monocultures.
9/5/2022	10:00-4:00 pm	026-29539	Multiflora rose (*Rosa multiflora*); Japanese barberry (*Berberis thunbergii*); Cattails (Typha latifolia)	Glyphosate (foliar)	4.00%	50 oz	10	cool, light wind	Follow up on a few cattails missed; Spot sprays of ROMU, barberry on lower trib; Need to treat field on far LDB; Continued cut stem on bittersweet; Hand-pulled some small stems of target species;
				Glyphosate (cut-stem)	25.00%	0.125	0.25		

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