

Annual Monitoring Report
FINAL
Little Pine Creek II
Monitoring Year 4 of 7

New River Basin
HUC 5050001
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 2023 – October 2023
Date Submitted: February 2024



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



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January 31, 2024

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

Subject: Re: Draft MY04 Monitoring Report
Little Pine Creek II Mitigation Project, Alleghany County
DMS Project # 856
DEQ Contract #LP082819

Dear Harry,

EWS received and reviewed the comments for the Little Pine Creek II Site Draft MY4 Monitoring Report from DMS on January 12, 2024. The following are the responses to those comments/questions (**IN RED**):

Report Comments

- Please include the project stream basin and HUC on the report cover. **Added.**
- Please update the goals/performance table to indicate the bank full hydrology criteria as 4 bank full events in separate years. **Updated Table and standards.**
- Please indicate that a partial sitewide supplemental planting will occur in conjunction with the winter 2024 stream repairs. **Text added to vegetation performance section.**
- Why is cumulative monitoring result “N/A” for easement compliance? Easement compliance is a monitoring requirement and if there is no encroachment, please indicate this. **Specific text added to summary table.**
- Please make sure the vegetation condition assessment dates are up-to-date in this table. **Footnote added to summary table to clarify assessment and evaluation dates.**
- Veg plot data table appears to be missing. This should be included for data through MY3 even though MY4 had no veg data collection. **Table 7 included.**
- Thank you for voluntarily upgrading the performance and goals table to include cumulative monitoring results. This is much appreciated.
- Please include the year of the aerial imagery; is this the most recent available? **Notation added to CCPV.**
- The herbicide log in Appendix F should be labelled. **Added title.**

DIGITAL SUPPORT FILES

- Please submit a groundwater gauge summary table and photo point photos. **Added to deliverables, Photopoint photos contained within visual assessment subfile.**

Please submit two final hard copies, in addition to a flash drive with a PDF of the report and all digital



support files (addressing any comments) in the correct file structure. Please include a copy of your response letter, inserted inside the front cover of each hard copy report (and included in the final PDF).

If you have any questions about these comments, please contact me at (828) 545-7057 or email me at harry.tsomides@deq.nc.gov before running any final copies.

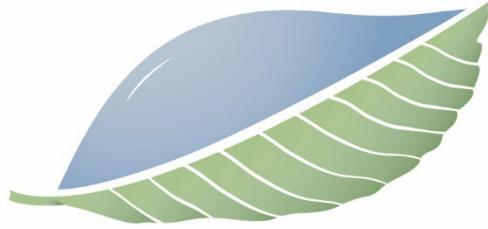
End of DMS Comments _____

Sincerely,

A handwritten signature in black ink that reads 'David Tuch'. The signature is fluid and cursive, with a long horizontal stroke extending from the end of the name.

David Tuch
Managing Partner
EW Solutions
14 O' Henry Avenues, Suite 206
Asheville, NC 28801

Prepared by:



EQUINOX

balance through proper planning

14 O' Henry Avenue, Suite 206

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 trees 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.

| Little Pine Creek II Mitigation Site (856) Summary, Goals, Performance, and Results. | | | | |
|--|--|--|---|---|
| Goal | Objective/Treatment | Performance Standard | Measurement | Cumulative Monitoring Results |
| *Restore riparian buffers | Plant native tree and understory species in the riparian zone. | Minimum of 320 stems/ac present at MY-3. Minimum of 260 stems/ac present, measuring 6ft at MY-5. | 8-Permanent Vegetation plots and 4 temporary vegetation plots | 5 of 8 Permanent Vegetation plots meeting stem/ac criteria. 4 of 4 Temporary Vegetation plots meeting criteria. |
| Exclude cattle | Install fencing along the conservation easement and cattle pasture boundaries. | Maintain conservation easement compliance | Visual assessment for conservation easement compliance | No encroachments observed during MY4. |
| *Stabilize eroding banks | Reconstruct stream channels with stable dimensions, add bank revetments and in-stream structures to protect restored/enhanced streams. | Channel banks should generally remain stable. Where bank migration does occur, it should not exceed 10% of the previous monitored bankfull width and 20% of the original design bankfull width. | Visual assessment and bank pin monitoring as necessary. | No evidence of instability within fixed cross-sections. Visual assessment indicates instability on one structure in Reach 2B. A total of 7 bank segments showed scour or erosion. |
| *Construct stream channels that are laterally and vertically stable. | 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. | In-stream habitat structures should remain intact and functional. Riffle cross sections should remain stable and show little change in bankfull area, Max depth ratio, and width-to-depth ratio. BHR shall not exceed 1.2 for restored channels. Riffle dimensions should fall within the parameters defined for the Rosgen stream type. | 10-Cross sections, visual assessment, 2- crest gages, and 2-continuous stage recorders. | Decrease or no change in Width-Depth ratios, Bankfull Max Depth are similar or close to As-Built for all constructed streams, BHR <1.2 for all cross sections. |
| *Improve stream habitat | 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. | In-stream habitat structures should remain intact and functional. Riffle cross sections should remain stable and show little change in bankfull area, Max depth ratio, and width-to-depth ratio. BHR shall not exceed 1.2 for restored channels. Riffle dimensions should fall within the parameters defined for the Rosgen stream type. | 10-Cross sections, visual assessment, 2- crest gages, and 2-continuous stage recorders. | Both Width-Depth and Entrenchment ratios within specifications or are similar to As-Built for all constructed streams. Surface flow sufficient during MY2. |
| Improve channel and floodplain connectivity | Reconstruct stream channels with bankfull at or near the floodplain elevation and bank height ratios ranging from 1.0- 1.1. | Four bankfull events occurring in separate years. | 13-Cross sections, visual assessment and 5-continuous stage recorders. | 4 events on LPC Reach 1, 7 events on LPC Reach 2A, 4 events on Tributary A, 4 events on Tributary B, and 4 events on Tributary C. occurring over 3 years. |
| Permanently protect the project site from harmful uses. | Establish a conservation easement on the site. | Record conservation easement prior to implementation. | Conservation Easement Compliance | No encroachments observed during MY4. |

* Assesment, evaluation, and results based upon MY3 data.

1.3. Restoration Type and Approach

The project includes six restoration reaches; three Priority 1 (P1) reaches 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. Previously noted vegetation problem areas and bare areas are nearly nonexistent in MY4. Seven areas of bank scour were present in MY4, similar to those noted in MY3. Some revegetation of these areas was evident between MY3 and MY4. As part of the planned stream repairs, supplemental planting will be conducted within portions of the site.

Areas of exotic vegetation are depicted within the CCPV (n=2). Multiflora rose (*Rosa multiflora*), Asiatic bittersweet (*Celastrus orbiculatus*) and Japanese honeysuckle (*Lonicera japonica*) were the dominant observed species. Invasive vegetation was identified in two primary pockets in Wetland 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 primarily Asiatic bittersweet. The larger patch of invasives in Reach 2B was predominantly multiflora rose along the non-creditable reach and southward into Wetland 2B. Treatments in summer 2023 have significantly reduced the number of invasive areas and their density. 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. Reach #1 and portions of Reach 2A continue to experience overbank and floodplain deposition, resulting in some entrenchment (Cross Section figures, Tables 11a and b, Appendix D). These areas will continue to be monitored for any changes in stability.

One exposed structure (113+30) and seven areas of bank scour or slumping (103+50, 110+20, 112+25, 113+30, 118+20, 121+50, and 123+30,) 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 110+20 was identified in MY3 and had somewhat improved in MY4. At Station 118+20, the outside bend has notable scour and bank slump. The area of instability at Station 121+50 has a similar amount of scour along the outer bend at the beginning of the "rock and roll" log structures. At the final problem areas (123+50), the bank at the of log-drop structures has a significant amount of erosion (CCPV and Table 5, Appendix B). The site will continue to be monitored for signs of instability.

NC Division of Mitigation Services has a contract for repairs. Repair work has been fully permitted and the repairs will begin in January 2024. A description and summary of the repairs will be included in the MY5 monitoring report.

No areas of encroachment or fence failure were observed during the assessment. The next site visit is planned for spring 2024.

1.5.3 Hydrology

Since completion of construction in late 2019, many bankfull events have been documented on the LPC II site (Table 12, Appendix E). Based on precipitation and stage recorder data the MY4 bankfull events recorded on Trib C on: April 28th, June 20th, and July 15th, 2023. The bankfull events on Reach 2A were recorded on June 23rd, July 31st, and September 8th, 2023. Two separate bankfull events were also recorded by crest gauge on Tributary A and Tributary B

Groundwater data from both wetland gages met established criteria during MY4. Wetland Gage 1 at Wetland 1 recorded 167 consecutive days (100%) during the MY4 growing season. Wetland Gage 2 at Wetland 2 also recorded 167 consecutive days (100%). Hydrology will continue to be monitored throughout the life of the project.

2.0 METHODS

2.1 Geomorphology

Detailed geomorphic measurements are not required in MY4, although a visual assessment was performed during site walk through.

2.2 Vegetation

Detailed vegetation inventory and analysis are not required in MY4, although a visual assessment was performed during site walk through.

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 |
| Tributary 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

| Restoration Level | Stream | | | Riparian Wetland | | Non-Rip | Coastal |
|-----------------------------------|--------|------|--------------|------------------|--------------|---------|---------|
| | 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 |
| | Vegetation Survey | Nov-2019 |
| Monitoring Year-1 | Stream Survey | Oct-20 |
| | Vegetation Survey | Oct-20 |
| Monitoring Year-2 | Supplimental Planting | Feb-21 |
| | Stream Survey | Oct-21 |
| | Vegetation Survey | Oct-21 |
| Monitoring Year-3 | Initial Site Assesement | Apr-22 |
| | Invasive treatment | Apr-22 |
| | Invasive treatment | June-22 |
| | Invasive treatment | Sept-22 |
| | Stream Survey | Oct-22 |
| | Vegetation Survey | Oct-22 |
| Monitoring Year-4 | Initial Site Assesement | Apr-23 |
| | Invasive treatment | Apr-23 |
| | Invasive treatment | Oct-23 |
| | Visual monitoring | Oct-23 |

Table 3. Project Contacts Table**Little Pine Creek II Stream and Wetland Mitigation Site/Project No. 856**

| | |
|--------------------------------|--|
| Designer | Wildland Engineering, Inc / 1430 South Mint St #104 Charlotte NC 282013 |
| Primary project design POC | Jeff Keaton / 919.851.9986 |
| Construction Contractor | Wright Contracting / 453 Silk Hope Liberty Rd Siler City, NC 27344 |
| Construction contractor POC | Ross Kennedy/336.736.4585 |
| Survey Contractor | Turner Surveying / P.O. Box 148 Swannanoa, NC 28778 |
| Survey contractor POC | David Turner/ 919.827.0745 |
| Planting Contractor | Carolina Silvics 908 Indian Trail Rd, Edenton, NC 27932 |
| Planting contractor POC | Mary Margaret McKinney 252.482.8491 |
| Seeding Contractor | Wright Contracting / 453 Silk Hope Liberty Rd Siler City, NC 27344 |
| Contractor point of contact | Ross Kennedy/336.736.4585 |
| Seed Mix Sources | Green Resource, LLC |
| Nursery Stock Suppliers | Mellow Marsh Farm |
| Monitoring Performers | Equinox / 14 O'Henry Avenue Suite 206 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 |

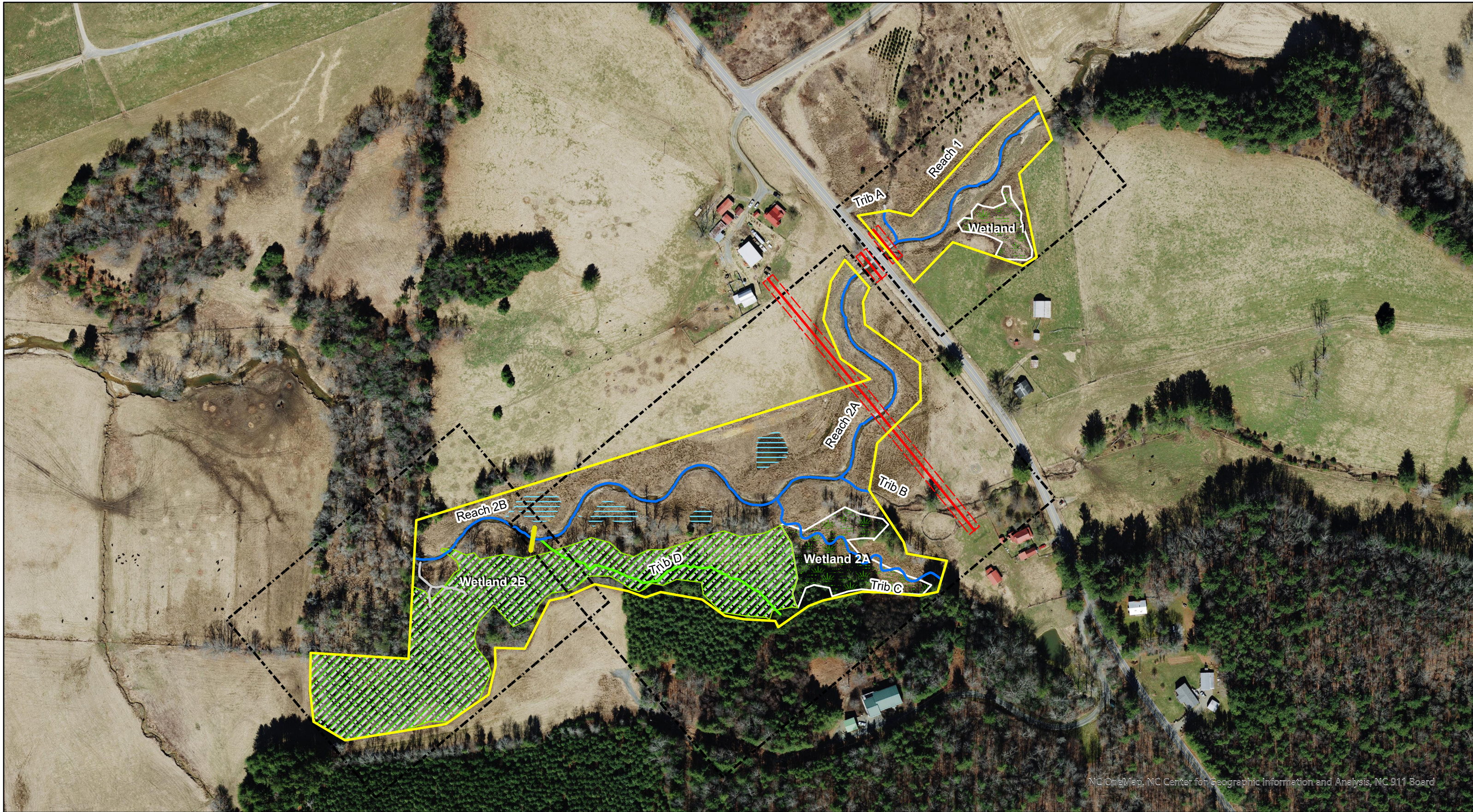
Table 4. Project Baseline Information and Attributes

| 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 |
| Perennial, Intermittent, Ephemeral | Perennial | Perennial | Perennial | Perennial | Perennial | Perennial | Perennial | Perennial | Perennial |
| 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.

Appendix B
Visual Assessment Data

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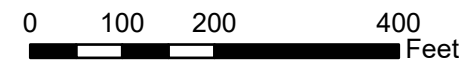
NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board



Little Pine Creek II Alleghany County, NC Overview Sheet

NC OneMap Orthoimagery 2022 (latest available)

| | | |
|-----------------------|----------------|-----------------------|
| Conservation Easement | Streams | Wetlands |
| ReachBreak | Non-Credit | Enhancement |
| OHW | Preservation | Preservation |
| Utility Easement | Restoration | Floodplain Depression |





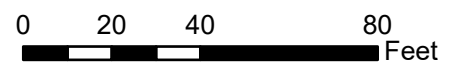
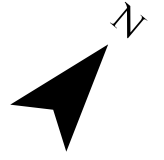
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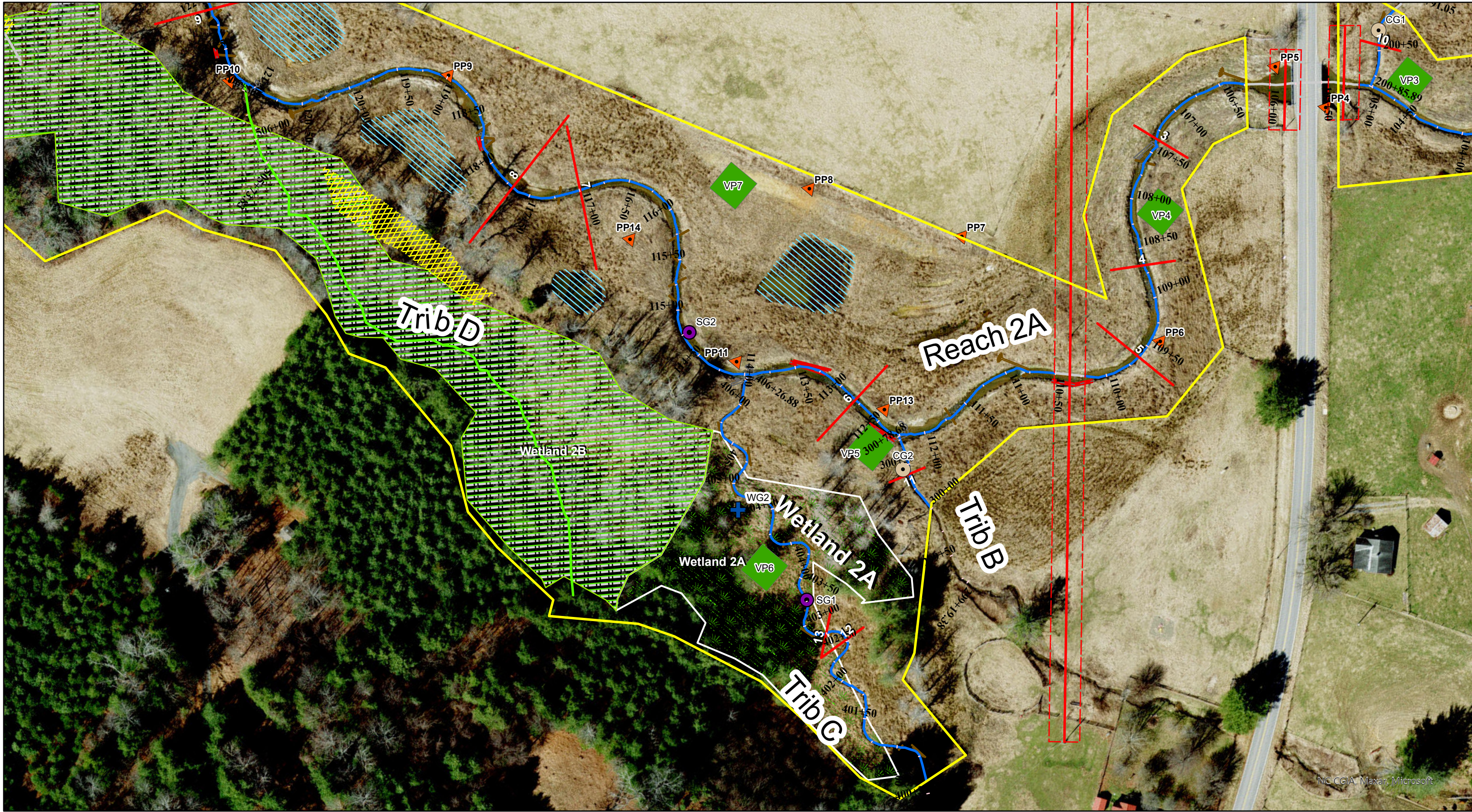


CCPV MY4
Little Pine Creek II
Allegheny County, NC

Sheet 1 of 3

- | | | | |
|------------------|----------------------|---------------------------|-----------------|
| LPCI Easement | Hydrology | Cross Sections | Restoration |
| OHW | Type | Permanent Vegetation Plot | Bank Erosion |
| Utility Easement | Crest gauge | Criteria | Wetlands |
| Photopoints | Wetland gauge | Meeting | Enhancement |
| | Criteria | Streams | |
| | Meeting | Non-Credit | |



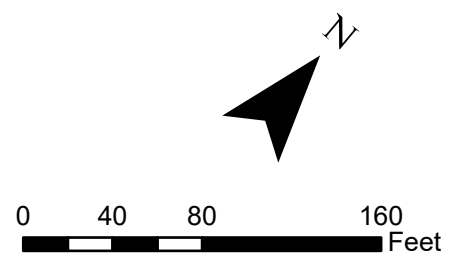


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CCPV MY4
Little Pine Creek II
Alleghany County, NC

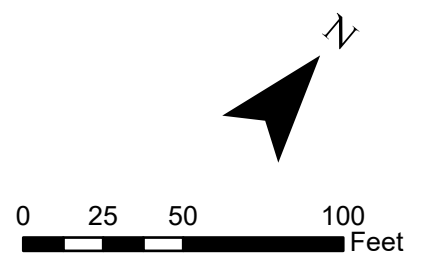
| | | | | | |
|-----------------------|------------------|-------------|----------------------|----------------|-------------------------------|
| LPCII Easement | Hydrology | Meeting | Wetland gauge | Meeting | Bank Erosion |
| OHW | Type | Crest gauge | Criteria | Meeting | Invasive Problem Areas |
| Utility Easement | Stream gauge | Meeting | Cross Sections | Meeting | Density |
| Floodplain Depression | | Meeting | | Meeting | Present |
| Photopoints | | Meeting | | Streams | Wetlands |
| | | Meeting | | Non-Credit | Enhancement |
| | | Meeting | | Preservation | Preservation |
| | | Meeting | | Restoration | |





CCPV MY4
Little Pine Creek II
Alleghany County, NC

- | | | | |
|-----------------------|----------------------------------|--------------|-------------------------------|
| LPCII Easement | Permanent Vegetation Plot | Preservation | Invasive Problem Areas |
| Floodplain Depression | Criteria | Restoration | Density |
| Photopoints | Meeting | Bank Erosion | Present |
| Cross Sections | Streams | Preservation | Wetlands |
| | Non-Credit | | |



| 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 October 25, 2023) | | | | | | | | | | |
| 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 | 18 | 96% | 0 | 0 | 96% |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does <u>NOT</u> 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 | 18 | 96% | 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 <u>NOT</u> exceed 15%. | 19 | 19 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 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 October 25, 2023) | | | | | | | | | | |
| 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 | 122 | 92% | 0 | 0 | 92% |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does <u>NOT</u> 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 | 122 | 92% | 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 <u>NOT</u> exceed 15%. | 22 | 22 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 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 October 25, 2023) | | | | | | | | | | |
|--|----------------------|---|---------------------------------------|--------------------------|-----------------------------|----------------------------|----------------------------------|--|---|---|
| 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. | | | 2 | 31 | 91% | 0 | 0 | 91% |
| | 2. Undercut | Banks undercut/overhanging to the extent that mass wasting appears likely. Does <u>NOT</u> include undercuts that are modest, appear sustainable and are providing habitat. | | | 0 | 0 | 100% | N/A | N/A | N/A |
| | 3. Mass Wasting | Bank slumping, calving, or collapse. | | | 0 | 0 | 100% | N/A | N/A | N/A |
| Totals | | | | | 2 | 31 | 91% | 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 <u>NOT</u> exceed 15%. | 11 | 12 | | | 92% | | | |
| | 4. Habitat | Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 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 October 25, 2023) | | | | | | | | | | |
|---|----------------------|---|---------------------------------------|--------------------------|-----------------------------|----------------------------|----------------------------------|--|---|---|
| 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 <u>NOT</u> 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 <u>NOT</u> exceed 15%. | 1 | 1 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 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 October 25, 2023) | | | | | | | | | | |
| 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 <u>NOT</u> 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 <u>NOT</u> exceed 15%. | 1 | 1 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow. | 1 | 1 | | | 100% | | | |

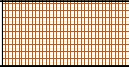
N/A - Item does not apply.

| 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 October 25, 2023) | | | | | | | | | | |
| 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 <u>NOT</u> 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. | 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 <u>NOT</u> exceed 15%. | 42 | 42 | | | 100% | | | |
| | 4. Habitat | Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio \geq 1.6. Rootwads/logs providing some cover at base-flow. | 42 | 42 | | | 100% | | | |

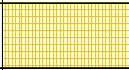
N/A - Item does not apply.

**Table 6. Vegetation Condition Assessment
Little Pine Creek II Stream and Wetland Mitigation Site**

Planted Acreage: 7.7 (Assessed April 19, and October 25, 2023)

| 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 |  | 2 | 0.21 | 1.50% |
| 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



Example undercut bank and toe structure exposure along Reach 2B.



Example undercutting along Reach 2A.



Example slump bank along Reach 2B.

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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 1 R | Veg Plot 2 R | Veg Plot 3 R | Veg Plot 4 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 | <i>Acer rubrum</i> | red maple | Tree | FAC | 1 | 1 | | | | | | | | | | | 2 | 2 | 1 | 1 | 2 | | 7 | 3 |
| | <i>Alnus serrulata</i> | hazel alder | Tree | OBL | | | | | | | | | | | | | | | | | | | 1 | |
| | <i>Betula nigra</i> | river birch | Tree | FACW | | | 1 | 1 | 3 | 3 | 6 | 6 | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 1 | 4 | 5 | 4 | 5 |
| | <i>Cornus amomum</i> | silky dogwood | Shrub | FACW | 1 | 1 | 2 | 2 | 1 | 1 | | | 1 | 1 | 1 | 1 | | | | | | | | |
| | <i>Fraxinus americana</i> | white ash | Tree | FACU | | | | | | | | | | | | | | | | | | 2 | | |
| | <i>Fraxinus pennsylvanica</i> | green ash | Tree | FACW | 5 | 5 | | | 4 | 4 | 1 | 1 | 3 | 3 | | | | | 2 | 2 | | 2 | 1 | 4 |
| | <i>Ilex verticillata</i> | common winterberry | Tree | FACW | | | | | | | | | | | 1 | 1 | | | | | | | | |
| | <i>Liriodendron tulipifera</i> | tuliptree | Tree | FACU | 1 | 1 | | | | | | | | | | | | | 1 | 1 | | | 1 | 1 |
| | <i>Nyssa sylvatica</i> | blackgum | Tree | FAC | 1 | 1 | | | | | | | | | | | 1 | 1 | 1 | 1 | | | | |
| | <i>Platanus occidentalis</i> | American sycamore | Tree | FACW | 5 | 5 | 3 | 3 | 5 | 5 | 1 | 1 | | | 2 | 2 | 3 | 3 | 5 | 5 | 5 | 5 | 1 | 1 |
| <i>Quercus michauxii</i> | swamp chestnut oak | Tree | FACW | | | | | | | 1 | 1 | | | | | | | 1 | 1 | | | 1 | 1 | |
| <i>Salix nigra</i> | 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.

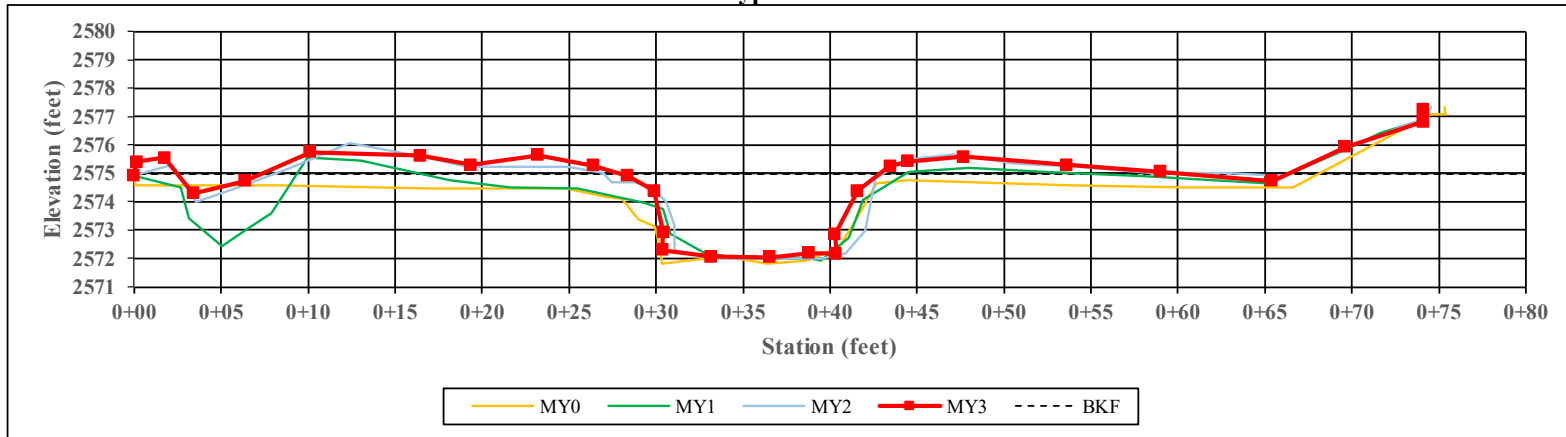
Appendix D
Stream Geomorphology Data

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Project Name: LPC II
Reach Name: Little Pine Creek

XS Number: 1
XS Type: Riffle

Station: 100+77



| 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

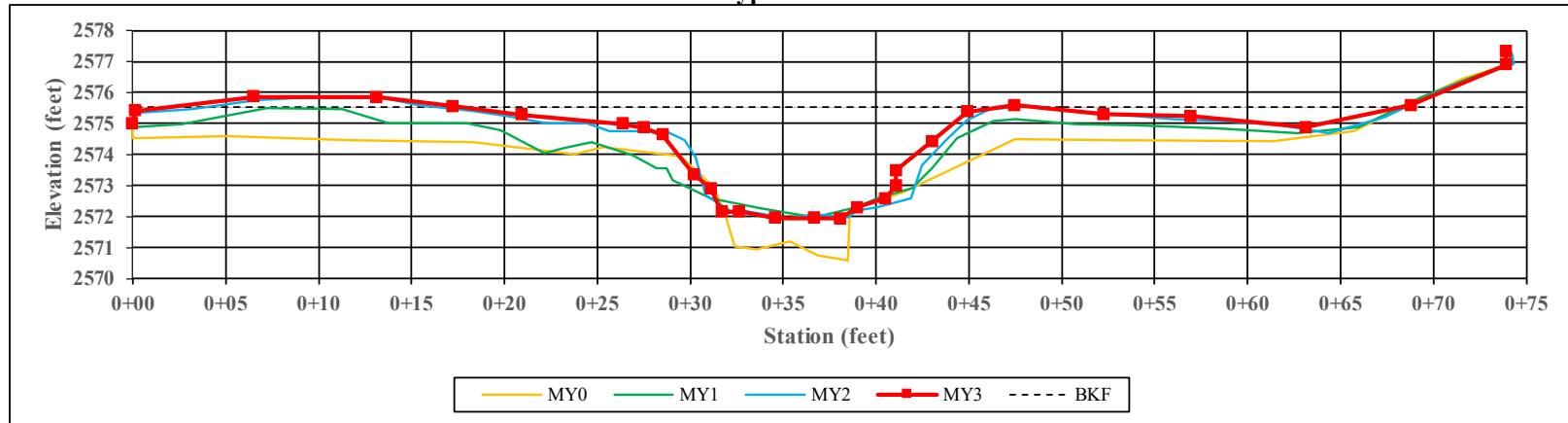


Right Descending Bank

Project Name: LPC II
 Reach Name: Little Pine Creek

XS Number: 2
 XS Type: Pool

Station: 100+91



| CHANNEL DIMENSIONS SUMMARY | MY0 | MY1 | MY2 | MY3 | MY4 | MY5 | MY6 | MY7 |
|--|------|------|------|------|-----|-----|-----|-----|
| Bankfull 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

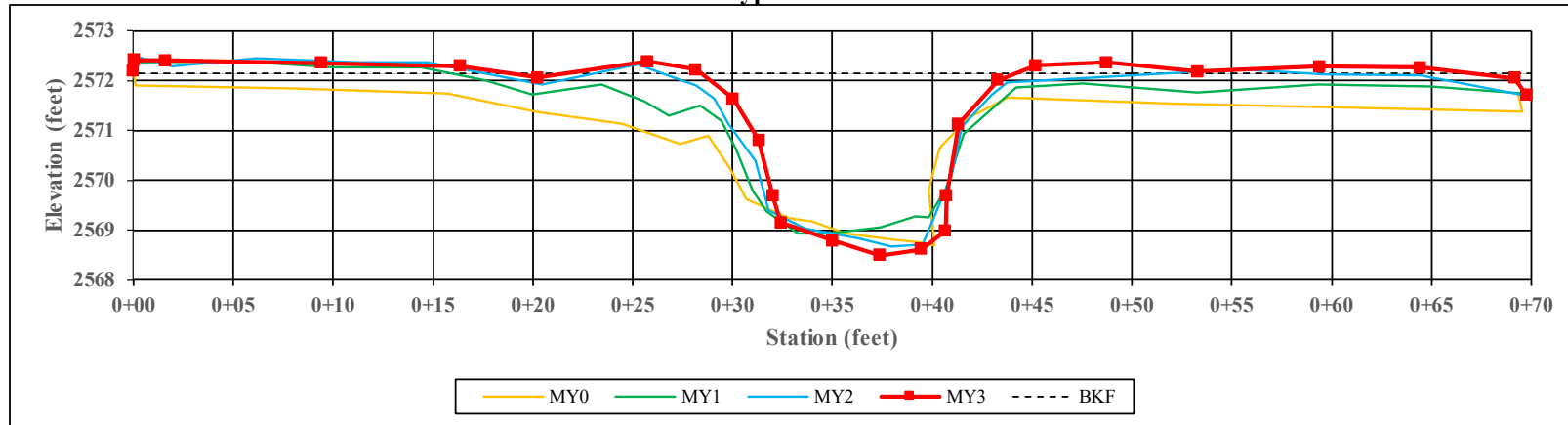


Right Descending Bank

Project Name: LPC II
Reach Name: Little Pine Creek

XS Number: 3
XS Type: Pool

Station: 107+50



| 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

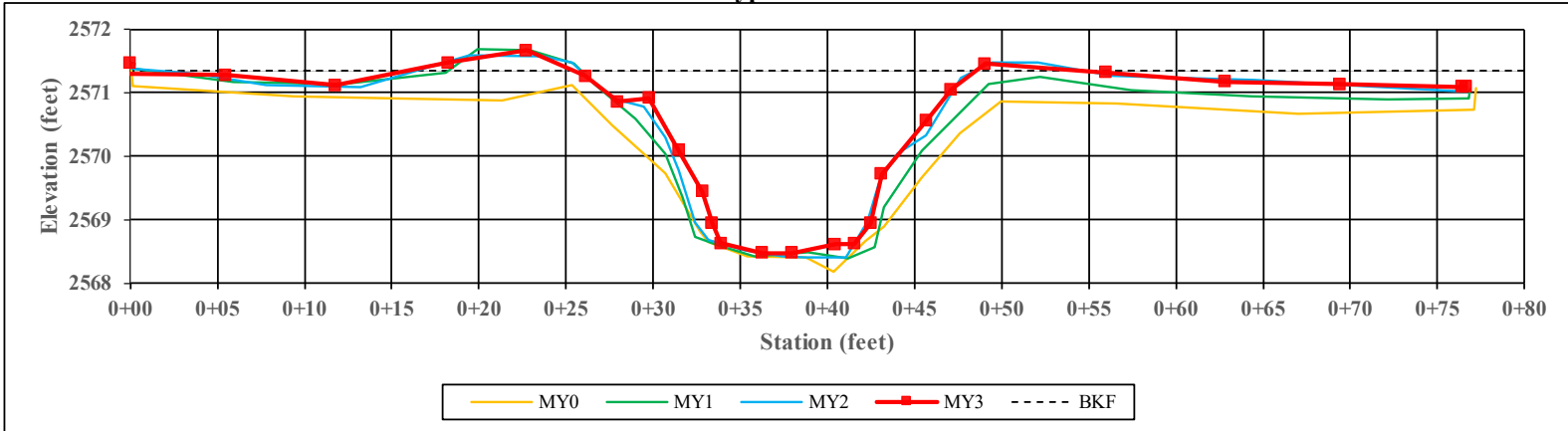


Right Descending Bank

Project Name: LPC II
 Reach Name: Little Pine Creek

XS Number: 4
 XS Type: Riffle

Station: 108+69



| 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

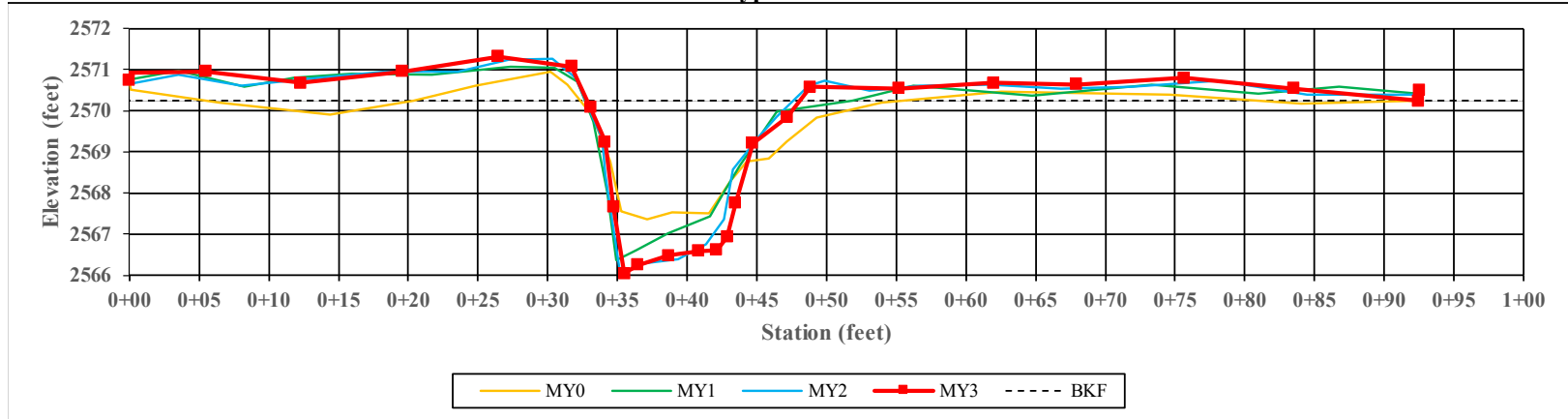


Right Descending Bank

Project Name: LPC II
Reach Name: Little Pine Creek

XS Number: 5
XS Type: Pool

Station: 109+64



| 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

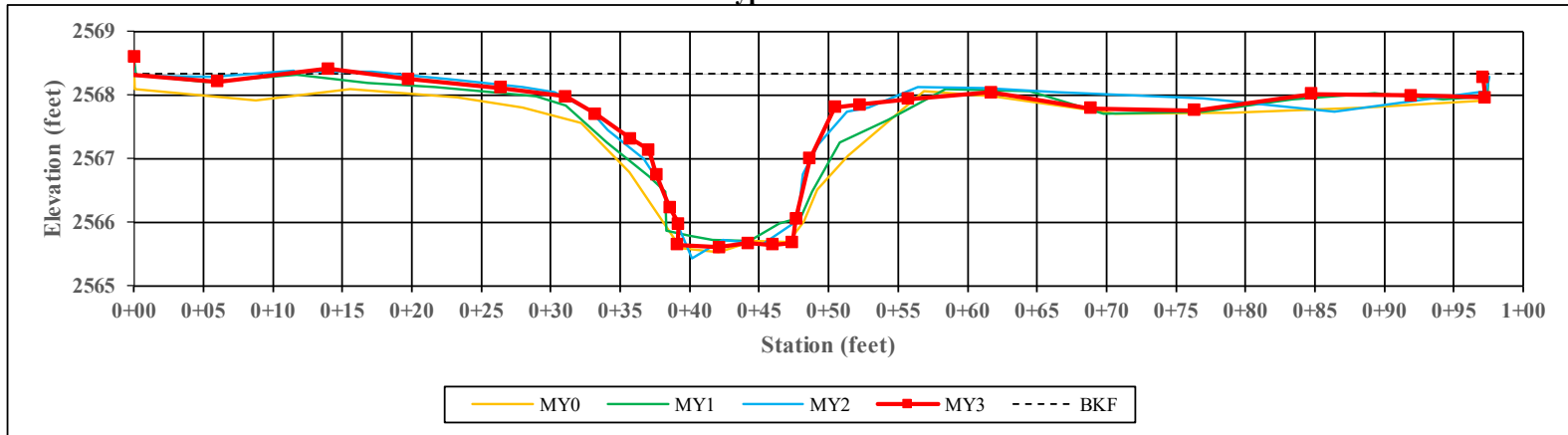


Right Descending Bank

Project Name: LPC II
Reach Name: Little Pine Creek

XS Number: 6
XS Type: Riffle

Station: 112+81



| 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

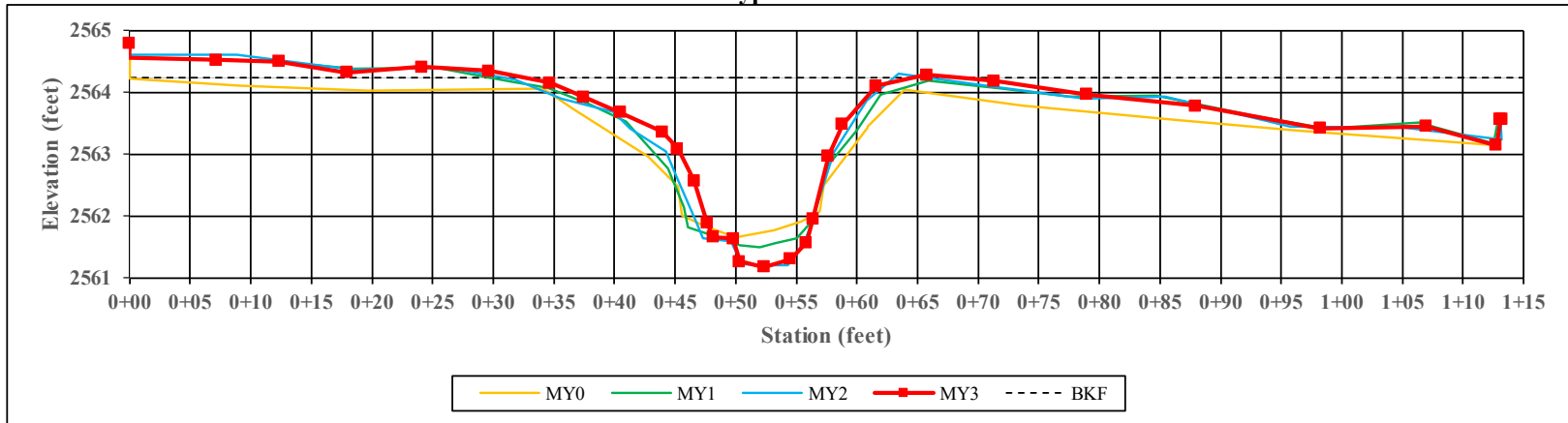


Right Descending Bank

Project Name: LPC II
Reach Name: Little Pine Creek

XS Number: 7
XS Type: Riffle

Station: 117+00



| 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

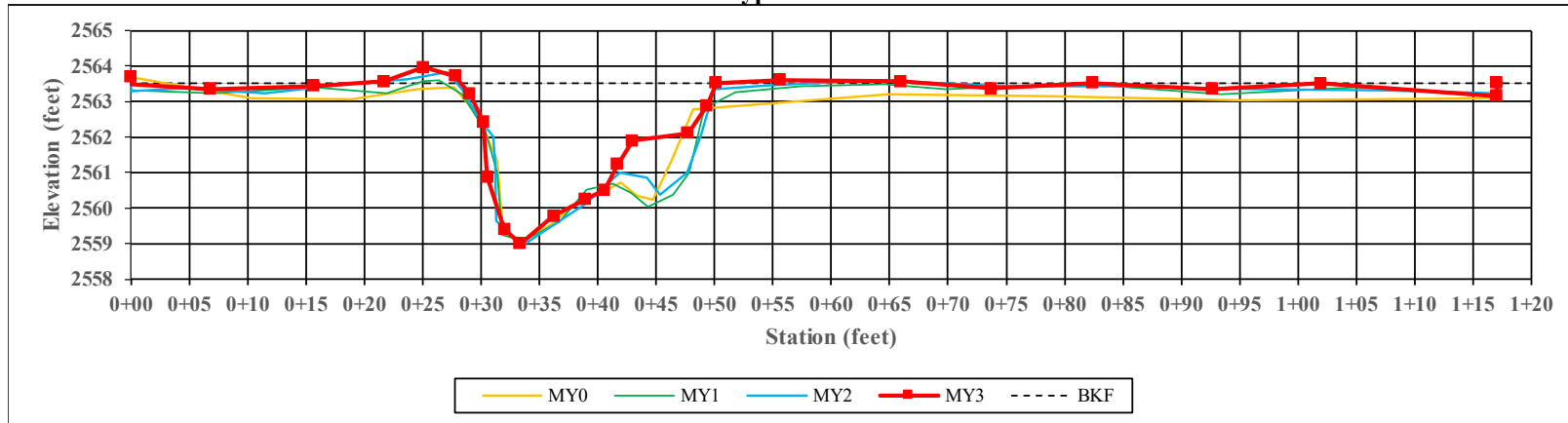


Right Descending Bank

Project Name: LPC II
Reach Name: Little Pine Creek

XS Number: 8
XS Type: Pool

Station: 117+79



| CHANNEL DIMENSIONS SUMMARY | | MY0 | MY1 | MY2 | MY3 | MY4 | MY5 | MY6 | MY7 |
|--|--|-------|-------|-------|-------|-----|-----|-----|-----|
| Bankfull 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

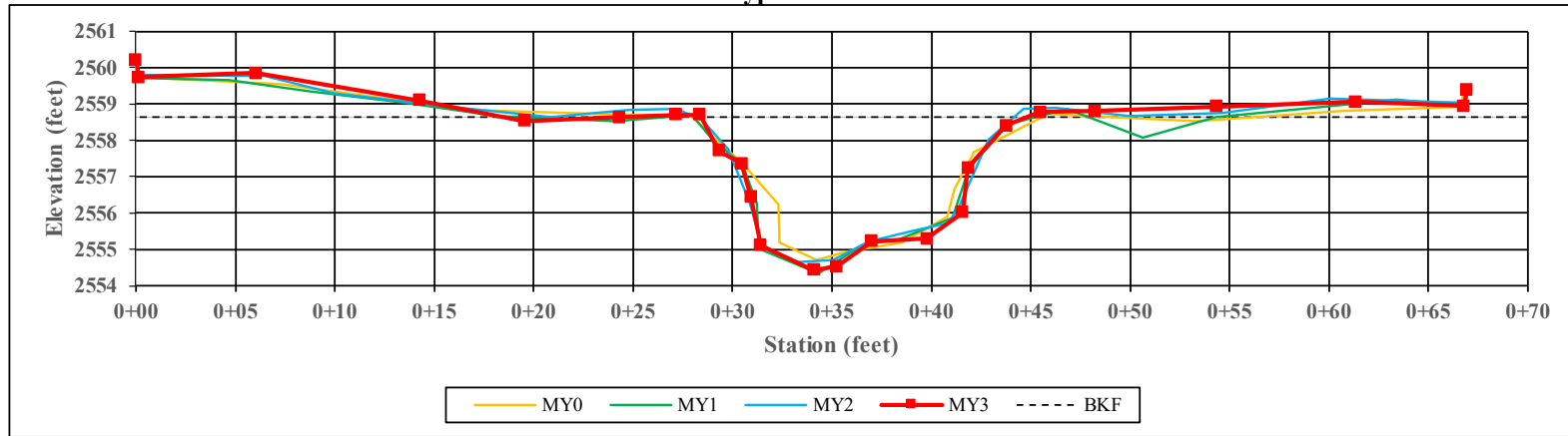


Right Descending Bank

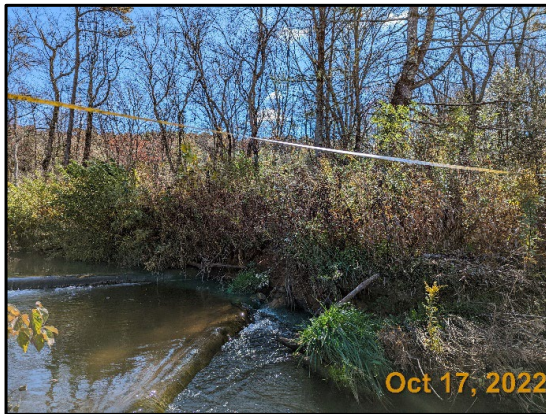
Project Name: LPC II
Reach Name: Little Pine Creek

XS Number: 9
XS Type: Pool

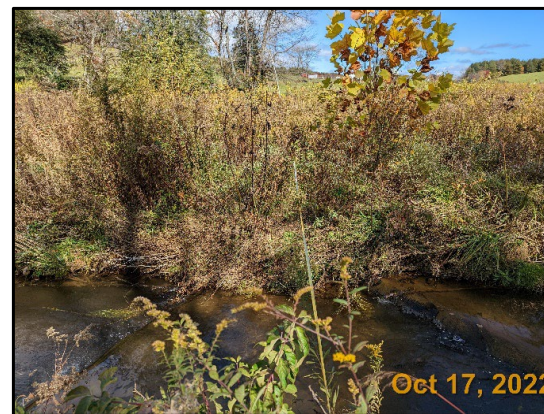
Station: 122+77



| 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

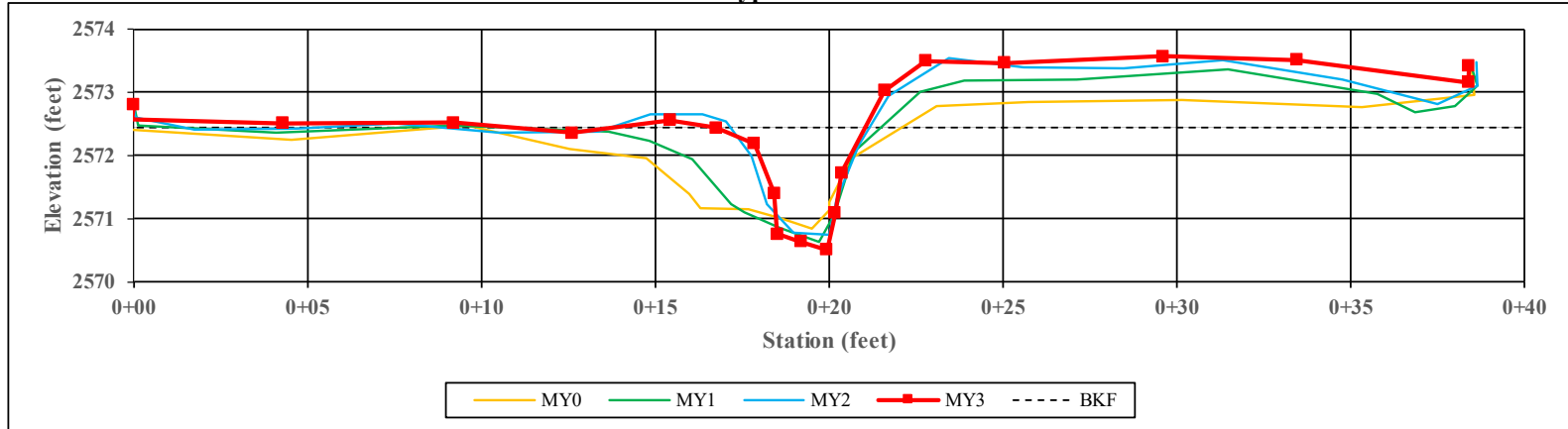


Right Descending Bank

Project Name: LPC II
 Reach Name: Trib A

XS Number: 10
 XS Type: Pool

Station: 200+31



| 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

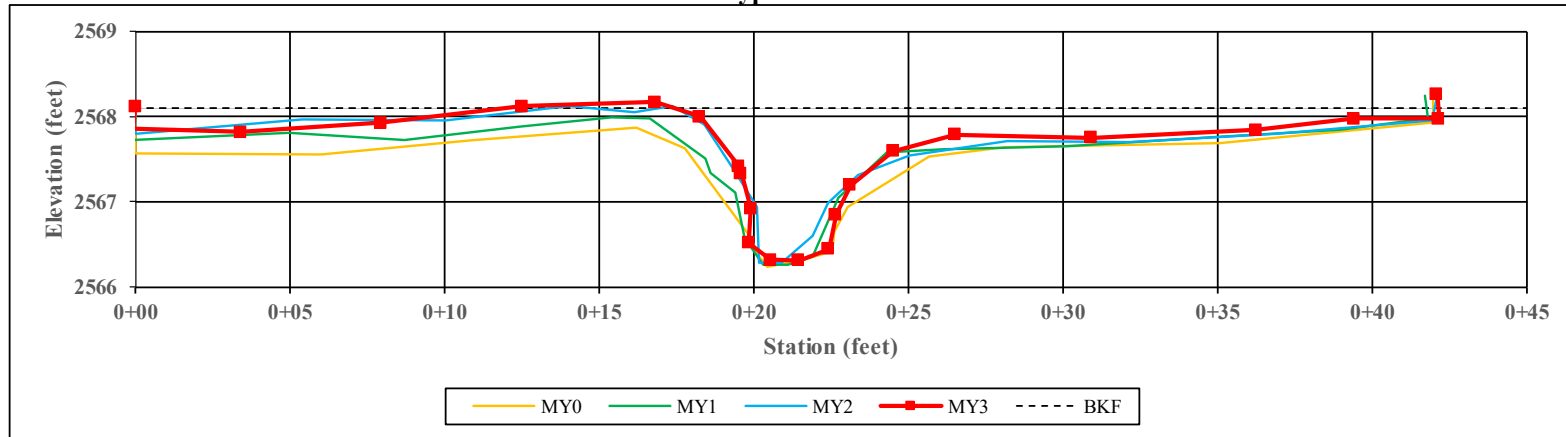


Downstream

Project Name: LPC II
 Reach Name: Trib B

XS Number: 11
 XS Type: Riffle

Station: 300+45



| 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

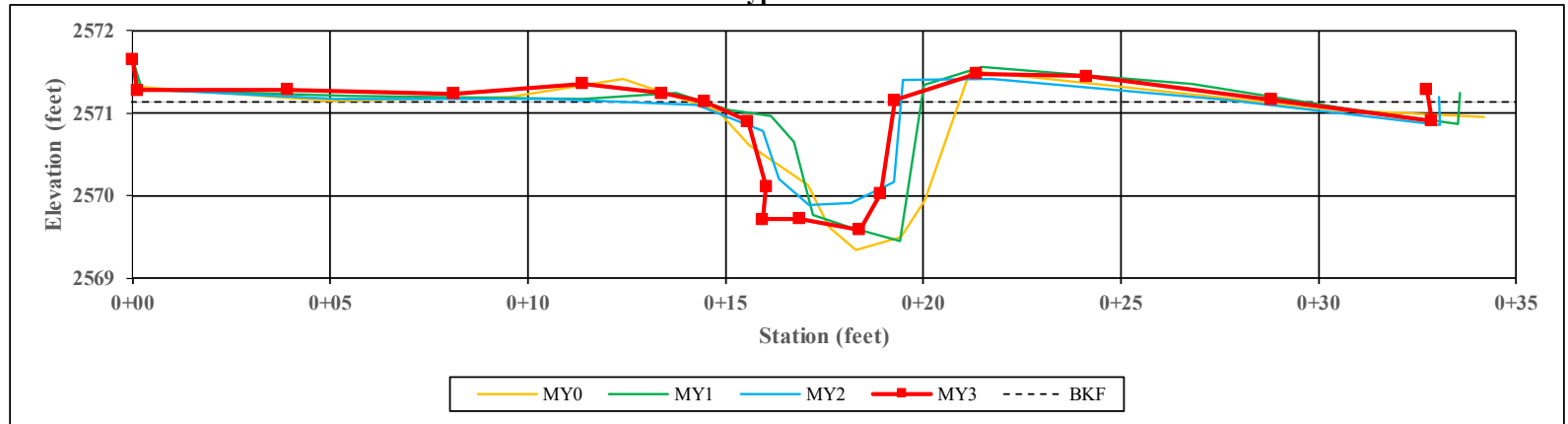


Right Descending Bank

Project Name: LPC II
Reach Name: Trib C

XS Number: 12
XS Type: Pool

Station: 402+52



| 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

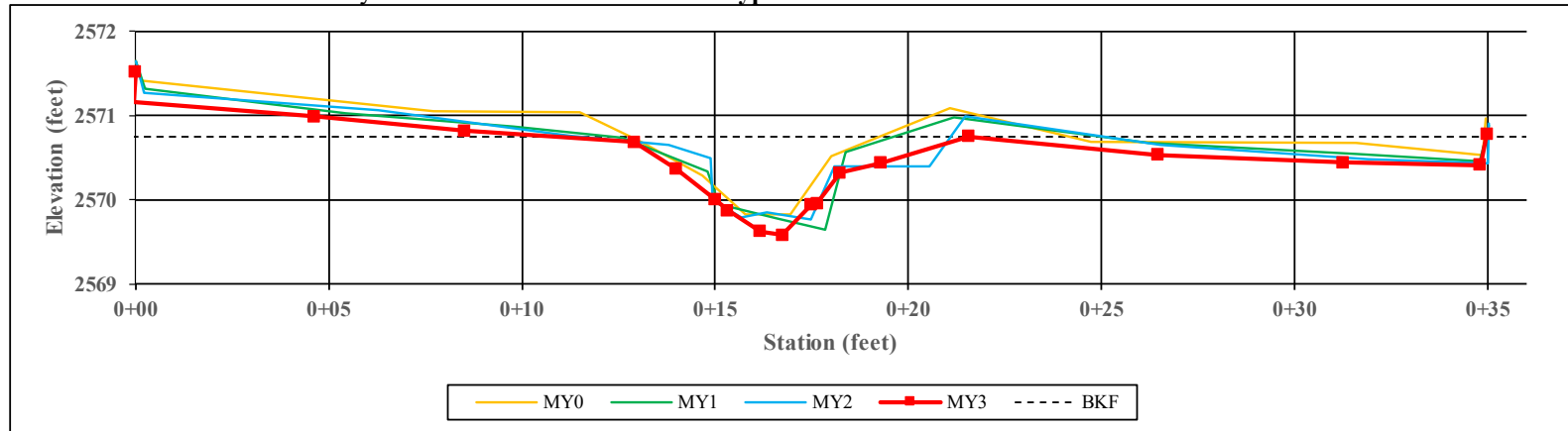


Right Descending Bank

Project Name: LPC II
 Reach Name: Tributary C

XS Number: 13
 XS Type: Riffle

Station: 402+75



| 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 | | | | - | - | - | - | - | - | - | - | - | - | - | - | | | | 36.4 | 58.4 | 52.5 | 80.1 | 19.8 | 12 | | | |
| Riffle Length (ft) | | | | - | - | - | - | - | - | - | - | - | - | - | - | 0.006 | 0.010 | 0.013 | 0.003 | 0.004 | 0.004 | 0.005 | 0.001 | 12 | | | |
| Riffle Slope (ft/ft) | | | | - | - | - | - | - | - | - | - | - | - | - | - | | | | 16.4 | 25.0 | 26.5 | 32.2 | 6.0 | 5 | | | |
| Pool Length (ft) | | | | - | - | - | - | - | - | - | - | - | - | - | - | | | | 2.6 | 4.2 | 4.5 | 5.4 | 1.1 | 5 | | | |
| Pool Max Depth (ft) | | | | - | - | - | - | - | - | - | - | - | - | - | - | | | | 36.0 | 87.0 | 138.0 | 66.1 | 105.5 | 107.1 | 128.2 | 25.3 | 5 |
| Pool Spacing (ft) | | | | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | | | | | |
| Pattern | | | | - | - | - | - | - | - | - | - | - | - | - | - | 46.0 | - | 53.0 | 35.4 | 46.0 | 47.9 | 52.6 | 6.8 | 4 | | | |
| Channel Belt Width (ft) | | | | - | - | - | - | - | - | - | - | - | - | - | - | 48.0 | - | 96.0 | 51.0 | 55.0 | 54.0 | 60.0 | 3.7 | 3 | | | |
| Radius of Curvature (ft) | | | | - | - | - | - | - | - | - | - | - | - | - | - | 2.0 | - | 4.0 | 2.0 | 2.2 | 2.2 | 2.4 | 0.1 | 3 | | | |
| Rc: Bankfull Width (ft/ft) | | | | - | - | - | - | - | - | - | - | - | - | - | - | 168.0 | - | 288.0 | 160.0 | 170.0 | 170.0 | 180.0 | 7.5 | 2 | | | |
| Meander Wavelength (ft) | | | | - | - | - | - | - | - | - | - | - | - | - | - | 2.0 | - | 5.0 | 1.4 | 1.8 | 1.9 | 2.1 | 0.3 | 4 | | | |
| Meander Width Ratio | | | | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | | | | | | |
| 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 | | | | | | |
|--|----------------|----|-----|------------------------|------|-----|-----|----|----------------------|-------|------|-----|-------|--------|-------|-----|-------|------|---------------------|------|-------|------|----|---|-------|
| | LL | UL | Eq. | Min | Mean | Med | Max | SD | N | Min | Mean | Med | Max | SD | N | Min | Mean | Max | Min | Mean | Med | Max | SD | N | |
| Dimension & Substrate - Riffle | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 | - | 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 | | | | | | | | |
| Rosgen Classification | | | | | | | | | | C/F | | | E4/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 | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 15.8 | 25.2 | 25.2 | 34.5 | 13.3 | 2 | | | |
| Riffle Length (ft) | | | | - | - | - | - | - | - | 0.04 | - | - | 0.05 | - | 2 | 0.018 | - | 0.032 | 0.011 | 0.017 | 0.017 | 0.023 | 0.008 | 2 | | | |
| Riffle Slope (ft/ft) | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 7.4 | 7.8 | 7.8 | 8.2 | 0.6 | 2 | | | |
| Pool Length (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 Max Depth (ft) | | | | - | - | - | - | - | - | 15.8 | 61.4 | 78 | 90.5 | 32.7 | 3 | 14 | - | 67 | - | 15.3 | - | - | - | 1 | | | |
| Pool Spacing (ft) | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | |
| Pattern | | | | - | - | - | - | - | - | 19.0 | - | - | 26.0 | - | 2 | 19.0 | - | 77.0 | 10.1 | 12.0 | 12.0 | 13.9 | 1.9 | 2 | | | |
| Channel Belt Width (ft) | | | | - | - | - | - | - | - | 22.0 | - | - | 66.0 | - | 2 | 19.0 | - | 43.0 | - | 21.4 | - | - | - | 1 | | | |
| Radius of Curvature (ft) | | | | - | - | - | - | - | - | 2.65 | - | - | 8.75 | - | 2 | 2.0 | - | 4.0 | - | 1.9 | - | - | - | 1 | | | |
| Rc: Bankfull Width (ft/ft) | | | | - | - | - | - | - | - | 55 | - | - | 140 | - | 2 | 77 | - | 124 | - | 51.1 | - | - | - | 1 | | | |
| Meander Wavelength (ft) | | | | - | - | - | - | - | - | 7.3 | - | - | 18.6 | - | 2 | 2.0 | - | 5.0 | - | 4.6 | - | - | - | 1 | | | |
| Meander Width Ratio | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | |
| 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) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rosgen Classification | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bankfull Velocity (fps) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bankfull Discharge (cfs) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Valley Length (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * Channel Thalweg Length (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ^ Channel Centerline (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sinuosity | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Water Surface Slope (ft/ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bankfull Slope (ft/ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rosgen Classification | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bankfull Velocity (fps) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bankfull Discharge (cfs) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Valley Length (ft) | | | | | | | | | | | | | | | | | | | | | | | | | |
| * Channel Thalweg Length (ft) | | | | | | | | | | | | | | | | | | | | | | | | | |
| ^ Channel Centerline (ft) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sinuosity | | | | | | | | | | | | | | | | | | | | | | | | | |
| Water Surface Slope (ft/ft) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bankfull Slope (ft/ft) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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**

| Dimension | 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 | | | | | | | | |
|--|--|--------|--------|--------|-----|-----|-----|-----|--|--------|--------|--------|-----|-----|-----|-----|--|--------|--------|--------|--------|-----|-----|-----|---|
| | 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 | 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 | 3.8 | 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 | - | - | - | - | |
| Dimension | 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 | | | | | | | | |
| | 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 | - | - | - | - | |
| Dimension | 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 | | | | | | | | |
| | 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 | - | - | - | - | |
| Dimension | Cross Section 10 (Pool) Tributary A | | | | | | | | Cross Section 11 (Riffle) Tributary B | | | | | | | | Cross Section 12 (Pool) Tributary C | | | | | | | | |
| | 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 | - | - | - | - | |
| Dimension | Cross Section 13 (Riffle) Tributary C | | | | | | | | | | | | | | | | | | | | | | | | |
| | 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 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 | | | | |
| | 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 |
| Dimension & Substrate - Riffle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | | | | | | | | | |
| Re: 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 | | | | |
| | 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 |
| Dimension & Substrate - Riffle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | | | | | | | | | |
| Re: 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 _{50%}) (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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Re: Bankfull Width (ft/ft) | 2.1 | 2.4 | - | 2.6 | - | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Meander Length (ft) | - | - | - | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Meander Length Ratio (L _m /W _{bt}) (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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R _i % / Ru _i % / P _i % / G _i % / S _i % | 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Re: 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R _i % / Ru _i % / P _i % / G _i % / S _i % | 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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Bankfull Photos



1. CG 1 04/19/2023



2. CG 1 10/25/2023



3. CG 2 04/19/2023



4. CG 2 10/25/2023

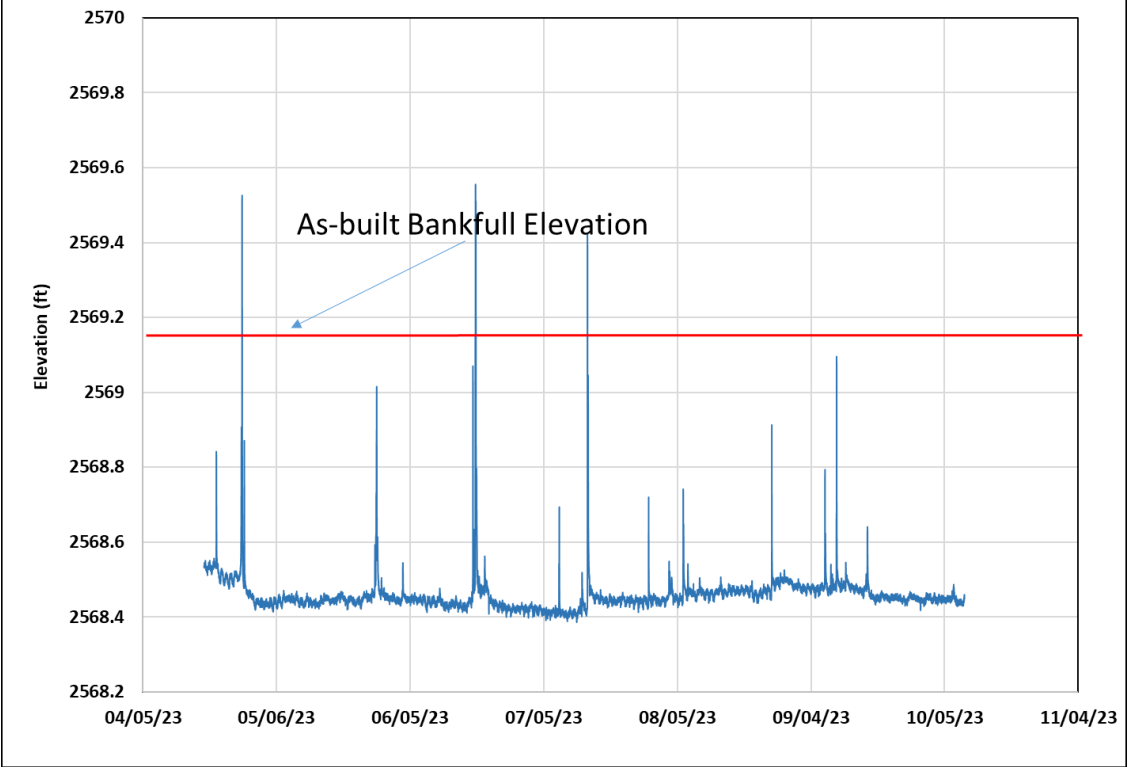
**Table 12. Verification of Bankfull Events
Little Pine Creek II Stream and Wetland Mitigation Site/Project No 856.**

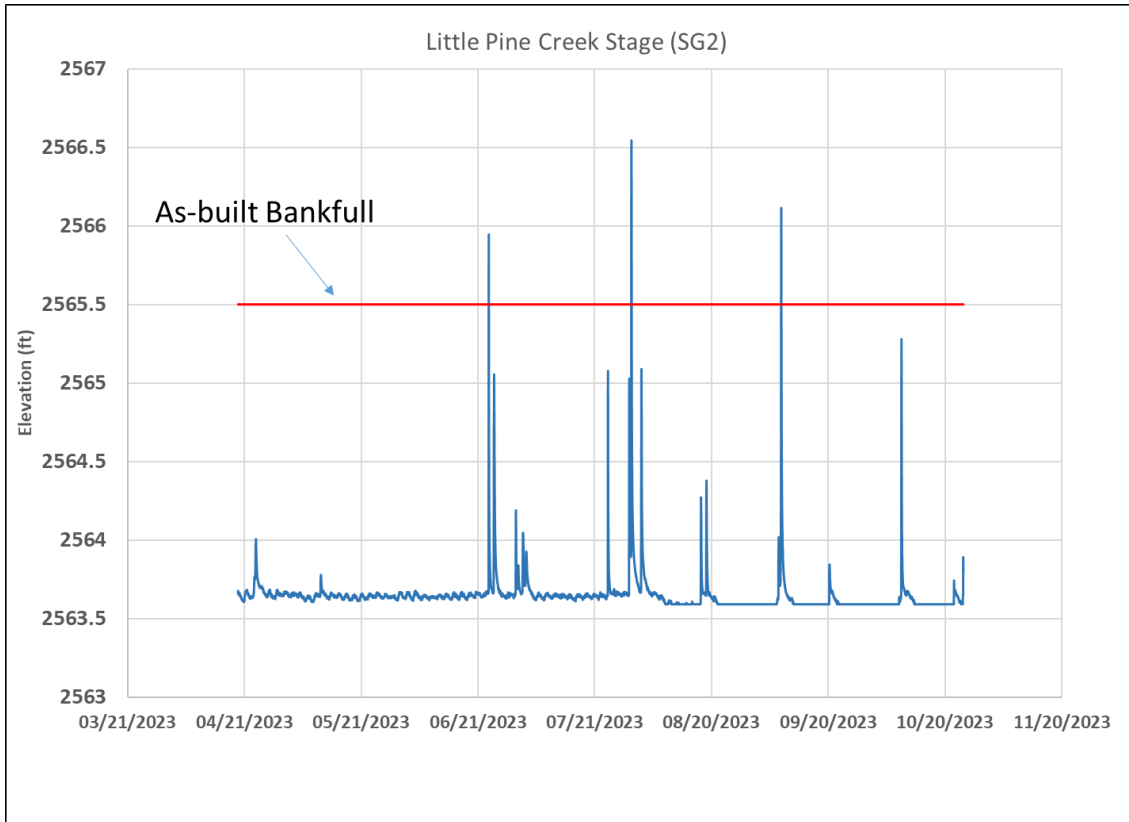
| Reach | Date of Data Collection | +Approximate Date of Occurrence | Method | Photo # (if available) |
|---------------------|--------------------------------|--|----------------------------|-------------------------------|
| LPC Reach 1 | 4/7/2020 | Unknown | Wrack Lines | n/a |
| | 10/6/2020 | Unknown | Wrack Lines | n/a |
| | 10/11/2020 | Unknown | Wrack Lines | n/a |
| | 10/25/2023 | Suspected 07/30/2023 | Wrack Lines | 5 |
| LPC Reach 2A | 10/6/2020 | 01/12/2020 | Stage Recorder | n/a |
| | 10/6/2020 | 01/24/2020 | Stage Recorder | n/a |
| | 4/7/2020 | 02/07/2020 | Stage Recorder/Wrack Lines | n/a |
| | 7/10/2020 | 04/13/2020 | Stage Recorder/Wrack Lines | n/a |
| | 10/6/2020 | 04/29/2020 | Stage Recorder | n/a |
| | 10/6/2020 | *5/21/2020 | Stage Recorder | n/a |
| | 10/12/2021 | 05/25/2021 | Stage Recorder | n/a |
| | 10/12/2021 | 06/12/2021 | Stage Recorder | n/a |
| | 10/12/2021 | 07/02/2021 | Stage Recorder | n/a |
| | 10/12/2021 | 08/07/2021 | Stage Recorder | n/a |
| | 10/12/2021 | 08/18/2021 | Stage Recorder | n/a |
| | 10/12/2021 | 10/09/2021 | Stage Recorder | n/a |
| | 10/18/2022 | 06/12/2022 | Stage Recorder | n/a |
| | 10/18/2022 | 08/19/2022 | Stage Recorder | n/a |
| | 10/18/2022 | 10/09/2022 | Stage Recorder | n/a |
| | 10/25/2023 | 06/23/2023 | Stage Recorder | n/a |
| | 10/25/2023 | 07/31/2023 | Stage Recorder | n/a |
| 10/25/2023 | 09/08/2023 | Stage Recorder | n/a | |
| Tributary A | 10/11/2021 | Unknown | Wrack Lines | n/a |
| | 10/17/2022 | Suspected 8/18/2022 | Crest Gage | n/a |
| | 04/19/2023 | Winter 2022 - Spring 2023 | Crest Gage | 1 |
| | 10/25/2023 | Summer 2023 | Crest Gage | 2 |
| Tributary B | 10/6/2020 | 05/21/2020 | Crest Gage | n/a |
| | 10/11/2021 | Unknown | Crest Gage | n/a |
| | 04/19/2023 | Winter 2022 - Spring 2023 | Crest Gage | 3 |
| | 10/25/2023 | Summer 2023 | Crest Gage | 4 |
| Tributary C | 10/6/2020 | 01/12/2020 | Stage Recorder | n/a |
| | 10/6/2020 | 05/21/2020 | Stage Recorder | n/a |
| | 10/6/2020 | 07/19/2020 | Stage Recorder | n/a |
| | 10/12/2021 | 08/18/2021 | Stage Recorder | n/a |
| | 10/18/2022 | 07/23/2022 | Stage Recorder | n/a |
| | 10/18/2022 | 10/18/2022 | Stage Recorder | n/a |
| | 10/25/2023 | 04/28/2023 | Stage Recorder | n/a |
| | 10/25/2023 | 06/20/2023 | Stage Recorder | n/a |
| 10/25/2023 | 07/15/2023 | Stage Recorder | n/a | |

*Stage recorder buried during this event.

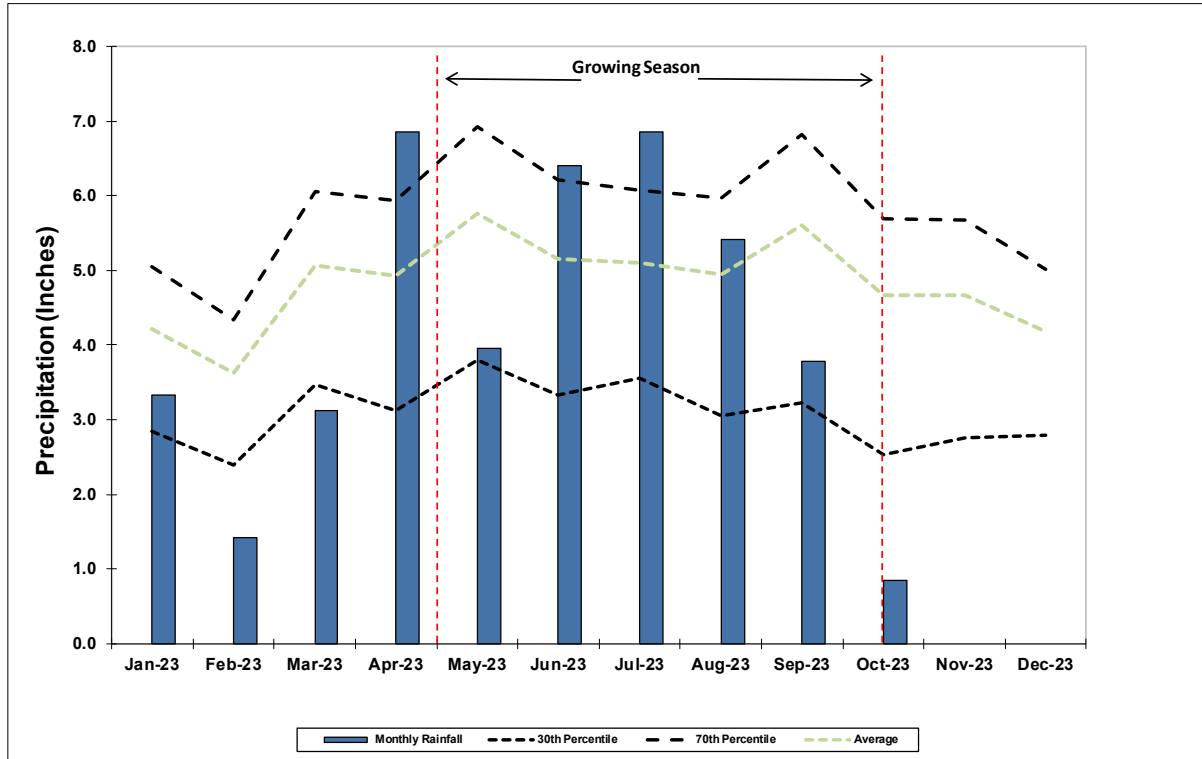
+ The multiple listed dates for 2021 and 2022 are based on precipitation and stage recorder data from January thru October.

Trib C Stage (SG1)





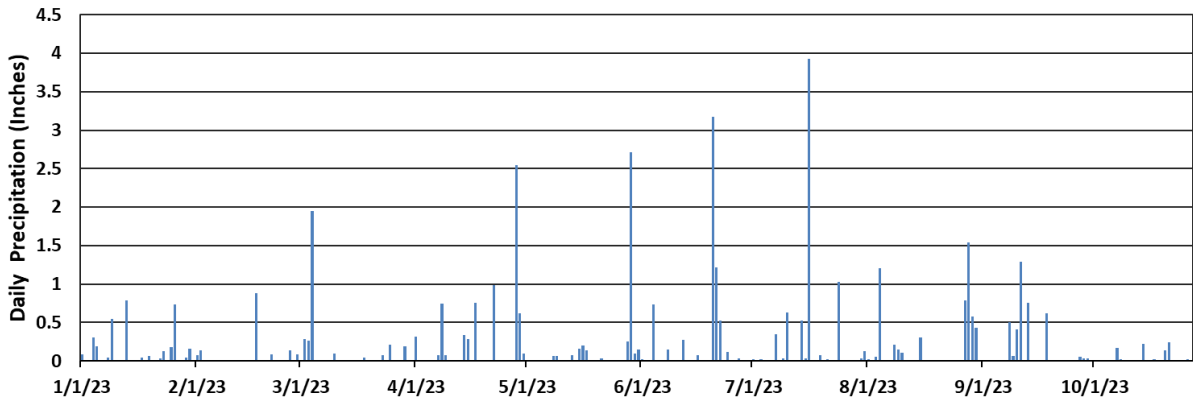
Little Pine Creek II Stream and Wetland Mitigation Site Precipitation Graphic



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-23 | 3.34 | 2.85 | 5.05 | 4.22 |
| Feb-23 | 1.43 | 2.4 | 4.34 | 3.62 |
| Mar-23 | 3.13 | 3.47 | 6.05 | 5.07 |
| Apr-23 | 6.86 | 3.12 | 5.94 | 4.93 |
| May-23 | 3.96 | 3.8 | 6.92 | 5.77 |
| Jun-23 | 6.41 | 3.33 | 6.21 | 5.16 |
| Jul-23 | 6.85 | 3.56 | 6.07 | 5.11 |
| Aug-23 | 5.42 | 3.05 | 5.97 | 4.94 |
| Sep-23 | 3.78 | 3.22 | 6.83 | 5.61 |
| Oct-23 | 0.85 | 2.53 | 5.69 | 4.67 |
| Nov-23 | - | 2.75 | 5.68 | 4.67 |
| Dec-23 | - | 2.79 | 5.01 | 4.19 |
| Total | 42.03 | 36.87 | 69.76 | 57.96 |

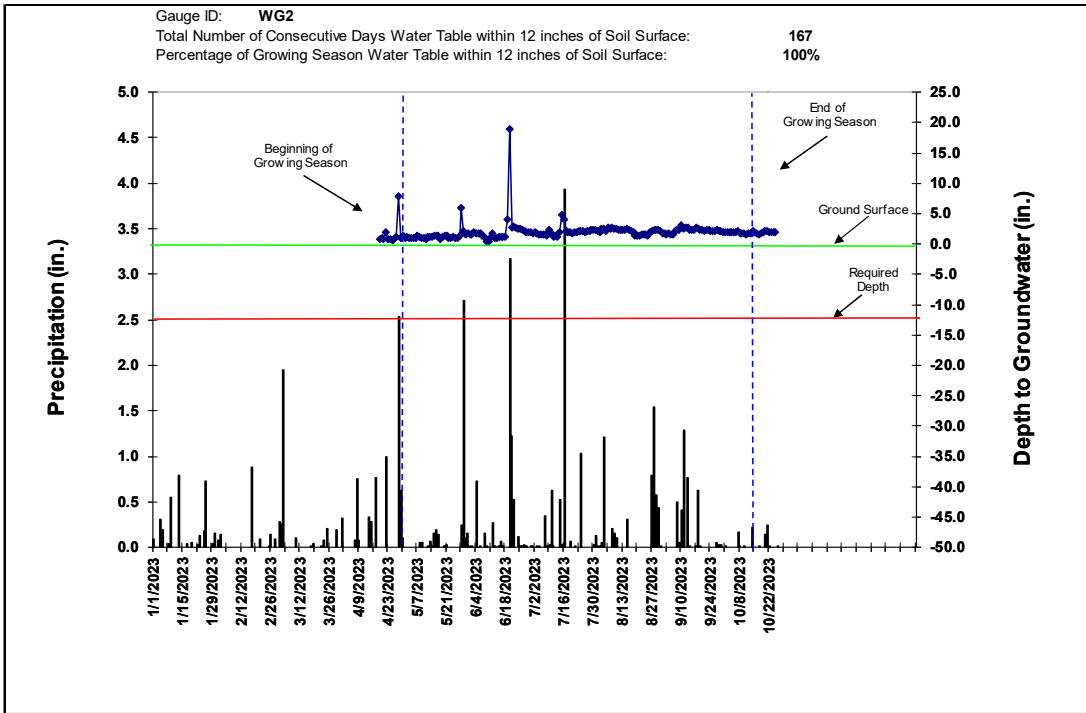
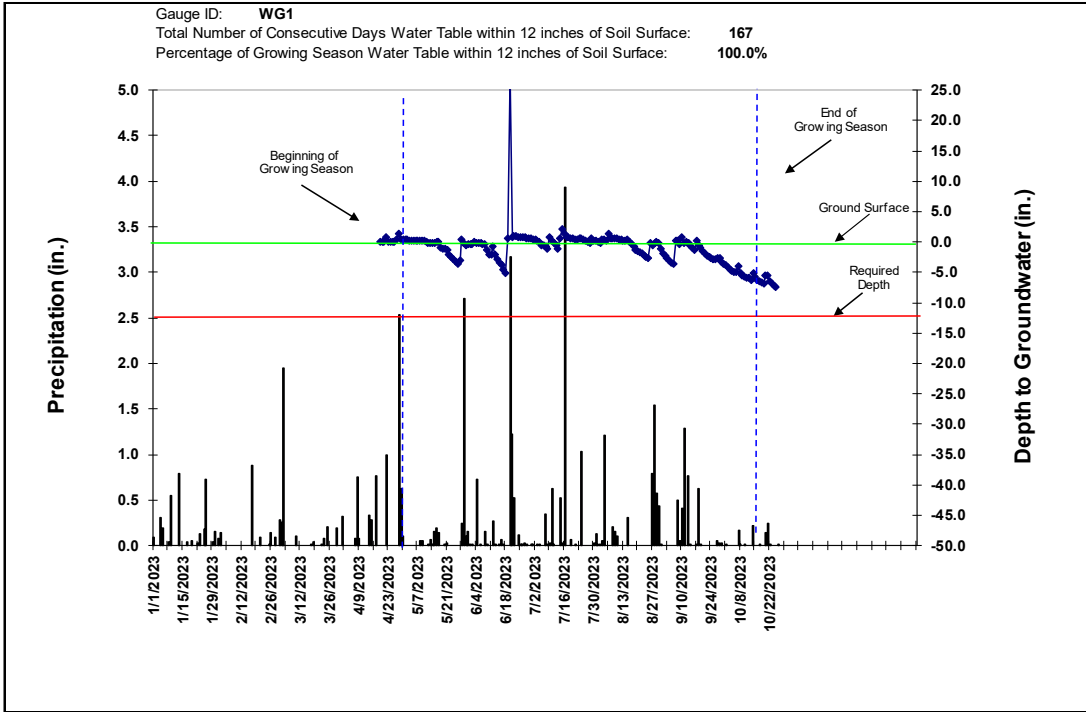
Little Pine Creek II Precipitation Data (inches)



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

| Monitoring Gauge | Performance Standard: 12 % NCSCO Station Sparta 2SE (318158) Growing Season: 4/30 to 10/14 (167 days) Max. Consecutive Hydroperiod (%) and number of consecutive days (n) | | | | | | | | | | | | | |
|---|--|-----|-------------|-----|-------------|-----|--|-----|-------------|---|--|---|-------------|---|
| | MY-1 (2020) | | MY-2 (2021) | | MY-3 (2022) | | MY-4 (2023) | | MY-5 (2024) | | MY-6 (2025) | | MY-7 (2026) | |
| | % | n | % | n | % | n | % | n | % | n | % | n | % | n |
| MW-1 | 91 | 153 | 84 | 142 | 98 | 165 | 100 | 167 | - | - | - | - | - | - |
| MW-2 | 93 | 156 | 39 | 66 | 60 | 101 | 100 | 167 | - | - | - | - | - | - |
| * Performance standard for groundwater gauges was calculated at 12 percent (20 days). Percent deviation is based upon this duration (2.0 days) | | | | | | | Exceeds requirements by 10% | | | | Fails to meet requirements, by less than 10% | | | |
| | | | | | | | Exceeds requirements, but by less than 10% | | | | Fails to meet requirements by more than 10% | | | |

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



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Appendix F
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Little Pine Creek II invasive vegetation treatment log.

| 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 (<i>Rosa multiflora</i>); Asian bittersweet (<i>Celastrus orbiculatus</i>); | 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 (<i>Typha latifolia</i>) | 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 (<i>Rosa multiflora</i>); Japanese barberry (<i>Berberis thunbergii</i>); Cattails (<i>Typha latifolia</i>) | 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 | | |
| 4/19/2023 | 10:00 am- 4:00 pm | 026-29539 | Asiatic bittersweet (<i>Celastrus orbiculatus</i> , Multiflora rose (<i>Rosa multiflora</i>); Japanese barberry (<i>Berberis thunbergii</i>); Cattails (<i>Typha latifolia</i>) | Glyphosate (foliar) | 4.00% | 112 | 22 | calm, mild (50), sunny | Sprayed large swaths of ROMU along LBD between floodplain and preservation wetland; treated back side (along field margin and into woodline). Cut and painted CEOR where found; |
| | | | | Glyphosate (cut-stem) | 25.00% | 0.125 | 0.25 | | |
| 10/25/2023 | 10:00 am- 2:00 pm | 026-29539 | Asiatic bittersweet (<i>Celastrus orbiculatus</i>) | Glyphosate (cut-stem) | 25.00% | 0.125 | 0.25 | Cold (42), sunny | Targeted large climbing CEOR along RDB edge of CE (w/ag field); large CEOR along preservation wetland margin; |

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