MONITORING YEAR 3 ANNUAL REPORT

FINAL

HONEY MILL MITIGATION SITE

Surry County, NC
DEQ Contract No. 7619
DMS Project No. 100083

Yadkin River Basin HUC 03040101
USACE Action ID No. SAW-2018-01789
NCDEQ DWR#: 18-1271
RFP #: 16-00746
RFP Issuance Date: December 7, 2017

Data Collection Period: January 2023 – October 2023
FINAL Submission Date: January, 2024

PREPARED FOR:

NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

January 4, 2024

Mr. Kelly Phillips
Project Manager
NCDEQ – Division of Mitigation Services
610 East Center Ave., Suite 301
Mooresville, NC 28115

RE: Draft: Year 3 Monitoring Report
Honey Mill Mitigation Site, Surry County
Yadkin River CU 03040101
DMS Project ID No. 100083 / DEQ Contract #007619

Dear Mr. Phillips:

Wildlands Engineering, Inc. (Wildlands) has reviewed the Division of Mitigation Services (DMS) comments from the Draft Year 3 Monitoring Report for the Honey Mill Mitigation Site that were received on January 3, 2024. The report has been updated to reflect those comments. The Final MY3 Report is included. DMS' comments are listed below in **bold**. Wildlands' responses to DMS' comments are noted in *italics*.

DMS' comment: Report Cover: Thank you for including the data collection dates.

Wildlands' response: You're welcome.

DMS' comment: Executive Summary: Thank you for providing concise status updates on the primary project monitoring items and referencing measures to accomplish the IRT requests.

Wildlands' response: You're welcome.

DMS' comment: Section 1.3 Project Attributes - Table 3: Convert the Lat/Long to decimal degrees.

Wildlands' response: The Lat/Long coordinates have been changed to decimal degrees in Table 3 in Section 1.3.

DMS' comment: Section 1.4.1 Vegetation Assessment - IRT Requested Forested Transect Results: Thank you for conducting the planted stem assessment in the forested areas. The reported survival rates are encouraging in these shaded areas.

Wildlands' response: Noted.

DMS' comment: Section 1.4.4 Areas of Concern and Management Activity: The full boundary assessment conducted during MY3 is appreciated. Please continue monitoring the easement boundary and document the results in the MY4 report.

Wildlands' response: Noted.

DMS' comment: Section 1.4.4 Areas of Concern and Management Activity - Invasive Species Management: The overall reduction in the invasive species population has been effective over the course of the project, the ongoing treatment is appreciated.

Wildlands' response: Noted.

Digital Support File Comments:

DMS' comment: Please submit stream and vegetation visual assessment tables in digital format.

Wildlands' response: All stream visual assessment tables have been included in the final digital submittal.

As requested, Wildlands has included two (2) hard copies of the final report, a full final .pdf copy of the report with the DMS comment letter and our response letter inserted after the cover page, and a full final electronic submittal of the support files. A copy of the DMS comment letter and our response letter have been included inside the front cover of each report's hard copy, as well. Please let me know if you have any questions.

Sincerely,

Kristi Suggs
Senior Environmental Scientist
ksuggs@wildlandseng.com

PREPARED BY:

Wildlands Engineering, Inc.
1430 South Mint Street, Suite 104
Charlotte, NC 28203

Phone: 704.332.7754
Fax: 704.332.3306

EXECUTIVE SUMMARY

Wildlands Engineering, Inc. (Wildlands) implemented a full-delivery stream mitigation project at the Honey Mill Mitigation Site (Site) for the North Carolina Department of Environmental Quality (DEQ) Division of Mitigation Services (DMS). The project restored and enhanced a total of 8,683 linear feet (LF) of perennial and intermittent stream in Surry County, NC. The Site is located within the Rutledge, Stoney and Flat Shoal Creek – Ararat River targeted local watershed (TWL) and NC Division of Water Resources (DWR) Subbasin 03-07-03. The project is providing 4,793.432 cool stream mitigation units (SMUs) for the Yadkin River Basin Hydrologic Unit Code (HUC) 03040101110020.

The Site's immediate drainage area and the surrounding watershed have a long history of agricultural activity. The project excludes livestock, creates stable stream banks, converts pasture to forest, and implements BMPs to filter agricultural runoff. These actions address stressors by reducing fecal, nutrient, and sediment inputs to project streams, and ultimately to the Ararat River, and reconnect instream and terrestrial habitats on the Site to upstream and downstream resources. Approximately 20.2-acres of land has been placed under permanent conservation easement to protect the Site in perpetuity. The established project goals include:

- Improve stream channel stability,
- Treat concentrated agricultural run-off,
- Improve in-stream habitat,
- Restore and enhance native floodplain and wetland vegetation,
- Exclude livestock from streams, and
- Permanently protect the project Site from harmful uses.

The Site is meeting the required stream, vegetation, and hydrology success criteria for Monitoring Year 3 (MY3). In MY3 the Site has met the required stream success criteria. The average planted stem density is 460 stems per acre and all plots met the MY3 density criteria. Three bankfull events were documented on the Venable Creek Reach 3 in MY3. The Site is on track to meet the MY7 bankfull flow requirements. No stream areas of instability were documented, and areas monitored per IRT request have remained stable. All fences are intact, and no encroachments present at the Site as of October 2023. Invasive species areas will continue to be monitored and adaptive management measures will be implemented as necessary to benefit the ecological health of the Site.

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Section 1: PROJECT OVERVIEW

1.1 Project Quantities and Credits

Wildlands Engineering, Inc. (Wildlands) implemented a full-delivery stream mitigation project at the Honey Mill Mitigation Site (Site) for the North Carolina Department of Environmental Quality (DEQ) Division of Mitigation Services (DMS). The project restored and enhanced a total of 8,683 linear feet (LF) of perennial and intermittent stream in Surry County, NC. The Site is located within the Rutledge, Stoney and Flat Shoal Creek – Ararat River targeted local watershed (TWL)and NC Division of Water Resources (DWR) Subbasin 03-07-03. A conservation easement has been recorded and is in place on 20.2 acres. The project is providing 4,793.432 cool stream mitigation units (SMUs) for the Yadkin River Basin Hydrologic Unit Code (HUC) 03040101110020. The Site contains eight unnamed tributaries (UTs) to Venable Creek (UT1, UT2, UT2A, UT2B, UT3, UT4, UT5, and UT6) and the mainstem of Venable Creek, which has been broken into four reaches and flows in a north easterly direction through the Site. Multiple riparian wetlands exist on-site; however, no credit is being sought for project wetlands.

Please refer to Table 1 and Table 1.1 for project credits by stream and the credit summary table respectively. Annual monitoring will be conducted for seven years with close-out anticipated to commence in 2027 given the success criteria are met.

Table 1: Project Quantities and Credits

Project Components						
Project Stream	**Mitigation Plan Footage[1, 2, 3]**	**As-Built Footage**	**Mitigation Category**	**Restoration Level**	**Mitigation Ratio (X:1)**	**Credits**
Venable Creek Reach 1	91	91.000	Cool	EII	2.500	36.386
Venable Creek Reach 2	211	211.000	Cool	EI	1.500	140.566
Venable Creek Reach 3	1647	1,647.000	Cool	R	1.000	1,646.644
Venable Creek Reach 4	1958	1,958.000	Cool	EII	2.500	783.042
UT1	273	273.000	Cool	R	1.000	272.885
UT2 Reach 1	742	742.000	Cool	EII	4.000	185.462
UT2 Reach 2	342	332.000	Cool	R	1.000	342.364
UT2A	893	893.000	Cool	EII	4.000	223.310
UT2B	70	70.000	Cool	N/A	0.000	0.000
UT3 Reach 1	784	784.000	Cool	EII	3.000	261.279

Table 1: Project Quantities and Credits

Project Components						
Project Stream	**Mitigation Plan Footage[1, 2, 3]**	**As-Built Footage**	**Mitigation Category**	**Restoration Level**	**Mitigation Ratio (X:1)**	**Credits**
UT3 Reach 2	306	306.000	Cool	R	1.000	306.172
UT4	440	440.000	Cool	EII	3.000	146.780
UT5	518	518.000	Cool	EII	3.000	172.553
UT6 Reach 1	214	213.000	Cool	EII	3.000	71.242
UT6 Reach 2	205	205.000	Cool	R	1.000	204.747
					Total:	**4,793.432**

Notes:
1. Internal culvert crossing, and external break excluded from the credited stream footage.
2. No direct Credit for BMPS.
3. UT6 originates within an overhead powerline easement. The conservation easement extends up to UT6's origin under the powerline, but proposed crediting does not begin until the stream exits the overhead easement.

Table 1.1: Credit Summary Table

Project Credits			
Restoration Level	**Stream**		
	Warm	**Cool**	**Cold**
Restoration	N/A	2,772.812	N/A
Enhancement I	N/A	140.566	N/A
Enhancement II	N/A	1,880.054	N/A
Preservation	N/A	N/A	N/A
Totals	**N/A**	**4,793.432**	**N/A**

1.2 Project Goals and Objectives

The Site is providing numerous ecological benefits within the Yadkin River Basin. The Site was selected based on its potential to support the objectives and goals of multiple conservation and watershed planning documents such as the 2009 Upper Yadkin River Basin Restoration Priorities (RBRP) and the 2015 North Carolina Wildlife Resource Communion's (NCWRC) Wildlife Action Plan (WAP). Table 2 below describes the project goals and how functional uplift at the Site will be measured and monitored.

Table 2: Goals, Performance Criteria, and Functional Improvements

Goal	Objective/Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
Exclude livestock from stream channels.	Install livestock fencing on all or portions of the Site and/or permanently remove livestock from all or portions of the Site to exclude livestock from stream channels and riparian areas.	Reduced agricultural runoff and cattle trampling in streams.	There is no required performance standard for this metric.	Visually monitor fenced portions of Site to ensure no cattle are entering the easement.	No cattle observed in easement in MY3.
Improve stability of stream channels.	Construct stream channels that will maintain stable cross-sections, patterns, and profiles over time.	Reduction in sediment inputs from bank erosion, reduction of shear stress, and improved overall hydraulic function.	Bank height ratios remain below 1.2 over the monitoring period. Visual assessments showing progression towards stability.	11 cross-section surveys in MY1, 2, 3, 5, & 7.	In MY3, all cross sections have a BHR <1.2. Channels are stable have maintained the constructed riffle and pool sequence.
Reconnect channels with floodplains.	Reconstruct stream channels with appropriate bankfull dimensions and depth relative to the existing floodplain.	Dispersion of high flows on the floodplain.	Four bankfull events, occurring in separate years during the monitoring period.	Venable Creek Reach 3- 1 Manual Crest Gage and 1 automated Crest Gage.	In MY3 three bankfull events were recorded. In MY2, one bankfull event was recorded. The Site is on track to meet criteria.
Improve instream habitat.	Install habitat features such as constructed riffles, cover logs, and brush toes into restored/enhanced streams. Add woody materials to channel beds. Construct pools of varying depth.	Increase and diversify available habitats for macroinvertebrates, fish, and amphibians leading to colonization and increase in biodiversity over time.	There is no required performance standard for this metric.	N/A	N/A
Restore and enhance native floodplain and streambank vegetation.	Plant native tree and understory species in riparian zones and plant appropriate species on streambanks.	Reduction in floodplain sediment inputs from runoff, increased bank stability, increased LWD and organic material in streams	In open planting areas a survival rate of 320 stems per acre at MY3, 260 planted stems per acre at MY5, and 210 stems per acre at MY7. Height requirement is 6 feet at MY5 and 8 feet at MY7.	9 permanent vegetation plots, 5 mobile vegetation plots in MY1, 2, 3, 5, & 7.	14/14 (100%) of the vegetation plots met the MY3 success criteria of 320 stems per acre.

Table 2: Goals, Performance Criteria, and Functional Improvements

Goal	Objective/Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
Treat concentrated agricultural runoff	Install agricultural BMPS in areas of concentrated agricultural runoff.	Treatment of runoff before it enters the stream channel.	There is no required performance standard for this metric.	N/A	N/A
Permanently protect the project Site from harmful uses.	Establish conservation easements on the Site.	Protect Site from encroachment on the riparian corridor and direct impact to streams and wetlands.	Prevent easement encroachment.	Visually inspect the perimeter of the Site to ensure no easement encroachment is occurring.	No easement encroachments were observed in MY3.

1.3 Project Attributes

The Site's immediate drainage area as well as the surrounding watershed has a long history of agricultural activity. Stream and wetland functional stressors for the Site were related to both historic and current land use practices. Major stream stressors for the Site pre-restoration included livestock trampling and fecal coliform inputs, lack of stabilizing stream bank and riparian vegetation, active erosion, and incision. The effects of these stressors resulted in channel instability, degraded water quality, and the loss of both aquatic and riparian habitat throughout the Site's watershed when compared to reference conditions.

The overall Site topography consists of steep, confined, and moderately confined valleys along the tributaries and flow into a more open and gradually sloped valley along the mainstem of Venable Creek. The project begins at a roadway culvert located at the intersection of Little Mountain Church Road and Venable Creek. The watersheds for UT3, UT4, and UT6 are roughly bound by Venable Farm Road to the west. All of the reach watersheds are encompassed by the Venable Creek watershed, which extends south past Little Mountain Church Road. The Site is typically defined by forested and agricultural land use with sporadic development of rural homes.

Pre-construction conditions are outlined in Table 3 below and Table 8 of Appendix C.

Table 3: Project Attributes

Project Information			
Project Name	Honey Mill Mitigation Site	**County**	Surry County
Project Area (acres)	20.2	**Project Coordinates**	36.428619, -80.610836
Planted Acreage	5 acres (full planting) plus supplemental planting		
Project Watershed Summary Information			
Physiographic Province	Piedmont	**River Basin**	Yadkin River
USGS Hydrologic Unit 8-digit	03040101	**USGS Hydrologic Unit 14-digit**	03040101110020

Table 3: Project Attributes

Project Watershed Summary Information			
DWR Sub-basin	03-07-03	**2011 NLCD Land Use Classification**	Forest (65%), Cultivated (21%), Shrubland (5%), Urban (9%), Open Water (0%)
Project Drainage Area (acres)	705	**Project Drainage Area Percentage of Impervious Area**	0.8%

Reach Summary Information															
Parameters	**Venable Creek**				**UT1**	**UT2**		**UT2A**	**UT2B**	**UT3**		**UT4**	**UT5**	**UT6**	
	R1	**R2**	**R3**	**R4**		**R1**	**R2**			**R1**	**R2**			**R1**	**R2**
Length of reach (linear feet) - post-restoration	91	211	1,647	1,958	273	742	332	893	80	784	306	440	518	213	205
Valley confinement	Unconfined to Confined														
Drainage area (acres)	183	519	599	705	334	21	43	21	9	15	18	9	12	8	10
Perennial (P), Intermittent (I), Ephemeral (E)	P	P	P	P	P	I/ P	P	P	P	P	P	P	I/ P	P	P
NCDWR Water Quality Classification	Class C														
Morphological Description (stream type) - Pre-Restoration	N/A	E4	E/C4	N/A	E4b	N/A	C4b	N/A	N/A	N/A	E4b	N/A	N/A	N/A	A4
Morphological Description (stream type) - post-restoration	N/A	B4	C4	N/A	C4b	N/A	B4	N/A	N/A	N/A	C4b	N/A	N/A	N/A	A4
Evolutionary trend (Simon's Model) - Pre- Restoration	N/A	III	IV	N/A	III	N/A	V->V	N/A	N/A	N/A	III	N/A	N/A	N/A	III

Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States - Section 404	Yes	Yes	USACE Action ID #SAW-2018-01789
Waters of the United States - Section 401	Yes	Yes	DWR# 18-1271
Division of Land Quality (Erosion and Sediment Control)	Yes	Yes	NPDES Construction Stormwater General Permit NCG010000
Endangered Species Act	Yes	Yes	Categorical Exclusion Document in Mitigation Plan

Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Historic Preservation Act	Yes	Yes	Categorical Exclusion Document in Mitigation Plan
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

1.4 Monitoring Year 3 Data Assessment

Annual monitoring for MY3 was conducted between January and October 2023. The stream, vegetation, and hydrologic success criteria for the Site follows the approved success criteria presented in the Honey Mill Mitigation Plan (Wildlands, 2020).

1.4.1 Vegetation Assessment

Supplemental Planting Background, IRT Approval, and Table 7 Densities

Please note that Table 7 only summarizes stem densities for the species included in the approved Mitigation Plan Performance Standard. However, with IRT approval, Wildlands conducted supplemental planting in 2.5 acres of wetland across the Site to support woody stem growth in March of 2022. During the same planting, additional stems were also planted in the enhancement II reaches with existing forest (approximately 7 acres) per IRT request. All species approval and substitutions were documented in the MY1 Annual Monitoring Report (Wildlands, 2021) and MY2 Annual Monitoring Report (Wildlands, 2022). Please refer to the IRT approved planted supplemental stems species and quantities in Appendix F.

The approved supplemental wetland and riparian species have been included in the vegetative survey and factored into the density and species composition for all vegetation data analysis as "Approved Post Mitigation Plan" species. To account for the IRT approved supplemental species please refer to Table 6 "Post Mitigation Plan Performance Standard" densities discussed in the results below.

Permanent and Mobile Vegetation Plot Results

The MY3 permanent plot planted stem density using the "Post Mitigation Plan" performance standard ranged from 324 to 486 stems per acre. All densities within the permanent plots (9/9) exceeded the MY3 criteria of 320 stems per acre. The MY3 "Post Mitigation Plan" planted stem densities in random mobile vegetation plots ranged from 324 to 688 stems per acre and all 5 mobile plots met the MY3 density criteria. The mobile plots are distributed across the Site to provide representative data of the open planting riparian corridor.

IRT Requested Forested Transect Results

As requested by the IRT in MY2, two forested woody vegetation transects have been added to monitor the survivorship of the shaded supplemental planting and will be assessed through MY7 but are not held to the Site's density or height requirements. Forested transect 1 was established on UT2 R1 and had a total stem count of 14 planted stems in MY2 and 13 stems in MY3 resulting in a 93% survival rate.

Forested transect 2 was established on UT4 and had a total stem count of 11 stems in MY2 and 9 stems in MY3 for an 82% survival rate.

Vegetation Data Results Summary

Overall, 100% (14/14) vegetation plots met the MY3 density criteria. The average stem height was 3 feet and is on track to meet MY5 criteria. Additionally, the overall planted density for the Site in MY2 was 460 stems per acre. There was an average of 7 species present per plot in MY3, despite dense herbaceous cover in wetlands areas. Following the supplemental planting in March 2022 woody stem survivorship, vigor, and diversity have improved substantially across the Site when compared to the initial planting.

Please see the Current Condition Plan View (CCPV) maps for permanent vegetation plot locations, MY3 mobile plot locations, and the March 2022 wetland and shaded supplemental planting areas. Vegetation plot and vegetation transect photographs are located in Appendix A. All vegetation summary data for plots and transects are in Appendix B.

1.4.2 Stream Assessment

Riffle cross-sections (XS) on the restoration reaches should be stable and show little change in bankfull area, maximum depth ratio, and width-to-depth ratio. All riffle cross-sections should fall within the parameters defined for the designated stream type. If any changes do occur, these changes will be evaluated to assess whether the stream channel is showing signs of instability. Indicators of instability include a vertically incising thalweg and/or eroding channel banks.

Morphological surveys for MY3 were conducted in June 2023. Cross-section survey results indicate that channel dimensions are stable and functioning as designed on all restoration reaches with minimal adjustments from MY1 to MY3. There are no indicators of stream instability across this Site in MY3.

1.4.3 Stream Hydrology Assessment

An automated pressure transducer is being used to monitor for bankfull flow events. Henceforth, this device is referred to as an automatic “crest gage (CG)” of CG1. A manual crest gage located at XS7 is also being used to corroborate the results of CG1. At the end of the seven-year monitoring period, four or more bankfull flow events must have occurred in separate years.

One bankfull event was recorded on Site in MY2 by CG1 on Venable Creek Reach 3. In MY3, three bankfull events were recorded by CG1 on 4/28/23, 6/20/23, and 8/6/23. Additionally, evidence of a bankfull event was captured at the manual crest gage in August 2023. Therefore, two bankfull events have been recorded in two separate years, the Site is on track to meet the performance criteria of four bankfull events occurring in separate years during the monitoring period. The 30th and 70th percentile data were collected from the Mount Airy 2 W, WETS station for years 1971-2020. As of August 2023, there has been an annual precipitation total of 30.95 inches per USGS 362416080334345 RAINGAGE AT ARARAT RIVER AT ARARAT, NC. The amount of precipitation the Site experiences is likely to fall in the average range for MY3.

The manual crest gage and automatic crest gage locations are included on the MY3 CCPV Figures 1a - 1d. Please refer to Appendix D for hydrology summary data and gage plots, and the Supplemental Photographs located in Appendix A for bankfull documentation at the manual crest gage.

1.4.4 Areas of Concern and Management Activity

Stream Stability

The streams appear stable and functioning with vegetation developing on the channel banks. No areas of instability were noted during the MY3 visual assessment that took place on 8/30/23.

Per IRT request, a few areas that appeared to be stabilizing in MY2 have continued to be monitored in MY3. The spring wetland seep in the right floodplain of Venable Creek Reach 3 provides important floodplain storage and is filling in with stabilizing vegetation. The pour point from the seep to the channel is stable. Wildlands will continue to monitor the seep in future monitoring years. UT2B (not for credit) which was dry during the MY2 Site walk, was flowing during the MY3 visual assessment on 8/30/23 and has remained stable. During dry times of the year, UT3 flows subsurface to the Venable Creek Reach 3 confluence. A marker was installed at the UT3 confluence to monitor vertical incision and no incision has occurred since installation in MY2. The meander bend above the UT3 confluence has continued to fill in with willows armoring the bank after being live staked in before the start of the MY3 growing season. All of these areas have been monitored and photographed in MY3. Please refer to Appendix A for the supplemental photolog.

All culverts, crossing areas, and BMPs have remained stable with riparian vegetation filling in nicely in the surrounding riparian corridor. The visual assessment tables and Supplemental BMP photographs are located in Appendix A.

Easement Exception and Fencing

There are three areas of easement exceptions that were documented at baseline conditions and will remain on the CCPV maps throughout the seven-year monitoring period per IRT request. No easement encroachments were observed in MY3.

Additional fencing was installed and any breaks in fencing were also repaired in September 2022. A full boundary inspection has been completed in MY3. All fences on the Site are intact and no encroachments were present as of October 2023.

Invasive Species Management

There were four established wooded areas with understory invasive species including multiflora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergia*), and Chinese privet (*Ligustrum sinense*). within the project area. These areas occupy less than 2% of the easement and are located within the existing forests along UT2, UT2A, UT3, and UT6, as shown on CCPV Figures 1a - 1d.

Treatments in MY2 were effective and there was a reduction in density of invasives within the mapped polygons from MY2 to MY3. In order to continue to keep the population in check throughout MY3, re-sprout treatments took place in May and July of 2023. Invasive areas will continue to be monitored for re-sprouts and treated as necessary. The open planting areas have established native herbaceous vegetation and are largely free of invasive species. See the vegetation condition assessment Table 5 in Appendix A.

1.5 Monitoring Year 3 Summary

Overall, the Site has met the required stream success criteria for MY3. The average planted stem density was 460 stems per acre and all vegetation plots met the MY3 density requirement of 320 stems per acre. Geomorphic surveys indicate that cross-section bankfull dimensions closely match the baseline monitoring with some minor adjustments, and streams are functioning as intended. Three bankfull events were documented in MY3, and the Site is on track to meet the MY7 bankfull flow requirements.

The MY3 visual assessment identified a few areas of invasive vegetation re-sprouts in wooded enhancement II reaches that were treated as needed throughout the year. The open planting areas have established native herbaceous vegetation and are largely free of invasive species. No stream areas of instability were documented. No easement encroachment was observed on the Site and boundary is intact. Wildlands will continue to monitor the Site and adaptive management measures will be implemented as necessary to benefit the ecological health of the Site.

Section 2: METHODOLOGY

Geomorphic data were collected following the standards outlined in The Stream Channel Reference Site: An Illustrated Guide to Field Techniques (Harrelson et al., 1994) and in the Stream Restoration: A Natural Channel Design Handbook (Doll et al., 2003). All Integrated Current Condition Mapping was recorded using a Trimble handheld GPS with sub-meter accuracy and processed using Pathfinder and ArcGIS. Stream gages were installed in riffles and monitored quarterly. Hydrologic monitoring instrument installation and monitoring methods are in accordance with the United States Army Corps of Engineers (USACE, 2003) standards. Vegetation monitoring protocols followed the Carolina Vegetation Survey-EEP Level 2 Protocol (Lee et al., 2008); however, vegetation data processing follows the NCDMS Vegetation Data Entry Tool and Vegetation Plot Data Table (NCDMS, 2020).

Section 3: REFERENCES

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Harrelson, Cheryl C; Rawlins, C.L.; Potyondy, John P. 1994. *Stream Channel Reference Sites: An Illustrated Guide to Field Technique.* Gen. Tech. Rep. RM-245. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest, and Range Experiment Station. 61 p.

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Rosgen, D.L. 1996. Applied River Morphology. Pagosa Springs, CO: Wildland Hydrology Books.

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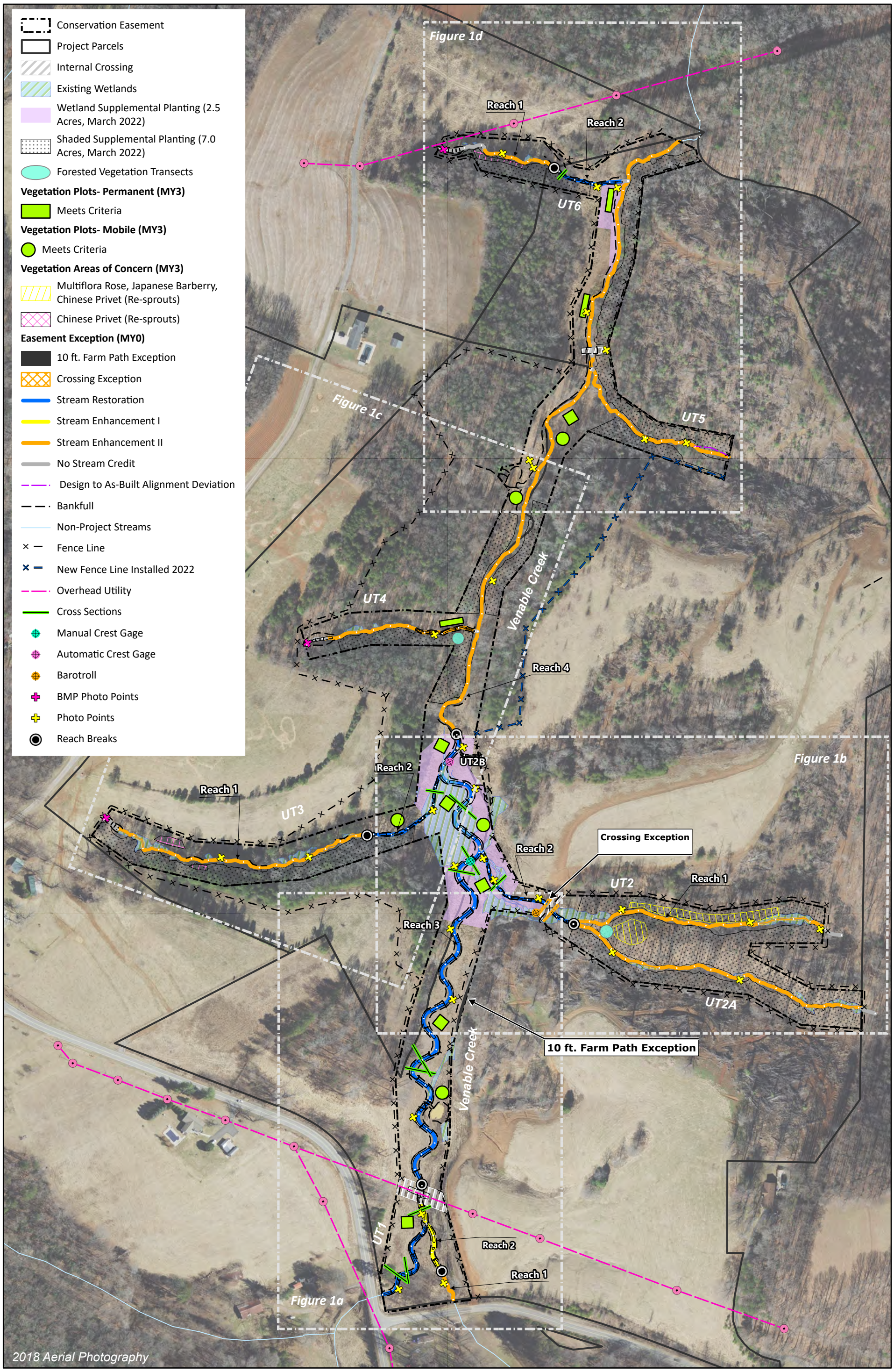


WILDLANDS ENGINEERING

125 250 500 Feet

Figure 1. Current Condition Plan View Key
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023
Surry County, NC

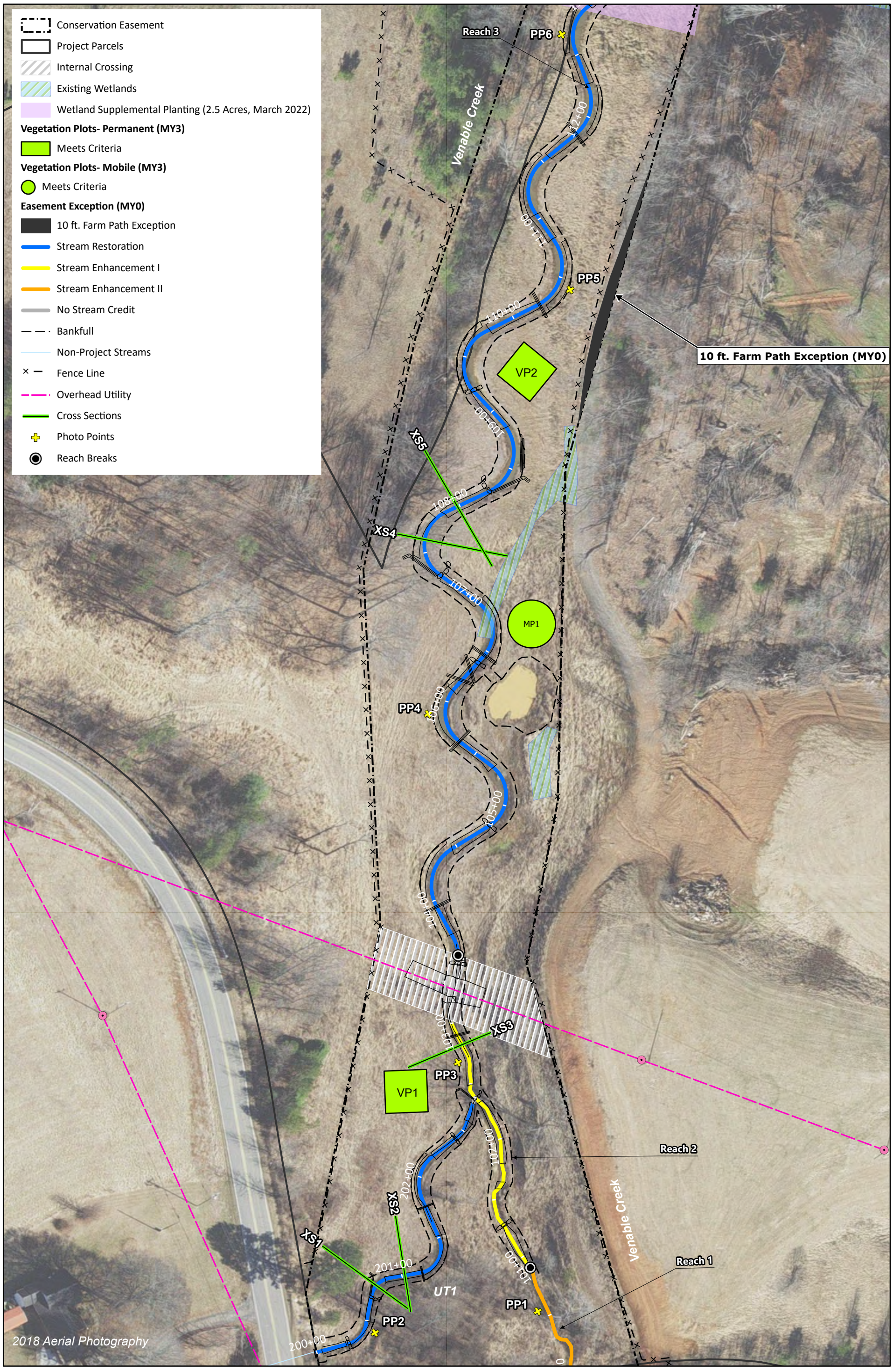
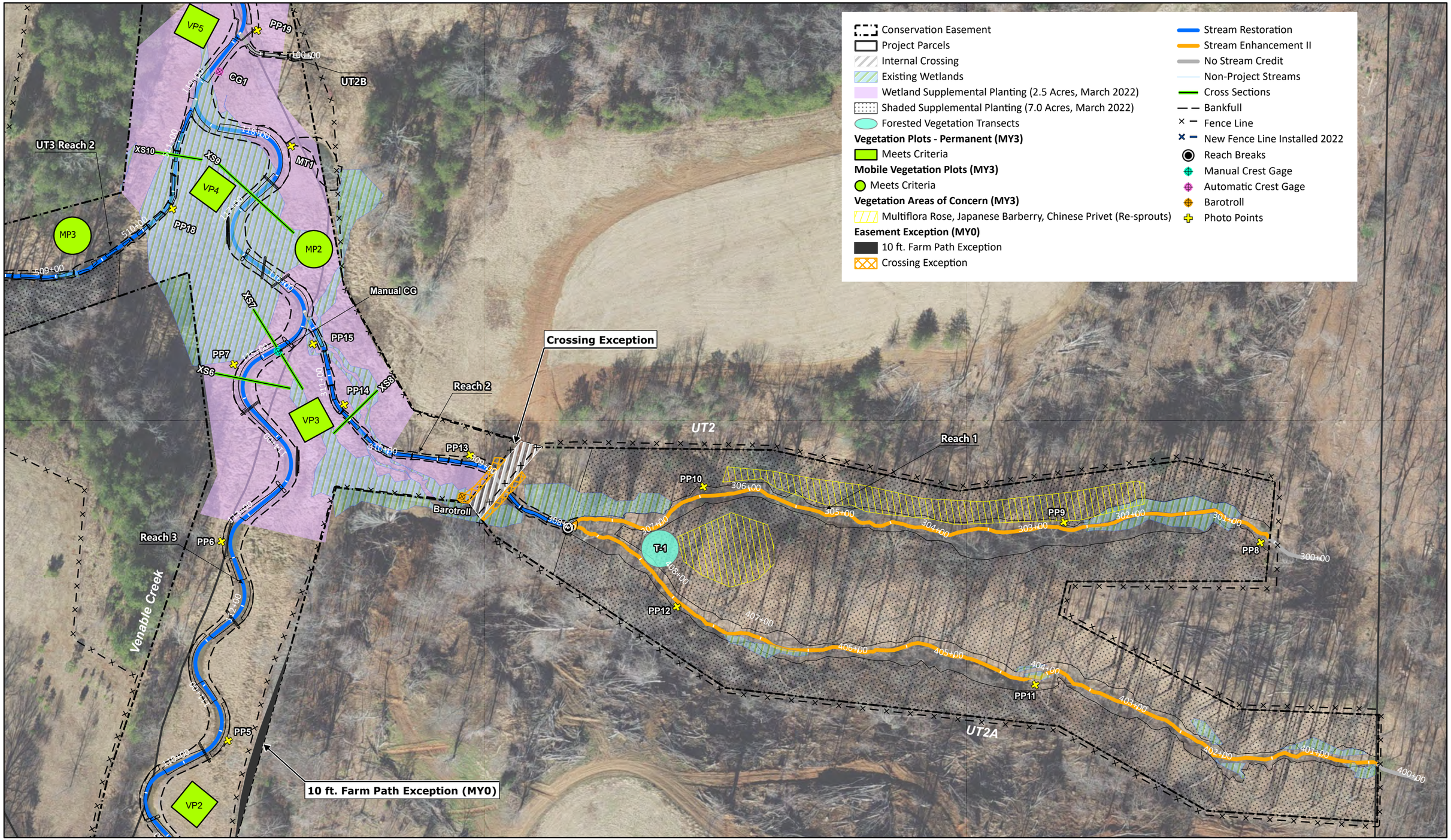
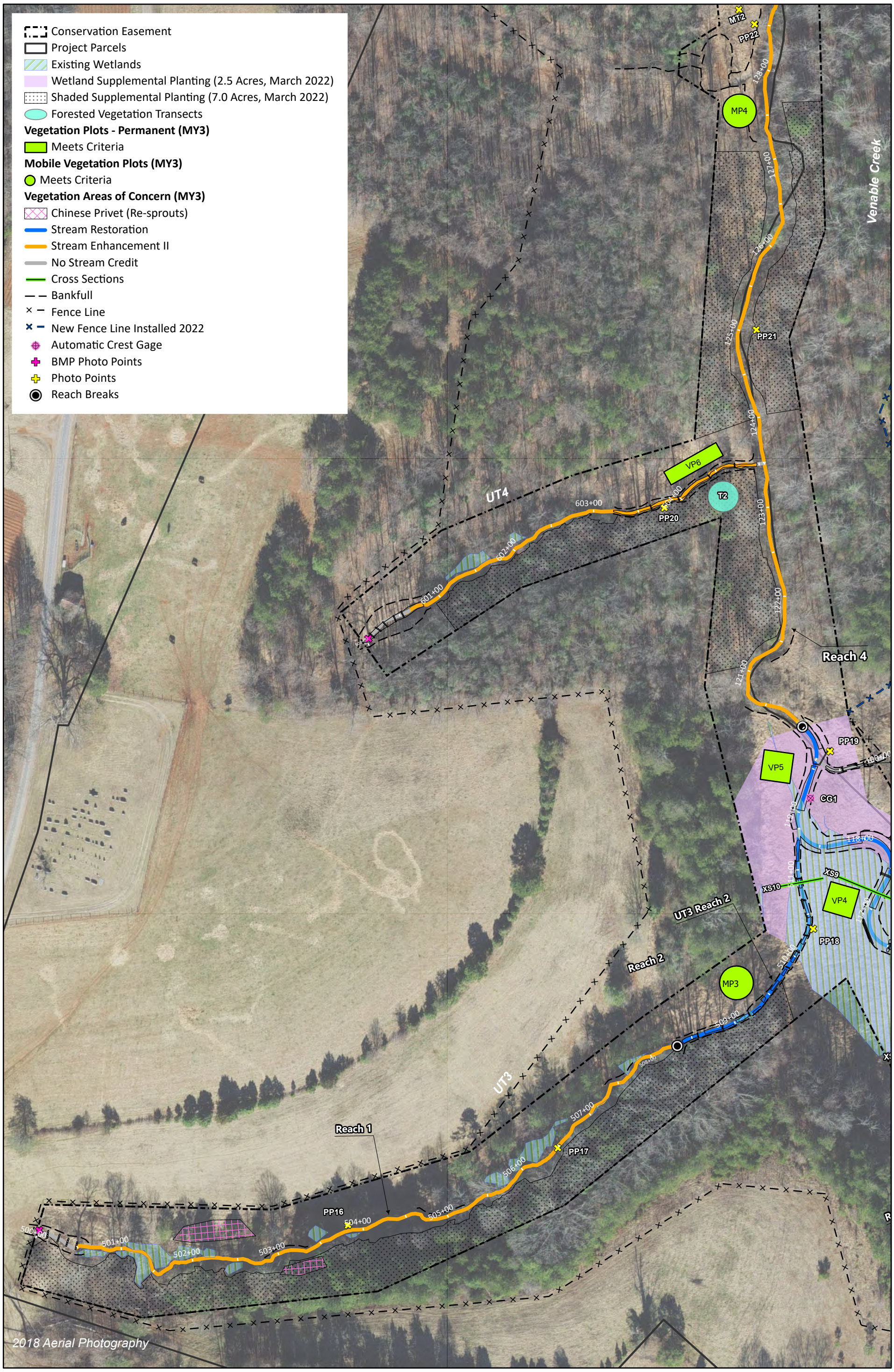


Figure 1a. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023
Surry County, NC



WILDLANDS ENGINEERING

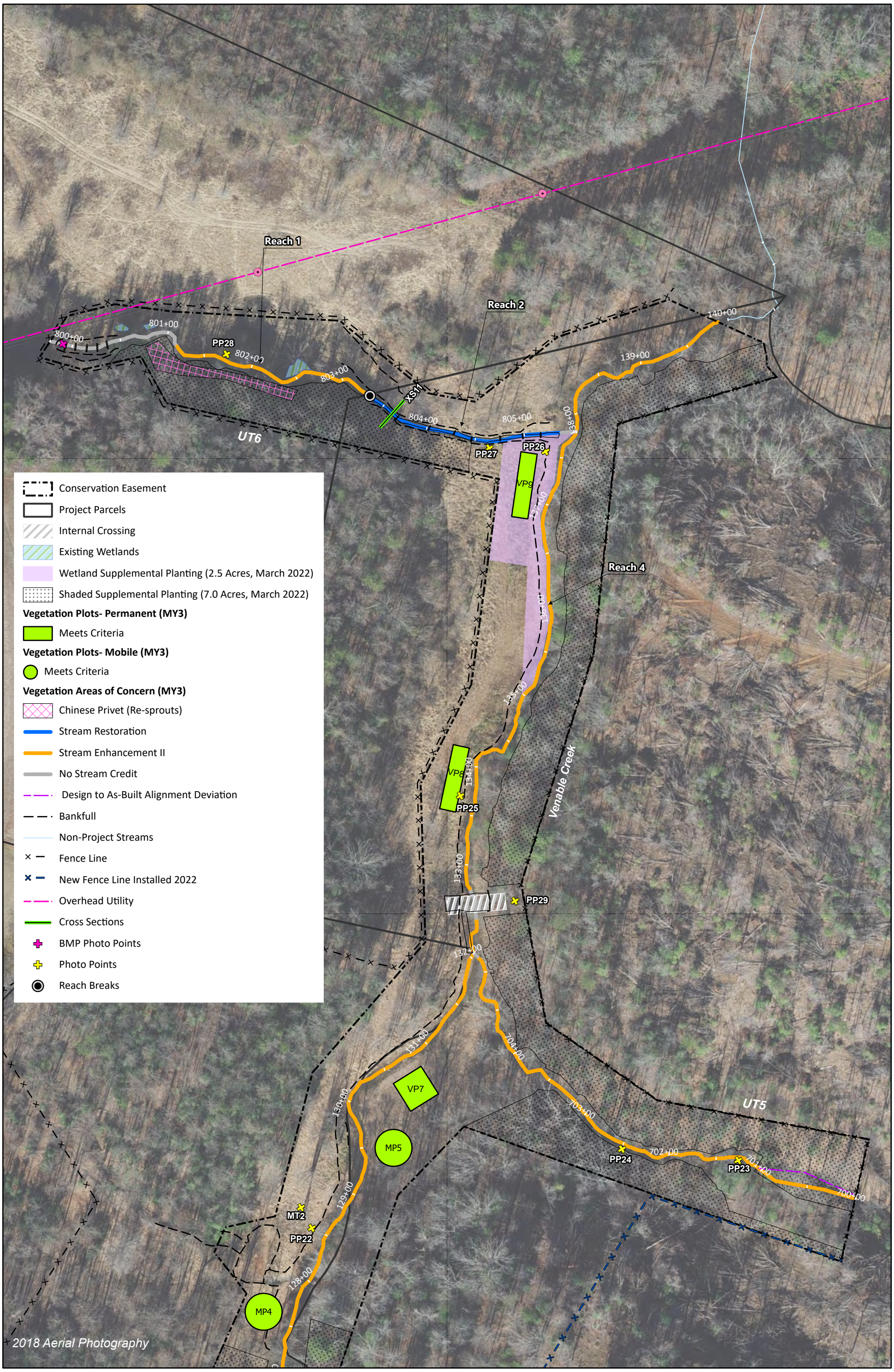
Figure 1b. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023
Surry County, NC



WILDLANDS ENGINEERING

0 100 200 Feet

Figure 1c. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023
Surry County, NC



WILDLANDS ENGINEERING

90 180 Feet

Figure 1d. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023
Surry County, NC

APPENDIX A. Visual Assessment Data

Table 4a. Visual Stream Morphology Stability Assessment Table

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Date of visual assessment: August 30, 2023
Venable Creek R2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	141
					Assessed Bank Length	282
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	5	5		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	1	1		100%

Date of visual assessment: August 30, 2023
Venable Creek R3

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	1,647
					Assessed Bank Length	3,294
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	15	15		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	18	18		100%

Table 4b. Visual Stream Morphology Stability Assessment Table

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Date of visual assessment: August 30, 2023
UT1

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	273
					Assessed Bank Length	546
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	6	6		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	4	4		100%

Date of visual assessment: August 30, 2023
UT2 R2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	342
					Assessed Bank Length	684
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	15	15		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	1	1		100%

Table 4c. Visual Stream Morphology Stability Assessment Table

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Date of visual assessment: August 30, 2023
UT3 R2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	306
					Assessed Bank Length	612
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
					Totals:	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	11	11		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	5	5		100%

Date of visual assessment: August 30, 2023
UT6 R2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	205
					Assessed Bank Length	410
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
					Totals:	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	6	6		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	N/A	N/A		N/A

Table 5. Vegetation Condition Assessment Table

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Date of visual assessment: August 30, 2023
Planted Acreage 4.97

Vegetation Category	Definitions	Mapping Threshold (ac)	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material.	0.10	0	0%
Low Stem Density Areas	Woody stem densities clearly below target levels based on current MY stem count criteria.	0.10	0	0%
		Total	**0**	**0%**
Areas of Poor Growth Rates	Planted areas where average height is not meeting current MY Performance Standard.	0.10	0	0%
		Cumulative Total	**0.0**	**0%**

Date of visual assessment: October, 2023
Easement Acreage 20.20

Vegetation Category	Definitions	Mapping Threshold (ac)	Combined Acreage	% of Easement Acreage
Invasive Areas of Concern	Invasives may occur outside of planted areas and within the easement and will therefore be calculated against the total easement acreage. Include species with the potential to directly outcompete native, young, woody stems in the short-term or community structure for existing communities. Invasive species included in summation above should be identified in report summary.	0.10	0.42	2%
Easement Encroachment Areas	Encroachment may be point, line, or polygon. Encroachment to be mapped consists of any violation of restrictions specified in the conservation easement. Common encroachments are mowing, cattle access, vehicular access. Encroachment has no threshold value as will need to be addressed regardless of impact area.	none	0%	

STREAM PHOTOGRAPHS

PHOTO POINT 1 Venable Creek R1 – upstream *(03/23/2023)*

PHOTO POINT 1 Venable Creek R1 – downstream *(03/23/2023)*

PHOTO POINT 2 UT1 – upstream *(03/23/2023)*

PHOTO POINT 2 UT1 – downstream *(03/23/2023)*

PHOTO POINT 3 Venable Creek R2 – upstream *(03/23/2023)*

PHOTO POINT 3 Venable Creek R2 – downstream *(03/23/2023)*

PHOTO POINT 4 Venable Creek R3 – upstream *(03/23/2023)*

PHOTO POINT 4 Venable Creek R3 – downstream *(03/23/2023)*

PHOTO POINT 5 Venable Creek R3 – upstream *(03/23/2023)*

PHOTO POINT 5 Venable Creek R3 – downstream *(03/23/2023)*

PHOTO POINT 6 Venable Creek R3 – upstream *(03/23/2023)*

PHOTO POINT 6 Venable Creek R3 – downstream *(03/23/2023)*

	
PHOTO POINT 7 Venable Creek R3 – upstream *(03/23/2023)*	**PHOTO POINT 7 Venable Creek R3 –** downstream *(03/23/2023)*
	
PHOTO POINT 8 UT2 R1 Headcut – upstream *(03/23/2023)*	**PHOTO POINT 8 UT2 R1 –** downstream *(03/23/2023)*
	
PHOTO POINT 9 UT2 R1 – upstream *(03/23/2023)*	**PHOTO POINT 9 UT2 R1 –** downstream *(03/23/2023)*

	
PHOTO POINT 10 UT2 R1 – upstream *(03/23/2023)*	**PHOTO POINT 10 UT2 R1 –** downstream *(03/23/2023)*
	
PHOTO POINT 11 UT2A – upstream *(03/23/2023)*	**PHOTO POINT 11 UT2A –** downstream *(03/23/2023)*
	
PHOTO POINT 12 UT2A – upstream *(03/23/2023)*	**PHOTO POINT 12 UT2A –** downstream *(03/23/2023)*

	
PHOTO POINT 13 UT2 R2 – upstream *(03/23/2023)*	**PHOTO POINT 13 UT2 R2 –** downstream *(03/23/2023)*
	
PHOTO POINT 14 UT2 R2 – upstream *(03/23/2023)*	**PHOTO POINT 14 UT2 R2 –** downstream *(03/23/2023)*
	
PHOTO POINT 15 UT2 R2 – upstream *(03/23/2023)*	**PHOTO POINT 15 UT2 R2 –** downstream *(03/23/2023)*

	
PHOTO POINT 16 UT3 R1 – upstream *(03/23/2023)*	**PHOTO POINT 16 UT3 R1 –** downstream *(03/23/2023)*
	
PHOTO POINT 17 UT3 R1 – upstream *(03/23/2023)*	**PHOTO POINT 17 UT3 R1–** downstream *(03/23/2023)*
	
PHOTO POINT 18 UT3 R2 – upstream *(03/23/2023)*	**PHOTO POINT 18 UT3 R2 –** downstream *(03/23/2023)*

PHOTO POINT 19 Venable Creek R3 – upstream *(03/23/2023)*

PHOTO POINT 19 Venable Creek R3 – downstream *(03/23/2023)*

PHOTO POINT 20 UT4 – upstream *(03/23/2023)*

PHOTO POINT 20 UT4 – downstream *(03/23/2023)*

PHOTO POINT 21 Venable Creek R4 – upstream *(03/23/2023)*

PHOTO POINT 21 Venable Creek R4 – downstream *(03/23/2023)*

	
PHOTO POINT 22 Venable Creek R4 – upstream *(03/23/2023)*	**PHOTO POINT 22 Venable Creek R4 –** downstream *(03/23/2023)*
	
PHOTO POINT 23 UT5 Headcut – upstream *(03/23/2023)*	**PHOTO POINT 23 UT5 –** downstream *(03/23/2023)*
	
PHOTO POINT 24 UT5 – upstream *(03/23/2023)*	**PHOTO POINT 24 UT5 –** downstream *(03/23/2023)*

	
PHOTO POINT 25 Venable Creek R4 – upstream *(03/23/2023)*	**PHOTO POINT 25 Venable Creek R4 –** downstream *(03/23/2023)*
	
PHOTO POINT 26 Venable Creek R4 – upstream *(03/23/2023)*	**PHOTO POINT 26 Venable Creek R4 –** downstream *(03/23/2023)*
	
PHOTO POINT 27 UT6 R2 – upstream *(03/23/2023)*	**PHOTO POINT 27 UT6 R2 –** downstream *(03/23/2023)*

PHOTO POINT 28 UT6 R1 – upstream *(03/23/2023)*

PHOTO POINT 28 UT6 R1 – downstream *(03/23/2023)*

PHOTO POINT 29 Venable Creek R4 Ford Crossing – *(03/23/2023)*

CULVERT CROSSING & BMP PHOTOGRAPHS

Venable Creek R1 Culvert – Outlet *(03/23/2023)*

Venable Creek R2 Crossing - Looking Upstream *(03/23/2023)*

Venable Creek R2 Crossing - Looking Downstream *(03/23/2023)*

Venable Creek R4 Crossing - Looking Upstream *(03/23/2023)*

Venable Creek R4 Crossing - Looking Downstream *(03/23/2023)*

UT1 Culvert – Outlet *(03/23/2023)*

UT2 Crossing Culvert – Inlet (03/23/2023)

UT2 Crossing Culvert – Outlet (03/23/2023)

UT3 BMP – Looking Downstream *(03/23/2023)*

UT4 BMP – Looking Downstream *(03/23/2023)*

UT6 BMP – Looking Downstream *(03/23/2023)*

MATURE TREE PHOTOGRAPHS

	
Mature Tree Photo Point 1 (Northeast) – Venable Creek Reach 3 *(08/30/2023)*	**Mature Tree Photo Point 2 (Northeast)** – Venable Creek Reach 4 *(08/30/2023)*

SUPPLEMENTAL PHOTOGRAPHS

UT2B- channel confluence with mainstem upstream *(08/30/2023)*

UT3- Subsurface Flow to Venable Creek stable upstream (*08/30/2023)*

VC R3- Meander Bend stabilizing above UT3 confluence after live staking in winter 2022 *(08/30/2023)*

VC R3- Wetland seep filling in with vegetation and forming vernal pool *(08/30/2023)*

	
VC R3- Wetland Seep to Main Channel on right floodplain stable *(08/30/2023)*	**VC R3**- bankfull event recorded at manual gage (08/30/2023)

PERMANENT VEGETATION PLOT PHOTOGRAPHS

PERMANENT VEGETATION PLOT 1 *(08/08/2023)*

PERMANENT VEGETATION PLOT 2 *(08/08/2023)*

PERMANENT VEGETATION PLOT 3 *(08/08/2023)*

PERMANENT VEGETATION PLOT 4 *(08/08/2023)*

PERMANENT VEGETATION PLOT 5 *(08/08/2023)*

PERMANENT VEGETATION PLOT 6 *(08/08/2023)*

PERMANENT VEGETATION PLOT 7 *(08/30/2023)*

PERMANENT VEGETATION PLOT 08 *(08/08/2023)*

PERMANENT VEGETATION PLOT 9 *(08/08/2023)*

MOBILE VEGETATION PLOT PHOTOGRAPHS

MOBILE VEGETATION PLOT 1 *(08/08/2023)*

MOBILE VEGETATION PLOT 2 *(08/08/2023)*

MOBILE VEGETATION PLOT 3 (*08/08/2023)*

MOBILE VEGETATION PLOT 4 *(08/08/2023)*

MOBILE VEGETATION PLOT 5 *(08/08/2023)*

FORESTED VEGETATION TRANSECT PHOTOGRAPHS

	
FORESTED VEGETATION TRANSECT 1 (*08/08/2023)*	**FORESTED VEGETATION TRANSECT 2** *(08/08/2023)*

APPENDIX B. Vegetation Plot Data

Table 6a. Vegetation Plot Data
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Planted Acreage	5
Date of Initial Plant	2021-03-01
Date(s) of Supplemental Plant(s)	2022-03-21
Date(s) Mowing	
Date of Current Survey	2023-08-08
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 F		Veg Plot 2 F		Veg Plot 3 F		Veg Plot 4 F		Veg Plot 5 F		Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F		Veg Plot 9 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Acer negundo	boxelder	Tree	FAC	1	1	1	1	2	2			1	1	1	1					3	3
	Carpinus caroliniana	American hornbeam	Tree	FAC													1	1	1	1		
	Carya cordiformis	bitternut hickory	Tree	FACU			1	1	3	3	1	1	1	1								
	Cornus amomum	silky dogwood	Shrub	FACW							2	2										
	Diospyros virginiana	common persimmon	Tree	FAC	3	3	2	2	1	1			1	1	2	2	1	1			1	1
	Hamamelis virginiana	American witchhazel	Tree	FACU	1	1									1	1	2	2	1	1		
	Lindera benzoin	northern spicebush	Tree	FAC																		
	Liriodendron tulipifera	tuliptree	Tree	FACU			1	1					1	1	2	2	2	2	1	1		
	Morus rubra	red mulberry	Tree	FACU	3	3			1	1			1	1	1	1	2	2			1	1
	Nyssa sylvatica	blackgum	Tree	FAC													1	1	1	1		
	Oxydendrum arboreum	sourwood	Shrub	UPL																		
	Platanus occidentalis	American sycamore	Tree	FACW	1	1	2	2	3	3	2	2	2	2	2	2	2	2	1	1	1	2
	Prunus serotina	black cherry	Tree	FACU					1	1												
	Quercus alba	white oak	Tree	FACU	1	1			1	1			2	2	2	2						
	Quercus phellos	willow oak	Tree	FAC																	1	1
	Quercus rubra	northern red oak	Tree	FACU	2	2	1	1									2	2	3	3		
	Salix nigra	black willow	Tree	OBL							1	1	1	1							2	2
	Ulmus americana	American elm	Tree	FACW							2	2									1	1
	Ulmus rubra	slippery elm	Tree	FAC			1	1			1	1										
Sum	Performance Standard				12	12	9	9	12	12	9	9	10	10	11	11	13	13	8	8	10	11
Post Mitigation Plan Species	Alnus serrulata	hazel alder	Tree	OBL					2	2			1	1					2	2	1	1
Sum	Proposed Standard				12	12	9	9	14	14	9	9	11	11	11	11	13	13	10	10	11	12
Mitigation Plan Performance Standard	Current Year Stem Count				12		9		12		9		10		11		13		8		11	
	Stems/Acre				486		364		486		364		405		445		526		324		445	
	Species Count				7		7		7		6		8		7		8		6		7	
	Dominant Species Composition (%)				25		22		21		22		18		18		15		30		25	
	Average Plot Height (ft.)				2		3		5		4		4		5		3		2		5	
	% Invasives				0		0		0		0		0		0		0		0		0	
Post Mitigation Plan Performance Standard	Current Year Stem Count				12		9		14		9		11		11		13		10		12	
	Stems/Acre				486		364		567		364		445		445		526		405		486	
	Species Count				7		7		8		6		9		7		8		7		8	
	Dominant Species Composition (%)				25		22		21		22		18		18		15		30		25	
	Average Plot Height (ft.)				2		3		5		4		4		5		3		3		5	
	% Invasives				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 6b. Vegetation Plot Data
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Planted Acreage	5
Date of Initial Plant	2021-03-01
Date(s) of Supplemental Plant(s)	2022-03-21
Date(s) Mowing	
Date of Current Survey	2023-08-08
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 R Total	Veg Plot 2 R Total	Veg Plot 3 R Total	Veg Plot 4 R Total	Veg Plot 5 R Total
Species Included in Approved Mitigation Plan	Acer negundo	boxelder	Tree	FAC	3	1			1
	Carpinus caroliniana	American hornbeam	Tree	FAC			1		3
	Carya cordiformis	bitternut hickory	Tree	FACU					
	Cornus amomum	silky dogwood	Shrub	FACW					
	Diospyros virginiana	common persimmon	Tree	FAC				3	
	Hamamelis virginiana	American witchhazel	Tree	FACU	1		1		
	Lindera benzoin	northern spicebush	Tree	FAC					1
	Liriodendron tulipifera	tuliptree	Tree	FACU	2			2	2
	Morus rubra	red mulberry	Tree	FACU	1				
	Nyssa sylvatica	blackgum	Tree	FAC					
	Oxydendrum arboreum	sourwood	Shrub	UPL					2
	Platanus occidentalis	American sycamore	Tree	FACW		3	5	5	2
	Prunus serotina	black cherry	Tree	FACU					
	Quercus alba	white oak	Tree	FACU		2	1	2	
	Quercus phellos	willow oak	Tree	FAC					
	Quercus rubra	northern red oak	Tree	FACU	1				6
	Salix nigra	black willow	Tree	OBL					
	Ulmus americana	American elm	Tree	FACW					
	Ulmus rubra	slippery elm	Tree	FAC		1			
Sum	Performance Standard				8	7	8	12	17
Post Mitigation Plan Species	Alnus serrulata	hazel alder	Tree	OBL		2	4		
Sum	Proposed Standard				8	9	12	12	17
Mitigation Plan Performance Standard	Current Year Stem Count				8	7	8	12	17
	Stems/Acre				324	283	324	486	688
	Species Count				5	4	4	4	7
	Dominant Species Composition (%)				38	33	42	42	35
	Average Plot Height (ft.)				3	2	4	3	2
	% Invasives				0	0	0	0	0
Post Mitigation Plan Performance Standard	Current Year Stem Count				8	9	12	12	17
	Stems/Acre				324	364	486	486	688
	Species Count				5	5	5	4	7
	Dominant Species Composition (%)				38	33	42	42	35
	Average Plot Height (ft.)				3	3	4	3	2
	% Invasives				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 6c. Forested Vegetation Transect Table

Vegetation Plot Data

DMS Project No. 100083

Monitoring Year 3 - 2023

Transect 1: UT2			
Scientific Name	Performance Standard Approval	MY2 Stems	MY3 Stems
Ilex opaca	Approved Mit Plan	4	4
Lindera benzoin	Approved Mit Plan	2	1
Platanus occidentalis	Approved Mit Plan	3	3
Oxydendrum arboreum	Approved Mit Plan	1	1
Liriodendron tulipifera	Approved Mit Plan	3	2
Fagus grandifolia	Approved Mit Plan	1	1
Diospyros virginiana	Approved Mit Plan	0	1
	TOTAL STEM COUNT:	**14**	**13**
	TOTAL SPECIES COUNT:	**6**	**6**
	AVERAGE PLOT HEIGHT (Meters)	**0.5**	**0.7**

Transect 2: UT4			
Scientific Name	Performance Standard Approval	MY2 Stems	MY2 Stems
Morus rubra	Approved Mit Plan	1	1
Carpinus carolinana	Approved Mit Plan	2	1
Cornus florida	Approved Mit Plan	1	1
Ulmus americana	Approved Mit Plan	1	1
Lindera benzoin	Approved Mit Plan	1	1
Acer negundo	Approved Mit Plan	2	1
Prunus serotina	Approved Mit Plan	1	1
Platanus occidentalis	Approved Mit Plan	1	1
Quercus rubra	Approved Mit Plan	1	1
	TOTAL STEM COUNT:	**11**	**9**
	TOTAL SPECIES COUNT:	**9**	**9**
	AVERAGE PLOT HEIGHT (Meters)	**0.6**	**0.7**

*Transects represent understory planting and are not held to density or height requirements per MY1 IRT site walk comments (8/16/2022).

Table 7. Vegetation Performance Standards Summary Table

Honey Mill Mitigation Site

DMS Project No. 100083

Monitoring Year 3 - 2023

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	486	2	7	0	364	3	7	0	486*	5	7	0
Monitoring Year 2	526	2	8	0	364	3	7	0	405*	4	6	0
Monitoring Year 1	486	2	7	0	405	2	8	0	364	3	5	0
Monitoring Year 0	567	2	8	0	526	2	10	0	445	2	6	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	364	4	6	0	405*	4	8	0	445	5	7	0
Monitoring Year 2	324	3	5	0	405*	2	8	0	283	3	6	0
Monitoring Year 1	202	2	4	0	324	2	7	0	324	2	6	0
Monitoring Year 0	567	2	9	0	364	2	8	0	607	2	10	0
	Veg Plot 7 F				Veg Plot 8 F				Veg Plot 9 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	526	3	8	0	324*	2	6	0	445*	5	7	0
Monitoring Year 2	486	3	9	0	364	2	6	0	486*	3	6	0
Monitoring Year 1	526	2	9	0	486	2	8	0	243	2	4	0
Monitoring Year 0	526	2	9	0	607	2	9	0	405	2	9	0
	Veg Plot Group 1 R				Veg Plot Group 2 R[1]				Veg Plot Group 3 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	5	0	283*	2	4	0	324*	4	4	0
Monitoring Year 2	324	5	4	0	607*	4	5	0	405*	2	5	0
Monitoring Year 1	81	2	2	0	445	2	10	0	405	2	5	0
Monitoring Year 0	445	2	7	0	567	2	11	0	445	2	8	0
	Veg Plot Group 4 R				Veg Plot Group 5 R							
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives				
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3	486	3	4	0	688	2	7	0				
Monitoring Year 2	445*	2	7	0	729	2	10	0				
Monitoring Year 1	405	2	4	0	607	2	8	0				
Monitoring Year 0	567	2	10	0	688	2	8	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.

*For stem densities in plots that inlcude post-mitigation plan approved species planted during the March 2022 supplemental planting please refer to table 7 for the "Post Mitigation Plan Performance Standard" referenced in the text.

1. Veg Plot Group 2R met criteria in MY3 with a density of 364 Stems/Ac. when "Post-Mitigation Plan" IRT approved species (including March 2022 supplemental stems) were included in table 7.

APPENDIX C. Stream Geomorphology Data

Table 8. Baseline Stream Data Summary
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

	Pre-Existing Condition																	
Parameter	**Venable Creek R2**			**Venable Creek R3**			**UT1**			**UT2 R2**			**UT3 R2**			**UT6 R2**		
	Min	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	10.6		1	10.5	10.8	2	8.7		1	4.0		1	4.2		1	2.1		1
Floodprone Width (ft)	46		1	90	113	2	69		1	11		1	27		1	8		1
Bankfull Mean Depth (ft)	1.5		1	1.6	1.7	2	1.1		1	0.3		1	0.9		1	0.8		1
Bankfull Max Depth (ft)	2.0		1	2.2	2.3	2	1.6		1	0.4		1	1.1		1	1.1		1
Bankfull Cross-sectional Area (ft^2)	15.6		1	16.9	18.1	2	9.8		1	1.2		1	3.8		1	1.6		1
Width/Depth Ratio	7.2		1	6.1	6.9	2	7.6		1	12.7		1	4.7		1	2.7		1
Entrenchment Ratio[1]	4.3		1	8.6	10.5	2	7.9		1	2.7		1	6.4		1	3.7		1
Bank Height Ratio	1.6		1	1.3	1.6	2	1.4		1	1.0		1	1.5		1	2.6		1
Max part size (mm) mobilized at bankfull	40.6		1	13.3		2	9.5		1	24.1		1	3.1		1	8.5		1
Rosgen Classification	E4			E/C4			E4b			C4b			E4b			A4		
Bankfull Discharge (cfs)	75			83			52			10			6			4		
Sinuosity	1.08			1.14			1.04			1.18			1.47			1.01		
Bankfull/Channel Slope (ft/ft)[2]	0.0190			0.0136			0.0212			0.0352			0.0369			0.0870		
	Design																	
Parameter	**Venable Creek R2**			**Venable Creek R3**			**UT1**			**UT2 R2**			**UT3 R2**			**UT6 R2**		
	Min	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	15.0		1	15.6		1	11.5		1	5.6		1	4.9		1	3.7		1
Floodprone Width (ft)	30		1	34		1	25		1	11		1	10		1	5		1
Bankfull Mean Depth (ft)	1.1		1	1.1		1	1.0		1	0.5		1	0.4		1	0.3		1
Bankfull Max Depth (ft)	---		1	---		1	---		1	---		1	---		1	---		1
Bankfull Cross-sectional Area (ft^2)	16.4		1	17.3		1	11.1		1	2.6		1	1.9		1	1.2		1
Width/Depth Ratio	13.8		1	14.1		1	11.8		1	12.1		1	12.3		1	11.2		1
Entrenchment Ratio[1]	2.0+		1	2.2+		1	2.2+		1	2.0+		1	2.0+		1	1.4+		1
Bank Height Ratio	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1
Max part size (mm) mobilized at bankfull	---		1	---		1	9.5		1	24.1		1	3.1		1	8.5		1
Rosgen Classification	B4			C4			C4b			B4			B4			A4		
Bankfull Discharge (cfs)	75			83			52			10			6			4		
Sinuosity	1.08			1.29			1.14			1.02			1.02			1.00		
Bankfull/Channel Slope (ft/ft)[2]	0.0230			0.0140			0.0210			0.0380			0.0340			0.0822		
	As-Built/ Baseline																	
Parameter	**Venable Creek R2**			**Venable Creek R3**			**UT1**			**UT2 R2**			**UT3 R2**			**UT6 R2**		
	Min	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	15.0		1	14.6	15.8	3	12.1		1	9.3		1	6.2		1	6.6		1
Floodprone Width (ft)	68		1	93	104	3	75		1	57		1	51		1	33		1
Bankfull Mean Depth (ft)	1.3		1	1.1	1.2	3	0.9		1	0.5		1	0.5		1	0.4		1
Bankfull Max Depth (ft)	2.1		1	1.8	2.0	3	1.6		1	0.8		1	0.7		1	0.7		1
Bankfull Cross-sectional Area (ft^2)[1]	20.2		1	16.0	19.4	3	11.0		1	4.8		1	2.8		1	3.0		1
Width/Depth Ratio	11.1		1	12.8	14.2	3	13.4		1	17.8		1	13.5		1	15.0		1
Entrenchment Ratio[1]	4.5		1	6.0	6.7	3	6.2		1	6.1		1	8.2		1	5.0		1
Bank Height Ratio	1.0		1	1.0		3	1.0		1	1.0		1	1.0		1	1.0		1
Max part size (mm) mobilized at bankfull	17.1		1	24.7		3	14.8		1	19.0		1	14.8		1	17.7		1
Rosgen Classification	B4			C4			C4b			B4			B4			A4		
Bankfull Discharge (cfs)	142			78	100	3	54			24			12			19		
Sinuosity	1.03			1.31			1.20			1.05			1.05			1.05		
Bankfull/Channel Slope (ft/ft)[2]	0.0245			0.0152			0.0232			0.0440			0.0387			0.0869		

1. ER for the baseline/monitoring parameters are based on the width of the cross-sect
2. Channel slope is calculated from the surface of the channel bed rather than water surface.
(---): Data was not provided, N/A: Not Applicable

Table 9. Morphology and Hydraulic Summary (Dimensional Parameters - Cross-Section)
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

	UT1 Cross-Section 1 Pool								UT1 Cross-Section 2 Riffle								Venable Creek R2 Cross-Section 3 Riffle							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	N/A	N/A	N/A	N/A					1039.2	1039.3	1039.3	1039.3					1034.6	1034.7	1034.7	1034.7				
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A	N/A	N/A	N/A					1.0	1.0	1.0	1.0					1.0	1.0	0.9	1.0				
Thalweg Elevation (ft)	1037.6	1037.5	1037.6	1037.7					1037.6	1037.7	1037.7	1037.8					1032.5	1032.6	1032.6	1032.4				
LTOB[2] Elevation (ft)	1039.7	1039.7	1039.7	1039.7					1039.2	1039.3	1039.3	1039.3					1034.6	1034.7	1034.5	1034.6				
LTOB[2] Max Depth (ft)	2.1	2.2	2.1	2.0					1.6	1.6	1.6	1.5					2.1	2.1	2.0	2.2				
LTOB[2] Cross Sectional Area (ft^2)	18.1	16.7	17.0	14.5					11.0	11.1	10.7	10.5					20.2	19.3	18.5	19.1				
	Venable Creek R3 Cross-Section 4 Pool								**Venable Creek R3 Cross-Section 5 Riffle**								**Venable Creek R3 Cross-Section 6 Pool**							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	N/A	N/A	N/A	N/A					1024.1	1024.0	1024.1	1024.0					N/A	N/A	N/A	N/A				
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A	N/A	N/A	N/A					1.0	1.0	1.0	1.0					N/A	N/A	N/A	N/A				
Thalweg Elevation (ft)	1021.4	1021.6	1021.3	1021.5					1022.3	1022.2	1022.3	1022.2					1013.1	1013.0	1013.1	1013.0				
LTOB[2] Elevation (ft)	1024.7	1024.8	1024.7	1024.7					1024.1	1024.0	1024.1	1024.1					1016.3	1016.3	1016.3	1016.3				
LTOB[2] Max Depth (ft)	3.3	3.2	3.5	3.1					1.8	1.9	1.8	1.9					3.2	3.3	3.2	3.3				
LTOB[2] Cross Sectional Area (ft^2)	33.4	33.6	35.9	34.1					17.1	18.1	17.5	18.3					33.3	35.0	35.9	36.1				
	Venable Creek R3 Cross-Section 7 Riffle								**UT2 R2 Cross-Section 8 Riffle**								**Venable Creek R3 Cross Section 9 Riffle**							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	1015.9	1015.9	1015.9	1015.9					1020.0	1020.4	1020.4	1020.4					1011.6	1011.6	1011.6	1011.6				
Bank Height Ratio - Based on AB Bankfull[1] Area	1.0	1.0	1.0	1.0					1.0	0.7	0.8	0.7					1.0	1.0	1.0	1.0				
Thalweg Elevation (ft)	1013.9	1013.9	1013.8	1013.8					1019.1	1019.4	1019.3	1019.2					1009.8	1009.8	1009.9	1009.8				
LTOB[2] Elevation (ft)	1015.9	1015.9	1015.8	1015.8					1020.0	1020.1	1020.1	1020.1					1011.6	1011.7	1011.7	1011.5				
LTOB[2] Max Depth (ft)	2.0	2.0	2.1	2.1					0.8	0.7	0.8	0.9					1.8	1.9	1.8	1.8				
LTOB[2] Cross Sectional Area (ft^2)	19.4	18.5	18.6	19.9					4.8	2.9	3.1	2.9					16.0	16.8	16.7	15.0				
	UT3 R2 Cross Section 10 Riffle								**UT6 R2 Cross-Section 11 Riffle**															
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**								
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	1011.9	1012.0	1012.0	1012.0					998.6	998.7	998.7	998.7												
Bank Height Ratio - Based on AB Bankfull[1] Area	1.0	0.9	0.9	0.8					1.0	0.8	0.8	0.9												
Thalweg Elevation (ft)	1011.2	1011.2	1011.2	1011.2					997.9	998.1	998.0	998.0												
LTOB[2] Elevation (ft)	1011.9	1011.9	1011.9	1011.9					998.6	998.6	998.6	998.6												
LTOB[2] Max Depth (ft)	0.7	0.7	0.6	0.7					0.7	0.5	0.6	0.7												
LTOB[2] Cross Sectional Area (ft^2)	2.8	2.4	2.2	2.0					3.0	1.9	2.1	2.6												

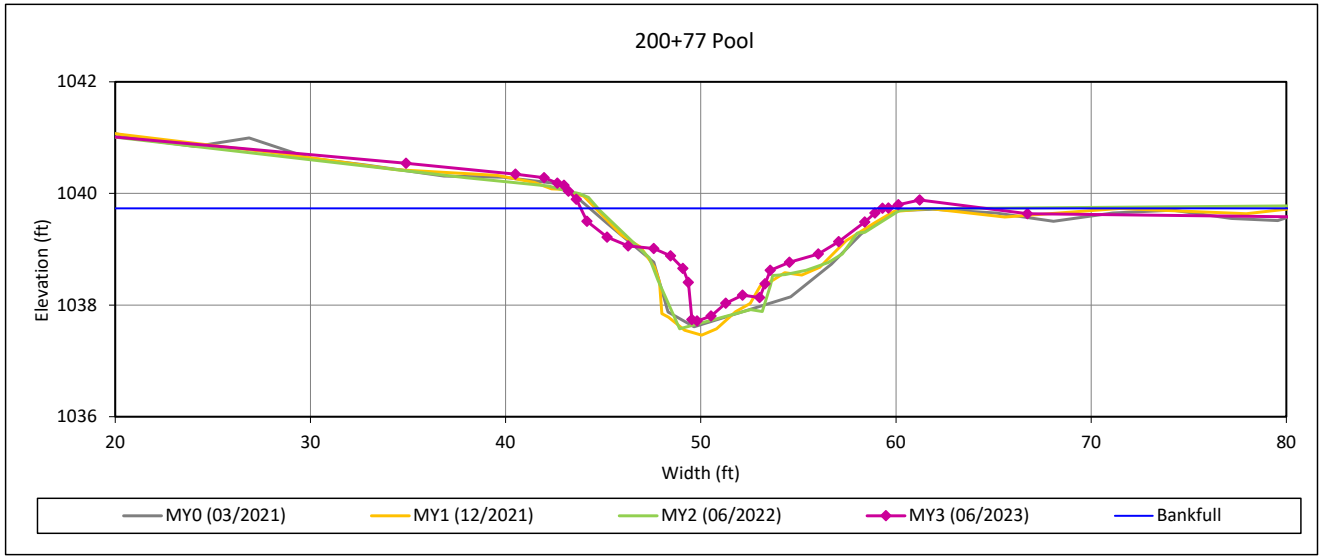
[1]Bank Height Ratio (BHR) takes the As-built bankful area as the basis for adjusting each subsequent year's bankfull elevation.

[2]LTOB Area and Max depth - These are based on the LTOB elevation for each years survey (The same elevation used for the LTOB in the BHR calculation). Area below the LTOB elevation will be used and tracked for each year as above. The difference between the LTOB elevation and the thalweg elevation (same as in the BHR calculation) will be recroded and tracked above as LTOB max depth.

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Cross-Section 1-UT1



Bankfull Dimensions	
14.5	x-section area (ft.sq.)
15.5	width (ft)
0.9	mean depth (ft)
2.0	max depth (ft)
16.6	wetted perimeter (ft)
0.9	hydraulic radius (ft)
16.5	width-depth ratio

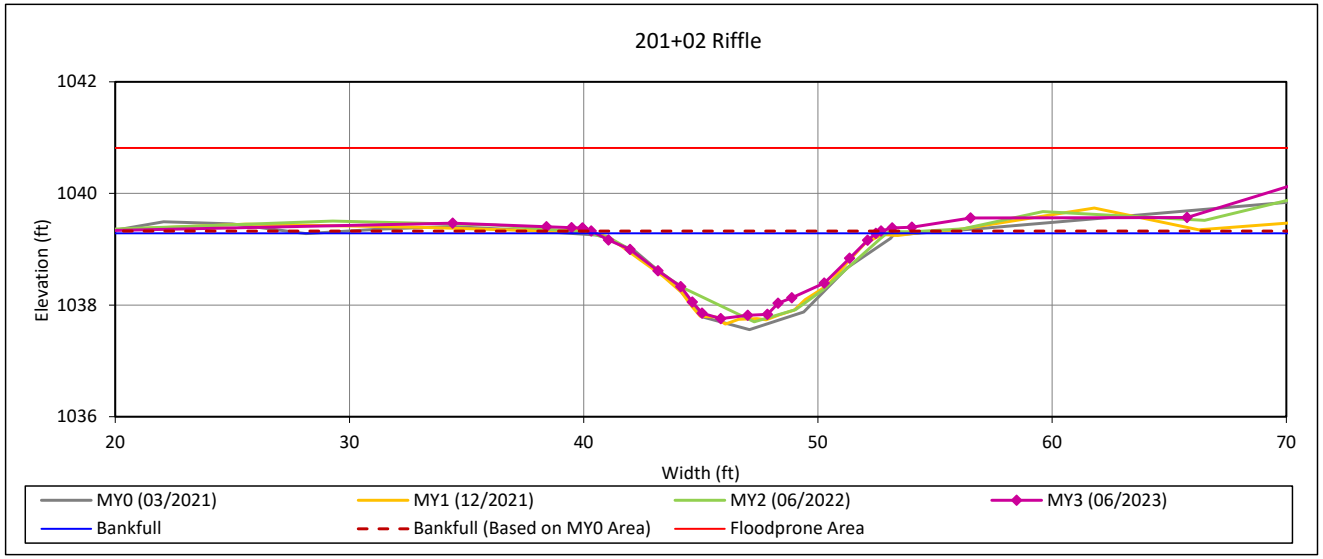
Survey Date: 06/2023
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Cross-Section 2-UT1



Bankfull Dimensions	
10.5	x-section area (ft.sq.)
12.0	width (ft)
0.9	mean depth (ft)
1.5	max depth (ft)
12.5	wetted perimeter (ft)
0.8	hydraulic radius (ft)
13.6	width-depth ratio
74.9	W flood prone area (ft)
6.3	entrenchment ratio
1.0	low bank height ratio

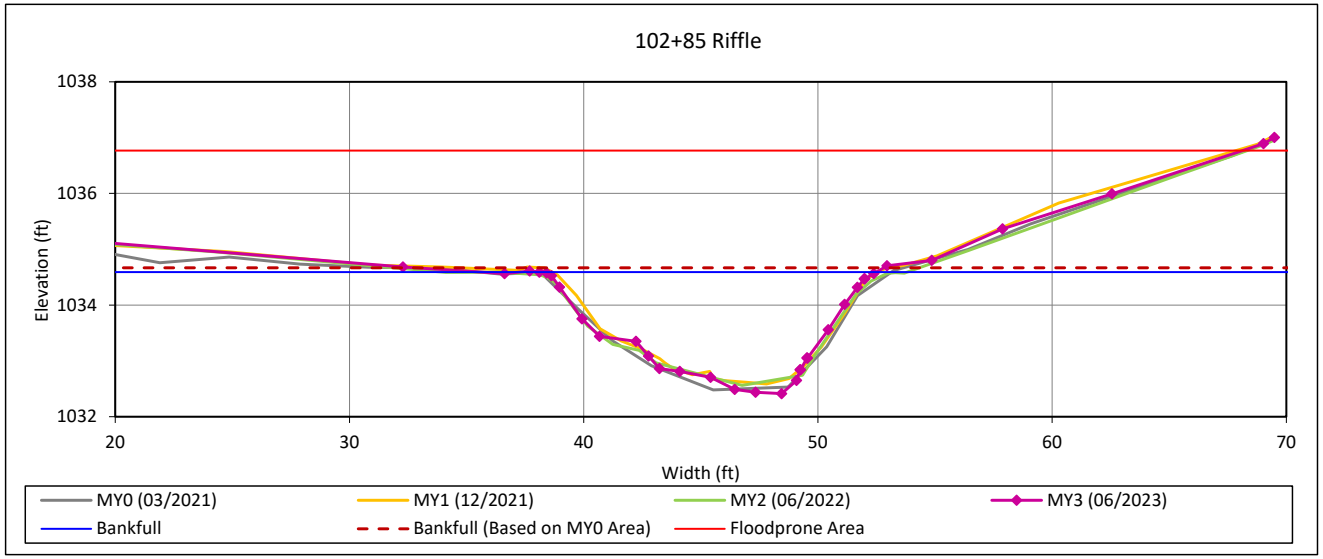
Survey Date: 06/2023
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Cross-Section 3-Venable Creek R2



Bankfull Dimensions	
19.1	x-section area (ft.sq.)
14.3	width (ft)
1.3	mean depth (ft)
2.2	max depth (ft)
15.3	wetted perimeter (ft)
1.2	hydraulic radius (ft)
10.7	width-depth ratio
68.1	W flood prone area (ft)
4.8	entrenchment ratio
1.0	low bank height ratio

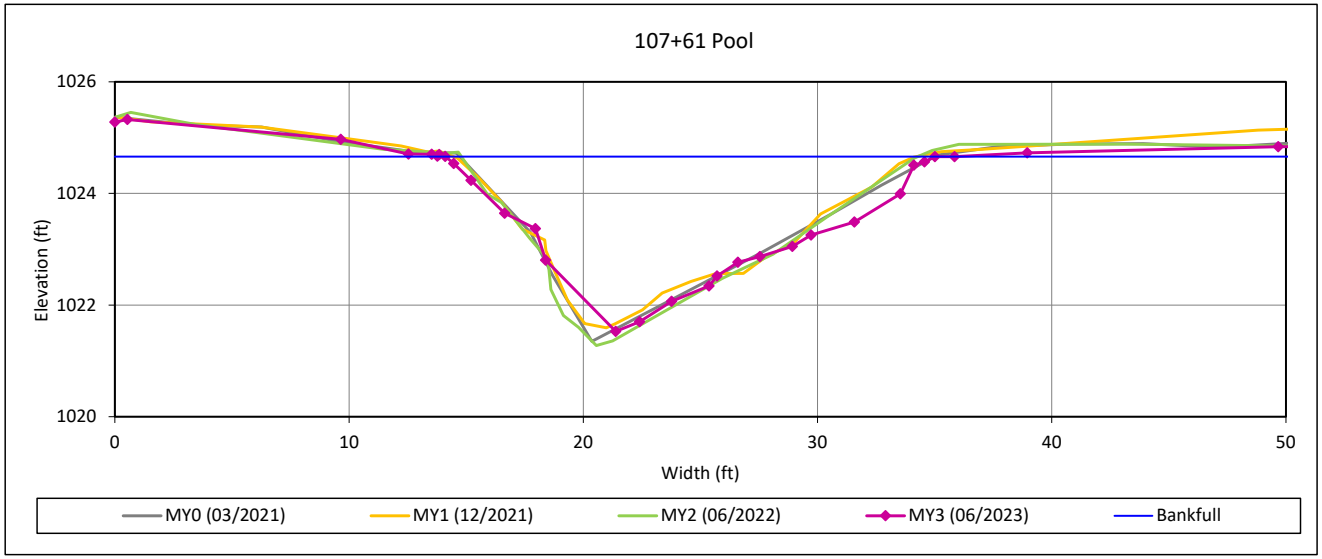
Survey Date: 06/2023
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Cross-Section 4-Venable Creek R3



Bankfull Dimensions	
34.1	x-section area (ft.sq.)
20.9	width (ft)
1.6	mean depth (ft)
3.1	max depth (ft)
22.2	wetted perimeter (ft)
1.5	hydraulic radius (ft)
12.8	width-depth ratio

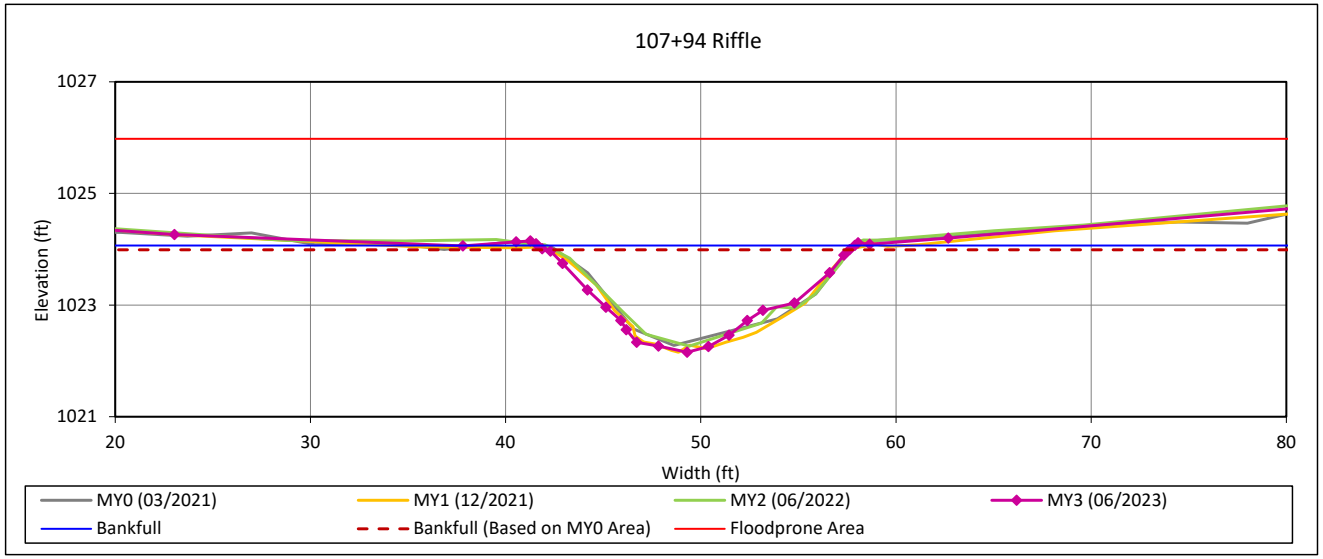
Survey Date: 06/2023
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Cross-Section 5-Venable Creek R3



Bankfull Dimensions	
18.3	x-section area (ft.sq.)
16.2	width (ft)
1.1	mean depth (ft)
1.9	max depth (ft)
16.8	wetted perimeter (ft)
1.1	hydraulic radius (ft)
14.3	width-depth ratio
103.7	W flood prone area (ft)
6.4	entrenchment ratio
1.0	low bank height ratio

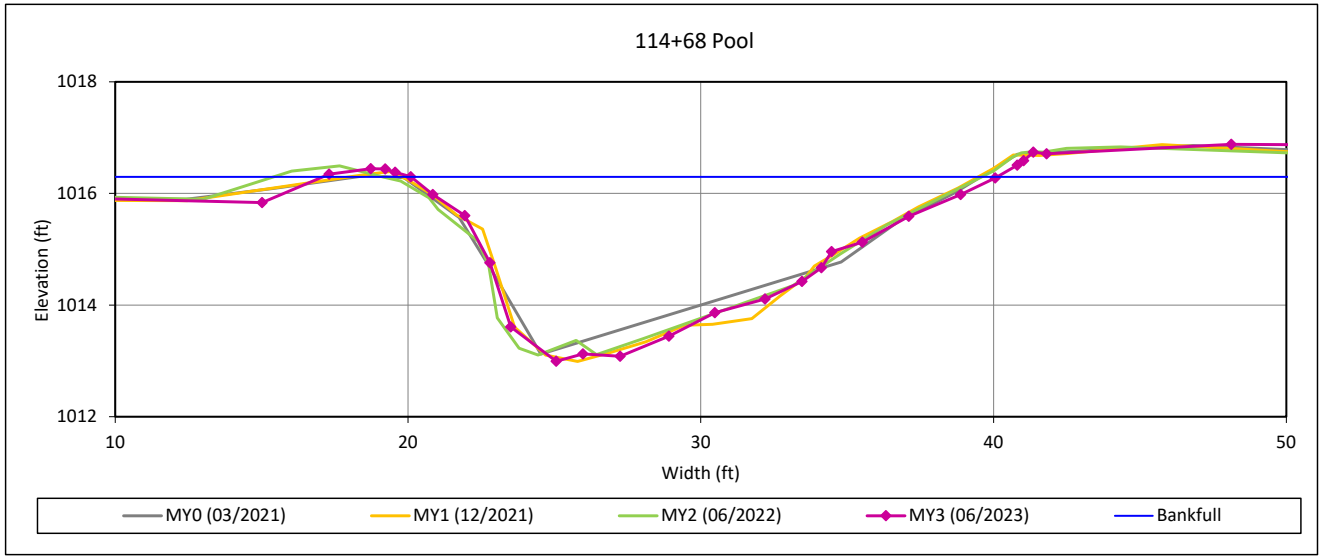
Survey Date: 06/2023
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Cross-Section 6-Venable Creek R3



Bankfull Dimensions	
36.1	x-section area (ft.sq.)
20.0	width (ft)
1.8	mean depth (ft)
3.3	max depth (ft)
21.7	wetted perimeter (ft)
1.7	hydraulic radius (ft)
11.1	width-depth ratio

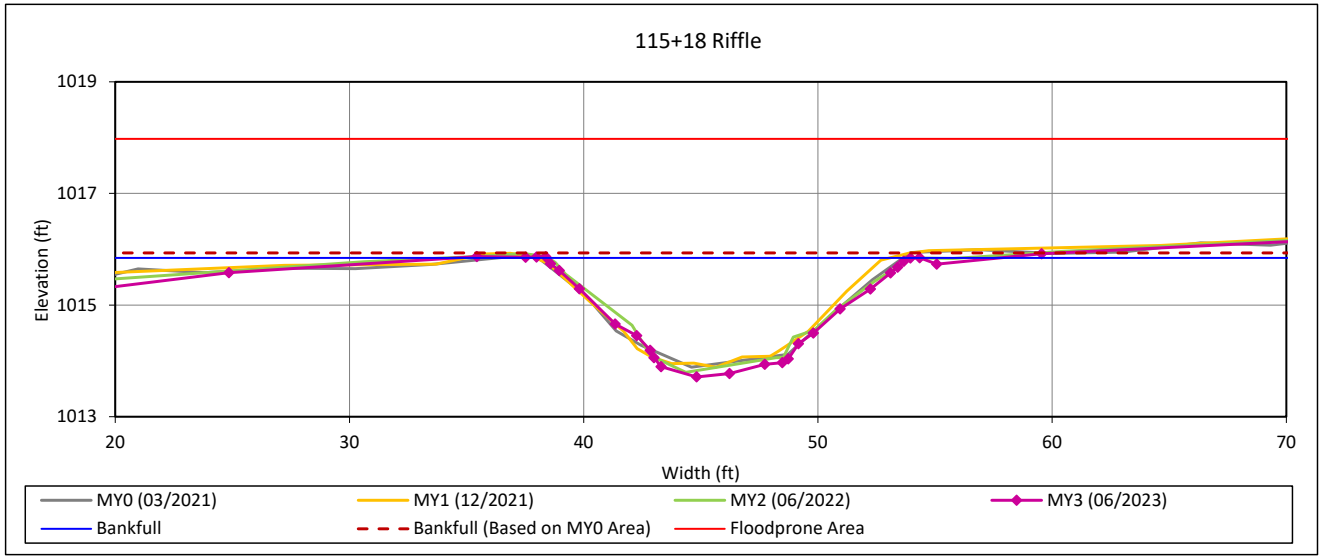
Survey Date: 06/2023
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Cross-Section 7-Venable Creek R3



Bankfull Dimensions	
19.9	x-section area (ft.sq.)
15.5	width (ft)
1.3	mean depth (ft)
2.1	max depth (ft)
16.3	wetted perimeter (ft)
1.2	hydraulic radius (ft)
12.1	width-depth ratio
93.1	W flood prone area (ft)
6.0	entrenchment ratio
1.0	low bank height ratio

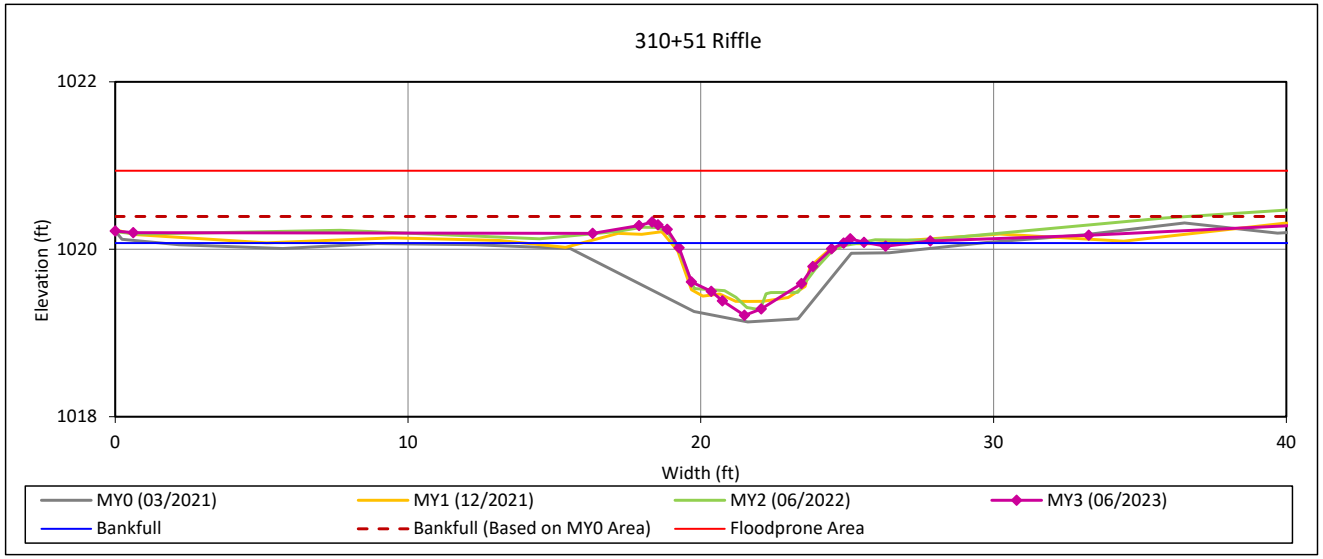
Survey Date: 06/2023
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Cross-Section 8-UT2 R2



Bankfull Dimensions	
2.9	x-section area (ft.sq.)
5.7	width (ft)
0.5	mean depth (ft)
0.9	max depth (ft)
6.1	wetted perimeter (ft)
0.5	hydraulic radius (ft)
11.2	width-depth ratio
57.5	W flood prone area (ft)
10.1	entrenchment ratio
0.7	low bank height ratio

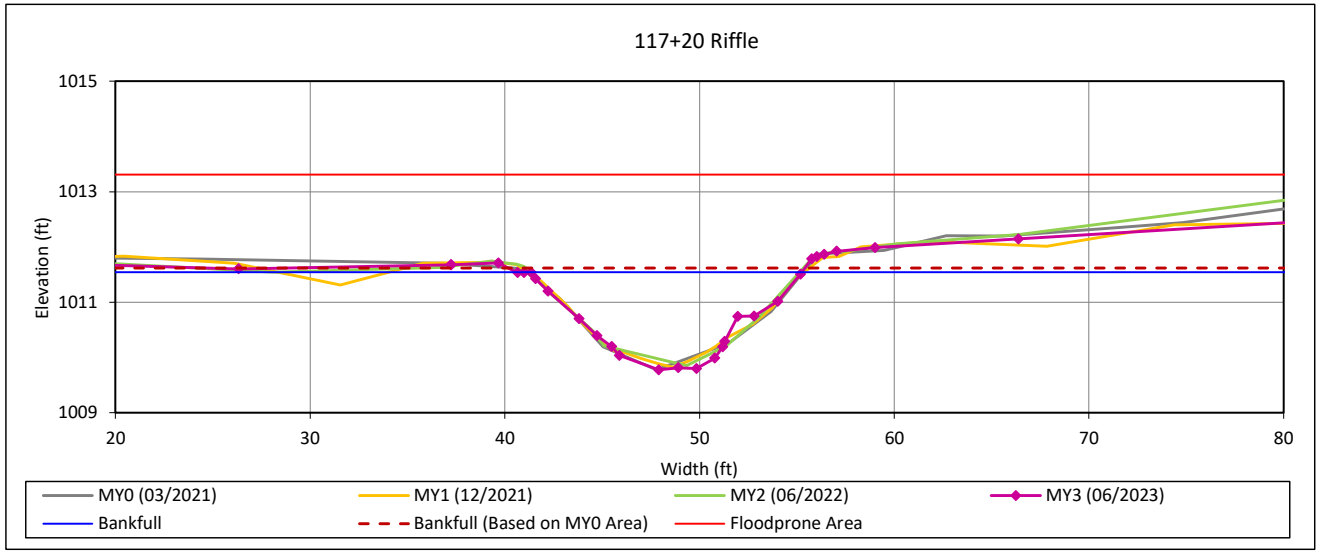
Survey Date: 06/2023
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Cross-Section 9-Venable Creek R3



Bankfull Dimensions	
15.0	x-section area (ft.sq.)
13.9	width (ft)
1.1	mean depth (ft)
1.8	max depth (ft)
14.6	wetted perimeter (ft)
1.0	hydraulic radius (ft)
13.0	width-depth ratio
101.7	W flood prone area (ft)
7.3	entrenchment ratio
1.0	low bank height ratio

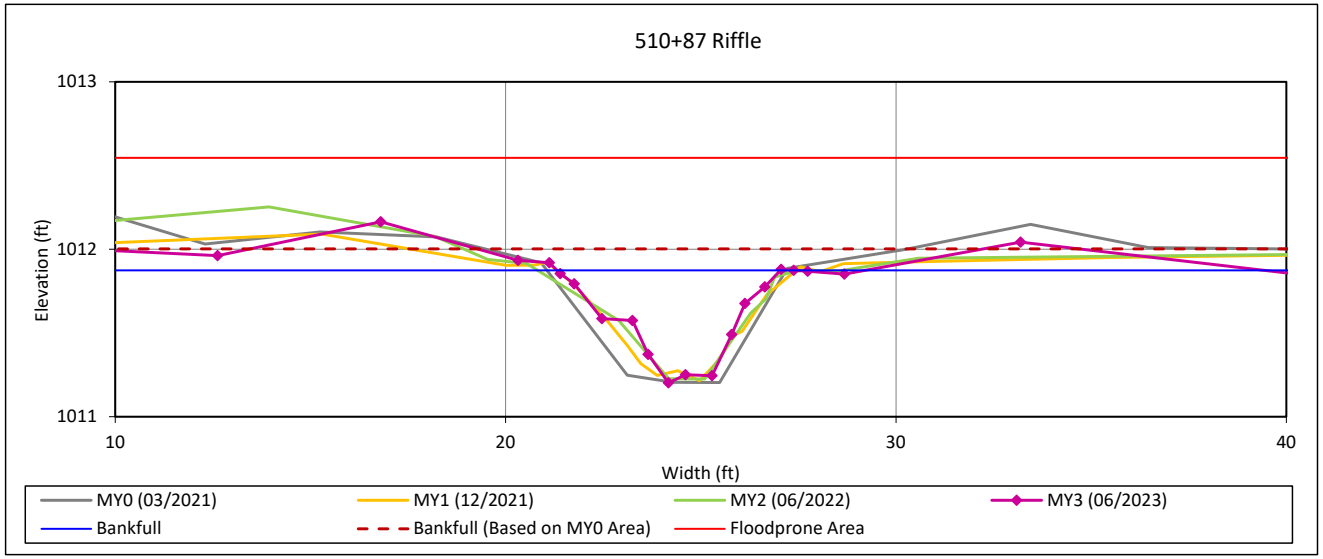
Survey Date: 06/2023
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Cross-Section 10-UT3 R2



Bankfull Dimensions	
2.0	x-section area (ft.sq.)
5.7	width (ft)
0.3	mean depth (ft)
0.7	max depth (ft)
6.0	wetted perimeter (ft)
0.3	hydraulic radius (ft)
16.4	width-depth ratio
50.0	W flood prone area (ft)
8.7	entrenchment ratio
0.8	low bank height ratio

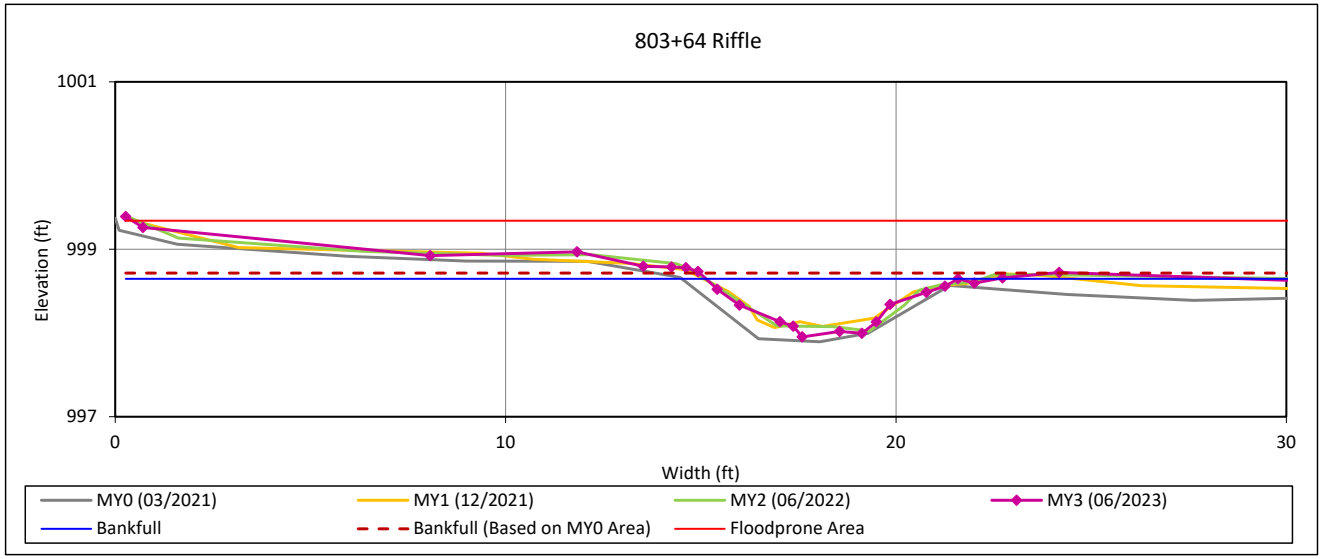
Survey Date: 06/2023
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Cross-Section 11-UT6 R2



Bankfull Dimensions	
2.6	x-section area (ft.sq.)
6.5	width (ft)
0.4	mean depth (ft)
0.7	max depth (ft)
6.7	wetted perimeter (ft)
0.4	hydraulic radius (ft)
16.3	width-depth ratio
36.3	W flood prone area (ft)
5.6	entrenchment ratio
0.9	low bank height ratio

Survey Date: 06/2023
Field Crew: Wildlands Engineering

View Downstream

APPENDIX D. Hydrology Data

Table 10. Bankfull Events

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Reach	MY1 (2021)	MY2 (2022)	MY3 (2023)	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
Venable Creek R3	None	11/6/2022	4/28/2023, 6/20/2023, 8/6/2023				

Table 11. Rainfall Summary

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

	MY1 (2021)	MY2 (2022)	MY3 (2023)	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
Annual Precip Total (Inches)[1]	35.67	46.89	30.95*				
WETS 30th Percentile (Inches)	32.45	32.45	32.45				
WETS 70th Percentile (Inches)	58.85	58.85	58.85				
Type of Year[2]	Average	Average	*				

30th and 70th percentile rainfall data collected from WETS Station: MOUNT AIRY 2 W, NC for years 1971-2020

1. Precipitation data collected from USGS 362416080334345 RAINGAGE AT ARARAT RIVER AT ARARAT, NC. The gage is located approximately 4 miles from the Site.

2. Type of year refers to amount of rainfall in the current year compared to the average percentiles i.e. Below Average, Average, Above Average.

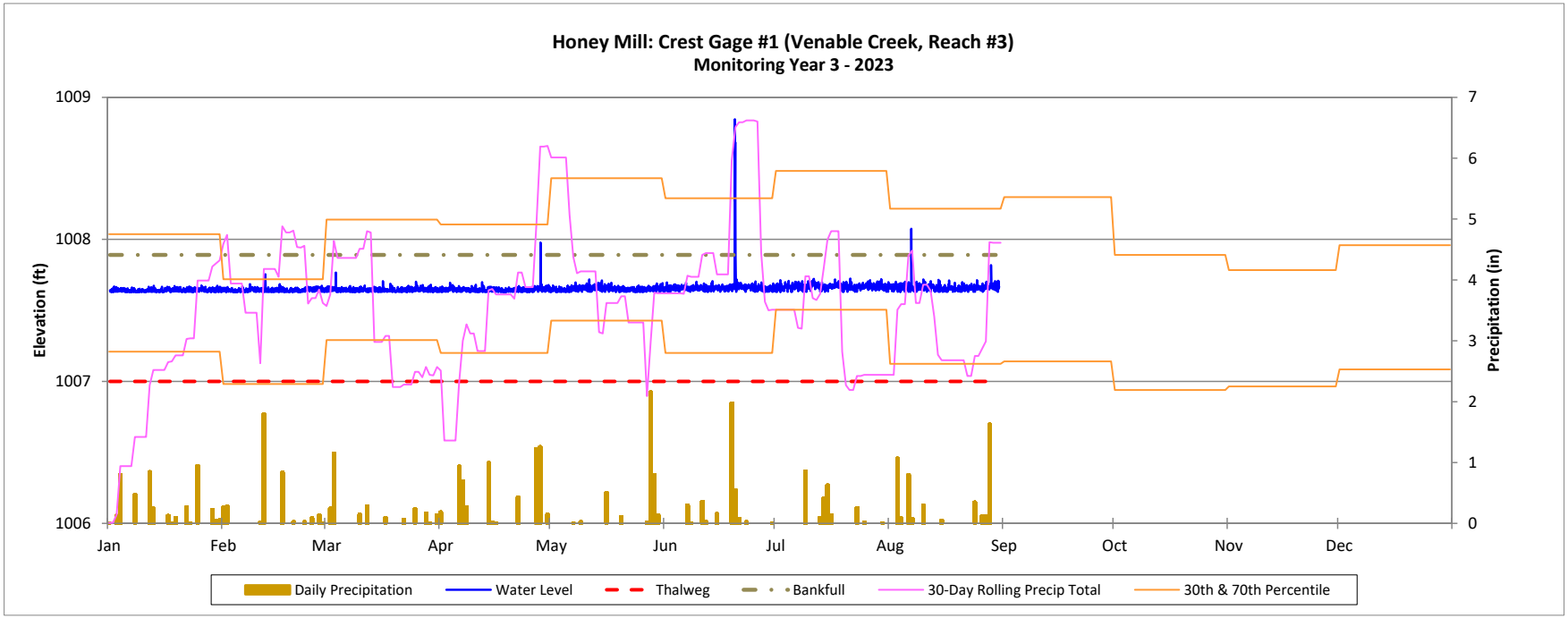
* Annual precipitation total was collected until 8/30/2023. Data will be updated in MY4.

Recorded Bankfull Flow Events Plot

Honey Mill Mitigation Site

DMS Project No. 100083

Monitoring Year 3 - 2023



APPENDIX E. Project Timeline and Contact Info

Table 12. Project Activity and Reporting History

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Activity or Report		Data Collection Complete	Completion or Delivery
404 Permit		September 2020	October 2020
Mitigation Plan		August 2019 - October 2020	October 2020
Final Design - Construction Plans		September 2020	September 2020
Construction		November 2020 - February 2021	February 2021
Temporary S&E mix applied to entire project area[1]		February 2021	February 2021
Permanent seed mix applied to reach/segments[1]		February 2021	February 2021
Bare root and live stake plantings for reach/segments		March 2021	March 2021
Baseline Monitoring (Year 0)	Stream Survey	March - June 2021	June 2021
	Vegetation Survey	March 2021	
	Remediation	N/A	N/A
	Encroachment	March- October 2021	October 2021
Year 1 Monitoring	Stream Survey	December 2021	January 2022
	Vegetation Survey		
	Remediation	N/A	N/A
	Encroachment		
Year 2 Monitoring	Stream Survey	June 2022	October 2022
	Vegetation Survey	August 2022	
	Invasive Treatment	March 2022	
	Fencing Installation/ Repair	September 2022	
	Encroachment	N/A	N/A
Year 3 Monitoring	Stream Survey	June 2023	October 2023
	Vegetation Survey	August 2023	
	Invasive Treatment	May & July 2023	
	Encroachment	N/A	N/A
Year 4 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 5 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 6 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 7 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		

[1]Seed and mulch is added as each section of construction is completed.

Table 13. Project Contact Table

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 3 - 2023

Designers Aaron Earley, PE, CFM	**Wildlands Engineering, Inc.** 1430 South Mint Street, Suite 104 Charlotte, NC 28203 704.332.7754
Construction Contractors	**Main Stream Earthworks, Inc.** 631 Camp Dan Valley Rd Reidsville, NC 27320
Planting Contractor	**Bruton Natural Systems, Inc.** PO Box 1197 Fremont, NC 27830
Seeding Contractor	**Main Stream Earthworks, Inc.** 631 Camp Dan Valley Rd Reidsville, NC 27320
Seed Mix Sources	**Green Resource LLC**
Nursery Stock Suppliers	
Bare Roots Live Stakes	**Bruton Natural Systems, Inc.**
Herbaceous Plugs	**Wetland Plants Inc.**
Monitoring Performers	**Wildlands Engineering, Inc.**
Monitoring, POC	Kristi Suggs (704) 332.7754 x.110

APPENDIX F. Supplemental Planting March 2022

IRT Approved Planted Supplemental Stems: Species and Quantities

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 2 - 2022

Shaded Bare Roots (7.0 AC)								
Species	Common Name	Max Spacing (ft)	Indiv. Spacning (ft)	Min. Caliper Size	Stratum	Percentage	Wetland Indicator Code	Quantity
Platanus occidentalis	Sycamore	25	12-25	0.25" - 1.0"	Canopy	10%	FACW	76
Carya cordiformis	Bitternut Hickory	25	12-25	0.25" - 1.0"	Canopy	5%	FACU	38
Ulmus rubra	*Slippery Elm*	25	12-25	0.25" - 1.0"	Canopy	5%	FAC	38
Carpinus caroliniana*	Ironwood	25	12-25	0.25" - 1.0"	Subcanopy	5%	FAC	38
Diospyros virginiana	Persimmon	25	12-25	0.25" - 1.0"	Canopy	10%	FAC	76
Morus rubra*	Red Mulberry	25	12-25	0.25" - 1.0"	Subcanopy	5%	FACU	38
Nyssa sylvatica	Black Gum	25	12-25	0.25" - 1.0"	Canopy	5%	FAC	38
Eunoymus americanus*	American Strawberry Bush	25	12-25	0.25" - 1.0"	Shrub	5%	FAC	38
Calycanthus floridus*	Sweetshrub	25	12-25	0.25" - 1.0"	Shrub	5%	FACU	38
Hamamelis virginiana*	Witch Hazel	25	12-25	0.25" - 1.0"	Subcanopy	5%	FACU	38
Quercus rubra	Northern Red Oak	25	12-25	0.25" - 1.0"	Canopy	5%	FACU	38
Fagus grandifolia	American Beech	25	12-25	0.25" - 1.0"	Canopy	7%	FACU	53
Quercus alba	White Oak	25	12-25	0.25" - 1.0"	Canopy	8%	FACU	61
Lindera benzoin*	Spicebush	25	12-25	0.25" - 1.0"	Shrub	5%	FAC	38
Cornus florida*	Flowering Dogwood	25	12-25	0.25" - 1.0"	Subcanopy	5%	FACU	38
Ozydendron arboreum*	Sourwood	25	12-25	0.25" - 1.0"	Subcanopy	5%	UPL	38
Ilex opaca*	American Holly	25	12-25	0.25" - 1.0"	Subcanopy	5%	FACU	38
						100%	**Total**	**760**
Wetland Planting Zone (2.5 AC)								
Species	Common Name	Max Spacing (ft)	Indiv. Spacing (ft)	Min. Caliper	Stratum	Percentage	Wetland Indicator Code	Quantity
Platanus occidentalis	Sycamore	12	6 x 12	0.25"	Canopy	15%	FACW	164
Ulmus americana	American Elm	12	6 x 12	0.25"	Canopy	10%	FACW	109
*Sambucus canadensis**	*Elderberry*	12	6 x 12	0.25"	Subconopy	10%	FAC	109
Acer negundo	Boxelder	12	6 x 12	0.25"	Canopy	10%	FAC	109
*Cephalanthus occidentalis**	*Buttonbush*	12	6 x 12	0.25"	Shrub	5%	OBL	54
*Alnus serrulata**	*Tag Alder*	12	6 x 12	0.25"	Subconopy	10%	OBL	109
						60%	**Total**	**654**
Live Stake								
Salix nigra	Black Willow	12	6 x 12	0.5" cal.	Canopy	20%	OBL	218
Salix sericea*	Silky Willow	12	6 x 12	0.5" cal.	Subconopy	12%	OBL	130
Cornus amomum*	Silky dogwood	12	6 x 12	0.5" cal.	Subconopy	8%	FACW	88
						40%	**Total**	**436**

* Subcanopy or shrub species - not held to monitoring height requirements
Italicized species were approved post-mitigation plan