MONITORING YEAR 2 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 2022 – October 2022
FINAL Submission Date: February, 2022

PREPARED FOR:

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

February 2, 2023

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

RE: FINAL: Year 2 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 Final Year 2 Monitoring Report for the Honey Mill Mitigation Site that were received on January 20, 2023. The report has been updated to reflect those comments. The Final MY2 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: Noted.

DMS' comment: Executive Summary: Thank you for providing concise status updates on each project action item and referencing the 8/16/22 Credit Release Site Walk.

Wildlands' response: You're welcome.

DMS' comment: Executive Summary: During the boundary walk to identify potential encroachment, was the easement boundary marking also assessed and determined to be within specification? Any deficiencies would need to be resolved and detailed in the MY3 report.

Wildlands' response: Yes, the easement boundary marking was checked during MY2. No deficiencies were identified.

DMS' comment: 1.4.4 Areas of Concern and Management Activity - Easement Encroachments: Cross-reference the 0.04-acre encroachment shown on Table 5 with the easement exception described in this section.

Wildlands' response: The area has been cross-referenced with the additional text added to the report "The areas of encroachment total to 0.04 AC (0.2% of the easement) and are exception areas documented at baseline and included in Table 5 (Appendix A)."

DMS' comment: 1.4.4 Areas of Concern and Management Activity - Shaded Supplemental Planting: Include brief discussion of sub-canopy and shrub species planted in the shaded area.

Wildlands' response: The addition discussion text was added to the report "The subcanopy bare roots planted in the shaded area were Ironwood (Carpinus caroliniana), Red Mulberry (Morus rubra), Witch Hazel (Hamamelis virginiana), Flowering Dogwood (Cornus florida), Sourwood (Ozydendron arboreum), and American Holly (Ilex opaca). The shrub bare roots planted include American Strawberry Bush (Eunoymus americanus), Sweetshrub (Calycanthus floridus), and Spicebush (Lindera benzoin)."

Updated Bankfull Information:

After the draft report was submitted Wildlands recorded a bankfull event in Winter 2022 and the report text has been updated with the additional bankfull documentation for the Final report.

Digital Support File Comments:

DMS' comment: Include upstream and downstream views for each set of photographs documenting crossing areas.

Wildlands' response: A culvert and crossing photo folder was added to the digital support file.

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's construction and as-built survey were completed between February - May 2021. In Monitoring Year 2 (MY2), the Site has met the required stream success criteria. The average planted stem density is 471 stems per acre with 13/14 vegetation plots on track to meet the MY3 density criteria. Supplemental planting in wetland areas (approximately 2.5 acres) and shaded areas (7.0 acres) was completed on Site in March 2022 prior to the onset of the growing season. To better capture floodplain access in future monitoring years a manual crest gage was added, and the automated crest gage was moved further downstream on Venable Creek Reach 3. Since moving the crest gage to a more representative cross-section, one bankfull event was documented on the Venable Creek Reach 3 in MY2. The Site is on track to meet the MY7 bankfull flow requirements. No stream areas of instability were documented in MY2. Areas noted during the 8/16/2022 MY1 Credit Release Site Walk will continue to be monitored. All fencing repairs have been completed and the boundary was walked with no encroachments present in October 2022. 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.
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.	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 MY2, one bankfull event was recorded on the Venable Creek Reach 3 Crest Gage.
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.	13/14 (93%) vegetation plots are on track to meet 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 new easement encroachments were observed in MY2. 0.04 acres of easement exceptions were noted in MY0. The fence was repaired throughout.

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° 25' 43.03"N 80° 36' 39.01"W
Planted Acreage	5 acres (full planting) plus supplemental planting		
Project Watershed Summary Information			
Physiographic Province	Piedmont	**River Basin**	Yadkin River

Table 3: Project Attributes

USGS Hydrologic Unit 8-digit	3040101	**USGS Hydrologic Unit 14-digit**	03040101110020
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	IV->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

Table 3: Project Attributes

Endangered Species Act	Yes	Yes	Categorical Exclusion Document in Mitigation Plan
Regulatory Considerations			
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 2 Data Assessment

Annual monitoring for MY2 was conducted between January and October 2022. 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

Please see the Current Condition Plan View (CCPV) maps for permanent vegetation plot locations, MY2 mobile plot locations, and the 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. Please note Table 6 summarizes only the Mitigation Performance Standard stem densities. However, IRT has approved supplemental wetland and riparian species that were added to the site as documented in the MY1 Annual Monitoring Report (Wildlands, 2021). Please see IRT approved planted supplemental stems species and quantities in Appendix G.

To account for the IRT approved supplemental species please refer to Table 7 “Post Mitigation Plan Performance Standard” densities discussed in the results below.

The MY2 permanent plot planted stem density using the “Post Mitigation Plan” performance standard ranged from 324 to 526 stems per acre. In MY2, 8/9 permanent plots are projected to meet the MY3 criteria of 320 stems per acre. The only permanent plot not on track to meet the MY3 criteria is vegetation plot 6 with a stem density of 283 stems per acre, however, it is still on track to meet the MY5 density criteria. The fixed plots with supplemental stems (permanent plots 3, 4, 5, and 9) have all improved in density from MY1 ranging from a 25%- 54% increase.

The overall MY2 “Post Mitigation Plan” planted density for the random mobile vegetation plots ranged from 324 to 729 stems per acre and all 5 mobile plots are projected to meet MY3 criteria. The mobile plots are distributed across the Site to provide representative data of the open planting riparian corridor.

As requested at the 8/16/22 MY1 Credit Release Site Walk, two forested woody vegetation transects were added to monitor the survivorship of the shaded supplemental planting. Forested transect 1 was

established on UT2 R1 and had a total stem count of 14 planted stems. Forested transect 2 was established on UT4 and had a total stem count of 11 stems. These transects will be evaluated to monitor survivorship of these stems under the canopy through MY7 and are not held to the density or height requirements. Meeting minutes from the 8/16/22 IRT Site walk are located in Appendix F.

Overall, 93% (13/14) vegetation plots are on track to meet the MY3 density criteria. The average stem height was 2.8 feet, increasing from MY1 to MY2. Additionally, the overall planted density for the Site in MY2 was 471 stems per acre, increasing 25% from MY1 due to the 2022 supplemental planting discussed further in **Section 1.4.4**. The species diversity has increased to an average of 7 species per plot. Therefore, the riparian vegetation on Site is performing well and diverse, native, herbaceous species are establishing in the easement. The woody stem density is projected to exceed requirement of 320 stems per acre in MY3.

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 MY2 were conducted in June 2022. Cross-section survey results indicate that channel dimensions are stable and functioning as designed on all restoration reaches with minimal adjustments from MY1 to MY2. Minor decreases in cross-sectional area, max depth, and bank height ratio within riffles XS8 and XS11 first observed in MY1, have since stabilized in MY2.

Pebble counts were conducted in March of 2021 during the MY0 data collection and were included in the as-built report (Wildlands, 2021). However, based on a DMS Technical Workgroup memo from 10/19/21 and concurrence received on 11/18/21 from the DMS project manager for the Site, pebble count collection is no longer required for the project from MY1 – MY7. Therefore, pebble counts will not be conducted during the remaining monitoring years unless requested by the IRT or deemed necessary based on best professional judgement. A copy of the DMS Technical Workgroup Memo and the email confirmation from the DMS project manager (Personal communication, Phillips 2021) are located in Appendix G.

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 a "crest gage (CG)." At the end of the seven-year monitoring period, four or more bankfull flow events must have occurred in separate years.

There was one bankfull event recorded on 11/6/22 by the crest gage on Venable Creek Reach 3 and 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. The average rainfall in MY2 exceeded the amount recorded in MY1 at 46.89 inches, which is classified as an average amount of precipitation for a given year. CG1 was originally installed on Venable Creek Reach 3 at XS7 to document bankfull events. However, little interaction with the floodplain at XS7 was documented based on the crest gage data collected from 3/4/2021 - 8/16/2022. On 5/25/22, Wildlands installed a manual crest gage to supplement the automated crest gage data at XS7 and the recoding interval for the automated gage was increased from 3 hours to 1 hour to increase the likelihood of capturing bankfull events.

The lack of bankfull documentation at crest gage location was discussed in the field at the 8/16/22 MY1 Credit Release Site Walk, and it was acknowledged XS7 is not representative of the overall floodplain conditions. The IRT approved relocation of the crest gage further downstream on Venable Creek, with the condition that the manual crest gage remain installed at XS7. CG1 was moved below the UT3 confluence along Venable Creek Reach 3 on 8/17/22. The manual crest gage and automatic crest gage locations have been updated on all MY2 CCPV figures. Based on the re-location of CG1, one bankfull events has been documented within the remaining monitoring period, and will likely document bankfull events in future monitoring years. Please refer to Appendix D for hydrology summary data and gage plots, and Appendix F for the 8/16/22 MY1 Credit Release Site Meeting Minutes.

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 MY2 visual assessment that took place between 8/16/22- 8/17/22. Stream areas discussed during the 8/16/22 MY1 Credit Release Site Walk are detailed below.

The spring wetland seep in the right floodplain of Venable Creek Reach 3 provides important floodplain storage, and the pour point to the channel is stable. Wildlands will continue to monitor the seep in future monitoring years. UT2B (not for credit) was dry during the visual assessment on 8/16/22 but has remained stable. During dry times of the year, UT3 flows subsurface to the Venable Creek Reach 3 confluence. However, the UT3 confluence has remained stable, and a marker was installed to monitor vertical incision. The meander bend above the UT3 confluence has scoured slightly at the brushtoe, although willows have filled in and are armoring the bank. This bend was not mapped as an area of concern because there is no evidence of active erosion, and it is a small area while the brushtoe along the rest of the meander remains largely intact. Wildlands will live stake the area before the start of the 2023 growing season and continue to monitor this area. 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. Photo point 29 was added to document the ford crossing on Venable Creek Reach 4 each year and has been added to the annual monitoring stream photolog as requested in the 8/16/22 MY1 Credit Release Site Meeting Minutes. 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. The areas of encroachment total to 0.04 AC (0.2% of the easement) and are exception areas documented at baseline and included in Table 5 (Appendix A). The additional fencing detailed below is also present on the MY2 CCPV maps.

All fencing additional installation and repairs were completed in September 2022. Approximately 910 LF of fencing was added on the eastern side of Venable Creek Reach 3 outside of the easement boundary, as cattle are being returned to the adjacent pasture. Any breaks in fencing were also repaired at the same time and a full boundary inspection was completed. All fence on the Site is intact and no encroachments were present as of October 2022. The fencing repair areas are documented in the supplemental photographs in Appendix A.

Wetland Supplemental Planting

During the MY1 vegetation survey and visual assessment of the Site, Wildlands noted 12% (2.5 acres) of restored floodplain were trending wetter than anticipated. In March 2022, Wildlands proactively added supplemental woody wetland stems to establish a well-vegetated riparian buffer early in the monitoring period. Three wetland species that were not originally included in the Honey Mill Mitigation Plan (Wildlands, 2020) planting list were Elderberry (*Sambucus canadensis*), Buttonbush (*Cephalanthus occidentalis*), and Tag Alder (*Alnus serrulata*). These species were approved by the IRT on January 3, 2022, as documented in the MY1 Annual Monitoring Report (Wildlands, 2021) and were thus entered into the NCDMS Vegetation Data Entry Tool as "Approved Post Mitigation Plan." The approved supplemental wetland species have been included in the MY2 vegetative survey and factored into the density and species composition for all vegetation data analysis. Please refer to the IRT approved planted supplemental stems species and quantities in Appendix G.

Shaded Supplemental Planting

In March 2022, Wildlands planted additional stems in the enhancement II reaches with existing forest (approximately 7 acres) with previously approved riparian species. The only substitution from the Honey Mill Mitigation Plan (Wildlands, 2020) was Slippery Elm (*Ulmus rubra*) for Tulip Poplar (*Liriodendron tulipifera*) due to availability at time of planting. The substitution was approved by the IRT on January 3, 2022, as documented in the MY1 Annual Monitoring Report (Wildlands, 2021). The subcanopy bare roots planted in the shaded area were Ironwood *(Carpinus caroliniana),* Red Mulberry *(Morus rubra),* Witch Hazel *(Hamamelis virginiana),* Flowering Dogwood *(Cornus florida),* Sourwood *(Ozydendron arboreum),* and American Holly *(Ilex opaca).* The shrub bare roots planted include American Strawberry Bush *(Eunoymus americanus),* Sweetshrub *(Calycanthus floridus),* and Spicebush *(Lindera benzoin).* As requested at the 8/16/22 MY1 Credit Release Site Walk, two forested woody vegetation transects were added to monitor the survivorship of the shaded supplemental planting. Meeting minutes from the 8/16/22 IRT Site walk are located in Appendix F. Please see IRT approved planted supplemental stems species and quantities in Appendix G.

Invasive Species Management

There were four established wooded areas with understory invasive species 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. The invasives were treated in March 2022 before the onset of the growing season and will continue to be monitored and treated as necessary in MY3. 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 2 Summary

Overall, the Site has met the required stream success criteria for MY2. The average planted stem density was 471 stems per acre with 13/14 vegetation plots on track to meet the MY3 density requirement of 320 stems per acre. Wetland and shaded supplemental planting took place in March 2022 prior to the onset of the growing season. There has been a 25% increase in average stem density from MY1 due to the supplemental planting efforts that took place in MY2. Geomorphic surveys indicate that cross-section bankfull dimensions closely match the baseline monitoring with some minor adjustments, and streams are functioning as intended. A manual crest gage was added, and the automated crest gage was moved further downstream on Venable Creek to better capture floodplain access in future monitoring years. Since moving the crest gage in MY2, one bankfull event was documented on the Venable Creek Reach 3. The Site is on track to meet the MY7 bankfull flow requirements. The MY2 visual assessment identified a few invasive vegetation areas of concern in wooded enhancement II reaches that were

treated before the onset of the growing season in March 2022 and are continuing to be monitored and treated as necessary. The open planting areas have established native herbaceous vegetation and are largely free of invasive species. No stream areas of instability were documented, and areas of channel adjustment noted during the 8/16/2022 MY1 Credit Release Site Walk will continue to be monitored per IRT request. All fencing repairs were completed, and the boundary monitored in October 2022. 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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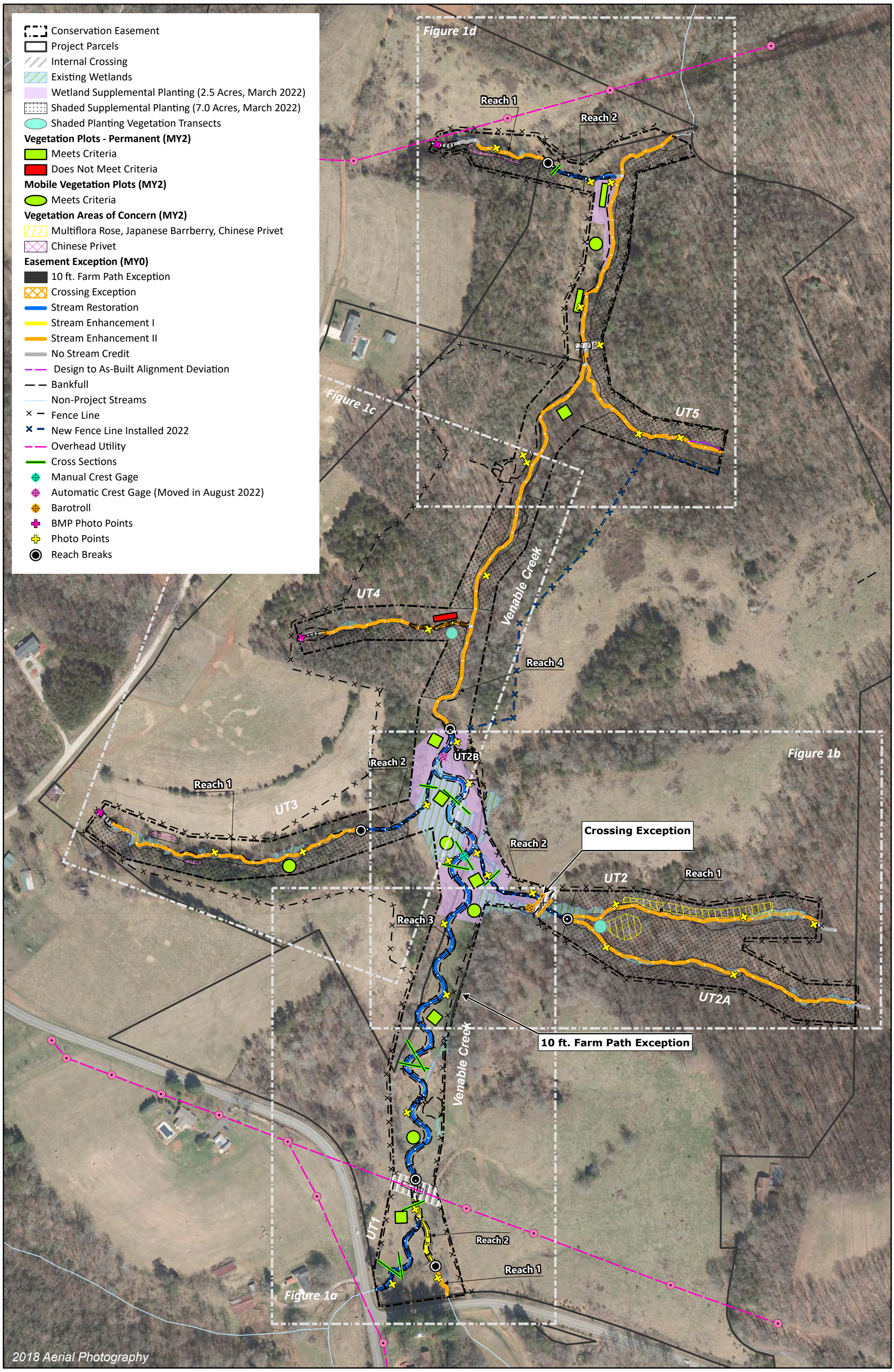
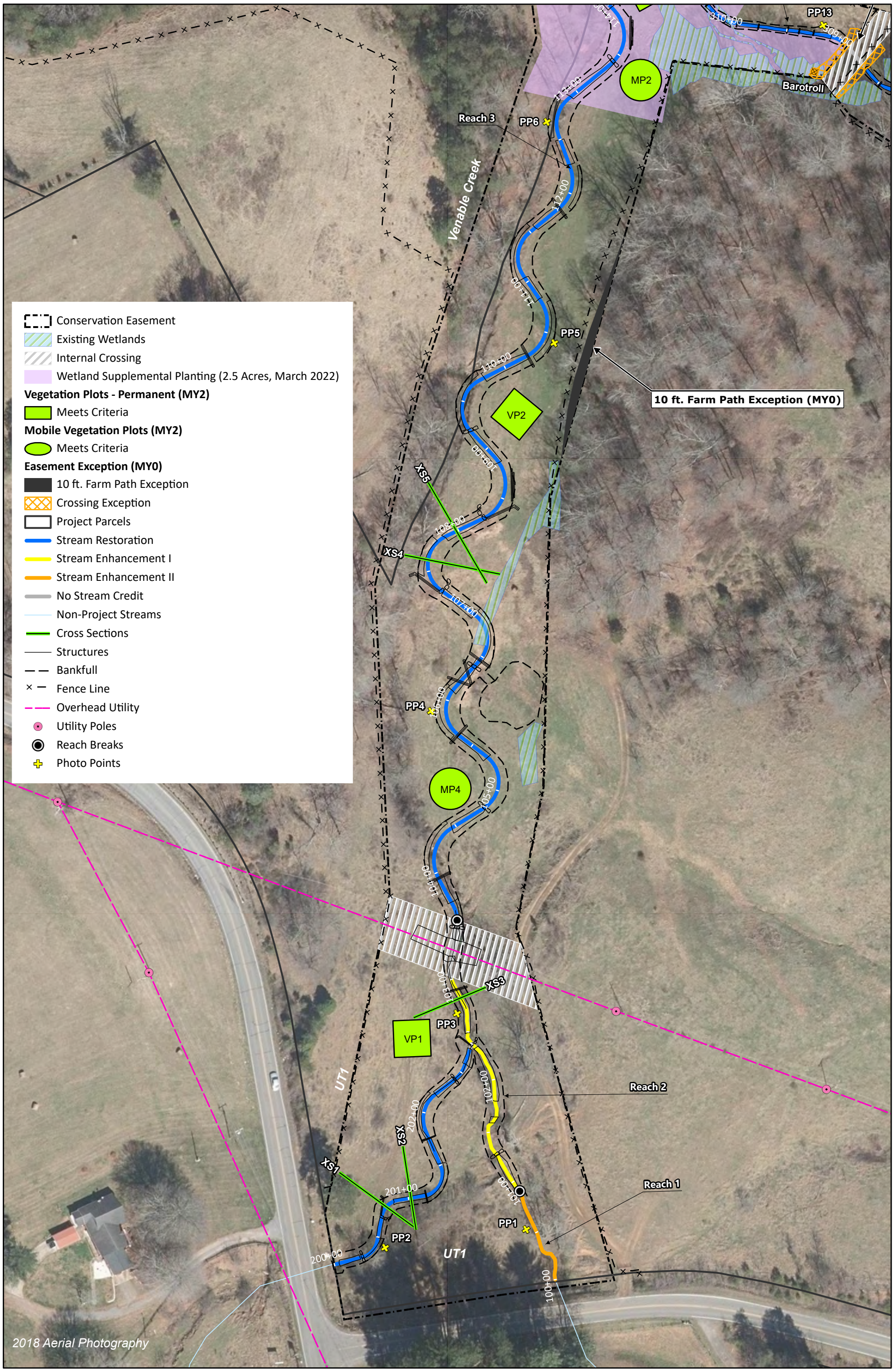


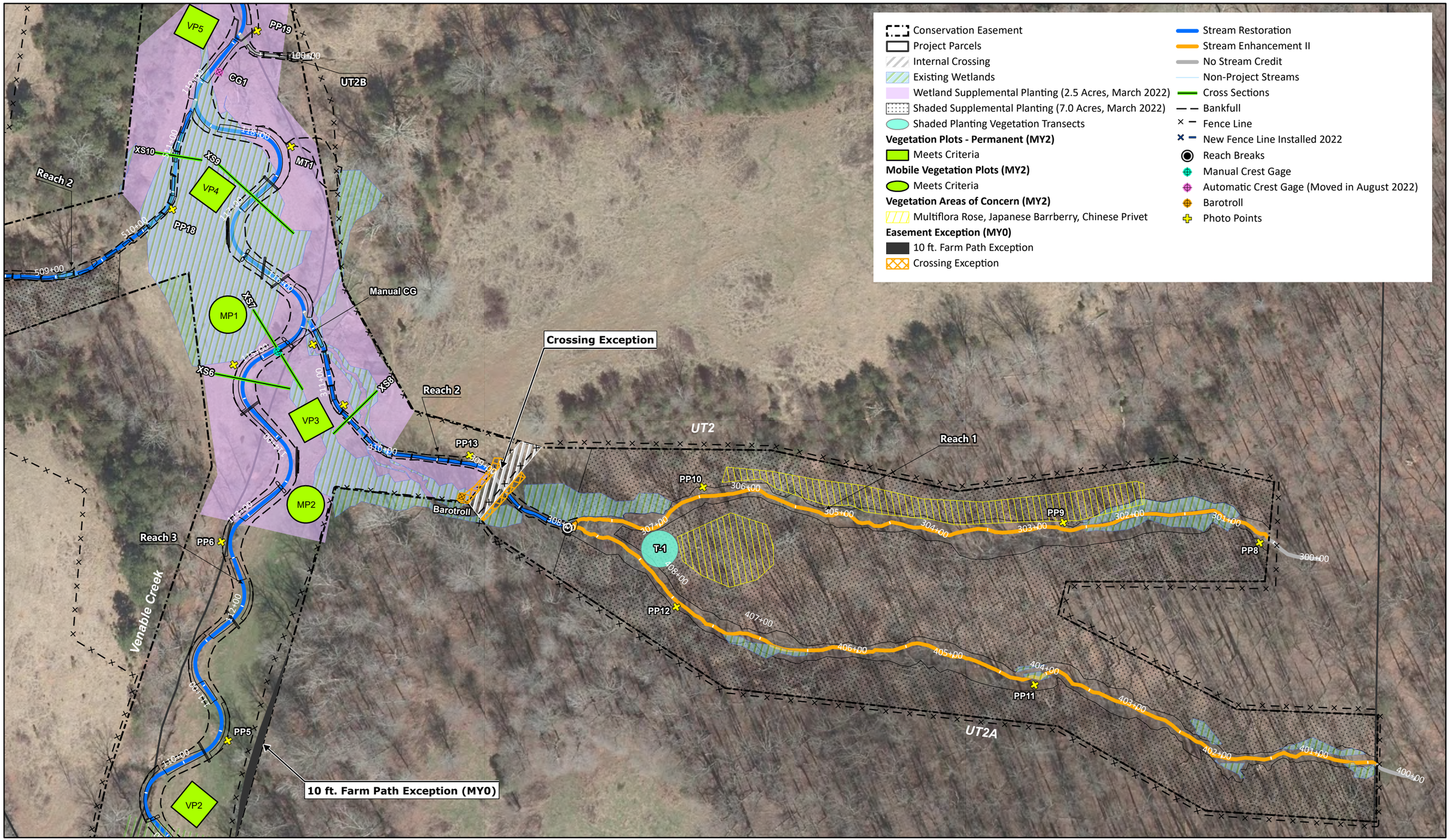
Figure 1. Current Condition Plan View Key
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 2 - 2022
Surry County, NC



WILDLANDS ENGINEERING

0 80 160 Feet

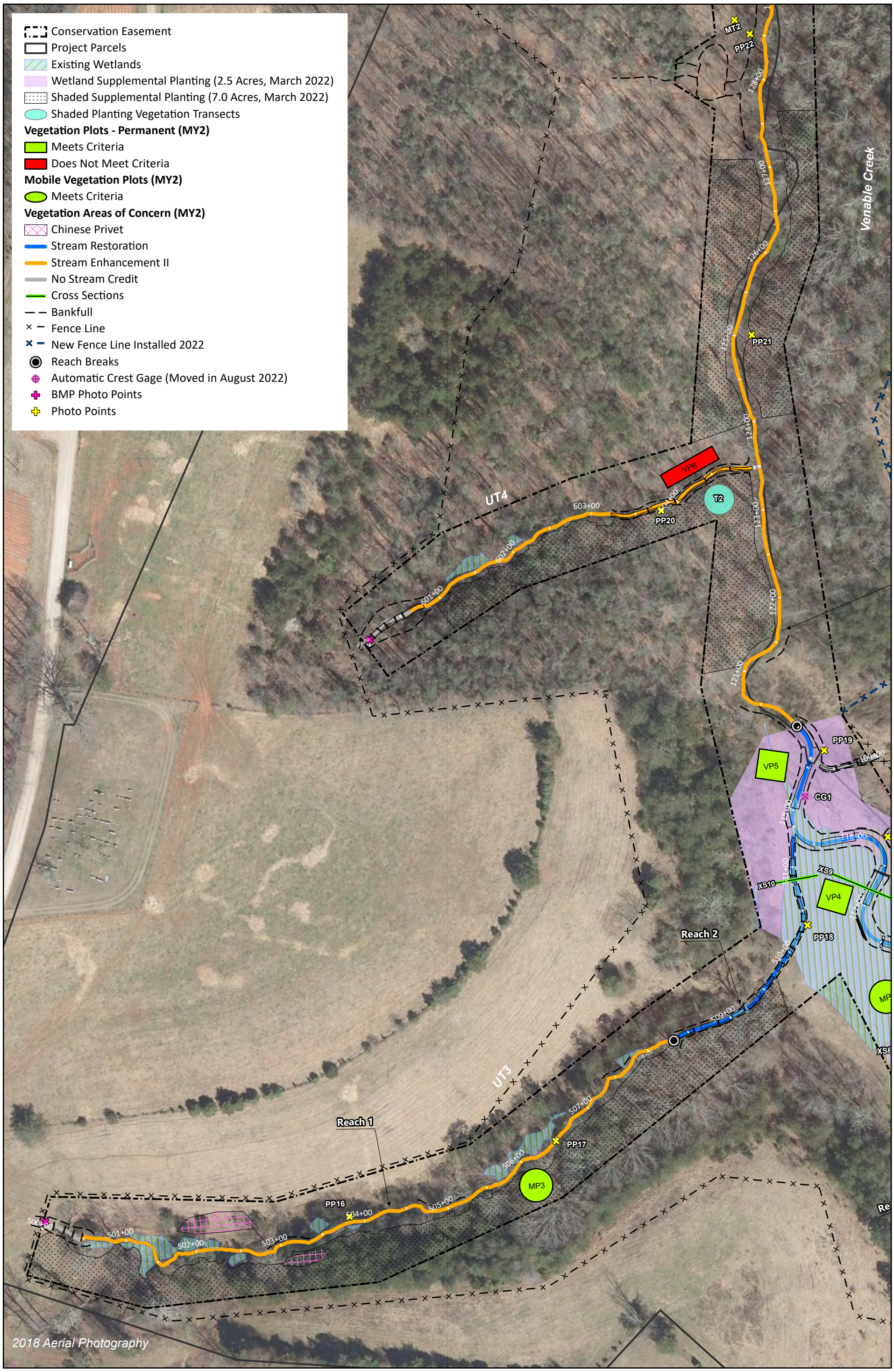
Figure 1a. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 2 - 2022
Surry County, NC



WILDLANDS ENGINEERING

0 90 180 Feet

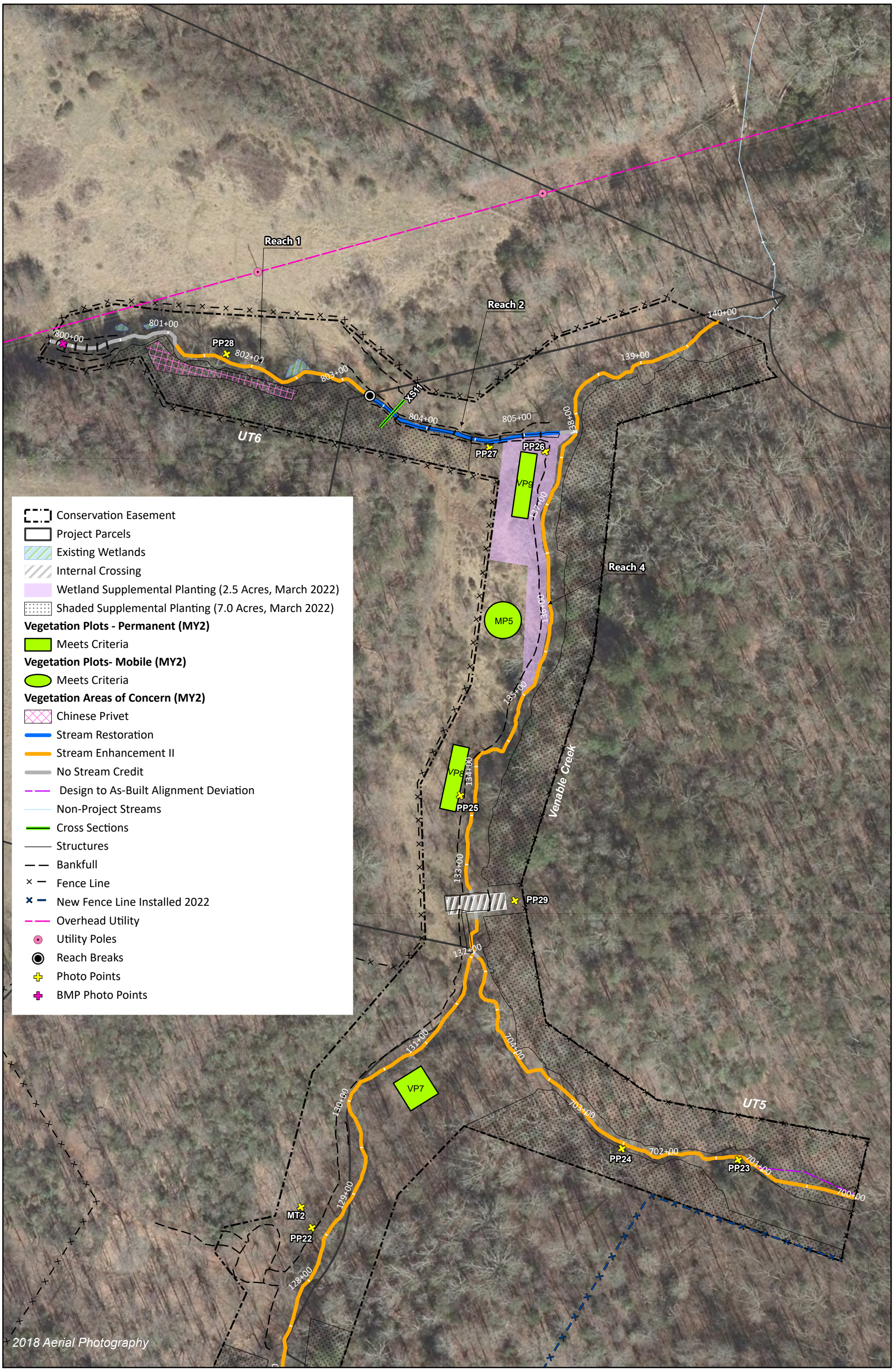
Figure 1b. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 2 - 2022
Surry County, NC



WILDLANDS ENGINEERING

0 100 200 Feet

Figure 1c. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 2 - 2022
Surry County, NC



WILDLANDS ENGINEERING

0 90 180 Feet

Figure 1d. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 2 - 2022
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 2 - 2022

Date of visual assessment: August 16 - August 17, 2022
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 16 - August 17, 2022
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 2 - 2022

Date of visual assessment: August 16 - August 17, 2022
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 16 - August 17, 2022
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	1,014
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 2 - 2022

Date of visual assessment: August 16 - August 17, 2022
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:	**0**	**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 16 - August 17, 2022
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:	**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%.	N/A	N/A		N/A

Table 5. Vegetation Condition Assessment Table

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

Date of visual assessment: August 16 - August 17, 2022
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: August 16 - August 17, 2022 & October 1, 2022
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[1]	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	0.04 ac (0.2%)	

[1]The listed easement exception areas were documented at baseline conditions. See section 1.4.2. No new areas of encroachment were documented since baseline.

STREAM PHOTOGRAPHS

PHOTO POINT 1 Venable Creek R1 – upstream *(04/14/2022)*

PHOTO POINT 1 Venable Creek R1 – downstream *(04/14/2022)*

PHOTO POINT 2 UT1 – upstream *(04/14/2022)*

PHOTO POINT 2 UT1 – downstream *(04/14/2022)*

PHOTO POINT 3 Venable Creek R2 – upstream *(04/14/2022)*

PHOTO POINT 3 Venable Creek R2 – downstream *(04/14/2022)*

PHOTO POINT 4 Venable Creek R3 – upstream *(04/14/2022)*

PHOTO POINT 4 Venable Creek R3 – downstream *(04/14/2022)*

PHOTO POINT 5 Venable Creek R3 – upstream *(04/14/2022)*

PHOTO POINT 5 Venable Creek R3 – downstream *(04/14/2022)*

PHOTO POINT 6 Venable Creek R3 – upstream *(04/14/2022)*

PHOTO POINT 6 Venable Creek R3 – downstream *(04/14/2022)*

	
PHOTO POINT 7 Venable Creek R3 – upstream *(04/14/2022)*	**PHOTO POINT 7 Venable Creek R3 –** downstream *(04/14/2022)*
	
PHOTO POINT 8 UT2 R1 Headcut – upstream *(04/14/2022)*	**PHOTO POINT 8 UT2 R1 –** downstream *(04/14/2022)*
	
PHOTO POINT 9 UT2 R1 – upstream *(04/14/2022)*	**PHOTO POINT 9 UT2 R1 –** downstream *(04/14/2022)*

	
PHOTO POINT 10 UT2 R1 – upstream *(04/14/2022)*	**PHOTO POINT 10 UT2 R1 –** downstream *(04/14/2022)*
	
PHOTO POINT 11 UT2A – upstream *(04/14/2022)*	**PHOTO POINT 11 UT2A –** downstream *(04/14/2022)*
	
PHOTO POINT 12 UT2A – upstream *(04/14/2022)*	**PHOTO POINT 12 UT2A –** downstream *(04/14/2022)*

	
PHOTO POINT 13 UT2 R2 – upstream *(04/14/2022)*	**PHOTO POINT 13 UT2 R2 –** downstream *(04/14/2022)*
	
PHOTO POINT 14 UT2 R2 – upstream *(04/14/2022)*	**PHOTO POINT 14 UT2 R2 –** downstream *(04/14/2022)*
	
PHOTO POINT 15 UT2 R2 – upstream *(04/14/2022)*	**PHOTO POINT 15 UT2 R2 –** downstream *(04/14/2022)*

	
PHOTO POINT 16 UT3 R1 – upstream *(04/14/2022)*	**PHOTO POINT 16 UT3 R1 –** downstream *(04/14/2022)*
	
PHOTO POINT 17 UT3 R1 – upstream *(04/14/2022)*	**PHOTO POINT 17 UT3 R1–** downstream *(04/14/2022)*
	
PHOTO POINT 18 UT3 R2 – upstream *(04/14/2022)*	**PHOTO POINT 18 UT3 R2 –** downstream *(04/14/2022)*

PHOTO POINT 19 Venable Creek R3 – upstream *(04/14/2022)*

PHOTO POINT 19 Venable Creek R3 – downstream *(04/14/2022)*

PHOTO POINT 20 UT4 – upstream *(04/14/2022)*

PHOTO POINT 20 UT4 – downstream *(04/14/2022)*

PHOTO POINT 21 Venable Creek R4 – upstream *(04/14/2022)*

PHOTO POINT 21 Venable Creek R4 – downstream *(04/14/2022)*

	
PHOTO POINT 22 Venable Creek R4 – upstream *(04/14/2022)*	**PHOTO POINT 22 Venable Creek R4 –** downstream *(04/14/2022)*
	
PHOTO POINT 23 UT5 Headcut – upstream *(04/14/2022)*	**PHOTO POINT 23 UT5 –** downstream *(04/14/2022)*
	
PHOTO POINT 24 UT5 – upstream *(04/14/2022)*	**PHOTO POINT 24 UT5 –** downstream *(04/14/2022)*

	
PHOTO POINT 25 Venable Creek R4 – upstream *(04/14/2022)*	**PHOTO POINT 25 Venable Creek R4 –** downstream *(04/14/2022)*
	
PHOTO POINT 26 Venable Creek R4 – upstream *(04/14/2022)*	**PHOTO POINT 26 Venable Creek R4 –** downstream *(04/14/2022)*
	
PHOTO POINT 27 UT6 R2 – upstream *(04/14/2022)*	**PHOTO POINT 27 UT6 R2 –** downstream *(04/14/2022)*

PHOTO POINT 28 UT6 R1 – upstream *(04/14/2022)*

PHOTO POINT 28 UT6 R1 – downstream *(04/14/2022)*

PHOTO POINT 29 Venable Creek R4 Ford Crossing – *(08/16/2022)*

MATURE TREE PHOTOGRAPHS

	
Mature Tree Photo Point 1 (Northeast) – Venable Creek Reach 3 *(4/14/2022)*	**Mature Tree Photo Point 2 (Northeast)** – Venable Creek Reach 4 *(4/14/2022)*

SUPPLEMENTAL PHOTOGRAPHS- BMP's

UT3 BMP photo– upstream *(08/16/2022)*

UT4 BMP photo– upstream *(08/16/2022)*

UT6 BMP photo– upstream *(08/16/2022)*

SUPPLEMENTAL PHOTOGRAPHS- Site Walk Follow Up

	
XS7 Manual Crest Gage– upstream *(05/25/2022)*	**New Automated Crest Gage Location (118+10) –** downstream *(08/17/2022)*
	
UT2B Dry Channel– upstream *(08/16/2022)*	**UT3 Subsurface Flow to Venable Creek–** upstream (*08/16/2022)*
	
VC R3- Meander Bend above UT3 confluence to be live staked before 2023 growing season on left bank *(08/16/2022)*	**VC R3-** Wetland Seep to Main Channel on right floodplain *(08/16/2022)*

MY2 FENCING REPAIRS/INSTALLATION PHOTOGRAPHS

UT2 Fence Repair– *(09/30/2022)*

UT2 R2 Crossing and Tree Removed– *(09/30/2022)*

UT5 Fence Repair– *(09/30/2022)*

UT5 Fence Repair– *(09/30/2022)*

New Easement Fence Installed on Field Adjacent to Venable Creek R4– *(09/30/2022)*

New Easement Fence Installed on Field Adjacent to Venable Creek R4– *(09/30/2022)*

	
New Easement Fence Installed on Field Adjacent to Venable Creek R4– *(09/30/2022)*	**New Easement Fence Installed on Field Adjacent to Venable Creek R4–** *(09/30/2022)*

PERMANENT VEGETATION PLOT PHOTOGRAPHS

PERMANENT VEGETATION PLOT 1 *(8/16/2022)*

PERMANENT VEGETATION PLOT 2 *(8/16/2022)*

PERMANENT VEGETATION PLOT 3 *(8/16/2022)*

PERMANENT VEGETATION PLOT 4 *(8/16/2022)*

PERMANENT VEGETATION PLOT 5 *(8/16/2022)*

PERMANET VEGETATION PLOT 6 *(8/16/2022)*

PERMANENT VEGETATION PLOT 7 *(8/17/2022)*

PERMANENT VEGETATION PLOT 8 *(8/17/2022)*

PERMANENT VEGETATION PLOT 9 *(8/17/2022)*

MOBILE VEGETATION PLOT PHOTOGRAPHS

MOBILE VEGETATION PLOT 1 *(8/16/2022)*

MOBILE VEGETATION PLOT 2 *(8/16/2022)*

MOBILE VEGETATION PLOT 3 (*8/16/2022)*

MOBILE VEGETATION PLOT 4 *(8/16/2022)*

MOBILE VEGETATION PLOT 5 *(8/17/2022)*

SHADED VEGETATION TRANSECT PHOTOGRAPHS

	
SHADED VEGETATION TRANSECT 1 (*8/16/2022)*	**SHADED VEGETATION TRANSECT 2** *(8/17/2022)*

APPENDIX B. Vegetation Plot Data

Table 6. Vegetation Performance Standards Summary Table

Honey Mill Mitigation Site

DMS Project No. 100083

Monitoring Year 2 - 2022

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												
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												
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												
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				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												
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												
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 please refer to table 7 for the "Post Mitigation Plan Performance Standard" referenced in the text.

Table 7a. Vegetation Plot Data
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 2 - 2022

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	2022-08-18
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	1	1			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										
	Cornus florida	flowering dogwood	Tree	FACU																		
	Diospyros virginiana	common persimmon	Tree	FAC	3	3	2	2	2	2			1	1	1	1	1	1			2	2
	Fagus grandifolia	American beech	Tree	FACU													1	1				
	Hamamelis virginiana	American witchhazel	Tree	FACU	1	1									1	1	1	1	1	1		
	Ilex opaca	American holly	Tree	FACU																		
	Lindera benzoin	northern spicebush	Tree	FAC																		
	Liriodendron tulipifera	tuliptree	Tree	FACU			1	1					1	1	1	1	2	2	1	1		
	Morus rubra	red mulberry	Tree	FACU	3	3			1	1			1	1			2	2			1	1
	Nyssa sylvatica	blackgum	Tree	FAC													1	1	2	2		
	Oxydendrum arboreum	sourwood	Shrub	UPL																		
	Platanus occidentalis	American sycamore	Tree	FACW	1	1	2	2	2	2	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	1	1						
	Quercus phellos	willow oak	Tree	FAC																	3	3
	Quercus rubra	northern red oak	Tree	FACU	2	2	1	1									1	1	3	3		
	Salix nigra	black willow	Tree	OBL									1	1								
	Ulmus americana	American elm	Tree	FACW							2	2									1	1
	Ulmus rubra	slippery elm	Tree	FAC			1	1			1	1										
Sum	Performance Standard				13	13	9	9	10	10	8	8	10	10	7	7	12	12	9	9	11	12
Post Mitigation Plan Species	Alnus serrulata	hazel alder	Tree	OBL					2	2			1	1							1	1
	Cephalanthus occidentalis	common buttonbush	Shrub	OBL																		
	Populus deltoides	*eastern cottonwood*	*Tree*	*FAC*																		
	Sambucus canadensis	American black elderberry	Tree										1	1								
Sum	Proposed Standard				13	13	9	9	12	12	8	8	12	12	7	7	12	12	9	9	12	13
Mitigation Plan Performance Standard	Current Year Stem Count					13		9		10		8		10		7		12		9		12
	Stems/Acre					526		364		405		324		405		283		486		364		486
	Species Count					8		7		6		5		8		6		9		6		6
	Dominant Species Composition (%)					23		22		25		25		17		29		17		33		23
	Average Plot Height (ft.)					2		3		4		3		2		3		3		2		3
	% Invasives					0		0		0		0		0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					13		9		12		8		12		7		12		9		13
	Stems/Acre					526		364		486		324		486		283		486		364		526
	Species Count					8		7		7		5		10		6		9		6		7
	Dominant Species Composition (%)					23		22		25		25		17		29		17		33		23
	Average Plot Height (ft.)					2		3		4		3		2		3		3		2		3
	% 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 7b. Vegetation Plot Data
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 2 - 2022

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	2022-08-18
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	1	3		2	2
	Carpinus caroliniana	American hornbeam	Tree	FAC					
	Carya cordiformis	bitternut hickory	Tree	FACU		1		1	
	Cornus amomum	silky dogwood	Shrub	FACW					1
	Cornus florida	flowering dogwood	Tree	FACU					3
	Diospyros virginiana	common persimmon	Tree	FAC	1	2		1	2
	Fagus grandifolia	American beech	Tree	FACU			4		
	Hamamelis virginiana	American witchhazel	Tree	FACU				2	
	Ilex opaca	American holly	Tree	FACU			2		
	Lindera benzoin	northern spicebush	Tree	FAC					1
	Liriodendron tulipifera	tuliptree	Tree	FACU	3		1	1	2
	Morus rubra	red mulberry	Tree	FACU					
	Nyssa sylvatica	blackgum	Tree	FAC					
	Oxydendrum arboreum	sourwood	Shrub	UPL					1
	Platanus occidentalis	American sycamore	Tree	FACW	3	7		3	3
	Prunus serotina	black cherry	Tree	FACU			2		1
	Quercus alba	white oak	Tree	FACU		2		1	
	Quercus phellos	willow oak	Tree	FAC					
	Quercus rubra	northern red oak	Tree	FACU					
	Salix nigra	black willow	Tree	OBL					
	Ulmus americana	American elm	Tree	FACW			1		2
	Ulmus rubra	slippery elm	Tree	FAC					
Sum	Performance Standard				8	15	10	11	18
Post Mitigation Plan Species	Alnus serrulata	hazel alder	Tree	OBL		1		4	
	Cephalanthus occidentalis	common buttonbush	Shrub	OBL			1		
	Populus deltoides	*eastern cottonwood*	*Tree*	*FAC*				*2*	
	Sambucus canadensis	American black elderberry	Tree						
Sum	Proposed Standard				8	16	11	15	18
Mitigation Plan Performance Standard	Current Year Stem Count				8	15	10	11	18
	Stems/Acre				324	607	405	445	729
	Species Count				4	5	5	7	10
	Dominant Species Composition (%)				38	44	36	24	17
	Average Plot Height (ft.)				5	4	21	2	2
	% Invasives				0	0	0	0	0
Post Mitigation Plan Performance Standard	Current Year Stem Count				8	16	11	15	18
	Stems/Acre				324	648	445	607	729
	Species Count				4	6	6	8	10
	Dominant Species Composition (%)				38	44	36	24	17
	Average Plot Height (ft.)				5	4	2	2	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 7c. Vegetation Transect Table

Vegetation Plot Data
DMS Project No. 100083
Monitoring Year 2 - 2022

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

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

*Transects represent understory planting and are not helpd to denisty or height requirements per MY1 IRT site walk comments (8/16/2022) in Appendix F.

APPENDIX C. Stream Geomorphology Data

Table 8. Baseline Stream Data Summary
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 2 - 2022

	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 2 - 2022

	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						1039.2	1039.3	1039.3						1034.6	1034.7	1034.7					
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A	N/A	N/A						1.0	1.0	1.0						1.0	1.0	0.9					
Thalweg Elevation (ft)	1037.6	1037.5	1037.6						1037.6	1037.7	1037.7						1032.5	1032.6	1032.6					
LTOB[2] Elevation (ft)	1039.7	1039.7	1039.7						1039.2	1039.3	1039.3						1034.6	1034.7	1034.5					
LTOB[2] Max Depth (ft)	2.1	2.2	2.1						1.6	1.6	1.6						2.1	2.1	2.0					
LTOB[2] Cross Sectional Area (ft^2)	18.1	16.7	17.0						11.0	11.1	10.7						20.2	19.3	18.5					
	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						1024.1	1024.0	1024.1						N/A	N/A	N/A					
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A	N/A	N/A						1.0	1.0	1.0						N/A	N/A	N/A					
Thalweg Elevation (ft)	1021.4	1021.6	1021.3						1022.3	1022.2	1022.3						1013.1	1013.0	1013.1					
LTOB[2] Elevation (ft)	1024.7	1024.8	1024.7						1024.1	1024.0	1024.1						1016.3	1016.3	1016.3					
LTOB[2] Max Depth (ft)	3.3	3.2	3.5						1.8	1.9	1.8						3.2	3.3	3.2					
LTOB[2] Cross Sectional Area (ft^2)	33.4	33.6	35.9						17.1	18.1	17.5						33.3	35.0	35.9					
	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						1020.0	1020.4	1020.4						1011.6	1011.6	1011.6					
Bank Height Ratio - Based on AB Bankfull[1] Area	1.0	1.0	1.0						1.0	0.7	0.8						1.0	1.0	1.0					
Thalweg Elevation (ft)	1013.9	1013.9	1013.8						1019.1	1019.4	1019.3						1009.8	1009.8	1009.9					
LTOB[2] Elevation (ft)	1015.9	1015.9	1015.8						1020.0	1020.1	1020.1						1011.6	1011.7	1011.7					
LTOB[2] Max Depth (ft)	2.0	2.0	2.1						0.8	0.7	0.8						1.8	1.9	1.8					
LTOB[2] Cross Sectional Area (ft^2)	19.4	18.5	18.6						4.8	2.9	3.1						16.0	16.8	16.7					
	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						998.6	998.7	998.7													
Bank Height Ratio - Based on AB Bankfull[1] Area	1.0	0.9	0.9						1.0	0.8	0.8													
Thalweg Elevation (ft)	1011.2	1011.2	1011.2						997.9	998.1	998.0													
LTOB[2] Elevation (ft)	1011.9	1011.9	1011.9						998.6	998.6	998.6													
LTOB[2] Max Depth (ft)	0.7	0.7	0.6						0.7	0.5	0.6													
LTOB[2] Cross Sectional Area (ft^2)	2.8	2.4	2.2						3.0	1.9	2.1													

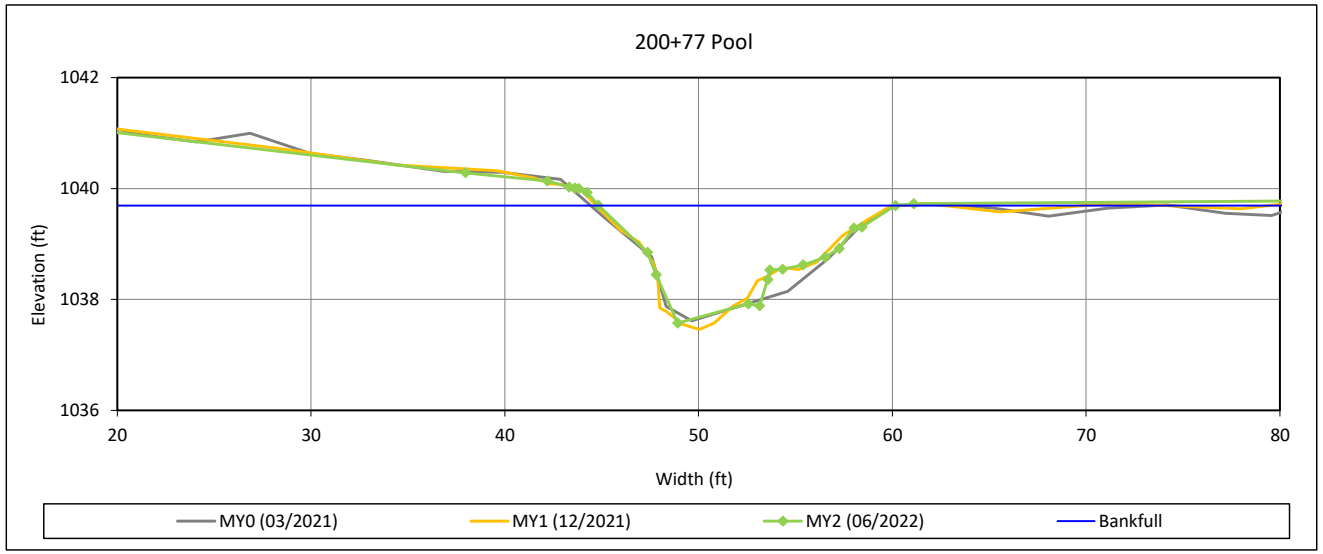
[1]Bank Height Ratio (BHR) takes the As-built bankful area as the basis for adjusting each subsequent year's bankfull elevation.

[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 2 - 2022

Cross-Section 1-UT1



Bankfull Dimensions	
17.0	x-section area (ft.sq.)
15.3	width (ft)
1.1	mean depth (ft)
2.1	max depth (ft)
16.4	wetted perimeter (ft)
1.0	hydraulic radius (ft)
13.8	width-depth ratio

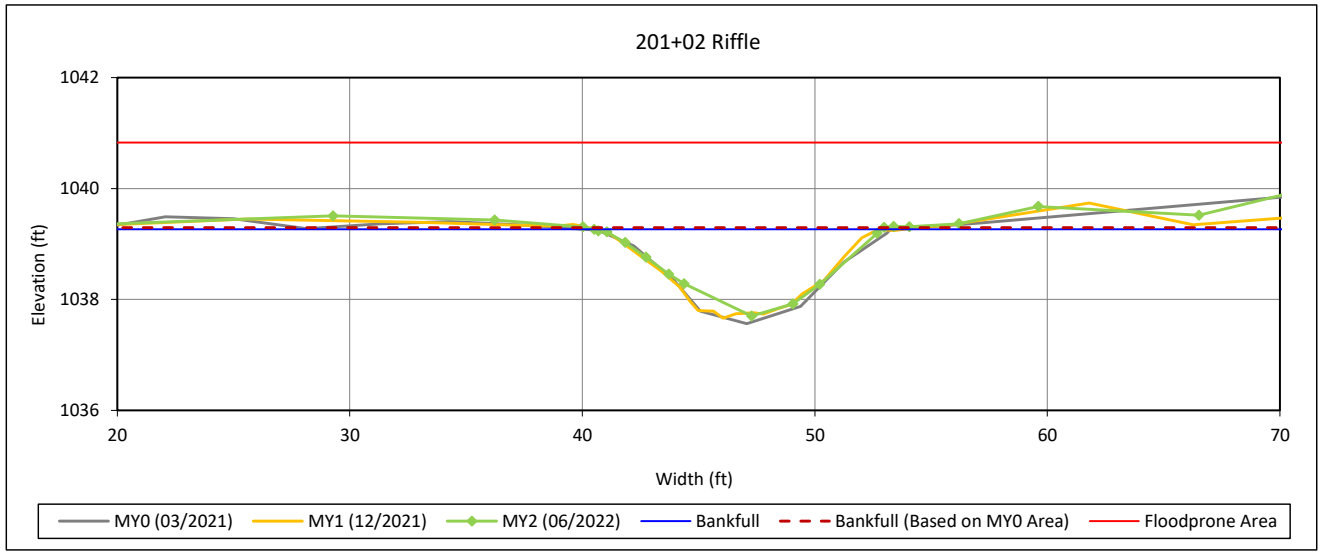
Survey Date: 06/2022
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

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

Cross-Section 2-UT1



Bankfull Dimensions	
10.7	x-section area (ft.sq.)
12.4	width (ft)
0.9	mean depth (ft)
1.6	max depth (ft)
12.8	wetted perimeter (ft)
0.8	hydraulic radius (ft)
14.4	width-depth ratio
75.1	W flood prone area (ft)
6.1	entrenchment ratio
1.0	low bank height ratio

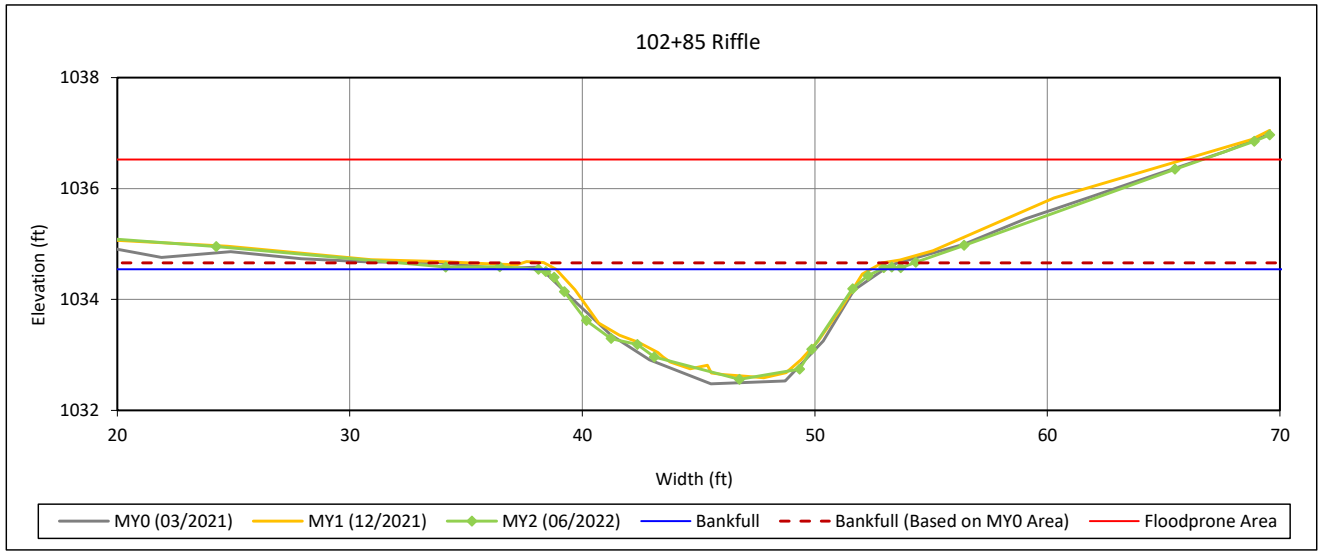
Survey Date: 06/2022
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

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

Cross-Section 3-Venable Creek R2



Bankfull Dimensions	
18.5	x-section area (ft.sq.)
14.7	width (ft)
1.3	mean depth (ft)
2.0	max depth (ft)
15.5	wetted perimeter (ft)
1.2	hydraulic radius (ft)
11.7	width-depth ratio
67.2	W flood prone area (ft)
4.6	entrenchment ratio
0.9	low bank height ratio

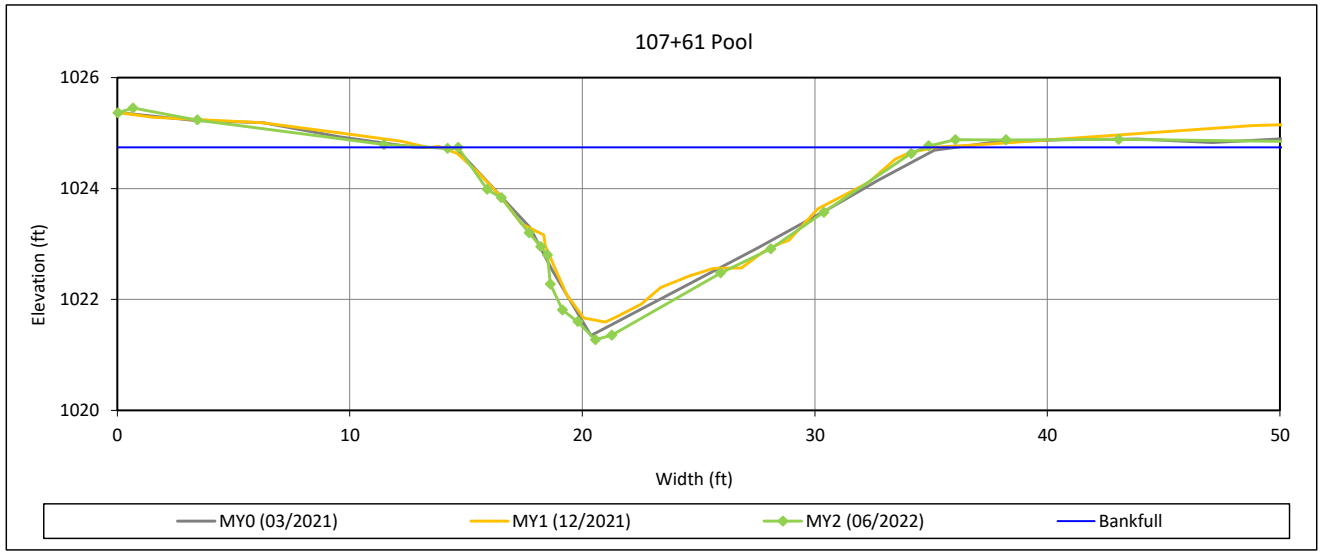
Survey Date: 06/2022
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

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

Cross-Section 4-Venable Creek R3



Bankfull Dimensions	
35.9	x-section area (ft.sq.)
20.1	width (ft)
1.8	mean depth (ft)
3.5	max depth (ft)
21.7	wetted perimeter (ft)
1.7	hydraulic radius (ft)
11.2	width-depth ratio

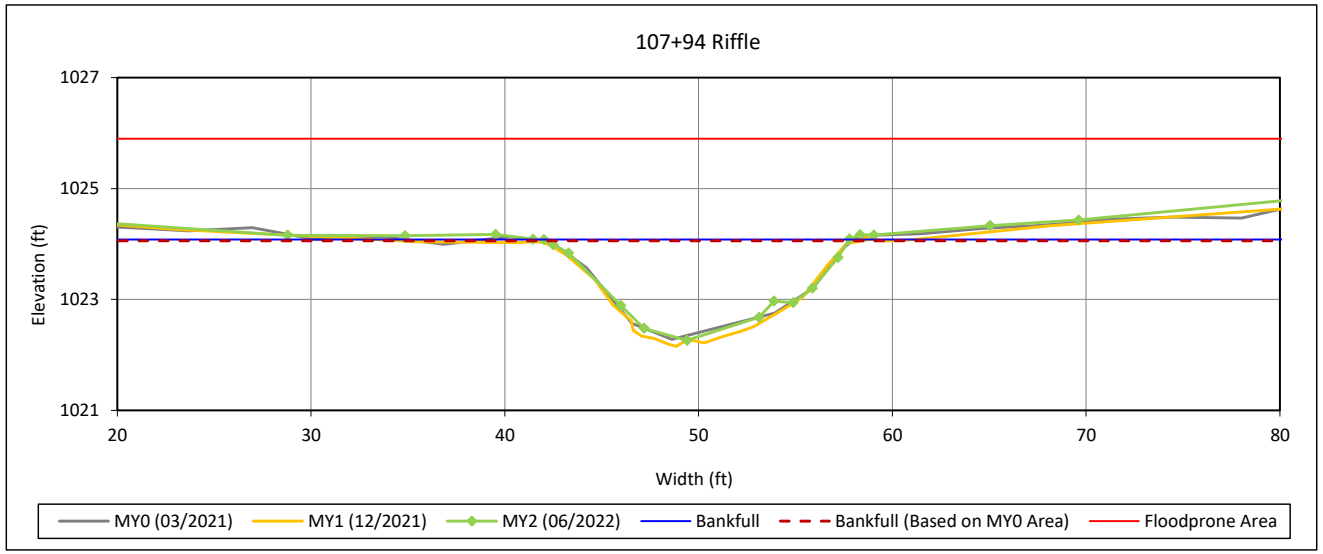
Survey Date: 06/2022
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

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

Cross-Section 5-Venable Creek R3



Bankfull Dimensions	
17.5	x-section area (ft.sq.)
15.8	width (ft)
1.1	mean depth (ft)
1.8	max depth (ft)
16.3	wetted perimeter (ft)
1.1	hydraulic radius (ft)
14.2	width-depth ratio
13.7	W flood prone area (ft)
0.9	entrenchment ratio
1.0	low bank height ratio

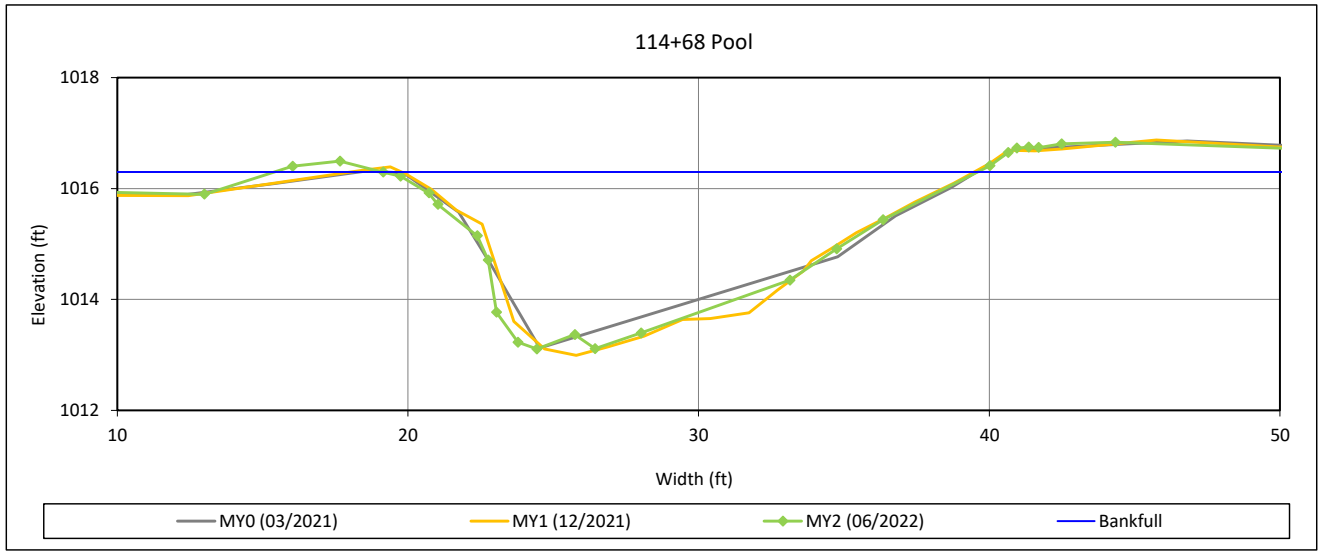
Survey Date: 06/2022
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

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

Cross-Section 6-Venable Creek R3



Bankfull Dimensions	
35.9	x-section area (ft.sq.)
20.4	width (ft)
1.8	mean depth (ft)
3.2	max depth (ft)
22.2	wetted perimeter (ft)
1.6	hydraulic radius (ft)
11.6	width-depth ratio

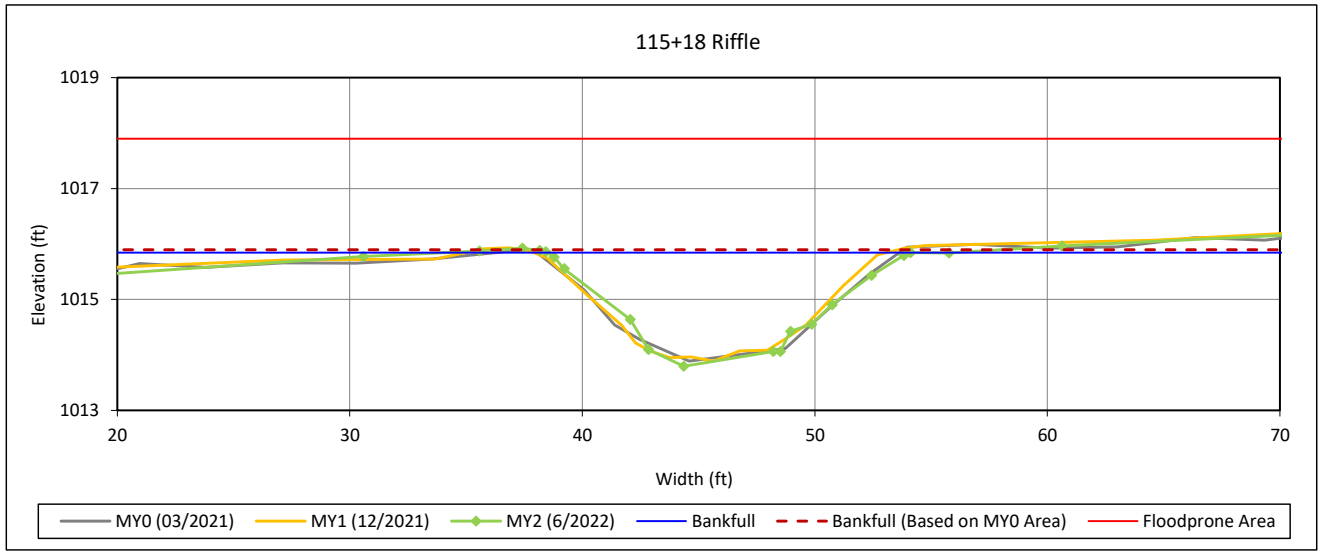
Survey Date: 06/2022
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

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

Cross-Section 7-Venable Creek R3



Bankfull Dimensions	
18.6	x-section area (ft.sq.)
15.6	width (ft)
1.2	mean depth (ft)
2.1	max depth (ft)
16.4	wetted perimeter (ft)
1.1	hydraulic radius (ft)
13.2	width-depth ratio
93.6	W flood prone area (ft)
6.0	entrenchment ratio
1.0	low bank height ratio

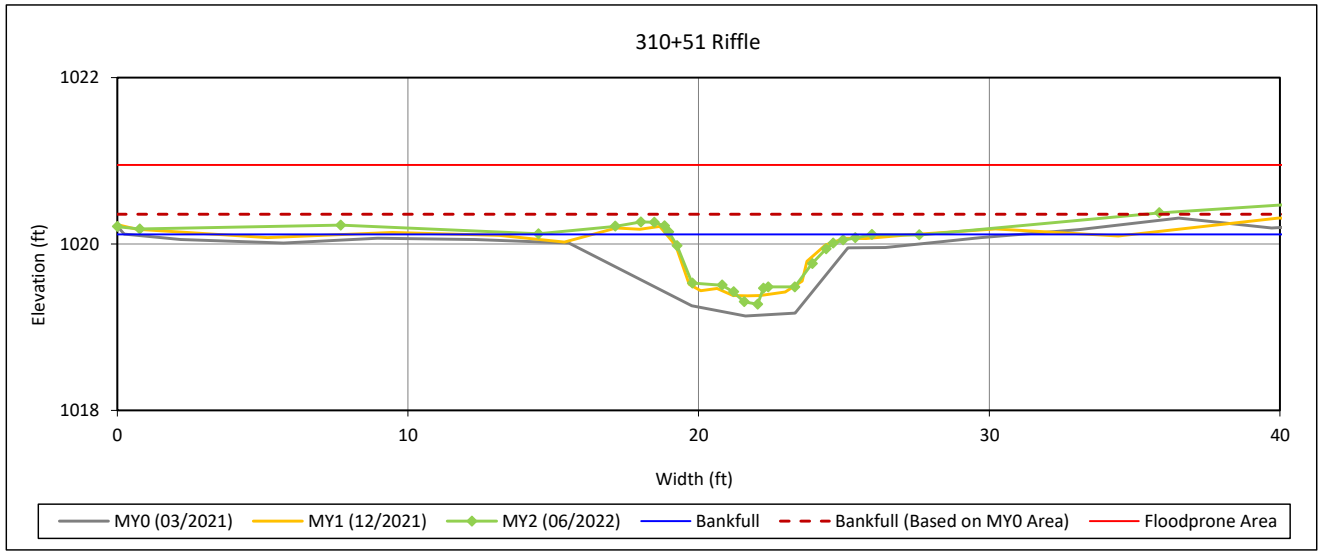
Survey Date: 06/2022
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

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

Cross-Section 8-UT2 R2



Bankfull Dimensions	
3.1	x-section area (ft.sq.)
6.9	width (ft)
0.4	mean depth (ft)
0.8	max depth (ft)
7.3	wetted perimeter (ft)
0.4	hydraulic radius (ft)
15.7	width-depth ratio
61.4	W flood prone area (ft)
8.9	entrenchment ratio
0.8	low bank height ratio

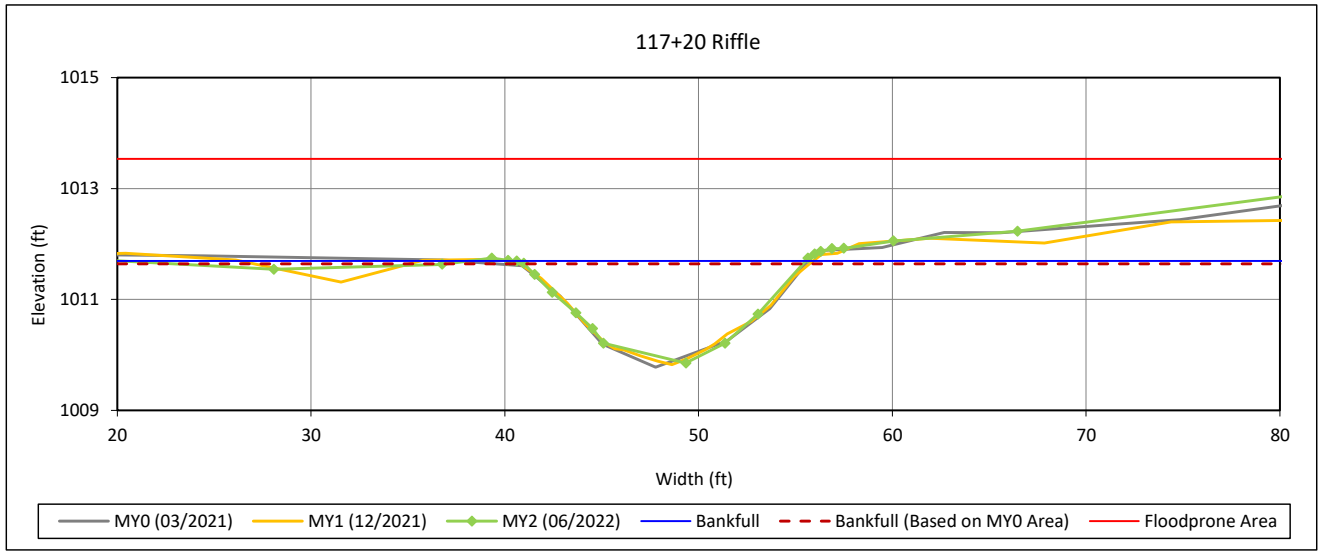
Survey Date: 06/2022
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

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

Cross-Section 9-Venable Creek R3



Bankfull Dimensions	
16.7	x-section area (ft.sq.)
14.9	width (ft)
1.1	mean depth (ft)
1.8	max depth (ft)
15.5	wetted perimeter (ft)
1.1	hydraulic radius (ft)
13.3	width-depth ratio
102.0	W flood prone area (ft)
6.8	entrenchment ratio
1.0	low bank height ratio

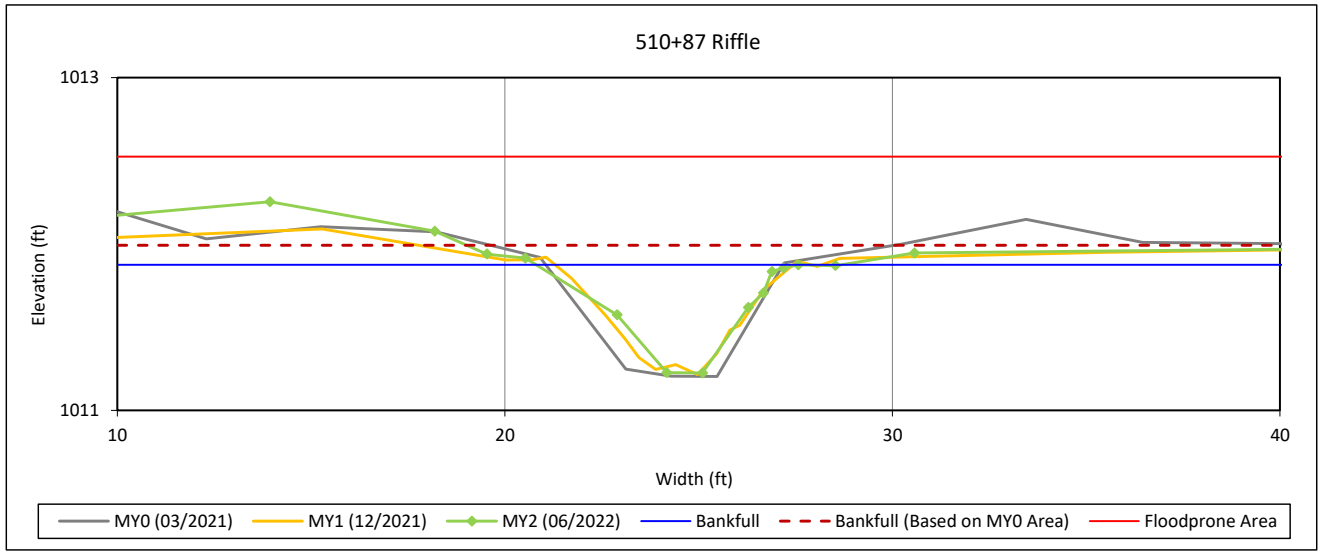
Survey Date: 06/2022
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

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

Cross-Section 10-UT3 R2



Bankfull Dimensions	
2.2	x-section area (ft.sq.)
6.8	width (ft)
0.3	mean depth (ft)
0.6	max depth (ft)
6.9	wetted perimeter (ft)
0.3	hydraulic radius (ft)
21.0	width-depth ratio
50.6	W flood prone area (ft)
7.5	entrenchment ratio
0.9	low bank height ratio

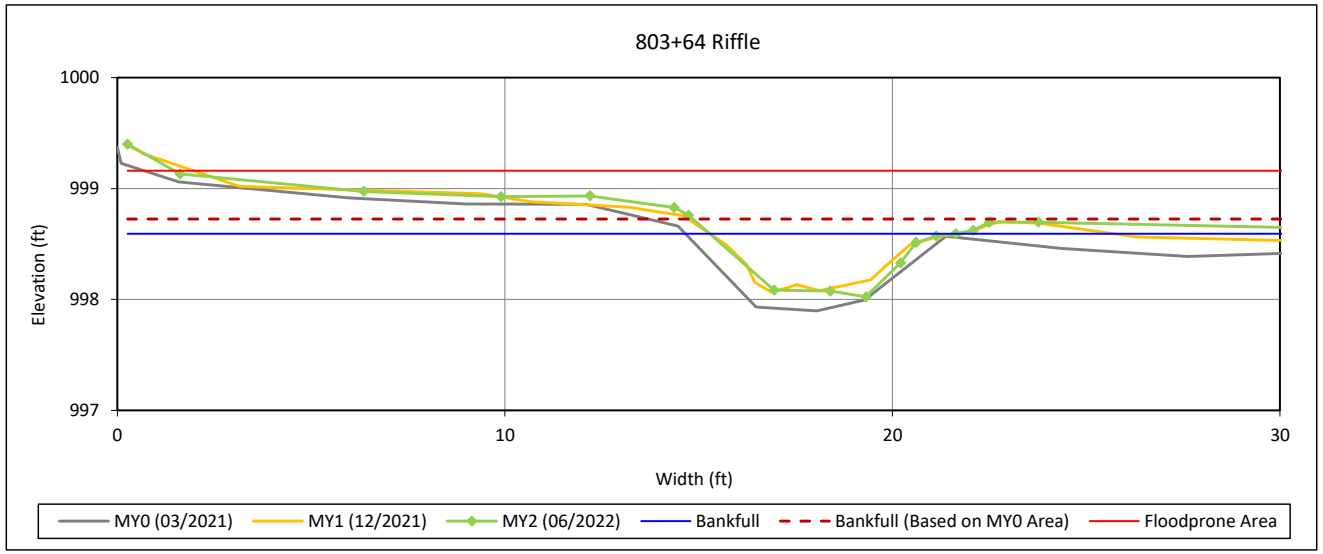
Survey Date: 06/2022
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

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

Cross-Section 11-UT6 R2



Bankfull Dimensions	
2.1	x-section area (ft.sq.)
6.3	width (ft)
0.3	mean depth (ft)
0.6	max depth (ft)
6.5	wetted perimeter (ft)
0.3	hydraulic radius (ft)
18.9	width-depth ratio
34.5	W flood prone area (ft)
5.4	entrenchment ratio
0.8	low bank height ratio

Survey Date: 06/2022
Field Crew: Wildlands Engineering

View Downstream

APPENDIX D. Hydrology Data

Table 10. Bankfull Events

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

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

Table 11. Rainfall Summary

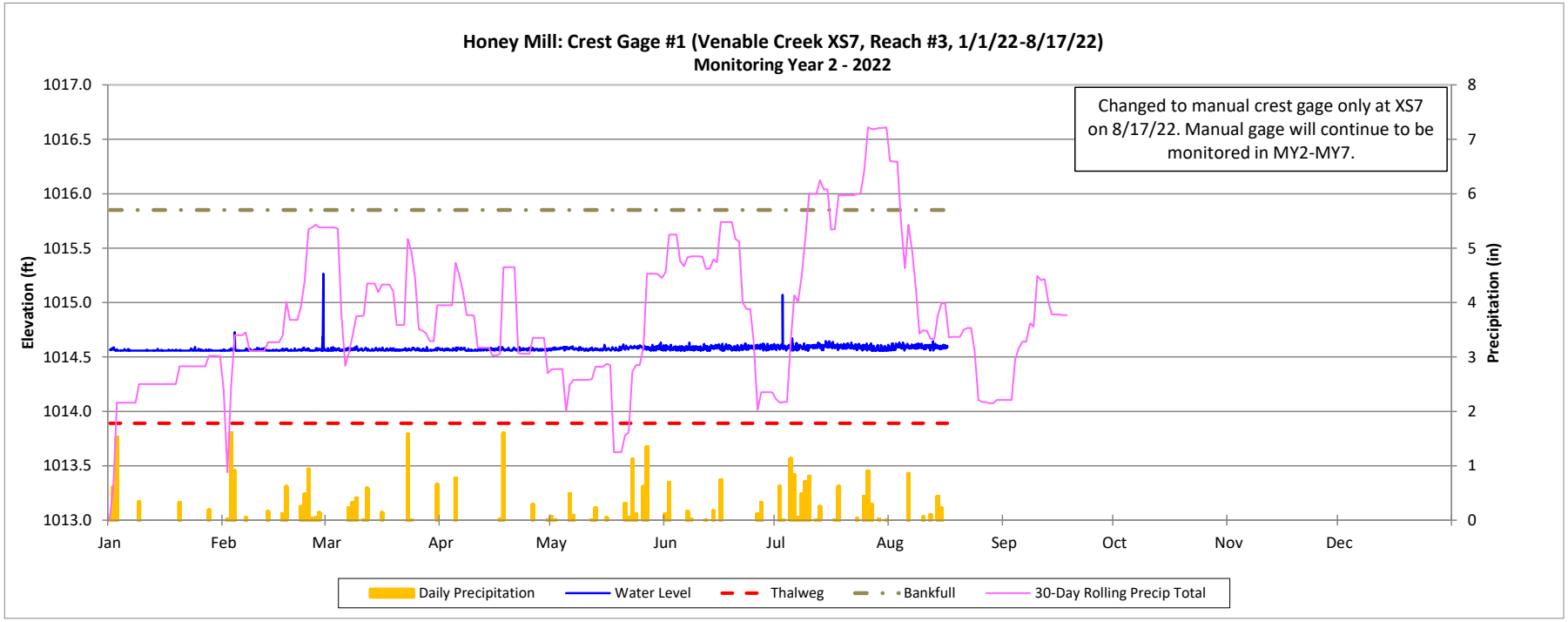
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 2 - 2022

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

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

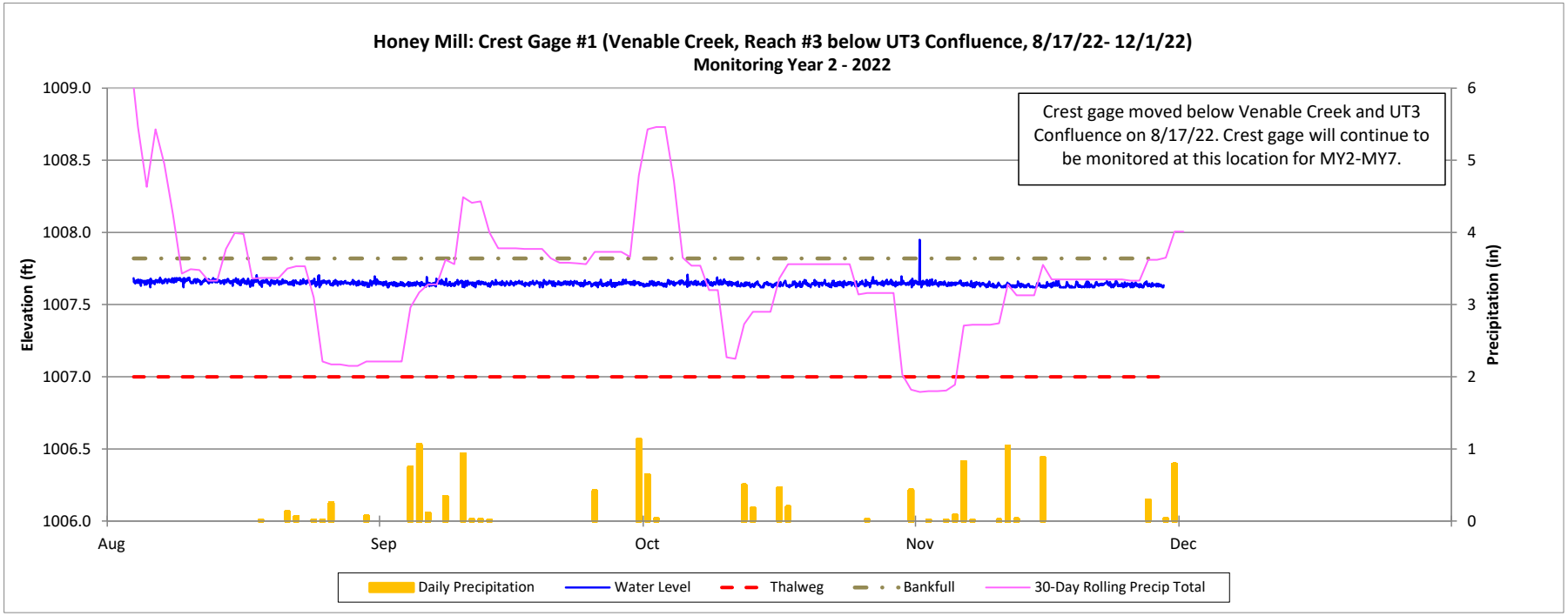
[1] Type of year refers to amount of rainfall in the current year compared to the average percentiles i.e. Below Average, Average, Above Average.

Recorded Bankfull Events Plot
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 2 - 2022



Recorded Bankfull Events Plot

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



APPENDIX E. Project Timeline and Contact Info

Table 12. Project Activity and Reporting History

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

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		
	Vegetation Survey		
	Remediation		
	Encroachment		
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 2 - 2022

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. Correspondence

MEETING NOTES

MEETING: MY1 Credit Release Site Walk
HONEY MILL Mitigation Site
Yadkin 03040101; Surry County, NC
DEQ Contract No. 7619
DMS Project No. 100083
Wildlands Project No. 005-02178

DATE: Tuesday, August 16, 2022

LOCATION: Little Mountain Church Road
Mt. Airy, NC

Attendees

Kim Browning, USACE
Erin Davis, NCDWR
Paul Wiesner, DMS
Kelly Phillips, DMS
Melonie Allen, DMS
Ella Wickliff, Wildlands
Sam Kirk, Wildlands
Aaron Earley, Wildlands

Meeting Notes

The meeting began at 8:30AM. Attendees discussed the site conditions and issues noted in the MY1 reports as summarized in the Opening Remarks section below. From there, the group walked the farm road to UT2 crossing, along Venable Creek to the restoration/enhancement transition, and then on to the UT3 confluence and UT1. The meeting concluded at 10:00 AM.

1) Opening Remarks

a) Erin asked that all in-stream vegetation treatment be called out in the MY reports.
b) Kim asked if all the replanted were in JD wetlands. Ella replied that a portion of the replanted areas were wetlands.
c) Kim asked if understory plantings are being monitored. Ella replied that mobile plots were moved to understory areas. Kim suggested that periodic transects be done as well.
d) Regarding CG1, which hasn't recorded a bankfull event: Erin remarked that they normally see them installed in pools and asked how often readings were taken. Ella responded every 3 hours. Ella said that a manual gage was added to XS7 near CG1. Kim suggested that CG1 be moved to a different location in the same reach and leave the manual gage at the current location. The addition of a manual gage and relocation of crest gage should be noted in the MY2 report. The new crest gage location is noted in the attached figure.
e) Aaron said that the eastern landowner plan on returning cattle to his fields. The landowner knows that fencing must be repaired and installed prior to cattle returning. Aaron was meeting a fence crew after

the meeting to discuss repairs and installation. Paul asked that installation and repairs dates be included in the MY2 report.

f) Paul asked that full easement boundary inspection and documentation be included in the MY2 report.
g) When walking UT2, Erin noted that the aggradation noted in the MY1 report seems to have washed away and not be a problem any longer.
h) Kim asked if livestock were present on the other side of Siloam Road at the upstream end of UT1. Aaron replied affirmatively.
i) Paul and Aaron clarified that at the easement exception areas (farm road and UT2 culvert crossing), the easement was not revised. The exceptions were documented in the baseline report.
j) Erin asked if the UT2 and UT3 confluence headcuts were stable and being monitored. Ella and Aaron replied that the headcuts have not moved and photo points were added at the confluences.
k) Ella asked for confirmation on mobile plot locations. Erin replied that they seem to be well distributed but to be sure to include invasive documentation in the monitoring report.
l) Kim asked that the downed tree inside the easement on UT2 shole be moved out of the easement.
m) Kim asked that vegetation be moved or cut back at photo points so the channel condition is obvious. She suggested that photo points at culvert crossings be taken upstream, downstream, and across the crossing. Ella replied that is how photos are typically taken at crossings and an additional photo point was added at the Ford Crossing. Photo points will be updated in the MY2 report.
n) Kim requested that photo points be added at BMPs. The attached figure shows the additional BMP photo points.
o) Kim asked that an eye be kept on the spring seep in the right floodplain of Venable Creek.
p) Erin suggested that matting and live stakes be added to the Venable Creek meander bend just upstream of UT3 confluence.
q) On UT2, Kim suggested that a transect be added upstream of the culvert crossing in the wooded area to monitoring understory planting. She said that understory planting will not be held to density or height requirements. Erin added that they are open to understory planting suggestions on materials/methods that produce the best results. The monitoring results will be evaluated to assess the viability and monitoring approach for future understory planting plans. The transect locations are shown in the attached figure.
r) Paul asked that the minutes of this meeting be included as an appendix to the MY2 report.
s) Kim confirmed that credits can be released as proposed.

These meeting minutes were prepared by Aaron Earley August 25, 2022. and represent the authors' interpretation of events.

Conservation Easement
Project Parcels
Existing Wetlands
Internal Crossing

Vegetation Plots - Permanent (MY1)
Meets Criteria
Did Not Meet Criteria

Vegetation Plots - Mobile
MY1
MY2 (proposed)

Vegetation Areas of Concern
Multiflora Rose, Barrberry, Privet
Privet
MY1 Supplemental Planting

Easement Encroachment
10 ft. Farm Path Encroachment
Pipe

Stream Restoration
Stream Enhancement I
Stream Enhancement II
No Credit
Alignment Deviation
Bankfull
Non-Project Streams
Fence Line
Overhead Utility
Cross Sections
Manual Crest Gage at XS7
Automatic Crest Gage moved in MY2
Barotroll
Photo Points
Reach Breaks

Additional Features from IRT site walk
Woody Stem Supplemental Planting Vegetation Transects
MY2 BMP and Ford Crossing Photos
Manual Crest Gage at XS7
Automatic Crest Gage moved in MY2

Reach 1
Reach 2
Reach 3
Reach 4
MP1
MP2
MP3
MP4
MP5
UT1
UT2
UT2A
UT2B
UT3
UT4
UT5
UT6
Venable Creek
Crossing Encroachment
10 ft. Farm Path Encroachment
1
2
3
4
5
6
7
8
9
2018 Aerial Photography

WILDLANDS ENGINEERING

0 250 500 Feet

Figure MY1 Credit Release Site Walk Meeting Notes
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021
Surry County, NC

To: DMS Technical Workgroup, DMS operations staff

From: Periann Russell, Division of Mitigation Services (DMS)

RE: Pebble count data requirements

Date: October 19, 2021

The DMS Technical Work Group met September 29, 2021 to discuss Interagency Review Team (IRT) and DMS requirements for collecting pebble count data as part of monitoring (MY0-MYx). Agreement was reached between all attending parties that pebble count data will not be required during the monitoring period for all future projects.

Sediment data and particle distribution will still be required for the mitigation plan as part of the proposed design explanation and justification.

Pebble counts and/or particle distributions currently being conducted by providers for annual monitoring may be discontinued at the discretion of the DMS project manager. If particle distribution was listed as a performance standard in the project mitigation plan, the provider is required to communicate the intent to cease data collection with the DMS project manager. The absence of pebble count data in future monitoring reports where pebble count data was listed as part of monitoring in the mitigation plan must be documented in the monitoring report. The September 29, 2021 Technical Work Group meeting may be cited as the source of the new policy.

The IRT reserves the right to request pebble count data/particle distributions if deemed necessary during the monitoring period.

Jeff Turner

From: Kristi Suggs
Sent: Tuesday, November 23, 2021 1:08 PM
To: Jeff Turner
Subject: FW: [External] FW: Pebble Count Data Requirements

Please see below.

Kristi Suggs | *Senior Environmental Scientist*
O: 704.332.7754 x110 **M**: 704.579.4828

Wildlands Engineering, Inc.
1430 S. Mint St, Suite 104
Charlotte, NC 28203

From: Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>
Sent: Thursday, November 18, 2021 3:56 PM
To: Kristi Suggs <ksuggs@wildlandseng.com>
Cc: Mimi Caddell <mcaddell@wildlandseng.com>
Subject: RE: [External] FW: Pebble Count Data Requirements

Kristi,

You may implement the new pebble count policy on any of the projects that I manage in accordance with the policy and your own professional judgement. Please feel free to utilize pebble count data for any site that you determine would benefit from the analysis. Some sites may have specific performance criteria or other factors where pebble counts could be required.

Let me know if you have any questions,

Kelly Phillips
Project Manager
NCDEQ Division of Mitigation Services

919-723-7565
kelly.phillips@ncdenr.gov

610 East Center Avenue
Suite 301
Mooresville, NC 28115

From: Kristi Suggs <ksuggs@wildlandseng.com>
Sent: Wednesday, October 27, 2021 1:26 PM
To: Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>

Cc: Mimi Caddell <mcaddell@wildlandseng.com>
Subject: [External] FW: Pebble Count Data Requirements

Kelly,

Jason Lorch in our Raleigh Office forwarded this meeting memo to me. It says that conducting pebble counts for DMS monitoring (MY0 – MY7) projects is no longer needed as long as it has been okayed by the DMS PM. Moving forward, are you going to allow us to stop doing them on your projects? Please let me know. Thank you!

Kristi

Kristi Suggs | *Senior Environmental Scientist*
O: 704.332.7754 x110 **M**: 704.579.4828

Wildlands Engineering, Inc.
1430 S. Mint St, Suite 104
Charlotte, NC 28203

From: Jason Lorch <jlorch@wildlandseng.com>
Sent: Monday, October 25, 2021 9:05 AM
To: Kristi Suggs <ksuggs@wildlandseng.com>
Subject: FW: Pebble Count Data Requirements

FYI!

Jason Lorch, GISP | *Senior Environmental Scientist*
O: 919.851.9986 x107 **M**: 919.413.1214

Wildlands Engineering, Inc.
312 West Millbrook Road, Suite 225
Raleigh, NC 27609

From: Russell, Periann <periann.russell@ncdenr.gov>
Sent: Thursday, October 21, 2021 10:05 AM
To: King, Scott <Scott.King@mbakerintl.com>; Catherine Manner <catherine@waterlandsolutions.com>; Tugwell, Todd J CIV USARMY CESAW (US) <Todd.J.Tugwell@usace.army.mil>; adam.spiller@kci.com; Brad Breslow <bbreslow@res.us>; Davis, Erin B <erin.davis@ncdenr.gov>; gginn@wolfcreekeng.com; grant lewis <glewis@axiomenvironmental.org>; Jeff Keaton <jkeaton@wildlandseng.com>; katie mckeithan <Katie.McKeithan@mbakerintl.com>; Kayne Van Stell <kayne@waterlandsolutions.com>; Kevin Tweedy <ktweedy@eprusa.net>; Reid, Matthew <matthew.reid@ncdenr.gov>; Ryan Smith <rsmith@lmgroup.net>; Melia, Gregory <gregory.melia@ncdenr.gov>; Allen, Melonie <melonie.allen@ncdenr.gov>; Famularo, Joseph T <Joseph.Famularo@ncdenr.gov>; Rich@mogmit.com; Bryan Dick <Bryan.Dick@freese.com>; Ryan Medric <rmedric@res.us>; Kim Browning <Kimberly.D.Browning@usace.army.mil>; Kayne Van Stell <kayne@waterlandsolutions.com>; Worth Creech <worth@restorationsystems.com>; Jason Lorch <jlorch@wildlandseng.com>
Cc: Crocker, Lindsay <Lindsay.Crocker@ncdenr.gov>; Wiesner, Paul <paul.wiesner@ncdenr.gov>; Tsomides, Harry <harry.tsomides@ncdenr.gov>; Reid, Matthew <matthew.reid@ncdenr.gov>; Dow, Jeremiah J <jeremiah.dow@ncdenr.gov>; Horton, Jeffrey <jeffrey.horton@ncdenr.gov>; Ullman, Kirsten J

<Kirsten.Ullman@NCDENR.gov>; Ackerman, Anjie <anjie.ackerman@ncdenr.gov>; Blackwell, Jamie D <james.blackwell@ncdenr.gov>; Xu, Lin <lin.xu@ncdenr.gov>; Mir, Danielle <Danielle.Mir@ncdenr.gov>; Corson, Kristie <kristie.corson@ncdenr.gov>; Russell, Periann <periann.russell@ncdenr.gov>; Sparks, Kimberly L <Kim.sparks@ncdenr.gov>
Subject: Pebble Count Data Requirements

Please review the attached memo documenting the agreed upon policy for pebble count data requirements.
Please reply (me only) to this email if accept that this memo represents (or misrepresents) our discussion on Sept 29.
Thank you.

Periann Russell
Geomorphologist
Division of Mitigation Services, Science and Analysis
NC Department of Environmental Quality

919 707 8306 office
919 208 1426 mobile
periann.russell@ncdenr.gov

Mailing: 1652 Mail Service Center Raleigh, NC 27699-1652
Physical: 217 West Jones Street Raleigh, NC 27603

APPENDIX G. 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