



**MONITORING YEAR 3
ANNUAL REPORT
Final**

December 2022

DRY CREEK MITIGATION SITE

Durham County, NC
Neuse River Basin
HUC 03020201010050

DMS Project No. 97082
NCDEQ Contract No. 6827
USACE Action ID No. SAW-2016-00880
DWR Project No. 2016-0369

Data Collection Dates: January - October 2022

PREPARED FOR:



**NC Department of Environmental Quality
Division of Mitigation Services**

1652 Mail Service Center
Raleigh, NC 27699-1652



December 7, 2022

Lindsay Crocker

NC Department of Environmental Quality, Division of Mitigation Services
217 W. Jones Street, Suite 3000
Raleigh, NC 27609-1652

Subject: DMS Comments
Dry Creek MY3, Project ID #97082, DMS Contract #6827

Dear Ms. Crocker,

We have reviewed the comments on the MY3 draft report for the above referenced project dated November 21, 2022 and have revised the report based on these comments. The revised documents are submitted with this letter. Below are responses to each of your comments. For your convenience, the comments are reprinted with our response in italics.

Report Comments:

1. Reminder that IRT (Browning) requested additional transect vegetation monitoring in MY4 for the replanted areas. The buffer portion of the project will also require monitoring regardless.

Response: Wildlands will conduct additional transect vegetation monitoring in MY4 for the replanted areas and annual vegetation monitoring in the buffer portion of the project.

2. Please update cross-section graphs with more clear versions if possible (this may be issue with DMS tool output and if so-ok).

Response: Cross-section graphs display blurry when report pdfs are reduced. To view clearer versions, refer to the non-reduced report pdf.

3. The vegetative narrative requests that five non-planted species be counted toward success, which is outside the typical IRT success criteria for vegetation. It should be noted that of these five, tulip poplar is on the original planting plan, and that red cedar is on the replanting list. Additionally, DMS recommends that Wildlands also request all the planted species on the 2.3-acre replanting list be added to the list of planted species counting for success. This decision should be made by IRT review and documented at credit release meeting for MY4 monitoring.

Response: The species list for the supplemental planting was approved by the IRT prior to planting. It is Wildlands understanding that these would automatically be added to the list of species counted towards success. Appendix F of the stream report documents the IRT's approval of these species for planting.



Buffer Report Comments:

1. 1. Section 1.3 Remove success wording for planted stems only. The riparian buffer rule states that “Native hardwood and native shrub volunteer species may be included to meet the final performance standard of 260 stems per acre.” Additionally, there is no requirement in the Riparian buffer rule that the volunteer vegetation must come from the planted list (like IRT rules). Please revise accordingly.

Response: Wildlands has revised the language used in the Buffer Report to properly align with the riparian buffer rule.

2. Section 1.3.1, second paragraph, update language to include all stems (desirable), and remove references to planted list species. The species selected do not have to be proposed, they should be considered desirable.

Response: Wildlands has revised the language in section 1.3.1 and 1.4.

If you have any questions, please contact me by phone (919) 851-9986, or by email (jlorch@wildlandseng.com).

Sincerely,

A handwritten signature in black ink, appearing to read "Jason Lorch", written over a white rectangular background.

Jason Lorch, *Monitoring Coordinator*

PREPARED BY:



312 West Millbrook Road, Suite 225
Raleigh, NC 27609

Jason Lorch
jlorch@wildlandseng.com
Phone: 919.851.9986

DRY CREEK MITIGATION SITE
Monitoring Year 3 Annual Report

TABLE OF CONTENTS

Section 1: PROJECT OVERVIEW1-1

 1.1 Project Quantities and Credits 1-1

 1.2 Project Goals and Objectives 1-2

 1.3 Project Attributes..... 1-4

Section 2: Monitoring Year 3 Data Assessment2-1

 2.1 Vegetative Assessment 2-1

 2.2 Vegetation Areas of Concern and Management 2-1

 2.3 Stream Assessment..... 2-1

 2.4 Stream Areas of Concern and Management..... 2-1

 2.5 Hydrology Assessment 2-2

 2.6 Wetland Assessment..... 2-2

 2.7 Monitoring Year 3 Summary 2-2

Section 3: REFERENCES.....3-1

TABLES

Table 1: Project Quantities and Credits..... 1-1

Table 2: Goals, Performance Criteria, and Functional Improvements 1-3

Table 3: Project Attributes 1-5

FIGURES

Figure 1a-b Current Condition Plan View

APPENDICES

Appendix A	Visual Assessment Data
Table 4	Visual Stream Morphology Stability Assessment Table
Table 5	Vegetation Condition Assessment Table
	Stream Photographs
	Stream Area of Concern Photographs
	Stream Crossing Photographs
	Vegetation Plot Photographs
Appendix B	Vegetation Plot Data
Table 6	Vegetation Plot Data
Table 7	Vegetation Performance Standards Summary Table
Appendix C	Stream Geomorphology Data
	Cross-Section Plots
Table 8	Baseline Stream Data Summary
Table 9	Cross-Section Morphology Monitoring Summary
Appendix D	Hydrology Data
Table 10	Bankfull Events
Table 11	Rainfall Summary
Table 12	Recorded In-Stream Flow Events Summary

Table 13	Recorded In-Stream Flow Events Plots Wetland Gauge Summary Groundwater Gauge Plots
Appendix E	Project Timeline and Contact Info
Table 14	Project Activity and Reporting History
Table 15	Project Contact Table
Appendix F	Additional Documentation
	MY2 IRT Site Visit
	Dry Creek MY3 Supplemental Planting
Table 1	Supplemental Planting



Section 1: PROJECT OVERVIEW

The Dry Creek Mitigation Site (Site) is located in Durham County, approximately 3 miles northwest of Butner, NC and approximately 2 miles west of the Granville County/Durham County line. Table 3 presents information related to the project attributes.

1.1 Project Quantities and Credits

The Site is located on 9 parcels under 6 different landowners and a conservation easement was recorded on 29.764 acres. Mitigation work within the Site included restoration, enhancement I, enhancement II, and preservation of perennial and intermittent stream channels. Table 1 below shows stream credits by reach and the total amount of stream credits expected at closeout.

Table 1: Project Quantities and Credits

PROJECT MITIGATION QUANTITIES							
Project Segment	Mitigation Plan Footage	As-Built Footage	Mitigation Category	Restoration Level	Mitigation Ratio (X:1)	Credits	Comments
Stream							
Dry Creek Reach 1	1,278	1,247	Warm	R	1.0	1,278.000	Pond Removal, Full Channel Restoration, Planted Buffer, Fencing Out Livestock
Dry Creek Reach 2	81	84	Warm	R	1.0	81.000	Full Channel Restoration, Planted Buffer, Fencing Out Livestock
	44	43	Warm	N/A	N/A	N/A	Internal Easement Culvert Crossing
	1,681	1,656	Warm	R	1.0	1,681.000	Full Channel Restoration, Planted Buffer, Fencing out Livestock
	60	60	Warm	N/A	N/A	N/A	Bridge Crossing, Easement Break
	85	75	Warm	R	1.0	85.000	Full Channel Restoration, Planted Buffer, Fencing out Livestock
Dry Creek Reach 3	1,603	1,583	Warm	R	1.0	1,603.000	Full Channel Restoration, Invasive Removal
Dry Creek Reach 4	241	243	Warm	R	1.0	241.000	Full Channel Restoration, Invasive Removal
	85	85	Warm	N/A	N/A	N/A	Culvert Crossing, Easement Break
	813	807	Warm	R	1.0	813.000	Full Channel Restoration, Invasive Removal
UT1 Reach 1	216	215	Warm	EII	2.5	86.400	Bank Repairs, Fencing Out Livestock, Planted Buffer
	35	36	Warm	N/A	N/A	N/A	Utility Crossing
	205	202	Warm	EII	2.5	82.000	Bank Repairs, Fencing Out Livestock, Planted Buffer



UTI Reach 2	631	627	Warm	R	1.0	631.000	Pond Removal, Full Channel Restoration, Planted Buffer, Fencing Out Livestock
	52	53	Warm	N/A	N/A	N/A	Culvert Crossing, Utility Relocation, Easement Break
	436	426	Warm	R	1.0	436.00	Full Channel Restoration, Planted Buffer, Fencing Out Livestock
UT1A	166	165	Warm	EI	1.5	110.667	Grade Control Structures, Fencing
UT2	151	135	Warm	EII	2.5	60.400	Bank Repairs, Fencing Out Livestock
UT3	156	160	Warm	EII	2.5	62.400	Bank Repairs, Fencing Out Livestock
UT4	115	114	Warm	P	10.0	11.500	Conservation Easement
UT5 Reach 1	298	285	Warm	EI	1.5	198.667	Grade Control Structures, Invasive Removal, Planted Buffer
	80	79	Warm	N/A	N/A	N/A	Culvert Crossing, Easement Break
UT5 Reach 2 ¹	119	112	Warm	R	1.0	104.000	Full Channel Restoration
UT6 Reach 1	617	612	Warm	R	1.0	617.000	Full Channel Restoration, Invasive Removal
UT6 Reach 2	209	209	Warm	P	10.0	20.900	Conservation Easement
UT6 Reach 3	89	89	Warm	R	1.0	89.000	Full Channel Restoration, Invasive Removal
UT7	415	408	Warm	EII	2.5	166.000	Bank Repairs

1. No credit proposed for UT5 Reach 2 Station 705+61 to 705+76 due to easement width being less than 15 feet wide.

Restoration Level	Stream		
	Warm	Cool	Cold
Restoration	7,659.000		
Enhancement I	309.334		
Enhancement II	457.200		
Preservation	32.400		
Totals	8,457.934		
Total Stream Credit	8,457.934		

1.2 Project Goals and Objectives

The project is intended to provide numerous ecological benefits. Table 2 below describes expected outcomes to water quality and ecological processes and provides project goals and objectives.

Table 2: Goals, Performance Criteria, and Functional Improvements

Goal	Objective/ Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
Improve the stability of stream channels.	Construct stream channels that will maintain stable cross-sections, patterns, and profiles over time.	Reduce erosion and sediment inputs; maintain appropriate bed forms and sediment size distribution.	ER stays over 2.2 and BHR below 1.2 with visual assessments showing progression towards stability.	Cross-section monitoring and visual inspections.	No deviations from design.
Improve instream habitat.	Install habitat features such as cover logs, log sills, and bush toes into restored/enhanced streams. Add woody materials to channel beds. Construct pools of varying depth. Fence out livestock.	Support biological communities and processes. Provide aquatic habitats for diverse populations of aquatic organisms.	There is no required performance standard for this metric.	N/A	N/A
Reconnect channels with floodplains and riparian wetlands.	Reconstruct stream channels with appropriate bankfull dimensions and depth relative to existing floodplain.	Reduce shear stress on channel; hydrate adjacent wetland areas; filter pollutants out of overbank flows; provide surface storage of water on floodplain; increase groundwater recharge while reducing outflow of stormwater; support water quality and habitat goals.	Four bankfull events in separate years within monitoring period. 30 consecutive days of flow for intermittent channels.	Crest gauges and/or pressure transducers recording flow elevations.	Bankfull events recorded on Dry Creek R2 and R3, UT1 R2, UT5 R2 and UT6 R1. UT1A, UT2, and UT5 R1 exceeded 30 days of consecutive flow during MY2.
Exclude cattle from project streams.	Install fencing around project areas adjacent to cattle pastures or remove cattle from the Site.	Reduce and control sediment inputs. Reduce and manage nutrient inputs. Contribute to protection of or improvement to a Water Supply Waterbody.	There is no required performance standard for this metric.	N/A	N/A
Restore / improve riparian buffers.	Plant native tree species in riparian zones that are currently insufficient.	Provide a canopy to shade streams and reduce thermal loadings; stabilize stream banks and floodplain; support water quality and habitat goals.	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 7 feet at MY5 and 10 feet at MY7.	One hundred square meter vegetation plots are placed on 2% of the planted area of the Site and monitored annually.	9 of the 12 vegetation plots have a planted stem density greater than 320 stems per acre. Supplemental planting occurred on October 19, 2022.



Goal	Objective/ Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
Permanently protect the project Site from harmful uses.	Establish conservation easements on the Site.	Ensure that development and agricultural uses that would damage the Site or reduce the benefits of the project are prevented.	Prevent easement encroachment.	Visually inspect the perimeter of the Site to ensure no easement encroachment is occurring.	No easement encroachments.
Stabilize eroding stream banks.	Reconstruct stream channels slated for restoration with stable dimensions. Create stable tie-ins for tributaries joining restored channels. Add bank revetments and in-stream structures to reaches to protect restored/enhanced streams.	Reduce sediment inputs. Contribute to protection of or improvement to a Water Supply Waterbody.	There is no required performance standard for this metric.	N/A	N/A

1.3 Project Attributes

The Site includes Dry Creek and eight unnamed tributaries. Prior to construction, cattle grazed in rotations along UT1, UT1a, and Dry Creek to the UT3 confluence, leading to significant ecological impacts along these streams. In addition, there were two in-line ponds located along UT1 Reach 2 and Dry Creek Reach 2 that were removed during construction. The northern half of the watershed has been forested since the 1950s, and the southern half of the watershed has remained primarily in agricultural use since 1940. In general, the area surrounding the Site has maintained its rural, agricultural character over the past 78 years with minor changes in land cover. Table 3 below and Table 8 in Appendix C present additional information on pre-restoration conditions.

Table 3: Project Attributes

PROJECT INFORMATION						
Project Name	Dry Creek Mitigation Site	County	Durham County			
Project Area (acres)	29.764	Project Coordinates	36.110792, -78.793900			
PROJECT WATERSHED SUMMARY INFORMATION						
Physiographic Province	Piedmont	River Basin	Neuse River			
USGS HUC 8-digit	03020201	USGS HUC 14-digit	03020201010050			
DWR Sub-basin	03-04-01	Land Use Classification	50% Forested, 40% Cultivated, 9% Residential			
Project Drainage Area (acres)	807	Percentage of Impervious Area	<1%			
RESTORATION TRIBUTARY SUMMARY INFORMATION						
Parameters	Dry Creek	UT1	UT1A	UT5	UT6	
Pre-project length (feet)	6,643	1,401	90	506	849	
Post-project (feet)	5,883	1,559	165	477	910	
Valley confinement (Confined, moderately confined, unconfined)	Moderately Confined to Unconfined	Confined				
Drainage area (acres)	807	85	22	25.5	36	
Perennial, Intermittent, Ephemeral	Perennial		Intermittent		Perennial	
DWR Water Quality Classification	WS-III (NSW)					
Dominant Stream Classification (existing)	C4/G4/E4/F4	G4	E4	G4	E4	
Dominant Stream Classification (proposed)	C4	C4		C4b		
Dominant Evolutionary class (Simon) if applicable	Stage IV					
REGULATORY CONSIDERATIONS						
Parameters	Applicable?	Resolved?	Supporting Documentation			
Water of the United States - Section 404	Yes	Yes	USACE Nationwide Permit No. 27 and DWQ 401 Water Quality Certification No. 4134.			
Water of the United States - Section 401	Yes	Yes				
Endangered Species Act	Yes	Yes	Categorical Exclusion in Mitigation Plan (Wildlands, 2019)			
Historic Preservation Act	Yes	Yes				
Coastal Zone Management Act (CZMA or CAMA)	N/A	N/A	N/A			
Essential Fisheries Habitat	N/A	N/A	N/A			



Section 2: Monitoring Year 3 Data Assessment

Annual monitoring and site visits were conducted during MY3 to assess the condition of the project. The vegetation and stream success criteria for the Site follow the approved success criteria presented in the Mitigation Plan (Wildlands, 2018). Performance criteria for vegetation, stream, and hydrologic assessment are located in Section 1.2 Table 2: Goals, Performance Criteria, and Functional Improvements. Methodology for annual monitoring is presented in the MY0 Annual Report (Wildlands, 2020).

2.1 Vegetative Assessment

The MY3 vegetative survey was completed in September 2022. Vegetation monitoring resulted in a stem density range of 243 to 607 stems per acre. Out of the 12 vegetation plots, nine are meeting the interim requirement of 320 stems per acre required at MY3. Fixed vegetation plots 5, 7, and 8 are not meeting the interim requirement required at MY3. However, they are on track to meet the final success criteria of 210 stems per acre. As seen through visual observations and vegetation plot data, many volunteers are establishing across the Site that were not in the approved Mitigation Plan planting list. Wildlands purposes to include mockernut hickory (*Carya tomentosa*), American holly (*Ilex opaca*), tulip poplar (*Liriodendron tulipifera*), black walnut (*Juglans nigra*), and eastern redcedar (*Juniperus virginiana*) as desirable species that should be counted toward the vegetation success criteria.

Herbaceous vegetation is abundant across the Site and includes native pollinator species indicating a healthy riparian habitat. The riparian habitat is helping to reduce nutrient runoff from the cattle fields outside the easement and stabilizing the stream banks. Refer to Appendix A for Vegetation Plot Photographs and the Vegetation Condition Assessment Table and Appendix B for Vegetation Plot Data.

2.2 Vegetation Areas of Concern and Management

After members of the IRT and Wildlands staff walked the Site on June 13, 2022, notable diversity and low stem density issues were discussed. The IRT recommend Wildlands complete several additional vegetation transects and replant accordingly. After further inspection, lack of species diversity was the greatest concern and not low stem density. With this in mind, Wildlands created and received approval from the IRT to supplementally plant on 2.3 acres across the Site. The supplemental planting occurred on October 19, 2022. Additional transects will be added to the supplemental planted area in MY4.

2.3 Stream Assessment

Morphological surveys for MY3 were conducted in May 2022. All streams within the Site are stable and functioning as designed. All 19 cross-sections at the Site show little to no change in the bankfull area and width-to-depth ratio, and bank height ratios are less than 1.2. Pebble count data is no longer required per the September 29, 2021 Technical Work Group Meeting and is not included in this report. The IRT reserves the right to request pebble count data/particle distributions if deemed necessary during the monitoring period. Refer to Appendix A for the Visual Stream Morphology Stability Assessment Table and Stream Photographs and Appendix C for Stream Geomorphology Data.

2.4 Stream Areas of Concern and Management

Localized bank erosion on the outside bend of a pool directly downstream of the culvert crossing along Dry Creek Reach 4, was identified during MY1. This area was repaired in March of MY2. After more than a year and several storm events, the repair is stable, and vegetation is establishing. See a timeline of before and after photos of the area in Appendix 2. This area will continue to be monitored to determine the success of the repair work.

Several small beaver dams were located along the upstream portion of Dry Creek before the confluence of UT1 during MY3. APHIS has removed the beaver and dams, but beavers are expected to return over the course of the seven-year monitoring period. Wildlands will continue to monitor the Site for beaver dams and remove them. No major stream bank damage has occurred from the beaver dams. Most vegetation removed by beavers has been resprouting.

2.5 Hydrology Assessment

Bankfull events were recorded on Dry Creek Reach 2 and 3 along with UT1 Reach 2, UT5 Reach 1, and UT6 Reach 1. All channels are on track to meet the hydrologic success criteria of four bankfull events in separate years.

In addition, the presence of baseflow must be documented on intermittent reaches (UT1A, UT2 and UT5 Reach 1) for a minimum of 30 consecutive days during a normal precipitation year. Intermittent reaches maintained baseflow from 114 to 290 consecutive days. Refer to Appendix D for hydrologic data.

2.6 Wetland Assessment

One groundwater gauge was installed and monitored within an existing wetland zone at a location requested by North Carolina Division of Water Resources. The purpose of the gauge is to assess potential effects to wetland hydrology from the construction of the restored stream channel through this area. The results of this monitoring are not tied to any success criterion. The measured hydroperiod was 5.7% of the growing season consecutively for MY3. Hydrology associated with the existing wetland currently being monitored was largely the result of the backwater effect of an impoundment on Dry Creek. By removing the impoundment during stream restoration activities, Wildlands anticipates an effect on hydrology and the associated gauge results. While the gauge results may indicate hydrological impairment, the overall ecological uplift associated with removal of the man-made impoundment outweighs the potential reduction in groundwater hydrology.

2.7 Monitoring Year 3 Summary

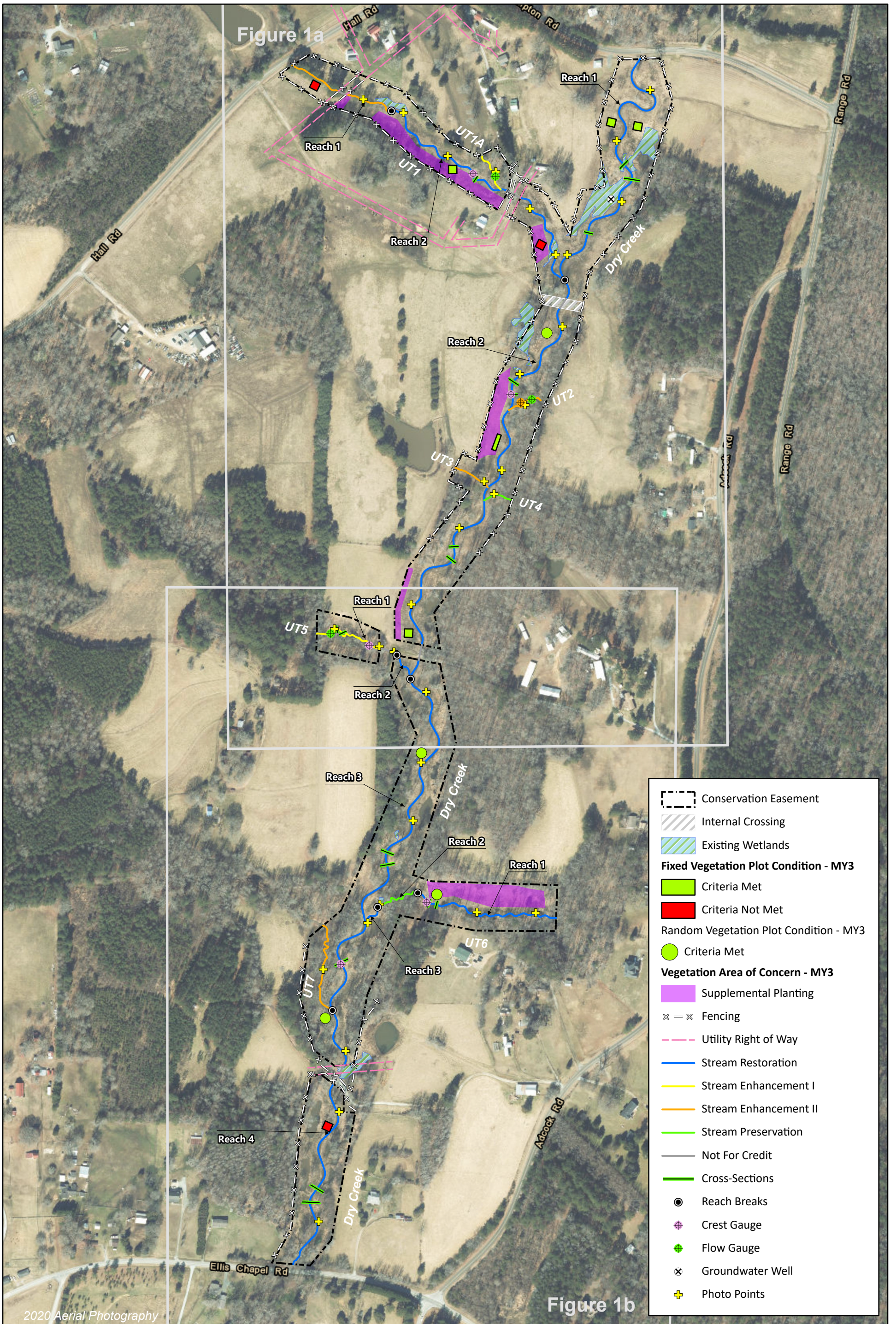
Of the 12 vegetation plots, nine are on track to meet the MY3 interim requirement of 320 planted stems per acre. Wildlands purposes to include several desirable volunteer species that should be counted toward the vegetation success criteria. A dense herbaceous layer including wetland and pollinator species has established across the Site. An approved supplemental planting occurred on October 19, 2022. All streams within the Site are stable and functioning as designed. The localized erosion identified in MY1 on Dry Creek Reach 4 was repaired and remains stable. Multiple bankfull events were documented on all stream reaches partially fulfilling the final bankfull hydrologic success requirement. Greater than 30 days of consecutive flow were recorded on monitored intermittent stream reaches UT1a, UT2, and UT5 Reach 1 fulfilling MY3 success requirement. Overall, the Site is meeting its goals of preventing excess nutrients and sediment from entering the Neuse River tributaries and is on track to meet final success criteria.

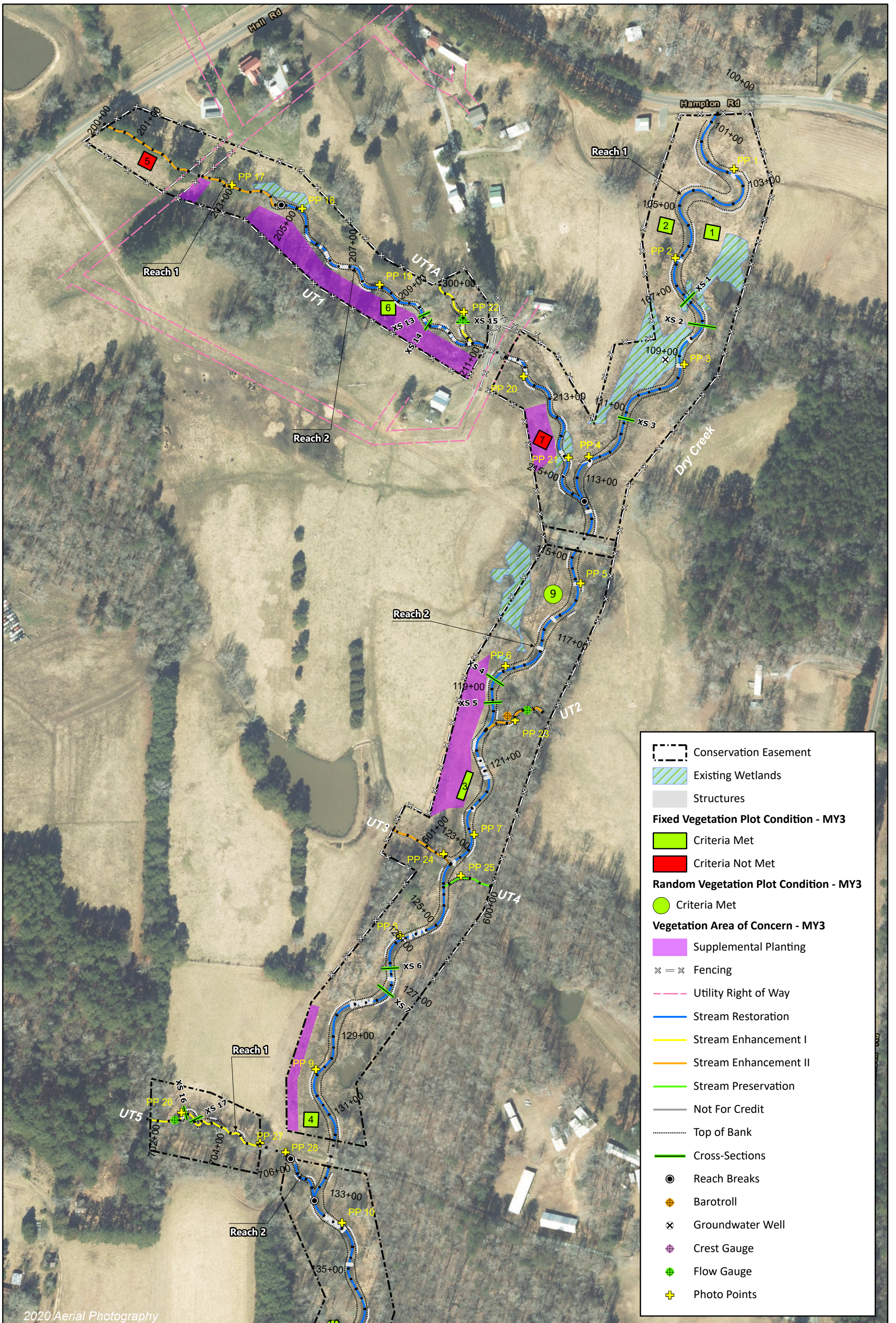
Summary information and data related to the performance of various project and monitoring elements can be found in the tables and figures in the report appendices. All raw data supporting the tables and figures in the appendices are available from DMS upon request.

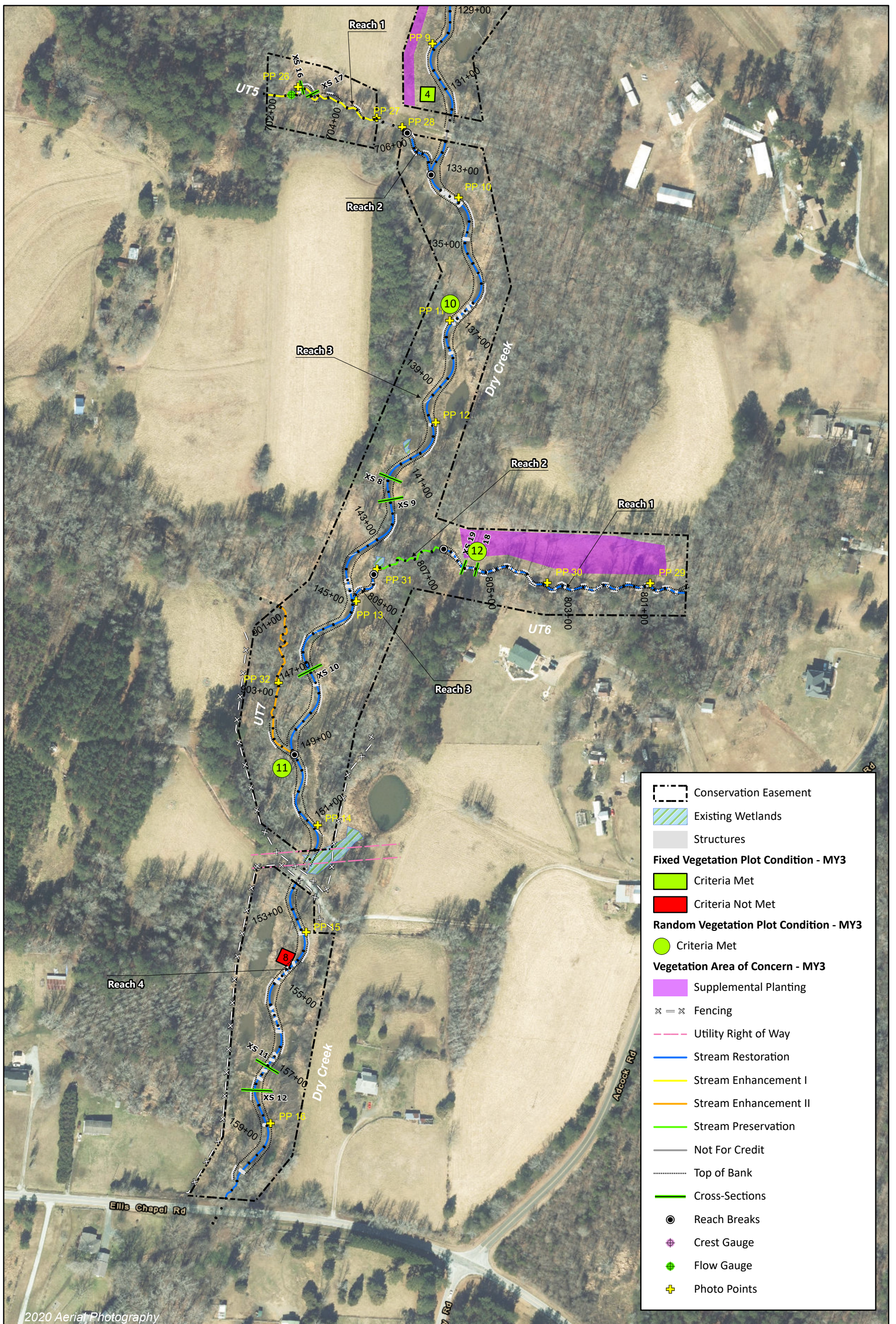


Section 3: REFERENCES

- Doll, B.A., Grabow, G.L., Hall, K.A., Halley, J., Harman, W.A., Jennings, G.D., and Wise, D.E. 2003. Stream Restoration A Natural Channel Design Handbook.
- Harrelson, C.C., Rawlins, C.L., Potyondy, J.P. 1994. *Stream Channel Reference Sites: An Illustrated Guide to Field Technique*. Gen. Tech. Rep. RM-245. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 61 p.
- Rosgen, D. L. 1994. A classification of natural rivers. *Catena* 22:169-199.
- North Carolina Interagency Review Team (NCIRT). 2016. Wilmington District Stream and Wetland Compensatory Mitigation Update.
- United States Army Corps of Engineers. 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.
- Wildlands Engineering, Inc. 2020. Dry Creek Mitigation Project Mitigation Plan. DMS, Raleigh, NC.
- Wildlands Engineering, Inc. 2021. Dry Creek Mitigation Project Monitoring Year 0 (MY0) Annual Report. DMS, Raleigh, NC







APPENDIX A. Visual Assessment Data

Table 4. Visual Stream Morphology Stability Assessment Table

Dry Creek Mitigation Site
 DMS Project No. 97082
 Monitoring Year 3 - 2022

Dry Creek Reach 1-4

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	5,883
					Assessed Bank Length	11,766
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.	12	12		100%
	Bank Protection	Bank erosion within the structures extent of influence does <u>not</u> exceed 15%.	36	36		100%

Visual assessment was completed October 18, 2022.

UT1 Reach 2

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	1,053
					Assessed Bank Length	2,106
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.	3	3		100%
	Bank Protection	Bank erosion within the structures extent of influence does <u>not</u> exceed 15%.	10	10		100%

Visual assessment was completed October 18, 2022.

Table 4. Visual Stream Morphology Stability Assessment Table

Dry Creek Mitigation Site
 DMS Project No. 97082
 Monitoring Year 3 - 2022

UT1A

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	165
					Assessed Bank Length	330
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.	0	0		N/A
	Bank Protection	Bank erosion within the structures extent of influence does <u>not</u> exceed 15%.	1	1		100%

Visual assessment was completed October 18, 2022.

UT5 Reach 1-2

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	397
					Assessed Bank Length	794
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.	0	0		N/A
	Bank Protection	Bank erosion within the structures extent of influence does <u>not</u> exceed 15%.	6	6		100%

Visual assessment was completed October 18, 2022.

Table 4. Visual Stream Morphology Stability Assessment Table

Dry Creek Mitigation Site
 DMS Project No. 97082
 Monitoring Year 3 - 2022

UT6 Reach 1 & 3

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	701
					Assessed Bank Length	1,402
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
Structure	Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	0	0		N/A
	Bank Protection	Bank erosion within the structures extent of influence does <u>not</u> exceed 15%.	17	17		100%

Visual assessment was completed October 18, 2022.

Table 5. Vegetation Condition Assessment Table

Dry Creek Mitigation Site
 DMS Project No. 97082
 Monitoring Year 3 - 2022

Planted Acreage 14.03

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	2.30*	16%
Total			2.30	16%
Areas of Poor Growth Rates	Planted areas where average height is not meeting current MY Performance Standard.	0.10	0	0%
Cumulative Total			2.30	16%

*An approved supplemental planting occurred on October 19, 2022 to increase species diversity. Visual assessment was completed October 18, 2022.

Easement Acreage 29.76

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	0%
Easement Encroachment Areas	Encroachment may be point, line, or polygon. Encroachment to be mapped consists of any violation of restrictions specified in the conservation easement. Common encroachments are mowing, cattle access, vehicular access. Encroachment has no threshold value as will need to be addressed regardless of impact area.	none	0 Encroachments Noted / 0 ac	

Visual assessment was completed October 18, 2022.

STREAM PHOTOGRAPHS



PHOTO POINT 1 Dry Creek R1 – upstream (3/10/2022)



PHOTO POINT 1 Dry Creek R1 – downstream (3/10/2022)



PHOTO POINT 2 Dry Creek R1 – upstream (3/10/2022)



PHOTO POINT 2 Dry Creek R1 – downstream (3/10/2022)



PHOTO POINT 3 Dry Creek R1 – upstream (3/10/2022)



PHOTO POINT 3 Dry Creek R1 – downstream (3/10/2022)





PHOTO POINT 4 Dry Creek R1 – upstream (3/10/2022)



PHOTO POINT 4 Dry Creek R1 – downstream (3/10/2022)



PHOTO POINT 5 Dry Creek R2 – upstream (3/10/2022)



PHOTO POINT 5 Dry Creek R2 – downstream (3/10/2022)



PHOTO POINT 6 Dry Creek R2 – upstream (3/10/2022)



PHOTO POINT 6 Dry Creek R2 – downstream (3/10/2022)





PHOTO POINT 7 Dry Creek R2 – upstream (3/10/2022)



PHOTO POINT 7 Dry Creek R2 – downstream (3/10/2022)



PHOTO POINT 8 Dry Creek R2 – upstream (3/10/2022)



PHOTO POINT 8 Dry Creek R2 – downstream (3/10/2022)



PHOTO POINT 9 Dry Creek R2 – upstream (3/10/2022)



PHOTO POINT 9 Dry Creek R2 – downstream (3/10/2022)





PHOTO POINT 10 Dry Creek R3 – upstream (3/10/2022)



PHOTO POINT 10 Dry Creek R3 – downstream (3/10/2022)



PHOTO POINT 11 Dry Creek R3 – upstream (3/10/2022)



PHOTO POINT 11 Dry Creek R3 – downstream (3/10/2022)



PHOTO POINT 12 Dry Creek R3 – upstream (3/10/2022)



PHOTO POINT 12 Dry Creek R3 – downstream (3/10/2022)





PHOTO POINT 13 Dry Creek R3 – upstream (3/10/2022)



PHOTO POINT 13 Dry Creek R3 – downstream (3/10/2022)



PHOTO POINT 14 Dry Creek R3 – upstream (3/10/2022)



PHOTO POINT 14 Dry Creek R3 – downstream (3/10/2022)



PHOTO POINT 15 Dry Creek R4 – upstream (3/10/2022)



PHOTO POINT 15 Dry Creek R4 – downstream (3/10/2022)





PHOTO POINT 16 Dry Creek R4 – upstream (3/10/2022)



PHOTO POINT 16 Dry Creek R4 – downstream (3/10/2022)



PHOTO POINT 17 UT1 R1 – upstream (3/10/2022)



PHOTO POINT 17 UT1 R1 – downstream (3/10/2022)



PHOTO POINT 18 UT1 R2 – upstream (3/10/2022)



PHOTO POINT 18 UT1 R2 – downstream (3/10/2022)





PHOTO POINT 19 UT1 R2 – upstream (3/10/2022)



PHOTO POINT 19 UT1 R2 – downstream (3/10/2022)



PHOTO POINT 20 UT1 R2 – upstream (3/10/2022)



PHOTO POINT 20 UT1 R2 – downstream (3/10/2022)



PHOTO POINT 21 UT1 R2 – upstream (3/10/2022)



PHOTO POINT 21 UT1 R2 – downstream (3/10/2022)





PHOTO POINT 22 UT1a – upstream (3/10/2022)



PHOTO POINT 22 UT1a – downstream (3/10/2022)



PHOTO POINT 23 UT2 – upstream (3/10/2022)



PHOTO POINT 23 UT2 – downstream (3/10/2022)



PHOTO POINT 24 UT3 – upstream (3/10/2022)



PHOTO POINT 24 UT3 – downstream (3/10/2022)





PHOTO POINT 25 UT4 – upstream (3/10/2022)



PHOTO POINT 25 UT4 – downstream (3/10/2022)



PHOTO POINT 26 UT5 R1 – upstream (3/10/2022)



PHOTO POINT 26 UT5 R1 – downstream (3/10/2022)



PHOTO POINT 27 UT5 R1 – upstream (3/10/2022)



PHOTO POINT 28 UT5 R2 – downstream (3/10/2022)





PHOTO POINT 29 UT6 R1 – upstream (3/10/2022)



PHOTO POINT 29 UT6 R1 – downstream (3/10/2022)



PHOTO POINT 30 UT6 R1 – upstream (3/10/2022)



PHOTO POINT 30 UT6 R1 – downstream (3/10/2022)



PHOTO POINT 31 UT6 R2 – upstream (3/10/2022)



PHOTO POINT 31 UT6 R2 – downstream (3/10/2022)





PHOTO POINT 32 UT7 – upstream (3/10/2022)



PHOTO POINT 32 UT7 – downstream (3/10/2022)



Stream Area of Concern Photographs
Dry Creek Reach 4



Before – Localized Erosion (11/4/2020)



Before – Localized Erosion (11/4/2020)



After – Repaired Localized Erosion (04/2/2021)



After – Repaired Localized Erosion (04/2/2021)



After – Repaired Localized Erosion (09/16/2021)



After – Repaired Localized Erosion (09/16/2021)



After – Repaired Localized Erosion (10/18/2022)



After – Repaired Localized Erosion (10/18/2022)

STREAM CROSSING PHOTOGRAPHS



Dry Creek Reach 2 – Looking Upstream (10/18/2022)



Dry Creek Reach 2 – Looking Downstream (10/18/2022)



Dry Creek Reach 2 – Looking Upstream (10/18/2022)



Dry Creek Reach 2 – Looking Downstream (10/18/2022)



Dry Creek Reach 4 – Looking Upstream (10/18/2022)



Dry Creek Reach 4 – Looking Downstream (10/18/2022)





UT1 Reach 1 – Looking Upstream (10/18/2022)



UT1 Reach 1 – Looking Downstream (10/18/2022)



UT1 Reach 2 – Looking Upstream (10/18/2022)



UT1 Reach 2 – Looking Downstream (10/18/2022)



UT5 – Looking Upstream (10/18/2022)



UT5 – Looking Downstream (10/18/2022)



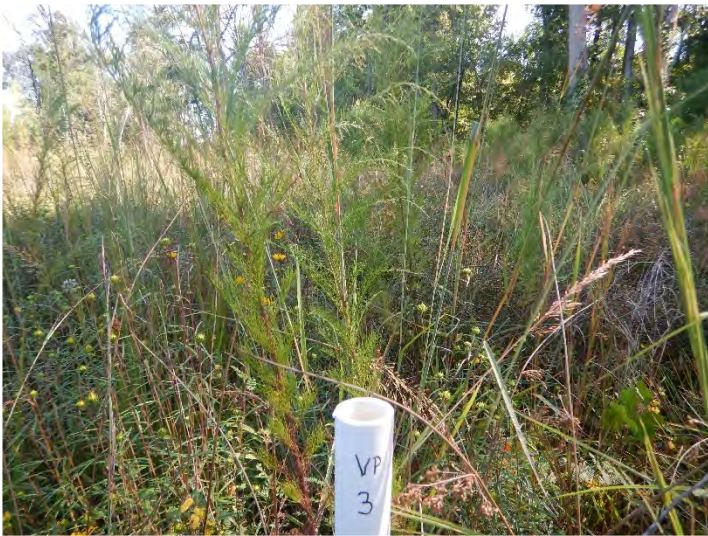
VEGETATION PLOT PHOTOGRAPHS



FIXED VEG PLOT 1 (9/14/2022)



FIXED VEG PLOT 2 (9/14/2022)



FIXED VEG PLOT 3 (9/14/2022)



FIXED VEG PLOT 4 (9/14/2022)



FIXED VEG PLOT 5 (9/14/2022)



FIXED VEG PLOT 6 (9/14/2022)





FIXED VEG PLOT 7 (9/14/2022)



FIXED VEG PLOT 8 (9/14/2022)



RANDOM VEG PLOT 9 (9/14/2022)



RANDOM VEG PLOT 10 (9/14/2022)



RANDOM VEG PLOT 11 (9/14/2022)



RANDOM VEG PLOT 12 (9/14/2022)



APPENDIX B. Vegetation Plot Data

Table 6. Vegetation Plot Data

Dry Creek Mitigation Site

DMS Project No. 97082

Monitoring Year 3 - 2022

Planted Acreage	14.04
Date of Initial Plant	2020-04-24
Date of Current Survey	2022-09-14
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	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW	6	6	2	2					3	3
	Fraxinus pennsylvanica	green ash	Tree	FACW					3	3	1	1	1	1
	Platanus occidentalis	American sycamore	Tree	FACW	1	4	5	5	5	9	2	3		
	Populus deltoides	eastern cottonwood	Tree	FAC	2	2								
	Quercus lyrata	overcup oak	Tree	OBL									2	2
	Quercus michauxii	swamp chestnut oak	Tree	FACW					2	2	5	5		
	Quercus nigra	water oak	Tree	FAC										
	Quercus pagoda	cherrybark oak	Tree	FACW			1	1						
Quercus phellos	willow oak	Tree	FAC											
Salix nigra	black willow	Tree	OBL		3						2			
Sum	Performance Standard				9	15	8	8	10	14	8	11	6	6
Post Mitigation Plan Species	Carya tomentosa	mockernut hickory	Tree											
	Ilex opaca	American holly	Tree	FACU										
	Juniperus virginiana	eastern redcedar	Tree	FACU										
	<i>Liquidambar styraciflua</i>	<i>sweetgum</i>	<i>Tree</i>	<i>FAC</i>								1		
Sum	Proposed Standard				9	15	8	8	10	14	8	11	6	6
Mitigation Plan Performance Standard	Current Year Stem Count					15		8		14		11		6
	Stems/Acre					607		324		567		445		243
	Species Count					4		3		3		4		3
	Dominant Species Composition (%)					40		56		64		42		50
	Average Plot Height (ft.)					6		4		3		4		3
	% Invasives					0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					15		8		14		11		6
	Stems/Acre					607		324		567		445		243
	Species Count					4		3		3		4		3
	Dominant Species Composition (%)					40		56		64		42		50
	Average Plot Height (ft.)					6		4		3		4		3
	% Invasives					0		0		0		0		0

Table 6. Vegetation Plot Data

Dry Creek Mitigation Site

DMS Project No. 97082

Monitoring Year 3 - 2022

Planted Acreage	14.04
Date of Initial Plant	2020-04-24
Date of Current Survey	2022-09-14
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree /Shrub	Indicator Status	Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F		Veg Plot 9 R	Veg Plot 10 R	Veg Plot 11 R	Veg Plot 12 R
					Planted	Total	Planted	Total	Planted	Total	Total	Total	Total	Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW	2	2		2			3	2	4	
	Fraxinus pennsylvanica	green ash	Tree	FACW	1	1			1	1	3		3	1
	Platanus occidentalis	American sycamore	Tree	FACW	2	5	3	3	4	5	5	9	1	7
	Populus deltoides	eastern cottonwood	Tree	FAC	1	1								
	Quercus lyrata	overcup oak	Tree	OBL									1	
	Quercus michauxii	swamp chestnut oak	Tree	FACW			2	2					1	
	Quercus nigra	water oak	Tree	FAC							1			
	Quercus pagoda	cherrybark oak	Tree	FACW									1	
Quercus phellos	willow oak	Tree	FAC									1		
Salix nigra	black willow	Tree	OBL											
Sum	Performance Standard				6	9	5	7	5	6	12	11	12	8
Post Mitigation Plan Species	Carya tomentosa	mockernut hickory	Tree											1
	Ilex opaca	American holly	Tree	FACU									1	
	Juniperus virginiana	eastern redcedar	Tree	FACU							2			
	<i>Liquidambar styraciflua</i>	<i>sweetgum</i>	<i>Tree</i>	<i>FAC</i>								1		
	<i>Pinus taeda</i>	<i>loblolly pine</i>	<i>Tree</i>	<i>FAC</i>										
Sum	Proposed Standard				6	9	5	7	5	6	14	11	13	9
Mitigation Plan Performance Standard	Current Year Stem Count					9		7		6	12	11	12	8
	Stems/Acre					364		283		243	486	445	486	324
	Species Count					4		3		2	4	2	7	2
	Dominant Species Composition (%)					56		43		83	42	75	33	88
	Average Plot Height (ft.)					6		4		6	4	3	2	4
	% Invasives					0		0		0	0	0	0	0
Post Mitigation Plan Performance Standard	Current Year Stem Count					9		7		6	14	11	13	9
	Stems/Acre					364		283		243	567	445	526	364
	Species Count					4		3		2	5	2	8	3
	Dominant Species Composition (%)					56		43		83	42	75	33	88
	Average Plot Height (ft.)					6		4		6	4	3	2	4
	% Invasives					0		0		0	0	0	0	0

Table 7. Vegetation Performance Standards Summary Table

Dry Creek Mitigation Site

DMS Project No. 97082

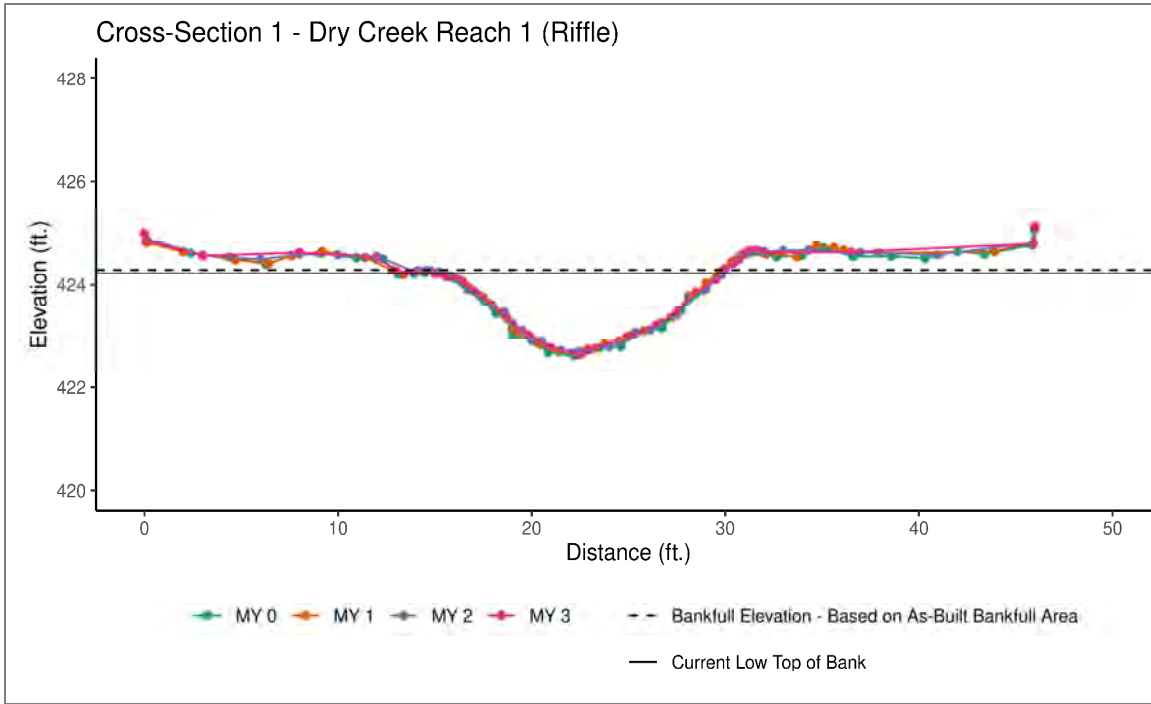
Monitoring Year 3 - 2022

	Veg Plot 1 F				Veg Plot 2 F				Veg Plot 3 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3	607	6	4	0	324	4	3	0	567	3	3	0
Monitoring Year 2	364	3	3	0	405	3	4	0	405	2	3	0
Monitoring Year 1	486	2	5	0	486	2	4	0	607	2	5	0
Monitoring Year 0	526	2	5	0	486	3	4	0	648	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	445	4	4	0	243	3	3	0	364	6	4	0
Monitoring Year 2	405	3	5	0	243	2	3	0	202	4	3	0
Monitoring Year 1	445	3	6	0	364	2	5	0	283	2	4	0
Monitoring Year 0	567	3	7	0	486	2	6	0	486	2	5	0
	Veg Plot 7 F				Veg Plot 8 F				Veg Plot Group 9 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	283	4	3	0	243	6	2	0	486	4	4	0
Monitoring Year 2	243	4	3	0	283	3	4	0	445	2	6	0
Monitoring Year 1	364	3	5	0	526	2	6	0	445	2	5	0
Monitoring Year 0	486	2	6	0	567	2	6	0	607	2	5	0
	Veg Plot Group 10 R				Veg Plot Group 11 R				Veg Plot Group 12 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	445	3	2	0	486	2	7	0	324	4	2	0
Monitoring Year 2	364	2	4	0	405	2	3	0	364	2	2	0
Monitoring Year 1	324	2	4	0	526	2	4	0	405	2	5	0
Monitoring Year 0	405	2	6	0	486	2	6	0	567	2	6	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.

APPENDIX C. Stream Geomorphology Data

Cross-Section Plots

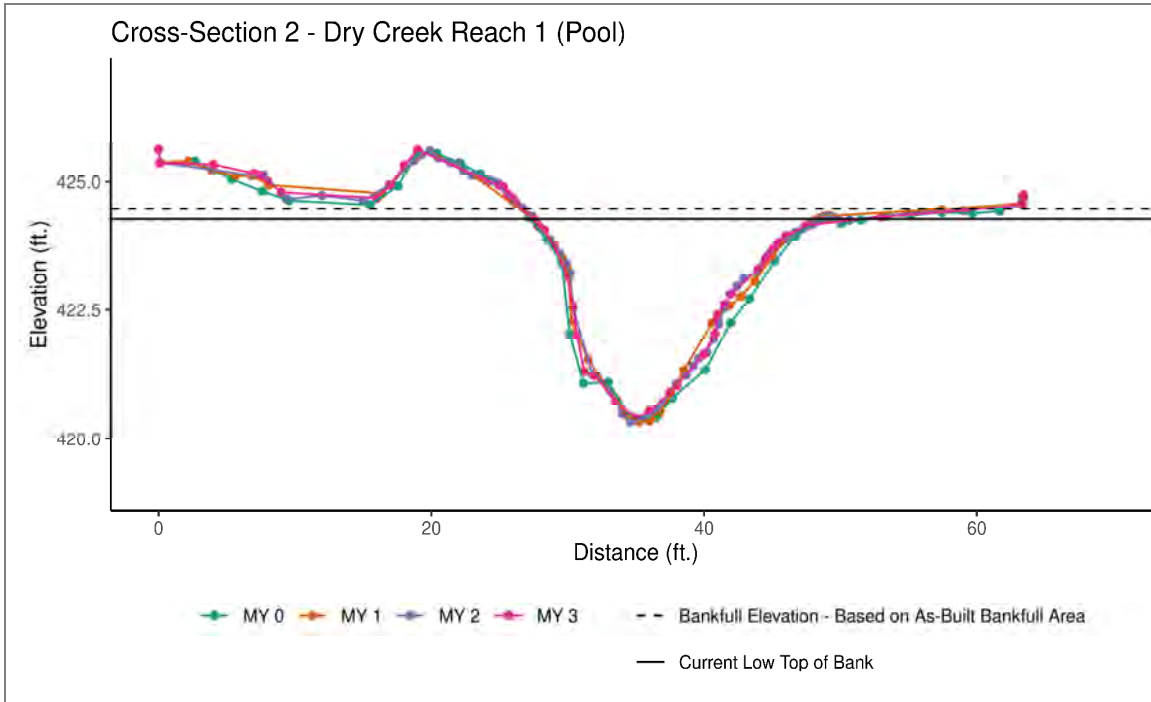


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	424.23	424.31	424.28	424.29		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.91	0.97	0.95		
Thalweg Elevation	422.61	422.65	422.67	422.64		
LTOB Elevation	424.23	424.16	424.23	424.22		
LTOB Max Depth	1.62	1.51	1.56	1.58		
LTOB Cross-Sectional Area	14.26	12.30	13.49	13.15		



Downstream (5/5/2022)



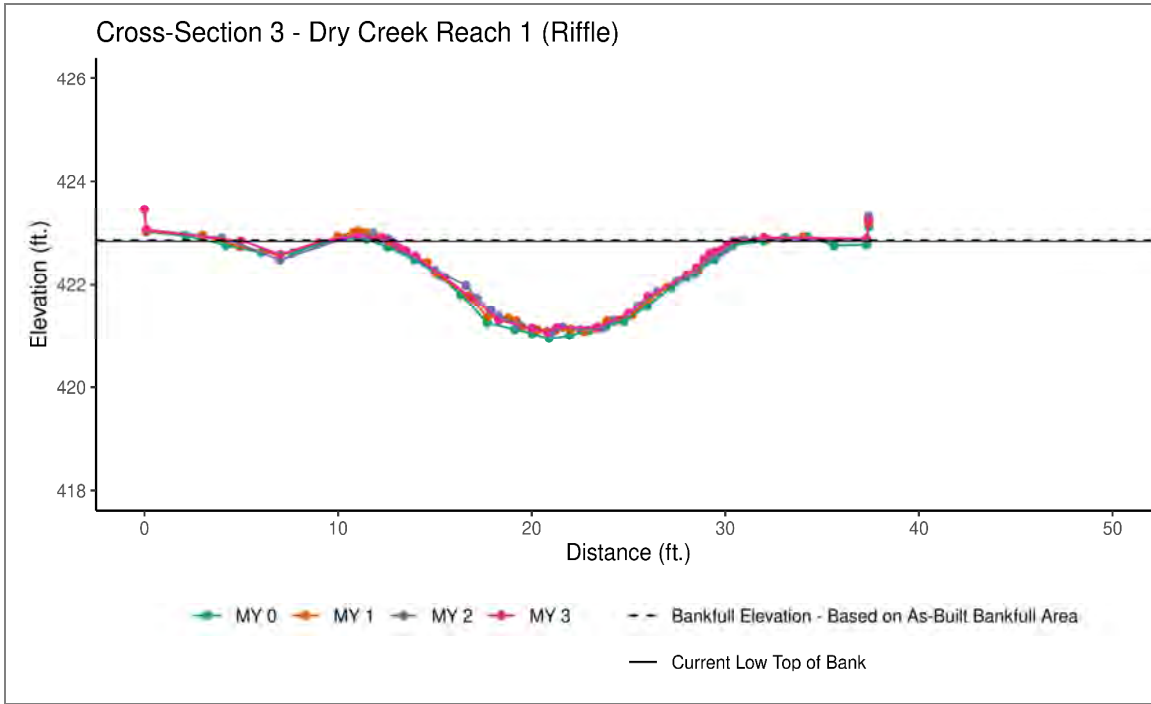


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	420.42	421.33	420.33	420.40		
LTOB Elevation	424.30	424.30	424.31	424.28		
LTOB Max Depth	3.88	2.97	3.98	3.88		
LTOB Cross-Sectional Area	46.39	37.26	41.85	41.56		



Downstream (5/5/2022)



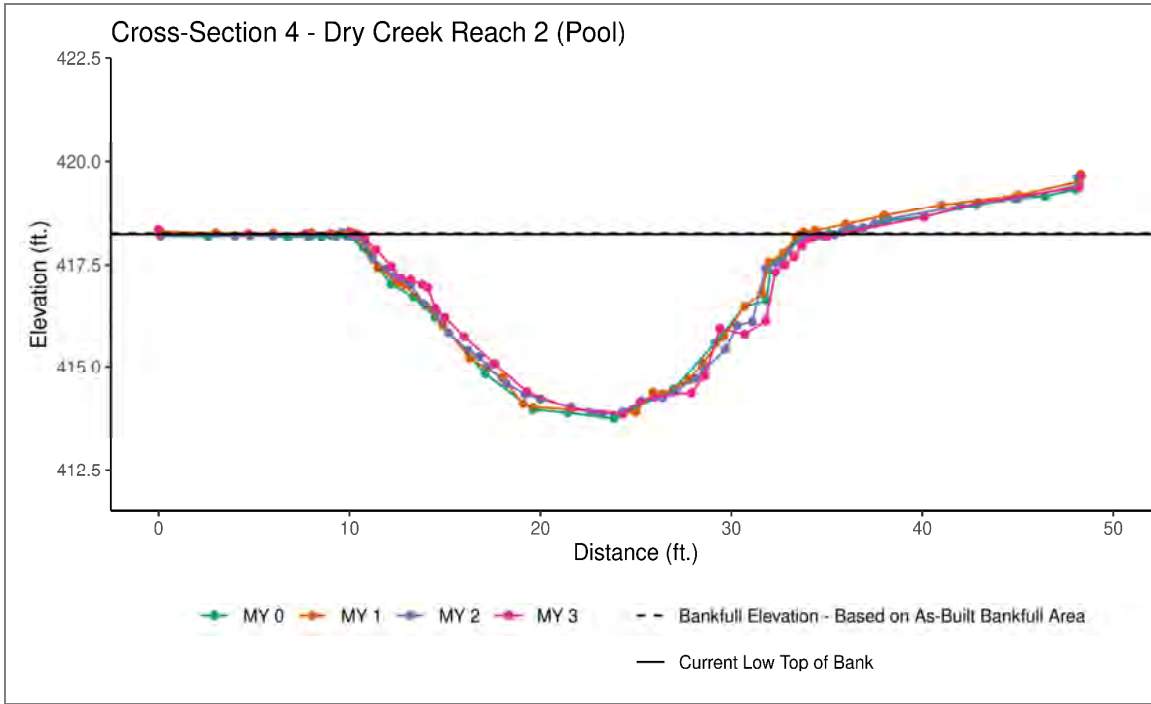


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	422.77	422.85	422.87	422.88		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.99	0.99	0.98		
Thalweg Elevation	420.95	421.11	421.06	421.08		
LTOB Elevation	422.77	422.83	422.86	422.85		
LTOB Max Depth	1.82	1.72	1.8	1.77		
LTOB Cross-Sectional Area	19.31	18.93	19.05	18.81		



Downstream (5/5/2022)



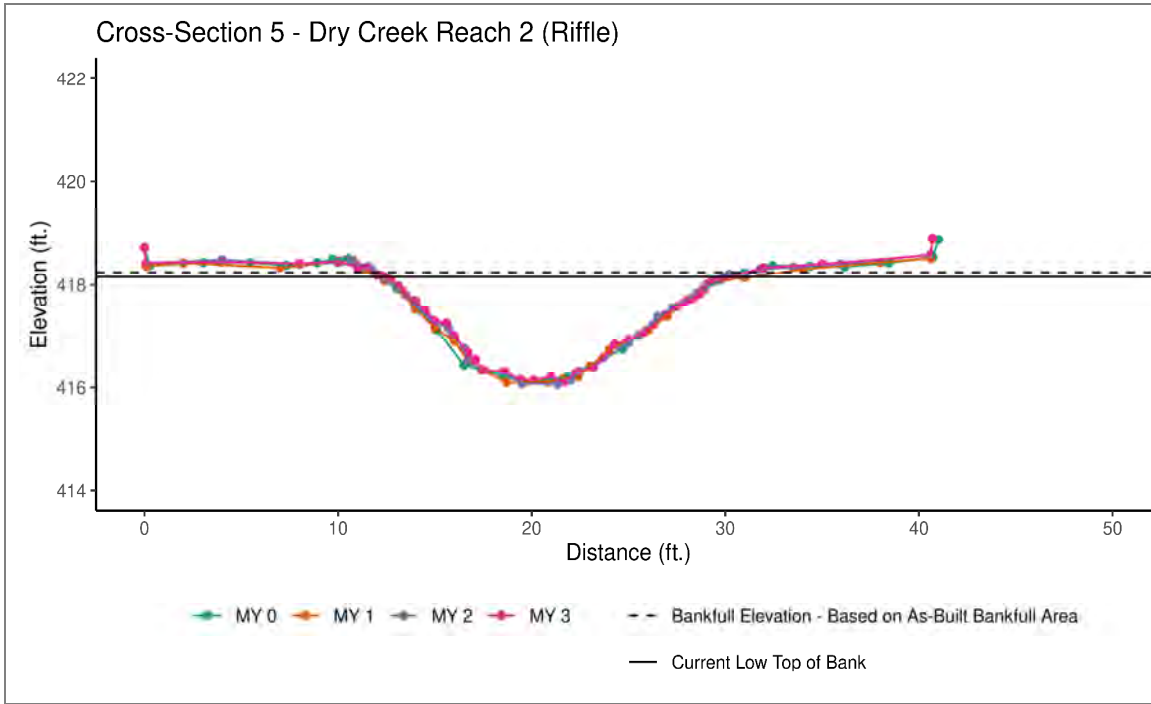


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	413.75	413.88	413.84	413.85		
LTOB Elevation	418.19	418.26	418.20	418.24		
LTOB Max Depth	4.44	4.38	4.36	4.39		
LTOB Cross-Sectional Area	65.43	65.79	64.55	64.89		



Downstream (5/5/2022)



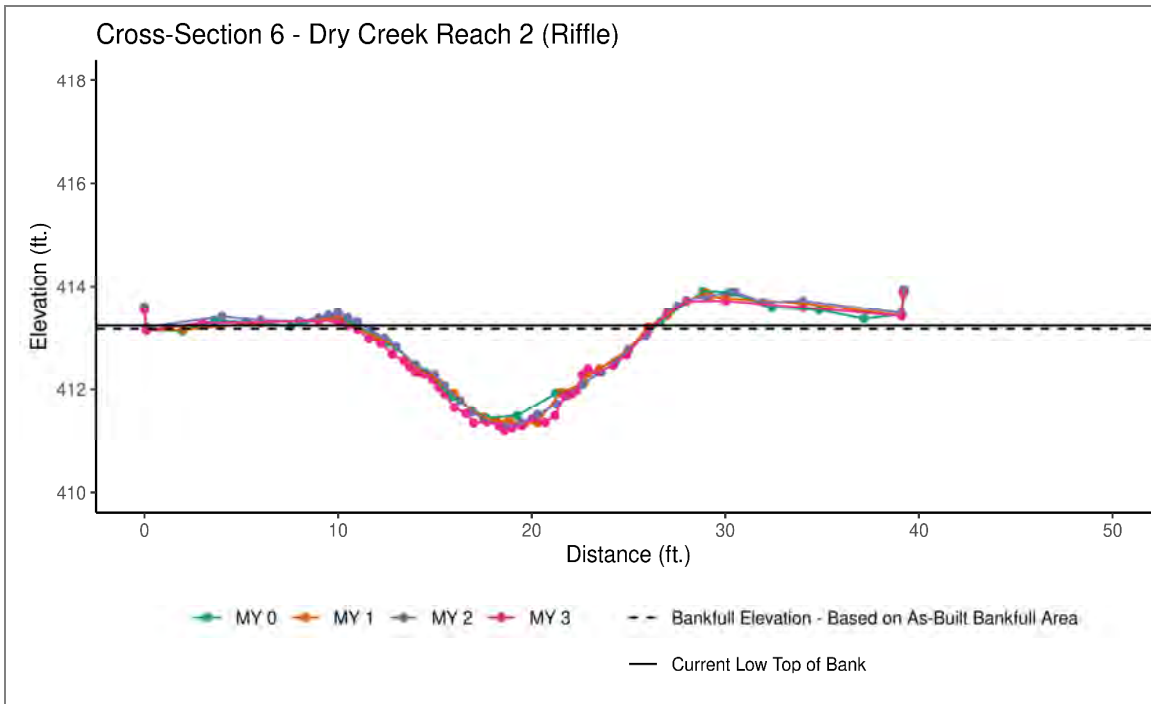


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	418.18	418.20	418.22	418.25		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.93	0.94	0.96		
Thalweg Elevation	416.12	416.10	416.06	416.11		
LTOB Elevation	418.18	418.05	418.08	418.16		
LTOB Max Depth	2.07	1.95	2.02	2.05		
LTOB Cross-Sectional Area	22.40	19.98	20.09	20.86		



Downstream (5/5/2022)



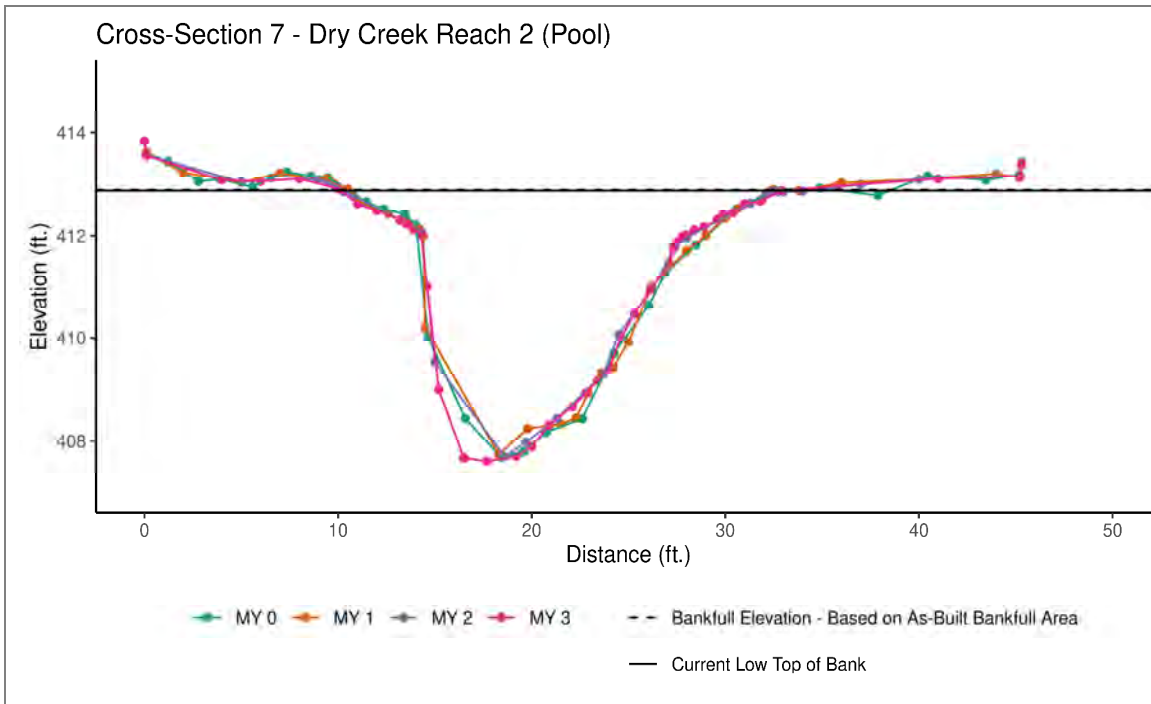


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	413.29	413.27	413.26	413.18		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	1.05	1.07	1.03		
Thalweg Elevation	411.45	411.33	411.26	411.21		
LTOB Elevation	413.29	413.37	413.39	413.24		
LTOB Max Depth	1.85	2.04	2.13	2.03		
LTOB Cross-Sectional Area	16.59	18.18	18.70	17.57		



Downstream (5/5/2022)



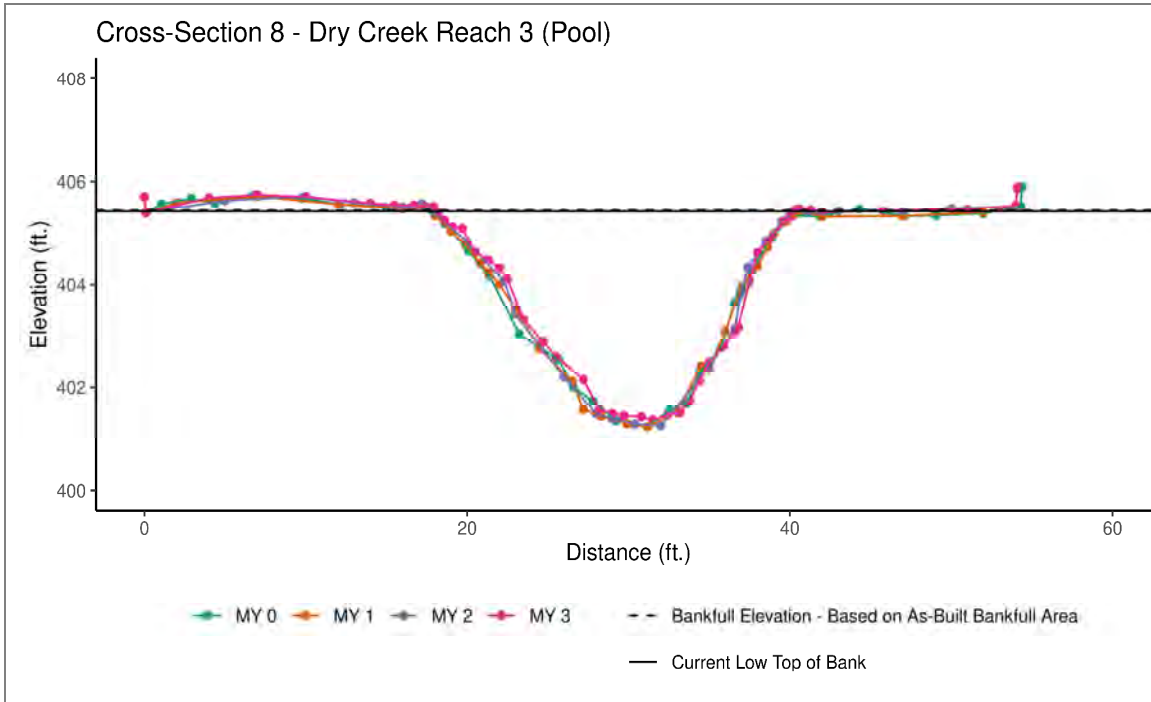


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	407.69	407.74	407.70	407.61		
LTOB Elevation	412.88	412.88	412.85	412.87		
LTOB Max Depth	5.19	5.14	5.15	5.26		
LTOB Cross-Sectional Area	55.21	53.38	51.52	54.87		



Downstream (5/5/2022)



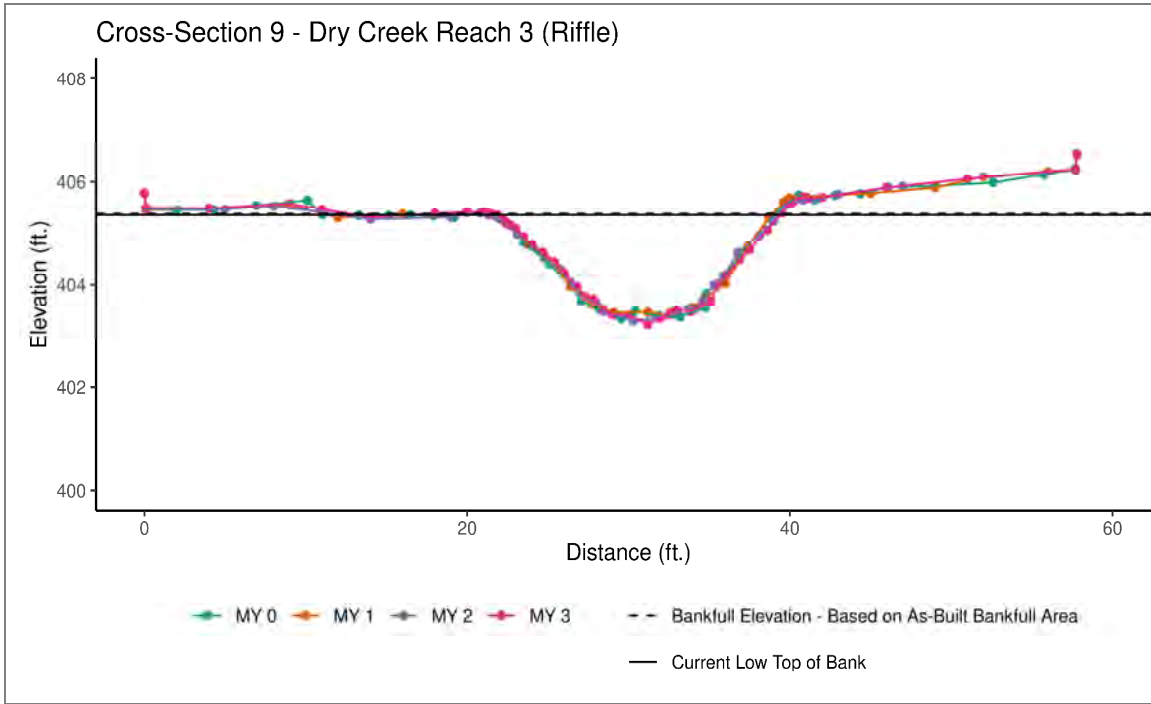


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	401.24	401.24	401.26	401.37		
LTOB Elevation	405.36	405.31	405.35	405.43		
LTOB Max Depth	4.12	4.07	4.09	4.06		
LTOB Cross-Sectional Area	52.18	51.01	51.42	51.76		



Downstream (5/5/2022)



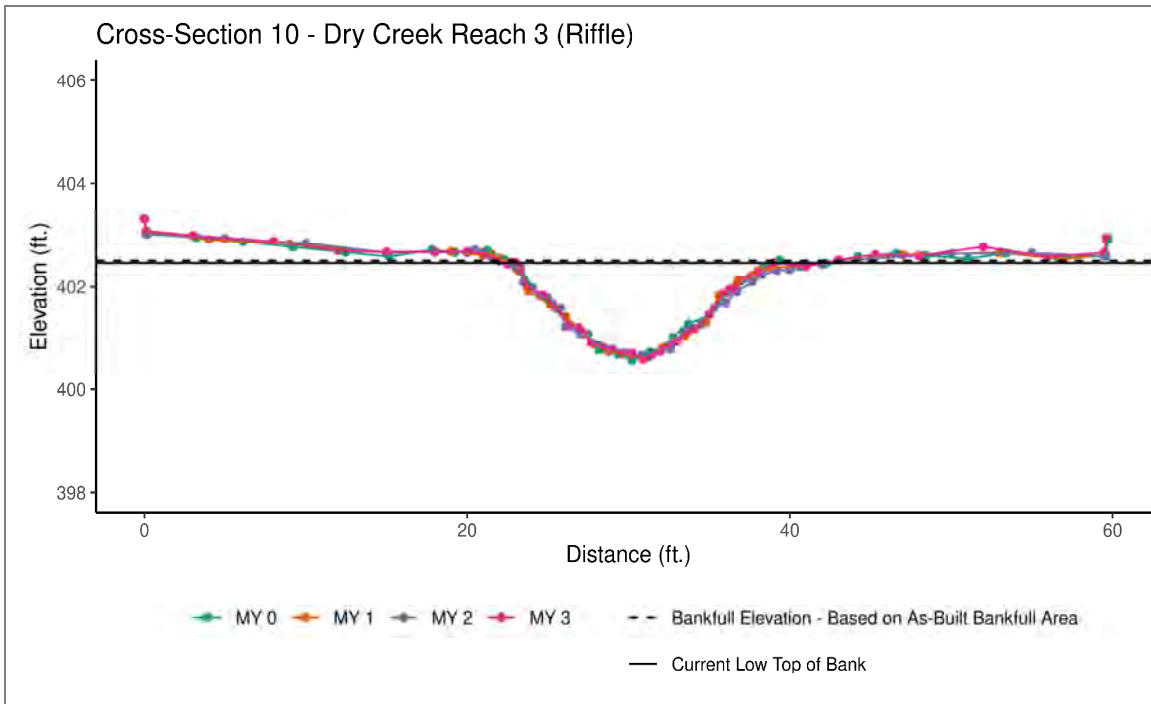


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	405.37	405.40	405.39	405.38		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.99	0.98	0.99		
Thalweg Elevation	403.33	403.40	403.29	403.22		
LTOB Elevation	405.37	405.37	405.36	405.36		
LTOB Max Depth	2.04	1.97	2.07	2.14		
LTOB Cross-Sectional Area	22.45	22.00	21.84	22.05		



Downstream (5/5/2022)



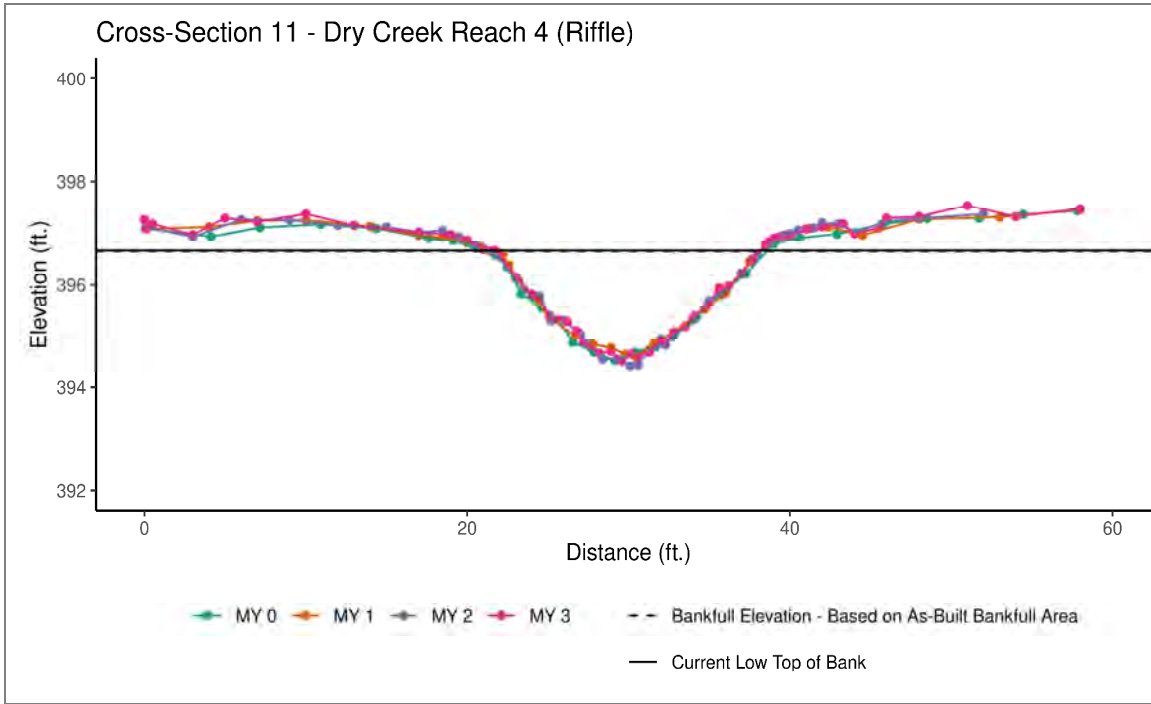


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	402.52	402.51	402.48	402.52		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.93	0.92	0.98		
Thalweg Elevation	400.56	400.63	400.65	400.59		
LTOB Elevation	402.52	402.38	402.33	402.47		
LTOB Max Depth	1.96	1.75	1.68	1.88		
LTOB Cross-Sectional Area	18.07	16.02	15.65	17.35		



Downstream (5/5/2022)



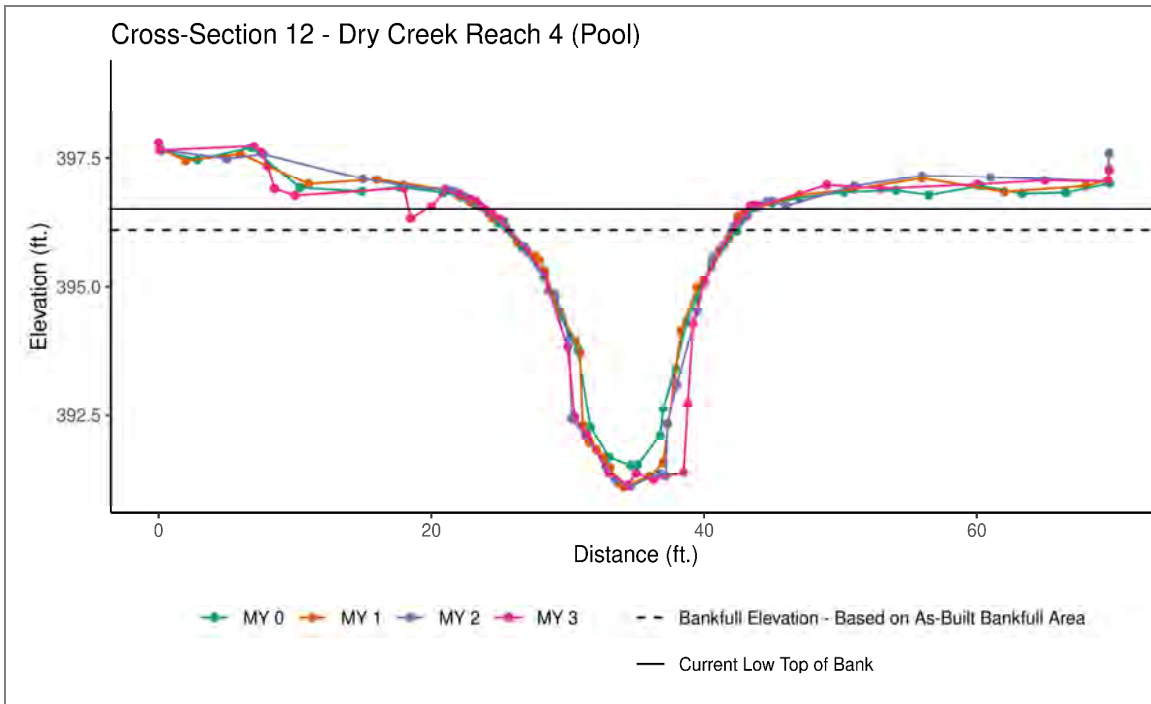


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	396.59	396.66	396.62	396.66		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.97	0.99	1.01		
Thalweg Elevation	394.52	394.58	394.42	394.51		
LTOB Elevation	396.59	396.59	396.61	396.67		
LTOB Max Depth	2.07	2.01	2.19	2.16		
LTOB Cross-Sectional Area	20.52	19.41	20.30	20.73		



Downstream (5/5/2022)



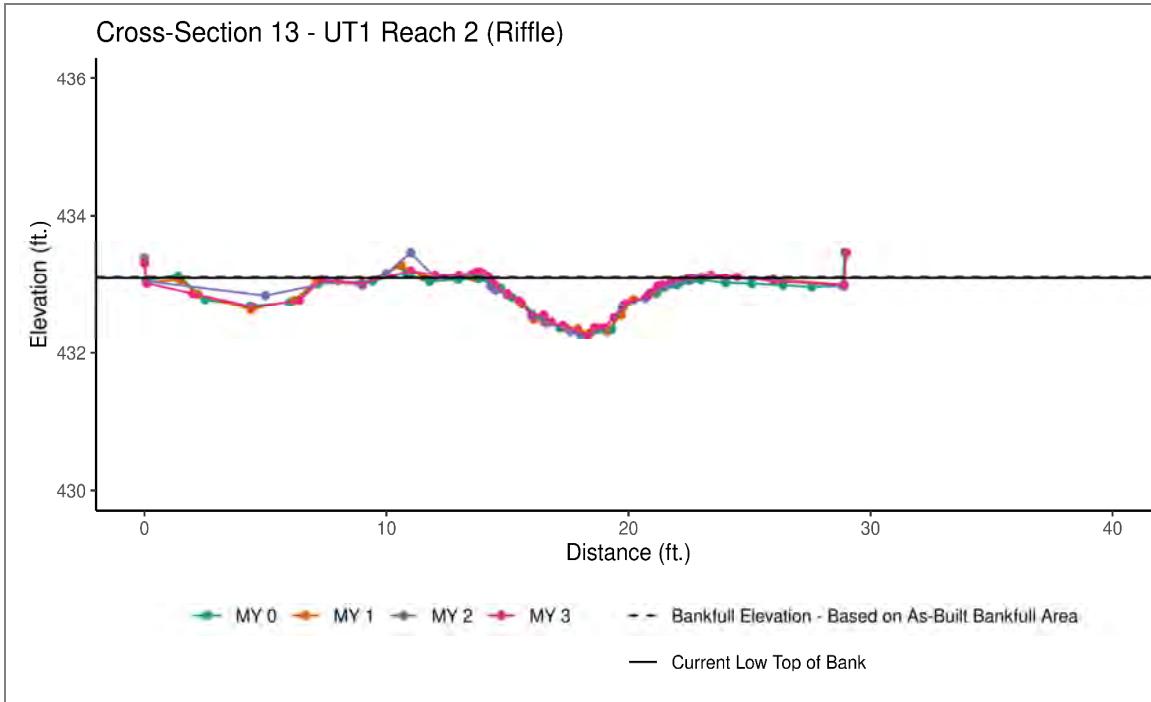


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	391.54	391.11	391.12	391.14		
LTOB Elevation	396.54	396.55	396.56	396.52		
LTOB Max Depth	5.00	5.44	5.44	5.38		
LTOB Cross-Sectional Area	46.62	48.72	51.78	53.99		



Downstream (5/5/2022)



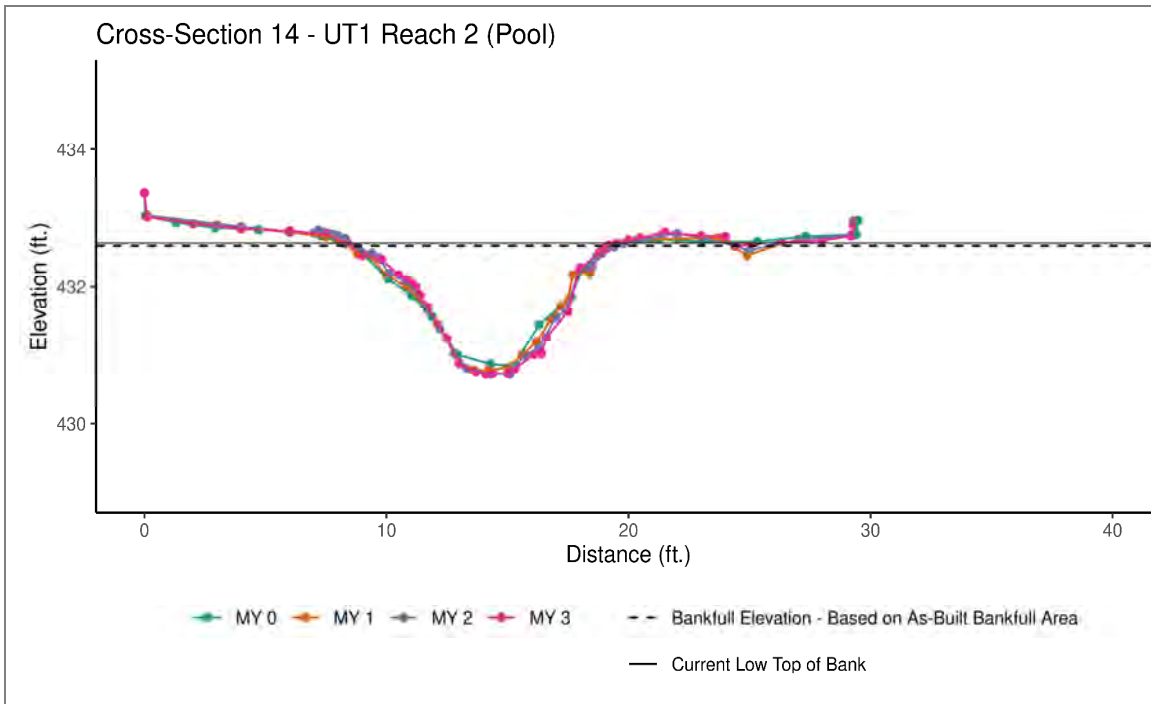


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	433.07	433.09	433.08	433.11		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.91	0.96	0.99		
Thalweg Elevation	432.27	432.29	432.26	432.26		
LTOB Elevation	433.07	433.02	433.05	433.10		
LTOB Max Depth	0.80	0.73	0.79	0.84		
LTOB Cross-Sectional Area	3.59	3.07	3.32	3.50		



Downstream (5/5/2022)



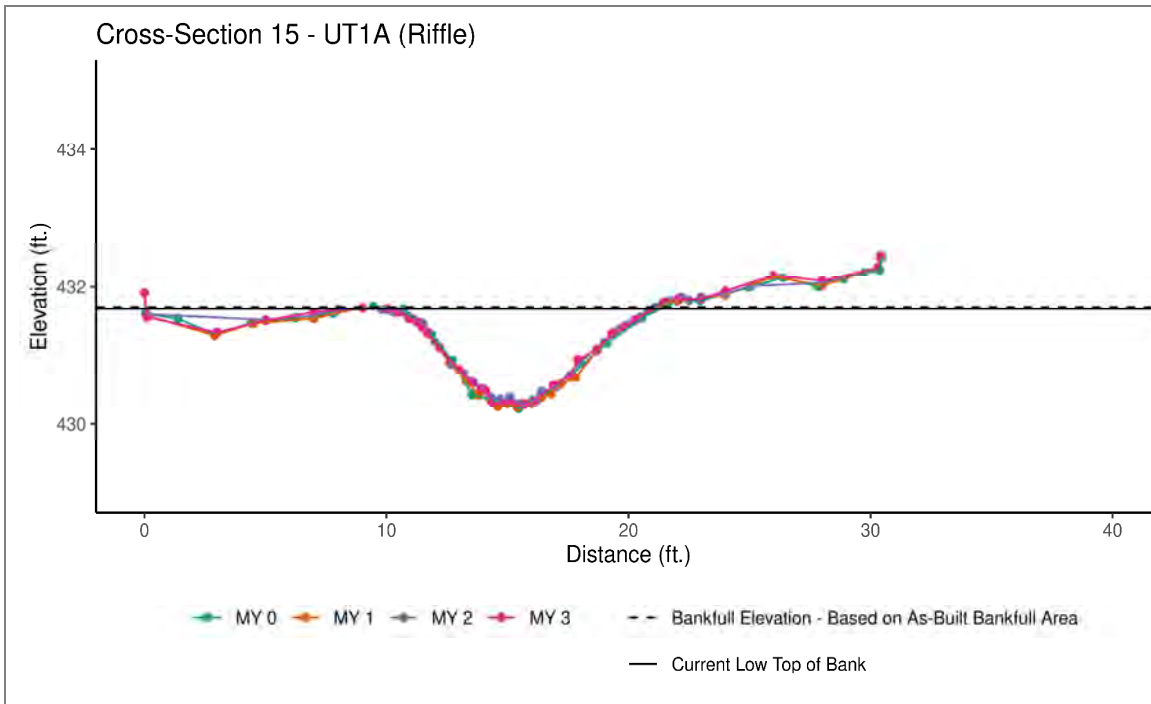


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	430.84	430.78	430.72	430.72		
LTOB Elevation	432.64	432.64	432.68	432.64		
LTOB Max Depth	1.80	1.86	1.96	1.92		
LTOB Cross-Sectional Area	10.64	10.98	11.53	11.14		



Downstream (5/5/2022)



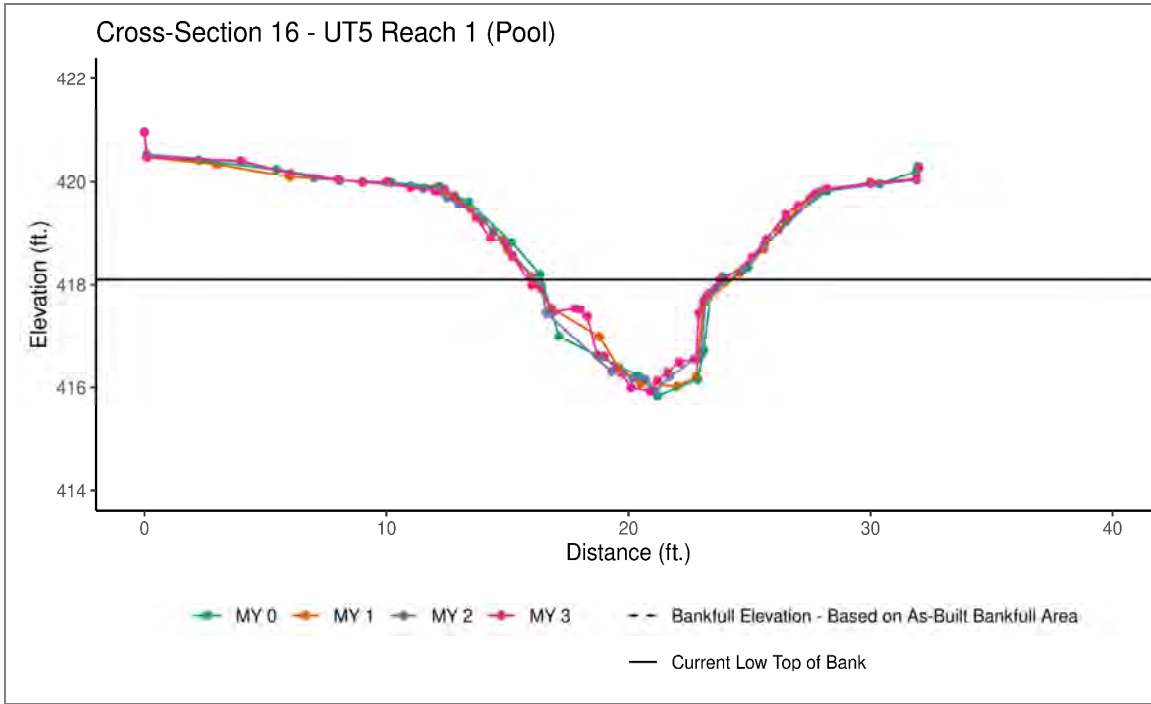


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	431.67	431.67	431.71	431.70		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	1.01	0.96	0.98		
Thalweg Elevation	430.22	430.24	430.30	430.27		
LTOB Elevation	431.67	431.68	431.66	431.67		
LTOB Max Depth	1.45	1.44	1.36	1.40		
LTOB Cross-Sectional Area	8.35	8.51	7.81	8.01		



Downstream (5/5/2022)



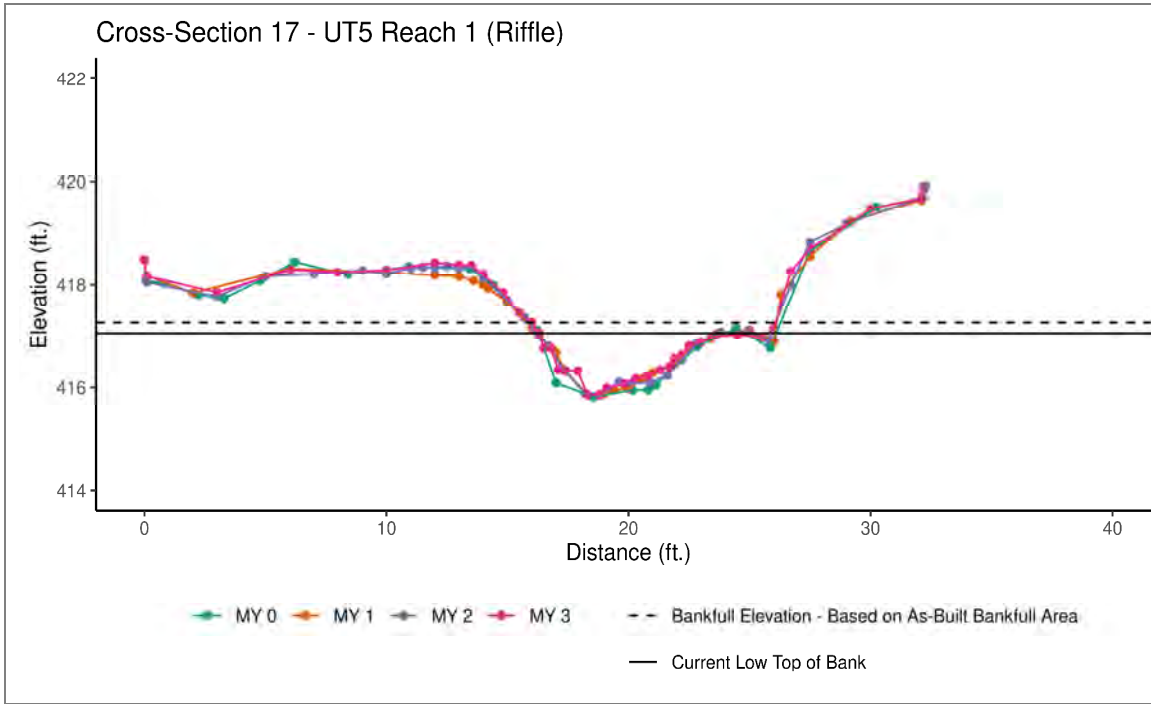


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	415.84	416.02	415.92	415.93		
LTOB Elevation	417.85	417.63	417.77	418.10		
LTOB Max Depth	2.01	1.61	1.85	2.17		
LTOB Cross-Sectional Area	9.38	6.56	8.19	9.38		



Downstream (5/5/2022)



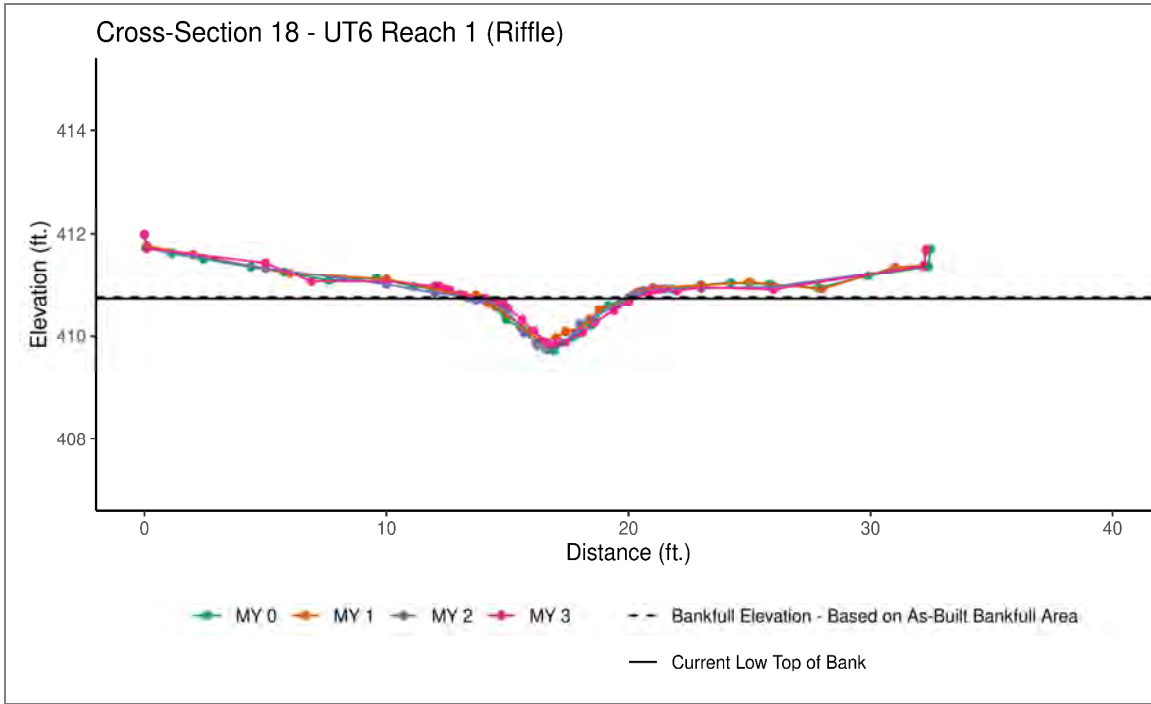


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	417.15	417.26	417.24	417.26		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.89	0.89	0.85		
Thalweg Elevation	415.82	415.86	415.85	415.86		
LTOB Elevation	417.15	417.11	417.09	417.05		
LTOB Max Depth	1.33	1.25	1.24	1.19		
LTOB Cross-Sectional Area	7.00	5.65	5.66	5.05		



Downstream (5/5/2022)



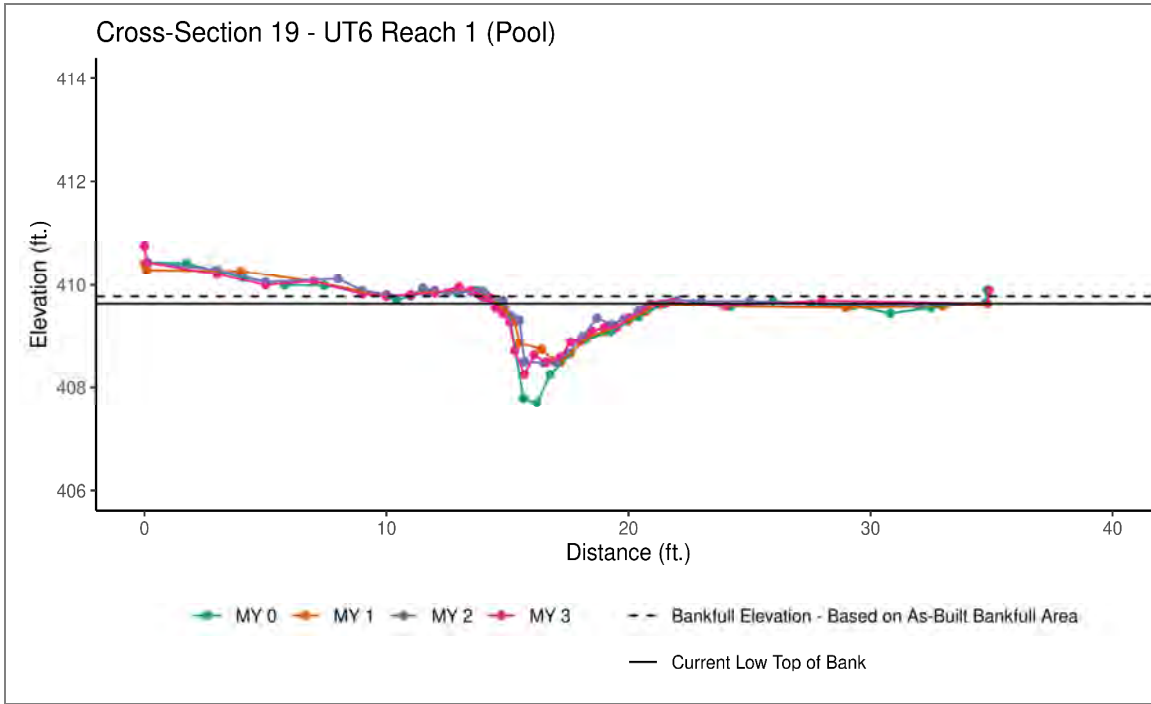


	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	410.70	410.79	410.74	410.76		
Bank Height Ratio - Based on AB-Bankfull Area	1.00	1.01	0.97	0.97		
Thalweg Elevation	409.70	409.91	409.73	409.80		
LTOB Elevation	410.70	410.80	410.71	410.73		
LTOB Max Depth	1.00	0.89	0.98	0.93		
LTOB Cross-Sectional Area	2.95	3.03	2.75	2.78		



Downstream (5/5/2022)





	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A	N/A		
Thalweg Elevation	407.70	408.50	408.48	408.25		
LTOB Elevation	409.60	409.60	409.63	409.63		
LTOB Max Depth	1.90	1.10	1.15	1.38		
LTOB Cross-Sectional Area	5.22	3.69	3.62	4.20		



Downstream (5/5/2022)



Table 8. Baseline Stream Data Summary

Dry Creek Mitigation Site

DMS Project No. 97082

Monitoring Year 3 - 2022

Parameter	PRE-EXISTING CONDITIONS			DESIGN		MONITORING BASELINE (MYO)		
	Min	Max	n	Min	Max	Min	Max	n
Dry Creek Reach 1								
Riffle Only								
Bankfull Width (ft)	16		1	17.8		14.6	18.2	2
Floodprone Width (ft)	140		1	39	89	70	152	2
Bankfull Mean Depth	0.7		1	1.3		1.0	1.1	2
Bankfull Max Depth	2.5		1	1.6	2.0	1.6	1.8	2
Bankfull Cross Sectional Area (ft ²)	11.0		1	23.6		14.2	19.4	2
Width/Depth Ratio	23.0		1	13.0		14.9	17.1	2
Entrenchment Ratio	8.9		1	2.2	5.0	3.9	10.4	2
Bank Height Ratio	1.3		1	1.0		1.0		2
Max part size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	C4			C4		C4		
Bankfull Discharge (cfs)	58		1	58.0		34	49	2
Sinuosity	1.19			1.20	1.30	1.30		
Water Surface Slope (ft/ft) ²	0.0060		1	0.0059		0.0034		
Other	---			---		---		
Dry Creek Reach 2								
Riffle Only								
Bankfull Width (ft)	13.5		1	17.8		15.9	18.2	2
Floodprone Width (ft)	15		1	39	89	126	155	2
Bankfull Mean Depth	0.9		1	1.3		1.0	1.2	2
Bankfull Max Depth	1.3		1	1.6	2.0	1.8	2.1	2
Bankfull Cross Sectional Area (ft ²)	12.8		1	23.6		16.5	22.4	2
Width/Depth Ratio	14.2		1	13.0		14.7	15.3	2
Entrenchment Ratio	1.1		1	2.2	5.0	7.9	8.5	2
Bank Height Ratio	2.6		1	1.0		1.0		2
Max part size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	F4			C4		C4		
Bankfull Discharge (cfs)	75		1	75.0		50	77	2
Sinuosity	1.07			1.20	1.30	1.20		
Water Surface Slope (ft/ft) ²	0.0050		1	0.0059		0.0069		
Other	---			---		---		
Dry Creek Reach 3								
Riffle Only								
Bankfull Width (ft)	1.9	1.4	2	17.8		16.9	17.6	2
Floodprone Width (ft)	18	26	2	39	89	175	219	2
Bankfull Mean Depth	1.2	1.5	2	1.3		1.1	1.3	2
Bankfull Max Depth	1.6	2.5	2	1.5		2.0		2
Bankfull Cross Sectional Area (ft ²)	15.0	27.9	2	23.6		18.1	22.4	2
Width/Depth Ratio	11.2	12.7	2	13.0		13.9	15.9	2
Entrenchment Ratio	1.4		2	2.2	5.0	9.9	12.9	2
Bank Height Ratio	2.1		2	1.0		1.0		2
Max part size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	F4			C4		C4		
Bankfull Discharge (cfs)	83		2	83.0		48	67	2
Sinuosity	1.39			1.20		1.20		
Water Surface Slope (ft/ft) ²	0.0040		2	0.0054		0.0049		
Other	---			---		---		

Table 8. Baseline Stream Data Summary

Dry Creek Mitigation Site

DMS Project No. 97082

Monitoring Year 3 - 2022

Parameter	PRE-EXISTING CONDITIONS			DESIGN		MONITORING BASELINE (MY0)		
	Min	Max	n	Min	Max	Min	Max	n
Dry Creek Reach 4								
Riffle Only								
Bankfull Width (ft)	1.9	1.4	2	17.8		16.7		2
Floodprone Width (ft)	18	26	2	39	89	190		2
Bankfull Mean Depth	1.2	1.5	2	1.3		1.2		2
Bankfull Max Depth	1.6	2.5	2	1.5		2.1		2
Bankfull Cross Sectional Area (ft ²)	15.0	27.9	2	23.6		20.5		2
Width/Depth Ratio	11.2	12.7	2	13.0		13.5		2
Entrenchment Ratio	1.4		2	2.2	5.0	11.4		2
Bank Height Ratio	2.1		2	1.0		1.0		2
Max part size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	F4			C4		C4		
Bankfull Discharge (cfs)	92		2	92		62		
Sinuosity	1.39		2	1.20		1.20		
Water Surface Slope (ft/ft) ²	0.0040		2	0.0075		0.0087		
Other	---			---		---		
UT1 Reach 2								
Riffle Only								
Bankfull Width (ft)	14		1	8.4		9.1		1
Floodprone Width (ft)	18		1	18	42	116		1
Bankfull Mean Depth	0.4		1	0.6		0.4		1
Bankfull Max Depth	1		1	1.0		0.8		1
Bankfull Cross Sectional Area (ft ²)	5.1		1	5.4		3.6		1
Width/Depth Ratio	38		1	13.0		23.0		1
Entrenchment Ratio	1.3		1	2.2	5.0	12.8		1
Bank Height Ratio	2.7		1	1.0		1.0		1
Max part size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	---			C4		C4		
Bankfull Discharge (cfs)	20		1	20		9		
Sinuosity	1.10		1	1.20		1.20		
Water Surface Slope (ft/ft) ²	0.0160		1	0.0180		0.0168		
Other	---			---		---		
UT1A								
Riffle Only								
Bankfull Width (ft)	---		1	7.5		10.6		1
Floodprone Width (ft)	---		1	17	38	78		1
Bankfull Mean Depth	---		1	0.7		0.8		1
Bankfull Max Depth	---		1	1.0		1.4		1
Bankfull Cross Sectional Area (ft ²)	---		1	5.2		8.3		1
Width/Depth Ratio	---		1	11.0		13.5		1
Entrenchment Ratio	---		1	2.2	5.0	7.4		1
Bank Height Ratio	---		1	1.0		1.0		1
Max part size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	---			C4		C4		
Bankfull Discharge (cfs)	---		1	8		39		
Sinuosity	1.10			1.20		1.20		
Water Surface Slope (ft/ft) ²	0.0100		1	0.0210		0.0119		
Other	---			---		---		

Table 8. Baseline Stream Data Summary

Dry Creek Mitigation Site
 DMS Project No. 97082
 Monitoring Year 3 - 2022

Parameter	PRE-EXISTING CONDITIONS			DESIGN		MONITORING BASELINE (MY0)			
	UT5 Reach 1								
Riffle Only	Min	Max	n	Min	Max	Min	Max	n	
Bankfull Width (ft)	3.4		1	6.8		8.3		1	
Floodprone Width (ft)	5		1	15	34	20		1	
Bankfull Mean Depth	0.6		1	0.5		0.8		1	
Bankfull Max Depth	0.9		1	0.8		1.3		1	
Bankfull Cross Sectional Area (ft ²)	1.9		1	3.7		7.0		1	
Width/Depth Ratio	5.9		1	13.0		9.8		1	
Entrenchment Ratio	1.4		1	2.2	5.0	2.4		1	
Bank Height Ratio	3.0		1	1.0		1.0		1	
Max part size (mm) mobilized at bankfull	---			---		---			
Rosgen Classification	---			C4b		C4b			
Bankfull Discharge (cfs)	11.5		1	11.5		33.7			
Sinuosity	1.20			1.20		1.20			
Water Surface Slope (ft/ft) ²	0.0330		1	0.0180		0.0268			
Other	---			---		---			
Parameter	UT6 Reach 1								
Riffle Only	Min	Max	n	Min	Max	Min	Max	n	
Bankfull Width (ft)	3	4.6	1	5.2		5.5		1	
Floodprone Width (ft)	4	150	1	11	25	55		1	
Bankfull Mean Depth	0.4	0.5	1	0.4		0.5		1	
Bankfull Max Depth	0.6		1	0.6		1.0		1	
Bankfull Cross Sectional Area (ft ²)	1.4	1.9	1	2.0		2.9		1	
Width/Depth Ratio	6.3	11.5	1	13.0		10.4		1	
Entrenchment Ratio	1.2	32.4	1	2.2	5.0	10.0		1	
Bank Height Ratio	1.2	6.9	1	1.0		1.0		1	
Max part size (mm) mobilized at bankfull	---			---		---			
Rosgen Classification	E4			C4b		C4b			
Bankfull Discharge (cfs)	6.4		1	6.4		12.0			
Sinuosity	1.20			1.20		1.20			
Water Surface Slope (ft/ft) ²	0.0260		1	0.0270		0.0324			
Other	---			---		---			

Table 9. Cross-Section Morphology Monitoring Summary

Dry Creek Mitigation Site
 DMS Project No. 97082
 Monitoring Year 3 - 2022

	Dry Creek Reach 1																	
	Cross-Section 1 (Riffle)						Cross-Section 2 (Pool)						Cross-Section 3 (Riffle)					
	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation (ft) - Based on AB-Bankfull ¹ Area	424.23	424.31	424.28	424.29			N/A	N/A	N/A	N/A			422.77	422.85	422.87	422.88		
Bank Height Ratio - Based on AB Bankfull ¹ Area	1.00	0.91	0.97	0.95			N/A	N/A	N/A	N/A			1.00	0.99	0.99	0.98		
Thalweg Elevation	422.61	422.65	422.67	422.64			420.42	421.33	420.33	420.40			420.95	421.11	421.06	421.08		
LTOB ² Elevation	424.23	424.16	424.23	424.22			424.30	424.30	424.31	424.28			422.77	422.83	422.86	422.85		
LTOB ² Max Depth (ft)	1.62	1.51	1.56	1.58			3.88	2.97	3.98	3.88			1.82	1.72	1.80	1.77		
LTOB ² Cross Sectional Area (ft ²)	14.26	12.30	13.49	13.15			46.39	37.26	41.85	41.56			19.31	18.93	19.05	18.81		
	Dry Creek Reach 2																	
	Cross-Section 4 (Pool)						Cross-Section 5 (Riffle)						Cross-Section 6 (Riffle)					
	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation (ft) - Based on AB-Bankfull ¹ Area	N/A	N/A	N/A	N/A			418.18	418.20	418.22	418.25			413.29	413.27	413.26	413.18		
Bank Height Ratio - Based on AB Bankfull ¹ Area	N/A	N/A	N/A	N/A			1.00	0.93	0.94	0.96			1.00	1.05	1.07	1.03		
Thalweg Elevation	413.75	413.88	413.84	413.85			416.12	416.10	416.06	416.11			411.45	411.33	411.26	411.21		
LTOB ² Elevation	418.19	418.26	418.20	418.24			418.18	418.05	418.08	418.16			413.29	413.37	413.39	413.24		
LTOB ² Max Depth (ft)	4.44	4.38	4.36	4.39			2.06	1.95	2.02	2.05			1.85	2.04	2.13	2.03		
LTOB ² Cross Sectional Area (ft ²)	65.43	65.79	64.55	64.89			22.40	19.98	20.09	20.86			16.59	18.18	18.70	17.57		
	Dry Creek Reach 2						Dry Creek Reach 3											
	Cross-Section 7 (Pool)						Cross-Section 8 (Pool)						Cross-Section 9 (Riffle)					
	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation (ft) - Based on AB-Bankfull ¹ Area	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A			405.37	405.40	405.39	405.38		
Bank Height Ratio - Based on AB Bankfull ¹ Area	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A			1.00	0.99	0.98	0.99		
Thalweg Elevation	407.69	407.74	407.70	407.61			401.24	401.24	401.26	401.37			403.33	403.40	403.29	403.22		
LTOB ² Elevation	412.88	412.88	412.85	412.87			405.36	405.31	405.35	405.43			405.37	405.37	405.36	405.36		
LTOB ² Max Depth (ft)	5.19	5.14	5.15	5.26			4.12	4.07	4.09	4.06			2.04	1.97	2.07	2.14		
LTOB ² Cross Sectional Area (ft ²)	55.21	53.38	51.52	54.87			52.18	51.01	51.42	51.76			22.45	22.00	21.84	22.05		

¹Bank Height Ratio (BHR) takes the As-built bankfull area as the basis for adjusting each subsequent years bankfull elevation.

²LTOB 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.

Table 9. Cross-Section Morphology Monitoring Summary

Dry Creek Mitigation Site
 DMS Project No. 97082
 Monitoring Year 3 - 2022

	Dry Creek Reach 3							Dry Creek Reach 4											
	Cross-Section 10 (Riffle)							Cross-Section 11 (Riffle)					Cross-Section 12 (Pool)						
	MY0	MY1	MY2	MY3	MY5	MY7		MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation (ft) - Based on AB-Bankfull ¹ Area	402.52	402.51	402.48	402.52				396.59	396.66	396.62	396.66			N/A	N/A	N/A	N/A		
Bank Height Ratio - Based on AB Bankfull ¹ Area	1.00	0.93	0.92	0.98				1.00	0.97	0.99	1.01			N/A	N/A	N/A	N/A		
Thalweg Elevation	400.56	400.63	400.65	400.59				394.52	394.58	394.42	394.51			391.54	391.11	391.12	391.14		
LTOB ² Elevation	402.52	402.38	402.33	402.47				396.59	396.59	396.61	396.67			396.54	396.55	396.56	396.52		
LTOB ² Max Depth (ft)	1.96	1.75	1.68	1.88				2.07	2.01	2.19	2.16			5.00	5.44	5.44	5.38		
LTOB ² Cross Sectional Area (ft ²)	18.07	16.02	15.65	17.35				20.52	19.41	20.30	20.73			46.62	48.72	51.78	53.99		
	UT1 Reach 2							UT1A											
	Cross-Section 13 (Riffle)							Cross-Section 14 (Pool)					Cross-Section 15 (Riffle)						
	MY0	MY1	MY2	MY3	MY5	MY7		MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation (ft) - Based on AB-Bankfull ¹ Area	433.07	433.09	433.08	433.11				N/A	N/A	N/A	N/A			431.67	431.67	431.71	431.70		
Bank Height Ratio - Based on AB Bankfull ¹ Area	1.00	0.91	0.96	0.99				N/A	N/A	N/A	N/A			1.00	1.01	0.96	0.98		
Thalweg Elevation	432.27	432.29	432.26	432.26				430.84	430.78	430.72	430.72			430.22	430.24	430.30	430.27		
LTOB ² Elevation	433.07	433.02	433.05	433.10				432.64	432.64	432.68	432.64			431.67	431.68	431.66	431.67		
LTOB ² Max Depth (ft)	0.80	0.73	0.79	0.84				1.80	1.86	1.96	1.92			1.45	1.44	1.36	1.40		
LTOB ² Cross Sectional Area (ft ²)	3.59	3.07	3.32	3.50				10.64	10.98	11.53	11.14			8.35	8.51	7.81	8.01		
	UT5 Reach 1							UT6 Reach 1											
	Cross-Section 16 (Pool)							Cross-Section 17 (Riffle)					Cross-Section 18 (Riffle)						
	MY0	MY1	MY2	MY3	MY5	MY7		MY0	MY1	MY2	MY3	MY5	MY7	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation (ft) - Based on AB-Bankfull ¹ Area	N/A	N/A	N/A	N/A				417.15	417.26	417.24	417.26			410.70	410.79	410.74	410.76		
Bank Height Ratio - Based on AB Bankfull ¹ Area	N/A	N/A	N/A	N/A				1.00	0.89	0.89	0.85			1.00	1.01	0.97	0.97		
Thalweg Elevation	415.84	416.02	415.92	415.93				415.82	415.86	415.85	415.86			409.70	409.91	409.73	409.80		
LTOB ² Elevation	417.85	417.63	417.77	418.10				417.15	417.11	417.09	417.05			410.70	410.80	410.71	410.73		
LTOB ² Max Depth (ft)	2.01	1.61	1.85	2.17				1.33	1.25	1.24	1.19			1.00	0.89	0.98	0.93		
LTOB ² Cross Sectional Area (ft ²)	9.38	6.56	8.19	9.38				7.00	5.65	5.66	5.05			2.95	3.03	2.75	2.78		
	UT6 Reach 1																		
	Cross-Section 19 (Pool)																		
	MY0	MY1	MY2	MY3	MY5	MY7													
Bankfull Elevation (ft) - Based on AB-Bankfull ¹ Area	N/A	N/A	N/A	N/A															
Bank Height Ratio - Based on AB Bankfull ¹ Area	N/A	N/A	N/A	N/A															
Thalweg Elevation	407.70	408.50	408.48	408.25															
LTOB ² Elevation	409.60	409.60	409.63	409.63															
LTOB ² Max Depth (ft)	1.91	1.10	1.15	1.38															
LTOB ² Cross Sectional Area (ft ²)	5.22	3.69	3.62	4.20															

¹Bank Height Ratio (BHR) takes the As-built bankfull area as the basis for adjusting each subsequent years bankfull elevation.

²LTOB 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 recoded and tracked above as LTOB max depth.

APPENDIX D. Hydrology Data

Table 10. Bankfull Events

Dry Creek Mitigation Site
 DMS Project No. 97082
 Monitoring Year 3 - 2022

Reach	MY1 (2020)	MY2 (2021)	MY3 (2022)	MY4 (2023)	MY5 (2024)	MY6 (2025)	MY7 (2026)
Dry Creek Reach 2	4/13/2020 10/11/2020	1/3/2021 2/16/2021	5/23/2022				
Dry Creek Reach 3	5/21/2020 10/11/2020	1/3/2021 2/16/2021	1/3/2022 5/23/2022 8/1/2022				
UT1 Reach 2	4/13/2020 10/11/2020	1/3/2021 2/16/2021	3/13/2022 5/23/2022				
UT5 Reach 1	10/11/2020	2/16/2021 4/9/2021	1/3/2022				
UT6 Reach 1	*	2/16/2021 4/9/2021	1/3/2022 5/23/2022				

*Gauge malfunction

Table 11. Rainfall Summary

Dry Creek Mitigation Site
 DMS Project No. 97082
 Monitoring Year 3 - 2022

	MY1 (2020)	MY2 (2021)	MY3 (2022)	MY4 (2023)	MY5 (2024)	MY6 (2025)	MY7 (2026)
Annual Precip Total	61.38	43.24	35.64*				
WETS 30th Percentile	43.73	43.75	43.01				
WETS 70th Percentile	50.88	51.13	50.84				
Normal	Y	L	*				

*Annual precipitation total was collected up until 10/18/2022. Data will be updated in MY4.

Table 12. Recorded In-Stream Flow Events Summary

Dry Creek Mitigation Site

DMS Project No. 97082

Monitoring Year 3 - 2022

Reach	Max Consecutive Days/Total Days Meeting Success Criteria*						
	MY1 (2020)	MY2 (2021)	MY3 (2022)**	MY4 (2023)	MY5 (2024)	MY6 (2025)	MY7 (2026)
UT1A	129 Days/ 251 Days	140 Days/ 162 Days	114 Days/ 145 Days				
UT2	295 Days/ 295 Days	284 Days/ 284 Days	290 Days/ 290 Days				
UT5 Reach 1	87 Days/ 155 Days	142 Days/ 157 Days	127 Days/ 156 Days				

*Success criteria is 30 consecutive days of flow.

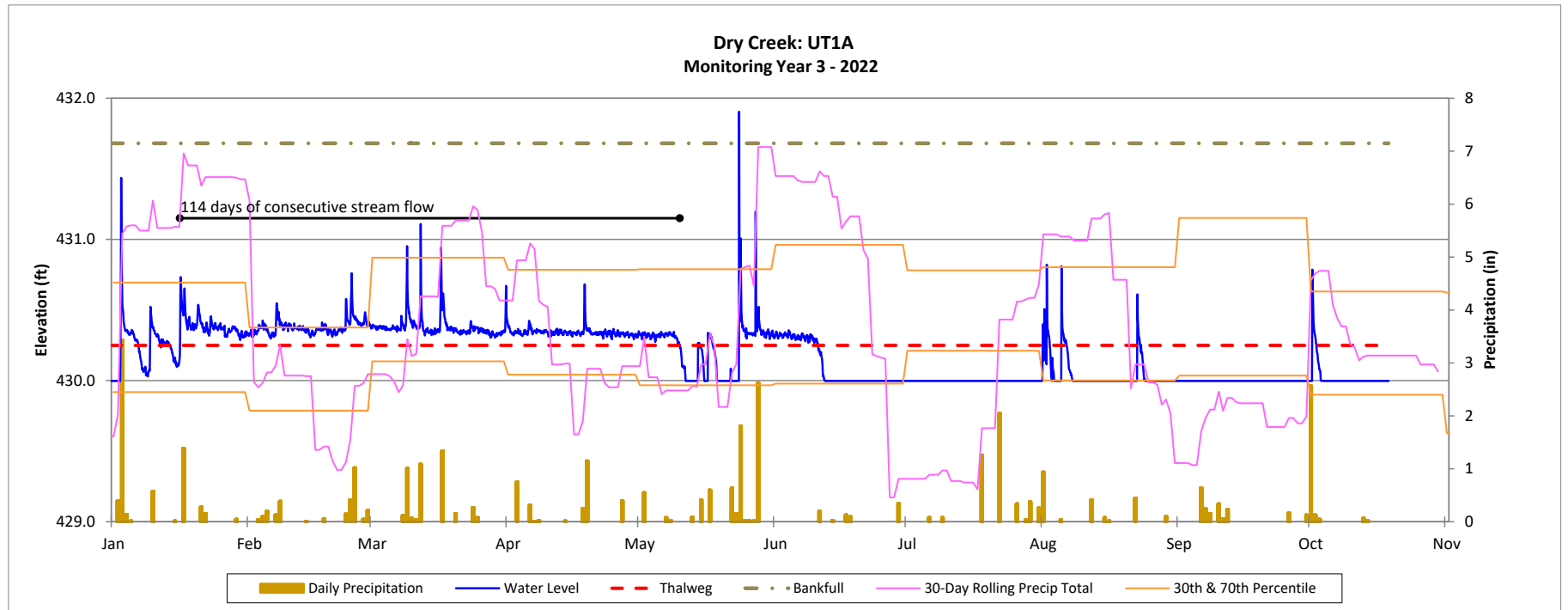
**Data was collected through 10/18/2022. Data will be updated in MY4.

Recorded In-Stream Flow Events Plot

Dry Creek Mitigation Site

DMS Project No. 97082

Monitoring Year 3 - 2022

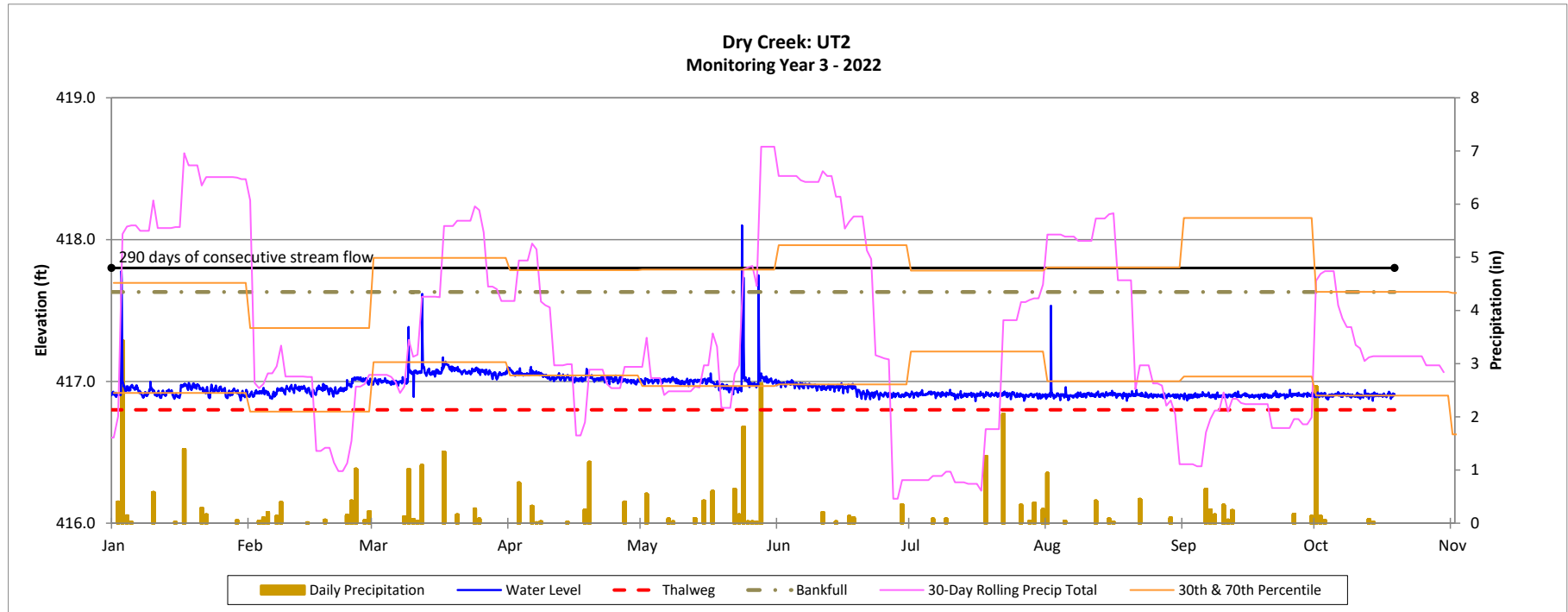


Recorded In-Stream Flow Events Plot

Dry Creek Mitigation Site

DMS Project No. 97082

Monitoring Year 3 - 2022



Recorded In-Stream Flow Events Plot

Dry Creek Mitigation Site

DMS Project No. 97082

Monitoring Year 3 - 2022

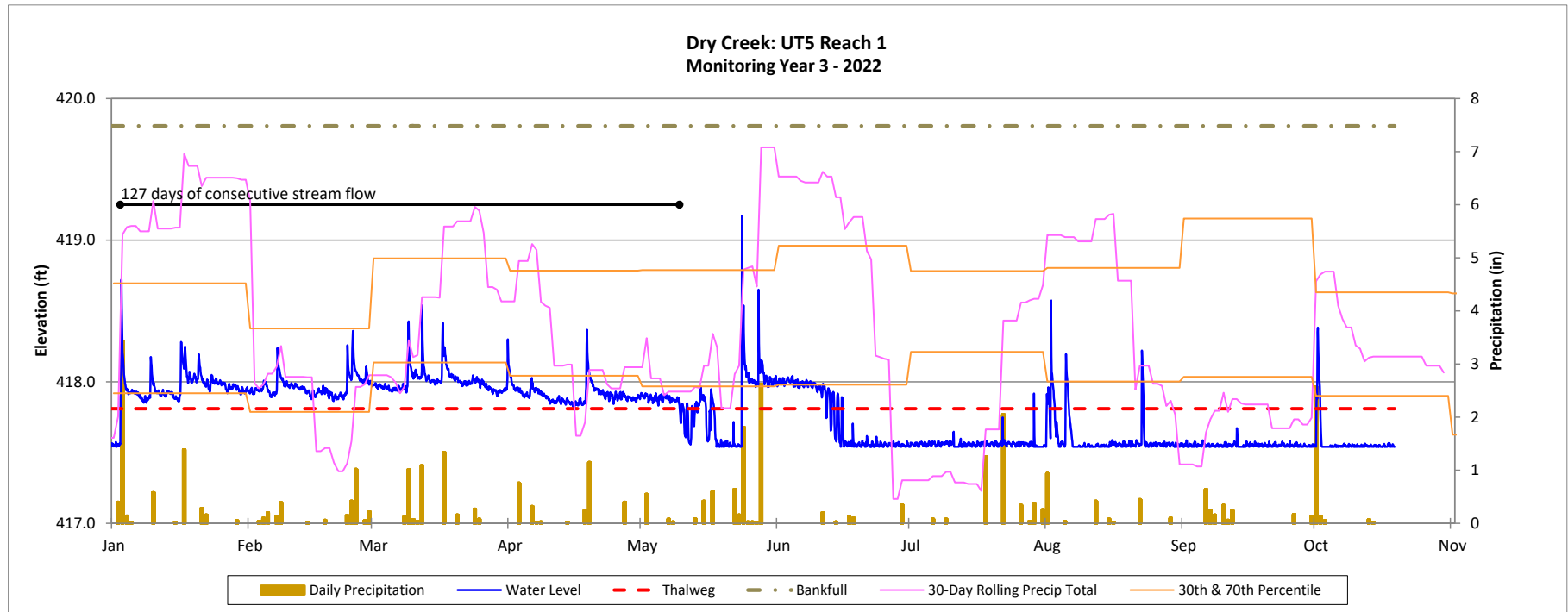


Table 13. Wetland Gauge Summary

Dry Creek Mitigation Site

DMS Project No. 97082

Monitoring Year 3 - 2022

Gauge	Max. Consecutive Hydroperiod (Percentage)						
	MY1 (2020)	MY2 (2021)	MY3 (2022)*	MY4 (2023)	MY5 (2024)	MY6 (2025)	MY7 (2026)
1	7 Days (2.7%)	9 Days (3.5%)	15 Days (5.7%)				

Performance Standard: **None**

WETS Station (Daily Rainfall): **Durham 8.0 NNE, NC**

WETS Station (30th & 70th Percentile): **Roxboro 7 ESE, NC**

Growing Season: **3/1/2022 to 11/11/2022 (255 Days)**

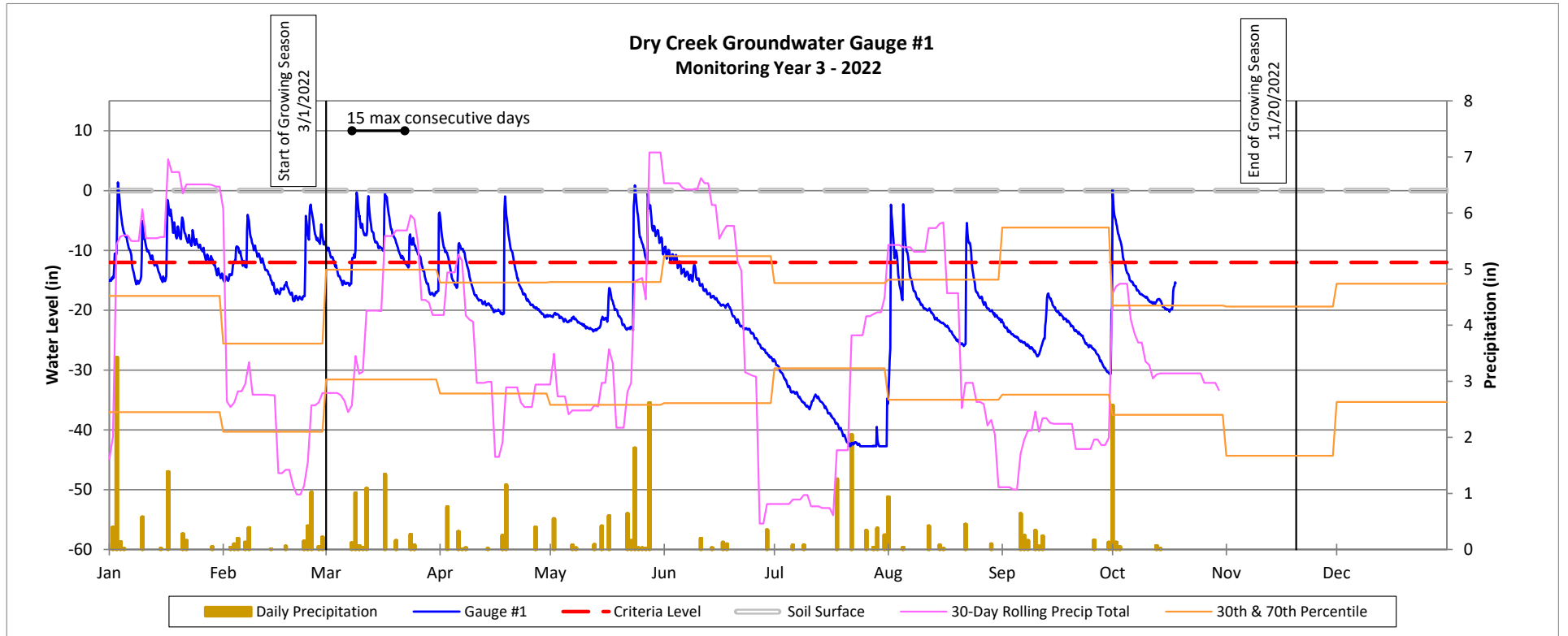
*Data was collected from 3/1/2022 to 10/18/2022 (231 Days).

Groundwater Gauge Plot

Dry Creek Mitigation Site

DMS Project No. 97082

Monitoring Year 3 - 2022



APPENDIX E. Project Timeline and Contact Info

Table 14. Project Activity and Reporting History

Dry Creek Mitigation Site
 DMS Project No. 97082
Monitoring Year 3 - 2022

Activity or Deliverable		Data Collection Complete	Task Completion or Deliverable Submission
Project Instituted		NA	March 15, 2016
Mitigation Plan Approved		NA	November 2018
Construction (Grading) Completed		NA	April 20, 2020
Planting Completed		NA	April 24, 2020
As-Built Survey Completed		NA	April 30, 2020
Baseline Monitoring Document (Year 0)	Stream Survey	April 30, 2020	August 2020
	Vegetation Survey	April 27, 2020	
Year 1 Monitoring	Stream Survey	November 4, 2020	December 2020
	Vegetation Survey	November 4, 2020	
	Manual Bank Repair	March 2021	
Year 2 Monitoring	Stream Survey	June 10, 2021	December 2021
	Vegetation Survey	September 16, 2021	
Year 3 Monitoring	Stream Survey	May 5, 2022	December 2022
	Vegetation Survey	September 14, 2022	
	Supplemental Planting	October 19, 2022	
Year 4 Monitoring			December 2023
Year 5 Monitoring	Stream Survey	2024	December 2024
	Vegetation Survey	2024	
Year 6 Monitoring			December 2025
Year 7 Monitoring	Stream Survey	2026	December 2026
	Vegetation Survey	2026	

Table 15. Project Contact Table

Dry Creek Mitigation Site
 DMS Project No. 97082
Monitoring Year 3 - 2022

Designer Nicole Macaluso Millns, PE	Wildlands Engineering, Inc. 312 West Millbrook Road, Suite 225 Raleigh, NC 27609 919.851.9986
Construction Contractor	Land Mechanic Designs, Inc. 126 Circle G Lane Willow Spring, NC 27592
Monitoring Performers Monitoring, POC	Wildlands Engineering, Inc. Jason Lorch 919.851.9986

APPENDIX F. Additional Documentation



MEETING MINUTES

MEETING: MY2 IRT Site Visit
Dry Creek Mitigation Site
Neuse River Basin 03020201; Durham County, NC
NCDMS Project No. 97082
USACE ID: SAW-2016-00880
NCDEQ Contract No. 6827

DATE: *On-site Meeting: Monday, June 13, 2022*
Meeting Notes Distributed: Thursday, June 16, 2022

Attendees

Kim Browning, USACE
Casey Haywood, USACE
Travis Wilson, NC Wildlife Resource Commission
Lindsay Crocker, NC Division of Mitigation Services
Jeremiah Dow, NC Division of Mitigation Services
Jason Lorch, Wildlands Engineering
Carolyn Lanza, Wildlands Engineering
Andrew Radecki, Wildlands Engineering

Meeting Notes

- Dry Creek Reach 1
 - Wildlands will repair the damaged fence from a fallen tree along the Hampton Road.
- Dry Creek Reach 4
 - The IRT was happy with the repair work completed in MY2.
- Vegetation
 - Wildlands will send an email to Kim Browning with a map of the supplemental planting areas, ring spray areas, and species list. The species list for supplemental planting will focus on increasing species diversity. No sycamore or green ash will be planted at Dry Creek. If supplemental planting is over 20% of the total planted area, then an AMP will be issued. If any soil amendments were used, that will be documented in the monitoring reports.

Carolyn Lanza

From: Browning, Kimberly D CIV USARMY CESAW (USA)
<Kimberly.D.Browning@usace.army.mil>
Sent: Friday, August 19, 2022 10:09 AM
To: Jason Lorch; Jeff Keaton
Cc: Carolyn Lanza
Subject: RE: Dry Creek MY3 Supplemental Planting

This update looks fine. I forwarded it to the IRT and received no comments. You're good to move forward.
Have a good weekend
Kim

Kim (Browning) Isenhour
Mitigation Project Manager, Regulatory Division | U.S. Army Corps of Engineers | 919.946.5107

-----Original Message-----

From: Jason Lorch <jlorch@wildlandseng.com>
Sent: Thursday, August 18, 2022 3:27 PM
To: Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil>; Jeff Keaton <jkeaton@wildlandseng.com>
Cc: Carolyn Lanza <clanza@wildlandseng.com>
Subject: [URL Verdict: Neutral][Non-DoD Source] RE: Dry Creek MY3 Supplemental Planting

Kim, this is actually the most up to date planting list for Dry Creek that we sent you. Jeff's last e-mail was the original version that the IRT previously commented on. Our staff is preparing to order plants and wanted to make sure the IRT is good with the updated planting list. Let us know if you have any questions or concerns. Thanks!

Jason Lorch, GISP | Senior Environmental Scientist

O: 919.851.9986 x107 M: 919.413.1214

Wildlands Engineering, Inc. <Blockedhttp://www.wildlandseng.com/>

312 West Millbrook Road, Suite 225

Raleigh, NC 27609

From: Jason Lorch
Sent: Wednesday, August 03, 2022 2:54 PM
To: 'Browning, Kimberly D CIV USARMY CESAW (USA)' <Kimberly.D.Browning@usace.army.mil>; Jeff Keaton <jkeaton@wildlandseng.com>
Cc: Carolyn Lanza <clanza@wildlandseng.com>; Davis, Erin B <erin.davis@ncdenr.gov>; Bowers, Todd <bowers.todd@epa.gov>; Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>; Merritt, Katie

<katie.merritt@ncdenr.gov>; Dow, Jeremiah J <jeremiah.dow@ncdenr.gov>; Crocker, Lindsay
<Lindsay.Crocker@ncdenr.gov>
Subject: RE: Dry Creek MY3 Supplemental Planting

Kim, attached is the updated planting list for Dry Creek based on the IRT's comments. Below is a list of the changes we made, and we will add random vegetation plots to the supplemental planted areas during MY4. Let me know if you have any additional questions or comments. Thanks!

UT1 and Dry Creek

Box elder was reduced from 10% to 5%.

Red Mulberry was reduced from 10% to 5%.

Painted buckeye was added at 5%.

Minor adjustments were made to several species based on the reduction in mulberry and box elder.

UT6

Red mulberry was reduced from 8% to 5%.

Minor adjustments were made to several species based on the reduction in mulberry.

A riparian seed mix was added as well.

Jason Lorch, GISP | Senior Environmental Scientist

O: 919.851.9986 x107 M: 919.413.1214

Wildlands Engineering, Inc. <Blocked<http://www.wildlandseng.com/>>

312 West Millbrook Road, Suite 225

Raleigh, NC 27609

-----Original Message-----

From: Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil
<mailto:Kimberly.D.Browning@usace.army.mil> >

Sent: Friday, July 22, 2022 11:50 AM

To: Jeff Keaton <jkeaton@wildlandseng.com <mailto:jkeaton@wildlandseng.com> >

Cc: Jason Lorch <jlorch@wildlandseng.com <mailto:jlorch@wildlandseng.com> >; Carolyn Lanza
<clanza@wildlandseng.com <mailto:clanza@wildlandseng.com> >; Davis, Erin B <erin.davis@ncdenr.gov
<mailto:erin.davis@ncdenr.gov> >; Bowers, Todd <bowers.todd@epa.gov <mailto:bowers.todd@epa.gov> >; Tugwell,
Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil <mailto:Todd.J.Tugwell@usace.army.mil> >; Merritt,
Katie <katie.merritt@ncdenr.gov <mailto:katie.merritt@ncdenr.gov> >; Dow, Jeremiah J <jeremiah.dow@ncdenr.gov
<mailto:jeremiah.dow@ncdenr.gov> >; Crocker, Lindsay <Lindsay.Crocker@ncdenr.gov
<mailto:Lindsay.Crocker@ncdenr.gov> >

Subject: RE: Dry Creek MY3 Supplemental Planting

Hi Jeff,

I ran this by the IRT for comments and would offer the following:

1. Red mulberry and box elder are not high quality restoration species, but they are acceptable in low quantities in the proposed diverse mix of species.
2. We appreciate the diversity of species proposed, including uncommon species such as Canadian serviceberry, and multiple understory trees/shrubs.
3. Please add a native seed mix for any bare areas.
4. Please add transects to the supplemental planted areas and plan to monitor veg in MY4.

Thanks for reach out. Have a good weekend, Kim

Kim (Browning) Isenhour

Mitigation Project Manager, Regulatory Division | U.S. Army Corps of Engineers | 919.946.5107

-----Original Message-----

From: Jeff Keaton <jkeaton@wildlandseng.com <mailto:jkeaton@wildlandseng.com> >

Sent: Wednesday, July 20, 2022 9:18 AM

To: Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil
<mailto:Kimberly.D.Browning@usace.army.mil> >

Cc: Jason Lorch <jlorch@wildlandseng.com <mailto:jlorch@wildlandseng.com> >; Carolyn Lanza
<clanza@wildlandseng.com <mailto:clanza@wildlandseng.com> >

Subject: [URL Verdict: Neutral][Non-DoD Source] Dry Creek MY3 Supplemental Planting

Hi Kim,

Attached is the proposed supplemental planting list and map for Dry Creek. Wildlands' Scientist surveyed supplemental vegetation plots throughout the potential low stem density areas on June 30th. Those findings are also in the attached PDF. Even though several of the supplemental vegetation plots meet stem density requirements, species diversity is below the required amounts. Due to the lack of species diversity, new species are being added to the supplemental planting list. The total supplemental planting is 16% (2.3 acres) of the entire planted area (14.3 acres) at MY0, so an Adaptive Management Plan should not be not required.

Please let us know if there are any questions or concerns about the proposed supplemental planting plan. Thanks.

Jeff Keaton, PE | Senior Water Resources Engineer

O: 919.851.9986 x103 M: 919.302.6919

Wildlands Engineering, Inc. <Blocked<http://www.wildlandseng.com/>>

312 West Millbrook Road, Suite 225

Raleigh, NC 27609

Table 1. Supplemental Planting

Dry Creek Mitigation Site

DMS Project No. 97082

Monitoring Year 3 - 2022

Supplemental Planting Along UT1 and Dry Creek

Scientific Name	Common Name	Stratum	Wetland Indicator Status	Container Type	Percentage of Stems	Number of Stems
<i>Acer negundo</i>	Box Elder	Canopy	FAC	Gallon	5%	16
<i>Aesculus sylvatica</i>	Painted Buckeye	Understory	FAC	Tubling	5%	16
<i>Asimina triloba</i>	Pawpaw	Understory	FAC	Tubling	5%	16
<i>Betula nigra</i>	River Birch	Canopy	FACW	Tubling	5%	16
<i>Diospyros virginiana</i>	Persimmon	Understory	FAC	Tubling	10%	32
<i>Hamamelis virginiana</i>	Witch Hazel	Understory	FACU	Tubling	8%	26
<i>Juniperus virginiana</i>	Eastern Red Cedar	Canopy	FACU	Tubling	9%	29
<i>Morus rubra</i>	Red Mulberry	Canopy	FACU	Tubling	5%	16
<i>Quercus alba</i>	White Oak	Canopy	FACU	Tubling	10%	32
<i>Quercus nigra</i>	Water Oak	Canopy	FAC	Tubling	10%	32
<i>Quercus phellos</i>	Willow Oak	Canopy	FAC	Tubling	10%	32
<i>Quercus shumardii</i>	Shumard Oak	Canopy	FAC	Tubling	8%	26
<i>Ulmus alata</i>	Winged Elm	Canopy	FACU	Tubling	10%	32
Total					100%	321

Supplemental Planting Along UT6

Scientific Name	Common Name	Stratum	Wetland Indicator Status	Container Type	Percentage of Stems	Number of Stems
<i>Amelanchier canadensis</i>	Canadian Serviceberry	Shrub	FAC	Tubling	3%	11
<i>Asimina triloba</i>	Pawpaw	Understory	FAC	Tubling	3%	11
<i>Betula nigra</i>	River Birch	Canopy	FACW	Tubling	10%	37
<i>Carpinus caroliniana</i>	American Hornbeam	Understory	FAC	Tubling	6%	22
<i>Diospyros virginiana</i>	Persimmon	Understory	FAC	Tubling	10%	37
<i>Hamamelis virginiana</i>	Witch Hazel	Understory	FACU	Tubling	6%	22
<i>Lindera benzoin</i>	Common Spicebush	Shrub	FAC	Tubling	3%	11
<i>Morus rubra</i>	Red Mulberry	Canopy	FACU	Tubling	5%	19
<i>Quercus michauxii</i>	Swamp Chestnut Oak	Canopy	FACW	Tubling	10%	37
<i>Quercus nigra</i>	Water Oak	Canopy	FAC	Tubling	10%	37
<i>Quercus pagoda</i>	Cherrybark Oak	Canopy	FACW	Gallon	5%	19
<i>Quercus phellos</i>	Willow Oak	Canopy	FAC	Tubling	10%	37
<i>Quercus shumardii</i>	Shumard Oak	Canopy	FAC	Tubling	10%	37
<i>Ulmus alata</i>	Winged Elm	Canopy	FACU	Tubling	9%	33
Total					100%	370

Riparian Seeding

Species Name	Common Name	Stratum	Wetland Status*	Percentage	Density (lbs/acre)
<i>Dichanthelium clandestinum</i>	Deertongue	Herb	FAC	15%	3
<i>Elymus virginicus</i>	Virginia Wild Rye	Herb	FACW	20%	4
<i>Panicum virgatum</i>	Switchgrass	Herb	FAC	5%	1
<i>Sorghastrum nutans</i>	Indiangrass	Herb	FACU	15%	3
<i>Rudbeckia hirta</i>	Blackeyed Susan	Herb	FACU	10%	2
<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis	Herb	FACU	10%	2

<i>Chamaecrista fasciculata</i>	Partridge Pea	Herb	FACU	2.5%	0.5
<i>Bidens aristosa</i>	Bur-Marigold	Herb	FACU	2.5%	0.5
<i>Schizachyrium scoparium</i>	Little Bluestem	Herb	FACU	20%	4
Total				100%	20