



MONITORING YEAR 2 ANNUAL REPORT

Final

MANEY FARM MITIGATION PROJECT

Chatham County, NC
NCDEQ Contract 005793
DMS ID No. 96314

Data Collection Period: March - September 2017
Draft Submission Date: November 14, 2017
Final Submission Date: December 6, 2017

PREPARED FOR:



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December 6, 2017

Jeff Schaffer
N.C. Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

RECEIVED

DEC 06 2017

DIVISION OF
MITIGATION SERVICES

RE: Monitoring Year 2 Report for Maney Farm Mitigation Project, Cape Fear River Basin – CU# 03030002
Chatham County, North Carolina
Contract No. 005793

Dear Mr. Schaffer,

We have reviewed the comments on the Monitoring Year 2 Report for the above referenced project dated November 29, 2017, 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.

- 1) DMS received the digital submissions on November 14, 2017. The digital data and drawings have been reviewed and determined to meet DMS requirements. However, DMS is calling to your attention that while Wildlands did provide reach breakdowns and mitigation approaches for each reach, in future submittals, please provide the reach lengths as required by contract and stated in DMS's Format, Data Requirements, and Content Guidance for Electronic Drawings Submitted to EEP version 1.0 (03/27/08).
An updated stream alignment GIS file has been submitted that includes reach lengths.

- 2) In paragraph one of the Executive Summary, paragraph two of Section 1 and Table 1, the assets and credits do not match up with the approved mitigation plan. Specifically, this DMS comment refers to:
 - a) the total stream credits
 - b) Reach UT 2A
 - c) Reach UT3B
 - d) Component lengths (lf) for Enhancement I and Enhancement II at the bottom of Table 1

Paragraph one of the Executive Summary, paragraph two of Section 1, and Table 1 have been updated to match the assets in the mitigation plan.





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 "JLorch".

Jason Lorch, *Monitoring Coordinator*

EXECUTIVE SUMMARY

Wildlands Engineering Inc. (Wildlands) implemented a full delivery project at the Maney Farm Mitigation Project (Site) for the North Carolina Division of Mitigation Services (DMS) to restore and enhance a total of 6,092 linear feet (LF) of perennial and intermittent streams in Chatham County, NC. The Site is expected to generate 4,922 stream mitigation units (SMUs) by closeout. The Site is located northwest of Pittsboro, NC and north of Silk Hope, NC in the Cape Fear River Basin 8-Digit Hydrologic Unit Code (HUC) 03030002 (Figure 1). The Site is also within the Cane Creek Targeted Local Watershed (HUC 03030002050050), which flows into Cane Creek and eventually into the Haw River. The streams are all unnamed tributaries (UT) to South Fork Cane Creek (SF) and are referred to herein as UT5F, UT1, UT2, UT3, UT4, and UT5.

The Site is located within the Cane Creek Targeted Local Watershed (TLW) which is discussed in DMS's 2009 Cape Fear River Basin Restoration Priorities (RBRP). The RBRP identifies the need to improve aquatic conditions and habitats as well as promoting good riparian conditions in the Cane Creek watershed. Prior to the restoration activities, the Site was maintained as cattle pasture and is one of the 51 animal operations referenced in the RBRP. The Site drains to the Haw River, which flows to B. Everett Jordan Lake (Jordan Lake). The 2005 NCDWR Cape Fear River Basinwide Water Quality Plan indicates that Jordan Lake is a drinking water supply (WS-IV), a primary area for recreation, and a designated Nutrient Sensitive Water which calls for reduction of non-point source pollution. The water supply watershed boundary for Jordan Lake is just six miles downstream from the Site. The Cape Fear watershed is also discussed in the 2005 North Carolina Wildlife Resource Commission's Wildlife Action Plan where sedimentation is noted as a major issue in the basin. Maps within the Wildlife Action Plan indicate that Priority Species are present along Cane Creek. Restoration activities at the Site directly addressed non-point source stressors by removing cattle from the streams, creating stable stream banks, restoring a riparian corridor, and placing 16.69 acres of land under permanent conservation easement.

The project goals established in the mitigation plan (Wildlands, 2015) were developed with careful consideration of goals and objectives that were described in the Cape Fear RBRP plan. The project goals included:

- Exclude cattle from project streams resulting in reduced pollutant inputs including fecal coliform, nitrogen, and phosphorous;
- Stabilize eroding stream banks resulting in reduced inputs of sediment into streams;
- Construct stream channels that are laterally and vertically stable resulting in a network of streams capable of supporting hydrologic, biologic, and water quality functions;
- Improve instream habitat resulting in improved aquatic communities within the streams;
- Reconnect channels with floodplains so that floodplains are inundated relatively frequently resulting in groundwater recharge, floodplain wetland and vernal pool inundation, and reduced shear stress on channels during larger flow events;
- Restore and enhance native floodplain forest resulting in stream shading, reduced thermal loads, woody input sources, and reduced flood flow velocities allowing for pollutants and sediments to settle; and
- Permanently protect the project site from harmful uses therefore ensuring that development and agricultural damage is prevented.

The project is helping meet the goals for the watershed and providing numerous ecological benefits within the Cape Fear River Basin. While many of these benefits are limited to the project area, others, such as pollutant removal and reduced sediment loading have farther-reaching effects. In addition, protected parcels downstream of this site promote cumulative project benefits within the watershed.



The Site construction and as-built surveys were completed between October 2015 and February 2016. A conservation easement is in place on 16.69 acres of the riparian corridors to protect them in perpetuity.

Monitoring Year 2 (MY2) assessments and site visits were completed between March and October, 2017 to assess the conditions of the project. Overall, the Site has met the required vegetation and stream success criteria for MY2. The overall average stem density for the standard planting zones at the Site is 453 stems per acre and is therefore on track to meet the MY3 requirement of 320 stems per acre. All restored and enhanced streams are stable and functioning as designed. Hydrologic monitoring stations with crest gages and pressure transducers were installed on the Site to document bankfull events on the restoration reaches. Multiple bankfull events have been recorded since project construction and therefore the Site has met the Monitoring Year 7 hydrology success criteria in which two or more bankfull events must have occurred in separate years within the restoration reaches. Additionally, a flow gage was established on the upstream, intermittent reach of UTSF Reach 1 to document flow during the annual monitoring period. The flow gage on UTSF Reach 1 recorded baseflow 137 consecutive days during the MY2 monitoring period and therefore met the established hydrologic criteria.



MANEY FARM MITIGATION PROJECT
Monitoring Year 2 Annual Report

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Section 1: PROJECT OVERVIEW

The Maney Farm Mitigation Project (Site) is located in northwestern Chatham County within the Cape Fear River Basin (USGS Hydrologic Unit 03030002). The Site is located off Center Church Road northwest of Pittsboro, and north of Silk Hope, North Carolina. The Site is located in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998). The project watershed consists primarily of agricultural and wooded land. The drainage area for project site is 211 acres (0.33 square miles).

The project streams consist of six unnamed tributaries to South Fork Cane Creek. Stream restoration reaches included UTSF (Reach 1 and 2) and UT5. Stream enhancement I (EI) and enhancement II (EII) reaches included UT1 (Reach A and B), EII; UT1 (Reach C), EI; UT2 (Reach A), EII; U2 (Reach B), EI; UT3 (Reach A), EII; U3 (Reach B), EI; and UT4 (Reach A), EII; U4 (Reach B), EI. Mitigation work within the Site included restoration and enhancement of 6,092 linear feet (LF) of perennial and intermittent stream channels. The riparian areas were planted with native vegetation to improve habitat and protect water quality. Construction activities were completed by Land Mechanic Designs, Inc. in January 2016. Planting and seeding activities were completed by Bruton Natural Systems, Inc. in February 2016. A conservation easement (16.69 ac; Deed Book 1537, Page 876) has been recorded and is in place along the stream and riparian corridors to protect them in perpetuity within a tract owned by the M. Darryl Lindley Revocable Trust. The project is expected to provide 4,922 stream mitigation units (SMU's) by closeout.

Directions and a map of the Site are provided in Figure 1 and project components are illustrated for the Site in Figure 2.

1.1 Project Goals and Objectives

Prior to construction activities, the streams and vegetative communities on the Site had been severely impacted due to livestock having direct access to the streams and riparian zones. Table 4 in Appendix 1 and Tables 10a through 10d in Appendix 4 present the pre-restoration conditions in detail.

This Site is intended to provide numerous ecological benefits within the Cape Fear River Basin. While many of these benefits are limited to the Maney Farm Mitigation Project area, others such as pollutant removal and reduced sediment loading have more far-reaching effects. Expected improvements to water quality and ecological processes are outlined below as project goals and objectives. These project goals were established and completed with careful consideration of goals and objectives that were described in the RBRP and to meet the DMS mitigation needs while maximizing the ecological and water quality uplift within the watershed.



The following project goals and related objectives established in the mitigation plan (Wildlands, 2015) included:

Goal	Objective	Expected Outcomes
Exclude cattle from project streams	Install fencing around conservation easements adjacent to cattle pastures.	Reduce pollutant inputs including fecal coliform, nitrogen, and phosphorous.
Stabilize eroding stream banks	Reconstruct stream channels with stable dimensions. Add bank revetments and in-stream structures to protect restored/enhanced streams.	Reduce inputs of sediment into streams.
Construct stream channels that are laterally and vertical stable	Construct stream channels that will maintain a stable pattern and profile considering the hydrologic and sediment inputs to the system, the landscape setting, and the watershed conditions.	Return a network of streams to a stable form that is capable of supporting hydrologic, biologic, and water quality functions.
Improve instream habitat	Install habitat features such as constructed riffles and brush toes into restored/enhanced streams. Add woody materials to channel beds. Construct pools of varying depth.	Improve aquatic communities in project streams.
Reconnect channels with floodplains so that floodplains are inundated relatively frequently	Reconstructing stream channels with appropriate bankfull dimensions and depth relative to the existing floodplain.	Raise local groundwater elevations. Inundate floodplain wetlands and vernal pools. Reduce shear stress on channels during larger flow events.
Restore and enhance native floodplain forest	Plant native tree and understory species in riparian zone.	Create and improve forested riparian habitats. Provide a canopy to shade streams and reduce thermal loadings. Create a source of woody inputs for streams. Reduce flood flow velocities on floodplain and allow pollutants and sediment to settle.
Permanently protect the project site from harmful uses	Establish a conservation easement on the site.	Ensure that development and agricultural uses that would damage the site or reduce the benefits of the project are prevented.

The design streams were restored to the appropriate type based on the surrounding landscape, climate, and natural vegetation communities but also with strong consideration to existing watershed conditions and trajectory. The final mitigation plan was submitted and accepted by the DMS in August 2015. Construction activities were completed by Land Mechanic Designs, Inc. in January 2016. Planting and seeding activities were completed by Bruton Natural Systems, Inc. in February 2016. Baseline monitoring (MY0) was conducted between January 2016 and February 2016. Annual monitoring will be conducted for seven years with the close-out anticipated to commence in 2022 given the success criteria are met. Appendix 1 provides more detailed project activity, history, contact information, and watershed/site background information for the Site.

1.2 Monitoring Year 2 Data Assessment

Annual monitoring and quarterly site visits were conducted during MY2 to assess the condition of the project. The stream and vegetation success criteria for the Site follows the approved success criteria presented in the Maney Farm Mitigation Project Mitigation Plan (Wildlands, 2015).

1.2.1 Vegetative Assessment

Planted woody vegetation is being monitored in accordance with the guidelines and procedures developed by the Carolina Vegetation Survey-EEP Level 2 Protocol (Lee et al., 2008). A total of 13 standard 10-meter by 10-meter vegetation plots and one non-standard 5-meter by 20-meter plot were established during the baseline monitoring within the project easement area. Plots were established to monitor both the standard planting zones (11 plots) as well as the supplemental planting zones (3 plots).

The final vegetative success criteria will be the survival of 210 planted stems per acre in the standard planting zones at the end of the seven-year monitoring period (MY7). The interim measure of vegetative success within the standard planting zones will be the survival of at least 320 planted stems per acre at the end of year three of the monitoring period (MY3) and at least 260 stems per acre at the end of the fifth year of monitoring (MY5). Planted vegetation must average 10 feet in height in each standard planting zone plot at the end of the seventh year of monitoring. If this performance standard is met by MY5 and stem density is trending towards success (i.e., no less than 260 five-year-old stems per acre), monitoring of vegetation on the Site may be terminated provided written approval is provided by the United States Army Corps of Engineers in consultation with the NC Interagency Review Team.

While there are no performance criteria for the stems established within the supplemental planting zones, these areas are monitored to document survival rates of these species.

The MY2 vegetative survey was completed in August 2017. The 2017 vegetation monitoring resulted in an average stem density of 453 stems per acre within the standard planting zones, which is well above the interim requirement of 320 stems per acre required at MY3 and approximately 30% less than the baseline density recorded (647 stems per acre). There was an average of 11 stems per plot as compared to an average of 16 stems per plot in MY0. All 11 of the plots are on track to meet the success criteria required for MY7 (Table 9a, Appendix 3).

Stem densities were monitored in the three supplemental planting zone plots to document annual survival rates within these zones. The overall average survival rate within these plots was 46% since establishment, indicating a significant mortality rate since the MY1 monitoring (Table 7b, Appendix 3). The survival rates of the species selected for these supplemental planting zones ranged from 76% (*Carpinus caroliniana*) to 0% (*Viburnum prunifolium*) in MY2 (Table 7c, Appendix 3).

Refer to Appendix 2 for vegetation plot photographs and the vegetation condition assessment table and Appendix 3 for vegetation data tables.

1.2.2 Vegetation Areas of Concern

Based on results from the supplemental planting zone plots, significant declines in survival rates occurred between MY1 and MY2 for the majority of these species. While these monitoring plots are not associated with the site success criteria, the high mortality rates are noted as an area of concern that will continue to be monitored and documented.

1.2.3 Stream Assessment

Morphological surveys for MY2 were conducted in March 2017. All streams within the site are stable.



In general, cross sections at the Site show little to no change in the bankfull area, maximum depth ratio, or width-to-depth ratio. The deposition noted in MY1 for the pools on UT1C, UT2B, UT3B, and UT4B have stabilized and cross-sectional areas fall within the range of the design parameters. Slight increases in bank height ratios for some cross sections are likely the result of the established vegetation causing some increases in deposition along the bankfull benches. Bank height ratios fall within the range for success stated in the mitigation plan.

A bank pin array was established on UTSF Reach 1 to monitor potential meander bend bank erosion at cross section 4. No changes in exposed length of bank pins were observed during the MY2 assessments indicating there has been no erosion of the bank at this cross section.

Longitudinal profile surveys are not required on the project unless visual inspection indicates reach wide vertical instability. Refer to Appendix 2 for the visual stability assessment table, CCPV map, and reference photographs. Refer to Appendix 4 for the morphological data and plots.

In general, substrate materials in the restoration and enhancement reaches indicated maintenance of coarser materials in the riffle reaches and finer particles in the pools.

1.2.4 Stream Areas of Concern

No stream areas of concern were identified during MY2.

1.2.5 Hydrology Assessment

At the end of the seven-year monitoring period, two or more bankfull events must have occurred in separate years within the restoration reaches. Bankfull events were recorded on all restoration reaches during MY1 and MY2 resulting in attainment of the stream hydrology assessment criteria. In addition, the presence of baseflow must be documented within the intermittent reach of UTSF Reach 1 for a minimum of 30 days during a normal precipitation year. Results from the flow gage established on UTSF Reach 1 indicate the stream is maintaining baseflow as expected for an intermittent stream. Baseflow was recorded for 47% of the monitoring period (137 consecutive days and 191 total days). Refer to Appendix 5 for hydrologic data.

1.2.6 Maintenance Plan

No maintenance plan is necessary at this time. Wildlands will continue to monitor bankfull depositional features within the restoration reaches. If subsequent monitoring efforts indicate a trend toward instability associated with these minor stream adjustments, a maintenance plan will be developed.

1.3 Monitoring Year 2 Summary

All streams within the Site are stable and functioning as designed. All vegetation plots are on track to meet the MY3 requirement of 320 stems per acre as noted in CCPV. Multiple bankfull events have been documented within the restored stream reaches at the Site in both MY1 and MY2, therefore the Site has met the Monitoring Year 7 hydrology success criteria. Additionally, the flow gage on UTSF Reach 1 recorded baseflow for 137 consecutive days during the MY2 monitoring period and therefore met the established hydrological criteria. All restored and enhanced streams are stable and functioning as designed.

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. Narrative background and supporting information formerly found in these reports can be found in the Mitigation Plan documents available on DMS's website. All raw data supporting the tables and figures in the appendices are available from DMS upon request.



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. Crest gages and pressure transducers were installed in surveyed riffle cross sections 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).

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.
- Lee, M.T., Peet, R.K., S.D., Wentworth, T.R. 2008. CVS-EEP Protocol for Recording Vegetation Version 4.2. Retrieved from <http://cvs.bio.unc.edu/protocol/cvs-eep-protocol-v4.2-lev1-5.pdf>.
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- United States Army Corps of Engineers. 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.
- United States Geological Survey. 1998. North Carolina Geology. <http://www.geology.enr.state.nc.us/usgs/carolina.htm>
- Wildlands Engineering, Inc. 2016. Maney Farm Mitigation Project Baseline Monitoring Document and As-Built Baseline Report. DMS, Raleigh, NC.
- Wildlands Engineering, Inc. 2015. Maney Farm Mitigation Project Mitigation Plan. DMS, Raleigh, NC.



APPENDIX 1. General Figures and Tables

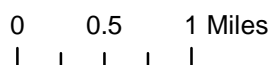
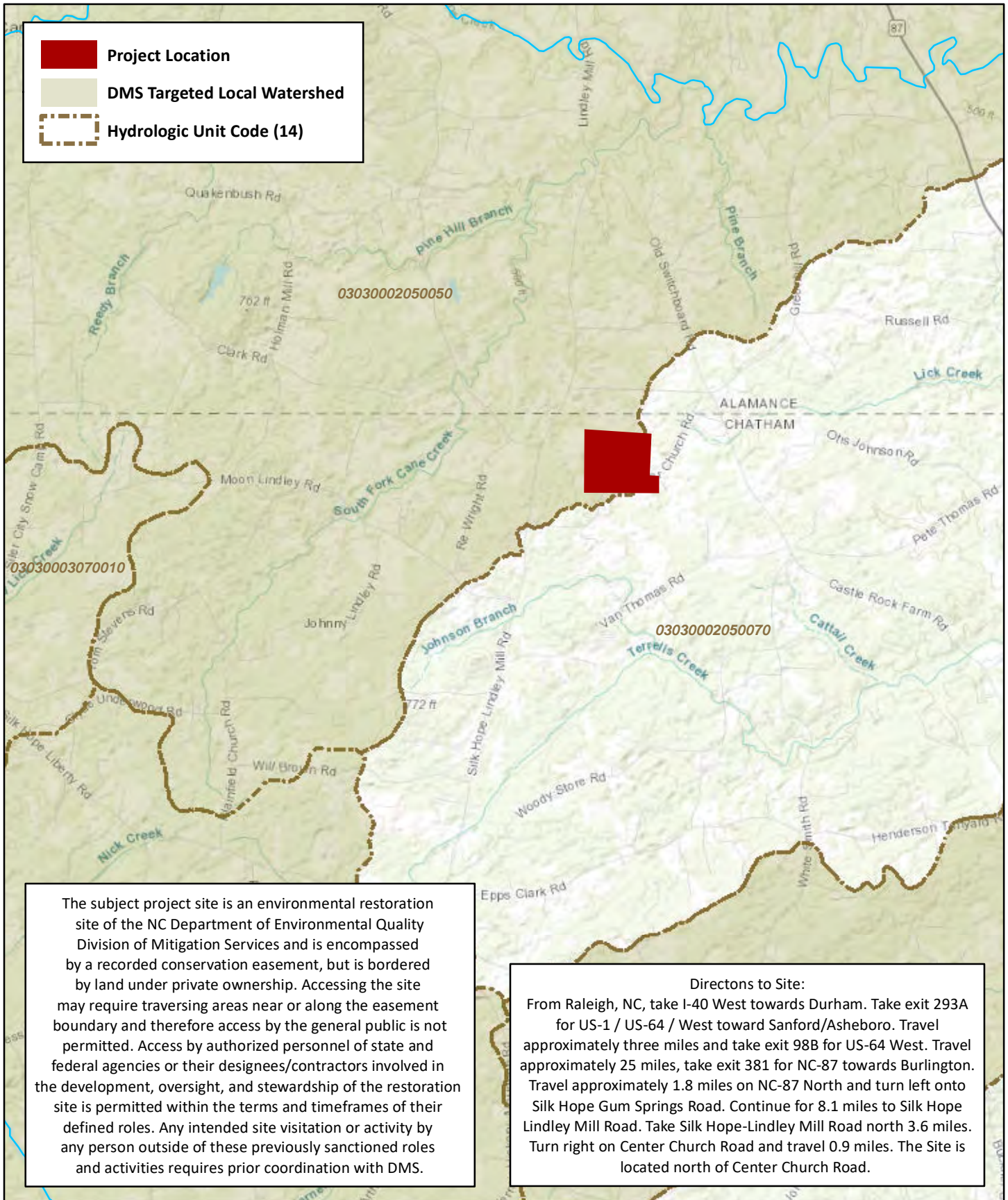


Figure 1 Project Vicinity Map
 Maney Farm Mitigation Project
 DMS Project No. 96314
 Monitoring Year 2 - 2017
 Chatham County, NC



Figure 2 Project Component/Asset Map
 Maney Farm Mitigation Project
 DMS Project No. 96314
 Monitoring Year 2 - 2017
 Chatham County, NC

Table 1. Project Components and Mitigation Credits

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

Mitigation Credits									
	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	4,922	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Project Components									
Reach ID	As-Built Stationing / Location	Existing Footage / Acreage	Approach	Restoration or Restoration Equivalent	Restoration Footage / Acreage	Mitigation Ratio	Credits (SMU / WMU)		
STREAMS									
UTSF - Reach 1	100+00 - 108+39 108+80 - 121+63	2,298	P1	Restoration	2,122	1:1	2,122		
UTSF - Reach 2	121+63 - 132+24	1,209	P1	Restoration	1,061	1:1	1,061		
UT1A	250+00 - 253+90	390	EII	Restoration	390	2.5:1	156		
UT1B	199+08 - 200+00	101	EII	Restoration	92	2.5:1	37		
UT1C	200+00 - 202+60	166	EI	Restoration	260	1.5:1	173		
UT2A	295+15 - 300+00	485	EII	Restoration	484	2.5:1	194		
UT2B	300+00 - 300+74	44	EI	Restoration	73	1.5:1	49		
UT3A	395+79 - 400+00	418	EII	Restoration	421	2.5:1	168		
UT3B	400+00 - 401+63	84	EI	Restoration	162	1.5:1	108		
UT4A	497+87 - 500+00	217	EII	Restoration	212	2.5:1	85		
UT4B	500+00 - 501+38	40	EI	Restoration	138	1.5:1	92		
UT5	602+00 - 608+77	778	P1	Restoration	677	1:1	677		

Component Summation						
Restoration Level	Stream (LF)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)	Buffer (square feet)	Upland (acres)
		Riverine	Non-Riverine			
Restoration	3,860	-	-	-	-	-
Enhancement		-	-	-	-	-
Enhancement I	633					
Enhancement II	1,599					
Creation		-	-	-	-	-
Preservation		-	-	-	-	-
High Quality Preservation		-	-	-	-	-

* Credit calculations were originally calculated along the as-built thalweg and updated to be calculated along stream centerlines for Monitoring Year 2 after discussions with NC IRT.

Table 2. Project Activity and Reporting History

Maney Farm Mitigation Project
 DMS Project No.96314
Monitoring Year 2 - 2017

Activity or Report	Data Collection Complete	Completion or Scheduled Delivery
Mitigation Plan	July 2014	August 2015
Final Design - Construction Plans	July 2014	August 2015
Construction	October 2015 - January 2016	January 2016
Temporary S&E mix applied to entire project area ¹	October 2015 - January 2016	January 2016
Permanent seed mix applied to reach/segments ¹	October 2015 - January 2016	January 2016
Bare root and live stake plantings for reach/segments	February 2016	February 2016
Baseline Monitoring Document (Year 0)	Stream Survey	February 2016
	Vegetation Survey	February 2016
Year 1 Monitoring	Stream Survey	September 2016
	Vegetation Survey	September 2016
Year 2 Monitoring	Stream Survey	March 2017
	Vegetation Survey	August 2017
Year 3 Monitoring	Stream Survey	2018
	Vegetation Survey	2018
Year 4 Monitoring	Stream Survey	2019
	Vegetation Survey	2019
Year 5 Monitoring	Stream Survey	2020
	Vegetation Survey	2020
Year 6 Monitoring	Stream Survey	2021
	Vegetation Survey	2021
Year 7 Monitoring	Stream Survey	2022
	Vegetation Survey	2022

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

Table 3. Project Contact Table

Maney Farm Mitigation Site
 DMS Project No.96314
Monitoring Year 2 - 2017

Designer Jeff Keaton, 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
Planting Contractor	Bruton Natural Systems, Inc P.O. Box 1197 Fremont, NC 27830
Seeding Contractor	Land Mechanic Designs, Inc. 126 Circle G Lane Willow Spring, NC 27592
Seed Mix Sources	Green Resource, LLC
Nursery Stock Suppliers Bare Roots Live Stakes	Bruton Natural Systems, Inc
Monitoring Performers	Wildlands Engineering, Inc.
Monitoring, POC	Jason Lorch 919-851-9986

Table 4. Project Information and Attributes

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

Project Information									
Project Name	Maney Farm Mitigation Site								
County	Chatham County								
Project Area (acres)	16.69								
Project Coordinates (latitude and longitude)	35°50'18.00" N, 79° 20'38.00" W								
Project Watershed Summary Information									
Physiographic Province	Carolina Slate Belt of the Piedmont Physiographic Province								
River Basin	Cape Fear								
USGS Hydrologic Unit 8-digit	03030002								
USGS Hydrologic Unit 14-digit	03030002050050								
DWR Sub-basin	03-06-04								
Project Drainage Area (acres)	211								
Project Drainage Area Percentage of Impervious Area	3%								
CGIA Land Use Classification	69% – Agriculture/Managed Herbaceous; 28% – Forested/Scrubland; 3% - Developed								
Reach Summary Information									
Parameters	UTSF-R1	UTSF-R2	UT1A	UT1B	UT1C	UT2A/B	UT3A/B	UT4A/B	UT5
Length of Reach (linear feet) - Post-Restoration	2,122	1,061	390	92	260	557	583	350	677
Drainage Area (acres)	115	211	16	4	19	11	10	20	76
NCDWR Stream Identification Score	27/37	37	21	25.5	28	26/30	20.75	22.5	32.5
NCDWR Water Quality Classification	N/A								
Morphological Description (stream type)	I/P	P	I	I	I	I/P	I	I	P
Evolutionary Trend (Simon's Model) - Pre-Restoration	II/IV	II/IV	III	V	II/IV	II/V	V/VI	II/V	II/III
Underlying Mapped Soils	Cid Silt Loam, Cid-Lignum Complex, Nanford-Badin Complex, Georgeville Silty Clay Loam								
Drainage Class	Well Drained - Moderately Well Drained								
Soil Hydric Status	Cid-Lignum Complex 2 to 6 percent slopes - Hydric								
Slope	0.0131	0.0086	0.0187	0.0396	0.0187	0.0366	0.0377	0.0232	0.0139
FEMA Classification	X								
Native Vegetation Community	Piedmont Bottomland Forest								
Percent Composition Exotic Invasive Vegetation - Post-Restoration	0%								
Regulatory Considerations									
Regulation	Applicable?			Resolved?			Supporting Documentation		
Waters of the United States - Section 404	X			X			USACE Nationwide Permit No.27 and DWR 401 Water Quality Certification No. 3885.		
Waters of the United States - Section 401	X			X					
Division of Land Quality (Dam Safety)	N/A			N/A			N/A		
Endangered Species Act	X			X			Maney Farm Mitigation Plan; Wildlands determined "no effect" on Chatham County listed endangered species. The USFWS responded on April 4, 2014 and concurred with NCWRC stating that "the proposed action is not likely to adversely affect any federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act."		
Historic Preservation Act	X			X			Correspondence from SHPO on March 24, 2014 indicating they were not aware of any historic resources that would be affected by the project.		
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	N/A			N/A			N/A		
FEMA Floodplain Compliance	X			X			Correspondence from Chatham County Public Works Director on January 12, 2015 stated that a floodplain development permit is not required since work is not occurring is not located in a Special Flood Hazard Area.		
Essential Fisheries Habitat	N/A			N/A			N/A		

APPENDIX 2. Visual Assessment Data



Figure 3.0 Integrated Current Condition Plan View (Key)
 Maney Farm Mitigation Project
 DMS Project No. 96314
 Monitoring Year 2 - 2017
 Chatham County, NC



0 250 500 Feet



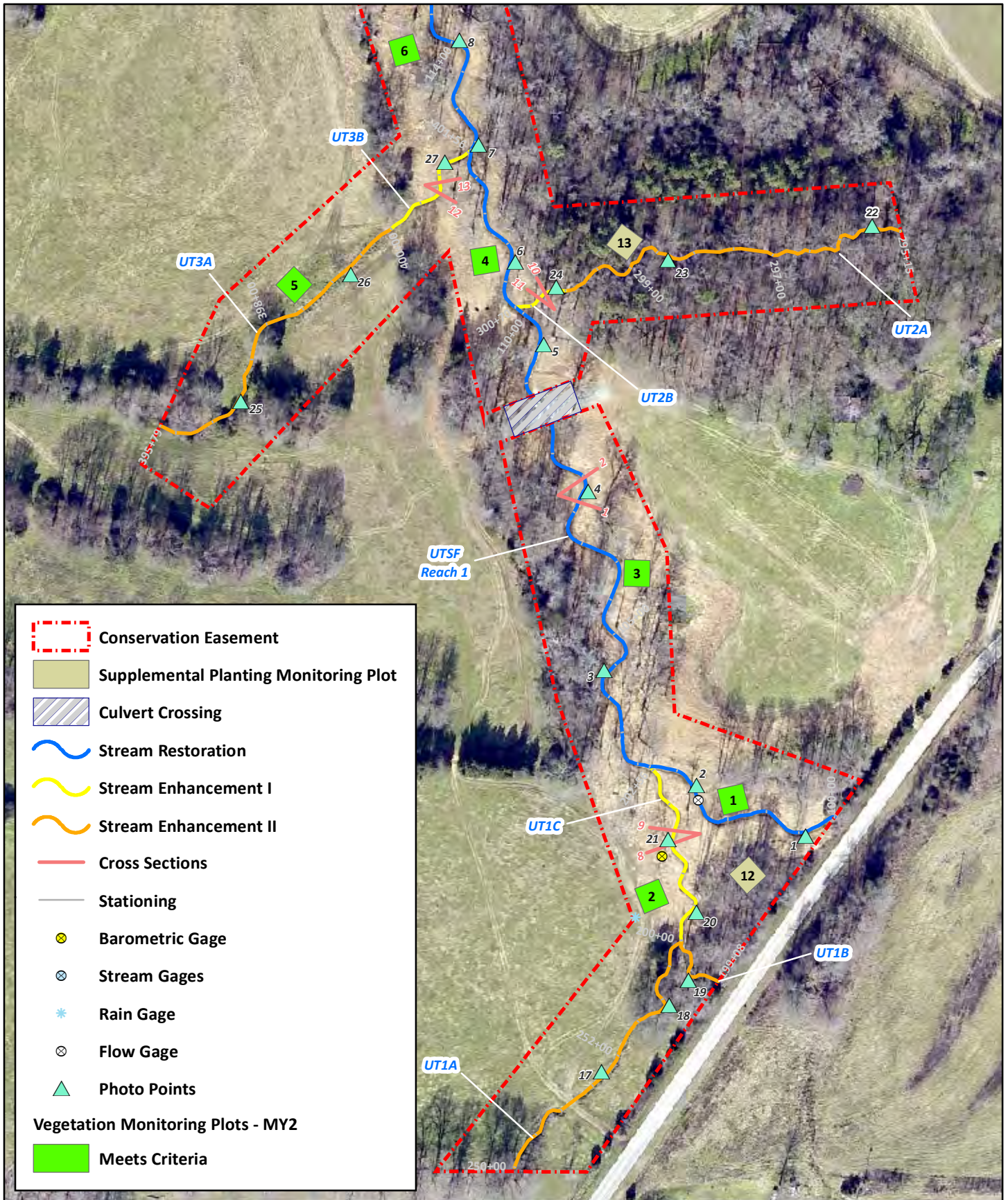
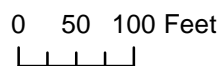


Figure 3.1 Integrated Current Condition Plan View
 Maney Farm Mitigation Project
 DMS Project No. 96314
 Monitoring Year 2 - 2017
 Chatham County, NC



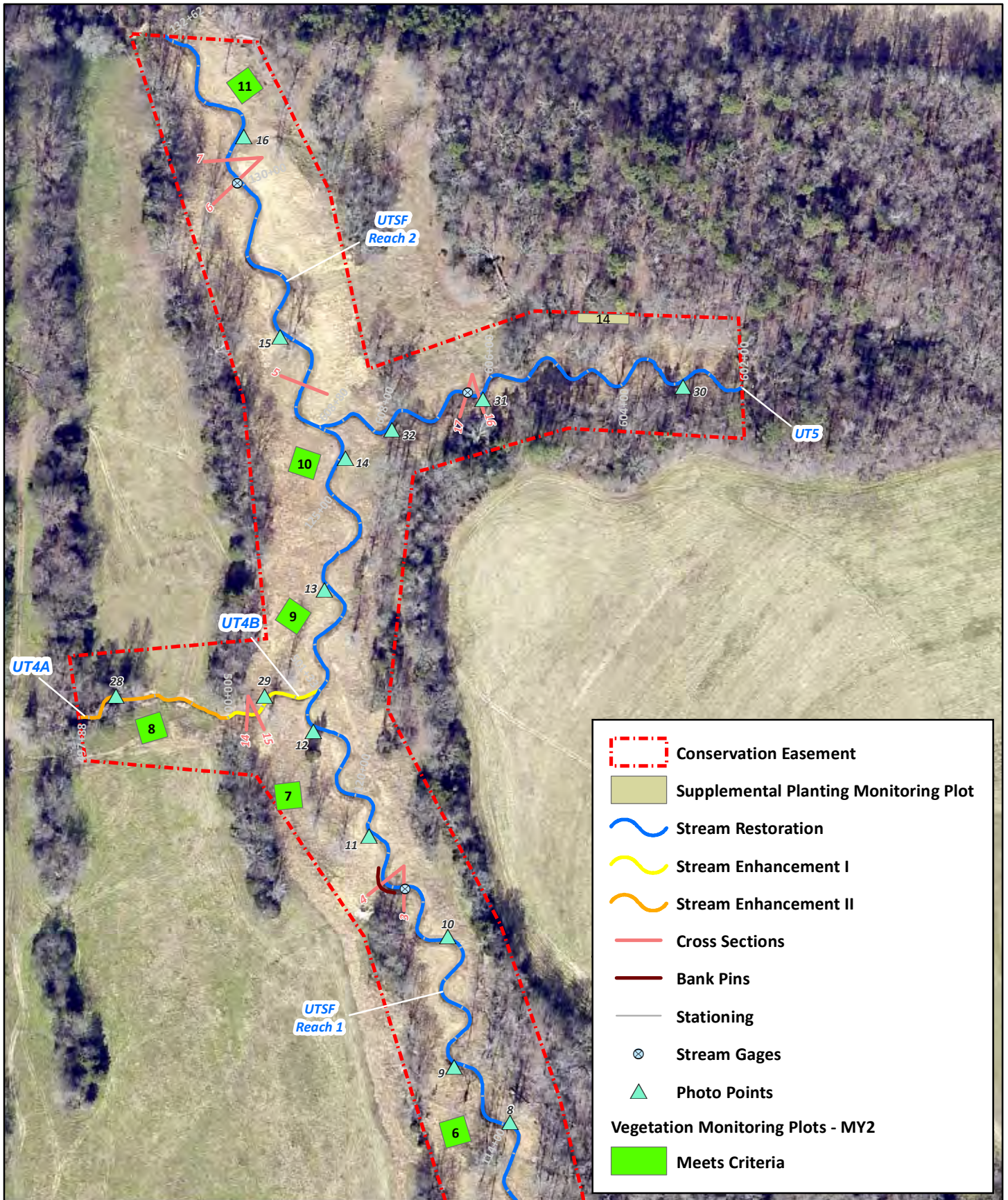


Figure 3.2 Integrated Current Condition Plan View
 Maney Farm Mitigation Project
 DMS Project No. 96314
 Monitoring Year 2 - 2017
 Chatham County, NC



0 50 100 Feet
 [Scale bar]



Table 5a. Visual Stream Morphology Stability Assessment Table

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

UTSF Reach 1 (2,142 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	38	38		100%				
	3. Meander Pool Condition	Depth Sufficient	38	38		100%				
		Length Appropriate	38	38		100%				
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	37	37		100%				
		Thalweg centering at downstream of meander bend (Glide)	38	38		100%				
Totals					0	0	100%	n/a	n/a	n/a
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals					0	0	100%	n/a	n/a	n/a
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	30	30			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	16	16			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	16	16			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	14	14			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	14	14			100%			

¹Excludes constructed riffles since they are evaluated in section 1.

Table 5b. Visual Stream Morphology Stability Assessment Table

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

UTSF Reach 2 (1,077 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	17	17		100%				
	3. Meander Pool Condition	Depth Sufficient	16	16		100%				
		Length Appropriate	16	16		100%				
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	16	16		100%				
Thalweg centering at downstream of meander bend (Glide)		16	16	100%						
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals					0	0	100%	n/a	n/a	n/a
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	10	10			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	7	7			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	7	7			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	3	3			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	3	3			100%			

¹Excludes constructed riffles since they are evaluated in section 1.

Table 5c. Visual Stream Morphology Stability Assessment Table

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

UT1C (256 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	9	9		100%				
	3. Meander Pool Condition	Depth Sufficient	8	8		100%				
		Length Appropriate	8	8		100%				
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	8	8		100%				
		Thalweg centering at downstream of meander bend (Glide)	8	8		100%				
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals					0	0	100%	n/a	n/a	n/a
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	n/a	n/a			n/a			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	n/a	n/a			n/a			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	n/a	n/a			n/a			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	n/a	n/a			n/a			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	n/a	n/a			n/a			

¹Excludes constructed riffles since they are evaluated in section 1.

Table 5d. Visual Stream Morphology Stability Assessment Table

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

UT2B (70 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	3	3		100%				
	3. Meander Pool Condition	Depth Sufficient	2	2		100%				
		Length Appropriate	2	2		100%				
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	2	2		100%				
		Thalweg centering at downstream of meander bend (Glide)	2	2		100%				
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals					0	0	100%	n/a	n/a	n/a
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	n/a	n/a			n/a			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	n/a	n/a			n/a			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	n/a	n/a			n/a			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	n/a	n/a			n/a			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	n/a	n/a			n/a			

¹Excludes constructed riffles since they are evaluated in section 1.

Table 5e. Visual Stream Morphology Stability Assessment Table

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

UT3B (155 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	5	5		100%				
	3. Meander Pool Condition	Depth Sufficient	4	4		100%				
		Length Appropriate	4	4		100%				
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	4	4		100%				
		Thalweg centering at downstream of meander bend (Glide)	4	4		100%				
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals					0	0	100%	n/a	n/a	n/a
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	n/a	n/a			n/a			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	n/a	n/a			n/a			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	n/a	n/a			n/a			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	n/a	n/a			n/a			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	n/a	n/a			n/a			

¹Excludes constructed riffles since they are evaluated in section 1.

Table 5f. Visual Stream Morphology Stability Assessment Table

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

UT4B (133 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	5	5		100%				
	3. Meander Pool Condition	Depth Sufficient	4	4		100%				
		Length Appropriate	4	4		100%				
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	4	4		100%				
		Thalweg centering at downstream of meander bend (Glide)	4	4	100%					
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals					0	0	100%	n/a	n/a	n/a
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	n/a	n/a			n/a			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	n/a	n/a			n/a			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	n/a	n/a			n/a			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	n/a	n/a			n/a			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	n/a	n/a			n/a			

¹Excludes constructed riffles since they are evaluated in section 1.

Table 5g. Visual Stream Morphology Stability Assessment Table

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

UTS (680 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	17	17		100%				
	3. Meander Pool Condition	Depth Sufficient	16	16		100%				
		Length Appropriate	16	16		100%				
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	16	16		100%				
		Thalweg centering at downstream of meander bend (Glide)	16	16		100%				
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals					0	0	100%	n/a	n/a	n/a
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	9	9			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	9	9			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	9	9			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	n/a	n/a			n/a			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	n/a	n/a			n/a			

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6. Vegetation Condition Assessment Table

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

Planted Acreage 16

Vegetation Category	Definitions	Mapping Threshold (Ac)	Number of Polygons	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material	0.1	0	0	0.0%
Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1	0	0.0	0.0%
Total			0	0.0	0.0%
Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 Ac	0	0	0%
Cumulative Total			0	0.0	0.0%

Easement Acreage 17

Vegetation Category	Definitions	Mapping Threshold (SF)	Number of Polygons	Combined Acreage	% of Easement Acreage
Invasive Areas of Concern	Areas of points (if too small to render as polygons at map scale).	1,000	0	0	0.0%
Easement Encroachment Areas	Areas of points (if too small to render as polygons at map scale).	none	0	0	0%

Stream Photographs



UTSF R1 – Photo Point 1 looking upstream (03/09/2017)



UTSF R1 – Photo Point 1 looking downstream (03/09/2017)



UTSF R1 – Photo Point 2 looking upstream (03/09/2017)



UTSF R1 – Photo Point 2 looking downstream (03/09/2017)



UTSF R1 – Photo Point 3 looking upstream (03/09/2017)



UTSF R1 – Photo Point 3 looking downstream (03/09/2017)



UTSF R1 – Photo Point 4 looking upstream (03/09/2017)



UTSF R1 – Photo Point 4 looking downstream (03/09/2017)



UTSF R1 – Photo Point 5 looking upstream (03/09/2017)



UTSF R1 – Photo Point 5 looking downstream (03/09/2017)



UTSF R1 – Photo Point 6 looking upstream (03/09/2017)



UTSF R1 – Photo Point 6 looking downstream (03/09/2017)



UTSF R1 – Photo Point 7 looking upstream (03/09/2017)



UTSF R1 – Photo Point 7 looking downstream (03/09/2017)



UTSF R1 – Photo Point 8 looking upstream (03/09/2017)



UTSF R1 – Photo Point 8 looking downstream (03/09/2017)



UTSF R1 – Photo Point 9 looking upstream (03/09/2017)



UTSF R1 – Photo Point 9 looking downstream (03/09/2017)



UTSF R1 – Photo Point 10 looking upstream (03/09/2017)



UTSF R1 – Photo Point 10 looking downstream (03/09/2017)



UTSF R1 – Photo Point 11 looking upstream (03/09/2017)



UTSF R1 – Photo Point 11 looking downstream (03/09/2017)



UTSF R1 – Photo Point 12 looking upstream (03/09/2017)



UTSF R1 – Photo Point 12 looking downstream (03/09/2017)



UTSF R2 – Photo Point 13 looking upstream (03/09/2017)



UTSF R2 – Photo Point 13 looking downstream (03/09/2017)



UTSF R2 – Photo Point 14 looking upstream (03/09/2017)



UTSF R2 – Photo Point 14 looking downstream (03/09/2017)



UTSF R2 – Photo Point 15 looking upstream (03/09/2017)



UTSF R2 – Photo Point 15 looking downstream (03/09/2017)



UTSF R2 – Photo Point 16 looking upstream (03/09/2017)



UTSF R2 – Photo Point 16 looking downstream (03/09/2017)



UT1A – Photo Point 17 looking upstream (03/09/2017)



UT1A – Photo Point 17 looking downstream (03/09/2017)



UT1A – Photo Point 18 looking upstream (03/09/2017)



UT1A – Photo Point 18 looking downstream (03/09/2017)



UT1B – Photo Point 19 looking upstream (03/09/2017)



UT1B – Photo Point 19 looking downstream (03/09/2017)



UT1C – Photo Point 20 looking upstream (03/09/2017)



UT1C – Photo Point 20 looking downstream (03/09/2017)



UT1C – Photo Point 21 looking upstream (03/09/2017)



UT1C – Photo Point 21 looking downstream (03/09/2017)



UT2A – Photo Point 22 looking upstream (03/09/2017)



UT2A – Photo Point 22 looking downstream (03/09/2017)



UT2A – Photo Point 23 looking upstream (03/09/2017)



UT2A – Photo Point 23 looking downstream (03/09/2017)



UT2B – Photo Point 24 looking upstream (03/09/2017)



UT2B – Photo Point 24 looking downstream (03/09/2017)



UT3A – Photo Point 25 looking upstream (03/09/2017)



UT3A – Photo Point 25 looking downstream (03/09/2017)



UT3A – Photo Point 26 looking upstream (03/09/2017)



UT3A – Photo Point 26 looking downstream (03/09/2017)



UT3B – Photo Point 27 looking upstream (03/09/2017)



UT3B – Photo Point 27 looking downstream (03/09/2017)



UT4A – Photo Point 28 looking upstream (03/09/2017)



UT4A – Photo Point 28 looking downstream (03/09/2017)



UT4B – Photo Point 29 looking upstream (03/09/2017)



UT4B – Photo Point 29 looking downstream (03/09/2017)



UT5 – Photo Point 30 looking upstream (03/09/2017)



UT5 – Photo Point 30 looking downstream (03/09/2017)



UT5 – Photo Point 31 looking upstream (03/09/2017)



UT5 – Photo Point 31 looking downstream (03/09/2017)



UT5 – Photo Point 32 looking upstream (03/09/2017)



UT5 – Photo Point 32 looking downstream (03/09/2017)

VEGETATION PHOTOGRAPHS



VEGETATION PLOT 1 – (08/24/2017)



VEGETATION PLOT 2 – (08/24/2017)



VEGETATION PLOT 3 – (08/24/2017)



VEGETATION PLOT 4 – (08/24/2017)



VEGETATION PLOT 5 – (08/24/2017)



VEGETATION PLOT 6 – (08/24/2017)



VEGETATION PLOT 7 – (08/24/2017)



VEGETATION PLOT 8 – (08/24/2017)



VEGETATION PLOT 9 – (08/24/2017)



VEGETATION PLOT 10 – (08/24/2017)



VEGETATION PLOT 11 – (08/24/2017)



VEGETATION PLOT 12 – (08/24/2017)



VEGETATION PLOT 13 – (08/24/2017)



VEGETATION PLOT 14 – (08/24/2017)

APPENDIX 3. Vegetation Plot Data

Table 7a. Vegetation Plot Criteria Attainment Table (Standard Planting Zones)

Maney Farm Mitigation Project
 DMS Project No.96314
Monitoring Year 2 - 2017

Plot	Success Criteria Met (Y/N)	Tract Mean
1	Y	100%
2	Y	
3	Y	
4	Y	
5	Y	
6	Y	
7	Y	
8	Y	
9	Y	
10	Y	
11	Y	

Table 7b. Percent Survival by Plot Table (Supplemental Planting Zones)

Maney Farm Mitigation Project
 DMS Project No.96314
Monitoring Year 2 - 2017

Plot	MY0 Stems/Plot	MY1 Stems/Plot	MY2 Stems/Plot	MY1 Survival (%)	MY2 Survival (%)	MY1 Mean Survival (%)	MY2 Mean Survival (%)
12	16	13	5	81%	31%	83%	46%
13	16	15	10	94%	63%		
14	16	12	7	75%	44%		

Table 7c. Percent Survival by Species Table (Supplemental Planting Zones)

Maney Farm Mitigation Project
 DMS Project No.96314
Monitoring Year 2 - 2017

Scientific Name	Common Name	MY0 Stems	MY1 Stems	MY2 Stems	MY1 Survival (%)	MY2 Survival (%)
<i>Aesculus pavia</i>	Red buckeye	3	3	1	100%	33%
<i>Callicarpa americana</i>	American beautyberry	11	9	1	82%	9%
<i>Calycanthus floridus</i>	Sweet-shrub	6	4	2	67%	33%
<i>Carpinus caroliniana</i>	American hornbeam	17	16	13	94%	76%
<i>Symphoricarpos orbiculatus</i>	Coralberry	10	7	5	70%	50%
<i>Viburnum prunifolium</i>	Black haw	1	1	0	100%	0%

Table 8. CVS Vegetation Tables - Metadata

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

Report Prepared By	Carolyn Lanza
Date Prepared	8/29/2017
Database Name	Maney Farm MY2- cvs-eep-entrytool-v2.5.0.mdb
Database Location	F:\Projects\005-02144 Maney Farm\Monitoring\Monitoring Year 2\Vegetation Assessment
Computer Name	CAROLYN
File Size	94806016
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT-----	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Project Planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Project Total Stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
ALL Stems by Plot and Spp	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
PROJECT SUMMARY-----	
Project Code	96314
Project Name	Maney Farm
Description	Stream Mitigation
Sampled Plots	14

Table 9a. Planted and Total Stems (Standard Planting Zones)

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

Scientific Name	Common Name	Species Type	Current Plot Data (MY2 2017)																							
			Vegetation Plot 1			Vegetation Plot 2			Vegetation Plot 3			Vegetation Plot 4			Vegetation Plot 5			Vegetation Plot 6			Vegetation Plot 7					
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T			
Acer negundo	Boxelder	Tree						2																		
Acer rubrum	Red maple	Tree														1										
Alnus serrulata	Tag alder	Shrub/Tree	1	1	1																					
Betula nigra	River birch	Tree	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	3	3	3						
Calycanthus floridus	Sweet-shrub	Shrub											1	1	1											
Carpinus caroliniana	American hornbeam	Shrub/Tree							2	2	2															
Fraxinus pennsylvanica	Green ash	Tree	3	3	34	3	3	19	6	6	20			10	2	2	3	2	2	2	6	6	6			
Liquidambar styraciflua	Sweetgum	Tree									3															
Liriodendron tulipifera	Tulip poplar	Tree													1	1	1	1	1	1						
Platanus occidentalis	American sycamore	Tree	2	2	2	1	1	1	1	1	1	5	5	5	1	1	1	2	2	3	3	3	3			
Quercus palustris	Pin oak	Tree	1	1	1	1	1	1							1	1	1									
Quercus phellos	Willow oak	Tree				4	4	10	1	1	1	2	2	2	5	5	5	2	2	2	1	1	1			
Ulmus alata	Winged elm	Tree									2															
Ulmus rubra	Slippery elm	Tree																		12						
Viburnum prunifolium	Black haw	Shrub/Tree										1	1	1								1	1	1		
Stem count			8	8	39	11	11	35	11	11	30	10	10	20	11	11	13	10	10	23	11	11	11			
Size (ares)			1			1			1			1			1			1			1			1		
Size (ACRES)			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02		
Species count			5	5	5	5	5	6	5	5	7	5	5	6	6	6	7	5	5	6	4	4	4	4		
Stems per ACRE			324	324	1578	445	445	1416	445	445	1214	405	405	809	445	445	526	405	405	931	445	445	445	445		

Scientific Name	Common Name	Species Type	Current Plot Data (MY2 2017)												Annual Summaries											
			Vegetation Plot 8			Vegetation Plot 9			Vegetation Plot 10			Vegetation Plot 11			MY2 (8/2017)			MY1 (9/2016)			MY0 (2/2016)					
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T			
Acer negundo	Boxelder	Tree													1											
Acer rubrum	Red maple	Tree						2				3														
Alnus serrulata	Tag alder	Shrub/Tree									1	1	1	2	2	2	4	4	4	7	7	7	13	13	13	
Betula nigra	River birch	Tree	3	3	3	1	1	1								13	13	13	19	19	19	25	25	25		
Calycanthus floridus	Sweet-shrub	Shrub																								
Carpinus caroliniana	American hornbeam	Shrub/Tree	2	2	2				2	2	2	1	1	1	7	7	7	10	10	10	13	13	13			
Fraxinus pennsylvanica	Green ash	Tree	5	5	5	3	3	5	3	3	15	3	3	20	36	36	139	35	35	35	36	36	36			
Liquidambar styraciflua	Sweetgum	Tree																								
Liriodendron tulipifera	Tulip poplar	Tree													2	2	2	7	7	7	16	16	16			
Platanus occidentalis	American sycamore	Tree	3	3	3	8	8	8	6	6	6	6	6	11	38	38	44	37	37	37	37	37	37			
Quercus palustris	Pin oak	Tree	1	1	1	1	1	1	1	1	1				6	6	6	15	15	15	16	16	16			
Quercus phellos	Willow oak	Tree													15	15	21	15	15	15	16	16	16			
Salix nigra	Black willow	Shrub/Tree						1																		
Ulmus alata	Winged elm	Tree			2																					
Ulmus rubra	Slippery elm	Tree						1																		
Viburnum prunifolium	Black haw	Shrub/Tree													2	2	2	4	4	4	4	4	4			
Stem count			14	14	16	13	13	19	13	13	28	12	12	35	123	123	238	149	149	149	176	176	176			
Size (ares)			1			1			1			1			11			11			11			11		
Size (ACRES)			0.02			0.02			0.02			0.02			0.27			0.27			0.27			0.27		
Species count			5	5	6	4	4	7	5	5	6	4	4	5	9	9	9	9	9	9	9	9	9	9		
Stems per ACRE			567	567	647	526	526	769	526	526	1,133	486	486	1,416	453	453	876	548	548	548	647	647	647	647		

Color for Density

- Exceeds requirements by 10%
- Exceeds requirements, but by less than 10%
- Fails to meet requirements, by less than 10%
- Fails to meet requirements by more than 10%
- Volunteers

PnoLS: Number of Planted stems excluding live stakes
 P-all: Number of planted stems including live stakes
 T: Total Stems

Table 9b. Planted and Total Stems (Supplemental Planting Zones)

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

Scientific Name	Common Name	Species Type	Current Plot Data (MY2 2017)									Annual Summaries											
			Vegetation Plot 12			Vegetation Plot 13			Vegetation Plot 14			MY2 (8/2017)			MY1 (9/2016)			MY0 (2/2016)					
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
<i>Aesculus pavia</i>	Red buckeye	Shrub/Tree				1	1	1							1	1	1	3	3	3	3	3	3
<i>Callicarpa americana</i>	American beautyberry	Shrub							1	1	1	1	1	1	9	9	9	11	11	11			
<i>Calycanthus floridus</i>	Sweet-shrub	Shrub	1	1	1	1	1	1				2	2	2	4	4	4	6	6	6			
<i>Carpinus caroliniana</i>	American hornbeam	Shrub Tree	3	3	3	5	5	5	5	5	5	13	13	13	16	16	16	17	17	17			
<i>Symphoricarpos orbiculatus</i>	Coralberry	Shrub	1	1	1	3	3	3	1	1	1	5	5	5	7	7	7	10	10	10			
<i>Viburnum prunifolium</i>	Black haw	Shrub Tree													1	1	1	1	1	1	1	1	1
Stem count			5	5	5	10	10	10	7	7	7	22	22	22	40	40	40	48	48	48			
Size (ares)			1			1			1			3			3			3					
Size (ACRES)			0.02			0.02			0.02			0.07			0.07			0.07					
Species count			3	3	3	4	4	4	3	3	3	5	5	5	6	6	6	6	6	6	6	6	6
Stems per ACRE			202	202	202	405	405	405	283	283	283	297	297	297	540	540	540	647	647	647			

Supplemental planting zones are monitored to determine survival rates of these species but the results will not be tied to project success.

APPENDIX 4. Morphological Summary Data and Plots

Table 10a. Baseline Stream Data Summary

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

UT South Fork Reaches 1 and 2

Parameter	Gage	Pre-Restoration Condition				Reference Reach Data				Design				As-Built/Baseline			
		UTSF Reach 1		UTSF Reach 2		Agony Acres UT1A-Reach 1		UT to Cane Creek		UTSF Reach 1		UTSF Reach 2		UTSF Reach 1		UTSF Reach 2	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle																	
Bankfull Width (ft)	N/A	3.2	12.0	4.7	8.2	9.1	10.4	11.5	12.3	9.5	12.1	8.8	9.3	12.7	13.7		
Floodprone Width (ft)		15	50	70	82	>36		31		21	48	27	61	85	150		
Bankfull Mean Depth		0.6	1.3	0.7	1.2	1.0	1.2	0.8	1.0	0.7	0.8	0.6	0.7	0.8	0.9		
Bankfull Max Depth		1.2	2.0	1.5		1.8		1.2	1.6	1.0	1.2	1.2	1.5	1.0	1.4		
Bankfull Cross Sectional Area (ft ²)		4.1	7.1	5.4	5.6	10.7	11.3	8.9	12.2	6.5	10.2	5.3	6.8	10.9	11.0		
Width/Depth Ratio		2.5	20.4	4.0	12.3	7.3	10.1	12.3	14.4	14.0	14.0	9.1	9.7	14.5	17.3		
Entrenchment Ratio		1.4	12.5	10.0	14.8	>3.9		2.5	2.7	2.2	5.0	2.2	5.0	6.2	10.9		
Bank Height Ratio		1.3	2.2	1.4	1.9					0.9	1.1	0.9	1.1	1.0	1.0		
D50 (mm)		Medium Sand		Silt/Clay						0.9	1.1	0.9	1.1	8.4	10.4		
Pattern																	
Riffle Length (ft)	N/A											9	50	9	40		
Riffle Slope (ft/ft)		0.0036	0.0274	0.0062	0.0258			0.0188	0.0704	0.0120	0.0505	0.0106	0.0447	0.0058	0.0432		
Pool Length (ft)														12	47		
Pool Max Depth (ft)		1.5	1.8	1.8	2	2.5		1.8	2.3	1.1	2.1	1.3	2.6	2.4	2.6		
Pool Spacing (ft)		23	239	44	145			27	73	3	67	4	85	29	85		
Pool Volume (ft ³)														45	78		
Substrate, Bed and Transport Parameters																	
Ri%/Ru%/P%/G%/S%	N/A													21/13/64/2/0/0	28/10/56/6/0/0		
SC%/Sa%/G%/C%/B%/Be%														SC/2.37/8.4/34.5/55/180	SC/0.40/10.4/37.9/71.7/180		
d16/d35/d50/d84/d95/d100		SC/VFS/MS/11.1/15.4/22.6		SC/SC/6.1/28.5/180										0.32	0.34		
Reach Shear Stress (Competency) lb/ft ²		0.39		0.45						0.42		0.44		0.35	0.37		
Max part size (mm) mobilized at bankfull		28.9		34.2						31.7		33.0					
Stream Power (Capacity) W/m ²																	
Additional Reach Parameters																	
Drainage Area (SM)	N/A	0.18		0.33		0.30		0.29		0.18		0.33		0.18	0.33		
Watershed Impervious Cover Estimate (%)		5%		3%						5%		3%		5%	3%		
Rosgen Classification		E5		E5		E4		E4		C		C		C	C		
Bankfull Velocity (fps)		2.8	4.8	3.4	3.6	2.2	2.4	3.8		3.0		2.8		2.8	2.7		
Bankfull Discharge (cfs)		19.6		19.3		25.3		40.0		19.0		29.0		19.0	29.0		
Q-NFF regression (2-yr)										43		67					
Q-USGS extrapolation (1.2-yr)										22		34					
Q-Mannings										4.8	8.0	6.9	11.0				
Valley Length (ft)		1,720		910						1,720		910		1,720	910		
Channel Thalweg Length (ft)		2,298		1,209						2,163		1,061		2,185	1,077		
Sinuosity		1.34		1.33		1.35		1.40		1.20	1.40	1.20	1.40	1.27	1.18		
Water Surface Slope (ft/ft) ²		0.0084		0.0075						0.0095		0.0113		0.0103	0.0078		
Bankfull Slope (ft/ft)										0.0129		0.0114		0.0102	0.0104		

SC: Silt/Clay <0.062 mm diameter particles

(---): Data was not provided

N/A: Not Applicable

Table 10b. Baseline Stream Data Summary

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

UT1C and UT2B

Parameter	Gage	Pre-Restoration Condition				Reference Reach Data		Design				As-Built/Baseline			
		UT1C		UT2B		UT to Varnals Creek		UT1C		UT2B		UT1C		UT2B	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle															
Bankfull Width (ft)	N/A	4.1		2.6		9.3	10.5	8.1		4.0		9.8		5.5	
Floodprone Width (ft)		5.3		4.4		20	64	18	41	9	20	60		60	
Bankfull Mean Depth		0.5		0.4		1.1	1.2	0.6		0.4		0.5		0.4	
Bankfull Max Depth		0.8		0.5		1.5	1.7	0.9	1.2	0.5	0.7	0.7		0.7	
Bankfull Cross Sectional Area (ft ²)		2.1		1.1		10.3	12.3	5.2		1.5		4.9		2.3	
Width/Depth Ratio		8.1		6.2		8.1	9.3	13.0		11.0		19.4		13.2	
Entrenchment Ratio		1.3		1.7		1.9	6.1	2.2	5.0	2.2	5.0	6.1		10.8	
Bank Height Ratio		2.3		5.4		0.9	1.0	0.9	1.1			1.0		1.0	
D50 (mm)		---		---								3.3		0.1	
Riffle Length (ft)		N/A					---		---		---		8	22	11
Riffle Slope (ft/ft)	---			---		0.0240	0.0570	0.0086	0.0355	0.0083	0.0342	0.0011	0.0110	0.0073	0.0106
Pool Length (ft)							---		---		---	6	22	13	19
Pool Max Depth (ft)	---			---		2.5	2.6	0.9	1.8	0.6	1.2	2.0		1.5	
Pool Spacing (ft)	34		44	---		8	82	2	44	1	24	22	38	22	
Pool Volume (ft ³)															
Channel Beltwidth (ft)	N/A	10	18	1	2	15	45	13	72	6	36	16	26		---
Radius of Curvature (ft)		9	16	1	3	8	47	11	47	5	23	9	15	13	25
Rc:Bankfull Width (ft/ft)		2.2	3.9	0.4	1.2	0.6	3.2	1.3	5.8	1.3	5.8	1.0	1.6	1.8	3.3
Meander Length (ft)		54	63		12		---	24	133	12	66	55	73		---
Meander Width Ratio		2.4	4.4	0.4	0.8	1.0	3.0	1.6	8.9	1.6	8.9	1.7	2.8		---
Ri%/Ru%/P%/G%/S%	N/A														
SC%/Sa%/G%/C%/B%/Be%												24/17/58/1/0/0		47/13/37/3/0/0	
d16/d35/d50/d84/d95/d100		---		---			---					SC/0.21/3.3/22.6/34.8/128		SC/SC/0.1/22.6/50.6/128	
Reach Shear Stress (Competency) lb/ft ²		---		---					---		---	0.15		0.23	
Max part size (mm) mobilized at bankfull		---		---					---		---				
Stream Power (Capacity) W/m ²									---		---				
Additional Reach Parameters															
Drainage Area (SM)	N/A	0.03		0.02		0.41		0.03		0.02		0.03		0.02	
Watershed Impervious Cover Estimate (%)		13%		0%		---		13%		0%		13%		0%	
Rosgen Classification		B5		B5		E4		C		C		C		C	
Bankfull Velocity (fps)		3.0		3.4		4.4	5.2	1.1		3.1		1.1		1.6	
Bankfull Discharge (cfs)		---		---		54.0		5.6		3.6		5.6		3.6	
Q-NFF regression (2-yr)								13		8					
Q-USGS extrapolation (1.2-yr)								6		4					
Q-Mannings								4.1	5.7	6.9	7.3				
Valley Length (ft)		142		42		---		220		62		231		67	
Channel Thalweg Length (ft)		166		44		---		260		74		256		70	
Sinuosity		1.17		1.04		1.20		1.10	1.25	1.10	1.25	1.11		1.04	
Water Surface Slope (ft/ft) ³		---		---		---		---		---		0.0053		0.0101	
Bankfull Slope (ft/ft)		---		---		---		0.0083		0.0080		0.0078	0.0080	0.0070	0.0084

SC: Silt/Clay <0.062 mm diameter particles
 (---): Data was not provided
 N/A: Not Applicable

Table 10c. Baseline Stream Data Summary

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

UT3B and UT4B

Parameter	Gage	Pre-Restoration Condition				Reference Reach Data		Design				As-Built/Baseline					
		UT3B		UT4B		UT to Varnals Creek		UT3B		UT4B		UT3B		UT4B			
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
Dimension and Substrate - Riffle																	
Bankfull Width (ft)	N/A	2.2		4.4		9.3		10.5		4.0		5.0		4.2		5.7	
Floodprone Width (ft)		11.4		23.3		20		64		9		20		11		25	
Bankfull Mean Depth		0.5		0.4		1.1		1.2		0.4		0.4		0.4		0.6	
Bankfull Max Depth		0.8		1.0		1.5		1.7		0.5		0.7		0.5		0.7	
Bankfull Cross Sectional Area (ft ²)		1.1		1.9		10.3		12.3		1.5		1.9		1.6		3.6	
Width/Depth Ratio		4.6		9.9		8.1		9.3		11.0		13.0		11.6		9.1	
Entrenchment Ratio		5.1		5.3		1.9		6.1		2.2		5.0		2.2		5.0	
Bank Height Ratio		2.2		1.4		0.9		1.0		0.9		1.1		0.9		1.1	
D50 (mm)		---		---		---		---		---		---		5.6		4.0	
Riffle Length (ft)		N/A	---		---		---		---		---		---		12		23
Riffle Slope (ft/ft)	---		---		0.0240		0.0570		0.0191		0.0786		0.0088		0.0312		
Pool Length (ft)	---		---		---		---		---		---		10		22		
Pool Max Depth (ft)	---		---		2.5		2.6		0.6		1.2		0.6		1.2		
Pool Spacing (ft)	56		157		---		---		8		82		1		24		
Pool Volume (ft ³)	---		---		---		---		---		---		---		---		
Channel Beltwidth (ft)	N/A	---		2		3		15		45		6		36		8	
Radius of Curvature (ft)		---		2		3		8		47		5		23		7	
Rc:Bankfull Width (ft/ft)		---		0.5		0.7		0.6		3.2		1.3		5.8		1.3	
Meander Length (ft)		---		11		22		---		---		12		66		15	
Meander Width Ratio		---		0.5		0.7		1.0		3.0		1.6		8.9		1.6	
Ri%/Ru%/P%/G%/S%	N/A	---		---		---		---		---		---		---		---	
SC%/Sa%/G%/C%/B%/Be%		---		---		---		---		---		---		---		---	
d16/d35/d50/d84/d95/d100		---		---		---		---		---		---		---		---	
Reach Shear Stress (Competency) lb/ft ²		---		---		---		---		---		---		0.33		0.14	
Max part size (mm) mobilized at bankfull		---		---		---		---		---		---		---		---	
Stream Power (Capacity) W/m ²	---		---		---		---		---		---		---		---		
Additional Reach Parameters																	
Drainage Area (SM)	N/A	0.02		0.03		0.41		---		0.02		0.03		0.02		0.03	
Watershed Impervious Cover Estimate (%)		0%		0%		---		---		0%		0%		0%		0%	
Rosgen Classification		ESb		ESb		E4		---		C		C		C		E	
Bankfull Velocity (fps)		3.2		3.0		4.4		5.2		3.3		3.3		2.2		1.5	
Bankfull Discharge (cfs)		---		---		54.0		---		3.5		5.3		3.5		5.3	
Q-NFF regression (2-yr)		---		---		---		---		8		12		---		---	
Q-USGS extrapolation (1.2-yr)		---		---		---		---		4		6		---		---	
Q-Mannings		---		---		---		---		7.8		12.0		4.1		5.5	
Valley Length (ft)		84		38		---		---		138		117		148		124	
Channel Thalweg Length (ft)		84		40		---		---		163		138		155		212	
Sinuosity		1.00		1.06		1.20		---		1.10		1.25		1.10		1.25	
Water Surface Slope (ft/ft) ²		---		---		---		---		---		---		0.0164		0.0043	
Bankfull Slope (ft/ft)		---		---		---		---		0.0170		0.0073		0.0127		0.0161	
		---		---		---		---		---		---		0.0059		0.0067	

SC: Silt/Clay <0.062 mm diameter particles

(---): Data was not provided

N/A: Not Applicable

Table 10d. Baseline Stream Data Summary

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

UT 5

Parameter	Gage	Pre-Restoration		Reference Reach Data				Design		As-Built/Baseline	
		UT5		Agony Acres UT1A-Reach 1		UT to Cane Creek		UT5		UT5	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle											
Bankfull Width (ft)	N/A	5.7		9.1	10.4	11.5	12.3	7.2		8.1	
Floodprone Width (ft)		40		>36		31		16	36	100	
Bankfull Mean Depth		0.6		1.0	1.2	0.8	1.0	0.6		0.5	
Bankfull Max Depth		1.2		1.8		1.2	1.6	0.8	1.0	0.9	
Bankfull Cross Sectional Area (ft ²)		3.5		10.7	11.3	8.9	12.2	4.1		4.0	
Width/Depth Ratio		9.1		7.3	10.1	12.3	14.4	13.0		16.6	
Entrenchment Ratio		7.1		>3.9		2.5	2.7	2.2	5.0	12.3	
Bank Height Ratio		1.4		---		---		0.9	1.1	1.0	
D50 (mm)		Silt/Clay		---		---		---		5.9	
Riffle Length (ft)	N/A	---		---		---		---		5	21
Riffle Slope (ft/ft)		0.0028	0.0638	---		0.0188	0.0704	0.0128	0.0541	0.0081	0.0374
Pool Length (ft)		---		---		---		---		18	42
Pool Max Depth (ft)		1.4		2.5		1.8	2.3	0.9	1.8	1.7	
Pool Spacing (ft)		9	197	---		27	73	2	44	31	51
Pool Volume (ft ³)		---		---		---		---		---	
Pattern											
Channel Beltwidth (ft)	N/A	3	18	21	93	102		12	64	22	40
Radius of Curvature (ft)		3	14	14	60	23	38	13	42	10	37
Rc:Bankfull Width (ft/ft)		0.5	2.5	1.5	5.8	2.0	3.1	1.3	5.8	1.0	3.7
Meander Length (ft)		16	58	---		---		22	118	63	97
Meander Width Ratio		0.5	3.2	2.3	8.9	8.3	8.9	1.6	8.9	2.3	4.0
Substrate, Bed and Transport Parameters											
Ri%/Ru%/P%/G%/S%	N/A	---		---		---		---		34/11/54/1/0/0	
SC%/Sa%/G%/C%/B%/Be%		---		---		---		---		SC/0.08/5.9/29.8/53.7/90	
d16/d35/d50/d84/d95/d100		SC/SC/SC/8.9/22.6/64		---		---		---		---	
Reach Shear Stress (Competency) lb/ft ²		0.19		---		---		0.37		0.31	
Max part size (mm) mobilized at bankfull		14.0		---		---		27.5		---	
Stream Power (Capacity) W/m ²	---		---		---		---		---		
Additional Reach Parameters											
Drainage Area (SM)	N/A	0.12		0.30		0.29		0.12		0.12	
Watershed Impervious Cover Estimate (%)		0%		---		---		0%		0%	
Rosgen Classification		E5		E4		E4		C		C	
Bankfull Velocity (fps)		2.1		2.2	2.4	3.8		2.9		3.5	
Bankfull Discharge (cfs)		7.4		25.3		40.0		14.0		14.0	
Q-NFF regression (2-yr)		---		---		---		32		---	
Q-USGS extrapolation (1.2-yr)		---		---		---		16		---	
Q-Mannings		---		---		---		5.4	11.0	---	
Valley Length (ft)		580		---		---		520		515	
Channel Thalweg Length (ft)		778		---		---		677		680	
Sinuosity		1.34		1.35		1.40		1.20	1.40	1.3	
Water Surface Slope (ft/ft) ²		0.0111		---		---		---		0.0114	
Bankfull Slope (ft/ft)		---		---		---		0.0138		0.0110	0.0114

SC: Silt/Clay <0.062 mm diameter particles

(---): Data was not provided

N/A: Not Applicable

Table 11a. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

	Cross Section 1, UTSF Reach 1 (Riffle)								Cross Section 2, UTSF Reach 1 (Pool)								Cross Section 3, UTSF Reach 1 (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
<i>based on fixed bankfull elevation</i>	567.0	567.0	567.0						566.4	566.4	566.4						556.5	556.5	556.5					
Bankfull Width (ft)	8.8	8.7	8.6						11.1	10.8	11.5						9.3	9.0	9.0					
Floodprone Width (ft)	85	85	85						---	---	---						85	85	85					
Bankfull Mean Depth (ft)	0.6	0.7	0.6						1.2	1.3	1.2						0.7	0.7	0.7					
Bankfull Max Depth (ft)	1.0	1.1	1.1						2.6	2.6	2.3						1.2	1.1	1.1					
Bankfull Cross Sectional Area (ft ²)	5.3	5.7	5.4						13.6	14.0	13.6						6.8	6.2	6.2					
Bankfull Width/Depth Ratio	14.6	13.3	13.5						9.1	8.3	9.7						12.8	13.1	13.0					
Bankfull Entrenchment Ratio	9.7	9.8	9.9						---	---	---						9.1	9.4	9.4					
Bankfull Bank Height Ratio	1.0	1.0	1.0						---	---	---						1.0	1.0	1.0					
	Cross Section 4, UTSF Reach 1 (Pool)								Cross Section 5, UTSF Reach 2 (Riffle)								Cross Section 6, UTSF Reach 2 (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
<i>based on fixed bankfull elevation</i>	556.0	556.0	556.0						549.9	549.9	549.9						547.9	547.9	547.9					
Bankfull Width (ft)	14.8	13.9	14.1						12.7	12.3	12.2						13.7	13.9	13.9					
Floodprone Width (ft)	---	---	---						150	150	150						150	150	150					
Bankfull Mean Depth (ft)	1.2	1.1	1.2						0.9	0.9	0.9						0.8	0.7	0.7					
Bankfull Max Depth (ft)	2.4	2.3	2.5						1.4	1.4	1.4						1.3	1.3	1.3					
Bankfull Cross Sectional Area (ft ²)	17.5	15.7	16.3						11.0	11.0	10.5						10.9	10.2	10.4					
Bankfull Width/Depth Ratio	12.6	12.2	12.1						14.5	13.7	14.3						17.3	18.9	18.7					
Bankfull Entrenchment Ratio	---	---	---						11.8	12.2	12.3						10.9	10.8	10.8					
Bankfull Bank Height Ratio	---	---	---						1.0	1.0	1.0						1.0	1.0	1.0					
	Cross Section 7, UTSF Reach 2 (Pool)								Cross Section 8, UT1C (Pool)								Cross Section 9, UT1C (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
<i>based on fixed bankfull elevation</i>	547.0	547.0	547.0						572.5	572.5	572.5						572.4	572.4	572.4					
Bankfull Width (ft)	12.3	12.0	12.1						7.6	6.6	7.0						9.8	9.8	9.9					
Floodprone Width (ft)	---	---	---						---	---	---						60	60	60					
Bankfull Mean Depth (ft)	1.2	1.2	1.2						1.0	0.8	0.8						0.5	0.5	0.5					
Bankfull Max Depth (ft)	2.1	2.1	2.2						2.0	1.6	1.6						0.7	0.7	0.8					
Bankfull Cross Sectional Area (ft ²)	14.7	14.0	14.5						7.7	5.5	5.2						4.9	4.6	4.5					
Bankfull Width/Depth Ratio	10.3	10.3	10.0						7.6	7.9	9.3						19.4	20.7	21.8					
Bankfull Entrenchment Ratio	---	---	---						---	---	---						6.1	6.1	6.1					
Bankfull Bank Height Ratio	---	---	---						---	---	---						1.0	1.1	1.0					

Table 11b. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)

Maney Farm Mitigation Project

DMS Project No.96314

Monitoring Year 2 - 2017

Dimension and Substrate	Cross Section 10, UT2B (Pool)								Cross Section 11, UT2B (Riffle)								Cross Section 12, UT3B (Pool)							
	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7
<i>based on fixed bankfull elevation</i>	564.2	564.2	564.2						563.9	563.9	563.9						563.0	563.0	563.0					
Bankfull Width (ft)	10.7	10.5	10.7						5.5	6.5	6.8						6.2	6.3	7.0					
Floodprone Width (ft)	---	---	---						60	60	60						---	---	---					
Bankfull Mean Depth (ft)	0.8	0.6	0.6						0.4	0.4	0.4						0.6	0.5	0.5					
Bankfull Max Depth (ft)	1.5	1.0	1.0						0.7	0.7	0.7						1.3	1.0	1.0					
Bankfull Cross Sectional Area (ft ²)	8.6	6.3	6.3						2.3	2.7	2.8						3.8	3.0	3.2					
Bankfull Width/Depth Ratio	13.3	17.4	17.9						13.2	15.7	16.5						10.1	13.4	15.5					
Bankfull Entrenchment Ratio	---	---	---						10.8	9.3	8.8						---	---	---					
Bankfull Bank Height Ratio	---	---	---						1.0	1.0	1.0						---	---	---					
Dimension and Substrate	Cross Section 13, UT3B (Riffle)								Cross Section 14, UT4B (Riffle)								Cross Section 15, UT4B (Pool)							
	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7
<i>based on fixed bankfull elevation</i>	562.8	562.8	562.8						553.8	553.8	553.8						553.6	553.6	553.6					
Bankfull Width (ft)	4.2	3.9	3.4						5.7	6.4	6.7						6.3	5.7	5.5					
Floodprone Width (ft)	60	60	60						25	25	25						---	---	---					
Bankfull Mean Depth (ft)	0.4	0.3	0.3						0.6	0.4	0.4						0.7	0.5	0.6					
Bankfull Max Depth (ft)	0.6	0.6	0.4						0.9	0.6	0.6						1.4	1.0	1.1					
Bankfull Cross Sectional Area (ft ²)	1.6	1.1	1.0						3.6	2.4	2.4						4.5	3.0	3.2					
Bankfull Width/Depth Ratio	11.6	13.0	11.8						9.1	17.3	19.2						8.7	11.0	9.4					
Bankfull Entrenchment Ratio	14.1	15.5	17.5						4.3	3.9	3.7						---	---	---					
Bankfull Bank Height Ratio	1.0	1.2	1.3						1.0	1.0	1.0						---	---	---					
Dimension and Substrate	Cross Section 16, UT5 (Pool)								Cross Section 17, UT5 (Riffle)															
	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7	Base	MY1	MY2	MY3	MY4	MY5	MY6	MY7								
<i>based on fixed bankfull elevation</i>	552.6	552.6	552.6						552.5	552.5	552.5													
Bankfull Width (ft)	8.0	7.6	7.3						8.1	8.1	8.2													
Floodprone Width (ft)	---	---	---						100	100	100													
Bankfull Mean Depth (ft)	1.0	1.1	1.1						0.5	0.4	0.5													
Bankfull Max Depth (ft)	1.7	1.7	1.7						0.9	0.8	0.8													
Bankfull Cross Sectional Area (ft ²)	7.9	8.0	7.9						4.0	3.5	3.8													
Bankfull Width/Depth Ratio	8.0	7.2	6.8						16.6	18.7	17.8													
Bankfull Entrenchment Ratio	---	---	---						12.3	12.4	12.2													
Bankfull Bank Height Ratio	---	---	---						1.0	1.0	1.0													

Table 12a. Monitoring Data - Stream Reach Data Summary

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

UT South Fork Reach 1

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle																
Bankfull Width (ft)	8.8	9.3	8.7	9.0	8.6	9.0										
Floodprone Width (ft)	85		85		85											
Bankfull Mean Depth	0.6	0.7	0.7		0.6	0.7										
Bankfull Max Depth	1.0	1.2	1.1		1.1											
Bankfull Cross Sectional Area (ft ²)	5.3	6.8	5.7	6.2	5.4	6.2										
Width/Depth Ratio	12.8	14.6	13.1	13.3	13.0	13.5										
Entrenchment Ratio	9.1	9.7	9.4	9.8	9.4	9.9										
Bank Height Ratio	1.0		1.0		1.0											
D50 (mm)	8.4		14.1		3.3											
Profile																
Riffle Length (ft)	9	50														
Riffle Slope (ft/ft)	0.0058	0.0432														
Pool Length (ft)	12	47														
Pool Max Depth (ft)	2.4	2.6														
Pool Spacing (ft)	29	85														
Pool Volume (ft ³)																
Pattern																
Channel Beltwidth (ft)	24	56														
Radius of Curvature (ft)	9	36														
Rc:Bankfull Width (ft/ft)	1.0	4.1														
Meander Wave Length (ft)	68	151														
Meander Width Ratio	2.7	6.5														
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	2,185															
Sinuosity (ft)	1.27															
Water Surface Slope (ft/ft)	0.0103															
Bankfull Slope (ft/ft)	0.0102	0.0104														
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	21/13/64/2/0/0		25/9/52/14/0/0				27/22/33/18/0/0									
d16/d35/d50/d84/d95/d100	SC/2.37/8.4/34.5/55/180		SC/2.4/14.1/60/107/256				SC/0.14/3.3/70/121/256									
% of Reach with Eroding Banks	0%		0%				0%									

(---): Data was not provided

Table 12b. Monitoring Data - Stream Reach Data Summary

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

UT South Fork Reach 2

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle																
Bankfull Width (ft)	12.7	13.7	12.3	13.9	12.2	13.9										
Floodprone Width (ft)	150		150		150											
Bankfull Mean Depth	0.8	0.9	0.7	0.9	0.7	0.9										
Bankfull Max Depth	1.3	1.4	1.3	1.4	1.3	1.4										
Bankfull Cross Sectional Area (ft ²)	10.9	11.0	10.2	11.0	10.4	10.5										
Width/Depth Ratio	14.5	17.3	13.7	18.9	14.3	18.7										
Entrenchment Ratio	10.9	11.8	10.8	12.2	10.8	12.3										
Bank Height Ratio	1.0		1.0		1.0											
D50 (mm)	10.4		14.6		7.3											
Profile																
Riffle Length (ft)	9	40														
Riffle Slope (ft/ft)	0.0055	0.0326														
Pool Length (ft)	23	50														
Pool Max Depth (ft)	2.1															
Pool Spacing (ft)	45	78														
Pool Volume (ft ³)																
Pattern																
Channel Beltwidth (ft)	37	54														
Radius of Curvature (ft)	17	28														
Rc:Bankfull Width (ft/ft)	1.6	2.6														
Meander Wave Length (ft)	110	144														
Meander Width Ratio	3.4	5.0														
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	1,077															
Sinuosity (ft)	1.18															
Water Surface Slope (ft/ft)	0.0078															
Bankfull Slope (ft/ft)	0.0077	0.0078														
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	28/10/56/6/0/0		15/16/43/26/0/1		23/21/44/11/1/0											
d16/d35/d50/d84/d95/d100	SC/0.4/10.4/37.9/72/180		0.13/4.7/15/85/124/256		SC/0.14/3.3/70/121/256											
% of Reach with Eroding Banks	0%		0%		0%											

(---): Data was not provided

Table 12c. Monitoring Data - Stream Reach Data Summary

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

UT1C

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7		
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Dimension and Substrate - Riffle																	
Bankfull Width (ft)	9.8		9.8		9.9												
Floodprone Width (ft)	60		60		60												
Bankfull Mean Depth	0.5		0.5		0.5												
Bankfull Max Depth	0.7		0.7		0.8												
Bankfull Cross Sectional Area (ft ²)	4.9		4.6		4.5												
Width/Depth Ratio	19.4		20.7		21.8												
Entrenchment Ratio	6.1		6.1		6.1												
Bank Height Ratio	1.0		1.1		1.0												
D50 (mm)	3.3		12.9		8.9												
Profile																	
Riffle Length (ft)	8	22															
Riffle Slope (ft/ft)	0.0011	0.0110															
Pool Length (ft)	6	22															
Pool Max Depth (ft)	2.0																
Pool Spacing (ft)	22	38															
Pool Volume (ft ³)																	
Pattern																	
Channel Beltwidth (ft)	16	26															
Radius of Curvature (ft)	9	15															
Rc:Bankfull Width (ft/ft)	1.0	1.6															
Meander Wave Length (ft)	55	73															
Meander Width Ratio	1.7	2.8															
Additional Reach Parameters																	
Rosgen Classification	C4																
Channel Thalweg Length (ft)	256																
Sinuosity (ft)	1.11																
Water Surface Slope (ft/ft)	0.0053																
Bankfull Slope (ft/ft)	0.0078	0.0080															
Ri%/Ru%/P%/G%/S%	---																
SC%/Sa%/G%/C%/B%/Be%	24/17/58/1/0/0		15/10/67/8/0/0	27/10/47/16/0/0													
d16/d35/d50/d84/d95/d100	SC/0.21/3.3/22.6/35/128		0.15/5.1/12.9/41/79/180	SC/0.63/8.9/64/107/180													
% of Reach with Eroding Banks	0%		0%	0%													

(---): Data was not provided

Table 12d. Monitoring Data - Stream Reach Data Summary

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

UT2B

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle																
Bankfull Width (ft)	5.5		6.5		6.8											
Floodprone Width (ft)	60		60		60											
Bankfull Mean Depth	0.4		0.4		0.4											
Bankfull Max Depth	0.7		0.7		0.7											
Bankfull Cross Sectional Area (ft ²)	2.3		2.7		2.8											
Width/Depth Ratio	13.2		15.7		16.5											
Entrenchment Ratio	10.8		9.3		8.8											
Bank Height Ratio	1.0		1.0		1.0											
D50 (mm)	0.1		0.2		0.2											
Profile																
Riffle Length (ft)	11	19														
Riffle Slope (ft/ft)	0.0073	0.0106														
Pool Length (ft)	13	19														
Pool Max Depth (ft)	1.5															
Pool Spacing (ft)	22															
Pool Volume (ft ³)																
Pattern																
Channel Beltwidth (ft)	---															
Radius of Curvature (ft)	13	25														
Rc:Bankfull Width (ft/ft)	1.8	3.3														
Meander Wave Length (ft)	---															
Meander Width Ratio	---															
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	70															
Sinuosity (ft)	1.04															
Water Surface Slope (ft/ft)	0.0101															
Bankfull Slope (ft/ft)	0.0070	0.0084														
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	47/13/37/3/0/0		39/23/31/8/0/0	44/26/21/9/0/0												
d16/d35/d50/d84/d95/d100	SC/SC/0.1/22.6/50.6/128		SC/SC/0.2/33.9/81.9/180	SC/SC/0.2/36.3/95/128												
% of Reach with Eroding Banks	0%		0%	0%												

(---): Data was not provided

Table 12e. Monitoring Data - Stream Reach Data Summary

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

UT3B

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle																
Bankfull Width (ft)	4.2		3.9		3.4											
Floodprone Width (ft)	60		60		60											
Bankfull Mean Depth	0.4		0.3		0.3											
Bankfull Max Depth	0.6		0.6		0.4											
Bankfull Cross Sectional Area (ft ²)	1.6		1.1		1.0											
Width/Depth Ratio	11.6		13.0		11.8											
Entrenchment Ratio	14.1		15.5		17.5											
Bank Height Ratio	1.0		1.2		1.3											
D50 (mm)	5.6		2.8		0.2											
Profile																
Riffle Length (ft)	12	23														
Riffle Slope (ft/ft)	0.0112	0.0419														
Pool Length (ft)	10	22														
Pool Max Depth (ft)	1.3															
Pool Spacing (ft)	30	36														
Pool Volume (ft ³)																
Pattern																
Channel Beltwidth (ft)	12	23														
Radius of Curvature (ft)	11	47														
Rc:Bankfull Width (ft/ft)	1.7	7.6														
Meander Wave Length (ft)	55	68														
Meander Width Ratio	1.9	3.7														
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	155															
Sinuosity (ft)	1.05															
Water Surface Slope (ft/ft)	0.0164															
Bankfull Slope (ft/ft)	0.0127	0.0161														
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	32/14/51/3/0/0		33/14/43/10/0/0	29/39/20/12/0/0												
d16/d35/d50/d84/d95/d100	SC/0.08/5.6/33.4/57/90		SC/0.2/2.8/41.3/85/180	SC/0.1/0.2/53.7/83/128												
% of Reach with Eroding Banks	0%		0%	0%												

(---): Data was not provided

Table 12f. Monitoring Data - Stream Reach Data Summary

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

UT4B

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle																
Bankfull Width (ft)	5.7		6.4		6.7											
Floodprone Width (ft)	25		25		25											
Bankfull Mean Depth	0.6		0.4		0.4											
Bankfull Max Depth	0.9		0.6		0.6											
Bankfull Cross Sectional Area (ft ²)	3.6		2.4		2.4											
Width/Depth Ratio	9.1		17.3		19.2											
Entrenchment Ratio	4.3		3.9		3.7											
Bank Height Ratio	1.0		1.0		1.0											
D50 (mm)	4.0		6.9		0.4											
Profile																
Riffle Length (ft)	8	19														
Riffle Slope (ft/ft)	0.0035	0.0113														
Pool Length (ft)	10	21														
Pool Max Depth (ft)	1.4															
Pool Spacing (ft)	31															
Pool Volume (ft ³)																
Pattern																
Channel Beltwidth (ft)	19	23														
Radius of Curvature (ft)	10	20														
Rc:Bankfull Width (ft/ft)	1.8	3.6														
Meander Wave Length (ft)	59	69														
Meander Width Ratio	3.3	4.1														
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	212															
Sinuosity (ft)	1.71															
Water Surface Slope (ft/ft)	0.0043															
Bankfull Slope (ft/ft)	0.0059	0.0067														
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	22/20/57/1/0/0		31/12/43/14/0/0	18/43/34/5/0/0												
d16/d35/d50/d84/d95/d100	SC/0.25/4.0/20.1/45/90		SC/0.19/6.9/59.2/90/180	SC/0.2/0.4/34.8/64/128												
% of Reach with Eroding Banks	0%		0%	0%												

(---): Data was not provided

Table 12g. Monitoring Data - Stream Reach Data Summary

Maney Farm Mitigation Project
 DMS Project No.96314
 Monitoring Year 2 - 2017

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle																
Bankfull Width (ft)	8.1		8.1		8.1											
Floodprone Width (ft)	100		100		100											
Bankfull Mean Depth	0.5		0.4		0.5											
Bankfull Max Depth	0.9		0.8		0.8											
Bankfull Cross Sectional Area (ft ²)	4.0		3.5		3.7											
Width/Depth Ratio	16.6		18.7		17.5											
Entrenchment Ratio	12.3		12.4		12.4											
Bank Height Ratio	1.0		1.0		1.0											
D50 (mm)	5.9		19.0		4.7											
Profile																
Riffle Length (ft)	5	21														
Riffle Slope (ft/ft)	0.0081	0.0374														
Pool Length (ft)	18	42														
Pool Max Depth (ft)	1.7															
Pool Spacing (ft)	31	51														
Pool Volume (ft ³)																
Pattern																
Channel Beltwidth (ft)	22	40														
Radius of Curvature (ft)	10	37														
Rc:Bankfull Width (ft/ft)	1.0	3.7														
Meander Wave Length (ft)	63	97														
Meander Width Ratio	2.3	4.0														
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	680															
Sinuosity (ft)	1.32															
Water Surface Slope (ft/ft)	0.0114															
Bankfull Slope (ft/ft)	0.0110	0.0114														
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	34/11/54/1/0/0		30/10/46/14/0/0	31/16/40/13/0/0												
d16/d35/d50/d84/d95/d100	SC/0.08/5.9/29.8/54/90		SC/0.18/19/61/101/180	SC/0.17/4.7/57.8/87/180												
% of Reach with Eroding Banks	0%		0%	0%												

(---): Data was not provided

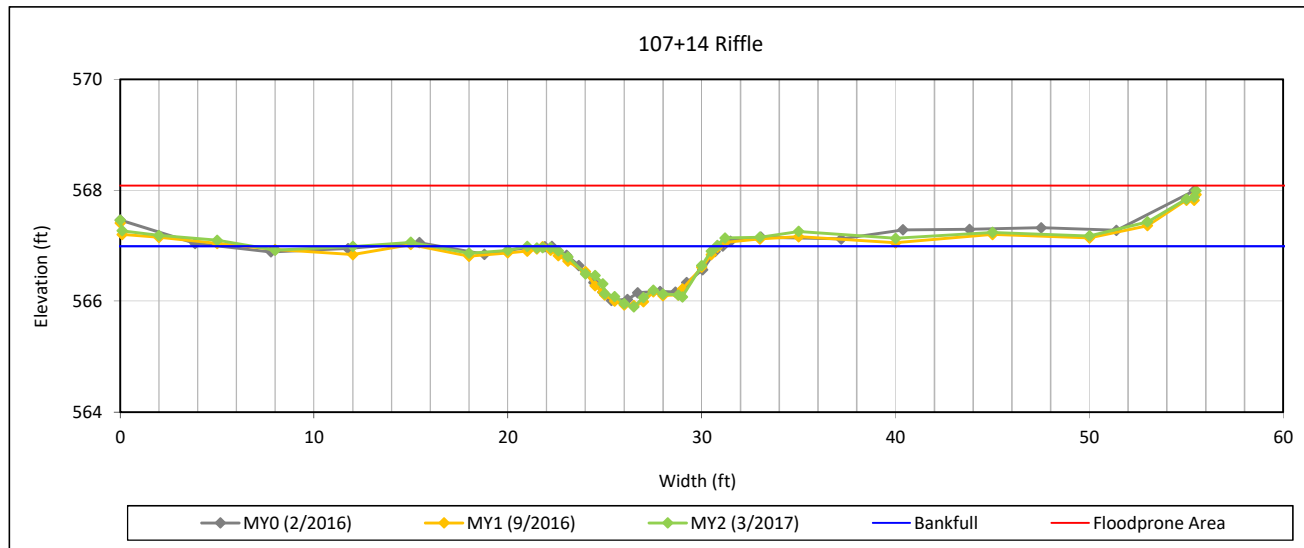
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 1, UTSF Reach 1



Bankfull Dimensions

5.4	x-section area (ft.sq.)
8.6	width (ft)
0.6	mean depth (ft)
1.1	max depth (ft)
9.1	wetted perimeter (ft)
0.6	hydraulic radius (ft)
13.5	width-depth ratio
85.0	W flood prone area (ft)
9.9	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

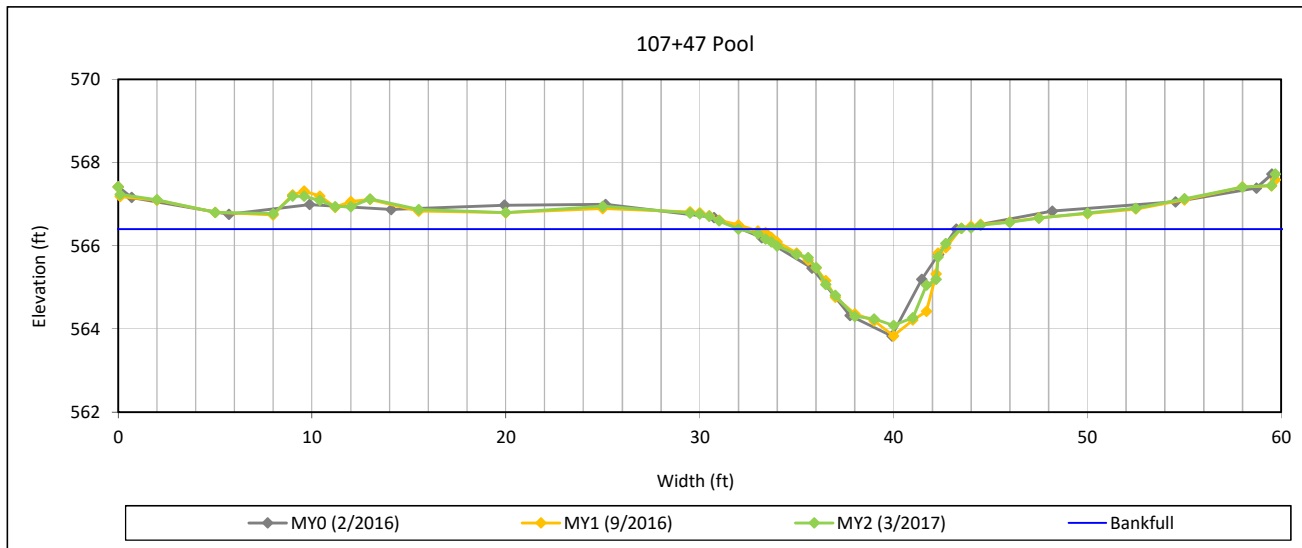
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 2, UTSF Reach 1



Bankfull Dimensions

13.6	x-section area (ft.sq.)
11.5	width (ft)
1.2	mean depth (ft)
2.3	max depth (ft)
13.0	wetted perimeter (ft)
1.0	hydraulic radius (ft)
9.7	width-depth ratio

Survey Date: 3/2017
Field Crew: Wildlands Engineering



View Downstream

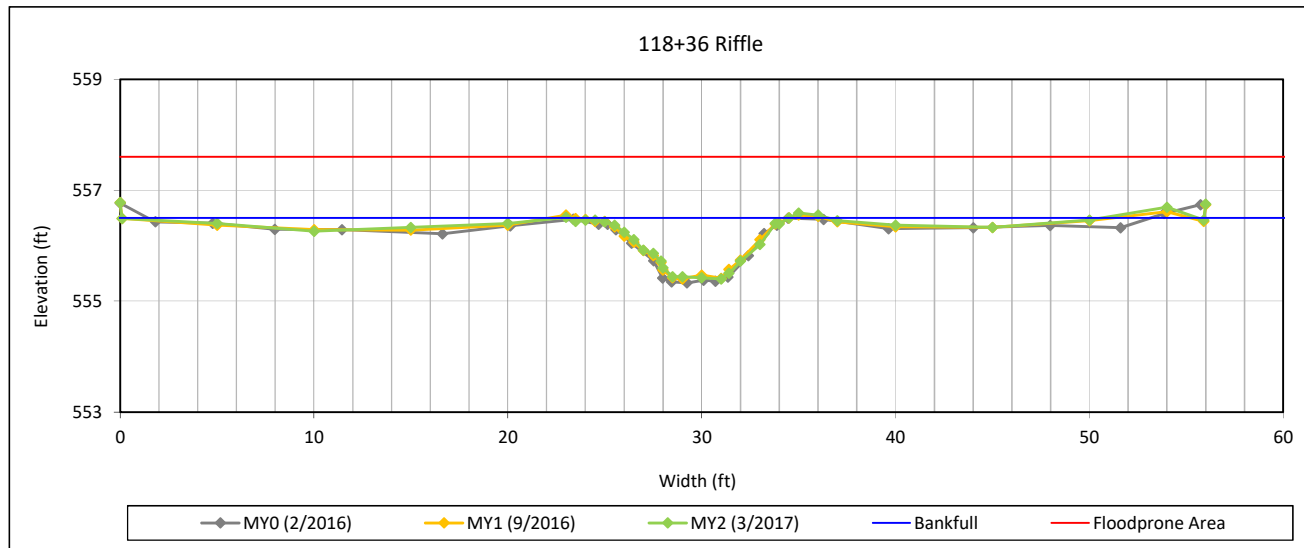
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 3, UTSF Reach 1



Bankfull Dimensions

6.2	x-section area (ft.sq.)
9.0	width (ft)
0.7	mean depth (ft)
1.1	max depth (ft)
9.4	wetted perimeter (ft)
0.7	hydraulic radius (ft)
13.0	width-depth ratio
85.0	W flood prone area (ft)
9.4	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

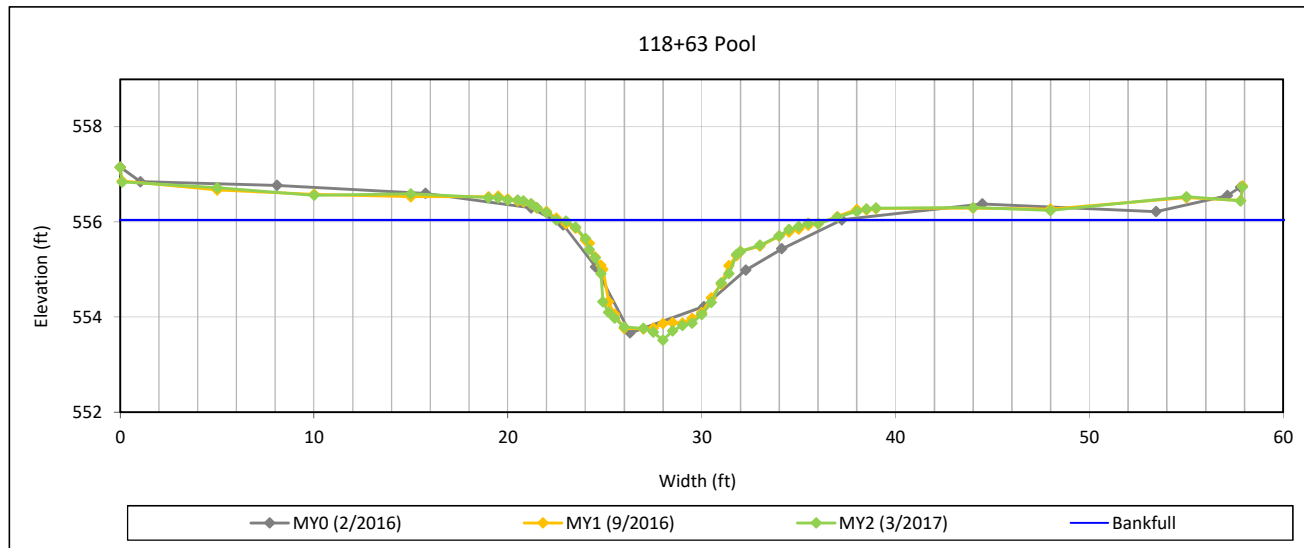
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 4, UTSF Reach 1



Bankfull Dimensions

16.3	x-section area (ft.sq.)
14.1	width (ft)
1.2	mean depth (ft)
2.5	max depth (ft)
15.7	wetted perimeter (ft)
1.0	hydraulic radius (ft)
12.1	width-depth ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

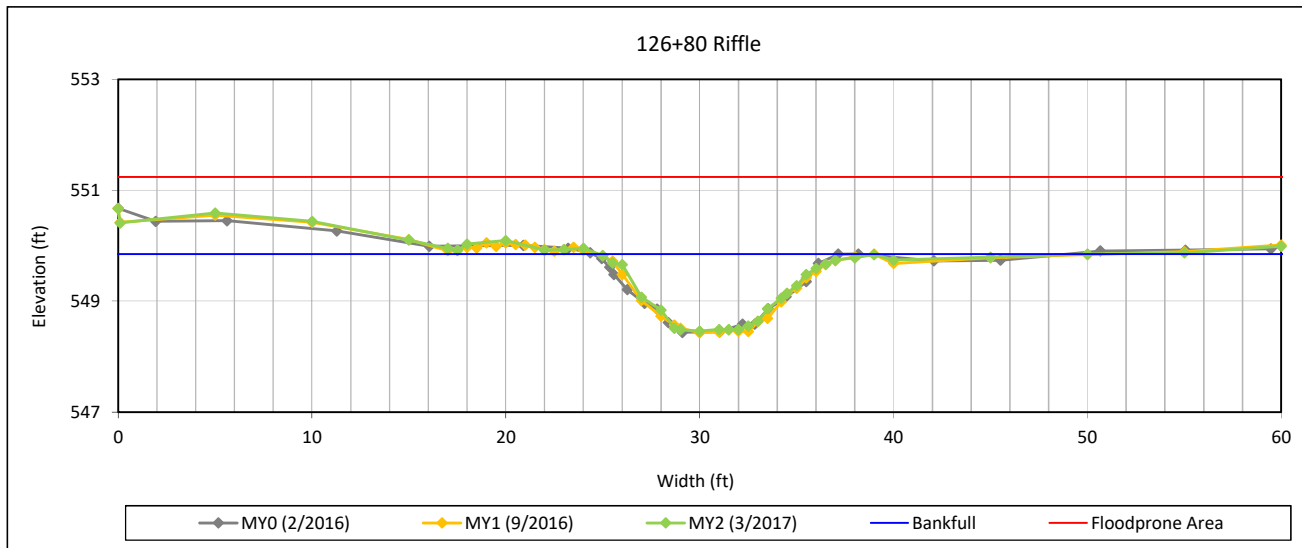
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 5, UTSF Reach 2



Bankfull Dimensions

10.5	x-section area (ft.sq.)
12.2	width (ft)
0.9	mean depth (ft)
1.4	max depth (ft)
12.7	wetted perimeter (ft)
0.8	hydraulic radius (ft)
14.3	width-depth ratio
150.0	W flood prone area (ft)
12.3	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

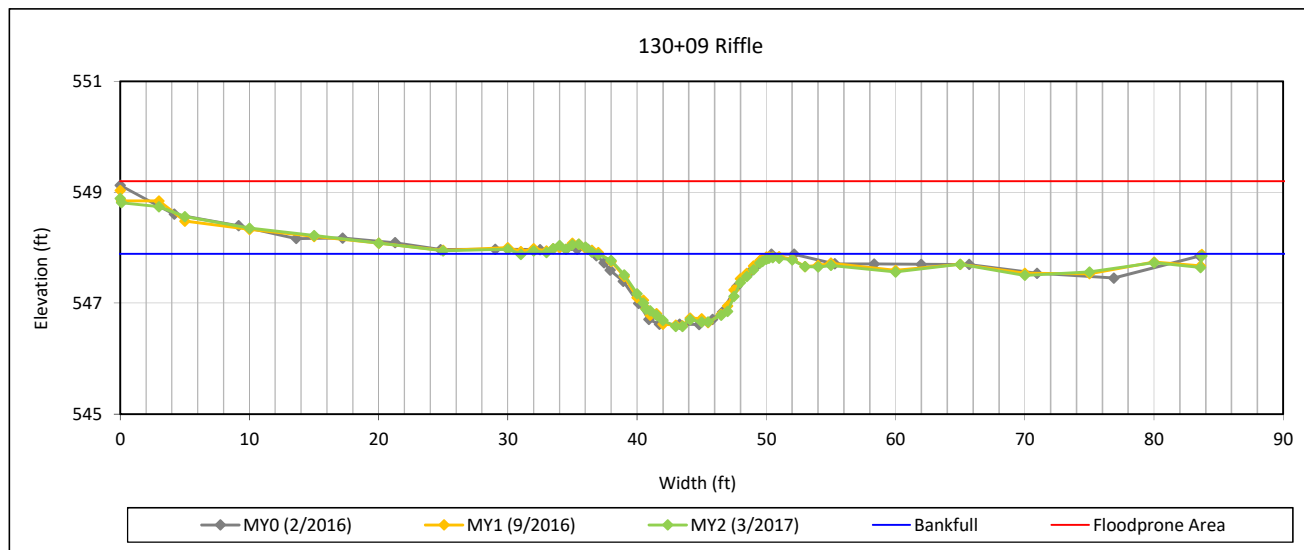
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 6, UTSF Reach 2



Bankfull Dimensions

10.4	x-section area (ft.sq.)
13.9	width (ft)
0.7	mean depth (ft)
1.3	max depth (ft)
14.3	wetted perimeter (ft)
0.7	hydraulic radius (ft)
18.7	width-depth ratio
150.0	W flood prone area (ft)
10.8	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

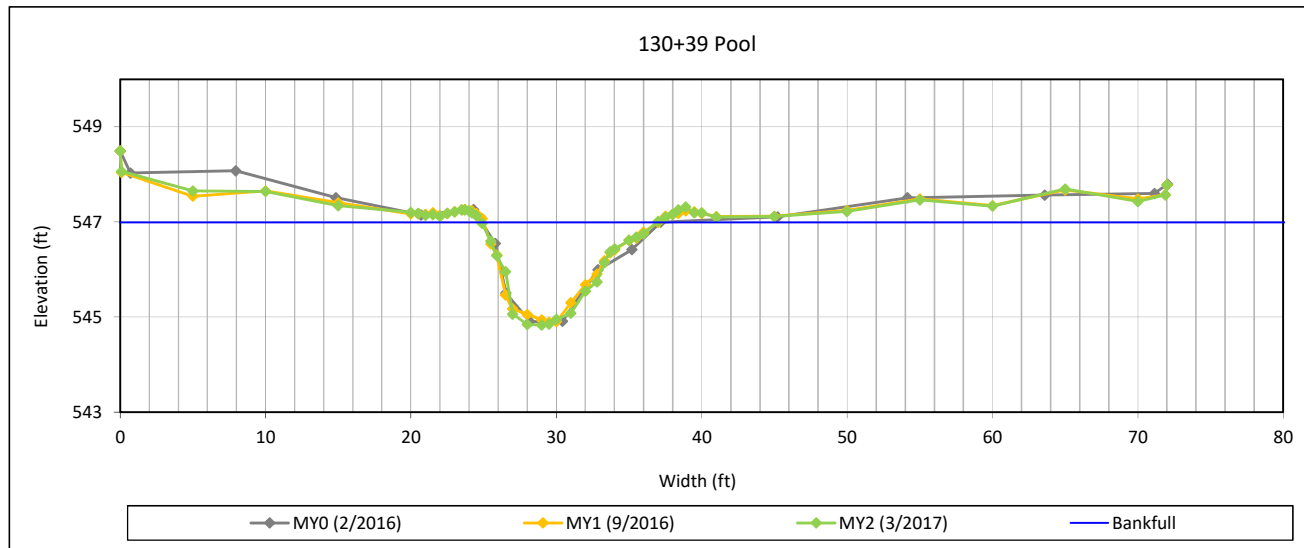
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 7, UTSF Reach 2



Bankfull Dimensions

14.5	x-section area (ft.sq.)
12.1	width (ft)
1.2	mean depth (ft)
2.2	max depth (ft)
13.3	wetted perimeter (ft)
1.1	hydraulic radius (ft)
10.0	width-depth ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

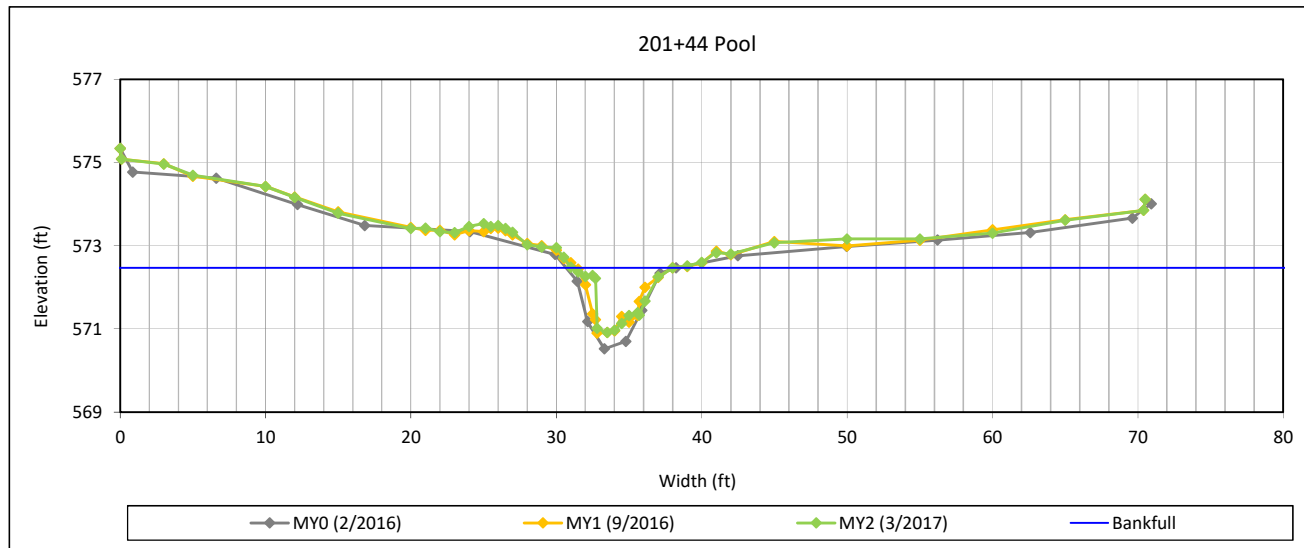
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 8, UT1C



Bankfull Dimensions

5.2	x-section area (ft.sq.)
7.0	width (ft)
0.8	mean depth (ft)
1.6	max depth (ft)
8.5	wetted perimeter (ft)
0.6	hydraulic radius (ft)
9.3	width-depth ratio

Survey Date: 3/2017
Field Crew: Wildlands Engineering



View Downstream

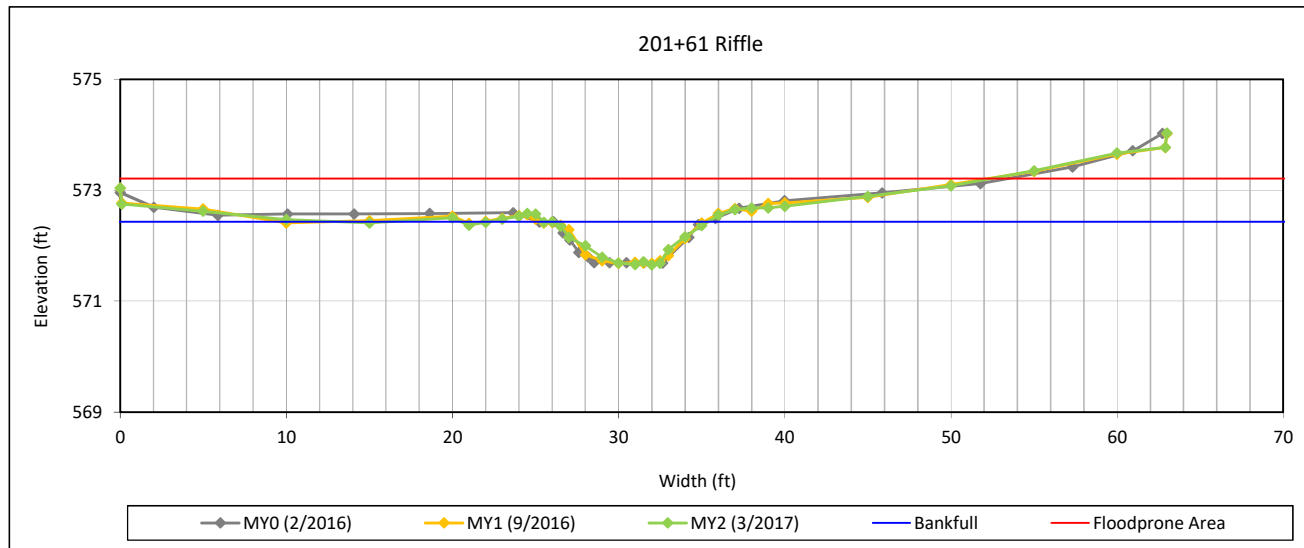
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 9, UT1C



Bankfull Dimensions

4.5	x-section area (ft.sq.)
9.9	width (ft)
0.5	mean depth (ft)
0.8	max depth (ft)
10.1	wetted perimeter (ft)
0.4	hydraulic radius (ft)
21.8	width-depth ratio
60.0	W flood prone area (ft)
6.1	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

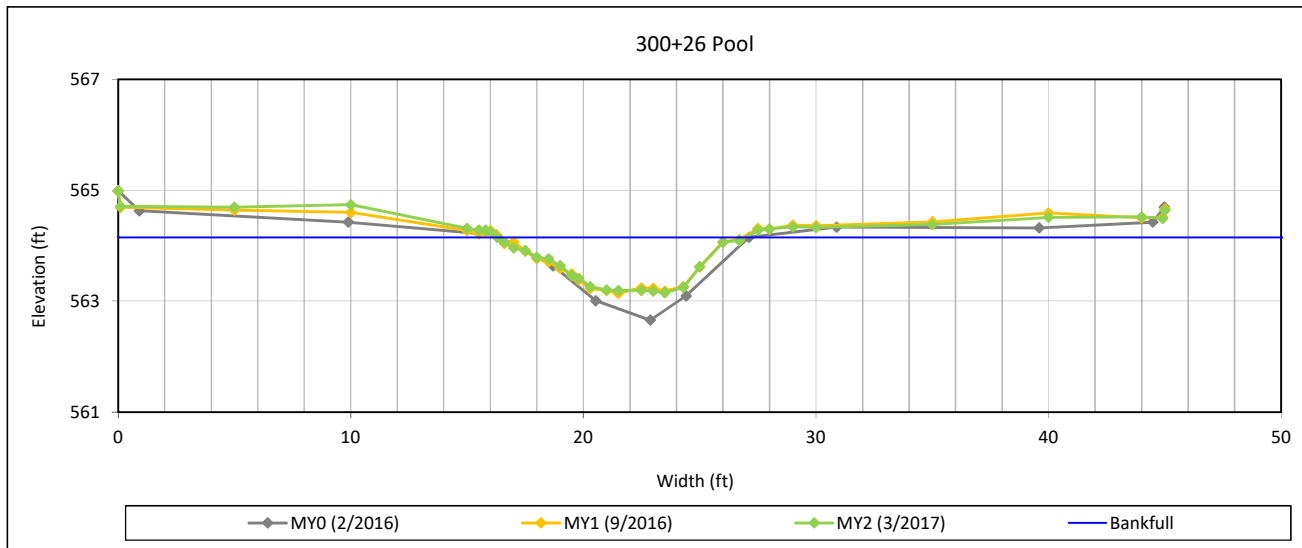
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 10, UT2B



Bankfull Dimensions

6.3	x-section area (ft.sq.)
10.7	width (ft)
0.6	mean depth (ft)
1.0	max depth (ft)
11.0	wetted perimeter (ft)
0.6	hydraulic radius (ft)
17.9	width-depth ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

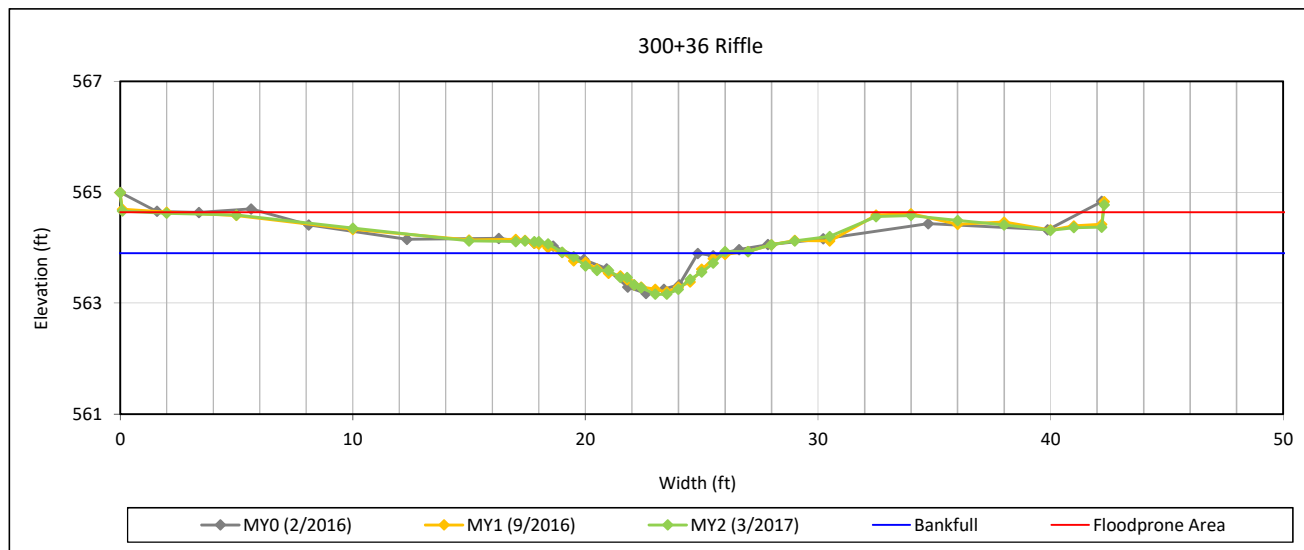
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 11, UT2B



Bankfull Dimensions

2.8	x-section area (ft.sq.)
6.8	width (ft)
0.4	mean depth (ft)
0.7	max depth (ft)
7.0	wetted perimeter (ft)
0.4	hydraulic radius (ft)
16.5	width-depth ratio
60.0	W flood prone area (ft)
8.8	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

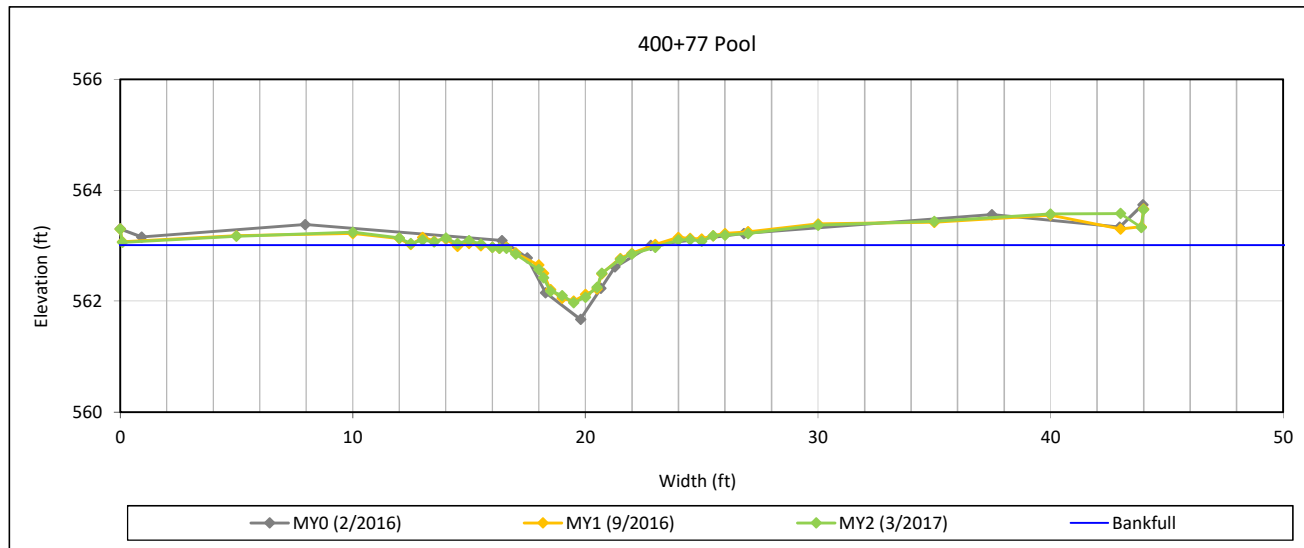
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 12, UT3B



Bankfull Dimensions

3.2	x-section area (ft.sq.)
7.0	width (ft)
0.5	mean depth (ft)
1.0	max depth (ft)
7.4	wetted perimeter (ft)
0.4	hydraulic radius (ft)
15.5	width-depth ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

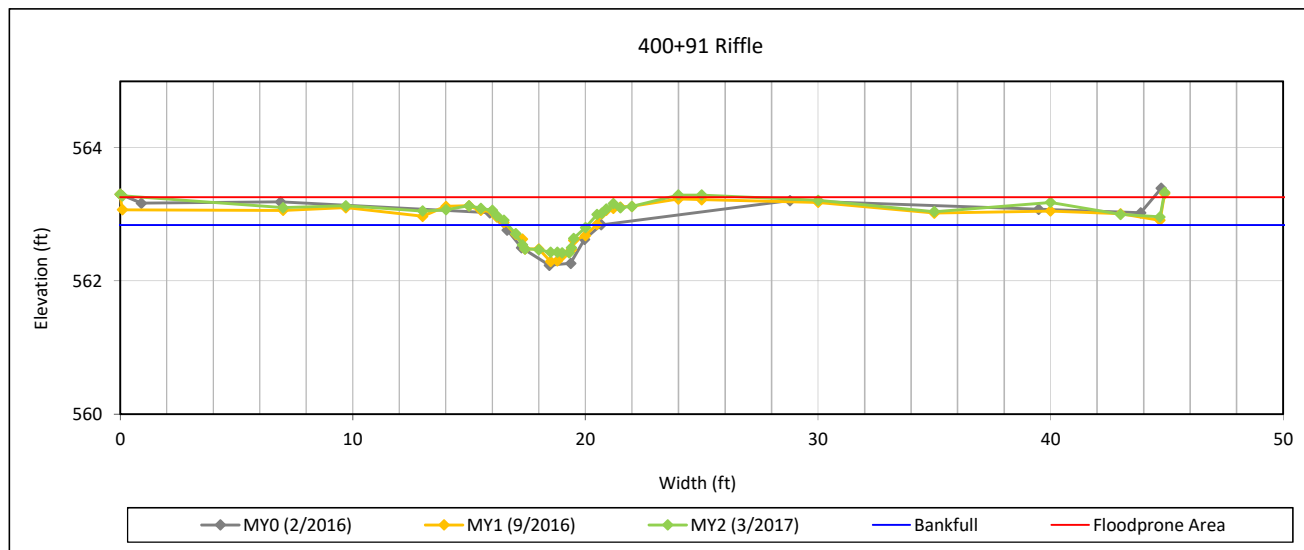
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 13, UT3B

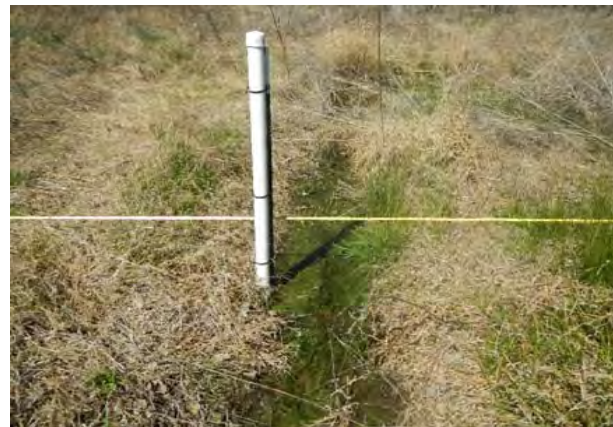


Bankfull Dimensions

1.0	x-section area (ft.sq.)
3.4	width (ft)
0.3	mean depth (ft)
0.4	max depth (ft)
3.6	wetted perimeter (ft)
0.3	hydraulic radius (ft)
11.8	width-depth ratio
60.0	W flood prone area (ft)
17.5	entrenchment ratio
1.3	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

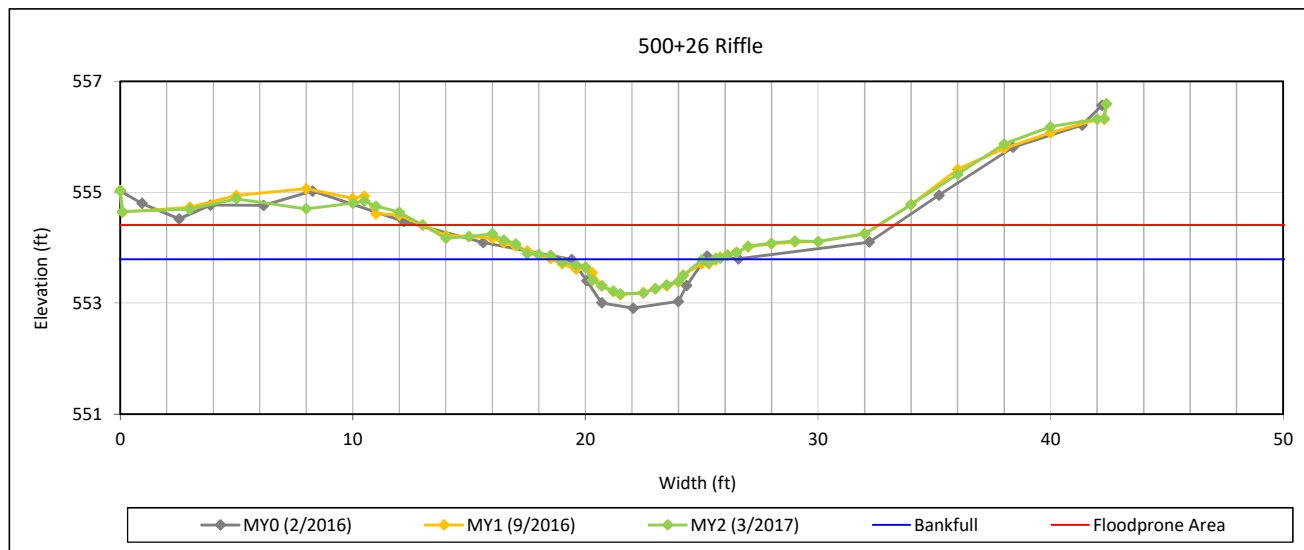
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 14, UT4B



Bankfull Dimensions

2.4	x-section area (ft.sq.)
6.7	width (ft)
0.4	mean depth (ft)
0.6	max depth (ft)
7.0	wetted perimeter (ft)
0.3	hydraulic radius (ft)
19.2	width-depth ratio
25.0	W flood prone area (ft)
3.7	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

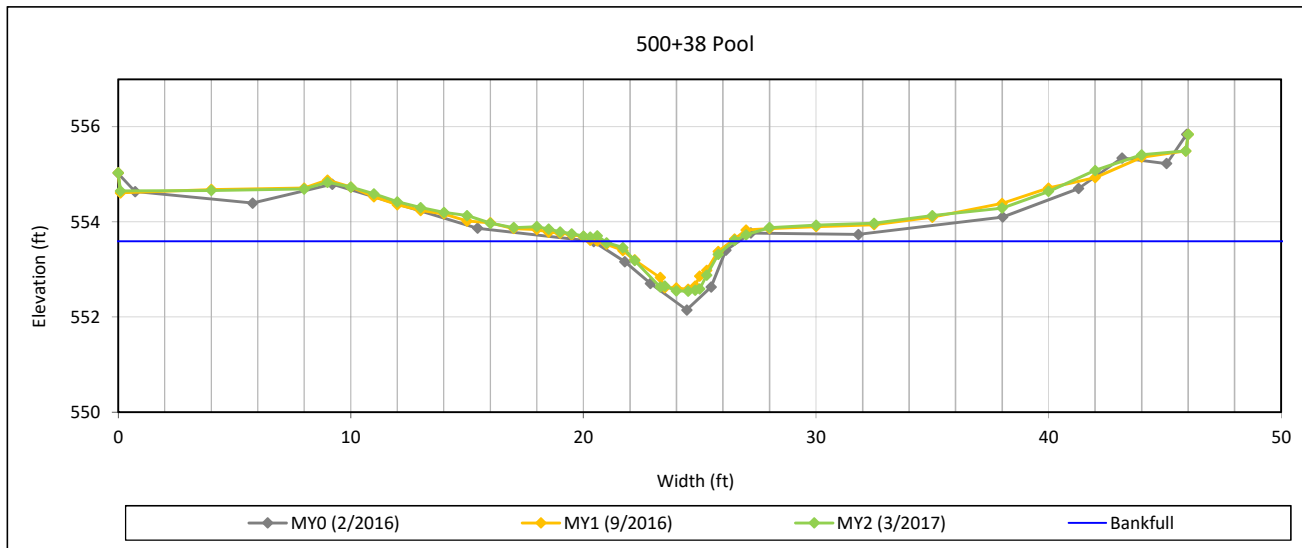
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 15, UT4B



Bankfull Dimensions

3.2	x-section area (ft.sq.)
5.5	width (ft)
0.6	mean depth (ft)
1.1	max depth (ft)
6.1	wetted perimeter (ft)
0.5	hydraulic radius (ft)
9.4	width-depth ratio

Survey Date: 3/2017
Field Crew: Wildlands Engineering



View Downstream

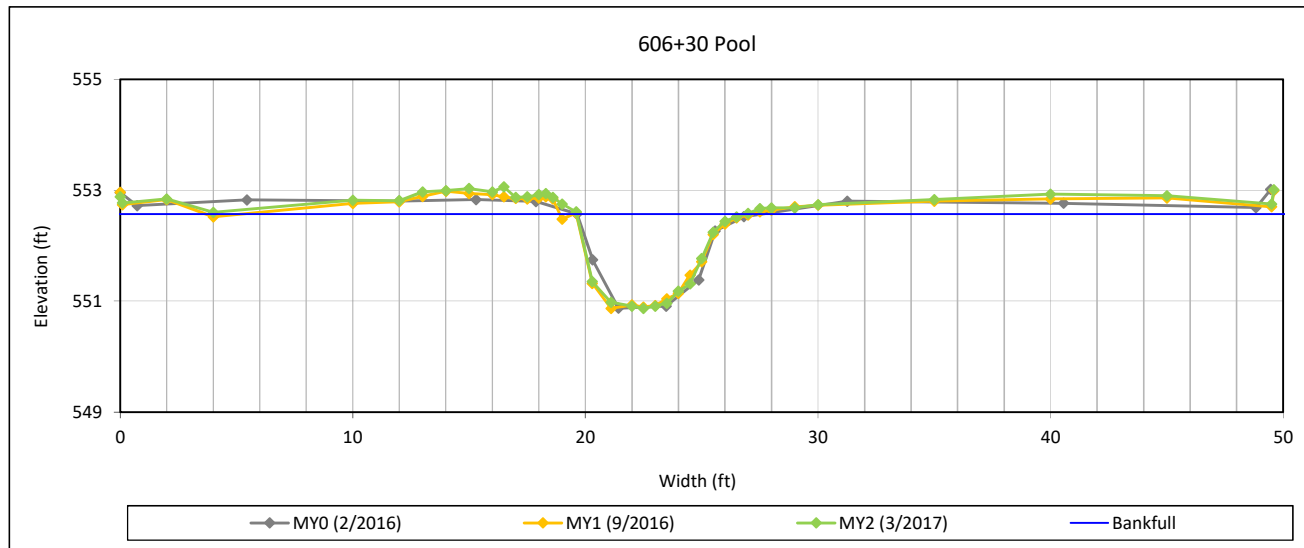
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 16, UT5



Bankfull Dimensions

7.9	x-section area (ft.sq.)
7.3	width (ft)
1.1	mean depth (ft)
1.7	max depth (ft)
8.6	wetted perimeter (ft)
0.9	hydraulic radius (ft)
6.8	width-depth ratio

Survey Date: 3/2017
Field Crew: Wildlands Engineering



View Downstream

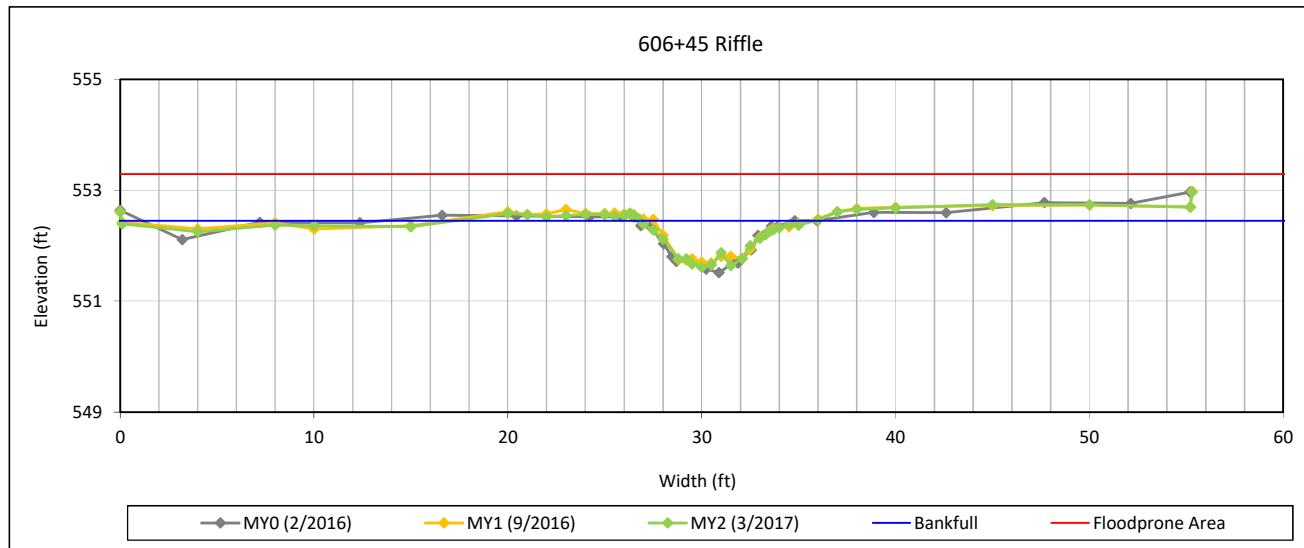
Cross Section Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

Cross Section 17, UT5



Bankfull Dimensions

3.8	x-section area (ft.sq.)
8.2	width (ft)
0.5	mean depth (ft)
0.8	max depth (ft)
8.5	wetted perimeter (ft)
0.4	hydraulic radius (ft)
17.8	width-depth ratio
100.0	W flood prone area (ft)
12.2	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering



View Downstream

Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

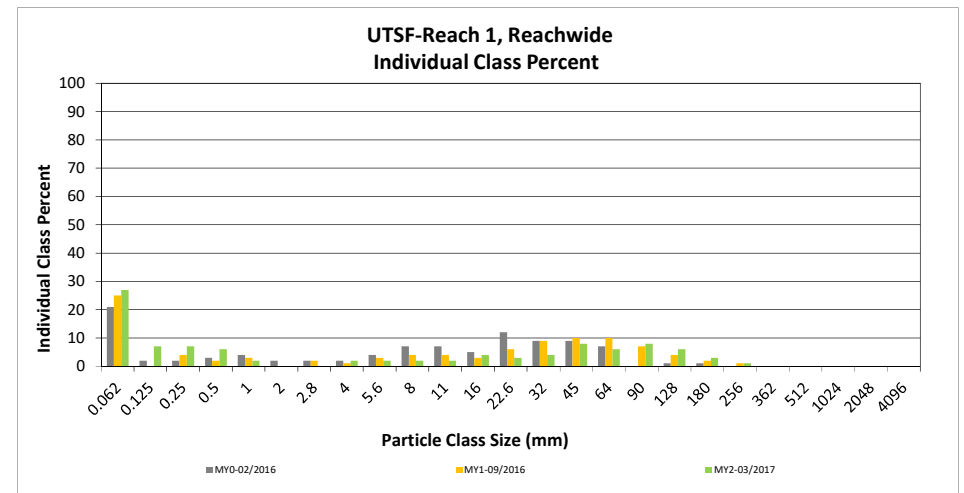
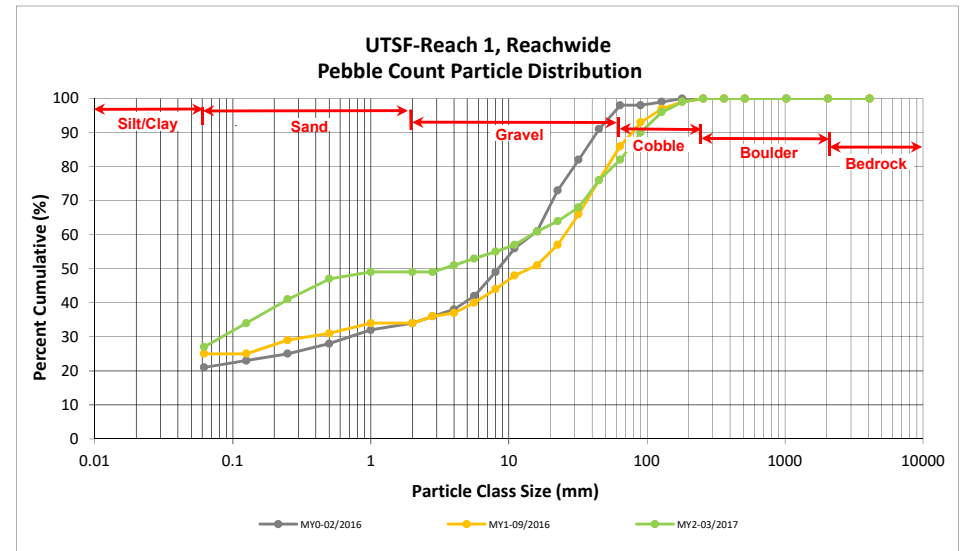
DMS Project No. 96314

Monitoring Year 2 - 2017

UTSF-Reach 1, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	26	27	27	27
SAND	Very fine	0.062	0.125		7	7	7	34
	Fine	0.125	0.250		7	7	7	41
	Medium	0.25	0.50	1	5	6	6	47
	Coarse	0.5	1.0		2	2	2	49
	Very Coarse	1.0	2.0					49
GRAVEL	Very Fine	2.0	2.8					49
	Very Fine	2.8	4.0	2		2	2	51
	Fine	4.0	5.6	2		2	2	53
	Fine	5.6	8.0	2		2	2	55
	Medium	8.0	11.0	2		2	2	57
	Medium	11.0	16.0	3	1	4	4	61
	Coarse	16.0	22.6	3		3	3	64
	Coarse	22.6	32	4		4	4	68
	Very Coarse	32	45	7	1	8	8	76
	Very Coarse	45	64	5	1	6	6	82
COBBLE	Small	64	90	8		8	8	90
	Small	90	128	6		6	6	96
	Large	128	180	3		3	3	99
	Large	180	256	1		1	1	100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
		Total		50	50	100	100	100

Reachwide Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	0.14
D ₅₀ =	3.3
D ₈₄ =	69.7
D ₉₅ =	120.7
D ₁₀₀ =	256.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

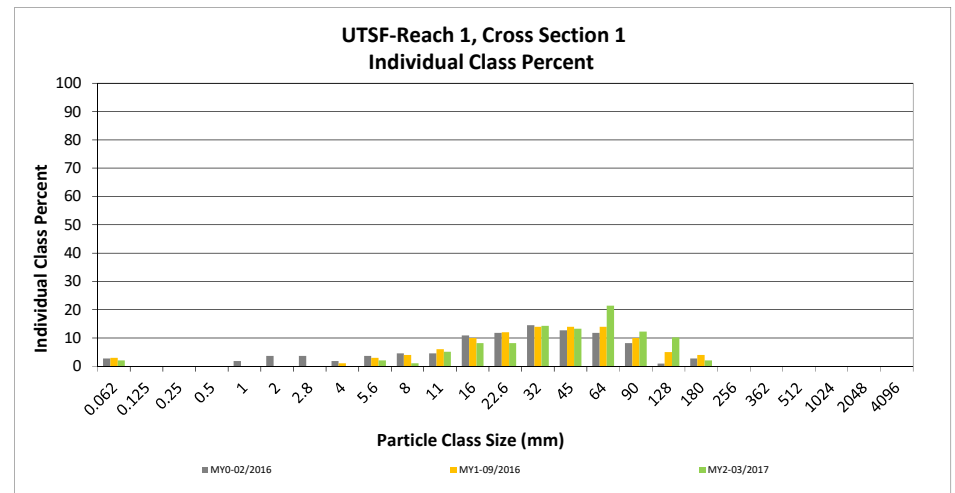
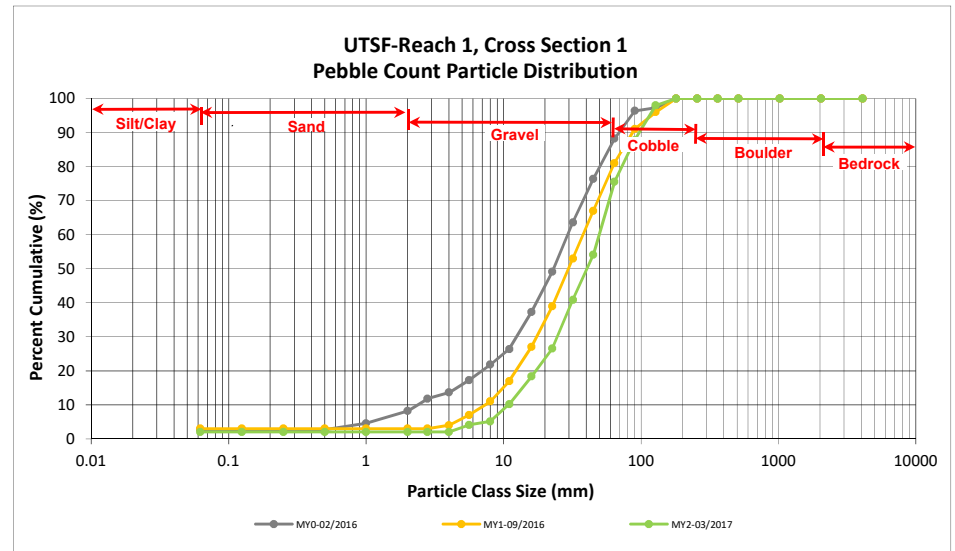
DMS Project No. 96314

Monitoring Year 2 - 2017

UTSF-Reach 1, Cross Section 1

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	2	2	2
SAND	Very fine	0.062	0.125			2
	Fine	0.125	0.250			2
	Medium	0.25	0.50			2
	Coarse	0.5	1.0			2
	Very Coarse	1.0	2.0			2
GRAVEL	Very Fine	2.0	2.8			2
	Very Fine	2.8	4.0			2
	Fine	4.0	5.6	2	2	4
	Fine	5.6	8.0	1	1	5
	Medium	8.0	11.0	5	5	10
	Medium	11.0	16.0	8	8	18
	Coarse	16.0	22.6	8	8	27
	Coarse	22.6	32	14	14	41
	Very Coarse	32	45	13	13	54
	Very Coarse	45	64	21	21	76
COBBLE	Small	64	90	12	12	88
	Small	90	128	10	10	98
	Large	128	180	2	2	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
		Total		98	100	100

Cross Section 1	
Channel materials (mm)	
D ₁₆ =	14.35
D ₃₅ =	27.78
D ₅₀ =	40.5
D ₈₄ =	81.1
D ₉₅ =	115.6
D ₁₀₀ =	180.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

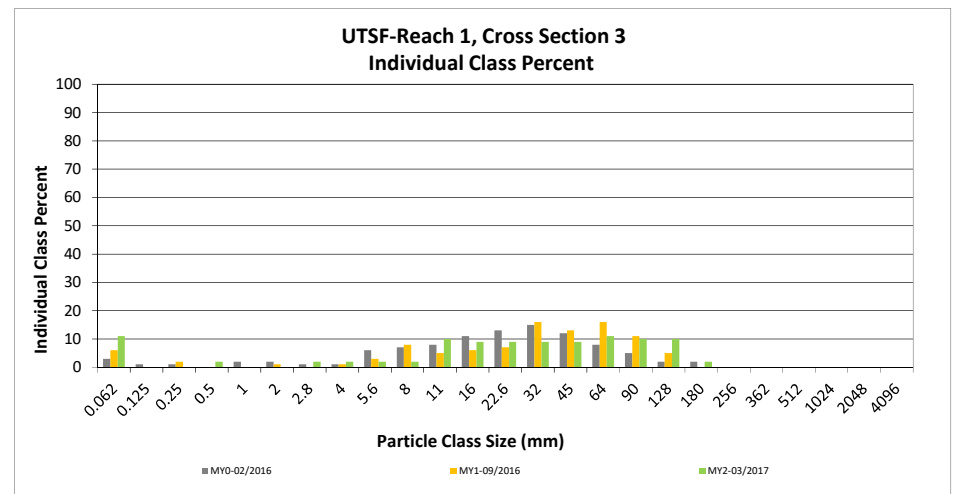
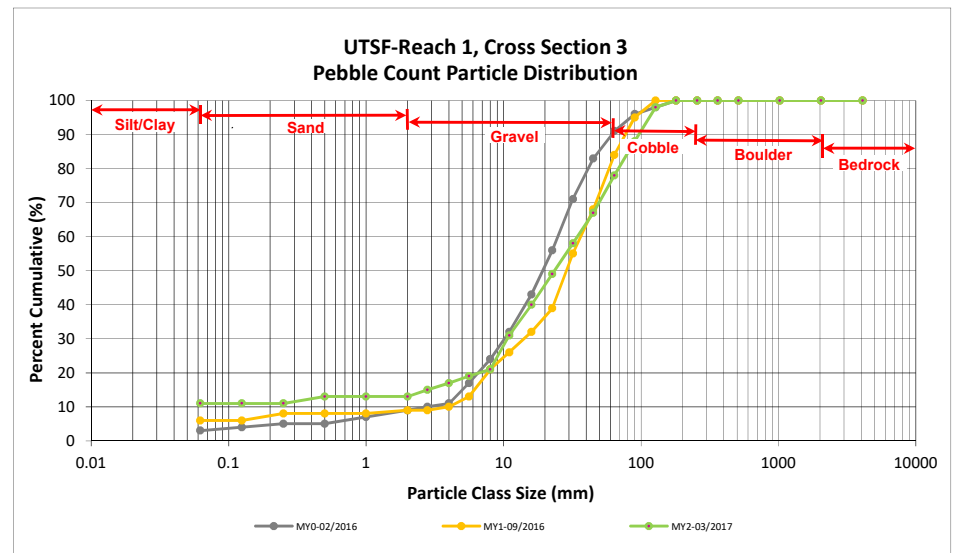
DMS Project No. 96314

Monitoring Year 2 - 2017

UTSF-Reach 1, Cross Section 3

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	11	11	11
SAND	Very fine	0.062	0.125			11
	Fine	0.125	0.250			11
	Medium	0.25	0.50	2	2	13
	Coarse	0.5	1.0			13
	Very Coarse	1.0	2.0			13
GRAVEL	Very Fine	2.0	2.8	2	2	15
	Very Fine	2.8	4.0	2	2	17
	Fine	4.0	5.6	2	2	19
	Fine	5.6	8.0	2	2	21
	Medium	8.0	11.0	10	10	31
	Medium	11.0	16.0	9	9	40
	Coarse	16.0	22.6	9	9	49
	Coarse	22.6	32	9	9	58
	Very Coarse	32	45	9	9	67
	Very Coarse	45	64	11	11	78
COBBLE	Small	64	90	10	10	88
	Small	90	128	10	10	98
	Large	128	180	2	2	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
		Total		100	100	100

Cross Section 3	
Channel materials (mm)	
D ₁₆ =	3.35
D ₃₅ =	12.99
D ₅₀ =	23.5
D ₈₄ =	78.5
D ₉₅ =	115.2
D ₁₀₀ =	180.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

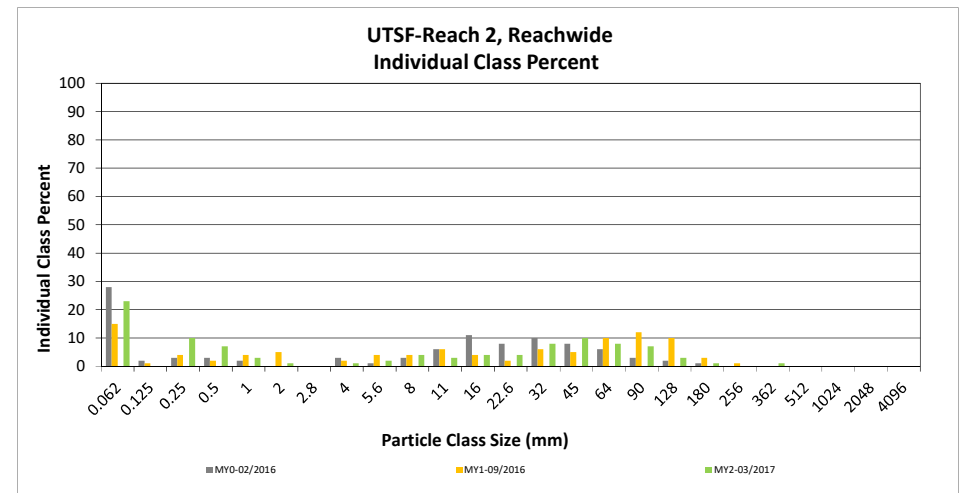
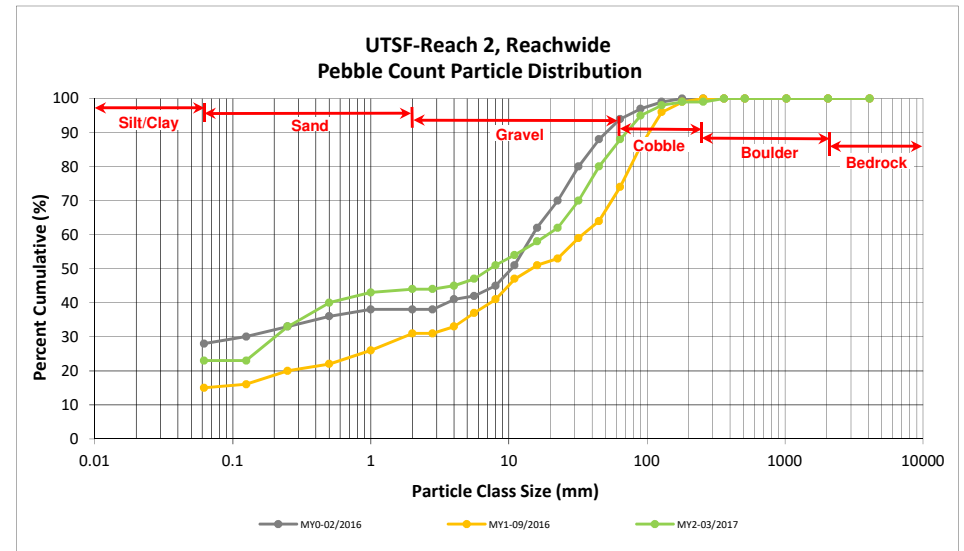
DMS Project No. 96314

Monitoring Year 2 - 2017

UTSF-Reach 2, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	21	23	23	23
SAND	Very fine	0.062	0.125					23
	Fine	0.125	0.250		10	10	10	33
	Medium	0.25	0.50		7	7	7	40
	Coarse	0.5	1.0	1	2	3	3	43
	Very Coarse	1.0	2.0		1	1	1	44
GRAVEL	Very Fine	2.0	2.8					44
	Very Fine	2.8	4.0	1		1	1	45
	Fine	4.0	5.6	2		2	2	47
	Fine	5.6	8.0	4		4	4	51
	Medium	8.0	11.0	3		3	3	54
	Medium	11.0	16.0	3	1	4	4	58
	Coarse	16.0	22.6	2	2	4	4	62
	Coarse	22.6	32	6	2	8	8	70
	Very Coarse	32	45	8	2	10	10	80
	Very Coarse	45	64	7	1	8	8	88
COBBLE	Small	64	90	6	1	7	7	95
	Small	90	128	3		3	3	98
	Large	128	180	1		1	1	99
	Large	180	256					99
BOULDER	Small	256	362	1		1	1	100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
		Total		50	50	100	100	100

Reachwide Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	0.30
D ₅₀ =	7.3
D ₈₄ =	53.7
D ₉₅ =	90.0
D ₁₀₀ =	362.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

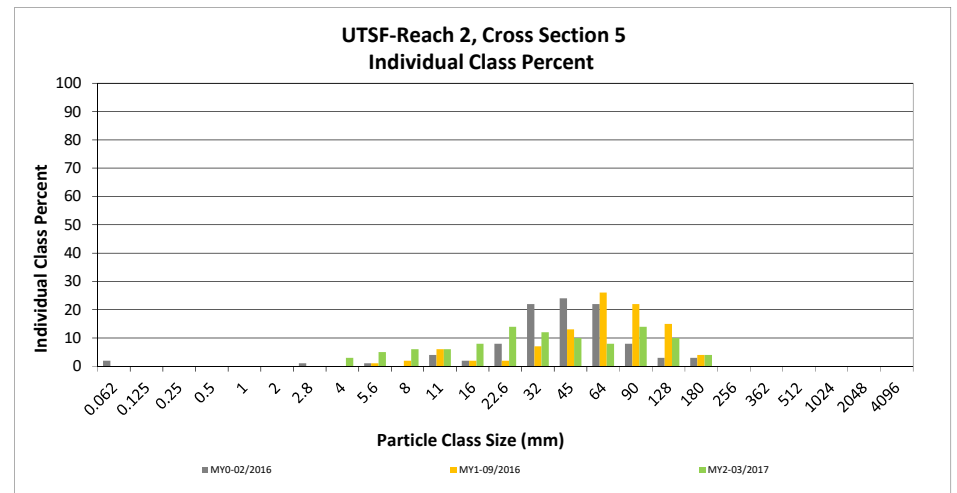
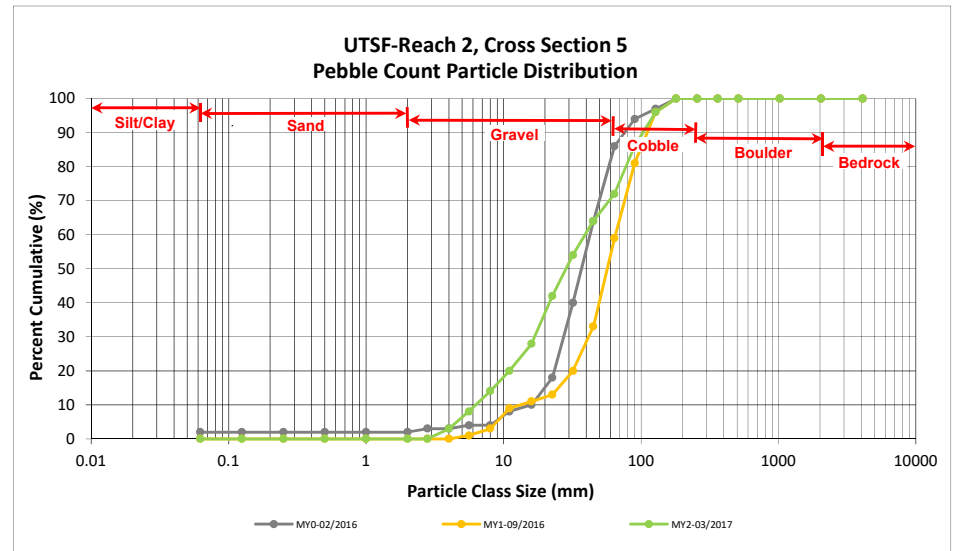
DMS Project No. 96314

Monitoring Year 2 - 2017

UTSF-Reach 2, Cross Section 5

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250			0
	Medium	0.25	0.50			0
	Coarse	0.5	1.0			0
	Very Coarse	1.0	2.0			0
GRAVEL	Very Fine	2.0	2.8			0
	Very Fine	2.8	4.0	3	3	3
	Fine	4.0	5.6	5	5	8
	Fine	5.6	8.0	6	6	14
	Medium	8.0	11.0	6	6	20
	Medium	11.0	16.0	8	8	28
	Coarse	16.0	22.6	14	14	42
	Coarse	22.6	32	12	12	54
	Very Coarse	32	45	10	10	64
	Very Coarse	45	64	8	8	72
COBBLE	Small	64	90	14	14	86
	Small	90	128	10	10	96
	Large	128	180	4	4	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
		Total		100	100	100

Cross Section 5	
Channel materials (mm)	
D ₁₆ =	8.90
D ₃₅ =	19.02
D ₅₀ =	28.5
D ₈₄ =	85.7
D ₉₅ =	123.6
D ₁₀₀ =	180.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

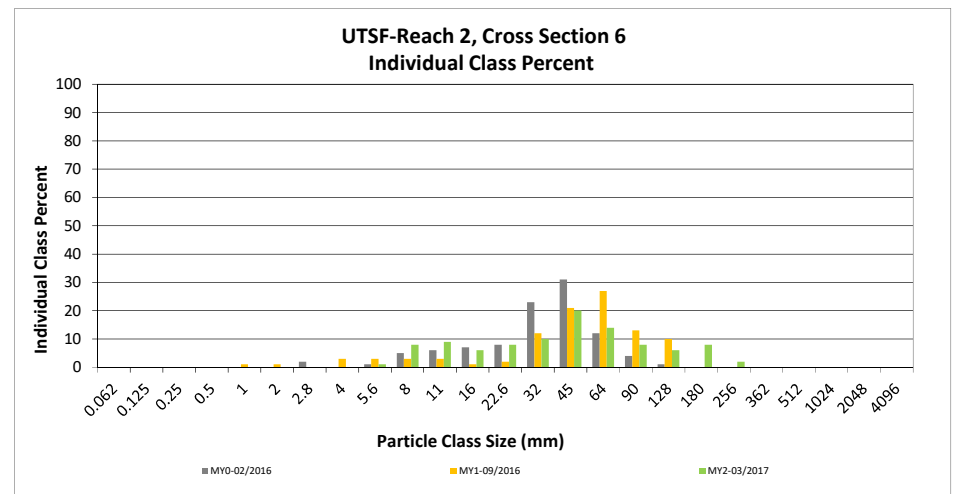
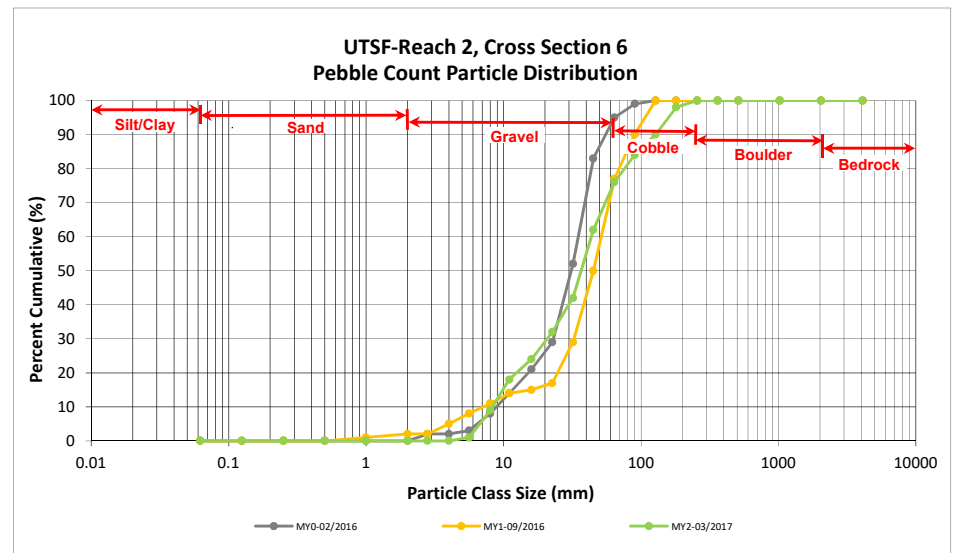
DMS Project No. 96314

Monitoring Year 2 - 2017

UTSF-Reach 2, Cross Section 6

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250			0
	Medium	0.25	0.50			0
	Coarse	0.5	1.0			0
	Very Coarse	1.0	2.0			0
GRAVEL	Very Fine	2.0	2.8			0
	Very Fine	2.8	4.0			0
	Fine	4.0	5.6	1	1	1
	Fine	5.6	8.0	8	8	9
	Medium	8.0	11.0	9	9	18
	Medium	11.0	16.0	6	6	24
	Coarse	16.0	22.6	8	8	32
	Coarse	22.6	32	10	10	42
	Very Coarse	32	45	20	20	62
	Very Coarse	45	64	14	14	76
COBBLE	Small	64	90	8	8	84
	Small	90	128	6	6	90
	Large	128	180	8	8	98
	Large	180	256	2	2	100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
		Total		100	100	100

Cross Section 6	
Channel materials (mm)	
D ₁₆ =	10.25
D ₃₅ =	25.09
D ₅₀ =	36.7
D ₈₄ =	90.0
D ₉₅ =	158.4
D ₁₀₀ =	256.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

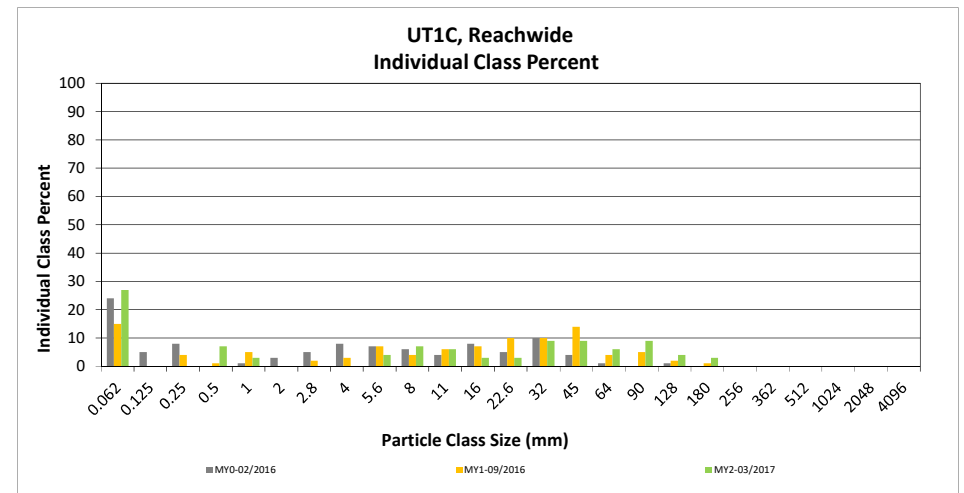
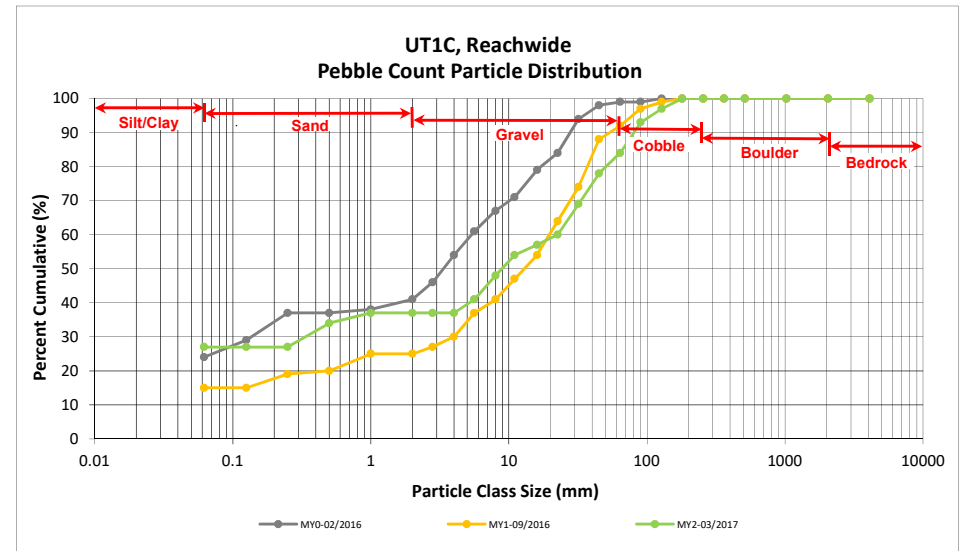
DMS Project No. 96314

Monitoring Year 2 - 2017

UT1C, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	7	20	27	27	27
SAND	Very fine	0.062	0.125					27
	Fine	0.125	0.250					27
	Medium	0.25	0.50		7	7	7	34
	Coarse	0.5	1.0	1	2	3	3	37
	Very Coarse	1.0	2.0					37
GRAVEL	Very Fine	2.0	2.8					37
	Very Fine	2.8	4.0					37
	Fine	4.0	5.6	3	1	4	4	41
	Fine	5.6	8.0	3	4	7	7	48
	Medium	8.0	11.0	2	4	6	6	54
	Medium	11.0	16.0	2	1	3	3	57
	Coarse	16.0	22.6	3		3	3	60
	Coarse	22.6	32	9		9	9	69
	Very Coarse	32	45	8	1	9	9	78
	Very Coarse	45	64	6		6	6	84
COBBLE	Small	64	90	9		9	9	93
	Small	90	128	4		4	4	97
	Large	128	180	3		3	3	100
	Large	180	256					100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				60	40	100	100	100

Reachwide Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	0.63
D ₅₀ =	8.9
D ₈₄ =	64.0
D ₉₅ =	107.3
D ₁₀₀ =	180.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

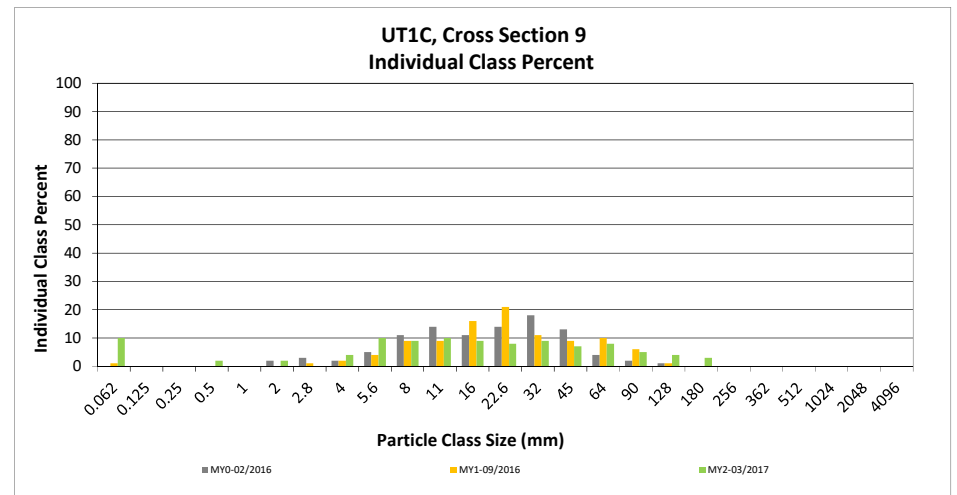
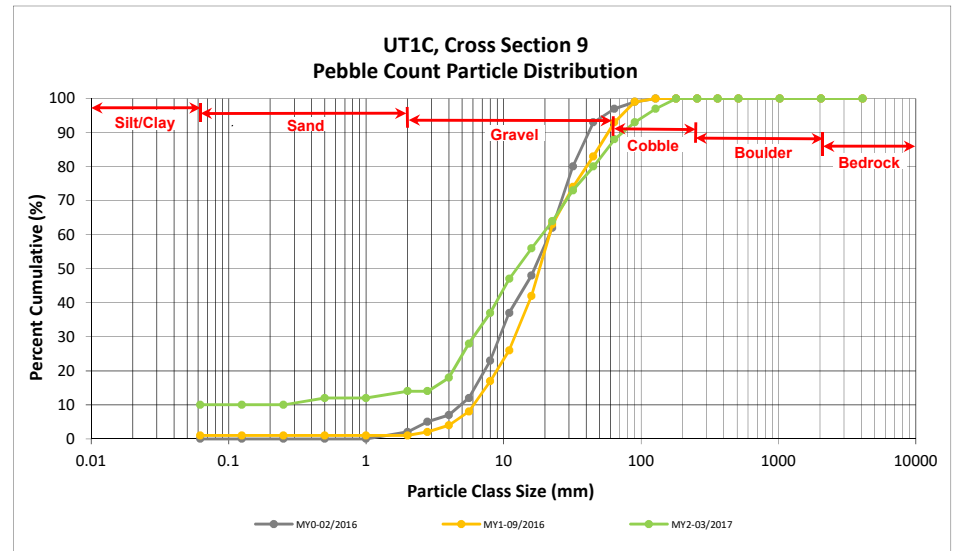
DMS Project No. 96314

Monitoring Year 2 - 2017

UT1C, Cross Section 9

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	10	10	10
SAND	Very fine	0.062	0.125			10
	Fine	0.125	0.250			10
	Medium	0.25	0.50	2	2	12
	Coarse	0.5	1.0			12
	Very Coarse	1.0	2.0	2	2	14
GRAVEL	Very Fine	2.0	2.8			14
	Very Fine	2.8	4.0	4	4	18
	Fine	4.0	5.6	10	10	28
	Fine	5.6	8.0	9	9	37
	Medium	8.0	11.0	10	10	47
	Medium	11.0	16.0	9	9	56
	Coarse	16.0	22.6	8	8	64
	Coarse	22.6	32	9	9	73
	Very Coarse	32	45	7	7	80
	Very Coarse	45	64	8	8	88
COBBLE	Small	64	90	5	5	93
	Small	90	128	4	4	97
	Large	128	180	3	3	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
		Total		100	100	100

Cross Section 9	
Channel materials (mm)	
D ₁₆ =	3.35
D ₃₅ =	7.39
D ₅₀ =	12.5
D ₈₄ =	53.7
D ₉₅ =	107.3
D ₁₀₀ =	180.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

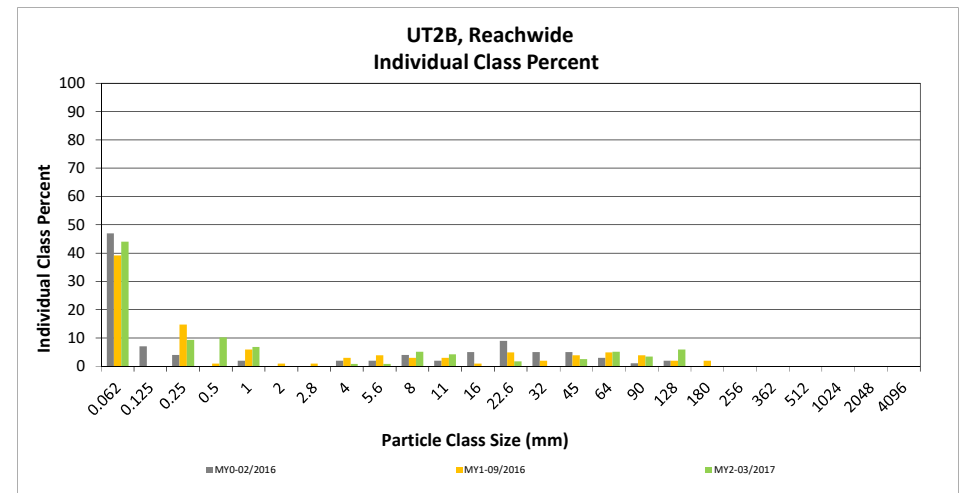
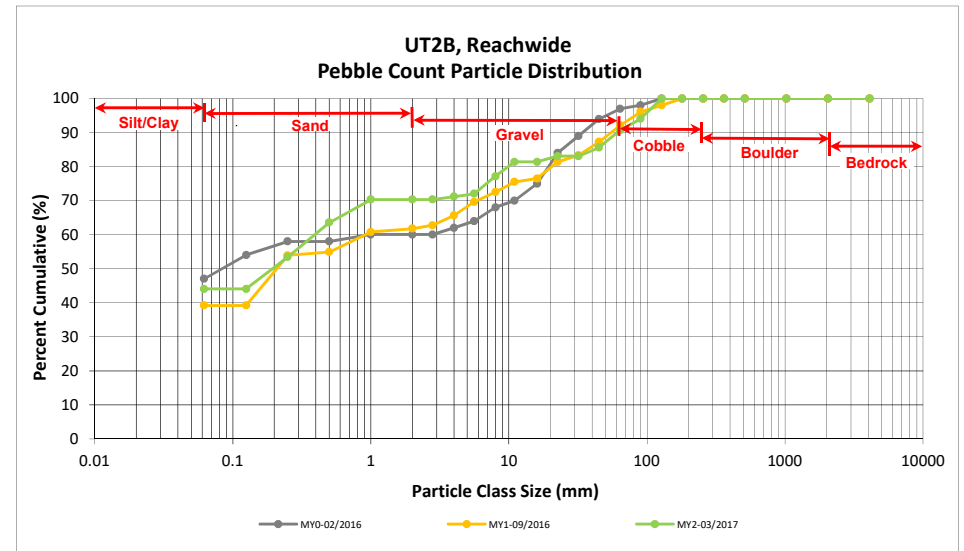
DMS Project No. 96314

Monitoring Year 2 - 2017

UT2B, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	22	30	52	44	44
SAND	Very fine	0.062	0.125					44
	Fine	0.125	0.250	4	7	11	9	53
	Medium	0.25	0.50		12	12	10	64
	Coarse	0.5	1.0		8	8	7	70
	Very Coarse	1.0	2.0					70
GRAVEL	Very Fine	2.0	2.8					70
	Very Fine	2.8	4.0	1		1	1	71
	Fine	4.0	5.6	1		1	1	72
	Fine	5.6	8.0	6		6	5	77
	Medium	8.0	11.0	5		5	4	81
	Medium	11.0	16.0					81
	Coarse	16.0	22.6	2		2	2	83
	Coarse	22.6	32					83
	Very Coarse	32	45	3		3	3	86
Very Coarse	45	64	6		6	5	91	
COBBLE	Small	64	90	4		4	3	94
	Small	90	128	7		7	6	100
	Large	128	180					100
	Large	180	256					100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				61	57	118	100	100

Reachwide	
Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	Silt/Clay
D ₅₀ =	0.2
D ₈₄ =	36.3
D ₉₅ =	95.1
D ₁₀₀ =	128.0



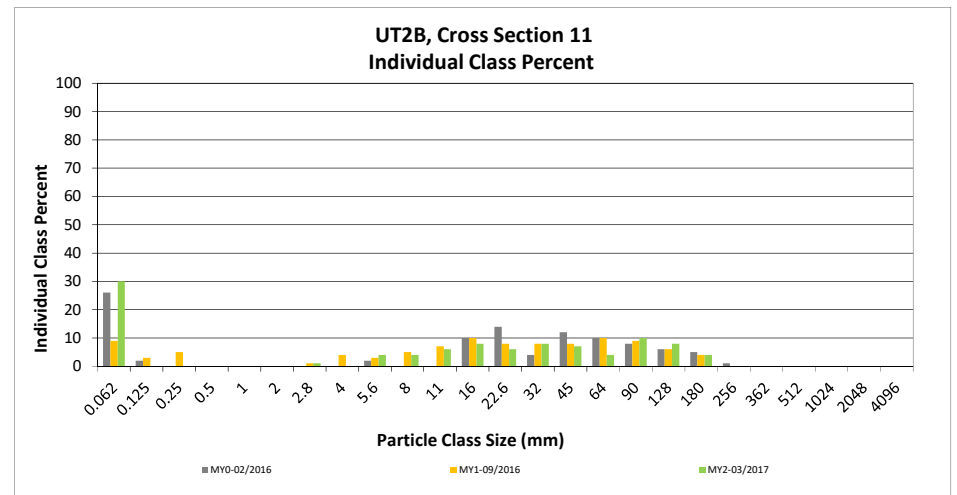
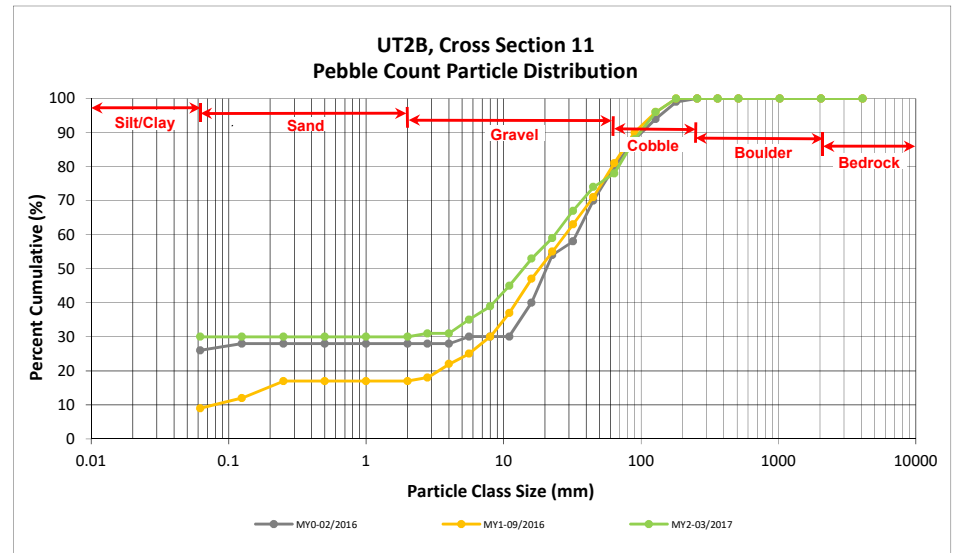
Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project
 DMS Project No. 96314
 Monitoring Year 2 - 2017

UT2B, Cross Section 11

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	30	30	30
SAND	Very fine	0.062	0.125			30
	Fine	0.125	0.250			30
	Medium	0.25	0.50			30
	Coarse	0.5	1.0			30
	Very Coarse	1.0	2.0			30
GRAVEL	Very Fine	2.0	2.8	1	1	31
	Very Fine	2.8	4.0			31
	Fine	4.0	5.6	4	4	35
	Fine	5.6	8.0	4	4	39
	Medium	8.0	11.0	6	6	45
	Medium	11.0	16.0	8	8	53
	Coarse	16.0	22.6	6	6	59
	Coarse	22.6	32	8	8	67
	Very Coarse	32	45	7	7	74
	Very Coarse	45	64	4	4	78
COBBLE	Small	64	90	10	10	88
	Small	90	128	8	8	96
	Large	128	180	4	4	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
		Total		100	100	100

Cross Section 11	
Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	5.60
D ₅₀ =	13.9
D ₈₄ =	78.5
D ₉₅ =	122.5
D ₁₀₀ =	180.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

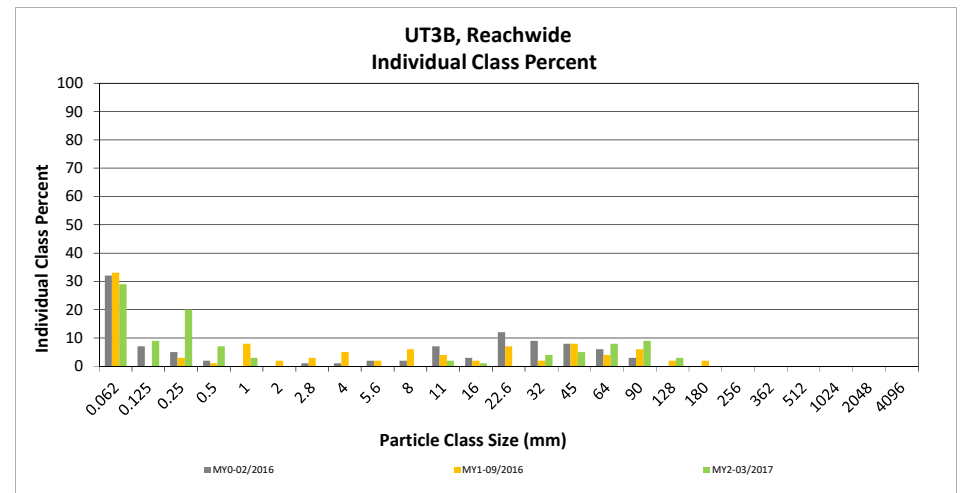
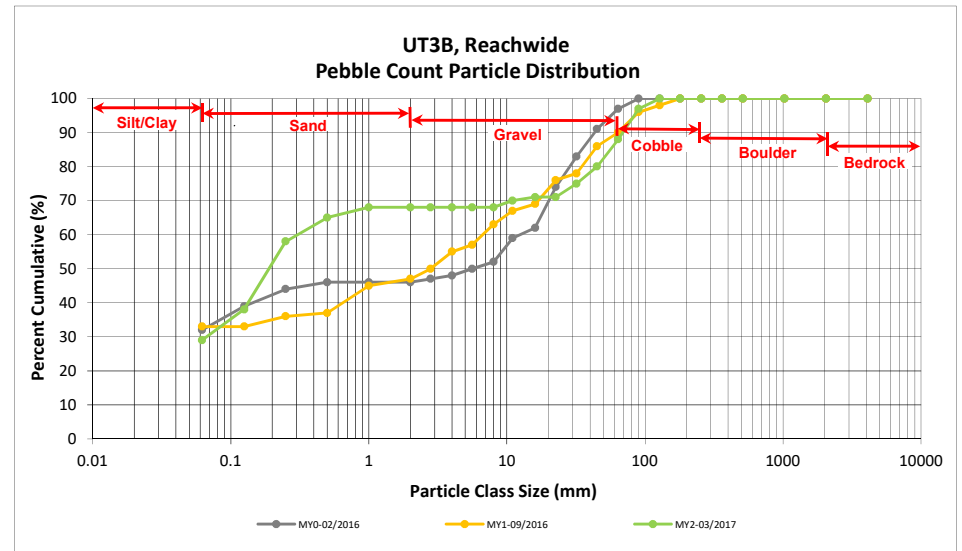
DMS Project No. 96314

Monitoring Year 2 - 2017

UT3B, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	6	23	29	29	29
SAND	Very fine	0.062	0.125		9	9	9	38
	Fine	0.125	0.250	15	5	20	20	58
	Medium	0.25	0.50	5	2	7	7	65
	Coarse	0.5	1.0	2	1	3	3	68
	Very Coarse	1.0	2.0					68
GRAVEL	Very Fine	2.0	2.8					68
	Very Fine	2.8	4.0					68
	Fine	4.0	5.6					68
	Fine	5.6	8.0					68
	Medium	8.0	11.0	2		2	2	70
	Medium	11.0	16.0	1		1	1	71
	Coarse	16.0	22.6					71
	Coarse	22.6	32	4		4	4	75
	Very Coarse	32	45	5		5	5	80
Very Coarse	45	64	8		8	8	88	
COBBLE	Small	64	90	9		9	9	97
	Small	90	128	3		3	3	100
	Large	128	180					100
	Large	180	256					100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				60	40	100	100	100

Reachwide Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	0.10
D ₅₀ =	0.2
D ₈₄ =	53.7
D ₉₅ =	83.4
D ₁₀₀ =	128.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

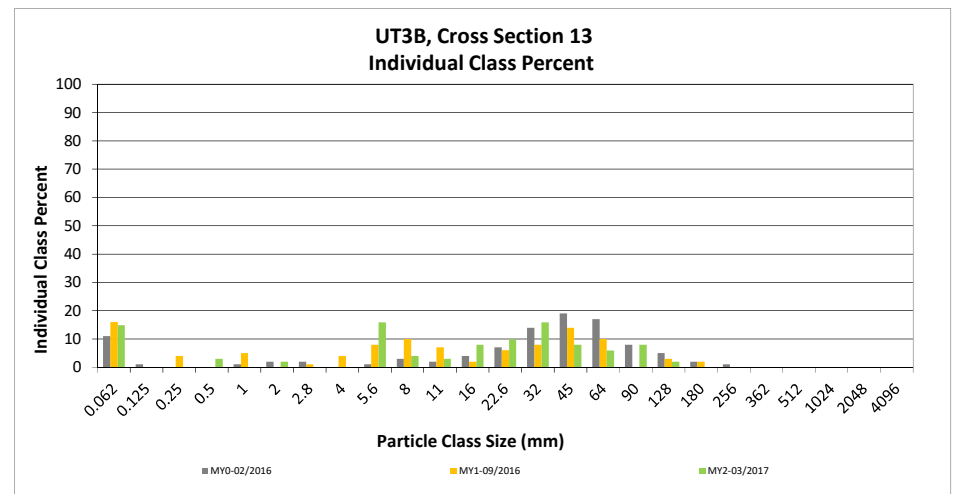
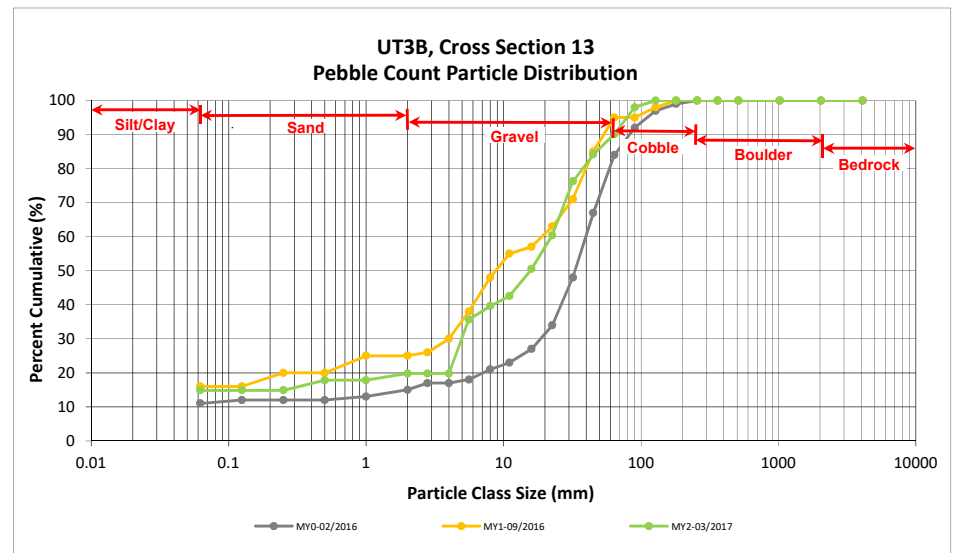
DMS Project No. 96314

Monitoring Year 2 - 2017

UT3B, Cross Section 13

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	15	15	15
SAND	Very fine	0.062	0.125			15
	Fine	0.125	0.250			15
	Medium	0.25	0.50	3	3	18
	Coarse	0.5	1.0			18
	Very Coarse	1.0	2.0	2	2	20
GRAVEL	Very Fine	2.0	2.8			20
	Very Fine	2.8	4.0			20
	Fine	4.0	5.6	16	16	36
	Fine	5.6	8.0	4	4	40
	Medium	8.0	11.0	3	3	43
	Medium	11.0	16.0	8	8	50
	Coarse	16.0	22.6	10	10	60
	Coarse	22.6	32	16	16	76
	Very Coarse	32	45	8	8	84
	Very Coarse	45	64	6	6	90
COBBLE	Small	64	90	8	8	98
	Small	90	128	2	2	100
	Large	128	180			100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
		Total		101	100	100

Cross Section 13	
Channel materials (mm)	
D ₁₆ =	0.33
D ₃₅ =	5.52
D ₅₀ =	15.6
D ₈₄ =	44.7
D ₉₅ =	79.0
D ₁₀₀ =	128.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

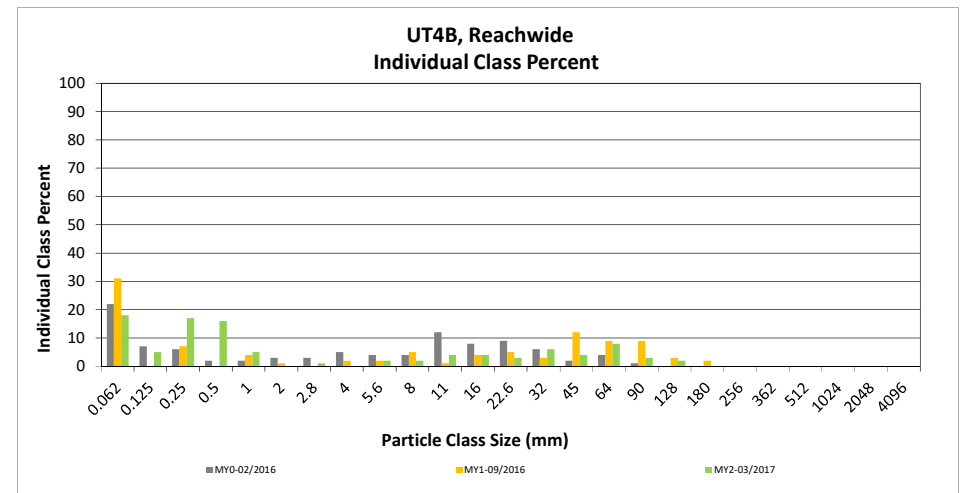
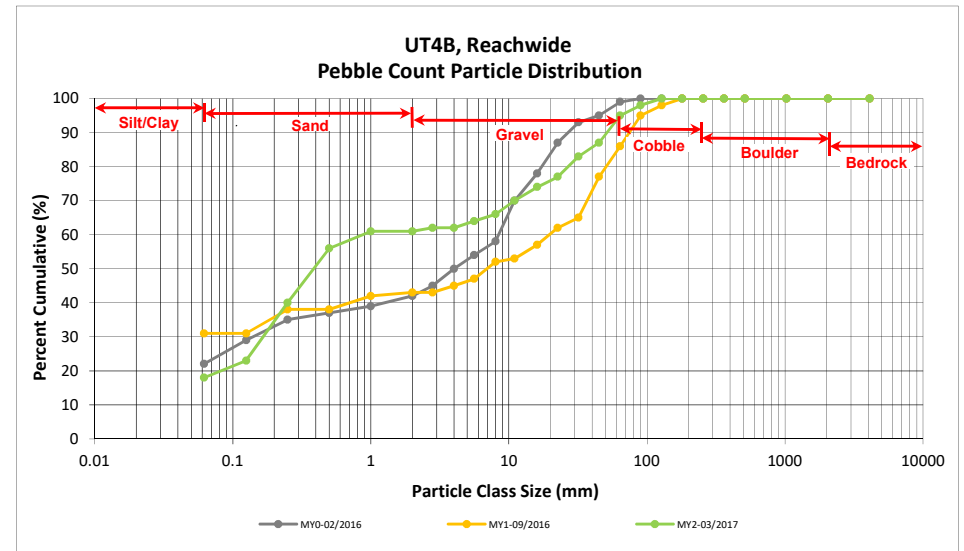
DMS Project No. 96314

Monitoring Year 2 - 2017

UT4B, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary		
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative	
SILT/CLAY	Silt/Clay	0.000	0.062	4	14	18	18	18	
SAND	Very fine	0.062	0.125	1	4	5	5	23	
	Fine	0.125	0.250	7	10	17	17	40	
	Medium	0.25	0.50	6	10	16	16	56	
	Coarse	0.5	1.0		5	5	5	61	
	Very Coarse	1.0	2.0					61	
GRAVEL	Very Fine	2.0	2.8		1	1	1	62	
	Very Fine	2.8	4.0					62	
	Fine	4.0	5.6	2		2	2	64	
	Fine	5.6	8.0	2		2	2	66	
	Medium	8.0	11.0	3	1	4	4	70	
	Medium	11.0	16.0	4		4	4	74	
	Coarse	16.0	22.6	3		3	3	77	
	Coarse	22.6	32	5	1	6	6	83	
	Very Coarse	32	45	3	1	4	4	87	
Very Coarse	45	64	6	2	8	8	95		
COBBLE	Small	64	90	2	1	3	3	98	
	Small	90	128	2		2	2	100	
	Large	128	180					100	
	Large	180	256					100	
Boulder	Small	256	362					100	
	Small	362	512					100	
	Medium	512	1024					100	
	Large/Very Large	1024	2048					100	
BEDROCK	Bedrock	2048	>2048					100	
		Total			50	50	100	100	100

Reachwide	
Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	0.20
D ₅₀ =	0.4
D ₈₄ =	34.8
D ₉₅ =	64.0
D ₁₀₀ =	128.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

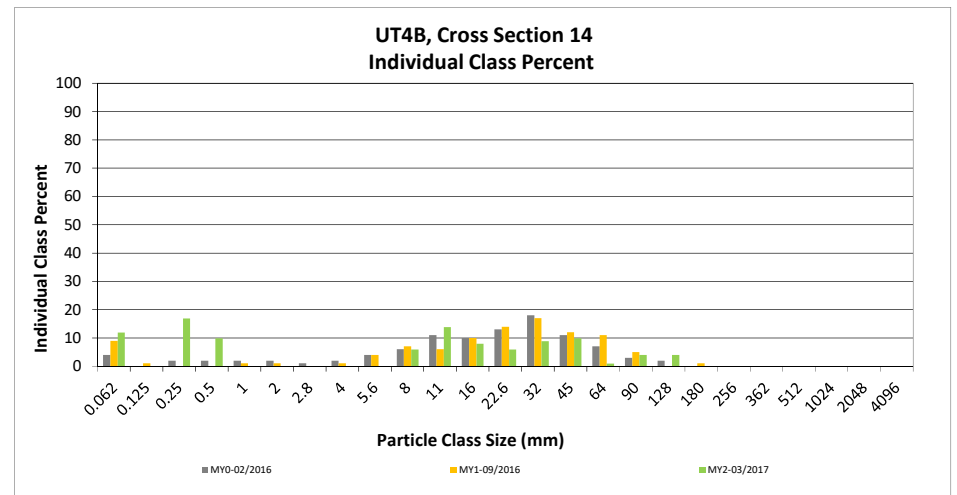
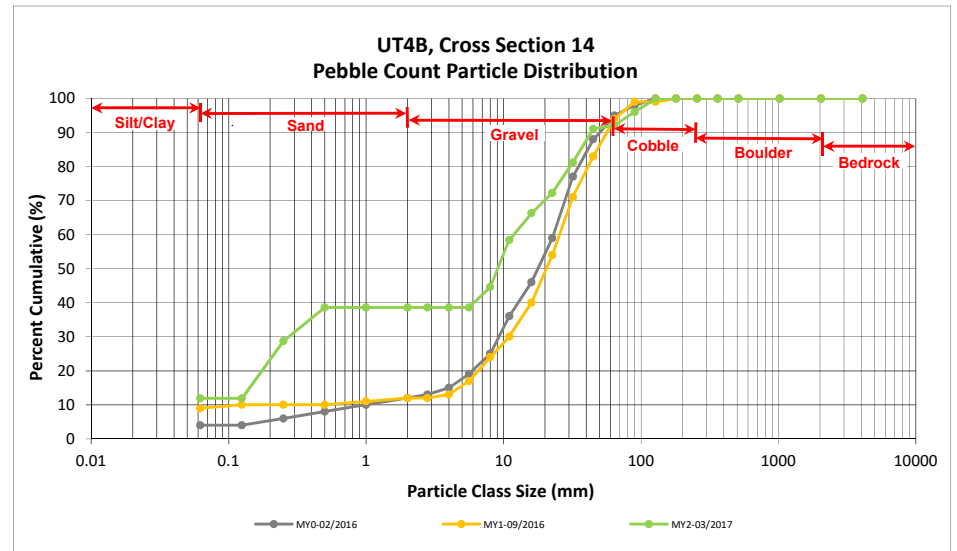
DMS Project No. 96314

Monitoring Year 2 - 2017

UT4B, Cross Section 14

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	12	12	12
SAND	Very fine	0.062	0.125			12
	Fine	0.125	0.250	17	17	29
	Medium	0.25	0.50	10	10	39
	Coarse	0.5	1.0			39
	Very Coarse	1.0	2.0			39
GRAVEL	Very Fine	2.0	2.8			39
	Very Fine	2.8	4.0			39
	Fine	4.0	5.6			39
	Fine	5.6	8.0	6	6	45
	Medium	8.0	11.0	14	14	58
	Medium	11.0	16.0	8	8	66
	Coarse	16.0	22.6	6	6	72
	Coarse	22.6	32	9	9	81
	Very Coarse	32	45	10	10	91
	Very Coarse	45	64	1	1	92
COBBLE	Small	64	90	4	4	96
	Small	90	128	4	4	100
	Large	128	180			100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
		Total		101	100	100

Cross Section 14	
Channel materials (mm)	
D ₁₆ =	0.15
D ₃₅ =	0.39
D ₅₀ =	9.1
D ₈₄ =	35.3
D ₉₅ =	82.3
D ₁₀₀ =	128.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

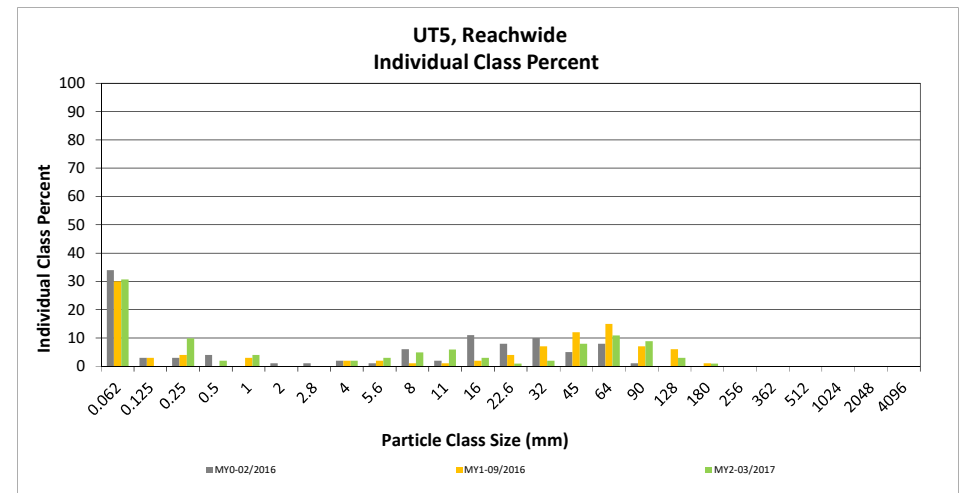
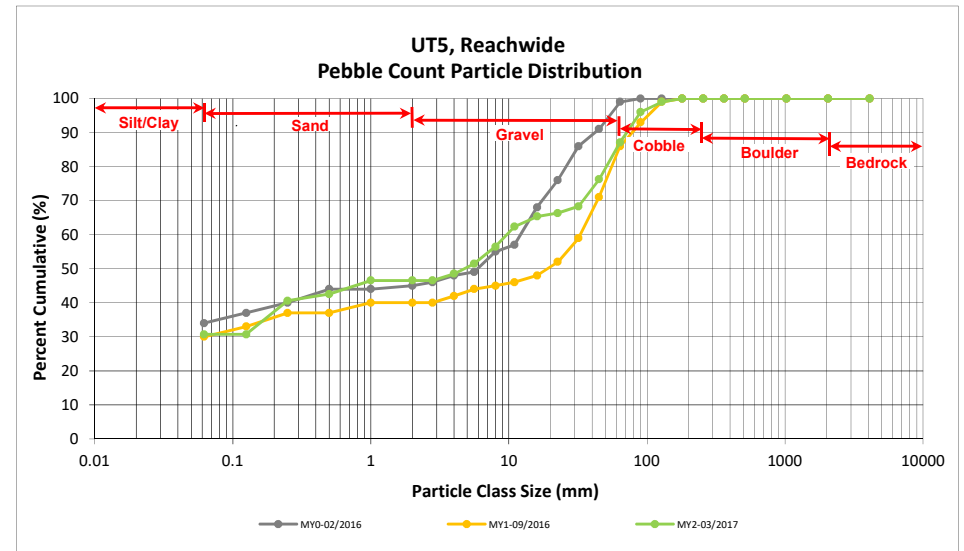
DMS Project No. 96314

Monitoring Year 2 - 2017

UT5, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	30	31	31	31
SAND	Very fine	0.062	0.125					31
	Fine	0.125	0.250		10	10	10	41
	Medium	0.25	0.50	2		2	2	43
	Coarse	0.5	1.0		4	4	4	47
	Very Coarse	1.0	2.0					47
GRAVEL	Very Fine	2.0	2.8					47
	Very Fine	2.8	4.0	2		2	2	49
	Fine	4.0	5.6	2	1	3	3	51
	Fine	5.6	8.0	4	1	5	5	56
	Medium	8.0	11.0	5	1	6	6	62
	Medium	11.0	16.0	1	2	3	3	65
	Coarse	16.0	22.6		1	1	1	66
	Coarse	22.6	32	1	1	2	2	68
	Very Coarse	32	45	8		8	8	76
	Very Coarse	45	64	11		11	11	87
COBBLE	Small	64	90	9		9	9	96
	Small	90	128	3		3	3	99
	Large	128	180	1		1	1	100
	Large	180	256					100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
		Total		50	51	101	100	100

Reachwide Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	0.17
D ₅₀ =	4.7
D ₈₄ =	57.8
D ₉₅ =	86.5
D ₁₀₀ =	180.0



Reachwide and Cross Section Pebble Count Plots

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

UT5, Cross Section 17

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250	2	2	2
	Medium	0.25	0.50	2	2	4
	Coarse	0.5	1.0			4
	Very Coarse	1.0	2.0			4
GRAVEL	Very Fine	2.0	2.8			4
	Very Fine	2.8	4.0			4
	Fine	4.0	5.6			4
	Fine	5.6	8.0	4	4	8
	Medium	8.0	11.0	10	10	18
	Medium	11.0	16.0	12	12	30
	Coarse	16.0	22.6	12	12	42
	Coarse	22.6	32	20	20	62
	Very Coarse	32	45	18	18	80
	Very Coarse	45	64	12	12	92
COBBLE	Small	64	90	8	8	100
	Small	90	128			100
	Large	128	180			100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
		Total		100	100	100

Cross Section 17	
Channel materials (mm)	
D ₁₆ =	10.32
D ₃₅ =	18.48
D ₅₀ =	26.0
D ₈₄ =	50.6
D ₉₅ =	72.7
D ₁₀₀ =	90.0

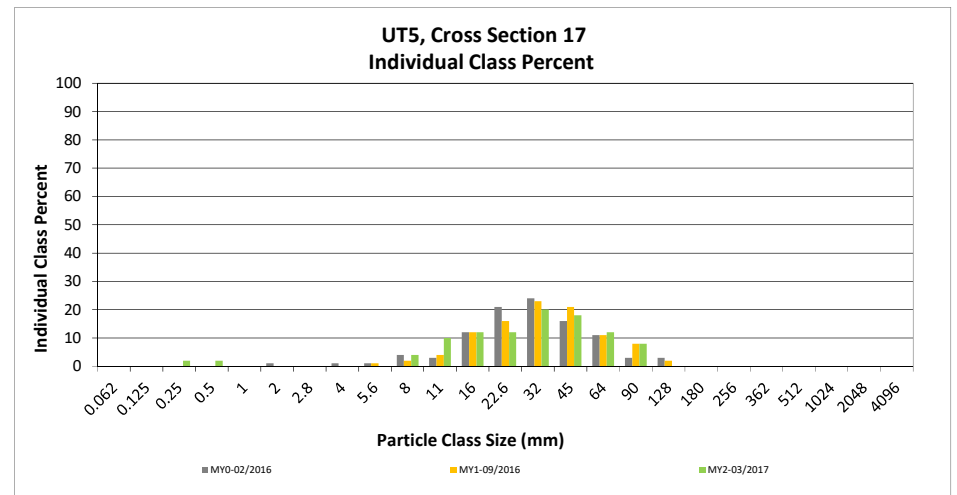
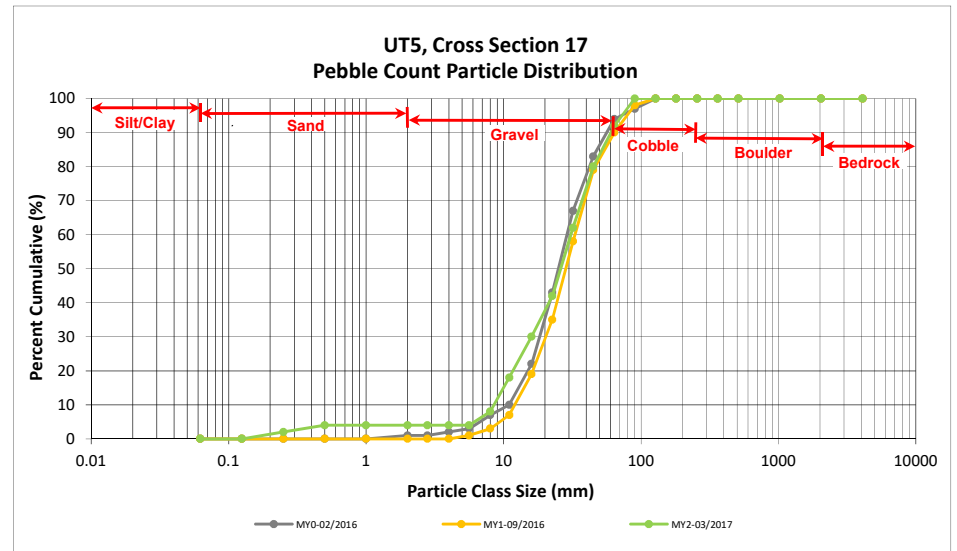


Table 13. Bank Pin Table

Maney Farm Mitigation Project

DMS Project No. 96314

Monitoring Year 2 - 2017

UT South Fork Reach 1 - Cross Section 4 Pool (Station 118+63)

Pin	Date	Exposure (in)
Upstream	4/15/2016	0.0
Midstream		0.0
Downstream		0.0
Upstream	9/14/2016	0.0
Midstream		0.0
Downstream		0.0
Upstream	10/19/2017	0.0
Midstream		0.0
Downstream		0.0

APPENDIX 5. Hydrology Summary Data

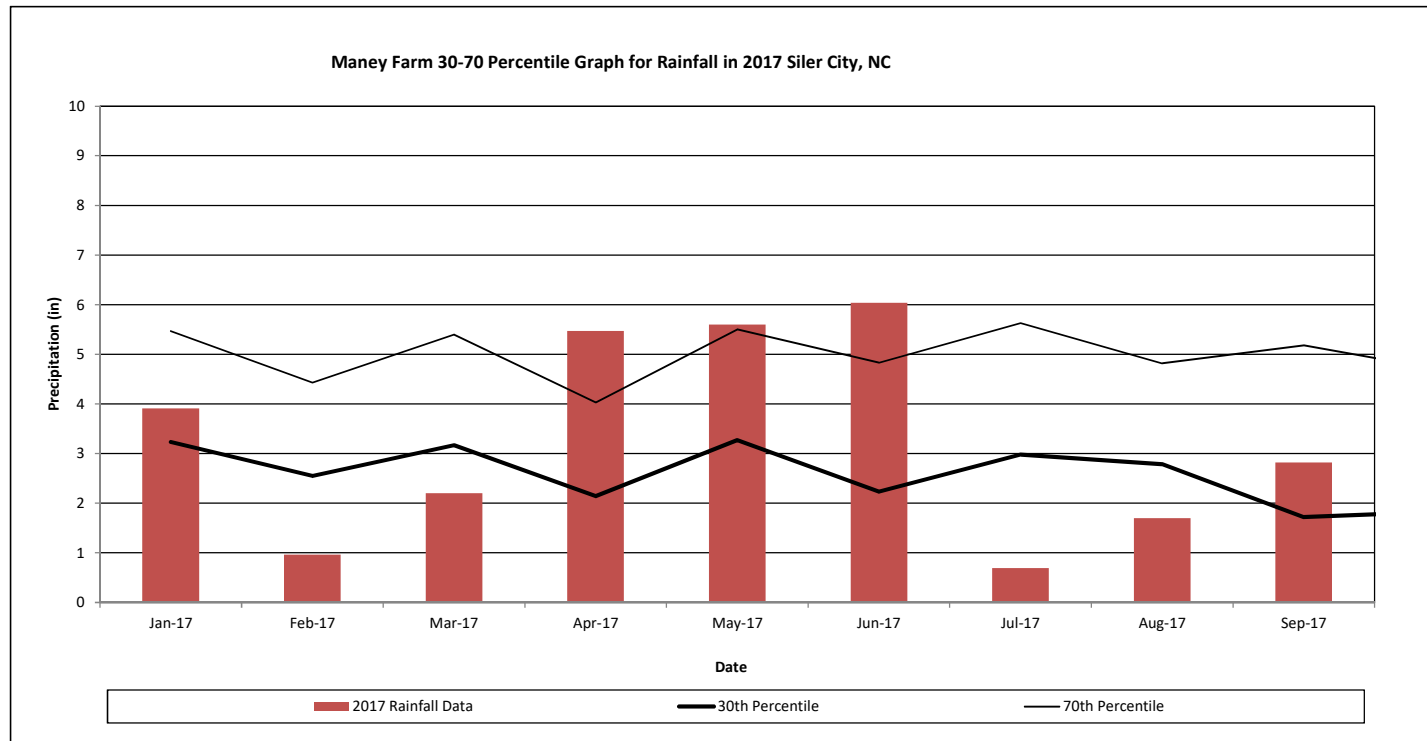
Table 14. Verification of Bankfull Events

Maney Farm Mitigation Site (DMS Project No.96314)
Monitoring Year 2 - 2017

Reach	Date of Data Collection	Date of Occurrence	Method
UTSF Reach 1	3/9/2017	1/9/2017	Crest Gage/ Pressure Transducer
	10/17/2017	7/23/2017	
UTSF Reach 2	3/9/2017	1/9/2017	
	10/17/2017	7/23/2017	
UT5	3/9/2017	1/9/2017	
	10/17/2017	7/23/2017	

Monthly Rainfall Data

Maney Farm Mitigation Site (DMS Project No.96314)
Monitoring Year 2 - 2017



¹ 2017 monthly rainfall from USDA Station SILER CITY (317924)

² 30th and 70th percentile rainfall data collected from weather station Siler City 2 S, NC7924 (USDA, 2002).

Stream Flow Gage

Maney Farm (DMS Project No. 96314)

Monitoring Year 2 - 2017

