Mitigation Project Name	Candy Creek Stream Mitigation Site	County	Guilford	USACE Action ID	2015-01209
DMS ID	96315	Date Project Instituted	2/21/2014	NCDWR Permit No	2014-0334
River Basin	Cape Fear	Date Prepared	5/22/2018		
Cataloging Unit	03030002				

Credit Release Milestone	Stream Credits						Wetland Credits							
	Scheduled Releases (Stream)	Warm	Cool	Cold	Anticipated Release Year (Stream)	Actual Release Date (Stream)	Scheduled Releases (Forested)	Riparian Riverine	Riparian Non-riverine	Non-riparian	Scheduled Releases (Coastal)	Coastal	Anticipated Release Year (Wetland)	Actual Release Date (Wetland)
Potential Credits (Mitigation Plan)		15,532.530												
Potential Credits (As-Built Survey)		15,506.467												
1 (Site Establishment)	N/A				N/A	N/A	N/A				N/A		N/A	N/A
2 (Year 0 / As-Built)	30%	4,651.940			2017	6/7/2017	30%				30%		N/A	N/A
3 (Year 1 Monitoring)	10%	1,550.647			2018	4/25/2018	10%				10%		N/A	N/A
4 (Year 2 Monitoring)	10%				2019		10%				15%		N/A	N/A
5 (Year 3 Monitoring)	10%				2020		15%				20%		N/A	N/A
6 (Year 4 Monitoring)	5%				2021		5%				10%		N/A	N/A
7 (Year 5 Monitoring)	10%				2022		15%				15%		N/A	N/A
8 (Year 6 Monitoring)	5%				2023		5%				N/A		N/A	N/A
9 (Year 7 Monitoring)	10%				2024		10%				N/A		N/A	N/A
Stream Bankfull Standard	10%						N/A				N/A			
Total Credits Released to Date		6,202.587												

DEBITS (released credits only)

Ratios			1	1.5	2.5	5	1	3	2	5	1	3	2	5	1	3	2	5
			Stream Restoration	Stream Enhancment I	Stream Enhancement II	Stream Preservation	Riparian Restoration	Riparian Creation	Riparian Enhancement	Riparian Preservation	Nonriparian Restoration	Nonriparian Creation	Nonriparian Enhancement	Nonriparian Preservation	Coastal Marsh Restoration	Coastal Marsh Creation	Coastal Marsh Enhancement	Coastal Marsh Preservation
As-Built Amounts (feet and acres)			12,774.000	2,023.000	2,133.000	2,653.000												
As-Built Amounts (mitigation credits)			12,774.000	1,348.667	853.200	530.600												
Percentage Released			40%	40%	40%	40%												
Released Amounts (feet / acres)			5,109.600	809.200	853.200	1,061.200												
Released Amounts (credits)			5,109.600	539.467	341.280	212.240												
NCDWR Permit	USACE Action ID	Project Name																
2015-0819	2015-01791	SR 2158 - Bridge 85 - Division 7	64.010															
	2015-02553	SR 2363 - Bridge 146 - Division 7	92.000															
2013-0223	2001-21125	NCDOT TIP U-2524C/D Add'l - Greensboro Outer Loop	37.000															
2013-0918	2005-21386	NCDOT TIP U-2525B/C - Greensboro Eastern Loop	3,639.000	606.900	639.900													
2013-0918	2005-21386	NCDOT TIP U-2525B/C - Greensboro Eastern Loop	1,277.590	202.300	213.300													
2017-1466	2009-02019	NCDOT TIP U-4734 - Division 9				1,061.200												
Remaining Amounts (feet / acres)			0.000	0.000	0.000	0.000												
Remaining Amounts (credits)			0.000	0.000	0.000	0.000												

Contingencies (if any): None

Signature of Wilmington District Official Approving Credit Release

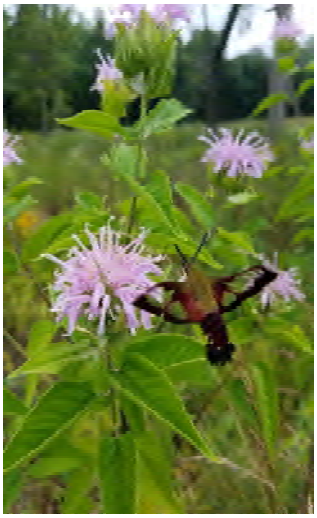
9/6/18
Date

1 - For NCDMS, no credits are released during the first milestone

2 - For NCDMS projects, the second credit release milestone occurs automatically when the as-built report (baseline monitoring report) has been made available to the NCIRT by posting it to the NCDMS Portal, provided the following criteria have been met:

1) Approval of the final Mitigation Plan
2) Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property
3) Completion of all physical and biological improvements to the mitigation site pursuant to the mitigation plan
4) Reciept of necessary DA permit authorization or written DA approval for porjects where DA permit issuance is not required

3 - A 10% reserve of credits is to be held back until the bankfull event performance standard has been met

MONITORING YEAR 2 ANNUAL REPORT

Final

CANDY CREEK MITIGATION SITE

Guilford County, NC
DEQ Contract 5794
DMS Project Number 96315
USACE Action ID Number 2015-01209
NCDWR Project Number 14-0334

Data Collection Period: March – October 2018
Submission Date: December 5, 2018

PREPARED FOR:

NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC27699-1652

PREPARED BY:

1430 South Mint Street, Suite 104
Charlotte, NC 28203

Phone: 704.332.7754
Fax: 704.332.3306

December 5, 2018

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

RE: **Draft Monitoring Year 2 Report Comments**
Candy Creek Mitigation Site (DMS #96315)
DMS Contract Number 5794
RFP Number 16-005568
Guilford County, NC

Dear Mr. Schaffer:

Wildlands Engineering, Inc. (Wildlands) has reviewed the Division of Mitigation Services (DMS) comments from the Draft Monitoring Year 2 report for the Candy Creek Mitigation Project. The following Wildlands responses to DMS's report comments are noted in italics lettering.

DMS comment; The digital data and drawings have been reviewed and DMS had the following comments:

a. **No GIS shapefiles were in the CCPV GIS Data folder. In MY1, this folder contained shapefiles for problem areas. Given that there are still stream and vegetation problem areas as well as areas of invasive vegetation, please provide MY2 shapefiles for these areas to verify no changes have occurred.**
b. **There are no Stream or Vegetation Photos included in the electronic files. Please include.**

Wildlands response; The CCPV GIS layers and the Stream and Vegetation Photos are located in the following folder of the electronic files from the draft submittal and are included on the final CD. support->visual assessment data->CCPV GIS data.

DMS comment; Section 1.2.3, Page 1-3: DMS suggests adding verbiage to this section explaining that when including the desirable volunteers all vegetation plots meet success criteria except for plot 35.

Wildlands response; Verbiage was referenced in Section 1.2.3 to state all vegetation plots, except plot 35, would meet success criteria if desirable volunteers were included.

DMS comment; Appendix 4, Table 11 – Based upon the guidance prepared by the Technical Workgroup sent out by the IRT regarding the method to be used to calculate Bank Height Ratio (BHR), DMS had the following comments:

a. **Cross-section 1: It seems like the cross-section either enlarged some or at a minimum stayed the same. Please verify.**
b. **Cross-section 3: It seems like the cross-section may stayed the same and not decreased. Please verify.**

c. **Cross-section 7: This one seems more like a candidate for a BHR less than 1. Please verify.**
d. **Cross-section 14: This one seems like it should be greater than 1.0. Please verify.**
e. **Cross-section 20: This one seems like it should be greater than 1.0. Please verify.**
f. **Cross-sections 23, 24, and 25: There are some changes to cross-sectional area but looks like they offset each other from year to year.**
g. **Cross-section 33: Given the level of down-cutting, BHR needs to be re-calculated for this cross-section.**
h. **Cross-section 36: This one seems more like a candidate for a BHR less than 1. Please verify.**
i. **Cross-section 41: This one seems more like a candidate for a BHR less than 1. Please verify.**

Wildlands response; Wildlands has verified the above cross-sections and updated Table 11 accordingly.

DMS comment; As required by contract, specifically RFP#16-005568 Addendum #1, Wildlands must submit an updated Monitoring Phase Performance Bon (MPPB) for Monitoring Year 3 (Task 9) to Jeff Jurek for his approval before DMS approves this deliverable and the associated payment.

Wildlands response; Wildlands has prepared and submitted a decrease rider and continuation certificate for MY3 (Task 9) to Jeff Jurek for approval.

DMS comment; As Wildlands has done in the past, please include a response to the comment letter and how/where the comments were addressed. Please insert this letter directly behind the cover page in the final deliverables. The IRT has requested that we include this letter with the final deliverables. The response letter will need to be included with all future monitoring deliverables.

Wildlands response; Wildlands has included this response letter as part of the final report deliverable to DMS and the IRT.

Enclosed please find three (3) hard copies and one (1) electronic copy on CD of the Final Monitoring Report. Please contact me at 704-332-7754 x110 if you have any questions.

Sincerely,

Kirsten Y. Gimbert

Kirsten Y. Gimbert
Environmental Scientist
kgimbert@wildlandseng.com

EXECUTIVE SUMMARY

Wildlands Engineering Inc. (Wildlands) implemented a full delivery project at the Candy Creek Mitigation Site (Site) for the North Carolina Division of Mitigation Services (DMS) to restore, enhance, and preserve a total of 19,583 linear feet (LF) of perennial and intermittent streams, in Guilford County, NC. The Site is expected to generate 15,507 stream mitigation units (SMUs) through the restoration, enhancement, and preservation of Candy Creek and nine unnamed tributaries (Table 1).

The Site is located northeast of the Town of Brown Summit within the DMS targeted local watershed for the Cape Fear River Basin Hydrologic Unit Code (HUC) 03030002010020 and NCDWR Subbasin 03-06-01 (Figure 1) and is being submitted for mitigation credit in the Cape Fear River Basin HUC 03030002. The Site is located within the Haw River Headwaters Watershed, which is part of DMS' Cape Fear River Basin Restoration Priorities (RBRP). While Candy Creek is not mentioned specifically, this document identifies a restoration goal for all streams within HUC 03030002 of reducing sediment and nutrient pollution to downstream Jordan Lake. The Haw River watershed was also identified in the 2005 NC Wildlife Resources Commission's Wildlife Action Plan as a priority area for freshwater habitat conservation and restoration to protect rare and endemic aquatic fauna and enhance species diversity. No rare and endemic aquatic species have been documented onsite or are proposed for re-establishment onsite as part of the project. The Wildlife Action Plan calls for "support of conservation and restoration of streams and riparian zones in priority areas (acquisition, easements, and buffer)." Restoration at the Site directly and indirectly addressed these goals by excluding cattle from the stream, creating stable stream banks, restoring a riparian corridor, and placing land historically used for agriculture under permanent conservation easement.

The project goals established in the mitigation plan (Wildlands, 2016) were to provide ecological enhancement and mitigate site water quality stressors that will benefit the receiving waters in the Cape Fear River Basin. This will primarily be achieved by creating functional and stable stream channels, increasing and improving the interaction of stream hydrology within the riparian zone, and improving floodplain habitat and ecological function. This will also be achieved by restoring a Piedmont Bottomland Forest community as described by Schafale and Weakley (1990) along the stream reaches within open pastures. Completed with careful consideration of goals and objectives that were described in the RBRP and to address stressors identified in the LWP, the following project goals were established:

- Reduce in-stream water quality stressors resulting in enhanced habitat and water quality in riffles and pools.
- 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 on-site habitat by diversifying and stabilizing the stream channel form; installing habitat features such as undercut logs, brush toe, wood and stone based riffles; and by establishing native stream bank vegetation and shading where none exists.
- Exclude cattle from project streams resulting in greater treatment and reduction of overland flow and landscape derived pollutants including fecal coliform, nitrogen, and phosphorus.
- Increase and improve stream hydrology connectivity with riparian floodplains resulting in temporary water storage and recharge of wetlands and floodplain pools during high flows; increased groundwater connectivity within floodplains and wetlands; promotion of nutrient and carbon exchange between streams and floodplains, and reduced shear stress on channels during larger flow events.

The Site construction and as-built surveys were completed between July 2016 and March 2017. A conservation easement was recorded on 61.74 acres to protect the restored riparian corridor in perpetuity.

Monitoring Year (MY) 2 assessments and site visits were completed between March and October 2018 to assess the conditions of the project. Overall, the Site has met the required stream, vegetation, and hydrology success criteria for MY2. The restored streams are stable and functioning as designed with minor adjustments observed. The average planted stem density for the Site is 412 stems per acre and is therefore on track to meet the MY3 requirement of 320 planted stems per acre. Crest and stream gages installed on the Site to document bankfull events and to monitor the presence of water in the intermittent stream recorded at least one bankfull event or greater on almost of the streams (except for UT1D) during MY2. The stream gage was established on the upstream, intermittent reach of UT1D to document baseflow during the annual monitoring period. The stream gage recorded baseflow for 301 consecutive days during the MY2 monitoring period and therefore has met the established hydrologic criteria.

In addition, the Site has several sections noted where the buffer width is less than 50 feet. The total length of these sections is approximately 3.1% of the total project length, less than the 5% allowed by the IRT. Please refer to Figures 2 and 3.

CANDY CREEK MITIGATION SITE
Monitoring Year 2 Annual Report

TABLE OF CONTENTS

APPENDICES

Section 1: PROJECT OVERVIEW

The Site is located in northeast Guilford County approximately 15 miles northeast of the City of Greensboro off of Old Reidsville Road and Hopkins Road (Figure 1). The Site is located in the Inner Piedmont Belt of the Piedmont Physiographic Province (USGS, 1998). The project watershed is primarily comprised of agricultural and forested land. The drainage area for the Site is 937 acres.

The project streams consist of Candy Creek and the unnamed tributaries (UT1, UT2, UT2A, UT2B, UT3, UT4, UT5, and UT5A). Stream restoration reaches included Candy Creek (Reach 1, 2, and 4), UT1C, UT1D, UT2 (Reach 1 Lower), UT3, UT4, and UT5. Stream enhancement (Level I and II) activities were utilized for Candy Creek Reach 3, UT2 (Reach 1 Upper), UT2 (Reach 2), UT2A, and UT2B. The intact and functional reaches associated with UT1C, UT3, and UT5 were preserved via the project conservation easement. The riparian areas along the restoration and enhancement reaches were planted with native vegetation to improve habitat and protect water quality.

Construction activities were completed by Land Mechanic Designs, Inc. in March 2017. Planting and seeding activities were completed by Bruton Natural Systems, Inc. in March 2017. A conservation easement has been recorded and is in place on 61.74 acres. The project is expected to generate 15,507 stream mitigation units (SMU's). Annual monitoring will be conducted for seven years with the close-out anticipated to commence in 2023 given the success criteria are met. Appendix 1 provides more detailed project activity, history, contact information, and watershed/site background information for this project.

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, stream impairments included incised and over widened channels, bank erosion with areas of mass wasting, historic channelization, floodplain alteration, degraded in-stream habitat, and impoundments. Riparian impairments included clearing and livestock grazing. Tables 10a-f in Appendix 4 present the pre-restoration conditions in detail.

The overarching goals of the stream mitigation project are to provide ecological enhancement and mitigate site water quality stressors that will benefit the receiving waters in the Cape Fear River Basin. The Site will treat almost all the headwaters of Candy Creek and 47% of the entire 3.1-square mile Candy Creek watershed before flowing to the Haw River. A primary goal of the RBRP is to restore and maintain water quality as stated in the Jordan Lake Nutrient Management Strategy. The project goals established for the Site were completed with careful consideration of goals and objectives that were described in the RBRP and include the following:

The primary goals and objectives of the Candy Creek Mitigation Site address stressors identified in the LWP and included the following:

- *Reduce in-stream water quality stressors.* Reconstruct stream channels with stable dimensions. Stabilize eroding stream banks. Add bank protection and in-stream structures to protect restored/enhanced 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.

- *Improve on-site habitat.* Construct diverse and stable channel form with varied and self-sustainable stream bedform. Install habitat features such as undercut logs, brush toe, wood and stone-based riffles. Establish native stream bank vegetation and shading where none exists.
- *Exclude cattle from project streams.* Install fencing around the conservation easement adjacent to cattle pastures.
- *Increase and improve the interaction of stream hydrology within the riparian zone to in turn improve floodplain habitat and ecological function.* Reconstruct stream channels with appropriate bankfull dimensions and raise them to the proper depths relative to a functioning floodplain.
- *Restore and enhance native floodplain forest.* Plant native trees and understory species, and treat invasive species in the riparian zone.
- *Permanently protect the project Site from harmful uses.* Establish a conservation easement on the Site.

1.2 Monitoring Year 2 Data Assessment

Annual monitoring was conducted during MY2 to assess the condition of the project. The stream, vegetation, and hydrologic success criteria for the Site follows the approved success criteria presented in the Candy Creek Mitigation Plan (Wildlands, 2016). Several sections were noted where the buffer width is less than 50 feet. The total length of these sections is approximately 3.1% of the total project length, less than the 5% allowed by the IRT. Please refer to Figures 2 and 3.

1.2.1 Stream Assessment

Morphological surveys for MY2 were conducted in June 2018. Bank erosion was observed within some isolated outside meander bends along Candy Creek Reach 1, 3 and 4, and slight scouring was also noted at cross-sections 32 and 33 on UT2 Reach 1; however, none of these areas are significant and the streams are functioning as designed. The remainder of the cross-sections appear consistent and all streams appear stable. Entrenchment ratios vary slightly from year to year due to minor changes in bankfull widths. Pools are deepening with point bar deposition occurring. Small adjustments in riffle widths occur due to vegetation, sediment deposition, and many other factors. These minor changes do not indicate channel 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.

1.2.2 Stream 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 and enhancement I (EI) reaches. Consistent flow must be documented in the intermittent stream (UT1D) at the Site. Under normal rainfall circumstances, the presence of stream flow on intermittent channels must be documented to occur every year for at least 30 consecutive days during the seven year monitoring period. The presence of stream flow must also be documented to occur intermittently in all months other than July through September of each monitoring year.

At least one bankfull event was recorded on each of the streams (except for UT1D) during MY2 resulting in partial attainment of the stream hydrology assessment criteria. There was a bankfull event recorded during MY1 and MY2 for UT5 and Candy Creek Reach 4; therefore, the success criteria have been met in MY2 for these restoration streams. Results from the stream gage established on UT1D indicate the stream is maintaining baseflow as expected for an intermittent stream. Baseflow was recorded for 100% of the monitoring period (301 consecutive days). Refer to Appendix 5 for hydrologic summary data and plot.

1.2.3 Vegetative Assessment

A total of 40 vegetation plots were established during the baseline monitoring within the project easement area. The majority of plots (37) were installed using a standard 10 meter by 10 meter plot. The additional plots (3) were established as 5 meter by 20 meter non-standard plots. The final vegetative success criteria will be the survival of 210 planted stems per acre in the planted riparian and wetland corridor at the end of the required monitoring period (MY7). The interim measure of vegetative success for the Site will be the survival of at least 320 planted stems per acre at the end of the third monitoring year(MY3) and at least 260 stems per acre at the end of the fifth monitoring year (MY5). Planted vegetation must average 10 feet in height in each 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/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.

The MY2 vegetative survey was completed in August 2018. The 2018 vegetation monitoring resulted in an average stem density of 412 stems per acre for the Site. This density is greater than the interim requirement of 320 stems/acre required at MY3, but approximately 32% less than the baseline density recorded at MY0 (610 stems/acre in March 2017). The average stem height is 2.8 feet for the Site. There is an average of 10 stems per plot as compared to 13 stems per plot in MY1. Seven vegetation plots (6, 12, 15, 17, 18, 30, and 35) did not meet the interim success criteria but are on track to meet the success criteria required for MY5 (260 stems/acre) and MY7 (210 stems/acre). Furthermore, if the desirable volunteers are included, each of these vegetation plots, except vegetation plot 35, meet success criteria. Refer to Appendix 2 for vegetation plot photographs and the vegetation condition assessment table and Appendix 3 for vegetation data tables.

1.2.4 Visual Assessment

Due to the recent hurricane events, Candy Creek was subjected to disturbances, which include multiple fallen trees throughout the site, sediment aggradation and bank erosion. All in-stream structures appear to be intact and functioning properly. The fallen trees over the streams are not impeding water flow.

1.2.5 Areas of Concern/Adaptive Management Plan

Stream areas of concern include minor instances of bank erosion and sediment deposition. A maintenance repair was implemented to stabilize the isolated areas of bank erosion along Candy Creek. The minor repairs consisted of both brush mattress and live stake installation. The minor areas of scour along UT2 will continue to be monitored and a maintenance plan will be established if deemed necessary. All fallen trees over the streams will be removed and dispersed within the site to create additional habitat.

Vegetation areas of concerned included the isolated areas of English ivy (*Hedera helix*) documented within the upper extent of Candy Creek. These areas were treated during the Fall of 2017 and will continue to be treated as necessary. Several riffles and a few pools contain dense infestations of the aquatic plant species Asian spiderwort (*Murdannia keisak*) and water primrose (*Ludwigia hexapetala*). An initial treatment for these aquatic species was implemented in the Fall of 2017; however, due to the dense nature of these species, continual treatment will be required.

The two small bare areas (<1% combined acreage and <3% of the planted acreage) within the floodplain valleys of UT2 were treated with lime, 10-10 fertilization and seeding, which are reflecting improvement; however, another application of seeding will take place during the appropriate season to maximize the potential growth. The planted stems remain healthy and volunteers remain abundant. The Site contains 3.1% of bare areas, low stem density areas and areas of poor growth rates, which is

less than 5% of the planted area. Refer to Appendix 2 for the vegetation condition assessment table and Integrated Current Condition Plan View (CCPV).

1.3 Monitoring Year 2 Summary

The Candy Creek Mitigation Site is on track to meet monitoring success criteria for vegetation, geomorphology, and hydrology performance standards. Morphological surveys indicate that the channel dimensions are stable and functioning as designed. The MY2 vegetation survey resulted in an average stem density of 412 planted stems per acre. The Site is on track to meeting the MY7 success criteria with 33 of 40 individual vegetation plots meeting the MY3 success criteria. The bankfull success criteria has been partially met and are expected to meet by MY7.

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. 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). Crest gages 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.

North Carolina Department of Natural Resources Division of Mitigation Services, 2009. Cape Fear River Basin Restoration Priorities. http://portal.ncdenr.org/c/document_library/get_file?uuid=864e82e8-725c-415e-8ed9-c72dfcb55012&groupId=60329

North Carolina Wildlife Resources Commission, 2005. North Carolina Wildlife Action Plan. Raleigh, NC

Rosgen, D. L. 1994. A classification of natural rivers. *Catena* 22:169-199.

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

United States Army Corps of Engineers. 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.

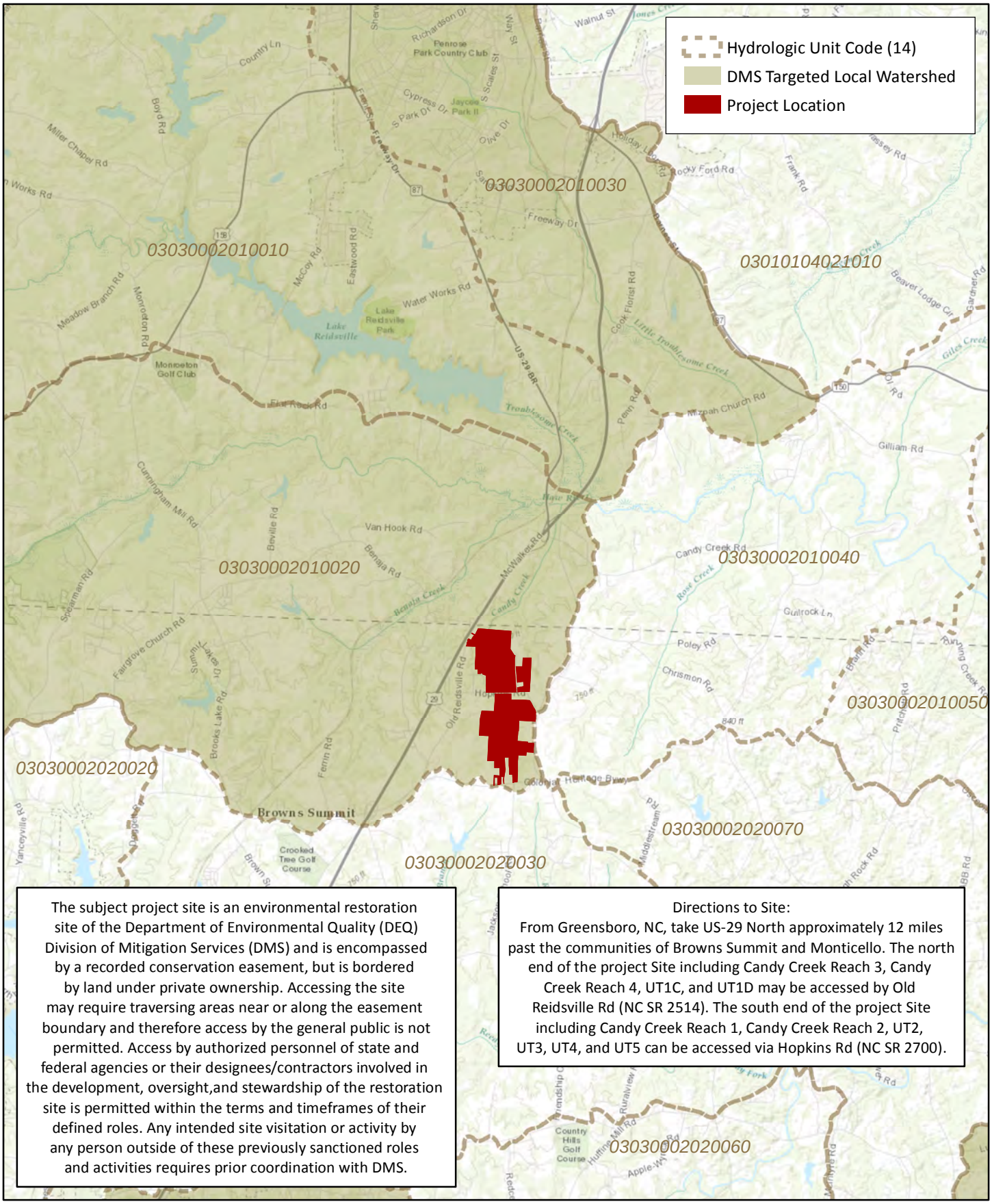
United States Army Corps of Engineers. Email 2018. Standard Measurement of the BHR Monitoring Parameter.

United States Department of Agriculture. Lincolnton, NC Weather Station NC4996. http://www.wcc.nrcs.usda.gov/climate/navigate_wets.html

United States Geological Survey. 1998. North Carolina Geology. http://www.geology.enr.state.nc.us/usgs/carolina.htm

Wildlands Engineering, Inc (2016). Candy Creek Mitigation Site Mitigation Plan. NCDMS, Raleigh, NC.

APPENDIX 1. General Figures and Tables



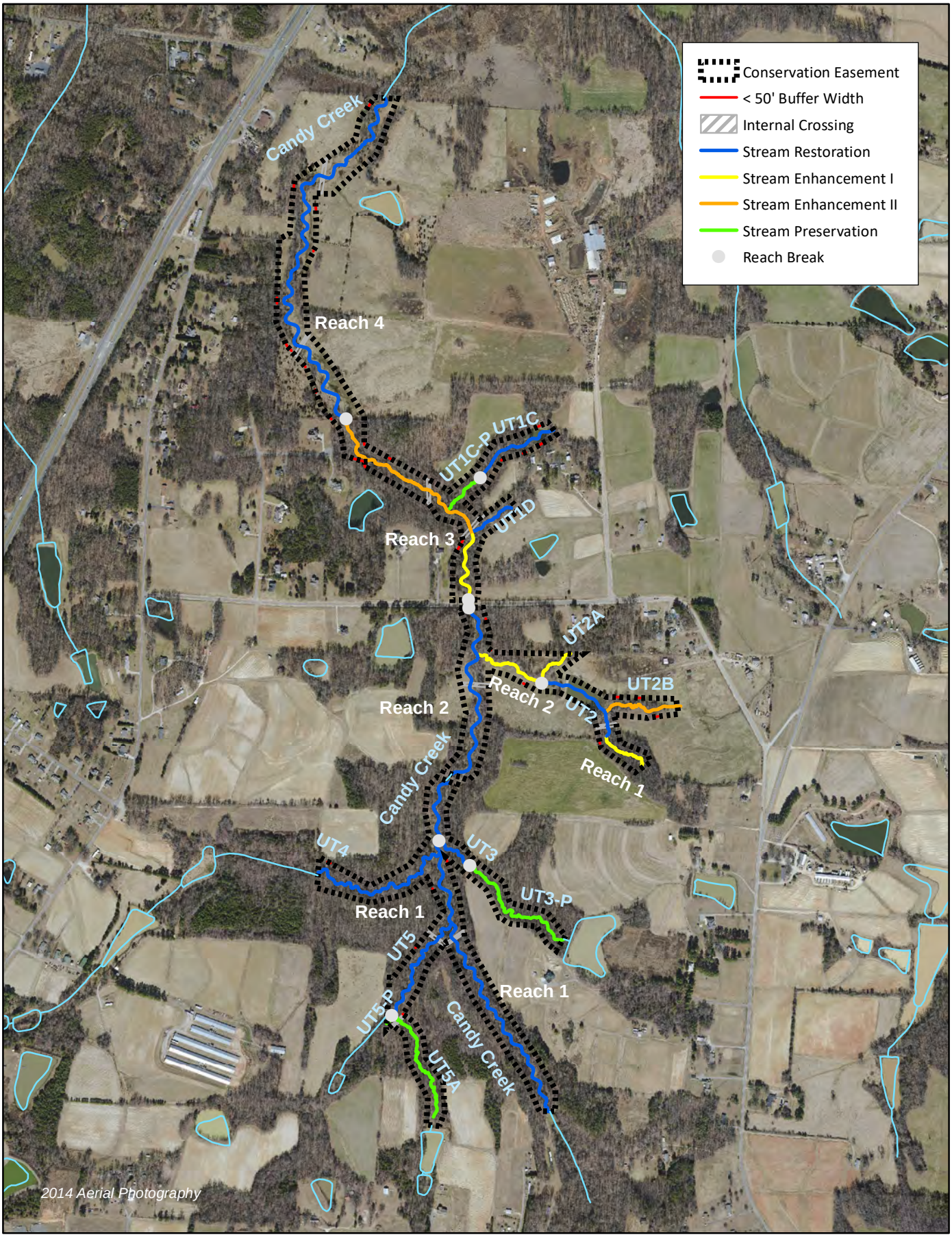
The subject project site is an environmental restoration site of the Department of Environmental Quality (DEQ) Division of Mitigation Services (DMS) and is encompassed by a recorded conservation easement, but is bordered by land under private ownership. Accessing the site may require traversing areas near or along the easement boundary and therefore access by the general public is not permitted. Access by authorized personnel of state and federal agencies or their designees/contractors involved in the development, oversight,and stewardship of the restoration site is permitted within the terms and timeframes of their defined roles. Any intended site visitation or activity by any person outside of these previously sanctioned roles and activities requires prior coordination with DMS.

Directions to Site:
From Greensboro, NC, take US-29 North approximately 12 miles past the communities of Browns Summit and Monticello. The north end of the project Site including Candy Creek Reach 3, Candy Creek Reach 4, UT1C, and UT1D may be accessed by Old Reidsville Rd (NC SR 2514). The south end of the project Site including Candy Creek Reach 1, Candy Creek Reach 2, UT2, UT3, UT4, and UT5 can be accessed via Hopkins Rd (NC SR 2700).

WILDLANDS ENGINEERING

Figure 1 Project Vicinity Map
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Guilford County, NC



WILDLANDS ENGINEERING

0 500 1,000 Feet

N

Figure 2 Project Component/Asset map
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Guilford County, NC

Table 1. Project Components and Mitigation Credits
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Mitigation Credits									
	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	14,975.867	530.600	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							
Candy Creek Reach 1	100+08 - 117+19	2,885	P1	Restoration	1,711	1:1	1,711.000
	117+45 - 126+27		P1	Restoration	882	1:1	882.000
Candy Creek Reach 2	126+27 - 131+80	2,398	P1	Restoration	553	1:1	553.000
	132+40 - 141+17		P1	Restoration	877	1:1	877.000
	141+43 - 148+42		P1	Restoration	699	1:1	699.000
Candy Creek Reach 3	149+02 - 155+05	2,333	EI	Enhancement	603	1.5:1	402.000
	155+05 - 155+33		EII	Enhancement	28	2.5:1	11.200
	155+62 -160+35		EII	Enhancement	473	2.5:1	189.200
	160+62 - 170+37		EII	Enhancement	975	2.5:1	390.000
Candy Creek Reach 4	170+71 - 178+74	3,386	P1	Restoration	803	1:1	803.000
	179+00 - 196+47		P1	Restoration	1,747	1:1	1,747.000
	196+68 - 206+35		P1	Restoration	967	1:1	967.000
UT1C	200+12 - 207+40	551	P1	Restoration	728	1:1	728.000
UT1C - P	207+40 - 211+38	398	-	Preservation	398	5:1	79.600
UT1D	250+00 - 253+79	437	P1	Restoration	379	1:1	379.000
UT2 Reach 1	300+00 - 304+24	940	EI	Enhancement	424	1.5:1	282.667
	304+24 - 305+01		P1	Restoration	77	1:1	77.000
	305+26 - 311+88		P1	Restoration	662	1:1	662.000
UT2 Reach 2	311+88 - 318+31	746	EI	Enhancement	643	1.5:1	428.667
UT2A	350+84 - 354+37	376	EI	Enhancement	353	1.5:1	235.333
UT2B	270+28 - 276+85	702	EII	Enhancement	657	2.5:1	262.800
UT3 - P	400+00 - 411+50	1,150	-	Preservation	1,150	5:1	230.000
UT3	411+50 - 414+96	729	P1	Restoration	346	1:1	346.000
UT4	500+49 - 514+05	1,270	P1	Restoration	1,356	1:1	1,356.000
UT5-P	599+19 - 600+00	81	-	Preservation	81	5:1	16.200
UT5	600+00 - 607+91	1,297	P1	Restoration	791	1:1	791.000
	608+16 - 610+12			Restoration	196	1:1	196.000
UT5A	650+00 - 659+70	1,056	-	Preservation	970	5:1	194.000
	659+99 - 660+53		-	Preservation	54	5:1	10.800

Component Summation						
Restoration Level	Stream (LF)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)	Buffer (square feet)	Upland (acres)
		Riverine	Non-Riverine			
Restoration	12,774	-	-	-	-	-
Enhancement		-	-	-	-	-
Enhancement I	2,023					
Enhancement II	2,133					
Preservation	2,653	-	-	-		

The linear feet associated with the stream crossings were excluded from the computations.

Table 2. Project Activity and Reporting History
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Activity or Report		Data Collection Complete	Completion or Scheduled Delivery
Mitigation Plan		November 2014	March 2016
Final Design - Construction Plans		July 2016	July 2016
Construction		July 2016 - March 2017	March 2017
Temporary S&E mix applied to entire project area [1]		July 2016 - March 2017	March 2017
Permanent seed mix applied to reach/segments		March 2017	March 2017
Bare root and live stake plantings for reach/segments		March 2017	March 2017
Baseline Monitoring Document (Year 0)	Stream Survey	October 2016 - March 2017	May 2017
	Vegetation Survey	March 2017	
Year 1 Monitoring	Stream Survey	October 2017	December 2017
	Vegetation Survey	October 2017	
Year 2 Monitoring	Stream Survey	June 2018	November 2018
	Vegetation Survey	August 2018	
Year 3 Monitoring	Stream Survey	2019	December 2019
	Vegetation Survey	2019	
Year 4 Monitoring	Stream Survey	2020	December 2020
	Vegetation Survey	2020	
Year 5 Monitoring	Stream Survey	2021	December 2021
	Vegetation Survey	2021	
Year 6 Monitoring	Stream Survey	2022	December 2022
	Vegetation Survey	2022	
Year 7 Monitoring	Stream Survey	2023	December 2023
	Vegetation Survey	2023	

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

Table 3. Project Contact Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Designer Aaron Earley, PE	**Wildlands Engineering, Inc.** 1430 South Mint Street, Suite 104 Charlotte, NC 28203 704.332.7754
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**	 **Dykes and Son Nursery** **Bruton Natural Systems, Inc & Foggy Mountain Nursery**
Monitoring Performers	**Wildlands Engineering, Inc.**
Monitoring, POC	Ruby Davis 704.332.7754 ext. 119

Table 4. Project Information and Attributes
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Project Information	
Project Name	Candy Creek Mitigation Site
County	Guilford County
Project Area (acres)	61.74
Project Coordinates (latitude and longitude)	Upstream Project Limits – 36°13'27.27"N, 79°39'37.79"W
	Downstream Project Limits – 36°14'39.74"N, 79°39'50.46"W

Project Watershed Summary Information	
Physiographic Province	Inner Piedmont Belt of the Piedmont Physiographic Province
River Basin	Cape Fear
USGS Hydrologic Unit 8-digit	03030002
USGS Hydrologic Unit 14-digit	03030002010020
DWR Sub-basin	03-06-01
Project Drainiage Area (acres)	937
Project Drainage Area Percentage of Impervious Area	1%
CGIA Land Use Classification	66% – Agriculture/Managed Herbaceous; 29% – Forested/Scrubland, 5% - Developed

Reach Summary Information

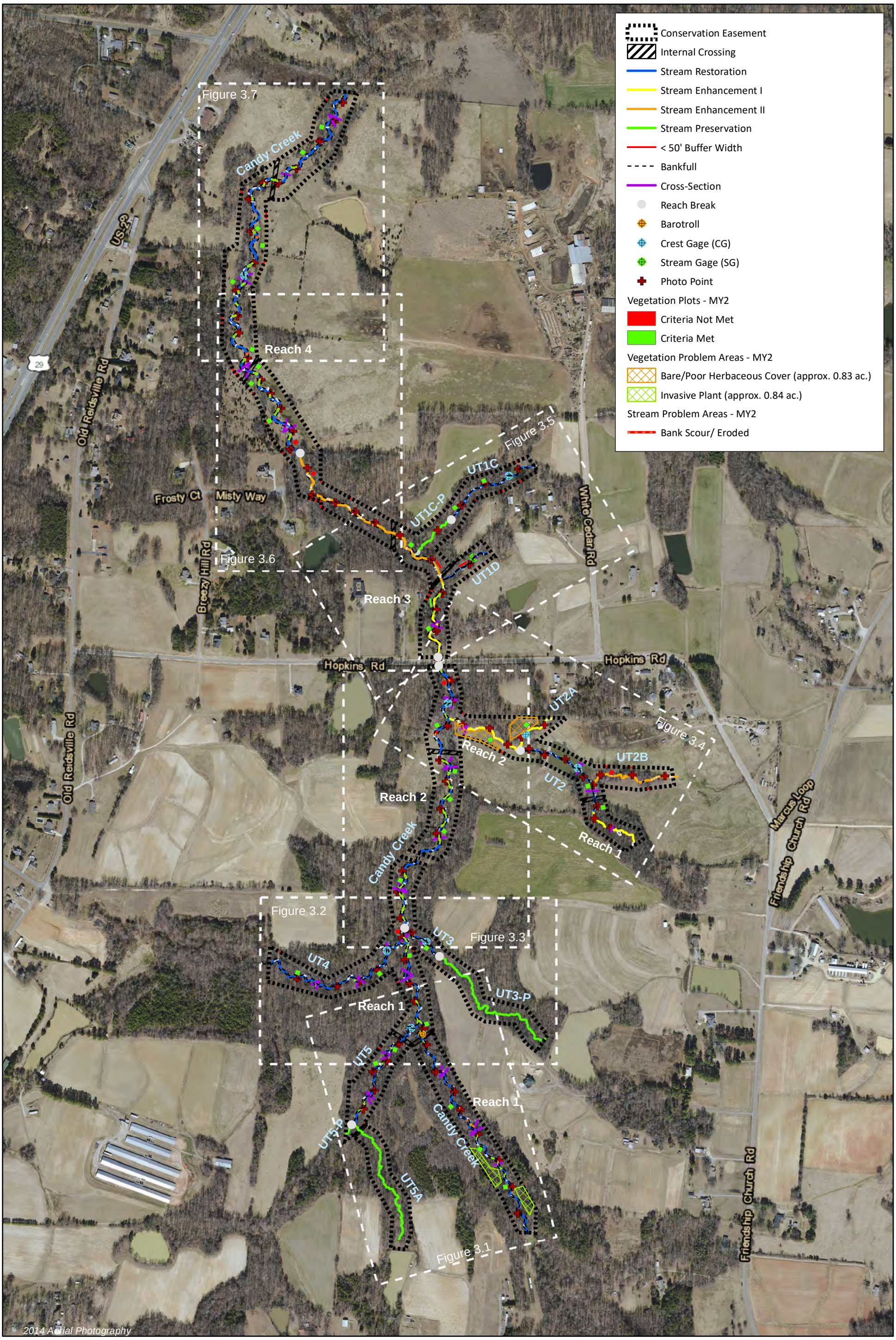
Parameters	Candy Creek Reach 1	Candy Creek Reach 2	Candy Creek Reach 3	Candy Creek Reach 4
Length of Reach (linear feet) - Post-Restoration	2,593	2,129	2,079	3,517
Drainage Area (acres)	560	694	809	937
NCDWR Stream Identification Score	40.5	40.5	45.0	45.0
NCDWR Water Quality Classification	WS-V (NSW)			
Morphological Desription (stream type)	G4c	F5	G4c	G4c
Evolutionary trend (Simon's Model) - Pre- Restoration	IV	IV	IV	III/IV
Underlying mapped soils	Clifford Sandy Clay Loam, Codorus Loam, Nathalie Sandy Loam, Poplar Forest Gravelly Sandy Loam			
Drainage class	Well Drained to Somewhat Poorly Drained			
Soil hydric status	Codorus Loam - Hydric			
Slope	---			
FEMA classification	N/A			
Native vegetation community	Piedmont Bottomland Forest			
Percent composition exotic invasive vegetation -Post-Restoration	0%			

Parameters	UT1C	UT1D	UT2	UT2A	UT2B	UT3	UT4	UT5	UT5A
Length of Reach (linear feet) - Post-Restoration	1,126	379	1,806	353	657	1,496	1,356	1,068	1,024
Drainage Area (acres)	28	6	63	15	24	79	190	137	45
NCDWR Stream Identification Score	35.0	27.5	34.5	31.5	31.5	36.5	37.5	31.5	33.5
NCDWR Water Quality Classification	C								
Morphological Desription (stream type)	E5b	C5	F5	G5	B5c	G4	G4	F4	N/A
Evolutionary trend (Simon's Model) - Pre- Restoration	III	II/III	III/V	III	III	IV	IV	IV	N/A
Underlying mapped soils	Casville Sandy Loam, Codorus Loam, Nathalie Sandy Loam								
Drainage class	Well Drained to Somewhat Poorly Drained								
Soil hydric status	Codorus Loam - Hydric								
Slope	---								
FEMA classification	N/A								
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	Yes	Yes	USACE Nationwide Permit No.27 (Action ID# SAW-2015-01209) and DWR 401 Water Quality Certification (letter from DWR dated 5/13/2015).
Waters of the United States - Section 401	Yes	Yes	
Division of Land Quality (Dam Safety)	No	N/A	N/A
Endangered Species Act	Yes	Yes	Candy Creek Mitigation Plan; Wildlands determined "no effect" on Guilford County listed endangered species. USFWS responded on April 4, 2014 and stated 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	Yes	Yes	No historic resources were found to be impacted (letter from SHPO dated 3/24/2014).
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

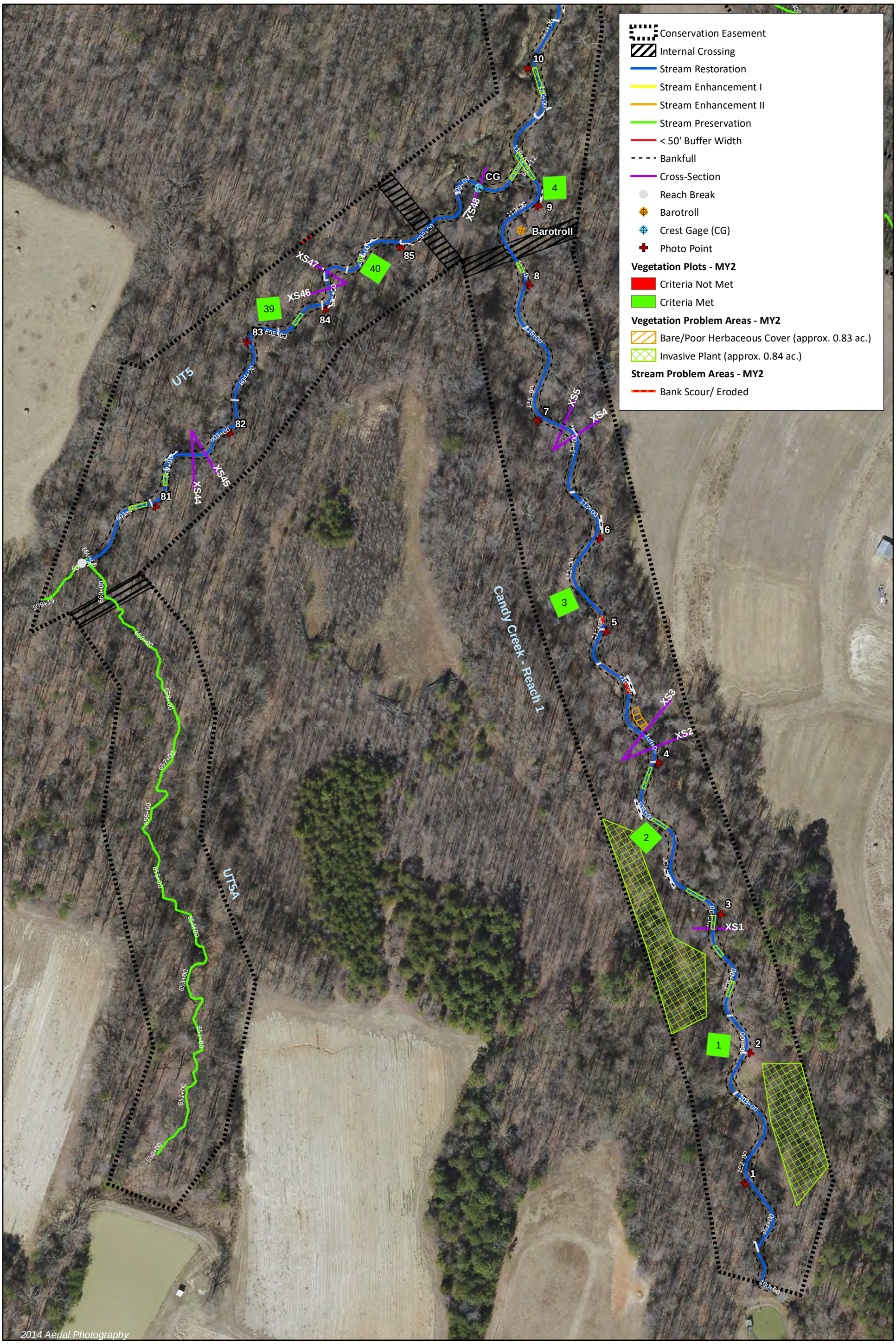
APPENDIX 2. Visual Assessment Data



WILDLANDS ENGINEERING

0 300 600 Feet

Figure 3.0 Integrated Current Condition Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018
Guilford County, NC



WILDLANDS ENGINEERING

0 125 250 Feet

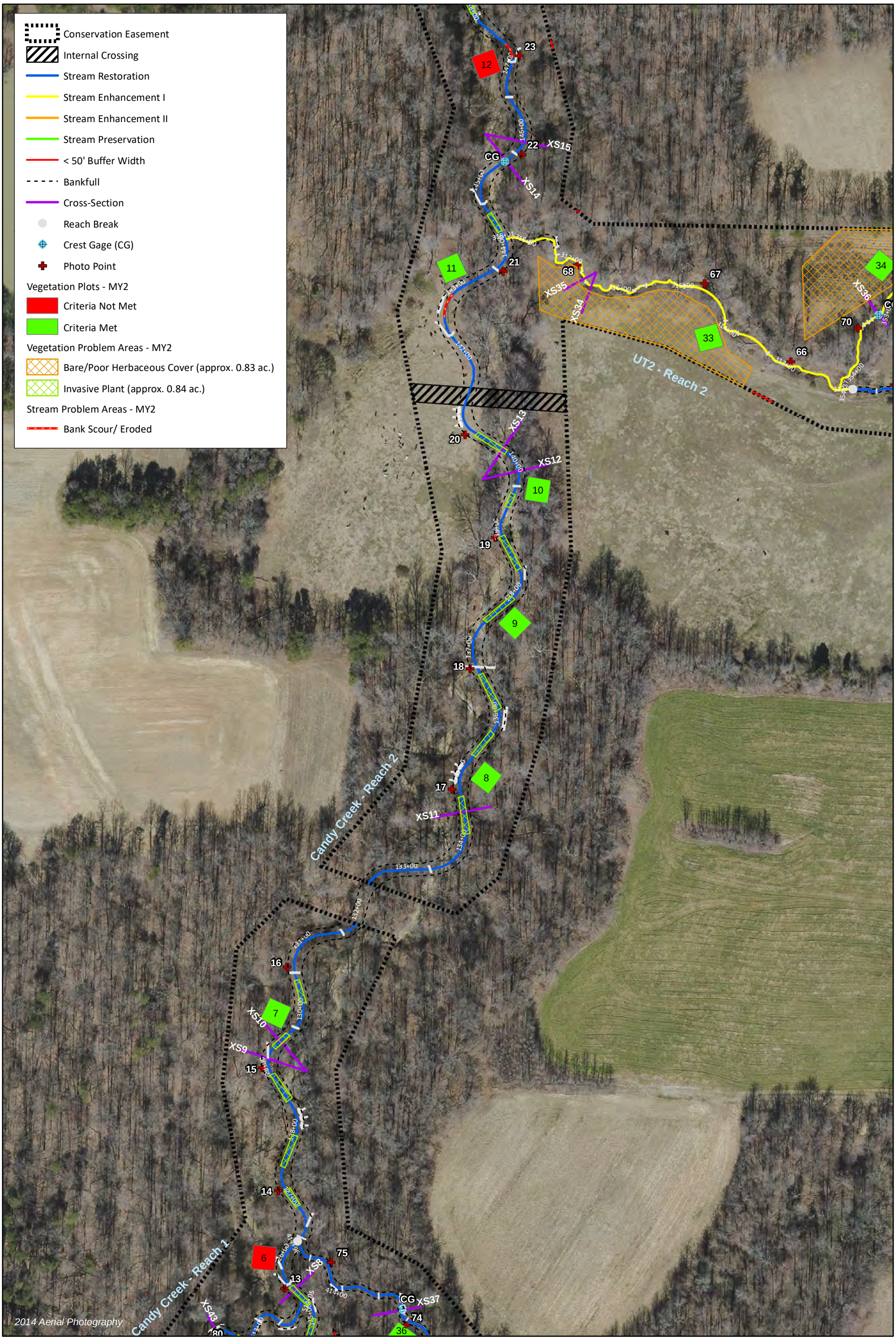
Figure 3.1 Integrated Current Condition Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Guilford County, NC

WILDLANDS ENGINEERING

0 125 250 Feet

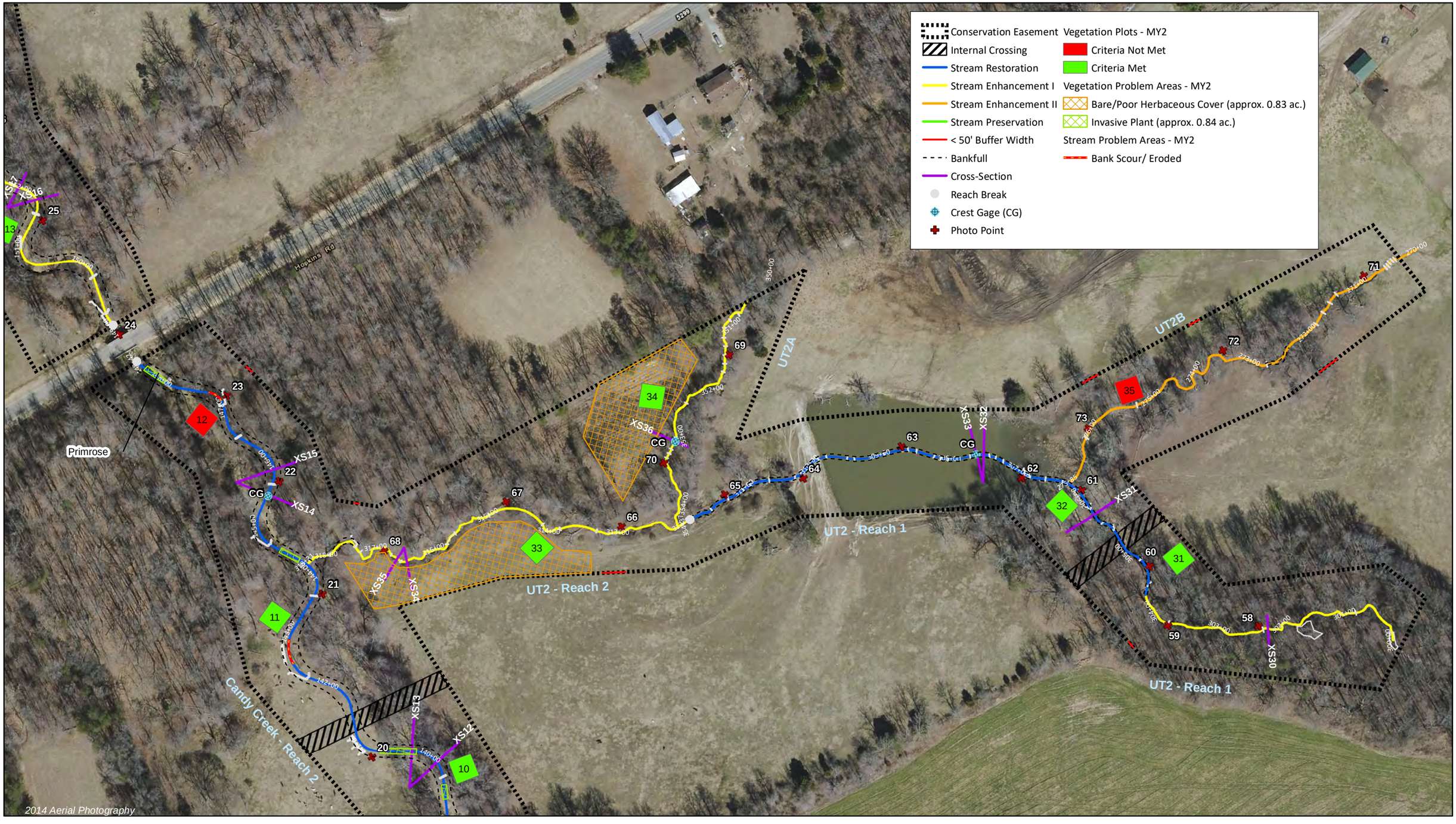
Figure 3.2 Integrated Current Condition Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018
Guilford County, NC



WILDLANDS ENGINEERING

0 125 250 Feet

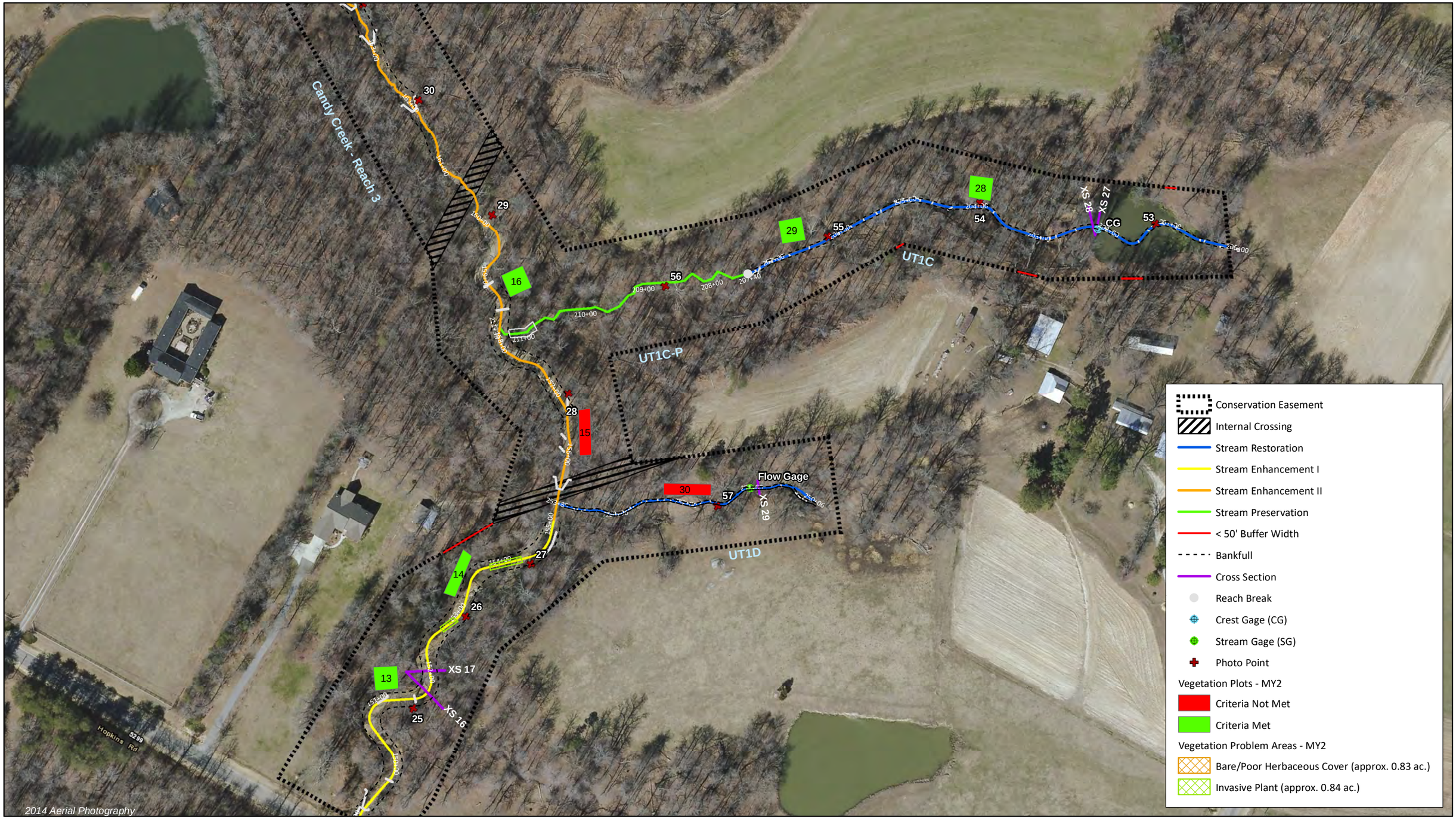
Figure 3.3 Integrated Current Condition Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018
Guilford County, NC



WILDLANDS ENGINEERING

0 125 250 Feet

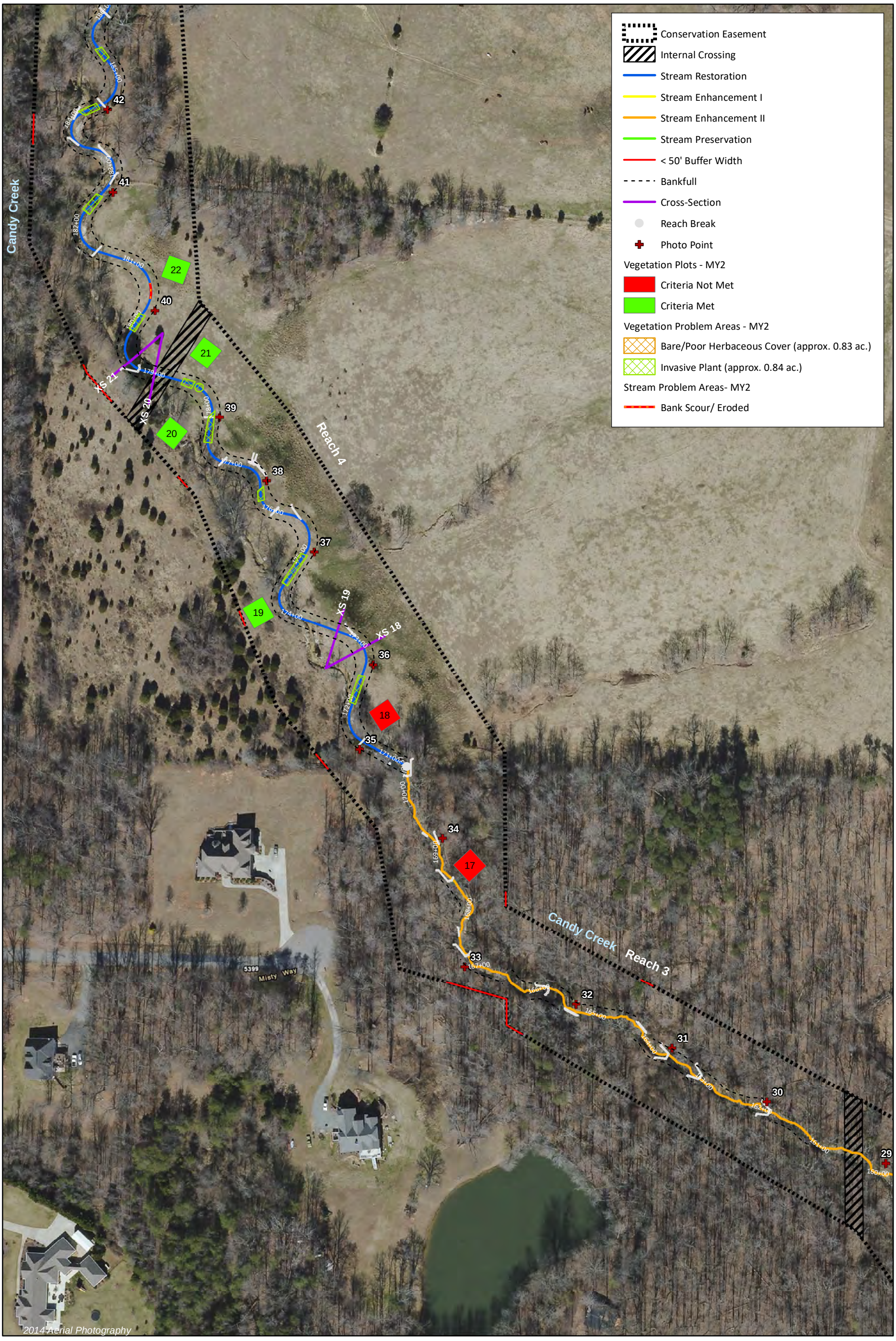
Figure 3.4 Integrated Current Condition Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018
Guilford County, NC



WILDLANDS ENGINEERING

0 125 250 Feet

Figure 3.5 Integrated Current Condition Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018
Guilford County, NC



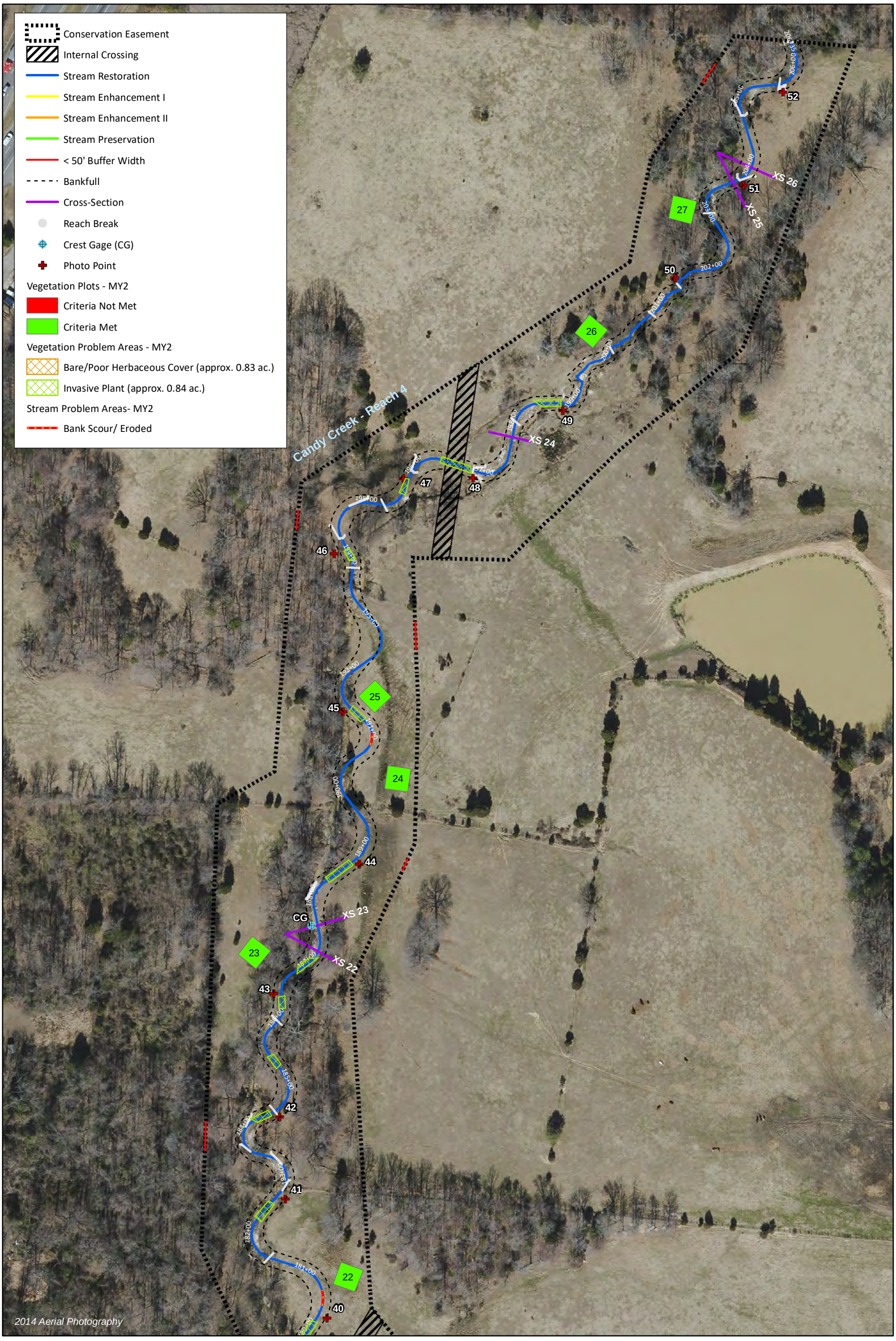
WILDLANDS ENGINEERING

0 125 250 Feet

N

Figure 3.6 Integrated Current Condition Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Guilford County, NC



WILDLANDS ENGINEERING

0 125 250 Feet

Figure 3.7 Integrated Current Condition Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018
Guilford County, NC

Table 5a. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 1 (2,619 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	39	39			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)	38	38			100%			
		Thalweg centering at downstream of meander bend (Glide)	38	38			100%			
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			2	29	99%	0	0	99%
	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	2	29	100%	n/a	n/a	n/a
3. Engineered Structures[1]	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	32	32			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	8	8			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	8	8			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	27	27			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	27	27			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5b. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 2 (2,215 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	24	24			100%			
	3. Meander Pool Condition	Depth Sufficient	24	24			100%			
		Length Appropriate	24	24			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	24	24			100%			
		Thalweg centering at downstream of meander bend (Glide)	24	24			100%			
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			2	40	98%	0	0	98%
	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	2	40	99%	n/a	n/a	n/a
3. Engineered Structures[1]	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	29	29			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	12	12			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	12	12			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	17	17			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	17	17			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5c. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 3 (2,135 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	23	23			100%			
	3. Meander Pool Condition	Depth Sufficient	17	17			100%			
		Length Appropriate	17	17			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	17	17			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.	35	35			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	12	12			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	12	12			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	23	23			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	23	23			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5d. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 4 (3,564 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	42	42			100%			
	3. Meander Pool Condition	Depth Sufficient	39	39			100%			
		Length Appropriate	39	39			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	38	38			100%			
		Thalweg centering at downstream of meander bend (Glide)	39	39			100%			
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			2	30	99%	0	0	99%
	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	2	30	100%	n/a	n/a	n/a
3. Engineered Structures[1]	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	56	56			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	22	22			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	22	22			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	38	38			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	38	38			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5e. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT1C (728 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	32	32			100%			
	3. Meander Pool Condition	Depth Sufficient	7	7			100%			
		Length Appropriate	7	7			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	7	7			100%			
		Thalweg centering at downstream of meander bend (Glide)	7	7			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.	29	29			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	22	22			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	22	22			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	7	7			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	7	7			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5f. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT1D (379 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	24	24			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.	30	30			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	29	29			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	29	29			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	1	1			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	20	20			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5g. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 Reach 1 (1,188 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	32	32			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.	32	32			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	31	31			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	31	31			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	1	1			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	22	22			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5h. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 Reach 2 (643 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	6	6			100%			
	3. Meander Pool Condition	Depth Sufficient	7	7			100%			
		Length Appropriate	7	7			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	7	7			100%			
		Thalweg centering at downstream of meander bend (Glide)	7	7			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.	8	8			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	8	8			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	2	2			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	4	4			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5i. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2A (353 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	11	11			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.	12	12			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	12	12			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	12	12			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does 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.	12	12			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5j. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2B (657 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	6	6			100%			
		Length Appropriate	6	6			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	6	6			100%			
		Thalweg centering at downstream of meander bend (Glide)	6	6			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.	16	16			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%.	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.	4	4			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5k. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT3 (346 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	11	11			100%			
	3. Meander Pool Condition	Depth Sufficient	10	10			100%			
		Length Appropriate	10	10			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	10	10			100%			
		Thalweg centering at downstream of meander bend (Glide)	10	10			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.	15	15			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%.	6	6			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	5	5			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5I. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT4 (1,356 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	32	32			100%			
	3. Meander Pool Condition	Depth Sufficient	30	30			100%			
		Length Appropriate	30	30			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	30	30			100%			
		Thalweg centering at downstream of meander bend (Glide)	30	30			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.	22	22			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%.	15	15			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	16	16			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 5m. Visual Stream Morphology Stability Assessment Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT5 (1,012 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	21	21			100%			
	3. Meander Pool Condition	Depth Sufficient	21	21			100%			
		Length Appropriate	21	21			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	21	21			100%			
		Thalweg centering at downstream of meander bend (Glide)	21	21			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.	22	22			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	12	12			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	12	12			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	12	12			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	12	12			100%			

[1]Excludes constructed riffles since they are evaluated in channel category.

Table 6. Vegetation Condition Assessment Table

Candy Creek Mitigation Site

DMS Project No. 96315

Monitoring Year 2 - 2018

Planted Acreage **32**

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	3	0.83	2.6%
Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 5, or 7 stem count criteria.	0.1	7	0.2	0.5%
		Total	**10**	**1.0**	**3.1%**
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	**10**	**1.0**	**3.1%**

Easement Acreage **62**

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	54	0.84	1.4%
Easement Encroachment Areas	Areas of points (if too small to render as polygons at map scale).	none	0	0	0.0%

STREAM PHOTOGRAPHS

Candy Creek Reach 1
Monitoring Year 2

	
Photo Point 1 – looking upstream *(8/29/2018)*	**Photo Point 1** – looking downstream *(8/29/2018)*
	
Photo Point 2 – looking upstream *(8/29/2018)*	**Photo Point 2** – looking downstream *(8/29/2018)*
	
Photo Point 3 – looking upstream *(8/29/2018)*	**Photo Point 3** – looking downstream *(8/29/2018)*

	
Photo Point 4 – looking upstream *(8/29/2018)*	**Photo Point 4** – looking downstream *(8/29/2018)*
	
Photo Point 5 – looking upstream *(8/29/2018)*	**Photo Point 5** – looking downstream *(8/29/2018)*
	
Photo Point 6 – looking upstream *(8/29/2018)*	**Photo Point 6** – looking downstream *(8/29/2018)*

	
Photo Point 7 – looking upstream *(8/29/2018)*	**Photo Point 7** – looking downstream *(8/29/2018)*
	
Photo Point 8 – looking upstream *(8/29/2018)*	**Photo Point 8** – looking downstream *(8/29/2018)*
	
Photo Point 9 – looking upstream *(8/29/2018)*	**Photo Point 9** – looking downstream *(8/29/2018)*

	
Photo Point 10 – looking upstream *(8/29/2018)*	**Photo Point 10** – looking downstream *(8/29/2018)*
	
Photo Point 11 – looking upstream *(8/29/2018)*	**Photo Point 11** – looking downstream *(8/29/2018)*
	
Photo Point 12 – looking upstream *(8/29/2018)*	**Photo Point 12** – looking downstream *(8/29/2018)*

	
Photo Point 13 – looking upstream *(8/29/2018)*	**Photo Point 13** – looking downstream *(8/29/2018)*

STREAM PHOTOGRAPHS

Candy Creek Reach 2
Monitoring Year 2

	
Photo Point 14 – looking upstream *(8/29/2018)*	**Photo Point 14** – looking downstream *(8/29/2018)*
	
Photo Point 15 – looking upstream *(9/19/2018)*	**Photo Point 15** – looking downstream *(9/19/2018)*
	
Photo Point 16 – looking upstream *(9/19/2018)*	**Photo Point 16** – looking downstream *(9/19/2018)*

	
Photo Point 17 – looking upstream *(9/19/2018)*	**Photo Point 17** – looking downstream *(9/19/2018)*
	
Photo Point 18 – looking upstream *(9/19/2018)*	**Photo Point 18** – looking downstream *(9/19/2018)*
	
Photo Point 19 – looking upstream *(9/19/2018)*	**Photo Point 19** – looking downstream *(9/19/2018)*

	
Photo Point 20 – looking upstream *(9/19/2018)*	**Photo Point 20** – looking downstream *(9/19/2018)*
	
Photo Point 21 – looking upstream *(9/19/2018)*	**Photo Point 21** – looking downstream *(9/19/2018)*
	
Photo Point 22 – looking upstream *(9/19/2018)*	**Photo Point 22** – looking downstream *(9/19/2018)*

Photo Point 23 – looking upstream *(9/19/2018)*

Photo Point 23 – looking downstream *(9/19/2018)*

Photo Point 24 – looking upstream *(9/19/2018)*

STREAM PHOTOGRAPHS

Candy Creek Reach 3
Monitoring Year 2

Photo Point 24 – looking downstream *(9/19/2018)*

Photo Point 25 – looking upstream *(9/19/2018)*

Photo Point 25 – looking downstream *(9/19/2018)*

Photo Point 26 – looking upstream *(9/19/2018)*

Photo Point 26 – looking downstream *(9/19/2018)*

	
Photo Point 27 – looking upstream *(9/19/2018)*	**Photo Point 27** – looking downstream *(9/19/2018)*
	
Photo Point 28 – looking upstream *(9/19/2018)*	**Photo Point 28** – looking downstream *(9/19/2018)*
	
Photo Point 29 – looking upstream *(9/25/2018)*	**Photo Point 29** – looking downstream *(9/25/2018)*

	
Photo Point 30 – looking upstream *(9/25/2018)*	**Photo Point 30** – looking downstream *(9/25/2018)*
	
Photo Point 31 – looking upstream *(9/25/2018)*	**Photo Point 31** – looking downstream *(9/25/2018)*
	
Photo Point 32 – looking upstream *(9/25/2018)*	**Photo Point 32** – looking downstream *(9/25/2018)*

	
Photo Point 33 – looking upstream *(9/25/2018)*	**Photo Point 33** – looking downstream *(9/25/2018)*
	
Photo Point 34 – looking upstream *(9/25/2018)*	**Photo Point 34** – looking downstream *(9/25/2018)*

STREAM PHOTOGRAPHS

Candy Creek Reach 4
Monitoring Year 2

	
Photo Point 35 – looking upstream *(9/25/2018)*	**Photo Point 35** – looking downstream *(9/25/2018)*
	
Photo Point 36 – looking upstream *(9/25/2018)*	**Photo Point 36** – looking downstream *(9/25/2018)*
	
Photo Point 37 – looking upstream *(9/25/2018)*	**Photo Point 37** – looking downstream *(9/25/2018)*

	
Photo Point 38 – looking upstream *(9/25/2018)*	**Photo Point 38** – looking downstream *(9/25/2018)*
	
Photo Point 39 – looking upstream *(9/25/2018)*	**Photo Point 39** – looking downstream *(9/25/2018)*
	
Photo Point 40 – looking upstream *(9/25/2018)*	**Photo Point 40** – looking downstream *(9/25/2018)*

	
Photo Point 41 – looking upstream *(9/25/2018)*	**Photo Point 41** – looking downstream *(9/25/2018)*
	
Photo Point 42 – looking upstream *(9/25/2018)*	**Photo Point 42** – looking downstream *(9/25/2018)*
	
Photo Point 43 – looking upstream *(9/25/2018)*	**Photo Point 43** – looking downstream *(9/25/2018)*

	
Photo Point 44 – looking upstream *(9/25/2018)*	**Photo Point 44** – looking downstream *(9/25/2018)*
	
Photo Point 45 – looking upstream *(9/25/2018)*	**Photo Point 45** – looking downstream *(9/25/2018)*
	
Photo Point 46 – looking upstream *(9/25/2018)*	**Photo Point 46** – looking downstream *(9/25/2018)*

	
Photo Point 47 – looking upstream *(9/25/2018)*	**Photo Point 47** – looking downstream *(9/25/2018)*
	
Photo Point 48 – looking upstream *(9/25/2018)*	**Photo Point 48** – looking downstream *(9/25/2018)*
	
Photo Point 49 – looking upstream *(9/25/2018)*	**Photo Point 49** – looking downstream *(9/25/2018)*

	
Photo Point 50 – looking upstream *(9/25/2018)*	**Photo Point 50** – looking downstream *(9/25/2018)*
	
Photo Point 51 – looking upstream *(9/25/2018)*	**Photo Point 51** – looking downstream *(9/25/2018)*
	
Photo Point 52 – looking upstream *(9/25/2018)*	**Photo Point 52** – looking downstream *(9/25/2018)*

STREAM PHOTOGRAPHS

UT1C and UT1D
Monitoring Year 2

	
Photo Point 53 – looking upstream *(9/19/2018)*	**Photo Point 53** – looking downstream *(9/19/2018)*
	
Photo Point 54 – looking upstream *(9/19/2018)*	**Photo Point 54** – looking downstream *(9/19/2018)*
	
Photo Point 55 – looking upstream *(9/19/2018)*	**Photo Point 55** – looking downstream *(9/19/2018)*

	
Photo Point 56 – looking upstream *(9/19/2018)*	**Photo Point 56** – looking downstream *(9/19/2018)*
	
Photo Point 57 – looking upstream *(9/19/2018)*	**Photo Point 57** – looking downstream *(9/19/2018)*

STREAM PHOTOGRAPHS

UT2, UT2A, and UT2B
Monitoring Year 2

	
Photo Point 58 – looking upstream *(9/19/2018)*	**Photo Point 58** – looking downstream *(9/19/2018)*
	
Photo Point 59 – looking upstream *(9/19/2018)*	**Photo Point 59** – looking downstream *(9/19/2018)*
	
Photo Point 60 – looking upstream *(9/19/2018)*	**Photo Point 60** – looking downstream *(9/19/2018)*

	
Photo Point 61 – looking upstream *(9/19/2018)*	**Photo Point 61** – looking downstream *(9/19/2018)*
	
Photo Point 62 – looking upstream *(9/19/2018)*	**Photo Point 62** – looking downstream *(9/19/2018)*
	
Photo Point 63 – looking upstream *(9/19/2018)*	**Photo Point 63** – looking downstream *(9/19/2018)*

	
Photo Point 64 – looking upstream *(9//19/2018)*	**Photo Point 64** – looking downstream *(9/19/2018)*
	
Photo Point 65 – looking upstream *(9/19/2018)*	**Photo Point 65** – looking downstream *(9/19/2018)*
	
Photo Point 66 – looking upstream *(9/19/2018)*	**Photo Point 66** – looking downstream *(9/19/2018)*

	
Photo Point 67 – looking upstream *(9/19/2018)*	**Photo Point 67** – looking downstream *(9/19/2018)*
	
Photo Point 68 – looking upstream *(9/19/2018)*	**Photo Point 68** – looking downstream *(9/19/2018)*
	
Photo Point 69 – looking upstream *(9/19/2018)*	**Photo Point 69** – looking downstream *(9/19/2018)*

	
Photo Point 70 – looking upstream *(9/19/2018)*	**Photo Point 70** – looking downstream *(9/19/2018)*
	
Photo Point 71 – looking upstream *(9/19/2018)*	**Photo Point 71** – looking downstream *(9/19/2018)*
	
Photo Point 72 – looking upstream *(9/19/2018)*	**Photo Point 72** – looking downstream *(9/19/2018)*

	
Photo Point 73 – looking upstream *(9/19/2018)*	**Photo Point 73** – looking downstream *(9/19/2018)*

STREAM PHOTOGRAPHS

UT3, UT4, and UT5
Monitoring Year 2

	
Photo Point 74 – looking upstream *(8/29/2018)*	**Photo Point 74** – looking downstream *(8/29/2018)*
	
Photo Point 75 – looking upstream *(8/29/2018)*	**Photo Point 75** – looking downstream *(8/29/2018)*
	
Photo Point 76 – looking upstream *(8/29/2018)*	**Photo Point 76** – looking downstream *(8/29/2018)*

	
Photo Point 77 – looking upstream *(8/29/2018)*	**Photo Point 77** – looking downstream *(8/29/2018)*
	
Photo Point 78 – looking upstream *(8/29/2018)*	**Photo Point 78** – looking downstream *(8/29/2018)*
	
Photo Point 79 – looking upstream *(8/29/2018)*	**Photo Point 79** – looking downstream *(8/29/2018)*

	
Photo Point 80 – looking upstream *(8/29/2018)*	**Photo Point 80** – looking downstream *(8/29/2018)*
	
Photo Point 81 – looking upstream *(8/29/2018)*	**Photo Point 81** – looking downstream *(8/29/2018)*
	
Photo Point 82 – looking upstream *(8/29/2018)*	**Photo Point 82** – looking downstream *(8/29/2018)*

Photo Point 83 – looking upstream *(8/29/2018)*

Photo Point 83 – looking downstream *(8/29/2018)*

Photo Point 84 – looking upstream *(8/29/2018)*

Photo Point 84 – looking downstream *(8/29/2018)*

Photo Point 85 – looking upstream *(8/29/2018)*

Photo Point 85 – looking downstream *(8/29/2018)*

VEGETATION PHOTOGRAPHS

Monitoring Year 2

Vegetation Plot 1 *(8/28/2018)*

Vegetation Plot 2 *(8/28/2018)*

Vegetation Plot 3 *(8/28/2018)*

Vegetation Plot 4 *(8/28/2018)*

Vegetation Plot 5 *(8/28/2018)*

Vegetation Plot 6 *(8/28/2018)*

Vegetation Plot 7 *(8/28/2018)*

Vegetation Plot 8 *(8/28/2018)*

Vegetation Plot 9 *(8/28/2018)*

Vegetation Plot 10 *(8/28/2018)*

Vegetation Plot 11 *(8/28/2018)*

Vegetation Plot 12 *(8/28/2018)*

Vegetation Plot 13 *(8/28/2018)*

Vegetation Plot 14 *(8/28/2018)*

Vegetation Plot 15 *(8/28/2018)*

Vegetation Plot 16 *(8/28/2018)*

Vegetation Plot 17 *(8/27/2018)*

Vegetation Plot 18 *(8/27/2018)*

Vegetation Plot 19 *(8/27/2018)*

Vegetation Plot 20 *(8/27/2018)*

Vegetation Plot 21 *(8/27/2018)*

Vegetation Plot 22 *(8/27/2018)*

Vegetation Plot 23 *(8/27/2018)*

Vegetation Plot 24 *(8/27/2018)*

Vegetation Plot 25 *(8/27/2018)*

Vegetation Plot 26 *(8/27/2018)*

Vegetation Plot 27 *(8/27/2018)*

Vegetation Plot 28 *(8/28/2018)*

Vegetation Plot 29 *(8/28/2018)*

Vegetation Plot 30 *(8/28/2018)*

Vegetation Plot 31 *(8/28/2018)*

Vegetation Plot 32 *(8/28/2018)*

Vegetation Plot 33 *(8/28/2018)*

Vegetation Plot 34 *(8/28/2018)*

Vegetation Plot 35 *(8/28/2018)*

Vegetation Plot 36 *(8/28/2018)*

Vegetation Plot 37 *(8/28/2018)*

Vegetation Plot 38 *(8/28/2018)*

Vegetation Plot 39 *(8/28/2018)*

Vegetation Plot 40 *(8/28/2018)*

APPENDIX 3. Vegetation Plot Data

Table 7. Vegetation Plot Criteria Attainment Table

Candy Creek Mitigation Site

DMS Project No. 96315

Monitoring Year 2 - 2018

Plot	Success Criteria Met (Y/N)	Tract Mean
1	Y	83%
2	Y	
3	Y	
4	Y	
5	Y	
6	N	
7	Y	
8	Y	
9	Y	
10	Y	
11	Y	
12	N	
13	Y	
14	Y	
15	N	
16	Y	
17	N	
18	N	
19	Y	
20	Y	
21	Y	
22	Y	
23	Y	
24	Y	
25	Y	
26	Y	
27	Y	
28	Y	
29	Y	
30	N	
31	Y	
32	Y	
33	Y	
34	Y	
35	N	
36	Y	
37	Y	
38	Y	
39	Y	
40	Y	

Table 8. CVS Vegetation Tables - Metadata

Candy Creek Mitigation Site

DMS Project No. 96315

Monitoring Year 2 - 2018

Report Prepared By	Ruby Davis
Date Prepared	10/2/2018 13:54
Database Name	Candy Creek MY1 CVS-v2.5.0.mdb
Database Location	Q:\ActiveProjects\005-02145 Candy Creek\Monitoring\Monitoring Year 2 (2018)\Vegetation Assessment
Computer Name	RUBY-PC
File Size	87818240
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	96315
Project Name	Candy Creek Mitigation Site
Sampled Plots	40

Table 9a. Planted and Total Stems
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

			Current Plot Data (MY2 2018)																				
			Vegetation Plot 1			Vegetation Plot 2			Vegetation Plot 3			Vegetation Plot 4			Vegetation Plot 5			Vegetation Plot 6			Vegetation Plot 7		
Scientific Name	Common Name	Species Type	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 rubrum	Red Maple	Tree			5						10									30			5
Alnus serrulata	Tag Alder	Shrub Tree																					
Betula nigra	River Birch	Tree	3	3	11	2	2	2	2	2	5	2	2	2	2	2	2				1	1	1
Carya ovata	Shagbark Hickory	Tree																					
Cercis canadensis	Redbud	Shrub Tree																					
Diospyros virginiana	American Persimmon	Tree																					
Fraxinus pennsylvanica	Green Ash	Tree	1	1	1	2	2	2	3	3	3	2	2	2	3	3	3	2	2	2	3	3	3
Lindera benzoin	Northern Spicebush	Shrub Tree																					
Liquidambar styraciflua	Sweet Gum	Tree									5			2									5
Liriodendron tulipifera	Tulip Poplar	Tree			15			30			10						11			30			25
Nyssa sylvatica	Black Gum	Tree																					
Platanus occidentalis	Sycamore	Tree	2	2	7	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	1	1	1
Prunus caroliniana	Carolina Laurel Cherry	Shrub Tree																					
Quercus lyrata	Overcup Oak	Tree															2						
Quercus michauxii	Swamp Chestnut Oak	Tree	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	2	2	2
Quercus pagoda	Cherrybark Oak	Tree													1	1	1						
Quercus phellos	Willow Oak	Tree	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
Rhus copallinum	Winged Sumac	Shrub Tree																					
Salix nigra	Black Willow	Tree									3												
Salix sericea	Silky Willow	Shrub Tree																					
Sambucus canadensis	Common Elderberry	Shrub Tree						1			2												
Ulmus alata	Winged Elm	Tree												15			25			45			
Ulmus americana	American Elm	Tree						5															
		Stem count	10	10	43	10	10	46	10	10	43	9	9	26	10	10	48	7	7	112	10	10	45
		Size (ares)		1			1			1			1			1			1			1	
		Size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02			0.02	
		Species count	5	5	7	5	5	8	5	5	10	5	5	7	6	6	9	4	4	7	5	5	8
		Stems per ACRE	405	405	1740	405	405	1,862	405	405	1,740	364	364	1,052	405	405	1,942	283	283	4,532	405	405	1,821

			Current Plot Data (MY2 2018)																				
			Vegetation Plot 8			Vegetation Plot 9			Vegetation Plot 10			Vegetation Plot 11			Vegetation Plot 12			Vegetation Plot 13			Vegetation Plot 14		
Scientific Name	Common Name	Species Type	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 rubrum	Red Maple	Tree			5						10												10
Alnus serrulata	Tag Alder	Shrub Tree																		1			
Betula nigra	River Birch	Tree	2	2	2	2	2	2				1	1	1				3	3	5	2	2	2
Carya ovata	Shagbark Hickory	Tree																					
Cercis canadensis	Redbud	Shrub Tree																					
Diospyros virginiana	American Persimmon	Tree																					1
Fraxinus pennsylvanica	Green Ash	Tree	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3	3	3	2	2	2
Lindera benzoin	Northern Spicebush	Shrub Tree																					
Liquidambar styraciflua	Sweet Gum	Tree						5						10			1			6			6
Liriodendron tulipifera	Tulip Poplar	Tree			5			5			5						10			11			11
Nyssa sylvatica	Black Gum	Tree																					
Platanus occidentalis	Sycamore	Tree	3	3	3	1	1	6	3	3	8	1	1	1	1	1	1	2	2	8	3	3	7
Prunus caroliniana	Carolina Laurel Cherry	Shrub Tree																					
Quercus lyrata	Overcup Oak	Tree																					
Quercus michauxii	Swamp Chestnut Oak	Tree	1	1	1	2	2	2				2	2	2	2	2	2	2	2	2	3	3	3
Quercus pagoda	Cherrybark Oak	Tree	1	1	1	1	1	1				2	2	2	1	1	1	1	1	1	1	1	1
Quercus phellos	Willow Oak	Tree	2	2	2	2	2	2	3	3	3	3	3	3	1	1	1	1	1	1			
Rhus copallinum	Winged Sumac	Shrub Tree												1									
Salix nigra	Black Willow	Tree																					
Salix sericea	Silky Willow	Shrub Tree			5						1												
Sambucus canadensis	Common Elderberry	Shrub Tree															1						
Ulmus alata	Winged Elm	Tree			10																		
Ulmus americana	American Elm	Tree																					10
		Stem count	12	12	37	11	11	26	9	9	30	12	12	23	7	7	19	12	12	38	11	11	53
		Size (ares)		1			1			1			1			1			1			1	
		Size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02			0.02	
		Species count	6	6	10	6	6	8	3	3	6	6	6	8	5	5	8	6	6	9	5	5	10
		Stems per ACRE	486	486	1,497	445	445	1,052	364	364	1,214	486	486	931	283	283	769	486	486	1,538	445	445	2,145

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 included

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
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

			Current Plot Data (MY2 2018)																				
			Vegetation Plot 15			Vegetation Plot 16			Vegetation Plot 17			Vegetation Plot 18			Vegetation Plot 19			Vegetation Plot 20			Vegetation Plot 21		
Scientific Name	Common Name	Species Type	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 rubrum	Red Maple	Tree															1						
Alnus serrulata	Tag Alder	Shrub Tree																					
Betula nigra	River Birch	Tree				1	1	1				1	1	1	2	2	2				1	1	1
Carya ovata	Shagbark Hickory	Tree																					
Cercis canadensis	Redbud	Shrub Tree																					
Diospyros virginiana	American Persimmon	Tree																					
Fraxinus pennsylvanica	Green Ash	Tree	3	3	4	3	3	3	3	3	3	2	2	2	3	3	3	2	2	2	2	2	2
Lindera benzoin	Northern Spicebush	Shrub Tree									1												
Liquidambar styraciflua	Sweet Gum	Tree																					
Liriodendron tulipifera	Tulip Poplar	Tree			4			15															
Nyssa sylvatica	Black Gum	Tree						1															
Platanus occidentalis	Sycamore	Tree				2	2	21	2	2	2	1	1	1	3	3	3	3	3	3	3	3	3
Prunus caroliniana	Carolina Laurel Cherry	Shrub Tree						1															
Quercus lyrata	Overcup Oak	Tree																					
Quercus michauxii	Swamp Chestnut Oak	Tree	1	1	1	2	2	2	1	1	1	3	3	3	2	2	2	1	1	1	1	1	1
Quercus pagoda	Cherrybark Oak	Tree	2	2	2	1	1	1	1	1	1				1	1	1	1	1	1	2	2	2
Quercus phellos	Willow Oak	Tree	1	1	1	2	2	2							2	2	2	1	1	1	2	2	2
Rhus copallinum	Winged Sumac	Shrub Tree																					
Salix nigra	Black Willow	Tree																					
Salix sericea	Silky Willow	Shrub Tree												4			1			15			4
Sambucus canadensis	Common Elderberry	Shrub Tree			1			1															
Ulmus alata	Winged Elm	Tree																					2
Ulmus americana	American Elm	Tree						10															
		Stem count	7	7	13	11	11	58	7	7	8	7	7	11	13	13	15	8	8	23	11	11	17
		Size (ares)		1			1			1			1			1			1			1	
		Size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02			0.02	
		Species count	4	4	6	6	6	11	4	4	5	4	4	5	6	6	8	5	5	6	6	6	8
		Stems per ACRE	283	283	526	445	445	2,347	283	283	324	283	283	445	526	526	607	324	324	931	445	445	688

			Current Plot Data (MY2 2018)																				
			Vegetation Plot 22			Vegetation Plot 23			Vegetation Plot 24			Vegetation Plot 25			Vegetation Plot 26			Vegetation Plot 27			Vegetation Plot 28		
Scientific Name	Common Name	Species Type	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 rubrum	Red Maple	Tree			1																		1
Alnus serrulata	Tag Alder	Shrub Tree																					
Betula nigra	River Birch	Tree	1	1	1	2	2	4	2	2	2				1	1	1	2	2	2	3	3	3
Carya ovata	Shagbark Hickory	Tree																					3
Cercis canadensis	Redbud	Shrub Tree																					
Diospyros virginiana	American Persimmon	Tree																					
Fraxinus pennsylvanica	Green Ash	Tree	3	3	3	3	3	3	2	2	2	3	3	3	3	3	3	2	2	2	4	4	4
Lindera benzoin	Northern Spicebush	Shrub Tree																					
Liquidambar styraciflua	Sweet Gum	Tree			5						5			10						1			10
Liriodendron tulipifera	Tulip Poplar	Tree																					32
Nyssa sylvatica	Black Gum	Tree																					
Platanus occidentalis	Sycamore	Tree	2	2	2	3	3	3				3	3	3	3	3	3	3	3	4	3	3	33
Prunus caroliniana	Carolina Laurel Cherry	Shrub Tree																					
Quercus lyrata	Overcup Oak	Tree																					
Quercus michauxii	Swamp Chestnut Oak	Tree				2	2	2	2	2	2	2	2	2	3	3	3	2	2	2	1	1	1
Quercus pagoda	Cherrybark Oak	Tree	2	2	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1			
Quercus phellos	Willow Oak	Tree	2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	1	1	1	2	2	2
Rhus copallinum	Winged Sumac	Shrub Tree																					
Salix nigra	Black Willow	Tree																					
Salix sericea	Silky Willow	Shrub Tree			4			1															
Sambucus canadensis	Common Elderberry	Shrub Tree																					1
Ulmus alata	Winged Elm	Tree																		1			
Ulmus americana	American Elm	Tree																					1
		Stem count	10	10	20	13	13	16	10	10	15	11	11	22	13	13	13	11	11	14	13	13	91
		Size (ares)		1			1			1			1			1			1			1	
		Size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02			0.02	
		Species count	5	5	8	6	6	7	5	5	6	5	5	6	6	6	6	6	6	8	5	5	11
		Stems per ACRE	405	405	809	526	526	647	405	405	607	445	445	890	526	526	526	445	445	567	526	526	3,683

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 included

PnoLS: Number of planted stems excluding live stakes
P-All: Number of planted stems including live stakes
T: Total stems

Table 9c. Planted and Total Stems
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

			Current Plot Data (MY2 2018)																				
			Vegetation Plot 29			Vegetation Plot 30			Vegetation Plot 31			Vegetation Plot 32			Vegetation Plot 33			Vegetation Plot 34			Vegetation Plot 35		
Scientific Name	Common Name	Species Type	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 rubrum	Red Maple	Tree			11			2			10									15			2
Alnus serrulata	Tag Alder	Shrub Tree																					
Betula nigra	River Birch	Tree						8							1	1	1	1	1	1			
Carya ovata	Shagbark Hickory	Tree																					
Cercis canadensis	Redbud	Shrub Tree			2																		
Diospyros virginiana	American Persimmon	Tree																					
Fraxinus pennsylvanica	Green Ash	Tree	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1
Lindera benzoin	Northern Spicebush	Shrub Tree																					
Liquidambar styraciflua	Sweet Gum	Tree									35			2									
Liriodendron tulipifera	Tulip Poplar	Tree			24						10			2			15			35			
Nyssa sylvatica	Black Gum	Tree																					
Platanus occidentalis	Sycamore	Tree	1	1	21	2	2	3	3	3	23	3	3	3	2	2	12	1	1	1	3	3	3
Prunus caroliniana	Carolina Laurel Cherry	Shrub Tree																					
Quercus lyrata	Overcup Oak	Tree																					
Quercus michauxii	Swamp Chestnut Oak	Tree	7	7	7	1	1	1	3	3	3	1	1	1	2	2	2	3	3	3	2	2	2
Quercus pagoda	Cherrybark Oak	Tree				1	1	1	2	2	2	1	1	1	1	1	1	1	1	1			
Quercus phellos	Willow Oak	Tree	1	1	1	1	1	1				2	2	2	2	2	2	3	3	3	1	1	1
Rhus copallinum	Winged Sumac	Shrub Tree																					
Salix nigra	Black Willow	Tree												1									
Salix sericea	Silky Willow	Shrub Tree																					
Sambucus canadensis	Common Elderberry	Shrub Tree			1																		
Ulmus alata	Winged Elm	Tree																		15			
Ulmus americana	American Elm	Tree			2			3															
		Stem count	11	11	71	7	7	21	11	11	86	10	10	15	11	11	36	12	12	77	7	7	9
		Size (ares)		1			1			1			1			1			1			1	
		Size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02			0.02	
		Species count	4	4	9	5	5	8	4	4	7	5	5	8	6	6	7	6	6	9	4	4	5
		Stems per ACRE	445	445	2,873	283	283	850	445	445	3,480	405	405	607	445	445	1,457	486	486	3,116	283	283	364

			Current Plot Data (MY2 2018)															Annual Mean			Annual Mean		
			Vegetation Plot 36			Vegetation Plot 37			Vegetation Plot 38			Vegetation Plot 39			Vegetation Plot 40			MY2 (2018)			MY0 (2017)		
Scientific Name	Common Name	Species Type	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 rubrum	Red Maple	Tree			30									20			20			188			
Alnus serrulata	Tag Alder	Shrub Tree																		1			
Betula nigra	River Birch	Tree	3	3	3	1	1	1	1	1	1	2	2	2				47	47	70	98	98	98
Carya ovata	Shagbark Hickory	Tree																		3			
Cercis canadensis	Redbud	Shrub Tree																		2			
Diospyros virginiana	American Persimmon	Tree																		1			
Fraxinus pennsylvanica	Green Ash	Tree	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2	103	103	104	107	107	107
Lindera benzoin	Northern Spicebush	Shrub Tree																		1			
Liquidambar styraciflua	Sweet Gum	Tree			5			50			10			5			10			188			
Liriodendron tulipifera	Tulip Poplar	Tree			12			10			23			40			54			444			
Nyssa sylvatica	Black Gum	Tree																		1			
Platanus occidentalis	Sycamore	Tree	3	3	13	3	3	8	2	2	2	1	1	1	3	3	3	83	83	224	107	107	107
Prunus caroliniana	Carolina Laurel Cherry	Shrub Tree																		1			
Quercus lyrata	Overcup Oak	Tree																		2			
Quercus michauxii	Swamp Chestnut Oak	Tree	1	1	1	1	1	1	2	2	2				1	1	1	68	68	68	109	109	109
Quercus pagoda	Cherrybark Oak	Tree	1	1	1	2	2	2	1	1	1	1	1	1	2	2	2	36	36	37	75	75	75
Quercus phellos	Willow Oak	Tree				1	1	1	3	3	3	2	2	2	3	3	3	70	70	70	107	107	107
Rhus copallinum	Winged Sumac	Shrub Tree																		1			
Salix nigra	Black Willow	Tree												1			3			8			
Salix sericea	Silky Willow	Shrub Tree																		35			
Sambucus canadensis	Common Elderberry	Shrub Tree																		8			
Ulmus alata	Winged Elm	Tree			75						15			35						238			
Ulmus americana	American Elm	Tree																		31			
		Stem count	10	10	142	11	11	76	12	12	60	9	9	110	11	11	98	407	407	1,726	603	603	603
		Size (ares)		1			1			1			1			1			40			40	
		Size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.99			0.99	
		Species count	4	4	7	5	5	7	5	5	8	4	4	8	5	5	8	6	6	6	6	6	6
		Stems per ACRE	405	405	5,747	445	445	3,076	486	486	2,428	364	364	4,452	445	445	3,966	412	412	1,746	610	610	610

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 included

PnoLS: Number of planted stems excluding live stakes
P-All: Number of planted stems including live stakes
T: Total stems

APPENDIX 4. Morphological Summary Data and Plots

Table 10a. Baseline Stream Data Summary

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 1

		Pre-Restoration Condition		Reference Reach Data								Design						As-Built/Baseline					
Parameter	Gage	Candy Creek Reach 1		Collins Creek		Long Branch		UT to Rocky Creek		Spencer Creek Reach 2		Candy Creek Reach 1 (100+08 - 118+91)		Candy Creek Reach 1 (118+91 - 125+27)		Candy Creek Reach 1 (125+27 - 126+27)		Candy Creek Reach 1 (100+08 - 118+91)		Candy Creek Reach 1 (118+91 - 125+27)		Candy Creek Reach 1 (125+27 - 126+27)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Shallow																							
Bankfull Width (ft)		8.7	9.4	11.9	20.1	14.8	18.6	12.2		10.7	11.2	10.6		13.6		16.8		11.9	12.8	16.1		17.0	
Floodprone Width (ft)		11	16	60		>50		72		60	>114	23	53	30	68	37	84	53	97	164		292	
Bankfull Mean Depth		1.3	1.4	1.6	2.7	1.3	2.1	1.3		1.6	1.8	0.8		1.0		1.2		0.5	0.7	0.9		1.2	
Bankfull Max Depth		1.7	1.8	3.3	4.2	1.9	2.9	1.8		2.1	2.6	1.2		1.5		1.8		1.0	1.2	1.8		2.3	
Bankfull Cross-sectional Area (ft^2)	N/A	12.1	12.3	32.9		25.0	34.6	16.3		17.8	19.7	8.2		13.2		19.9		5.7	8.9	13.9		20.3	
Width/Depth Ratio		6.2	7.2	4.4	12.1	7.9	13.8	9.1		5.8	7.1	13.7		14.0		14.2		18.4	25.3	18.6		14.3	
Entrenchment Ratio[1]		1.2	1.7	2.0	3.0	>3.4		6.0		5.5	>10.2	2.2	5.0	2.2	5.0	2.2	5.0	4.4	8.1	10.2		17.1	
Bank Height Ratio[2]		3.8	3.9	1.0	1.1	1.2	1.5	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
D50 (mm)		2.4																0.9		2.8		14.6	
Riffle Length (ft)				---		---		---		---		---		---		---		11	55	7	59	17	29
Riffle Slope (ft/ft)		0.007	0.031	0.003	0.008	0.012	0.013	0.061	0.089	0.013		0.005	0.078	0.007	0.047	0.007	0.023	0.002	0.055	0.006	0.017	0.007	0.017
Pool Length (ft)	N/A			---		---		---		---		---		---		---		18	70	19	57	52	
Pool Max Depth (ft)		2.1		2.4		2.2		2.2		3.3		0.9	2.4	1.2	3.0	1.4	3.7	2.1	3.0	3.3		3.2	
Pool Spacing (ft)		20	57	32	80	50	105	26	81	71		23	85	30	106	37	118	23	102	53	110	N/A	
Pool Volume (ft^3)																							
Pattern																							
Channel Beltwidth (ft)		N/A		---		60		---		38	41	28	94	39	121	50	150	19	47	25	58	54	
Radius of Curvature (ft)		N/A		---		16	87	---		11	15	16	34	20	44	25	54	17	38	22	44	40	
Rc:Bankfull Width (ft/ft)	N/A	N/A		---		1.1	4.7	---		1.3	1.4	1.5	3.2	1.5	3.2	1.5	3.2	1.6	3.0	1.4	2.6	2.4	
Meander Length (ft)		N/A		---		---		---		---		53	148	68	190	84	235	32	92	65	110	160	
Meander Width Ratio		N/A		---		---		---		---		5.0	14.0	5	14.0	5.0	14.0	3.1	6.4	3.6	6.2	3.2	
Substrate, Bed and Transport Parameters																							
Ri%/Ru%/P%/G%/S%																							
SC%/Sa%/G%/C%/B%/Be%																							
d16/d35/d50/d84/d95/d100		0.57/1.4/2.4/15.3/26/45		---		---		---		0.6/3.0/8.8/42.0/90/---								SC/0.35/0.9/62/114/512		SC/0.34/2.8/72/168/256		0.15/0.9/15/83/129/256	
Reach Shear Stress (Competency) lb/ft^2	N/A	0.73										0.45		0.45		0.45		0.28	0.41	0.40		0.63	
Max part size (mm) mobilized at bankfull																							
Stream Power (Capacity) W/m^2												---		---		---		---		---		---	
Additional Reach Parameters																							
Drainage Area (SM)		0.88		1.68		1.49		1.10		0.96		0.22		0.24		0.88		0.22		0.24		0.88	
Watershed Impervious Cover Estimate (%)		1%		---		---		---		---		1%		1%		1%		1%		1%		1%	
Rosgen Classification		G4c		E4		C/E4		E4b		E4		C/E		C/E		C/E		C4					
Bankfull Velocity (fps)		5.3	5.4	3.9		3.6	4.0	5.5		4.9	5.4	3.0		3.3		3.2		2.7	4.2	3.0		3.2	
Bankfull Discharge (cfs)		65		115	150	101	124	85		97		24		42		65		24		42		65	
Q-NFF regression (2-yr)		---																					
Q-USGS extrapolation (1.2-yr)	N/A	---																					
Q-Mannings		---																					
Valley Length (ft)		2,268		---		---		---		---		1,615		550		88		1,615		550		88	
Channel Thalweg Length (ft)		2,887		---		---		---		---		1,894		636		100		1,883		636		100	
Sinuosity		1.27		---		1.30		1.10		2.30		1.17		1.16		1.14		1.17		1.16		1.14	
Water Surface Slope ($ft/ft)^2$		---		---		---		---		---		0.004	0.021	0.006	0.012	0.006		0.010		0.008		0.009	
Bankfull Slope (ft/ft)		---		---		---		---		---		0.012		0.009		0.005		0.010		0.009		0.008	

SC: Silt/Clay <0.062 mm diameter particles
(---): Data was not provided
N/A: Not Applicable
[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Table 10b. Baseline Stream Data Summary

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reaches 2 and 3

		Pre-Restoration Condition				Reference Reach Data		Design						As-Built/Baseline					
Parameter	**Gage**	**Candy Creek Reach 2**		**Candy Creek Reach 3**		**See Table 7a**		**Candy Creek Reach 2 (126+27 - 143+06)**		**Candy Creek Reach 2 (143+06 - 148+02)**		**Candy Creek Reach 3 (149+02 - 155+05)**		**Candy Creek Reach 2 (126+27 - 143+06)**		**Candy Creek Reach 2 (143+06 - 148+02)**		**Candy Creek Reach 3 (149+02 - 155+05)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Riffle																			
Bankfull Width (ft)		18.2	19.4	15.3	17.6			17.5		17.0		20.0		16.1	19.5	16.7		19.2	
Floodprone Width (ft)		27	99+	24	60			39	88	37	85	44	100	154	254	164		57	
Bankfull Mean Depth		1.2	1.5	1.6	1.7			1.2		1.2		1.4		1.0	1.2	1.2		1.5	
Bankfull Max Depth		1.8	2.4	2.2	2.4			1.9		1.9		2.1		1.9	2.1	1.8		2.3	
Bankfull Cross-sectional Area (ft^2)	N/A	23.4	27.9	25.8	27.6	See Table 10a		21.8		20.9		28.0		16.2	23.3	20.8		28.2	
Width/Depth Ratio		11.9	16.2	9.1	11.2			14.0		13.8		14.3		13.3	16.3	13.5		13.1	
Entrenchment Ratio[1]		1.4	3.2+	1.4	3.9			2.2	5.0	2.2	5.0	2.2	5.0	9.5	15.8	9.8		3.0	
Bank Height Ratio[2]		1.3	2.4	1.8	2.3			1.0		1.0		1.0		1.0		1.0		1.0	
D50 (mm)		0.8		N/A										0.4		0.5		1.0	
Riffle Length (ft)								---		---		---		24	63	14	60	10	61
Riffle Slope (ft/ft)		0.005	0.010	N/A				0.004	0.035	0.011	0.035	0.006	0.013	0.001	0.019	0.001	0.019	0.001	0.035
Pool Length (ft)	N/A					See Table 10a		---		---		---		23	101	23	58	22	53
Pool Max Depth (ft)		2.7		N/A				1.5	3.9	1.5	3.8	2.1	4.2	3.3	3.5	3.9		3.5	
Pool Spacing (ft)		16	68	N/A				39	124	37	119	40	130	59	146	55	136	49	97
Pool Volume (ft^3)																			
Pattern																			
Channel Beltwidth (ft)		N/A		N/A				48	156	38	151	N/A		31	72	23	68	N/A	
Radius of Curvature (ft)		N/A		N/A				26	56	26	54	N/A		20	107	27	42	N/A	
Rc:Bankfull Width (ft/ft)	N/A	N/A		N/A		See Table 10a		1.5	3.2	1.5	3.2	N/A		1.1	4.5	1.3	1.9	N/A	
Meander Length (ft)		N/A		N/A				88	245	85	238	N/A		81	171	54	121	N/A	
Meander Width Ratio		N/A		N/A				2.2	8.9	2.2	8.9	N/A		1.4	3.0	1.1	3.0	N/A	
Substrate, Bed and Transport Parameters																			
Ri%/Ru%/P%/G%/S%																			
SC%/Sa%/G%/C%/B%/Be%																			
d16/d35/d50/d84/d95/d100	N/A	SC/0.3/0.8/9.1/13.9/23		N/A		See Table 10a								SC/0.17/0.4/93/146/256		SC/0.21/0.5/72/117/362		SC/0.27/1.0/113/148/256	
Reach Shear Stress (Competency) lb/ft^2		0.42		N/A				0.50		0.50		N/A		0.40	0.48	0.58		N/A	
Max part size (mm) mobilized at bankfull																			
Stream Power (Capacity) W/m^2								---		---		---		---		---		---	
Additional Reach Parameters																			
Drainage Area (SM)		1.08		1.26				0.93		1.08		1.26		0.93		1.08		1.26	
Watershed Impervious Cover Estimate (%)		1%		1%				1%		1%		1%		1%		1%		1%	
Rosgen Classification		F5		G4c				C/E		C/E		C/E		C5		C5		C5	
Bankfull Velocity (fps)		3.6	4.3	3.4	3.6			3.5		4.0		3.2		3.2	4.6	4.1		3.3	
Bankfull Discharge (cfs)		85		93				75		85		93		75		85		93	
Q-NFF regression (2-yr)		---		---															
Q-USGS extrapolation (1.2-yr)	N/A	---		---		See Table 10a													
Q-Mannings		---		---															
Valley Length (ft)		1,387		551				1,363		426		511		1,363		426		490	
Channel Thalweg Length (ft)		1,780		671				1,679		536		628		1,679		536		603	
Sinuosity		1.28		1.22				1.23		1.26		1.23		1.23		1.26		1.23	
Water Surface Slope ($ft/ft)^2$		---		---				0.004	0.009	0.009		0.004	0.005	0.007		0.008		0.004	
Bankfull Slope (ft/ft)		---		---				0.006		0.018		0.007		0.007		0.009		0.005	

SC: Silt/Clay <0.062 mm diameter particles
(---): Data was not provided
N/A: Not Applicable
[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Table 10c. Baseline Stream Data Summary

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 4

		Pre-Restoration Condition		Reference Reach Data		Design				As-Built/Baseline			
Parameter	**Gage**	**Candy Creek Reach 4**		**See Table 7a**		**Candy Creek Reach 4 (170+71 - 196+50)**		**Candy Creek Reach 4 (196+50 - 206+35)**		**Candy Creek Reach 4 (170+71 - 196+50)**		**Candy Creek Reach 4 (196+50 - 206+35)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Riffle													
Bankfull Width (ft)	N/A	11.4	14.1	See Table 10a		22.0		20.0		19.1	24.9	21.7	23.2
Floodprone Width (ft)		17	21			77	176	70	120	158	222	132	155
Bankfull Mean Depth		1.5	1.8			1.5		1.4		1.4	1.5	1.4	1.5
Bankfull Max Depth		1.8	2.1			2.2		2.0		2.1	2.9	2.5	2.9
Bankfull Cross-sectional Area (ft^2)		20.4	21.5			32.1		27.2		26.9	38.1	31.6	32.8
Width/Depth Ratio		6.4	9.2			15.1		14.7		13.6	16.3	14.4	17.1
Entrenchment Ratio[1]		1.5	1.5			3.5	8.0	3.5	6.0	7.1	11.6	6.1	6.7
Bank Height Ratio[2]		1.9	2.3			1.0		1.0		1.0		1.0	
D50 (mm)		2.2								0.4		0.6	
Riffle Length (ft)	N/A			See Table 10a		---		---		14	74	15	53
Riffle Slope (ft/ft)		N/A				0.006	0.020	0.011	0.039	0.003	0.022	0.004	0.025
Pool Length (ft)						---		---		20	125	22	71
Pool Max Depth (ft)		2.8				2.9	4.4	2.7	4.1	4.5	4.6	4.1	
Pool Spacing (ft)		N/A				88	154	26	132	40	145	52	111
Pool Volume (ft^3)													
Pattern													
Channel Beltwidth (ft)	N/A	N/A		See Table 10a		66	154	30	100	66	154	30	100
Radius of Curvature (ft)		N/A				25	55	25	50	25	55	25	50
Rc:Bankfull Width (ft/ft)		N/A				1.2	2.5	1.3	2.5	1.2	2.5	1.3	2.5
Meander Length (ft)		N/A				84	220	80	220	84	220	80	220
Meander Width Ratio		N/A				3.0	7.0	1.5	5.0	3.0	7.0	1.5	5.0
Substrate, Bed and Transport Parameters													
Ri%/Ru%/P%/G%/S%	N/A			See Table 10a									
SC%/Sa%/G%/C%/B%/Be%													
d16/d35/d50/d84/d95/d100		0.3/0.7/2.2/14/28/256								SC/0.15/0.4/64/180/256		0.09/0.26/0.6/49/111/180	
Reach Shear Stress (Competency) lb/ft^2		0.69				0.46		0.46		0.40	0.44	0.85	0.83
Max part size (mm) mobilized at bankfull													
Stream Power (Capacity) W/m^2						---		---		---		---	
Additional Reach Parameters													
Drainage Area (SM)	N/A	1.46		See Table 10a		1.40		1.46		1.40		1.46	
Watershed Impervious Cover Estimate (%)		1%				1%		1%		1%		1%	
Rosgen Classification		G4c				C/E		C/E		C5		C5	
Bankfull Velocity (fps)		4.9	5.2			3.3		4.0		3.3		3.2	3.3
Bankfull Discharge (cfs)		105				---		105		---		105	
Q-NFF regression (2-yr)		---											
Q-USGS extrapolation (1.2-yr)		---											
Q-Mannings		---											
Valley Length (ft)		2,847				1,976		744		1,981		745	
Channel Thalweg Length (ft)		3,359				2,575		983		2,579		985	
Sinuosity		1.18				1.30		1.32		1.30		1.32	
Water Surface Slope ($ft/ft)^2$		---				0.004	0.008	0.009	0.013	0.005		0.010	
Bankfull Slope (ft/ft)		---				0.005		0.012		0.005		0.008	

SC: Silt/Clay <0.062 mm diameter particles
(---): Data was not provided
N/A: Not Applicable
[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Table 10d. Baseline Stream Data Summary

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT1C and UT1D

		Pre-Restoration Condition				Reference Reach Data								Design				As-Built/Baseline			
Parameter	Gage	UT1C		UT1D		UT to Varnals Creek		Spencer Creek Reach 3		Agony Acres UT1-Reach 3		UT to Richland Creek		UT1C		UT1D		UT1C		UT1D	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Shallow																					
Bankfull Width (ft)	N/A	8.7		6.4		9.3	10.5	6.3	9.3	9.1	10.4	8.8	10.4	5.8		3.7		7.8		7.6	
Floodprone Width (ft)		12		34		20	64	14	125	36+		28	31	13	29	8	18	28		15	
Bankfull Mean Depth		1.3		0.6		1.1	1.2	0.8	1.0	1.0	1.2	0.8	0.9	0.4		0.2		0.5		0.5	
Bankfull Max Depth		1.7		1.0		1.5	1.7	1.0	1.2	1.8		1.1	1.3	0.5		0.3		0.9		0.8	
Bankfull Cross-sectional Area (ft^2)		7.2		3.7		10.3	12.3	6.6	8.7	10.7	11.3	7.8	8.5	2.1		0.8		4.0		3.8	
Width/Depth Ratio		4.5		11.2		8.1	9.3	7.9	9.3	7.3	10.1	10.0	12.8	16.0		16.1		15.0		15.4	
Entrenchment Ratio[1]		2.1		5.3		1.9	6.1	1.7	4.3	>3.9		2.5	4.0	2.2	5.0	2.2	5.0	3.6		2.0	
Bank Height Ratio[2]		3.8		1.2		0.9	1.0	1.0		1.0		1.4	2.1	1.0		1.0		1.0		1.0	
D50 (mm)		0.3		0.3														12.8		31.2	
Riffle Length (ft)	N/A					---		---		---		---		---		---		3	43	4	62
Riffle Slope (ft/ft)		N/A		N/A		0.024	0.057	0.018	0.034	N/A		0.021	0.045	0.030	0.050	0.006	0.112	0.003	0.082	0.002	0.085
Pool Length (ft)						---		---		---		---		---		---		5.0	20.0	4.0	15.0
Pool Max Depth (ft)		N/A		N/A		2.5	2.6	1.2	1.8	2.5		N/A		0.7	1.3	0.5	0.8	1.7		1.1	
Pool Spacing (ft)		N/A		N/A		8	82	9	46	N/A		N/A		8	29	5	26	6	51	6	33
Pool Volume (ft^3)																					
Pattern																					
Channel Beltwidth (ft)	N/A	N/A		N/A		15	45	10	50	21	93	N/A		N/A		N/A		N/A		N/A	
Radius of Curvature (ft)		N/A		N/A		8	47	12	85	14	60	N/A		N/A		N/A		N/A		N/A	
Rc:Bankfull Width (ft/ft)		N/A		N/A		0.6	3.2	1.9	9.1	1.5	5.8	N/A		N/A		N/A		N/A		N/A	
Meander Length (ft)		N/A		N/A		---		53	178	---		N/A		N/A		N/A		N/A		N/A	
Meander Width Ratio		N/A		N/A		1.0	3.0	1.6	5.4	2.3	8.9	N/A		N/A		N/A		N/A		N/A	
Substrate, Bed and Transport Parameters																					
Ri%/Ru%/P%/G%/S%	N/A																				
SC%/Sa%/G%/C%/B%/Be%																					
d16/d35/d50/d84/d95/d100		SC/SC/0.3/9.4/30/90		SC/0.1/0.3/2.9/5.2/16		---		1.9/8.9/11/64/128/---		---		---						SC/0.39/12.8/82/117/180		0.3/6.1/31/57/78/128	
Reach Shear Stress (Competency) lb/ft^2		2.70		0.39										0.31		0.50		0.84		1.48	
Max part size (mm) mobilized at bankfull																					
Stream Power (Capacity) W/m^2														---		---		---		---	
Additional Reach Parameters																					
Drainage Area (SM)	N/A	0.04		0.01		0.41		0.37		0.30		0.28		0.04		0.01		0.04		0.01	
Watershed Impervious Cover Estimate (%)		1%		<1%		---		---		---		---		1%		<1%		1%		<1%	
Rosgen Classification		E5b		C5		B		E4		E4		C4/E4		B/C		B/C		B/C		B/C	
Bankfull Velocity (fps)		0.8		0.5		4.4	5.2	5	5.6	2.2	2.4	3.5	4.1	2.5		3.0		1.5		0.5	
Bankfull Discharge (cfs)		6		2		54		35		25		29	32	6		2		6		2	
Q-NFF regression (2-yr)		---		---																	
Q-USGS extrapolation (1.2-yr)		---		---																	
Q-Mannings		---		---																	
Valley Length (ft)		688		378		---		---		---		---		684		370		672		363	
Channel Thalweg Length (ft)		728		436		---		---		---		---		740		385		728		379	
Sinuosity		1.06		1.15		1.20		1.00	1.30	1.35		1.00		1.08		1.04		1.08		1.04	
Water Surface Slope ($ft/ft)^2$		---		---		---		---		---		---		0.028		0.006	0.075	0.028		0.051	
Bankfull Slope (ft/ft)		---		---		---		---		---		---		0.040		0.052		0.028		0.045	

SC: Silt/Clay <0.062 mm diameter particles
(---): Data was not provided
N/A: Not Applicable
[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Table 10e. Baseline Stream Data Summary

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 and UT2A

		Pre-Restoration Condition						Reference Reach Data		Design						As-Built/Baseline					
Parameter	Gage	UT2 - Reach 1		UT2 - Reach 2		UT2A		See Table 7d		UT2 - Reach 1		UT2 - Reach 2		UT2A		UT2 - Reach 1		UT2 - Reach 2		UT2A	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Shallow																					
Bankfull Width (ft)	N/A	3.1	6.7	5.2		2.8		See Table 10d		6.4		7.5		4.6		4.8	7.5	7.8		7.0	
Floodprone Width (ft)		4	9	7		9				19	82	16	28	10	18	22	47	60		31	
Bankfull Mean Depth		0.4	0.8	0.6		0.4				0.4		0.5		0.3		0.3	0.9	0.5		0.6	
Bankfull Max Depth		0.8	1.0	0.9		0.6				0.6		0.8		0.4		0.4	1.5	0.8		1.0	
Bankfull Cross-sectional Area (ft^2)		2.4	3.0	3.3		1.2				2.7		3.9		1.3		1.2	6.8	4.1		4.1	
Width/Depth Ratio		4.0	14.9	8.3		6.6				15.1		14.4		16.3		8.3	18.5	14.9		11.9	
Entrenchment Ratio[1]		1.1	1.3	1.4		3.1				3.0	12.8	2.1	3.7	2.2	3.9	2.9	9.8	7.7		4.4	
Bank Height Ratio[2]		4.3	4.9	3.8		5.7				1.0		1.0		1.0		1.0		1.0		1.0	
D50 (mm)		0.1		N/A		N/A										34.6		4.5		2.5	
Riffle Length (ft)	N/A							See Table 10d		---		---		---		4	68	7	80	3	102
Riffle Slope (ft/ft)		0.003	0.110	N/A		N/A				0.011	0.070	0.017	0.032	0.035	0.065	0.004	0.063	0.001	0.055	0.019	0.071
Pool Length (ft)										---		---		---		4	18	11	62	4	12
Pool Max Depth (ft)		1.1		N/A		N/A				1.0	1.9	1.0	2.0	0.6	1.0	1.7		1.5		1.5	2.1
Pool Spacing (ft)		22	116	N/A		N/A				8	42	17	53	6	30	8	45	13	51	7	55
Pool Volume (ft^3)																					
Pattern																					
Channel Beltwidth (ft)	N/A	N/A		N/A		N/A		See Table 10d		N/A		N/A		N/A		10	25	N/A		N/A	
Radius of Curvature (ft)		N/A		N/A		N/A				N/A		N/A		N/A		17	54	N/A		N/A	
Rc:Bankfull Width (ft/ft)		N/A		N/A		N/A				N/A		N/A		N/A		3.7	9.2	N/A		N/A	
Meander Length (ft)		N/A		N/A		N/A				N/A		N/A		N/A		21	68	N/A		N/A	
Meander Width Ratio		N/A		N/A		N/A				N/A		N/A		N/A		2.2	5.6	N/A		N/A	
Substrate, Bed and Transport Parameters																					
Ri%/Ru%/P%/G%/S%	N/A							See Table 10d													
SC%/Sa%/G%/C%/B%/Be%																					
d16/d35/d50/d84/d95/d100		SC/SC/0.1/22.6 /36.7/90		N/A		N/A										0.35/6.0/34.6/70/90/256		0.2/0.7/5/56/161/>2048		0.27/1.1/2.5/47/76/180	
Reach Shear Stress (Competency) lb/ft^2		1.80		N/A		N/A				0.95		---		---		0.31	1.05	0.45		1.32	
Max part size (mm) mobilized at bankfull																					
Stream Power (Capacity) W/m^2										---		---		---		---		---		---	
Additional Reach Parameters																					
Drainage Area (SM)	N/A	0.07		0.10		0.02		See Table 10d		0.07		0.10		0.02		0.07		0.10		0.02	
Watershed Impervious Cover Estimate (%)		3%		3%		5%				3%		3%		5%		3%		3%		5%	
Rosgen Classification		F5		G5c		G5				B		C/E		B		C4		C5		C5	
Bankfull Velocity (fps)		3.0	3.7	3.6		3.5				3.1		3.1		2.3		1.3	7.5	2.9		1.0	
Bankfull Discharge (cfs)		9		12		4				9		12		4		9		12		4	
Q-NFF regression (2-yr)		---		---		---															
Q-USGS extrapolation (1.2-yr)		---		---		---															
Q-Mannings		---		---		---															
Valley Length (ft)		1,105		595		341				1,168		591		340		1,168		591		358	
Channel Thalweg Length (ft)		1,279		731		376				1,208		645		349		1,208		643		366	
Sinuosity		1.16		1.23		1.10				1.03		1.09		1.02		1.03		1.09		1.02	
Water Surface Slope ($ft/ft)^2$		---		---		---				0.010	0.035	0.014	0.016	0.032	0.036	0.021	0.031	0.015		0.039	
Bankfull Slope (ft/ft)		---		---		---				0.038		0.019		0.038		0.023	0.032	0.014		0.040	

SC: Silt/Clay <0.062 mm diameter particles
(---): Data was not provided
N/A: Not Applicable
[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Table 10f. Baseline Stream Data Summary

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2017

UT3, UT4, and UT5

		PRE-RESTORATION CONDITION						REFERENCE REACH DATA		DESIGN						AS-BUILT/BASELINE					
Parameter	**Gage**	**UT3**		**UT4**		**UT5**		**See Table 7d**		**UT3**		**UT4**		**UT5**		**UT3**		**UT4**		**UT5**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Shallow																					
Bankfull Width (ft)		5.8		8.5		9.5				7.8		11.0		9.8		8.8		11.5	15.1	9.7	10.6
Floodprone Width (ft)		8		11		10				17	100	24	135	22	100	77		98	288	83	229
Bankfull Mean Depth		0.7		0.8		0.7				0.6		0.9		0.8		0.6		0.9	1.1	0.6	0.8
Bankfull Max Depth		0.9		1.0		1.0				0.9		1.2		1.1		1.1		1.6	2.1	0.9	1.3
Bankfull Cross-sectional Area (ft^2)	N/A	3.9		7.2		6.7		See Table 10d		4.8		9.4		7.5		5.5		11.0	15.2	6.0	8.8
Width/Depth Ratio		8.8		10.2		13.4				12.7		12.9		12.8		14.0		10.2	15.0	12.8	15.5
Entrenchment Ratio[1]		1.3		1.2		1.1				2.2	12.8	2.2	12.3	2.2	10.2	8.8		6.5	25.0	8.6	21.6
Bank Height Ratio[2]		5.4		6.2		5.6				1.0		1.0		1.0		1.0		1.0		1.0	
D50 (mm)		10.6		2.8		12.5										1.5		0.6		0.6	
Riffle Length (ft)										---		---		---		8	20	8	69	11	28
Riffle Slope (ft/ft)		0.011	0.072	0.011	0.064	0.020	0.012			0.012	0.092	0.003	0.018	0.003	0.035	0.007	0.057	0.000	0.072	0.000	0.027
Pool Length (ft)	N/A							See Table 10d		---		---		---		8	24	9	42	12	39
Pool Max Depth (ft)		1.1		1.4		1.2				1.1	2.1	1.7	2.6	1.5	2.4	1.1	2.7	2.3	2.9	1.9	
Pool Spacing (ft)		6	43	12	42	9	54			17	43	28	66	25	64	24	33	24	123	26	65
Pool Volume (ft^3)																					
Pattern																					
Channel Beltwidth (ft)		N/A		N/A		N/A				6	16	10	28	9	64	7	19	10	45	10	39
Radius of Curvature (ft)		N/A		N/A		N/A				10	27	14	28	13	49	12	24	12	33	11	48
Rc:Bankfull Width (ft/ft)	N/A	N/A		N/A		N/A		See Table 10d		1.3	3.5	1.3	2.5	1.3	5.0	1.1	2.1	1.1	2.1	0.8	3.6
Meander Length (ft)		N/A		N/A		N/A				41	101	39	105	54	127	28	76	31	72	34	71
Meander Width Ratio		N/A		N/A		N/A				0.8	2.0	0.9	2.5	0.9	6.5	0.8	1.7	0.7	2.7	0.9	2.2
Substrate, Bed and Transport Parameters																					
Ri%/Ru%/P%/G%/S%																					
SC%/Sa%/G%/C%/B%/Be%																					
d16/d35/d50/d84/d95/d100	N/A	SC/0.1/10.6/22.6/41/64		0.3/0.5/2.8/28.5/40.6/64		0.3/2.8/12.5/29.7/41/90		See Table 10d								SC/0.36/1.5/81/111/180		SC/0.16/0.6/100/161/512		SC/SC/0.6/32/143/362	
Reach Shear Stress (Competency) lb/ft^2		0.93		0.55		1.90				0.81		0.61		0.28		0.88		0.30	0.32	0.23	0.30
Max part size (mm) mobilized at bankfull																					
Stream Power (Capacity) W/m^2										---		---		---		---		---		---	
Additional Reach Parameters																					
Drainage Area (SM)		0.12		0.30		0.21				0.12		0.30		0.21		0.12		0.30		0.21	
Watershed Impervious Cover Estimate (%)		1%		0%		1%				1%		0%		1%		1%		0%		1%	
Rosgen Classification		G4		G4		F4				C/E		C/E		C/E		C5		C5/E5		C5/E5	
Bankfull Velocity (fps)		3.7		4.2		3.3				2.9		3.2		2.9		2.5		2.0	2.7	2.5	3.7
Bankfull Discharge (cfs)		14		30		22				14		30		22		14		30		22	
Q-NFF regression (2-yr)		---		---		---															
Q-USGS extrapolation (1.2-yr)	N/A	---		---		---		See Table 10d													
Q-Mannings		---		---		---															
Valley Length (ft)		238		1,058		732				301		1,111		845		301		1,111		845	
Channel Thalweg Length (ft)		346		1,270		1,012				346		1,355		1,012		346		1,356		1,012	
Sinuosity		1.45		1.20		1.38				1.15		1.22		1.20		1.15		1.22		1.20	
Water Surface Slope (ft/ft)[2]		---		---		---				0.011	0.032	0.003	0.012	0.002	0.010	0.024		0.006		0.006	
Bankfull Slope (ft/ft)		---		---		---				0.016	0.032	0.012		0.012		0.022		0.006		0.007	

SC: Silt/Clay <0.062 mm diameter particles
(---): Data was not provided
N/A: Not Applicable
[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

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

Candy Creek Mitigation Site

DMS Project No. 96315

Monitoring Year 2 - 2018

	Cross-Section 1, Candy Creek Reach 1 (Riffle)								Cross-Section 2, Candy Creek Reach 1 (Pool)								Cross-Section 3, Candy Creek Reach 1 (Riffle)								Cross-Section 4, Candy Creek Reach 1 (Pool)							
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	765.9	765.9	766.0						763.4	763.4	763.5						763.0	763.0	763.1						757.4	757.4	757.5					
Low Bank Elevation (ft)	765.9	765.9	766.0						763.4	763.4	763.4						763.0	763.0	763.1						757.4	757.4	757.4					
Bankfull Width (ft)	12.8	11.3	12.2						18.7	17.0	19.5						12.0	10.6	11.8						12.5	11.7	13.5					
Floodprone Width (ft)	71	71	71.0						---	---	---						97	97	97.0						---	---	---					
Bankfull Mean Depth (ft)	0.7	0.7	0.7						1.0	0.9	0.9						0.5	0.5	0.5						1.1	1.1	1.0					
Bankfull Max Depth (ft)	1.2	1.2	1.2						3.0	3.0	2.9						1.0	0.9	1.0						2.1	2.0	1.9					
Bankfull Cross Sectional Area (ft^2)	8.9	8.3	8.9						18.4	15.8	18.4						5.7	5.1	5.7						13.5	12.3	13.5					
Bankfull Width/Depth Ratio	18.4	15.4	16.8						19.0	18.3	20.7						25.3	22.2	24.5						11.6	11.1	13.5					
Bankfull Entrenchment Ratio[1]	5.5	6.3	5.8						---	---	---						8.1	9.1	8.2						---	---	---					
Bankfull Bank Height Ratio[2]	1.0	1.0	1.0						---	---	---						1.0	1.0	1.0						---	---	---					
	Cross-Section 5, Candy Creek Reach 1 (Riffle)								Cross-Section 6, Candy Creek Reach 1 (Pool)								Cross-Section 7, Candy Creek Reach 1 (Riffle)								Cross-Section 8, Candy Creek Reach 1 (Riffle)							
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	757.1	757.1	757.1						749.3	749.3	749.4						748.9	748.9	749.0						747.3	747.3	747.3					
Low Bank Elevation (ft)	757.1	757.1	757.1						749.3	749.3	749.3						748.9	748.9	748.9						747.3	747.3	747.3					
Bankfull Width (ft)	11.9	12.1	12.1						19.9	19.7	20.4						16.1	14.8	14.3						17.0	15.3	15.4					
Floodprone Width (ft)	53	53	53.0						---	---	---						164	164	164						292	292	292					
Bankfull Mean Depth (ft)	0.6	0.6	0.6						1.8	1.7	1.7						0.9	1.0	1.0						1.2	1.3	1.3					
Bankfull Max Depth (ft)	1.2	1.2	1.3						3.3	4.0	4.0						1.8	1.8	1.8						2.3	2.3	2.3					
Bankfull Cross Sectional Area (ft^2)	7.1	7.5	7.1						35.5	34.2	35.5						13.9	14.3	13.9						20.3	20.3	20.3					
Bankfull Width/Depth Ratio	19.9	19.5	20.5						11.2	11.3	11.7						18.6	15.4	14.7						14.3	11.5	11.7					
Bankfull Entrenchment Ratio[1]	4.4	4.4	4.4						---	---	---						10.2	11.1	11.5						17.1	19.1	18.9					
Bankfull Bank Height Ratio[2]	1.0	1.0	1.0						---	---	---						1.0	1.0	<1						1.0	1.0	1.0					
	Cross-Section 9, Candy Creek Reach 2 (Pool)								Cross-Section 10, Candy Creek Reach 2 (Riffle)								Cross-Section 11, Candy Creek Reach 2 (Riffle)								Cross-Section 12, Candy Creek Reach 2 (Pool)							
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	745.6	745.6	745.5						745.0	745.0	745.0						741.1	741.1	741.0						737.4	737.4	737.5					
Low Bank Elevation (ft)	745.6	745.6	745.6						745.0	745.0	745.0						741.1	741.1	741.1						737.4	737.4	737.4					
Bankfull Width (ft)	22.0	24.9	24.1						16.1	16.0	16.7						16.3	16.2	15.6						23.6	23.7	23.5					
Floodprone Width (ft)	---	---	---						254	254	254						154	154	154						---	---	---					
Bankfull Mean Depth (ft)	1.8	1.7	1.7						1.0	1.0	1.0						1.2	1.3	1.3						1.9	1.7	1.9					
Bankfull Max Depth (ft)	3.5	3.9	4.1						1.9	2.0	2.0						1.9	2.3	2.2						3.3	3.5	3.7					
Bankfull Cross Sectional Area (ft^2)	40.1	42.1	40.1						16.2	16.5	16.2						19.8	21.5	19.8						44.2	40.9	44.2					
Bankfull Width/Depth Ratio	12.0	14.7	14.5						16.0	15.5	16.7						13.3	12.2	12.3						12.6	13.7	12.5					
Bankfull Entrenchment Ratio[1]	---	---	---						15.8	15.9	15.2						9.5	9.5	9.9						---	---	---					
Bankfull Bank Height Ratio[2]	---	---	---						1.0	1.0	1.0						1.0	1.0	1.1						---	---	---					
	Cross-Section 13, Candy Creek Reach 2 (Riffle)								Cross-Section 14, Candy Creek Reach 2 (Riffle)								Cross-Section 15, Candy Creek Reach 2 (Pool)															
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)								
Bankfull Elevation	737.0	737.0	736.9						733.1	733.1	733.1						733.2	733.2	733.4													
Low Bank Elevation (ft)	737.0	737.0	737.0						733.1	733.1	733.1						733.2	733.2	733.2													
Bankfull Width (ft)	19.5	18.2	18.1						16.7	17.3	16.8						23.9	21.8	30.9													
Floodprone Width (ft)	221	221	221						164	164	164						---	---	---													
Bankfull Mean Depth (ft)	1.2	1.3	1.3						1.2	1.3	1.2						1.9	2.2	1.5													
Bankfull Max Depth (ft)	2.1	2.0	2.1						1.8	2.1	1.9						3.9	4.5	4.4													
Bankfull Cross Sectional Area (ft^2)	23.3	24.3	23.3						20.8	22.7	20.8						46.3	47.8	46.3													
Bankfull Width/Depth Ratio	16.3	13.7	14.00						13.5	13.2	13.6						12.3	9.9	20.6													
Bankfull Entrenchment Ratio[1]	11.3	12.1	12.2						9.8	9.5	9.7						---	---	---													
Bankfull Bank Height Ratio[2]	1.0	1.0	1.1						1.0	1.0	1.0						---	---	---													

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018).

Table 11b. Morphology and Hydraulic Summary (Dimensional Parameters - Cross-Section)
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

	Cross-Section 16, Candy Creek Reach 3 (Pool)								Cross-Section 17, Candy Creek Reach 3 (Riffle)								Cross-Section 18, Candy Creek Reach 4 (Pool)								Cross-Section 19, Candy Creek Reach 4 (Riffle)							
Dimension and Substrate[3]	Base* (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	729.2	729.2	729.2						729.1	729.1	729.2						720.6	720.6	720.7						720.5	720.5	720.5					
Low Bank Elevation (ft)	729.2	729.2	729.2						729.1	729.1	729.2						720.6	720.6	720.6						720.5	720.5	720.5					
Bankfull Width (ft)	26.2	25.8	25.5						19.2	18.0	20.2						26.9	26.3	37.1						19.1	19.8	20.0					
Floodprone Width (ft)	---	---	---						57	57	57						---	---	---						222	222	222					
Bankfull Mean Depth (ft)	1.9	2.1	2.0						1.5	1.4	1.4						2.2	2.1	1.6						1.4	1.2	1.3					
Bankfull Max Depth (ft)	3.5	4.2	4.1						2.3	2.4	2.3						4.5	4.8	4.7						2.2	2.1	2.3					
Bankfull Cross-Sectional Area (ft2)	50.0	54.3	50.0						28.2	25.9	28.2						58.7	55.5	58.7						26.9	23.3	26.9					
Bankfull Width/Depth Ratio	13.8	12.3	13.0						13.1	12.5	14.5						12.3	12.4	23.4						13.6	16.8	14.8					
Bankfull Entrenchment Ratio[1]	---	---	---						3.0	3.2	2.8						---	---	---						11.6	11.2	11.1					
Bankfull Bank Height Ratio[2]	---	---	---						1.0	1.0	1.0						---	---	---						1.0	1.0	1.0					
	Cross-Section 20, Candy Creek Reach 4 (Riffle)								Cross-Section 21, Candy Creek Reach 4 (Pool)								Cross-Section 22, Candy Creek Reach 4 (Pool)								Cross-Section 23, Candy Creek Reach 4 (Riffle)							
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	717.8	717.8	717.8						717.7	717.7	717.5						714.0	714.0	714.0						713.9	713.9	713.9					
Low Bank Elevation (ft)	717.8	717.8	717.9						717.7	717.7	717.5						714.0	714.0	714.0						713.9	713.9	713.9					
Bankfull Width (ft)	22.4	22.2	21.3						29.3	30.0	28.6						23.6	23.8	22.8						24.9	22.5	22.9					
Floodprone Width (ft)	158	158	158						---	---	---						---	---	---						180	180	180					
Bankfull Mean Depth (ft)	1.4	1.4	1.5						2.4	2.5	2.5						2.2	2.1	2.2						1.5	1.7	1.7					
Bankfull Max Depth (ft)	2.1	2.3	2.3						4.6	4.6	5.2						4.6	4.0	4.5						2.9	2.8	2.8					
Bankfull Cross-Sectional Area (ft2)	31.0	31.7	31.0						70.1	74.0	70.1						51.1	50.2	51.1						38.1	37.4	38.1					
Bankfull Width/Depth Ratio	16.2	15.6	14.7						12.2	12.2	11.7						10.9	11.3	10.2						16.3	13.5	13.8					
Bankfull Entrenchment Ratio[1]	7.1	7.1	7.4						---	---	---						---	---	---						7.2	8.0	7.9					
Bankfull Bank Height Ratio[2]	1.0	1.0	1.1						---	---	---						---	---	---						1.0	1.0	1.0					
	Cross-Section 24, Candy Creek Reach 4 (Riffle)								Cross-Section 25, Candy Creek Reach 4 (Riffle)								Cross-Section 26, Candy Creek Reach 4 (Pool)								Cross-Section 27, UT1C (Riffle)							
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	707.8	707.8	707.8						702.6	702.6	702.7						702.1	702.1	702.3						752.2	752.2	752.2					
Low Bank Elevation (ft)	707.8	707.8	707.8						702.6	702.6	702.6						702.1	702.1	702.3						752.2	752.2	752.1					
Bankfull Width (ft)	23.2	23.5	23.6						21.7	21.6	22.2						23.6	24.6	28.9						7.8	7.8	9.3					
Floodprone Width (ft)	155	155	155						132	132	132						---	---	---						28	28	28					
Bankfull Mean Depth (ft)	1.4	1.4	1.3						1.5	1.5	1.5						2.2	2.1	1.8						0.5	0.5	0.4					
Bankfull Max Depth (ft)	2.9	2.5	2.4						2.5	2.6	2.5						4.1	4.4	4.2						0.9	0.8	1.0					
Bankfull Cross-Sectional Area (ft2)	31.6	32.4	31.6						32.8	32.8	32.8						51.3	52.5	51.3						4.0	3.7	4.0					
Bankfull Width/Depth Ratio	17.1	17.1	17.6						14.4	14.3	15.0						10.8	11.6	16.20						15.0	16.2	21.7					
Bankfull Entrenchment Ratio[1]	6.7	6.6	6.6						6.1	6.1	6.0						---	---	---						3.6	3.6	3.0					
Bankfull Bank Height Ratio[2]	1.0	1.0	1.0						1.0	1.0	1.0						---	---	---						1.0	1.0	<1					
	Cross-Section 28, UT1C (Pool)								Cross-Section 29, UT1D (Riffle)								Cross-Section 30, UT2 Reach 1 (Riffle)								Cross-Section 31, UT2 Reach 1 (Riffle)							
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	752.1	752.1	752.0						742.7	742.7	742.7						771.9	771.9	771.7						763.8	763.8	763.8					
Low Bank Elevation (ft)	752.1	752.1	752.0						742.7	742.7	742.7						771.9	771.9	771.7						763.8	763.8	763.8					
Bankfull Width (ft)	6.4	9.1	5.7						7.6	7.1	7.1						7.5	7.8	7.6						4.8	4.3	3.9					
Floodprone Width (ft)	---	---	---						15	15	15						22	22	22						47	47	47					
Bankfull Mean Depth (ft)	0.9	0.7	0.9						0.5	0.5	0.5						0.9	0.8	0.9						0.3	0.2	0.3					
Bankfull Max Depth (ft)	1.7	1.8	1.7						0.8	0.8	0.9						1.5	1.4	1.5						0.4	0.3	0.5					
Bankfull Cross-Sectional Area (ft2)	5.4	6.1	5.4						3.8	3.3	3.8						6.8	6.3	6.8						1.2	0.8	1.2					
Bankfull Width/Depth Ratio	7.5	13.5	6.1						15.4	15.3	13.1						8.3	9.7	8.6						18.5	23.3	12.6					
Bankfull Entrenchment Ratio[1]	---	---	---						2.0	2.1	2.1						2.9	2.8	2.9						9.8	11.0	12.1					
Bankfull Bank Height Ratio[2]	---	---	---						1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.1					

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.
*Revised MY0 dimensions reported for XS16 in MY1 to correct error.
[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018).

Table 11c. Morphology and Hydraulic Summary (Dimensional Parameters - Cross-Section)
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

	Cross-Section 32, UT2 Reach 1 (Pool)								Cross-Section 33, UT2 Reach 1 (Riffle)								Cross-Section 34, UT2 Reach 2 (Pool)								Cross-Section 35, UT2 Reach 2 (Riffle)							
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	760.4	760.4	760.2						760.0	760.0	759.8						734.8	734.8	735.0						734.6	734.6	734.7					
Low Bank Elevation (ft)	760.4	760.4	760.4						760.0	760.0	759.8						734.8	734.8	734.8						734.6	734.6	764.7					
Bankfull Width (ft)	10.1	11.3	8.4						7.8	7.0	6.3						10.2	9.6	12.5						7.8	7.8	13.2					
Floodprone Width (ft)	---	---	---						88	88	88						---	---	---						60	60	60					
Bankfull Mean Depth (ft)	0.6	0.6	0.7						0.5	0.5	0.6						0.8	0.5	0.6						0.5	0.4	0.3					
Bankfull Max Depth (ft)	1.7	1.7	1.9						0.8	1.1	1.2						1.5	0.8	1.6						0.8	0.8	0.8					
Bankfull Cross-Sectional Area (ft2)	6.2	7.2	6.2						3.5	3.2	3.5						7.9	4.5	7.9						4.1	3.0	4.1					
Bankfull Width/Depth Ratio	16.4	17.7	11.3						17.2	15.1	11.3						13.3	20.2	19.6						14.9	20.2	42.5					
Bankfull Entrenchment Ratio[1]	---	---	---						11.3	12.6	14.0						---	---	---						7.7	7.7	4.5					
Bankfull Bank Height Ratio[2]	---	---	---						1.0	1.0	1.1						---	---	---						1.0	1.0	1.0					

	Cross-Section 36, UT2A (Riffle)								Cross-Section 37, UT3 Reach 2 (Riffle)								Cross-Section 38, UT4 (Riffle)								Cross-Section 39, UT4 (Pool)							
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	747.7	747.7	747.8						749.7	749.7	749.6						753.6	753.6	753.7						753.2	753.2	753.3					
Low Bank Elevation (ft)	747.7	747.7	747.7						749.7	749.7	749.7						753.6	753.6	753.5						753.2	753.2	753.2					
Bankfull Width (ft)	7.0	7.6	8.3						8.8	8.7	8.4						15.1	14.7	16.8						14.1	15.2	21.9					
Floodprone Width (ft)	31	31	37						77	77	77						98	98	98						---	---	---					
Bankfull Mean Depth (ft)	0.6	0.5	0.5						0.6	0.6	0.7						1.0	1.0	0.9						1.3	1.1	0.8					
Bankfull Max Depth (ft)	1.0	1.0	1.1						1.1	1.1	1.1						2.1	2.1	2.0						2.3	2.3	2.4					
Bankfull Cross-Sectional Area (ft2)	4.1	3.7	4.1						5.5	5.3	5.5						15.2	14.4	15.2						17.8	16.9	17.8					
Bankfull Width/Depth Ratio	11.9	15.8	16.7						14.0	14.1	12.8						15.0	15.0	18.5						11.2	13.6	26.9					
Bankfull Entrenchment Ratio[1]	4.4	4.1	4.4						8.8	8.9	9.2						6.5	6.7	5.8						---	---	---					
Bankfull Bank Height Ratio[2]	1.0	1.0	<1						1.0	1.0	1.1						1.0	1.0	<1						---	---	---					

	Cross-Section 40, UT4 (Pool)								Cross-Section 41, UT4 (Riffle)								Cross-Section 42, UT4 (Riffle)								Cross-Section 43, UT4 (Pool)							
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	750.3	750.3	750.5						750.2	750.2	750.3						748.3	748.3	748.4						748.0	748.0	748.1					
Low Bank Elevation (ft)	750.3	750.3	750.5						750.2	750.2	750.1						748.3	748.3	748.4						748.0	748.0	748.0					
Bankfull Width (ft)	14.5	15.0	16.8						11.8	12.3	16.2						11.5	12.3	11.9						16.9	15.0	16.0					
Floodprone Width (ft)	---	---	---						172	172	172						288	288	288						---	---	---					
Bankfull Mean Depth (ft)	1.3	1.1	1.1						0.9	0.9	0.7						1.1	1.0	1.1						1.2	1.3	1.3					
Bankfull Max Depth (ft)	2.3	2.3	2.4						1.6	1.6	1.6						1.8	1.7	1.9						2.9	3.1	3.2					
Bankfull Cross-Sectional Area (ft2)	18.5	16.3	18.5						11.0	11.1	11.0						13.0	12.7	12.4						20.2	18.9	20.2					
Bankfull Width/Depth Ratio	11.4	13.8	15.2						12.7	13.7	23.7						10.2	11.9	10.9						14.2	12.0	12.7					
Bankfull Entrenchment Ratio[1]	---	---	---						14.6	13.9	10.6						25.0	23.5	24.2						---	---	---					
Bankfull Bank Height Ratio[2]	---	---	---						1.0	1.0	<1						1.0	1.0	1.0						---	---	---					

	Cross-Section 44, UT5 (Riffle)								Cross-Section 45, UT5 (Pool)								Cross-Section 46, UT5 (Riffle)								Cross-Section 47, UT5 (Pool)							
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	758.4	758.4	758.3						758.4	758.4	758.4						755.0	755.0	755.1						754.8	754.8	754.8					
Low Bank Elevation (ft)	758.4	758.4	758.4						758.4	758.4	758.3						755.0	755.0	755.1						754.8	754.8	754.8					
Bankfull Width (ft)	9.7	9.6	9.8						10.6	10.2	9.9						9.9	9.5	9.9						13.1	13.0	17.0					
Floodprone Width (ft)	83	83	83						---	---	---						84	84	84						---	---	---					
Bankfull Mean Depth (ft)	0.6	0.6	0.6						0.9	0.9	1.0						0.7	0.7	0.7						1.1	1.1	0.9					
Bankfull Max Depth (ft)	0.9	0.9	1.1						1.9	1.9	1.9						1.0	0.9	1.1						1.9	2.0	2.1					
Bankfull Cross-Sectional Area (ft2)	6.0	5.6	6.0						9.8	9.5	9.8						6.8	6.3	6.8						14.7	14.2	14.7					
Bankfull Width/Depth Ratio	15.5	16.2	15.90						11.4	11.1	10.0						14.5	14.4	14.4						11.6	11.9	19.6					
Bankfull Entrenchment Ratio[1]	8.6	8.7	8.5						---	---	---						8.5	8.8	8.5						---	---	---					
Bankfull Bank Height Ratio[2]	1.0	1.0	1.1						---	---	---						1.0	1.0	1.0						---	---	---					

	Cross-Section 48, UT5 (Riffle)							
Dimension and Substrate[3]	Base (10/2016)	MY1 (2017)	MY2 (2018)	MY3 (2019)	MY4 (2020)	MY5 (2021)	MY6 (2022)	MY7 (2023)
Bankfull Elevation	753.0	753.0	753.0					
Low Bank Elevation (ft)	753.0	753.0	752.9					
Bankfull Width (ft)	10.6	10.8	17.0					
Floodprone Width (ft)	229	229	229					
Bankfull Mean Depth (ft)	0.8	0.8	0.5					
Bankfull Max Depth (ft)	1.3	1.3	1.3					
Bankfull Cross-Sectional Area (ft2)	8.8	8.4	8.8					
Bankfull Width/Depth Ratio	12.8	13.8	32.9					
Bankfull Entrenchment Ratio[1]	21.6	21.2	13.5					
Bankfull Bank Height Ratio[2]	1.0	1.0	<1					

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.
[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018).

Table 12a. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 1 (Sta. 100+08 - 118+91)

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	11.9	12.8	10.6	12.1	11.8	12.2										
Floodprone Width (ft)	53	97	53	97	53.0	97.0										
Bankfull Mean Depth	0.5	0.7	0.5	0.7	0.5	0.7										
Bankfull Max Depth	1.0	1.2	0.9	1.2	1.0	1.3										
Bankfull Cross-Sectional Area (ft2)	5.7	8.9	5.1	8.3	5.7	8.9										
Width/Depth Ratio	18.4	25.3	15.4	22.2	16.8	24.5										
Entrenchment Ratio[1]	4.4	8.1	4.4	9.1	4.4	8.2										
Bank Height Ratio[2]	1.0		1.0		0.9											
D50 (mm)	0.9		1.7		1.1											
Profile																
Riffle Length (ft)	11	55														
Riffle Slope (ft/ft)	0.002	0.055														
Pool Length (ft)	18	70														
Pool Max Depth (ft)	2.1	3.0														
Pool Spacing (ft)	23	102														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	19	47														
Radius of Curvature (ft)	17	38														
Rc:Bankfull Width (ft/ft)	1.6	3.0														
Meander Wave Length (ft)	32	92														
Meander Width Ratio	3.1	6.4														
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	1,883															
Sinuosity (ft)	1.17															
Water Surface Slope (ft/ft)	0.010															
Bankfull Slope (ft/ft)	0.010															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	SC/0.35/0.9/62/114/512															
% of Reach with Eroding Banks	0%		<1%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12b. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 1 (Sta. 118+91 - 125+27)

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	16.1		16.8		14.3											
Floodprone Width (ft)	164		164		164											
Bankfull Mean Depth	0.9		1.0		1											
Bankfull Max Depth	1.8		1.8		1.8											
Bankfull Cross-Sectional Area (ft2)	13.9		14.3		13.9											
Width/Depth Ratio	18.6		15.4		14.7											
Entrenchment Ratio[1]	10.2		11.1		11.5											
Bank Height Ratio[2]	1.0		1.0		1											
D50 (mm)	2.8		6.1		0.9											
Profile																
Riffle Length (ft)	7	59														
Riffle Slope (ft/ft)	0.006	0.017														
Pool Length (ft)	19	57														
Pool Max Depth (ft)	3.3															
Pool Spacing (ft)	53	110														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	25	58														
Radius of Curvature (ft)	22	44														
Rc:Bankfull Width (ft/ft)	1.4	2.6														
Meander Wave Length (ft)	65	110														
Meander Width Ratio	3.6	6.2														
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	636															
Sinuosity (ft)	1.16															
Water Surface Slope (ft/ft)	0.008															
Bankfull Slope (ft/ft)	0.009															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	SC/0.34/2.8/72/168/256															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12c. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 1 (Sta. 125+27 - 126+27)

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	17.0		15.3		15.4											
Floodprone Width (ft)	292		292		292											
Bankfull Mean Depth	1.2		1.3		1.3											
Bankfull Max Depth	2.3		2.3		2.3											
Bankfull Cross-Sectional Area (ft2)	20.3		20.3		20.3											
Width/Depth Ratio	14.3		11.5		11.7											
Entrenchment Ratio[1]	17.1		19.1		18.9											
Bank Height Ratio[2]	1.0		1.0		1.0											
D50 (mm)	14.6		36.9		11											
Profile																
Riffle Length (ft)	17	29														
Riffle Slope (ft/ft)	0.007	0.017														
Pool Length (ft)	52															
Pool Max Depth (ft)	3.2															
Pool Spacing (ft)	N/A															
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	54															
Radius of Curvature (ft)	40															
Rc:Bankfull Width (ft/ft)	2.4															
Meander Wave Length (ft)	160															
Meander Width Ratio	3.2															
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	100															
Sinuosity (ft)	1.14															
Water Surface Slope (ft/ft)	0.009															
Bankfull Slope (ft/ft)	0.008															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	0.15/0.9/15/83/129/256															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12d. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 2 (Sta. 126+27 - 143+06)

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	16.1	19.5	16.0	18.2	15.6	18.1										
Floodprone Width (ft)	154	254	154	254	154	254										
Bankfull Mean Depth	1.0	1.2	1.0	1.3	1.0	1.3										
Bankfull Max Depth	1.9	2.1	2.0	2.3	2.0	2.2										
Bankfull Cross-Sectional Area (ft2)	16.2	23.3	16.5	24.3	16.2	23.3										
Width/Depth Ratio	13.3	16.3	12.2	13.7	14.0	17.2										
Entrenchment Ratio[1]	9.5	15.8	9.5	15.9	9.9	15.2										
Bank Height Ratio[2]	1.0		1.0		1.0	1.1										
D50 (mm)	0.4		8.3		11.0											
Profile																
Riffle Length (ft)	24	63														
Riffle Slope (ft/ft)	0.001	0.019														
Pool Length (ft)	23	101														
Pool Max Depth (ft)	3.3	3.5														
Pool Spacing (ft)	59	146														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	31	72														
Radius of Curvature (ft)	20	107														
Rc:Bankfull Width (ft/ft)	1.1	4.5														
Meander Wave Length (ft)	81	171														
Meander Width Ratio	1.4	3.0														
Additional Reach Parameters																
Rosgen Classification	C5															
Channel Thalweg Length (ft)	1,679															
Sinuosity (ft)	1.23															
Water Surface Slope (ft/ft)	0.007															
Bankfull Slope (ft/ft)	0.007															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	SC/0.17/0.4/93/146/256															
% of Reach with Eroding Banks	0%		<1%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12e. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 2 (Sta. 143+06 - 148+02)

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	16.7		17.3		16.8											
Floodprone Width (ft)	164		164		164											
Bankfull Mean Depth	1.2		1.3		1.2											
Bankfull Max Depth	1.8		2.1		1.9											
Bankfull Cross-Sectional Area (ft2)	20.8		22.7		20.8											
Width/Depth Ratio	13.5		13.2		13.6											
Entrenchment Ratio[1]	9.8		9.5		9.7											
Bank Height Ratio[2]	1.0		1.0		1.0											
D50 (mm)	0.5		11.0		11.0											
Profile																
Riffle Length (ft)	14	60														
Riffle Slope (ft/ft)	0.001	0.019														
Pool Length (ft)	23	58														
Pool Max Depth (ft)	3.9															
Pool Spacing (ft)	55	136														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	23	68														
Radius of Curvature (ft)	27	42														
Rc:Bankfull Width (ft/ft)	1.3	1.9														
Meander Wave Length (ft)	54	121														
Meander Width Ratio	1.1	3.0														
Additional Reach Parameters																
Rosgen Classification	C5															
Channel Thalweg Length (ft)	536															
Sinuosity (ft)	1.26															
Water Surface Slope (ft/ft)	0.008															
Bankfull Slope (ft/ft)	0.009															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	SC/0.21/0.5/72/117/362															
% of Reach with Eroding Banks	0%		2%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12f. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 3 (Sta. 149+02 - 155+05)

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	19.2		18.0		20.2											
Floodprone Width (ft)	57		57		57											
Bankfull Mean Depth	1.5		1.4		1.4											
Bankfull Max Depth	2.3		2.4		2.3											
Bankfull Cross-Sectional Area (ft2)	28.2		25.9		28.2											
Width/Depth Ratio	13.1		12.5		14.5											
Entrenchment Ratio[1]	3.0		3.2		2.8											
Bank Height Ratio[2]	1.0		1.0		0.9											
D50 (mm)	1.0		1.2		0.7											
Profile																
Riffle Length (ft)	10	61														
Riffle Slope (ft/ft)	0.001	0.035														
Pool Length (ft)	22	53														
Pool Max Depth (ft)	3.5															
Pool Spacing (ft)	49	97														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	N/A															
Radius of Curvature (ft)	N/A															
Rc:Bankfull Width (ft/ft)	N/A															
Meander Wave Length (ft)	N/A															
Meander Width Ratio	N/A															
Additional Reach Parameters																
Rosgen Classification	C5															
Channel Thalweg Length (ft)	603															
Sinuosity (ft)	1.23															
Water Surface Slope (ft/ft)	0.004															
Bankfull Slope (ft/ft)	0.005															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	SC/0.27/1.0/113/148/256															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12g. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 4 (Sta. 170+71 - 196+50)

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	19.1	24.9	19.8	22.5	20.0	22.9										
Floodprone Width (ft)	158	222	158	222	158	222										
Bankfull Mean Depth	1.4	1.5	1.2	1.7	1.3	1.7										
Bankfull Max Depth	2.1	2.9	2.1	2.8	2.3	2.8										
Bankfull Cross-Sectional Area (ft2)	26.9	38.1	23.3	37.4	26.9	38.1										
Width/Depth Ratio	13.6	16.3	13.5	16.8	13.8	14.8										
Entrenchment Ratio[1]	7.1	11.6	7.1	11.2	7.4	11.1										
Bank Height Ratio[2]	1.0		1.0		1.0											
D50 (mm)	0.4		0.8		0.6											
Profile																
Riffle Length (ft)	14	74														
Riffle Slope (ft/ft)	0.003	0.022														
Pool Length (ft)	20	125														
Pool Max Depth (ft)	4.5	4.6														
Pool Spacing (ft)	40	145														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	66	154														
Radius of Curvature (ft)	25	55														
Rc:Bankfull Width (ft/ft)	1.2	2.5														
Meander Wave Length (ft)	84	220														
Meander Width Ratio	3.0	7.0														
Additional Reach Parameters																
Rosgen Classification	C5															
Channel Thalweg Length (ft)	2,579															
Sinuosity (ft)	1.30															
Water Surface Slope (ft/ft)	0.005															
Bankfull Slope (ft/ft)	0.005															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	SC/0.15/0.4/64/180/256															
% of Reach with Eroding Banks	0%		<1%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12h. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy Creek Reach 4 (Sta. 196+50 - 206+35)

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	21.7	23.2	21.6	23.5	22.2	23.6										
Floodprone Width (ft)	132	155	132	155	132	155										
Bankfull Mean Depth	1.4	1.5	1.4	1.5	1.3	1.5										
Bankfull Max Depth	2.5	2.9	2.5	2.6	2.4	2.5										
Bankfull Cross-Sectional Area (ft2)	31.6	32.8	32.4	32.8	31.6	32.8										
Width/Depth Ratio	14.4	17.1	14.3	17.1	15.0	17.6										
Entrenchment Ratio[1]	6.1	6.7	6.1	6.6	6.0	6.6										
Bank Height Ratio[2]	1.0		1.0		1.0											
D50 (mm)	0.6		16.6		0.8											
Profile																
Riffle Length (ft)	15	53														
Riffle Slope (ft/ft)	0.004	0.025														
Pool Length (ft)	22	71														
Pool Max Depth (ft)	4.1															
Pool Spacing (ft)	52	111														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	30	100														
Radius of Curvature (ft)	25	50														
Rc:Bankfull Width (ft/ft)	1.3	2.5														
Meander Wave Length (ft)	80	220														
Meander Width Ratio	1.5	5.0														
Additional Reach Parameters																
Rosgen Classification	C5															
Channel Thalweg Length (ft)	985															
Sinuosity (ft)	1.32															
Water Surface Slope (ft/ft)	0.010															
Bankfull Slope (ft/ft)	0.008															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	0.09/0.3/0.6/49/111/180															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12i. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT1C

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	7.8		7.8		9.3											
Floodprone Width (ft)	28		28		28											
Bankfull Mean Depth	0.5		0.5		0.4											
Bankfull Max Depth	0.9		0.8		1.0											
Bankfull Cross-Sectional Area (ft2)	4.0		3.7		4.0											
Width/Depth Ratio	15.0		16.2		21.7											
Entrenchment Ratio[1]	3.6		3.6		3											
Bank Height Ratio[2]	1.0		1.0		0.9											
D50 (mm)	12.8		48.8		58.6											
Profile																
Riffle Length (ft)	3	43														
Riffle Slope (ft/ft)	0.003	0.082														
Pool Length (ft)	5	20														
Pool Max Depth (ft)	1.7															
Pool Spacing (ft)	6	51														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	N/A															
Radius of Curvature (ft)	N/A															
Rc:Bankfull Width (ft/ft)	N/A															
Meander Wave Length (ft)	N/A															
Meander Width Ratio	N/A															
Additional Reach Parameters																
Rosgen Classification	B/C															
Channel Thalweg Length (ft)	728															
Sinuosity (ft)	1.08															
Water Surface Slope (ft/ft)	0.028															
Bankfull Slope (ft/ft)	0.028															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	SC/0.4/12.8/82/117/180															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12j. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT1D

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	7.6		7.1		7.1											
Floodprone Width (ft)	15		15		15											
Bankfull Mean Depth	0.5		0.5		0.5											
Bankfull Max Depth	0.8		0.8		0.9											
Bankfull Cross-Sectional Area (ft2)	3.8		3.3		3.8											
Width/Depth Ratio	15.4		15.3		13.1											
Entrenchment Ratio[1]	2.0		2.1		2.1											
Bank Height Ratio[2]	1.0		1.0		0.9											
D50 (mm)	31.2		4.5		22.6											
Profile																
Riffle Length (ft)	4	62														
Riffle Slope (ft/ft)	0.002	0.085														
Pool Length (ft)	4	15														
Pool Max Depth (ft)	1.1															
Pool Spacing (ft)	6	33														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	N/A															
Radius of Curvature (ft)	N/A															
Rc:Bankfull Width (ft/ft)	N/A															
Meander Wave Length (ft)	N/A															
Meander Width Ratio	N/A															
Additional Reach Parameters																
Rosgen Classification	B/C															
Channel Thalweg Length (ft)	379															
Sinuosity (ft)	1.04															
Water Surface Slope (ft/ft)	0.051															
Bankfull Slope (ft/ft)	0.045															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	0.3/6.1/31/57/78/128															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12k. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 - Reach 1

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	4.8	7.5	4.3	7.5	3.9	7.6										
Floodprone Width (ft)	22	47	22	47	22	88										
Bankfull Mean Depth	0.3	0.9	0.2	0.8	0.3	0.9										
Bankfull Max Depth	0.4	1.5	0.3	1.4	0.5	1.5										
Bankfull Cross-Sectional Area (ft2)	1.2	6.8	0.8	6.3	1.2	6.8										
Width/Depth Ratio	8.3	18.5	9.7	23.3	8.6	12.6										
Entrenchment Ratio[1]	2.9	9.8	2.8	11.0	2.9	14.0										
Bank Height Ratio[2]	1.0		1.0		1.0	1.1										
D50 (mm)	34.6		27.7		33.3											
Profile																
Riffle Length (ft)	4	68														
Riffle Slope (ft/ft)	0.004	0.063														
Pool Length (ft)	4	18														
Pool Max Depth (ft)	1.7															
Pool Spacing (ft)	8	45														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	10	25														
Radius of Curvature (ft)	17	54														
Rc:Bankfull Width (ft/ft)	3.7	9.2														
Meander Wave Length (ft)	21	68														
Meander Width Ratio	2.2	5.6														
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	1,208															
Sinuosity (ft)	1.03															
Water Surface Slope (ft/ft)	0.021	0.031														
Bankfull Slope (ft/ft)	0.023	0.032														
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	0.35/6.0/34.6/70/90/256															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12l. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 - Reach 2

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	7.8		7.8		13.2											
Floodprone Width (ft)	60		60		60											
Bankfull Mean Depth	0.5		0.4		0.3											
Bankfull Max Depth	0.8		0.8		0.8											
Bankfull Cross-Sectional Area (ft2)	4.1		3.0		4.1											
Width/Depth Ratio	14.9		20.2		42.5											
Entrenchment Ratio[1]	7.7		7.7		4.5											
Bank Height Ratio[2]	1.0		1.0		0.9											
D50 (mm)	4.5		1.9		0.6											
Profile																
Riffle Length (ft)	7	80														
Riffle Slope (ft/ft)	0.001	0.055														
Pool Length (ft)	11	62														
Pool Max Depth (ft)	1.5															
Pool Spacing (ft)	13	51														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	N/A															
Radius of Curvature (ft)	N/A															
Rc:Bankfull Width (ft/ft)	N/A															
Meander Wave Length (ft)	N/A															
Meander Width Ratio	N/A															
Additional Reach Parameters																
Rosgen Classification	C5															
Channel Thalweg Length (ft)	643															
Sinuosity (ft)	1.09															
Water Surface Slope (ft/ft)	0.015															
Bankfull Slope (ft/ft)	0.014															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	0.2/0.7/5/56/161/>2048															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12m. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2A

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	7.0		7.6		8.3											
Floodprone Width (ft)	31		31		36.8											
Bankfull Mean Depth	0.6		0.5		0.5											
Bankfull Max Depth	1.0		1.0		1.1											
Bankfull Cross-Sectional Area (ft2)	4.1		3.7		4.1											
Width/Depth Ratio	11.9		15.8		16.7											
Entrenchment Ratio[1]	4.4		4.1		4.4											
Bank Height Ratio[2]	1.0		1.0		1											
D50 (mm)	2.5		1.4		5.6											
Profile																
Riffle Length (ft)	3	102														
Riffle Slope (ft/ft)	0.019	0.071														
Pool Length (ft)	4	12														
Pool Max Depth (ft)	1.5	2.1														
Pool Spacing (ft)	7	55														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	N/A															
Radius of Curvature (ft)	N/A															
Rc:Bankfull Width (ft/ft)	N/A															
Meander Wave Length (ft)	N/A															
Meander Width Ratio	N/A															
Additional Reach Parameters																
Rosgen Classification	C5															
Channel Thalweg Length (ft)	366															
Sinuosity (ft)	1.02															
Water Surface Slope (ft/ft)	0.039															
Bankfull Slope (ft/ft)	0.040															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	0.27/1.1/2.5/47/76/180															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12n. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT3

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	8.8		8.7		8.4											
Floodprone Width (ft)	77		77		77											
Bankfull Mean Depth	0.6		0.6		0.7											
Bankfull Max Depth	1.1		1.1		1.1											
Bankfull Cross-Sectional Area (ft2)	5.5		5.3		5.5											
Width/Depth Ratio	14.0		14.1		12.8											
Entrenchment Ratio[1]	8.8		8.9		9.2											
Bank Height Ratio[2]	1.0		1.0		1.1											
D50 (mm)	1.5		11.9		0.4											
Profile																
Riffle Length (ft)	8	20														
Riffle Slope (ft/ft)	0.007	0.057														
Pool Length (ft)	8	24														
Pool Max Depth (ft)	1.1	2.1														
Pool Spacing (ft)	24	33														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	7	19														
Radius of Curvature (ft)	12	24														
Rc:Bankfull Width (ft/ft)	1.1	2.1														
Meander Wave Length (ft)	28	76														
Meander Width Ratio	0.8	1.7														
Additional Reach Parameters																
Rosgen Classification	C5															
Channel Thalweg Length (ft)	346															
Sinuosity (ft)	1.15															
Water Surface Slope (ft/ft)	0.024															
Bankfull Slope (ft/ft)	0.022															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	SC/0.36/1.5/81/111/180															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12o. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT4

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	11.5	15.1	12.3	14.7	11.9	16.8										
Floodprone Width (ft)	98	288	98	288	98	288										
Bankfull Mean Depth	0.9	1.1	0.9	1.0	0.7	1.1										
Bankfull Max Depth	1.6	2.1	1.6	2.1	1.6	2.0										
Bankfull Cross-Sectional Area (ft2)	11.0	15.2	11.1	14.4	11.0	15.2										
Width/Depth Ratio	10.2	15.0	11.9	15.0	10.9	23.7										
Entrenchment Ratio[1]	6.5	25.0	6.7	23.5	5.8	24.2										
Bank Height Ratio[2]	1.0		1.0		0.9	1.0										
D50 (mm)	0.6		12.1		0.4											
Profile																
Riffle Length (ft)	8	69														
Riffle Slope (ft/ft)	0.000	0.072														
Pool Length (ft)	9	42														
Pool Max Depth (ft)	2.3															
Pool Spacing (ft)	24	123														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	10	45														
Radius of Curvature (ft)	12	33														
Rc:Bankfull Width (ft/ft)	1.1	2.1														
Meander Wave Length (ft)	31	72														
Meander Width Ratio	0.7	2.7														
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	1,356															
Sinuosity (ft)	1.22															
Water Surface Slope (ft/ft)	0.006															
Bankfull Slope (ft/ft)	0.006															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	SC/0.2/0.6/100/161/512															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Table 12p. Monitoring Data - Stream Reach Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT5

Parameter	As-Built/Baseline 2016		MY1 2017		MY2 2018		MY3 2019		MY4 2020		MY5 2021		MY6 2022		MY7 2023	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate[3]																
Bankfull Width (ft)	9.7	10.6	9.6	10.8	9.8	17.0										
Floodprone Width (ft)	83	229	83	229	83	229										
Bankfull Mean Depth	0.6	0.8	0.6	0.8	0.5	0.6										
Bankfull Max Depth	0.9	1.3	0.9	1.3	1.1	1.3										
Bankfull Cross-Sectional Area (ft2)	6.0	8.8	5.6	8.4	6.0	8.8										
Width/Depth Ratio	12.8	15.5	13.8	16.2	14.4	32.9										
Entrenchment Ratio[1]	8.6	21.6	8.8	21.2	8.5	13.5										
Bank Height Ratio[2]	1.0		1.0		1.0	1.1										
D50 (mm)	0.6		1.7		0.6											
Profile																
Riffle Length (ft)	11	28														
Riffle Slope (ft/ft)	0.000	0.027														
Pool Length (ft)	12	39														
Pool Max Depth (ft)	1.9															
Pool Spacing (ft)	26	65														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	10	39														
Radius of Curvature (ft)	11	48														
Rc:Bankfull Width (ft/ft)	0.8	3.6														
Meander Wave Length (ft)	34	71														
Meander Width Ratio	0.9	2.2														
Additional Reach Parameters																
Rosgen Classification	C5/E5															
Channel Thalweg Length (ft)	1,012															
Sinuosity (ft)	1.20															
Water Surface Slope (ft/ft)	0.006															
Bankfull Slope (ft/ft)	0.007															
Ri%/Ru%/P%/G%/S%	---															
SC%/Sa%/G%/C%/B%/Be%	---															
d16/d35/d50/d84/d95/d100	SC/SC/0.6/32/143/362															
% of Reach with Eroding Banks	0%		0%													

(---): Data was not provided

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

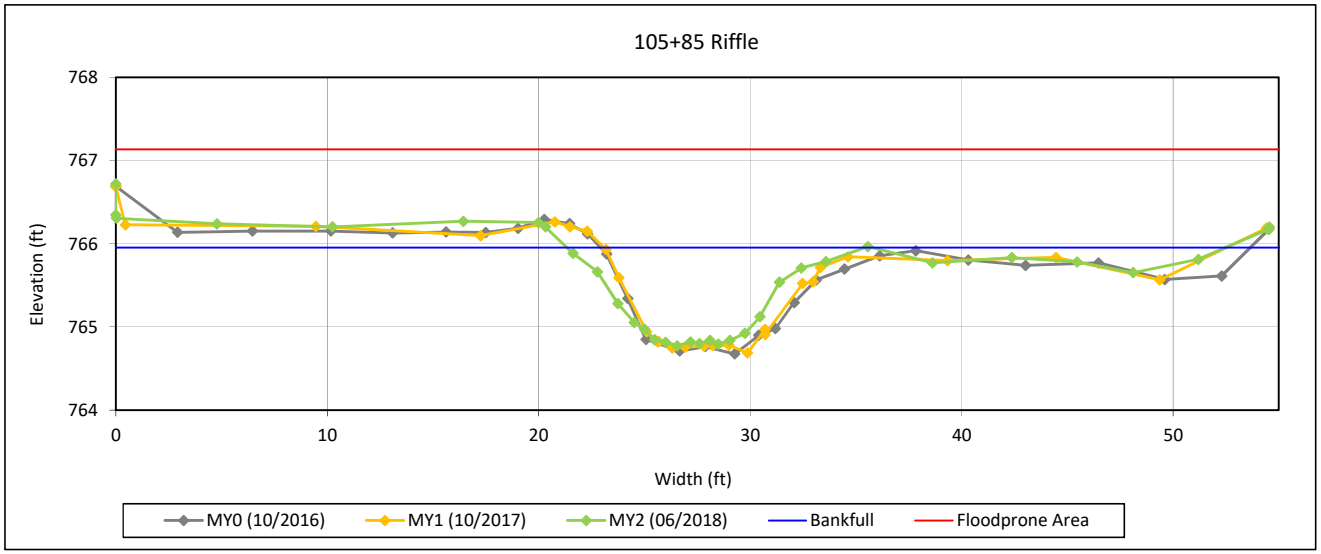
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

[3]Prior to MY2, bankfull dimensions were calculated using a fixed bankfull elevation. For MY2 through MY7 bankfull elevation is calculated using a fixed Abkf as described in the Standard Measurement of the BHR Monitoring Parameter provided by NCIRT and NCDMS (9/2018)

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 1 - Candy Creek Reach 1



Bankfull Dimensions	
8.9	x-section area (ft.sq.)
12.2	width (ft)
0.7	mean depth (ft)
1.2	max depth (ft)
12.5	wetted perimeter (ft)
0.7	hydraulic radius (ft)
16.8	width-depth ratio
71.0	W flood prone area (ft)
5.8	entrenchment ratio
1.0	low bank height ratio

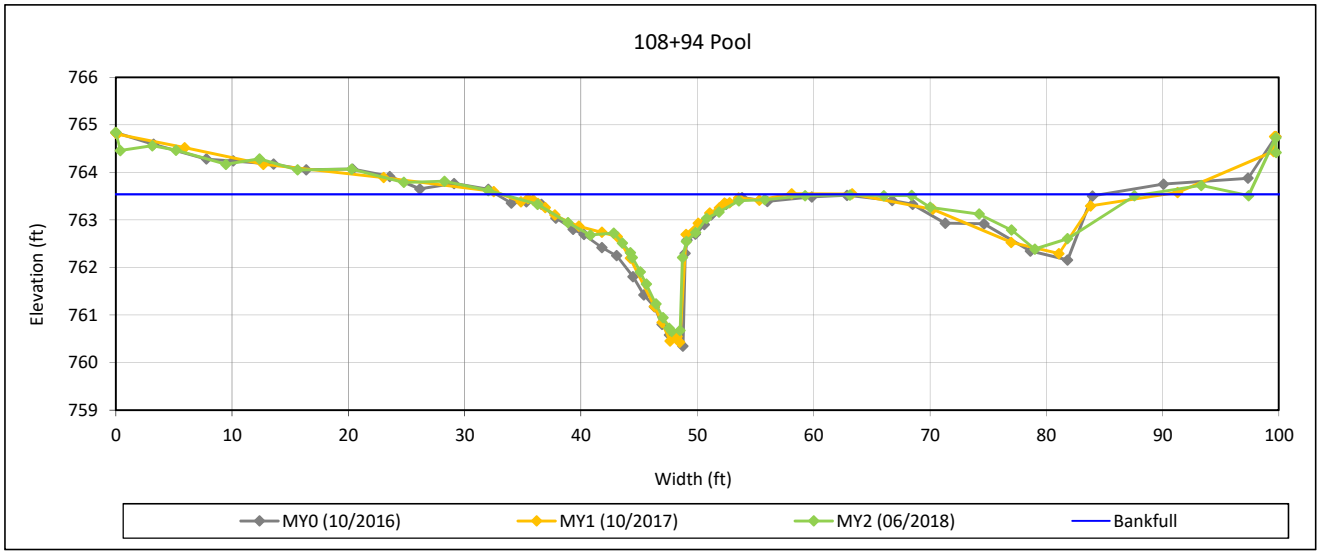
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 2 - Candy Creek Reach 1



Bankfull Dimensions	
18.4	x-section area (ft.sq.)
19.5	width (ft)
0.9	mean depth (ft)
2.9	max depth (ft)
21.6	wetted perimeter (ft)
0.9	hydraulic radius (ft)
20.7	width-depth ratio

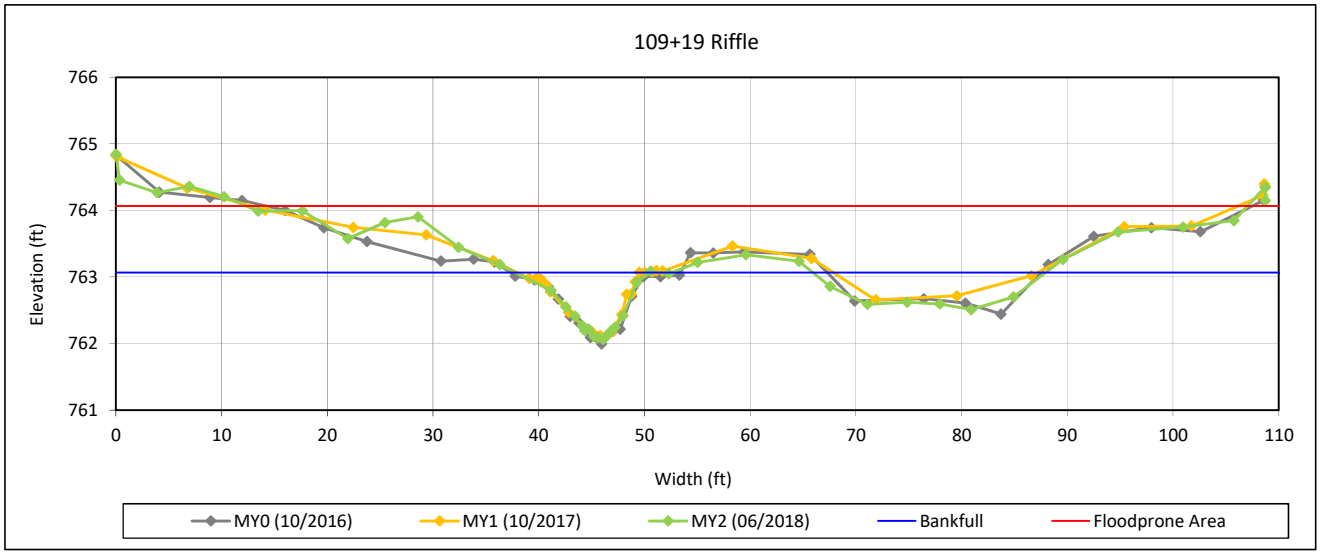
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 3 - Candy Creek Reach 1



Bankfull Dimensions	
5.7	x-section area (ft.sq.)
11.8	width (ft)
0.5	mean depth (ft)
1.0	max depth (ft)
12.0	wetted perimeter (ft)
0.5	hydraulic radius (ft)
24.5	width-depth ratio
97.0	W flood prone area (ft)
8.2	entrenchment ratio
1.0	low bank height ratio

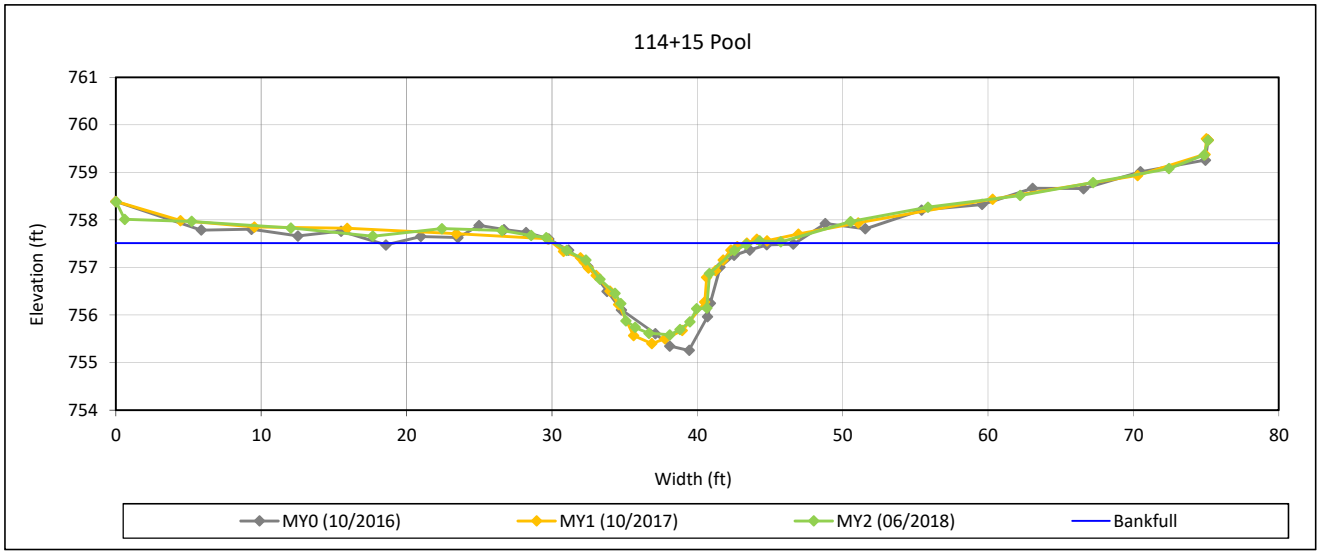
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross Section 4 - Candy Creek Reach 1



Bankfull Dimensions	
13.5	x-section area (ft.sq.)
13.5	width (ft)
1.0	mean depth (ft)
1.9	max depth (ft)
14.6	wetted perimeter (ft)
0.9	hydraulic radius (ft)
13.5	width-depth ratio

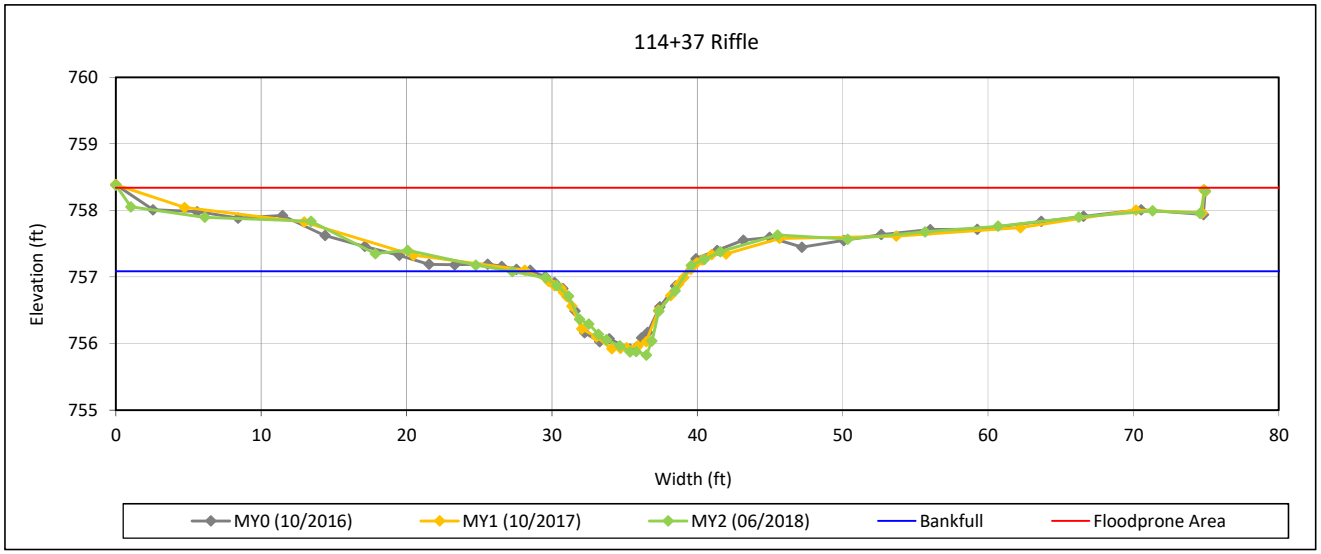
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 5 - Candy Creek Reach 1



Bankfull Dimensions	
7.1	x-section area (ft.sq.)
12.1	width (ft)
0.6	mean depth (ft)
1.3	max depth (ft)
12.5	wetted perimeter (ft)
0.6	hydraulic radius (ft)
20.5	width-depth ratio
53.0	W flood prone area (ft)
4.4	entrenchment ratio
1.0	low bank height ratio

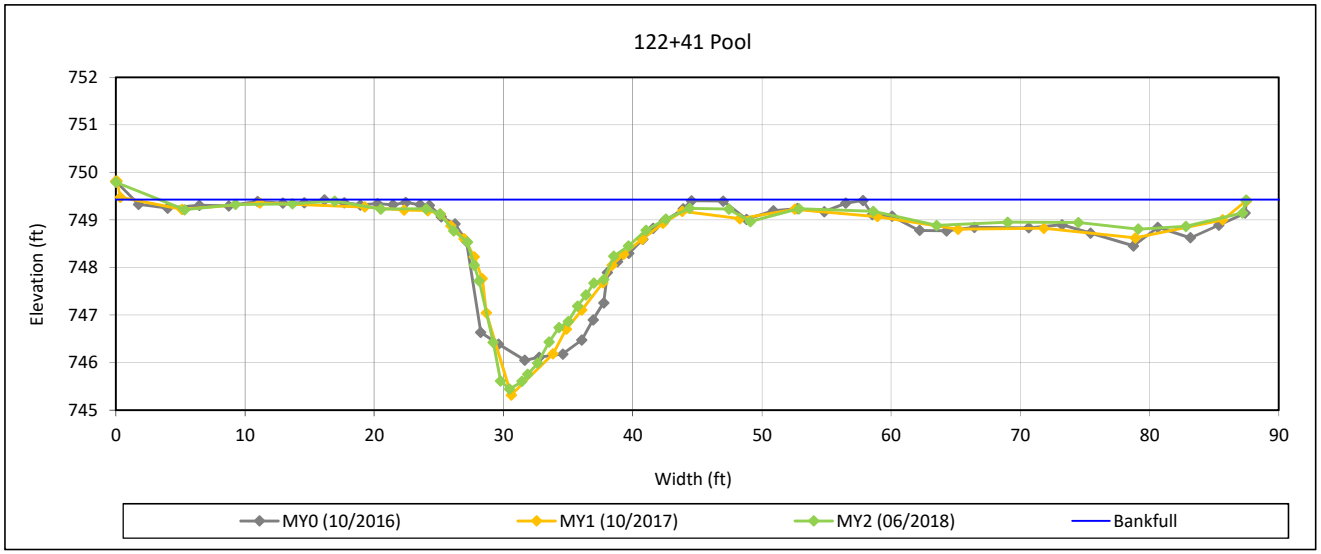
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 6 - Candy Creek Reach 1



Bankfull Dimensions	
35.5	x-section area (ft.sq.)
20.4	width (ft)
1.7	mean depth (ft)
4.0	max depth (ft)
22.5	wetted perimeter (ft)
1.6	hydraulic radius (ft)
11.7	width-depth ratio

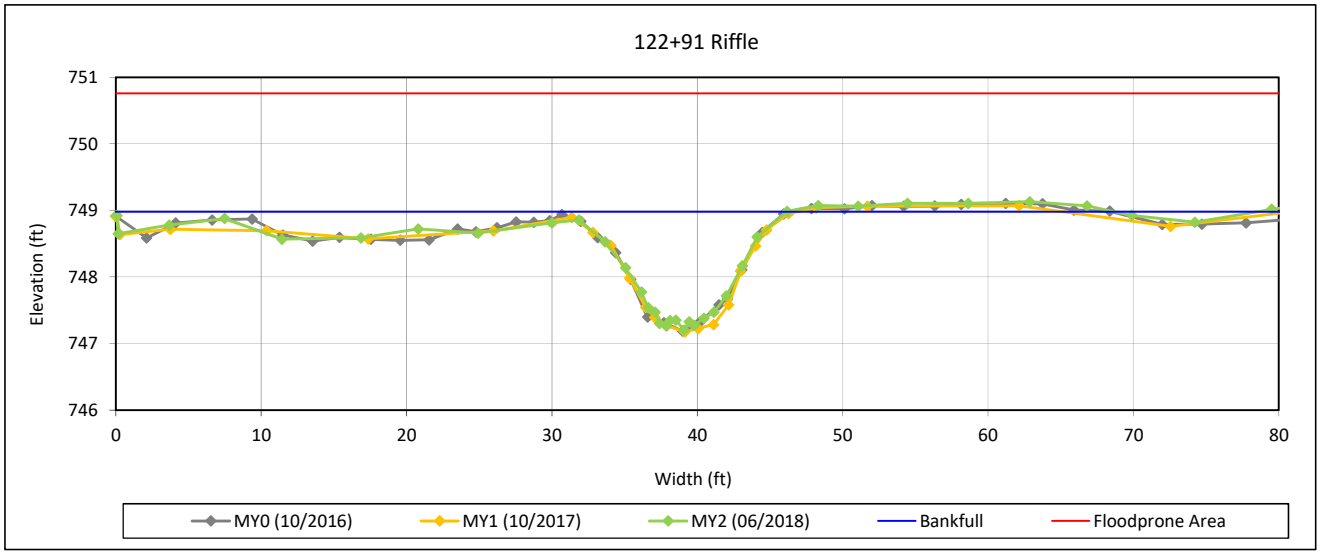
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 7 - Candy Creek Reach 1



Bankfull Dimensions	
13.9	x-section area (ft.sq.)
14.3	width (ft)
1.0	mean depth (ft)
1.8	max depth (ft)
14.9	wetted perimeter (ft)
0.9	hydraulic radius (ft)
14.7	width-depth ratio
164.0	W flood prone area (ft)
11.5	entrenchment ratio
0.93	low bank height ratio

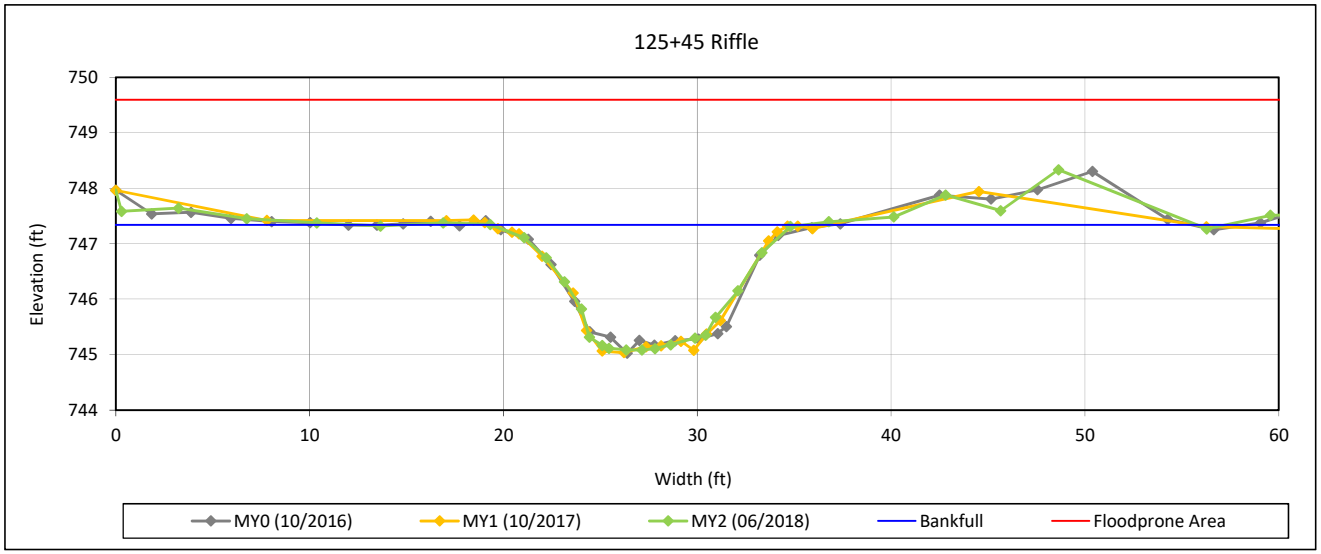
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 8 - Candy Creek Reach 1



Bankfull Dimensions	
20.3	x-section area (ft.sq.)
15.4	width (ft)
1.3	mean depth (ft)
2.3	max depth (ft)
16.5	wetted perimeter (ft)
1.2	hydraulic radius (ft)
11.7	width-depth ratio
292.0	W flood prone area (ft)
18.9	entrenchment ratio
1.0	low bank height ratio

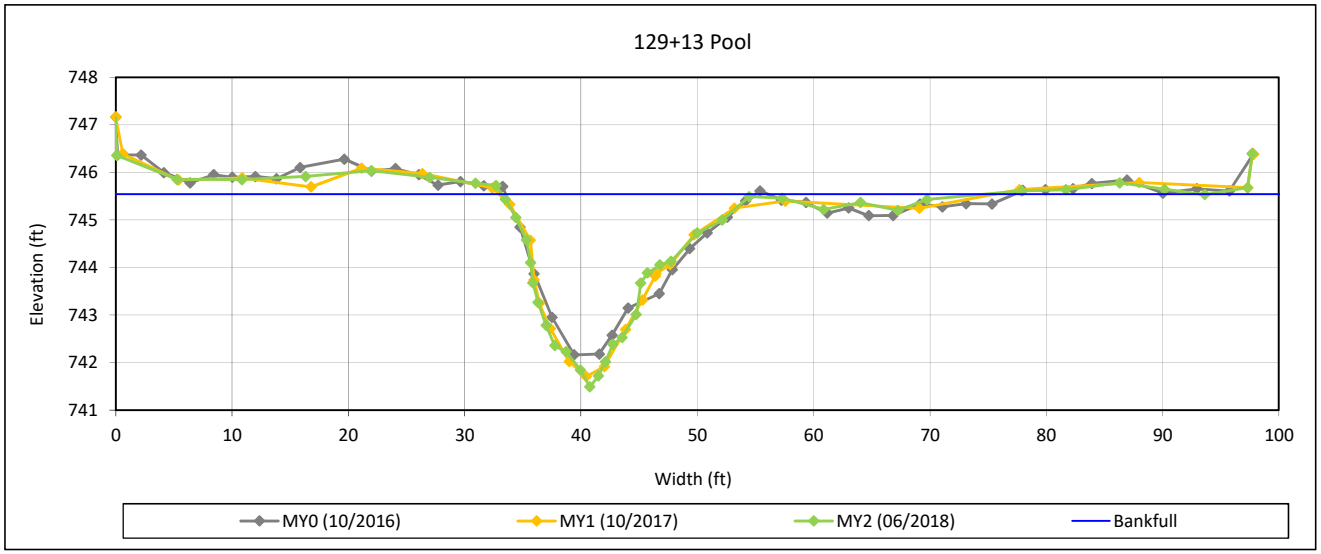
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 9 - Candy Creek Reach 2



Bankfull Dimensions	
40.1	x-section area (ft.sq.)
24.1	width (ft)
1.7	mean depth (ft)
4.1	max depth (ft)
26.3	wetted perimeter (ft)
1.5	hydraulic radius (ft)
14.5	width-depth ratio

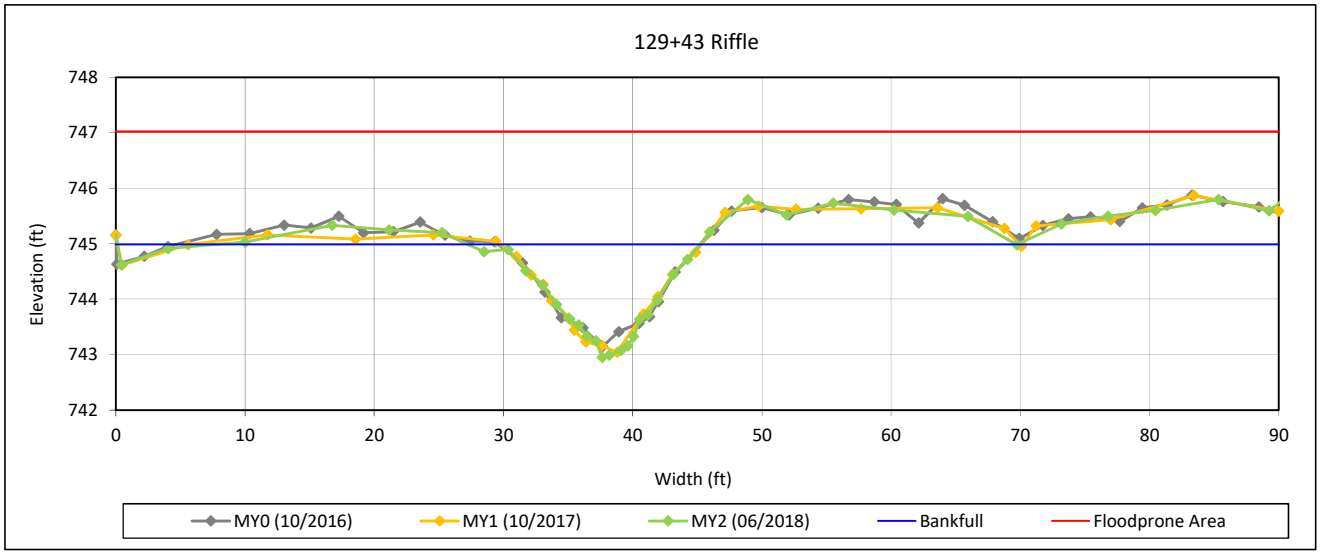
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 10 - Candy Creek Reach 2



Bankfull Dimensions	
16.2	x-section area (ft.sq.)
16.7	width (ft)
1.0	mean depth (ft)
2.0	max depth (ft)
17.3	wetted perimeter (ft)
0.9	hydraulic radius (ft)
17.2	width-depth ratio
254.0	W flood prone area (ft)
15.2	entrenchment ratio
1.0	low bank height ratio

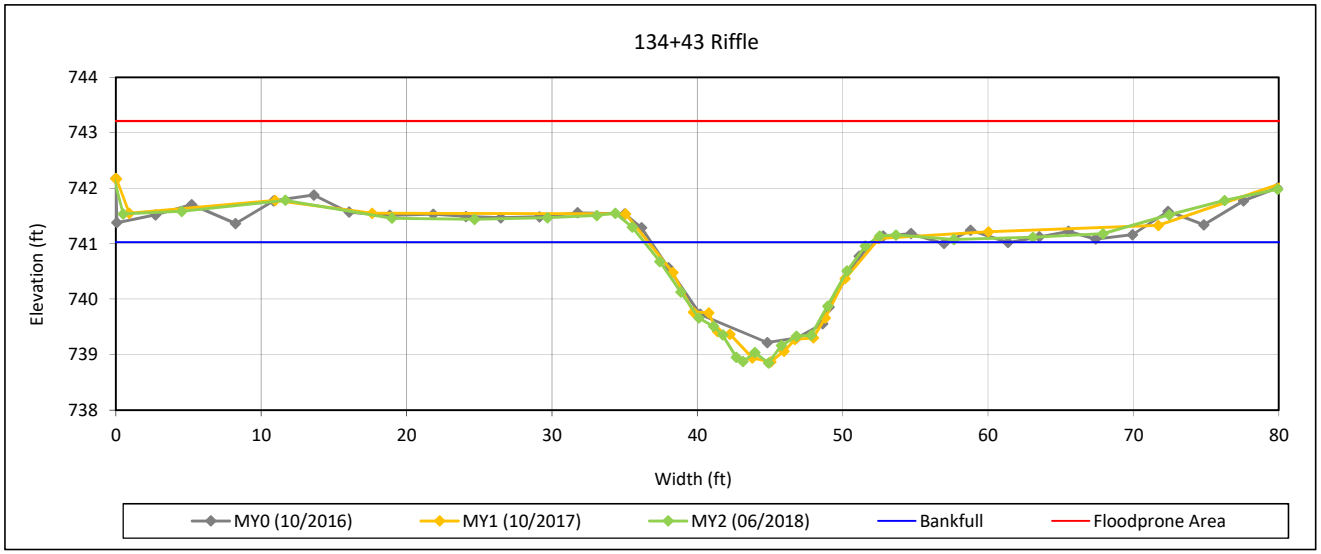
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 11 - Candy Creek Reach 2



Bankfull Dimensions	
19.8	x-section area (ft.sq.)
15.6	width (ft)
1.3	mean depth (ft)
2.2	max depth (ft)
16.4	wetted perimeter (ft)
1.2	hydraulic radius (ft)
12.3	width-depth ratio
154.0	W flood prone area (ft)
9.9	entrenchment ratio
1.1	low bank height ratio

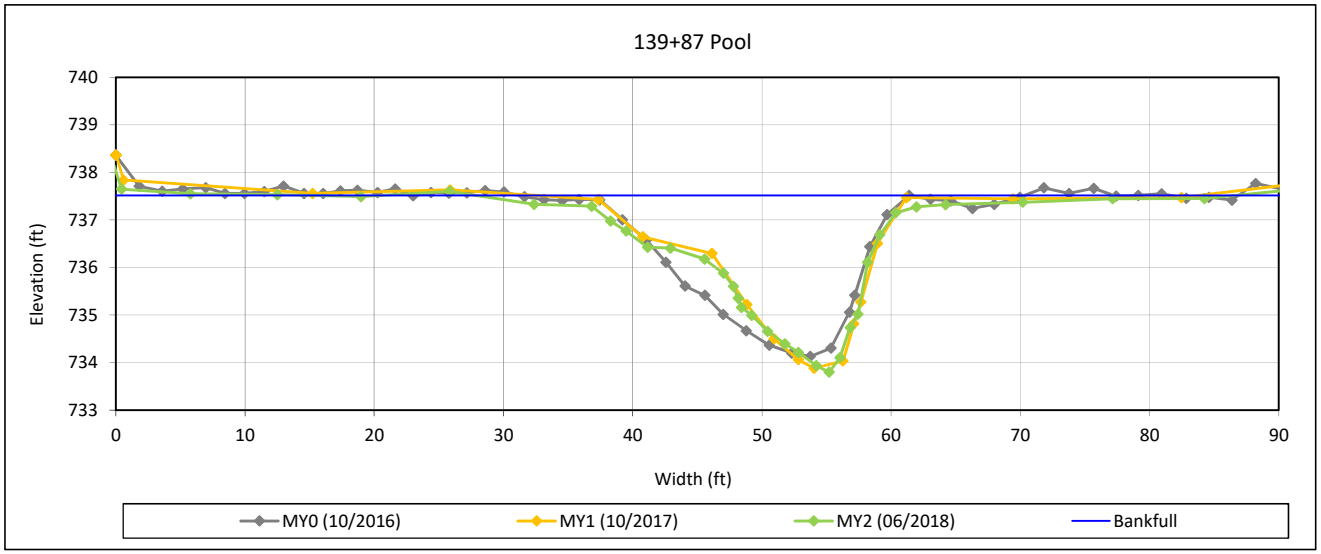
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 12 - Candy Creek Reach 2



Bankfull Dimensions	
44.2	x-section area (ft.sq.)
23.5	width (ft)
1.9	mean depth (ft)
3.7	max depth (ft)
25.2	wetted perimeter (ft)
1.8	hydraulic radius (ft)
12.5	width-depth ratio

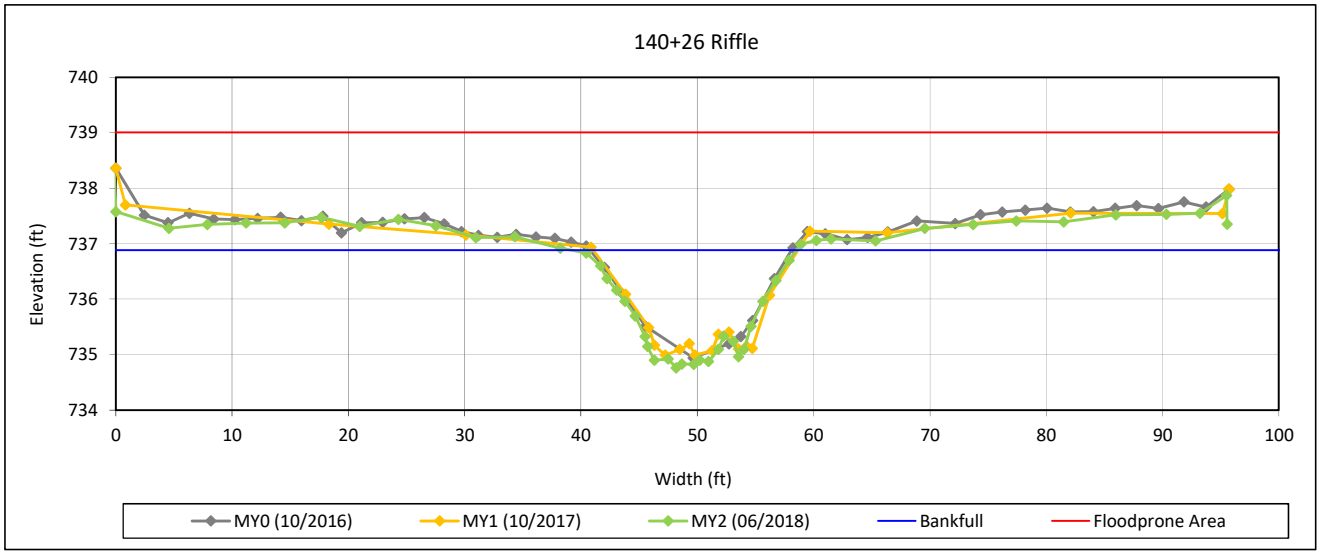
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 13 - Candy Creek Reach 2



Bankfull Dimensions	
23.3	x-section area (ft.sq.)
18.1	width (ft)
1.3	mean depth (ft)
2.1	max depth (ft)
19.0	wetted perimeter (ft)
1.2	hydraulic radius (ft)
14.0	width-depth ratio
221.0	W flood prone area (ft)
12.2	entrenchment ratio
1.1	low bank height ratio

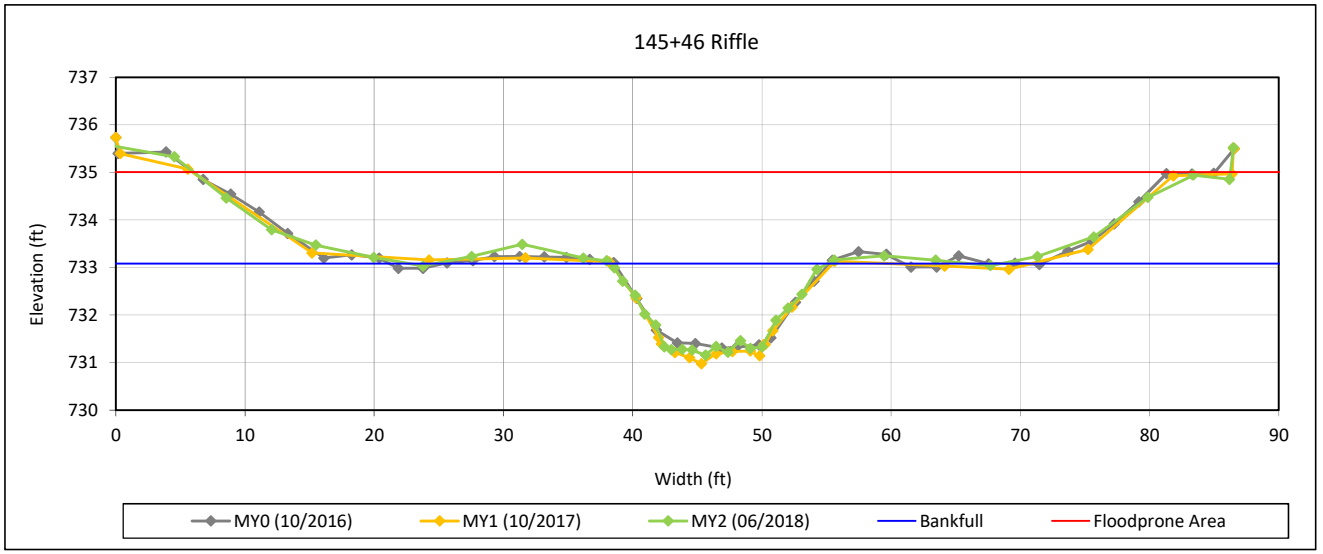
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 14 - Candy Creek Reach 2



Bankfull Dimensions	
20.8	x-section area (ft.sq.)
16.8	width (ft)
1.2	mean depth (ft)
1.9	max depth (ft)
17.6	wetted perimeter (ft)
1.2	hydraulic radius (ft)
13.6	width-depth ratio
164.0	W flood prone area (ft)
9.7	entrenchment ratio
1.0	low bank height ratio

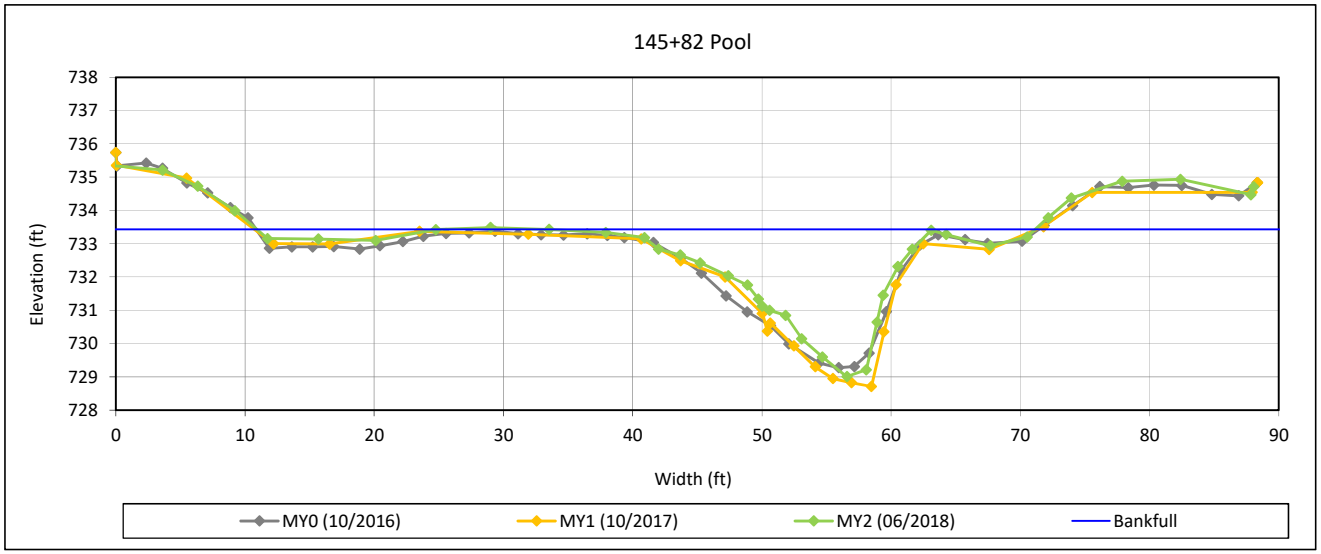
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 15 - Candy Creek Reach 2



Bankfull Dimensions	
46.3	x-section area (ft.sq.)
30.9	width (ft)
1.5	mean depth (ft)
4.4	max depth (ft)
33.4	wetted perimeter (ft)
1.4	hydraulic radius (ft)
20.6	width-depth ratio

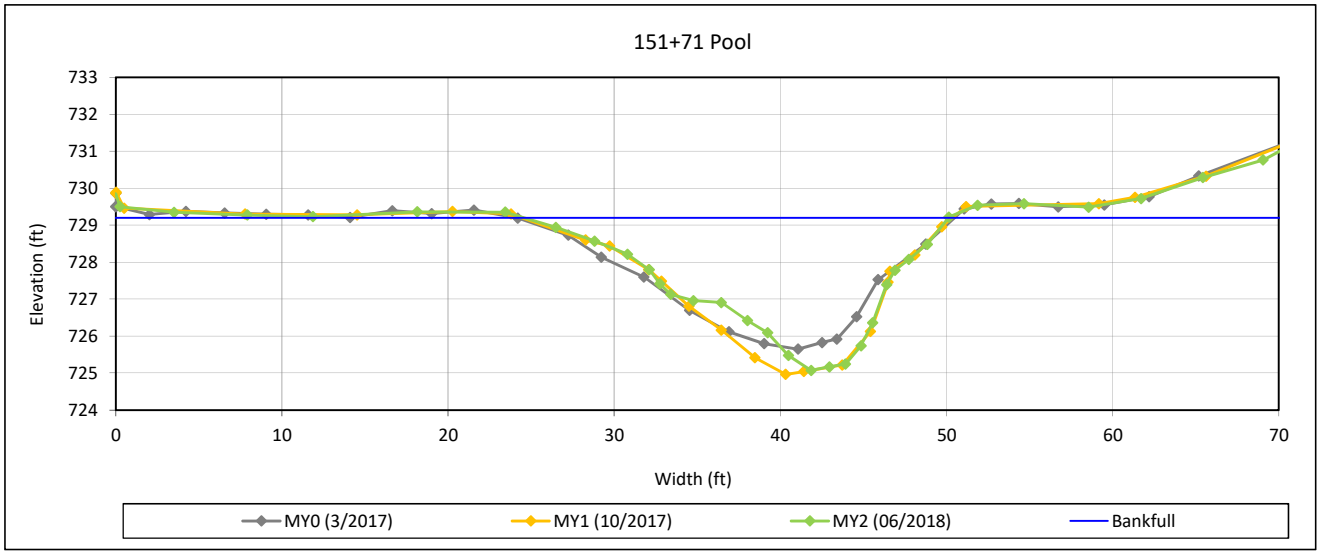
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 16 - Candy Creek Reach 3



Bankfull Dimensions	
50.0	x-section area (ft.sq.)
25.5	width (ft)
2.0	mean depth (ft)
4.1	max depth (ft)
27.5	wetted perimeter (ft)
1.8	hydraulic radius (ft)
13.0	width-depth ratio

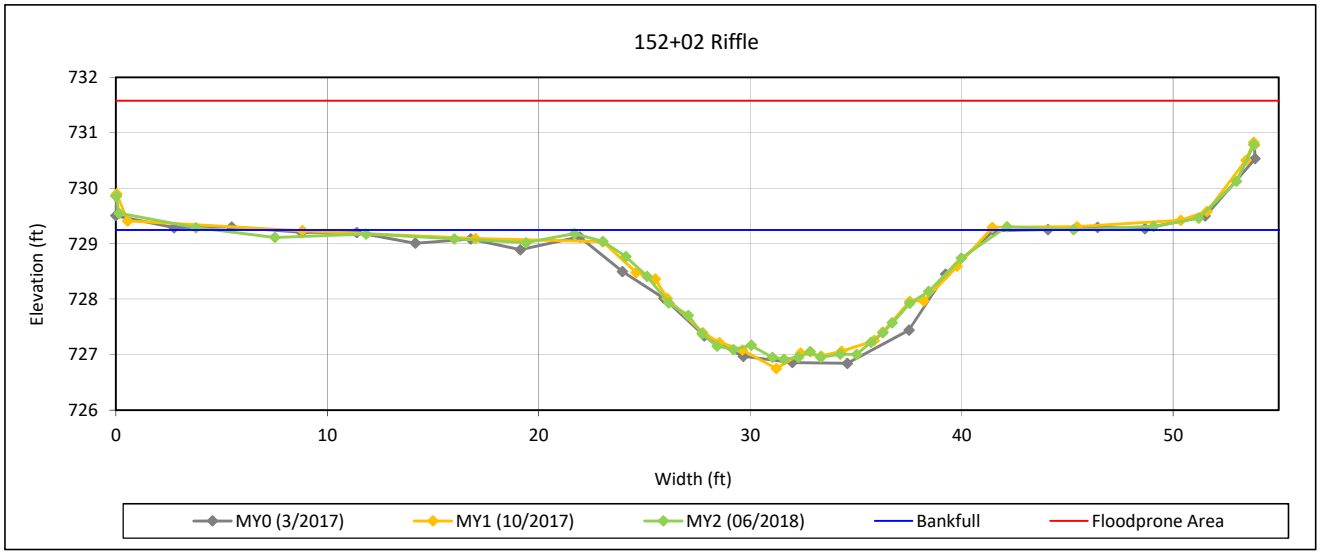
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 17 - Candy Creek Reach 3



Bankfull Dimensions	
28.2	x-section area (ft.sq.)
20.2	width (ft)
1.4	mean depth (ft)
2.3	max depth (ft)
21.0	wetted perimeter (ft)
1.3	hydraulic radius (ft)
14.5	width-depth ratio
57.0	W flood prone area (ft)
2.8	entrenchment ratio
1.0	low bank height ratio

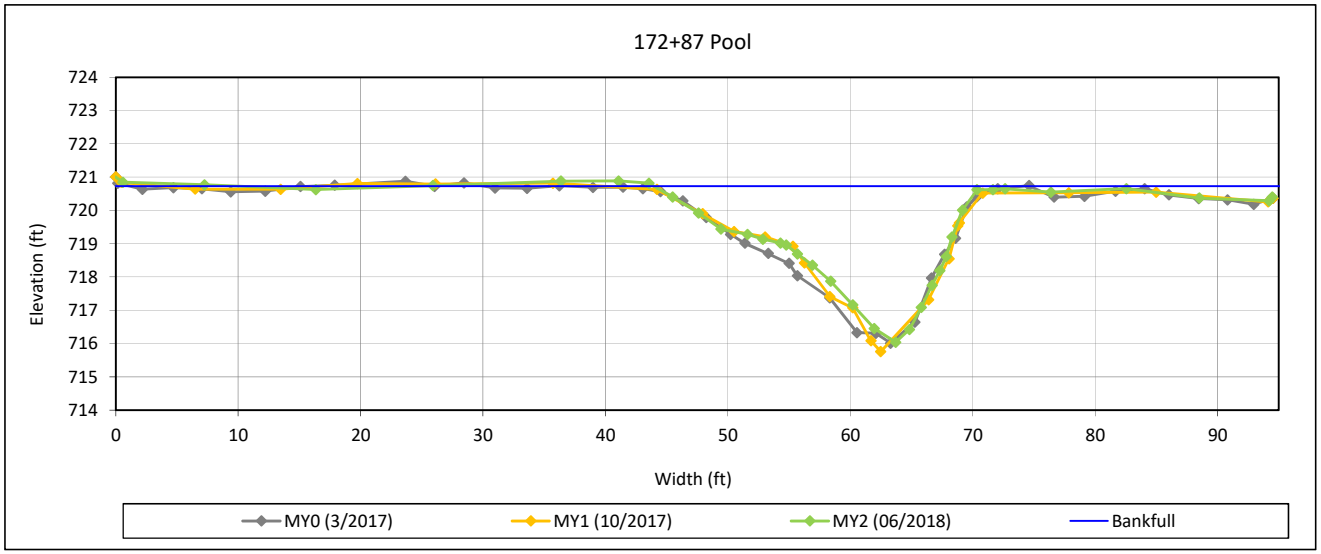
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 18 - Candy Creek Reach 4



Bankfull Dimensions	
58.7	x-section area (ft.sq.)
37.1	width (ft)
1.6	mean depth (ft)
4.7	max depth (ft)
39.2	wetted perimeter (ft)
1.5	hydraulic radius (ft)
23.4	width-depth ratio

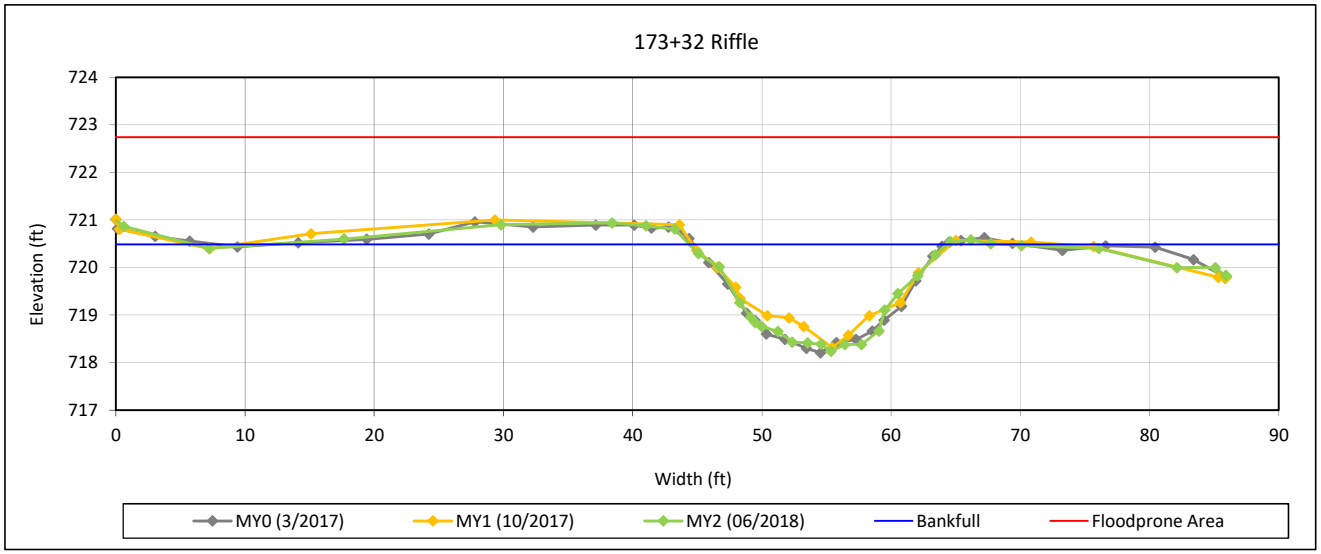
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 19 - Candy Creek Reach 4



Bankfull Dimensions	
26.9	x-section area (ft.sq.)
20.0	width (ft)
1.3	mean depth (ft)
2.3	max depth (ft)
20.7	wetted perimeter (ft)
1.3	hydraulic radius (ft)
14.8	width-depth ratio
222.0	W flood prone area (ft)
11.1	entrenchment ratio
1.0	low bank height ratio

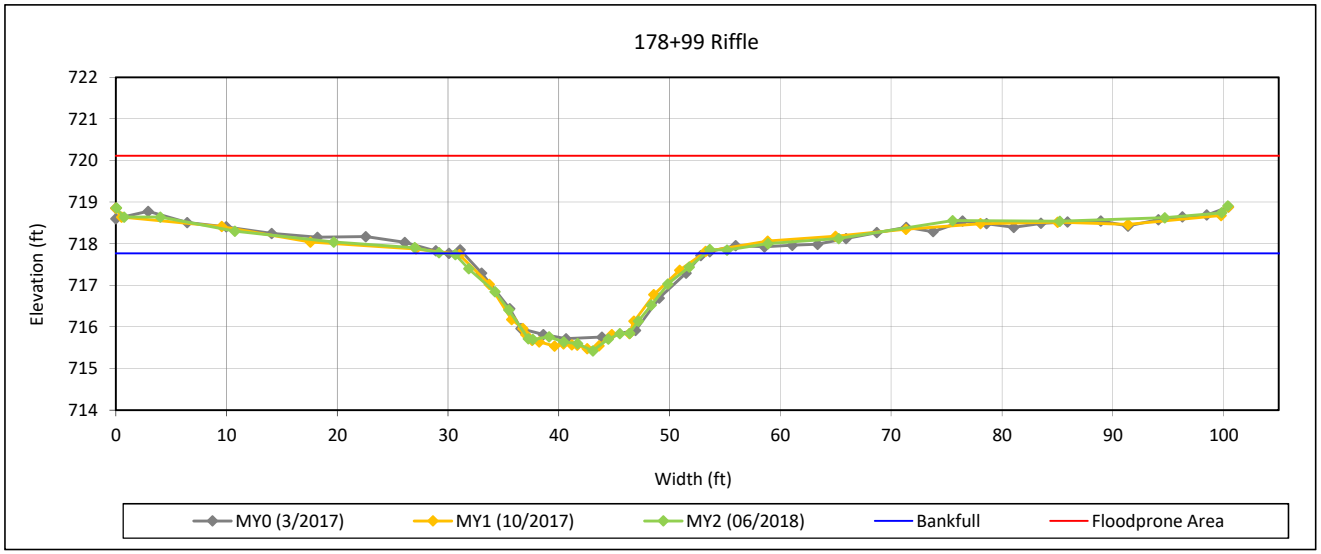
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 20 - Candy Creek Reach 4



Bankfull Dimensions	
31.0	x-section area (ft.sq.)
21.3	width (ft)
1.5	mean depth (ft)
2.3	max depth (ft)
22.0	wetted perimeter (ft)
1.4	hydraulic radius (ft)
14.7	width-depth ratio
158.0	W flood prone area (ft)
7.4	entrenchment ratio
1.1	low bank height ratio

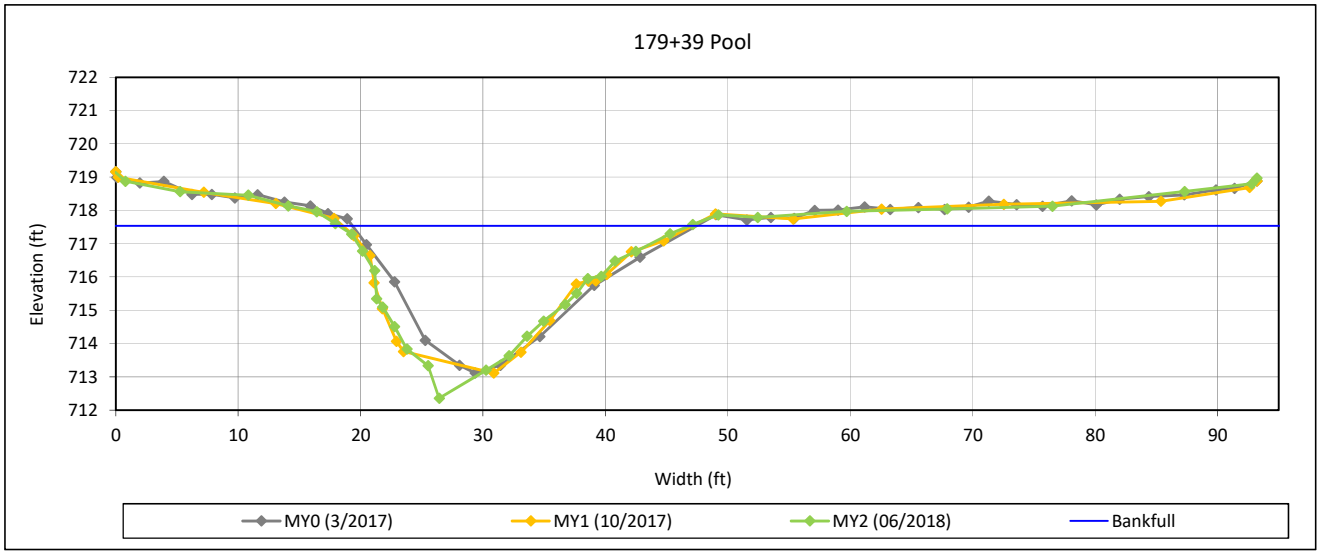
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 21 - Candy Creek Reach 4



Bankfull Dimensions	
70.1	x-section area (ft.sq.)
28.6	width (ft)
2.5	mean depth (ft)
5.2	max depth (ft)
31.3	wetted perimeter (ft)
2.2	hydraulic radius (ft)
11.7	width-depth ratio

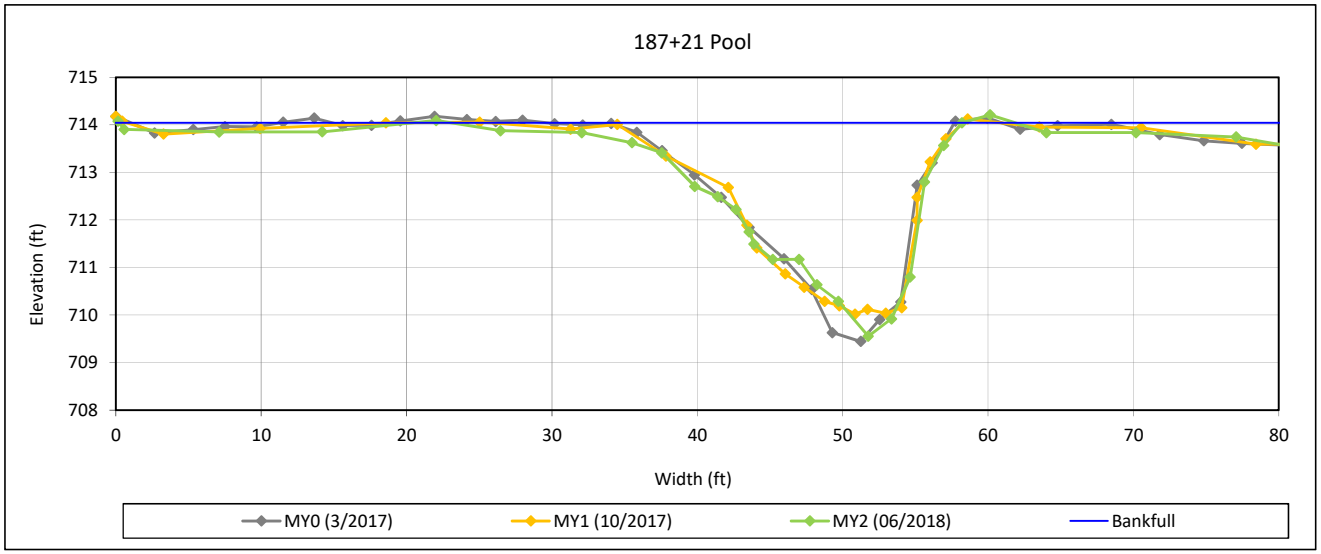
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 22 - Candy Creek Reach 4



Bankfull Dimensions	
51.1	x-section area (ft.sq.)
22.8	width (ft)
2.2	mean depth (ft)
4.5	max depth (ft)
25.3	wetted perimeter (ft)
2.0	hydraulic radius (ft)
10.2	width-depth ratio

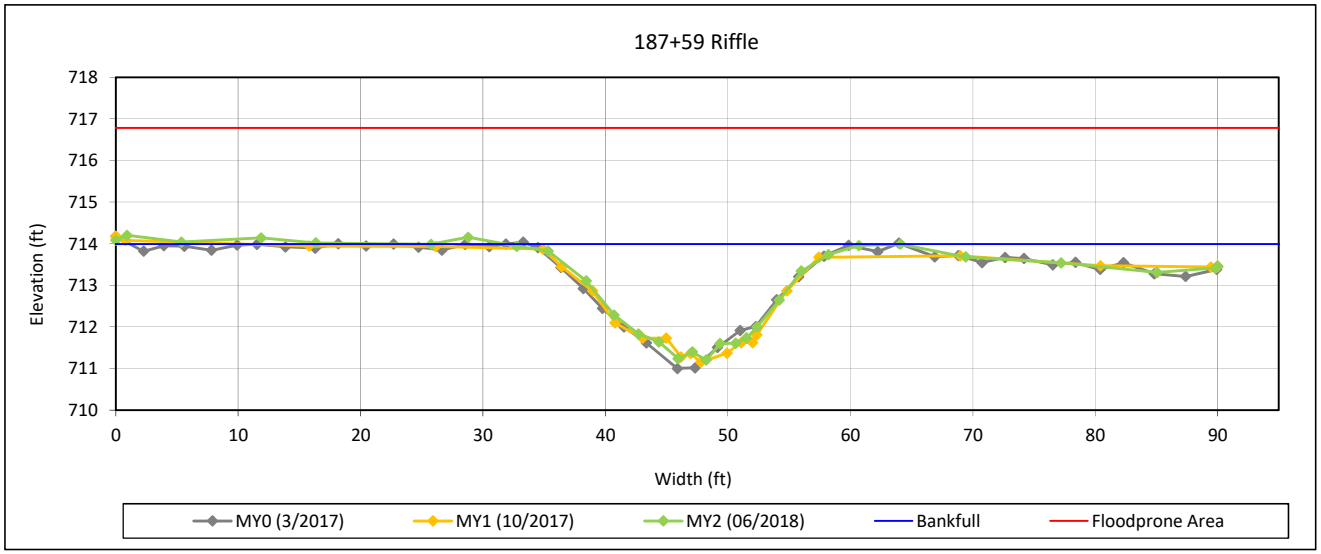
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 23 - Candy Creek Reach 4



Bankfull Dimensions	
38.1	x-section area (ft.sq.)
22.9	width (ft)
1.7	mean depth (ft)
2.8	max depth (ft)
23.6	wetted perimeter (ft)
1.6	hydraulic radius (ft)
13.8	width-depth ratio
180.0	W flood prone area (ft)
7.9	entrenchment ratio
1.0	low bank height ratio

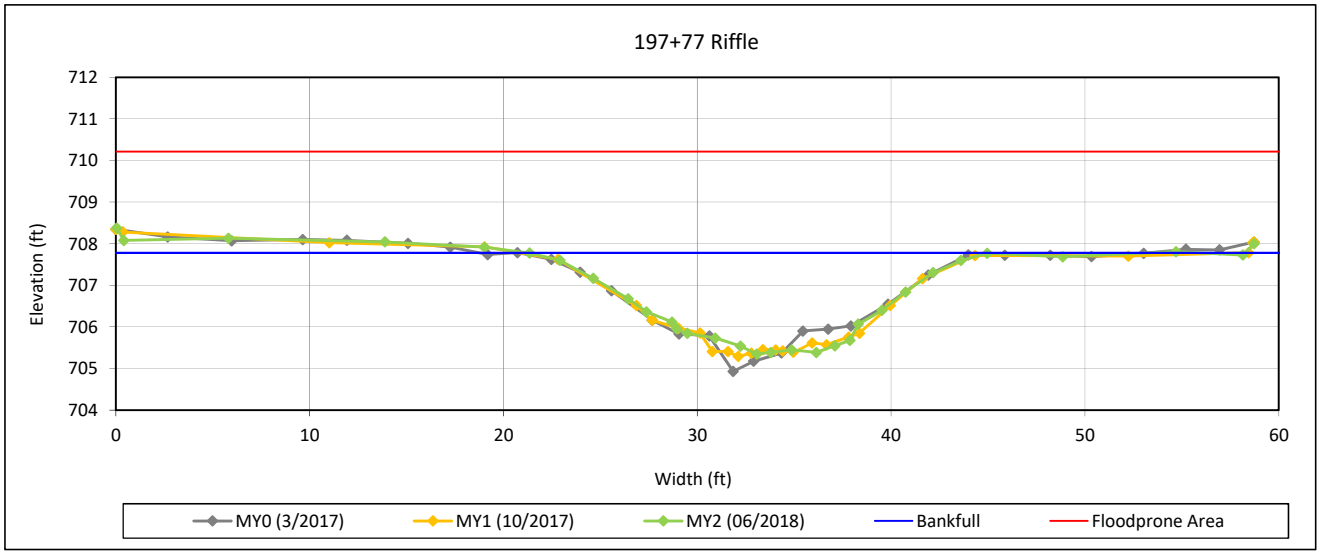
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 24 - Candy Creek Reach 4



Bankfull Dimensions	
31.6	x-section area (ft.sq.)
23.6	width (ft)
1.3	mean depth (ft)
2.4	max depth (ft)
24.3	wetted perimeter (ft)
1.3	hydraulic radius (ft)
17.6	width-depth ratio
155.0	W flood prone area (ft)
6.6	entrenchment ratio
1.0	low bank height ratio

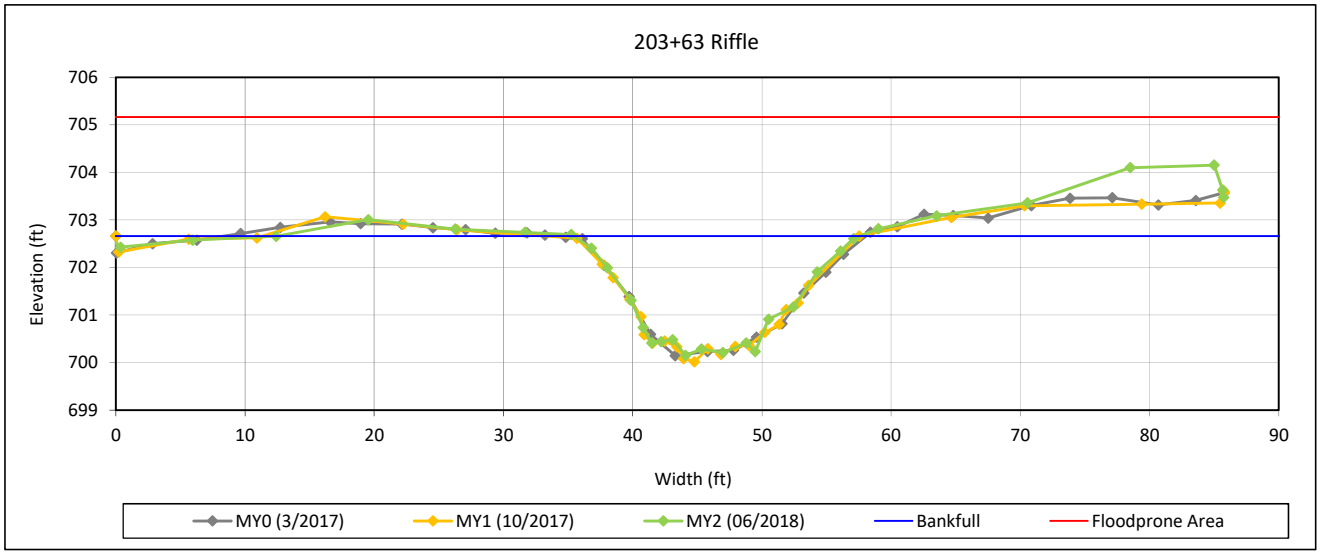
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 25 - Candy Creek Reach 4



Bankfull Dimensions	
32.8	x-section area (ft.sq.)
22.2	width (ft)
1.5	mean depth (ft)
2.5	max depth (ft)
23.2	wetted perimeter (ft)
1.4	hydraulic radius (ft)
15.0	width-depth ratio
132.0	W flood prone area (ft)
6.0	entrenchment ratio
1.0	low bank height ratio

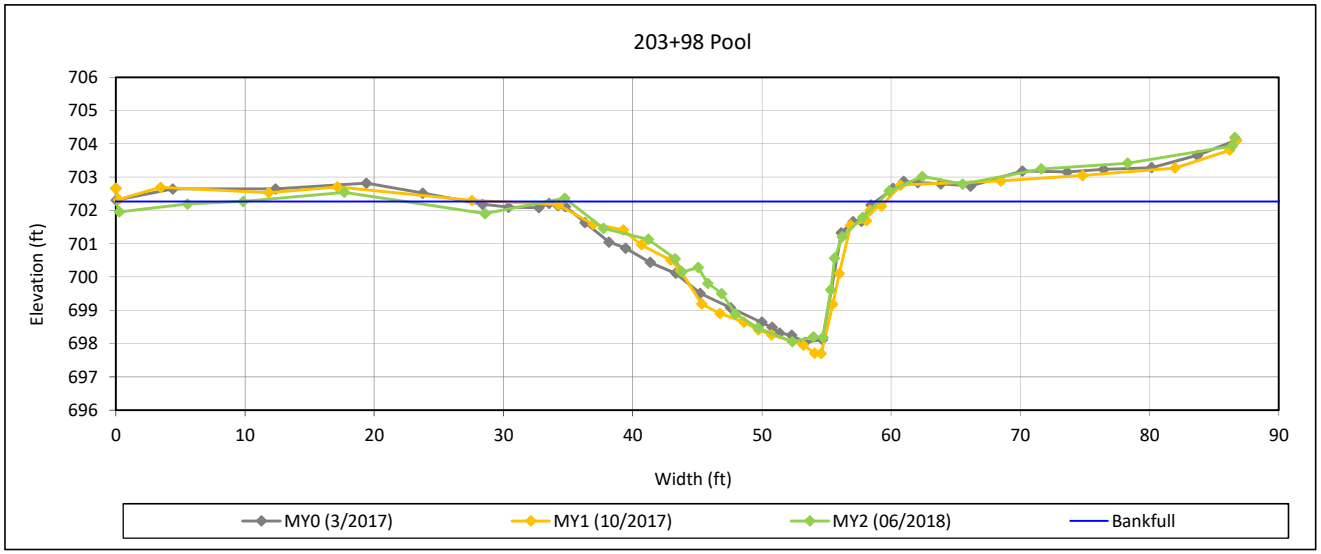
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 26 - Candy Creek Reach 4



Bankfull Dimensions	
51.3	x-section area (ft.sq.)
28.9	width (ft)
1.8	mean depth (ft)
4.2	max depth (ft)
31.8	wetted perimeter (ft)
1.6	hydraulic radius (ft)
16.2	width-depth ratio

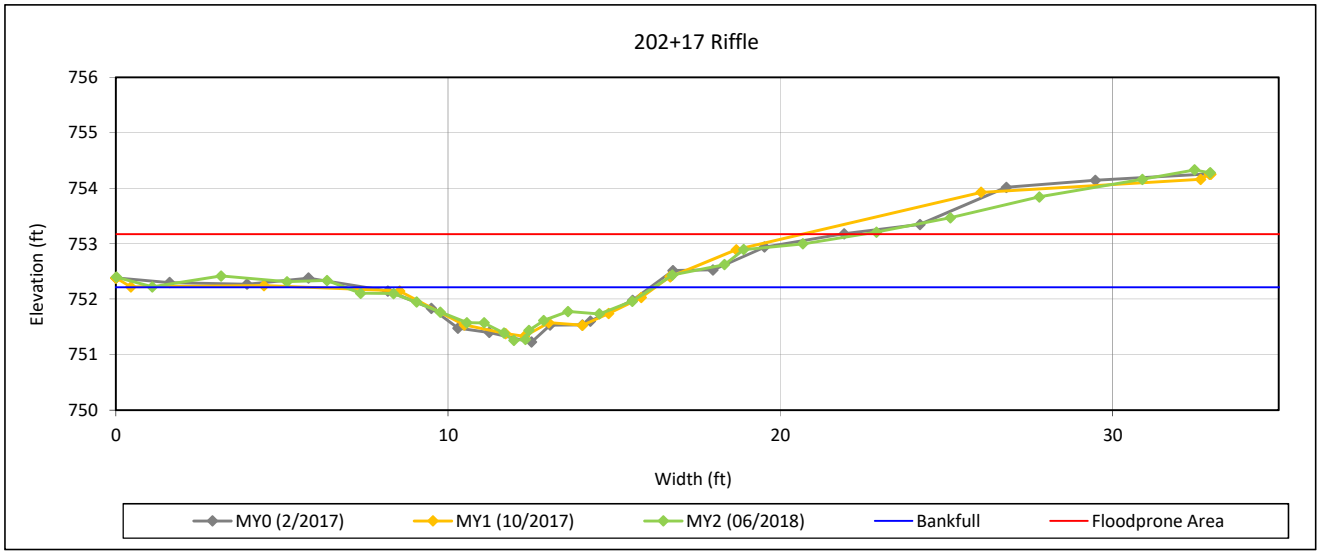
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 27 - UT1C



Bankfull Dimensions	
4.0	x-section area (ft.sq.)
9.3	width (ft)
0.4	mean depth (ft)
1.0	max depth (ft)
9.7	wetted perimeter (ft)
0.4	hydraulic radius (ft)
21.7	width-depth ratio
28.0	W flood prone area (ft)
3.0	entrenchment ratio
0.9	low bank height ratio

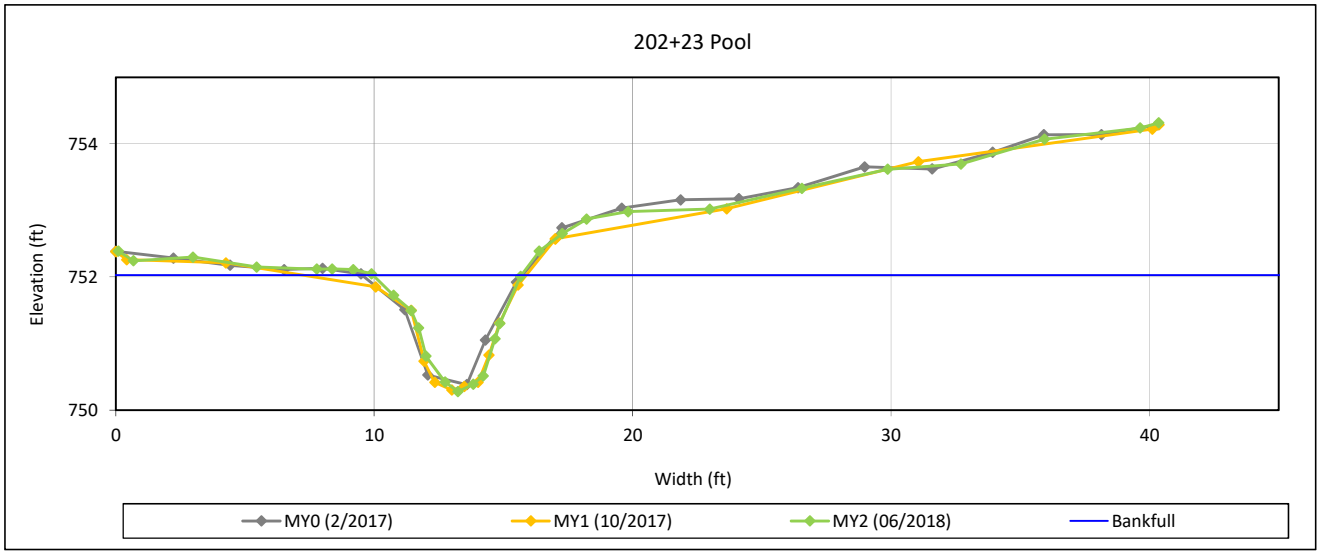
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 28 - UT1C



Bankfull Dimensions	
5.4	x-section area (ft.sq.)
5.7	width (ft)
0.9	mean depth (ft)
1.7	max depth (ft)
7.0	wetted perimeter (ft)
0.8	hydraulic radius (ft)
6.1	width-depth ratio

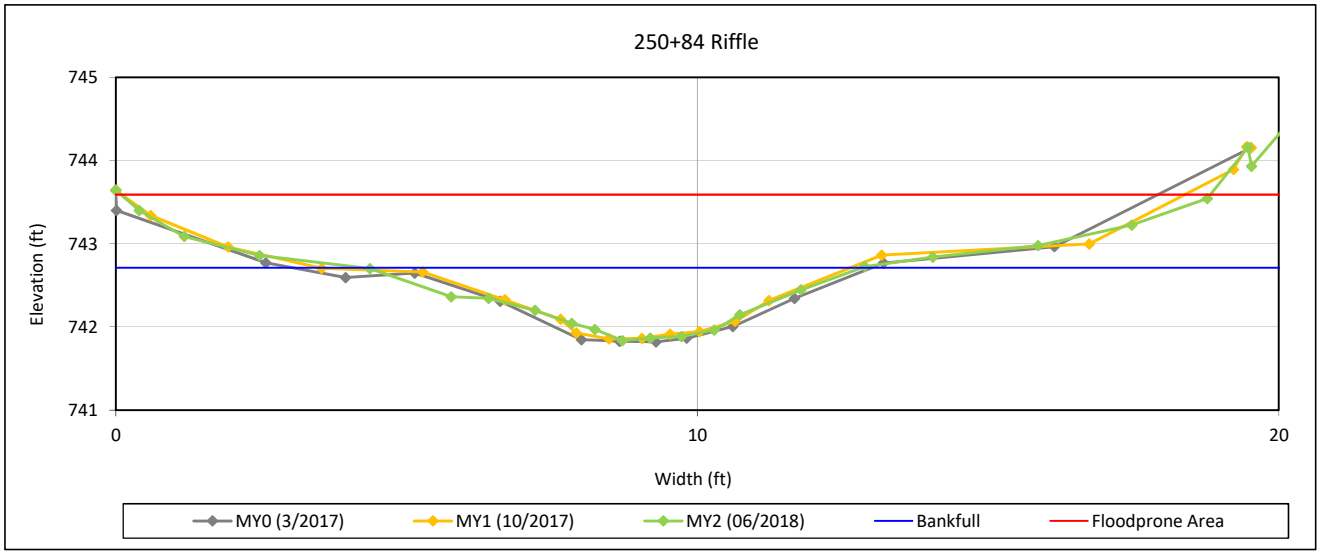
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 29 - UT1D



Bankfull Dimensions	
3.8	x-section area (ft.sq.)
7.1	width (ft)
0.5	mean depth (ft)
0.9	max depth (ft)
7.2	wetted perimeter (ft)
0.5	hydraulic radius (ft)
13.1	width-depth ratio
15.0	W flood prone area (ft)
2.1	entrenchment ratio
1.0	low bank height ratio

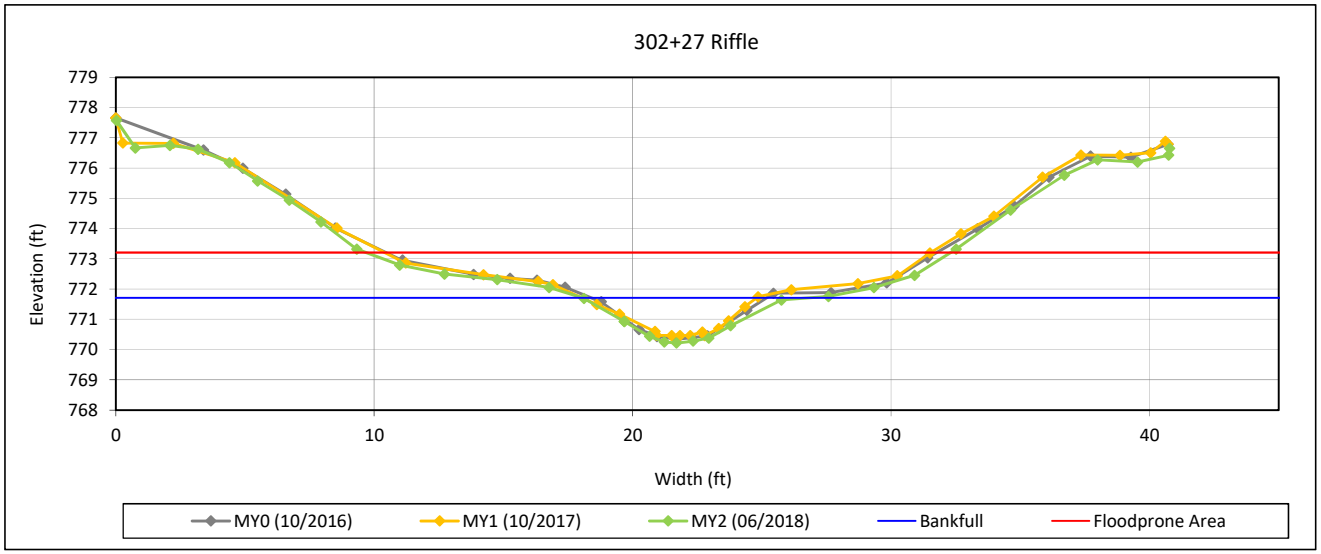
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 30 - UT2 Reach 1



Bankfull Dimensions	
6.8	x-section area (ft.sq.)
7.6	width (ft)
0.9	mean depth (ft)
1.5	max depth (ft)
8.2	wetted perimeter (ft)
0.8	hydraulic radius (ft)
8.6	width-depth ratio
22.0	W flood prone area (ft)
2.9	entrenchment ratio
1.0	low bank height ratio

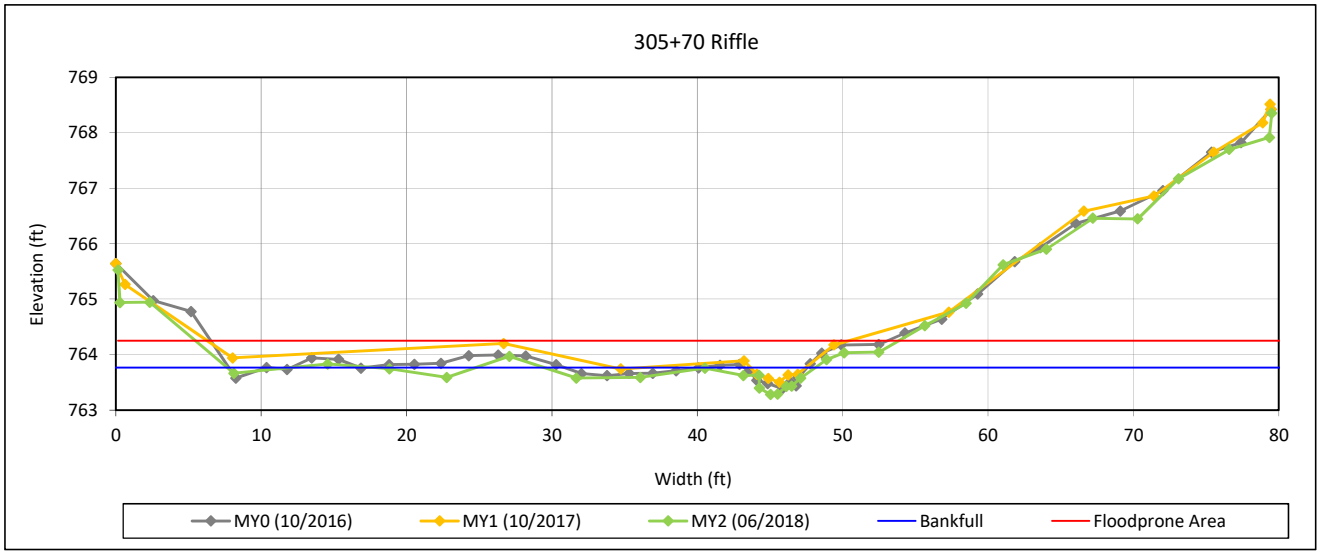
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 31 - UT2 Reach 1



Bankfull Dimensions	
1.2	x-section area (ft.sq.)
3.9	width (ft)
0.3	mean depth (ft)
0.5	max depth (ft)
4.1	wetted perimeter (ft)
0.3	hydraulic radius (ft)
12.6	width-depth ratio
47.0	W flood prone area (ft)
12.1	entrenchment ratio
1.1	low bank height ratio

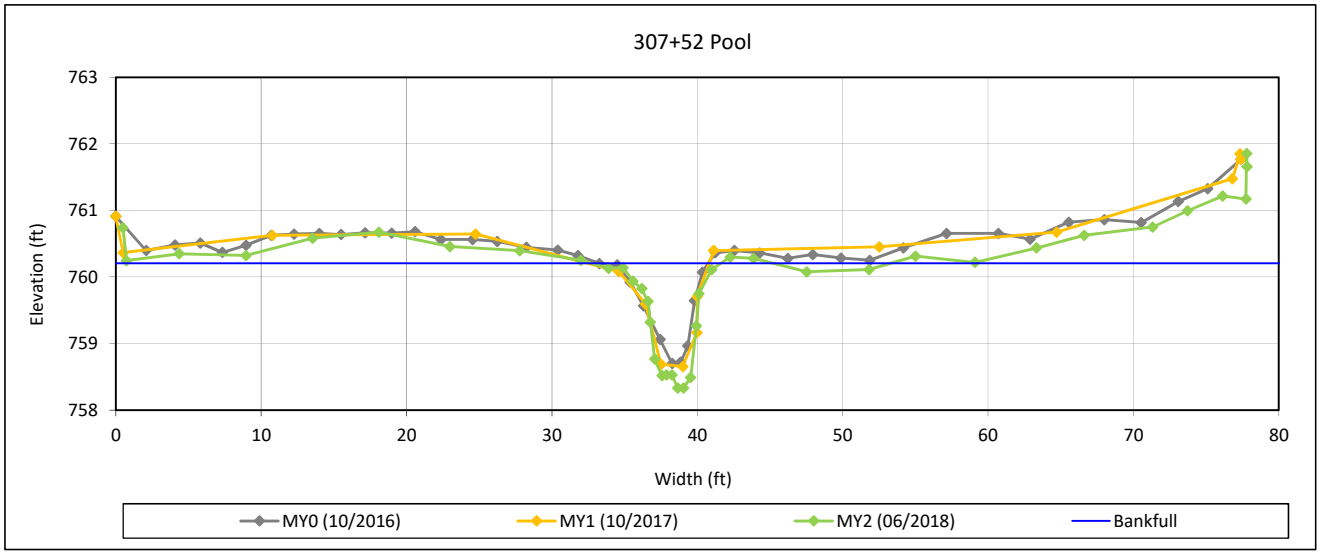
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 32 - UT2 Reach 1



Bankfull Dimensions	
6.2	x-section area (ft.sq.)
8.4	width (ft)
0.7	mean depth (ft)
1.9	max depth (ft)
10.0	wetted perimeter (ft)
0.6	hydraulic radius (ft)
11.3	width-depth ratio

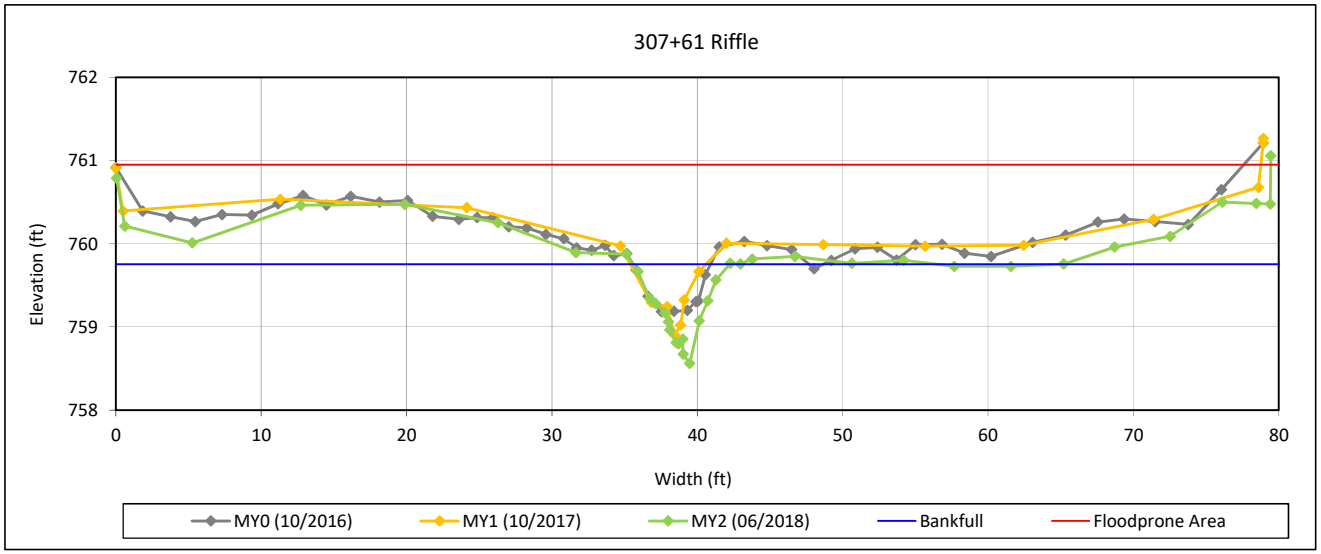
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 33 - UT2 Reach 1



Bankfull Dimensions	
3.5	x-section area (ft.sq.)
6.3	width (ft)
0.6	mean depth (ft)
1.2	max depth (ft)
6.9	wetted perimeter (ft)
0.5	hydraulic radius (ft)
11.3	width-depth ratio
88.0	W flood prone area (ft)
14.0	entrenchment ratio
1.1	low bank height ratio

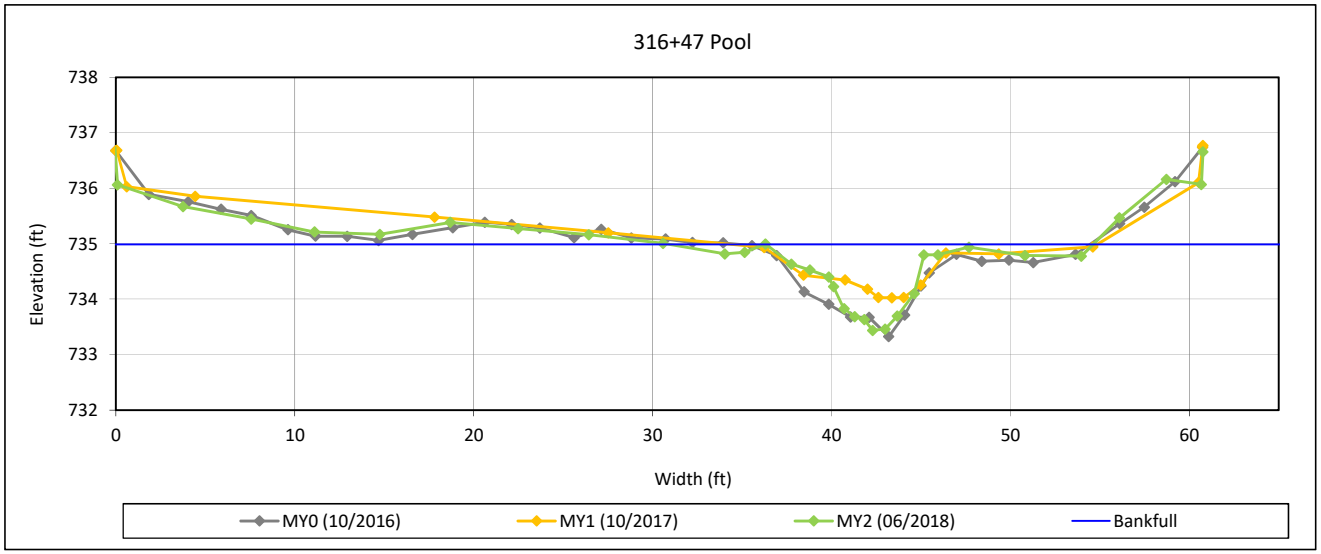
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 34 - UT2 Reach 2



Bankfull Dimensions	
7.9	x-section area (ft.sq.)
12.5	width (ft)
0.6	mean depth (ft)
1.6	max depth (ft)
13.2	wetted perimeter (ft)
0.6	hydraulic radius (ft)
19.6	width-depth ratio

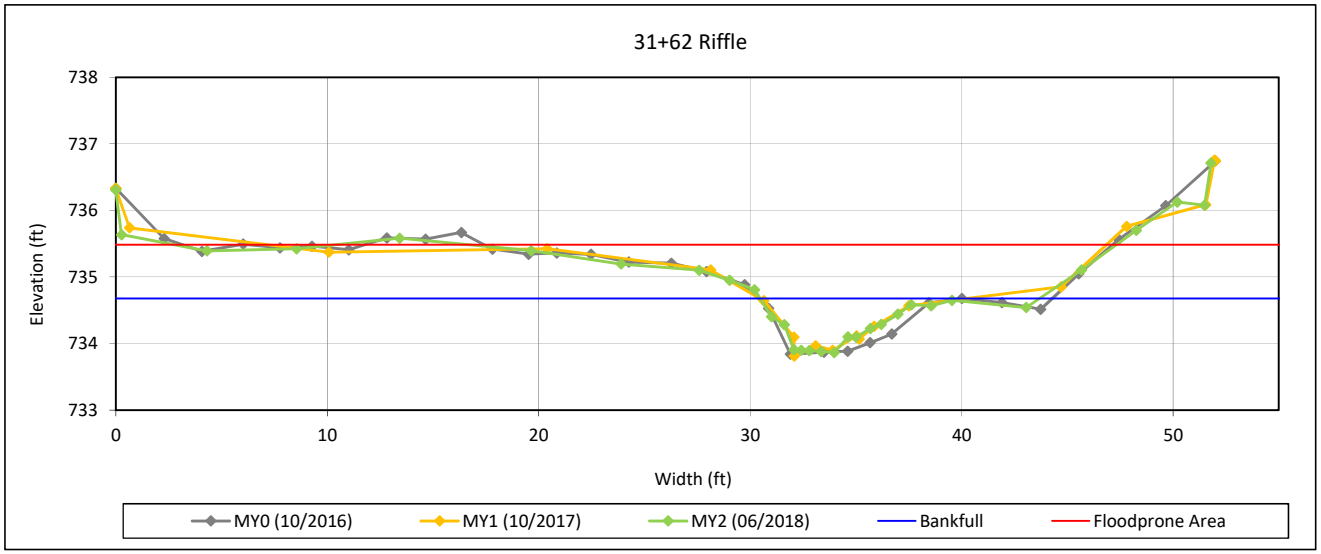
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 35 - UT2 Reach 2



Bankfull Dimensions	
4.1	x-section area (ft.sq.)
13.2	width (ft)
0.3	mean depth (ft)
0.8	max depth (ft)
13.5	wetted perimeter (ft)
0.3	hydraulic radius (ft)
42.5	width-depth ratio
60.0	W flood prone area (ft)
4.5	entrenchment ratio
1.0	low bank height ratio

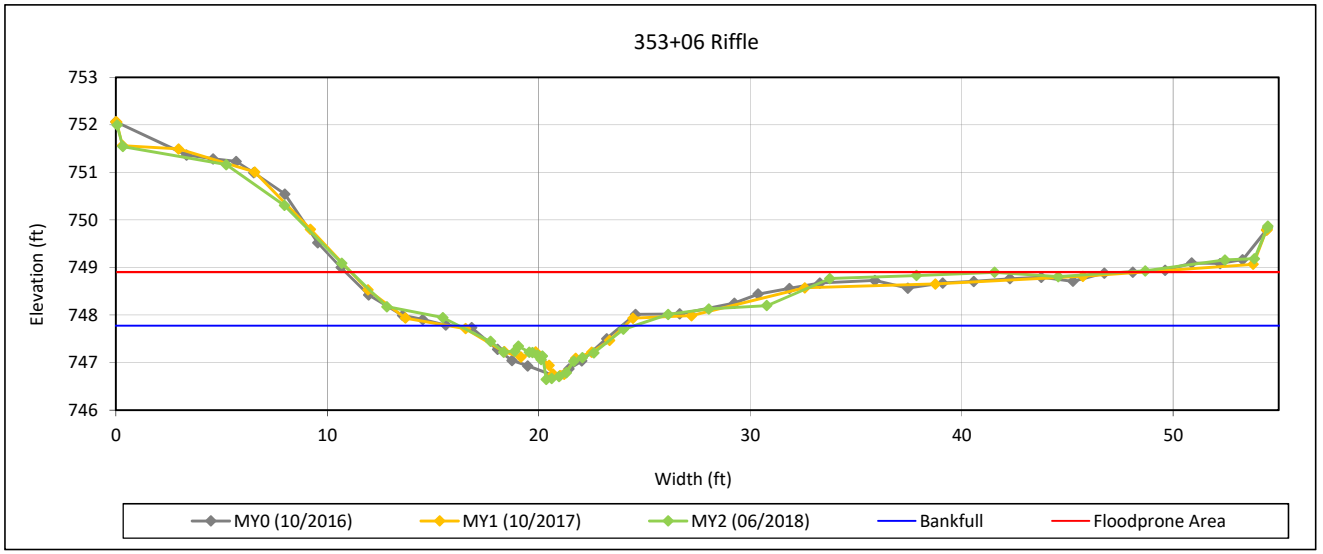
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 36 - UT2A



Bankfull Dimensions	
4.1	x-section area (ft.sq.)
8.3	width (ft)
0.5	mean depth (ft)
1.1	max depth (ft)
9.0	wetted perimeter (ft)
0.5	hydraulic radius (ft)
16.7	width-depth ratio
36.8	W flood prone area (ft)
4.4	entrenchment ratio
0.9	low bank height ratio

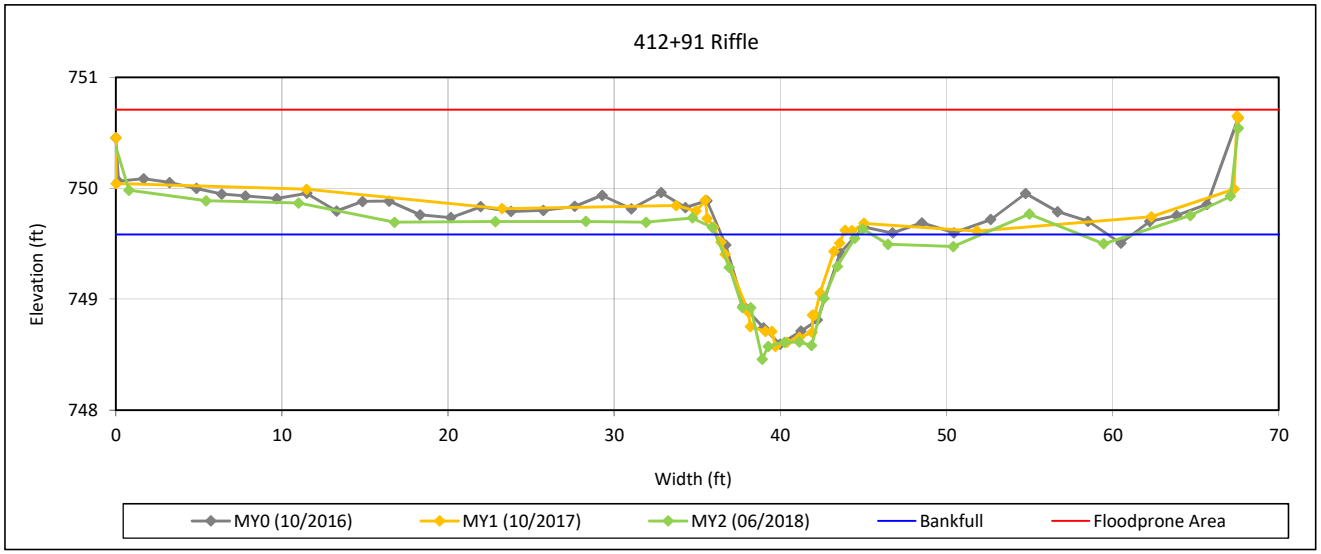
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 37 - UT3



Bankfull Dimensions	
5.5	x-section area (ft.sq.)
8.4	width (ft)
0.7	mean depth (ft)
1.1	max depth (ft)
8.9	wetted perimeter (ft)
0.6	hydraulic radius (ft)
12.8	width-depth ratio
77.0	W flood prone area (ft)
9.2	entrenchment ratio
1.1	low bank height ratio

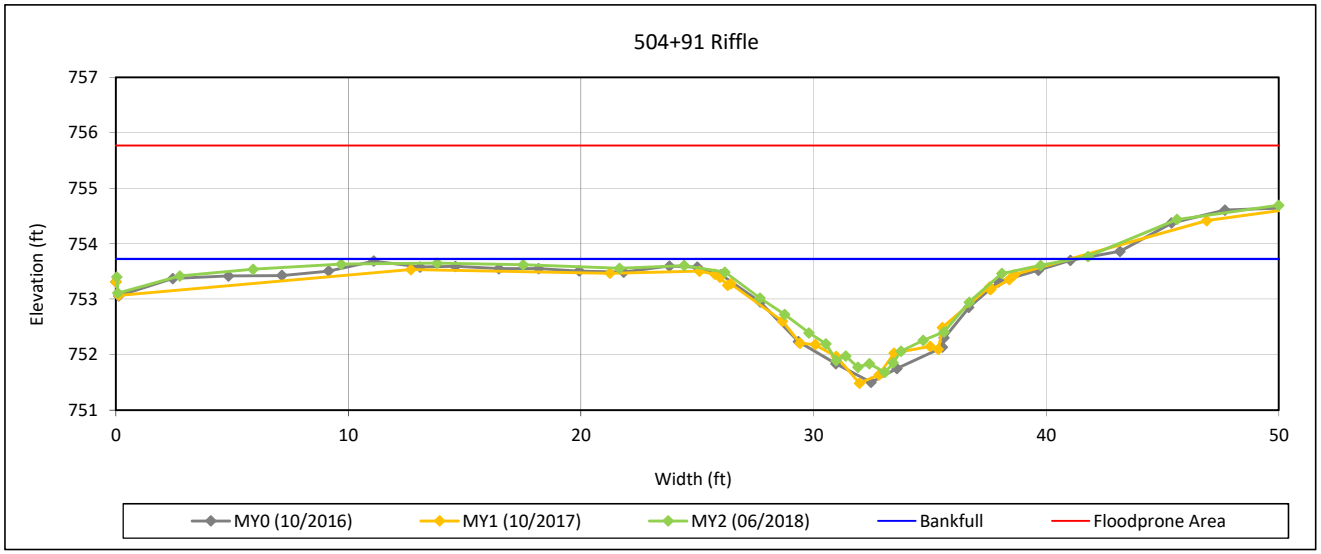
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 38 - UT4



Bankfull Dimensions	
15.2	x-section area (ft.sq.)
16.8	width (ft)
0.9	mean depth (ft)
2.0	max depth (ft)
17.5	wetted perimeter (ft)
0.9	hydraulic radius (ft)
18.5	width-depth ratio
98.0	W flood prone area (ft)
5.8	entrenchment ratio
0.9	low bank height ratio

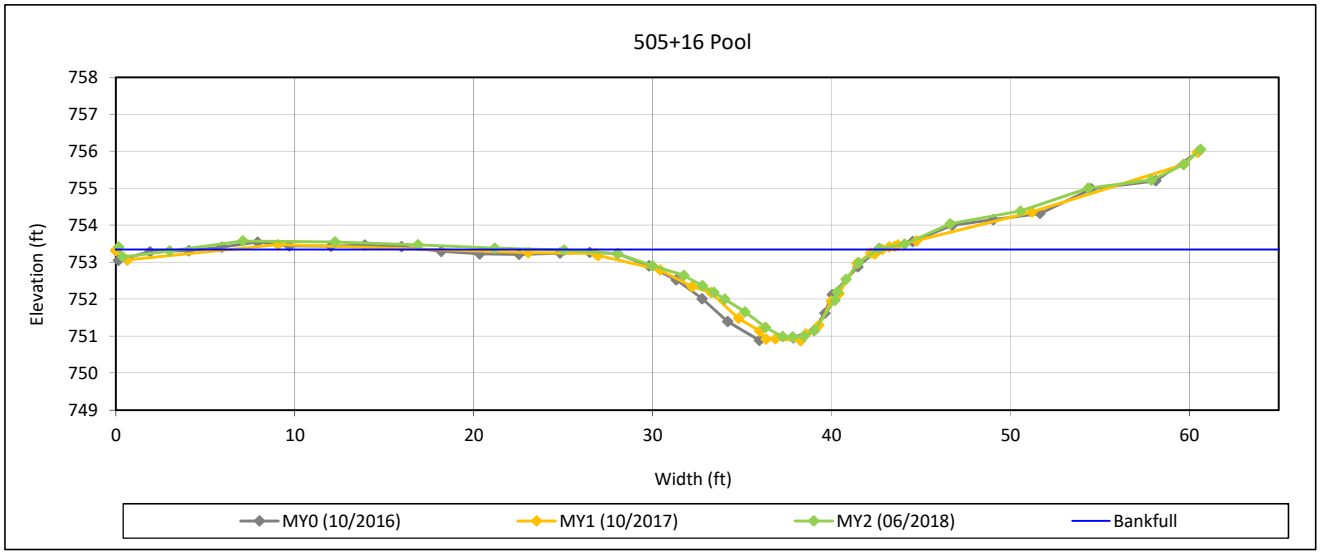
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 39 - UT4



Bankfull Dimensions	
17.8	x-section area (ft.sq.)
21.9	width (ft)
0.8	mean depth (ft)
2.4	max depth (ft)
23.0	wetted perimeter (ft)
0.8	hydraulic radius (ft)
26.9	width-depth ratio

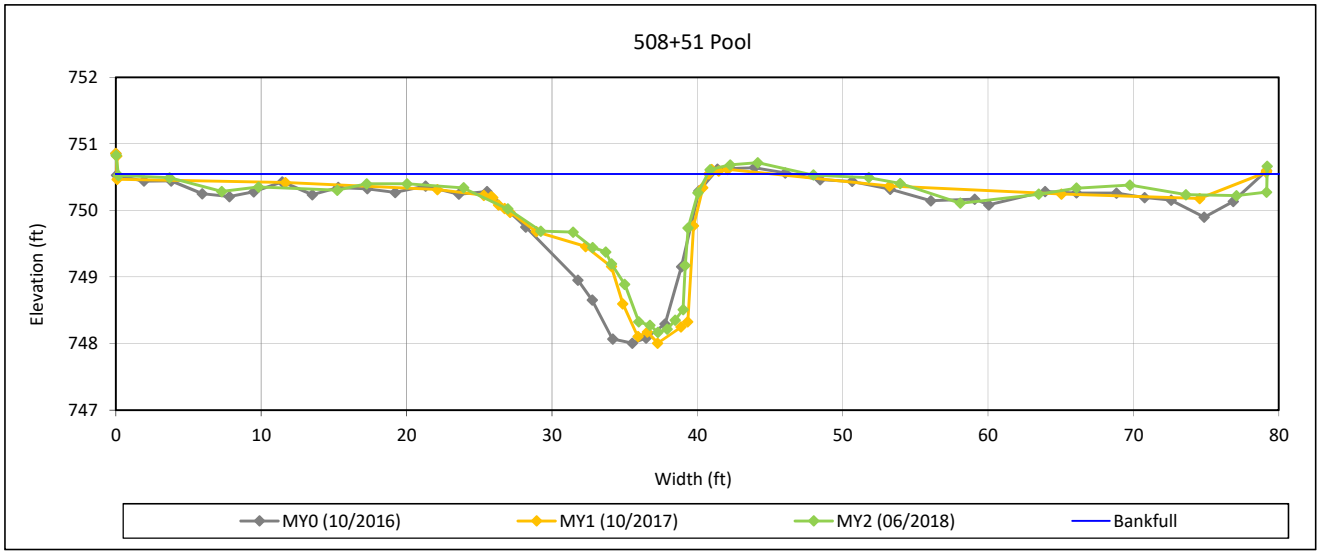
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 40 - UT4



Bankfull Dimensions	
18.5	x-section area (ft.sq.)
16.8	width (ft)
1.1	mean depth (ft)
2.4	max depth (ft)
18.3	wetted perimeter (ft)
1.0	hydraulic radius (ft)
15.2	width-depth ratio

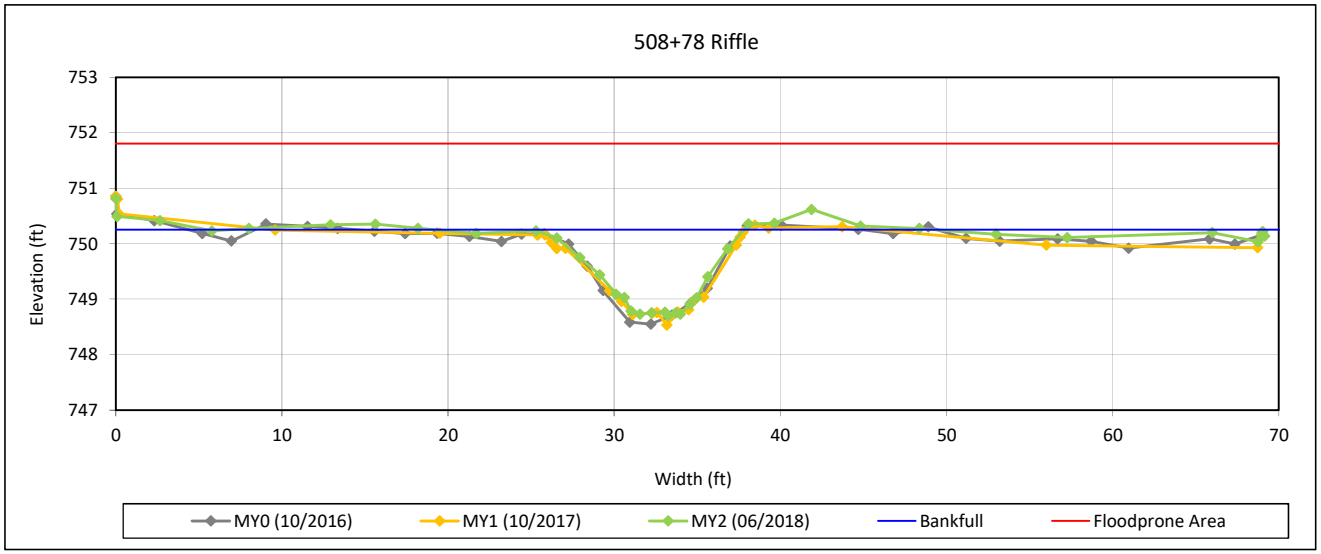
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 41 - UT4



Bankfull Dimensions	
11.0	x-section area (ft.sq.)
16.2	width (ft)
0.7	mean depth (ft)
1.6	max depth (ft)
16.7	wetted perimeter (ft)
0.7	hydraulic radius (ft)
23.7	width-depth ratio
172.0	W flood prone area (ft)
10.6	entrenchment ratio
0.9	low bank height ratio

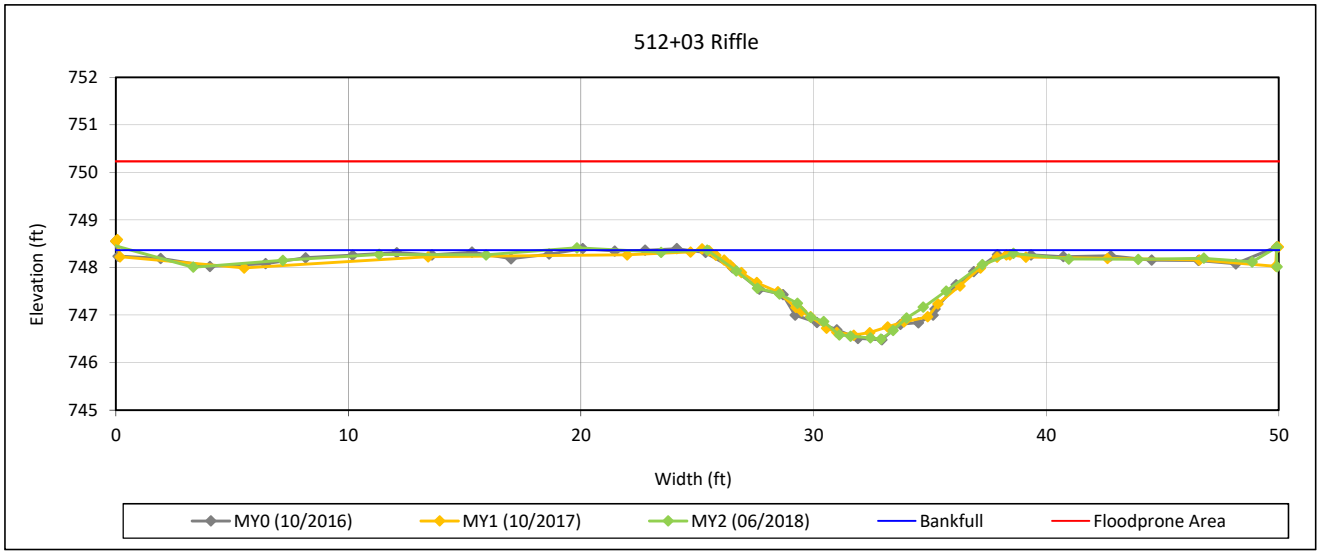
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 42 - UT4



Bankfull Dimensions	
13.0	x-section area (ft.sq.)
11.9	width (ft)
1.1	mean depth (ft)
1.9	max depth (ft)
12.4	wetted perimeter (ft)
1.0	hydraulic radius (ft)
10.9	width-depth ratio
288.0	W flood prone area (ft)
24.2	entrenchment ratio
1.0	low bank height ratio

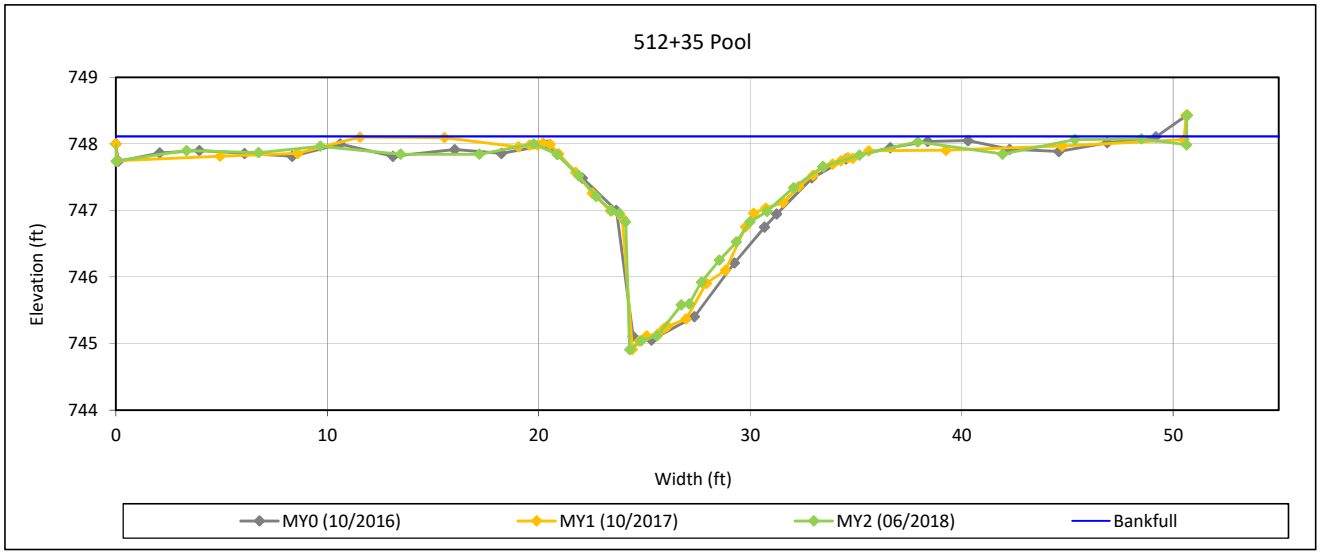
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 43 - UT4



Bankfull Dimensions	
20.2	x-section area (ft.sq.)
16.0	width (ft)
1.3	mean depth (ft)
3.2	max depth (ft)
18.4	wetted perimeter (ft)
1.1	hydraulic radius (ft)
12.7	width-depth ratio

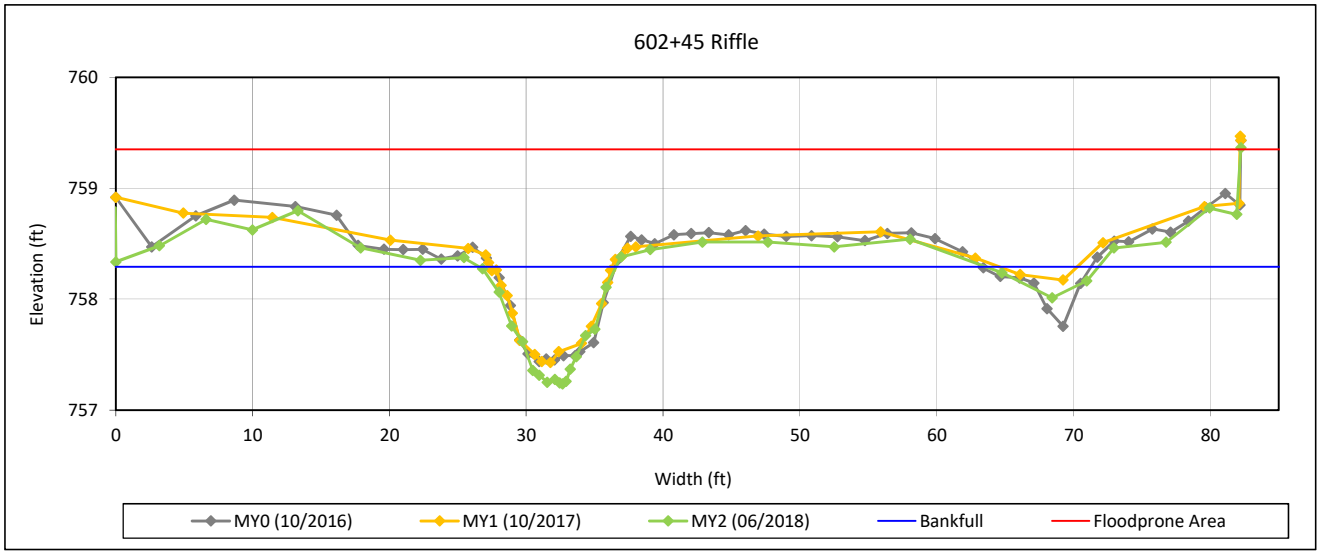
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 44 - UT5



Bankfull Dimensions	
6.0	x-section area (ft.sq.)
9.8	width (ft)
0.6	mean depth (ft)
1.1	max depth (ft)
10.1	wetted perimeter (ft)
0.6	hydraulic radius (ft)
15.9	width-depth ratio
83.0	W flood prone area (ft)
8.5	entrenchment ratio
1.1	low bank height ratio

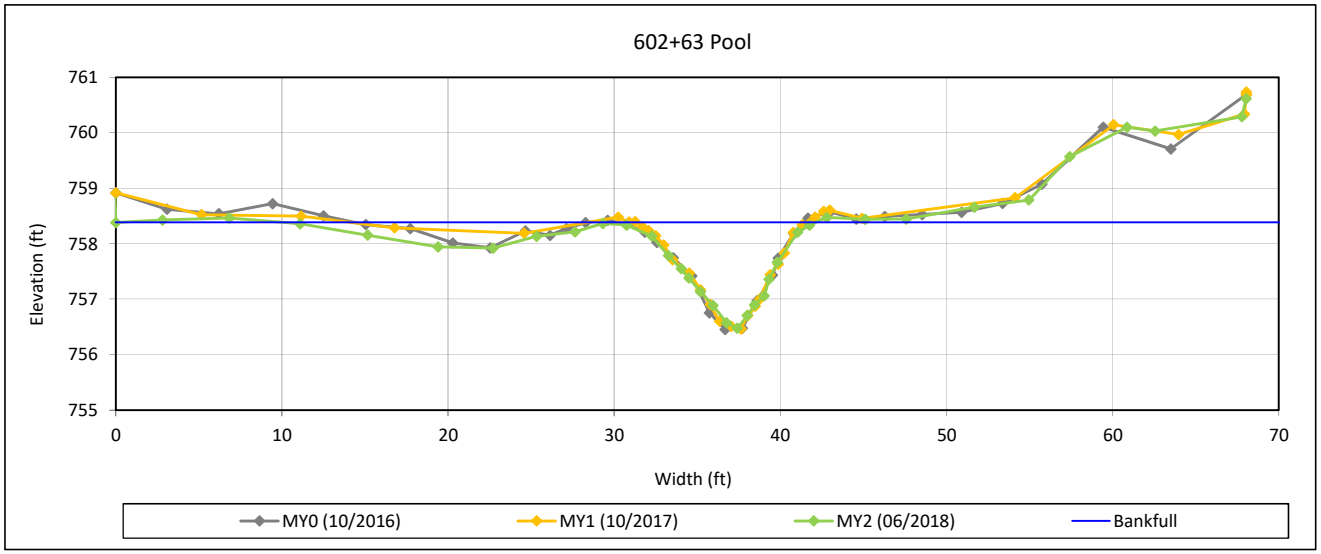
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 45 - UT5



Bankfull Dimensions	
9.8	x-section area (ft.sq.)
9.9	width (ft)
1.0	mean depth (ft)
1.9	max depth (ft)
10.6	wetted perimeter (ft)
0.9	hydraulic radius (ft)
10.0	width-depth ratio

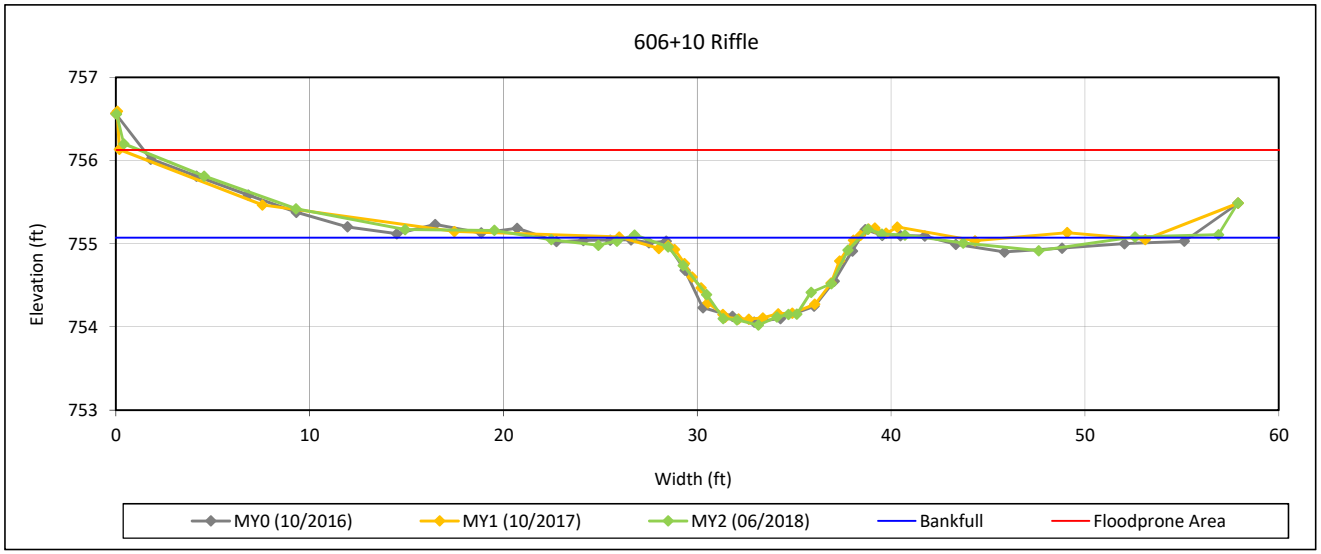
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 46 - UT5



Bankfull Dimensions	
6.8	x-section area (ft.sq.)
9.9	width (ft)
0.7	mean depth (ft)
1.1	max depth (ft)
10.2	wetted perimeter (ft)
0.7	hydraulic radius (ft)
14.4	width-depth ratio
84.0	W flood prone area (ft)
8.5	entrenchment ratio
1.0	low bank height ratio

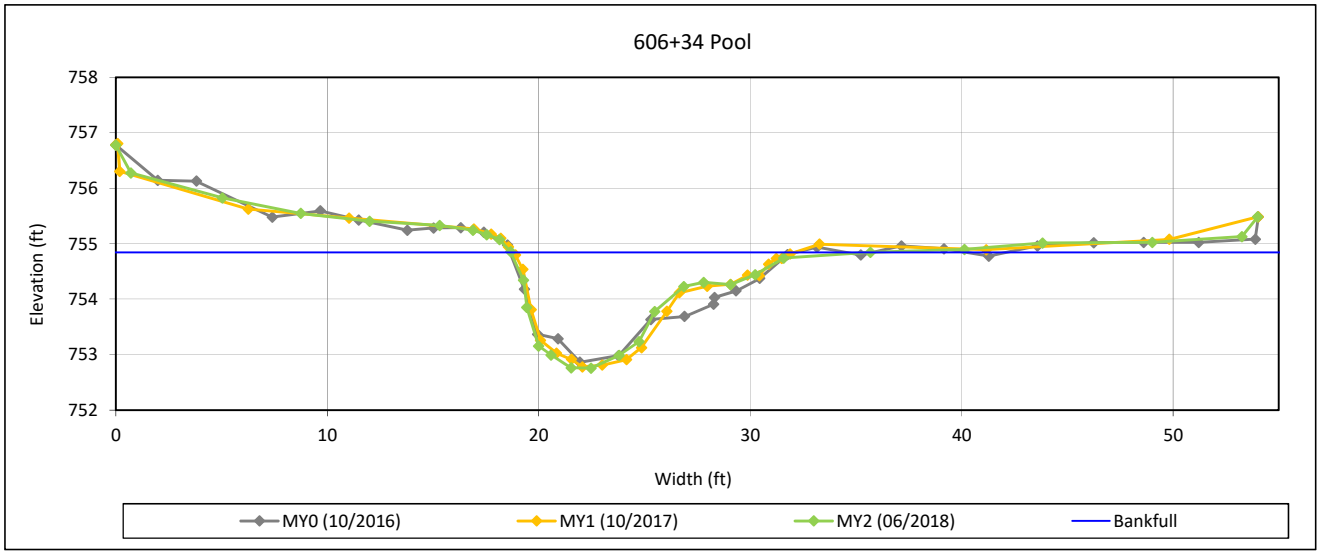
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 47 - UT5



Bankfull Dimensions	
14.7	x-section area (ft.sq.)
17.0	width (ft)
0.9	mean depth (ft)
2.1	max depth (ft)
18.3	wetted perimeter (ft)
0.8	hydraulic radius (ft)
19.6	width-depth ratio

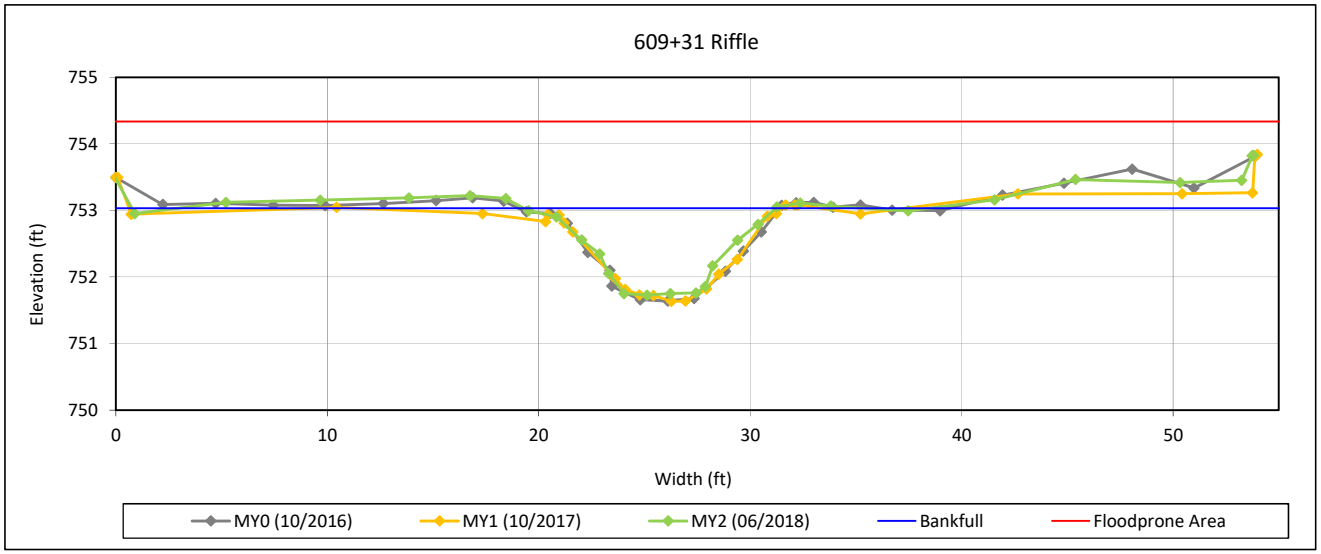
Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Cross-Section 48 - UT5



Bankfull Dimensions	
8.8	x-section area (ft.sq.)
17.0	width (ft)
0.5	mean depth (ft)
1.3	max depth (ft)
17.5	wetted perimeter (ft)
0.5	hydraulic radius (ft)
32.9	width-depth ratio
229.0	W flood prone area (ft)
13.5	entrenchment ratio
0.9	low bank height ratio

Survey Date: 06/2018
Field Crew: Wildlands Engineering

View Downstream

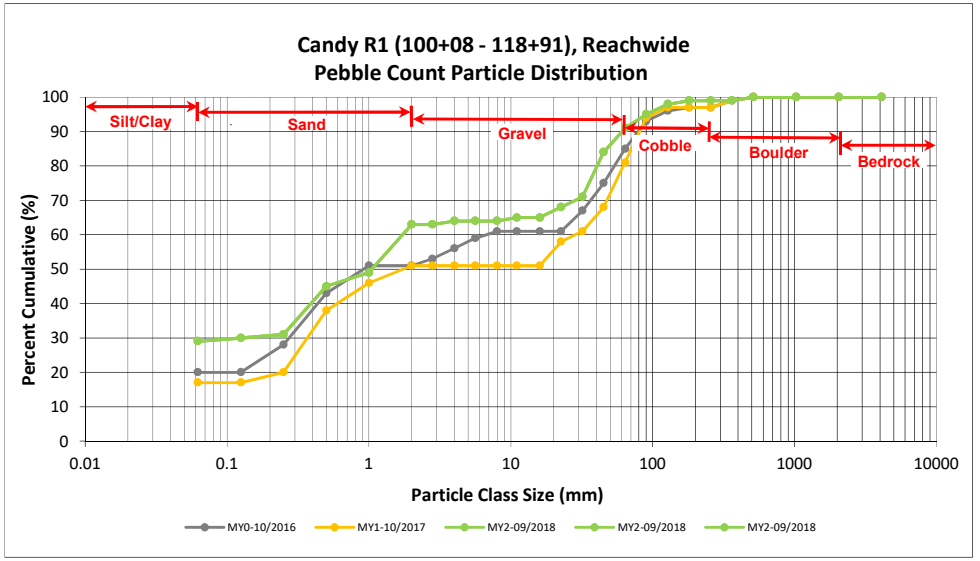
Reachwide and Cross-Section Pebble Count Plots

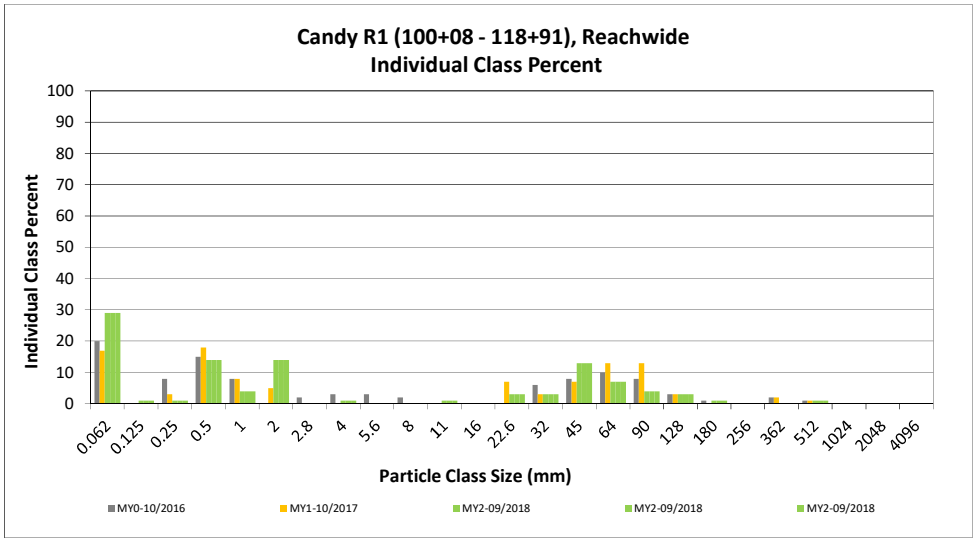
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R1 (100+08 - 118+91), 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	5	24	29	29	29
SAND	Very fine	0.062	0.125		1	1	1	30
	Fine	0.125	0.250	1		1	1	31
	Medium	0.25	0.50	3	11	14	14	45
	Coarse	0.5	1.0	4		4	4	49
	Very Coarse	1.0	2.0	2	12	14	14	63
GRAVEL	Very Fine	2.0	2.8					63
	Very Fine	2.8	4.0	1		1	1	64
	Fine	4.0	5.6					64
	Fine	5.6	8.0					64
	Medium	8.0	11.0		1	1	1	65
	Medium	11.0	16.0					65
	Coarse	16.0	22.6	2	1	3	3	68
	Coarse	22.6	32	3		3	3	71
	Very Coarse	32	45	13		13	13	84
	Very Coarse	45	64	7		7	7	91
COBBLE	Small	64	90	4		4	4	95
	Small	90	128	3		3	3	98
	Large	128	180	1		1	1	99
	Large	180	256					99
BOULDER	Small	256	362					99
	Small	362	512	1		1	1	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} =	1.1
D_{84} =	45.0
D_{95} =	90.0
D_{100} =	512.0





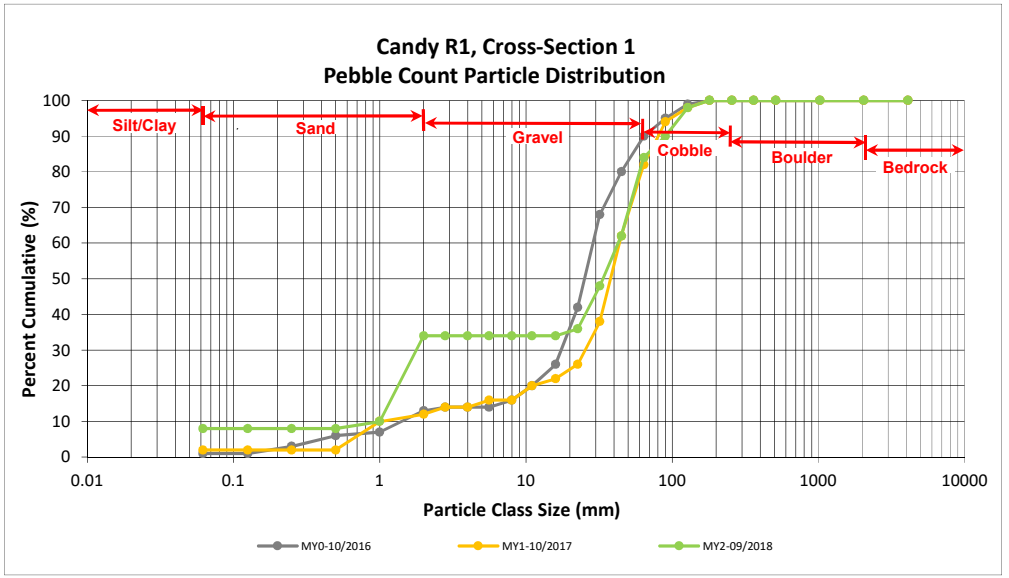
Reachwide and Cross-Section Pebble Count Plots

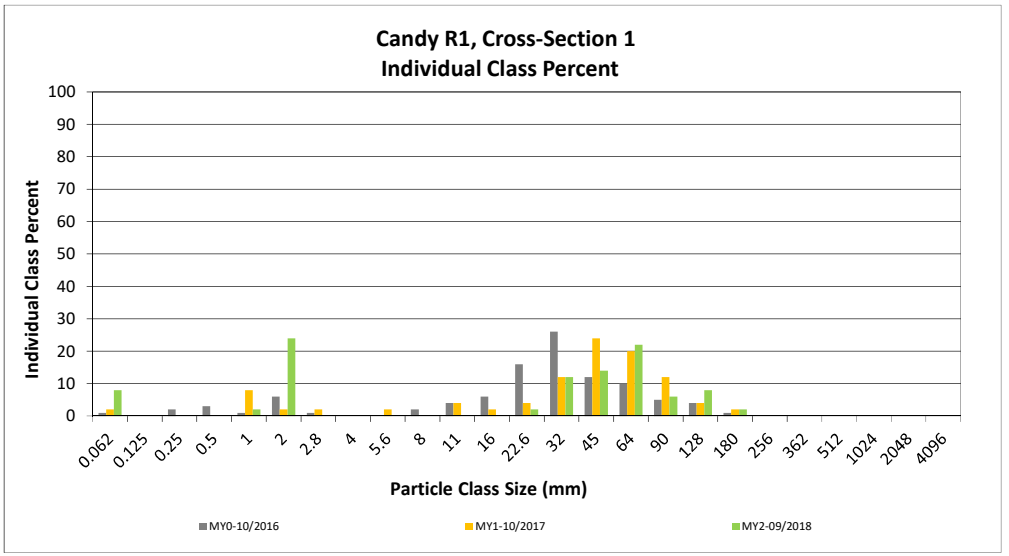
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R1, Cross-Section 1

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	8	8	8
SAND	Very fine	0.062	0.125			8
	Fine	0.125	0.250			8
	Medium	0.25	0.50			8
	Coarse	0.5	1.0	2	2	10
	Very Coarse	1.0	2.0	24	24	34
GRAVEL	Very Fine	2.0	2.8			34
	Very Fine	2.8	4.0			34
	Fine	4.0	5.6			34
	Fine	5.6	8.0			34
	Medium	8.0	11.0			34
	Medium	11.0	16.0			34
	Coarse	16.0	22.6	2	2	36
	Coarse	22.6	32	12	12	48
	Very Coarse	32	45	14	14	62
	Very Coarse	45	64	22	22	84
COBBLE	Small	64	90	6	6	90
	Small	90	128	8	8	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 1	
Channel materials (mm)	
D_{16} =	1.19
D_{35} =	19.02
D_{50} =	33.6
D_{84} =	64.0
D_{95} =	112.2
D_{100} =	180.0





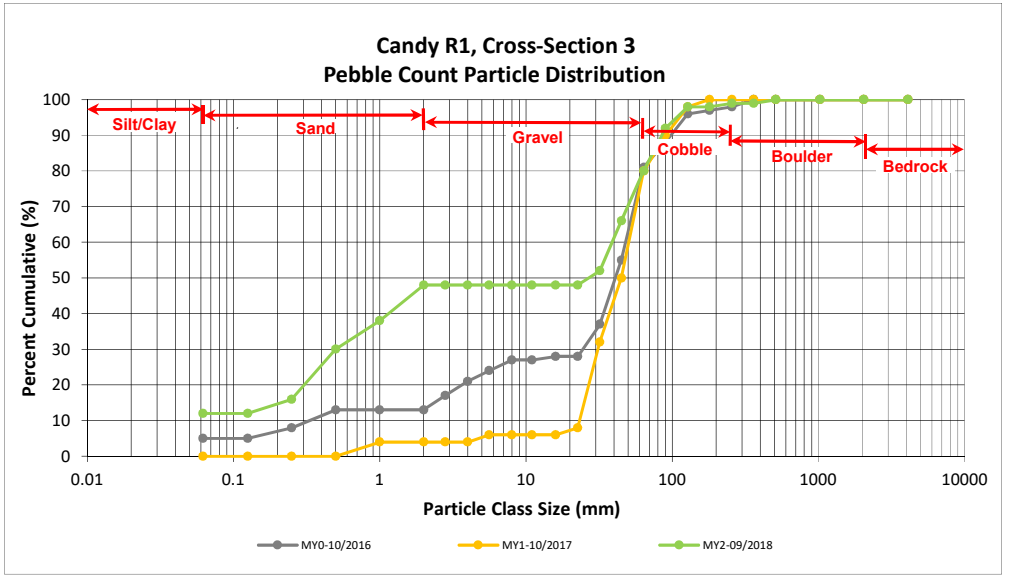
Reachwide and Cross-Section Pebble Count Plots

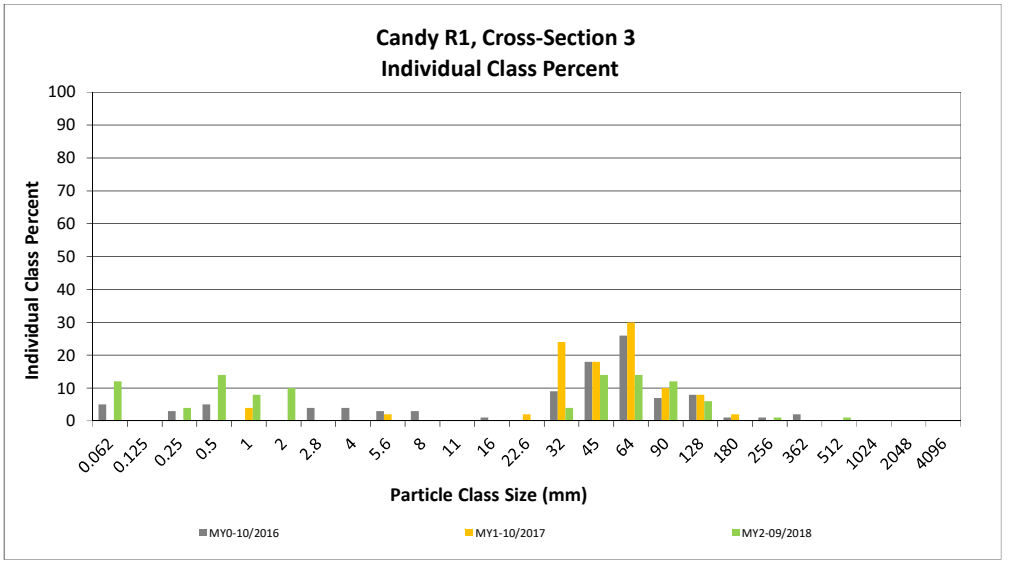
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R1, Cross-Section 3

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	12	12	12
SAND	Very fine	0.062	0.125			12
	Fine	0.125	0.250	4	4	16
	Medium	0.25	0.50	14	14	30
	Coarse	0.5	1.0	8	8	38
	Very Coarse	1.0	2.0	10	10	48
GRAVEL	Very Fine	2.0	2.8			48
	Very Fine	2.8	4.0			48
	Fine	4.0	5.6			48
	Fine	5.6	8.0			48
	Medium	8.0	11.0			48
	Medium	11.0	16.0			48
	Coarse	16.0	22.6			48
	Coarse	22.6	32	4	4	52
	Very Coarse	32	45	14	14	66
	Very Coarse	45	64	14	14	80
COBBLE	Small	64	90	12	12	92
	Small	90	128	6	6	98
	Large	128	180			98
	Large	180	256	1	1	99
BOULDER	Small	256	362			99
	Small	362	512	1	1	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} =	0.25
D_{35} =	0.77
D_{50} =	26.9
D_{84} =	71.7
D_{95} =	107.3
D_{100} =	512.0





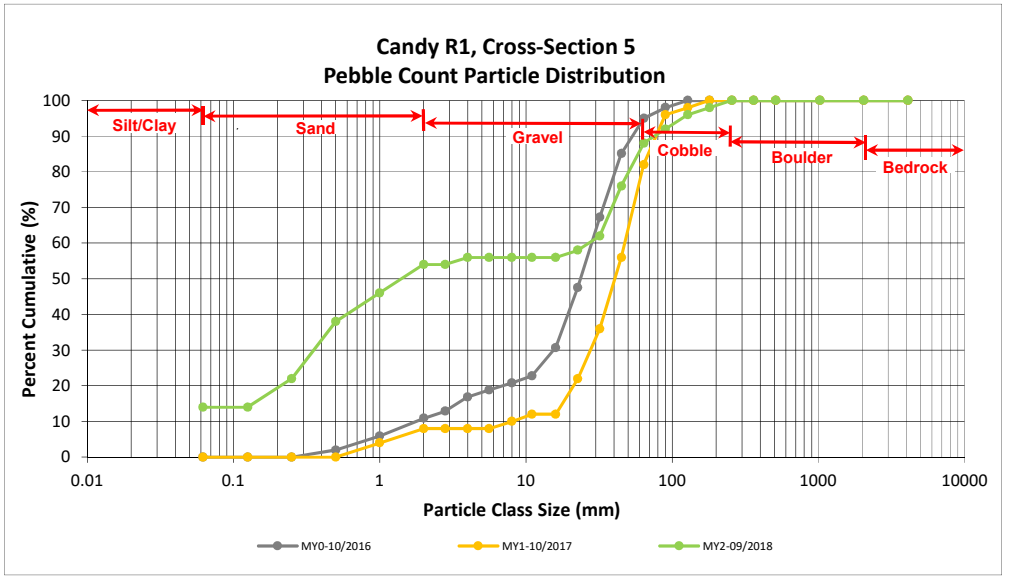
Reachwide and Cross-Section Pebble Count Plots

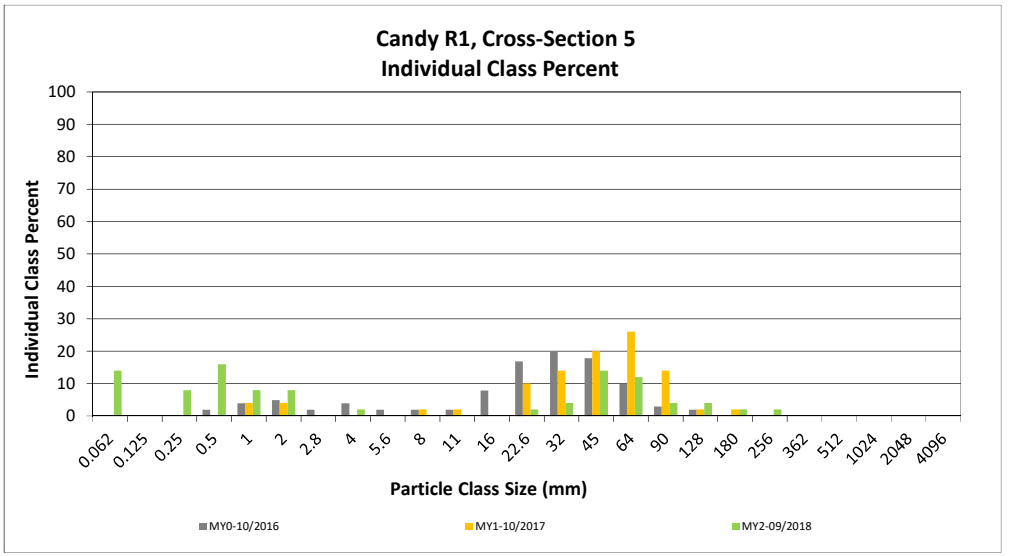
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R1, Cross-Section 5

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	14	14	14
SAND	Very fine	0.062	0.125			14
	Fine	0.125	0.250	8	8	22
	Medium	0.25	0.50	16	16	38
	Coarse	0.5	1.0	8	8	46
	Very Coarse	1.0	2.0	8	8	54
GRAVEL	Very Fine	2.0	2.8			54
	Very Fine	2.8	4.0	2	2	56
	Fine	4.0	5.6			56
	Fine	5.6	8.0			56
	Medium	8.0	11.0			56
	Medium	11.0	16.0			56
	Coarse	16.0	22.6	2	2	58
	Coarse	22.6	32	4	4	62
	Very Coarse	32	45	14	14	76
	Very Coarse	45	64	12	12	88
COBBLE	Small	64	90	4	4	92
	Small	90	128	4	4	96
	Large	128	180	2	2	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 5	
Channel materials (mm)	
D_{16} =	0.15
D_{35} =	0.44
D_{50} =	1.4
D_{84} =	56.9
D_{95} =	117.2
D_{100} =	256.0





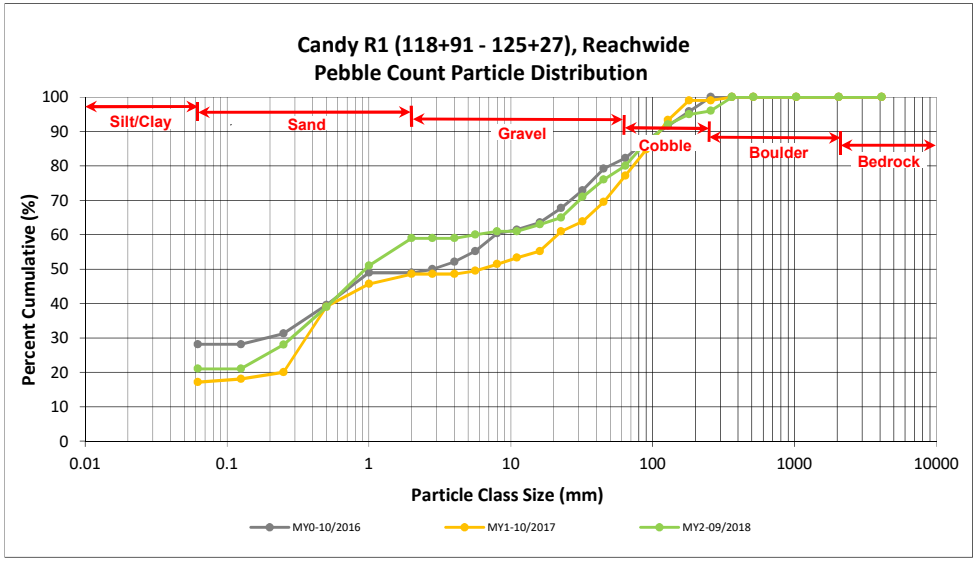
Reachwide and Cross-Section Pebble Count Plots

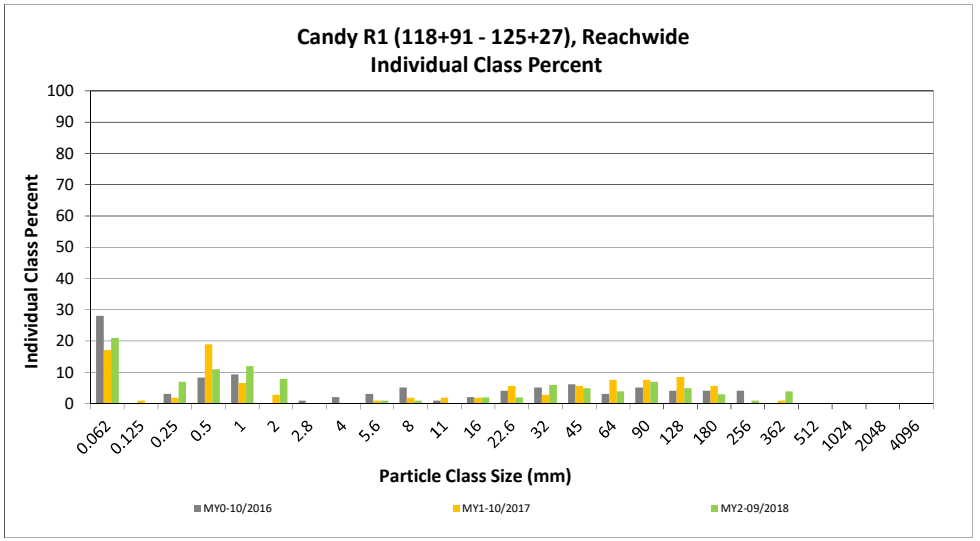
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R1 (118+91 - 125+27), 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	17	21	21	21
SAND	Very fine	0.062	0.125					21
	Fine	0.125	0.250	1	6	7	7	28
	Medium	0.25	0.50	2	9	11	11	39
	Coarse	0.5	1.0	6	6	12	12	51
	Very Coarse	1.0	2.0	2	6	8	8	59
GRAVEL	Very Fine	2.0	2.8					59
	Very Fine	2.8	4.0					59
	Fine	4.0	5.6		1	1	1	60
	Fine	5.6	8.0		1	1	1	61
	Medium	8.0	11.0					61
	Medium	11.0	16.0	1	1	2	2	63
	Coarse	16.0	22.6	1	1	2	2	65
	Coarse	22.6	32	4	2	6	6	71
	Very Coarse	32	45	5		5	5	76
	Very Coarse	45	64	4		4	4	80
COBBLE	Small	64	90	7		7	7	87
	Small	90	128	5		5	5	92
	Large	128	180	3		3	3	95
	Large	180	256	1		1	1	96
BOULDER	Small	256	362	4		4	4	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} =	0.39
D_{50} =	0.9
D_{84} =	77.8
D_{95} =	180.0
D_{100} =	362.0





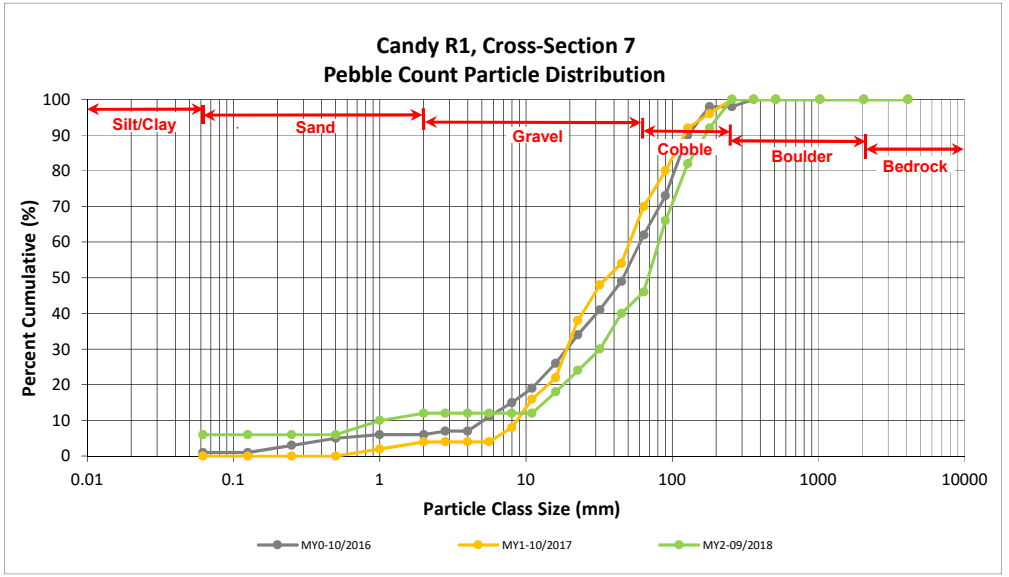
Reachwide and Cross-Section Pebble Count Plots

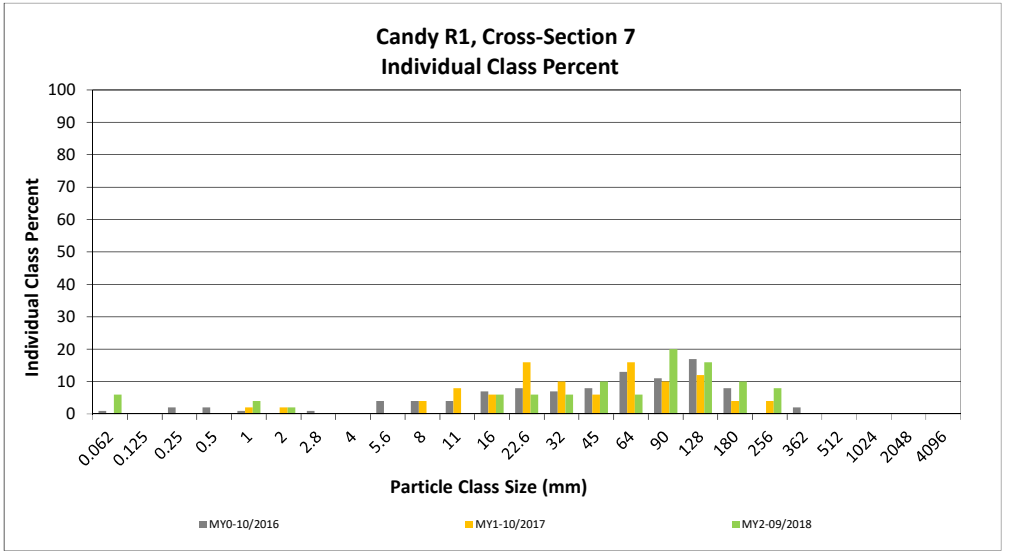
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R1, Cross-Section 7

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	6	6	6
SAND	Very fine	0.062	0.125			6
	Fine	0.125	0.250			6
	Medium	0.25	0.50			6
	Coarse	0.5	1.0	4	4	10
	Very Coarse	1.0	2.0	2	2	12
GRAVEL	Very Fine	2.0	2.8			12
	Very Fine	2.8	4.0			12
	Fine	4.0	5.6			12
	Fine	5.6	8.0			12
	Medium	8.0	11.0			12
	Medium	11.0	16.0	6	6	18
	Coarse	16.0	22.6	6	6	24
	Coarse	22.6	32	6	6	30
	Very Coarse	32	45	10	10	40
	Very Coarse	45	64	6	6	46
COBBLE	Small	64	90	20	20	66
	Small	90	128	16	16	82
	Large	128	180	10	10	92
	Large	180	256	8	8	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 7	
Channel materials (mm)	
D_{16} =	14.12
D_{35} =	37.95
D_{50} =	68.5
D_{84} =	137.0
D_{95} =	205.4
D_{100} =	256.0





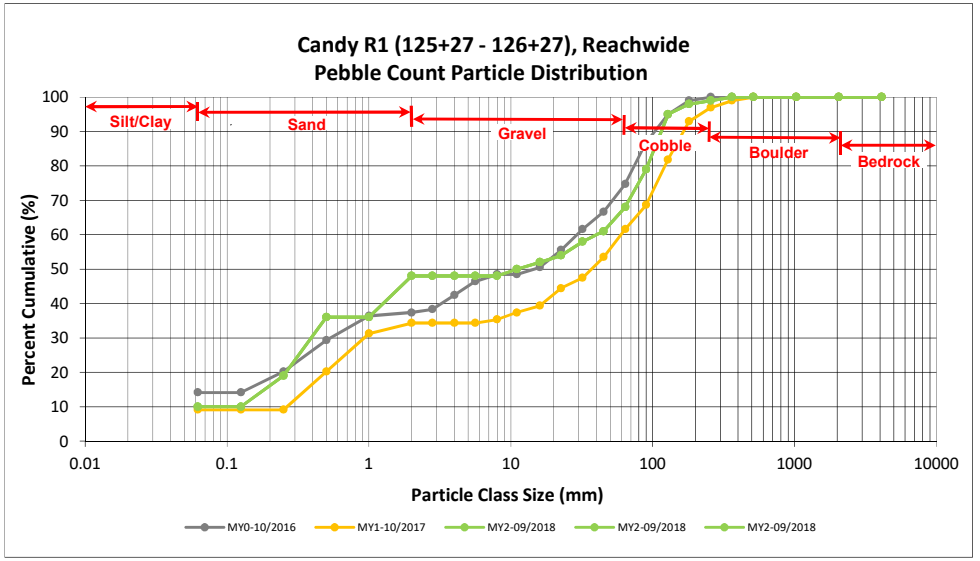
Reachwide and Cross-Section Pebble Count Plots

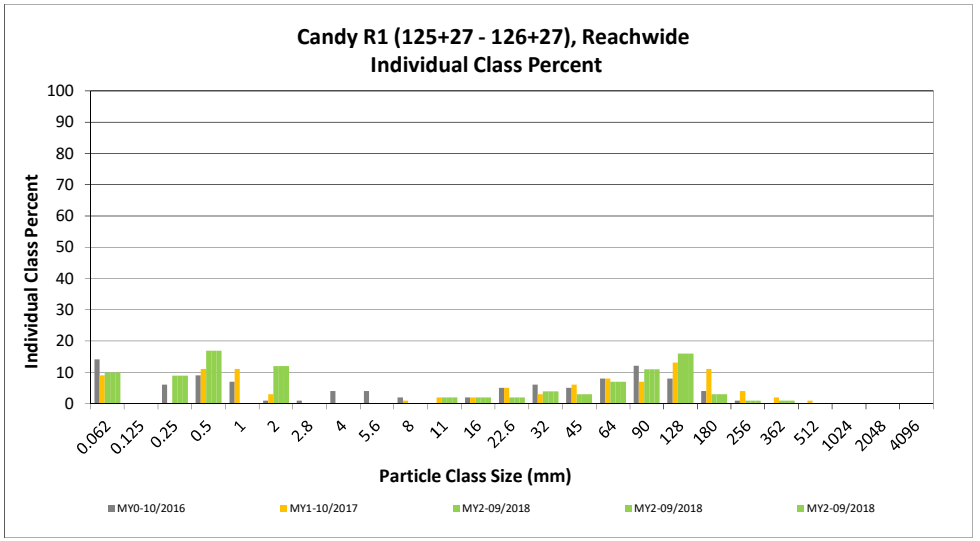
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R1 (125+27 - 126+27), 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	3	7	10	10	10
SAND	Very fine	0.062	0.125					10
	Fine	0.125	0.250		9	9	9	19
	Medium	0.25	0.50	4	13	17	17	36
	Coarse	0.5	1.0					36
	Very Coarse	1.0	2.0	6	6	12	12	48
GRAVEL	Very Fine	2.0	2.8					48
	Very Fine	2.8	4.0					48
	Fine	4.0	5.6					48
	Fine	5.6	8.0					48
	Medium	8.0	11.0	2		2	2	50
	Medium	11.0	16.0	2		2	2	52
	Coarse	16.0	22.6	2		2	2	54
	Coarse	22.6	32	4		4	4	58
	Very Coarse	32	45	3		3	3	61
	Very Coarse	45	64	7		7	7	68
COBBLE	Small	64	90	11		11	11	79
	Small	90	128	16		16	16	95
	Large	128	180	3		3	3	98
	Large	180	256	1		1	1	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	**65**	**35**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.20
D_{35} =	0.48
D_{50} =	11.0
D_{84} =	100.5
D_{95} =	128.0
D_{100} =	362.0





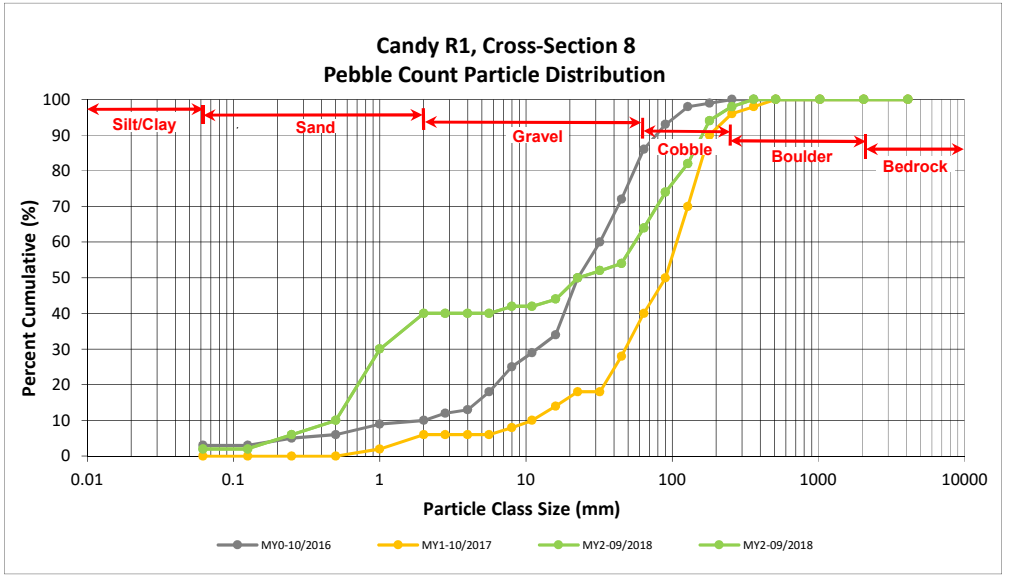
Reachwide and Cross-Section Pebble Count Plots

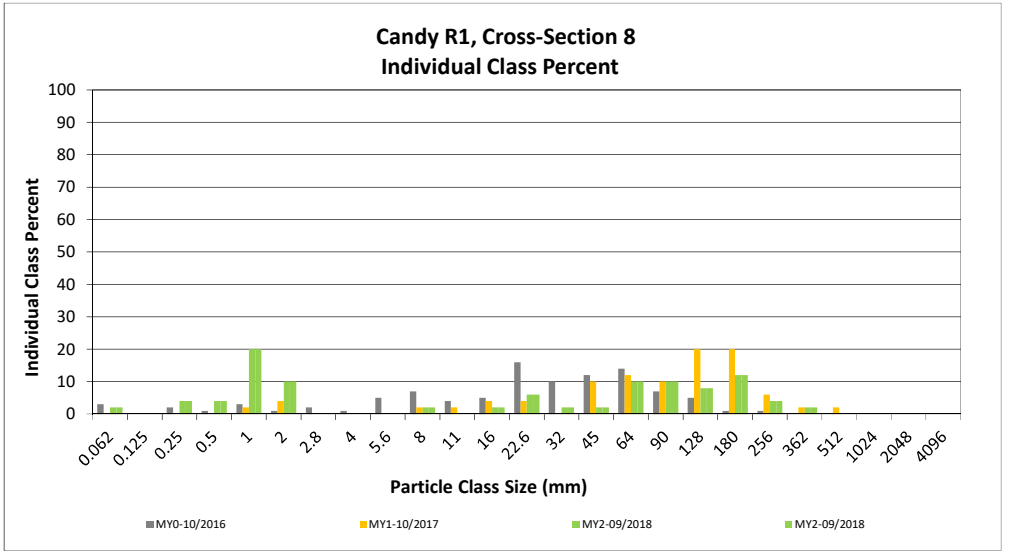
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R1, Cross-Section 8

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	2	2
SAND	Very fine	0.062	0.125			2
	Fine	0.125	0.250	4	4	6
	Medium	0.25	0.50	4	4	10
	Coarse	0.5	1.0	20	20	30
	Very Coarse	1.0	2.0	10	10	40
GRAVEL	Very Fine	2.0	2.8			40
	Very Fine	2.8	4.0			40
	Fine	4.0	5.6			40
	Fine	5.6	8.0	2	2	42
	Medium	8.0	11.0			42
	Medium	11.0	16.0	2	2	44
	Coarse	16.0	22.6	6	6	50
	Coarse	22.6	32	2	2	52
	Very Coarse	32	45	2	2	54
	Very Coarse	45	64	10	10	64
COBBLE	Small	64	90	10	10	74
	Small	90	128	8	8	82
	Large	128	180	12	12	94
	Large	180	256	4	4	98
BOULDER	Small	256	362	2	2	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 8	
Channel materials (mm)	
D_{16} =	0.62
D_{35} =	1.41
D_{50} =	22.6
D_{84} =	135.5
D_{95} =	196.6
D_{100} =	362.0





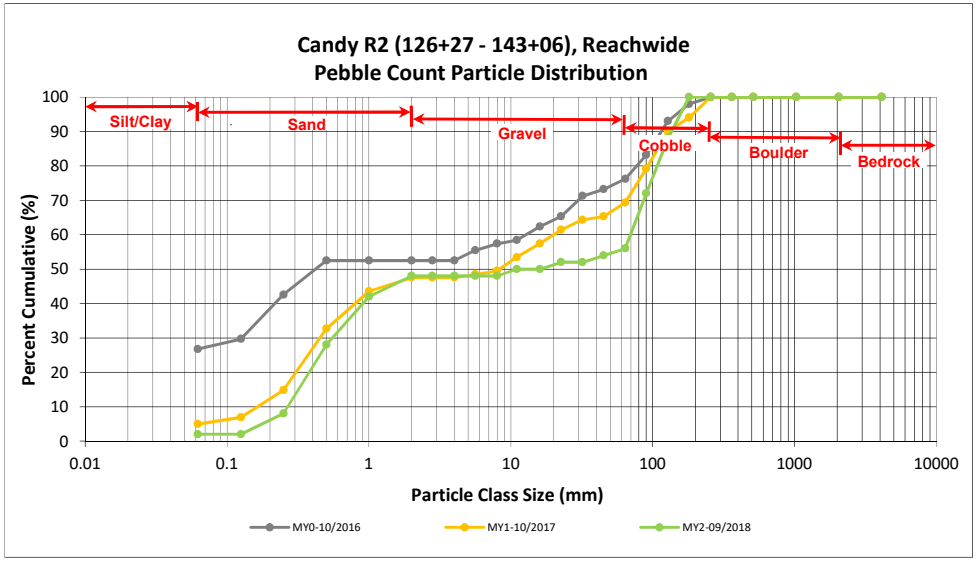
Reachwide and Cross-Section Pebble Count Plots

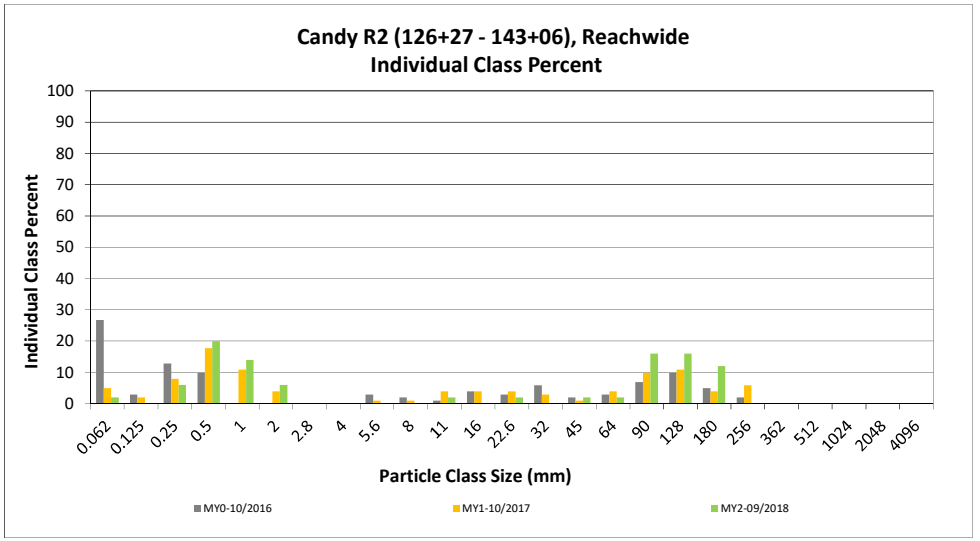
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R2 (126+27 - 143+06), 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		2	2	2
SAND	Very fine	0.062	0.125					2
	Fine	0.125	0.250	6		6	6	8
	Medium	0.25	0.50	20		20	20	28
	Coarse	0.5	1.0	14		14	14	42
	Very Coarse	1.0	2.0	6		6	6	48
GRAVEL	Very Fine	2.0	2.8					48
	Very Fine	2.8	4.0					48
	Fine	4.0	5.6					48
	Fine	5.6	8.0					48
	Medium	8.0	11.0	2		2	2	50
	Medium	11.0	16.0					50
	Coarse	16.0	22.6	2		2	2	52
	Coarse	22.6	32					52
	Very Coarse	32	45	2		2	2	54
	Very Coarse	45	64	2		2	2	56
COBBLE	Small	64	90	16		16	16	72
	Small	90	128	16		16	16	88
	Large	128	180	12		12	12	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**	**0**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.33
D_{35} =	0.71
D_{50} =	11.0
D_{84} =	117.2
D_{95} =	156.2
D_{100} =	180.0





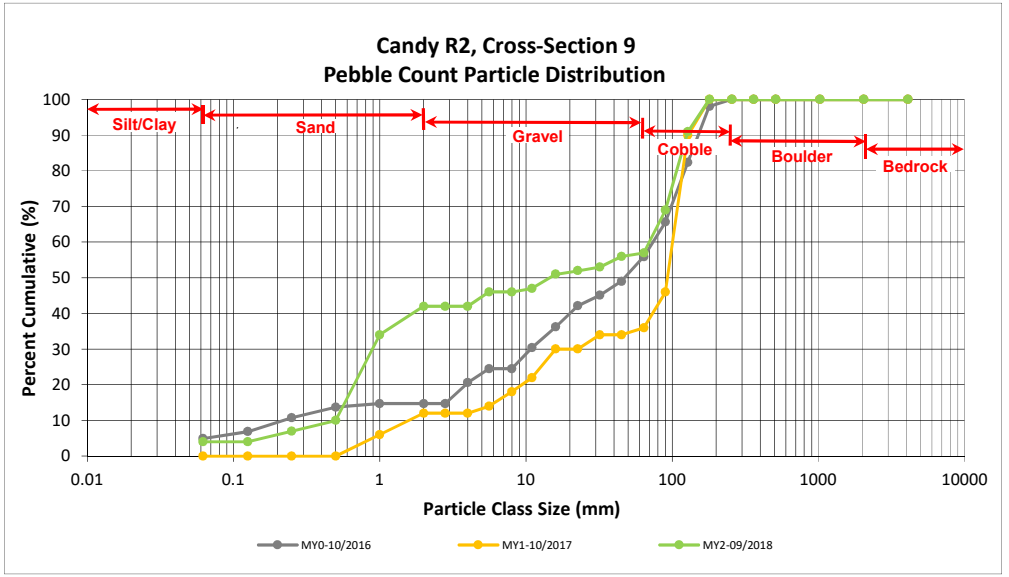
Reachwide and Cross-Section Pebble Count Plots

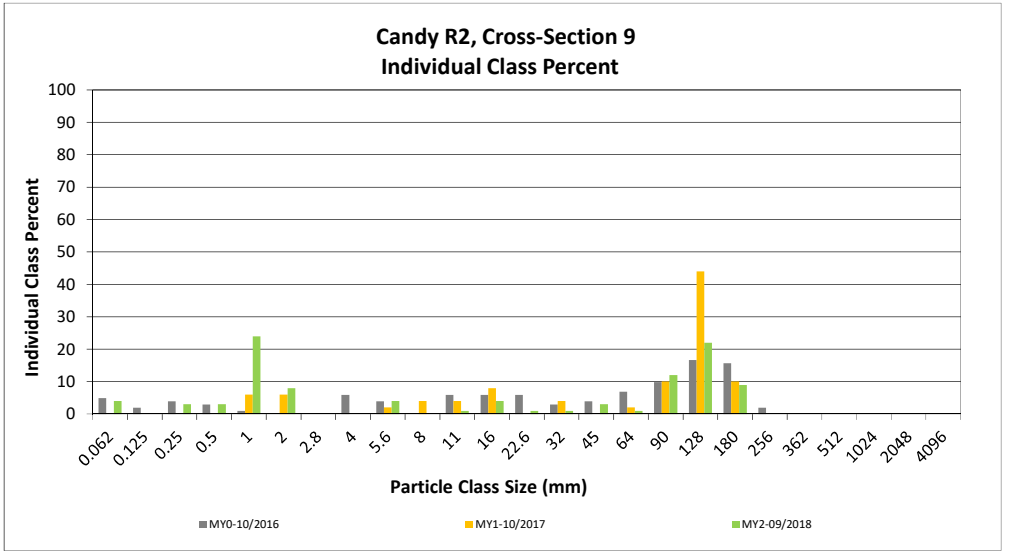
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R2, Cross-Section 9

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4	4	4
SAND	Very fine	0.062	0.125			4
	Fine	0.125	0.250	3	3	7
	Medium	0.25	0.50	3	3	10
	Coarse	0.5	1.0	24	24	34
	Very Coarse	1.0	2.0	8	8	42
GRAVEL	Very Fine	2.0	2.8			42
	Very Fine	2.8	4.0			42
	Fine	4.0	5.6	4	4	46
	Fine	5.6	8.0			46
	Medium	8.0	11.0	1	1	47
	Medium	11.0	16.0	4	4	51
	Coarse	16.0	22.6	1	1	52
	Coarse	22.6	32	1	1	53
	Very Coarse	32	45	3	3	56
	Very Coarse	45	64	1	1	57
COBBLE	Small	64	90	12	12	69
	Small	90	128	22	22	91
	Large	128	180	9	9	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} =	0.59
D_{35} =	1.09
D_{50} =	14.6
D_{84} =	114.4
D_{95} =	148.9
D_{100} =	180.0





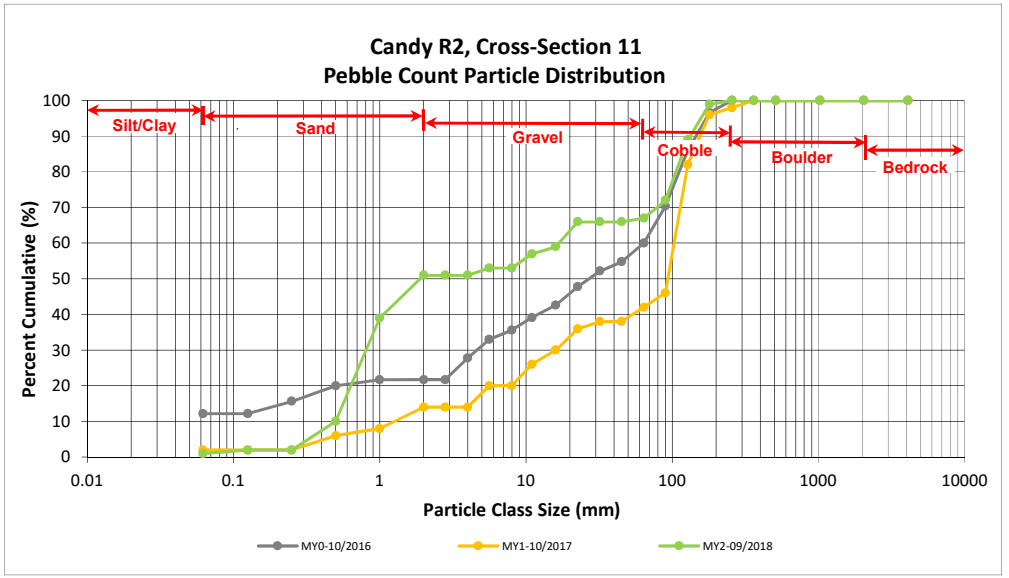
Reachwide and Cross-Section Pebble Count Plots

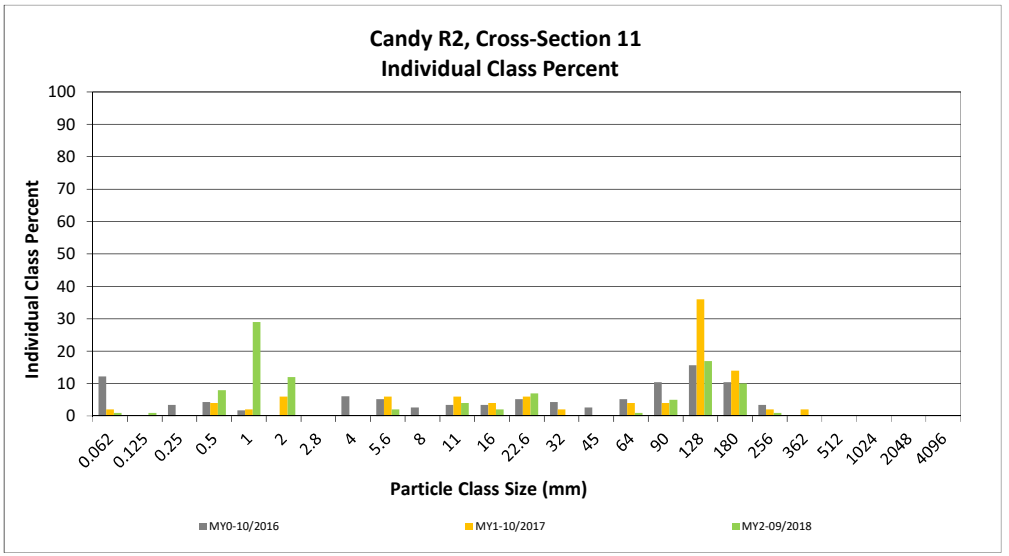
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R2, Cross-Section 11

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	1	1
SAND	Very fine	0.062	0.125	1	1	2
	Fine	0.125	0.250			2
	Medium	0.25	0.50	8	8	10
	Coarse	0.5	1.0	29	29	39
	Very Coarse	1.0	2.0	12	12	51
GRAVEL	Very Fine	2.0	2.8			51
	Very Fine	2.8	4.0			51
	Fine	4.0	5.6	2	2	53
	Fine	5.6	8.0			53
	Medium	8.0	11.0	4	4	57
	Medium	11.0	16.0	2	2	59
	Coarse	16.0	22.6	7	7	66
	Coarse	22.6	32			66
	Very Coarse	32	45			66
	Very Coarse	45	64	1	1	67
COBBLE	Small	64	90	5	5	72
	Small	90	128	17	17	89
	Large	128	180	10	10	99
	Large	180	256	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	**100**	**100**	**100**

Cross-Section 11	
Channel materials (mm)	
D_{16} =	0.58
D_{35} =	0.91
D_{50} =	1.9
D_{84} =	115.4
D_{95} =	157.1
D_{100} =	256.0





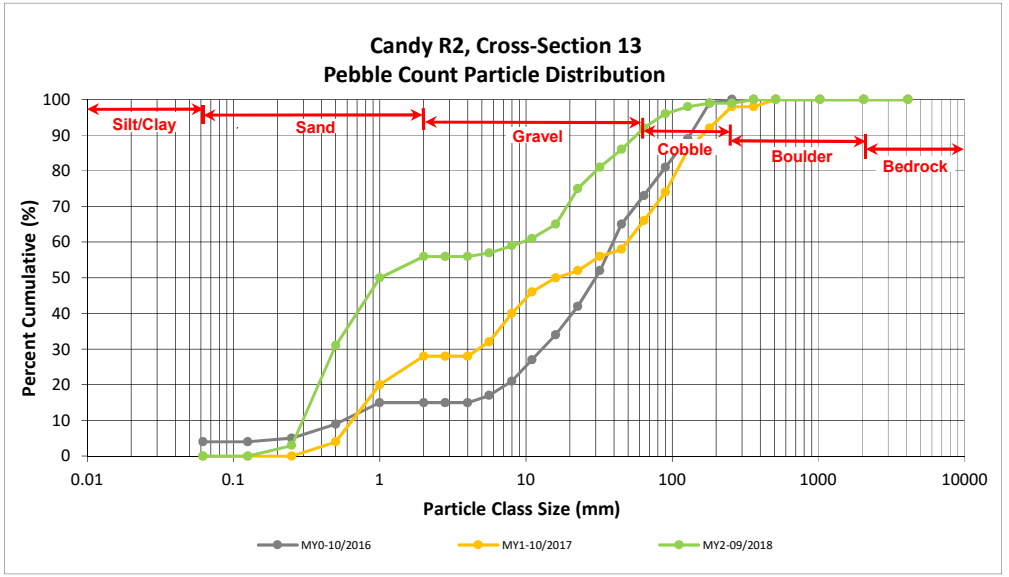
Reachwide and Cross-Section Pebble Count Plots

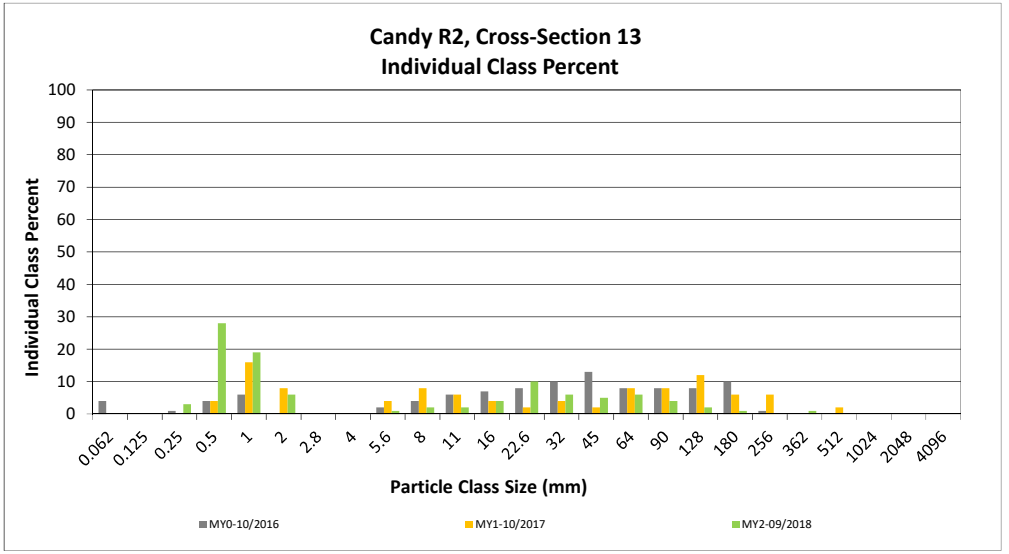
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R2, Cross-Section 13

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250	3	3	3
	Medium	0.25	0.50	28	28	31
	Coarse	0.5	1.0	19	19	50
	Very Coarse	1.0	2.0	6	6	56
GRAVEL	Very Fine	2.0	2.8			56
	Very Fine	2.8	4.0			56
	Fine	4.0	5.6	1	1	57
	Fine	5.6	8.0	2	2	59
	Medium	8.0	11.0	2	2	61
	Medium	11.0	16.0	4	4	65
	Coarse	16.0	22.6	10	10	75
	Coarse	22.6	32	6	6	81
	Very Coarse	32	45	5	5	86
	Very Coarse	45	64	6	6	92
COBBLE	Small	64	90	4	4	96
	Small	90	128	2	2	98
	Large	128	180	1	1	99
	Large	180	256			99
BOULDER	Small	256	362	1	1	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 13	
Channel materials (mm)	
D_{16} =	0.34
D_{35} =	0.58
D_{50} =	1.0
D_{84} =	39.3
D_{95} =	82.6
D_{100} =	362.0





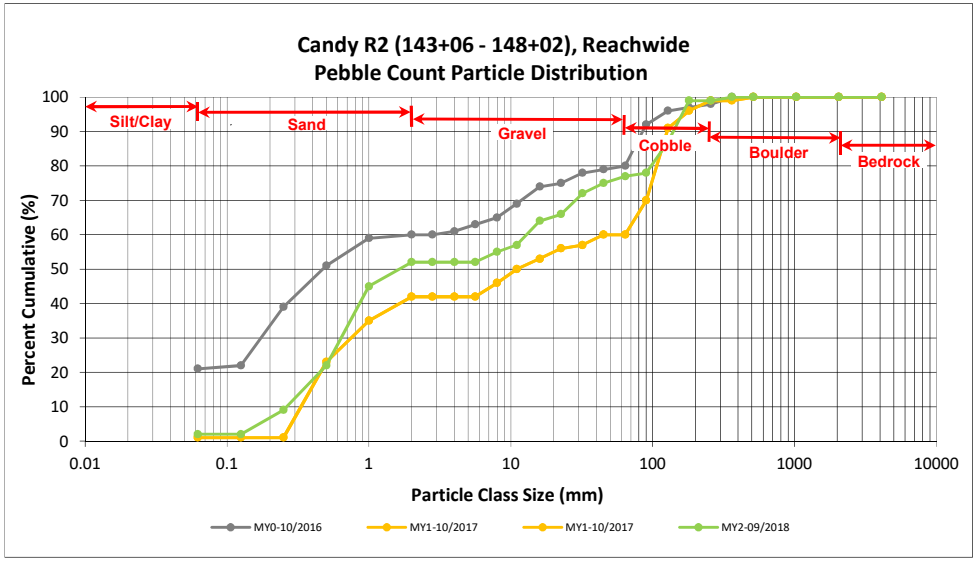
Reachwide and Cross-Section Pebble Count Plots

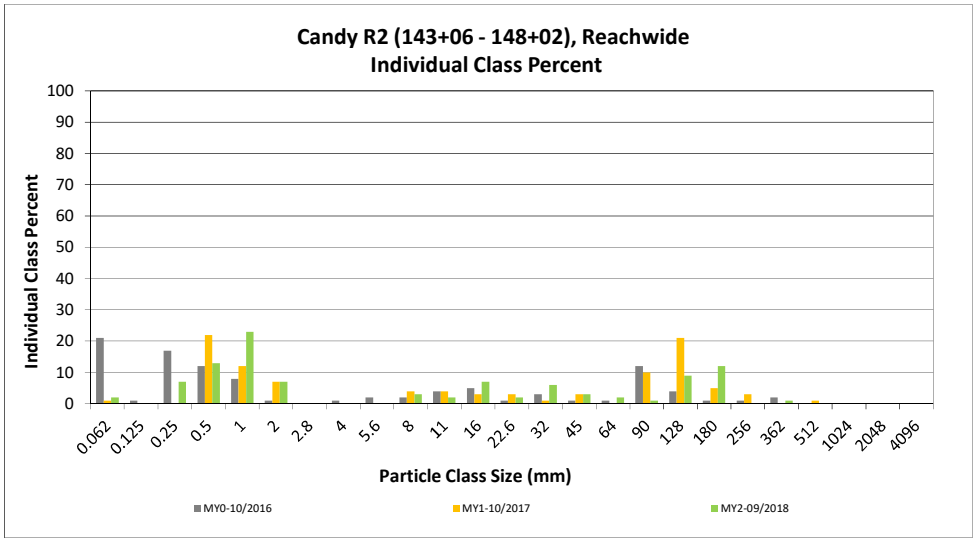
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R2 (143+06 - 148+02), 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	2	2	2
SAND	Very fine	0.062	0.125					2
	Fine	0.125	0.250		7	7	7	9
	Medium	0.25	0.50	3	10	13	13	22
	Coarse	0.5	1.0	10	13	23	23	45
	Very Coarse	1.0	2.0	4	3	7	7	52
GRAVEL	Very Fine	2.0	2.8					52
	Very Fine	2.8	4.0					52
	Fine	4.0	5.6					52
	Fine	5.6	8.0	3		3	3	55
	Medium	8.0	11.0	1	1	2	2	57
	Medium	11.0	16.0	4	3	7	7	64
	Coarse	16.0	22.6	1	1	2	2	66
	Coarse	22.6	32	1	5	6	6	72
	Very Coarse	32	45		3	3	3	75
	Very Coarse	45	64	2		2	2	77
COBBLE	Small	64	90	1		1	1	78
	Small	90	128	9		9	9	87
	Large	128	180	10	2	12	12	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} =	0.36
D_{35} =	0.74
D_{50} =	1.6
D_{84} =	113.8
D_{95} =	160.7
D_{100} =	362.0





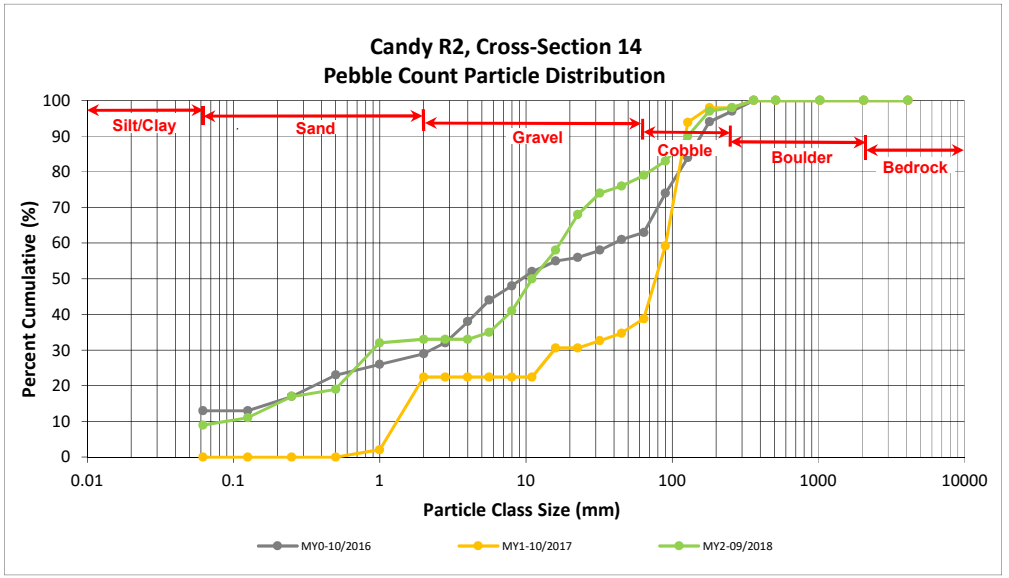
Reachwide and Cross-Section Pebble Count Plots

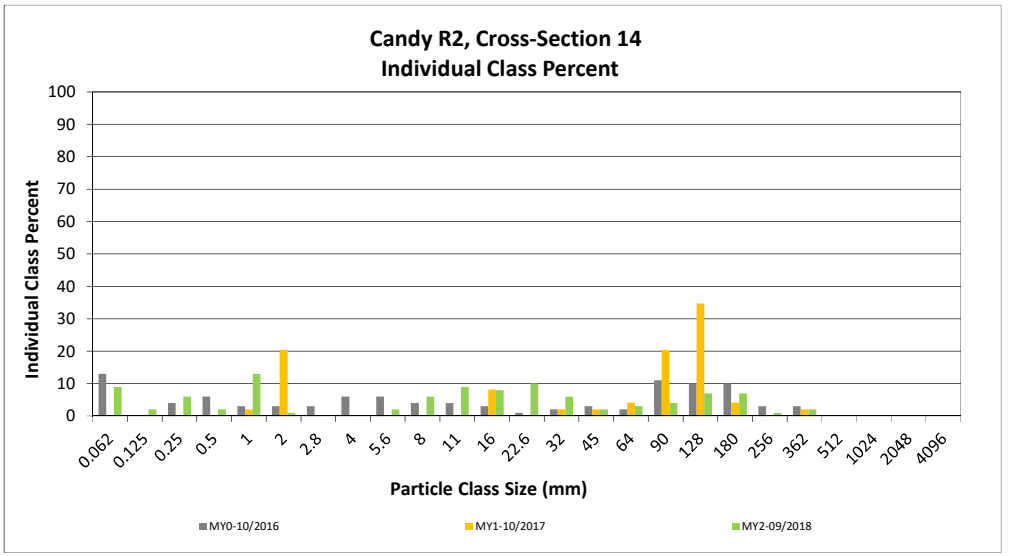
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R2, Cross-Section 14

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	9	9	9
SAND	Very fine	0.062	0.125	2	2	11
	Fine	0.125	0.250	6	6	17
	Medium	0.25	0.50	2	2	19
	Coarse	0.5	1.0	13	13	32
	Very Coarse	1.0	2.0	1	1	33
GRAVEL	Very Fine	2.0	2.8			33
	Very Fine	2.8	4.0			33
	Fine	4.0	5.6	2	2	35
	Fine	5.6	8.0	6	6	41
	Medium	8.0	11.0	9	9	50
	Medium	11.0	16.0	8	8	58
	Coarse	16.0	22.6	10	10	68
	Coarse	22.6	32	6	6	74
	Very Coarse	32	45	2	2	76
	Very Coarse	45	64	3	3	79
COBBLE	Small	64	90	4	4	83
	Small	90	128	7	7	90
	Large	128	180	7	7	97
	Large	180	256	1	1	98
BOULDER	Small	256	362	2	2	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 14	
Channel materials (mm)	
D_{16} =	0.22
D_{35} =	5.60
D_{50} =	11.0
D_{84} =	94.6
D_{95} =	163.3
D_{100} =	362.0





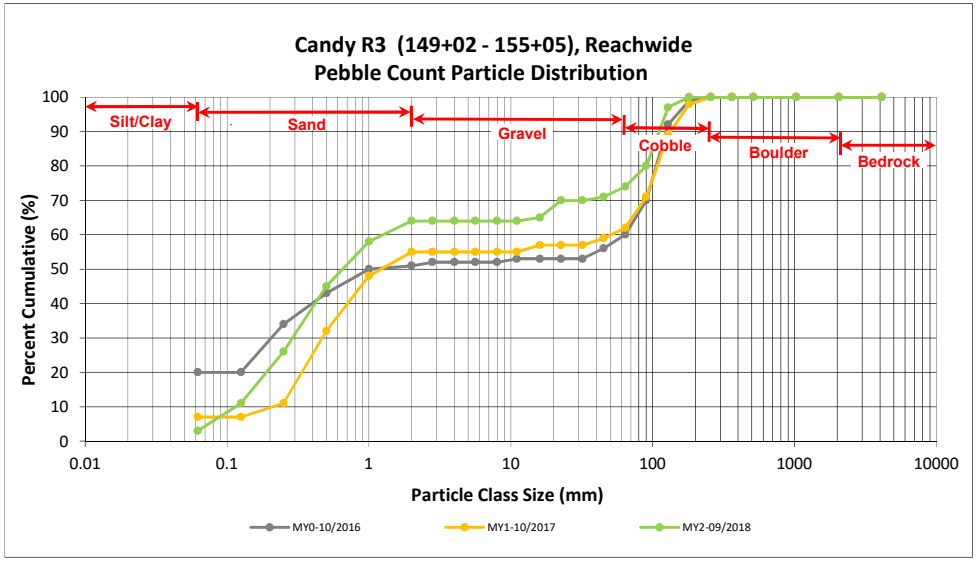
Reachwide and Cross-Section Pebble Count Plots

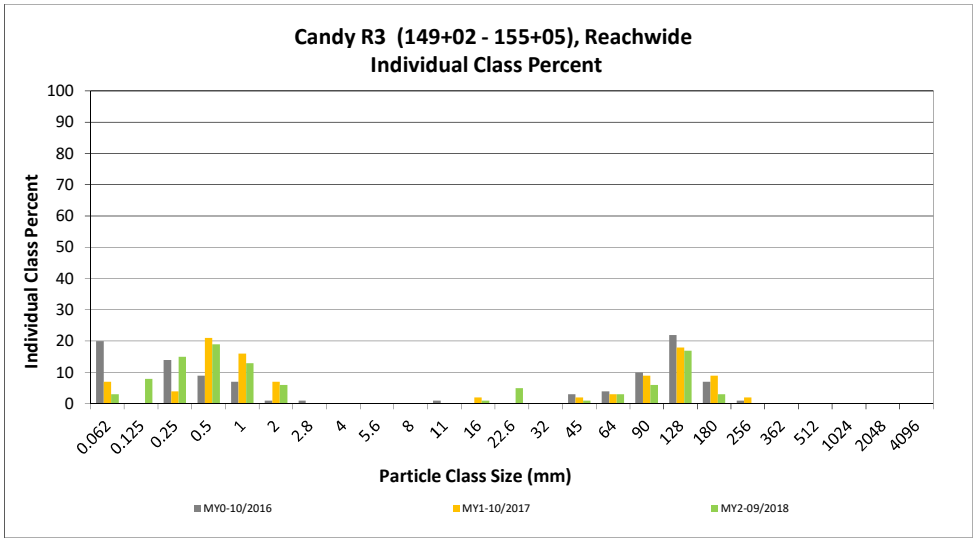
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R3 (149+02 - 155+05), 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		3	3	3	3
SAND	Very fine	0.062	0.125		8	8	8	11
	Fine	0.125	0.250	4	11	15	15	26
	Medium	0.25	0.50	7	12	19	19	45
	Coarse	0.5	1.0	4	9	13	13	58
	Very Coarse	1.0	2.0	4	2	6	6	64
GRAVEL	Very Fine	2.0	2.8					64
	Very Fine	2.8	4.0					64
	Fine	4.0	5.6					64
	Fine	5.6	8.0					64
	Medium	8.0	11.0					64
	Medium	11.0	16.0		1	1	1	65
	Coarse	16.0	22.6	4	1	5	5	70
	Coarse	22.6	32					70
	Very Coarse	32	45	1		1	1	71
	Very Coarse	45	64	2	1	3	3	74
COBBLE	Small	64	90	5	1	6	6	80
	Small	90	128	16	1	17	17	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	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.16
D_{35} =	0.35
D_{50} =	0.7
D_{84} =	97.8
D_{95} =	122.8
D_{100} =	180.0





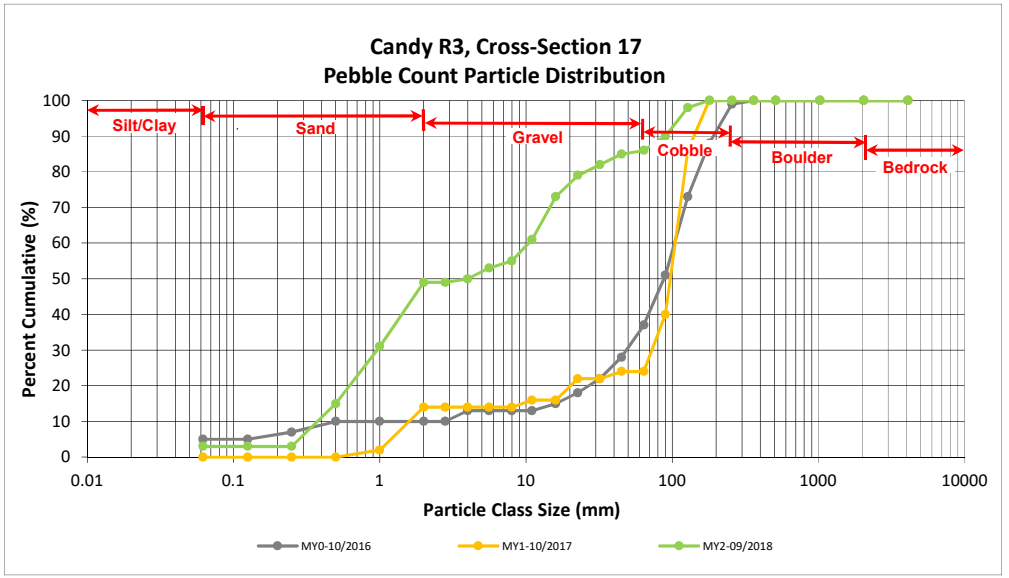
Reachwide and Cross-Section Pebble Count Plots

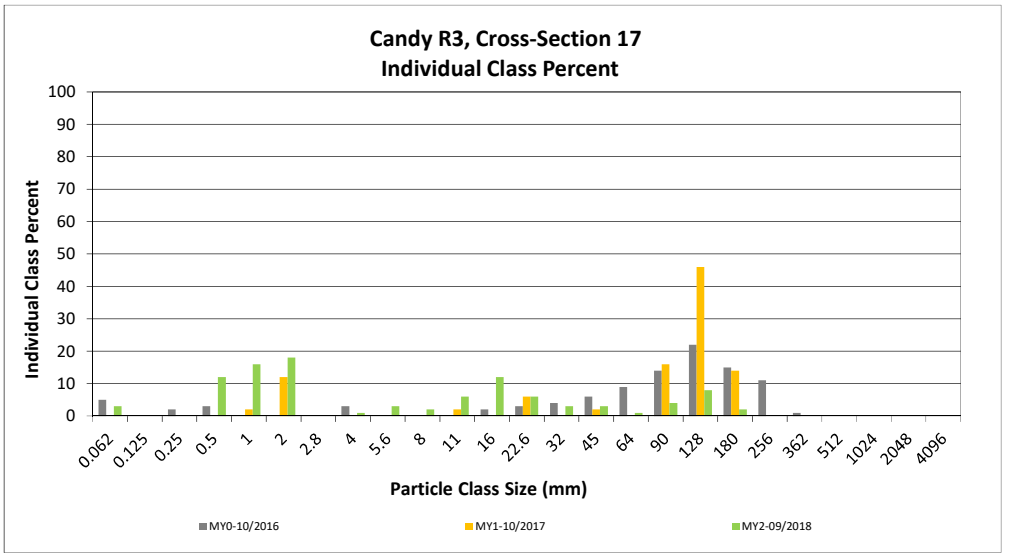
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R3, Cross-Section 17

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	3	3	3
SAND	Very fine	0.062	0.125			3
	Fine	0.125	0.250			3
	Medium	0.25	0.50	12	12	15
	Coarse	0.5	1.0	16	16	31
	Very Coarse	1.0	2.0	18	18	49
GRAVEL	Very Fine	2.0	2.8			49
	Very Fine	2.8	4.0	1	1	50
	Fine	4.0	5.6	3	3	53
	Fine	5.6	8.0	2	2	55
	Medium	8.0	11.0	6	6	61
	Medium	11.0	16.0	12	12	73
	Coarse	16.0	22.6	6	6	79
	Coarse	22.6	32	3	3	82
	Very Coarse	32	45	3	3	85
	Very Coarse	45	64	1	1	86
COBBLE	Small	64	90	4	4	90
	Small	90	128	8	8	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 17	
Channel materials (mm)	
D_{16} =	0.52
D_{35} =	1.17
D_{50} =	4.0
D_{84} =	40.2
D_{95} =	112.2
D_{100} =	180.0





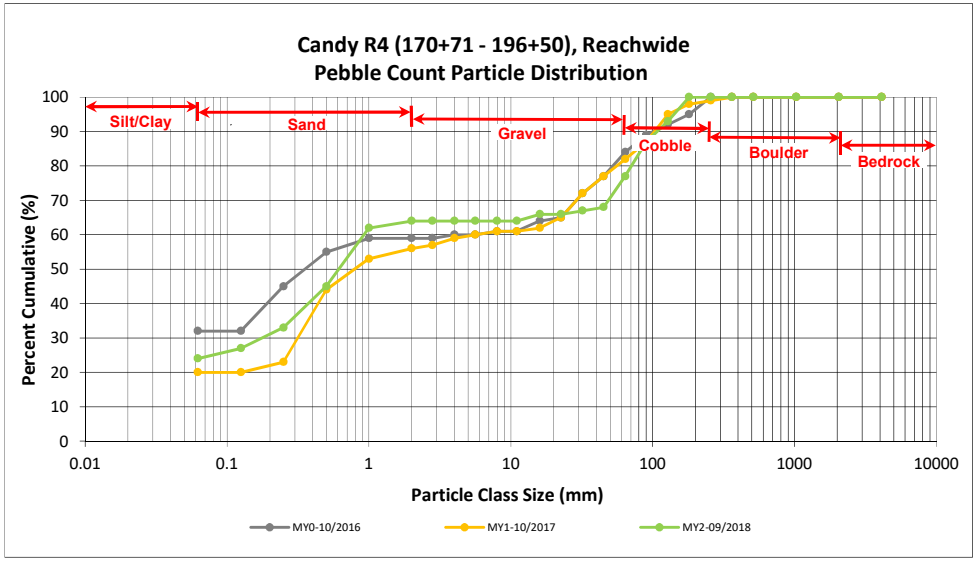
Reachwide and Cross-Section Pebble Count Plots

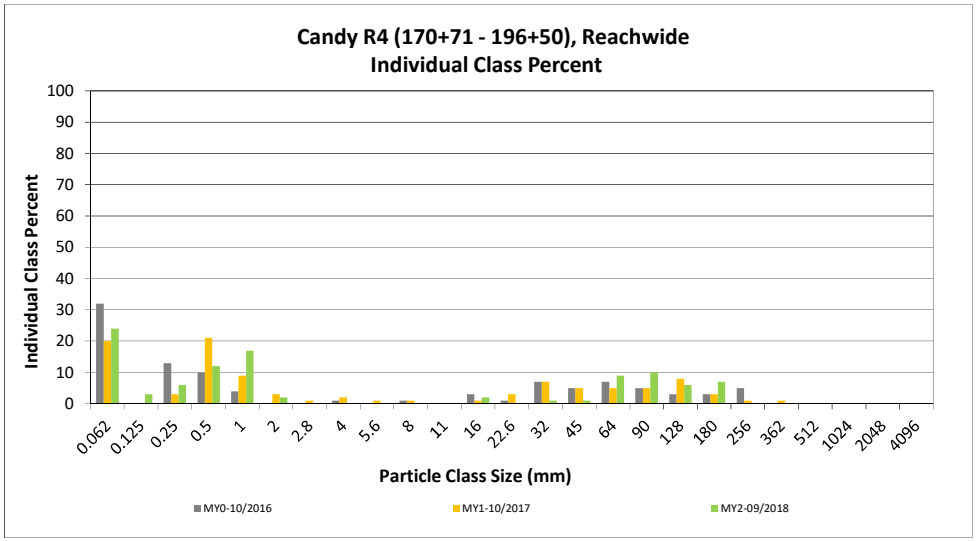
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R4 (170+71 - 196+50), 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	20	24	24	24
SAND	Very fine	0.062	0.125		3	3	3	27
	Fine	0.125	0.250	4	2	6	6	33
	Medium	0.25	0.50	4	8	12	12	45
	Coarse	0.5	1.0	5	12	17	17	62
	Very Coarse	1.0	2.0		2	2	2	64
GRAVEL	Very Fine	2.0	2.8					64
	Very Fine	2.8	4.0					64
	Fine	4.0	5.6					64
	Fine	5.6	8.0					64
	Medium	8.0	11.0					64
	Medium	11.0	16.0	1	1	2	2	66
	Coarse	16.0	22.6					66
	Coarse	22.6	32	1		1	1	67
	Very Coarse	32	45	1		1	1	68
	Very Coarse	45	64	9		9	9	77
COBBLE	Small	64	90	9	1	10	10	87
	Small	90	128	6		6	6	93
	Large	128	180	6	1	7	7	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} =	0.28
D_{50} =	0.6
D_{84} =	81.3
D_{95} =	141.1
D_{100} =	180.0





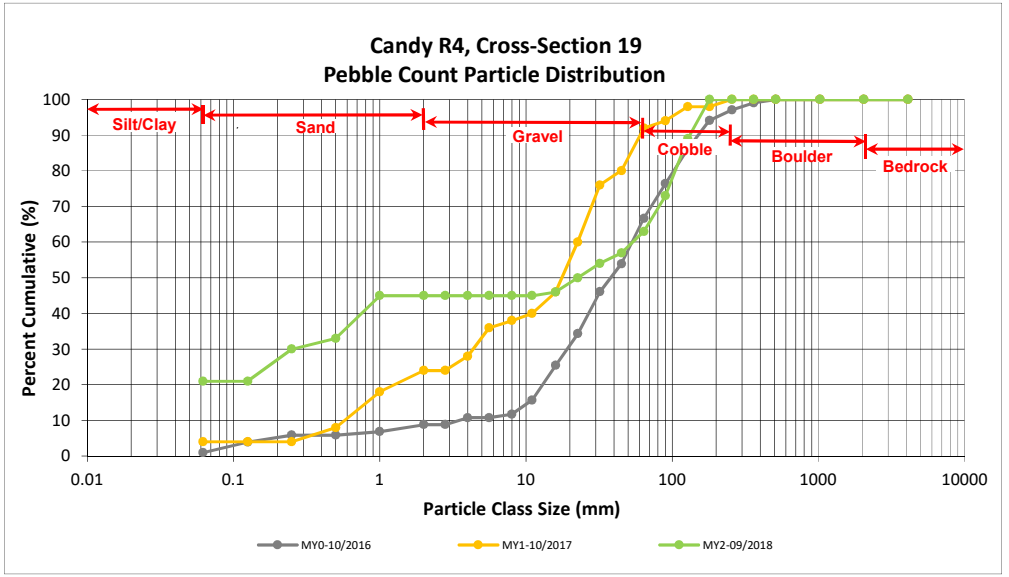
Reachwide and Cross-Section Pebble Count Plots

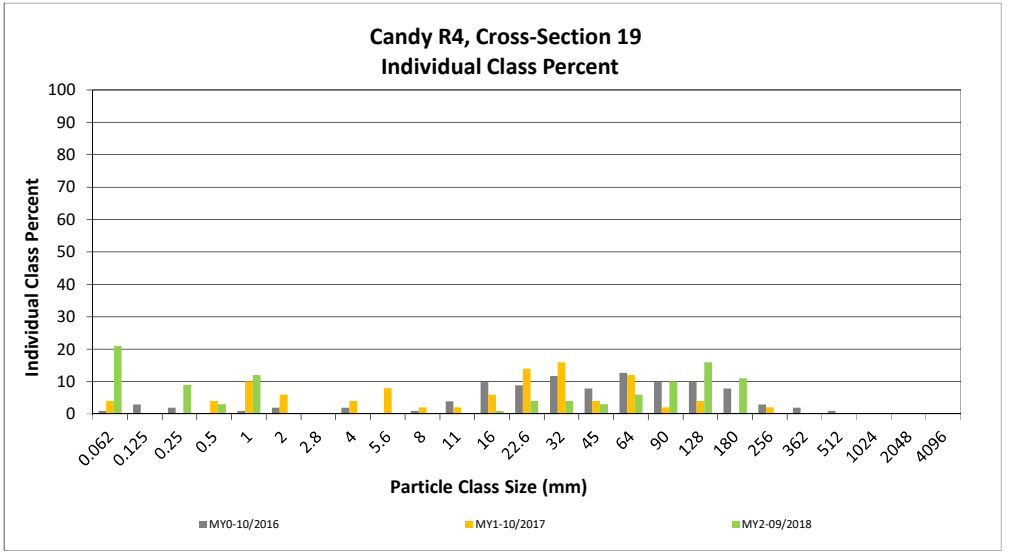
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R4, Cross-Section 19

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	21	21	21
SAND	Very fine	0.062	0.125			21
	Fine	0.125	0.250	9	9	30
	Medium	0.25	0.50	3	3	33
	Coarse	0.5	1.0	12	12	45
	Very Coarse	1.0	2.0			45
GRAVEL	Very Fine	2.0	2.8			45
	Very Fine	2.8	4.0			45
	Fine	4.0	5.6			45
	Fine	5.6	8.0			45
	Medium	8.0	11.0			45
	Medium	11.0	16.0	1	1	46
	Coarse	16.0	22.6	4	4	50
	Coarse	22.6	32	4	4	54
	Very Coarse	32	45	3	3	57
	Very Coarse	45	64	6	6	63
COBBLE	Small	64	90	10	10	73
	Small	90	128	16	16	89
	Large	128	180	11	11	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 19	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.56
D_{50} =	22.6
D_{84} =	114.7
D_{95} =	154.2
D_{100} =	180.0





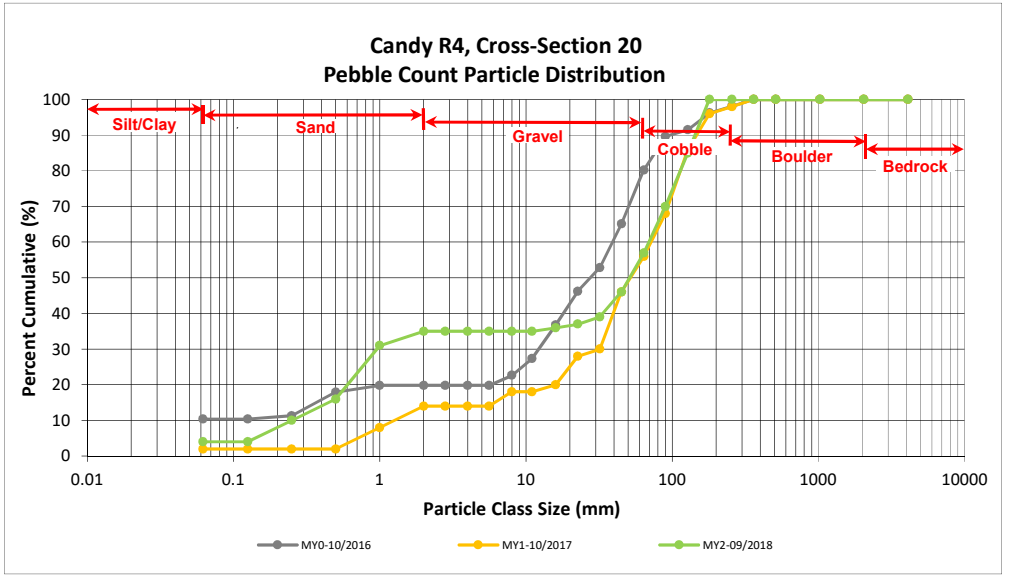
Reachwide and Cross-Section Pebble Count Plots

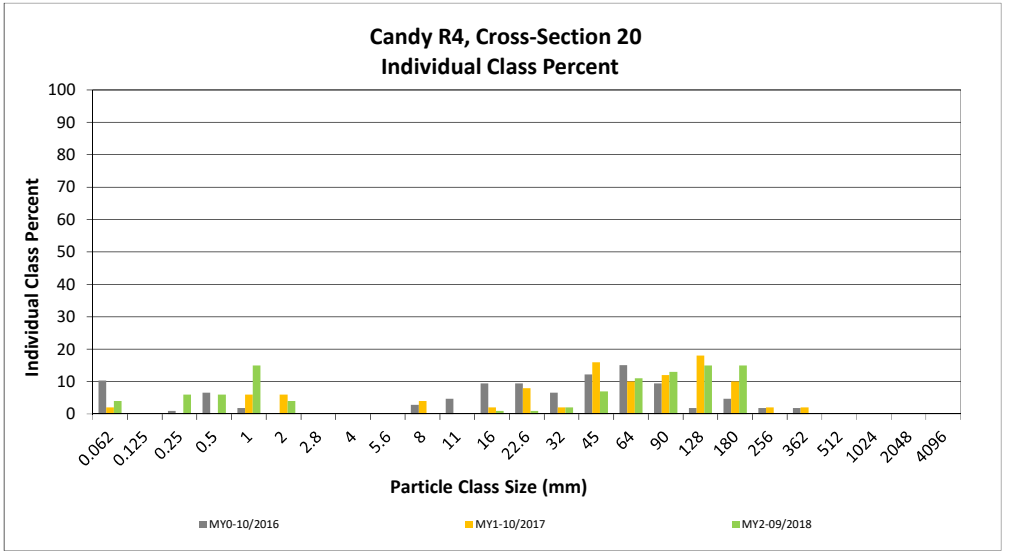
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R4, Cross-Section 20

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4	4	4
SAND	Very fine	0.062	0.125			4
	Fine	0.125	0.250	6	6	10
	Medium	0.25	0.50	6	6	16
	Coarse	0.5	1.0	15	15	31
	Very Coarse	1.0	2.0	4	4	35
GRAVEL	Very Fine	2.0	2.8			35
	Very Fine	2.8	4.0			35
	Fine	4.0	5.6			35
	Fine	5.6	8.0			35
	Medium	8.0	11.0			35
	Medium	11.0	16.0	1	1	36
	Coarse	16.0	22.6	1	1	37
	Coarse	22.6	32	2	2	39
	Very Coarse	32	45	7	7	46
	Very Coarse	45	64	11	11	57
COBBLE	Small	64	90	13	13	70
	Small	90	128	15	15	85
	Large	128	180	15	15	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 20	
Channel materials (mm)	
D_{16} =	0.50
D_{35} =	2.00
D_{50} =	51.1
D_{84} =	125.0
D_{95} =	160.7
D_{100} =	180.0





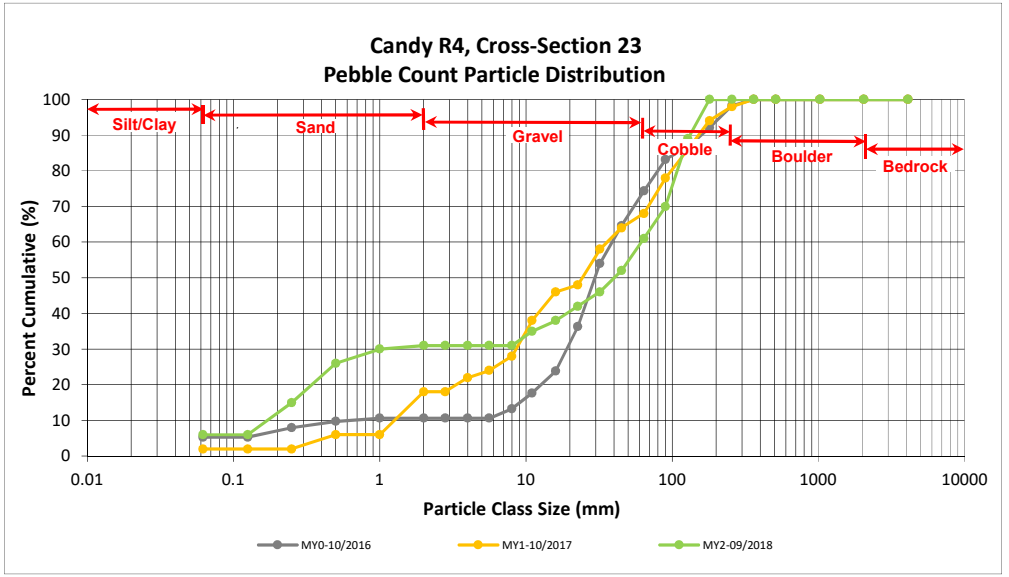
Reachwide and Cross-Section Pebble Count Plots

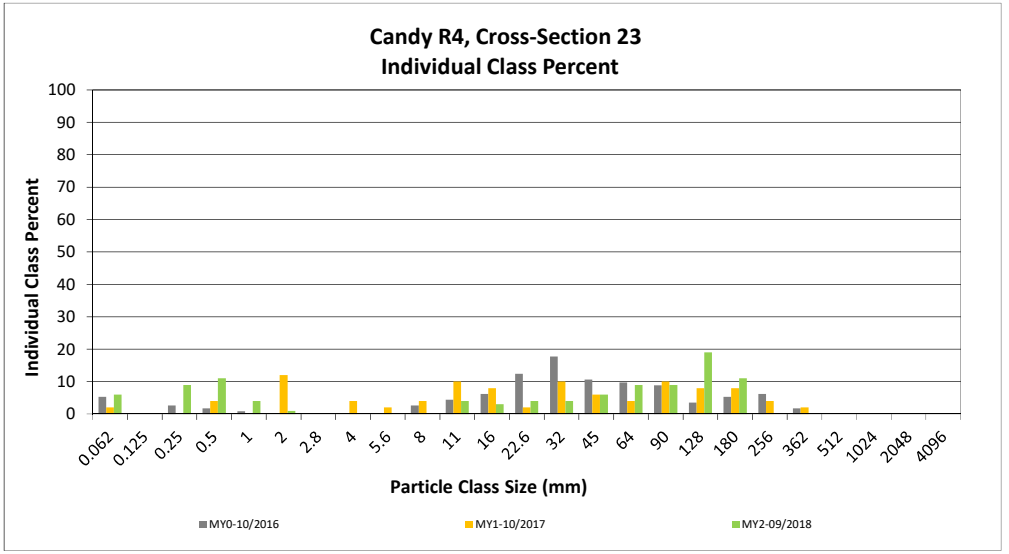
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R4, Cross-Section 23

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	6	6	6
SAND	Very fine	0.062	0.125			6
	Fine	0.125	0.250	9	9	15
	Medium	0.25	0.50	11	11	26
	Coarse	0.5	1.0	4	4	30
	Very Coarse	1.0	2.0	1	1	31
GRAVEL	Very Fine	2.0	2.8			31
	Very Fine	2.8	4.0			31
	Fine	4.0	5.6			31
	Fine	5.6	8.0			31
	Medium	8.0	11.0	4	4	35
	Medium	11.0	16.0	3	3	38
	Coarse	16.0	22.6	4	4	42
	Coarse	22.6	32	4	4	46
	Very Coarse	32	45	6	6	52
	Very Coarse	45	64	9	9	61
COBBLE	Small	64	90	9	9	70
	Small	90	128	19	19	89
	Large	128	180	11	11	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 23	
Channel materials (mm)	
D_{16} =	0.27
D_{35} =	11.00
D_{50} =	40.2
D_{84} =	116.7
D_{95} =	154.2
D_{100} =	180.0





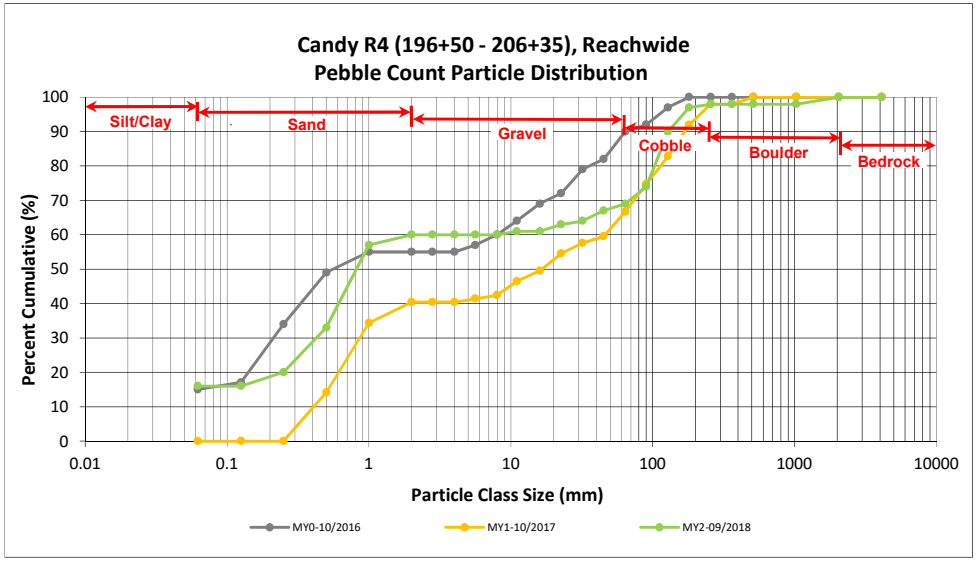
Reachwide and Cross-Section Pebble Count Plots

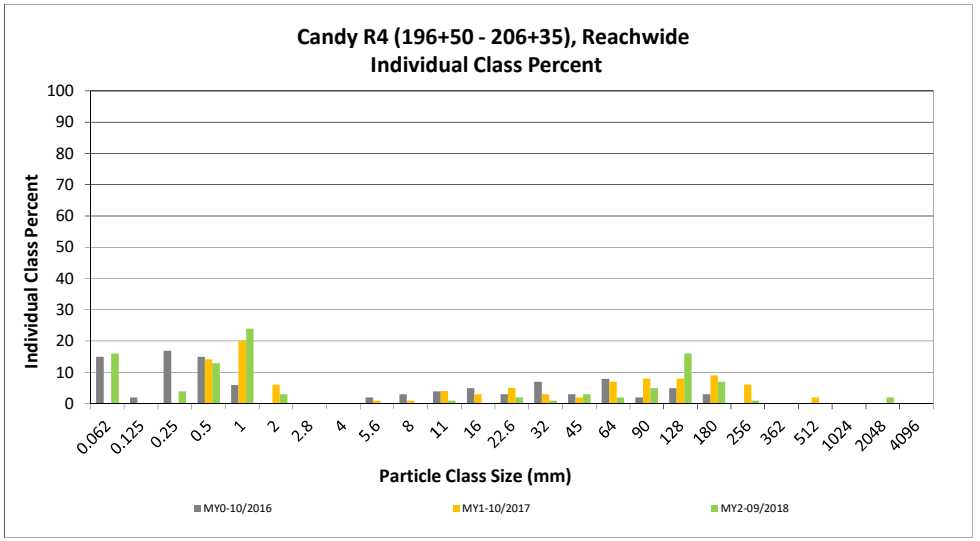
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R4 (196+50 - 206+35), 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		16	16	16	16
SAND	Very fine	0.062	0.125					16
	Fine	0.125	0.250		4	4	4	20
	Medium	0.25	0.50	2	11	13	13	33
	Coarse	0.5	1.0	13	11	24	24	57
	Very Coarse	1.0	2.0	2	1	3	3	60
GRAVEL	Very Fine	2.0	2.8					60
	Very Fine	2.8	4.0					60
	Fine	4.0	5.6					60
	Fine	5.6	8.0					60
	Medium	8.0	11.0	1		1	1	61
	Medium	11.0	16.0					61
	Coarse	16.0	22.6		2	2	2	63
	Coarse	22.6	32	1		1	1	64
	Very Coarse	32	45	2	1	3	3	67
	Very Coarse	45	64		2	2	2	69
COBBLE	Small	64	90	5		5	5	74
	Small	90	128	15	1	16	16	90
	Large	128	180	6	1	7	7	97
	Large	180	256	1		1	1	98
BOULDER	Small	256	362					98
	Small	362	512					98
	Medium	512	1024					98
	Large/Very Large	1024	2048	2		2	2	100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.53
D_{50} =	0.8
D_{84} =	112.2
D_{95} =	163.3
D_{100} =	2048.0





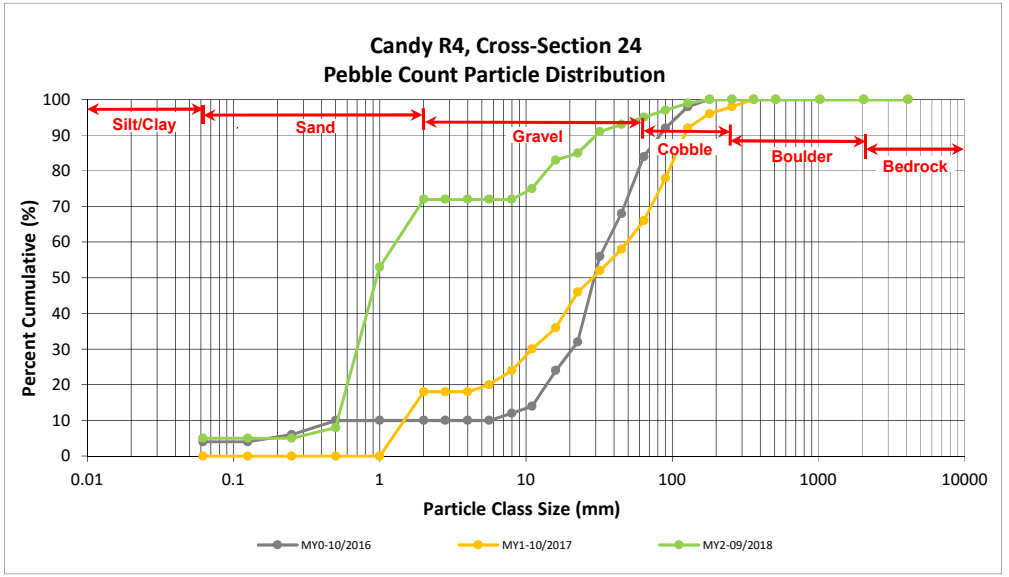
Reachwide and Cross-Section Pebble Count Plots

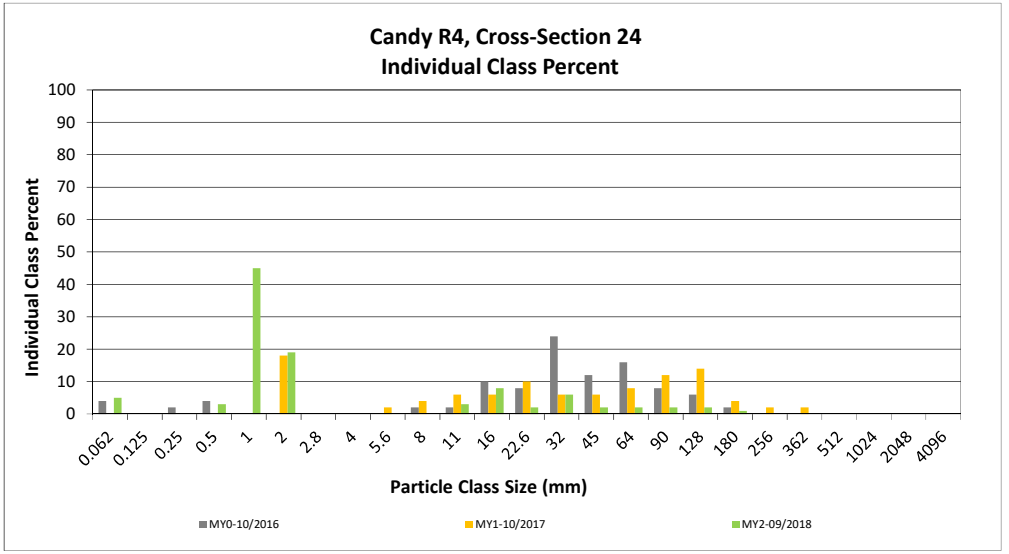
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R4, Cross-Section 24

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	5	5	5
SAND	Very fine	0.062	0.125			5
	Fine	0.125	0.250			5
	Medium	0.25	0.50	3	3	8
	Coarse	0.5	1.0	45	45	53
	Very Coarse	1.0	2.0	19	19	72
GRAVEL	Very Fine	2.0	2.8			72
	Very Fine	2.8	4.0			72
	Fine	4.0	5.6			72
	Fine	5.6	8.0			72
	Medium	8.0	11.0	3	3	75
	Medium	11.0	16.0	8	8	83
	Coarse	16.0	22.6	2	2	85
	Coarse	22.6	32	6	6	91
	Very Coarse	32	45	2	2	93
	Very Coarse	45	64	2	2	95
COBBLE	Small	64	90	2	2	97
	Small	90	128	2	2	99
	Large	128	180	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	**100**	**100**	**100**

Cross-Section 24	
Channel materials (mm)	
D_{16} =	0.57
D_{35} =	0.76
D_{50} =	1.0
D_{84} =	19.0
D_{95} =	64.0
D_{100} =	180.0





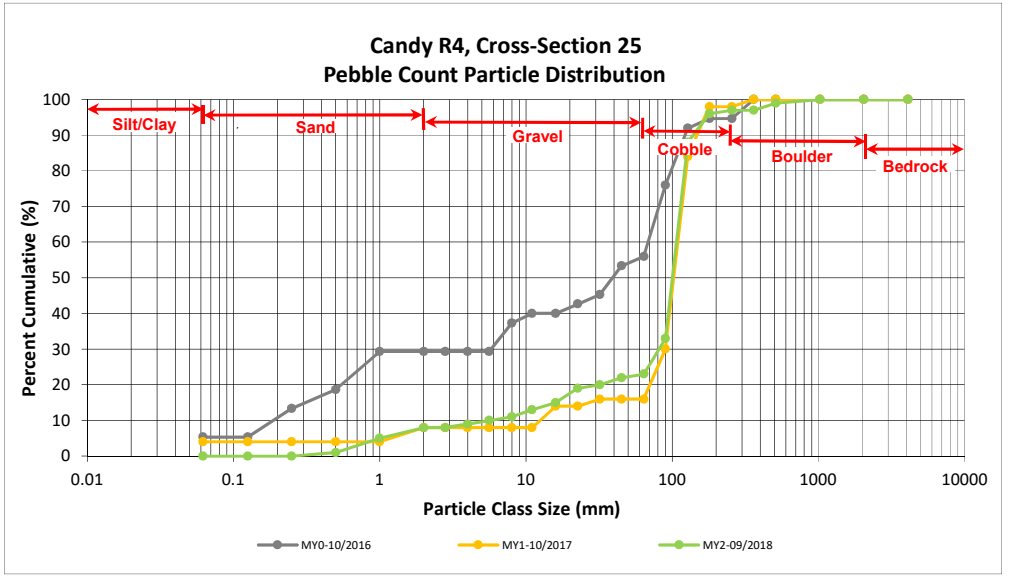
Reachwide and Cross-Section Pebble Count Plots

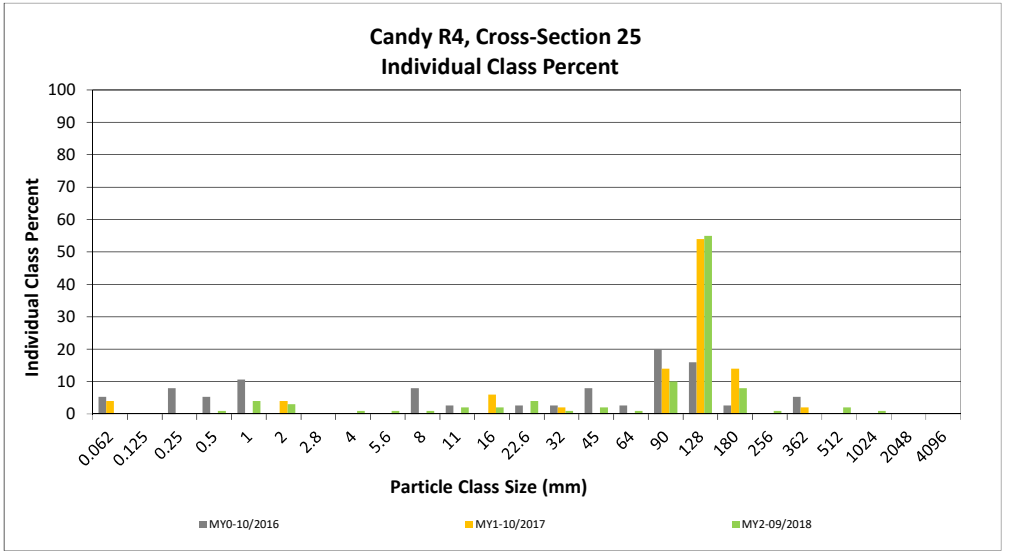
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Candy R4, Cross-Section 25

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	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	1	1	1
	Coarse	0.5	1.0	4	4	5
	Very Coarse	1.0	2.0	3	3	8
GRAVEL	Very Fine	2.0	2.8			8
	Very Fine	2.8	4.0	1	1	9
	Fine	4.0	5.6	1	1	10
	Fine	5.6	8.0	1	1	11
	Medium	8.0	11.0	2	2	13
	Medium	11.0	16.0	2	2	15
	Coarse	16.0	22.6	4	4	19
	Coarse	22.6	32	1	1	20
	Very Coarse	32	45	2	2	22
	Very Coarse	45	64	1	1	23
COBBLE	Small	64	90	10	10	33
	Small	90	128	55	55	88
	Large	128	180	8	8	96
	Large	180	256	1	1	97
BOULDER	Small	256	362			97
	Small	362	512	2	2	99
	Medium	512	1024	1	1	100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross-Section 25	
Channel materials (mm)	
D_{16} =	17.44
D_{35} =	91.16
D_{50} =	100.4
D_{84} =	124.8
D_{95} =	172.5
D_{100} =	1024.0





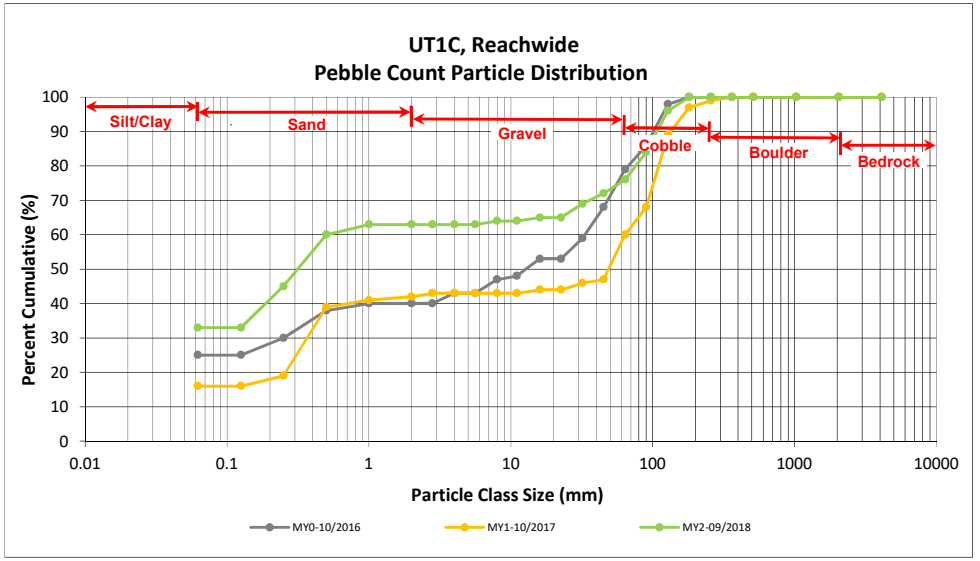
Reachwide and Cross-Section Pebble Count Plots

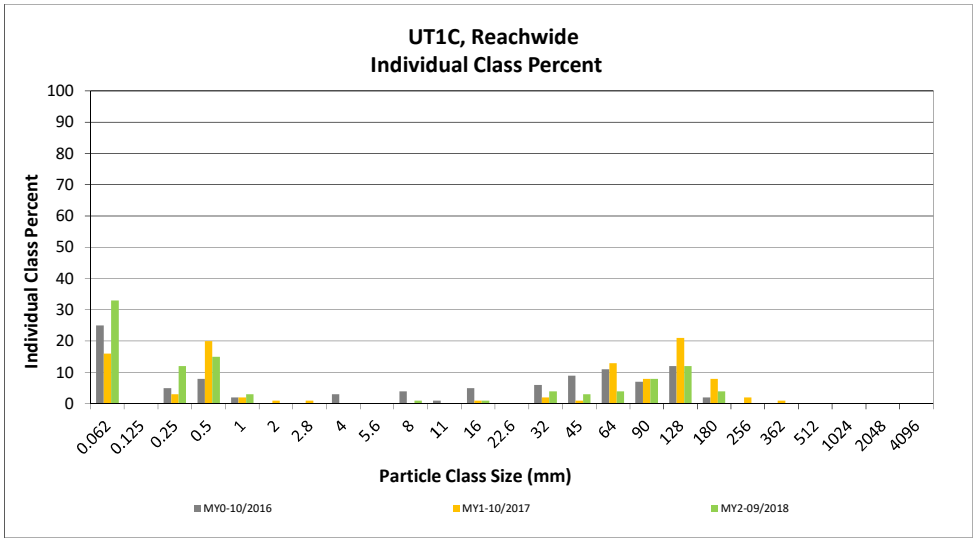
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

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	10		10	20	20
SAND	Very fine	0.062	0.125					20
	Fine	0.125	0.250	1		1	2	22
	Medium	0.25	0.50	3		3	6	28
	Coarse	0.5	1.0	3		3	6	34
	Very Coarse	1.0	2.0					34
GRAVEL	Very Fine	2.0	2.8					34
	Very Fine	2.8	4.0					34
	Fine	4.0	5.6					34
	Fine	5.6	8.0	1		1	2	36
	Medium	8.0	11.0					36
	Medium	11.0	16.0	1		1	2	38
	Coarse	16.0	22.6					38
	Coarse	22.6	32	2		2	4	42
	Very Coarse	32	45	1		1	2	44
	Very Coarse	45	64	4		4	8	52
COBBLE	Small	64	90	8		8	16	68
	Small	90	128	12		12	24	92
	Large	128	180	4		4	8	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**	**0**	**50**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	6.69
D_{50} =	58.6
D_{84} =	113.8
D_{95} =	145.5
D_{100} =	180.0





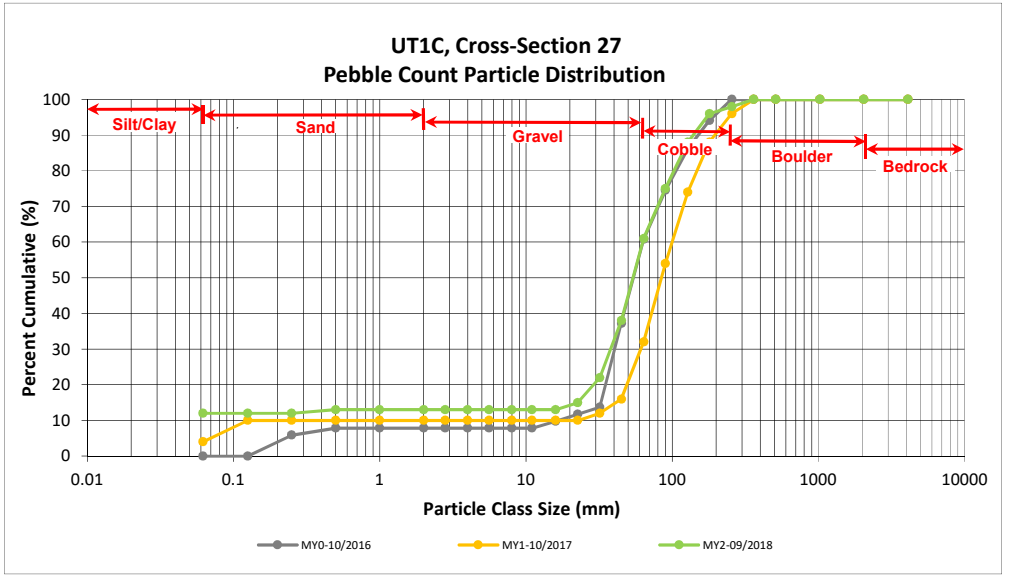
Reachwide and Cross-Section Pebble Count Plots

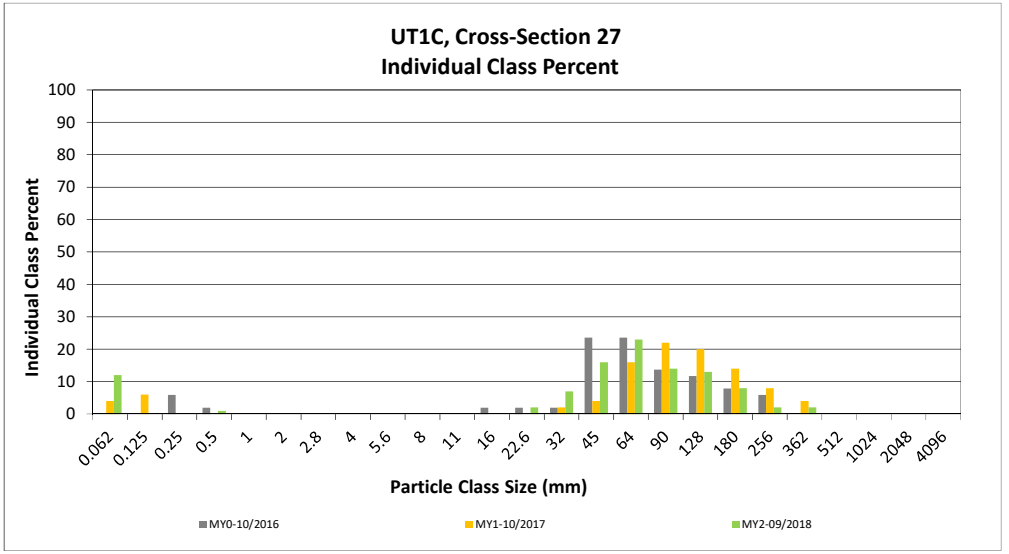
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT1C, Cross-Section 27

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	12	12	12
SAND	Very fine	0.062	0.125			12
	Fine	0.125	0.250			12
	Medium	0.25	0.50	1	1	13
	Coarse	0.5	1.0			13
	Very Coarse	1.0	2.0			13
GRAVEL	Very Fine	2.0	2.8			13
	Very Fine	2.8	4.0			13
	Fine	4.0	5.6			13
	Fine	5.6	8.0			13
	Medium	8.0	11.0			13
	Medium	11.0	16.0			13
	Coarse	16.0	22.6	2	2	15
	Coarse	22.6	32	7	7	22
	Very Coarse	32	45	16	16	38
	Very Coarse	45	64	23	23	61
COBBLE	Small	64	90	14	14	75
	Small	90	128	13	13	88
	Large	128	180	8	8	96
	Large	180	256	2	2	98
BOULDER	Small	256	362	2	2	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 27	
Channel materials (mm)	
D_{16} =	23.75
D_{35} =	42.21
D_{50} =	54.1
D_{84} =	114.9
D_{95} =	172.5
D_{100} =	362.0





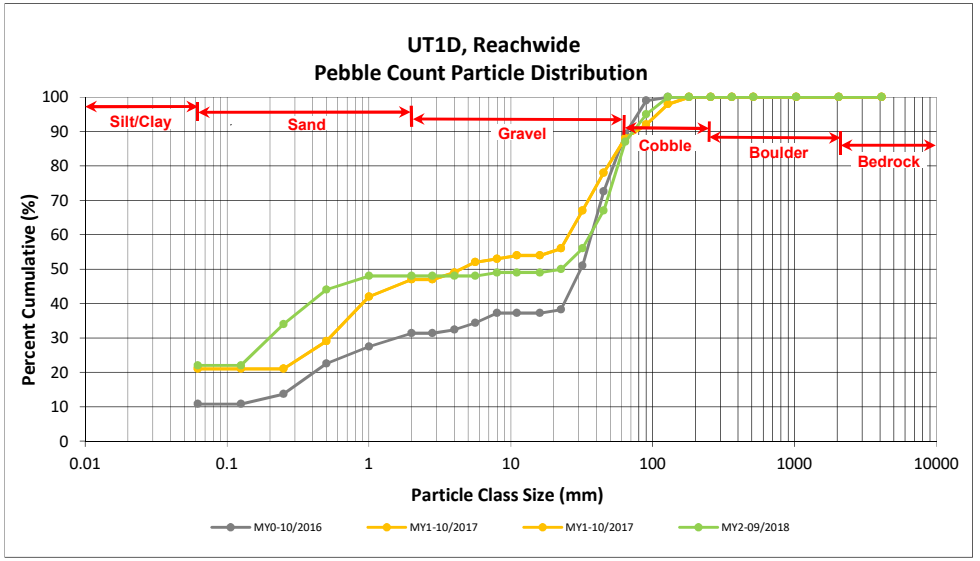
Reachwide and Cross-Section Pebble Count Plots

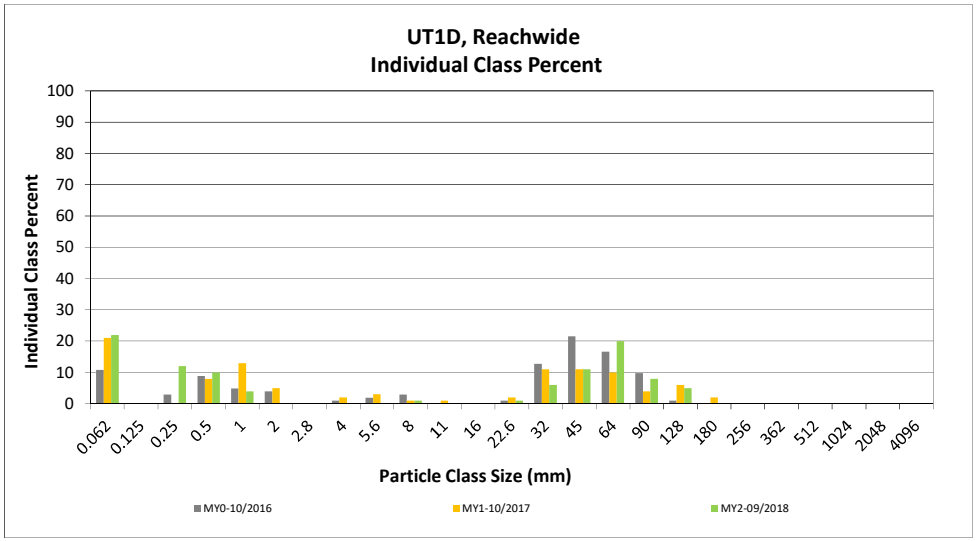
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT1D, 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	18	22	22	22
SAND	Very fine	0.062	0.125					22
	Fine	0.125	0.250	2	10	12	12	34
	Medium	0.25	0.50	2	8	10	10	44
	Coarse	0.5	1.0	4		4	4	48
	Very Coarse	1.0	2.0					48
GRAVEL	Very Fine	2.0	2.8					48
	Very Fine	2.8	4.0					48
	Fine	4.0	5.6					48
	Fine	5.6	8.0	1		1	1	49
	Medium	8.0	11.0					49
	Medium	11.0	16.0					49
	Coarse	16.0	22.6	1		1	1	50
	Coarse	22.6	32	4	2	6	6	56
	Very Coarse	32	45	6	5	11	11	67
	Very Coarse	45	64	17	3	20	20	87
COBBLE	Small	64	90	5	3	8	8	95
	Small	90	128	4	1	5	5	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} =	0.27
D_{50} =	22.6
D_{84} =	60.7
D_{95} =	90.0
D_{100} =	128.0





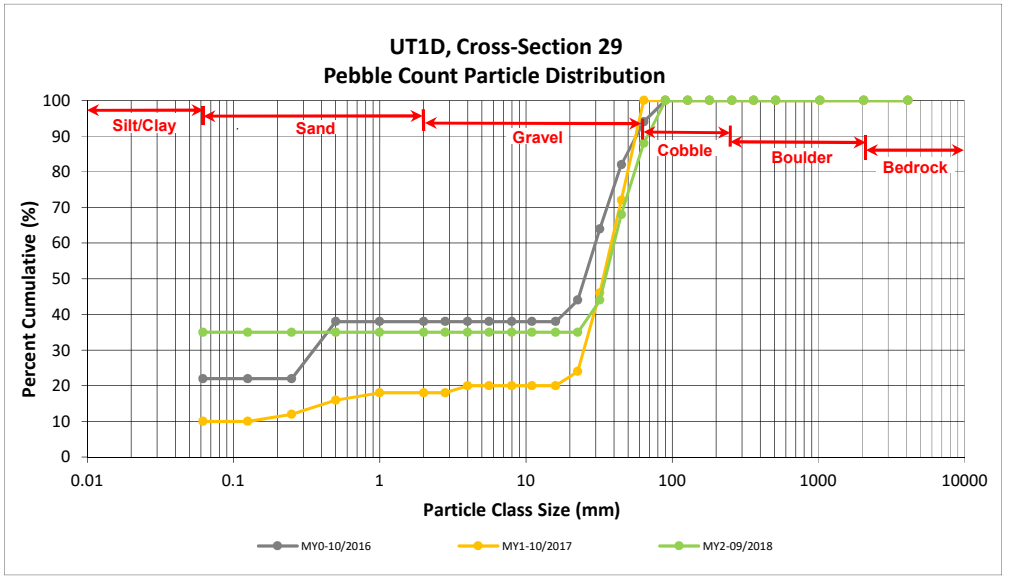
Reachwide and Cross-Section Pebble Count Plots

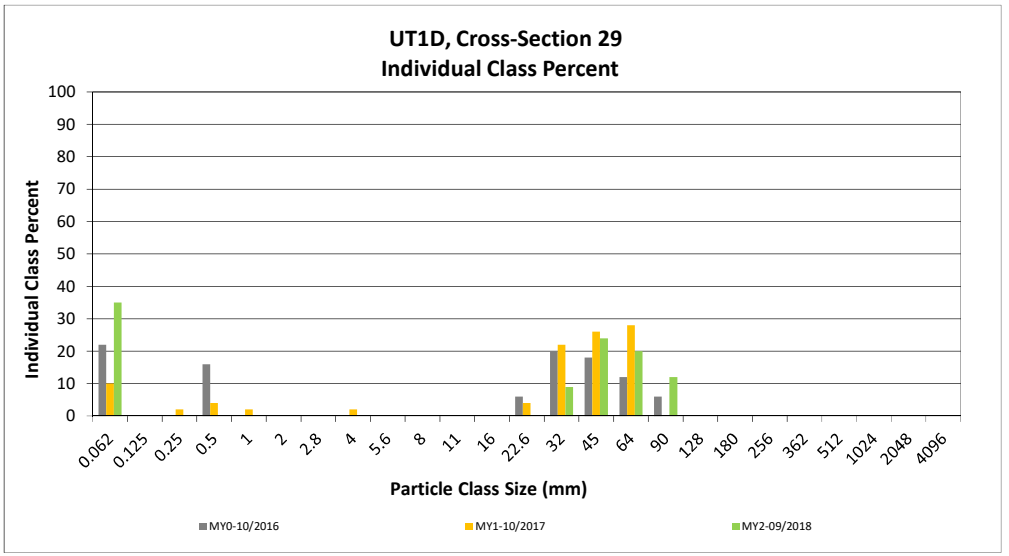
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT1D, Cross-Section 29

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	35	35	35
SAND	Very fine	0.062	0.125			35
	Fine	0.125	0.250			35
	Medium	0.25	0.50			35
	Coarse	0.5	1.0			35
	Very Coarse	1.0	2.0			35
GRAVEL	Very Fine	2.0	2.8			35
	Very Fine	2.8	4.0			35
	Fine	4.0	5.6			35
	Fine	5.6	8.0			35
	Medium	8.0	11.0			35
	Medium	11.0	16.0			35
	Coarse	16.0	22.6			35
	Coarse	22.6	32	9	9	44
	Very Coarse	32	45	24	24	68
	Very Coarse	45	64	20	20	88
COBBLE	Small	64	90	12	12	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 29	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	Silt/Clay
D_{50} =	34.8
D_{84} =	59.6
D_{95} =	78.1
D_{100} =	90.0





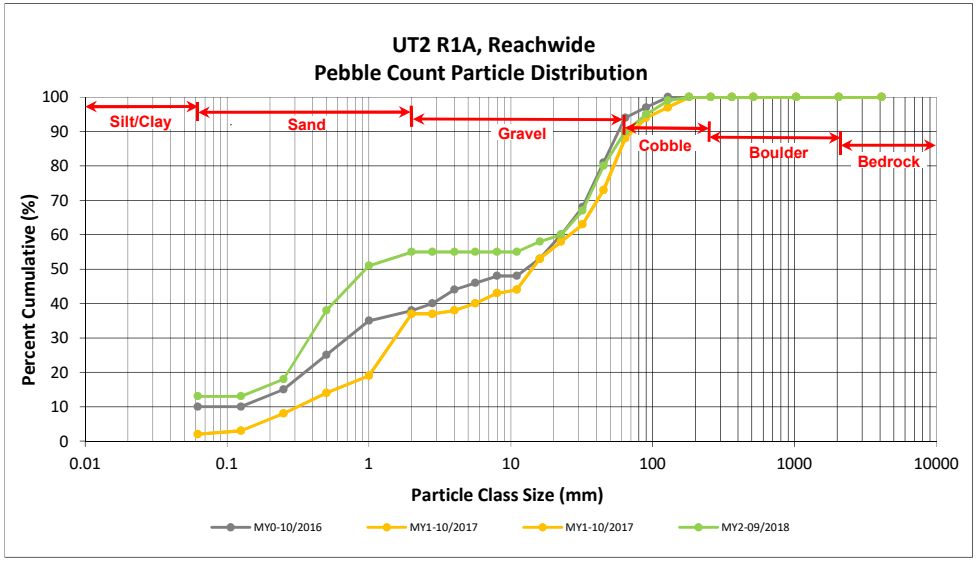
Reachwide and Cross-Section Pebble Count Plots

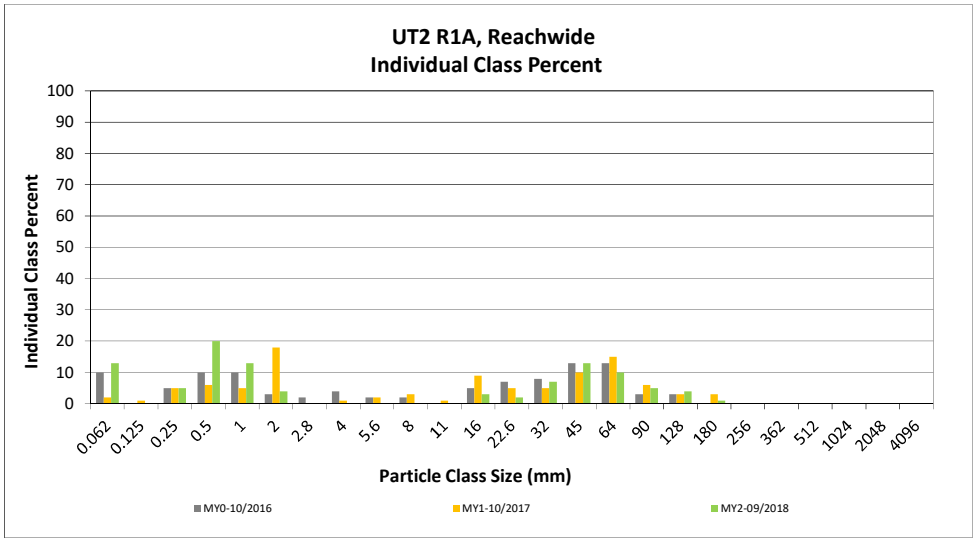
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 R1A, 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	3	10	13	13	13
SAND	Very fine	0.062	0.125					13
	Fine	0.125	0.250		5	5	5	18
	Medium	0.25	0.50	5	15	20	20	38
	Coarse	0.5	1.0	6	7	13	13	51
	Very Coarse	1.0	2.0		4	4	4	55
GRAVEL	Very Fine	2.0	2.8					55
	Very Fine	2.8	4.0					55
	Fine	4.0	5.6					55
	Fine	5.6	8.0					55
	Medium	8.0	11.0					55
	Medium	11.0	16.0	1	2	3	3	58
	Coarse	16.0	22.6	2		2	2	60
	Coarse	22.6	32	5	2	7	7	67
	Very Coarse	32	45	12	1	13	13	80
	Very Coarse	45	64	8	2	10	10	90
COBBLE	Small	64	90	3	2	5	5	95
	Small	90	128	4		4	4	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**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.19
D_{35} =	0.45
D_{50} =	0.9
D_{84} =	51.8
D_{95} =	90.0
D_{100} =	180.0





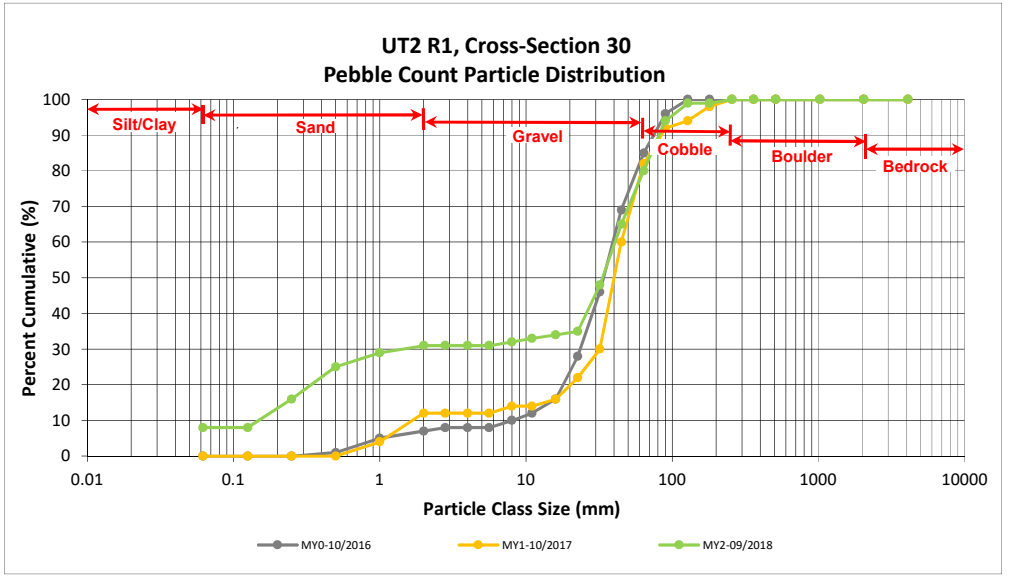
Reachwide and Cross-Section Pebble Count Plots

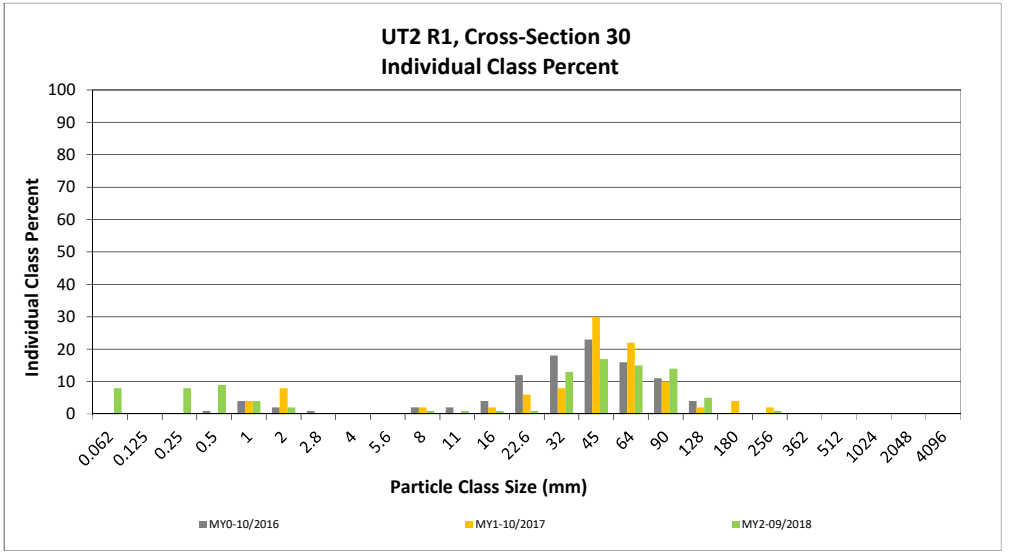
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 R1, Cross-Section 30

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	8	8	8
SAND	Very fine	0.062	0.125			8
	Fine	0.125	0.250	8	8	16
	Medium	0.25	0.50	9	9	25
	Coarse	0.5	1.0	4	4	29
	Very Coarse	1.0	2.0	2	2	31
GRAVEL	Very Fine	2.0	2.8			31
	Very Fine	2.8	4.0			31
	Fine	4.0	5.6			31
	Fine	5.6	8.0	1	1	32
	Medium	8.0	11.0	1	1	33
	Medium	11.0	16.0	1	1	34
	Coarse	16.0	22.6	1	1	35
	Coarse	22.6	32	13	13	48
	Very Coarse	32	45	17	17	65
	Very Coarse	45	64	15	15	80
COBBLE	Small	64	90	14	14	94
	Small	90	128	5	5	99
	Large	128	180			99
	Large	180	256	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	**100**	**100**	**100**

Cross-Section 30	
Channel materials (mm)	
D_{16} =	0.25
D_{35} =	22.60
D_{50} =	33.3
D_{84} =	70.5
D_{95} =	96.6
D_{100} =	256.0





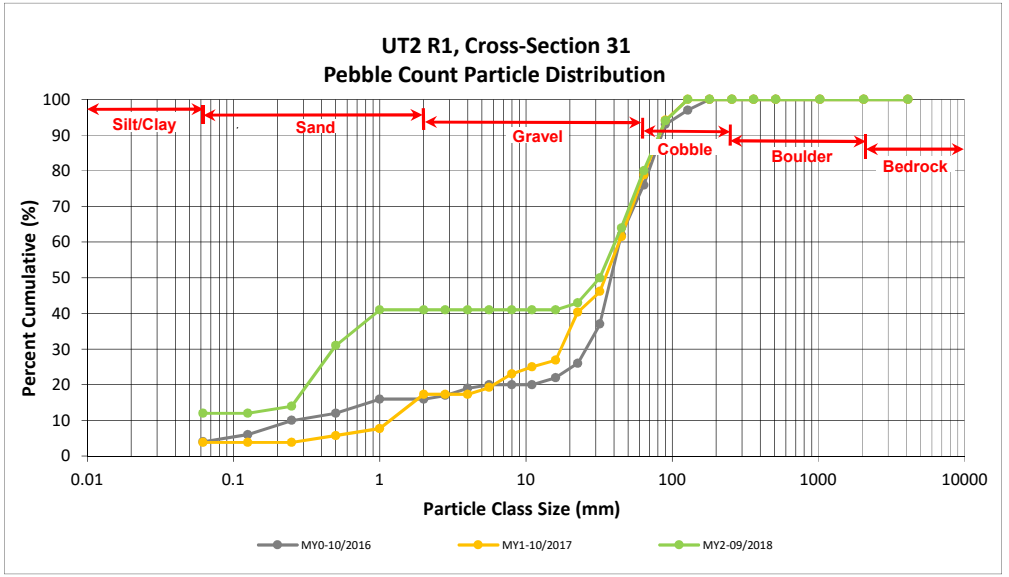
Reachwide and Cross-Section Pebble Count Plots

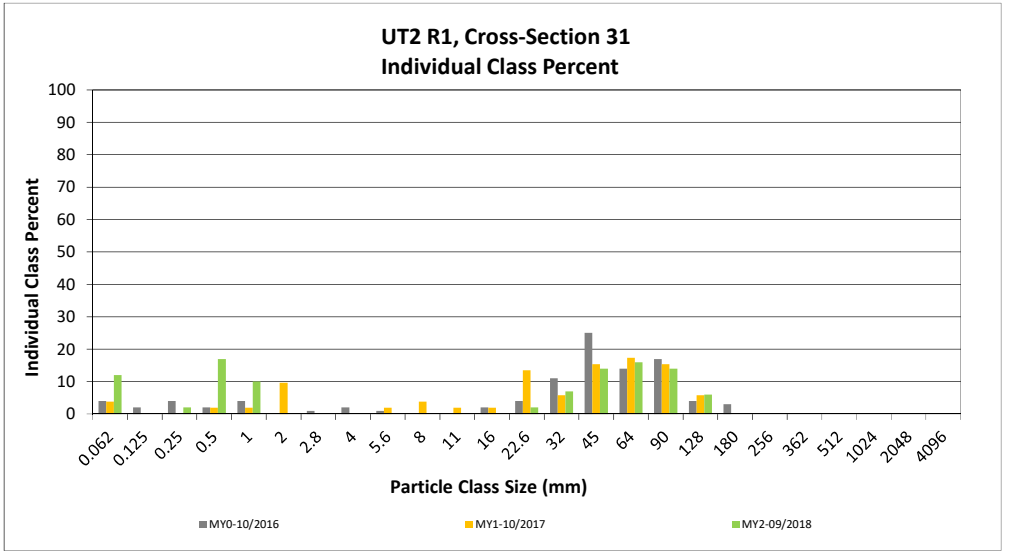
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 R1, Cross-Section 31

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	12	12	12
SAND	Very fine	0.062	0.125			12
	Fine	0.125	0.250	2	2	14
	Medium	0.25	0.50	17	17	31
	Coarse	0.5	1.0	10	10	41
	Very Coarse	1.0	2.0			41
GRAVEL	Very Fine	2.0	2.8			41
	Very Fine	2.8	4.0			41
	Fine	4.0	5.6			41
	Fine	5.6	8.0			41
	Medium	8.0	11.0			41
	Medium	11.0	16.0			41
	Coarse	16.0	22.6	2	2	43
	Coarse	22.6	32	7	7	50
	Very Coarse	32	45	14	14	64
	Very Coarse	45	64	16	16	80
COBBLE	Small	64	90	14	14	94
	Small	90	128	6	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	**100**	**100**	**100**

Cross-Section 31	
Channel materials (mm)	
D_{16} =	0.27
D_{35} =	0.66
D_{50} =	32.0
D_{84} =	70.5
D_{95} =	95.4
D_{100} =	128.0





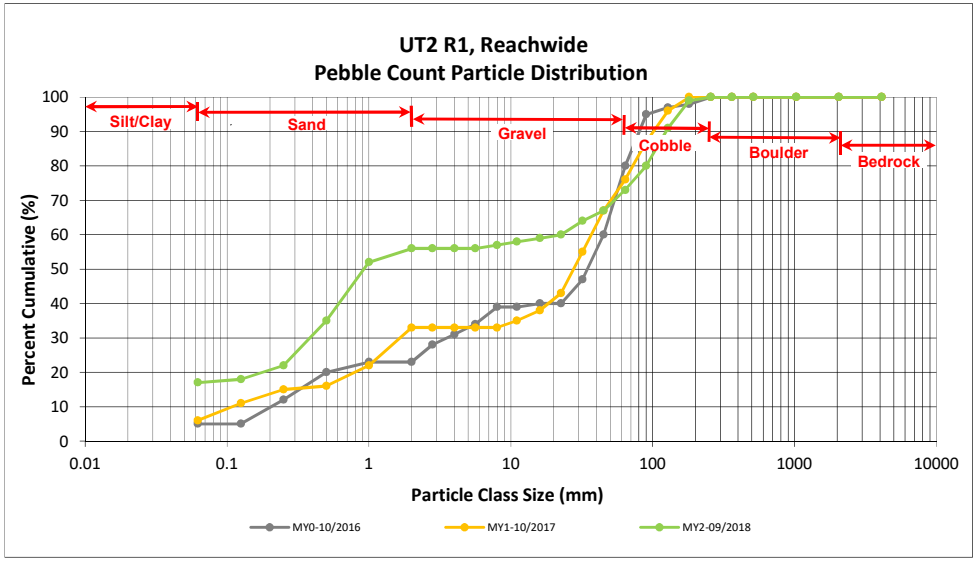
Reachwide and Cross-Section Pebble Count Plots

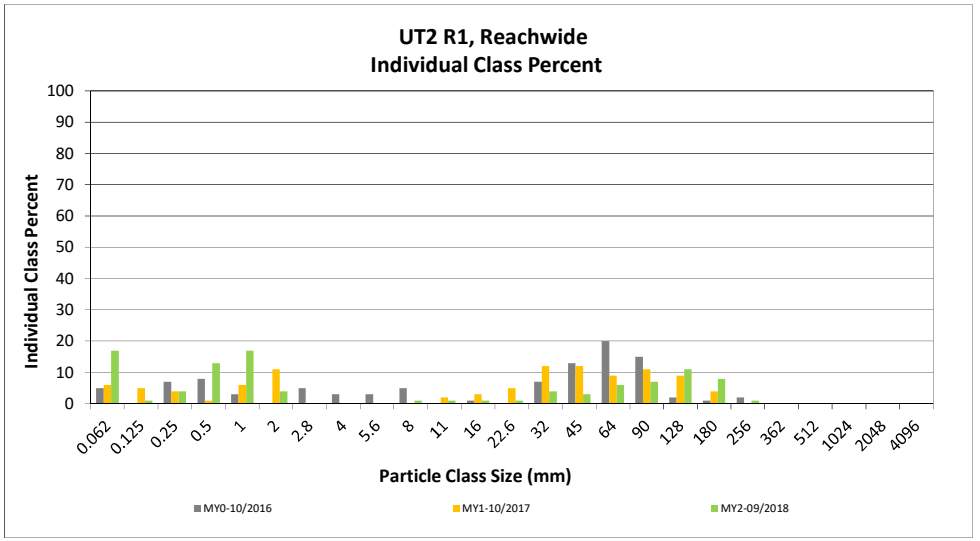
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 R1, 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	16	17	17	17
SAND	Very fine	0.062	0.125		1	1	1	18
	Fine	0.125	0.250		4	4	4	22
	Medium	0.25	0.50	3	10	13	13	35
	Coarse	0.5	1.0	11	6	17	17	52
	Very Coarse	1.0	2.0	1	3	4	4	56
GRAVEL	Very Fine	2.0	2.8					56
	Very Fine	2.8	4.0					56
	Fine	4.0	5.6					56
	Fine	5.6	8.0	1		1	1	57
	Medium	8.0	11.0	1		1	1	58
	Medium	11.0	16.0		1	1	1	59
	Coarse	16.0	22.6	1		1	1	60
	Coarse	22.6	32	3	1	4	4	64
	Very Coarse	32	45	1	2	3	3	67
	Very Coarse	45	64	3	3	6	6	73
COBBLE	Small	64	90	7		7	7	80
	Small	90	128	9	2	11	11	91
	Large	128	180	7	1	8	8	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} =	0.50
D_{50} =	0.9
D_{84} =	102.3
D_{95} =	151.8
D_{100} =	256.0





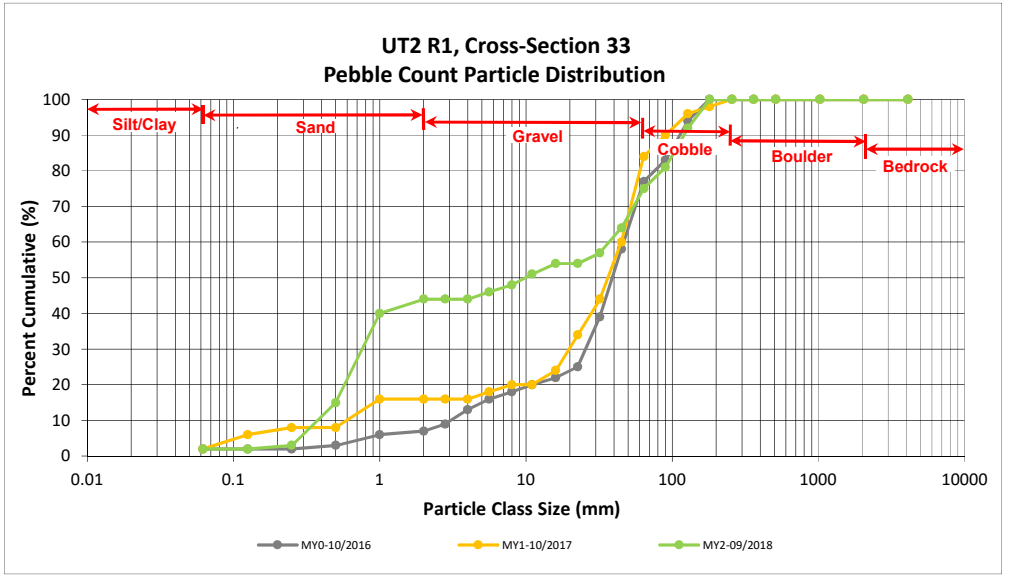
Reachwide and Cross-Section Pebble Count Plots

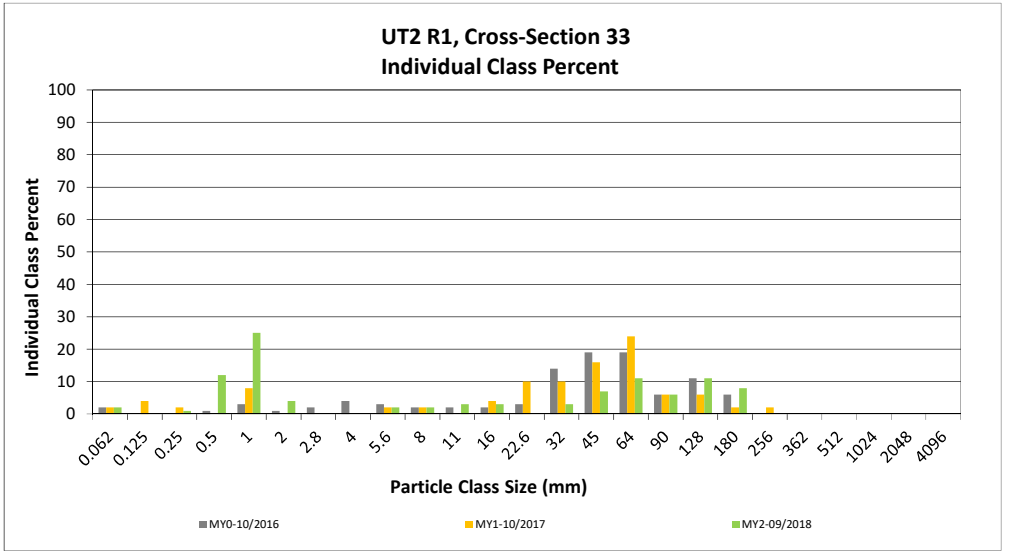
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 R1, Cross-Section 33

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	2	2
SAND	Very fine	0.062	0.125			2
	Fine	0.125	0.250	1	1	3
	Medium	0.25	0.50	12	12	15
	Coarse	0.5	1.0	25	25	40
	Very Coarse	1.0	2.0	4	4	44
GRAVEL	Very Fine	2.0	2.8			44
	Very Fine	2.8	4.0			44
	Fine	4.0	5.6	2	2	46
	Fine	5.6	8.0	2	2	48
	Medium	8.0	11.0	3	3	51
	Medium	11.0	16.0	3	3	54
	Coarse	16.0	22.6			54
	Coarse	22.6	32	3	3	57
	Very Coarse	32	45	7	7	64
	Very Coarse	45	64	11	11	75
COBBLE	Small	64	90	6	6	81
	Small	90	128	11	11	92
	Large	128	180	8	8	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 33	
Channel materials (mm)	
D_{16} =	0.51
D_{35} =	0.87
D_{50} =	9.9
D_{84} =	99.1
D_{95} =	145.5
D_{100} =	180.0





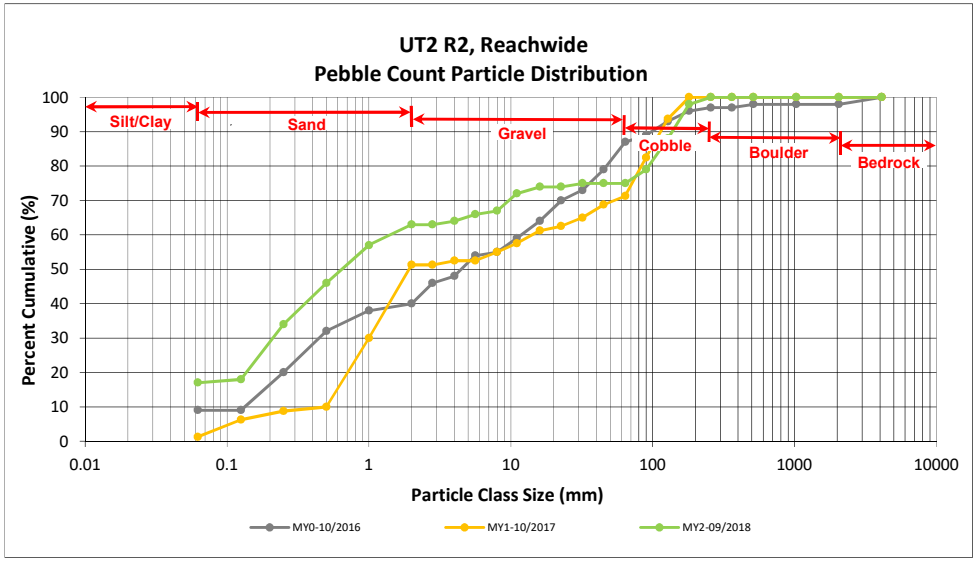
Reachwide and Cross-Section Pebble Count Plots

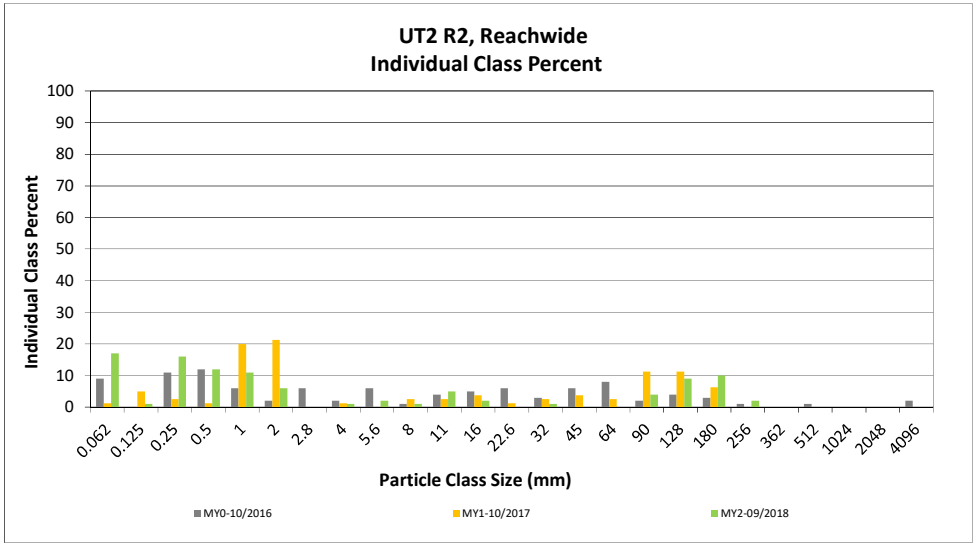
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 R2, 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	8	9	17	17	17
SAND	Very fine	0.062	0.125		1	1	1	18
	Fine	0.125	0.250	1	15	16	16	34
	Medium	0.25	0.50	3	9	12	12	46
	Coarse	0.5	1.0	2	9	11	11	57
	Very Coarse	1.0	2.0	2	4	6	6	63
GRAVEL	Very Fine	2.0	2.8					63
	Very Fine	2.8	4.0	1		1	1	64
	Fine	4.0	5.6	2		2	2	66
	Fine	5.6	8.0	1		1	1	67
	Medium	8.0	11.0	3	2	5	5	72
	Medium	11.0	16.0	2		2	2	74
	Coarse	16.0	22.6					74
	Coarse	22.6	32		1	1	1	75
	Very Coarse	32	45					75
	Very Coarse	45	64					75
COBBLE	Small	64	90	4		4	4	79
	Small	90	128	9		9	9	88
	Large	128	180	10		10	10	98
	Large	180	256	2		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	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.26
D_{50} =	0.6
D_{84} =	109.5
D_{95} =	162.5
D_{100} =	256.0





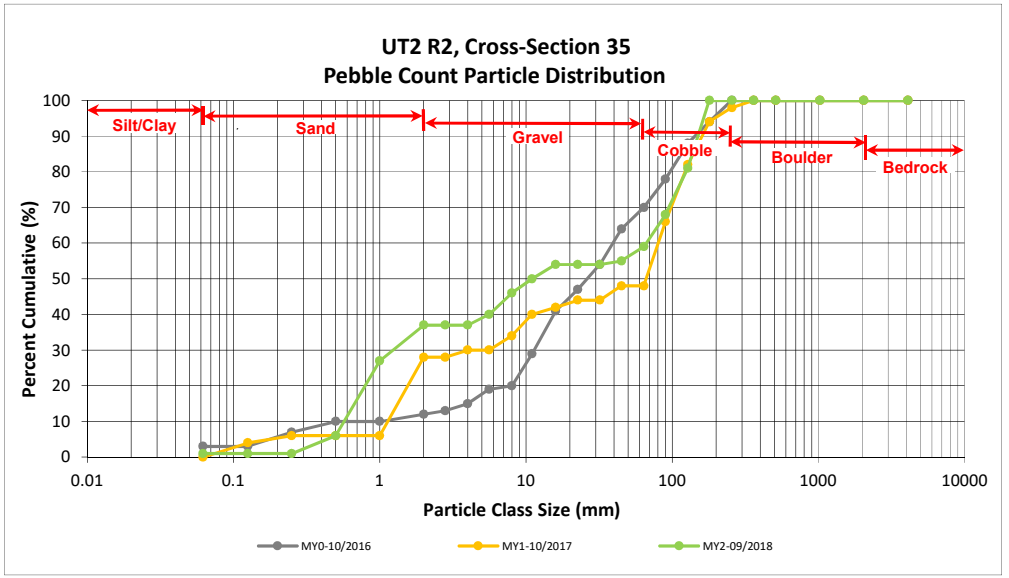
Reachwide and Cross-Section Pebble Count Plots

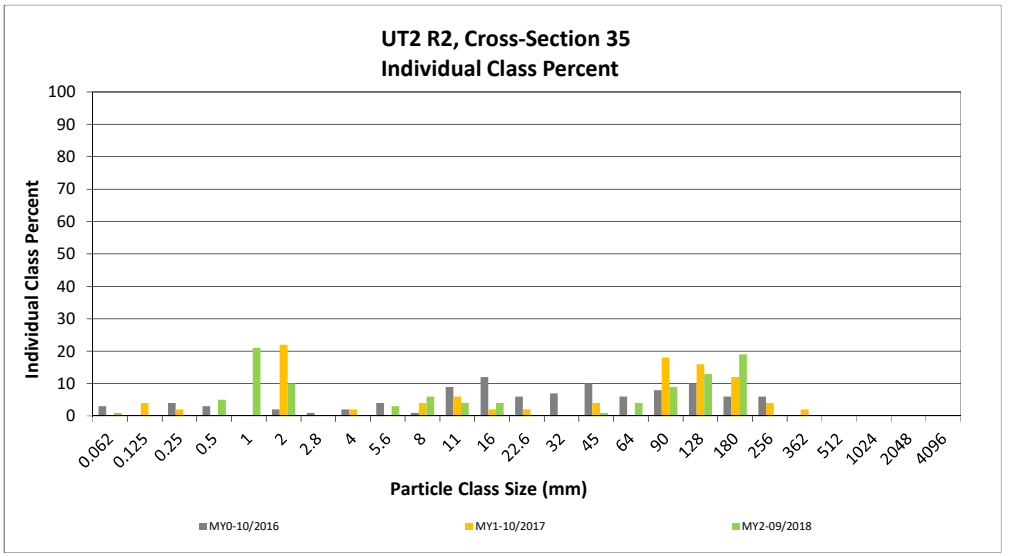
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2 R2, Cross-Section 35

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	1	1
SAND	Very fine	0.062	0.125			1
	Fine	0.125	0.250			1
	Medium	0.25	0.50	5	5	6
	Coarse	0.5	1.0	21	21	27
	Very Coarse	1.0	2.0	10	10	37
GRAVEL	Very Fine	2.0	2.8			37
	Very Fine	2.8	4.0			37
	Fine	4.0	5.6	3	3	40
	Fine	5.6	8.0	6	6	46
	Medium	8.0	11.0	4	4	50
	Medium	11.0	16.0	4	4	54
	Coarse	16.0	22.6			54
	Coarse	22.6	32			54
	Very Coarse	32	45	1	1	55
	Very Coarse	45	64	4	4	59
COBBLE	Small	64	90	9	9	68
	Small	90	128	13	13	81
	Large	128	180	19	19	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 35	
Channel materials (mm)	
D_{16} =	0.70
D_{35} =	1.74
D_{50} =	11.0
D_{84} =	135.1
D_{95} =	164.6
D_{100} =	180.0





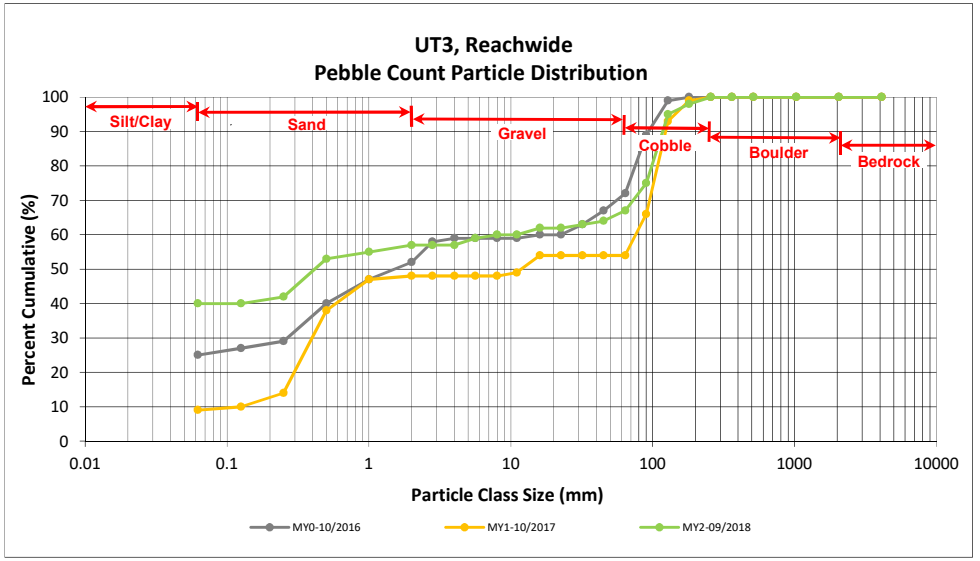
Reachwide and Cross-Section Pebble Count Plots

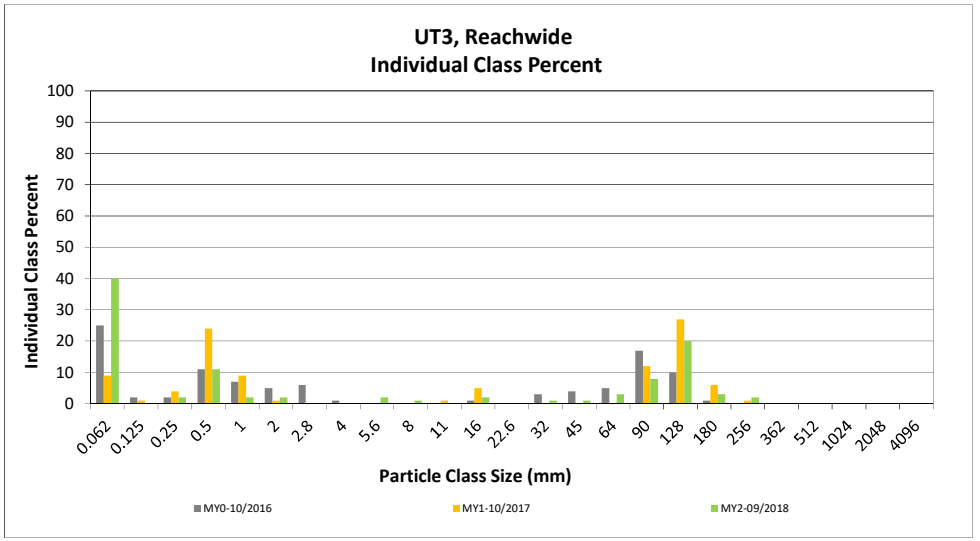
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT3, 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	33	40	40	40
SAND	Very fine	0.062	0.125					40
	Fine	0.125	0.250	1	1	2	2	42
	Medium	0.25	0.50	1	10	11	11	53
	Coarse	0.5	1.0	1	1	2	2	55
	Very Coarse	1.0	2.0	2		2	2	57
GRAVEL	Very Fine	2.0	2.8					57
	Very Fine	2.8	4.0					57
	Fine	4.0	5.6	1	1	2	2	59
	Fine	5.6	8.0		1	1	1	60
	Medium	8.0	11.0					60
	Medium	11.0	16.0	2		2	2	62
	Coarse	16.0	22.6					62
	Coarse	22.6	32	1		1	1	63
	Very Coarse	32	45	1		1	1	64
	Very Coarse	45	64	1	2	3	3	67
COBBLE	Small	64	90	8		8	8	75
	Small	90	128	19	1	20	20	95
	Large	128	180	3		3	3	98
	Large	180	256	2		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	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	Silt/Clay
D_{50} =	0.4
D_{84} =	105.5
D_{95} =	128.0
D_{100} =	256.0





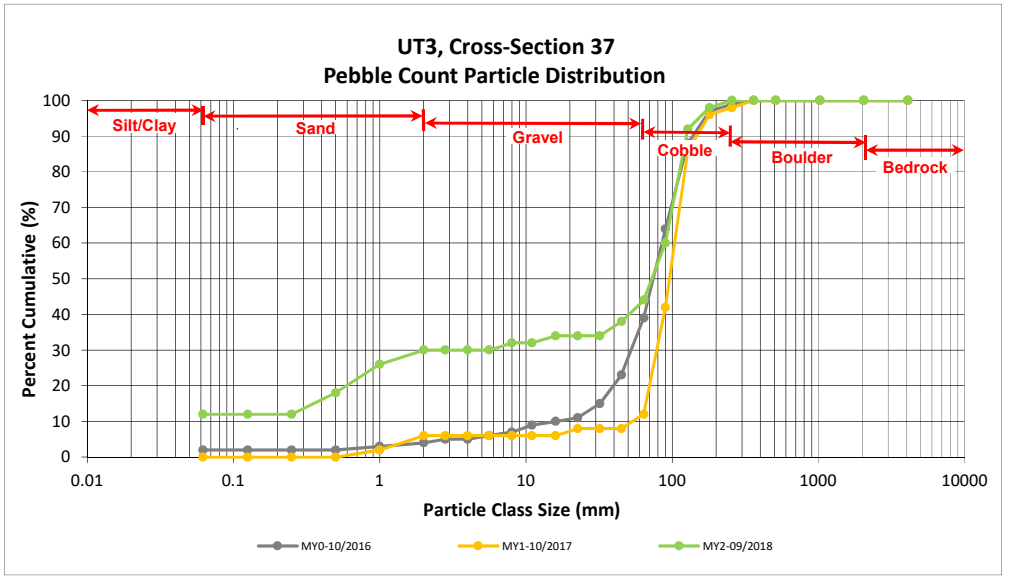
Reachwide and Cross-Section Pebble Count Plots

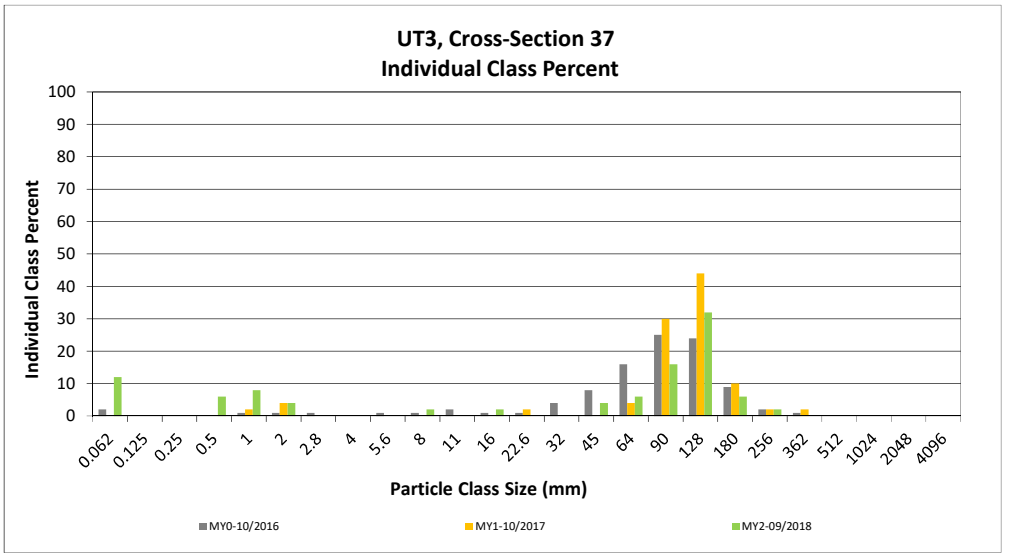
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT3, Cross-Section 37

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	12	12	12
SAND	Very fine	0.062	0.125			12
	Fine	0.125	0.250			12
	Medium	0.25	0.50	6	6	18
	Coarse	0.5	1.0	8	8	26
	Very Coarse	1.0	2.0	4	4	30
GRAVEL	Very Fine	2.0	2.8			30
	Very Fine	2.8	4.0			30
	Fine	4.0	5.6			30
	Fine	5.6	8.0	2	2	32
	Medium	8.0	11.0			32
	Medium	11.0	16.0	2	2	34
	Coarse	16.0	22.6			34
	Coarse	22.6	32			34
	Very Coarse	32	45	4	4	38
	Very Coarse	45	64	6	6	44
COBBLE	Small	64	90	16	16	60
	Small	90	128	32	32	92
	Large	128	180	6	6	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 37	
Channel materials (mm)	
D_{16} =	0.40
D_{35} =	34.85
D_{50} =	72.7
D_{84} =	117.2
D_{95} =	151.8
D_{100} =	256.0





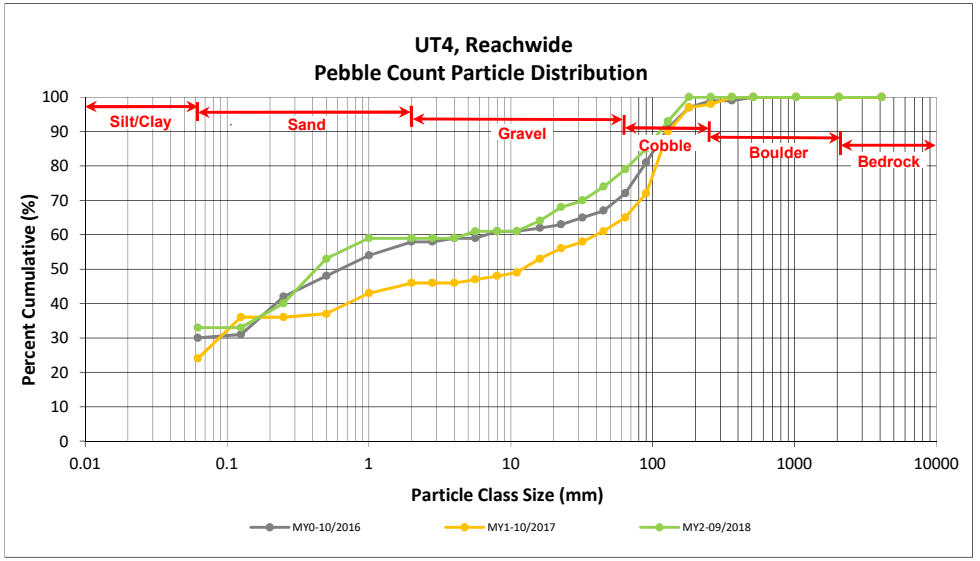
Reachwide and Cross-Section Pebble Count Plots

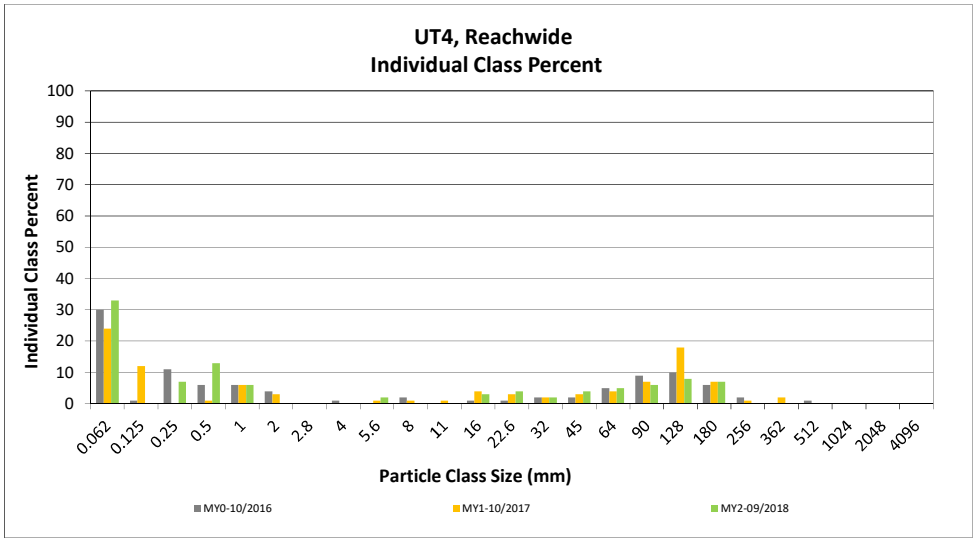
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT4, 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	27	33	33	33
SAND	Very fine	0.062	0.125					33
	Fine	0.125	0.250	1	6	7	7	40
	Medium	0.25	0.50	3	10	13	13	53
	Coarse	0.5	1.0	2	4	6	6	59
	Very Coarse	1.0	2.0					59
GRAVEL	Very Fine	2.0	2.8					59
	Very Fine	2.8	4.0					59
	Fine	4.0	5.6		2	2	2	61
	Fine	5.6	8.0					61
	Medium	8.0	11.0					61
	Medium	11.0	16.0	2	1	3	3	64
	Coarse	16.0	22.6	4		4	4	68
	Coarse	22.6	32	2		2	2	70
	Very Coarse	32	45	4		4	4	74
	Very Coarse	45	64	5		5	5	79
COBBLE	Small	64	90	6		6	6	85
	Small	90	128	8		8	8	93
	Large	128	180	7		7	7	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} =	0.15
D_{50} =	0.4
D_{84} =	85.0
D_{95} =	141.1
D_{100} =	180.0





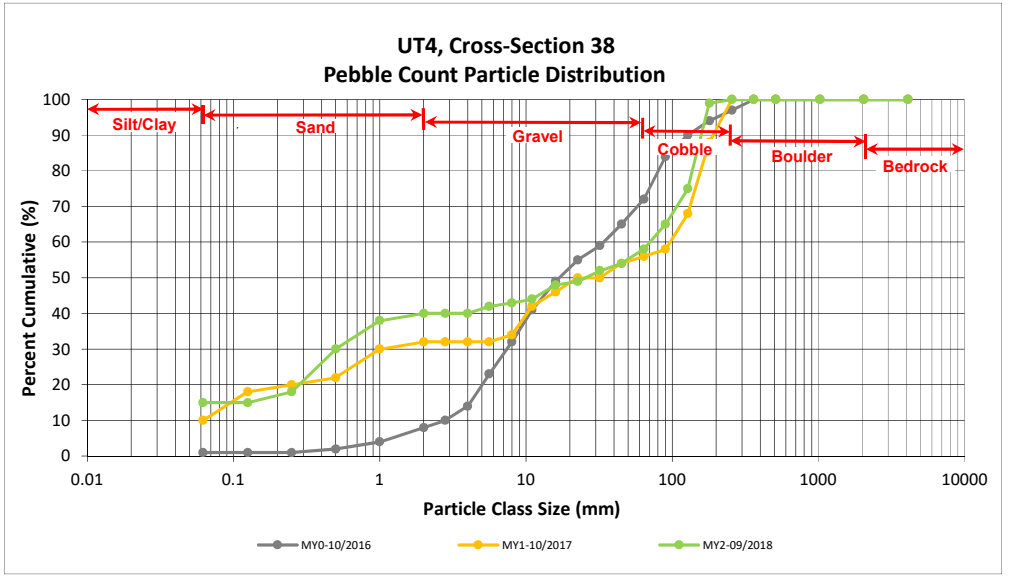
Reachwide and Cross-Section Pebble Count Plots

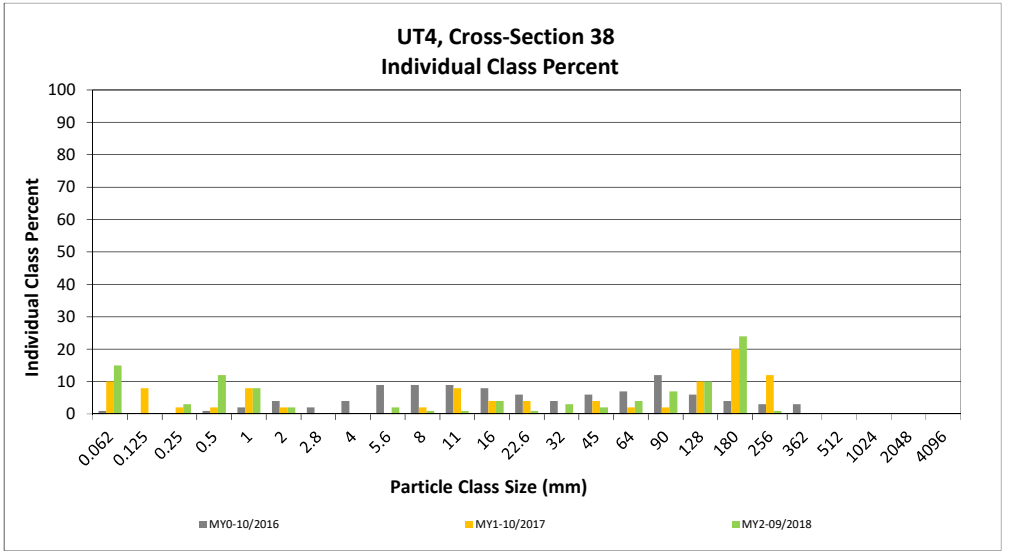
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT4, Cross-Section 38

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	15	15	15
SAND	Very fine	0.062	0.125			15
	Fine	0.125	0.250	3	3	18
	Medium	0.25	0.50	12	12	30
	Coarse	0.5	1.0	8	8	38
	Very Coarse	1.0	2.0	2	2	40
GRAVEL	Very Fine	2.0	2.8			40
	Very Fine	2.8	4.0			40
	Fine	4.0	5.6	2	2	42
	Fine	5.6	8.0	1	1	43
	Medium	8.0	11.0	1	1	44
	Medium	11.0	16.0	4	4	48
	Coarse	16.0	22.6	1	1	49
	Coarse	22.6	32	3	3	52
	Very Coarse	32	45	2	2	54
	Very Coarse	45	64	4	4	58
COBBLE	Small	64	90	7	7	65
	Small	90	128	10	10	75
	Large	128	180	24	24	99
	Large	180	256	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	**100**	**100**	**100**

Cross-Section 38	
Channel materials (mm)	
D_{16} =	0.16
D_{35} =	0.77
D_{50} =	25.4
D_{84} =	145.5
D_{95} =	170.1
D_{100} =	256.0





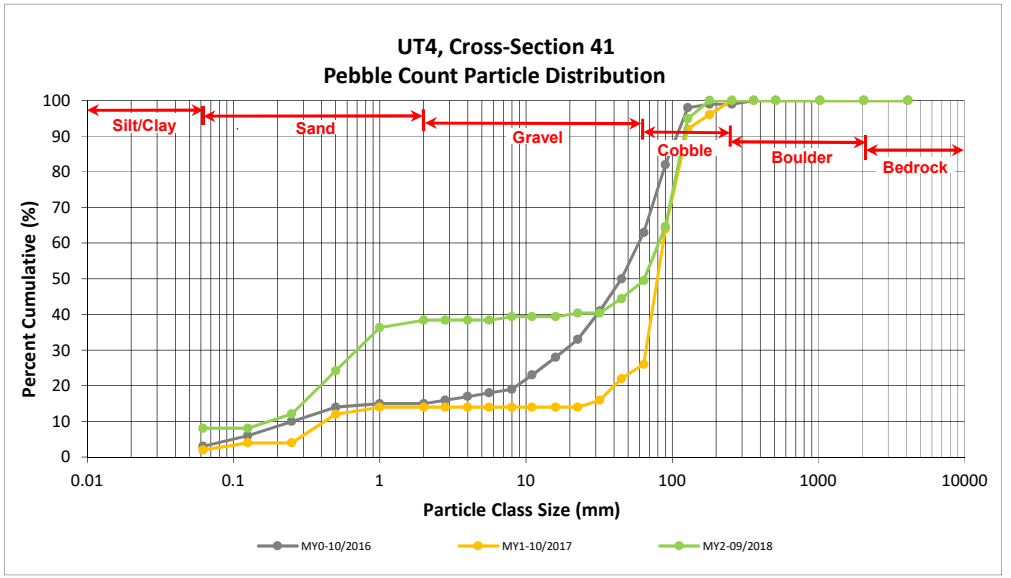
Reachwide and Cross-Section Pebble Count Plots

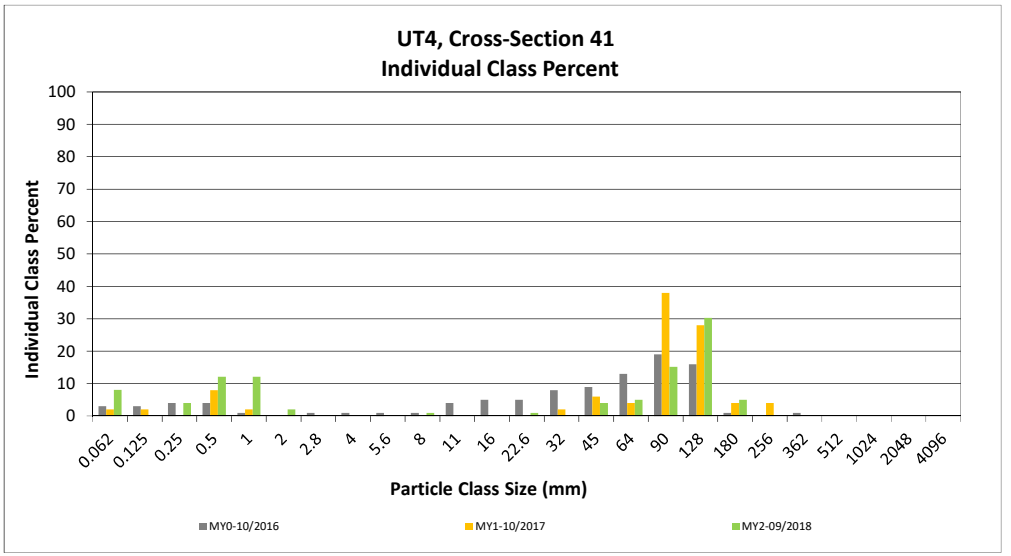
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT4, Cross-Section 41

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	8	8	8
SAND	Very fine	0.062	0.125			8
	Fine	0.125	0.250	4	4	12
	Medium	0.25	0.50	12	12	24
	Coarse	0.5	1.0	12	12	36
	Very Coarse	1.0	2.0	2	2	38
GRAVEL	Very Fine	2.0	2.8			38
	Very Fine	2.8	4.0			38
	Fine	4.0	5.6			38
	Fine	5.6	8.0	1	1	39
	Medium	8.0	11.0			39
	Medium	11.0	16.0			39
	Coarse	16.0	22.6	1	1	40
	Coarse	22.6	32			40
	Very Coarse	32	45	4	4	44
	Very Coarse	45	64	5	5	49
COBBLE	Small	64	90	15	15	65
	Small	90	128	30	30	95
	Large	128	180	5	5	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	**99**	**100**	**100**

Cross-Section 41	
Channel materials (mm)	
D_{16} =	0.31
D_{35} =	0.92
D_{50} =	64.7
D_{84} =	112.7
D_{95} =	128.4
D_{100} =	180.0





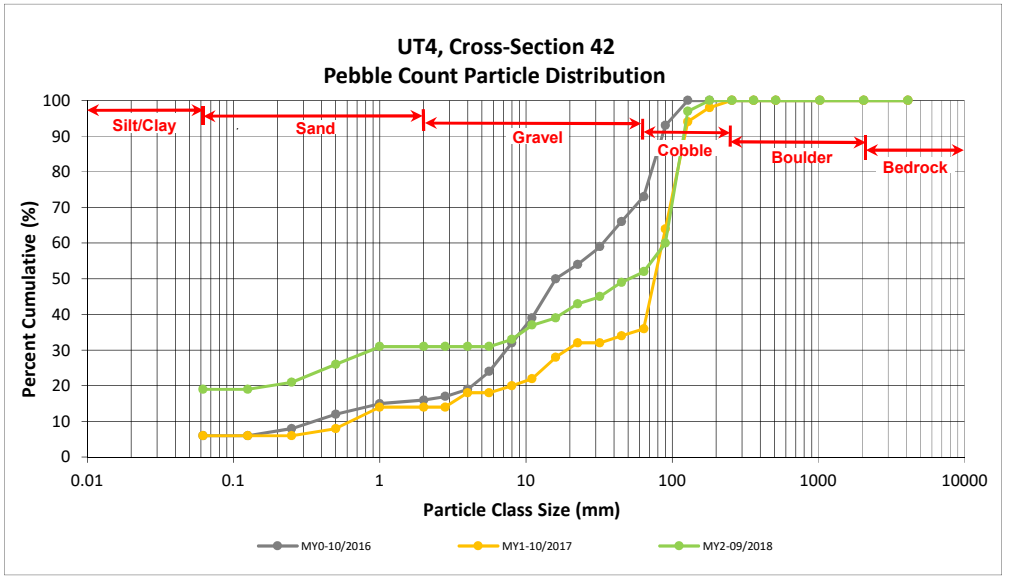
Reachwide and Cross-Section Pebble Count Plots

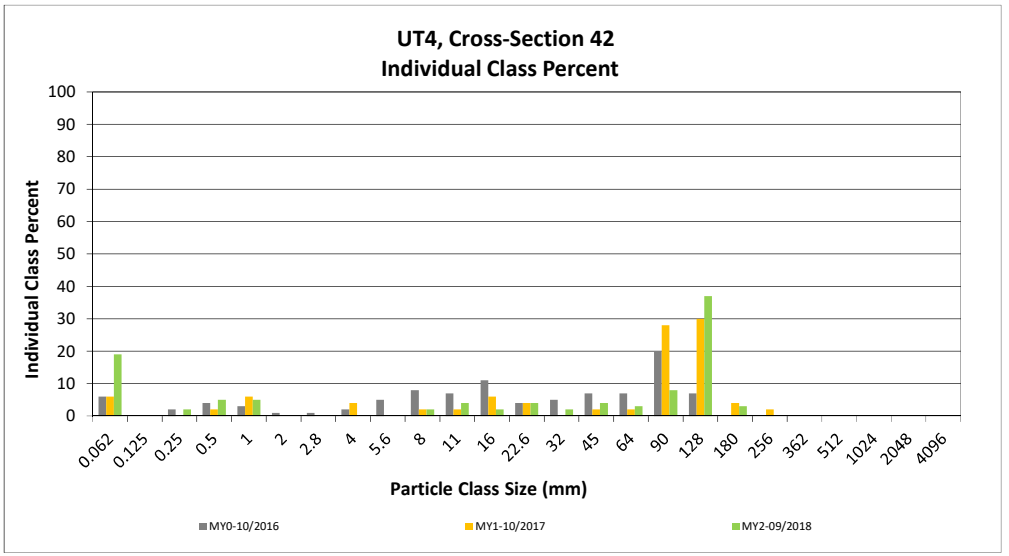
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT4, Cross-Section 42

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	19	19	19
SAND	Very fine	0.062	0.125			19
	Fine	0.125	0.250	2	2	21
	Medium	0.25	0.50	5	5	26
	Coarse	0.5	1.0	5	5	31
	Very Coarse	1.0	2.0			31
GRAVEL	Very Fine	2.0	2.8			31
	Very Fine	2.8	4.0			31
	Fine	4.0	5.6			31
	Fine	5.6	8.0	2	2	33
	Medium	8.0	11.0	4	4	37
	Medium	11.0	16.0	2	2	39
	Coarse	16.0	22.6	4	4	43
	Coarse	22.6	32	2	2	45
	Very Coarse	32	45	4	4	49
	Very Coarse	45	64	3	3	52
COBBLE	Small	64	90	8	8	60
	Small	90	128	37	37	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 43	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	9.38
D_{50} =	50.6
D_{84} =	113.1
D_{95} =	125.6
D_{100} =	180.0





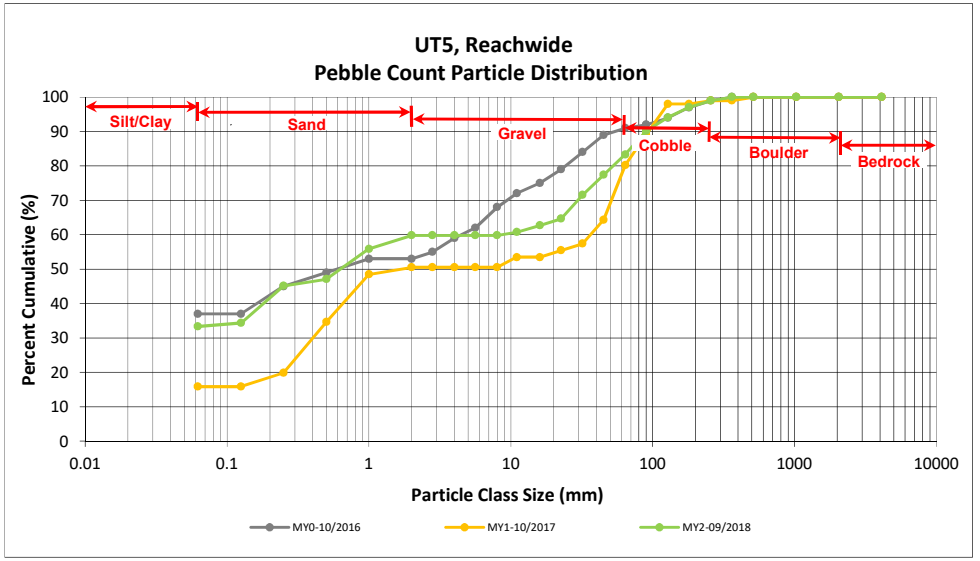
Reachwide and Cross-Section Pebble Count Plots

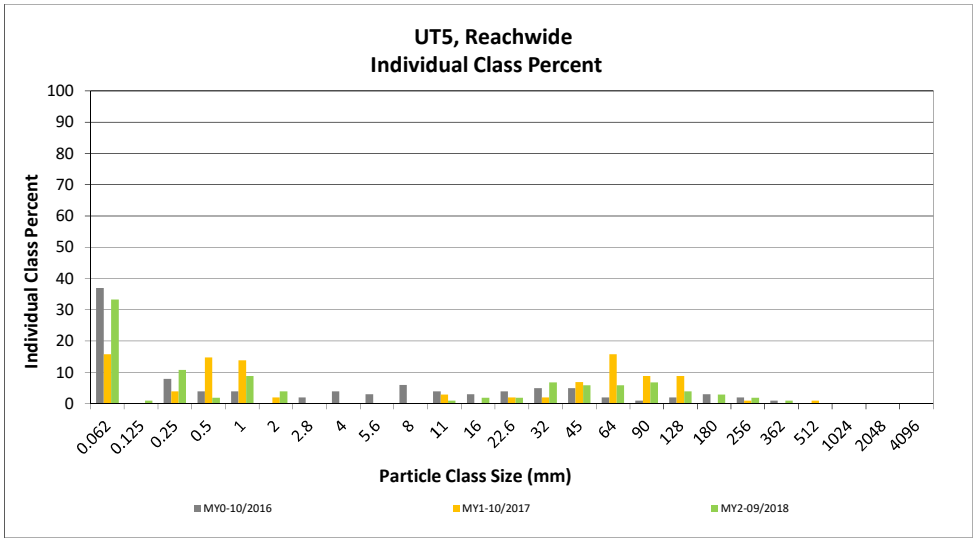
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

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	9	25	34	33	33
SAND	Very fine	0.062	0.125		1	1	1	34
	Fine	0.125	0.250		11	11	11	45
	Medium	0.25	0.50		2	2	2	47
	Coarse	0.5	1.0	1	8	9	9	56
	Very Coarse	1.0	2.0	3	1	4	4	60
GRAVEL	Very Fine	2.0	2.8					60
	Very Fine	2.8	4.0					60
	Fine	4.0	5.6					60
	Fine	5.6	8.0					60
	Medium	8.0	11.0	1		1	1	61
	Medium	11.0	16.0	2		2	2	63
	Coarse	16.0	22.6	2		2	2	65
	Coarse	22.6	32	5	2	7	7	72
	Very Coarse	32	45	5	1	6	6	77
	Very Coarse	45	64	5	1	6	6	83
COBBLE	Small	64	90	7		7	7	90
	Small	90	128	4		4	4	94
	Large	128	180	3		3	3	97
	Large	180	256	2		2	2	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**	**52**	**102**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.13
D_{50} =	0.6
D_{84} =	66.2
D_{95} =	141.8
D_{100} =	362.0





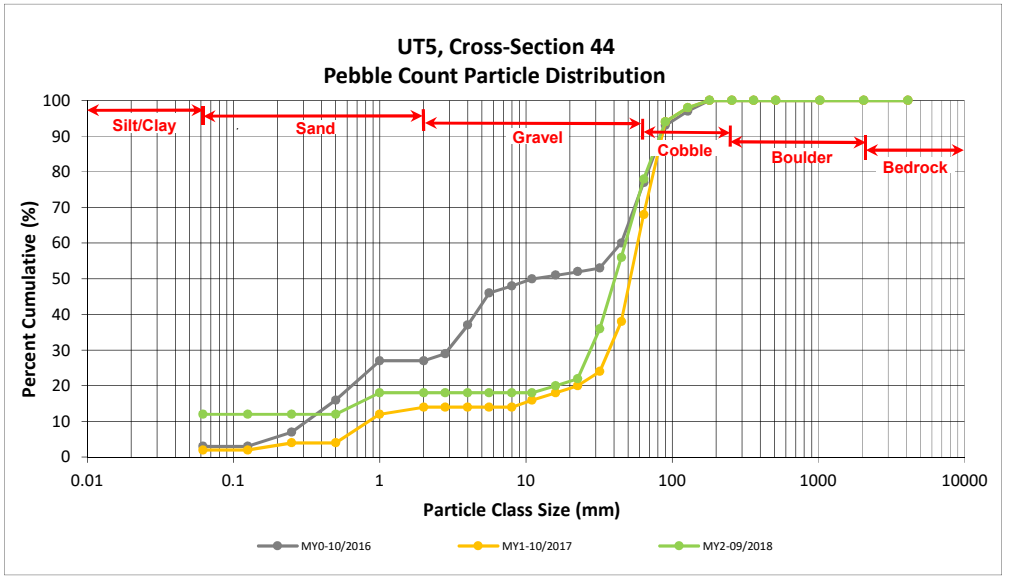
Reachwide and Cross-Section Pebble Count Plots

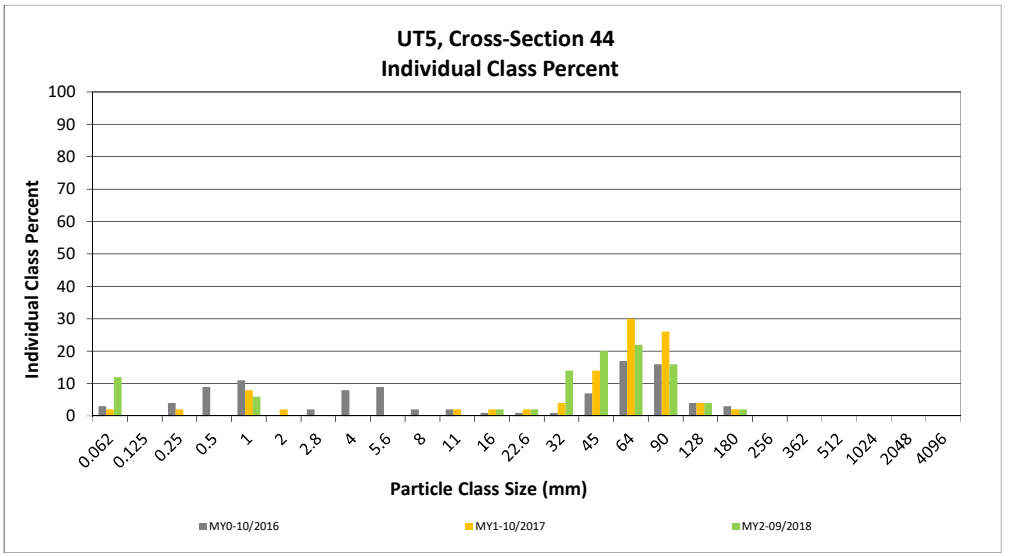
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT5, Cross-Section 44

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	12	12	12
SAND	Very fine	0.062	0.125			12
	Fine	0.125	0.250			12
	Medium	0.25	0.50			12
	Coarse	0.5	1.0	6	6	18
	Very Coarse	1.0	2.0			18
GRAVEL	Very Fine	2.0	2.8			18
	Very Fine	2.8	4.0			18
	Fine	4.0	5.6			18
	Fine	5.6	8.0			18
	Medium	8.0	11.0			18
	Medium	11.0	16.0	2	2	20
	Coarse	16.0	22.6	2	2	22
	Coarse	22.6	32	14	14	36
	Very Coarse	32	45	20	20	56
	Very Coarse	45	64	22	22	78
COBBLE	Small	64	90	16	16	94
	Small	90	128	4	4	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 44	
Channel materials (mm)	
D_{16} =	0.79
D_{35} =	31.21
D_{50} =	40.6
D_{84} =	72.7
D_{95} =	98.3
D_{100} =	180.0





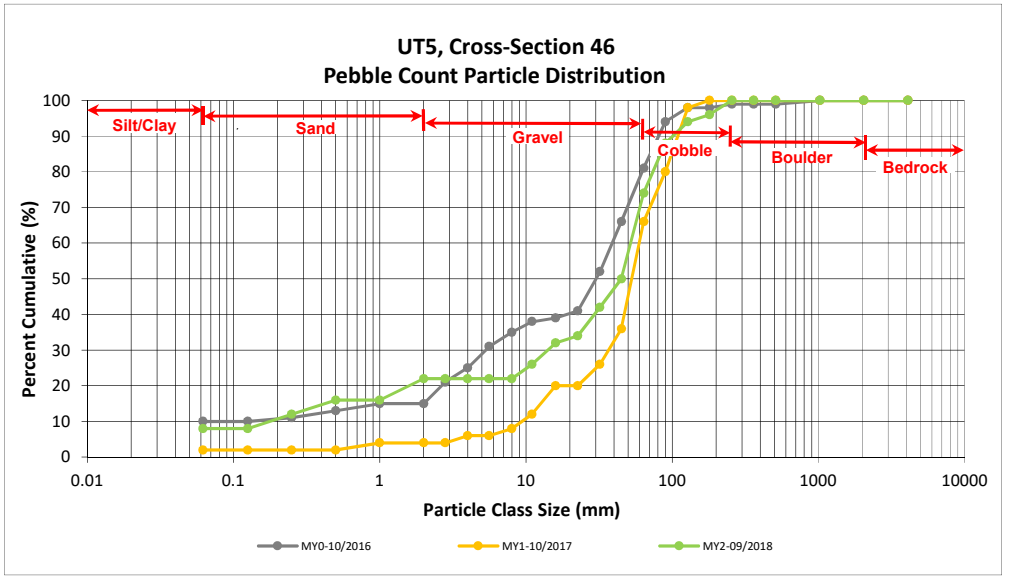
Reachwide and Cross-Section Pebble Count Plots

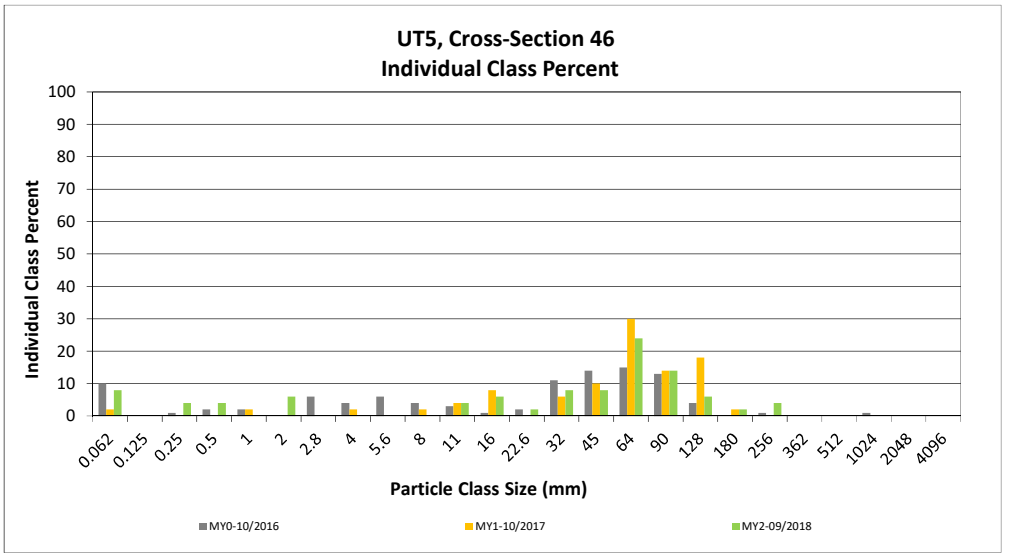
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT5, Cross-Section 46

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	8	8	8
SAND	Very fine	0.062	0.125			8
	Fine	0.125	0.250	4	4	12
	Medium	0.25	0.50	4	4	16
	Coarse	0.5	1.0			16
	Very Coarse	1.0	2.0	6	6	22
GRAVEL	Very Fine	2.0	2.8			22
	Very Fine	2.8	4.0			22
	Fine	4.0	5.6			22
	Fine	5.6	8.0			22
	Medium	8.0	11.0	4	4	26
	Medium	11.0	16.0	6	6	32
	Coarse	16.0	22.6	2	2	34
	Coarse	22.6	32	8	8	42
	Very Coarse	32	45	8	8	50
	Very Coarse	45	64	24	24	74
COBBLE	Small	64	90	14	14	88
	Small	90	128	6	6	94
	Large	128	180	2	2	96
	Large	180	256	4	4	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 46	
Channel materials (mm)	
D_{16} =	0.50
D_{35} =	23.60
D_{50} =	45.0
D_{84} =	81.6
D_{95} =	151.8
D_{100} =	256.0





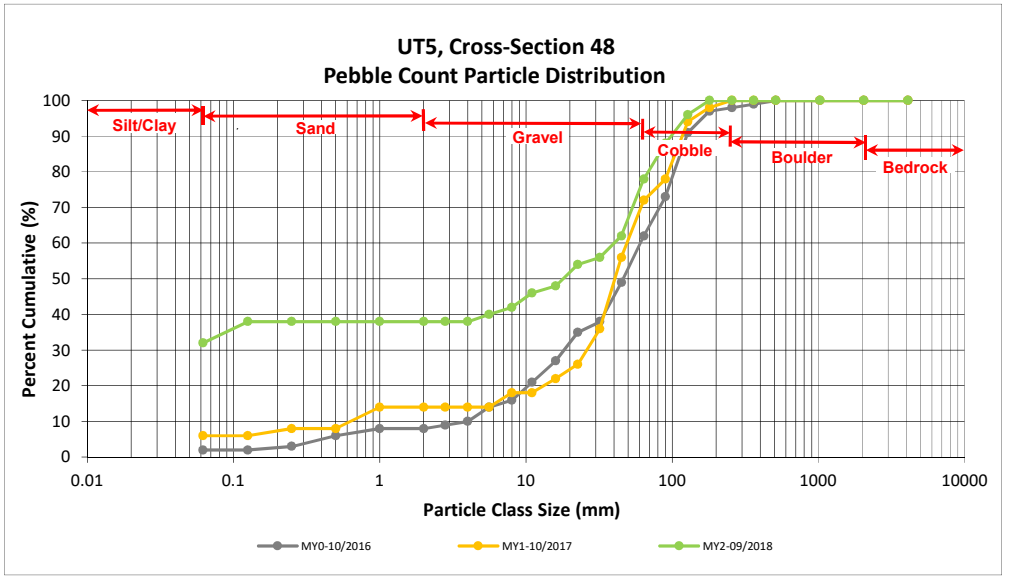
Reachwide and Cross-Section Pebble Count Plots

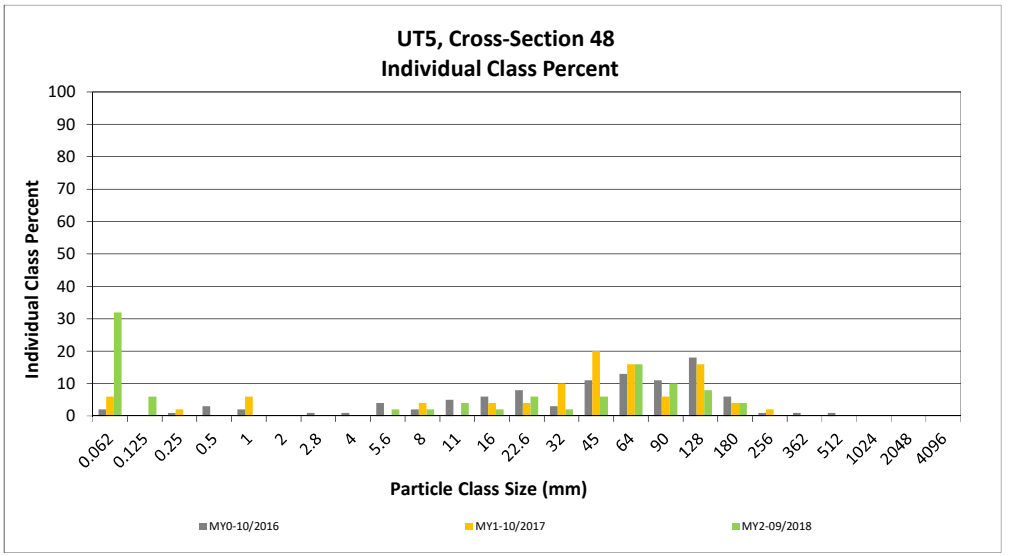
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT5, Cross-Section 48

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	32	32	32
SAND	Very fine	0.062	0.125	6	6	38
	Fine	0.125	0.250			38
	Medium	0.25	0.50			38
	Coarse	0.5	1.0			38
	Very Coarse	1.0	2.0			38
GRAVEL	Very Fine	2.0	2.8			38
	Very Fine	2.8	4.0			38
	Fine	4.0	5.6	2	2	40
	Fine	5.6	8.0	2	2	42
	Medium	8.0	11.0	4	4	46
	Medium	11.0	16.0	2	2	48
	Coarse	16.0	22.6	6	6	54
	Coarse	22.6	32	2	2	56
	Very Coarse	32	45	6	6	62
	Very Coarse	45	64	16	16	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 48	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.09
D_{50} =	18.0
D_{84} =	78.5
D_{95} =	122.5
D_{100} =	180.0





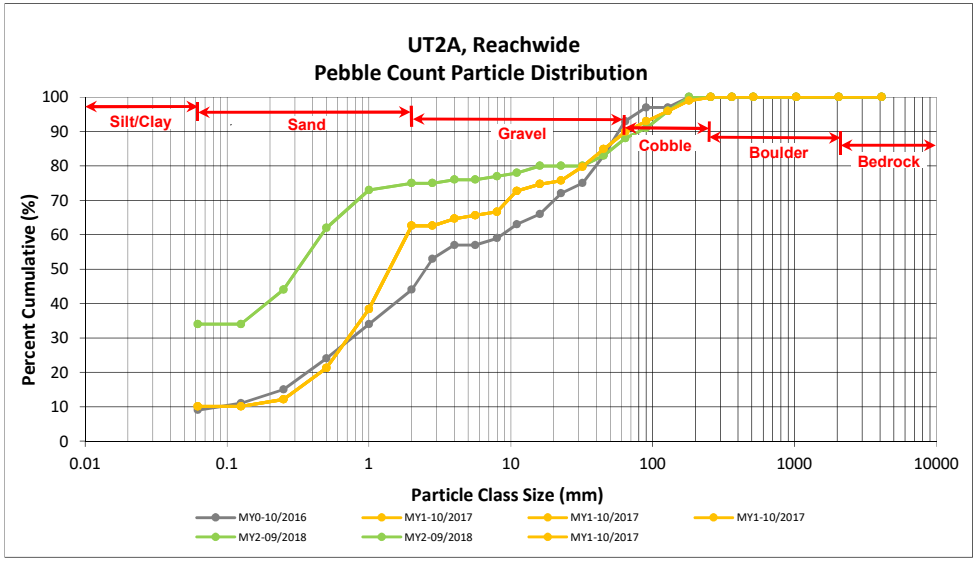
Reachwide and Cross-Section Pebble Count Plots

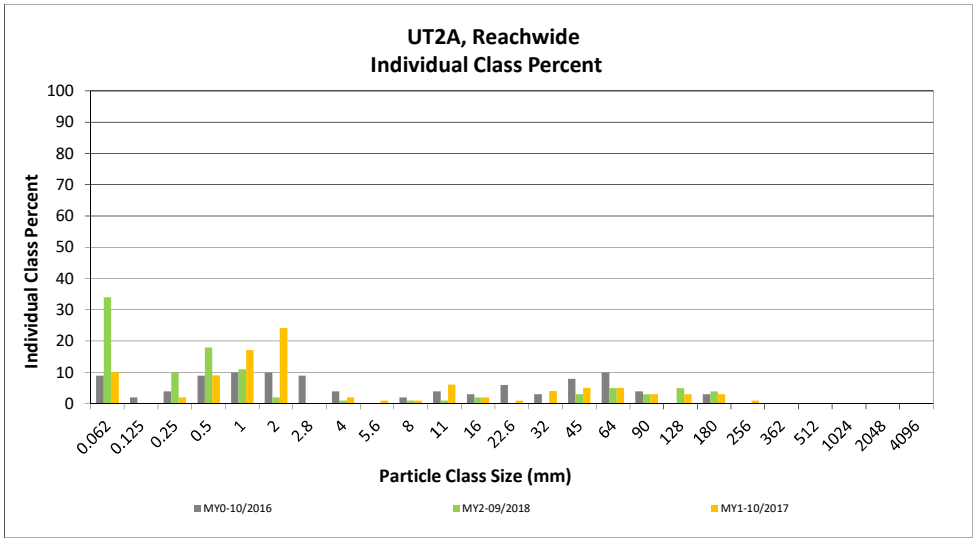
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2A, 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	3	7	10	10	10
SAND	Very fine	0.062	0.125					10
	Fine	0.125	0.250		2	2	2	12
	Medium	0.25	0.50	1	8	9	9	21
	Coarse	0.5	1.0	5	12	17	17	38
	Very Coarse	1.0	2.0	13	11	24	24	63
GRAVEL	Very Fine	2.0	2.8					63
	Very Fine	2.8	4.0	1	1	2	2	65
	Fine	4.0	5.6		1	1	1	66
	Fine	5.6	8.0	1		1	1	67
	Medium	8.0	11.0	3	3	6	6	73
	Medium	11.0	16.0	2		2	2	75
	Coarse	16.0	22.6	1		1	1	76
	Coarse	22.6	32	4		4	4	80
	Very Coarse	32	45	4	1	5	5	85
	Very Coarse	45	64	5		5	5	90
COBBLE	Small	64	90	2	1	3	3	93
	Small	90	128	3		3	3	96
	Large	128	180	1	2	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**	**49**	**99**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.34
D_{35} =	0.87
D_{50} =	1.4
D_{84} =	42.5
D_{95} =	114.5
D_{100} =	256.0





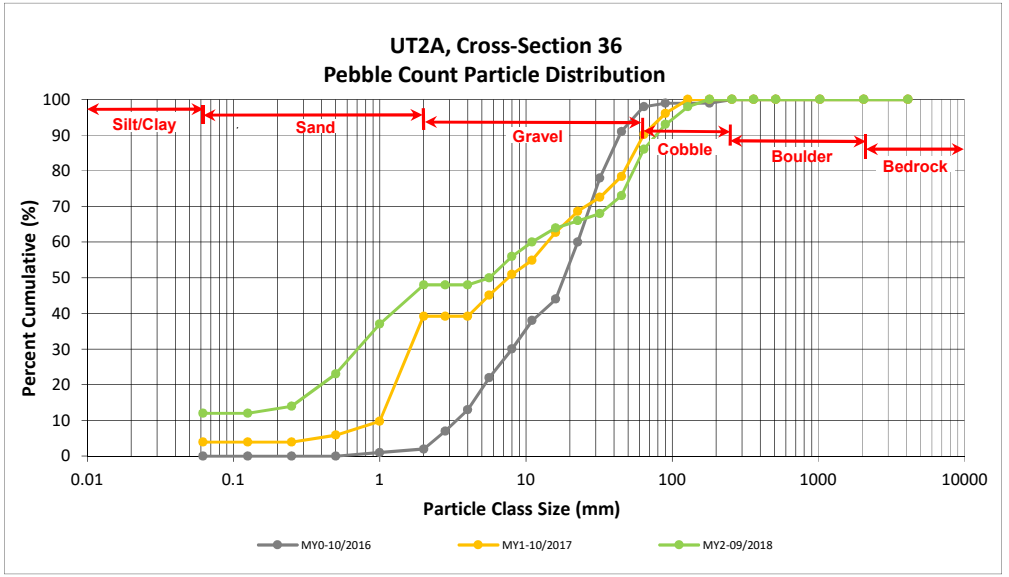
Reachwide and Cross-Section Pebble Count Plots

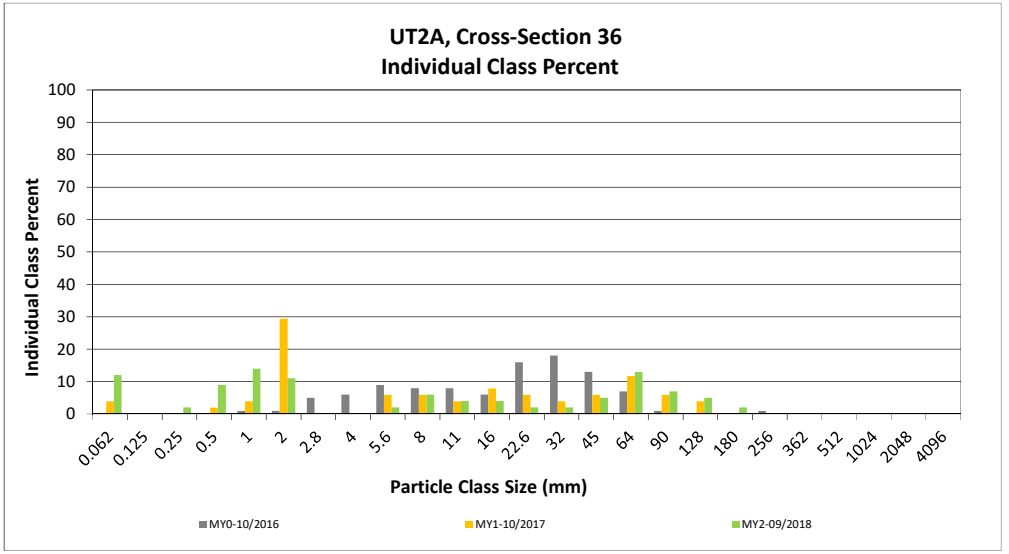
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

UT2A, Cross-Section 36

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	12	12	12
SAND	Very fine	0.062	0.125			12
	Fine	0.125	0.250	2	2	14
	Medium	0.25	0.50	9	9	23
	Coarse	0.5	1.0	14	14	37
	Very Coarse	1.0	2.0	11	11	48
GRAVEL	Very Fine	2.0	2.8			48
	Very Fine	2.8	4.0			48
	Fine	4.0	5.6	2	2	50
	Fine	5.6	8.0	6	6	56
	Medium	8.0	11.0	4	4	60
	Medium	11.0	16.0	4	4	64
	Coarse	16.0	22.6	2	2	66
	Coarse	22.6	32	2	2	68
	Very Coarse	32	45	5	5	73
	Very Coarse	45	64	13	13	86
COBBLE	Small	64	90	7	7	93
	Small	90	128	5	5	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 36	
Channel materials (mm)	
D_{16} =	0.29
D_{35} =	0.91
D_{50} =	5.6
D_{84} =	60.6
D_{95} =	103.6
D_{100} =	180.0





APPENDIX 5. Hydrology Summary Data and Plots

Table 13. Verification of Bankfull Events

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 2 - 2018

Reach	Monitoring Year	Date of Occurrence	Method
Candy Creek Reach 4	MY1	6/19/2017	Stream Gage
	MY2	7/30/2018	
		9/17/2018	
		10/11/2018	
Candy Creek Reach 2	MY2	10/11/2018	Stream Gage
UT1C	MY2	2/9/2018	Stream Gage
		3/9/2018	
		10/22/2018	
UT2	MY2	1/27/2018	Stream Gage
		7/30/2018	
		9/17/2018	
		10/11/2018	
UT2A	MY2	2/9/2018	Stream Gage
UT3	MY2	10/11/2018	Stream Gage
UT4	MY2	1/31/2018	Stream Gage
		7/30/2018	
		9/17/2018	
		10/11/2018	
UT5	MY1	4/24/2017	Stream Gage
		6/19/2017	
	MY2	1/31/2018	Stream Gage
		2/6/2018	
		3/9/2018	
		7/30/2018	
		9/17/2018	
		10/11/2018	

Stream Gage Plot

Candy Creek Mitigation Site (DMS Project No. 96315)

Monitoring Year 2 - 2018