MONITORING YEAR 3

ANNUAL REPORT

Final

MOORES FORK STREAM MITIGATION PROJECT

Surry County, NC
DEQ Contract 6500
DMS Project Number 94709
DWR # 12-0396
USACE Action ID SAW-2011-02257

Data Collection Period: April-October 2018
Submission Date: December 5, 2018

PREPARED FOR:

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

PREPARED BY:

Wildlands Engineering, Inc.
1430 South Mint Street, Suite 104
Charlotte, NC 28203
Phone: 704.332.7754
Fax: 704.332.3306

December 5, 2018

Mr. Matthew Reid
Western Project Manager
Division of Mitigation Services
5 Ravenscroft Dr., Suite 102
Asheville, NC 28801

RE: Moores Fork Stream Mitigation Project
Yadkin River Basin – CU# 03040101
Surry County, North Carolina
NCEEP Project # 94709
Contract No. 6500

Dear Mr. Reid:

Wildlands Engineering, Inc. (Wildlands) has reviewed the Division of Mitigation Services (DMS) comments from the Draft Monitoring Year 3 report for the Moores Fork Stream Mitigation Project. The following Wildlands responses to DMS's report comments are noted in italics lettering.

DMS comment; Two overhead lines were identified on a recent site visit. One crosses Corn Trib, and the other crosses Moores Fork. Please see the attached asbuilt sheets for locations. Please assume 20' utility easement and reduce credit in these sections by 50%. A brief discussion can be added in Section 1: Project Overview. Please update references to mitigation asset totals in the report with the revised number as necessary.

Wildlands response; Text was added to the second paragraph in Section 1 of the report to describe the reduction of 10.4 Stream Mitigation Units (SMUs) on Moores Fork and 4.1 SMUs on Corn Trib because of the 20' overhead powerline easement.

DMS comment; 1.2.2 Vegetation Areas of Concern: DMS has hired a contractor to treat invasives at the site. The contractor has treated the site multiple times this summer and fall: July 5-6, July 10-12, August 24 and 27, September 3 and 5, and November 28-30. The contractor will continue to work on the site to eradicate the invasives.

Wildlands response; Text in Section 1.2.2 has been added to indicate that invasive species treatment occurred in the summer and fall.

DMS comment; Table 1: Please update table after determining utility crossing losses.

Wildlands response; Table 1 was updated with the reductions from the utility crossings on Moores Fork and Corn Trib for a total of 11,588 SMUs.

DMS comment; Table 2: Please add Invasive Species Treatment to table for MY3 (Jul, Aug, Sep and Nov 2018).

Wildlands response; Invasive Species Treatment dates for MY3 were added to Table 2.

DMS comment; CCPV: Thanks for providing updated invasive species polygons. Please continue to update as treatment occurs and populations are reduced. This map is a useful tool for the contractor treating the site.

Wildlands response; Wildlands will continue to update the CCPV figures as treatment of invasive species occurs and populations are reduced.

DMS comment; CCPV: Please update map with the two additional utility lines.

Wildlands response; The CCPV figures have been updated with the additional utility lines crossing on Moores Fork and Corn Trib.

DMS comment; DMS made a site visit on November 26, 2018. We are exploring the possibility of remedial action to some areas depicted on the CCPV as being problem areas. DMS will coordinate with Wildlands when final decisions have been made.

Wildlands response; Thank you for this information. Wildlands will look for communication from DMS about possible remedial action to some areas of concern depicted on the CCPV.

DMS comment; Cross-sections: Please turn off markers for all years except MY3.

Wildlands response; All markers have been turned off except for MY3 on cross-section plots.

DMS comment; Please add the attached treatment logs to an Appendix F.

Wildlands response; Invasive species treatment logs were added to an Appendix F.

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
Project Manager
kgimbert@wildlandseng.com

EXECUTIVE SUMMARY

The North Carolina Department of Environmental Quality (NCDEQ) Division of Mitigation Services (DMS) restored, enhanced, and preserved approximately 19,587 linear feet (LF) of Moores Fork and 13 unnamed tributaries (UTs), provided livestock fencing and alternative water sources to keep livestock out of the streams, removed invasive plant species across the project, and established native riparian buffers. The restoration project was developed to fulfill stream mitigation requirements accepted by the DMS for the Upper Yadkin River Basin (HUC 03040101). The Moores Fork Stream Mitigation Project (the Site) will net 11,588 stream mitigation units through a combination of restoration, enhancement I and II, and preservation.

The Site is within a Targeted Local Watershed (TLW) identified in the Upper Yadkin River Basin Restoration Priority (RBRP) plan (NCDENR, 2009). The RBRP identified the Stewarts Creek 14-digit HUC 03040101100010 as a TLW. Agriculture is the primary land use in the watershed (36% agriculture land cover and only 3% impervious cover) and the RBRP identified degraded riparian buffers as the major stressor to water quality. The Site is also located within the identified as a priority subwatershed for stream restoration and agricultural BMPs during the initial Upper Yadkin-Ararat River local watershed planning (LWP).

The final design was completed in June of 2013. Construction activities and as-built surveys were completed in December of 2014. Planting of the site took place in February of 2015. A large flood event with an estimated return interval of 50 to 100 years occurred at the site on April 18-19, 2015, causing damage to the main stem of Moores Fork. This damage was repaired in March and April of 2016, and a second as-built survey was performed on the repaired areas in April of 2016. The baseline monitoring efforts began in June of 2016 and monitoring year one efforts were initiated in late October of 2016. The Monitoring Year 3 (MY3) monitoring activities were completed in October 2018.

The Site is on track to meet MY3 success criteria for vegetation, geomorphology, and hydrology performance standards. The MY3 vegetation survey resulted in an average stem density of 458 planted stems per acre. The Site has met the interim requirement of 320 planted stems per acre, with 9 of the 12 plots (75%) individually meeting this requirement. The MY3 vegetation monitoring and visual assessment revealed invasive plant populations have responded to treatment that occurred in Summer and Fall of 2018. Morphological surveys indicate that the channel dimensions are stable and functioning as designed with minor deviation from the as-built baseline dimensions. A few instances of localized bank erosion and structure instability are present on the Site. At least one bankfull event occurred during MY3 and was recorded by the Moores Fork crest gage and debris indicators were observed on Silage Tributary. The performance standard of two recorded bankfull events in separate monitoring years has been met for both Moores Fork and Silage Tributary.

MOORES FORK STREAM MITIGATION PROJECT

Year 3 Monitoring Report

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APPENDICES

Section 1: PROJECT OVERVIEW

The Site was implemented under a design-bid-build contract with DMS in Surry County, NC. The Site is located in the Yadkin River Basin; eight-digit Cataloging Unit (CU) 03040101 and the 14-digit Hydrologic Unit Code (HUC) 03040101100010 (Figure 1). Located in the Piedmont physiographic province (NCGS 2004), the project watershed primarily includes agricultural land cover. The drainage area for the lower end of Moores Fork is 1,527 acres and the drainage area for Silage Tributary is 156 acres. The site is located approximately 0.25 mile north of NC 89 on Horton Road. The project site is located on both sides of Horton Road. Latitude and longitude for the site are 36.506671 N and -80.704115 W, respectively (Figure 1).

The NCDEQ Division of Mitigation Services (DMS) restored, enhanced, and preserved approximately 19,587 linear feet (LF) of Moores Fork and 13 unnamed tributaries (UTs), provided livestock fencing and alternative water sources to keep livestock out of the streams, removed invasive plant species across the project, and established native riparian buffers. The restoration project was developed to fulfill stream mitigation requirements accepted by the DMS for the Upper Yadkin River Basin (HUC 03040101). Mitigation work within the Site included restoring and enhancing 15,308 LF and preserving 4,279 LF of stream. The Moores Fork Stream Restoration Project will net 11,588 stream mitigation units (SMUs) through a combination of restoration, enhancement I and II, and preservation. Due to overhead utility easements that cross project streams, 7.8 SMUs were removed on Silage Tributary Reach 2 (starting at STA 30+10.49 and ending at STA 30+33.95), 10.4 SMUs were removed on Moores Fork (starting at STA 37+22.01 and ending at STA 37+42.79), and 4.1 SMUs were removed on Corn Trib (starting at STA 19+38.58 and ending at STA 19+59.15) as shown in Table 1 of Appendix A.

The final design was completed in June of 2013. Construction activities and as-built surveys were completed in December of 2014. Planting of the site took place in March of 2015. A large flood event with an estimated return interval of 50 to 100 years occurred at the site on April 18-19, 2015, causing damage to the main stem of Moores Fork. This damage was repaired in March and April of 2016, and a second as-built survey was performed on the repaired areas in April of 2016. The baseline monitoring efforts began in June of 2016 and monitoring year one efforts were initiated in late October of 2016. The Monitoring Year 3 monitoring activities were completed in October 2018. More detailed information related to the project activity, history, and contacts can be found in Appendix A, Tables 1 and 2. Directions and a map of the Site are provided in Figure 1 and project components are illustrated for the Site in Figure 2. Please refer to the Project Component Map (Figure 2) for the stream features and to Table 1 for the project component and mitigation credit information for the Site. This report documents the results of the monitoring year three efforts (MY3).

1.1 Project Goals and Objectives

Prior to construction activities, dairy and farming operations on the site had deforested riparian buffers and allowed direct livestock access to the stream, leading to elevated temperatures and nutrients. Channel straightening and dredging throughout much of the project had also contributed to channel degradation. Table 11 in Appendix D present the pre-restoration conditions in detail.

This mitigation site is intended to provide numerous ecological benefits within the Yadkin River Basin. The project goals identified in the Mitigation Plan (Confluence, 2012) include:

- Improve water quality in Moores Fork and the UTs through reductions in sediment and nutrient inputs from local sources;
- Create conditions for dynamic equilibrium of water and sediment movement between the supply reaches and project reaches;

- Promote floodwater attenuation and secondary functions associated with more frequent and extensive floodwater contact times;
- Improve in-stream habitat by increasing the diversity of bedform features;
- Enhance and protect native riparian vegetation communities; and
- Reduce fecal, nutrient, and sediment loads to project streams by promoting and implementing livestock best management practices.

The project objectives have been defined as follows:

- Restoration of the dimension, pattern, profile of approximately 1,828 LF of Moores Fork Reach 2 and 243 LF of the Pond Tributary;
- Restoration of the dimension and profile (Enhancement I) of the channel for approximately 2,832 LF of Moores Fork Reach 3, 900 LF of Silage Reach 1, 2,448 LF of Silage Reach 2, 300 LF of Barn Reach 1 and 112 LF of Corn Reach 2;
- Limited channel work coupled with livestock exclusion, gully stabilization, invasive species control and buffer planting (Enhancement II) on approximately 761 LF of Moores Fork Reach 1, 167 LF of Cow Tributary 1,767 LF of Cow Tributary 2, 3,134 LF of Barn Reach 2, 1,350 LF of Corn Reach 1, and 466 LF of UT1;
- Livestock exclusion fencing and other best management practice installations;
- Invasive plant species control measures across the entire project wherever necessary; and
- Preservation of approximately 4,279 LF of relatively un-impacted forested streams (UTs 2, 3, 6, 7, 8, 9, 10) in a permanent conservation easement.

1.2 Monitoring Year 3 Data Assessment

Annual monitoring was conducted during MY3 (April to October 2018) to assess the condition of the project. The stream restoration success criteria for the Site follows the approved performance standards presented in the Moores Fork Stream Mitigation Project Final Mitigation Plan (Confluence, 2012). Annual monitoring will be conducted for seven years to provide a project data chronology that will facilitate an understanding of project status and trends.

1.2.1 Vegetation Assessment

A total of 12 vegetation monitoring plots were established during the baseline monitoring within the project easement areas using a standard 10 by 10 meter plot. Please refer to Figure 3 in Appendix B for the vegetation monitoring locations. At the end of year five of the monitoring period, the vegetation success criterion is the survival of 260 planted stems per acre in the riparian corridor along restored and enhanced reaches. The final vegetation success criterion is the survival of 210 planted stems per acre at the end of year seven of the monitoring period. The interim measure of vegetation success for the Site is the survival of at least 320 planted stems per acre at the end of year three of the monitoring period.

The MY3 vegetation survey was completed in August 2018, resulting in an average stem density of 458 planted stems per acre. The Site has met the interim requirement of 320 stems per acre, with 9 of the 12 plots (75%) individually meeting this requirement. Vegetation plots 2 and 8, both having densities of 283 stems per acre, did not meet the interim success criteria. However, they still meet the MY5 density requirements of 260 planted stems per acre. Vegetation plot 3, with 242 stems per acre, still meets the MY7 density requirement of 210 stems per acre. The planted stem mortality was approximately 3% of the MY2 stem count which was 472 stems per acre. There is an average of 11 stems per plot. Approximately 2.1% of the planted stems scored a vigor of 1, indicating that they are unlikely to survive. This low vigor rating is due to damage from storm events, suffocation from dense herbaceous cover,

insects, vine strangulation, deer herbivory, or other unknown factors. Please refer to Appendix B for vegetation plot photographs and Appendix C for vegetation data tables.

1.2.2 Vegetation Areas of Concern

Several vegetation problem areas of invasive plant populations were identified in MY3 throughout the Site. Species included: kudzu (*Pueraria montana*), Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*), Multiflora rose (*Rosa multiflora*), Winter Creeper (*Euonymus fortunei*), Oriental Bittersweet (*Celastrus orbiculatus*), and Japanese stilt grass (*Microstegium vimineum*). The supplemental treatment of invasive species that occurred in the Summer and Fall of 2018 significantly reduced areas of Chinese privet, multiflora rose, and kudzu. Along the floodplain of Moores Fork Reach 3, areas of Kudzu and Chinese privet persist after the treatment. Many planted stems continue to be damaged from vine strangulation along Barn Tributary Reach 1. DMS has hired a contractor to treat invasives at the Site. The contractor treated the Site multiple times this summer and fall: July 5-6, July 10-12, August 24 and 27, September 3 and 5, and November 28-30. The contractor will continue to work on the Site to eradicate the invasives species. Areas of invasive species that persist throughout the conservation easement are indicated on Figure 3 in Appendix B.

The site has a strong herbaceous cover consisting of various species of clover, rye grass, fescue, and sedge. Isolated bare/poorly vegetated areas that were observed in MY2 have herbaceous cover that is becoming established in MY3. These vegetation areas of concern are shown in Figure 3 in Appendix B.

1.2.3 Stream Assessment

Morphological surveys for MY3 were conducted in June 2018. In general, MY3 riffle pebble counts in Moores Fork indicate coarser sediment size distribution as compared to MY0. Cross-section data indicate that channel dimensions for Moores Fork have changed very little since the April 2016 baseline data was collected. Riffle width to depth ratios have changed only modestly, and pool depths are being maintained close to baseline depths. At Moores Fork riffle cross-section 2, the width to depth ratio has increased compared to MY0 but appears stable. At Moores Fork pool cross-section 6, an increase in bankfull cross-sectional area was observed in MY2 where a boulder of a stone toe structure has been undermined on the outer bend of the channel. Additional scour behind the structure at this bend was observed in MY3.

Along Silage Tributary, MY3 riffle pebble counts indicate similar or coarser sediment size distribution as compared to MY0. Silage Tributary Reach 1 MY3 indicates somewhat larger deviations from the baseline in part due to the small channel dimensions. On Silage Tributary riffle cross-section 1, scour along the right bank has caused an increase in bankfull bank height ratio. Similarly on Silage Tributary riffle cross-sections 3 and 6, the survey data indicates some channel bed scour due to concentrated flow against a small bar that has formed, resulting in a decrease in width to depth ratios as compared to MY0. For the remaining cross-sections, results indicate that channel dimensions are stable and functioning well. Please refer to Appendix D for cross-section plots and morphological summary tables.

1.2.4 Stream Areas of Concern

Stream areas of concern include instances of bank erosion and sediment deposition. In MY3, a significant area of erosion was observed on the left bank of Moores Fork Reach 2 near STA 35+60. Moores Fork Reach 3 continues to have localized areas of bank erosion near STA 49+00 and just upstream of the confluence of UT8 (STA 44+50). Three structures have been undermined including a log vane structure at STA 41+10, a stone toe boulder at STA 47+50, and root wads at STA 44+50. Additionally, headcuts are visible at both the UT8 and UT10 wetland confluences located along Moores Fork Reach 3. Silage Tributary Reach 2 has new or expanded bank erosion (STA 22+30, 30+30, 31+20, and 34+50). Several structures along Silage Tributary Reach 1 and 2 have been undermined including log

structures at STA 15+80, 18+20, 26+90, 31+90, 33+10 and a boulder step footer at STA 35+20. These areas will continue to be monitored in future years for signs of accelerated instability. Stream areas of concern are indicated in Table 6 and Figure 3 in Appendix B.

1.2.5 Hydrology Assessment

Bankfull data collected from Moores Fork Reach 2 and the Silage Tributary Reach 2 on April 12, 2018 indicate that a bankfull event occurred. A crest gage bankfull measurement was documented for Moores Fork and debris wracklines on the floodplain was evident for the Silage Tributary. NCCRONOS daily rainfall data suggest that the bankfull event may have occurred around March 25, 2018. Two bankfull flow events must be documented on restoration reaches within the seven-year monitoring period and must occur in separate years. Therefore, the performance standard has been met for the Site in MY3. Refer to Appendix E for hydrologic data and graphs.

1.3 Monitoring Year 3 Summary

The Site is on track to meet monitoring success criteria for MY7 vegetation, geomorphology, and hydrology performance standards. The MY3 vegetation survey resulted in an average stem density of 458 planted stems per acre. The Site has met the interim requirement of 320 planted stems per acre, with 9 of the 12 plots (75%) individually meeting this requirement. The MY3 vegetation monitoring and visual assessment revealed invasive plant populations have responded to treatment that occurred in Spring 2018. Morphological surveys indicate that the channel dimensions are stable and functioning as designed with minor deviation from the as-built baseline dimensions. A few instances of localized bank erosion and structure instability are present on the Site. At least one bankfull event occurred during MY3 and was recorded by the Moores Fork crest gage and debris indicators were observed on Silage Tributary. The performance standard of two recorded bankfull events in separate monitoring years has been met for both Moores Fork and Silage Tributary.

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 annual monitoring 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.

Section 3: REFERENCES

Confluence Engineering, PC. 2012. Moores Fork Stream Mitigation Plan. NCEEP, Raleigh, NC.

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

Lee, Michael T., Peet, Robert K., Steven D., Wentworth, Thomas R. 2008. CVS-EEP Protocol for Recording Vegetation Version 4.2. Retrieved from: http://cvs.bio.unc.edu/protocol/cvs-eep-protocol-v4.2-lev1-2.pdf

North Carolina Climate Retrieval and Observations Network of the Southeast Database (NCCRONOS). 2016. State Climate Office of North Carolina. Version 2.7.2. MT Airy 2 W. Station ID No. 315890. Accessed October 2017.

North Carolina Division of Water Resources (NCDWR). 2016. Surface Water Classifications. Retrieved from http://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/classifications

NCDENR. 2009. Upper Yadkin River Basin Restoration Priorities. Retrieved from https://deq.nc.gov/about/divisions/mitigation-services/dms-planning/watershed-planning-documents/yadkin-river-basin

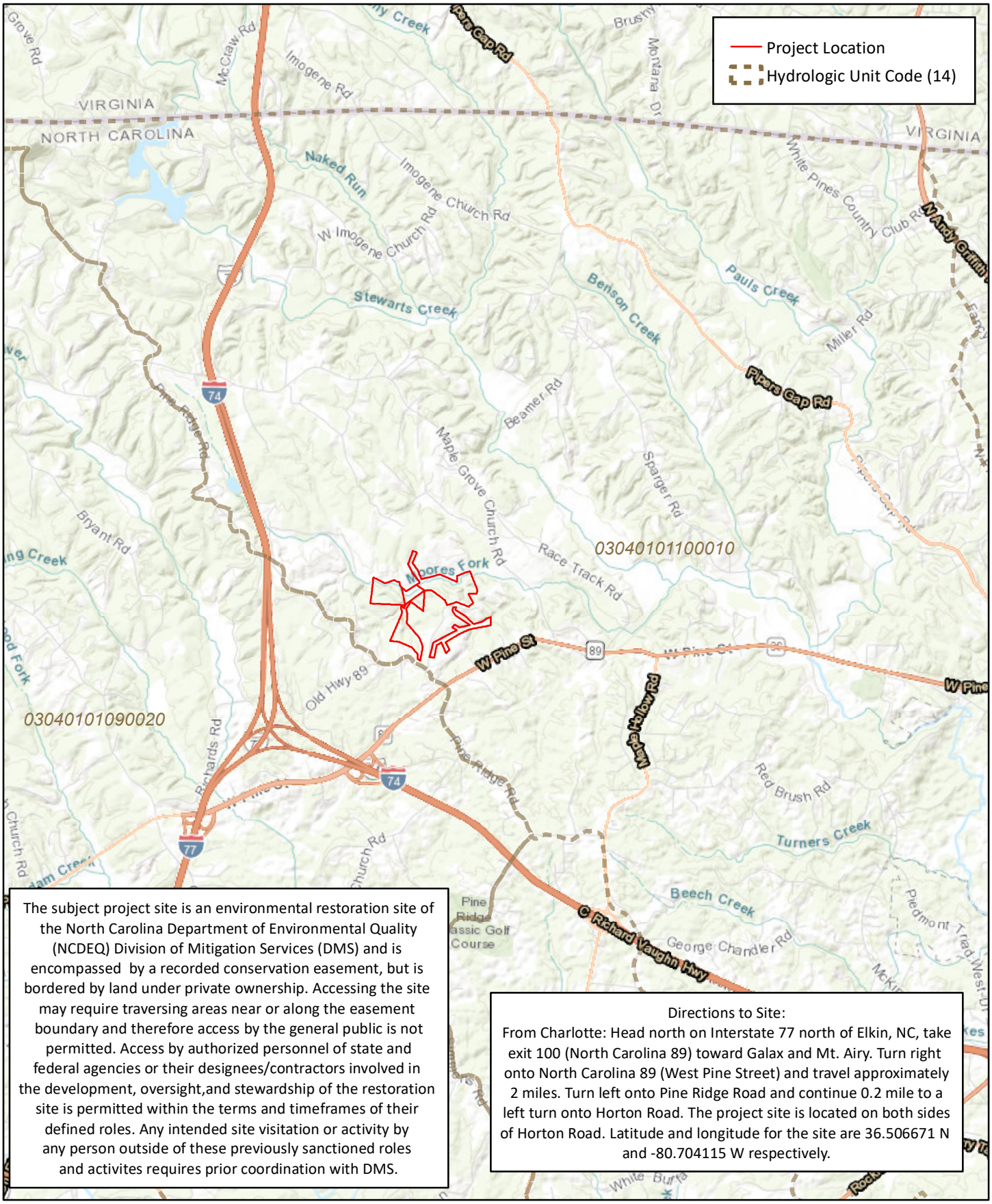
North Carolina Geological Survey (NCGS). 2004. Physiography of North Carolina. Map compiled by the Division of Land Resources. Raleigh.

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

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

United States Geological Survey (USGS), 1998. North Carolina Geology. https://deq.nc.gov/about/divisions/energy-mineral-land-resources/north-carolina-geological-survey/

APPENDIX A. General Tables and Figures



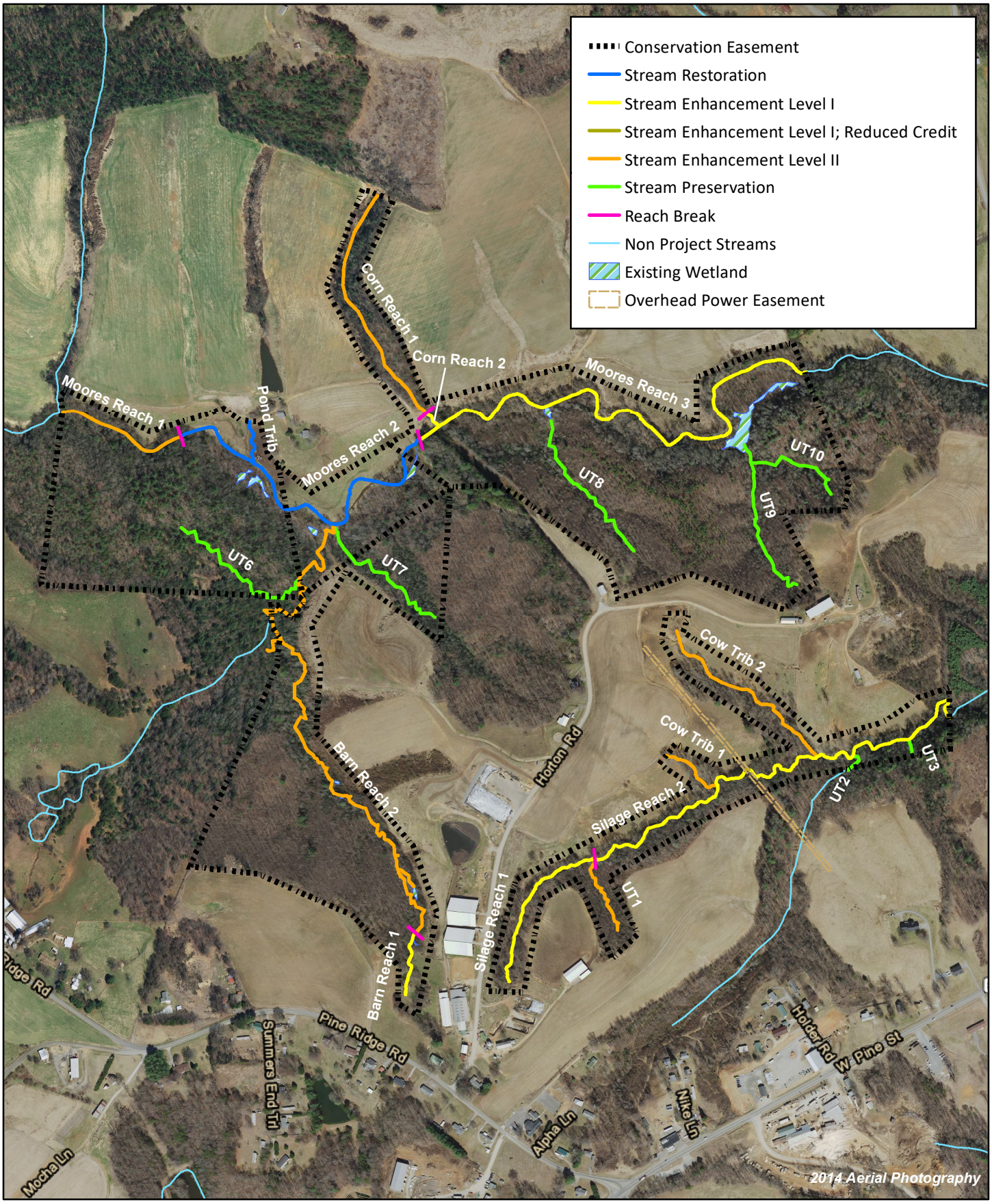
The subject project site is an environmental restoration site of the North Carolina Department of Environmental Quality (NCDEQ) Division of Mitigation Services (DMS) and is encompassed by a recorded conservation easement, but is bordered by land under private ownership. Accessing the site may require 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 activites requires prior coordination with DMS.

Directions to Site:
From Charlotte: Head north on Interstate 77 north of Elkin, NC, take exit 100 (North Carolina 89) toward Galax and Mt. Airy. Turn right onto North Carolina 89 (West Pine Street) and travel approximately 2 miles. Turn left onto Pine Ridge Road and continue 0.2 mile to a left turn onto Horton Road. The project site is located on both sides of Horton Road. Latitude and longitude for the site are 36.506671 N and -80.704115 W respectively.

WILDLANDS ENGINEERING

Figure 1 Project Vicinity Map
Moores Fork Stream Mitigation Site
DMS Project No. 94709
Monitoring Year 3 - 2018

Surry County, NC



WILDLANDS ENGINEERING

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Figure 2 Project Component/Asset Map
Moores Fork Stream Mitigation Site
DMS Project No. 94709
Monitoring Year 3 - 2018

Surry County, NC

Table 1. Project Components and Mitigation Credits
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Mitigation Credit Summaries [1]				
Type	**Restoration**	**Enhancement I**	**Enhancement II**	**Preservation**
Total	2071.000	5757.790	2902.953	855.800

Project Components [1]								
Project Component or Reach ID	**Stationing**	**Pre-project Footage or Acreage**	**Restoration Footage or Acreage**	**Restoration Level**	**Restoration or Rest Equiv.**	**Mitigation Ratio**	**Mitigation Credits**	**Notes**
Moores Reach 1	STA 989-1750	761	761	N/A	EII	2.5:1	304.400	-
Moores Reach 2	STA 1750-3578	1,636	1,828	P2	R	1:1	1,828.000	-
Moores Reach 3	STA 3578-6410	2,856	2,832	P2/3	EI	1:1	2,821.610	Reduction in 10.39 SMU because of 20' overhead powerline easement
Silage Reach 1	STA 1000-1900	900	900	P1	EI	1:1	900.000	-
Silage Reach 2	STA 1900-4348	2,448	2,448	P3	EI	1.5:1	1,624.180	Reduction in 7.82 SMU because of 20' overhead powerline easement.
Cow Trib 1	STA 1219-1386	167	167	P4	EII	1.5:1	111.333	-
Cow Trib 2	STA 1331-2098	767	767	P4	EII	1.5:1	511.333	-
Pond Trib	STA 1000-1243	194	243	P2	R	1:1	243.000	-
Barn Reach 1	STA 1000-1300	300	300	P3	EI	1:1	300.000	-
Barn Reach 2	STA 1350-3746; STA 4069-4757	3,134	3,134	N/A	EII	2.5:1	1,253.600	-
Corn Reach 1	STA 1000-2350	1,350	1,350	N/A	EII	2.5:1	535.886	Reduction in 4.114 SMU because of 20' overhead powerline
Corn Reach 2	STA 2350-2462	112	112	P3	EI	1:1	112.000	-
UT1	STA 1000-1466	466	466	N/A	EII	2.5:1	186.400	-
Preservation Reaches	UTs 2,3,6,7,8,9,10	4,279	4,279	N/A	P	5:1	855.800	-

Length and Area Summations [1]								
Restoration Level	**Stream (Linear Feet)**	**Riparian Wetland (acres)**		**Non-riparian Wetland (acres)**	**Buffer (Square feet)**		**Upland (acres)**	
		Riverine	Non-Riverine					
		-						
Restoration	2,071	-	-	-	-	-	-	-
Enhancement		-	-	-	-	-	-	-
Enhancement I	6,592							
Enhancement II	6,645							
Creation		-	-	-			-	-
Preservation	4,279	-	-	-			-	-
High Quality Preservation	-	-	-	-			-	-
	-	-	-	-			-	-

N/A - Not Applicable

[1]Project components and mitigation credits reverted back to Mitigation Plan totals as requested by IRT.

Table 2. Project Activity and Reporting History
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Activity or Deliverable		Data Collection Complete	Completion or Delivery
Mitigation Plan		December-2011	November-2012
Final Design – Construction Plans		N/A	June-2013
Construction (Repairs)		N/A	December-2014 (April-2016)
Temporary S&E Mix Applied		N/A	December-2014 (April-2016)
Permanent Seed Mix Applied		N/A	December-2014 (April-2016)
Containerized, Bare Root and B&B Plantings For Reach/Segments		N/A	February-2015 (April-2016)
Invasive Species Treatment		May-2016	May-2016
Baseline Monitoring Document (Year 0)	Vegetation Survey	June-2016	August-2016
	Stream Survey	June-2016	
Invasive Species Treatment		September-2016	September-2016
Year 1 Monitoring	Vegetation Survey	October-2016	November-2016
	Stream Survey	November-2016	
Year 2 Monitoring	Vegetation Survey	August-2017	November-2017
	Stream Survey	June 2017 - July 2017	
Invasive Species Treatment		July, Aug, Sept & Nov 2018	November-2018
Year 3 Monitoring	Vegetation Survey	August-2018	November-2018
	Stream Survey	June-2018	
Year 4 Monitoring	Vegetation Survey	2019	November-2019
	Stream Survey	2019	
Year 5 Monitoring	Vegetation Survey	2020	November-2020
	Stream Survey	2020	
Year 6 Monitoring	Vegetation Survey	2021	November-2021
	Stream Survey	2021	
Year 7 Monitoring	Vegetation Survey	2022	November-2022
	Stream Survey	2022	

N/A - Not Applicable

Table 3. Project Contacts Table
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Designer	Wildlands Engineering, Inc. 167-B Haywood Road Asheville, NC 28806
Primary project design POC	Andrew Bick 828-606-0306
Construction Contractor	Carolina Environmental Contracting, Inc. 150 Pine Ridge Road Mount Airy, NC 27030
Construction contractor POC	Wayne Taylor 336-341-6489
Survey Contractor	Turner Land Surveying, PLLC PO Box 41023 Raleigh, NC 27629
Survey Contractor POC	David Turner 919-623-5095
Planting Contractor	Keller Environmental, LLC 7921 Haymarket Lane Raleigh, NC 27615
Planting Contractor POC	Jay Keller 919-749-8259
Seeding Contractor	Carolina Environmental Contracting, Inc. 150 Pine Ridge Road Mount Airy, NC 27030
Seeding Contractor POC	Wayne Taylor 336-341-6489
Seed Mix Sources	Green Resources 336-855-6363
Nursery Stock Suppliers	Foggy Mountain Nursery 336-384-5323
Monitoring Performers	Wildlands Engineering, Inc. 1430 South Mint Street, Ste 104 Charlotte, NC 28205 704.332.7754
Stream Monitoring POC	Kirsten Gimbert 704-332-7754, ext 110
Vegetation Monitoring POC	Kirsten Gimbert 704-332-7754, ext 110

Table 4a. Project Baseline Information and Attributes
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Project Information	
Project Name	Moores Fork Stream Mitigation Project
County	Surry
Project Area (acres)	~140
Project Coordinates (latitude and longitude)	36.506671 N, 80.704115 W
Project Watershed Summary Information	
Physiographic Province	Piedmont
River Basin	Yadkin
USGS Hydrologic Unit 8-digit	03040101
USGS Hydrologic Unit 14-digit	03040101100010
DWR Sub-basin	Pee Dee River Subbasin 03-07-02
Project Drainage Area (acres)	1,527 ac (2.39 mi^2)
Project Drainage Area Percentage of Impervious Area	<5%
CGIA Land Use Classification	Cropland and Pasture, Confined Animal Operations

Reach Summary Information

Parameters	Moores Fork Reach 1 & 2	Moores Fork Reach 3	Silage	Cow Trib 1	Cow Trib 2
Length of Reach Post Construction (LF)	2,636	2,885	3,348	167	767
Valley classification (Rosgen)	VIII	VIII	II/IV	II	II
Drainage area (acres)	1,193	1,527	156	4	16
NCDWQ stream identification score	35	34.5	23.5	20	23.5
NCDWQ Water Quality Classification	WS-IV	WS-IV	WS-IV	WS-IV	WS-IV
Morphological Description (Rosgen stream type)	C4	C4	G4/C4	G5	G5
Evolutionary trend	C-F	C-F	G-F	G	G
Underlying mapped soils	CsA, FsE	CsA, FsE	FeD2	FeD2	FeD2
Drainage class	well drained	well drained	well drained	well drained	well drained
Soil Hydric status	not hydric	not hydric	not hydric	not hydric	not hydric
Slope	0.008	0.006	0.030	0.056	0.038
FEMA classification	Not in SFHA	Not in SFHA	Not in SFHA	Not in SFHA	Not in SFHA
Native vegetation community	Felsic Mesic Forest	Felsic Mesic Forest	Felsic Mesic Forest	Felsic Mesic Forest	Felsic Mesic Forest
Percent composition of exotic invasive vegetation	0	0	0	0	0

Wetland Summary Information

Parameters	Wetland 1	Wetland 2	Wetland 3	Wetland 4
Size of Wetland (acres)	0.49	0.04	0.08	0.15
Wetland Type	riparian non-riverine	riparian non-riverine	riparian non-riverine	riparian non-riverine
Mapped Soil Series	FsE	FsE	CsA	FsE & CsA
Drainage class	well drained	well drained	well drained	well drained
Soil Hydric Status	not hydric	not hydric	not hydric	not hydric
Source of Hydrology	UT9 & UT10	UT8	Toe seep	Toe seep
Hydrologic Impairment	none	none	none	none
Native vegetation community	Dist. Small Stream/ Narrow FP Forest	Dist. Small Stream/ Narrow FP Forest	Dist. Small Stream/ Narrow FP Forest	Dist. Small Stream/ Narrow FP Forest
Percent composition of exotic invasive vegetation	0	0	0	0

Regulatory Considerations

Regulation	Applicable?	Resolved?	Supporting Documentation
Waters of the United States – Section 404	Y	Y	USACE ID No. SAW-2011-02257
Waters of the United States – Section 401	Y	Y	NCDWR # 12-0396
Endangered Species Act	Y	Y	CE Approved 12/21/11
Historic Preservation Act	N	N/A	-
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	N	N/A	-
FEMA Floodplain Compliance	N	N/A	-
Essential Fisheries Habitat	N	N/A	-

N/A Not-applicable

Table 4b. Project Baseline Information and Attributes
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Project Information	
Project Name	Moores Fork Stream Mitigation Project
County	Surry
Project Area (acres)	~140
Project Coordinates (latitude and longitude)	36.506671 N, 80.704115 W
Project Watershed Summary Information	
Physiographic Province	Piedmont
River Basin	Yadkin
USGS Hydrologic Unit 8-digit	03040101
USGS Hydrologic Unit 14-digit	03040101100010
DWR Sub-basin	Pee Dee River Subbasin 03-07-02
Project Drainage Area (acres)	1,527 ac (2.39 mi^2)
Project Drainage Area Percentage of Impervious Area	<5%
CGIA Land Use Classification	Cropland and Pasture, Confined Animal Operations

Reach Summary Information

Parameters	Pond Trib	Barn Reach 1 & 2	Corn Reach 1 & 2	UT1
Length of Reach Post Construction (LF)	243	3,434	1,452	466
Valley classification (Rosgen)	VIII	IV	IV	IV
Drainage area (acres)	27	184	30	6
NCDWQ stream identification score	20	36.5	21	23
NCDWQ Water Quality Classification	WS-IV	WS-IV	WS-IV	WS-IV
Morphological Description (Rosgen stream type)	B4/5	G4	G4	B4
Evolutionary trend	B-C-F	G-F	G-F	-
Underlying mapped soils	CsA	FeD2, FsE	CsA, FsE	FeD2
Drainage class	well drained	well drained	well drained	well drained
Soil Hydric status	not hydric	not hydric	not hydric	not hydric
Slope	0.029	0.025	0.057	0.040 +/-
FEMA classification	Not in SFHA	Not in SFHA	Not in SFHA	Not in SFHA
Native vegetation community	Felsic Mesic Forest	Felsic Mesic Forest	Felsic Mesic Forest	Felsic Mesic Forest
Percent composition of exotic invasive vegetation	0	0	0	0

Wetland Summary Information

Parameters	Wetland 5	Wetland 6
Size of Wetland (acres)	0.03	0.06
Wetland Type	riparian non-riverine	riparian non-riverine
Mapped Soil Series	FeD2	FsE & FeD2
Drainage class	well drained	well drained
Soil Hydric Status	not hydric	not hydric
Source of Hydrology	Toe Seep	Toe Seep
Hydrologic Impairment	none	none
Native vegetation community	Dist. Small Stream/ Narrow FP Forest	Dist. Small Stream/ Narrow FP Forest
Percent composition of exotic invasive vegetation	0	0

N/A Not-applicable

Table 5. Monitoring Component Summary

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Parameter	Monitoring Feature	Quantity/ Length by Reach												Frequency
		Moores Reach 1	Pond Trib	Moores Reach 2	Corn Reach 1	Corn Reach 2	Moores Reach 3	Silage Reach 1	Silage Reach 2	UT1	Cow Trib 1	Cow Trib 2	Barn 1	Barn 2	
Dimension	Riffle XS			2			4	1	3						Years 1, 2, 3, 5, 7
	Pool XS			1			2	1	2						Years 1, 2, 3, 5, 7
Substrate	100 Pebble Count			2			4	1	3						Annual
Hydrology	Crest Gage			1					1						Semi-Annual
Vegetation	Vegetation Plots			4			3	1	2			1	1		Annual
Visual Assessment	Project Site	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Semi-Annual
Reference Photos	Permanent Photo Points	2	2	11	1	2	19	6	12	2	2	4	3	3	Annual

APPENDIX B. Visual Assessment Data

WILDLANDS ENGINEERING

Figure 3.0 Integrated Current Condition Plan View (Key)
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018
Surry County, NC

- Conservation Easement
- Overhead Power Line Easement
- Stream Restoration
- Stream Enhancement Level I
- Stream Enhancement Level I; Reduced Credit
- Stream Enhancement Level II
- Stream Enhancement Level II; Reduced Credit
- Stream Preservation
- Reach Break
- Non Project Streams
- Top of Bank
- Existing Wetland
- Photo Point
- Crest Gage
- Cross-Section

Vegetation Monitoring Plots (VP) - MY3

- Criteria Met
- Criteria Not Met

Vegetation Areas of Concern - MY3

- Invasive Plant Population
- Bare/Poor Herbaceous Cover

Stream Areas of Concern - MY3

- Aggradation
- Erosion

Structures

- Constructed Riffle
- Brushmat
- Geolift
- Debris Plug
- Bridge
- Gully Stabilization
- Facines

Structures

- Root Wad
- J-Hook
- Rock Vane
- Log Vane
- Step
- Stone Toe

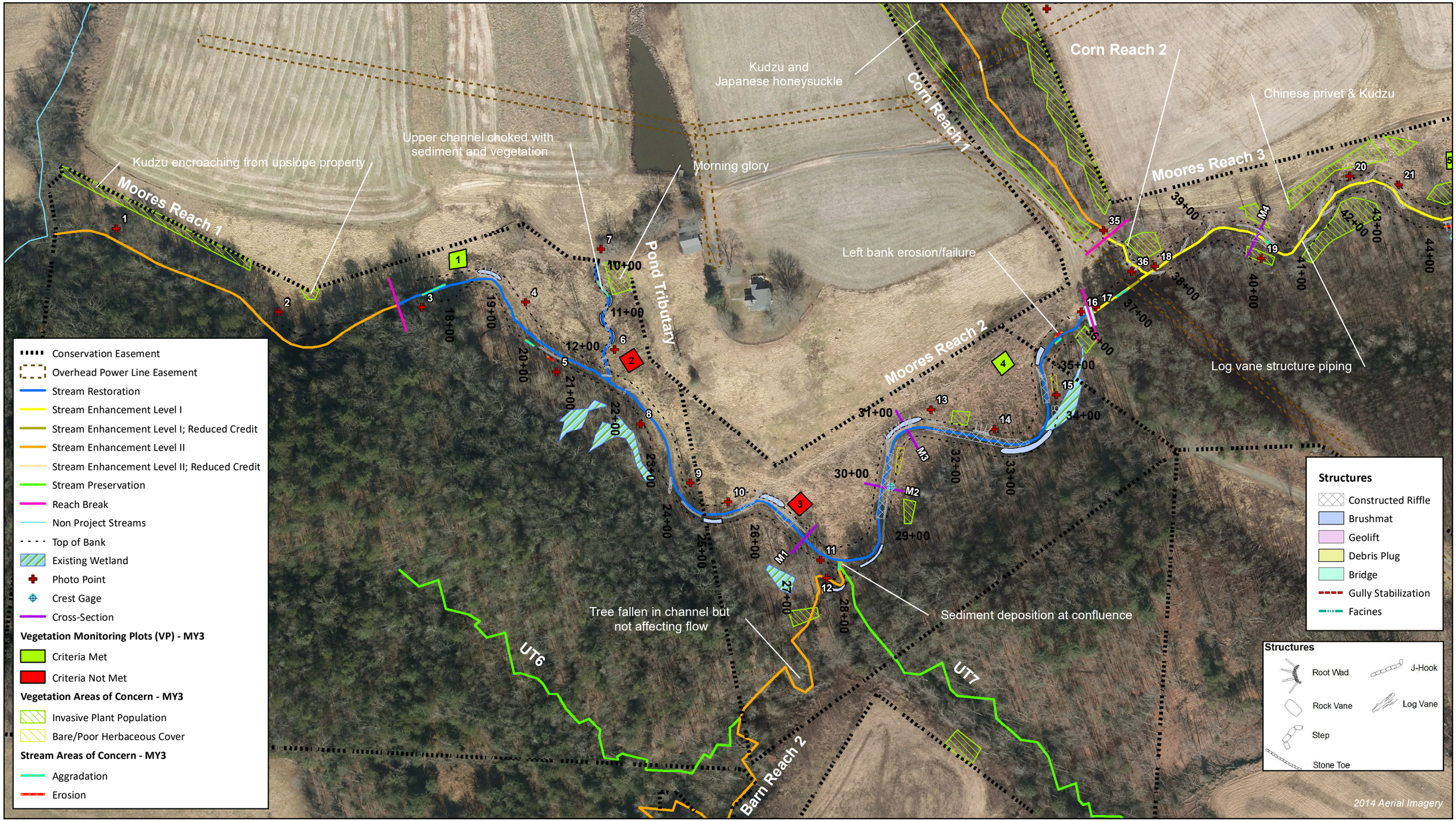
Corn Reach 1
Corn Reach 2
Moores Reach 2
Moores Reach 3
Pond Tributary
UT8
Oriental bittersweet and Japanese Honeysuckle
Kudzu and Japanese honeysuckle
Headcut at wetland outlet
Stone toe boulder undermined
Chinese Privet & Kudzu
Upper channel choked with sediment and vegetation
Morning glory
Left bank erosion
Log vane structure piping
2014 Aerial Imagery

WILDLANDS ENGINEERING

0 250 500 Feet

N

Figure 3.1 Integrated Current Condition Plan View (Sheet 1 of 6)
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018
Surry County, NC

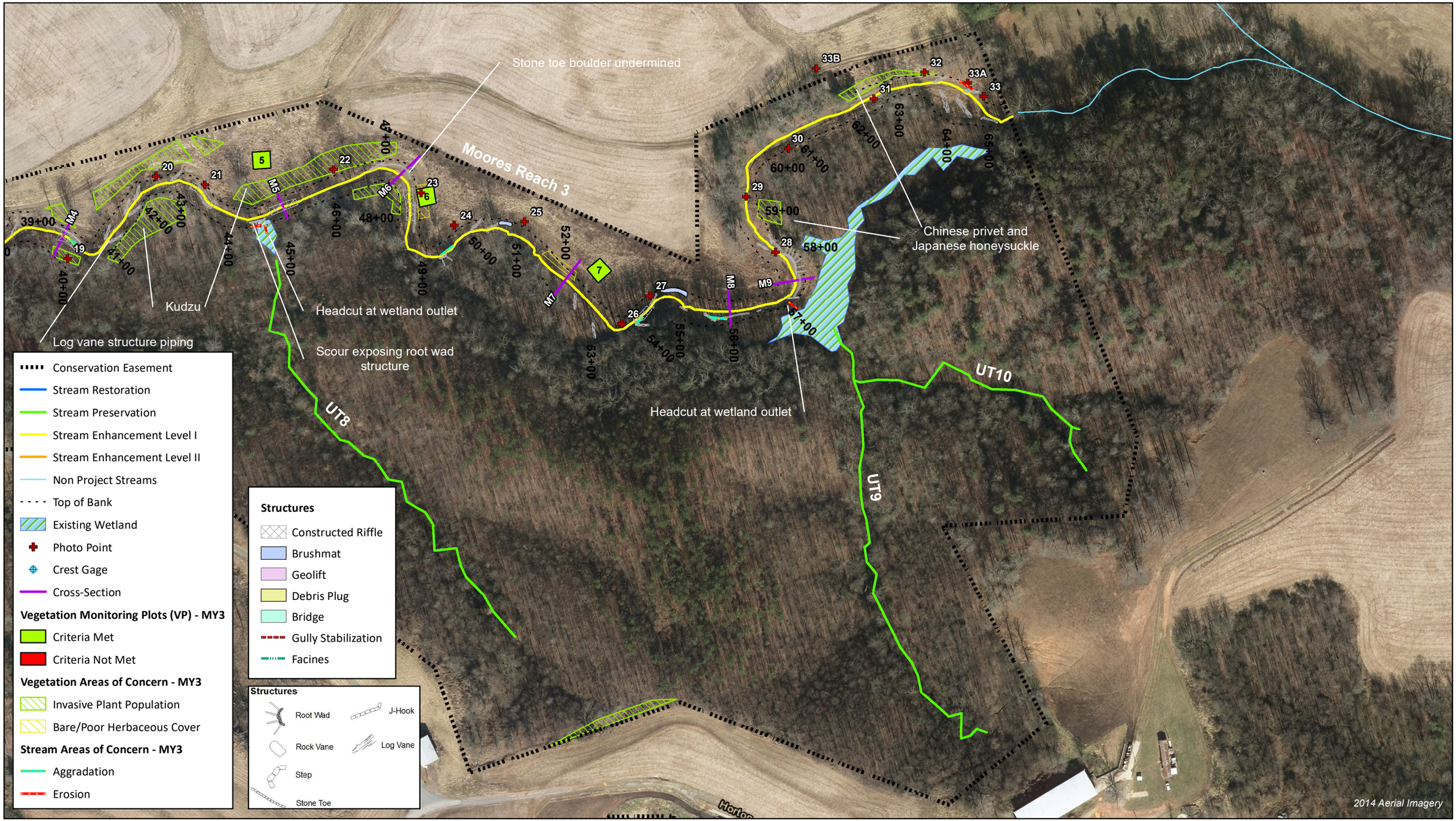


WILDLANDS ENGINEERING

0 250 500 Feet

N

Figure 3.2 Integrated Current Condition Plan View (Sheet 2 of 6)
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018
Surry County, NC

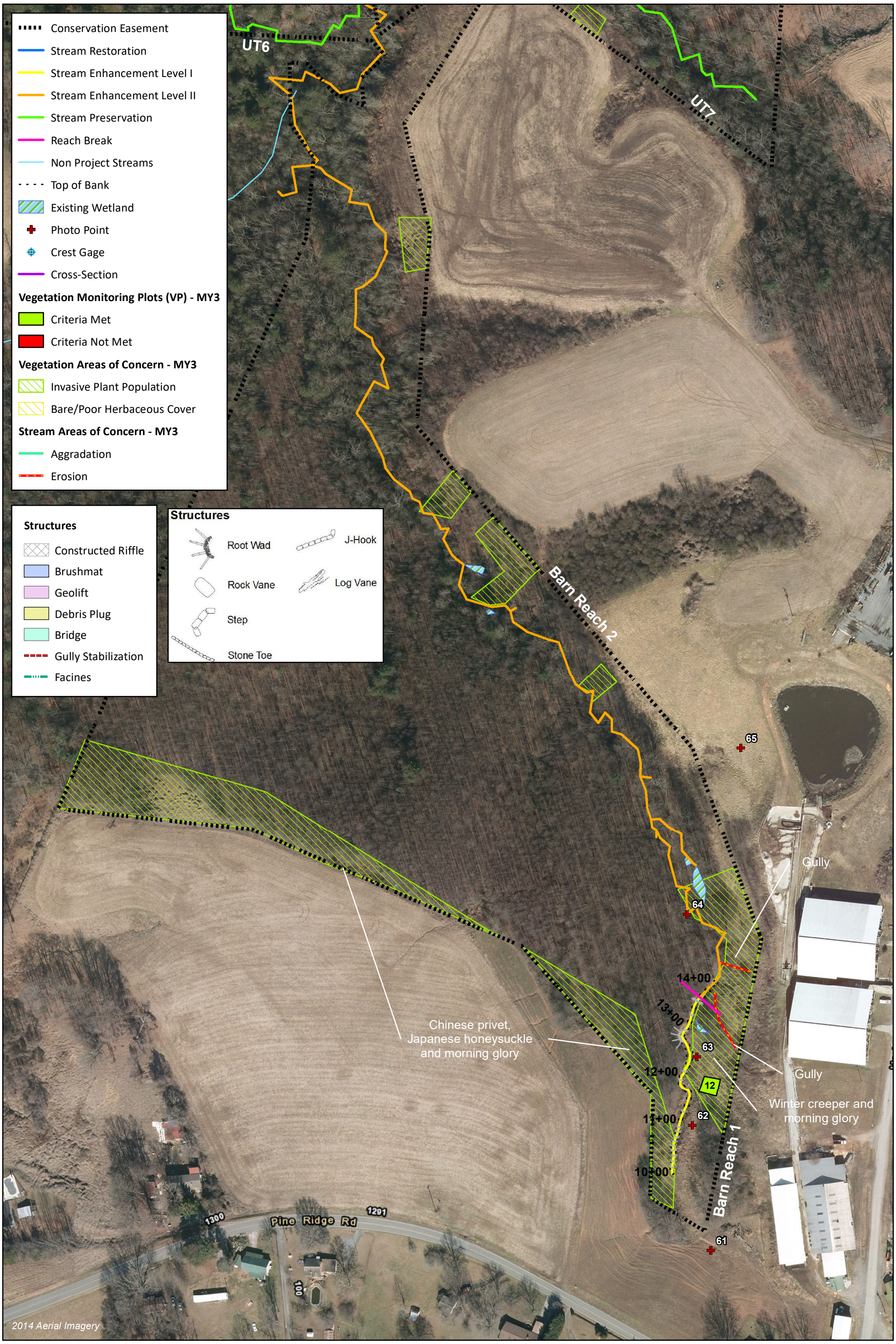


WILDLANDS ENGINEERING

0 250 500 Feet

N

Figure 3.3 Integrated Current Condition Plan View (Sheet 3 of 6)
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018
Surry County, NC



WILDLANDS ENGINEERING

0 250 500 Feet

Figure 3.4 Integrated Current Condition Plan View (Sheet 4 of 6)
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018
Surry County, NC

Conservation Easement
Overhead Power Line Easement
Stream Restoration
Stream Enhancement Level I
Stream Enhancement Level I; Reduced Credit
Stream Enhancement Level II
Stream Preservation
Reach Break
Non Project Streams
Top of Bank
Existing Wetland
Photo Point
Crest Gage
Cross-Section

Vegetation Monitoring Plots (VP) - MY3

Criteria Met
Criteria Not Met

Vegetation Areas of Concern - MY3

Invasive Plant Population
Bare/Poor Herbaceous Cover

Stream Areas of Concern - MY3

Aggradation
Erosion

Structures

Constructed Riffle
Brushmat
Geolift
Debris Plug
Bridge
Gully Stabilization
Facines

Structures

Root Wad
J-Hook
Rock Vane
Log Vane
Step
Stone Toe

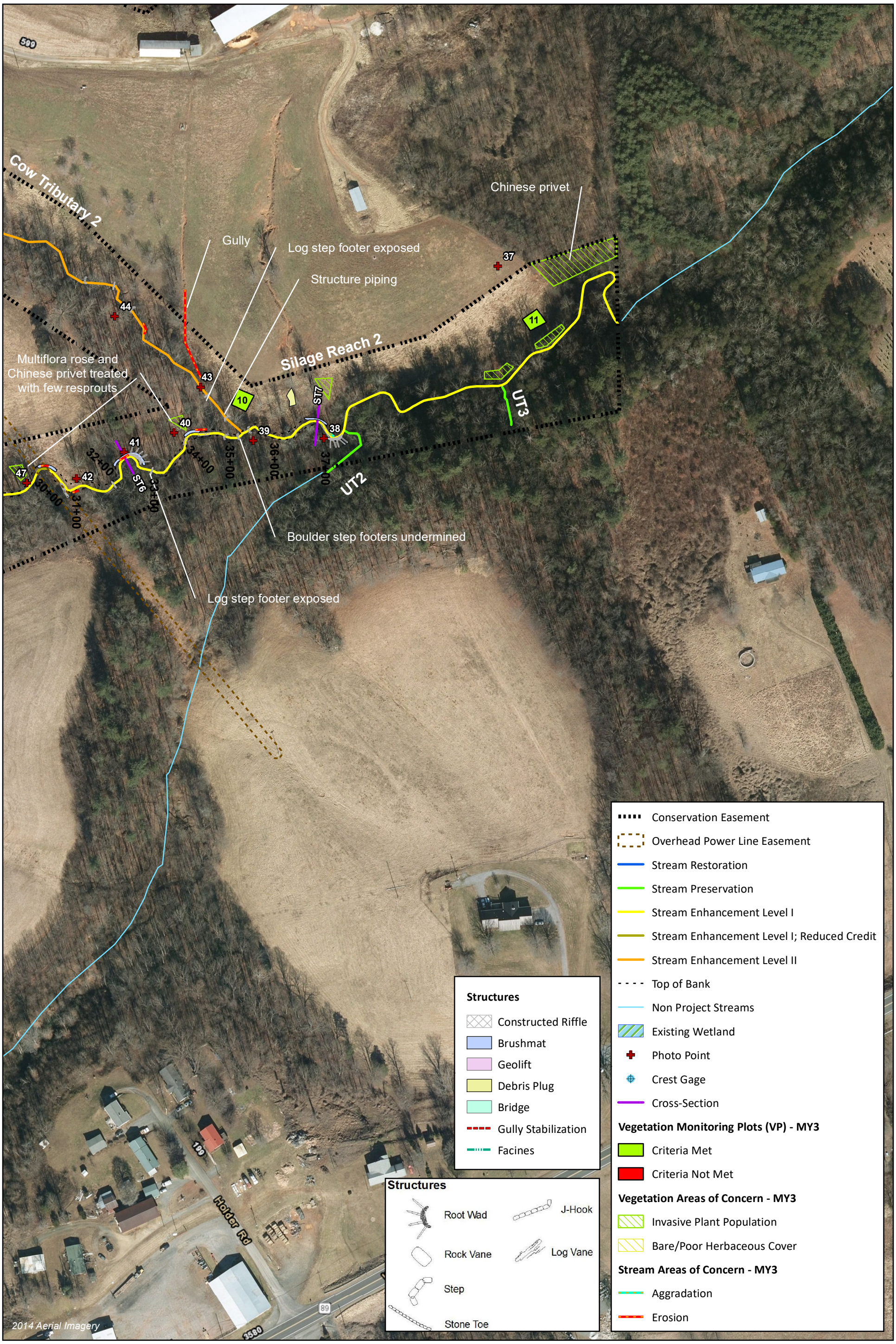
Horton Rd
500
Gully
Cow Tributary 2
8
46
45
44
Gully
Chinese privet and multiflora rose treated with few resprouts
Cow Tributary 1
50
ST5
29+00
30+00
47
42
41
ST6
32+00
33+00
40
Gully
49
48
28+00
51
ST4
ST3
27+00
Silage Reach 2
52
26+00
25+00
53
9
24+00
23+00
54
Structure piping
Log step footer exposed
Log piping
Gully
Gully
19+00
21+00
22+00
20+00
56
18+00
55
17+00
57
16+00
Chinese privet
58
15+00
Gully
UT1
Log structure undermined
14+00
ST2
ST1
Silage Reach 1
13+00
67
12+00
Fallen Tree Over Channel
59
11+00
60
10+00
66
Kudzu and Oriental bittersweet
Multiflora rose, Chinese privet
2014 Aerial Imagery

WILDLANDS ENGINEERING

0 250 500 Feet

N

Figure 3.5 Integrated Current Condition Plan View (Sheet 5 of 6)
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018
Surry County, NC



WILDLANDS ENGINEERING

0 250 500 Feet

Figure 3.6 Integrated Current Condition Plan View (Sheet 6 of 6)
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018
Surry County, NC

Table 6a. Visual Stream Morphology Stability Assessment Table

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Moores Fork Reach 1 (Assessed Length : 761 feet)

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	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	4	4			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	5	5			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	5	5			100%			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	5	5			100%			
		2. Thalweg centering at downstream of meander (Glide)	5	5			100%			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	0	0	100%
	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%	0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	0	0	100%
				Totals	0	0	100%	0	0	100%
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	N/A	N/A			N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	N/A	N/A			N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	N/A	N/A			N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

Table 6b. Visual Stream Morphology Stability Assessment Table

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Moores Fork Reach 2 (Assessed Length : 1875 feet)

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	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			3	85	95%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	8	8			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	6	7			86%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	6	7			86%			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	6	7			86%			
		2. Thalweg centering at downstream of meander (Glide)	6	7			86%			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			2	35	98%	1	10	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%	0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	0	0	100%
				Totals	2	35	98%	1	10	99%
3. Engineered Structures	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.	5	5			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%. (See guidance for this table in EEP monitoring guidance document)	9	9			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	2	2			100%			

Table 6c. Visual Stream Morphology Stability Assessment Table

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Moores Fork Reach 3 (Assessed Length : 2885 feet)

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	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			5	130	95%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	13	13			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	16	16			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	16	16			100%			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	16	16			100%			
		2. Thalweg centering at downstream of meander (Glide)	16	16			100%			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			2	50	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%	0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	0	0	100%
				Totals	2	50	98%	0	0	98%
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	24	27			89%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	6	6			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	24	27			89%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	18	18			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	3	3			100%			

Table 6d. Visual Stream Morphology Stability Assessment Table

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Silage Reach 1 (Assessed Length : 900 feet)

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	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	N/A	N/A			N/A			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	12	12			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	12	12			100%			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	12	12			100%			
		2. Thalweg centering at downstream of meander (Glide)	12	12			100%			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			2	35	96%	0	0	96%
	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%	0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	0	0	100%
				Totals	2	35	96%	0	0	96%
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	6	8			75%			
	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.	6	8			75%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	1	1			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

Table 6e. Visual Stream Morphology Stability Assessment Table

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Silage Reach 2 (Assessed Length : 2448 feet)

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	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			5	60	98%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	15	15			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	13	16			81%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	13	16			81%			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	13	16			81%			
		2. Thalweg centering at downstream of meander (Glide)	13	16			81%			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			6	100	96%	0	0	96%
	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%	0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	0	0	100%
				Totals	6	100	96%	0	0	96%
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	12	16			75%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	12	16			75%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	12	16			75%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	3	4			75%			

Table 6f. Visual Stream Morphology Stability Assessment Table

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Cow Trib 1 (Assessed Length : 167 feet)

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	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	N/A	N/A			N/A			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	2	2			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	2	2			100%			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander (Glide)	N/A	N/A			N/A			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			N/A	N/A	N/A	0	0	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.			N/A	N/A	N/A	0	0	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse			N/A	N/A	N/A	0	0	N/A
				Totals	0	0	N/A	0	0	N/A
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	13	13			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	13	13			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	13	13			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

Table 6g. Visual Stream Morphology Stability Assessment Table

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Cow Trib 2 (Assessed Length : 767 feet)

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	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	N/A	N/A			N/A			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	N/A	N/A			N/A			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	N/A	N/A			N/A			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander (Glide)	N/A	N/A			N/A			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	N/A	N/A	100%
	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%	0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			1	20	99%	0	0	99%
				Totals	1	20	99%	0	0	99%
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	22	24			92%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	22	24			92%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	22	24			92%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

Table 6h. Visual Stream Morphology Stability Assessment Table

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Pond Trib (Assessed Length : 243 feet)

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	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			1	40	84%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	N/A	N/A	Channel largely overgrown with vegetation. No discernible facets in some segments of channel.		N/A			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	N/A	N/A			N/A			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	N/A	N/A			N/A			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander (Glide)	N/A	N/A			N/A			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	0	0	100%
	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%	0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	0	0	100%
				Totals	0	0	100%	0	0	100%
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	7	7			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.	N/A	N/A			N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

Table 6i. Visual Stream Morphology Stability Assessment Table

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Barn Trib Reach 1 (Assessed Length : 350 feet)

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	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	N/A	N/A	Channel largely overgrown with vegetation. No discernible facets in some segments of channel.		N/A			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	N/A	N/A			N/A			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	N/A	N/A			N/A			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander (Glide)	N/A	N/A			N/A			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	0	0	100%
	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%	0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	0	0	100%
				Totals	0	0	100%	0	0	100%
3. Engineered Structures	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.	15	15			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	15	15			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	1	1			100%			

Table 6j. Visual Stream Morphology Stability Assessment Table

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Corn Trib Reach 2 (Assessed Length : 112 feet)

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	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	N/A	N/A			N/A			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	1	1			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	1	1			100%			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	1	1			100%			
		2. Thalweg centering at downstream of meander (Glide)	1	1			100%			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	0	0	100%
	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%	0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	0	0	100%
				Totals	0	0	100%	0	0	100%
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	4	4			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	4	4			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	4	4			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	N/A	N/A			N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	N/A	N/A			N/A			

Table 7. Visual Stream Morphology Stability Assessment Table

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Planted Acreage **15.4**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	Cross Hatch Yellow	4	0.06	0.4%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres	N/A	6	0.15	1.0%
			Total	10	0.21	1.4%
3. 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 acres	N/A	0	0.00	0.0%
			Cumulative Total	10	0.21	1.4%

Easement Acreage **140**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Easement Acreage
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	1000 SF	Cross Hatch Green	45	7.0	5.0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	None	N/A	0	0.00	0.0%

Stream Photographs

PP1 – Moores Reach 1, looking upstream *(06/05/2018)*

PP2 – Moores Reach 1, looking downstream *(06/05/2018)*

PP3 – Moores Reach 2, looking downstream *(06/05/2018)*

PP4 – Moores Reach 2, looking downstream *(06/05/2018)*

PP5 – Moores Reach 2, looking upstream *(06/05/2018)*

PP6 – Pond Tributary, looking downstream *(06/05/2018)*

PP7 – Pond Tributary, looking downstream *(06/05/2018)*

PP8 – Moores Reach 2, looking downstream *(06/05/2018)*

PP9 – Moores Reach 2, looking downstream *(06/05/2018)*

PP10 – Moores Reach 2, looking downstream *(06/05/2018)*

PP11 – Moores Reach 2, looking downstream *(06/05/2018)*

PP12 – Barn Reach 2, looking upstream *(06/05/2018)*

PP13 – Moores Reach 2, looking downstream *(06/05/2018)*

PP14 – Moores Reach 2, looking downstream *(06/05/2018)*

PP15 – Moores Reach 2, looking downstream *(06/05/2018)*

PP16 – Moores Reach 2, looking upstream *(06/05/2018)*

PP17 – Moores Reach 3, looking downstream *(06/05/2018)*

PP18 – Moores Reach 3, looking downstream *(06/05/2018)*

PP19 – Moores Reach 3, looking downstream *(06/05/2018)*

PP20 – Moores Reach 3, looking downstream *(06/05/2018)*

PP21 – Moores Reach 3, looking downstream *(06/05/2018)*

PP22 – Moores Reach 3, looking downstream *(06/05/2018)*

PP23 – Moores Reach 3, looking downstream *(06/05/2018)*

PP24 – Moores Reach 3, looking downstream *(06/05/2018)*

PP25 – Moores Reach 3, looking downstream *(06/05/2018)*

PP26 – Moores Reach 3, looking downstream *(06/05/2018)*

PP27 – Moores Reach 3, looking downstream *(06/05/2018)*

PP28 – Moores Reach 3, looking downstream *(06/05/2018)*

PP29 – Moores Reach 3, looking downstream *(06/05/2018)*

PP30 – Moores Reach 3, looking downstream *(06/05/2018)*

PP31 – Moores Reach 3, looking downstream *(06/05/2018)*

PP32 – Moores Reach 3, looking downstream *(06/05/2018)*

PP33 – Moores Reach 3, looking downstream *(06/05/2018)*

PP33a – Moores Reach 3, looking upstream *(06/05/2018)*

PP33b – Moores Reach 3, looking downstream *(06/05/2018)*

PP34 – Corn Reach 1, looking downslope *(06/05/2018)*

PP35 – Corn Reach 2, looking downstream *(06/05/2018)*

PP36 – Corn Reach 2, looking upstream *(06/05/2018)*

PP37 – Silage Reach 2, looking downslope *(06/06/2018)*

PP38 – Silage Reach 2, looking downstream *(06/06/2018)*

PP39 – Silage Reach 2, looking upstream *(06/06/2018)*

PP40 – Silage Reach 2, looking downstream *(06/06/2018)*

PP41 – Silage Reach 2, looking downstream *(06/06/2018)*

PP42 – Silage Reach 2, looking downstream *(06/06/2018)*

PP43 – Cow Tributary 2, looking downstream *(06/06/2018)*

PP44 – Cow Tributary 2, looking downstream *(06/06/2018)*

PP45 – Cow Tributary 2, looking downstream *(06/06/2018)*

PP46 – Cow Tributary 2, looking upstream *(06/06/2018)*

	
PP47 – Silage Reach 2, looking downstream *(06/06/2018)*	**PP48 –** Silage Reach 2, looking upstream *(06/06/2018)*
	
PP49 – Cow Tributary 1, looking upstream *(06/06/2018)*	**PP50 –** Cow Tributary 1, looking upstream *(06/06/2018)*
	
PP51 – Silage Reach 2, looking downstream *(06/06/2018)*	**PP52 –** Silage Reach 2, looking upstream *(06/06/2018)*

PP53 – Silage Reach 2, looking downstream *(06/06/2018)*

PP54 – Silage Reach 2, looking upstream *(06/06/2018)*

PP55 – UT1, looking upstream *(06/06/2018)*

PP56 – Silage Reach 1, looking downstream *(06/06/2018)*

PP57 – Silage Reach 1, looking upstream *(06/06/2018)*

PP58 – Silage Reach 1, looking upstream *(06/06/2018)*

PP59 – Silage Reach 1, looking downstream *(06/06/2018)*

PP60 – Silage Reach 1, looking downstream *(06/06/2018)*

PP61 – Barn Reach 1, looking downslope *(06/05/2018)*

PP62 – Barn Reach 1, looking downstream *(06/05/2018)*

PP63 – Barn Reach 1, looking downstream *(06/05/2018)*

PP64 – Barn Reach 2, looking downstream *(06/05/2018)*

PP65 – Barn Reach 2, looking downslope *(06/05/2018)*

PP66 – Silage Reach 1, looking upslope *(06/05/2018)*

PP67 – UT1, looking downstream *(06/06/2018)*

Vegetation Photographs

Vegetation Plot 1 – *(8/06/2018)*

Vegetation Plot 2 – *(8/06/2018)*

Vegetation Plot 3 – *(8/06/2018)*

Vegetation Plot 4 – *(8/06/2018)*

Vegetation Plot 5 – *(8/06/2018)*

Vegetation Plot 6 – *(8/06/2018)*

Vegetation Plot 7 – *(8/06/2018)*

Vegetation Plot 8 – *(8/07/2018)*

Vegetation Plot 9 – *(8/07/2018)*

Vegetation Plot 10 – *(8/07/2018)*

Vegetation Plot 11 – *(8/07/2018)*

Vegetation Plot 12 – *(8/07/2018)*

APPENDIX C. Vegetation Plot Data

Table 8. Vegetation Plot Criteria Attainment

Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Plot	MY3 Success Criteria Met (Y/N)	Tract Mean
1	Y	75%
2	N	
3	N	
4	Y	
5	Y	
6	Y	
7	Y	
8	N	
9	Y	
10	Y	
11	Y	
12	Y	

Table 9. CVS Vegetation Plot Metadata

Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Database Name	cvs-eep-entrytool-v2.5.0 Moores MY3.mdb
Database Location	Q:\ActiveProjects\005-02153 Moores Monitoring\Monitoring\Monitoring Year 3\Vegetation Assessment
Computer Name	MIMI-PC
File Size	48578560
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, 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	94709
Project Name	Moores Fork Stream Mitigation
Description	
River Basin	
Length(ft)	
Stream-to-edge Width (ft)	
Area (sq m)	
Required Plots (calculated)	
Sampled Plots	12
Required Plots (calculated)	12
Sampled Plots	12

Table 10. Planted and Total Stem Counts
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

			Current Plot Data (MY3 2018)																				
			94709-01-0001			94709-01-0002			94709-01-0003			94709-01-0004			94709-01-0005			94709-01-0006			94709-01-0007		
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																					
Betula nigra	River Birch, Red Birch	Tree															1						
Cercis canadensis	Redbud	Shrub Tree																					
Diospyros virginiana	American Persimmon	Tree	3	3	5	1	1	1										1	1	1			
Fraxinus pennsylvanica	Green Ash, Red Ash	Tree										8	8	8	2	2	2	1	1	1	2	2	4
Liriodendron tulipifera	Tulip Poplar	Tree							3	3	3							1	1	1			
Nyssa sylvatica	Black Gum	Tree																2	2	2	2	2	2
Platanus occidentalis	Sycamore	Tree							1	1	1	3	3	3	9	9	9	2	2	2	7	7	7
Quercus lyrata	Overcup Oak	Tree	6	6	6	4	4	4				2	2	2				3	3	3			
Quercus montana	Rock Chestnut Oak	Tree				1	1	1	2	2	2							4	4	4	1	1	1
Quercus nigra	Water Oak	Tree	3	3	3	1	1	1				1	1	1	1	1	1						
Quercus phellos	Willow Oak	Tree										1	1	1	2	2	2						
Rhus glabra	Smooth Sumac	Shrub Tree															1						2
		Stem count	12	12	14	7	7	7	6	6	6	15	15	15	14	14	16	14	14	14	12	12	16
		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	3	3	3	4	4	4	3	3	3	5	5	5	4	4	6	7	7	7	4	4	5
		Stems per ACRE	486	486	567	283	283	283	243	243	243	607	607	607	567	567	647	567	567	567	486	486	647

			Current Plot Data (MY3 2018)															Annual Means								
			94709-01-0008			94709-01-0009			94709-01-0010			94709-01-0011			94709-01-0012			MY3 (2018)			MY2 (2017)			MY1 (2016)			MY0 (2016)		
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**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	Red Maple	Tree			3						15			2						20			7						
Betula nigra	River Birch, Red Birch	Tree																		1	1	1	3			2			
Cercis canadensis	Redbud	Shrub Tree			1															1									
Diospyros virginiana	American Persimmon	Tree				1	1	3	4	4	4	1	1	1	6	6	6	17	17	21	16	16	17	14	14	14	14	14	14
Fraxinus pennsylvanica	Green Ash, Red Ash	Tree													2	2	2	15	15	17	15	15	16	13	13	13	14	14	14
Liriodendron tulipifera	Tulip Poplar	Tree			2			2			40							4	4	48	4	4	70	4	4	8	4	4	4
Nyssa sylvatica	Black Gum	Tree	2	2	2	1	1	1	4	4	4	5	5	5				16	16	16	17	17	17	20	20	20	19	19	19
Platanus occidentalis	Sycamore	Tree													1	1	1	23	23	23	24	24	24	25	25	26	26	26	26
Quercus lyrata	Overcup Oak	Tree	3	3	3	6	6	6				3	3	3	1	1	1	28	28	28	30	30	30	28	28	28	29	29	29
Quercus montana	Rock Chestnut Oak	Tree				1	1	1				5	5	5				14	14	14	14	14	14	21	21	21	22	22	22
Quercus nigra	Water Oak	Tree	1	1	1	6	6	6	2	2	2							15	15	15	15	15	17	14	14	14	14	14	14
Quercus phellos	Willow Oak	Tree				1	1	1										4	4	4	4	4	4	7	7	7	7	7	7
Rhus glabra	Smooth Sumac	Shrub Tree			2															5			2			1			
		Stem count	6	6	14	16	16	20	10	10	65	14	14	16	10	10	10	136	136	213	140	140	221	146	146	154	149	149	149
		size (ares)	1			1			1			1			1			12			12			12			12		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.30			0.30			0.30			0.30		
		Species count	3	3	7	6	6	7	3	3	5	4	4	5	4	4	4	9	9	13	10	10	12	9	9	11	9	9	9
		Stems per ACRE	243	243	567	647	647	809	405	405	2630	567	567	647	405	405	405	459	459	718	472	472	745	492	492	519	502	502	502

Color for Density

Exceeds requirements by 10%
Exceeds requirements, but by less than 10%
Fails to meet requirements, by less than 10%
Fails to meet requirements by more than 10%
Volunteer species included in total

PnoLS: Number of pla
P-all: Number of planted stems including live stakes
T: Total stems

APPENDIX D. Morphological Summary Data and Plots

Table 11a. Baseline Stream Data Summary
Moores Fork Stream Mitigation Project
DMS Project No.94709
Monitoring Year 3 - 2018

Moores Reach 1, Reach 2, & Reach 3; Silage Reach 1 & Reach 2

		PRE-RESTORATION CONDITION								REFERENCE REACH DATA		DESIGN								AS-BUILT/BASELINE							
Parameter	**Gage**	**Moores Fork Reaches 1/2**		**Moores Fork Reach 3**		**Silage Reach 1**		**Silage Reach 2**		**Mill Branch**		**Moores Fork Reaches 1/2**		**Moores Fork Reach 3**		**Silage Reach 1**		**Silage Reach 2**		**Moores Fork Reaches 1/2**		**Moores Fork Reach 3**		**Silage Reach 1**		**Silage Reach 2**	
		Min	**Max**	**Min**	**Max**	**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 - Riffle																											
Bankfull Width (ft)		27.3	30.6	24.9	34.2	6.7	6.9	18.2		27.2	33.6	36.5		37.0		8.8		12.5		31.8	33.2	30.2	52.2	4.2		10.6	14.6
Floodprone Width (ft)		109.0	137.7	104.0	125.0	11	16.0	100.0		72.1	72.5	145		124		19		28		145		124		9.4		23	30
Bankfull Mean Depth		1.7	2.6	2.3	2.9	0.8	1.2	1.7		1.9	2.2	2.2		2.3		0.6		1.00		2.1	2.2	1.9	2.6	0.7		0.6	0.8
Bankfull Max Depth		3.0	3.4	4.0		1.2	1.7	2.3		2.4	2.7	3.5		3.6		0.8		1.50		3.3	3.5	3.3	4.1	1.2		1.3	1.5
Bankfull Cross-sectional Area (ft^2)	N/A	46.9	78.2	73.3	77.6	5.6	8.4	31.6		50.8	72.4	82.1		85.3		5.1		13.1		67.2	74.1	72.5	101.1	2.8		6.9	9.3
Width/Depth Ratio		12.0	15.9	8.4	15.1	5.7	8.0	10.5		14.5	15.6	16.2		16.0		15.1		11.9		14.9	15	12.5	26.9	6.4		16.2	22.7
Entrenchment Ratio		4.0	4.5	3.7	4.2	1.6	2.3	5.5		2.7		5.0		4.0		2.2		2.2		4.4	4.6	2.5	4.1	4.5		1.3	2.6
Bank Height Ratio		1.2	1.4	1.2	1.9	1.0	1.6	3.1		1.0	1.1	1.0		1.0		1.0		1.5		1.0		1.0		1.0		1.0	
D50 (mm)		29		30		4		23		20		29		30		4		23		11	25	13	28	16		6	14
Riffle Length (ft)		---		---		---		---		---		50	70	10	195	---		16	63	32	178	26.0	199.0	---		13.12	55.95
Riffle Slope (ft/ft)		---		---		---		---		---		0.0059	0.0180	0.0038	0.02	---		0.0492	0.0514	0.0045	0.0158	0.0027	0.0180	---		0.0017	0.0554
Pool Length (ft)	N/A	---		---		---		---		---		42	140	40	112	---		15	35	63	170	81.0	139.0	---		10	19
Pool Max Depth (ft)		---		---		---		---		---		5.0		5.5		---		---		3.0	6.0	4.3	8.5	1.2		1.4	2.4
Pool Spacing (ft)		---		---		---		---		---		130	270	78	334	20	23	15	75	118	295	106	325	13.3	171.5	21	79
Pattern																											
Channel Beltwidth (ft)		52	161	43	208	---		---		86		55	165	53	267	---		---		7	84	8	59	7	36	8	59
Radius of Curvature (ft)		65.8	102.7	41	94	---		---		19.6	25.8	53	124	58	74	---		---		25	58	13	24	9	25	13	24
Rc:Bankfull Width (ft/ft)	N/A	2.4	3.4	1.7	2.8	---		---		0.7	0.9	2.0	6.0	1.7	4.0	---		---		0.8	1.8	0.4	0.8	2.1	6.0	1.2	2.3
Meander Length (ft)		N/A		N/A		---		---		N/A		N/A		N/A		---		---		123	210	63	158	61	100	63	158
Meander Width Ratio		1.9	5.3	1.7	6.1	---		---		3.2		1.9	5.7	1.7	8.6	---		---		3.9	6.6	2.1	5.2	14.5	23.8	5.9	14.9
Substrate, Bed and Transport Parameters																											
Ri%/Ru%/P%/G%/S%																											
SC%/Sa%/G%/C%/B%/Be%																											
d50/d84/d95	N/A	28/67/89 and 29/43/56		---		---		---		40/89/133		---		---		---		---		25/58/90 and 11/38/110		8; 28/62/150; 13/28/51; 2		16/35/61		9.8/37/64 and 6/31/72	
Max part size (mm) mobilized at bankfull																											
Stream Power (Capacity) W/m^2																											
Additional Reach Parameters																											
Drainage Area (SM)		1.9		2.39		0.070		0.24		5		1.90		2.34		0.070		0.24		1.90		2.34		0.070		0.24	
Watershed Impervious Cover Estimate (%)		<5%		<5%		<5%		<5%		---		<5%		<5%		<5%		<5%		<5%		<5%		<5%		<5%	
Rosgen Classification		C4		C4		G4/B4		E4		C4		C4		C4		B4		E4		C4		C4		B4		E4	
Bankfull Velocity (fps)		4.1	5.3	4.6	5.2	5.4	6.6	6.3		5.0	5.5	5.0		4.9		4.5		4.5		4.4	4.6	4.2	5.1	5.0		4.5	5.1
Bankfull Discharge (cfs)		193.9	411.4	380.1	358.4	30.2	55.1	197.5		N/A		250-260		260		24		60		297.6	340.8	348.4	468.7	13.8		31.2	44.3
Q-USGS NC HR1 (2-yr)	N/A	237-278		278		29		63		385		237-278		278		29		63		237-278		278		29		63	
Valley Length (ft)		2227		2234		1079		1200		4730		2227		2234		1079		1200		2227		2234		1079		1200	
Channel Thalweg Length (ft)		2393		2847		1198		1441		327		2578		2825		1198		1441		2,628		2,856		1,198		1,441	
Sinuosity		1.07		1.27		1.11		1.20		1.26		1.16		1.26		1.11		1.20		1.2		1.3		1.11		1.20	
Water Surface Slope ($ft/ft)^2$		0.0077		0.0067		0.0357		0.0294		0.0101		0.0076		0.0064		0.0357		0.0294		0.005541		0.005511		0.0389		0.02758	
Bankfull Slope (ft/ft)		---		---		---		---		---		---		---		---		---		0.005265		0.006112		0.0404		0.02740	

(---): Data was not provided
N/A: Not Applicable

Table 11b. Baseline Stream Data Summary
Moores Fork Stream Mitigation Project
DMS Project No.94709
Monitoring Year 3 - 2018

Barn Trib, Corn Trib, Pond Trib

		PRE-RESTORATION CONDITION						REFERENCE REACH DATA				DESIGN						AS-BUILT/BASELINE					
Parameter	Gage	Barn		Corn		Pond		Barn Trib Pres Rch		Corn Trib Pres Rch		Barn (Reach 1)		Corn		Pond		Barn (Reach 1)		Corn (Reach 2)		Pond	
		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 - Riffle																							
Bankfull Width (ft)	N/A	1.6		4.6		16.3		7.0		4.1		6.0		6.6		8.0		---		---		---	
Floodprone Width (ft)		4.0		7.8		50.0		9.9		13.7		19		20		25		---		---		---	
Bankfull Mean Depth		0.6		0.5		1.5		0.7		0.4		0.5		0.4		0.7		---		---		---	
Bankfull Max Depth		0.8		0.7		2.6		1.1		0.5		0.8		0.6		1.0		---		---		---	
Bankfull Cross-sectional Area (ft^2)		0.9		2.4		24.4		4.6		1.5		3.2		2.9		5.5		---		---		---	
Width/Depth Ratio		2.9		8.9		10.9		10.6		11.2		11.3		15.1		11.6		---		---		---	
Entrenchment Ratio		2.5		1.7		3.1		1.4		3.3		3.2		3.0		3.1		---		---		---	
Bank Height Ratio		7.6		3.8		1.1		1.6		1.7		1.0		1.0		1.0		---		---		---	
D50 (mm)		---		---		---		46		46		---		---		---		---		---		---	
Riffle Length (ft)	N/A	---		---		---		---		---		---		---		5	31	---		12.0		8.4	27.3
Riffle Slope (ft/ft)		---		---		---		---		---		---		---		0.02	0.0538	---		0.0498		0.0136	0.0241
Pool Length (ft)		---		---		---		---		---		8	13	---		10	30	---		17.5	32.9	27.8	37.9
Pool Max Depth (ft)		---		---		---		---		---		---		---		---		---		2.6	3.6	0.7	1.4
Pool Spacing (ft)		---		---		---		---		---		8	10	---		15	54	6.11	77.7	9	56	22	43
Pool Volume (ft^3)		---		---		---		---		---		---		---		---							
Pattern																							
Channel Beltwidth (ft)	N/A	---		---		---		---		---		---		---		---		13	26	20	22	24	24
Radius of Curvature (ft)		---		---		---		---		---		---		---		---		12	30	12	29	15	21
Rc:Bankfull Width (ft/ft)		---		---		---		---		---		---		---		---		---		---		---	
Meander Length (ft)		---		---		---		---		---		---		---		---		71	85	49	61	66	78
Meander Width Ratio		---		---		---		---		---		---		---		---		---		---		---	
Substrate, Bed and Transport Parameters																							
Ri%/Ru%/P%/G%/S%	N/A																						
SC%/Sa%/G%/C%/B%/Be%																							
d50/d84/d95																							
Max part size (mm) mobilized at bankfull																							
Stream Power (Capacity) W/m^2																							
Additional Reach Parameters																							
Drainage Area (SM)	N/A	0.01		0.05		0.04		0.08		0.05		0.01		0.05		0.040		0.01		0.05		0.040	
Watershed Impervious Cover Estimate (%)		<5%		<5%		<5%		<5%		<5%		<5%		<5%		<5%		<5%		<5%		<5%	
Rosgen Classification		G4		G4		C4b (trampled)		B4		E4b		E4b		B4		C4b		E4b		B4		C4b	
Bankfull Velocity (fps)		2.70		5.01		7.4		3.84		2.7		3.31		4.7		3.93		---		---		---	
Bankfull Discharge (cfs)		2.5		12.0		181.4		17.7		4.0		11		---		19		---		---		---	
Q-USGS NC HR1 (2-yr)		8		---		20		---		---		8		---		20							
Q-Mannings		11		---		19		---		---		11		---		19		11		---		19	
Valley Length (ft)		622		84		187		622		---		330		84		187		330		84		187	
Channel Thalweg Length (ft)		250		97		194		84		28		350		97		243		350		112		243	
Sinuosity		0.40		1.15		1.04		0.14		---		1.06		1.15		1.30		1.06		1.3		1.3	
Water Surface Slope $(ft/ft)^2$		0.0206		0.0567		0.029		0.0211		0.0243		0.0206		0.0567		0.0176		0.0478	0.1124	0.0425		0.0118	
Bankfull Slope (ft/ft)		---		---		---		---		---		---		---		---		0.0463	0.1005	0.0478		0.0129	

(---): Data was not provided
N/A: Not Applicable

Table 12a. Morphology and Hydraulic Summary (Dimensional Parameters - Cross-Section)

Moores Fork Stream Mitigation Project

DMS Project No.94709

Monitoring Year 3 - 2018

Moores Fork

	Cross-Section M1 (Riffle)								Cross-Section M2 (Riffle)								Cross-Section M3 (Pool)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**	**Base[1]**	**MY1[1]**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**
bankfull elevation (ft)	1150.4	1150.4	1150.4	1150.5					1148.7	1148.7	1148.7	1149.1					1148.4	1148.4	1148.4	1148.7				
low bank elevation (ft)	1150.4	1150.5	1150.4	1150.3					1148.7	1148.7	1148.6	1148.8					1148.4	1148.3	1148.4	1146.7				
Bankfull Width (ft)	33.2	34.2	34.1	36.0					31.8	32.5	32.5	38.5					39.1	39.3	38.9	42.4				
Floodprone Width (ft)	145.0	145.0	145.0	145.0					145.0	145.0	145.0	145.0					---	---	---	---				
Bankfull Mean Depth (ft)	2.2	2.2	2.1	2.1					2.1	2.0	1.9	1.7					2.3	2.3	2.3	2.2				
Bankfull Max Depth (ft)	3.3	3.2	3.4	3.5					3.5	3.4	3.4	3.7					5.2	5.1	5.2	5.4				
Bankfull Cross-Sectional Area (ft^2)	74.1	74.3	71.9	74.1					67.2	65.6	62.0	67.2					91.8	90.1	87.8	91.8				
Bankfull Width/Depth Ratio	14.9	15.7	16.1	17.5					15.0	16.1	17.0	22.1					16.6	17.2	17.2	19.5				
Bankfull Entrenchment Ratio	4.4	4.2	4.3	4.0					4.6	4.5	4.5	3.8					---	---	---	---				
Bankfull Bank Height Ratio	1.0	1.0	1.0	<1.0					1.0	1.0	1.0	<1.0					---	---	---	---				
	Cross-Section M4 (Riffle)								**Cross-Section M5 (Riffle)**								**Cross-Section M6 (Pool)**							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**	**Base[1]**	**MY1**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**	**Base[1]**	**MY1**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**
bankfull elevation (ft)	1142.3	1142.3	1142.3	1142.5					1139.5	1139.5	1139.5	1139.5					1138.6	1138.6	1138.6	1138.4				
low bank elevation (ft)	1141.6	1141.6	1141.6	1141.6					1139.5	1139.4	1139.7	1139.7					1138.6	1138.5	1138.5	1136.8				
Bankfull Width (ft)	52.2	51.6	52.3	56.7					32.0	31.6	32.6	32.7					39.3	39.1	39.3	45.5				
Floodprone Width (ft)	124.0	124.0	124.0	124.0					124.0	124.0	124.0	124.0					---	---	---	---				
Bankfull Mean Depth (ft)	1.9	1.9	1.8	1.8					2.3	2.3	2.2	2.2					2.7	2.7	2.9	2.3				
Bankfull Max Depth (ft)	3.3	3.2	3.7	3.5					3.5	3.6	3.6	3.8					5.1	5.5	5.2	5.0				
Bankfull Cross-Sectional Area (ft^2)	101.1	97.4	95.8	101.1					73.0	72.4	72.8	73.0					106.1	106.2	115.6	106.1				
Bankfull Width/Depth Ratio	26.9	27.3	28.6	31.9					14.0	13.8	14.6	14.6					14.5	14.4	13.3	19.5				
Bankfull Entrenchment Ratio	2.4	2.4	2.4	2.2					3.9	3.9	4.1	3.8					---	---	---	---				
Bankfull Bank Height Ratio	<1.0	<1.0	<1.0	<1.0					1.0	1.0	1.1	1.0					---	---	---	---				
	Cross-Section M7 (Run)								**Cross-Section M8 (Riffle)**								**Cross-Section M9 (Pool)**							
Dimension and Substrate	**Base[1]**	**MY1**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1[1]**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1[1]**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**
bankfull elevation (ft)	1134.9	1134.9	1134.9	1135.0					1132.4	1132.4	1132.4	1132.4					1132.1	1132.1	1132.1	1132.1				
low bank elevation (ft)	1134.9	1134.9	1135.0	1134.8					1132.4	1132.3	1132.3	1132.2					1132.1	1132.1	1132.1	1132.1				
Bankfull Width (ft)	49.5	49.2	49.6	51.0					34.6	34.0	33.5	36.5					30.6	33.1	32.9	35.9				
Floodprone Width (ft)	124.0	124.0	124.0	124.0					124.0	124.0	124.0	124.0					---	---	---	---				
Bankfull Mean Depth (ft)	2.4	2.4	2.4	2.3					2.6	2.7	2.7	2.5					4.0	3.8	3.7	3.4				
Bankfull Max Depth (ft)	3.5	3.5	3.8	4.0					4.1	4.3	4.2	4.3					6.3	6.3	6.5	6.2				
Bankfull Cross-Sectional Area (ft^2)	118.1	117.0	117.7	118.1					91.5	91.5	89.2	91.5					122.0	125.9	122.3	122.0				
Bankfull Width/Depth Ratio	20.7	20.7	20.9	22.0					13.1	12.6	12.6	14.6					7.7	8.7	8.8	10.6				
Bankfull Entrenchment Ratio	2.5	2.5	2.5	2.4					3.6	3.6	3.7	3.4					---	---	---	---				
Bankfull Bank Height Ratio	1.0	1.0	1.0	<1.0					1.0	1.0	1.0	1.0					---	---	---	---				

[1]Adjustment in survey points included in bankfull calculations resulting in change to previous monitoring year bankfull dimensions.

[2]Prior to MY3, bankfull dimensions were calculated using a fixed bankfull elevation. For MY3 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. Morphology and Hydraulic Summary (Dimensional Parameters - Cross-Section)

Moores Fork Stream Mitigation Project

DMS Project No.94709

Monitoring Year 3 - 2018

Silage Tributary

	Cross-Section ST1 (Riffle)								Cross-Section ST2 (Pool)								Cross-Section ST3 (Riffle)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1[1]**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1[1]**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**
bankfull elevation (ft)	1234.6	1234.6	1234.6	1234.1					1233.4	1233.4	1233.4	1233.3					1193.4	1193.4	1193.4	1193.2				
low bank elevation (ft)	1234.6	1234.6	1234.6	1234.4					1233.4	1233.4	1233.5	1233.4					1193.4	1193.4	1193.4	1193.0				
Bankfull Width (ft)	4.2	4.0	4.5	4.2					5.1	4.5	5.3	4.6					14.6	14.7	14.6	12.9				
Floodprone Width (ft)	9.4	9.2	9.6	10.7					---	---	---	---					22.5	22.8	24.6	24.6				
Bankfull Mean Depth (ft)	0.7	0.6	0.9	0.7					0.6	0.6	0.6	0.7					0.6	0.6	0.8	0.7				
Bankfull Max Depth (ft)	1.2	1.1	1.5	0.9					1.2	1.2	1.1	1.0					1.3	1.3	1.9	1.7				
Bankfull Cross-Sectional Area (ft^2)	2.8	2.3	4.1	2.8					3.2	2.8	3.0	3.2					9.3	8.8	11.0	9.3				
Bankfull Width/Depth Ratio	6.4	6.7	4.8	6.2					8.0	7.2	9.2	6.5					22.7	22.8	19.4	18.0				
Bankfull Entrenchment Ratio	2.2	2.3	2.2	2.6					---	---	---	---					1.5	1.5	1.7	1.9				
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.3					---	---	---	---					1.0	1.0	1.0	<1.0				

	Cross-Section ST4 (Pool)								Cross-Section ST5 (Pool)								Cross-Section ST6 (Riffle)							
Dimension and Substrate	**Base[1]**	**MY1[1]**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**	**Base[1]**	**MY1[1]**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**	**Base[1]**	**MY1[1]**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**
bankfull elevation (ft)	1193.1	1193.1	1193.1	1192.9					1185.1	1185.1	1185.1	1184.8					1175.4	1175.4	1175.4	1175.4				
low bank elevation (ft)	1193.1	1192.9	1192.9	1192.3					1185.1	1184.9	1185.0	1184.7					1175.4	1175.3	1175.3	1175.4				
Bankfull Width (ft)	13.9	14.9	14.7	15.3					7.8	8.7	8.4	8.8					9.6	8.4	8.7	8.2				
Floodprone Width (ft)	---	---	---	---					---	---	---	---					28.0	28.0	28.0	28.0				
Bankfull Mean Depth (ft)	1.1	1.3	1.1	1.0					1.0	0.9	1.0	0.9					0.7	0.7	0.8	0.8				
Bankfull Max Depth (ft)	2.4	2.7	2.3	2.3					1.4	1.5	1.6	1.3					1.3	1.5	1.5	1.5				
Bankfull Cross-Sectional Area (ft^2)	15.5	19.4	16.0	15.5					7.9	8.1	8.7	7.9					6.8	6.1	7.3	6.8				
Bankfull Width/Depth Ratio	12.5	11.4	13.4	15.2					7.7	9.4	8.1	9.8					13.5	11.6	10.4	9.9				
Bankfull Entrenchment Ratio	---	---	---	---					---	---	---	---					2.9	3.3	3.2	3.4				
Bankfull Bank Height Ratio	---	---	---	---					---	---	---	---					1.0	<1.0	<1.0	1.0				

	Cross-Section ST7 (Riffle)							
Dimension and Substrate	**Base[1]**	**MY1[1]**	**MY2**	**MY3[2]**	**MY4**	**MY5**	**MY6**	**MY7**
bankfull elevation (ft)	1164.7	1164.7	1164.7	1164.7				
low bank elevation (ft)	1164.7	1164.6	1164.6	1164.6				
Bankfull Width (ft)	10.3	10.5	10.8	9.6				
Floodprone Width (ft)	29.6	31.8	33.6	32.9				
Bankfull Mean Depth (ft)	0.9	0.9	0.9	0.9				
Bankfull Max Depth (ft)	1.5	1.6	1.8	1.6				
Bankfull Cross-Sectional Area (ft^2)	8.8	9.3	9.6	8.8				
Bankfull Width/Depth Ratio	12.0	12.0	12.1	10.5				
Bankfull Entrenchment Ratio	2.9	3.0	3.1	3.4				
Bankfull Bank Height Ratio	1.0	<1.0	1.0	1.0				

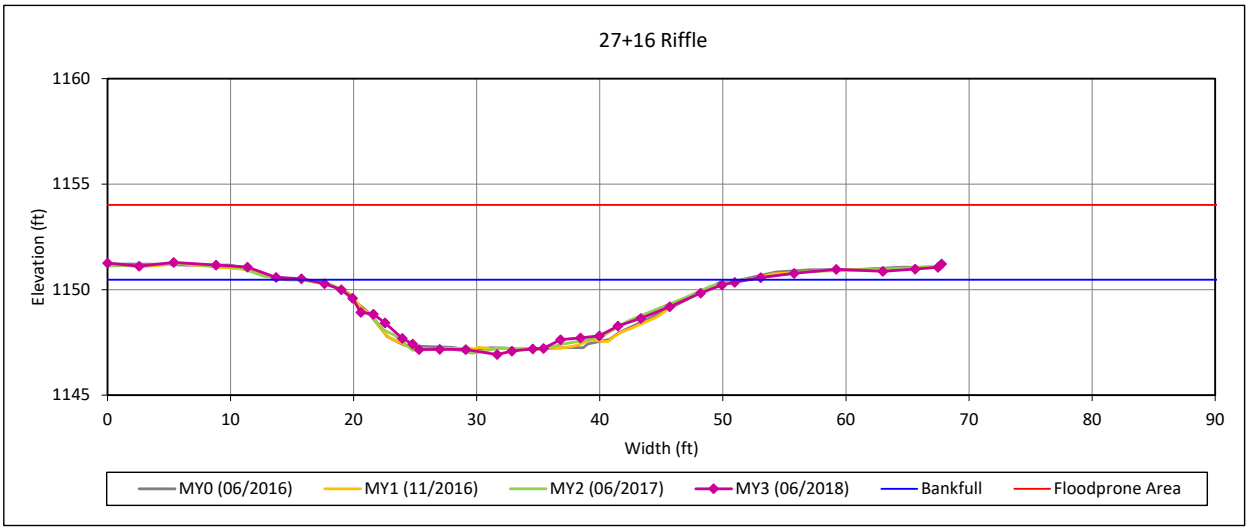
[1]Adjustment in survey points included in bankfull calculations resulting in change to previous monitoring year bankfull dimensions.

[2]Prior to MY3, bankfull dimensions were calculated using a fixed bankfull elevation. For MY3 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

Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Cross-Section M1- Moores Fork



Bankfull Dimensions	
74.1	x-section area (ft.sq.)
36.0	width (ft)
2.1	mean depth (ft)
3.5	max depth (ft)
37.2	wetted perimeter (ft)
2.0	hydraulic radius (ft)
17.5	width-depth ratio
145.0	W flood prone area (ft)
4.0	entrenchment ratio
0.9	low bank height ratio

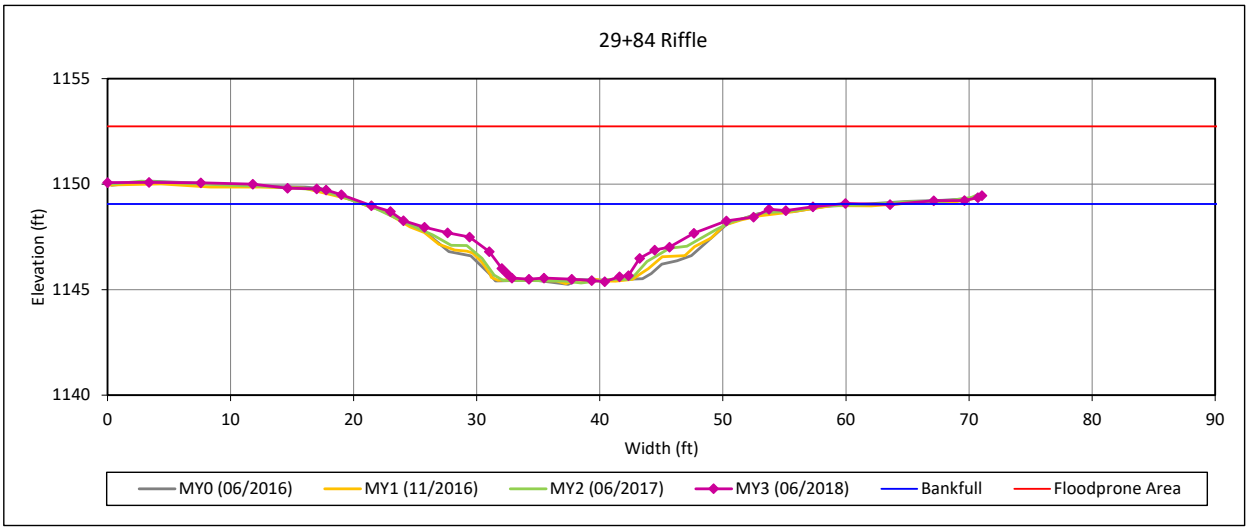
Survey Date: 06/2018
Field Crew: Kee Mapping & Surveying

View Downstream

Cross-Section Plots

Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Cross-Section M2- Moores Fork



Bankfull Dimensions	
67.2	x-section area (ft.sq.)
38.5	width (ft)
1.7	mean depth (ft)
3.7	max depth (ft)
39.9	wetted perimeter (ft)
1.7	hydraulic radius (ft)
22.1	width-depth ratio
145.0	W flood prone area (ft)
3.8	entrenchment ratio
0.9	low bank height ratio

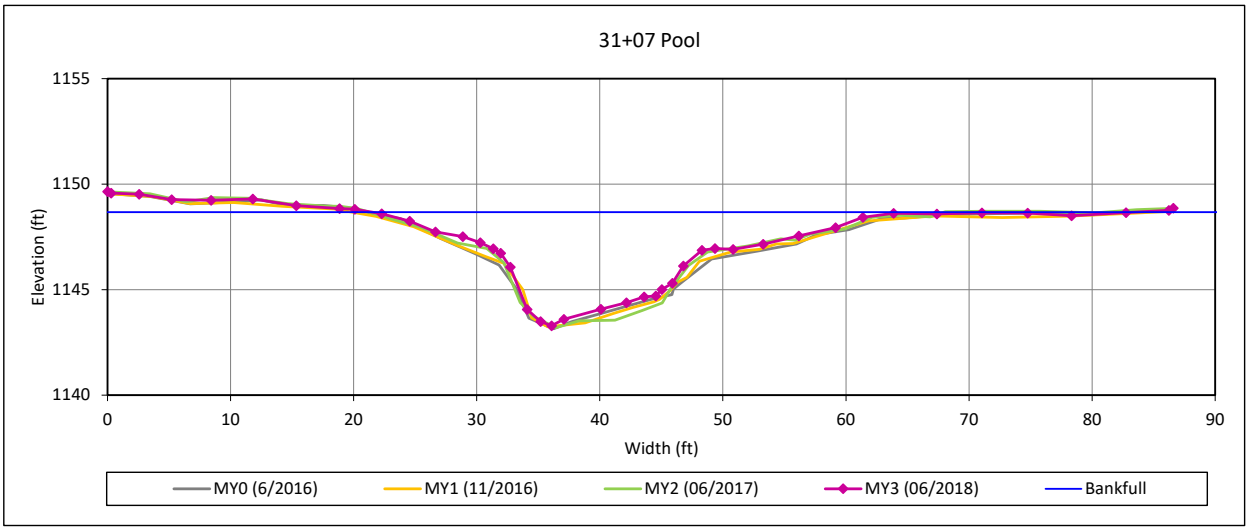
Survey Date: 06/2018
Field Crew: Kee Mapping & Surveying

View Downstream

Cross-Section Plots

Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Cross-Section M3- Moores Fork



Bankfull Dimensions	
91.8	x-section area (ft.sq.)
42.4	width (ft)
2.2	mean depth (ft)
5.4	max depth (ft)
44.9	wetted perimeter (ft)
2.0	hydraulic radius (ft)
19.5	width-depth ratio

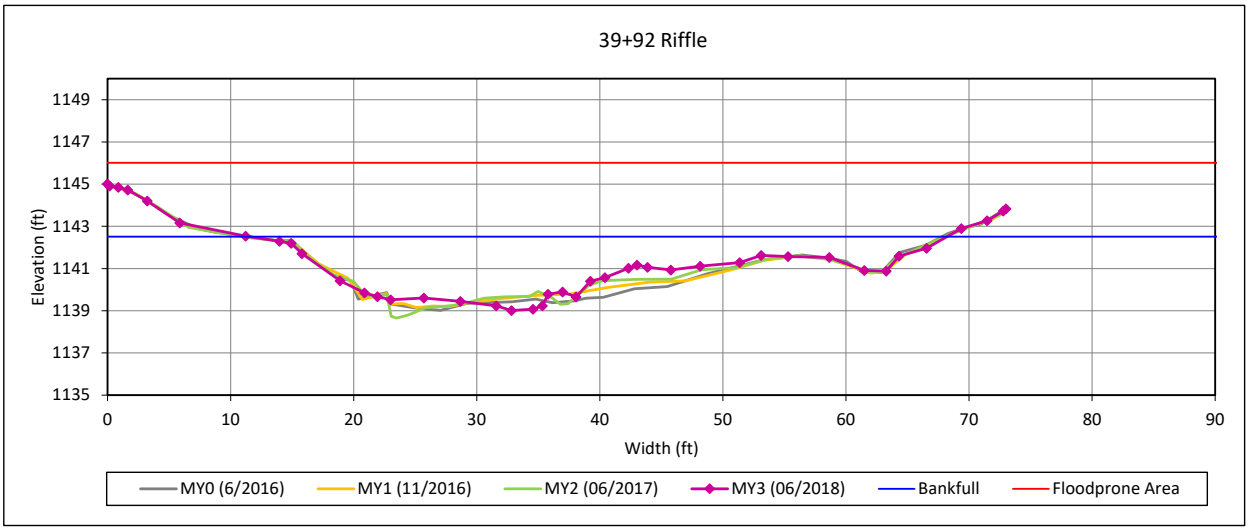
Survey Date: 06/2018
Field Crew: Kee Mapping & Surveying

View Downstream

Cross-Section Plots

Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Cross-Section M4- Moores Fork



Bankfull Dimensions	
101.1	x-section area (ft.sq.)
56.7	width (ft)
1.8	mean depth (ft)
3.5	max depth (ft)
58.3	wetted perimeter (ft)
1.7	hydraulic radius (ft)
31.9	width-depth ratio
124.0	W flood prone area (ft)
2.2	entrenchment ratio
0.7	low bank height ratio

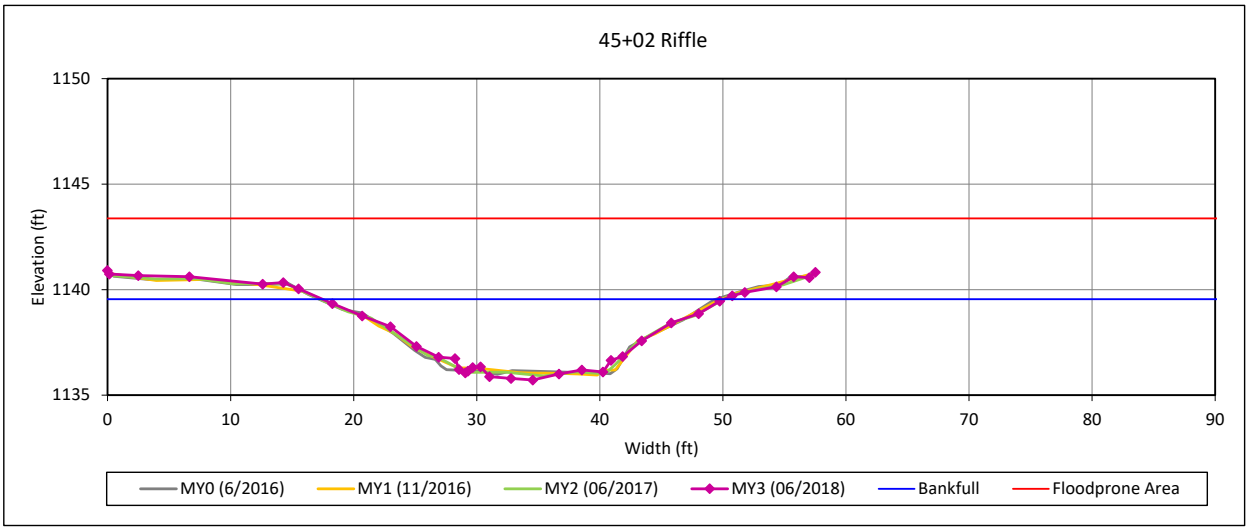
Survey Date: 06/2018
Field Crew: Kee Mapping & Surveying

View Downstream

Cross-Section Plots

Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Cross-Section M5- Moores Fork



Bankfull Dimensions	
73.0	x-section area (ft.sq.)
32.7	width (ft)
2.2	mean depth (ft)
3.8	max depth (ft)
34.3	wetted perimeter (ft)
2.1	hydraulic radius (ft)
14.6	width-depth ratio
124.0	W flood prone area (ft)
3.8	entrenchment ratio
1.0	low bank height ratio

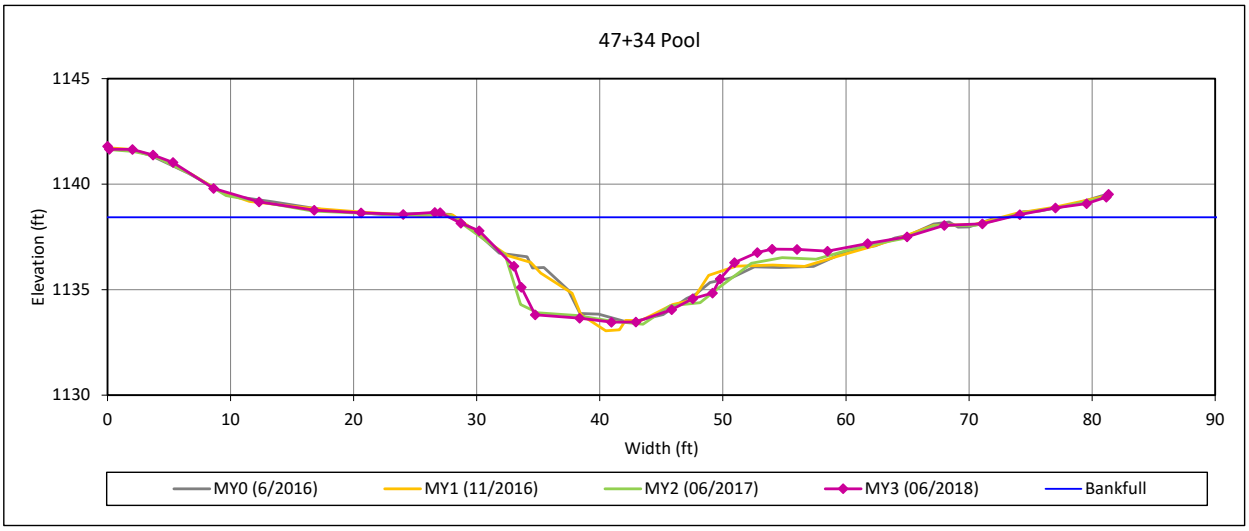
Survey Date: 06/2018
Field Crew: Kee Mapping & Surveying

View Downstream

Cross-Section Plots

Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Cross-Section M6- Moores Fork



Bankfull Dimensions	
106.1	x-section area (ft.sq.)
45.5	width (ft)
2.3	mean depth (ft)
5.0	max depth (ft)
48.1	wetted perimeter (ft)
2.2	hydraulic radius (ft)
19.5	width-depth ratio

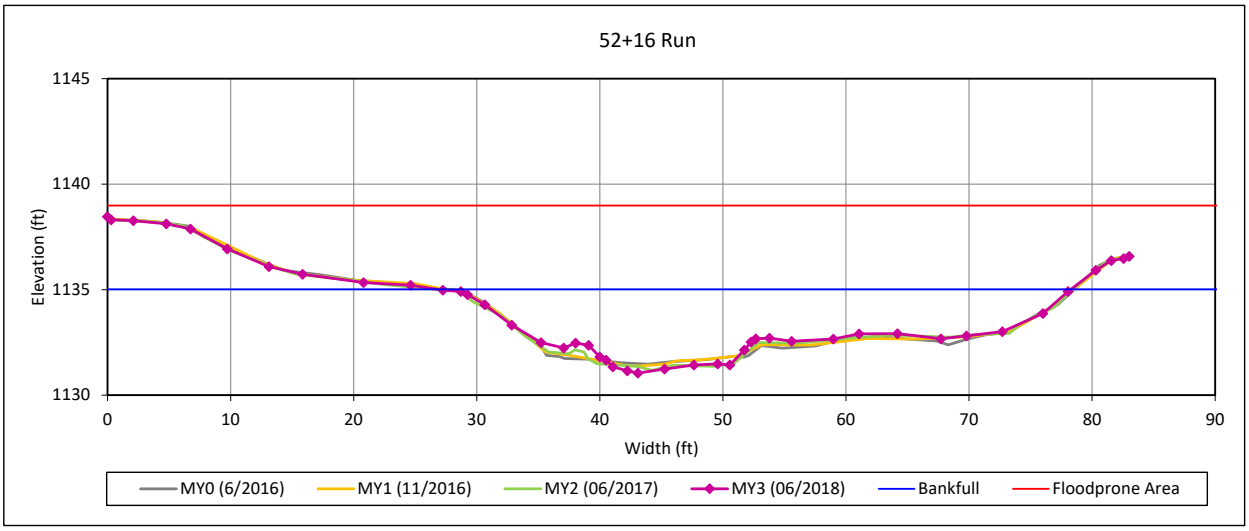
View Downstream

Survey Date: 06/2018
Field Crew: Kee Mapping & Surveying

Cross-Section Plots

Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Cross-Section M7- Moores Fork



Bankfull Dimensions	
118.1	x-section area (ft.sq.)
51.0	width (ft)
2.3	mean depth (ft)
4.0	max depth (ft)
52.6	wetted perimeter (ft)
2.2	hydraulic radius (ft)
22.0	width-depth ratio
124.0	W flood prone area (ft)
2.4	entrenchment ratio
0.9	low bank height ratio

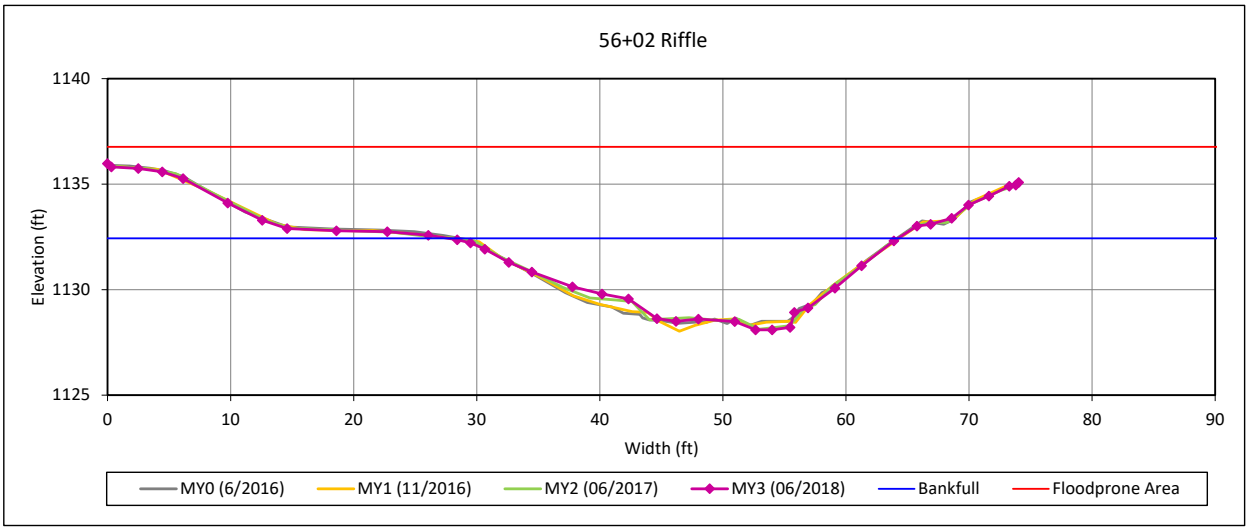
Survey Date: 06/2018
Field Crew: Kee Mapping & Surveying

View Downstream

Cross-Section Plots

Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Cross-Section M8- Moores Fork



Bankfull Dimensions	
91.5	x-section area (ft.sq.)
36.5	width (ft)
2.5	mean depth (ft)
4.3	max depth (ft)
38.3	wetted perimeter (ft)
2.4	hydraulic radius (ft)
14.6	width-depth ratio
124.0	W flood prone area (ft)
3.4	entrenchment ratio
1.0	low bank height ratio

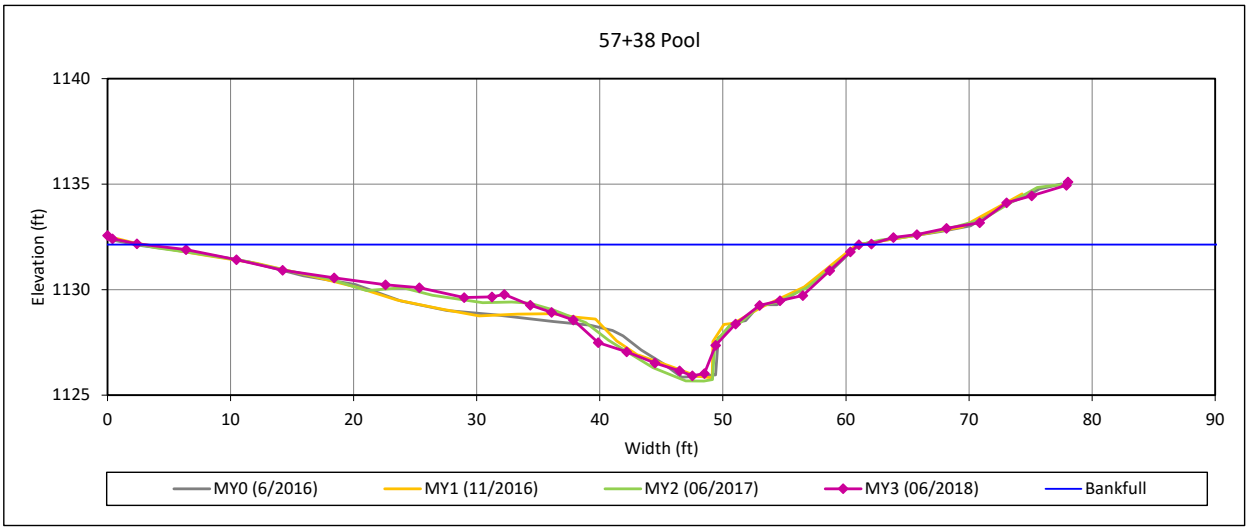
Survey Date: 06/2018
Field Crew: Kee Mapping & Surveying

View Downstream

Cross-Section Plots

Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Cross-Section M9- Moores Fork



Bankfull Dimensions	
122.0	x-section area (ft.sq.)
35.9	width (ft)
3.4	mean depth (ft)
6.2	max depth (ft)
38.3	wetted perimeter (ft)
3.2	hydraulic radius (ft)
10.6	width-depth ratio

Survey Date: 06/2018
Field Crew: Kee Mapping & Surveying

View Downstream

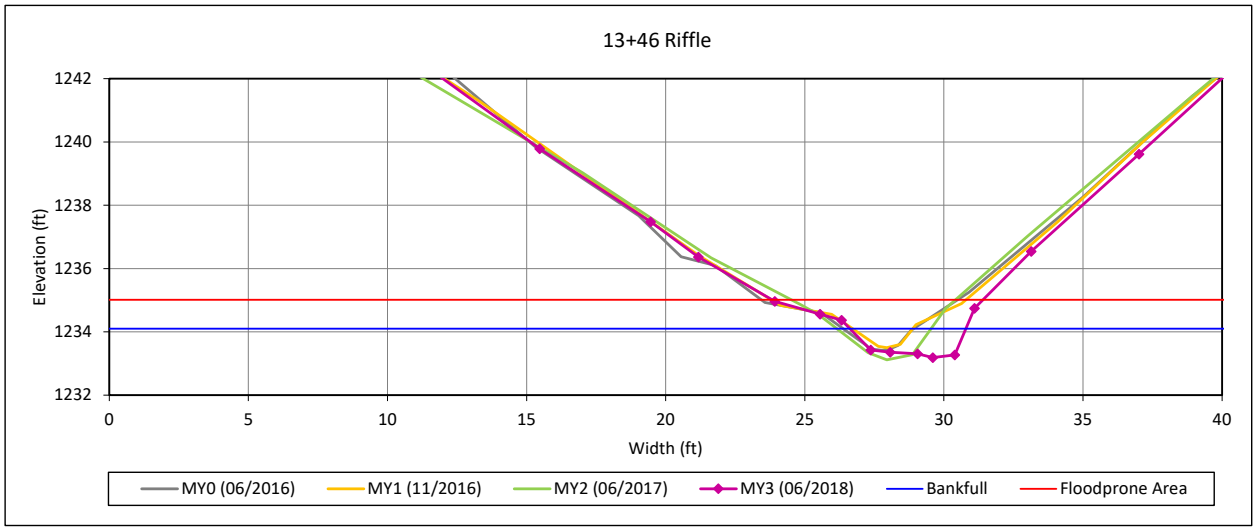
Cross-Section Plots

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Cross-Section ST1- Silage Trib



Bankfull Dimensions	
2.8	x-section area (ft.sq.)
4.2	width (ft)
0.7	mean depth (ft)
0.9	max depth (ft)
5.0	wetted perimeter (ft)
0.6	hydraulic radius (ft)
6.2	width-depth ratio
10.7	W flood prone area (ft)
2.6	entrenchment ratio
1.3	low bank height ratio

Survey Date: 06/2018

Field Crew: Kee Mapping & Surveying

View Downstream

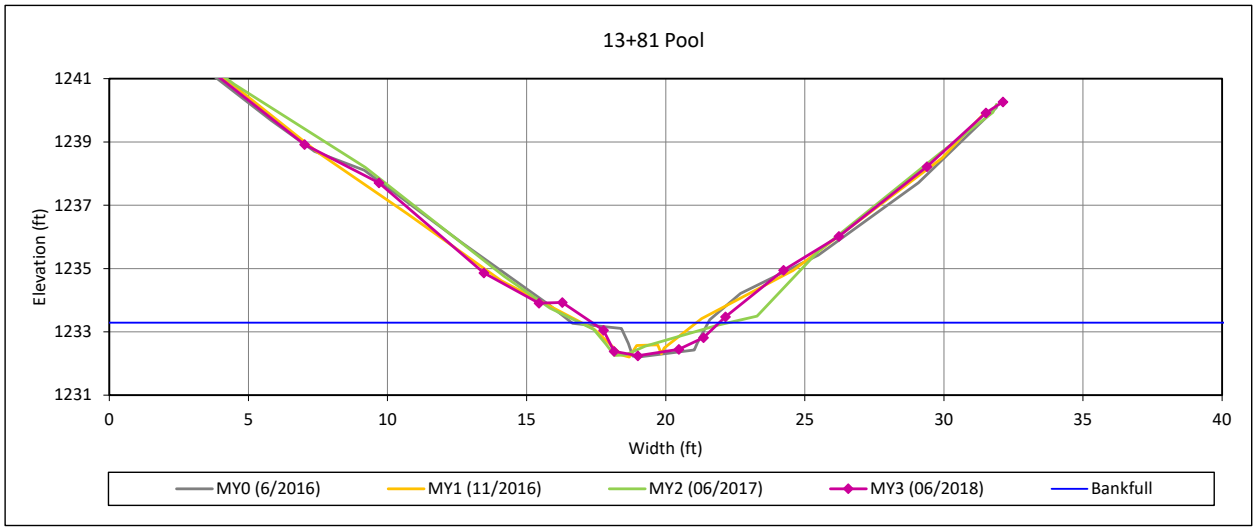
Cross-Section Plots

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Cross-Section ST2- Silage Trib



Bankfull Dimensions	
3.2	x-section area (ft.sq.)
4.6	width (ft)
0.7	mean depth (ft)
1.0	max depth (ft)
5.3	wetted perimeter (ft)
0.6	hydraulic radius (ft)
6.5	width-depth ratio

Survey Date: 06/2018

Field Crew: Kee Mapping & Surveying

View Downstream

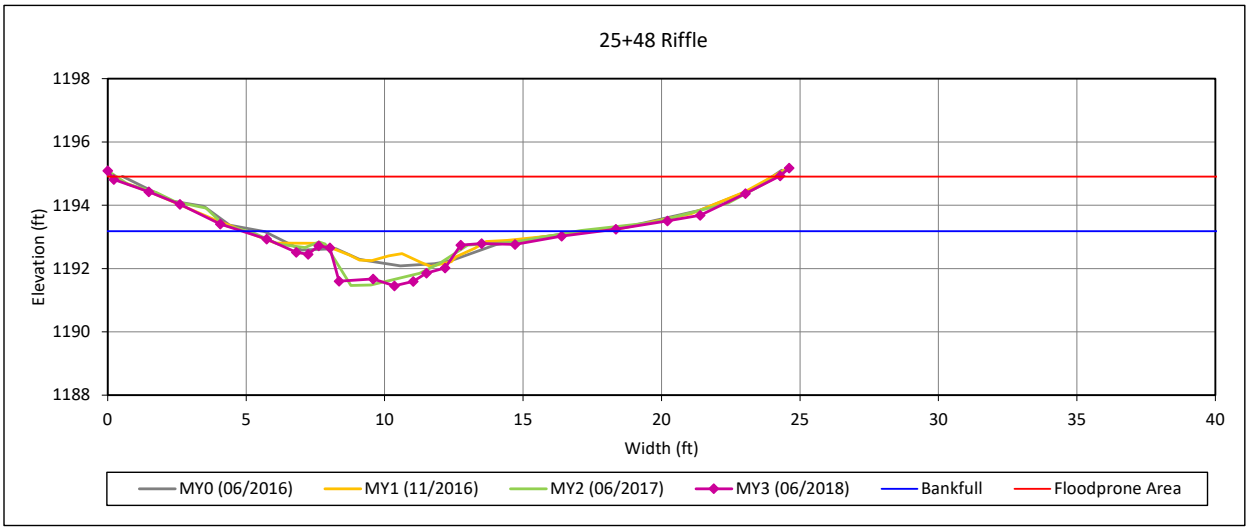
Cross-Section Plots

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Cross-Section ST3 - Silage Trib



Bankfull Dimensions	
9.3	x-section area (ft.sq.)
12.9	width (ft)
0.7	mean depth (ft)
1.7	max depth (ft)
14.4	wetted perimeter (ft)
0.6	hydraulic radius (ft)
18.0	width-depth ratio
24.6	W flood prone area (ft)
1.9	entrenchment ratio
0.9	low bank height ratio

Survey Date: 06/2018

Field Crew: Kee Mapping & Surveying

View Downstream

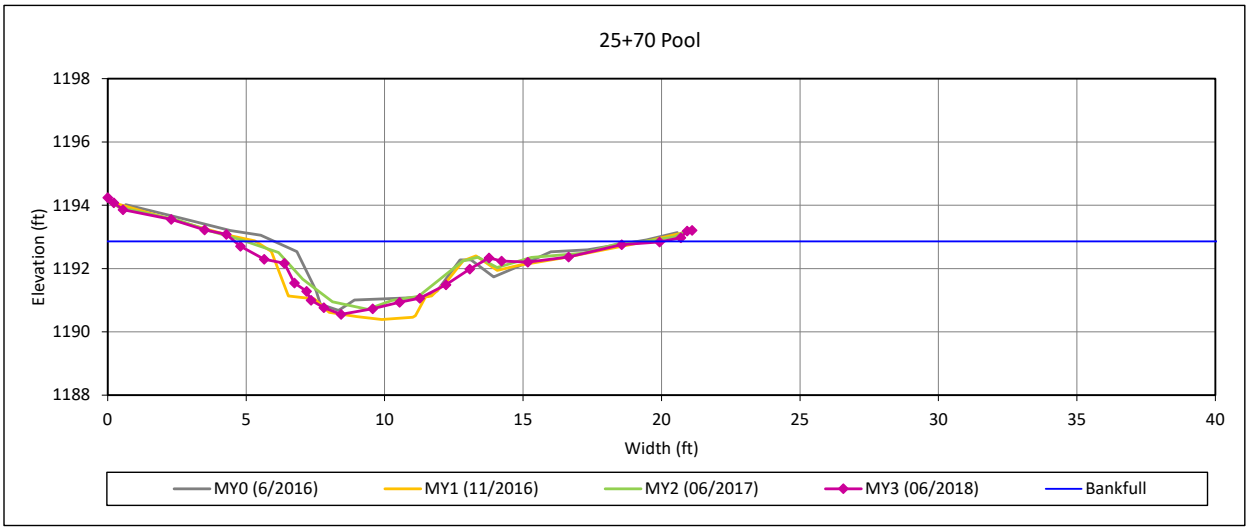
Cross-Section Plots

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Cross-Section ST4 - Silage Trib



Bankfull Dimensions	
15.5	x-section area (ft.sq.)
15.3	width (ft)
1.0	mean depth (ft)
2.3	max depth (ft)
16.6	wetted perimeter (ft)
0.9	hydraulic radius (ft)
15.2	width-depth ratio

Survey Date: 06/2018

Field Crew: Kee Mapping & Surveying

View Downstream

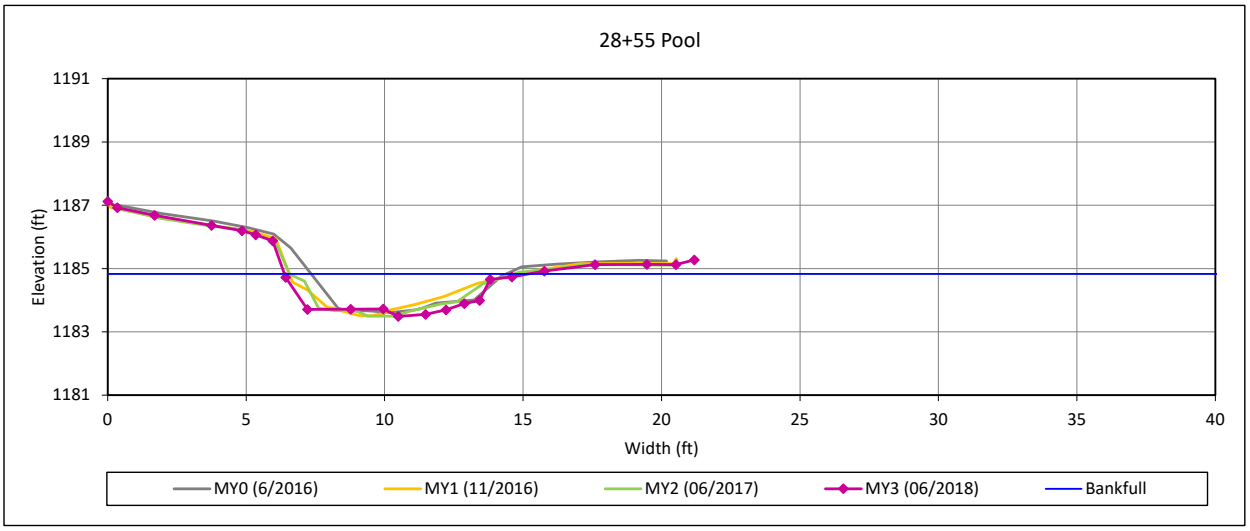
Cross-Section Plots

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Cross-Section ST5 - Silage Trib



Bankfull Dimensions	
7.9	x-section area (ft.sq.)
8.8	width (ft)
0.9	mean depth (ft)
1.3	max depth (ft)
9.9	wetted perimeter (ft)
0.8	hydraulic radius (ft)
9.8	width-depth ratio

Survey Date: 06/2018

Field Crew: Kee Mapping & Surveying

View Downstream

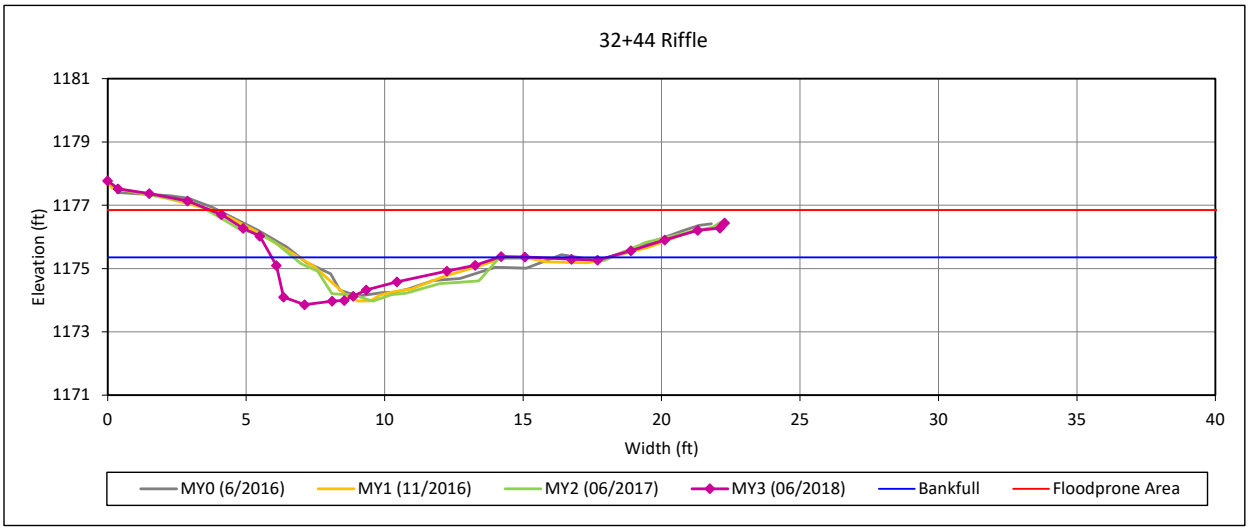
Cross-Section Plots

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Cross-Section ST6 - Silage Trib



Bankfull Dimensions	
6.8	x-section area (ft.sq.)
8.2	width (ft)
0.8	mean depth (ft)
1.5	max depth (ft)
9.3	wetted perimeter (ft)
0.7	hydraulic radius (ft)
9.9	width-depth ratio
28.0	W flood prone area (ft)
3.4	entrenchment ratio
1.0	low bank height ratio

Survey Date: 06/2018

Field Crew: Kee Mapping & Surveying

View Downstream

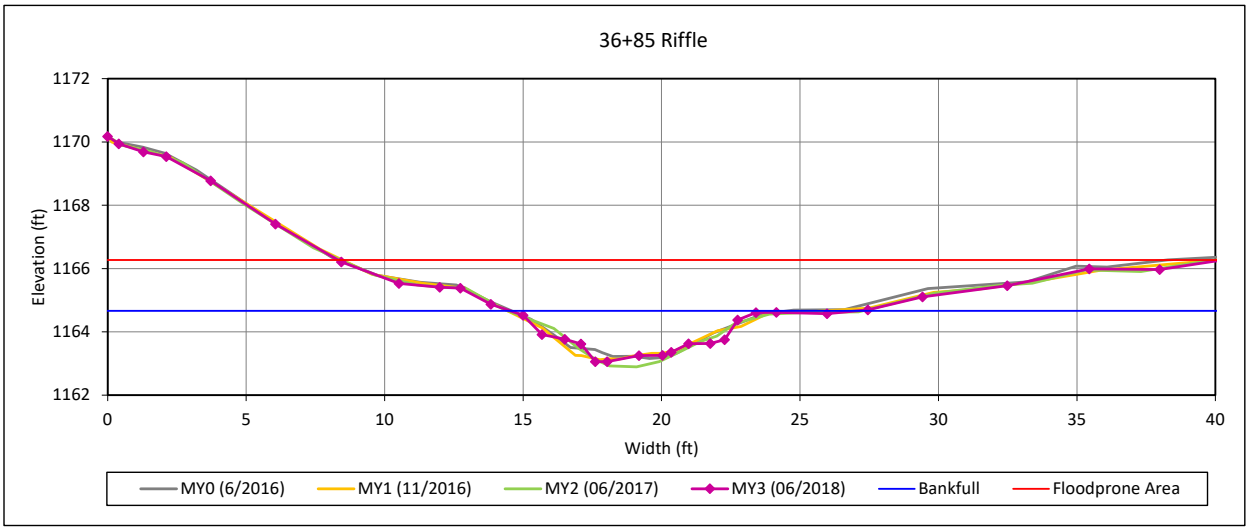
Cross-Section Plots

Moores Fork Stream Mitigation Project

DMS Project No. 94709

Monitoring Year 3 - 2018

Cross-Section ST7- Silage Trib



Bankfull Dimensions	
8.8	x-section area (ft.sq.)
9.6	width (ft)
0.9	mean depth (ft)
1.6	max depth (ft)
10.6	wetted perimeter (ft)
0.8	hydraulic radius (ft)
10.5	width-depth ratio
32.9	W flood prone area (ft)
3.4	entrenchment ratio
1.0	low bank height ratio

Survey Date: 06/2018

Field Crew: Kee Mapping & Surveying

View Downstream

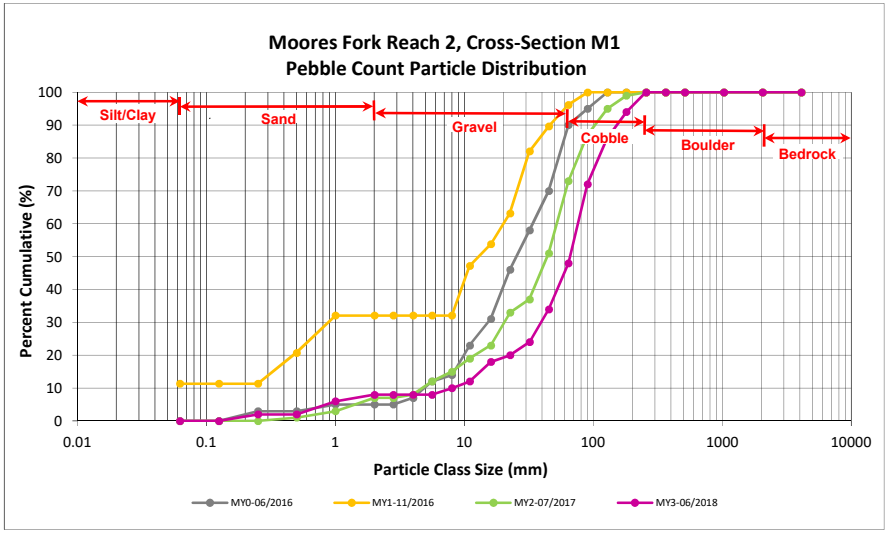
Cross-Section Pebble Count Plots

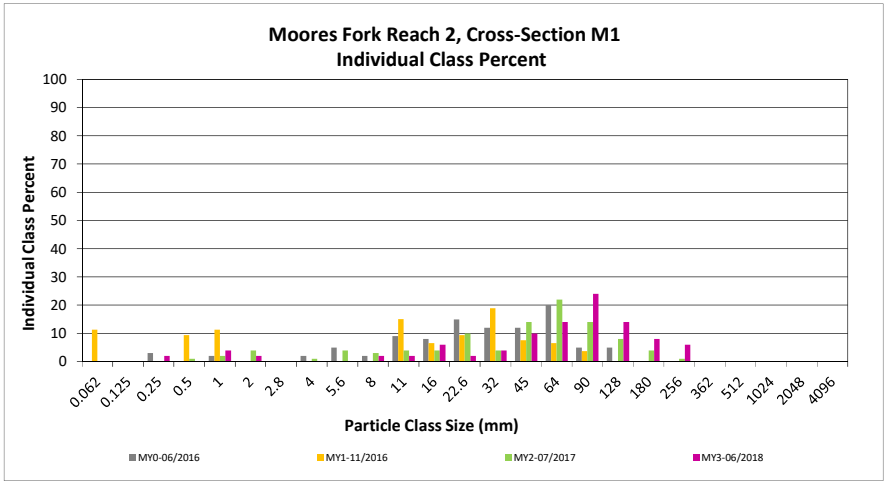
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Moores Fork Reach 2, Cross-Section M1

Particle Class		Diameter (mm) min	Diameter (mm) max	Riffle 100-Count	Summary: Class Percentage	Summary: Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250	2	2	2
	Medium	0.25	0.50			2
	Coarse	0.5	1.0	4	4	6
	Very Coarse	1.0	2.0	2	2	8
GRAVEL	Very Fine	2.0	2.8			8
	Very Fine	2.8	4.0			8
	Fine	4.0	5.6			8
	Fine	5.6	8.0	2	2	10
	Medium	8.0	11.0	2	2	12
	Medium	11.0	16.0	6	6	18
	Coarse	16.0	22.6	2	2	20
	Coarse	22.6	32	4	4	24
	Very Coarse	32	45	10	10	34
	Very Coarse	45	64	14	14	48
COBBLE	Small	64	90	24	24	72
	Small	90	128	14	14	86
	Large	128	180	8	8	94
	Large	180	256	6	6	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 M1	
Channel materials (mm)	
D_{16} =	14.12
D_{35} =	46.15
D_{50} =	65.8
D_{84} =	121.7
D_{95} =	190.9
D_{100} =	256.0





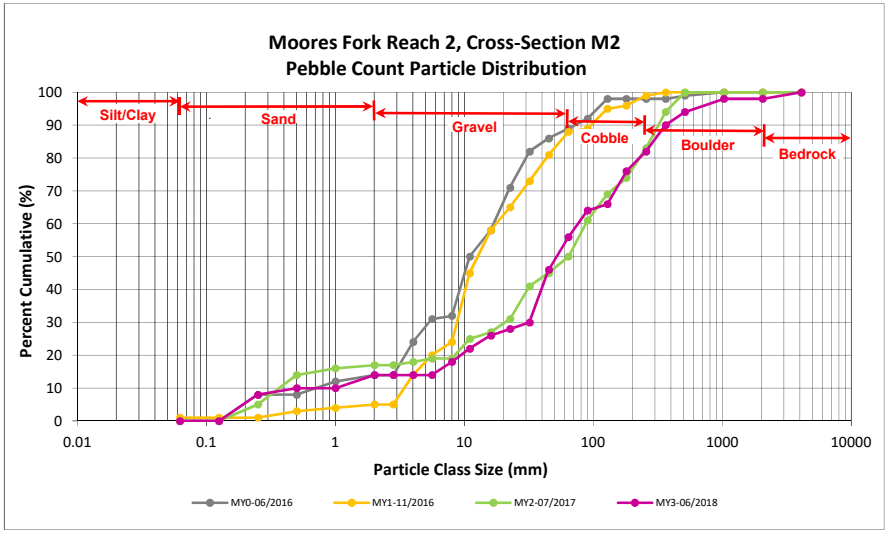
Cross-Section Pebble Count Plots

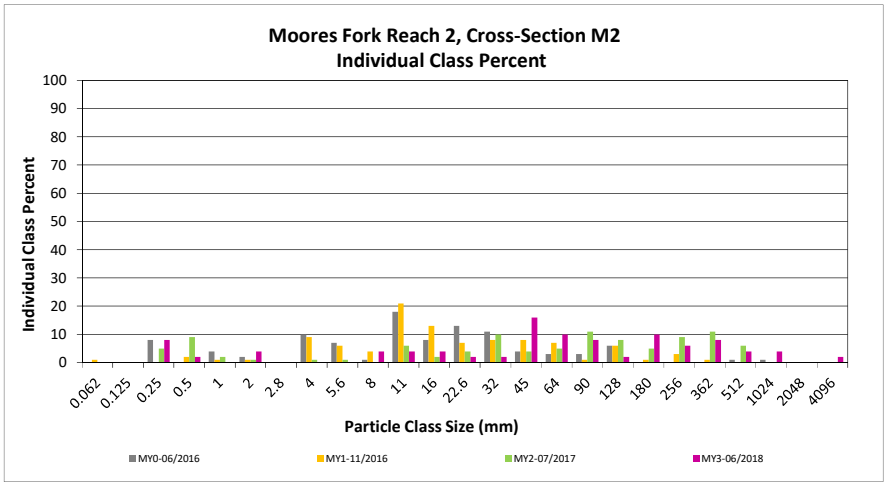
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Moores Fork Reach 2, Cross-Section M2

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	8	8	8
	Medium	0.25	0.50	2	2	10
	Coarse	0.5	1.0			10
	Very Coarse	1.0	2.0	4	4	14
GRAVEL	Very Fine	2.0	2.8			14
	Very Fine	2.8	4.0			14
	Fine	4.0	5.6			14
	Fine	5.6	8.0	4	4	18
	Medium	8.0	11.0	4	4	22
	Medium	11.0	16.0	4	4	26
	Coarse	16.0	22.6	2	2	28
	Coarse	22.6	32	2	2	30
	Very Coarse	32	45	16	16	46
	Very Coarse	45	64	10	10	56
COBBLE	Small	64	90	8	8	64
	Small	90	128	2	2	66
	Large	128	180	10	10	76
	Large	180	256	6	6	82
BOULDER	Small	256	362	8	8	90
	Small	362	512	4	4	94
	Medium	512	1024	4	4	98
	Large/Very Large	1024	2048			98
BEDROCK	Bedrock	2048	>2048	2	2	100
			Total	**100**	**100**	**100**

Cross-Section M2	
Channel materials (mm)	
D_{16} =	6.69
D_{35} =	35.60
D_{50} =	51.8
D_{84} =	279.2
D_{95} =	608.9
D_{100} =	>2048





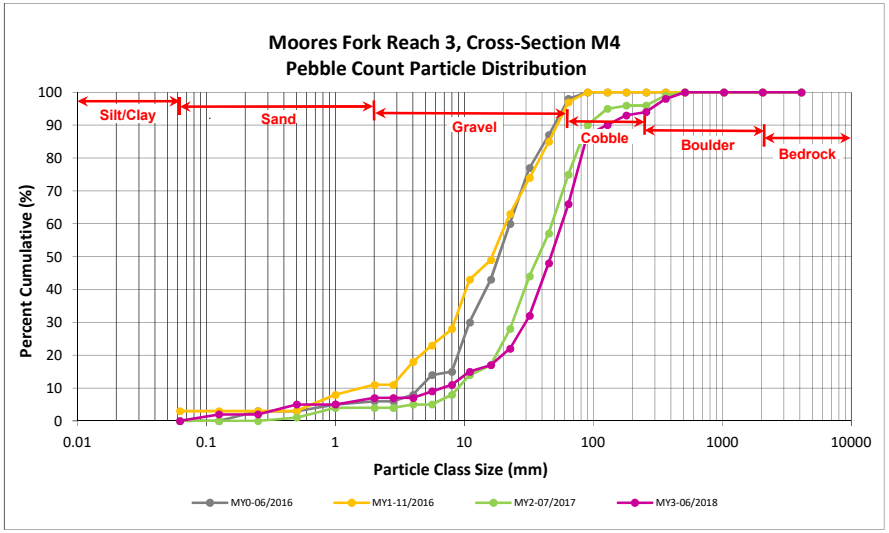
Cross-Section Pebble Count Plots

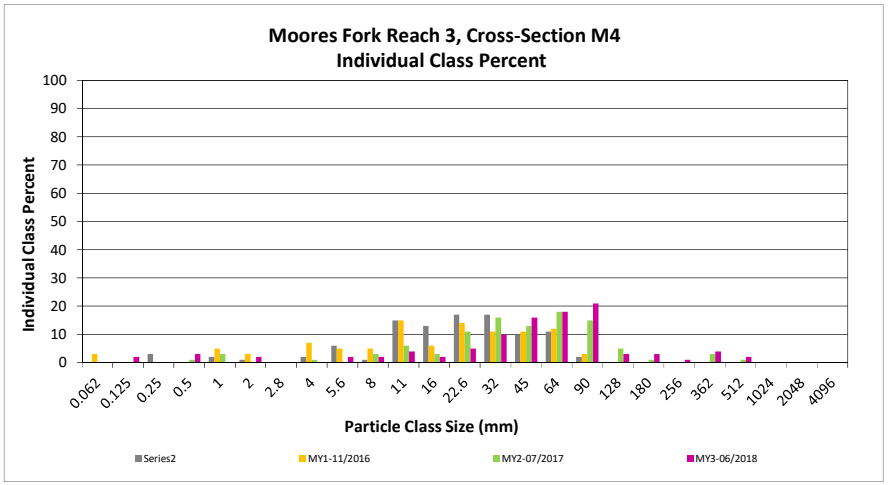
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Moores Fork Reach 3, Cross-Section M4

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	2	2	2
	Fine	0.125	0.250			2
	Medium	0.25	0.50	3	3	5
	Coarse	0.5	1.0			5
	Very Coarse	1.0	2.0	2	2	7
GRAVEL	Very Fine	2.0	2.8			7
	Very Fine	2.8	4.0			7
	Fine	4.0	5.6	2	2	9
	Fine	5.6	8.0	2	2	11
	Medium	8.0	11.0	4	4	15
	Medium	11.0	16.0	2	2	17
	Coarse	16.0	22.6	5	5	22
	Coarse	22.6	32	10	10	32
	Very Coarse	32	45	16	16	48
	Very Coarse	45	64	18	18	66
COBBLE	Small	64	90	21	21	87
	Small	90	128	3	3	90
	Large	128	180	3	3	93
	Large	180	256	1	1	94
BOULDER	Small	256	362	4	4	98
	Small	362	512	2	2	100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross-Section M4	
Channel materials (mm)	
D_{16} =	13.27
D_{35} =	34.11
D_{50} =	46.8
D_{84} =	85.7
D_{95} =	279.2
D_{100} =	512.0





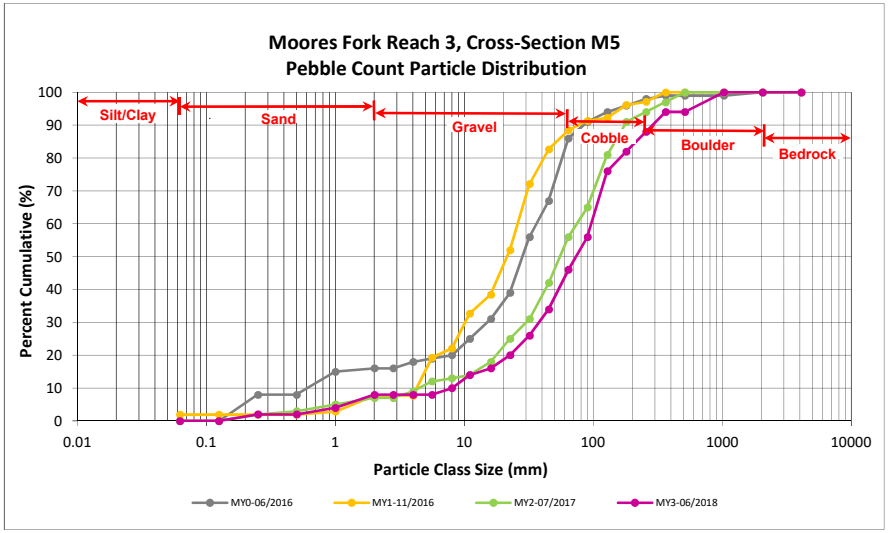
Cross-Section Pebble Count Plots

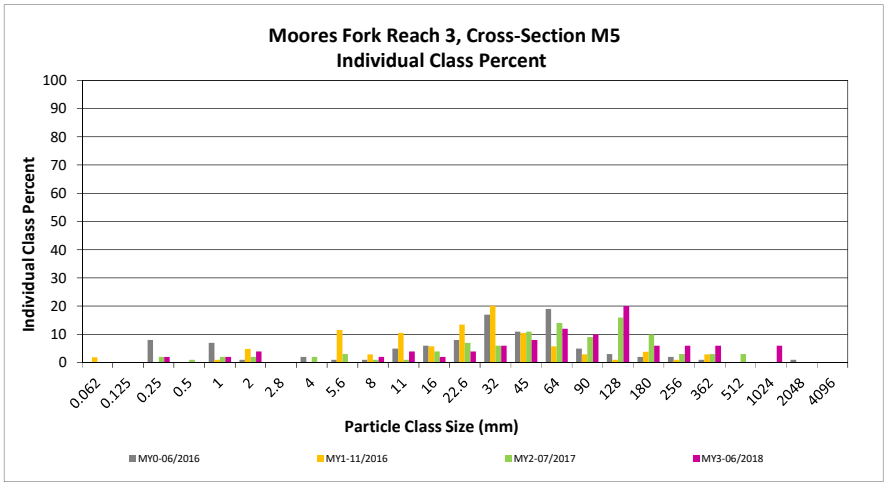
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Moores Fork Reach 3, Cross-Section M5

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	2	2	2
	Medium	0.25	0.50			2
	Coarse	0.5	1.0	2	2	4
	Very Coarse	1.0	2.0	4	4	8
GRAVEL	Very Fine	2.0	2.8			8
	Very Fine	2.8	4.0			8
	Fine	4.0	5.6			8
	Fine	5.6	8.0	2	2	10
	Medium	8.0	11.0	4	4	14
	Medium	11.0	16.0	2	2	16
	Coarse	16.0	22.6	4	4	20
	Coarse	22.6	32	6	6	26
	Very Coarse	32	45	8	8	34
	Very Coarse	45	64	12	12	46
COBBLE	Small	64	90	10	10	56
	Small	90	128	20	20	76
	Large	128	180	6	6	82
	Large	180	256	6	6	88
BOULDER	Small	256	362	6	6	94
	Small	362	512			94
	Medium	512	1024	6	6	100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross-Section M5	
Channel materials (mm)	
D_{16} =	16.00
D_{35} =	46.34
D_{50} =	73.4
D_{84} =	202.4
D_{95} =	574.7
D_{100} =	1024.0





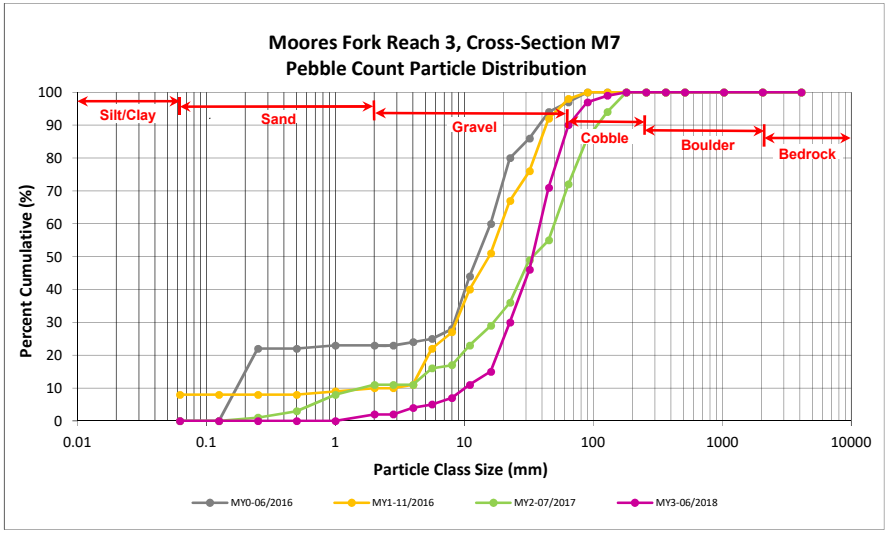
Cross-Section Pebble Count Plots

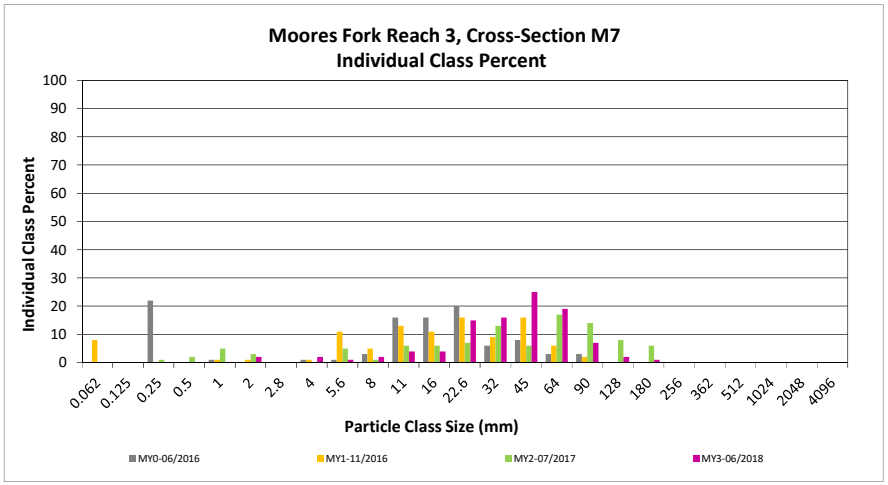
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Moores Fork Reach 3, Cross-Section M7

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			0
	Coarse	0.5	1.0			0
	Very Coarse	1.0	2.0	2	2	2
GRAVEL	Very Fine	2.0	2.8			2
	Very Fine	2.8	4.0	2	2	4
	Fine	4.0	5.6	1	1	5
	Fine	5.6	8.0	2	2	7
	Medium	8.0	11.0	4	4	11
	Medium	11.0	16.0	4	4	15
	Coarse	16.0	22.6	15	15	30
	Coarse	22.6	32	16	16	46
	Very Coarse	32	45	25	25	71
	Very Coarse	45	64	19	19	90
COBBLE	Small	64	90	7	7	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 M7	
Channel materials (mm)	
D_{16} =	16.37
D_{35} =	25.19
D_{50} =	33.8
D_{84} =	57.3
D_{95} =	81.6
D_{100} =	180.0





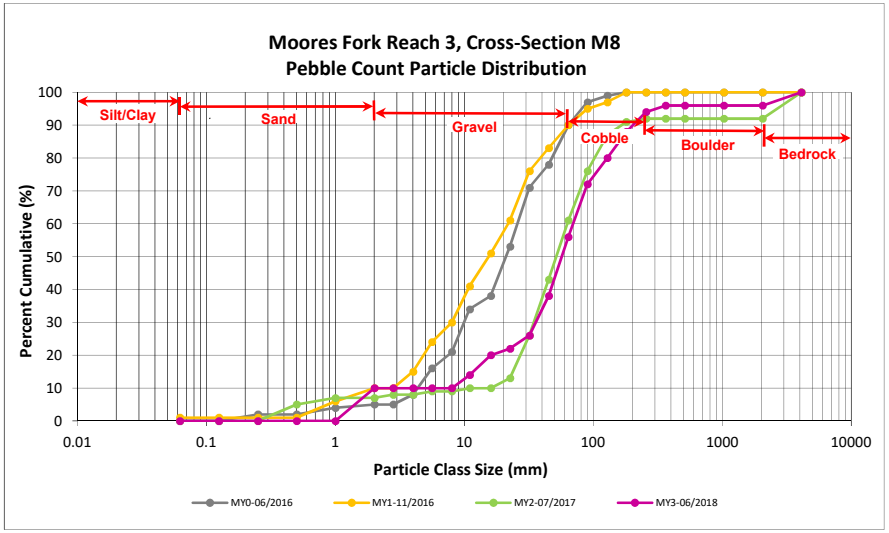
Cross-Section Pebble Count Plots

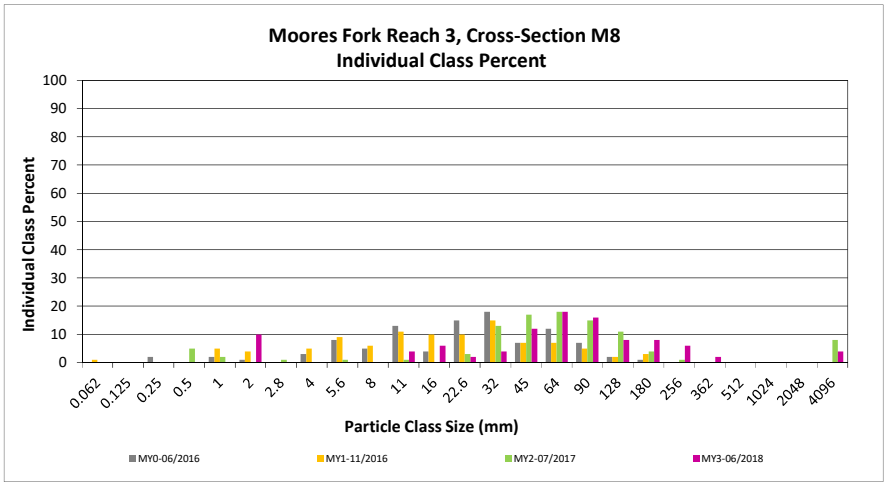
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Moores Fork Reach 3, Cross-Section M8

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			0
	Coarse	0.5	1.0			0
	Very Coarse	1.0	2.0	10	10	10
GRAVEL	Very Fine	2.0	2.8			10
	Very Fine	2.8	4.0			10
	Fine	4.0	5.6			10
	Fine	5.6	8.0			10
	Medium	8.0	11.0	4	4	14
	Medium	11.0	16.0	6	6	20
	Coarse	16.0	22.6	2	2	22
	Coarse	22.6	32	4	4	26
	Very Coarse	32	45	12	12	38
	Very Coarse	45	64	18	18	56
COBBLE	Small	64	90	16	16	72
	Small	90	128	8	8	80
	Large	128	180	8	8	88
	Large	180	256	6	6	94
BOULDER	Small	256	362	2	2	96
	Small	362	512			96
	Medium	512	1024			96
	Large/Very Large	1024	2048			96
BEDROCK	Bedrock	2048	>2048	4	4	100
			Total	**100**	**100**	**100**

Cross-Section M8	
Channel materials (mm)	
D_{16} =	12.46
D_{35} =	41.32
D_{50} =	56.9
D_{84} =	151.8
D_{95} =	304.4
D_{100} =	>2048





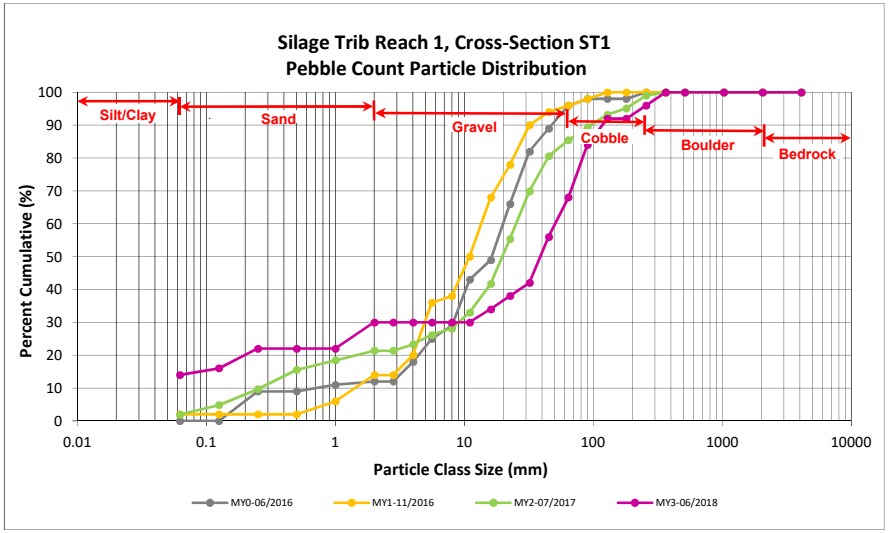
Cross-Section Pebble Count Plots

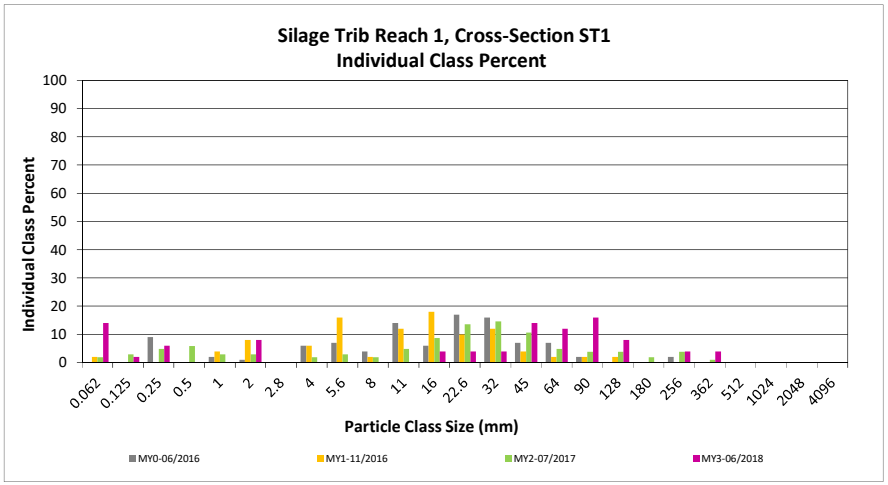
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Silage Trib Reach 1, Cross-Section ST1

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	2	2	16
	Fine	0.125	0.250	6	6	22
	Medium	0.25	0.50			22
	Coarse	0.5	1.0			22
	Very Coarse	1.0	2.0	8	8	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			30
	Medium	8.0	11.0			30
	Medium	11.0	16.0	4	4	34
	Coarse	16.0	22.6	4	4	38
	Coarse	22.6	32	4	4	42
	Very Coarse	32	45	14	14	56
	Very Coarse	45	64	12	12	68
COBBLE	Small	64	90	16	16	84
	Small	90	128	8	8	92
	Large	128	180			92
	Large	180	256	4	4	96
BOULDER	Small	256	362	4	4	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 ST1	
Channel materials (mm)	
D_{16} =	0.13
D_{35} =	17.44
D_{50} =	38.9
D_{84} =	90.0
D_{95} =	234.4
D_{100} =	362.0





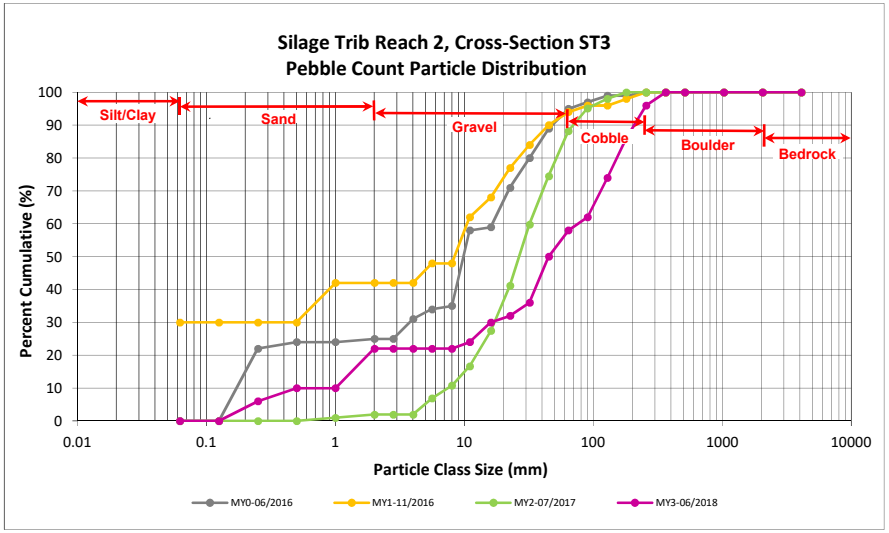
Cross-Section Pebble Count Plots

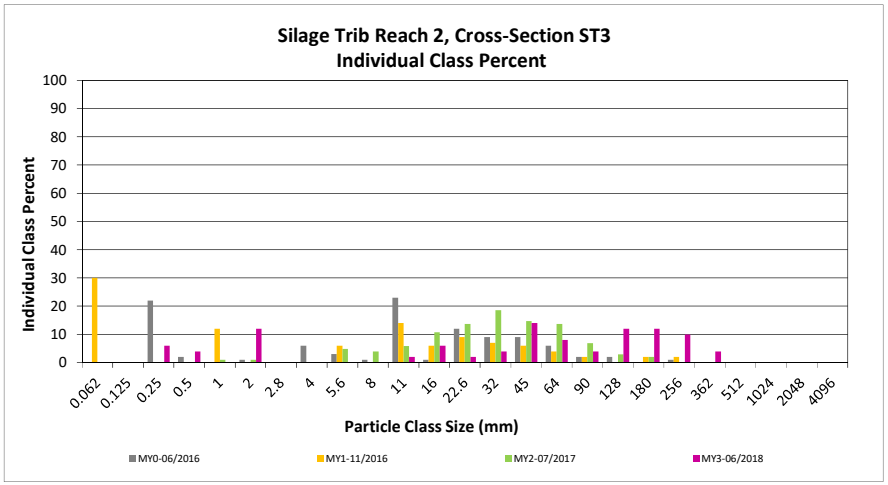
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Silage Trib Reach 2, Cross-Section ST3

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	6	6	6
	Medium	0.25	0.50	4	4	10
	Coarse	0.5	1.0			10
	Very Coarse	1.0	2.0	12	12	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	2	2	24
	Medium	11.0	16.0	6	6	30
	Coarse	16.0	22.6	2	2	32
	Coarse	22.6	32	4	4	36
	Very Coarse	32	45	14	14	50
	Very Coarse	45	64	8	8	58
COBBLE	Small	64	90	4	4	62
	Small	90	128	12	12	74
	Large	128	180	12	12	86
	Large	180	256	10	10	96
BOULDER	Small	256	362	4	4	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 ST3	
Channel materials (mm)	
D_{16} =	1.41
D_{35} =	29.34
D_{50} =	45.0
D_{84} =	170.1
D_{95} =	247.1
D_{100} =	362.0





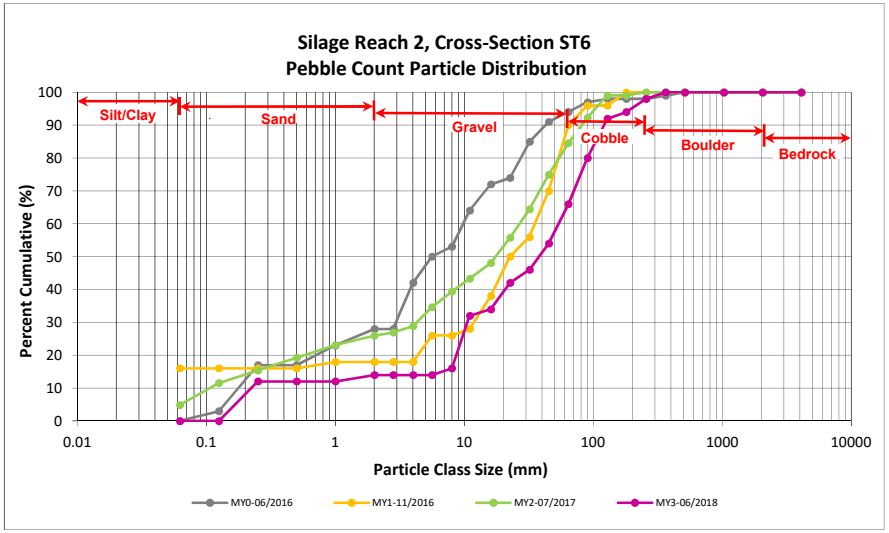
Cross-Section Pebble Count Plots

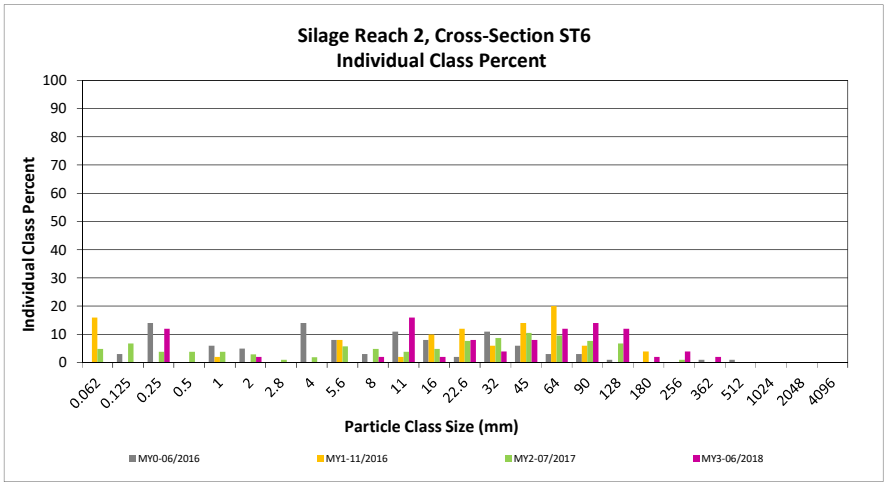
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Silage Reach 2, Cross-Section ST6

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	12	12	12
	Medium	0.25	0.50			12
	Coarse	0.5	1.0			12
	Very Coarse	1.0	2.0	2	2	14
GRAVEL	Very Fine	2.0	2.8			14
	Very Fine	2.8	4.0			14
	Fine	4.0	5.6			14
	Fine	5.6	8.0	2	2	16
	Medium	8.0	11.0	16	16	32
	Medium	11.0	16.0	2	2	34
	Coarse	16.0	22.6	8	8	42
	Coarse	22.6	32	4	4	46
	Very Coarse	32	45	8	8	54
	Very Coarse	45	64	12	12	66
COBBLE	Small	64	90	14	14	80
	Small	90	128	12	12	92
	Large	128	180	2	2	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 ST6	
Channel materials (mm)	
D_{16} =	8.00
D_{35} =	16.71
D_{50} =	37.9
D_{84} =	101.2
D_{95} =	196.6
D_{100} =	362.0





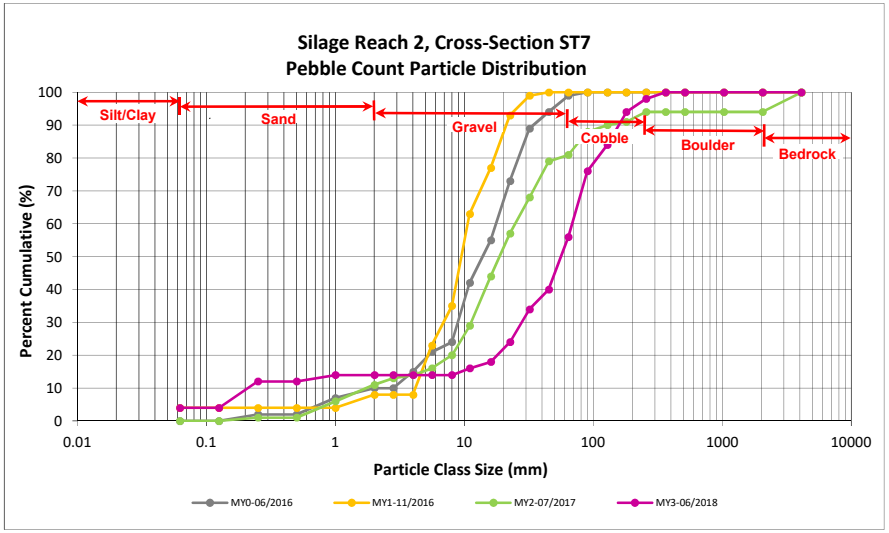
Cross-Section Pebble Count Plots

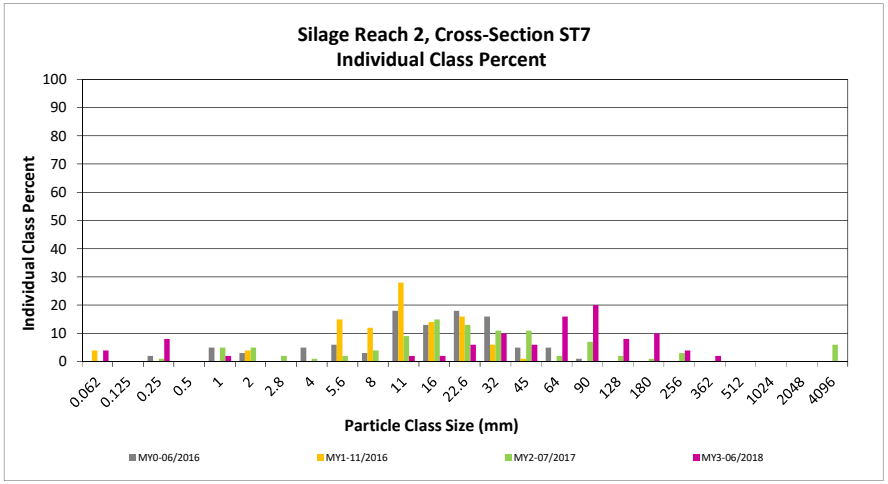
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018

Silage Reach 2, Cross-Section ST7

Particle Class		Diameter (mm) min	Diameter (mm) max	Riffle 100-Count	Summary: Class Percentage	Summary: 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	8	8	12
	Medium	0.25	0.50			12
	Coarse	0.5	1.0	2	2	14
	Very Coarse	1.0	2.0			14
GRAVEL	Very Fine	2.0	2.8			14
	Very Fine	2.8	4.0			14
	Fine	4.0	5.6			14
	Fine	5.6	8.0			14
	Medium	8.0	11.0	2	2	16
	Medium	11.0	16.0	2	2	18
	Coarse	16.0	22.6	6	6	24
	Coarse	22.6	32	10	10	34
	Very Coarse	32	45	6	6	40
	Very Coarse	45	64	16	16	56
COBBLE	Small	64	90	20	20	76
	Small	90	128	8	8	84
	Large	128	180	10	10	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 ST7	
Channel materials (mm)	
D_{16} =	11.00
D_{35} =	33.87
D_{50} =	56.1
D_{84} =	128.0
D_{95} =	196.6
D_{100} =	362.0





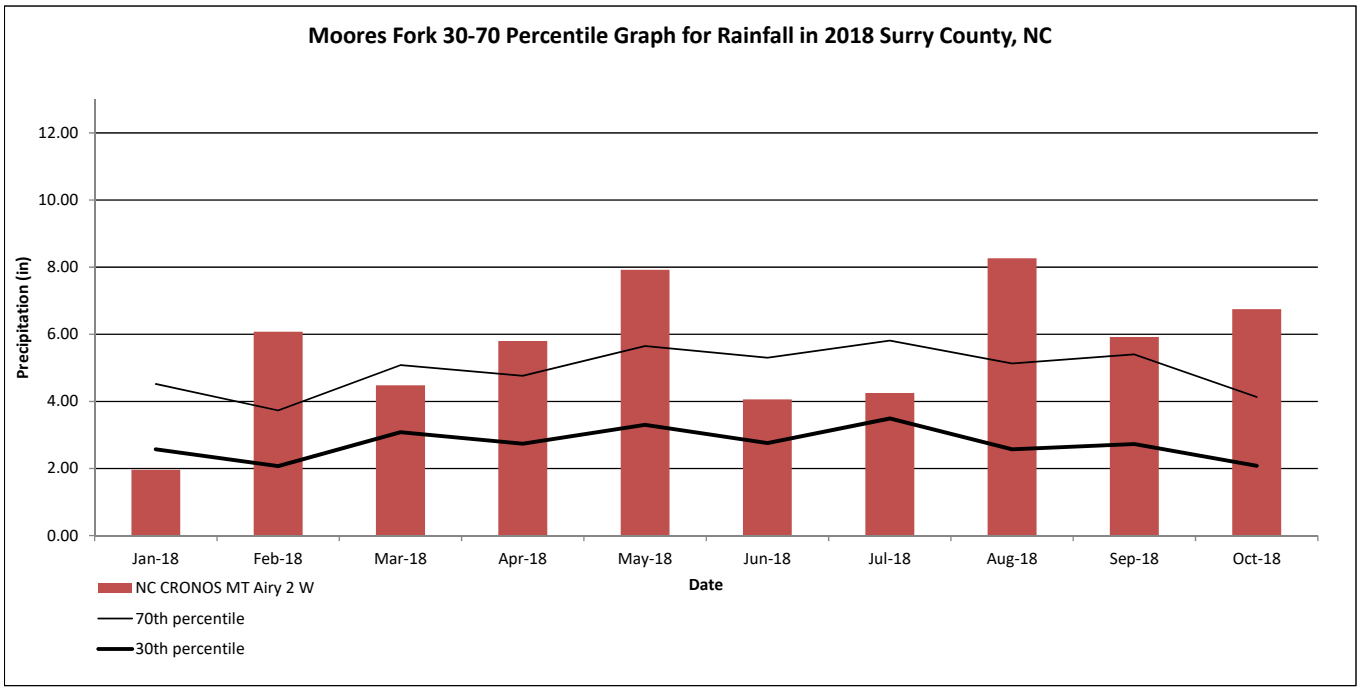
APPENDIX E. Hydrology Summary Data and Plots

Table 13. Verification of Bankfull Events
Moores Fork Stream Mitigation Project
DMS Project No.94709
Monitoring Year 3 - 2018

Reach	Monitoring Year	Date of Data Collection	Date of Occurrence	Method	Measurement (ft)
Moores Fork Reach 2	MY1	10/25/2016	~8/4/2016	Crest Gage	1.30
	MY2	7/10/2017	~5/25/2017	Crest Gage	2.55
	MY3	4/12/2018	~3/25/2018	Crest Gage	2.73
Silage Reach 2	MY1	10/25/2016	~8/4/2016	Crest Gage	0.75
	MY3	4/12/2018	~3/25/2018	Debris wracklines	N/A

Monthly Rainfall Data

Moores Fork Stream Mitigation Project
DMS Project No.94709
Monitoring Year 3 - 2018



[1] 2018 rainfall collected from NC CRONOS Station Name: MT AIRY 2 W (NCSU, 2018)

[2] 30th and 70th percentile rainfall data collected from weather station MT AIRY 2 W, NC (USDA, 2018)

APPENDIX F. Invasive Species Treatment Logs

MEMO

To: Matthew Reid, NCDEQ

From: Joe Secoges

Date: 09/08/2018

Subject: Moore's Fork Mitigation Site Maintenance Report

For reporting purposes, Eastern Forest Consultants produced a map delineating five management units. The units are labeled A through E on a map attached to the memo to help describe tasks performed in various areas of the property.

Tasks Preformed:

- **Management Area A**- July 5th, 6th, and 11th was spent spraying in Management Area A. Invasive species found in the management area include Japanese honeysuckle, kudzu, Chinese privet, multi-flora rose and oriental bittersweet. There were large amounts of honeysuckle sprayed in the cove area on the south side, along with a small area of kudzu. Chinese privet was scattered throughout all of the area, some spots being denser with the species than others. The herbicide used to spray all species, except kudzu, was Rodeo. Rodeo was used at a rate of 5oz per gallon. The kudzu was controlled with Transline at an approximate rate of 10 oz per acre (half the amount allowed on a site in one year).

  On August 24th, Area A was treated again. The honeysuckle, privet, rose, and bittersweet were treated using a mix of 4 oz Rodeo and 2 oz Vastlan per gallon of water. Kudzu was treated again using Transline at an approximate rate of 10 oz per acre.

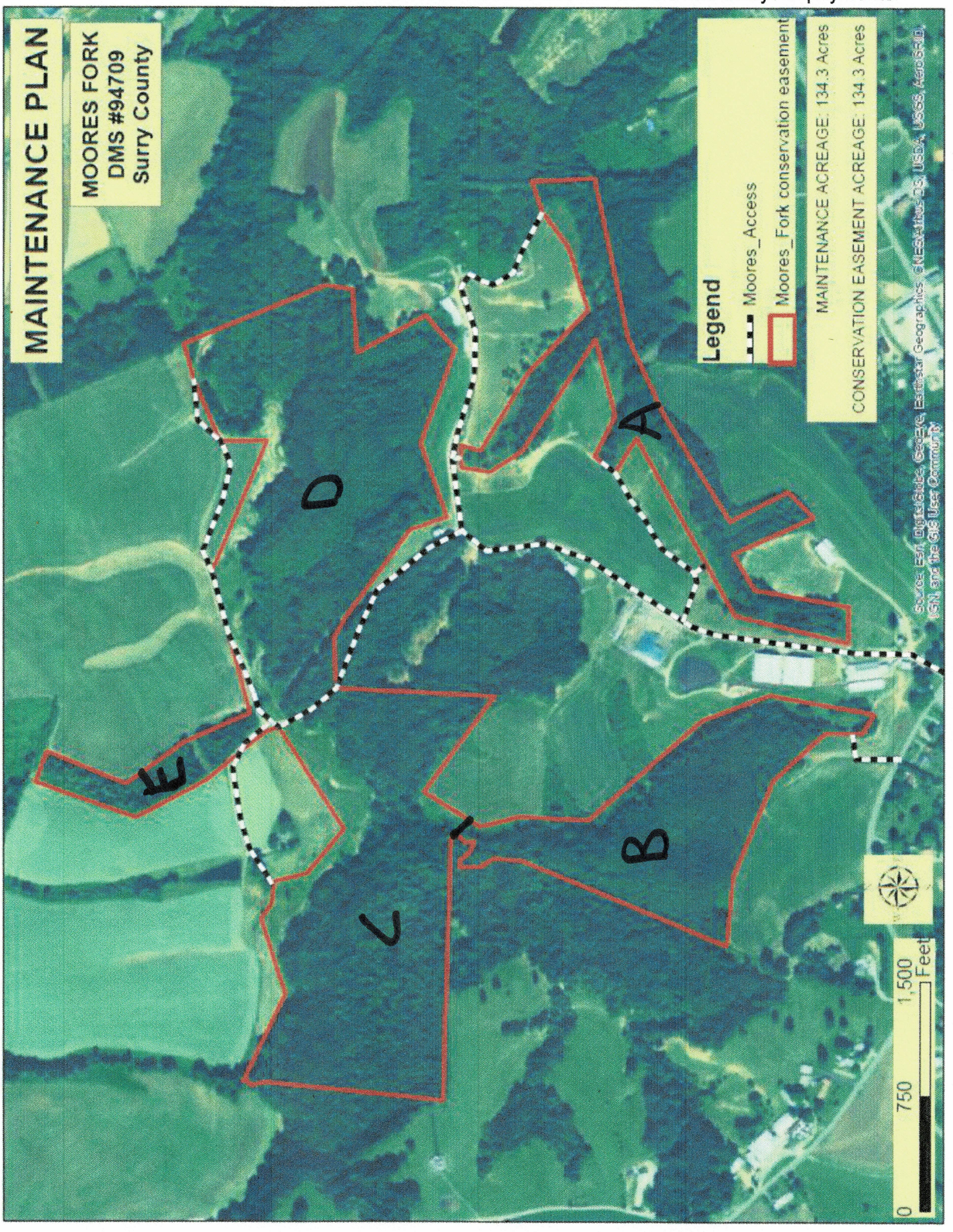
- **Management Area B**- July 10th and 11th was spent treating Management Area B. Invasive species found in the area include Japanese honeysuckle, kudzu, Chinese privet, multi-flora rose and oriental bittersweet. Honeysuckle and bittersweet had a well-established presence in the area. There was also a small patch of kudzu that was starting to work its way back into the forested area. Rodeo was used at a rate of 5oz per gallon. The kudzu was controlled with Transline at an approximate rate of 10 oz per acre. Several ailanthus and paulownia trees were treated via hack and squirt.

  On August 24th, and 27th and September 3rd and 5th, Area B was treated again. The honeysuckle, privet, rose, and bittersweet were treated using a mix of 4 oz Rodeo and 2 oz Vastlan per gallon of water. Kudzu was treated again using Transline at an approximate rate of 10 oz per acre.

- **Management Area C**- Management Area C was treated on July 11th and 12th. Invasive species found in the management area include Japanese honeysuckle, kudzu, Chinese privet, multi-flora rose and oriental bittersweet. The area was not heavily populated with invasive species. The south side of the stream was more heavily populated, but was still

MEASUREMENT AND PAYMENT

The invasive vegetation treatment will be paid per the Payments and Milestones Schedule listed in Section 4.6 of this RFQ. VENDOR must follow the PAYMENT & INVOICING PROCEDURES listed in Section 4.7 to avoid delays in payments.



EFL Management Units

2018 Kudzu Locations

WILDLANDS ENGINEERING

0 300 600 Feet

N

Site Assessment Report
Integrated Current Condition Plan View (Key)
Moores Fork Stream Mitigation Project
DMS Project No. 94709
Monitoring Year 3 - 2018
Surry County, NC

sporadic. Rodeo was used at a rate of 5oz per gallon. The kudzu was controlled with Transline at an approximate rate of 10 oz per acre.

On August 27th and September 5th, Area C was treated again. The honeysuckle, privet, rose, and bittersweet were treated using a mix of 4 oz Rodeo and 2 oz Vastlan per gallon of water. Kudzu was treated again using Transline at an approximate rate of 10 oz per acre.

- **Management Area D**- Management Area D was treated on July 11th and 12th. Invasive species found in the management area include Japanese honeysuckle, kudzu, Chinese privet, multi-flora rose and oriental bittersweet. Invasive species populations in this area were sporadic but dense when found. Rodeo was used at a rate of 5oz per gallon. The kudzu was controlled with Transline at an approximate rate of 10 oz per acre. Some ailanthus trees were flagged to be hacked and squirted on the next application.

  On August 24th and 27th, Area D was treated again. The honeysuckle, privet, rose, and bittersweet were treated using a mix of 4 oz Rodeo and 2 oz Vastlan per gallon of water. Kudzu was treated again using Transline at an approximate rate of 10 oz per acre.

- **Management Area E**- Management Area E was treated on the afternoon of July 10th and 12th. Invasive species found in the management area include Japanese honeysuckle, kudzu, Chinese privet, multi-flora rose and Oriental bittersweet. The area was dense in honeysuckle, and bittersweet and had some dense areas of kudzu on the outer edges. Rodeo was used at a rate of 5oz per gallon. The kudzu was controlled with Transline at an approximate rate of 10 oz per acre.

  On August 27th and September 5th, Area E was treated again. The honeysuckle, privet, rose, and bittersweet were treated using a mix of 4 oz Rodeo and 2 oz Vastlan per gallon of water. Kudzu was treated again using Transline at an approximate rate of 10 oz per acre.

Other Notable Information:

- Kudzu was found to be more abundant than originally noted on the site assessment report. A map is attached to this memo noting the kudzu that was located and treated in the field.
- On the second round of control (late August – early September) extra care was taken when treating kudzu along the field edges, especially in Blocks B and E, because corn and/or sorghum was planted nearby.

PESTICIDE/HERBICIDE APPLICATION RECORD

PROPERTY OWNER/MANAGER:

Name: Matthew Reid
NC DEQ DMS

Address: 5 Ravenscroft Drive, Suite 102
Asheville, NC 28801

Telephone #: 828-231-7912

ADDRESS/LOCATION OF APPLICATION SITE (if different than above):

Address/Location: Moore's Fork Mitigation Site – Surry County

CERTIFIED APPLICATOR:

Joseph M. Secoges (Applicator Cert. # 026-34911 / Consultant Cert. # 030-1312)
Eastern Forest Consultants LLC
P.O. Box 1577
Clemmons, NC 27012
240-446-1583

DATE + START/END TIME OF APPLICATION: 7/5/2018; 1000-1630

RESTRICTED ENTRY INTERVAL (REI):

DURATION (# OF HOURS): 4 Hours

EXPIRATION (DATE/TIME): 7/5/18 @ 2030

PLANTS/SITES TREATED: Upland Area around Stream

PRINCIPLE PESTS TO BE CONTROLLED: Privet, Honeysuckle, Bittersweet, Multi-flora Rose

ACREAGE, AREA, OR NUMBER OF PLANTS TREATED:

Spot Spray As Needed

IDENTIFICATION/AMOUNT OF PESTICIDES USED:

1) Brand/Common Name: Rodeo
EPA Reg. Number: 62719-324
Amount Applied to Site: 165 oz
Application Rate: 5 oz/gallon

2) Brand/Common Name: CWC 90 Surfactant
EPA Reg. Number: N/A
Amount Applied to Site: 33 oz
Application Rate: 1 oz / gallon

3) Brand/Common Name: Bullseye Spray Pattern Indicator
EPA Reg. Number: N/A
Amount Applied to Site: 33 oz
Application Rate: 1 oz / gallon

4) Brand/Common Name:
EPA Reg. Number:
Amount Applied to Site:
Application Rate:

DILUENTS USED (Water, Oil, Fuel, etc.):

1) Diluent: Water
Amount Applied to Site: 33 gallons
Application Rate: As Needed

2) Diluent:
Amount Applied to Site:
Application Rate:

TYPE OF APPLICATION EQUIPMENT USED: Back-pack Sprayers

WEATHER:

Temp:	90-95 deg F
Wind Speed:	0-5 mph
Wind Direction:	variable

NOTES: Sprayed with Preston Millsaps and John Smith
Treated “Block A” on SE side of property

PESTICIDE/HERBICIDE APPLICATION RECORD

PROPERTY OWNER/MANAGER:

Name: Matthew Reid
NC DEQ DMS

Address: 5 Ravenscroft Drive, Suite 102
Asheville, NC 28801

Telephone #: 828-231-7912

ADDRESS/LOCATION OF APPLICATION SITE (if different than above):

Address/Location: Moore's Fork Mitigation Site – Surry County

CERTIFIED APPLICATOR:

Joseph M. Secoges (Applicator Cert. # 026-34911 / Consultant Cert. # 030-1312)
Eastern Forest Consultants LLC
P.O. Box 1577
Clemmons, NC 27012
240-446-1583

DATE + START/END TIME OF APPLICATION: 7/6/2018; 0930-1200

RESTRICTED ENTRY INTERVAL (REI):

DURATION (# OF HOURS): 4 Hours

EXPIRATION (DATE/TIME): 7/6/18 @ 1600

PLANTS/SITES TREATED: Upland Area around Stream

PRINCIPLE PESTS TO BE CONTROLLED: Privet, Honeysuckle, Bittersweet, Multi-flora Rose

ACREAGE, AREA, OR NUMBER OF PLANTS TREATED:

Spot Spray As Needed

IDENTIFICATION/AMOUNT OF PESTICIDES USED:

1) Brand/Common Name: Rodeo
EPA Reg. Number: 62719-324
Amount Applied to Site: 60 oz
Application Rate: 5 oz/gallon

2) Brand/Common Name: CWC 90 Surfactant
EPA Reg. Number: N/A
Amount Applied to Site: 12 oz
Application Rate: 1 oz / gallon

3) Brand/Common Name: Bullseye Spray Pattern Indicator
EPA Reg. Number: N/A
Amount Applied to Site: 12 oz
Application Rate: 1 oz / gallon

4) Brand/Common Name:
EPA Reg. Number:
Amount Applied to Site:
Application Rate:

DILUENTS USED (Water, Oil, Fuel, etc.):

1) Diluent: Water
Amount Applied to Site: 12 gallons
Application Rate: As Needed

2) Diluent:
Amount Applied to Site:
Application Rate:

TYPE OF APPLICATION EQUIPMENT USED: Back-pack Sprayers

WEATHER:

Temp:	85-95 deg F
Wind Speed:	0-5 mph
Wind Direction:	variable

NOTES: Sprayed with Preston Millsaps and John Smith
Treated northern end of “Block A” on SE side of property
Heavy rain storm came in about an hour after we finished spraying…no spraying after rain event

PESTICIDE/HERBICIDE APPLICATION RECORD

PROPERTY OWNER/MANAGER:

Name: Matthew Reid
NC DEQ DMS

Address: 5 Ravenscroft Drive, Suite 102
Asheville, NC 28801

Telephone #: 828-231-7912

ADDRESS/LOCATION OF APPLICATION SITE (if different than above):

Address/Location: Moore's Fork Mitigation Site – Surry County

CERTIFIED APPLICATOR:

Joseph M. Secoges (Applicator Cert. # 026-34911 / Consultant Cert. # 030-1312)
Eastern Forest Consultants LLC
P.O. Box 1577
Clemmons, NC 27012
240-446-1583

DATE + START/END TIME OF APPLICATION: 7/10/2018; 0930-1600

RESTRICTED ENTRY INTERVAL (REI):

DURATION (# OF HOURS): 4 Hours

EXPIRATION (DATE/TIME): 7/10/18 @ 2000

PLANTS/SITES TREATED: Upland Area around Stream

PRINCIPLE PESTS TO BE CONTROLLED: Privet, Honeysuckle, Bittersweet, Multi-flora Rose

ACREAGE, AREA, OR NUMBER OF PLANTS TREATED:

Spot Spray As Needed

IDENTIFICATION/AMOUNT OF PESTICIDES USED:

1) Brand/Common Name: Rodeo
EPA Reg. Number: 62719-324
Amount Applied to Site: 255 oz
Application Rate: 5 oz/gallon

2) Brand/Common Name: CWC 90 Surfactant
EPA Reg. Number: N/A
Amount Applied to Site: 51 oz
Application Rate: 1 oz / gallon

3) Brand/Common Name: Bullseye Spray Pattern Indicator
EPA Reg. Number: N/A
Amount Applied to Site: 51 oz
Application Rate: 1 oz / gallon

4) Brand/Common Name:
EPA Reg. Number:
Amount Applied to Site:
Application Rate:

DILUENTS USED (Water, Oil, Fuel, etc.):

1) Diluent: Water
Amount Applied to Site: 51 gallons
Application Rate: As Needed

2) Diluent:
Amount Applied to Site:
Application Rate:

TYPE OF APPLICATION EQUIPMENT USED: Back-pack Sprayers

WEATHER:

Temp:	85-95 deg F
Wind Speed:	0-5 mph
Wind Direction:	variable

NOTES: Sprayed with Preston Millsaps and John Smith
Treated blocks “B” and “E”

PESTICIDE/HERBICIDE APPLICATION RECORD

PROPERTY OWNER/MANAGER:

Name: Matthew Reid
NC DEQ DMS

Address: 5 Ravenscroft Drive, Suite 102
Asheville, NC 28801

Telephone #: 828-231-7912

ADDRESS/LOCATION OF APPLICATION SITE (if different than above):

Address/Location: Moore's Fork Mitigation Site – Surry County

CERTIFIED APPLICATOR:

Joseph M. Secoges (Applicator Cert. # 026-34911 / Consultant Cert. # 030-1312)
Eastern Forest Consultants LLC
P.O. Box 1577
Clemmons, NC 27012
240-446-1583

DATE + START/END TIME OF APPLICATION: 7/11/2018; 0930-1430

RESTRICTED ENTRY INTERVAL (REI):

DURATION (# OF HOURS): 12 Hours

EXPIRATION (DATE/TIME): 7/12/18 @ 0230

PLANTS/SITES TREATED: Upland Area around Stream

PRINCIPLE PESTS TO BE CONTROLLED: Kudzu

ACREAGE, AREA, OR NUMBER OF PLANTS TREATED:

Spot Spray As Needed

IDENTIFICATION/AMOUNT OF PESTICIDES USED:

1) Brand/Common Name: Transline
EPA Reg. Number: 62719-259
Amount Applied to Site: 20 oz
Application Rate: 8 oz / 12 gallons

2) Brand/Common Name: CWC 90 Surfactant
EPA Reg. Number: N/A
Amount Applied to Site: 30 oz
Application Rate: 1 oz / gallon

3) Brand/Common Name: Bullseye Spray Pattern Indicator
EPA Reg. Number: N/A
Amount Applied to Site: 30 oz
Application Rate: 1 oz / gallon

4) Brand/Common Name:
EPA Reg. Number:
Amount Applied to Site:
Application Rate:

DILUENTS USED (Water, Oil, Fuel, etc.):

1) Diluent: Water
Amount Applied to Site: 30 gallons
Application Rate: As Needed

2) Diluent:
Amount Applied to Site:
Application Rate:

TYPE OF APPLICATION EQUIPMENT USED: Back-pack Sprayers

WEATHER:

Temp:	85-95 deg F
Wind Speed:	0-5 mph
Wind Direction:	variable

NOTES: Sprayed with John Smith
Treated all known kudzu in blocks A and B, Some in C and D
Rain Storm started about 35 minutes after we stopped spraying

PESTICIDE/HERBICIDE APPLICATION RECORD

PROPERTY OWNER/MANAGER:

Name: Matthew Reid
NC DEQ DMS

Address: 5 Ravenscroft Drive, Suite 102
Asheville, NC 28801

Telephone #: 828-231-7912

ADDRESS/LOCATION OF APPLICATION SITE (if different than above):

Address/Location: Moore's Fork Mitigation Site – Surry County

CERTIFIED APPLICATOR:

Joseph M. Secoges (Applicator Cert. # 026-34911 / Consultant Cert. # 030-1312)
Eastern Forest Consultants LLC
P.O. Box 1577
Clemmons, NC 27012
240-446-1583

DATE + START/END TIME OF APPLICATION: 7/12/2018; 0930-1600

RESTRICTED ENTRY INTERVAL (REI):

DURATION (# OF HOURS): 12 Hours

EXPIRATION (DATE/TIME): 7/13/18 @ 0600

PLANTS/SITES TREATED: Upland Area around Stream

PRINCIPLE PESTS TO BE CONTROLLED: Kudzu, Privet, Bittersweet, Rose, Honeysuckle

ACREAGE, AREA, OR NUMBER OF PLANTS TREATED:

Spot Spray As Needed

IDENTIFICATION/AMOUNT OF PESTICIDES USED:

1) Brand/Common Name: Transline
EPA Reg. Number: 62719-259
Amount Applied to Site: 18 oz
Application Rate: 12 oz / 12 gallons

2) Brand/Common Name: Rodeo
EPA Reg. Number: 62719-324
Amount Applied to Site: 90 oz
Application Rate: 5 oz / gallon

2) Brand/Common Name: CWC 90 Surfactant
EPA Reg. Number: N/A
Amount Applied to Site: 36 oz
Application Rate: 1 oz / gallon

3) Brand/Common Name: Bullseye Spray Pattern Indicator
EPA Reg. Number: N/A
Amount Applied to Site: 36 oz
Application Rate: 1 oz / gallon

DILUENTS USED (Water, Oil, Fuel, etc.):

1) Diluent: Water
Amount Applied to Site: 36 gallons
Application Rate: As Needed

2) Diluent:
Amount Applied to Site:
Application Rate:

TYPE OF APPLICATION EQUIPMENT USED: Back-pack Sprayers

WEATHER:

Temp:	80-90 deg F
Wind Speed:	0-10 mph
Wind Direction:	variable

NOTES: Sprayed with Preston Millsaps John Smith
Treated all known kudzu in blocks C, D, and E
Joe sprayed kudzu with Transline and Preston and John sprayed other invasive spp. with Rodeo

PESTICIDE/HERBICIDE APPLICATION RECORD

PROPERTY OWNER/MANAGER:

Name: Matthew Reid
NC DEQ DMS

Address: 5 Ravenscroft Drive, Suite 102
Asheville, NC 28801

Telephone #: 828-231-7912

ADDRESS/LOCATION OF APPLICATION SITE (if different than above):

Address/Location: Moore's Fork Mitigation Site – Surry County

CERTIFIED APPLICATOR:

Joseph M. Secoges (Applicator Cert. # 026-34911 / Consultant Cert. # 030-1312)
Eastern Forest Consultants LLC
P.O. Box 1577
Clemmons, NC 27012
240-446-1583

DATE + START/END TIME OF APPLICATION: 8/24/2018; 0800-1600

RESTRICTED ENTRY INTERVAL (REI):

DURATION (# OF HOURS): 24 Hours

EXPIRATION (DATE/TIME): 8/25/18 @ 1600

PLANTS/SITES TREATED: Upland Area around Stream

PRINCIPLE PESTS TO BE CONTROLLED: Kudzu, Privet, Bittersweet, Rose, Honeysuckle

ACREAGE, AREA, OR NUMBER OF PLANTS TREATED:

Spot Spray As Needed

IDENTIFICATION/AMOUNT OF PESTICIDES USED:

1) Brand/Common Name: Transline
EPA Reg. Number: 62719-259
Amount Applied to Site: 45.5 oz
Application Rate: 21 oz / 12 gallons

2) Brand/Common Name: Vastlan
EPA Reg. Number: 62719-687
Amount Applied to Site: 30 oz
Application Rate: 4 oz / gallon

3) Brand/Common Name: Rodeo
EPA Reg. Number: 62719-324
Amount Applied to Site: 60 oz
Application Rate: 5 oz / gallon

4) Brand/Common Name: CWC 90 Surfactant
EPA Reg. Number: N/A
Amount Applied to Site: 38 oz
Application Rate: 1 oz / gallon

5) Brand/Common Name: Bullseye Spray Pattern Indicator
EPA Reg. Number: N/A
Amount Applied to Site: 38 oz
Application Rate: 1 oz / gallon

DILUENTS USED (Water, Oil, Fuel, etc.):

1) Diluent: Water
Amount Applied to Site: 38 gallons
Application Rate: As Needed

2) Diluent:
Amount Applied to Site:
Application Rate:

TYPE OF APPLICATION EQUIPMENT USED: Back-pack Sprayers

WEATHER:

Temp:	80-90 deg F
Wind Speed:	0-10 mph
Wind Direction:	variable

NOTES: Sprayed with Preston Millsaps
Joe treated kudzu in block A, south side of block B and block D; Preston treated various invasives in block A.
Joe sprayed kudzu with Transline and Preston sprayed other invasive spp. with Rodeo and Vastlan

PESTICIDE/HERBICIDE APPLICATION RECORD

PROPERTY OWNER/MANAGER:

Name:	Matthew Reid NC DEQ DMS
Address:	5 Ravenscroft Drive, Suite 102 Asheville, NC 28801
Telephone #:	828-231-7912

ADDRESS/LOCATION OF APPLICATION SITE (if different than above):

Address/Location: Moore's Fork Mitigation Site – Surry County

CERTIFIED APPLICATOR:

Preston Millsaps (Applicator Cert. # 026-36367)
Eastern Forest Consultants LLC
P.O. Box 1577
Clemmons, NC 27012
240-446-1583

DATE + START/END TIME OF APPLICATION: 8/27/2018; 0830-1700

RESTRICTED ENTRY INTERVAL (REI):

DURATION (# OF HOURS): 24 Hours

EXPIRATION (DATE/TIME): 8/28/18 @ 1700

PLANTS/SITES TREATED: Upland Area around Stream

PRINCIPLE PESTS TO BE CONTROLLED: Privet, Bittersweet, Rose, Honeysuckle

ACREAGE, AREA, OR NUMBER OF PLANTS TREATED:

Spot Spray As Needed

IDENTIFICATION/AMOUNT OF PESTICIDES USED:

1) Brand/Common Name: Vastlan
EPA Reg. Number: 62719-687
Amount Applied to Site: 42 oz
Application Rate: 4 oz / gallon

2) Brand/Common Name: Rodeo
EPA Reg. Number: 62719-324
Amount Applied to Site: 84 oz
Application Rate: 5 oz / gallon

3) Brand/Common Name: CWC 90 Surfactant
EPA Reg. Number: N/A
Amount Applied to Site: 21 oz
Application Rate: 1 oz / gallon

4) Brand/Common Name: Bullseye Spray Pattern Indicator
EPA Reg. Number: N/A
Amount Applied to Site: 21 oz
Application Rate: 1 oz / gallon

DILUENTS USED (Water, Oil, Fuel, etc.):

1) Diluent: Water
Amount Applied to Site: 21 gallons
Application Rate: As Needed

2) Diluent:
Amount Applied to Site:
Application Rate:

TYPE OF APPLICATION EQUIPMENT USED: Back-pack Sprayer

WEATHER:

Temp:	Approx. 90 deg F
Wind Speed:	0-10 mph
Wind Direction:	variable

NOTES:

Sprayed on blocks C, D, and E and the southern portion of block B

PESTICIDE/HERBICIDE APPLICATION RECORD

PROPERTY OWNER/MANAGER:

Name: Matthew Reid
NC DEQ DMS

Address: 5 Ravenscroft Drive, Suite 102
Asheville, NC 28801

Telephone #: 828-231-7912

ADDRESS/LOCATION OF APPLICATION SITE (if different than above):

Address/Location: Moore's Fork Mitigation Site – Surry County

CERTIFIED APPLICATOR:

Preston Millsaps (Applicator Cert. # 026-36367)
Eastern Forest Consultants LLC
P.O. Box 1577
Clemmons, NC 27012
336-466-4008

DATE + START/END TIME OF APPLICATION:

9/3/2018: 0815-1700

RESTRICTED ENTRY INTERVAL (REI):

DURATION (# OF HOURS): 24 hours

EXPIRATION (DATE/TIME): 9/4/2018 @ 1700

PLANTS/SITES TREATED:

Sites treated were hill tops, side slopes, and bottomlands

PRINCIPLE PESTS TO BE CONTROLLED:

Privet, bittersweet, honeysuckle, paulownia, ailanthus

ACREAGE, AREA, OR NUMBER OF PLANTS TREATED:

Spot sprayed as needed

IDENTIFICATION/AMOUNT OF PESTICIDES USED:

11) Brand/Common Name: Vastlan
EPA Reg. Number: 62719-687
Amount Applied to Site: 36 oz
Application Rate: 2 oz/Gallon

2) Brand/Common Name: Rodeo
EPA Reg. Number: 62719-324
Amount Applied to Site: 72 oz
Application Rate: 4 oz/Gallon

3) Brand/Common Name: Spreader 90 Surfactant
EPA Reg. Number: N/A
Amount Applied to Site: 18 oz
Application Rate: 1 oz /gallon

4) Brand/Common Name: Bullseye Dye
EPA Reg. Number: N/A
Amount Applied to Site: 18 oz
Application Rate: 1 oz/gallon

DILUENTS USED (Water, Oil, Fuel, etc.):

1) Diluent: Water
Amount Applied to Site: 18 gallons
Application Rate: As Needed

2) Diluent:
Amount Applied to Site:
Application Rate:

TYPE OF APPLICATION EQUIPMENT USED:

Backpack sprayer

WEATHER:

Temp:	85-90 deg F
Wind Speed:	0-5 mph
Wind Direction:	variable

NOTES:

There was a shower around 1530.

PESTICIDE/HERBICIDE APPLICATION RECORD

PROPERTY OWNER/MANAGER:

Name: Matthew Reid
NC DEQ DMS

Address: 5 Ravenscroft Drive, Suite 102
Asheville, NC 28801

Telephone #: 828-231-7912

ADDRESS/LOCATION OF APPLICATION SITE (if different than above):

Address/Location: Moore's Fork Mitigation Site – Surry County

CERTIFIED APPLICATOR:

Joseph M. Secoges (Applicator Cert. # 026-34911 / Consultant Cert. # 030-1312)
Eastern Forest Consultants LLC
P.O. Box 1577
Clemmons, NC 27012
240-446-1583

DATE + START/END TIME OF APPLICATION: 9/5/2018; 0900-1515

RESTRICTED ENTRY INTERVAL (REI):

DURATION (# OF HOURS): 12 Hours

EXPIRATION (DATE/TIME): 9/6/18 @ 0315

PLANTS/SITES TREATED: Upland Area around Stream

PRINCIPLE PESTS TO BE CONTROLLED: Kudzu

ACREAGE, AREA, OR NUMBER OF PLANTS TREATED:

Spot Spray As Needed

IDENTIFICATION/AMOUNT OF PESTICIDES USED:

1) Brand/Common Name: Transline
EPA Reg. Number: 62719-259
Amount Applied to Site: 42 oz
Application Rate: 21 oz / 12 gallons

2) Brand/Common Name: CWC 90 Surfactant
EPA Reg. Number: N/A
Amount Applied to Site: 24 oz
Application Rate: 1 oz / gallon

3) Brand/Common Name: Bullseye Spray Pattern Indicator
EPA Reg. Number: N/A
Amount Applied to Site: 24 oz
Application Rate: 1 oz / gallon

4) Brand/Common Name:
EPA Reg. Number:
Amount Applied to Site:
Application Rate:

DILUENTS USED (Water, Oil, Fuel, etc.):

1) Diluent: Water
Amount Applied to Site: 24 gallons
Application Rate: As Needed

2) Diluent:
Amount Applied to Site:
Application Rate:

TYPE OF APPLICATION EQUIPMENT USED: Back-pack Sprayers

WEATHER:

Temp:	85-95 deg F
Wind Speed:	0-10 mph
Wind Direction:	variable

NOTES: Treated all known kudzu in northern portion of Block B, all of C, and all of E
Wind was still in morning when spraying kudzu near corn and sorghum