



MONITORING YEAR 5 ANNUAL REPORT

Final

SCALY BARK CREEK MITIGATION SITE

Stanly County, NC
NCDEQ Contract 002030
NCDMS Project Number 94148

Data Collection Period: March 2015-July 2015
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PREPARED FOR:



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EXECUTIVE SUMMARY

Wildlands Engineering (Wildlands) completed a full-delivery project for the North Carolina Division of Mitigation Services (NCDMS) to restore and enhance a total of 8,438 linear feet (LF) and preserve 700 LF of stream in Stanly County, NC. The project is being completed to provide 6,450 stream mitigation units (SMUs) in the Yadkin River Basin. The project streams consist of Scaly Bark Creek, a third order stream, as well as six unnamed first and second order tributaries (UTs) to Scaly Bark Creek (UT1, UT1A, UT1B, UT2, UT3, and UT4). At the downstream limits of the project, the drainage area is 1,619 acres (2.5 square miles).

The Scaly Bark Creek Mitigation Site, hereafter referred to as the Site, is approximately 2.6 miles southwest of downtown Albemarle, NC, off of Highway 24/27 in the central portion of Stanly County (Figure 1). The Site is located in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998). The Site is within the Rocky River watershed (North Carolina Division of Water Resources (NCDWR) Subbasin 03-07-13) of the Yadkin River Basin (United States Geological Survey (USGS) Hydrologic Unit 03040105060030). Land use within the watershed is rural and is dominated by forestry, agriculture, and livestock operations with approximately 60% of the watershed forested and 40% used for agriculture. The Site is located in an active cattle pasture surrounded by wooded lots, small agricultural operations, and rural residential areas within a 212-acre tract of land owned by Franchot Palmer.

Prior to construction; activities such as livestock trampling on the banks, vegetation maintenance and removal by the landowner, lack of riparian buffer to stabilize banks and filter runoff, and channel maintenance and straightening by the landowner resulted in an unstable stream system. The primary objectives of the project were to decrease nutrient and fecal coliform levels, sediment input, and water temperature; increase dissolved oxygen concentrations; create appropriate in-stream and terrestrial habitat; and decrease channel velocities. These objectives were achieved by restoring 4,860 LF of perennial stream channel, enhancing 3,578 LF of perennial and intermittent stream channel, and preserving 700 LF of intermittent stream channel. Figure 2 and Table 1 present the restoration and enhancement design for the Site.

The following project goals were established to address the effects listed above in the executive summary from watershed and project Site stressors:

- Remove harmful nutrients from creek flow, including fecal pollution;
- Reduce pollution of the creek by excess sediment;
- Increase dissolved oxygen concentrations;
- Improve stream bank stability;
- Improve in-stream habitat;
- Restore terrestrial habitat; and
- Improve aesthetics of the riparian corridor.

Restoration, preservation and enhancement construction efforts were completed in April 2011. A conservation easement is in place on the 26.6 acres of riparian corridor and stream resources to protect them in perpetuity.

Monitoring Year 5 (MY5) monitoring and site visits were completed during March – July 2015 to assess the conditions of the project. The Site has met the required vegetation, stream, and hydrologic success criteria for MY5. The Site's overall average stem density of 389 stems per acre is greater than the 260 stem per acre density required for MY5. All restored and enhanced streams are stable and functioning as designed, and the Site has met the Monitoring Year 5 (MY5) hydrologic success criteria.



SCALY BARK CREEK MITIGATION SITE
Monitoring Year 5 Annual Report

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Section 1: PROJECT OVERVIEW

The Scaly Bark Creek Mitigation Site is located off of NC Highway 24/27 in the central portion of Stanly County, NC. The Site is approximately 2.6 miles southwest of downtown Albemarle, NC within the Rocky River watershed (NCDWR Subbasin 03-07-13) of the Yadkin River Basin (USGS Hydrologic Unit 03040105060030). The Site is located in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998). Land use within the watershed is rural and is dominated by forestry, agriculture, and livestock operations; with approximately 60% of the watershed forested and 40% used for agriculture. The Site is located in an active cattle pasture surrounded by wooded lots, small agricultural operations, and rural residential areas within a 212-acre tract of land owned by Franchot Palmer.

Streams on the Site consist of Scaly Bark Creek, a third order stream, as well as six unnamed first and second order UTs to Scaly Bark Creek (UT1, UT1A, UT1B, UT2, UT3, and UT4). At the downstream limits of the project, the drainage area is 1,619 acres (2.5 square miles). Scaly Bark Creek (NCDWQ Index No. 13-17-31-2), which is the main creek on the Site, has been classified as Class C waters. Class C waters are protected for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, agriculture, and other uses.

Mitigation work at the Site included full restoration on Scaly Bark Creek, the lower portion of UT1, and UT2. The remainder of the onsite streams were enhanced and preserved. All onsite riparian areas were planted with native species. Construction and planting activities were completed in April 2011. A conservation easement is in place on the 26.6 acres of riparian corridor and stream resources to protect them in perpetuity. Directions and a map of the Site are provided in Figure 1.

1.1 Project Goals and Objectives

Prior to construction activities, the primary watershed stressor was the high sediment load received from the upstream watershed due to bank erosion and lack of erosion control during agricultural practices. Activities such as livestock trampling on the banks, vegetation maintenance and removal by the landowner, lack of riparian buffer to stabilize banks and filter runoff, and channel maintenance and straightening by the landowner resulted in an unstable stream system. As a result of the aforementioned watershed and land activities, the Site had poor water quality due to sediment and fecal pollution, poor habitat due to lack of riparian vegetation and lack of in-stream bed diversity, and unstable geomorphic conditions. Tables in Appendix 1 and 4 present the Site's pre-restoration conditions in detail.

The primary objectives of the project were to decrease nutrient and fecal coliform levels, sediment input, and water temperature; increase dissolved oxygen concentrations; create appropriate in-stream and terrestrial habitat, and decrease channel velocities. Restoration of dimension, pattern, and profile was implemented for Scaly Bark Creek, the lower portion of UT1, and UT2; enhancement of profile and dimension, working within the existing channel, was implemented for the remaining portion of UT1, UT1A, UT1B, UT3, and a portion of UT4. The Site's riparian areas were also planted to stabilize streambanks, improve habitat, and protect water quality. Figure 2 and Table 1 present the restoration, enhancement and preservation assets for the Site.



The following project goals were established and listed in the Mitigation Plan (approved 7/7/2010) to address the effects listed above and in the executive summary from watershed and project Site stressors:

- Remove harmful nutrients from creek flow, including fecal pollution;
- Reduce pollution of the creek by excess sediment;
- Increase dissolved oxygen concentrations;
- Improve stream bank stability;
- Improve in-stream habitat;
- Restore terrestrial habitat; and
- Improve aesthetics of the riparian corridor.

The project objectives established in the Mitigation Plan (approved 7/7/2010) to meet these goals were to:

- Fence out cattle from the riparian corridor to remove fecal contamination and eliminate bank trampling;
- Provide a floodplain for excess sediment to settle out while maintaining appropriate sediment transport through the design reach and eliminating sediment contributions from bank erosion in the project reaches;
- Provide aeration points at riffle and drop structures to increase dissolved oxygen;
- Provide riparian vegetation root mass to stabilize banks and to provide terrestrial habitat;
- Construct a geomorphically stable, self-maintaining channel to provide for stable stream form;
- Provide aquatic habitat bedform diversity in the form of riffles and pools, as well as terrestrial habitat with riparian planting; and
- Provide channel shading to reduce water temperatures which will improve habitat quality and help to improve dissolved oxygen concentrations.

1.2 Monitoring Year 5 Data Assessment

Annual monitoring and quarterly site visits were conducted between March and July 2015 to assess the condition of the project. The stream restoration success criteria for the Site follows the approved success criteria presented in the Scaly Bark Mitigation Plan (approved 7/7/2010).

1.2.1 Vegetative Assessment

A total of 29 vegetation plots were established during the baseline monitoring within the project easement area using standard 10 meter by 10 meter vegetation monitoring plots. Plots were randomly established within planted portions of the stream restoration and enhancement areas to capture the heterogeneity of the designed vegetative communities. The plot corners were marked and are recoverable either through field identification or with the use of a GPS unit. Reference photographs at the origin looking diagonally across the plot to the opposite corner were taken to capture the same reference photograph locations as the as-built. The final vegetative success criteria is the survival of 260 planted stems per acre in the riparian corridor along restored and enhanced reaches at the end of monitoring year five (MY5). In MY1, MY2, and MY3; supplemental plantings were completed to offset marginal survival rates associated with the initial planting. Plants utilized during these supplemental planting events were chosen to be comparable to the heights of the surviving trees.



The MY5 vegetation survey was completed in June 2015 and resulted in all 29 vegetation plots meeting the final success criteria requirement. For MY5, the average stem density resulted in 389 stems per acre which meets the 260 stem/acre success criteria. Volunteers are not included in the Site's stem density results; however, with the inclusion of volunteers the combined average density for the Site is 554 stems per acre.

Please refer to Appendix 3 for vegetation summary tables and raw data tables and Appendix 2 for vegetation plot photographs and the vegetation condition assessment table.

1.2.2 Vegetation Areas of Concern

Vegetation monitoring and visual assessments throughout the five year monitoring period revealed several vegetation areas of concern; which included non-native invasive species, areas with low herbaceous growth, and areas with low planted stem densities and vigor.

An invasive species management and control plan was initially initiated in MY3 and has continued annually during the monitoring period. The primary invasive species documented and controlled on the Site include tree of heaven (*Ailanthus altissima*), Chinese privet (*Ligustrum sinense*), and Japanese honeysuckle (*Lonicera japonica*). Invasive species management has included foliar herbicidal applications as well as cutting and applying herbicide directly to the cut stumps. Please refer to Appendix 2 and Figures 3.0-3.3 for the Current Condition Plan View (CCPV), which outlines the invasive species treatment areas.

While the Site has met the MY5 vegetation success criteria, there are a few areas in which the overall stem numbers and heights do not appear to be as vigorous. Visual assessments of the areas along UT1 Reach 1 and Scaly Bark Reach 2 that were previously classified as having characteristically low herbaceous growth and dry soil conditions indicated that these areas are sufficiently vegetated and are progressing towards the intended riparian vegetative community type.

Please refer to Appendix 2 and Figures 3.0-3.3 for the Current Condition Plan View (CCPV), which outlines the invasive species treatment areas.

Maintenance Plan

An additional supplementing planting effort will occur in the winter of 2015/2016 to augment woody species prior to the project closeout. Additionally, visual assessments will be performed in 2016 prior to project closeout to determine if any additional maintenance is necessary to control invasive species within the Site.

1.2.3 Stream Assessment

Morphological surveys for MY5 were conducted in June and July 2015. All streams within the Site are stable and have met the success criteria for MY5. The scour areas noted on Scaly Bark Reach 1 at station 108+30 and on UT2 at station 502+00 during previous monitoring years are heavily vegetated and as a result these areas were noted as stable in MY5. Please refer to Appendix 2 for the stream visual assessment tables, the CCPV, and reference photographs. Refer to Appendix 4 for the morphological data and plots.

Riffle cross-sections surveyed along the restoration reaches appear stable and show little to no change in the bankfull area, maximum depth ratio, or width-to-depth ratio. All surveyed riffle cross-section dimensions fell within the parameters defined for channels of the appropriate Rosgen stream type. The surveyed longitudinal profile data for the stream restoration reaches illustrates that the bedform features are maintaining lateral and vertical stability. Profile measurements including riffle slope, riffle length, pool

length, and pool-to-pool spacing were based on bed profile. The riffles are remaining steeper and shallower than the pools. The longitudinal profiles show that the bank height ratios remain very near to 1.0 for all of the restoration reaches. In-stream structures used to enhance channel habitat and stability on the outside bank of meander bends, such as root wads and brush toe, are providing stability and habitat as designed. No changes were observed that indicated a change in the radius of curvature or channel belt width; therefore, pattern data is not included in the MY5 report.

In general, substrate materials in the restoration reaches indicate maintenance of coarser materials in the riffle features and finer particles in the pool features. In most riffle cross sections, the particle size distribution for MY5 is similar or slightly larger than MY4.

At the end of MY5, two or more bankfull events must occur in separate years within the restored reaches. While no bankfull events were recorded in MY5, multiple bankfull events were previously recorded for the project reaches in MY4 and MY3 (Appendix 5, Table 13). Based on documented bankfull events during previous monitoring years, the success criteria has been met for the five-year monitoring period.

1.3 Monitoring Year 5 Summary

The Site has met the required vegetation, stream, and hydrologic mitigation success criteria for MY5. The MY5 vegetation assessment resulted in all 29 vegetation plots meeting the MY5 success criteria of 260 stems/acre. Geomorphically, the stability of each restored and enhanced stream remains in good standing. Visual assessment suggests the channels show little sign of instability within the bed, bank, or engineered structures and the stream survey shows little change in bankfull parameters, profile dimensions, and stream slopes. While no bankfull events were documented in MY5, two or more bankfull events have been documented during the five-year monitoring period for all stream reaches at the Site.

Summary information/data related to various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting can be found in the Mitigation Plan (formerly Restoration Plan) documents available on NCDMS's website. All raw data supporting the tables and figures in the appendices is available from NCDMS upon request.

Section 2: METHODOLOGY

Geomorphic data collected followed 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). Longitudinal and cross-sectional data were collected using a total station and were georeferenced to established benchmarks and NC State Plane coordinates. Morphological surveys were conducted using a total station tied to these geo-referenced (control) points. Reachwide pebble counts were conducted along each restored reach for channel classification. Cross-section substrate analyses conducted in each surveyed riffle followed the 100 count wetted perimeter methodology to characterize pavement. All CCPV mapping was recorded using a Trimble handheld GPS with sub-meter accuracy and processed using Pathfinder and ArcView. Crest gages were installed during the baseline monitoring period in surveyed riffle cross-sections and were monitored quarterly. Hydrology attainment installation and monitoring methods are in accordance with the USACE (2003) standards. Vegetation monitoring protocols followed the Carolina Vegetation Survey-NCEEP Level 2 Protocol (Lee et al., 2006).

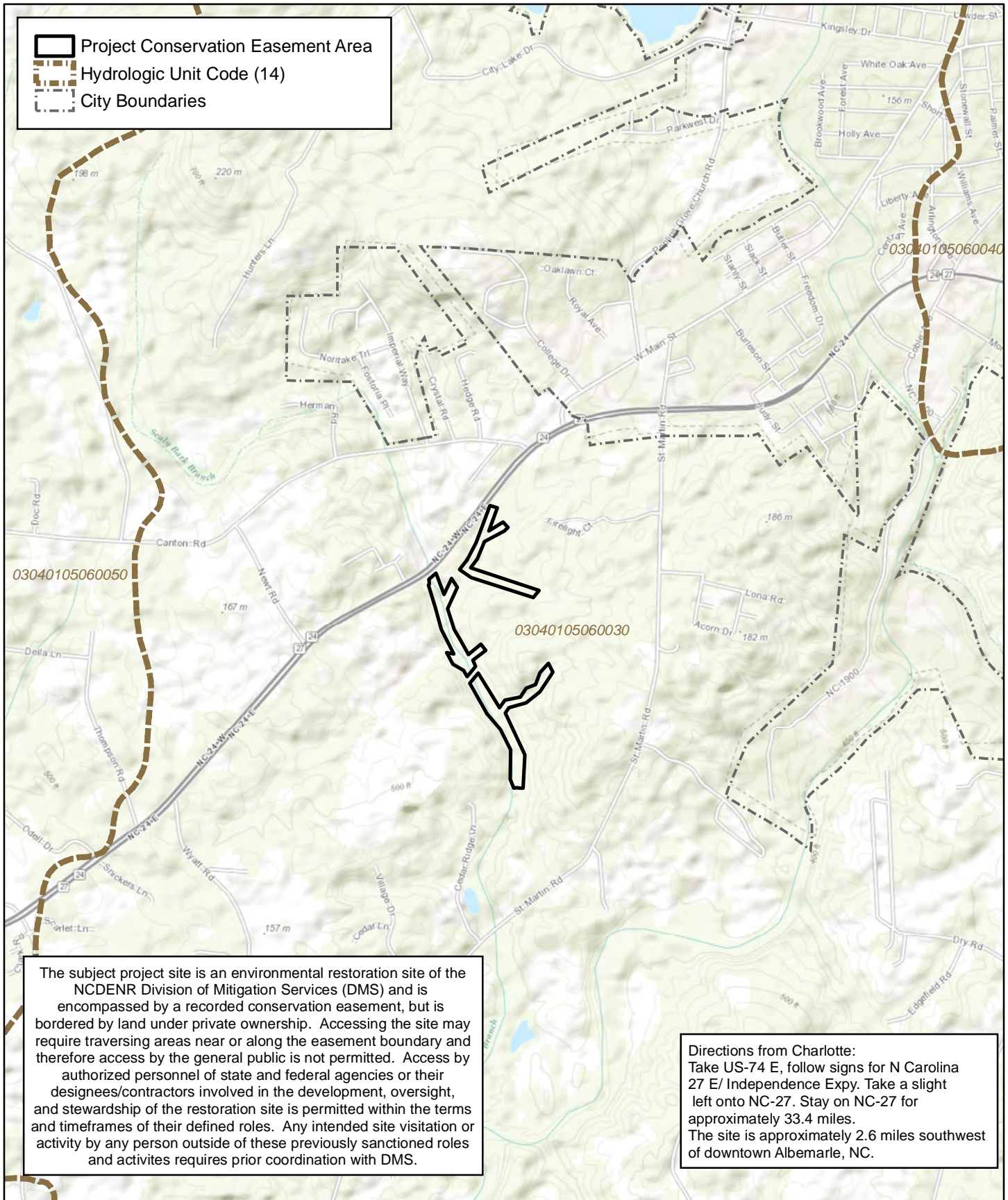


Section 3: REFERENCES

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- Wildlands Engineering, Inc. 2011. Scaly Bark Mitigation Site Baseline Monitoring Document and As-Built Baseline Report. NCEEP, Raleigh, NC.



APPENDIX 1. General Tables and Figures



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

Directions from Charlotte:
 Take US-74 E, follow signs for N Carolina 27 E/ Independence Expy. Take a slight left onto NC-27. Stay on NC-27 for approximately 33.4 miles.
 The site is approximately 2.6 miles southwest of downtown Albemarle, NC.

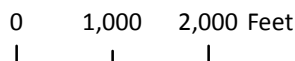
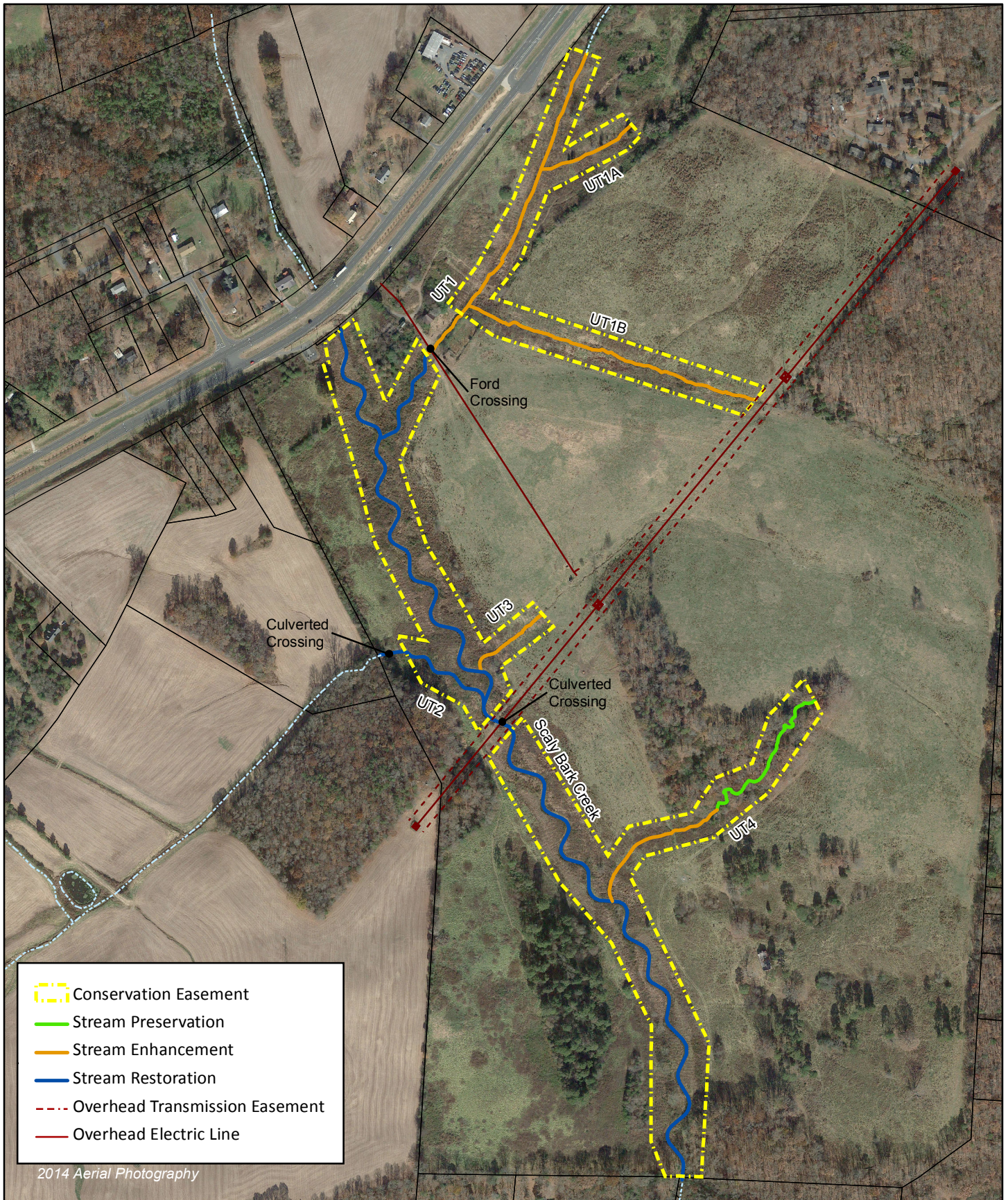


Figure 1. Project Vicinity Map
 Scaly Bark Creek Mitigation Site
 DMS Project Number 94148
 Monitoring Year 5
 Stanly County, NC



0 250 500 Feet



Figure 2. Project Component/Asset Map
 Scaly Bark Creek Mitigation Site
 DMS Project Number 94148
 Monitoring Year 5
 Stanly County, NC

Table 1. Project Components and Mitigation Credits
Scaly Bark Creek Mitigation Site (NCDMS Project No.94148)
Monitoring Year 5

Mitigation Credits									
Type	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
	R	RE	R	RE	R	RE			
Totals	6,291	140	N/A	N/A	N/A	N/A		N/A	N/A
Project Components									
Reach ID	Stationing/ Location	Existing Footage (LF)	Approach	Restoration or Restoration Equivalent	Restoration Footage (LF)*	Mitigation Ratio			
Scaly Bark Creek Reaches 1 & 2	100+00.00- 141+71.79	3,600	Priority 1	Restoration	4,058	1:1			
UT1 Reach 1	200+00.00- 211+10.37	1,104	spot grading and planting	Enhancement II	1,098	2.5:1			
UT1 Reach 2	213+10.37- 217+32.36	330	Priority 1	Restoration	402	1:1			
UT1a	302+78.00- 306+68.00	390	spot grading and planting	Enhancement II	390	2.5:1			
UT1b	400+10.00- 412+08.00	1,198	spot grading and planting	Enhancement II	1,166	2.5:1			
UT2	500+00.00- 503+93.00	262	Priority 1	Restoration	400	1:1			
UT3	600+00.00- 603+26.00	282	spot grading and planting	Enhancement II	341	2.5:1			
UT4	707+00.00- 712+69.00	516	spot grading and planting	Enhancement II	583	2.5:1			
UT4	700+00.00- 707+00.00	700	spot grading and planting	Preservation	700	5:1			
Component Summation									
Restoration Level	Stream (linear feet)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)		Buffer (square feet)	Upland (acres)		
		Riverine	Non-Riverine						
Restoration	4,860	-	-	-	-	-	-		
Enhancement		-	-	-	-	-	-		
Enhancement I	-								
Enhancement II	3,578								
Creation		-	-	-	-				
Preservation	700	-	-	-	-				
High Quality Preservation	-	-	-	-	-				
BMP Elements									
Elements	Location		Purpose/Function		Notes				
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
BMP Elements									
BR = Bioretention Cell; S F= Sand Filter; SW = Stormwater Wetland; WDP = Wet Detention Pond; DDP = Dry Detention Pond; FS = Filter Strip; S = Grassed Swale; LS = Level Spreader; NI = Natural Infiltration Area; FB = Forested Buffer									
*Linear footage excludes crossings.									

Table 2. Project Activity and Reporting History
 Scaly Bark Creek Mitigation Site (NCDMS Project No.94148)
 Monitoring Year 5

Activity or Report	Date Collection Complete	Completion or Delivery
Mitigation Plan	May 2010	May 2010
Final Design - Construction Plans	December 2010	December 2010
Construction	April 2011	April 2011
Temporary S&E mix applied to entire project area*	April 2011	April 2011
Permanent seed mix applied to reach/segments	April 2011	April 2011
Containerized and B&B plantings for reach/segments	April 2011	April 2011
Baseline Monitoring Document (Year 0 Monitoring - baseline)	March/April 2011	June 2011
Year 1 Monitoring	November 2011	November 2011
Supplemental Planting	January/February 2012	January/February 2012
Year 2 Monitoring	September 2012	November 2012
Supplemental Planting	March 2013	March 2013
Year 3 Monitoring	September 2013	November 2013
Invasive Species Treatment & Control	October 2013	October 2013
Supplemental Planting	March 2014	March 2014
Year 4 Monitoring	July 2014	December 2014
Invasive Species Treatment & Control	July 2014	July 2014
Year 5 Monitoring	July 2015	November 2015
Invasive Species Treatment & Control	July 2015	July 2015

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

Table 3. Project Contacts Table
 Scaly Bark Creek Mitigation Site (NCDMS Project No.94148)
 Monitoring Year 5

Designer	Wildlands Engineering, Inc. 1430 South Mint Street, Suite 104 Charlotte, NC 28203 704.332.7754
Shawn Wilkerson	
Construction Contractor	North State Environmental, Inc. 2889 Lowery Street Winston-Salem, NC 27101 336.725.2010
Darrell Westmoreland	
Planting Contractor	North State Environmental, Inc. 2889 Lowery Street Winston-Salem, NC 27101 336.725.2010
Stephen Joyce	
Seeding Contractor	North State Environmental, Inc. 2889 Lowery Street Winston-Salem, NC 27101 336.725.2010
Stephen Joyce	
Seed Mix Sources	Green Resource
Nursery Stock Suppliers	Dykes and Son Nursery Pinelands Nursery North State Environmental, Inc.
<i>Bare Roots</i>	
<i>Plugs</i>	
<i>Live Stakes/Brush Mattress</i>	
Monitoring Performers	Wildlands Engineering, Inc. Kirsten Y. Gimbert 704.332.7754, ext. 110
Stream Monitoring, POC	
Vegetation Monitoring, POC	

Table 4. Project Baseline Information and Attributes
 Scaly Bark Creek Mitigation Site (NCDMS Project No.94148)
 Monitoring Year 5

Project Information (Pre-Restoration)							
Project Name	Scaly Bark Creek Mitigation Site						
County	Stanly						
Project Area (acres)	26.6						
Project Coordinates (latitude and longitude)	35° 19' 38.338" N, 80° 14' 19.315"W						
Project Watershed Summary Information							
Physiographic Province	Piedmont						
River Basin	Yadkin						
USGS Hydrologic Unit 8-digit	03040105	USGS Hydrologic Unit 14-digit	03040105060030				
DWQ Sub-basin	Rocky River (03-07-13)						
Project Drainage Area (acres)	1,619						
Project Drainage Area Percentage of Impervious Area	<10%						
CGIA Land Use Classification	U						
Reach Summary Information							
Parameters	Scaly Bark	UT1	UT1a	UT1b	UT2	UT3	UT4
Length of reach (linear feet) - Post-Restoration	4,058	1,500	390	1,166	400	341	583
Valley classification	VIII						
Drainage area (acres)	1,619	173	46	83	436	36	25
NCDWQ stream identification score	43.5	31	21.5	26.5	37.5	19.5	24
NCDWQ Water Quality Classification	C						
Morphological Description (stream type)	C4	Reach1: E4 Reach 2: C4	E4	C4b	C4	C4	Reach 1: B4 Reach 2: C4
Evolutionary trend (Simon's Model) - Pre- Restoration	Reach 1: Stage 2 Reach 2: Stage 3, 4 & 5	Reach 2: Stage 2 & 4	n/a	n/a	Stage 4	n/a	n/a
Underlying mapped soils	BaB, BaD, BbB & BbD		GoC, GoF		KkB	MhB	Oa
Drainage class	well drained		well-drained to excessively drained		moderately well- drained	moderate to moderately rapid	moderately well-drained
Soil Hydric status	No		No		No	No	Yes (inclusions)
Slope	gently sloping to steep uplands		gently sloping to strongly sloping		lower slopes	nearly level to gently sloping	nearly level
FEMA classification	Zone AE (downstream end of Scaly Bark only); all other areas were not mapped						
Native vegetation community	Piedmont Bottomland Forest						
Percent composition of exotic invasive vegetation - Post-Restoration	0%						
Regulatory Considerations							
Regulation	Applicable?	Resolved?			Supporting Documentation		
Waters of the United States - Section 404	Yes	Yes			USACE Nationwide Permit No.27 and		
Waters of the United States - Section 401	Yes	Yes			DWQ 401 Water Quality Certification		
Endangered Species Act	Yes	Yes			Scaly Bark Mitigation Plan; studies found suitable habitat not present for		
Historic Preservation Act	Yes	Yes			No historic resources were found to be impacted (letter from SHPO)		
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	n/a			n/a		
FEMA Floodplain Compliance	Yes	Yes			LOMR approved		
Essential Fisheries Habitat	Yes	Yes			No adverse impacts to aquatic resources were found (letter from NCWRC)		

U= Unknown

APPENDIX 2. Visual Assessment Data

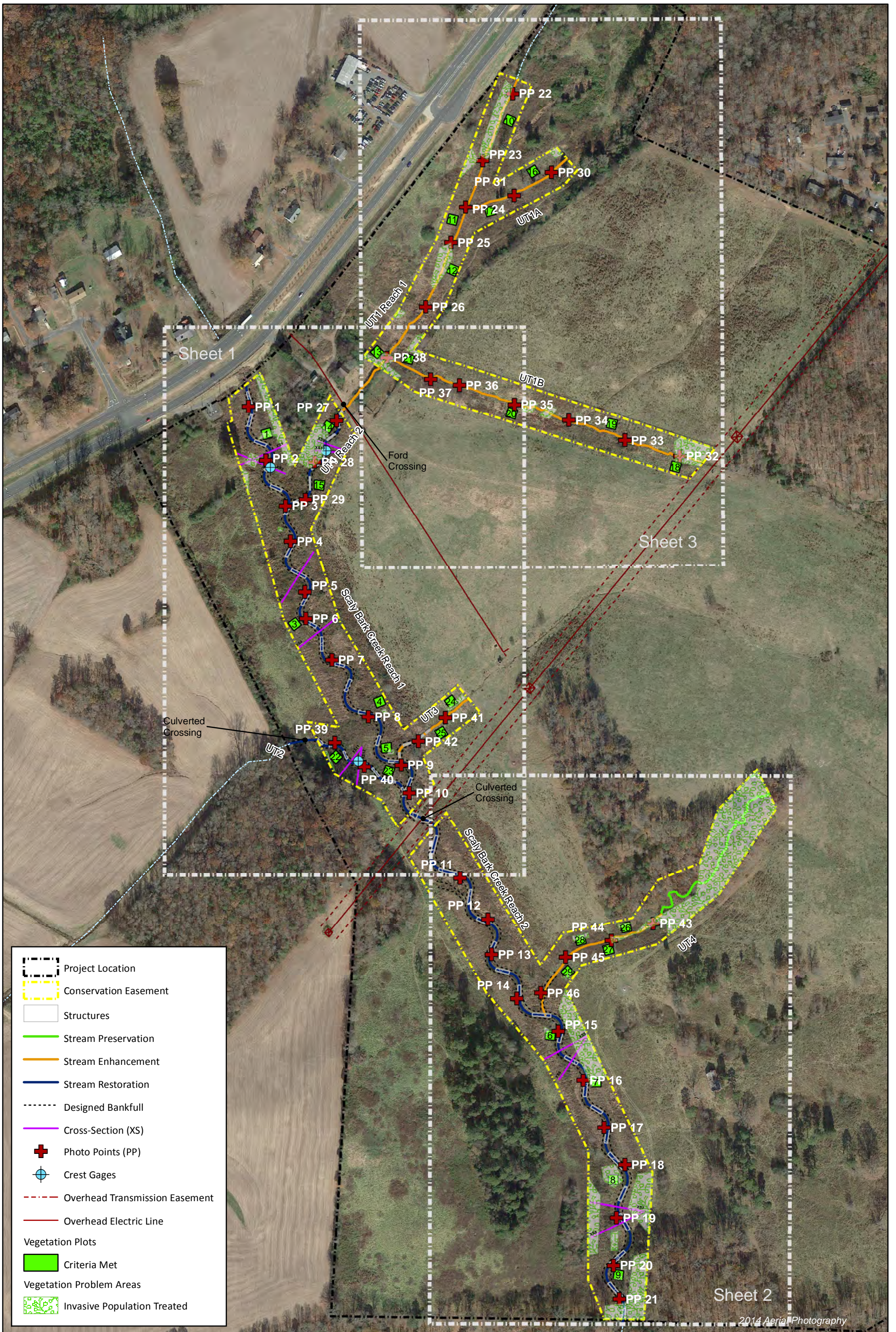
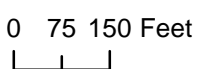


Figure 3.0 Integrated Current Condition Plan View (Key)
 Scaly Bark Creek Mitigation Site
 DMS Project Number 94148
 Monitoring Year 5



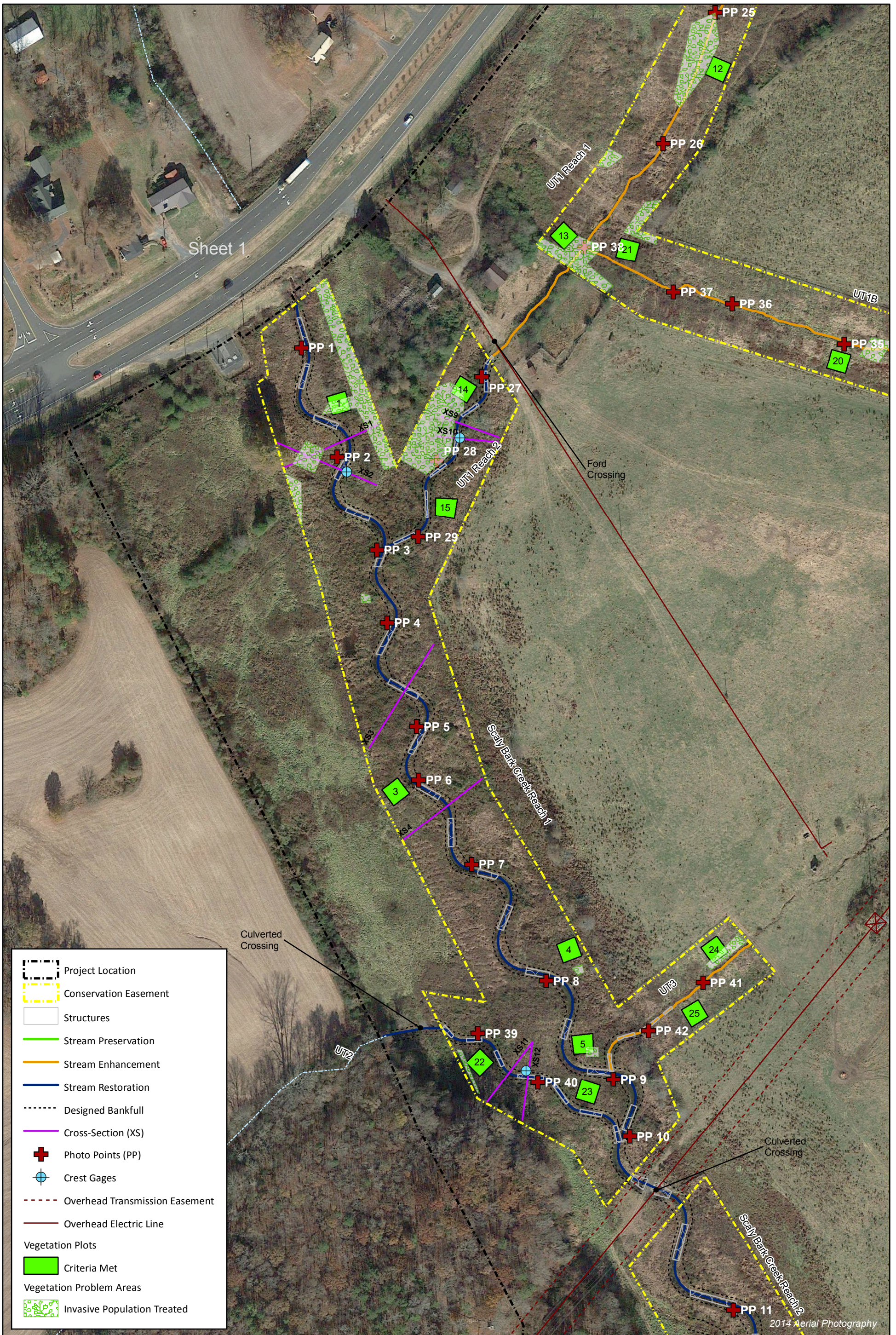
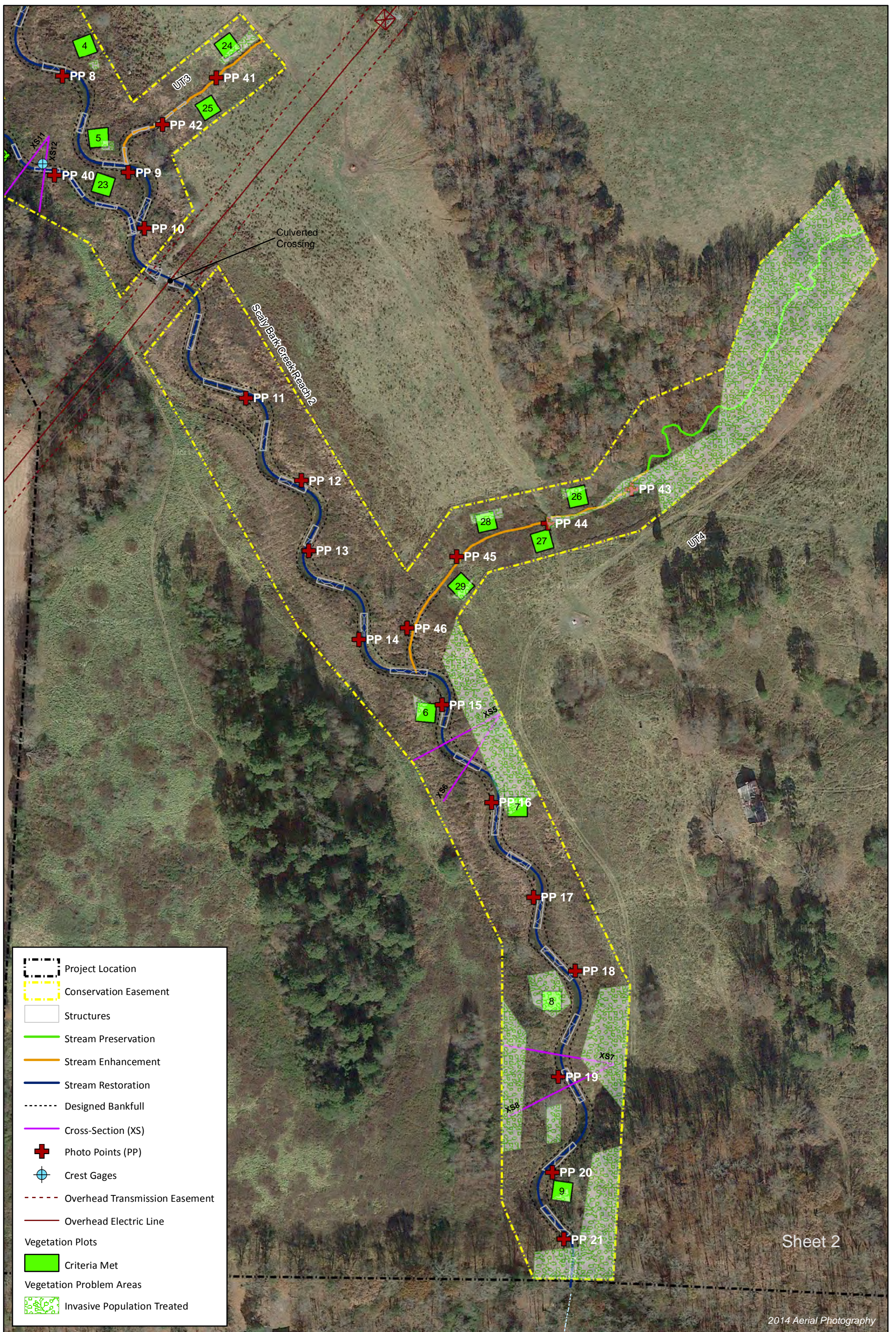


Figure 3.1 Integrated Current Condition Plan View (Sheet 1 of 3)
 Scaly Bark Creek Mitigation Site
 DMS Project Number 94148
 Monitoring Year 5



0 75 150 Feet





0 75 150 Feet



Figure 3.2 Integrated Current Condition Plan View (Sheet 2 of 3)
 Scaly Bark Creek Mitigation Site
 DMS Project Number 94148
 Monitoring Year 5

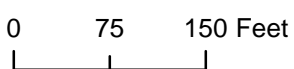
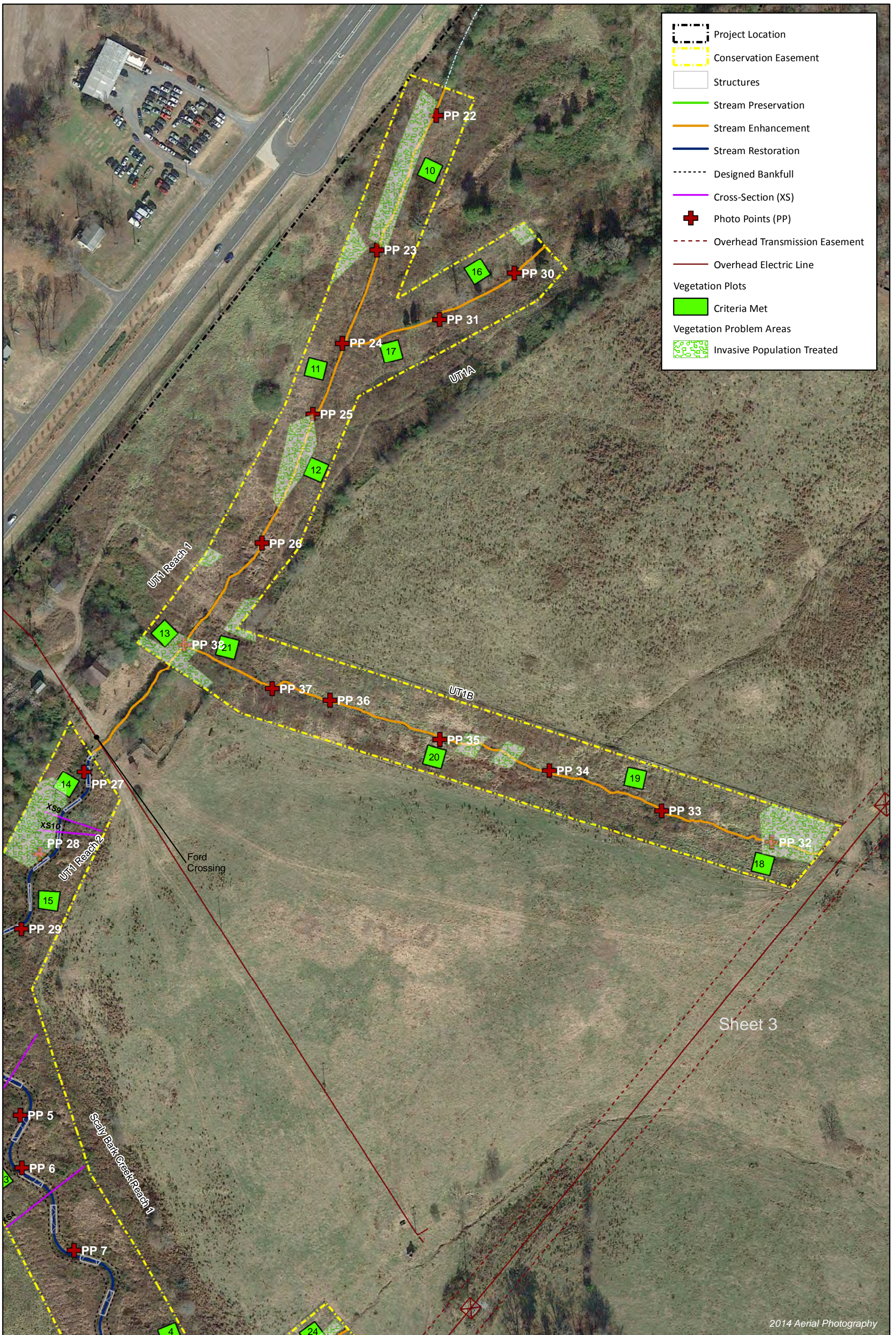


Figure 3.3 Integrated Current Condition Plan View (Sheet 3 of 3)
 Scaly Bark Creek Mitigation Site
 DMS Project Number 94148
 Monitoring Year 5

Table 5a. Visual Stream Morphology Stability Assessment Table
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Scaly Bark Reaches 1 and 2 (4,058 LF)
 Monitoring Year 5

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	37	37			100%			
	3. Meander Pool Condition	Depth Sufficient	37	37			100%			
		Length Appropriate	37	37			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	37	37			100%			
		Thalweg centering at downstream of meander bend (Glide)	37	37			100%			
Totals										
2. Bank	1. Scoured/Eroded	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										
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%.	13	13			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	13	13			100%			

Table 5b. Visual Stream Morphology Stability Assessment Table
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 UT1 Reach 2 (402 LF)
 Monitoring Year 5

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation		
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%					
		Degradation			0	0	100%					
	2. Riffle Condition	Texture/Substrate	6	6			100%					
	3. Meander Pool Condition	Depth Sufficient	6	6			100%					
		Length Appropriate	6	6			100%					
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	6	6			100%					
		Thalweg centering at downstream of meander bend (Glide)	6	6			100%					
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	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		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					
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.										
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.										
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.										
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.										

n/a: Constructed riffles were built; no engineered structures were built on UT1

Table 5c. Visual Stream Morphology Stability Assessment Table
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 UT2 (400 LF)
 Monitoring Year 5

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation					100%			
		Degradation					100%			
	2. Riffle Condition	Texture/Substrate	7	7		100%				
	3. Meander Pool Condition	Depth Sufficient	7	7		100%				
		Length Appropriate	7	7		100%				
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	7	7		100%				
		Thalweg centering at downstream of meander bend (Glide)	7	7		100%				
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.					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.					100%	0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse					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.	1	1			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	1	1			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	1	1			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	1	1			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	1	1			100%			

Table 6. Vegetation Condition Assessment Table
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Monitoring Year 5

Planted Acreage		25.4			
Vegetation Category	Definitions	Mapping Threshold (acres)	Number of Polygons	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material	0.1	0	0	0%
Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1	0	0	0%
Total			0	0	0%
Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0	0	0	0%
Cumulative Total			0	0	0%

Easement Acreage		26.6			
Vegetation Category	Definitions	Mapping Threshold (SF)	Number of Polygons	Combined Acreage	% of Planted Acreage
Invasive Areas of Concern*	Areas or points (if too small to render as polygons at map scale).	1000	0	0	0%
Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	0	0	0%

*All areas have been treated and will be reassessed in the Winter/Spring 2016 prior to project closeout.

Stream Photographs



Photo Point 1 – looking upstream (06/23/2015)



Photo Point 1 – looking downstream (06/23/2015)



Photo Point 2 – looking upstream (06/23/2015)



Photo Point 2 – looking downstream (06/23/2015)

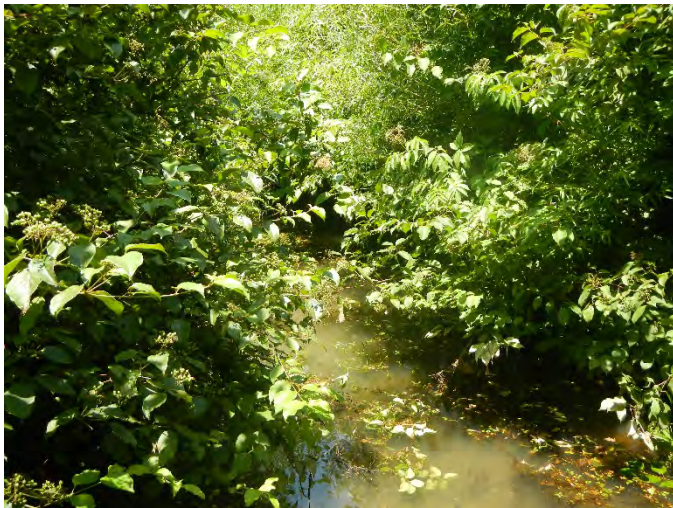


Photo Point 3 – looking upstream (06/23/2015)



Photo Point 3 – looking downstream (06/23/2015)





Photo Point 4 – looking upstream (06/23/2015)



Photo Point 4 – looking downstream (06/23/2015)



Photo Point 5 – looking upstream (06/23/2015)



Photo Point 5 – looking downstream (06/23/2015)



Photo Point 6 – looking upstream (06/23/2015)



Photo Point 6 – looking downstream (06/23/2015)





Photo Point 7 – looking upstream (06/23/2015)



Photo Point 7 – looking downstream (06/23/2015)

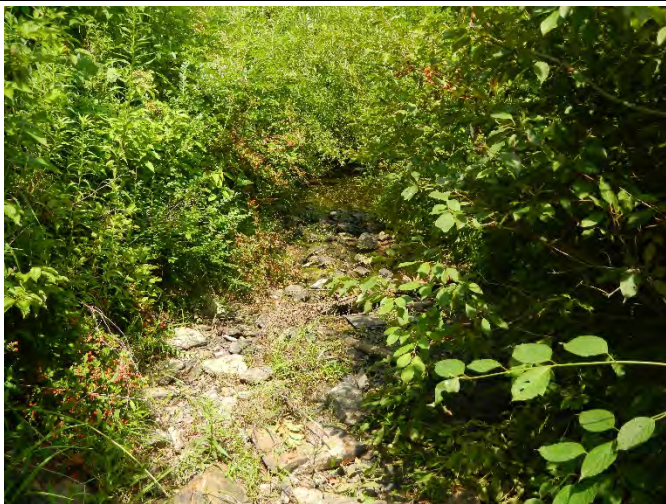


Photo Point 8 – looking upstream (06/23/2015)



Photo Point 8 – looking downstream (06/23/2015)



Photo Point 9 – looking upstream (06/23/2015)

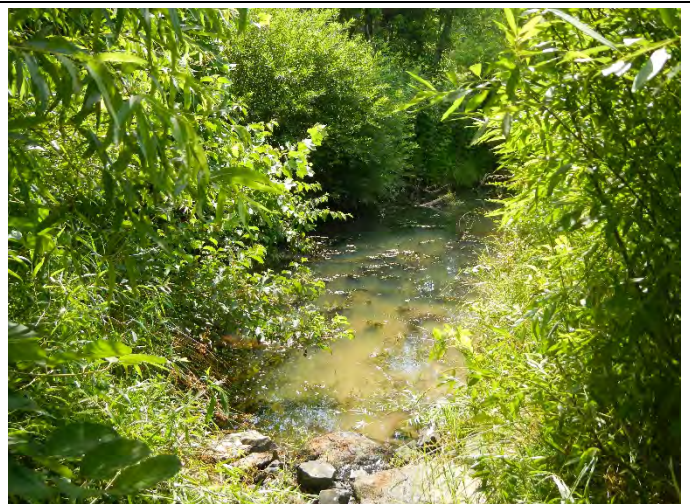


Photo Point 9 – looking downstream (06/23/2015)





Photo Point 10 – looking upstream (06/23/2015)



Photo Point 10 – looking downstream (06/23/2015)



Photo Point 11 – looking upstream (06/23/2015)



Photo Point 11 – looking downstream (06/23/2015)



Photo Point 12 – looking upstream (06/23/2015)



Photo Point 12 – looking downstream (06/23/2015)





Photo Point 13 – looking upstream (06/23/2015)



Photo Point 13 – looking downstream (06/23/2015)



Photo Point 14 – looking upstream (06/23/2015)



Photo Point 14 – looking downstream (06/23/2015)



Photo Point 15 – looking upstream (06/23/2015)



Photo Point 15 – looking downstream (06/23/2015)





Photo Point 16 – looking upstream (06/23/2015)



Photo Point 16 – looking downstream (06/23/2015)



Photo Point 17 – looking upstream (06/23/2015)



Photo Point 17 – looking downstream (06/23/2015)



Photo Point 18 – looking upstream (06/23/2015)

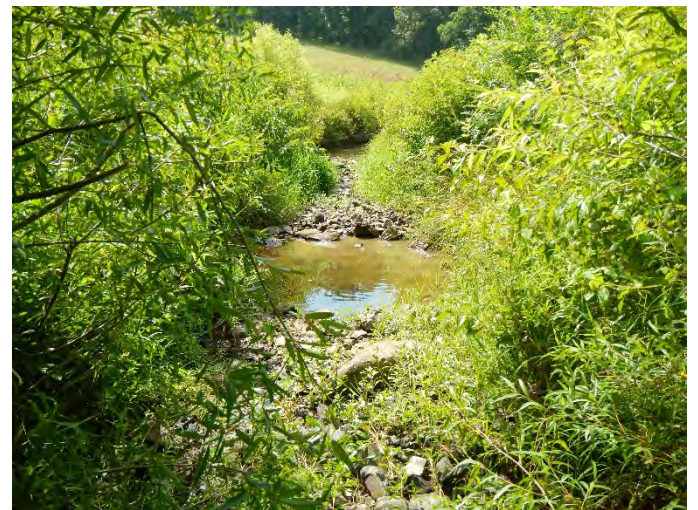


Photo Point 18 – looking downstream (06/23/2015)





Photo Point 19 – looking upstream (06/23/2015)



Photo Point 19 – looking downstream (06/23/2015)



Photo Point 20 – looking upstream (06/23/2015)



Photo Point 20 – looking downstream (06/23/2015)

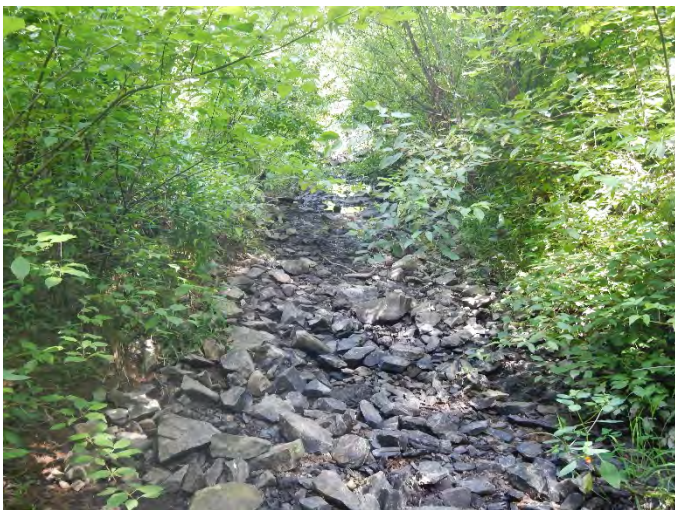


Photo Point 21 – looking upstream (06/23/2015)



Photo Point 21 – looking downstream (06/23/2015)





Photo Point 22 – looking upstream (06/23/2015)



Photo Point 22 – looking downstream (06/23/2015)



Photo Point 23 – looking upstream (06/23/2015)



Photo Point 23 – looking downstream (06/23/2015)



Photo Point 24 – looking upstream (06/23/2015)



Photo Point 24 – looking downstream (06/23/2015)





Photo Point 25 – looking upstream (06/23/2015)



Photo Point 25 – looking downstream (06/23/2015)



Photo Point 26 – looking upstream (06/23/2015)



Photo Point 26 – looking downstream (06/23/2015)



Photo Point 27 – looking upstream (06/23/2015)



Photo Point 27 – looking downstream (06/23/2015)





Photo Point 28 – looking upstream (06/23/2015)



Photo Point 28 – looking downstream (06/23/2015)



Photo Point 29 – looking upstream (06/23/2015)



Photo Point 29 – looking downstream (06/23/2015)



Photo Point 30 – looking upstream (06/23/2015)



Photo Point 30 – looking downstream (06/23/2015)





Photo Point 31 – looking upstream (06/23/2015)



Photo Point 31 – looking downstream (06/23/2015)



Photo Point 32 – looking upstream (06/23/2015)



Photo Point 32 – looking downstream (06/23/2015)



Photo Point 33 – looking upstream (06/23/2015)



Photo Point 33 – looking downstream (06/23/2015)





Photo Point 34 – looking upstream (06/23/2015)



Photo Point 34 – looking downstream (06/23/2015)



Photo Point 35 – looking upstream (06/23/2015)



Photo Point 35 – looking downstream (06/23/2015)



Photo Point 36 – looking upstream (06/23/2015)



Photo Point 36 – looking downstream (06/23/2015)





Photo Point 37 – looking upstream (06/23/2015)



Photo Point 37 – looking downstream (06/23/2015)



Photo Point 38 – looking upstream (06/23/2015)



Photo Point 38 – looking downstream (06/23/2015)



Photo Point 39 – looking upstream (06/23/2015)



Photo Point 39 – looking downstream (06/23/2015)





Photo Point 40 – looking upstream (06/23/2015)



Photo Point 40 – looking downstream (06/23/2015)



Photo Point 41 – looking upstream (06/23/2015)



Photo Point 41 – looking downstream (06/23/2015)



Photo Point 42 – looking upstream (06/23/2015)



Photo Point 42 – looking downstream (06/23/2015)





Photo Point 43 – looking upstream (06/23/2015)



Photo Point 43 – looking downstream (06/23/2015)



Photo Point 44 – looking upstream (06/23/2015)



Photo Point 44 – looking downstream (06/23/2015)



Photo Point 45 – looking upstream (06/23/2015)



Photo Point 45 – looking downstream (06/23/2015)





Photo Point 46 – looking upstream (06/23/2015)



Photo Point 46 – looking downstream (06/23/2015)



Vegetation Photographs



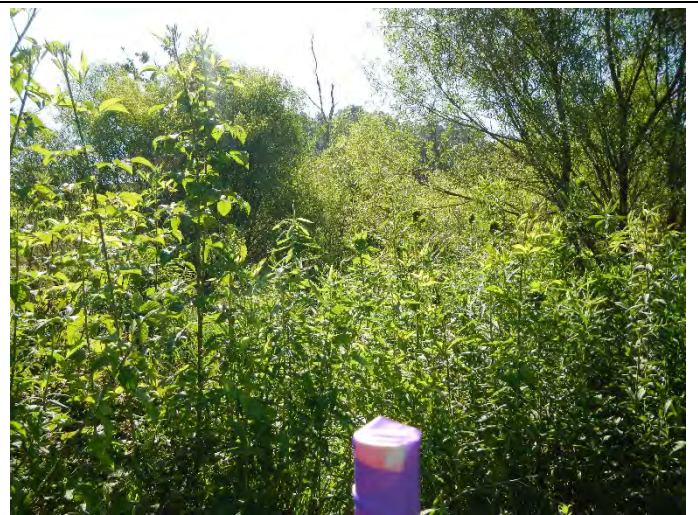
Vegetation Plot 1 (6/2015)



Vegetation Plot 2 (6/2015)



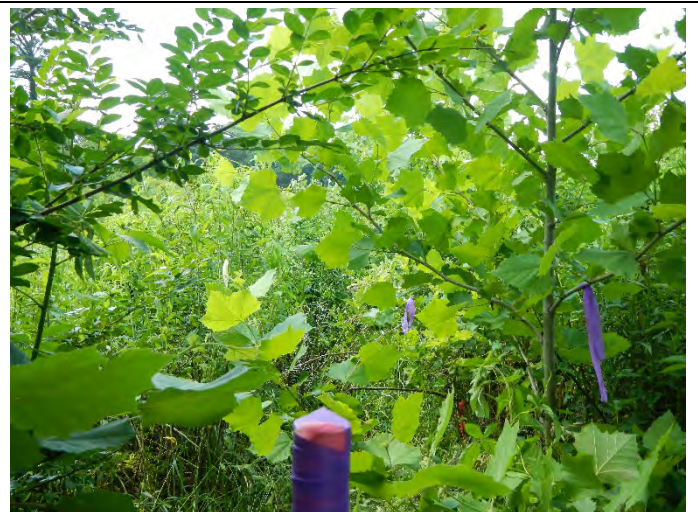
Vegetation Plot 3 (6/2015)



Vegetation Plot 4 (6/2015)



Vegetation Plot 5 (6/2015)



Vegetation Plot 6 (6/2015)





Vegetation Plot 7 (6/2015)



Vegetation Plot 8 (6/2015)



Vegetation Plot 9 (6/2015)



Vegetation Plot 10 (6/2015)



Vegetation Plot 11 (6/2015)



Vegetation Plot 12 (6/2015)





Vegetation Plot 13 (6/2015)



Vegetation Plot 14 (6/2015)



Vegetation Plot 15 (6/2015)



Vegetation Plot 16 (6/2015)



Vegetation Plot 17 (6/2015)



Vegetation Plot 18 (6/2015)





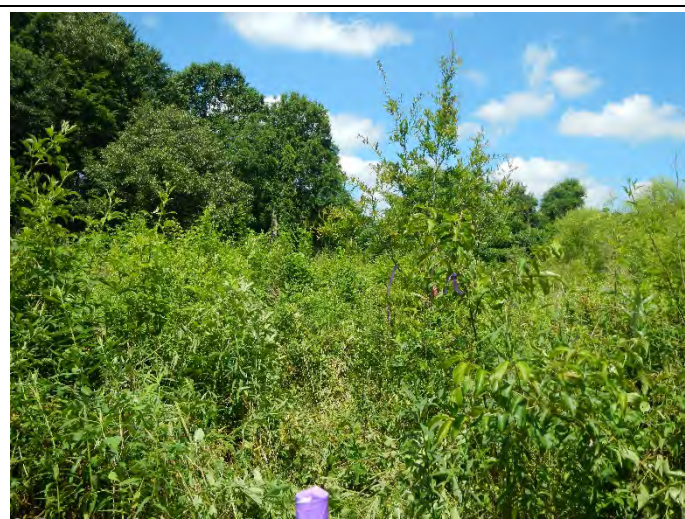
Vegetation Plot 19 (6/2015)



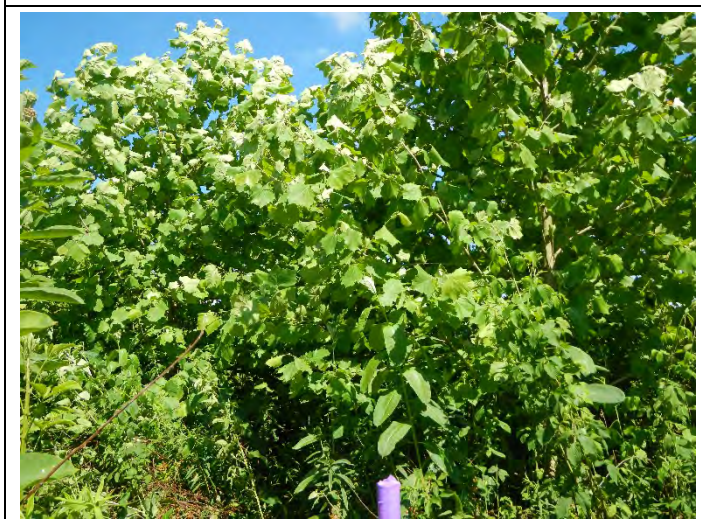
Vegetation Plot 20 (6/2015)



Vegetation Plot 21 (6/2015)



Vegetation Plot 22 (6/2015)



Vegetation Plot 23 (6/2015)



Vegetation Plot 24 (6/2015)





Vegetation Plot 25 (6/2015)



Vegetation Plot 26 (6/2015)



Vegetation Plot 27 (6/2015)



Vegetation Plot 28 (6/2015)



Vegetation Plot 29 (6/2015)



APPENDIX 3. Vegetation Plot Data

Table 7. Vegetation Plot Criteria Attainment
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Monitoring Year 5

Plot	MY5 Success Criteria Met (Y/N)	Tract Mean
1	Y	100%
2	Y	
3	Y	
4	Y	
5	Y	
6	Y	
7	Y	
8	Y	
9	Y	
10	Y	
11	Y	
12	Y	
13	Y	
14	Y	
15	Y	
16	Y	
17	Y	
18	Y	
19	Y	
20	Y	
21	Y	
22	Y	
23	Y	
24	Y	
25	Y	
26	Y	
27	Y	
28	Y	
29	Y	

Table 8. CVS Vegetation Plot Metadata
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Monitoring Year 5

Report Prepared By	Alea K. Tuttle
Date Prepared	7/21/2015 16:28
database name	Scaly Bark MY5 cvs-eep-entrytool-v2.3.1_Yr5.mdb
database location	Q:\ActiveProjects\005-02122 Scaly Bark Creek Mitigation Project\Monitoring\Monitoring Year 5\Vegetation Assessment
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT-----	
Metadata	This worksheet, which is a summary of the project and the 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.
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	94148
Project Name	Scaly Bark Creek
Description	Scaly Bark Creek Mitigation Site
Sampled Plots	29

Table 9. Planted and Total Stem Counts
Scaly Bark Creek (NCDMS Project No. 94148)
Monitoring Year 5

Scientific Name	Common Name	Species Type	Current Plot Data (MY5 2015)																				
			94148-WE-0001			94148-WE-0002			94148-WE-0003			94148-WE-0004			94148-WE-0005			94148-WE-0006			94148-WE-0007		
			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 floridanum	Southern sugar maple, Florida maple	Tree							2	2	2	1	1	1	1	1	1				2	2	2
Acer rubrum	Red maple	Tree										1	1	2			2						
Alnus serrulata	Hazel alder	Shrub																					
Baccharis	Baccharis	Shrub																					
Betula nigra	River birch	Tree	1	1	1	2	2	2				1	1	1				1	1	1			
Carpinus caroliniana	American hornbeam	Tree				1	1	1				1	1	1									
Carya	Hickory	Tree																					
Carya cordiformis	Bitternut hickory	Tree																					
Carya ovata	Shagbark hickory	Tree																					
Celtis	Hackberry	Tree																					
Celtis laevigata	Sugarberry	Tree													1	1	1						
Celtis occidentalis	Common hackberry	Tree																					
Cornus	Dogwood	Shrub or Tree																					
Cornus amomum	Silky dogwood	Shrub				1	1	1	2	2	2				1	1	1	1	1	1	1	1	1
Cornus florida	Flowering dogwood	Tree	1	1	1										1	1	1						
Diospyros virginiana	Common persimmon	Tree												1									
Fraxinus pennsylvanica	Green ash	Tree				1	1	1				1	1	1				2	2	2			
Ilex opaca	American holly	Tree																					
Juglans nigra	Black walnut	Tree																					
Juniperus virginiana	Eastern redcedar	Tree																		1			
Liquidambar	Sweetgum	Tree																					
Liquidambar styraciflua	Sweetgum	Tree																			1	1	1
Liriodendron tulipifera	Tuliptree	Tree				1	1	1	2	2	2				2	2	2						
Platanus occidentalis	American sycamore	Tree	3	3	3				1	1	1	2	2	2	3	3	3	3	3	3			
Quercus	Oak	Tree																					
Quercus falcata	Southern red oak	Tree																					
Quercus laurifolia	Laurel oak	Tree																					
Quercus lyrata	Overcup oak	Tree																					
Quercus michauxii	Swamp chestnut oak	Tree										2	2	2	5	5	5	1	1	1	1	1	1
Quercus nigra	Water oak	Tree				1	1	1				2	2	2	5	5	5	1	1	1			
Quercus pagoda	Cherrybark oak	Tree				1	1	1										3	3	3			
Quercus phellos	Willow oak	Tree							1	1	1							1	1	1	2	2	2
Quercus rubra	Northern red oak	Tree	2	2	2																		
Salix	Willow	Shrub or Tree																					
Salix nigra	Black willow	Tree																					
Salix sericea	Silky willow	Shrub			6									4									
Sambucus canadensis	Common Elderberry	Shrub			3																		
Ulmus alata	Winged elm	Tree																					
Unknown																							
Stem count			7	7	16	8	8	8	8	8	8	9	9	15	14	14	16	12	12	13	7	7	7
size (ares)			1			1			1			1			1			1			1		
size (ACRES)			0.02			0.02			0.02			0.02			0.02			0.02			0.02		
Species count			4	4	6	7	7	7	5	5	5	7	7	9	7	7	8	7	7	8	5	5	5
Stems per ACRE			283.3	283.3	647.5	323.7	323.7	323.7	323.7	323.7	323.7	364.2	364.2	607	566.6	566.6	647.5	485.6	485.6	526.1	283.3	283.3	283.3

Color Coding for Table

- 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 Planted stems excluding live stakes

P-all: Number of planted stems including live stakes

T: Total Stems

Table 9. Planted and Total Stem Counts
Scaly Bark Creek (NCDMS Project No. 94148)
Monitoring Year 5

Scientific Name	Common Name	Species Type	Current Plot Data (MY5 2015)																				
			94148-WE-0008			94148-WE-0009			94148-WE-0010			94148-WE-0011			94148-WE-0012			94148-WE-0013			94148-WE-0014		
			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 floridanum	Southern sugar maple, Florida maple	Tree				1	1	1	1	1	1	2	2	2	1	1	1	1	1	1			
Acer rubrum	Red maple	Tree			3	8	8	18												1			
Alnus serrulata	Hazel alder	Shrub																					
Baccharis	Baccharis	Shrub																					
Betula nigra	River birch	Tree	1	1	1							1	1	1									
Carpinus caroliniana	American hornbeam	Tree																					
Carya	Hickory	Tree	1	1	1																		
Carya cordiformis	Bitternut hickory	Tree																					
Carya ovata	Shagbark hickory	Tree																		2	2	2	
Celtis	Hackberry	Tree																					
Celtis laevigata	Sugarberry	Tree						1							1	1	1	3	3	3	1	1	1
Celtis occidentalis	Common hackberry	Tree																					
Cornus	Dogwood	Shrub or Tree																					
Cornus amomum	Silky dogwood	Shrub				1	1	1															
Cornus florida	Flowering dogwood	Tree				1	1	2	2	2	2	2	2	2	2	2	2	1	1	1			
Diospyros virginiana	Common persimmon	Tree	3	3	3	1	1	1												2			
Fraxinus pennsylvanica	Green ash	Tree									2				1	1	1				1	1	1
Ilex opaca	American holly	Tree				1	1	1															
Juglans nigra	Black walnut	Tree																					
Juniperus virginiana	Eastern redcedar	Tree																					
Liquidambar	Sweetgum	Tree																					
Liquidambar styraciflua	Sweetgum	Tree				1	1	1															
Liriodendron tulipifera	Tuliptree	Tree	1	1	1							1	1	1	1	1	1	2	2	2	1	1	1
Platanus occidentalis	American sycamore	Tree	1	1	1	7	7	7				2	2	2	5	5	5	2	2	2	2	2	2
Quercus	Oak	Tree						2	1	1	1								1	1	1		
Quercus falcata	Southern red oak	Tree																			1	1	1
Quercus laurifolia	Laurel oak	Tree	1	1	1																		
Quercus lyrata	Overcup oak	Tree	1	1	1				1	1	1												
Quercus michauxii	Swamp chestnut oak	Tree																					
Quercus nigra	Water oak	Tree	1	1	1				1	1	1	1	1	1	1	1	1	1	1	1			
Quercus pagoda	Cherrybark oak	Tree																					
Quercus phellos	Willow oak	Tree							2	2	2	1	1	1	1	1	1						
Quercus rubra	Northern red oak	Tree	1	1	1				1	1	1												
Salix	Willow	Shrub or Tree																					
Salix nigra	Black willow	Tree																					
Salix sericea	Silky willow	Shrub																					
Sambucus canadensis	Common Elderberry	Shrub																					5
Ulmus alata	Winged elm	Tree																					
Unknown																							
Stem count			11	11	14	21	21	35	9	9	11	10	10	10	13	13	13	11	11	14	8	8	13
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			9	9	10	8	8	10	7	7	8	7	7	7	8	8	8	7	7	9	6	6	7
Stems per ACRE			445.2	445.2	566.6	849.8	849.8	1416	364.2	364.2	445.2	404.7	404.7	404.7	526.1	526.1	526.1	445.2	445.2	566.6	323.7	323.7	526.1

Color Coding for Table

- 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 Planted stems excluding live stakes

P-all: Number of planted stems including live stakes

T: Total Stems

Table 9. Planted and Total Stem Counts
Scaly Bark Creek (NCDMS Project No. 94148)
Monitoring Year 5

Scientific Name	Common Name	Species Type	Current Plot Data (MY5 2015)																				
			94148-WE-0015			94148-WE-0016			94148-WE-0017			94148-WE-0018			94148-WE-0019			94148-WE-0020			94148-WE-0021		
			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 floridanum	Southern sugar maple, Florida maple	Tree							1	1	1	3	3	3	1	1	1	3	3	3			
Acer rubrum	Red maple	Tree																					
Alnus serrulata	Hazel alder	Shrub																					
Baccharis	Baccharis	Shrub																					
Betula nigra	River birch	Tree	2	2	2				1	1	1	2	2	2	2	2	2						
Carpinus caroliniana	American hornbeam	Tree																					
Carya	Hickory	Tree																					
Carya cordiformis	Bitternut hickory	Tree																					
Carya ovata	Shagbark hickory	Tree																1	1	1	1	1	1
Celtis	Hackberry	Tree				4	4	4															
Celtis laevigata	Sugarberry	Tree	1	1	1																		
Celtis occidentalis	Common hackberry	Tree																					
Cornus	Dogwood	Shrub or Tree																					
Cornus amomum	Silky dogwood	Shrub																					
Cornus florida	Flowering dogwood	Tree	2	2	2				5	5	5												
Diospyros virginiana	Common persimmon	Tree										2	2	2									
Fraxinus pennsylvanica	Green ash	Tree				1	1	1							2	2	2				6	6	6
Ilex opaca	American holly	Tree	1	1	1																		
Juglans nigra	Black walnut	Tree									1						1						
Juniperus virginiana	Eastern redcedar	Tree																					
Liquidambar	Sweetgum	Tree																					
Liquidambar styraciflua	Sweetgum	Tree																					
Liriodendron tulipifera	Tuliptree	Tree				1	1	1	2	2	2							1	1	1			
Platanus occidentalis	American sycamore	Tree				1	1	1							3	3	3				2	2	2
Quercus	Oak	Tree						3															
Quercus falcata	Southern red oak	Tree																					
Quercus laurifolia	Laurel oak	Tree										1	1	1									
Quercus lyrata	Overcup oak	Tree													1	1	1						
Quercus michauxii	Swamp chestnut oak	Tree	1	1	1																		
Quercus nigra	Water oak	Tree	1	1	1	1	1	1							1	1	1						
Quercus pagoda	Cherrybark oak	Tree																					
Quercus phellos	Willow oak	Tree																2	2	2			
Quercus rubra	Northern red oak	Tree																					
Salix	Willow	Shrub or Tree																					
Salix nigra	Black willow	Tree																					
Salix sericea	Silky willow	Shrub																					
Sambucus canadensis	Common Elderberry	Shrub																					50
Ulmus alata	Winged elm	Tree																					
Unknown																							
Stem count			8	8	8	8	8	11	9	9	10	8	8	8	10	10	11	7	7	7	9	9	59
size (ares)			1			1			1			1			1			1			1		
size (ACRES)			0.02			0.02			0.02			0.02			0.02			0.02			0.02		
Species count			6	6	6	5	5	6	4	4	5	4	4	4	6	6	7	4	4	4	3	3	4
Stems per ACRE			323.7	323.7	323.7	323.7	323.7	445.2	364.2	364.2	404.7	323.7	323.7	323.7	404.7	404.7	445.2	283.3	283.3	283.3	364.2	364.2	2388

Color Coding for Table

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- 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 Planted stems excluding live stakes

P-all: Number of planted stems including live stakes

T: Total Stems

Table 9. Planted and Total Stem Counts
Scaly Bark Creek (NCDMS Project No. 94148)
Monitoring Year 5

Scientific Name	Common Name	Species Type	Current Plot Data (MY5 2015)																							
			94148-WE-0022			94148-WE-0023			94148-WE-0024			94148-WE-0025			94148-WE-0026			94148-WE-0027			94148-WE-0028			94148-WE-0029		
			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 floridanum	Southern sugar maple, Florida maple	Tree	1	1	1				2	2	2				1	1	1									
Acer rubrum	Red maple	Tree			17																					
Alnus serrulata	Hazel alder	Shrub																								
Baccharis	Baccharis	Shrub																								
Betula nigra	River birch	Tree										1	1	1				1	1	1						
Carpinus caroliniana	American hornbeam	Tree																								
Carya	Hickory	Tree																								
Carya cordiformis	Bitternut hickory	Tree																								
Carya ovata	Shagbark hickory	Tree																								
Celtis	Hackberry	Tree																					1	1	1	
Celtis laevigata	Sugarberry	Tree	1	1	1				1	1	1	1	1	1	4	4	4	1	1	1						
Celtis occidentalis	Common hackberry	Tree													1	1	1									
Cornus	Dogwood	Shrub or Tree																								
Cornus amomum	Silky dogwood	Shrub	2	2	2																					
Cornus florida	Flowering dogwood	Tree							3	3	3										1	1	1			
Diospyros virginiana	Common persimmon	Tree										1	1	1							1	1	1	1	1	1
Fraxinus pennsylvanica	Green ash	Tree							3	3	3				1	1	1				1	1	1			
Ilex opaca	American holly	Tree																								
Juglans nigra	Black walnut	Tree																								
Juniperus virginiana	Eastern redcedar	Tree																								
Liquidambar	Sweetgum	Tree																								
Liquidambar styraciflua	Sweetgum	Tree			1																1	1	1			
Liriodendron tulipifera	Tuliptree	Tree	1	1	1	3	3	3							1	1	1	2	2	2	1	1	1	2	2	2
Platanus occidentalis	American sycamore	Tree				4	4	4													2	2	2	2	2	2
Quercus	Oak	Tree																								
Quercus falcata	Southern red oak	Tree																								
Quercus laurifolia	Laurel oak	Tree										1	1	1	1	1	1	2	2	2						
Quercus lyrata	Overcup oak	Tree																								
Quercus michauxii	Swamp chestnut oak	Tree																								
Quercus nigra	Water oak	Tree	2	2	2							4	4	4	1	1	1							1	1	1
Quercus pagoda	Cherrybark oak	Tree																			2	2	2	2	2	2
Quercus phellos	Willow oak	Tree	1	1	1													1	1	1						
Quercus rubra	Northern red oak	Tree	1	1	1							1	1	1				2	2	2				1	1	1
Salix	Willow	Shrub or Tree																								
Salix nigra	Black willow	Tree																								
Salix sericea	Silky willow	Shrub																								
Sambucus canadensis	Common Elderberry	Shrub																								
Ulmus alata	Winged elm	Tree																								
Unknown																										
Stem count			9	9	27	7	7	7	9	9	9	9	9	9	10	10	10	9	9	9	9	9	9	10	10	10
size (ares)			1			1			1			1			1			1			1			1		
size (ACRES)			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02		
Species count			7	7	9	2	2	2	4	4	4	6	6	6	7	7	7	6	6	6	7	7	7	7	7	7
Stems per ACRE			364.2	364.2	1093	283.3	283.3	283.3	364.2	364.2	364.2	364.2	364.2	364.2	404.7	404.7	404.7	364.2	364.2	364.2	364.2	364.2	364.2	404.7	404.7	404.7

Color Coding for Table

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- Exceeds requirements, but by less than 10%
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P-all: Number of planted stems including live stakes
T: Total Stems

Table 9. Planted and Total Stem Counts
Scaly Bark Creek (NCDMS Project No. 94148)
Monitoring Year 5

Scientific Name	Common Name	Species Type	Annual Means																		
			MYS (2015)			MY4 (2014)			MY3 (2013)			MY2 (2012)			MY1 (2011)			MY0 (2011)			
			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 floridanum	Southern sugar maple, Florida maple	Tree	24	24	24	35	35	35	37	37	37	46	46	46	57	57	57	104	104	104	
Acer rubrum	Red maple	Tree	9	9	43	5	5	18	6	6	11										
Alnus serrulata	Hazel alder	Shrub													3	3	3	5	5	5	
Baccharis	Baccharis	Shrub						1			1										
Betula nigra	River birch	Tree	16	16	16	15	15	16	5	5	5	5	5	5	12	12	12	32	32	32	
Carpinus caroliniana	American hornbeam	Tree	2	2	2	3	3	3	3	3	3	4	4	4							
Carya	Hickory	Tree	1	1	1	1	1	1	1	1	1				1	1	1	3	3	3	
Carya cordiformis	Bitternut hickory	Tree										4	4	4	15	15	15	25	25	25	
Carya ovata	Shagbark hickory	Tree	4	4	4	9	9	9	8	8	8	21	21	21	5	5	5	12	12	12	
Celtis	Hackberry	Tree	5	5	5	6	6	7	7	7											
Celtis laevigata	Sugarberry	Tree	15	15	16	9	9	9	12	12	12	17	17	17							
Celtis occidentalis	Common hackberry	Tree	1	1	1	2	2	2	2	2	2	3	3	3	4	4	4	12	12	12	
Cornus	Dogwood	Shrub or Tree							1	1	1				2	2	2	2	2	2	
Cornus amomum	Silky dogwood	Shrub	9	9	9	9	9	9	9	9	9	9	9	9	11	11	11	11	11	11	
Cornus florida	Flowering dogwood	Tree	21	21	22	20	20	20	26	26	26	37	37	37	66	66	66	120	120	120	
Diospyros virginiana	Common persimmon	Tree	9	9	12	8	8	8	1	1	1										
Fraxinus pennsylvanica	Green ash	Tree	20	20	22	17	17	17	17	17	18										
Ilex opaca	American holly	Tree	2	2	2	2	2	2	2	2	2	4	4	4	30	30	30	91	91	91	
Juglans nigra	Black walnut	Tree			2			5													
Juniperus virginiana	Eastern redcedar	Tree			1	3	3	3	3	3	5	2	2	2	1	1	1	2	2	2	
Liquidambar	Sweetgum	Tree				31	31	31	26	26	26	26	26	26	16	16	16	107	107	107	
Liquidambar styraciflua	Sweetgum	Tree	3	3	4	45	45	46	37	37	38	37	37	37	5	5	5	7	7	7	
Liriodendron tulipifera	Tuliptree	Tree	25	25	25							2	2	2	2	2	2				
Platanus occidentalis	American sycamore	Tree	45	45	45	1	1	1				1	1	1							
Quercus	Oak	Tree	2	2	7	7	7	7													
Quercus falcata	Southern red oak	Tree	1	1	1	3	3	3													
Quercus laurifolia	Laurel oak	Tree	6	6	6	2	2	2	4	4	4	3	3	3	19	19	19	34	34	34	
Quercus lyrata	Overcup oak	Tree	3	3	3	19	19	21	15	15	15	14	14	14							
Quercus michauxii	Swamp chestnut oak	Tree	2	2	2	6	6	6													
Quercus nigra	Water oak	Tree	25	25	25	15	15	22	13	13	13	17	17	17							
Quercus pagoda	Cherrybark oak	Tree	8	8	8	9	9	9	10	10	10	10	10	10							
Quercus phellos	Willow oak	Tree	12	12	12						12										
Quercus rubra	Northern red oak	Tree	9	9	9						4										
Salix	Willow	Shrub or Tree									23										
Salix nigra	Black willow	Tree										1	1	1	10	10	10	13	13	13	
Salix sericea	Silky willow	Shrub			10																
Sambucus canadensis	Common Elderberry	Shrub			58																
Ulmus alata	Winged elm	Tree																			
Unknown								2													
Stem count			279	279	397	282	282	315	245	245	294	263	263	263	259	259	259	580	580	580	
size (ares)			29				29			29			29			29					
size (ACRES)			0.717				0.72			0.72			0.72			0.72					
Species count			26	26	30	25	25	28	22	22	26	20	20	20	17	17	17	16	16	16	
Stems per ACRE			389.3	389.3	554	393.5	393.5	439.6	341.9	341.9	410.3	367	367	367	361.4	361.4	361.4	809.4	809.4	809.4	

Color Coding for Table

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- Fails to meet requirements, by less than 10%
- Fails to meet requirements by more than 10%
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T: Total Stems

APPENDIX 4. Morphological Summary Data and Plots

Table 10a. Baseline Stream Data Summary
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Scaly Bark Creek Reaches 1 and 2
 Monitoring Year 5

Parameter	Gauge	Regional Curve						Pre-Restoration Condition				Reference Reach Data						Design				As-Built/Baseline								
		Reach 1			Reach 2			Reach 1		Reach 2		UT to Rocky Creek		Spencer Creek 1		Spencer Creek 2		Reach 1		Reach 2		Reach 1			Reach 2					
		LL	UL	Eq.	LL	UL	Eq.	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Med	Max	Min	Med	Max			
Dimension and Substrate - Riffle																														
Bankfull Width (ft)	n/a							27.6	17.0	23.9		12.2		8.7	10.7	11.2		17.0	20.0		0.0	17.1	17.4	21.2	21.3	21.4				
Floodprone Width (ft)								87.0	111.0	112.0		72.0		229.0	60.0	114+		37+	44+		0	0	0	200+	200+	200+				
Bankfull Mean Depth								1.0	1.6	2.0		1.3		1.2	1.6	1.8		1.6	1.8		1.4	1.4	1.4	1.6	1.7	1.7				
Bankfull Max Depth								2.6	2.8	3.0		1.8		1.9	2.1	2.6		2.3	2.5		0.0	2.2	2.3	2.3	2.4	2.6				
Bankfull Cross-sectional Area (ft ²)								26.3	33.2	39.0		16.3		10.6	17.8	19.7		27.1	36.3		24.6	25.2	25.8	34.3	35.6	36.8				
Width/Depth Ratio								29.0	10.6	12.0		9.1		7.3	5.8	7.1		10.7	11.0		13.0	13.0	13.0	12.2	12.8	13.3				
Entrenchment Ratio								3.1	4.7	6.5		6.0		26.3	5.5	10.2		2.2+	2.2+		0	0	0	0	0	0				
Bank Height Ratio								1.0	1.0	1.0		1.0		1.0	1.0	1.0		1.0	1.0		0.0	1.0	1.0	0.0	1.0	1.0				
D50 (mm)							57.8	56.9	53.7		22.6		8.6	8.8																
Profile																														
Riffle Length (ft)	n/a							7 (min) - 22 (max)				N/P		N/P		N/P		20	52	10	63	17	35	55	30	49	69			
Riffle Slope (ft/ft)								0.0180	0.0260	0.0033	0.0490	0.0606	0.0892	0.0100	0.0670	0.0130		0.0087	0.0204	0.0069	0.0203	0.0050	0.0136	0.0283	0.0023	0.0075	0.0188			
Pool Length (ft)								31 (min) - 184 (max)				N/P		N/P		N/P		30	84	42	81	37	62	98	45	67	96			
Pool Max Depth (ft)								2.26	2.85	2.22	3.31	2.2		2.5		3.3		3.5	4.5	4.0	5.5	3.4	4.3	6.1	3.6	4.6	5.5			
Pool Spacing (ft)*								31	62	45	117	26	81	13	47	71		38	114	45	132	71	104	165	92	119	147			
Pool Volume (ft ³)											-		-		-		-		-											
Pattern																														
Channel Beltwidth (ft)	n/a							52				54		69		24		52	38	41	60	120	80	140	60	-	120	80	-	140
Radius of Curvature (ft)								43	93	15	146	n/a		5	22	11	15	35	50	40	60	35	-	50	40	-	60			
Rc:Bankfull Width (ft/ft)								1.6	3.4	0.9	6.1	n/a		0.6	2.5	1.3	1.4	2.1	2.9	2.0	3.0	2.1	-	2.9	2.0	-	3.0			
Meander Wave Length (ft)								81	163	60	190	n/a		54	196	46	48	125	160	160	200	125	-	160	160	-	200			
Meander Width Ratio								1.9	2.9	3.2		n/a		2.8	6	3.4	3.6	3.5	7.1	4.0	7.0	3.5	-	7.1	4.0	-	7.0			
Substrate, Bed and Transport Parameters																														
Ri%/Ru%/P%/G%/S%	n/a																													
SC%/Sa%/G%/C%/B%/Be%																														
d16/d35/d50/d84/d95/d100								0.9/13.7/35.9/101.2/172.5/>2048				<0.063/2.4/22.6/120/256		0.1/3/8.6/77/180		<0.062/3/8.8/42/90		SC/SC/5.78/71.7/137/362				SC/7.6/21.5/83.2/151.8/362								
Reach Shear Stress (Competency) lb/ft ²								0.47		0.50-0.55								0.56		0.59		0.50	-	0.51	0.43	-	0.45			
Max part size (mm) mobilized at bankfull								30-40		30-40								30	40	40	50	27	-	28	23	-	25			
Stream Power (Capacity) W/m ²																														
Additional Reach Parameters																														
Drainage Area (SM)	n/a							1.09	1.65	2.38	2.53	1.10		0.50		0.96														
Impervious Cover Estimate (%)								27%				N/P		N/P		N/P														
Rosgen Classification								C4		C4		E4b		E3/C4		E4		C4		C4		C4			C4					
Bankfull Velocity (fps)		-	-	-	-	-	-	3.8		3.8		4.5						3.7		4.1		3.7			4.1					
Bankfull Discharge (cfs)		95	128	-	167	174	-					85		-		97		100		150										
Q-NFF regression								192		259																				
Q-USGS extrapolation								87	162	123	221																			
Q-Mannings								80		85		96																		
Valley Length (ft)								1480		2003		N/P		N/P		N/P		1480		2003										
Channel Thalweg Length (ft)								3600				N/P		N/P		N/P		4060				4058								
Sinuosity (ft)								1.1		1.0		N/P		N/P		N/P		1.2		1.2		2.7			0.0					
Water Surface Slope (ft/ft)								0.0087		0.0025		0.0051		N/P		N/P		N/P		0.0067		0.0053		0.0067			0.0049			
Bankfull Slope (ft/ft)								0.00568 (min) - 0.00944 (max)				N/P		N/P		N/P		0.0064		0.0056		0.0067			0.0050					

N/P: Data was not provided

*Design P:P spacing reported in the Restoration Plan included in-line pools, which are considered a habitat quality rather than a stability parameter, for evaluating for a channels profile stability. Subsequent monitoring years will evaluate pool Dmax for spacing

Table 10b. Baseline Stream Data Summary
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
UT1 Reach 2 and UT2
Monitoring Year 5

Parameter	Gauge	Regional Curve						Pre-Restoration Condition				Reference Reach Data						Design				As-Built/Baseline					
		UT1 Reach 2			UT2			UT1 Reach 2		UT2		UT to Rocky Creek		Spencer Creek 1		Spencer Creek 2		UT1 Reach 2		UT2		UT1 Reach 2			UT2		
		LL	UL	Eq.	LL	UL	Eq.	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Med	Max	Min	Med	Max
Dimension and Substrate - Riffle																											
Bankfull Width (ft)	n/a							10.6		13.3		12.2		8.7		10.7	11.2	11.0	12.0			12.1		13.0			
Floodprone Width (ft)								78.0		94.0		72.0		229.0		60.0	114+	24+	26+			200+		200+			
Bankfull Mean Depth								1.1		1.0		1.3		1.2		1.6	1.8	1.1	1.1			1.0		0.9			
Bankfull Max Depth								1.6		1.8		1.8		1.9		2.1	2.6	1.5	1.5			1.7		1.5			
Bankfull Cross-sectional Area (ft ²)	n/a							12.0		13.0		16.3		10.6		17.8	19.7	12.0	13.5			12.4		11.4			
Width/Depth Ratio								9.4		13.6		9.1		7.3		5.8	7.1	10.1	10.7			11.9		14.8			
Entrenchment Ratio								7.3		7.1		6.0		26.3		5.5	10.2	2.2+	2.2+			2.2+		2.2+			
Bank Height Ratio								1.3		1.2		1.0		1.0		1.0		1.0	1.0			1.0		1.0			
D50 (mm)								27.3		55.6		22.6		8.6		8.8											
Profile																											
Riffle Length (ft)	n/a							5	32	6	23	N/P		N/P		N/P		29	42	23	37	11	30	41	21	29	41
Riffle Slope (ft/ft)								0.0050	0.0250	0.0137	0.0740	0.0606	0.0892	0.0100	0.0670	0.0130		0.0153	0.0245	0.0162	0.0281	0.0150	0.0187	0.0233	0.0215	0.0230	0.0272
Pool Length (ft)								37	61	26	40	N/P		N/P		N/P		14	39	20	44	21	30	43	27	31	37
Pool Max Depth (ft)								1.36	1.87	1.71	2.07	2.20		2.50		3.30		2.3	3.5	2.2	3.5	2.5	3.3	4.0	2.9	3.1	3.5
Pool Spacing (ft)*								75	88	48	90	26	81	13	47	71		17	55	18	60	55	59	77	55	59	70
Pool Volume (ft ³)																											
Pattern																											
Channel Beltwidth (ft)	n/a							20		28		n/a		24	52	38	41	50	80	50	80	50	-	80	50	-	80
Radius of Curvature (ft)								22	83	23	89			5	22	11	15	25	33	25	34	25	-	33	25	-	34
Rc:Bankfull Width (ft/ft)								2.1	7.8	1.7	6.7			0.6	2.5	1.3	1.4	2.3	3.0	2.1	2.8	2.3	-	3.0	2.1	-	2.8
Meander Wave Length (ft)								45	93	39	113			54	196	46	48	80	100	90	120	80	-	100	90	-	120
Meander Width Ratio								1.9		2.1				2.8	6.0	3.4	3.6	4.5	7.3	4.2	6.7	4.5	-	7.3	4.2	-	6.7
Substrate, Bed and Transport Parameters																											
Ri%/Ru%/P%/G%/S%	n/a																										
SC%/Sa%/G%/C%/B%/Be%																											
d16/d35/d50/d84/d95/d100								SC/0.9/27.3/94.6/158.4/>2048		16.0/30/55.6/128/164.4/>2048		<0.063/2.4/22.6/120/256		0.1/3/8.6/77/180		<0.062/3/8.8/42/90					0.025/16/37.24/104.7/157.1/362			SC/8.8/16.9/75.9/152/512			
Reach Shear Stress (Competency) lb/ft ²								0.7		0.52								0.61	0.67			0.55		0.68			
Max part size (mm) mobilized at bankfull								50-60		30-40								40	50	50	60			31		39	
Stream Power (Capacity) W/m ²																											
Additional Reach Parameters																											
Drainage Area (SM)	n/a							0.47		0.68		1.10		0.50		0.96											
Impervious Cover Estimate (%)								33%		4%		N/P		N/P		N/P											
Rosgen Classification								E4		C4		E4b		E3/C4		E4		C4	C4			C4		C4			
Bankfull Velocity (fps)								4.2		3.8								4.2	3.7			4.2		3.7			
Bankfull Discharge (cfs)								52	67	50		85		-		97		50	50								
Q-NFF regression								79		103																	
Q-USGS extrapolation	n/a							42	85	31	65																
Q-Mannings								47		52																	
Valley Length (ft)								358		356		N/P		N/P		N/P		358	356								
Channel Thalweg Length (ft)								330		262		N/P		N/P		N/P		422	393			402		400			
Sinuosity (ft)								1.0		1.1		N/P		N/P		N/P		1.1	1.1			1.1		1.1			
Water Surface Slope (ft/ft)								0.0130		0.0189		N/P		N/P		N/P		0.0107	0.0113			0.0101		0.0121			
Bankfull Slope (ft/ft)								0.0119		0.0177		N/P		N/P		N/P		0.0097	0.0116			0.0094		0.0130			

N/P: Data was not provided

*Design P:P spacing reported in the Restoration Plan included in-line pools, which are considered a habitat quality rather than a stability parameter, for evaluating for a channels profile stability. Subsequent monitoring years will evaluate pool Dmax for spacing.

Table 11. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters - Cross-Section)
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Scaly Bark Creek Reaches 1 and 2, UT1 Reach 2, and UT2
Monitoring Year 5

Dimension and Substrate	Scaly Bark Reach 1																							
	Cross-Section 1 (Pool)						Cross-Section 2 (Riffle)						Cross-Section 3 (Riffle)						Cross-Section 4 (Pool)					
	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
<i>based on fixed bankfull elevation</i>																								
Bankfull Width (ft)	21.1	19.6	19.4	20.3	19.5	20.9	17.9	17.7	24.7	18.6	17.7	18.3	18.3	18.3	19.1	19.1	17.1	17.6	24.1	25.8	23.5	27.5	25.2	22.3
Floodprone Width (ft)	n/a	n/a	n/a	n/a	n/a	n/a	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	n/a	n/a	n/a	n/a	n/a	n/a
Bankfull Mean Depth (ft)	1.8	1.8	1.7	1.7	1.7	1.8	1.4	1.3	1.1	1.3	1.5	1.4	1.4	1.4	1.3	1.3	1.40	1.3	1.9	1.7	1.9	1.6	1.6	1.8
Bankfull Max Depth (ft)	3.5	3.4	2.8	3.0	3.1	3.1	2.2	2.0	2.3	2.5	2.4	2.3	2.2	2.3	2.2	2.4	2.2	2.2	3.7	3.4	3.4	3.5	3.6	3.6
Bankfull Cross-Sectional Area (ft ²)	38.6	35.0	32.8	34.1	33.8	37.3	24.6	23.1	26.8	23.2	25.6	25.9	25.8	24.2	25.0	24.0	23.1	22.8	45.2	43.6	43.9	44.4	40.3	40.5
Bankfull Width/Depth Ratio	11.6	11.0	11.5	12.1	11.2	11.7	13.0	13.6	22.7	14.9	12.2	12.9	13.0	13.3	14.6	15.3	12.6	13.7	12.9	15.3	12.6	17.1	15.7	12.3
Bankfull Entrenchment Ratio	n/a	n/a	n/a	n/a	n/a	n/a	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	n/a	n/a	n/a	n/a	n/a	n/a
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
d50 (mm)							27	42	22	76	47	101	30	30	45	48	34	58						
Dimension and Substrate	Scaly Bark Reach 2																							
	Cross-Section 5 (Pool)						Cross-Section 6 (Riffle)						Cross-Section 7 (Pool)						Cross-Section 8 (Riffle)					
	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
<i>based on fixed bankfull elevation</i>																								
Bankfull Width (ft)	26.6	27.4	30.7	27.3	30.5	26.5	21.4	26.7	23.6	23.0	20.8	22.7	24.7	24.5	25.0	23.8	23.8	25.0	21.2	21.4	22.5	21.1	20.2	21.7
Floodprone Width (ft)	n/a	n/a	n/a	n/a	n/a	n/a	200+	200+	200+	200+	200+	200+	n/a	n/a	n/a	n/a	n/a	n/a	200+	200+	200+	200+	200+	200+
Bankfull Mean Depth (ft)	2.0	2.0	1.8	2.0	1.9	2.1	1.6	1.3	1.5	1.5	1.6	1.5	2.0	1.9	1.8	1.9	1.9	2.0	1.7	1.7	1.6	1.7	1.6	1.7
Bankfull Max Depth (ft)	4.6	4.4	4.5	4.5	4.6	4.4	2.3	2.3	2.4	2.3	2.3	2.3	3.9	3.7	3.6	3.9	3.8	4.1	2.6	2.6	2.7	2.7	2.6	2.7
Bankfull Cross-Sectional Area (ft ²)	52.2	53.9	55.3	54.1	54.9	56.4	34.3	33.8	35.5	33.4	32.1	33.5	48.3	46.3	45.1	45.2	45.3	48.7	36.8	35.3	35.8	36.7	32.9	36.3
Bankfull Width/Depth Ratio	13.6	13.9	17.0	13.8	15.7	12.4	13.3	21.0	15.7	15.8	13.4	15.4	12.7	13.0	13.9	12.5	12.50	12.9	12.2	13.0	14.1	12.1	12.4	13.0
Bankfull Entrenchment Ratio	n/a	n/a	n/a	n/a	n/a	n/a	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	n/a	n/a	n/a	n/a	n/a	n/a	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
d50 (mm)							45	57	38	35	24	69							23	49	33	58	45	134
Dimension and Substrate	UT1 Reach 2												UT2											
	Cross-Section 9 (Pool)						Cross-Section 10 (Riffle)						Cross-Section 11 (Pool)						Cross-Section 12 (Riffle)					
	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5	Base	MY1	MY2	MY3	MY4	MY5
<i>based on fixed bankfull elevation</i>																								
Bankfull Width (ft)	18.2	26.6	17.6	16.9	16.9	17.3	12.1	11.9	12.2	10.2	13.5	11.7	15.4	14.8	17.0	15.2	15.4	13.8	13.0	13.0	13.0	12.0	13.5	12.5
Floodprone Width (ft)	n/a	n/a	n/a	n/a	n/a	n/a	200+	200+	200+	200+	200+	200+	n/a	n/a	n/a	n/a	n/a	n/a	200+	200+	200+	200+	200+	200+
Bankfull Mean Depth (ft)	1.5	1.2	1.3	1.3	1.4	1.1	1.0	1.0	1.0	0.9	0.8	0.9	1.5	1.4	1.4	1.4	1.5	1.4	0.9	0.9	1.0	1.0	0.9	1.0
Bankfull Max Depth (ft)	3.3	3.0	2.7	3.0	2.9	2.1	1.7	1.6	1.7	1.6	1.7	1.6	2.9	2.6	2.9	3.0	3.0	2.7	1.5	1.5	1.7	1.6	1.7	1.7
Bankfull Cross-Sectional Area (ft ²)	28.0	26.6	23.5	22.1	23.1	19.4	12.4	11.4	11.8	10.2	11.3	10.4	23.3	20.8	23.8	21.9	22.9	19.1	11.4	11.7	12.9	11.4	12.1	11.9
Bankfull Width/Depth Ratio	11.9	17.6	13.2	12.9	12.4	15.3	11.9	12.3	12.6	13.6	16.1	13.1	10.2	10.6	12.1	10.6	10.4	10.0	14.8	14.5	13.1	12.5	15.1	13.1
Bankfull Entrenchment Ratio	n/a	n/a	n/a	n/a	n/a	n/a	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	n/a	n/a	n/a	n/a	n/a	n/a	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
d50 (mm)							48	39	12	56	68	84							35	15	41	27	27	101

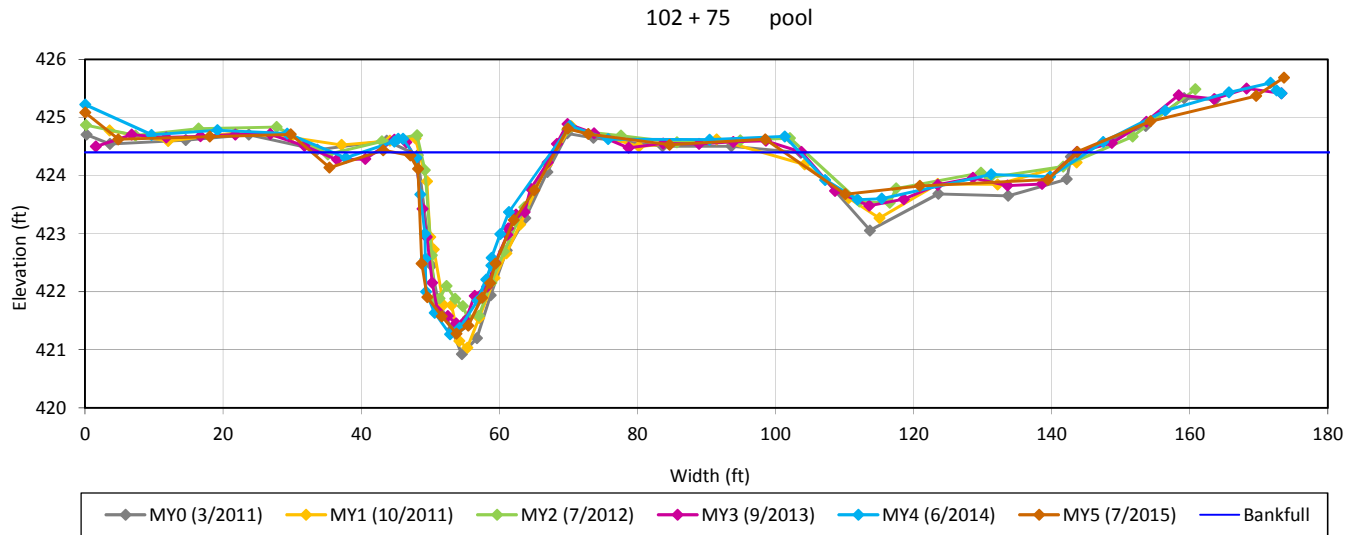
Table 12a. Monitoring Data - Stream Reach Data Summary
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Scaly Bark Creek Reach 1
Monitoring Year 5

Parameter	As-Built/Baseline			MY-1			MY-2			MY-3			MY-4			MY-5		
	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	17.9	18.1	18.3	17.7	18.0	18.3	19.1	21.9	24.7	18.6	18.9	19.1	17.1	17.4	17.7	17.6	18.0	18.3
Floodprone Width (ft)	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+
Bankfull Mean Depth	1.4	1.4	1.4	1.3	1.3	1.4	1.1	1.2	1.3	1.3	1.3	1.3	1.4	1.4	1.5	1.3	1.4	1.4
Bankfull Max Depth	2.2	2.2	2.2	2.0	2.2	2.3	2.2	2.2	2.3	2.4	2.5	2.5	2.2	2.3	2.4	2.2	2.3	2.3
Bankfull Cross-sectional Area (ft ²)	24.6	25.2	25.8	23.1	23.6	24.2	25.0	25.9	26.8	23.2	23.6	24.0	23.1	24.4	25.6	22.8	24.3	25.9
Width/Depth Ratio	13.0	13.0	13.0	13.3	13.4	13.6	14.6	18.6	22.7	14.9	15.1	15.3	12.2	12.4	12.6	12.9	13.3	13.7
Entrenchment Ratio	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
D50 (mm)																		
Profile																		
Riffle Length (ft)	17	35	55	22	34	52	16	30	67	25	36	54	27	38	57	26	34	61
Riffle Slope (ft/ft)	0.0050	0.0136	0.0283	0.0052	0.0149	0.0332	0.0055	0.0133	0.0372	0.0087	0.0190	0.0323	0.0029	0.0173	0.0322	0.0026	0.0162	0.0250
Pool Length (ft)	37	62	98	39	63	89	32	56	82	38	65	99	38	65	95	41	66	90
Pool Max Depth (ft)	3.4	4.3	6.1	3.4	3.9	6.8	3.2	4.1	6.6	3.6	4.4	6.6	3.0	3.9	5.7	3.2	4.0	5.3
Pool Spacing (ft)	71	104	165	67	103	160	72	100	165	71	106	170	67	98	159	66	98	142
Pool Volume (ft ³)																		
Pattern																		
Channel Beltwidth (ft)	60	-	120															
Radius of Curvature (ft)	35	-	50															
Rc:Bankfull Width (ft/ft)	2.1	-	2.9															
Meander Wave Length (ft)	125	-	160															
Meander Width Ratio	3.5	-	7.1															
Additional Reach Parameters																		
Rosgen Classification	C4			C4			C4			C4			C4			C4		
Channel Thalweg Length (ft)	1886			1886			1886			1886			1886			1886		
Sinuosity (ft)	1.3			1.3			1.3			1.3			1.3			1.3		
Water Surface Slope (ft/ft)	0.0067			0.0069			n/a ¹			0.0072			0.0066			n/a ¹		
Bankfull Slope (ft/ft)	0.0067			0.0069			0.0071			0.0070			0.0066			0.0068		
Ri%/Ru%/P%/G%/S%																		
SC%/Sa%/G%/C%/B%/Be%																		
d16/d35/d50/d84/d95/d100	SC/SC/6/72/137/362			SC/SC/22/101/165/512			SC/SC/23/97/170/256			6/12/23/114/164/362			5/16/25/105/161/512			5/16/25/105/161/512		
% of Reach with Eroding Banks	0%			0%			0%			0%			2%			0%		

¹ Water surface slope wasn't calculated because there was little to no baseflow during Year 2 and Year 5 Monitoring.

Cross-Section Plots
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Monitoring Year 5

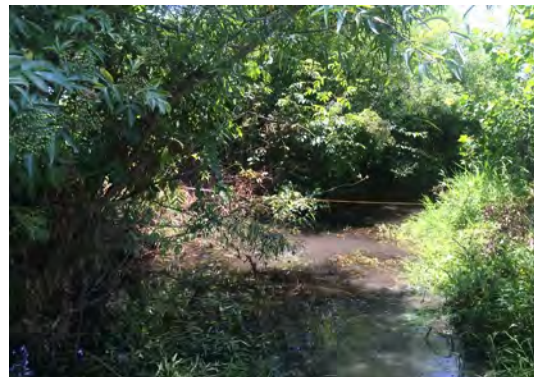
Cross Section 1-Scaly Bark Reach 1



Bankfull Dimensions

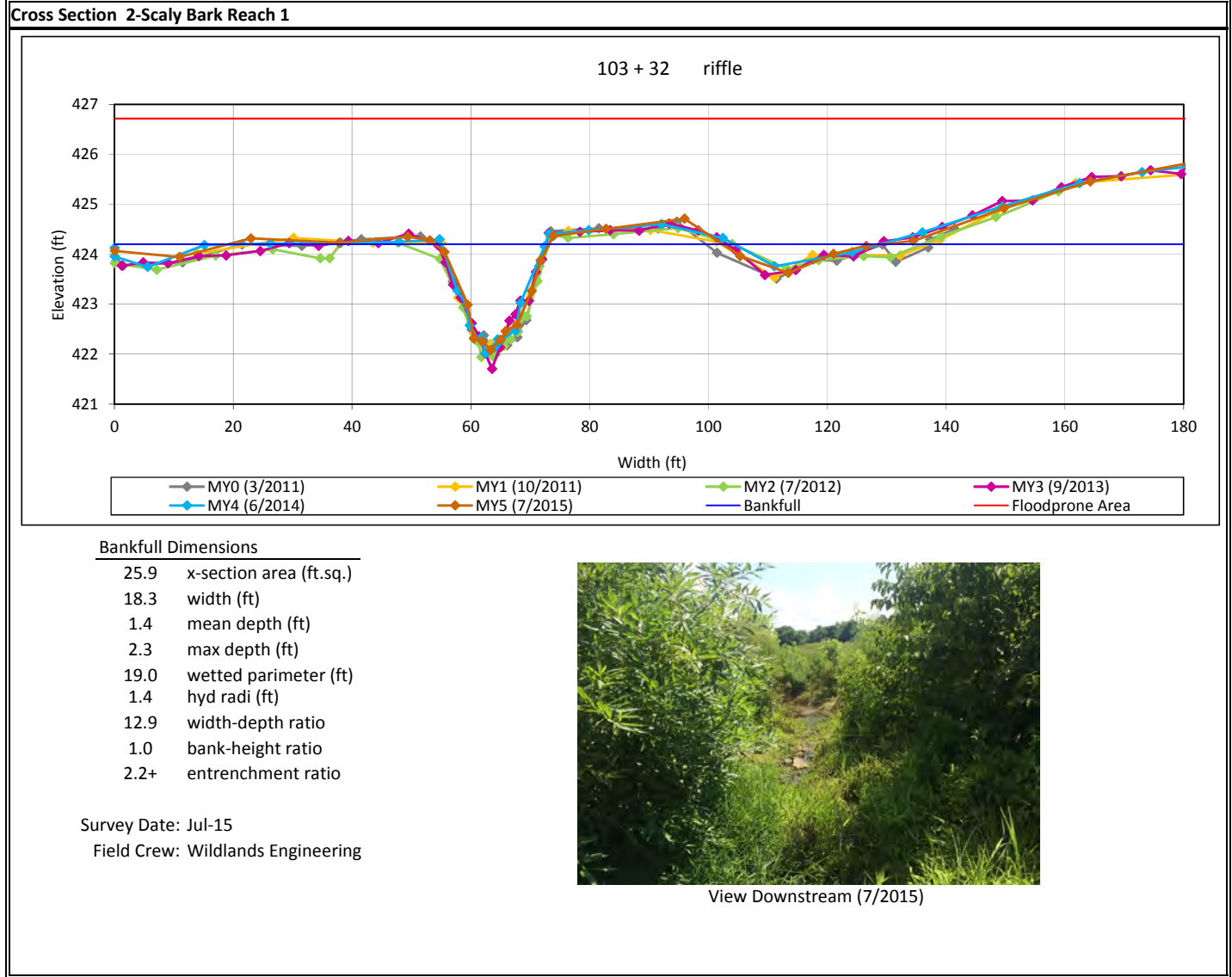
37.3	x-section area (ft.sq.)
20.9	width (ft)
1.8	mean depth (ft)
3.1	max depth (ft)
22.7	wetted perimeter (ft)
1.6	hyd radi (ft)
11.7	width-depth ratio

Survey Date: Jul-15
 Field Crew: Wildlands Engineering



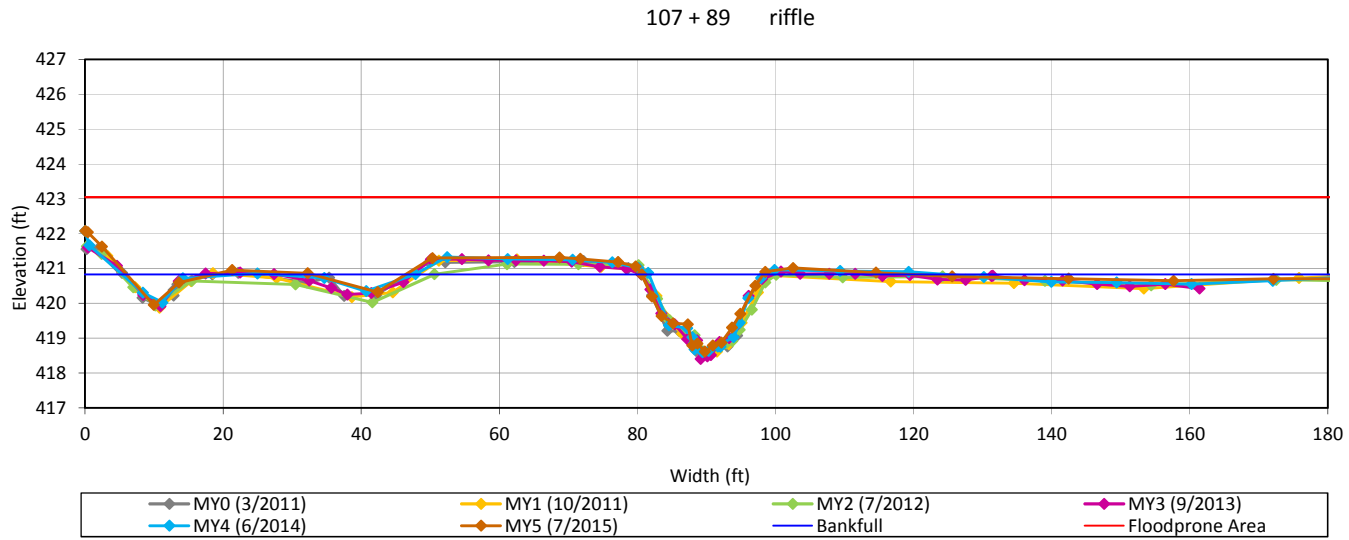
View Downstream (07/2015)

Cross-Section Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5



Cross-Section Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5

Cross Section 3-Scaly Bark Reach 1



Bankfull Dimensions

22.8	x-section area (ft.sq.)
17.6	width (ft)
1.3	mean depth (ft)
2.2	max depth (ft)
18.5	wetted perimeter (ft)
1.2	hyd radi (ft)
13.7	width-depth ratio
1.0	bank-height ratio
2.2+	entrenchment ratio

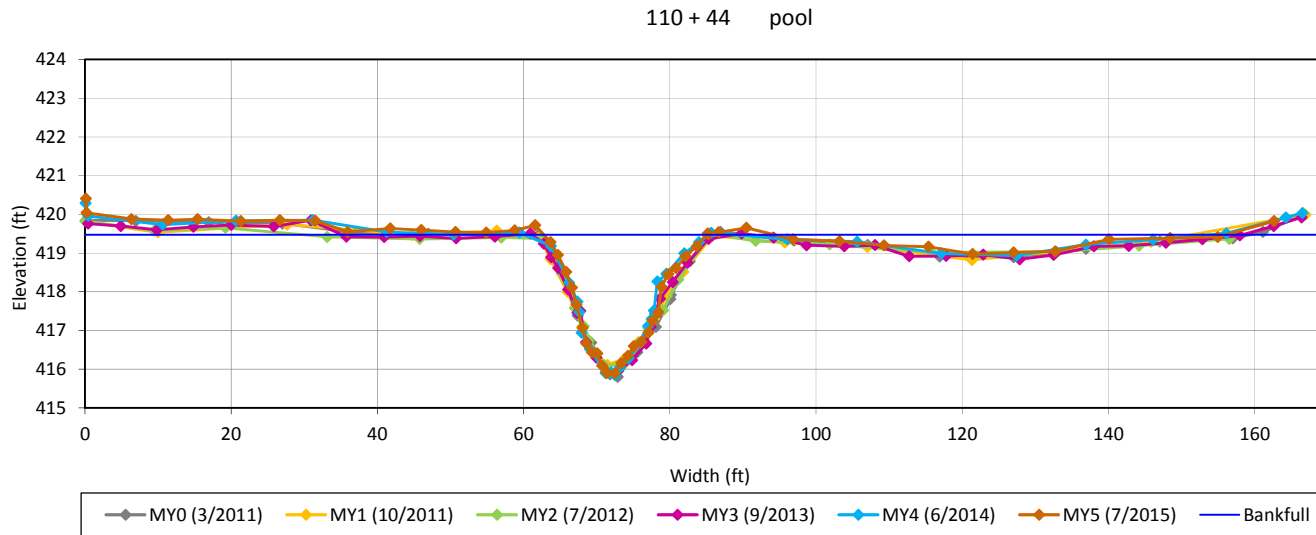
Survey Date: Jul-15
 Field Crew: Wildlands Engineering



View Downstream (7/2015)

Cross-Section Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5

Cross Section 4-Scaly Bark Reach 1



Bankfull Dimensions

40.5	x-section area (ft.sq.)
22.3	width (ft)
1.8	mean depth (ft)
3.6	max depth (ft)
23.9	wetted parimeter (ft)
1.7	hyd radi (ft)
12.3	width-depth ratio

Survey Date: Jul-15
 Field Crew: Wildlands Engineering

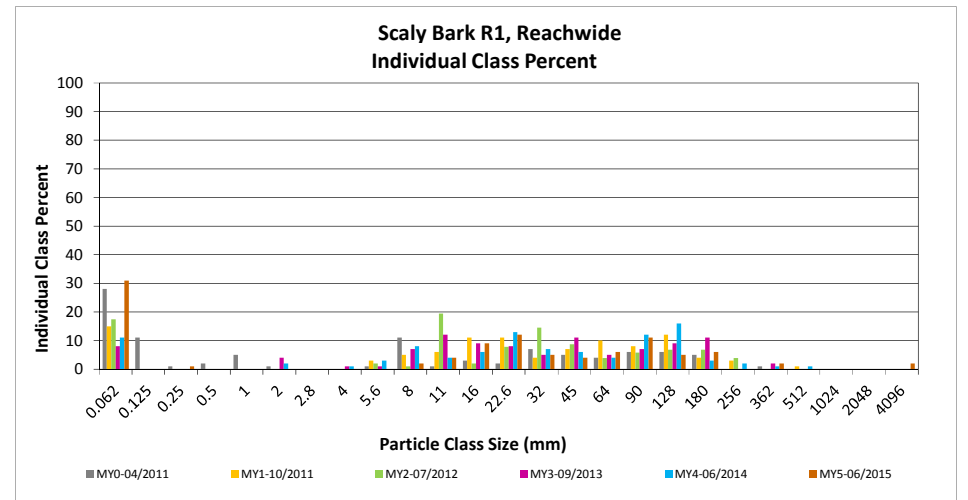
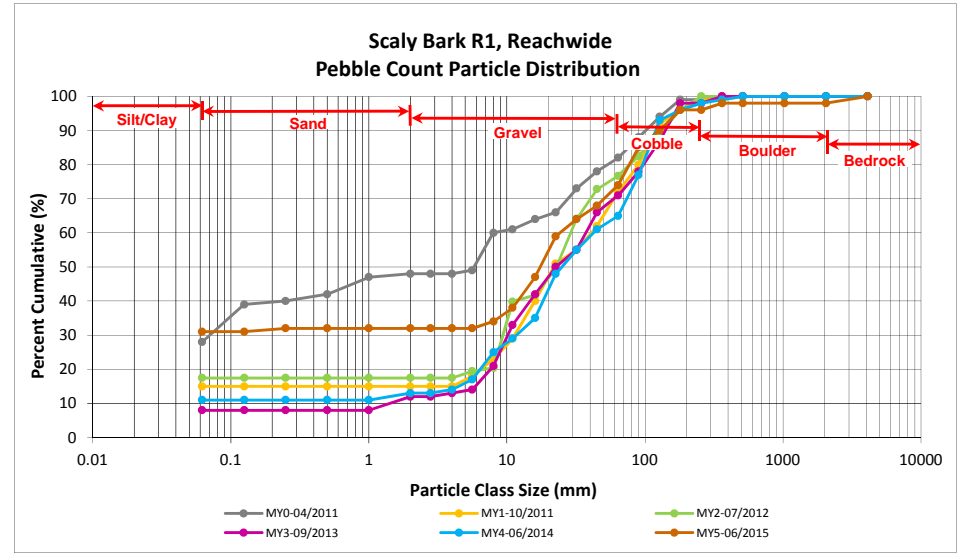


View Downstream (7/2015)

Reachwide and Cross Section Pebble Count Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5 - 2015
 Scaly Bark R1, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062		11	11	11	11
SAND	Very fine	0.062	0.125					11
	Fine	0.125	0.250					11
	Medium	0.25	0.50					11
	Coarse	0.5	1.0					11
	Very Coarse	1.0	2.0		2	2	2	13
GRAVEL	Very Fine	2.0	2.8					13
	Very Fine	2.8	4.0	1		1	1	14
	Fine	4.0	5.6	1	2	3	3	17
	Fine	5.6	8.0	3	5	8	8	25
	Medium	8.0	11.0		4	4	4	29
	Medium	11.0	16.0		6	6	6	35
	Coarse	16.0	22.6	3	10	13	13	48
	Coarse	22.6	32	3	4	7	7	55
	Very Coarse	32	45	3	3	6	6	61
Very Coarse	45	64	4	4	4	4	65	
COBBLE	Small	64	90	12		12	12	77
	Small	90	128	14	2	16	16	93
	Large	128	180	3		3	3	96
	Large	180	256	2		2	2	98
BOULDER	Small	256	362	1		1	1	99
	Small	362	512		1	1	1	100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				50	50	100	100	100

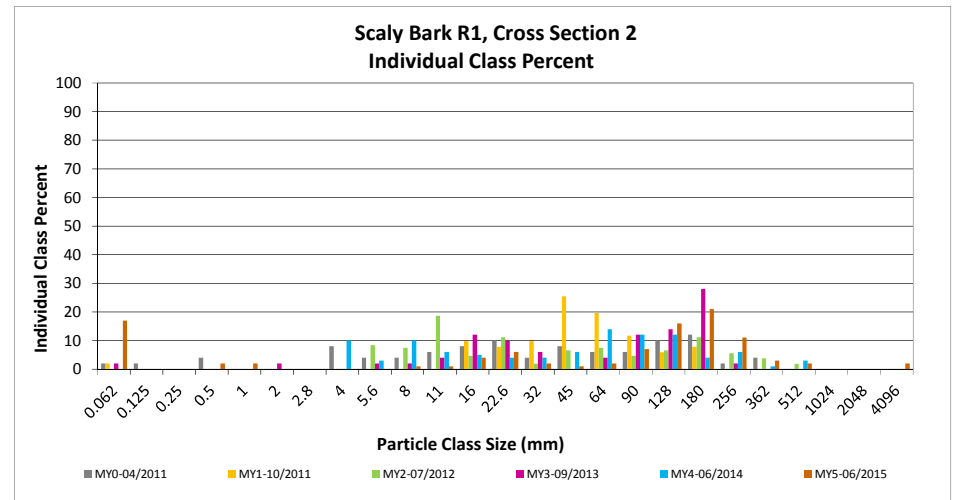
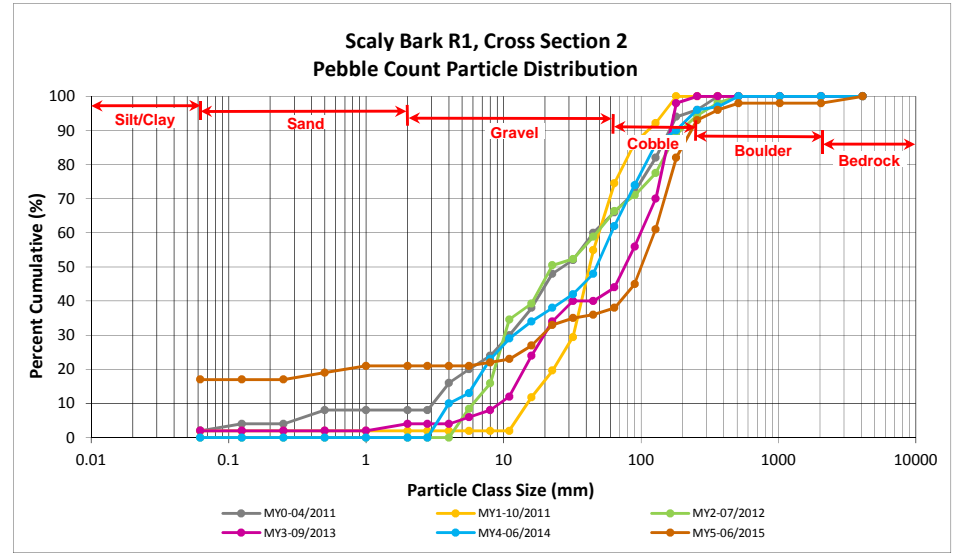
Reachwide Channel materials (mm)	
D ₁₆ =	5.01
D ₃₅ =	16.00
D ₅₀ =	25.0
D ₈₄ =	105.0
D ₉₅ =	160.7
D ₁₀₀ =	512.0



Reachwide and Cross Section Pebble Count Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5 - 2015
 Scaly Bark R1, Cross Section 2

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	17	17	17
SAND	Very fine	0.062	0.125			17
	Fine	0.125	0.250			17
	Medium	0.25	0.50	2	2	19
	Coarse	0.5	1.0	2	2	21
	Very Coarse	1.0	2.0			21
GRAVEL	Very Fine	2.0	2.8			21
	Very Fine	2.8	4.0			21
	Fine	4.0	5.6			21
	Fine	5.6	8.0	1	1	22
	Medium	8.0	11.0	1	1	23
	Medium	11.0	16.0	4	4	27
	Coarse	16.0	22.6	6	6	33
	Coarse	22.6	32	2	2	35
	Very Coarse	32	45	1	1	36
	Very Coarse	45	64	2	2	38
COBBLE	Small	64	90	7	7	45
	Small	90	128	16	16	61
	Large	128	180	21	21	82
	Large	180	256	11	11	93
BOULDER	Small	256	362	3	3	96
	Small	362	512	2	2	98
	Medium	512	1024			98
	Large/Very Large	1024	2048			98
BEDROCK	Bedrock	2048	>2048	2	2	100
Total				100	100	100

Cross Section 2	
Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	32.00
D ₅₀ =	100.5
D ₈₄ =	191.9
D ₉₅ =	322.5
D ₁₀₀ =	>2048



Reachwide and Cross Section Pebble Count Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5 - 2015
 Scaly Bark R1, Cross Section 3

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	7	7	7
SAND	Very fine	0.062	0.125			7
	Fine	0.125	0.250			7
	Medium	0.25	0.50			7
	Coarse	0.5	1.0			7
	Very Coarse	1.0	2.0			7
GRAVEL	Very Fine	2.0	2.8			7
	Very Fine	2.8	4.0	1	1	8
	Fine	4.0	5.6			8
	Fine	5.6	8.0	1	1	9
	Medium	8.0	11.0	4	4	13
	Medium	11.0	16.0	7	7	20
	Coarse	16.0	22.6	6	6	26
	Coarse	22.6	32	5	5	31
	Very Coarse	32	45	7	7	38
	Very Coarse	45	64	17	17	55
COBBLE	Small	64	90	19	19	74
	Small	90	128	16	16	90
	Large	128	180	6	6	96
	Large	180	256	2	2	98
BOULDER	Small	256	362			98
	Small	362	512			98
	Medium	512	1024			98
	Large/Very Large	1024	2048			98
BEDROCK	Bedrock	2048	>2048	2	2	100
Total				100	100	100

Cross Section 3	
Channel materials (mm)	
D ₁₆ =	12.92
D ₃₅ =	38.88
D ₅₀ =	57.7
D ₈₄ =	112.2
D ₉₅ =	170.1
D ₁₀₀ =	>2048

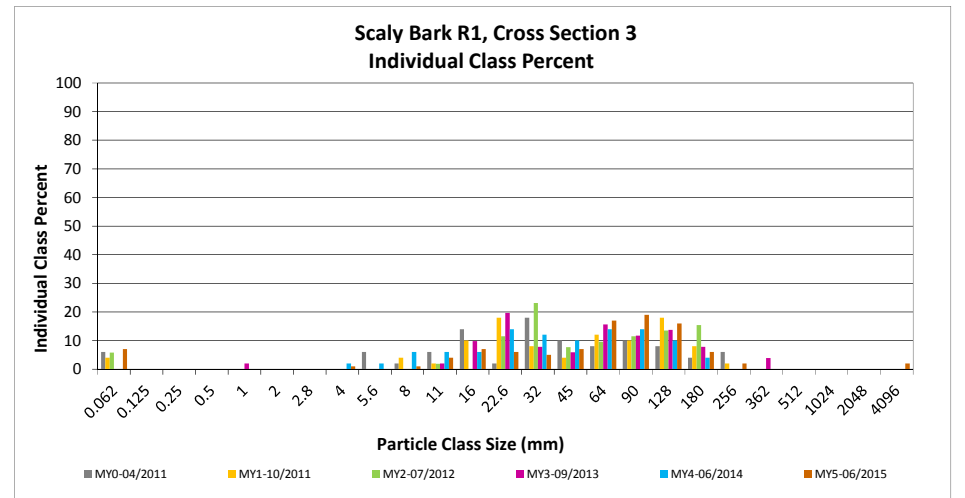
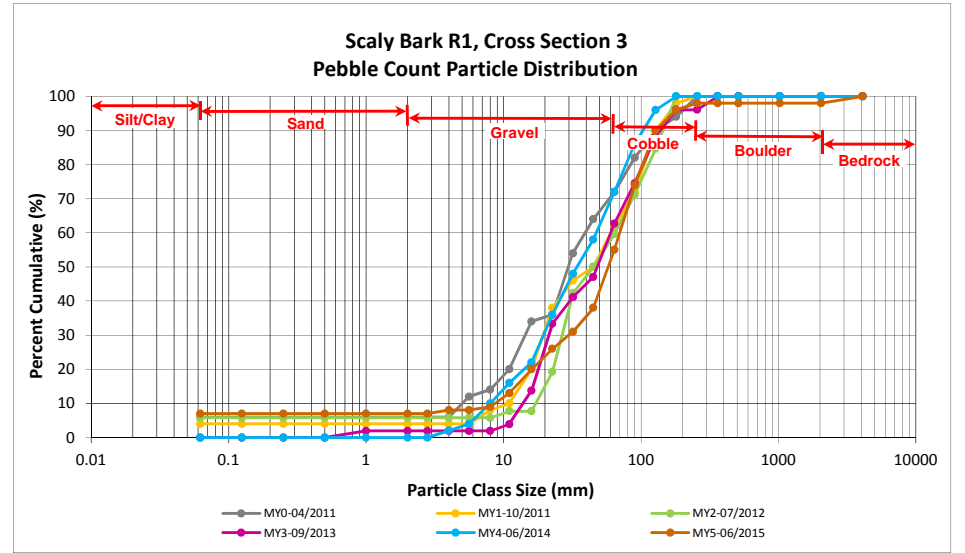
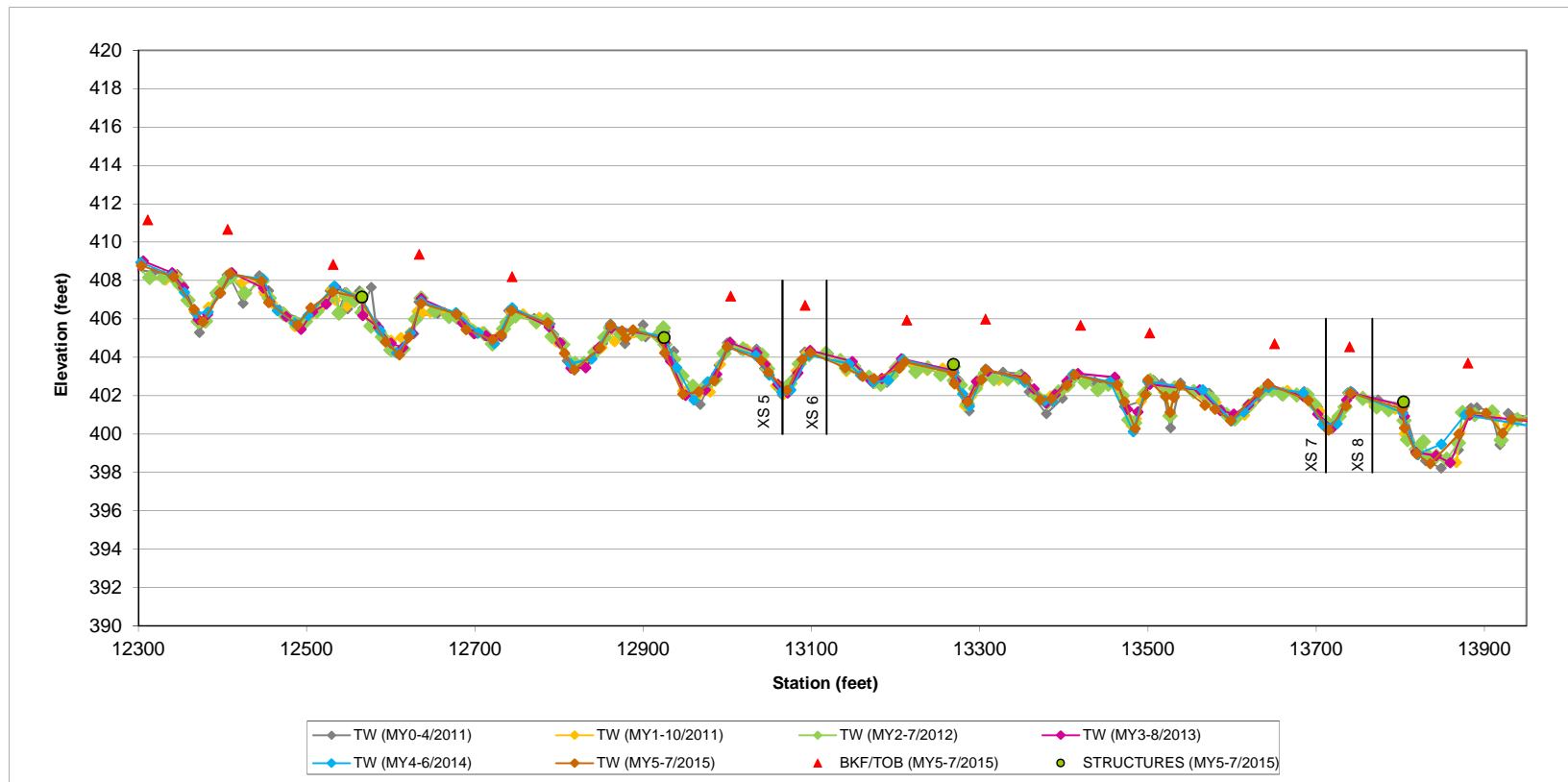


Table 12b. Monitoring Data - Stream Reach Data Summary
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Scaly Bark Creek Reach 2
Monitoring Year 5

Parameter	As-Built/Baseline			MY-1			MY-2			MY-3			MY-4			MY-5		
	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	21.2	21.3	21.4	21.4	24.0	26.7	22.5	23.1	23.6	21.1	22.1	23.0	20.2	20.5	20.8	21.7	22.2	22.7
Floodprone Width (ft)	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+	200+
Bankfull Mean Depth	1.6	1.7	1.7	1.3	1.5	1.7	1.5	1.5	1.6	1.5	1.6	1.7	1.6	1.6	1.6	1.5	1.6	1.7
Bankfull Max Depth	2.3	2.4	2.6	2.3	2.4	2.6	2.4	2.5	2.7	2.3	2.5	2.7	2.3	2.5	2.6	2.3	2.5	2.7
Bankfull Cross-sectional Area (ft ²)	34.3	35.6	36.8	33.8	34.5	35.3	35.5	35.6	35.8	33.4	35.1	36.7	32.1	32.5	32.9	33.5	34.9	36.3
Width/Depth Ratio	12.2	12.8	13.3	13.0	17.0	21.0	14.1	14.9	15.7	12.1	14.0	15.8	12.4	12.9	13.4	13.0	14.2	15.4
Entrenchment Ratio	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+	2.2+
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
D50 (mm)																		
Profile																		
Riffle Length (ft)	30	49	69	24	41	66	25	42	67	28	44	69	32	47	78	32	48	74
Riffle Slope (ft/ft)	0.0023	0.0075	0.0188	0.0041	0.0091	0.0168	0.0051	0.0107	0.0265	0.0043	0.0115	0.0214	0.0065	0.0121	0.0195	0.0050	0.0126	0.0190
Pool Length (ft)	45	67	96	43	65	82	24	51	72	41	69	86	38	67	84	40	71	84
Pool Max Depth (ft)	3.6	4.6	5.5	3.5	4.4	5.2	3.6	4.5	5.4	4.0	4.8	6.1	3.6	5.0	6.4	4.4	5.4	6.6
Pool Spacing (ft)	92	119	147	91	109	154	93	113	140	85	115	137	90	115	154	72	113	132
Pool Volume (ft ³)																		
Pattern																		
Channel Beltwidth (ft)	80	-	140															
Radius of Curvature (ft)	40	-	60															
Rc:Bankfull Width (ft/ft)	2.0	-	3.0															
Meander Wave Length (ft)	160	-	200															
Meander Width Ratio	4.0	-	7.0															
Additional Reach Parameters																		
Rosgen Classification	C4			C4			C4			C4			C4			C4		
Channel Thalweg Length (ft)	2220			2220			2220			2200			2200			2200		
Sinuosity (ft)	1.1			1.1			1.1			1.1			1.1			1.1		
Water Surface Slope (ft/ft)	0.0049			0.0046			n/a ¹			0.0050			0.0052			n/a ¹		
Bankfull Slope (ft/ft)	0.0050			0.0048			0.0049			0.0048			0.0055			0.0053		
Ri%/Ru%/P%/G%/S%																		
SC%/Sa%/G%/C%/B%/Be%																		
d16/d35/d50/d84/d95/d100	SC/8/22/83/152/362			SC/SC/21/101/165/512			SC/SC/28/108/200/512			18/41/58/215/431/1024			8/19/30/193/1024/2048			21/41/70/155/234/512		
% of Reach with Eroding Banks				0%			0%			0%			0%			0%		

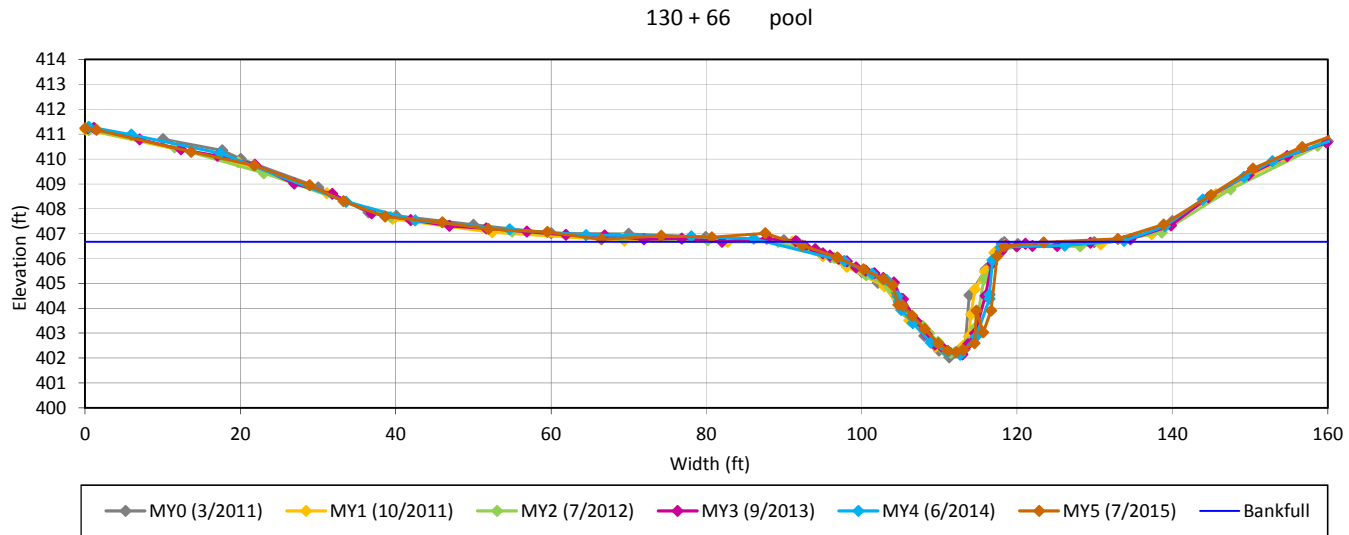
¹ Water surface slope wasn't calculated because there was little to no baseflow during Year 2 and Year 5 Monitoring.

Longitudinal Profile Plots
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Scaly Bark Reach 2
Monitoring Year 5



Cross-Section Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5

Cross Section 5-Scaly Bark Creek Reach 2



Bankfull Dimensions

56.4	x-section area (ft.sq.)
26.5	width (ft)
2.1	mean depth (ft)
4.4	max depth (ft)
30.6	wetted parimeter (ft)
1.8	hyd radi (ft)
12.4	width-depth ratio

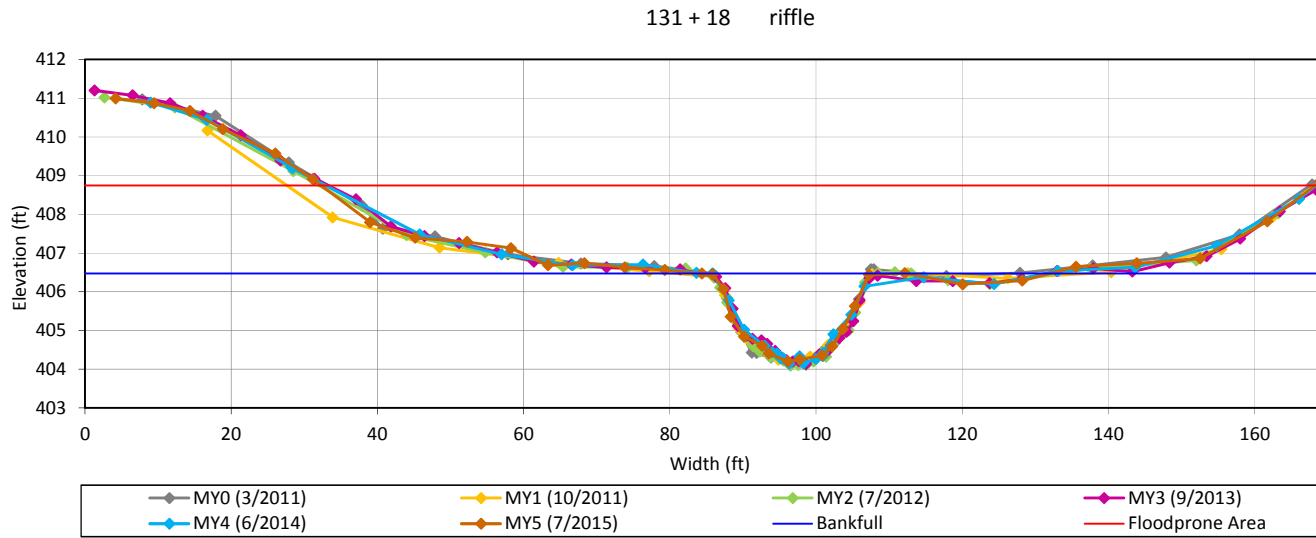
Survey Date: Jul-15
 Field Crew: Wildlands Engineering



View Downstream (7/2015)

Cross-Section Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5

Cross Section 6-Scaly Bark Creek Reach 2



Bankfull Dimensions

33.5	x-section area (ft.sq.)
22.7	width (ft)
1.5	mean depth (ft)
2.3	max depth (ft)
23.5	wetted perimeter (ft)
1.4	hyd radi (ft)
15.4	width-depth ratio
1.0	bank-height ratio
2.2+	entrenchment ratio

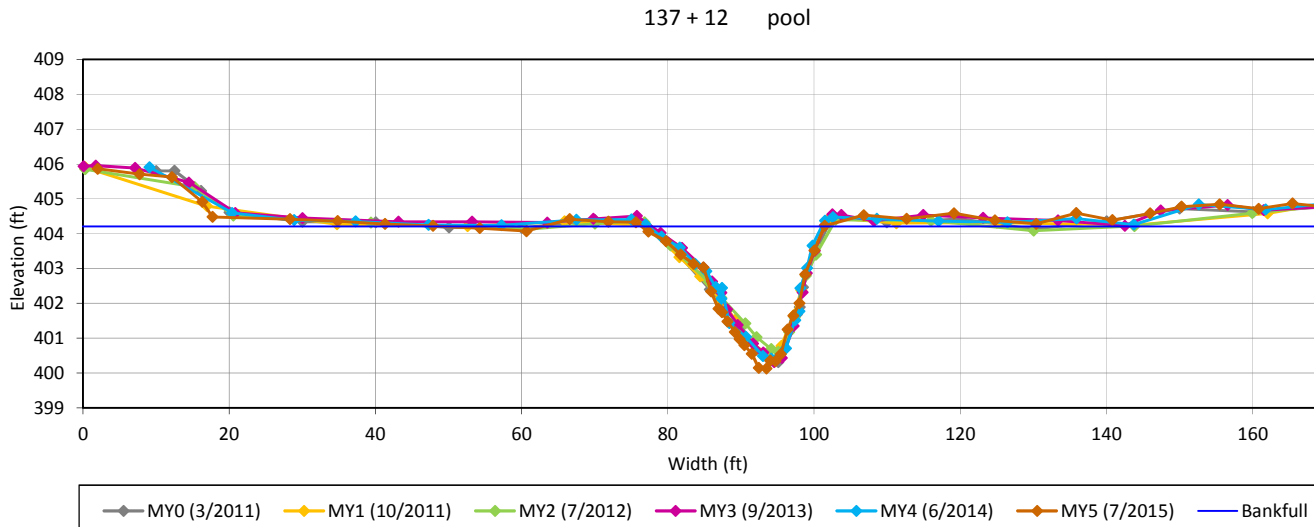
Survey Date: Jul-15
 Field Crew: Wildlands Engineering



View Downstream (7/2015)

Cross-Section Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5

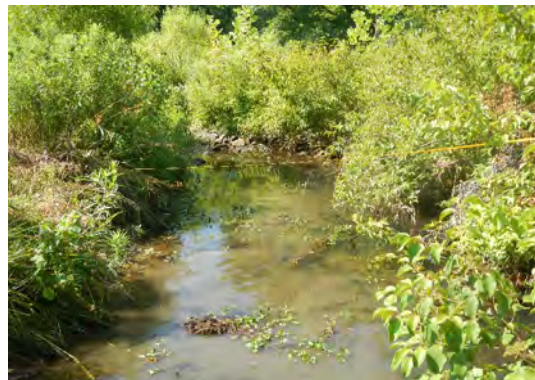
Cross Section 7-Scaly Bark Creek Reach 2



Bankfull Dimensions

48.7	x-section area (ft.sq.)
25.0	width (ft)
1.9	mean depth (ft)
4.1	max depth (ft)
26.9	wetted parimeter (ft)
1.8	hyd radi (ft)
12.9	width-depth ratio

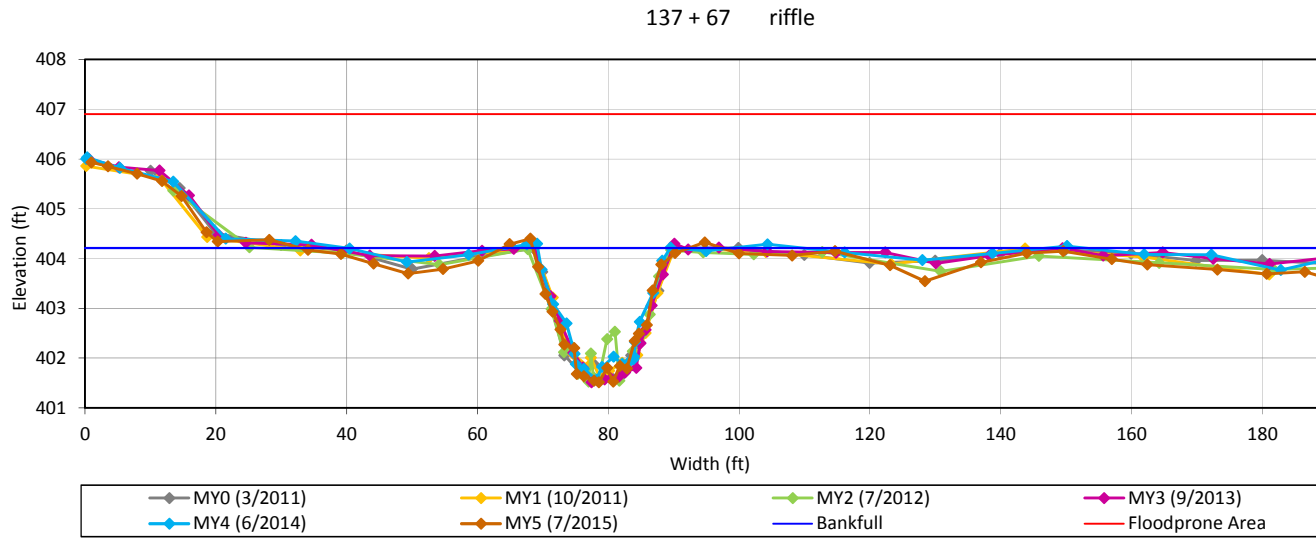
Survey Date: Jul-15
 Field Crew: Wildlands Engineering



View Downstream (7/2015)

Cross-Section Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5

Cross Section 8-Scaly Bark Creek Reach 2



Bankfull Dimensions

36.3	x-section area (ft.sq.)
21.7	width (ft)
1.7	mean depth (ft)
2.7	max depth (ft)
23.0	wetted perimeter (ft)
1.6	hyd radi (ft)
13.0	width-depth ratio
1.0	bank-height ratio
2.2+	entrenchment ratio

Survey Date: Jul-15

Field Crew: Wildlands Engineering

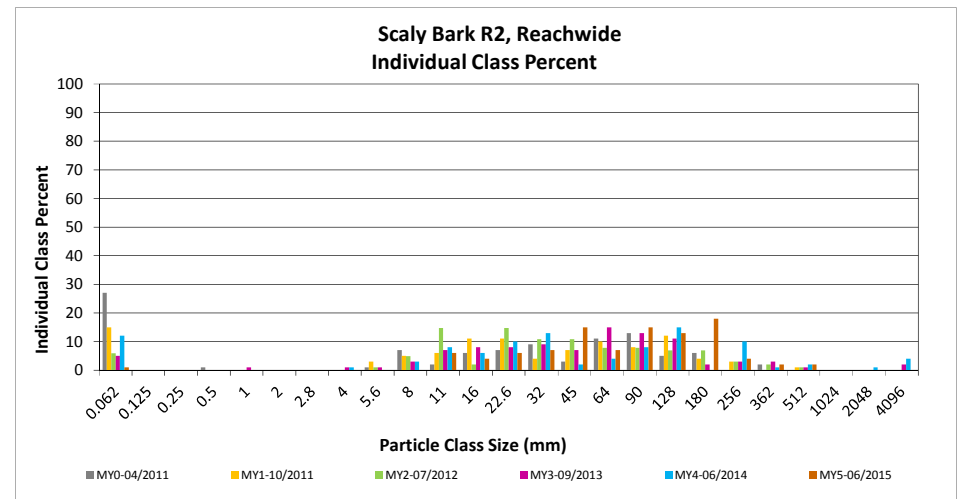
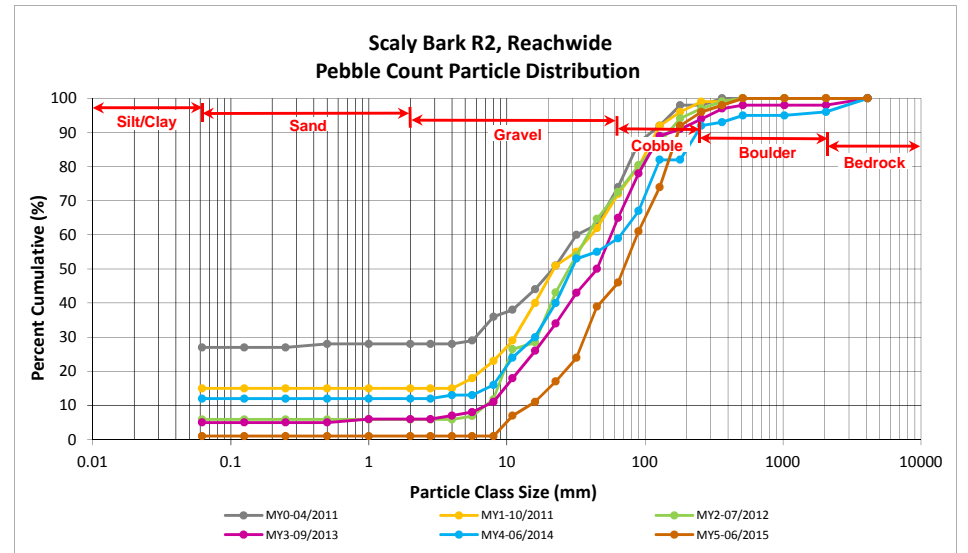


View Downstream (7/2015)

Reachwide and Cross Section Pebble Count Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5 - 2015
 Scaly Bark R2, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062		1	1	1	1
SAND	Very fine	0.062	0.125					1
	Fine	0.125	0.250					1
	Medium	0.25	0.50					1
	Coarse	0.5	1.0					1
	Very Coarse	1.0	2.0					1
GRAVEL	Very Fine	2.0	2.8					1
	Very Fine	2.8	4.0					1
	Fine	4.0	5.6					1
	Fine	5.6	8.0					1
	Medium	8.0	11.0	2	4	6	6	7
	Medium	11.0	16.0		4	4	4	11
	Coarse	16.0	22.6	4	2	6	6	17
	Coarse	22.6	32	1	6	7	7	24
	Very Coarse	32	45	8	7	15	15	39
Very Coarse	45	64	3	4	7	7	46	
COBBLE	Small	64	90	5	10	15	15	61
	Small	90	128	8	5	13	13	74
	Large	128	180	12	6	18	18	92
	Large	180	256	4	4	4	4	96
BOULDER	Small	256	362	1	1	2	2	98
	Small	362	512	2	2	2	2	100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				50	50	100	100	100

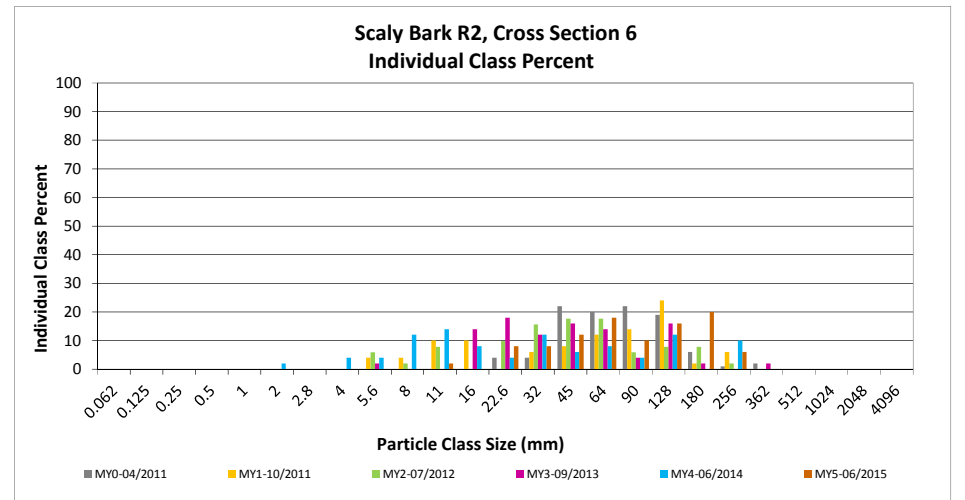
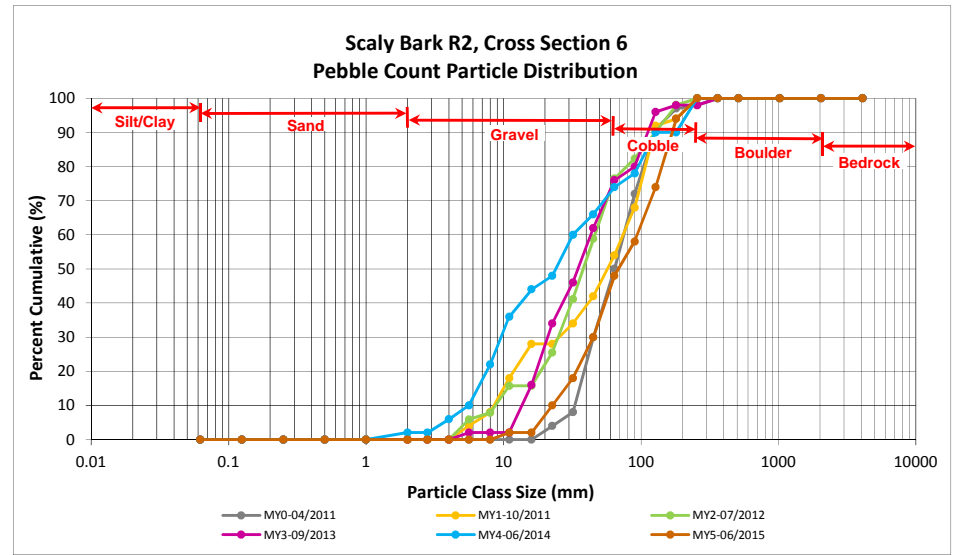
Reachwide Channel materials (mm)	
D ₁₆ =	21.34
D ₃₅ =	41.09
D ₅₀ =	70.1
D ₈₄ =	154.7
D ₉₅ =	234.4
D ₁₀₀ =	512.0



Reachwide and Cross Section Pebble Count Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5 - 2015
 Scaly Bark R2, Cross Section 6

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062			0
<i>SAND</i>	Very fine	0.062	0.125			0
	Fine	0.125	0.250			0
	Medium	0.25	0.50			0
	Coarse	0.5	1.0			0
	Very Coarse	1.0	2.0			0
<i>GRAVEL</i>	Very Fine	2.0	2.8			0
	Very Fine	2.8	4.0			0
	Fine	4.0	5.6			0
	Fine	5.6	8.0			0
	Medium	8.0	11.0	2	2	2
	Medium	11.0	16.0			2
	Coarse	16.0	22.6	8	8	10
	Coarse	22.6	32	8	8	18
	Very Coarse	32	45	12	12	30
	Very Coarse	45	64	18	18	48
<i>COBBLE</i>	Small	64	90	10	10	58
	Small	90	128	16	16	74
	Large	128	180	20	20	94
	Large	180	256	6	6	100
<i>BOULDER</i>	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
<i>BEDROCK</i>	Bedrock	2048	>2048			100
Total				100	100	100

Cross Section 6	
Channel materials (mm)	
D ₁₆ =	29.34
D ₃₅ =	49.63
D ₅₀ =	68.5
D ₈₄ =	151.8
D ₉₅ =	190.9
D ₁₀₀ =	256.0



Reachwide and Cross Section Pebble Count Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5 - 2015
 Scaly Bark R2, Cross Section 8

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250			0
	Medium	0.25	0.50			0
	Coarse	0.5	1.0			0
	Very Coarse	1.0	2.0			0
GRAVEL	Very Fine	2.0	2.8			0
	Very Fine	2.8	4.0			0
	Fine	4.0	5.6			0
	Fine	5.6	8.0			0
	Medium	8.0	11.0	2	2	2
	Medium	11.0	16.0	2	2	4
	Coarse	16.0	22.6	4	4	8
	Coarse	22.6	32	6	6	14
	Very Coarse	32	45	8	8	22
	Very Coarse	45	64	6	6	28
COBBLE	Small	64	90	10	10	38
	Small	90	128	10	10	48
	Large	128	180	16	16	64
	Large	180	256	24	24	88
BOULDER	Small	256	362	4	4	92
	Small	362	512	4	4	96
	Medium	512	1024	4	4	100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
Total				100	100	100

Cross Section 8	
Channel materials (mm)	
D ₁₆ =	34.85
D ₃₅ =	81.25
D ₅₀ =	133.6
D ₈₄ =	241.4
D ₉₅ =	469.5
D ₁₀₀ =	1024.0

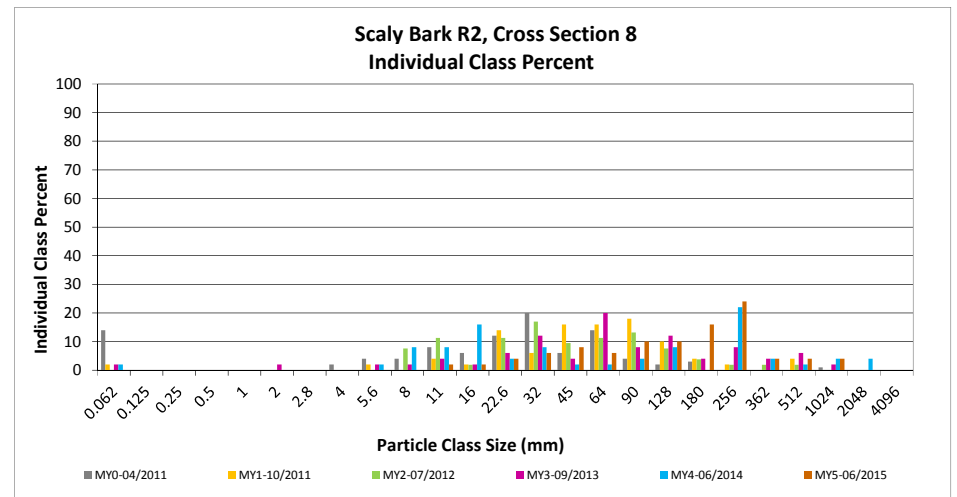
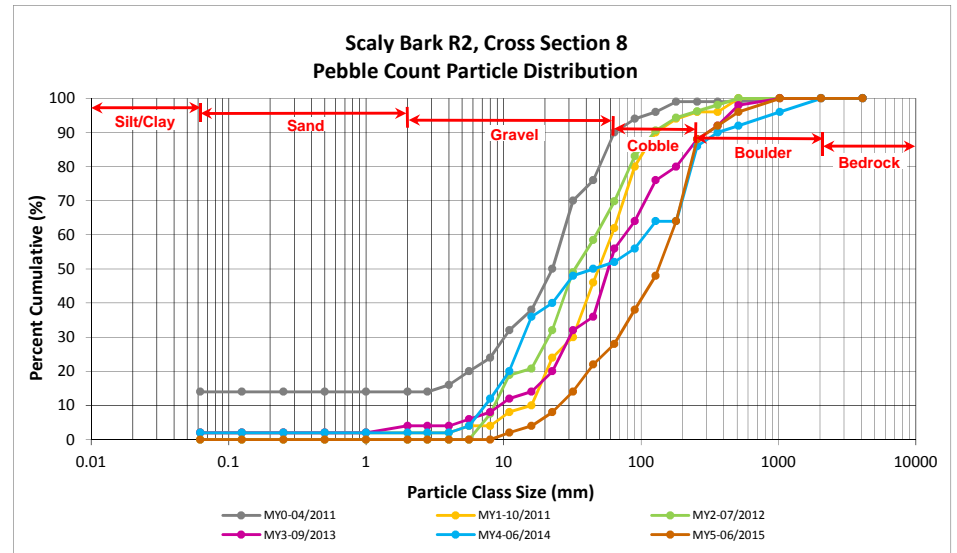


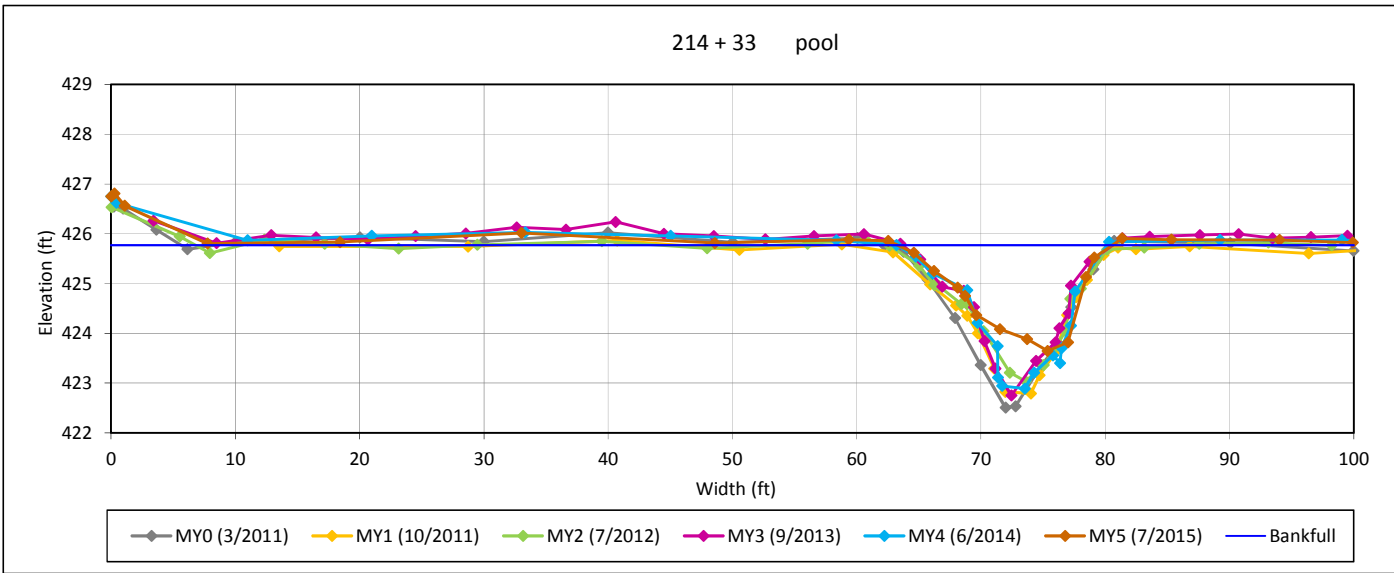
Table 12c. Monitoring Data - Stream Reach Data Summary
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
UT1 Reach 2
Monitoring Year 5

Parameter	As-Built/Baseline			MY-1			MY-2			MY-3			MY-4			MY-5		
	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max
Dimension and Substrate - Riffle																		
Bankfull Width (ft)		12.1			11.9			12.2			10.2			13.5			11.7	
Floodprone Width (ft)		200+			200+			200+			200+			200+			200+	
Bankfull Mean Depth		1.0			1.0			1.0			0.9			0.8			0.9	
Bankfull Max Depth		1.7			1.6			1.7			1.6			1.4			1.6	
Bankfull Cross-sectional Area (ft ²)		12.4			11.4			11.8			10.2			11.3			10.4	
Width/Depth Ratio		11.9			12.3			12.6			13.6			16.1			13.1	
Entrenchment Ratio		2.2+			2.2+			2.2+			2.2+			2.2+			2.2+	
Bank Height Ratio		1.0			1.0			1.0			1.0			1.0			1.0	
D50 (mm)																		
Profile																		
Riffle Length (ft)	11	30	41	6	31	44	8	24	44	13	31	44	23	35	47	29	32	42
Riffle Slope (ft/ft)	0.0150	0.0187	0.0233	0.0132	0.0161	0.0272	0.0104	0.0172	0.0280	0.0159	0.0246	0.0306	0.0132	0.0205	0.0314	0.0171	0.0189	0.0303
Pool Length (ft)	21	30	43	19	27	40	15	27	31	22	31	46	17	27	33	24	29	32
Pool Max Depth (ft)	2.5	3.3	4.0	2.3	2.9	3.8	2.2	2.7	3.4	2.6	2.9	3.1	2.8	3.2	3.8	2.5	3.0	3.2
Pool Spacing (ft)	55	59	77	55	59	79	49	59	73	58	64	75	58	60	72	51	63	77
Pool Volume (ft ³)																		
Pattern																		
Channel Beltwidth (ft)	50	-	80															
Radius of Curvature (ft)	25	-	33															
Rc:Bankfull Width (ft/ft)	2.3	-	3.0															
Meander Wave Length (ft)	80	-	100															
Meander Width Ratio	4.5	-	7.3															
Additional Reach Parameters																		
Rosgen Classification		C4			C4			C4			C4			C4			C4	
Channel Thalweg Length (ft)		399			399			399			399			399			399	
Sinuosity (ft)		1.1			1.1			1.1			1.1			1.1			1.1	
Water Surface Slope (ft/ft)		0.0101			0.0100			n/a ¹			0.0100			0.0103			n/a ¹	
Bankfull Slope (ft/ft)		0.0094			0.0092			0.0096			0.0101			0.0101			0.0099	
Ri%/Ru%/P%/G%/S%																		
SC%/Sa%/G%/C%/B%/Be%																		
d16/d35/d50/d84/d95/d100	SC/16/37/105/157/362			SC/26/38/94/191/256			SC/4/9/96/152/362			SC/1/11/102/156/512			SC/52/68/119/163/256			SC/5/34/124/191/256		
% of Reach with Eroding Banks				0%			0%			0%			0%			0%		

¹ Water surface slope wasn't calculated because there was little to no baseflow during Year 2 and Year 5 Monitoring.

Cross-Section Plots
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Monitoring Year 5

Cross Section 9-UT1 Reach 2



Bankfull Dimensions

19.4	x-section area (ft.sq.)
17.3	width (ft)
1.1	mean depth (ft)
2.1	max depth (ft)
18.1	wetted parimeter (ft)
1.1	hyd radi (ft)
15.3	width-depth ratio

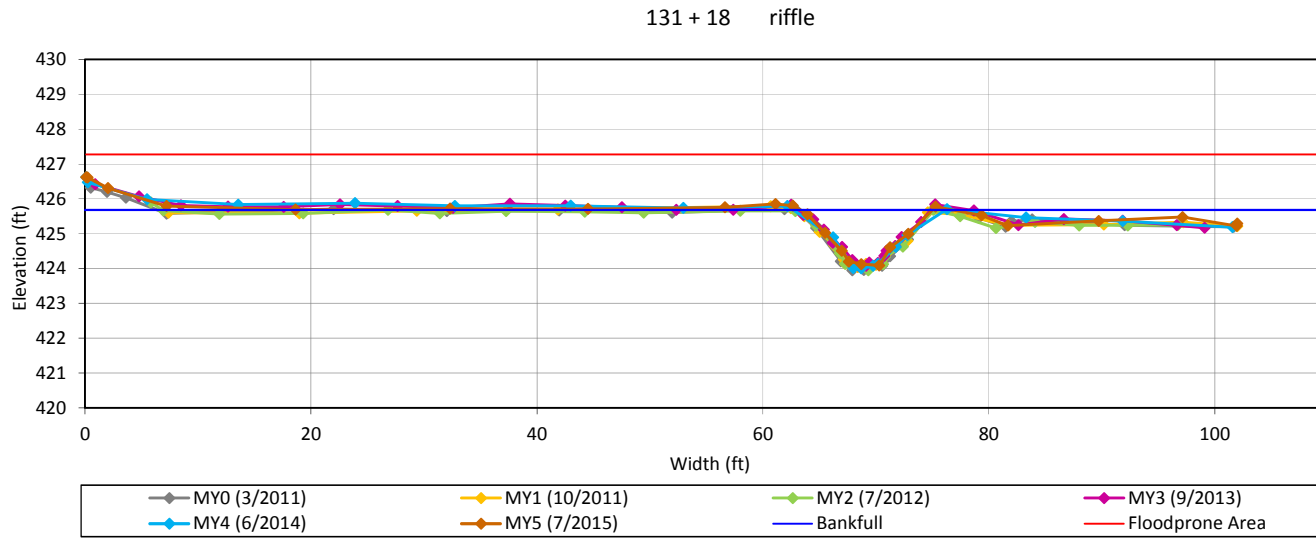
Survey Date: Jul-15
 Field Crew: Wildlands Engineering



View Downstream (7/2015)

Cross-Section Plots
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Monitoring Year 5

Cross Section 10-UT1 Reach 2



Bankfull Dimensions

- 10.4 x-section area (ft.sq.)
- 11.7 width (ft)
- 0.9 mean depth (ft)
- 1.6 max depth (ft)
- 12.2 wetted perimeter (ft)
- 0.9 hyd radi (ft)
- 13.1 width-depth ratio
- 1.0 bank-height ratio
- 2.2+ entrenchment ratio

Survey Date: Jul-15

Field Crew: Wildlands Engineering

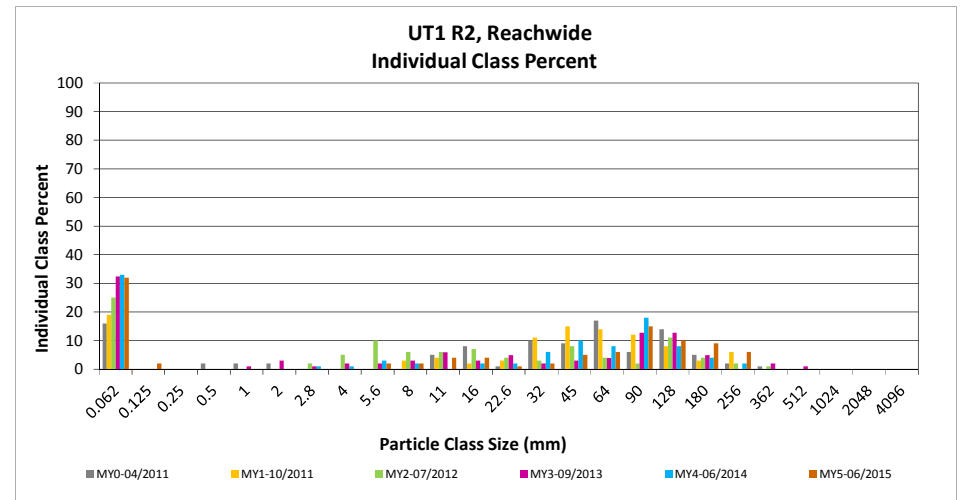
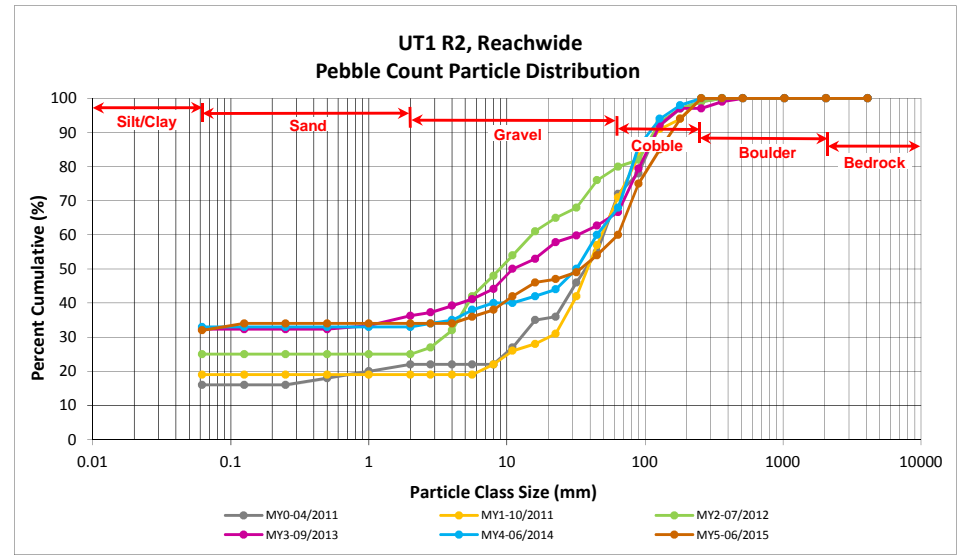


View Downstream (7/2015)

Reachwide and Cross Section Pebble Count Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5 - 2015
 UT1 R2, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062		32	32	32	32
SAND	Very fine	0.062	0.125		2	2	2	34
	Fine	0.125	0.250					34
	Medium	0.25	0.50					34
	Coarse	0.5	1.0					34
	Very Coarse	1.0	2.0					34
GRAVEL	Very Fine	2.0	2.8					34
	Very Fine	2.8	4.0					34
	Fine	4.0	5.6		2	2	2	36
	Fine	5.6	8.0	1	1	2	2	38
	Medium	8.0	11.0	1	3	4	4	42
	Medium	11.0	16.0	2	2	4	4	46
	Coarse	16.0	22.6		1	1	1	47
	Coarse	22.6	32	2		2	2	49
	Very Coarse	32	45	4	1	5	5	54
	Very Coarse	45	64	6		6	6	60
COBBLE	Small	64	90	14	1	15	15	75
	Small	90	128	10		10	10	85
	Large	128	180	5	4	9	9	94
	Large	180	256	5	1	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				50	50	100	100	100

Reachwide Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	4.73
D ₅₀ =	34.3
D ₈₄ =	123.6
D ₉₅ =	190.9
D ₁₀₀ =	256.0



Reachwide and Cross Section Pebble Count Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5 - 2015
 UT1 R2, Cross Section 10

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			0
GRAVEL	Very Fine	2.0	2.8			0
	Very Fine	2.8	4.0			0
	Fine	4.0	5.6			0
	Fine	5.6	8.0			0
	Medium	8.0	11.0			0
	Medium	11.0	16.0			0
	Coarse	16.0	22.6	4	4	4
	Coarse	22.6	32	6	6	10
	Very Coarse	32	45	6	6	16
	Very Coarse	45	64	12	12	28
COBBLE	Small	64	90	28	28	56
	Small	90	128	20	20	76
	Large	128	180	10	10	86
	Large	180	256	14	14	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 10	
Channel materials (mm)	
D ₁₆ =	45.00
D ₃₅ =	69.69
D ₅₀ =	83.7
D ₈₄ =	168.1
D ₉₅ =	225.7
D ₁₀₀ =	256.0

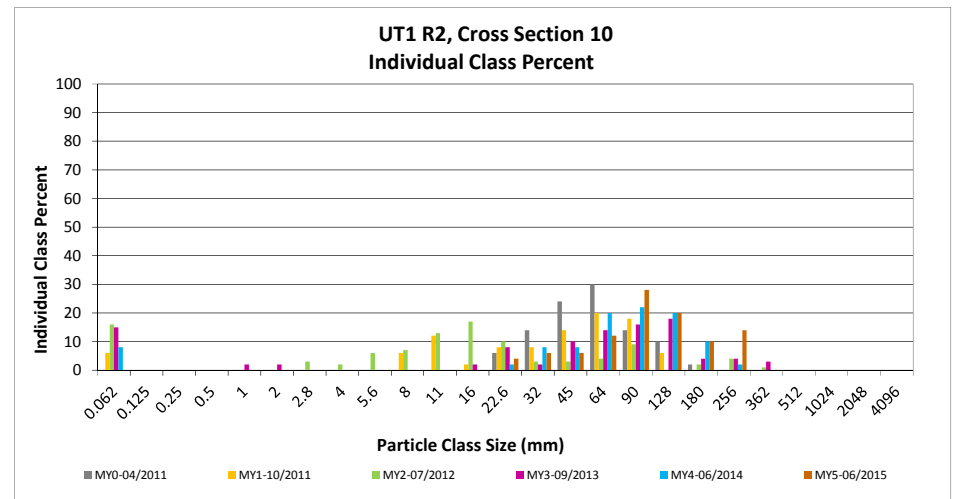
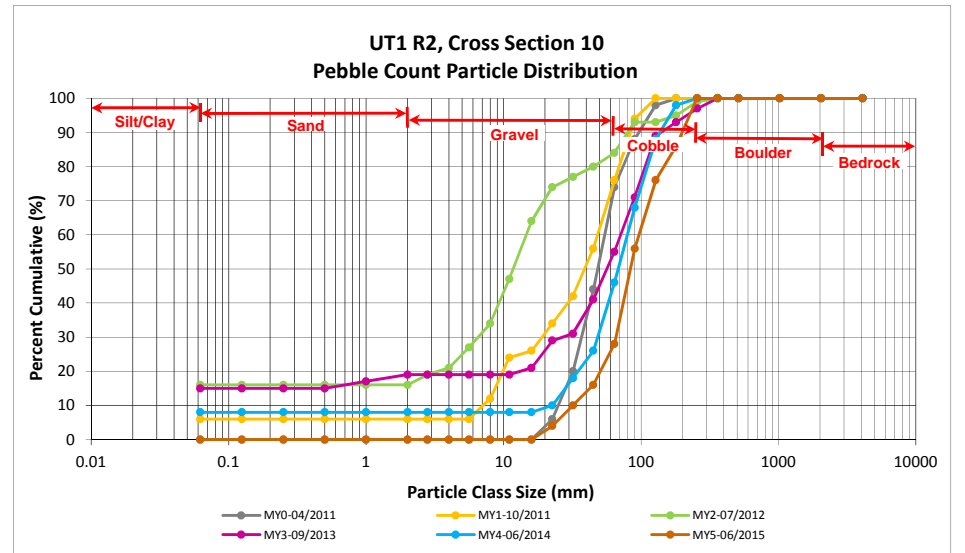


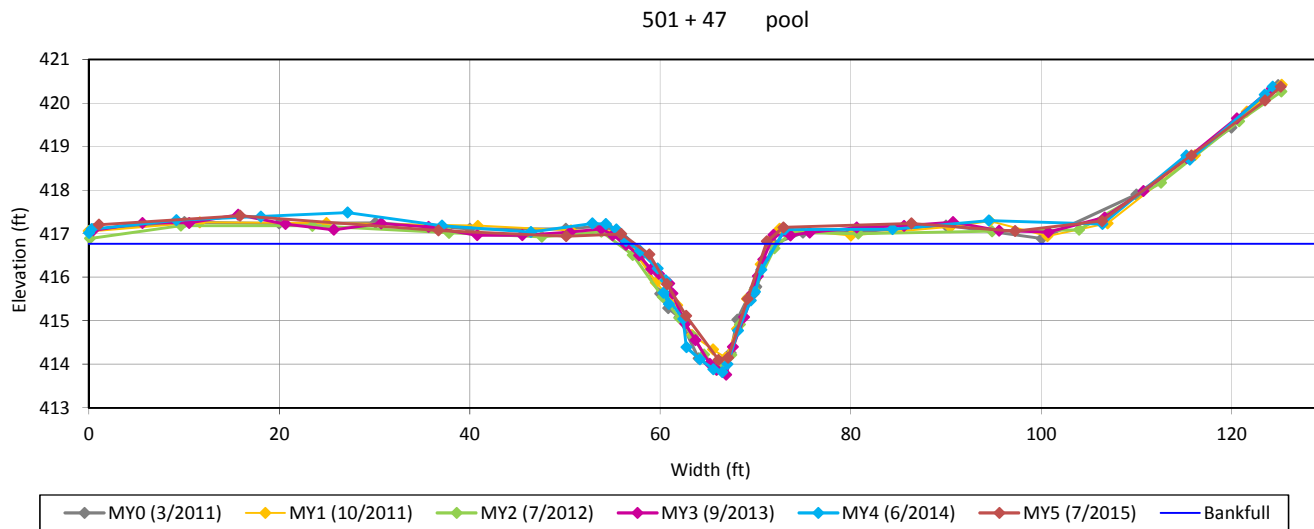
Table 12d. Monitoring Data - Stream Reach Data Summary
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
UT2
Monitoring Year 5

Parameter	As-Built/Baseline			MY-1			MY-2			MY-3			MY-4			MY-5		
	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max	Min	Med	Max
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	13.0			13.0			13.0			12.0			13.5			12.5		
Floodprone Width (ft)	200+			200+			200+			200+			200+			200+		
Bankfull Mean Depth	0.9			0.9			1.0			1.0			0.9			1.0		
Bankfull Max Depth	1.5			1.5			1.7			1.6			1.7			1.7		
Bankfull Cross-sectional Area (ft ²)	11.4			11.7			12.9			11.4			12.1			11.9		
Width/Depth Ratio	14.8			14.5			13.1			12.5			15.1			13.1		
Entrenchment Ratio	2.2+			2.2+			2.2+			2.2+			2.2+			2.2+		
Bank Height Ratio	1.0			1.0			1.0			1.0			1.0			1.0		
D50 (mm)																		
Profile																		
Riffle Length (ft)	21	29	41	16	26	38	18	23	33	17	30	35	18	29	38	13	28	38
Riffle Slope (ft/ft)	0.0215	0.0230	0.0272	0.0187	0.0264	0.0543	0.0190	0.0267	0.0369	0.0157	0.0306	0.0349	0.0160	0.0269	0.0606	0.0189	0.0325	0.0621
Pool Length (ft)	27	31	37	28	31	37	27	33	39	31	32	34	27	33	37	26	31	36
Pool Max Depth (ft)	2.9	3.1	3.5	2.5	3.0	3.3	3.0	3.2	3.4	2.2	2.7	3.2	2.9	3.3	3.8	2.9	3.2	3.5
Pool Spacing (ft)	55	59	70	51	58	78	54	57	75	50	64	77	51	60	75	57	66	67
Pool Volume (ft ³)																		
Pattern																		
Channel Beltwidth (ft)	50	-	80															
Radius of Curvature (ft)	25	-	34															
Rc:Bankfull Width (ft/ft)	2.1	-	2.8															
Meander Wave Length (ft)	90	-	120															
Meander Width Ratio	4.2	-	6.7															
Additional Reach Parameters																		
Rosgen Classification	C4			C4			C4			C4			C4			C4		
Channel Thalweg Length (ft)	380			380			380			380			380			380		
Sinuosity (ft)	1.1			1.1			1.1			1.1			1.1			1.1		
Water Surface Slope (ft/ft)	0.0121			0.0121			n/a ¹			0.0123			0.0126			n/a ¹		
Bankfull Slope (ft/ft)	0.0130			0.0130			0.0127			0.0133			0.0161			0.0125		
Ri%/Ru%/P%/G%/S%																		
SC%/Sa%/G%/C%/B%/Be%																		
d16/d35/d50/d84/d95/d100	SC/9/17/76/152/512			SC/6/14/77/157/362			SC/13/25/94/163/362			SC/14/27/109/171/362			SC/14/27/104/158/362			SC/24/50/152/234/362		
% of Reach with Eroding Banks				0%			0%			0%			0%			0%		

¹ Water surface slope wasn't calculated because there was little to no baseflow during Year 2 and Year 5 Monitoring.

Cross-Section Plots
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Monitoring Year 5

Cross Section 11-UT2



Bankfull Dimensions

19.1	x-section area (ft.sq.)
13.8	width (ft)
1.4	mean depth (ft)
2.7	max depth (ft)
15.0	wetted perimeter (ft)
1.3	hyd radi (ft)
10.0	width-depth ratio

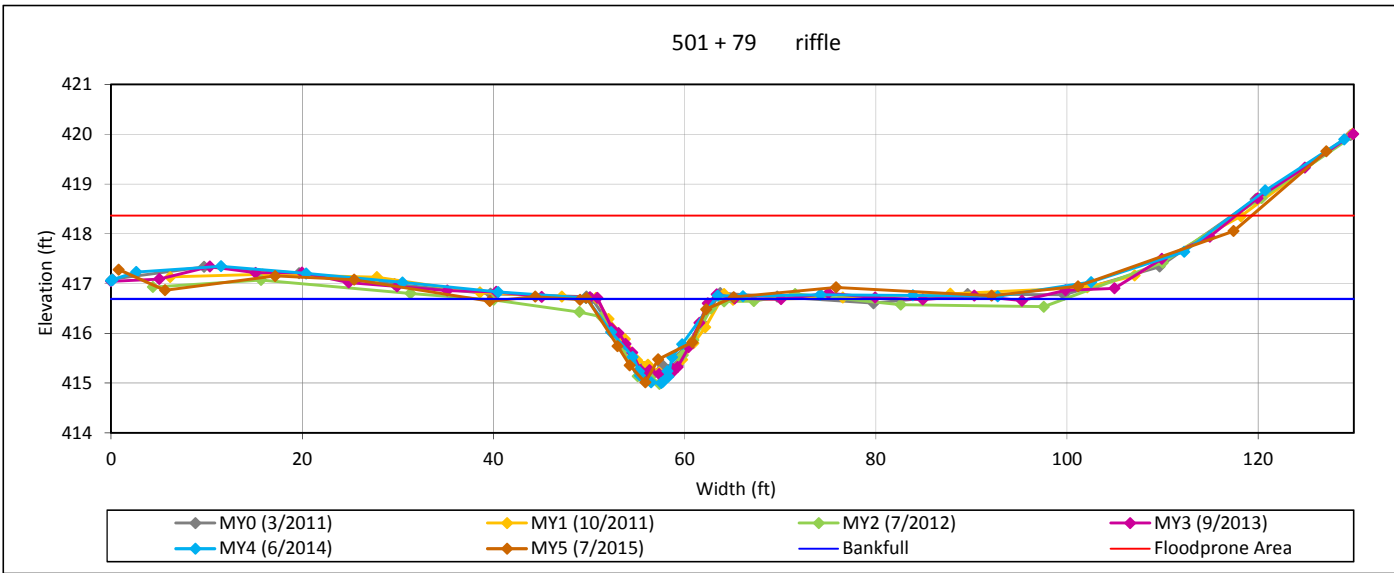
Survey Date: Jul-15
 Field Crew: Wildlands Engineering



View Downstream (7/2015)

Cross-Section Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5

Cross Section 12-UT2



Bankfull Dimensions

- 11.9 x-section area (ft.sq.)
- 12.5 width (ft)
- 1.0 mean depth (ft)
- 1.7 max depth (ft)
- 12.9 wetted perimeter (ft)
- 0.9 hyd radi (ft)
- 13.1 width-depth ratio
- 1.0 bank-height ratio
- 2.2+ entrenchment ratio

Survey Date: Jul-15
 Field Crew: Wildlands Engineering

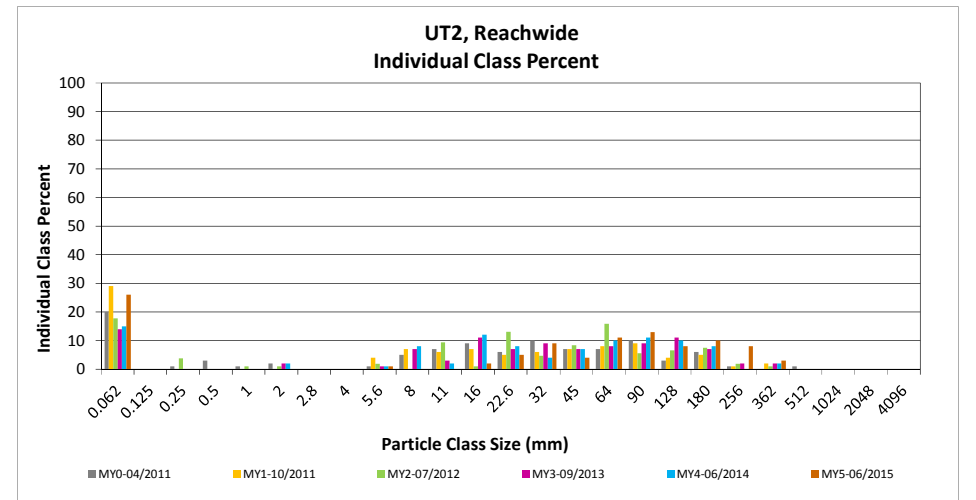
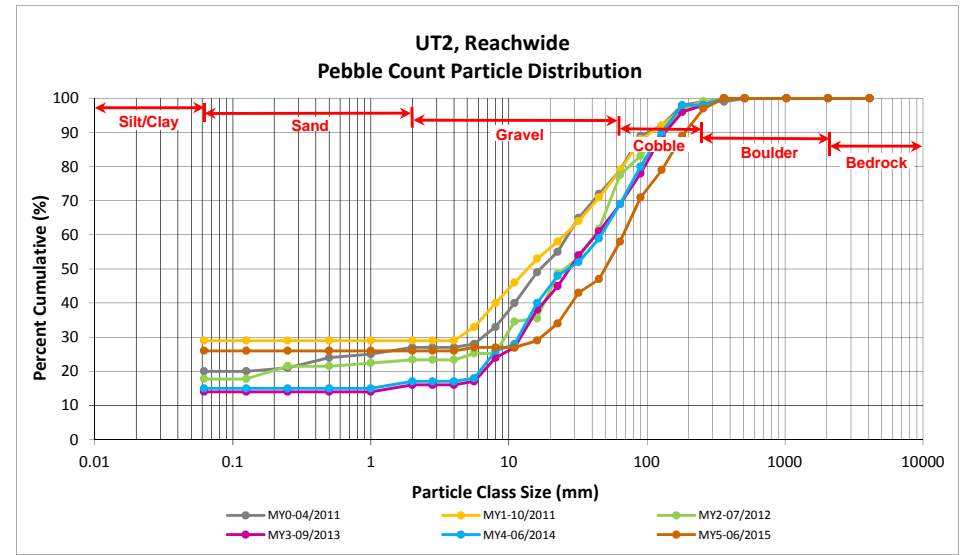


View Downstream (7/2015)

Reachwide and Cross Section Pebble Count Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5 - 2015
 UT2, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	24	26	26	26
SAND	Very fine	0.062	0.125					26
	Fine	0.125	0.250					26
	Medium	0.25	0.50					26
	Coarse	0.5	1.0					26
	Very Coarse	1.0	2.0					26
GRAVEL	Very Fine	2.0	2.8					26
	Very Fine	2.8	4.0				1	26
	Fine	4.0	5.6		1	1	1	27
	Fine	5.6	8.0					27
	Medium	8.0	11.0					27
	Medium	11.0	16.0	1	1	2	2	29
	Coarse	16.0	22.6	2	3	5	5	34
	Coarse	22.6	32	2	7	9	9	43
	Very Coarse	32	45	2	2	4	4	47
Very Coarse	45	64	9	2	11	11	58	
COBBLE	Small	64	90	10	3	13	13	71
	Small	90	128	7	1	8	8	79
	Large	128	180	7	3	10	10	89
	Large	180	256	5	3	8	8	97
BOULDER	Small	256	362	3		3	3	100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				50	50	100	100	100

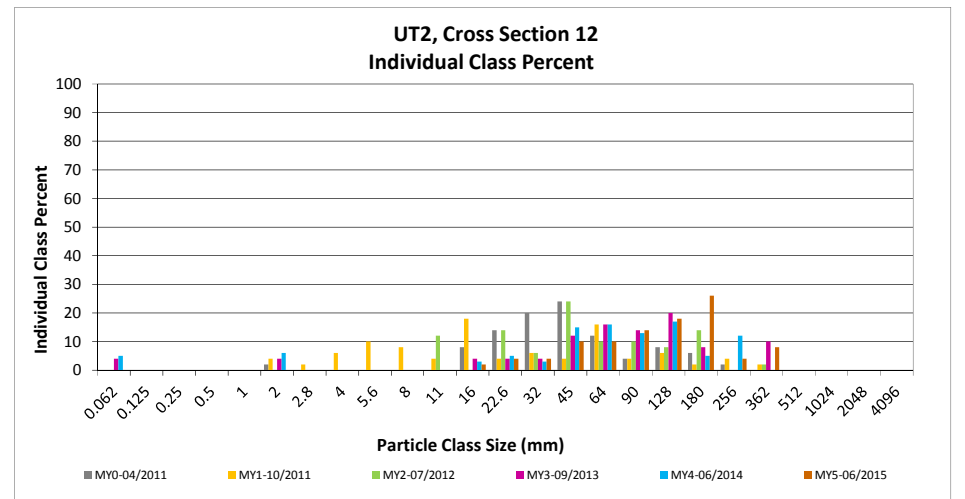
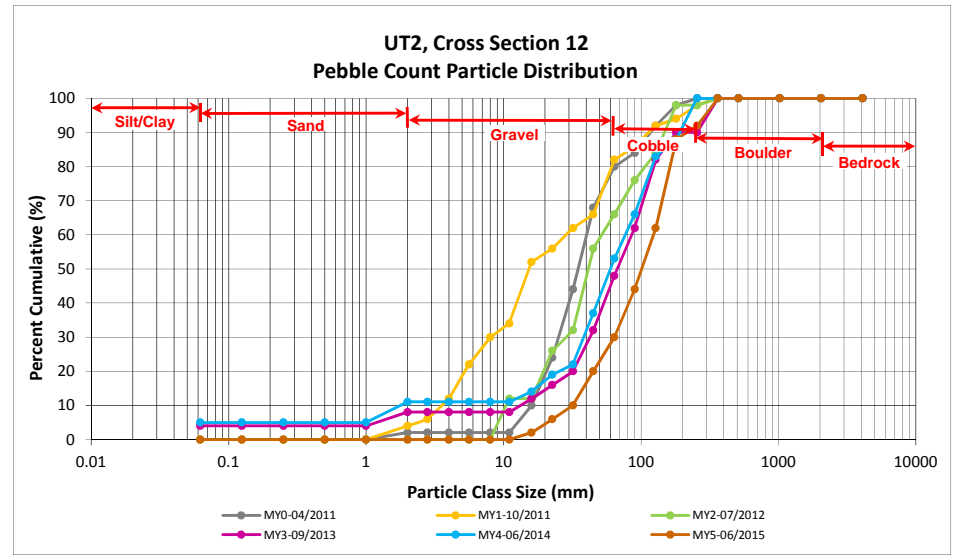
Reachwide Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	23.49
D ₅₀ =	49.5
D ₈₄ =	151.8
D ₉₅ =	234.4
D ₁₀₀ =	362.0



Reachwide and Cross Section Pebble Count Plots
 Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
 Monitoring Year 5 - 2015
 UT2, Cross Section 12

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			0
GRAVEL	Very Fine	2.0	2.8			0
	Very Fine	2.8	4.0			0
	Fine	4.0	5.6			0
	Fine	5.6	8.0			0
	Medium	8.0	11.0			0
	Medium	11.0	16.0	2	2	2
	Coarse	16.0	22.6	4	4	6
	Coarse	22.6	32	4	4	10
	Very Coarse	32	45	10	10	20
	Very Coarse	45	64	10	10	30
COBBLE	Small	64	90	14	14	44
	Small	90	128	18	18	62
	Large	128	180	26	26	88
	Large	180	256	4	4	92
BOULDER	Small	256	362	8	8	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 12	
Channel materials (mm)	
D ₁₆ =	39.26
D ₃₅ =	72.29
D ₅₀ =	101.2
D ₈₄ =	170.8
D ₉₅ =	291.5
D ₁₀₀ =	362.0



APPENDIX 5. Hydrology Data

Table 13. Hydrology Summary Data
Scaly Bark Creek Mitigation Site (NCDMS Project No. 94148)
Monitoring Year 5

Reach	MY	Date Recorded	Date of Occurrence	Gage Reading (ft)	Determination	Bankfull Event Met
					Method	
Scaly Bark	MY3	2/6/2013	1/17/2013	2.05	Crest Gage	Y
	MY3	5/2/2013	4/4/2013	2.35	Crest Gage	Y
	MY3	7/10/2013	5/23/2013	3.3	Crest Gage	Y
	MY4	1/21/2014	1/10/2014	1.9	Crest Gage	Y
	MY4	6/10/2014	5/15/2014	2.65	Crest Gage	Y
UT1	MY3	7/11/2013	5/23/2013	4<	Crest Gage	Y
	MY4	8/20/2014	6/27/2014	N/A	Wrack Lines	Y
UT2	MY3	2/6/2013	1/17/2013	0.8	Crest Gage	Y
	MY3	7/11/2013	5/23/2013	1.7	Crest Gage	Y
	MY4	1/21/2014	1/10/2014	0.85	Crest Gage	Y