Cane Creek (EEP #69)
Stream Restoration Site

2011 Annual Monitoring Report (Year 5 of 5)

Alamance County, North Carolina
EEP Project No. 69
Design Firm: Stantec Consulting Services, Inc.

February 2012

Prepared for:

NCDENR / Ecosystem Enhancement Program
1619 Mail Service Center
Raleigh, NC 27699-1619

Prepared by:

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APPENDICES

1.0 Executive Summary

The Cane Creek (EEP #69) stream restoration project comprises 2,187 linear feet of stream restoration. The project is in Alamance County north of Siler City, north of Old Dam Road (SR 2370), and west of Snow Camp Road (SR 1004). The project site is located in the Cape Fear River basin (HUC 03030002050050); this HUC has been identified as a Targeted Local Watershed (TLW) in EEP's Cape Fear River Basin Restoration Priorities 2009. Site construction and plantings were completed in March of 2006. The goals and objectives for Cane Creek (EEP #69) stream restoration are:

Goals:

- Improving water quality
- Reducing erosion and sedimentation
- Reducing nutrient loads from entering the stream through a filtration buffer
- Increasing stream floodplain access

Objectives:

- Improving aquatic habitat with the use of natural material stabilization structures and a riparian buffer
- Excluding cattle from the stream
- Providing wildlife habitat through the creation of a riparian zone

There are five vegetation monitoring plots within the conservation easement which are all meeting the stem density criteria for total stems. Post construction only one plot (Plot 4) was established. Four additional vegetation monitoring plots were added during monitoring year (MY)-02. Since planted vs. natural stems were indistinguishable, stems, planted or not, were identified as natural stems within the added plots (1, 2, 3, & 5). All plots have been monitored using Level II of the CVS-EEP vegetation monitoring protocol, which has been implemented for MY-02, MY-03, MY-04, and this year, MY-05. The previous monitoring plot 1 was inadvertently established within the pathway of the existing use farm path/crossing within the easement. A new vegetation monitoring plot 1 was established on April 12, 2011 upstream of the previous plot 1 near station 31+00. Supplemental plantings for areas with low woody stem densities using 1 gallon container plants were conducted on March 11, 2011. As a result of the supplemental planting, planted stems were identified and flagged within plots 1, 2, 3, and 5 during vegetation monitoring plot data collection conducted on August 30, 2011 (Appendix C). All plots combined have a planted stem density of 194 woody stems/acre, which excludes live stakes. Including lives stakes, planted stems, and natural stems there are 2,995 stems/acre within the conservation easement. The success criterion for woody species is 320 stems/acre after MY-03. A mortality rate of 10 percent will be allowed after MY-04 (288 stems/acre), with another 10 percent allowed after MY-05 (260 stems/acre). Natural woody stems observed in abundance include red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), Eastern red cedar (*Juniperus virginiana*), and red elm (*Ulmus rubra*).

The vegetation problem areas are composed of areas of invasive exotic vegetation. Invasive exotics throughout the conservation easement that are a threat to native vegetation include tree of heaven (*Ailanthus altisimma*), princess tree (*Paulownia tomentosa*), and multiflora rose (*Rosa multiflora*). Three stands of tree of heaven were observed in the conservation easement. Multiflora rose is the most abundant exotic species of concern located in patches throughout the conservation easement, however this species has succumbed to disease and noticeable dieback has been observed throughout the conservation easement. Other invasives observed scattered throughout the site include Chinese privet (*Ligustrum sinense*), tall fescue (*Schedonurus arundinaceus*) and Japanese honeysuckle (*Lonicera japonica*). According to the EEP Invasives of Concern/Interest List, tree of heaven, princess tree, mulitflora rose, Chinese privet, and Japanese honeysuckle are all classified as "High Concern" species and fescue as a "Low/Moderate Concern" species. Although these species have been given different ranks of severity, the functionality of the project is not expected to be impaired significantly. It is likely that all of these species were present in and adjacent to the conservation easement prior to construction. For additional information relating to vegetation, see Appendix C.

The UT to Cane Creek remains stable with well established vegetation on the banks throughout the reach. The data collected on the stream for MY-05 exhibits little change from data collected in MY-04. The longitudinal profile and cross section data collection occurred in March 2011 while the foliage was still absent to provide better visibility. The pebble counts and visual assessment were conducted in October 2011 at the end of the growing season.

Based on the Visual Stream Morphology Stability Assessment, 98% of the stream is stable and performing as intended. The stream instability rating on the visual assessment was related to two stream segments showing signs of aggradation, which has deflected flow laterally due to vegetation present in the channel. The pool at station 21+40 has black willow (*Salix nigra*) growing in the center of the stream at the end of the riffle, which does not allow centering of the flow as it enters the pool. The flow is deflected to the outer meander bend, creating minor toe erosion for a length of approximately 15 feet. The stream bank in this area is not steep or high and therefore bank failure or mass wasting is not a concern. This issue was observed during the initial site visit (February 2011) and has not appeared to have degraded further at the time of the site visit conducted in October 2011. The riffle at station 27+40 has herbaceous vegetation present in the center of the channel creating minor flow deflection. The riffle had previously widened and the flow is not centered throughout the segment for a length of approximately 40 feet, however it is presently stable and is not expected to have future instability issues. The sill rocks of the rock structures at stations 27+75 and 30+78 remain disconnected to the structure arms as noted in previous annual reports. While the stream bed elevation is no longer controlled by the sill rocks, the structure does not show localized degradation and the integrity of the adjacent stream banks at the structures is stable. The vane arms for these two structures are intact and functioning properly. The piping noted on the current condition plan view created by gaps between the arm and sill rock for structures at station 15+60 and 22+75 are also not creating any instability issues.

Overall, the stream is stable and exhibits little signs of change to the profile, pattern and dimension. A comparison of the MY-04 and current MY-05 cross sections shows only one cross section with minor changes to the geometry. Pool cross section 2 shows a developing point bar on the inside meander bend. The localized bank erosion on the outside of the bend shown in MY-04 for cross section 2 due to a tree falling from the bank is re-stabilizing and is not anticipated to be a future issue. The MY-05 pebble counts display a closer alignment to the MY-03 particle size distributions than the MY-04 distributions. The riffle pebble count data reported in MY-04 for riffle sections 3 and 5 were conducted when the stream was dry and vegetation was present in the channel, therefore skewing the results found in previous and subsequent years.

Beaver activity has been present within the conservation easement in past monitoring years. During the site visit in October 2011, evidence of new beaver activity was observed in several locations along the stream. Recently cut woody vegetation was observed from station 17+60 to the stream crossing at station 19+10 for a distance of approximately 150 linear feet. A vegetative debris and muck collection was found under the water surface that may be the beginnings of a future beaver dam near stream station 18+40. Additional beaver activity was observed downstream of the stream crossing at station 19+10 through approximate stream station 20+50. The remnant beaver dam at station 20+50 (breached by monitoring performers in February 2011) was rebuilt as observed in the October site visit, with freshly cut vegetation. This rebuilt beaver dam at station 20+50 is creating impoundment issues upstream approximately 120 feet to the stream crossing.

Summary information/data related to the occurrence of items such as beaver or encroachment, and statistics related to performance of various project and monitoring elements, can be found in the tables and figures in the report appendices. Narrative background and supporting information formally found in these reports can be found in the mitigation and restoration plan documents available on EEP's website. All raw data supporting the tables and figures in the appendices are available for EEP upon request.

2.0 Methodology

Methodologies follow EEP monitoring report template Version 1.3 (1/15/10) and guidelines (Lee et al 2008). Photos were taken with a digital camera. A Trimble Geo XT handheld unit with sub-meter accuracy was used to collect vegetation monitoring plot origins, and problem area locations. Cross sectional and longitudinal surveys were conducted using Total Station survey equipment. Data were entered into AutoCAD Civel3D to obtain dimensions of the cross sections and parameters applicable to the longitudinal profile. Reports were then generated to display summaries of the stream survey.

2.1 Vegetation Methodologies

Level II of the EEP/CVS protocol, version 4.2, was used to collect data for MY-05, which includes both natural stems and woody stems. Since Plots 2, 3, and 5 were established in MY-02, all stems recorded in these plots were classified as natural stems. A new Vegetation Plot 1 was established on April 12, 2011 upstream of the previous plot 1. Vegetation monitoring data was collected on August 30, 2011. Data collected for these plots are in Appendix C.

2.2 Stream Methodologies

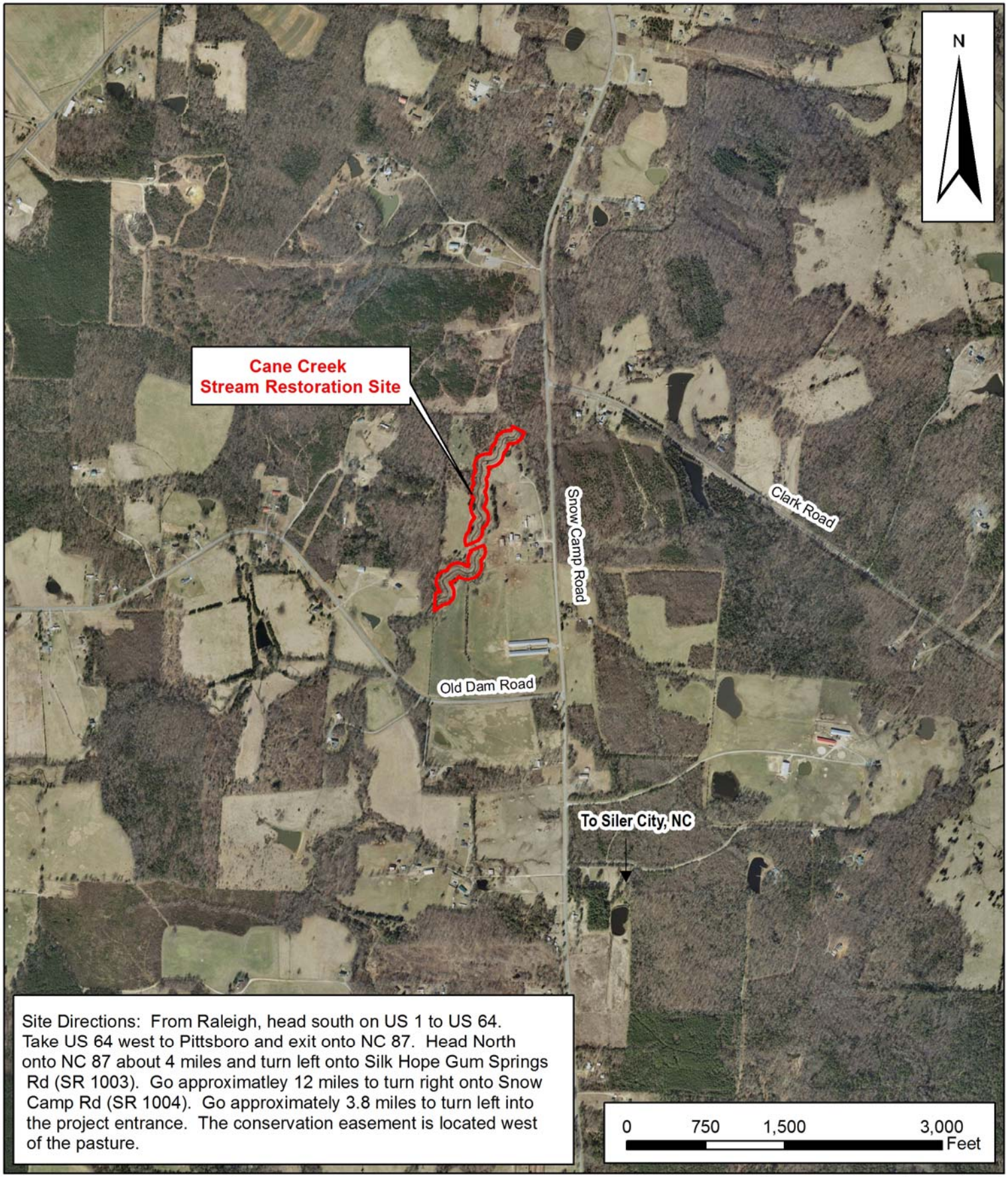
Stream profile and cross sections were surveyed using Total Station equipment and methods. The survey data was collected on March 15, 2011 and were plotted using AutoCAD Civel3D. The longitudinal profile was generated using the MY-02 alignment. Wolman's Method was used to determine particle size distribution. Cross sectional data were extracted based on a linear alignment between the end pins.

3.0 References

Lee, Michael T., R. K. Peet, S. D. Roberts, and T. R. Wentworth. 2006. CVS-EEP Protocol for Recording Vegetation, Version 4.0 (http://cvs.bio.unc.edu/methods.htm)

Weakley, A.S. 2011. Flora of the Carolinas, Virginia, Georgia, and surrounding areas. Working draft of January 2007. University of North Carolina Herbarium, North Carolina Botanical Garden, University of North Carolina. 1015pp.

Appendix A. Project Vicinity Map and Background Tables



The Catena Group

Cane Creek Stream Restoration Site

Site Location Map

Alamance County, North Carolina

EEP Project No. 69

2010 Aerial Orthophotographic Maps
Source: NC One Maps

Date:
February 2012

Ecosystem Enhancement Program

Figure
1

Table 1a and b. Project Components and Summations

Table 1a. Project Components Cane Creek / EEP #69									
Project Component or Reach ID	**Existing Feet/ Acres**	**Restoration Level**	**Approach**	**Footage or Acreage**	**Stationing**	**Mitigation Ratio**	**Mitigation Units**	**BMP Elements[1]**	**Comment**
Reach 1	2,187*	R	P2	2,187 lf*	10+11-32+88	1:1	2,187 lf*	CF=5730lf	Instream structure and vegetated buffer

*This length excludes a cattle crossing at station 19-10 and a 30 foot cattle crossing at station 32+88.
CF = Cattle Fencing

Table 1b. Component Summations Cane Creek / EEP #69							
		Riparian Wetland (ac)		**Non-**			
Restoration Level	**Stream (lf)**	**Riverine**	**Non-Riverine**	**Riparian (ac)**	**Upland (ac)**	**Buffer (ac)**	**BMP**
Restoration	2,187	-	-	-	-	-	-
Enhancement	-	-	-	-	-	-	-
Enhancement I	-	-	-	-	-	-	-
Enhancement II	-	-	-	-	-	-	-
Creation	-	-	-	-	-	-	-
Preservation	-	-	-	-	-	-	-
HQ Preservation	-	-	-	-	-	-	-
Totals (feet/acres)	2,187	0	0	0	0	0	1
MU Totals	2,187	0	0	0	0	0	

Table 2. Project Activity and Reporting History

Table 2. Project Activity and Reporting History Cane Creek / EEP #69		
Elapsed Time Since Grading Complete:	5 years 9 months	
Elapsed Time Since Initial Planting Complete:	5 years 9 months	
Number of Reporting Years[1]:	5	
Activity or Deliverable	**Data Collection Complete**	**Completion or Delivery**
Restoration Plan	N/A	April 2003
Final Design – Construction Plan	N/A	October 2005
Construction	N/A	March 2006
Containerized, bare root, and B&B plantings for Reach/Segments 1&2	N/A	March 2006
Mitigation Plan / As-Built (Year 0 Monitoring – baseline)	May 2006	June 2006
Year 1 Monitoring	February 2007	March 2007
Year 2 Monitoring	October 2008	January 2009
Year 3 Monitoring	September 2009	December 2009
Year 4 Monitoring	October 2010	December 2010
Year 5 Supplemental Planting (Containerized by Axiom Environmental, Inc)	March 11, 2011	March 14, 2011
Year 5 Monitoring	October 2011	December 2011

1 = Number of reports produced excluding the baseline

Table 3. Project Contacts Table

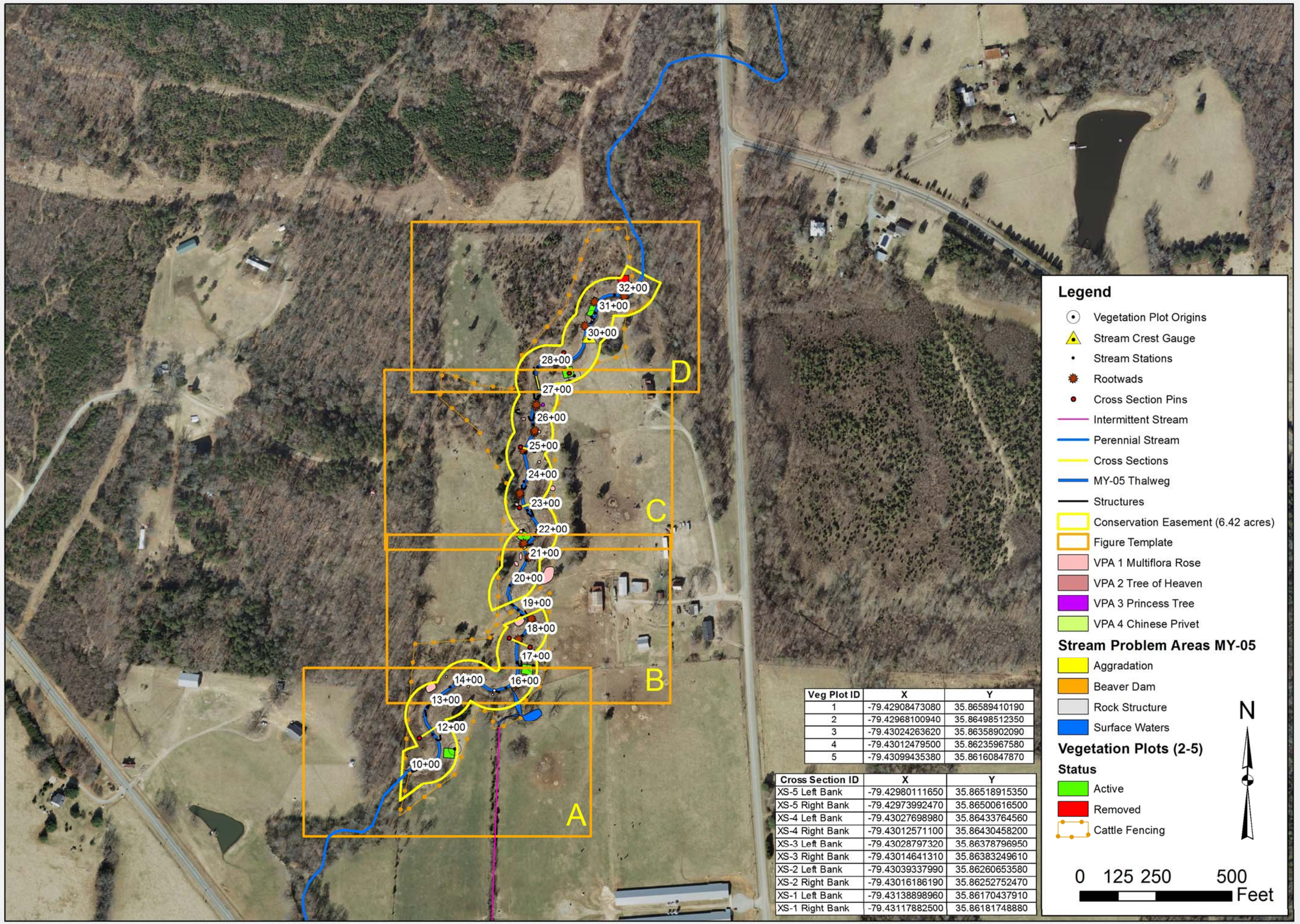
Table 3. Project Contact Table Cane Creek / EEP #69	
Designer **Primary Project Design POC**	Stantec Consulting Services Inc 801 Jones Franklin Road, Suite 300 Raleigh, North Carolina 27606 David Bidelspach - (919) 851-6866
Construction Contractor **Construction Contractor POC**	Shamrock Environmental Corp. 6101 Corporate Park Drive Browns Summit, North Carolina 27699 Bill Wright - (800) 881-1098
Survey Contractor **Survey Contractor POC**	Mulkey Engineers and Consultants P.O. Box 33127 Raleigh, North Carolina 27636 Derek F. Batts – (919) 851-1912
Planting Contractor **Planting Contractor POC**	Seal Brothers Contracting, LLC P.O.Box 86 Dobson, North Carolina 27017 Brian Seal – (336) 786-2263
Seeding Contractor **Seeding Contractor POC**	Seal Brothers Contracting, LLC P.O.Box 86 Dobson, North Carolina 27017 Brian Seal – (336) 786-2263
Seed Mix Sources	Shamrock Environmental Corp. 6101 Corporate Park Drive Browns Summit, North Carolina 27699
Nursery Stock Suppliers	Hills Nursery Co., Inc. (931) 668-4364
Monitoring Performers	The Catena Group (TCG) 410-B Millstone Drive Hillsborough, North Carolina 27678
Stream Monitoring POC	Ward Consulting Engineers 8368 Six Forks Road, Suite 104 Raleigh, NC 27613-5083
Vegetation Monitoring POC	The Catena Group (TCG) 410-B Millstone Drive Hillsborough, North Carolina 27678

Table 4. Cane Creek /EE P #69 Project Attribute Table

Project County	Alamance
Physiographic Region	Piedmont
Ecoregion	Carolina Slate Belt
Project River Basin	Cape Fear
USGS HUC for Project (14 digit)	0303002050050
NCDWQ Sub-basin for Project	Cane Creek
Within extent of EEP Watershed Plan?	Watershed Restoration Plan for the Cape Fear River Basin 2001
WRC Hab Class (Warm, Cool, Cold)	Warm water
% of Project easement fenced or demarcated	100% fenced beyond the 50 ft easement buffer
Beaver activity observed during the design phase?	U
Restoration Component Attribute Table	
Reach 1	
Drainage Area (acres)	2,003
Stream Order	3rd
Restored Length (feet)	2,187
Perennial or Intermittent	Perennial
Watershed Type (Rural, Urban, Developing, etc.)	Rural
Watershed LULC Distribution:	
Residential	5%*
Ag – Row Crop	10%*
Ag – Livestock	50%*
Forested	35%*
Watershed Impervious cover (%)	<5%*
NCDWQ AU/Index Number	22
NCDWQ Classification	C, NSW
303d listed?	No
Upstream of a 303d listed segment	No
Reasons for 303d listing or stressor	N/A
Total acreage of easement	6.42
Total vegetated acreage within the easement	6.42
Total planted acreage as part of the restoration	6.42
Rosgen classification of pre-existing	C4
Rosgen classification of As-built	C
Valley Type	VIII
Valley Slope	0.0034 ft/ft
Valley side slope range	0.07-0.135 ft/ft
Valley toe slope range	0.02-0.03 ft/ft
Cowardin classification	R3UB1
Trout waters designation	No
Species of concern, endangered, etc.	No
Dominant soil series and Characteristics	
Series	Herndon
Depth	Unknown
Clay %	Unknown
K	Unknown
T	Unknown

* These values are approximations from cursory analysis

Appendix B. Visual Assessment Data



Veg Plot ID	X	Y
1	-79.42908473080	35.86589410190
2	-79.42968100940	35.86498512350
3	-79.43024263620	35.86358902090
4	-79.43012479500	35.86235967580
5	-79.43099435380	35.86160847870

Cross Section ID	X	Y
XS-5 Left Bank	-79.42980111650	35.86518915350
XS-5 Right Bank	-79.42973992470	35.86500616500
XS-4 Left Bank	-79.43027698980	35.86433764560
XS-4 Right Bank	-79.43012571100	35.86430458200
XS-3 Left Bank	-79.43028797320	35.86378796950
XS-3 Right Bank	-79.43014641310	35.86383249610
XS-2 Left Bank	-79.43039337990	35.86260653580
XS-2 Right Bank	-79.43016186190	35.86252752470
XS-1 Left Bank	-79.43138898960	35.86170437910
XS-1 Right Bank	-79.43117882500	35.86181748880

Legend

- Vegetation Plot Origins
- Stream Crest Gauge
- Stream Stations
- Rootwads
- Cross Section Pins
- Intermittent Stream
- Perennial Stream
- Cross Sections
- MY-05 Thalweg
- Structures
- Conservation Easement (6.42 acres)
- Figure Template
- VPA 1 Multiflora Rose
- VPA 2 Tree of Heaven
- VPA 3 Princess Tree
- VPA 4 Chinese Privet

Stream Problem Areas MY-05

- Aggradation
- Beaver Dam
- Rock Structure
- Surface Waters

Vegetation Plots (2-5)

Status

- Active
- Removed
- Cattle Fencing

N

0 125 250 500 Feet

The Catena Group

Date: February 2012

Scale: As Shown

Job No.: EEP #69

Title:

Cane Creek Stream Restoration Project

MY-05

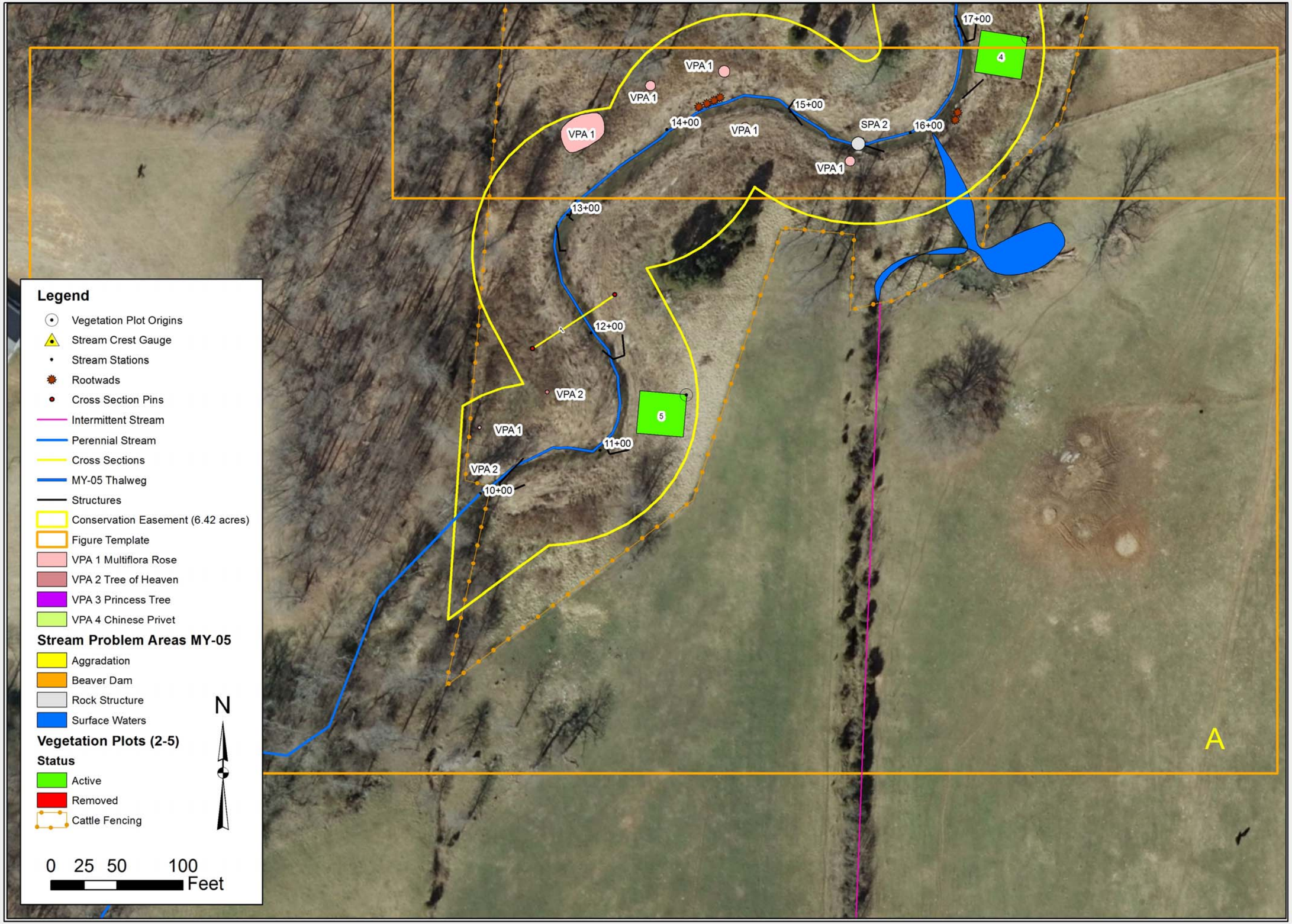
Aerial Orthophotography NC One Maps 2010

Client:

Ecosystem Enhancement Program

Figure

Key



The Catena Group

Date:
February 2012

Scale:
As Shown

Job No.:
EEP #69

Title:

Cane Creek Stream Restoration Project

MY-05

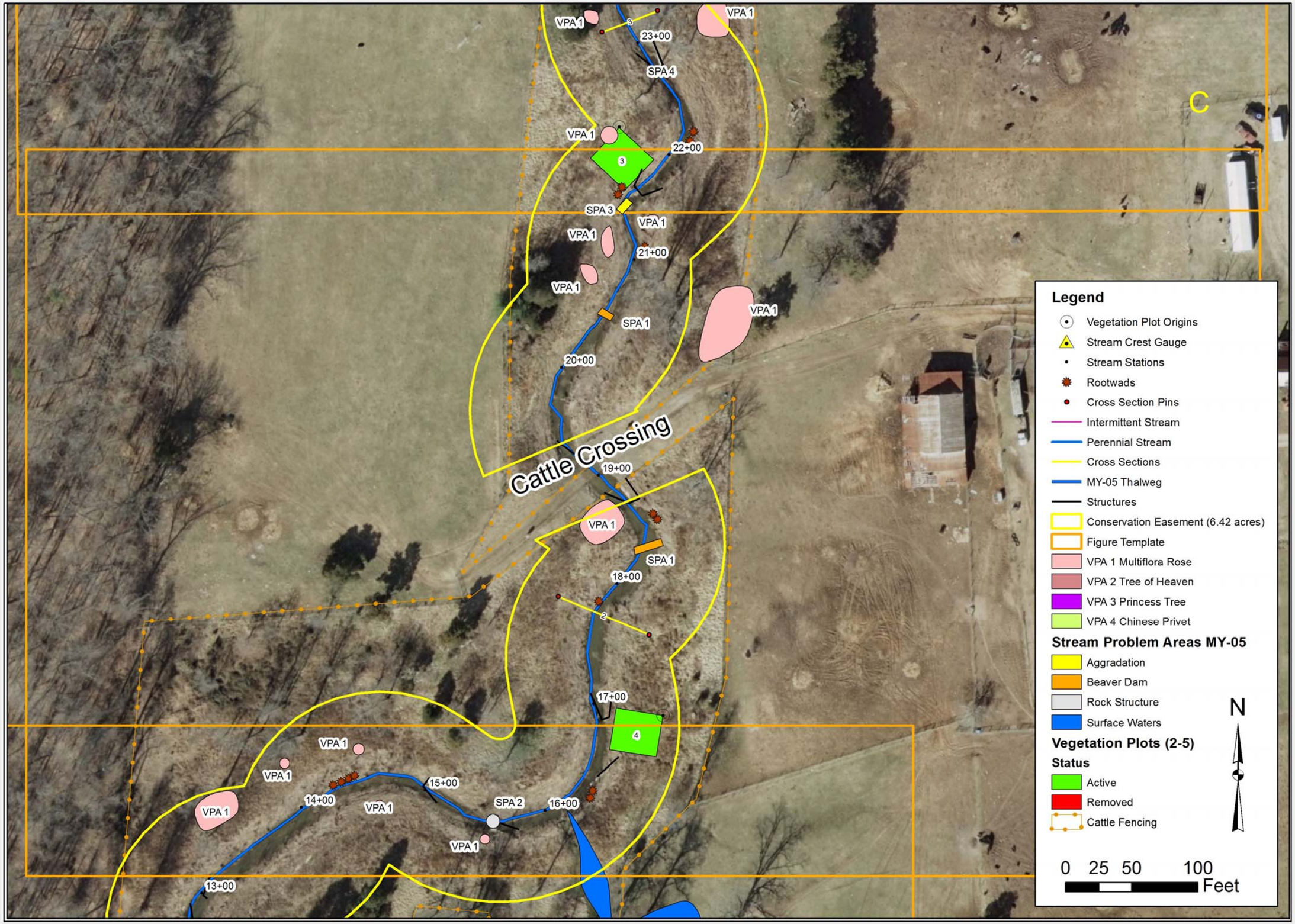
Aerial Orthophotography NC One Maps 2010

Client:

Ecosystem Enhancement Program

Figure

A



The Catena Group

Date:
February 2012

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As Shown

Job No.:
EEP #69

Title:

Cane Creek Stream Restoration Project

MY-05

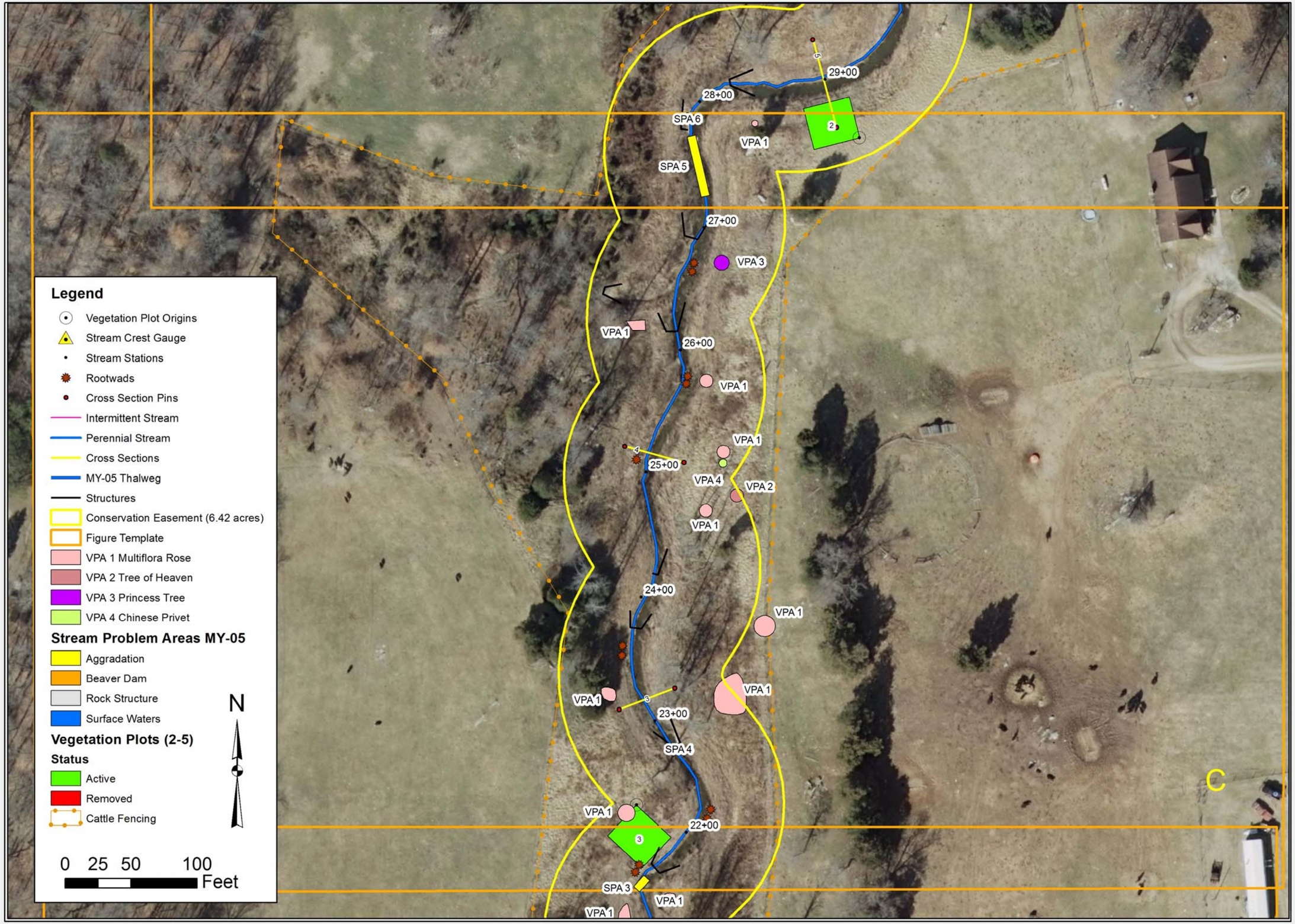
Aerial Orthophotography NC One Maps 2010

Client:

Ecosystem Enhancement Program

Figure

B



The Catena Group

Date:
February 2012

Scale:
As Shown

Job No.:
EEP #69

Title:

Cane Creek Stream Restoration Project

MY-05

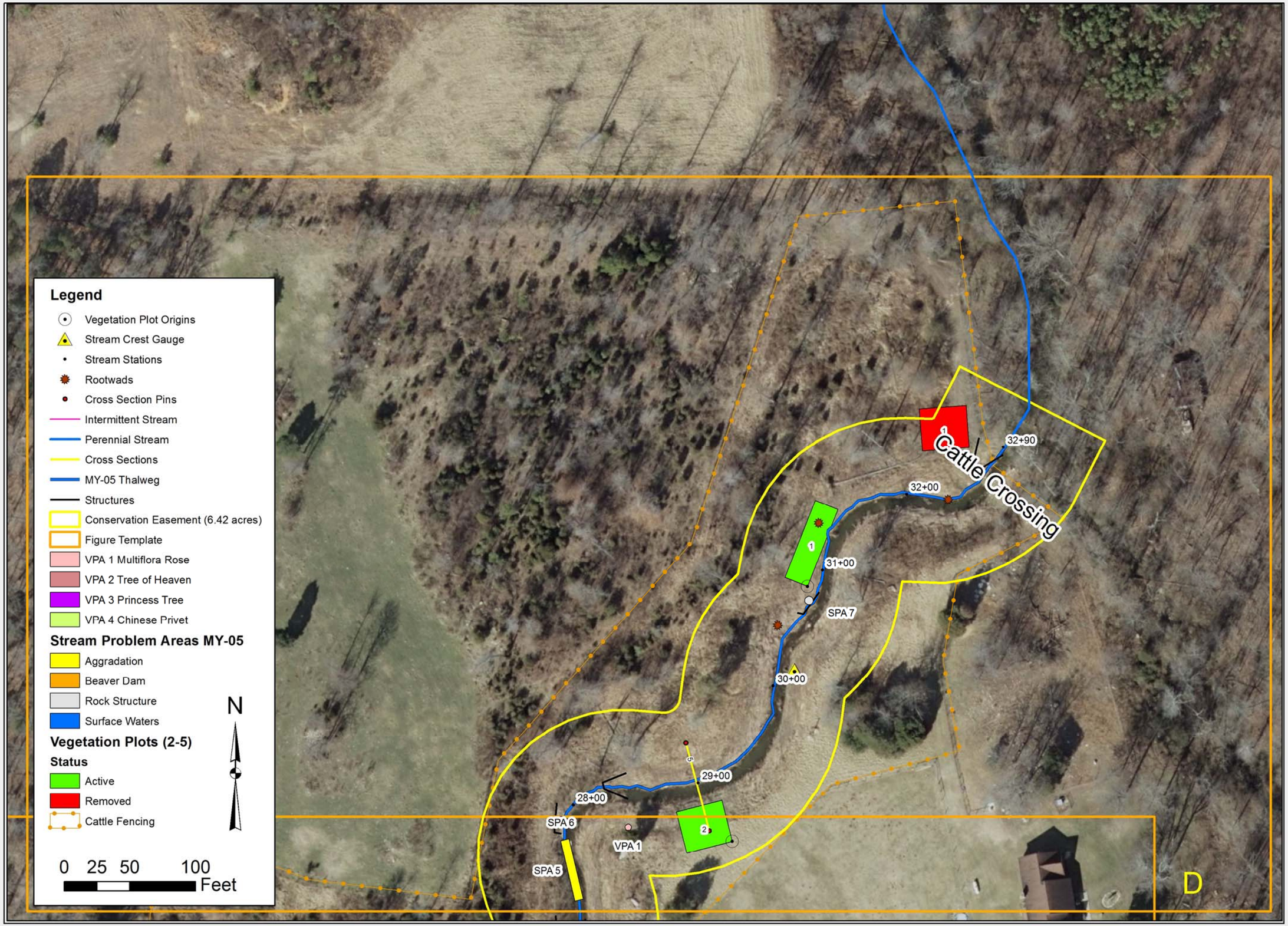
Aerial Orthophotography NC One Maps 2010

Client:

Ecosystem Enhancement Program

Figure

C



The Catena Group

Date:
February 2012

Scale:
As Shown

Job No.:
EEP #69

Title:

Cane Creek Stream Restoration Project

MY-05

Aerial Orthophotography NC One Maps 2010

Client:

Ecosystem Enhancement Program

Figure

D

Table 5 **Visual Stream Morphology Stability Assessment**
Reach ID Main Channel
Assessed Length 2232

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			2	55	98%			
		2. Degradation - Evidence of downcutting					100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	21	22			95%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	23	23			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	23	23			100%			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	20	23			87%			
		2. Thalweg centering at downstream of meander (Glide)	21	23			91%			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			1	15	100%			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%			100%
	3. Mass Wasting	Bank slumping, calving, or collapse					100%			100%
				Totals	1	15	100%	0	0	100%
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	30	32			94%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	20	22			91%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	20	22			91%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	32	32			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	13	13			100%			

Table 6 Vegetation Condition Assessment

Planted Acreage[1] **6.42**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres	See CCPV Legend	0	0.00	0.0%
			Cumulative Total	0	0.00	0.0%

Easement Acreage[2] **14**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Easement Acreage
4. Invasive Areas of Concern[4]	Areas or points (if too small to render as polygons at map scale).	1000 SF	See CCPV Legend	25	0.13	1.0%

1 = Enter the planted acreage within the easement. This number is calculated as the easement acreage minus any existing mature tree stands that were not subject to supplemental planting of the understory, the channel acreage, crossings or any other elements not directly planted as part of the project effort.

2 = The acreage within the easement boundaries.

3 = Encroachment may occur within or outside of planted areas and will therefore be calculated against the overall easement acreage. In the event a polygon is cataloged into items 1, 2 or 3 in the table and is the result of encroachment, the associated acreage should be tallied in the relevant item (i.e., item 1,2 or 3) as well as a parallel tally in item 5.

4 = Invasives may occur in or out of planted areas, but still within the easement and will therefore be calculated against the overall easement acreage. Invasives of concern/interest are listed below. The list of high concern spcies are those with the potential to directly outcompete native, young, woody stems in the short-term (e.g. monitoring period or shortly thereafter) or affect the community structure for existing, more established tree/shrub stands over timeframes that are slightly longer (e.g. 1-2 decades). The low/moderate concern group are those species that generally do not have this capacity over the timeframes discussed and therefore are not expected to be mapped with regularity, but can be mapped, if in the judgement of the observer their coverage, density or distribution is suppressing the viability, density, or growth of planted woody stems. Decisions as to whether remediation will be needed are based on the integration of risk factors by EEP such as species present, their coverage, distribution relative to native biomass, and the practicality of treatment. For example, even modest amounts of Kudzu or Japanese Knotweed early in the projects history will warrant control, but potentially large coverages of Microstegium in the herb layer will not likley trigger control because of the limited capacities to impact tree/shrub layers within the timeframes discussed and the potential impacts of treating extensive amounts of ground cover. Those species with the "watch list" designator in gray shade are of interest as well, but have yet to be observed across the state with any frequency. Those in *red italics* are of particular interest given their extreme risk/threat level for mapping as points where isolated specimens are found, particularly ealry in a projects monitoring history. However, areas of discreet, dense patches will of course be mapped as polygons. The symbology scheme below was one that was found to be helpful for symbolzing invasives polygons, particulalry for situations where the conditon for an area is somewhere between isolated specimens and dense, discreet patches. In any case, the point or polygon/area feature can be symbolized to describe things like high or low concern and species can be listed as a map inset, in legend items if the number of species are limited or in the narrative section of the executive summary.

UT to Cane Creek MY-05 Photo Points

Photo 1. Looking downstream at XS-1

Photo 2. Looking downstream at XS-2

Photo 3. Looking downstream at XS-3

Photo 4. Looking downstream at XS-4

Photo 5. Looking downstream at XS-5

MY-02 Vegetation Plot Photos

New Plot 1. MY-05, April 2011.

Plot 2. MY-02, September 2008.

Plot 3. MY-03, September 2008

MY-05 Vegetation Plot Photos

Plot 1. MY-05: August 30, 2011.

Plot 2. MY-05: August 30, 2011.

Plot 3. MY-05: August 30, 2011

Plot 4. MY-02 September 2008

Plot 4. MY-05: August 30, 2011

Plot 5. MY-02, September 2008

Plot 5. MY-05: August 30, 2011

Appendix C. Vegetation Assessment Data

Table 7. Vegetation Plot Mitigation Success Summary Table

Vegetation Plot ID	Vegetation Survival Threshold Met (MY-05: 260 planted stems/acre)?	Tract Mean
01	YES	100%
02	YES	
03	YES	
04	YES	
05	YES	

Table 8. CVS Vegetation Metadata Table

Report Prepared By	The Catena Group
Date Prepared	11/5/2011 0:00
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
ALL Stems by Plot and spp	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
PROJECT SUMMARY----------	
Project Code	69
project Name	UT to Cane Creek
Description	2260 lf of stream restoration
River Basin	Cape Fear
length(ft)	2187 lf
stream-to-edge width (ft)	12
area (sq m)	6.42 acres easement
Required Plots (calculated)	5
Sampled Plots	5

EEP Project Code 69. Project Name: UT to Cane Creek

			Current Plot Data (MY5 2011)															Annual Means								
			E69-01-VP1			E69-01-VP2			E69-01-VP3			E69-01-VP4			E69-01-VP5			MY5 (2011)			MY4 (2010)			MY3 (2009)		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo	boxelder	Tree												1						1						
Acer negundo var. negundo	boxelder	Tree																					1			
Acer rubrum	red maple	Tree			104			1			11			8	1	1	4	1	1	128						
Acer rubrum var. rubrum	red maple	Tree																					17			
Baccharis angustifolia	saltwater false willow	Shrub			1															1						
Baccharis halimifolia	eastern baccharis	Shrub Tree																					2			
Carpinus caroliniana	American hornbeam	Shrub Tree	3	3	13	2	2	2										5	5	15						
Carya cordiformis	bitternut hickory	Tree												1						1						
Cornus amomum	silky dogwood	Shrub			4									7						11			5			
Diospyros virginiana	common persimmon	Tree				1	1	1							1	1	1	2	2	2						
Fraxinus pennsylvanica	green ash	Tree	1	1	3			3						7			2	1	1	15			20			
Juniperus virginiana	eastern redcedar	Tree			4			4			27			1			3			39						
Juniperus virginiana var. virginiana	eastern redcedar	Tree																					20			
Liquidambar styraciflua	sweetgum	Tree			12						12			23			13			60			45			
Liriodendron tulipifera	tuliptree	Tree			3															3						
Pinus taeda	loblolly pine	Tree			3						1									4						
Prunus serotina	black cherry	Shrub Tree									1									1						
Quercus	oak	Shrub Tree																					1			
Quercus lyrata	overcup oak	Tree						1			1						1			3			2			
Quercus michauxii	swamp chestnut oak	Tree						1												1			1			
Quercus pagoda	cherrybark oak	Tree													3	3	3	3	3	3						
Quercus rubra	northern red oak	Tree													2	2	2	2	2	2						
Rhus copallinum var. copallinum	flameleaf sumac	Shrub Tree																					2			
Rhus typhina	Staghorn Sumac	Shrub						1			1			1						3						
Salix nigra	black willow	Tree	3	3	3				1	1	1	4	4	4				8	8	8	5	5	6	11	11	11
Salix sericea	silky willow	Shrub Tree										2	2	2				2	2	2	2	2	2	2	2	2
Sambucus canadensis	Common Elderberry	Shrub Tree									1			11						12			7			
Ulmus alata	winged elm	Tree												1			16			17			27			
Ulmus rubra	slippery elm	Tree												38						38			63			
		Stem count	7	7	150	3	3	14	1	1	56	6	6	105	7	7	45	24	24	370	7	7	221	13	13	13
		size (ares)	1			1			1			1			1			5			5			5		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.12			0.12			0.12		
		Species count	3	3	10	2	2	8	1	1	9	2	2	13	4	4	9	8	8	23	2	2	16	2	2	2
		Stems per ACRE	283.3	283.3	6070	121.4	121.4	566.6	40.47	40.47	2266	242.8	242.8	4249	283.3	283.3	1821	194.2	194.2	2995	56.66	56.66	1789	105.2	105.2	105.2

WEEKLY INSPECTION REPORT

Date of Inspection: 03-11-2011

Date of Report: 03-15-2011

SCO ID#: 09-0730012

Supplemental Planting Oversight for *EEP Supplemental Planting 2010-03*

Project: **Cane Creek – EEP #69**

Location: Alamance County, North Carolina

Inspection of: Supplemental Planting 2010-03 (Constr Contract D09116s) (Contract(s))

By: Axiom Environmental, Inc. (Designer)
(Name)

Name & Title of Inspector Phillip H. Perkinson – Project Scientist

COMMENTS: The Cane Creek supplemental planting was initiated 03-11-2011 and completed 03-14-2011.

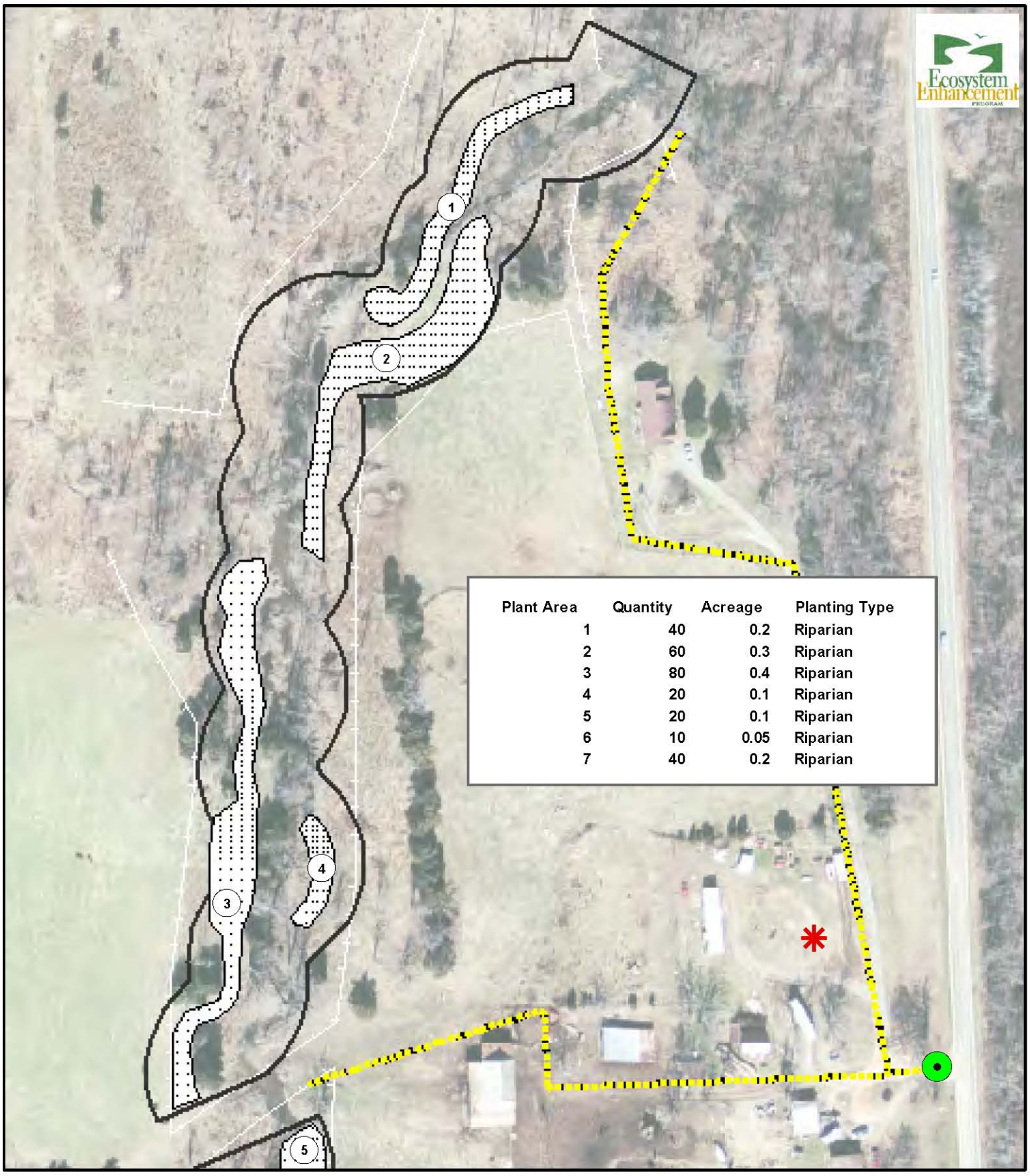
Axiom Environmental flagged each planting zone prior to the arrival of planting crews. Planting contractor (River Works, George Morris) delivered plants to the site in an enclosed trailer; all trees were planted by hand using shovels. All plants were provided by NCEEP through the NCWRC's Dan River nursery. During planting Axiom verified species, plant size, and distribution in each planting zone. A concerted effort was made in order to facilitate equal distribution of species throughout the site. A total of 270 containerized plants were planted within the site per the planting plan – see attached.

Axiom noted a considerable amount of multiflora rose throughout much of the easement. Heavily infested areas were avoided due to access.

All stems planted met NC EEP size and vigor requirements. A final walk through was conducted by Axiom Environmental on 03-14-2011, all work was completed as outlined in the bid document.

Species	Quantity Planted	Container Size
Black Willow, *Salix nigra*	30	#5
Cherrybark Oak, *Quercus pagoda*	60	#5
Green Ash, *Fraxinus pennsylvanica*	14	#5
Ironwood, *Carpinus caroliniana*	50	#5
Persimmon, *Diospyros virginiana*	30	#5
Red maple, *Acer rubrum*	28	#5
Red Oak, *Quercus rubra*	58	#5

(This report is to be made weekly by the designer and submitted as a part of monthly progress reports.)



Plant Area	Quantity	Acreage	Planting Type
1	40	0.2	Riparian
2	60	0.3	Riparian
3	80	0.4	Riparian
4	20	0.1	Riparian
5	20	0.1	Riparian
6	10	0.05	Riparian
7	40	0.2	Riparian

Legend

- 2010-03 Planting Areas
- Staging Area
- Site Access
- 2010-03 Project Easements

N

0 75 150 300 Feet

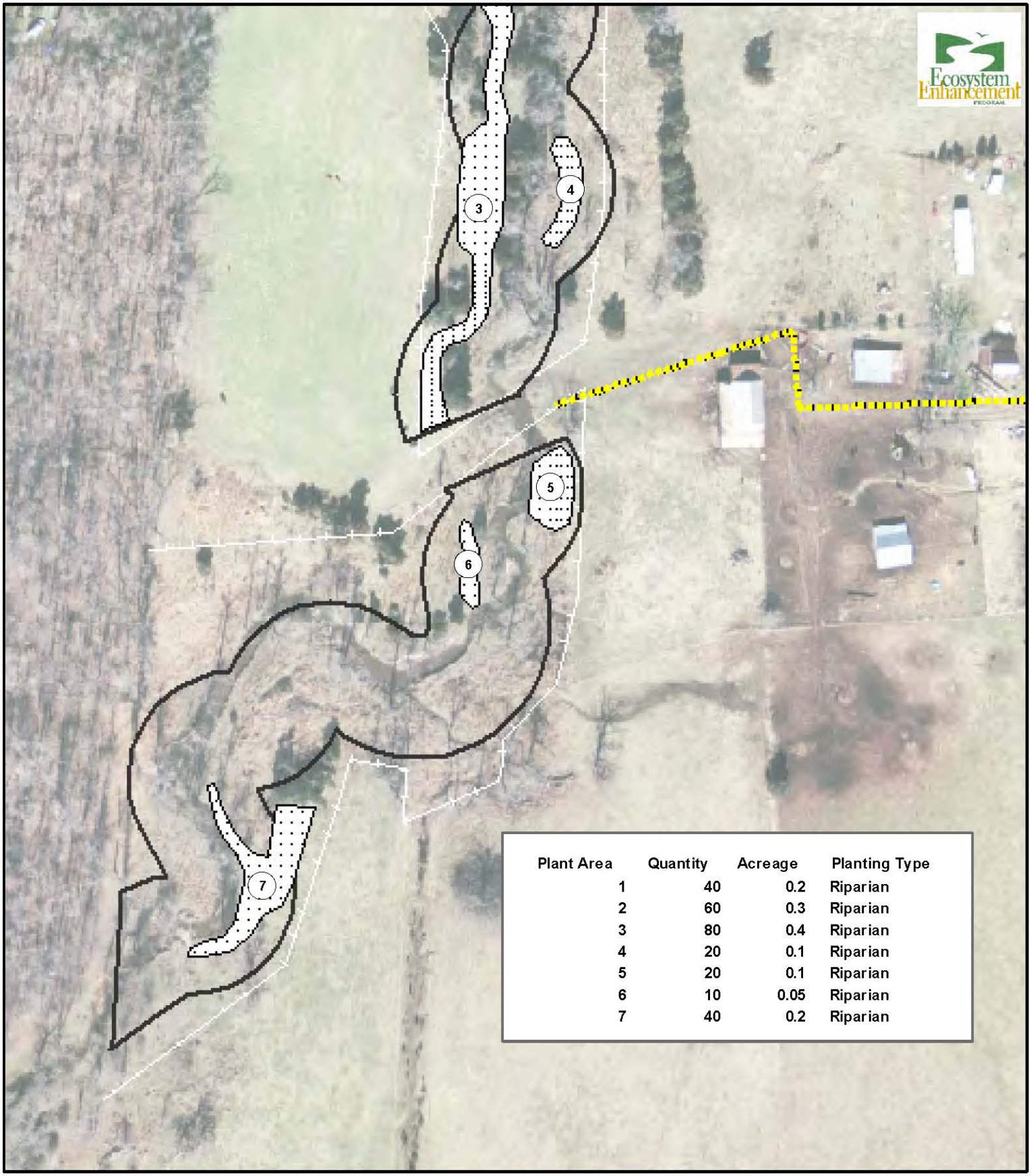
Cane Creek - EEP #69

Alamance County

PLANTING PLAN

1 of 2

October 2010



Plant Area	Quantity	Acreage	Planting Type
1	40	0.2	Riparian
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3	80	0.4	Riparian
4	20	0.1	Riparian
5	20	0.1	Riparian
6	10	0.05	Riparian
7	40	0.2	Riparian

Legend

- 2010-03 Planting Areas
- Staging Area
- Site Access
- 2010-03 Project Easements

N

0 75 150 300 Feet

Cane Creek - EEP #69

Alamance County

PLANTING PLAN

2 of 2

October 2010

EEP Supplemental Planting Species Lists - SP2010-03

(Various Project Sites)

Containerized Plant Measurements - June 2010

Plant Species	Type	Minimum Caliper (inches)	Minimum Height (feet)
Black Cherry	tree	7/16	4.0
Black Willow	tree	11/16	5.5
Carolina Ash 10-gal	tree	3/4	7.0
Cherrybark Oak	tree	3/8	2.5
Green Ash	tree	3/4	7.0
Ironwood	tree	7/16	4.0
Persimmon	tree	5/16	3.5
Red Maple	tree	3/8	3.0
Red Oak	tree	1/2	4.5
River Birch 10-gal	tree	1	7.0
River Birch 5-gal	tree	7/8	6.0
Water Oak	tree	3/8	2.5
White Oak	tree	5/8	3.0
Willow Oak	tree	3/8	3.0
Arrowwood	shrub	3/8	2.5
Button Bush	shrub	1/2	5.0
Elderberry	shrub	1/2	4.5
Red Chokeberry	shrub	3/8	5.0
Silky Dogwood	shrub	5/8	5.0

Appendix D. Stream Survey Data

Project:	UT to Cane Creek
Cross Section:	Cross Section 1
Feature	Riffle
Station:	12+15
Date:	3/15/11
Crew:	SV.ZP

Summary (bankfull)

	MY0	MY1	MY2	MY3	MY4	MY5
A (Bankfull	53.9	48.6	35.4	44.2	46.5	46.7
W (Bankful	26.5	27.1	21.9	25.5	29.1	33.2
Max d	3.2	3.1	2.5	3.0	2.9	3.0
Mean d	2.0	1.8	1.6	1.7	1.6	1.4
W/D	13.0	15.1	13.5	14.7	18.2	23.7

MY00-2006			MY01-2007			MY02-2008			MY03-2009			MY04-2010			MY05-2011		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
-10.92	576.97		0.00	576.72	LPIN	0.00	576.77	LPIN	0.00	576.83	LPIN	0.00	576.88	LPIN	0.00	576.88	LPIN
-1.10	576.90		4.05	576.10		13.34	575.08		0.52	576.57		12.09	575.06		0.12	576.65	
0.00	576.88	LPIN	10.73	575.15		27.96	574.51		5.63	576.11		18.81	574.52		2.28	576.05	
15.28	574.55		16.08	574.57		33.85	574.07	)BL Bankfu	11.62	575.19		25.84	574.44		7.76	575.52	
30.15	574.43	3L Bankfull	19.66	574.37		36.71	573.57		23.08	574.46		30.59	574.40	BL Bankfull	14.88	574.49	
35.01	573.65		29.66	574.47	3L Bankfull	38.01	572.90		30.85	574.47	ıkfull Left T	34.42	573.87		21.43	574.48	
38.54	572.16		32.50	574.01		40.05	572.18	TOE L	34.79	574.02		36.78	572.77		26.83	574.33	
40.04	571.39		34.52	573.77		41.18	571.93		37.99	572.84		40.74	572.07	TOE L	31.06	574.37	
41.75	571.28		36.89	572.98		44.51	571.59	TW	41.27	571.94	TOE	41.94	571.99		33.15	574.07	TOBL
44.88	571.25	TW	38.55	572.90		48.21	571.63		44.44	571.51		44.05	571.60		35.37	573.74	NKFULL LE
50.31	571.44		39.11	572.50		50.80	572.03	TOE R	45.73	571.74	TW	44.48	571.69		37.19	573.11	
52.95	572.29		40.11	572.19		53.37	572.85		48.11	571.59		45.72	571.56	TW	39.15	572.46	
56.76	574.50	lankfull Rigl	40.53	571.71		57.35	574.91	)BR Bankfu	50.29	571.91	TOE	47.60	571.69		40.47	572.15	
57.20	574.76	TOBR	40.77	571.51		68.18	574.88		52.30	572.61		50.54	572.05	TOE R	41.22	571.82	TOE L
74.47	574.94	RPIN	43.19	571.42	TW	74.41	575.00	RPIN	56.71	574.66	lankfull Rigl	53.11	572.68		43.03	571.55	
75.02	574.98		44.13	571.42					58.62	575.02	TOBR	56.17	574.43	lankfull Rigl	44.37	571.53	TW
79.14	576.66		45.14	571.53					64.28	574.85		57.64	575.05	TOBR	45.74	571.51	
90.27	577.58		45.90	571.52					68.65	574.82		62.87	575.03		47.98	571.42	
			46.48	571.61					74.01	575.01		68.67	574.88		49.70	571.58	
			48.17	571.66					74.65	574.98	RPIN	74.54	575.01	RPIN	50.76	571.88	TOE R
			49.96	571.75											52.23	572.40	
			51.19	571.92											53.46	572.81	
			51.73	572.00											54.92	573.79	NKFULL RI
			52.52	572.43											56.38	574.40	
			54.63	573.80											57.90	574.92	TOBR
			56.82	574.50	lankfull Right										61.37	574.99	
			57.72	574.87	TOBR										66.76	574.91	
			67.16	574.90											71.40	574.88	
			74.43	574.94	RPIN										74.06	574.94	
															74.40	575.00	RPIN

Photo of XS-1, looking in the downstream direction

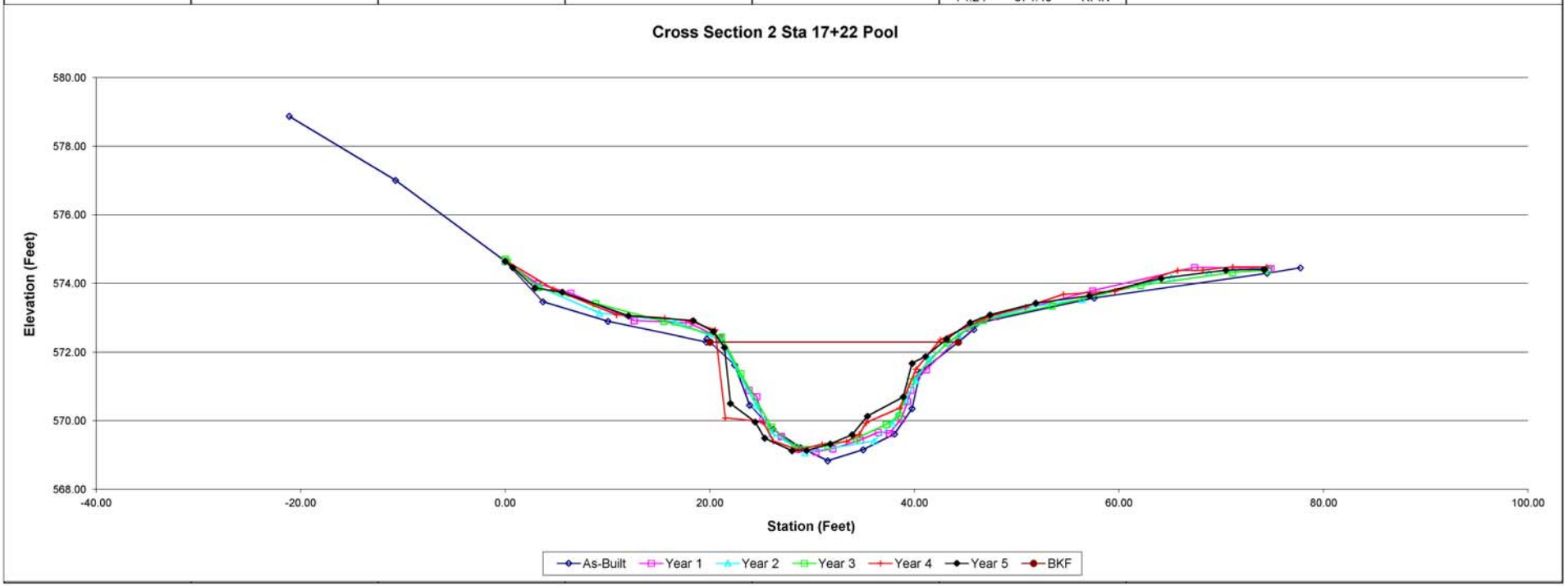
Project:	UT to Cane Creek
Cross Section:	Cross Section 2
Feature	Pool
Station:	17+22
Date:	3/15/11
Crew:	SV.ZP

Summary (bankfull)

	MY0	MY1	MY2	MY3	MY4	MY5
A (Bankfull	51.9	49.6	46.9	47.6	44.6	46.1
W (Bankfu	24.3	23.3	22.3	22.9	21.7	21.7
Max d	3.5	3.3	3.2	3.2	3.1	3.2
Mean d	2.1	2.1	2.1	2.1	2.1	2.1
W/D	11.3	10.9	10.6	11.0	10.5	10.3

MY00-2006			MY01-2007			MY02-2008			MY03-2009			MY04-2010			MY05-2011		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
-21.13	578.87		0.00	574.64	LPIN	0.00	574.65	LPIN	0.00	574.70	LPIN	0.00	574.66	LPIN	0.00	574.64	LPIN
-10.73	577.00		3.09	573.99		3.22	573.90		0.18	574.63		4.69	573.83		0.72	574.46	
0.00	574.64	LPIN	6.41	573.71		9.20	573.13		3.22	573.88		10.87	573.08		2.90	573.86	
3.67	573.46		12.60	572.91		16.59	572.88	Bankfull Lef	8.83	573.41		15.59	572.99		5.56	573.74	
10.03	572.89		17.96	572.84	TOBL	21.10	572.34	TOBL	15.50	572.89		18.13	572.89		12.03	573.05	
19.65	572.29	BL Bankfull	20.99	572.40	Bankfull Lef	24.52	570.44		21.17	572.43	kfull Left T	20.52	572.63	L Bankfull L	18.37	572.91	
19.69	572.38		23.83	570.89		26.06	569.63	TOE L	23.03	571.37		20.51	572.64		20.34	572.59	TOBL
22.42	571.62		24.59	570.70		29.32	569.07	TW	26.02	569.82	TOE	21.50	570.08	TOE L	21.42	572.13	NKFULL LE
23.88	570.45		25.18	570.02		36.04	569.40		28.32	569.23		25.21	569.96		22.01	570.50	
26.16	569.75		26.99	569.54		37.83	569.91		31.56	569.26	TW	26.19	569.40		24.42	569.96	TOE L
28.86	569.21		28.65	569.17		39.18	570.61	TOE R	34.38	569.49		28.67	569.14	TW	25.35	569.49	
31.52	568.83	TW	30.36	569.09	TW	40.13	571.17		37.26	569.89		30.96	569.31		28.03	569.12	TW
34.98	569.15		32.03	569.18		41.41	571.79		38.49	570.14	TOE	33.37	569.39		29.46	569.13	
38.04	569.61		34.71	569.43		44.30	572.49		39.61	571.14		34.61	569.60		31.77	569.32	
39.76	570.35		36.48	569.66		46.09	572.86	R Bankfull	43.17	572.27		35.27	569.94		33.91	569.59	
40.57	571.41		37.57	569.63		51.04	573.29		46.74	572.92	kfull Right T	38.57	570.37	TOE R	35.40	570.13	
45.80	572.65	ankfull Righ	38.73	570.05		56.40	573.53		53.46	573.34		40.15	571.50		38.91	570.69	TOE R
46.13	572.83	TOBR	39.33	570.56		65.12	574.17		62.11	573.94		42.53	572.36	TOBR	39.78	571.67	
57.57	573.57		39.66	570.89		68.78	574.32		71.10	574.31		47.29	573.03		41.08	571.87	
74.48	574.29	RPIN	40.24	571.31		74.38	574.43	RPIN	74.56	574.38	RPIN	50.89	573.31		43.15	572.38	NKFULL RI
77.73	574.45		41.17	571.49								54.59	573.68		45.45	572.85	TOBR
			45.23	572.69	R Bankfull Right							59.61	573.77		47.39	573.08	
			47.96	573.03								65.72	574.37		51.86	573.42	
			57.43	573.78								68.18	574.38		57.10	573.63	
			67.39	574.46								71.13	574.48		64.13	574.14	
			74.66	574.43	RPIN							74.42	574.48	RPIN	70.45	574.38	
			74.87	574.43											74.12	574.40	
															74.24	574.40	RPIN

Photo of XS-2, looking in the downstream direction



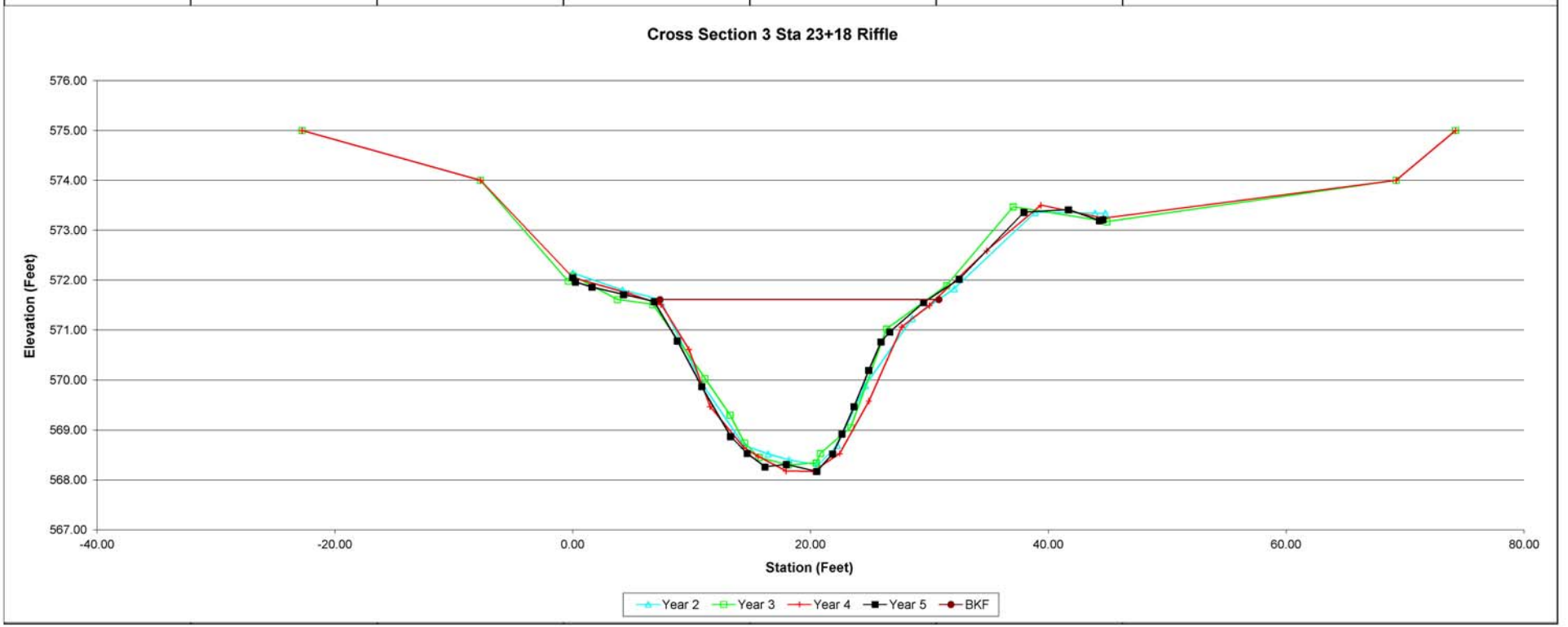
Project:	UT to Cane Creek
Cross Section:	Cross Section 3
Feature	Riffle
Station:	23+18
Date:	3/15/11
Crew:	SV.ZP

Summary (bankfull)

	MY0	MY1	MY2	MY3	MY4	MY5
A (Bankfull)			45.8	42.1	47.6	46.7
W (Bankfull)			23.5	22.5	23.5	23.8
Max d			3.3	3.2	3.4	3.4
Mean d			2.0	1.9	2.0	2.0
W/D			12.0	12.0	11.6	12.1

MY00-2006			MY01-2007			MY02-2008			MY03-2009			MY04-2010			MY05-2011		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
Data not available			Data not available			0.00	572.14	LPIN	-22.76	575.00		-22.76	575.00		0.00	572.05	LPIN
						4.17	571.80		-7.76	574.00		-7.76	574.00		0.22	571.96	
						7.33	571.61	)BL Bankfu	-0.37	571.98		0.00	572.05	LPIN	1.62	571.86	
						10.83	569.94		0.00	572.09	LPIN	4.70	571.73		4.28	571.71	
						14.38	568.69	TOE L	3.76	571.61		7.43	571.51	3L Bankfull	6.85	571.57	TOBL
						16.43	568.52		6.73	571.51	ıkfull Left T	9.76	570.61		8.79	570.78	NKFULL LE
						18.17	568.40		11.12	570.03		11.55	569.47		10.85	569.87	
						20.65	568.30	TW	13.23	569.30		14.37	568.65	TOE L	13.28	568.87	
						22.24	568.69	TOE R	14.45	568.74	TOE	15.58	568.47		14.67	568.53	TOE L
						24.60	569.89		15.68	568.45		17.94	568.18	TW	16.17	568.26	
						28.54	571.23	)BR Bankfu	18.11	568.30	TW	20.22	568.17		17.96	568.31	TW
						32.08	571.83		20.48	568.34		22.45	568.53	TOE R	20.53	568.17	
						38.89	573.36		20.82	568.53	TOE	24.90	569.58		21.85	568.52	TOE R
						43.91	573.34		23.38	569.05		27.67	571.06	TOBR	22.64	568.92	
						44.78	573.34	RPIN	26.39	571.02	ıfull Right T	29.99	571.49	ankfull Righ	23.65	569.47	
									31.44	571.89		34.82	572.59		24.89	570.19	
									37.04	573.47		39.37	573.50		25.92	570.76	NKFULL RI
									44.91	573.17	RPIN	44.64	573.24	RPIN	26.66	570.96	TOBR
									69.24	574.00		69.24	574.00		29.51	571.55	
									74.24	575.00		74.24	575.00		32.50	572.02	
															37.94	573.36	
															41.68	573.41	
															44.29	573.19	
															44.59	573.21	RPIN

Photo of XS-3 looking in the downstream direction



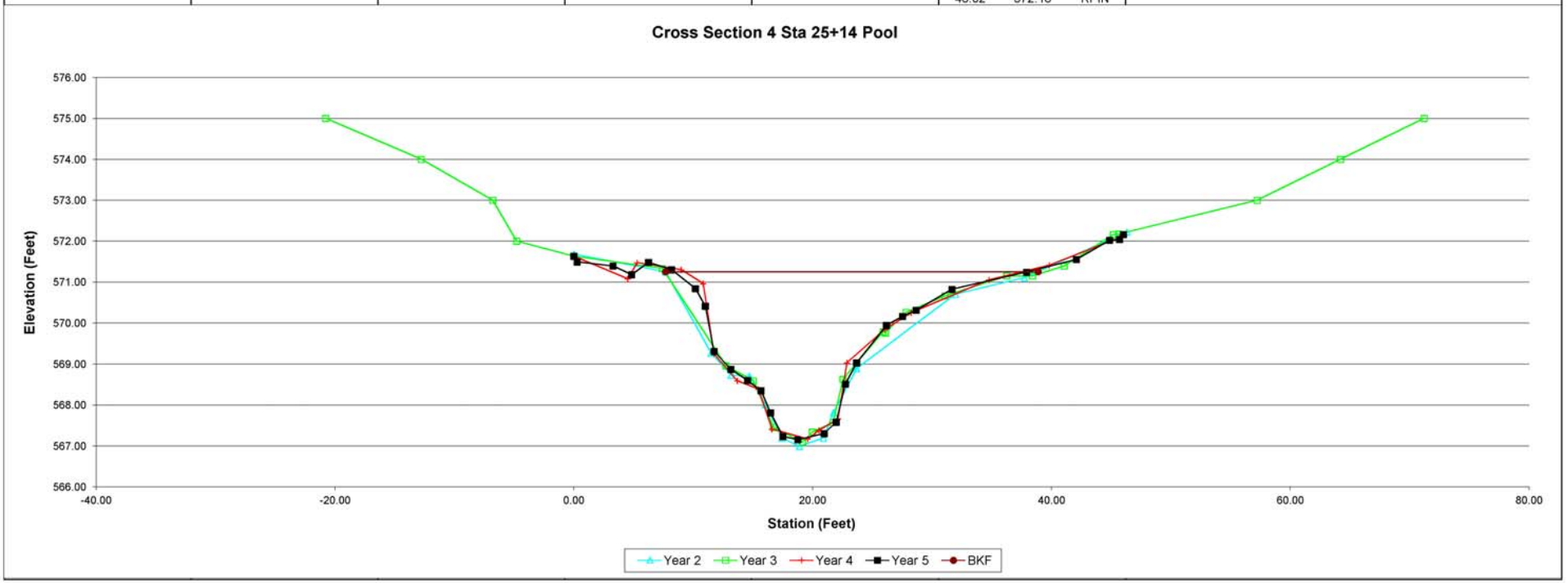
Project:	UT to Cane Creek
Cross Section:	Cross Section 4
Feature	Pool
Station:	25+14
Date:	3/15/11
Crew:	SV.ZP

Summary (bankfull)

	MY0	MY1	MY2	MY3	MY4	MY5
A (Bankfull			57.8	55.8	52.0	51.4
W (Bankfu			31.2	33.0	28.3	29.6
Max d			4.3	4.2	4.1	4.1
Mean d			1.9	1.7	1.8	1.7
W/D			16.9	19.5	15.4	17.1

MY00-2006			MY01-2007			MY02-2008			MY03-2009			MY04-2010			MY05-2011		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
Data not available			Data not available			0.00	571.68	LPIN	-20.79	575.00		0.00	571.63	LPIN	0.00	571.63	LPIN
						7.67	571.25	3L Bankfull	-12.79	574.00		4.51	571.08		0.27	571.49	
						11.49	569.27		-6.79	573.00		5.31	571.47		3.28	571.39	
						13.17	568.73		-4.79	572.00		8.98	571.30	3ankfull Lef	4.84	571.18	
						14.70	568.70		0.00	571.63	LPIN	10.82	570.96	TOBL	6.25	571.48	
						16.02	568.01	TOE L	7.40	571.33	ıkfull Left T	11.73	569.25		8.18	571.30	
						17.40	567.19		12.73	568.96		13.69	568.59		10.17	570.84	TOBL
						18.88	566.99	TW	15.03	568.59		15.46	568.39		11.01	570.41	NKFULL LE
						20.90	567.19		16.73	567.45	TOE L	16.59	567.41	TOE L	11.74	569.31	
						21.74	567.81	TOE R	19.16	567.09	TW	19.58	567.17	TW	13.15	568.87	
						23.67	568.89		19.97	567.34		20.53	567.38		14.54	568.60	
						31.96	570.70	R Bankfull	21.71	567.57	TOE R	22.12	567.66	TOE R	15.67	568.35	
						37.73	571.10		22.54	568.63		22.87	569.03		16.47	567.81	TOE L
						46.31	572.22	RPIN	25.90	569.78		26.02	569.84		17.50	567.23	
									26.09	569.76		28.25	570.25	TOBR	18.75	567.15	TW
									27.83	570.26	ıfull Right T	34.77	571.05		20.96	567.30	
									31.07	570.66		39.81	571.41		21.97	567.58	TOE R
									36.26	571.15		45.69	572.08	RPIN	22.74	568.51	
									38.41	571.15					23.68	569.03	
									41.06	571.39					26.18	569.94	
									45.18	572.16					27.53	570.16	NKFULL RI
									45.61	572.17	RPIN				28.66	570.31	TOBR
									57.21	573.00					31.67	570.82	
									64.21	574.00					37.91	571.24	
									71.21	575.00					42.08	571.55	
															44.86	572.02	
															45.70	572.04	
															46.02	572.16	RPIN

Photo of XS-4, looking in the downstream direction



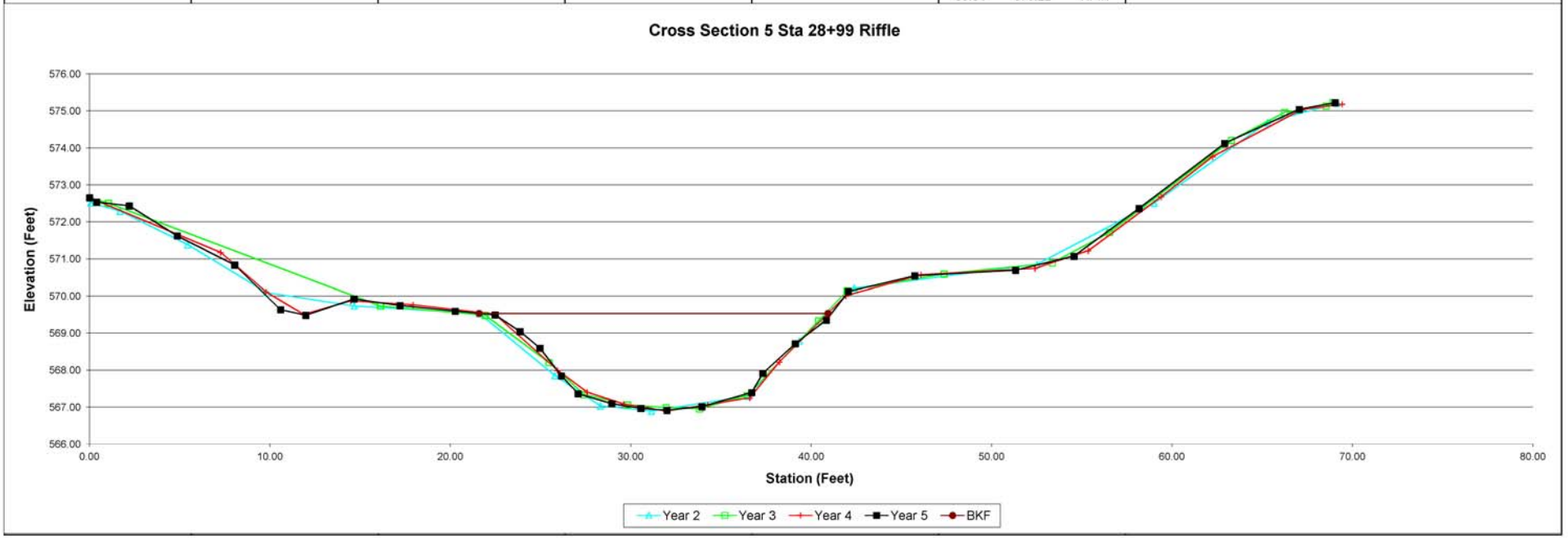
Project:	UT to Cane Creek
Cross Section:	Cross Section 5
Feature	Riffle
Station:	28+99
Date:	3/15/11
Crew:	SV.ZP

Summary (bankfull)

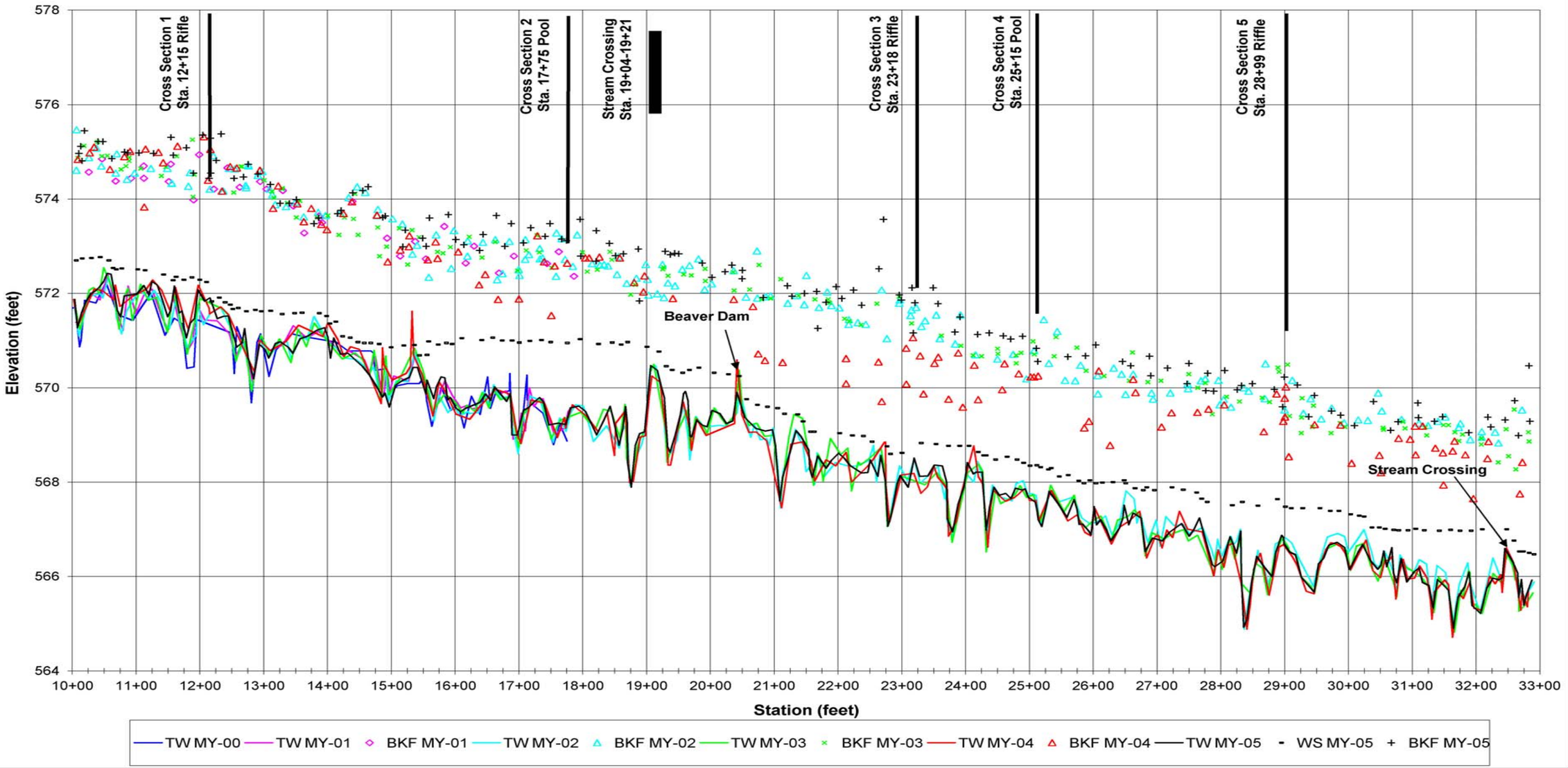
	MY0	MY1	MY2	MY3	MY4	MY5
A (Bankfull			34.0	31.8	39.0	32.4
W (Bankful			19.3	18.8	22.7	19.5
Max d			2.6	2.5	2.8	2.6
Mean d			1.8	1.7	1.7	1.7
W/D			11.0	11.1	13.2	11.8

MY00-2006			MY01-2007			MY02-2008			MY03-2009			MY04-2010			MY05-2011		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
Data not available			Data not available			0.00	572.65	LPIN	0.00	572.65	LPIN	0.00	572.65	LPIN	0.00	572.65	LPIN
						0.06	572.51		1.04	572.50		7.27	571.17		0.40	572.53	
						1.69	572.29		16.11	569.73		9.77	570.11		2.20	572.43	
						5.43	571.38		16.15	569.73		11.87	569.50		4.86	571.62	
						9.81	570.09		21.93	569.48	ıkfull Left T	14.48	569.87		8.05	570.83	
						14.67	569.73		25.47	568.20		17.93	569.76		10.59	569.63	
						21.59	569.53	3L Bankfull	27.40	567.34	TOE L	22.45	569.51	3L Bankfull	11.99	569.48	
						25.79	567.85		29.83	567.06		25.93	567.99		14.66	569.92	
						28.31	567.03	TOE L	31.96	566.98	TW	27.58	567.40	TOE L	17.21	569.74	
						31.14	566.89	TW	33.82	566.95		29.60	567.08		20.27	569.59	
						36.50	567.29	TOE R	36.45	567.31	TOE R	31.94	566.89	TW	22.48	569.49	TOBL
						39.34	568.79		40.40	569.33		34.26	567.06		23.86	569.04	NKFULL LE
						42.38	570.21	R Bankfull	41.99	570.14	ıfull Right T	36.59	567.25	TOE R	24.96	568.59	
						52.52	570.85		47.36	570.59		38.24	568.22		26.16	567.84	
						59.00	572.50		53.36	570.89		41.91	570.00	R Bankfull	27.08	567.36	TOE L
						65.28	574.68		56.53	571.71		46.08	570.57		28.95	567.09	
						69.17	575.21	RPIN	63.29	574.20		52.40	570.74		30.56	566.96	
									66.24	574.96		55.36	571.22		32.00	566.91	TW
									68.53	575.13		59.40	572.68		33.94	567.01	
									68.93	575.23	RPIN	62.24	573.76		36.70	567.39	TOE R
												67.16	575.03		37.32	567.91	
												69.42	575.18	RPIN	39.12	568.71	NKFULL RI
															40.84	569.35	
															42.06	570.12	TOBR
															45.74	570.54	
															51.33	570.69	
															54.57	571.07	
															58.17	572.36	
															62.92	574.12	
															67.05	575.04	
															69.04	575.22	RPIN

Photo of XS-5, looking in the downstream direction

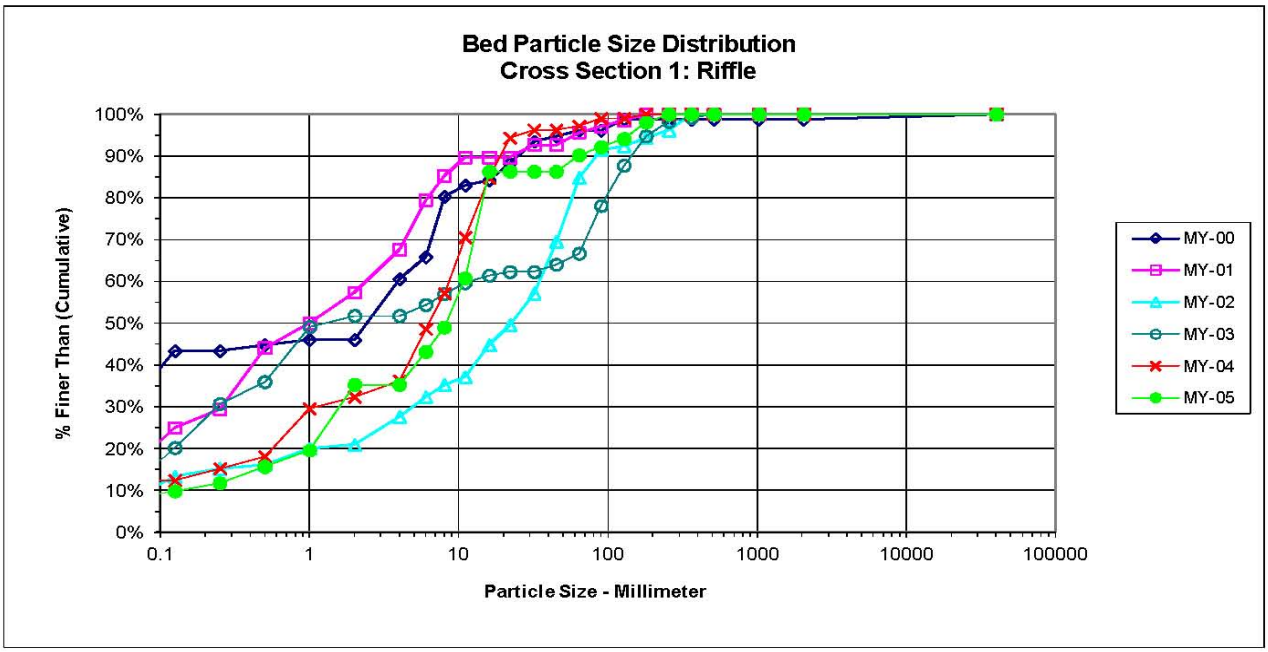


UT to Cane Creek
Longitudinal Profile
Main Channel: Station 10+00-32+90



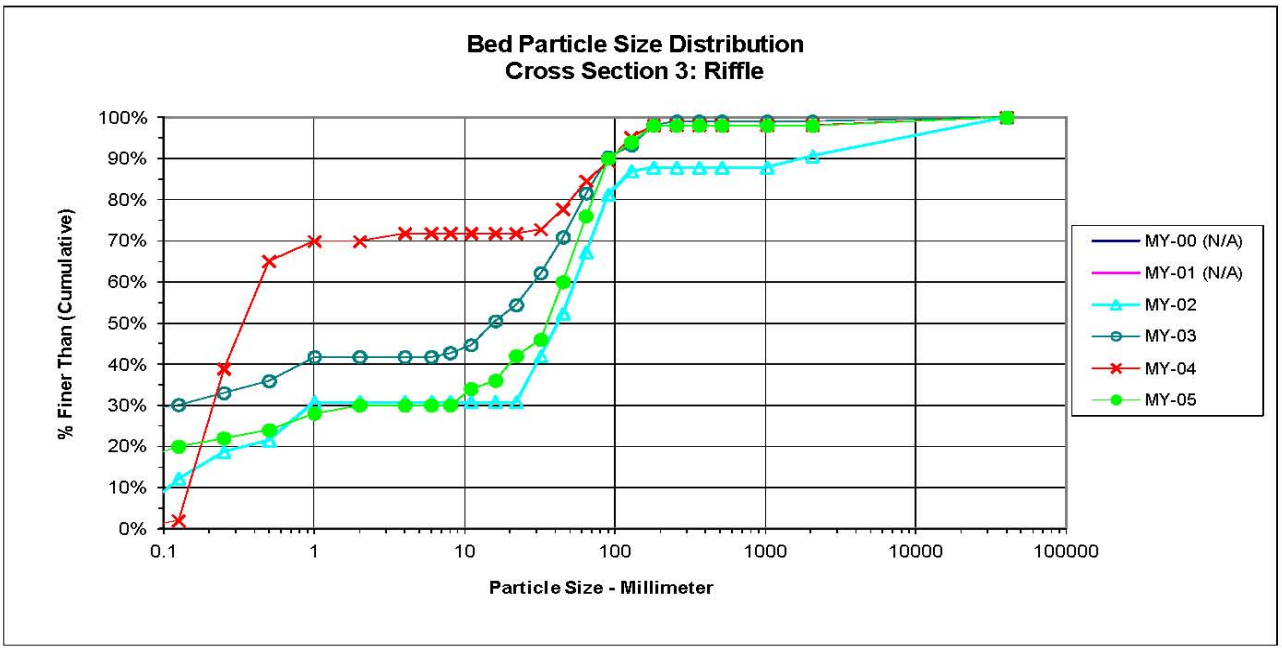
PEBBLE COUNT								
Project:	UT to Cane Creek, Project # 69					**Date:**	10/20/2011	
Location:	Cross Section #1							
				Particle Counts				
Inches	Particle	Millimeter		Riffles	Pools	Total No.	Item %	% Cumulative
	Silt/Clay	< 0.062	S/C	8	0	8	8%	8%
	Very Fine	.062 - .125	S	2	0	2	2%	10%
	Fine	.125 - .25	A	2	0	2	2%	12%
	Medium	.25 - .50	N	4	0	4	4%	16%
	Coarse	.50 - 1.0	D	4	0	4	4%	20%
.04 -.08	Very Coarse	1.0 - 2.0	S	16	0	16	16%	35%
.08 - .16	Very Fine	2.0 - 4.0		0	0	0	0%	35%
.16 - .22	Fine	4.0 - 5.7	G	8	0	8	8%	43%
.22 - .31	Fine	5.7 - 8.0	R	6	0	6	6%	49%
.31 - .44	Medium	8.0 - 11.3	A	12	0	12	12%	61%
.44 - .63	Medium	11.3 - 16.0	V	26	0	26	25%	86%
.63 - .89	Coarse	16.0 - 22.6	E	0	0	0	0%	86%
.89 - 1.26	Coarse	22.6 - 32.0	L	0	0	0	0%	86%
1.26 - 1.77	Very Coarse	32.0 - 45.0	S	0	0	0	0%	86%
1.77 - 2.5	Very Coarse	45.0 - 64.0		4	0	4	4%	90%
2.5 - 3.5	Small	64 - 90	C	2	0	2	2%	92%
3.5 - 5.0	Small	90 - 128	O	2	0	2	2%	94%
5.0 - 7.1	Large	128 - 180	B	4	0	4	4%	98%
7.1 - 10.1	Large	180 - 256	L	2	0	2	2%	100%
10.1 - 14.3	Small	256 - 362	B	0	0	0	0%	100%
14.3 - 20	Small	362 - 512	L	0	0	0	0%	100%
20 - 40	Medium	512 - 1024	D	0	0	0	0%	100%
40 - 80	Lrg- Very Lrg	1024 - 2048	R	0	0	0	0%	100%
	Bedrock		BDRK	0	0	0	0%	100%
			Totals	**102**	**0**	**102**	**100%**	**100%**

d16	d35	d50	d84	d95
0.5	2.0	8.3	15.6	139.7



PEBBLE COUNT								
Project:	UT to Cane Creek, Project # 69					**Date:**	10/20/2011	
Location:	Cross Section #3							
				Particle Counts				
Inches	Particle	Millimeter		Riffles	Pools	Total No.	Item %	% Cumulative
	Silt/Clay	< 0.062	S/C	16	0	16	16%	16%
	Very Fine	.062 - .125	S	4	0	4	4%	20%
	Fine	.125 - .25	A	2	0	2	2%	22%
	Medium	.25 - .50	N	2	0	2	2%	24%
	Coarse	.50 - 1.0	D	4	0	4	4%	28%
.04 -.08	Very Coarse	1.0 - 2.0	S	2	0	2	2%	30%
.08 - .16	Very Fine	2.0 - 4.0		0	0	0	0%	30%
.16 - .22	Fine	4.0 - 5.7	G	0	0	0	0%	30%
.22 - .31	Fine	5.7 - 8.0	R	0	0	0	0%	30%
.31 - .44	Medium	8.0 - 11.3	A	4	0	4	4%	34%
.44 - .63	Medium	11.3 - 16.0	V	2	0	2	2%	36%
.63 - .89	Coarse	16.0 - 22.6	E	6	0	6	6%	42%
.89 - 1.26	Coarse	22.6 - 32.0	L	4	0	4	4%	46%
1.26 - 1.77	Very Coarse	32.0 - 45.0	S	14	0	14	14%	60%
1.77 - 2.5	Very Coarse	45.0 - 64.0		16	0	16	16%	76%
2.5 - 3.5	Small	64 - 90	C	14	0	14	14%	90%
3.5 - 5.0	Small	90 - 128	O	4	0	4	4%	94%
5.0 - 7.1	Large	128 - 180	B	4	0	4	4%	98%
7.1 - 10.1	Large	180 - 256	L	0	0	0	0%	98%
10.1 - 14.3	Small	256 - 362	B	0	0	0	0%	98%
14.3 - 20	Small	362 - 512	L	0	0	0	0%	98%
20 - 40	Medium	512 - 1024	D	0	0	0	0%	98%
40 - 80	Lrg- Very Lrg	1024 - 2048	R	0	0	0	0%	98%
	Bedrock		BDRK	2	0	2	2%	100%
			Totals	**100**	**0**	**100**	**100%**	**100%**

d16	d35	d50	d84	d95
0.1	13.5	35.7	78.9	141.0



PEBBLE COUNT								
Project:	UT to Cane Creek, Project # 69					**Date:**	10/20/2011	
Location:	Cross Section #5							
				Particle Counts				
Inches	Particle	Millimeter		Riffles	Pools	Total No.	Item %	% Cumulative
	Silt/Clay	< 0.062	S/C	14	0	14	14%	14%
	Very Fine	.062 - .125	S	6	0	6	6%	20%
	Fine	.125 - .25	A	2	0	2	2%	22%
	Medium	.25 - .50	N	6	0	6	6%	28%
	Coarse	.50 - 1.0	D	1	0	1	1%	29%
.04 -.08	Very Coarse	1.0 - 2.0	S	2	0	2	2%	31%
.08 - .16	Very Fine	2.0 - 4.0		0	0	0	0%	31%
.16 - .22	Fine	4.0 - 5.7	G	10	0	10	10%	41%
.22 - .31	Fine	5.7 - 8.0	R	0	0	0	0%	41%
.31 - .44	Medium	8.0 - 11.3	A	10	0	10	10%	50%
.44 - .63	Medium	11.3 - 16.0	V	4	0	4	4%	54%
.63 - .89	Coarse	16.0 - 22.6	E	6	0	6	6%	60%
.89 - 1.26	Coarse	22.6 - 32.0	L	10	0	10	10%	70%
1.26 - 1.77	Very Coarse	32.0 - 45.0	S	6	0	6	6%	76%
1.77 - 2.5	Very Coarse	45.0 - 64.0		12	0	12	12%	88%
2.5 - 3.5	Small	64 - 90	C	10	0	10	10%	98%
3.5 - 5.0	Small	90 - 128	O	0	0	0	0%	98%
5.0 - 7.1	Large	128 - 180	B	0	0	0	0%	98%
7.1 - 10.1	Large	180 - 256	L	2	0	2	2%	100%
10.1 - 14.3	Small	256 - 362	B	0	0	0	0%	100%
14.3 - 20	Small	362 - 512	L	0	0	0	0%	100%
20 - 40	Medium	512 - 1024	D	0	0	0	0%	100%
40 - 80	Lrg- Very Lrg	1024 - 2048	R	0	0	0	0%	100%
	Bedrock		BDRK	0	0	0	0%	100%
			Totals	**101**	**0**	**101**	**100%**	**100%**

d16	d35	d50	d84	d95
0.1	4.9	10.9	57.4	82.1

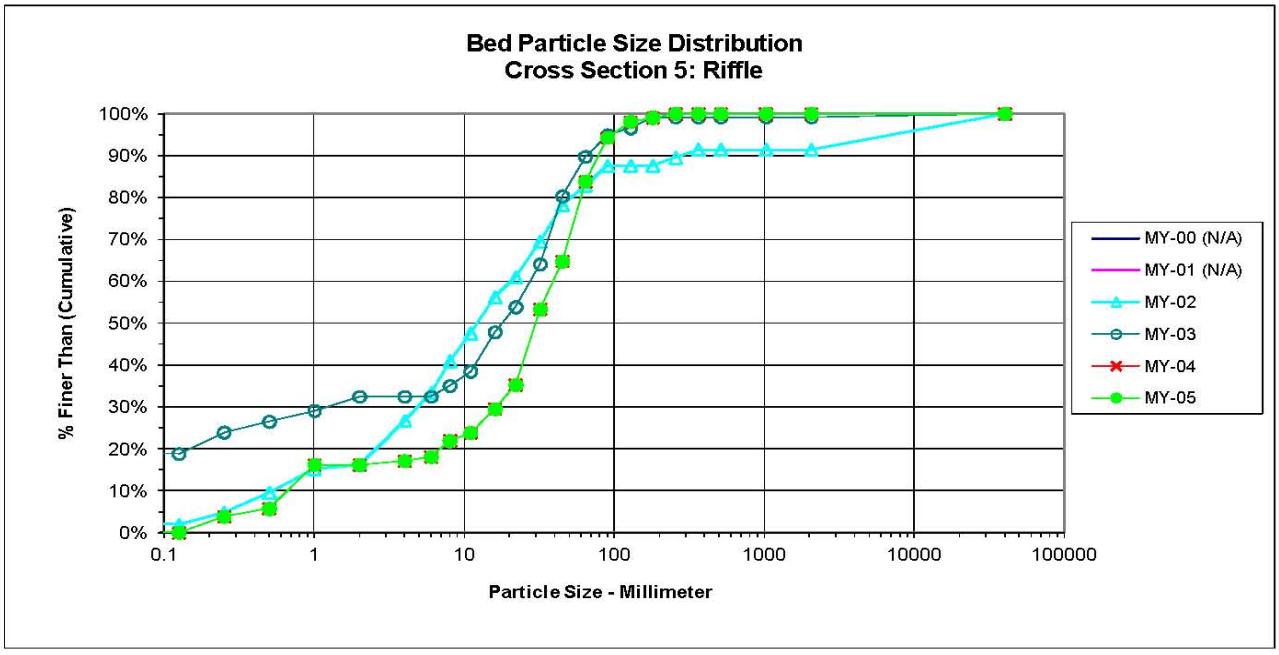


Table 10a. Baseline Stream Data Summary
Cane Creek Stream Mitigation Site/Project No. 69 Main Channel (2232 feet)

Parameter	Gauge[2]	Regional Curve			Pre-Existing Condition						Reference Reach(es) Data						Design			Monitoring Baseline					
Dimension and Substrate - Riffle Only		LL	UL	Eq.	Min	Mean	Med	Max	SD[5]	n	Min	Mean	Med	Max	SD[5]	n	Min	Med	Max	Min	Mean	Med	Max	SD[5]	n
Bankfull Width (ft)							44.5						14.3					24				26.6			
Floodprone Width (ft)							88						47					72				72			
Bankfull Mean Depth (ft)							1						1.5					2				2.2			
[1]Bankfull Max Depth (ft)													2.2					3.2							
Bankfull Cross Sectional Area (ft^2)							46.5						21.4					47.7				51			
Width/Depth Ratio							43						10					12				13.9			
Entrenchment Ratio							2						3.3					3				2.7			
[1]Bank Height Ratio							0.8											1				1			
Profile																									
Riffle Length (ft)																				48		54	60		
Riffle Slope (ft/ft)							0.016											0.003		0.002		0.032	0.004		
Pool Length (ft)																				31		43	79		
Pool Max depth (ft)													2.5					5							
Pool Spacing (ft)							355				9			49				82		77		100	160		
Pattern																									
Channel Beltwidth (ft)							63						80					105				110			
Radius of Curvature (ft)							24				9.3			29			48	60	72	44		64	83		
Rc:Bankfull width (ft/ft)											0.7			3			2		3						
Meander Wavelength (ft)							218				32			92			53	123	192	48		127	205		
Meander Width Ratio							14						5.6					4.38				4.14			
Transport parameters																									
Reach Shear Stress (competency) lb/f^2							0.54											0.26							
Max part size (mm) mobilized at bankfull							55											55							
Stream Power (transport capacity) W/m^2																									
Additional Reach Parameters																									
Rosgen Classification							C4						C4b					C4				C4			
Bankfull Velocity (fps)							4.3											4.2							
Bankfull Discharge (cfs)							202																		
Valley length (ft)							1960																		
Channel Thalweg length (ft)							2301						397					2232				2232			
Sinuosity (ft)							1.17						1.2					1.14				1.14			
Water Surface Slope (Channel) (ft/ft)							0.0056											0.0023				0.0029			
BF slope (ft/ft)							0.0056											0.0023				0.0032			
[3]Bankfull Floodplain Area (acres)																									
[4]% of Reach with Eroding Banks																									
Channel Stability or Habitat Metric																									
Biological or Other																									

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile. 2 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data; 5. Of value/needed only if the n exceeds 3

Table 10b. Baseline Stream Data Summary (Substrate, Bed, Bank, and Hydrologic Containment Parameter Distributions)
Cane Creek Stream Mitigation Site/Project No. 69 Main Channel (2232 feet)

Parameter	Pre-Existing Condition							Reference Reach(es) Data							Design							As-built/Baseline						
[1]Ri% / Ru% / P% / G% / S%																												
[1]SC% / Sa% / G% / C% / B% / Be%																												
[1]d16 / d35 / d50 / d84 / d95 / di^{p} / di^{sp} (mm)			18																									
[2]Entrenchment Class <1.5 / 1.5-1.99 / 2.0-4.9 / 5.0-9.9 / >10			100																					2.3	11			
[3]Incision Class <1.2 / 1.2-1.49 / 1.5-1.99 / >2.0																												

Shaded cells indicate that these will typically not be filled in.

1 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave

2 = Entrenchment Class - Assign/bin the reach footage into the classes indicated and provide the percentage of the total reach footage in each class in the table. This will result from the measured cross-sections as well as visual estimates

3 = Assign/bin the reach footage into the classes indicated and provide the percentage of the total reach footage in each class in the table. This will result from the measured cross-sections as well as the longitudinal profile

Footnotes 2,3 - These classes are loosley built around the Rosgen classification and hazard ranking breaks, but were adjusted slightly to make for easier assignment to somewhat coarser bins based on visual estimates in the field such that measurement of every segment for ER would not be necessary.
The intent here is to provide the reader/consumer of design and monitoring information with a good general sense of the extent of hydrologic containment in the pre-existing and the rehabilitated states as well as comparisons to the reference distributions.
ER and BHR have been addressed in prior submissions as a subsample (cross-sections as part of the design survey), however, these subsamples have often focused entirely on facilitating design without providing a thorough pre-constrution distribution of these parameters, leaving the reader/consumer with a sample that is weighted heavily on the stable sections of the reach. This means that the distributions for these parameters should include data from both the cross-section surveys and the longitudinal profile and in the case of ER, visual estimates. For example, the typical longitudinal profile permits sampling of the BHR at riffles beyond those subject to cross-sections and therefore can be readily integrated and provide a more complete sample distribution for these parameters, thereby providing the distribution/coverage necessary to provide meaningful comparisons.

Table 11a. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters – Cross Sections)
Cane Creek Stream Mitigation Site/Project No. 69 Main Channel (2232 feet)

	Cross Section 1 (Riffle)							Cross Section 2 (Pool)							Cross Section 3 (Riffle)							Cross Section 4 (Pool)							Cross Section 5 (Riffle)						
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Record elevation (datum) used	574.43	574.43	574.43	574.43	574.43	547.43		572.29	572.29	572.29	572.29	572.29	572.29		NA	N/A	571.61	571.61	571.61	571.61		N/A	N/A	571.25	571.25	571.25	571.25		NA	N/A	569.53	569.53	569.53	569.53	
Bankfull Width (ft)	26.489	27.2	28.31	25.45	25.528	33.238		24.268	24.2	26.17	27.24	23.934	21.74		NA	N/A	23.45	22.5	22.648	23.776		N/A	N/A	31.21	33	29.29	29.648		NA	N/A	26.31	25.67	18.45	19.529	
Floodprone Width (ft)	72	72	72	72	72	72		72	72	72	72	72	72		NA	N/A	95.4	95.4	95.4	95.4		NA	N/A	92	92	92	92		NA	N/A	59.1	59.1	59.1	59.1	
Bankfull Mean Depth (ft)	2.0359	1.8	1.65	1.74	1.7566	1.4036		2.1389	2.2	2.17	2.02	2.1618	2.1208		NA	N/A	1.95	1.87	2.0392	1.9628		NA	N/A	1.85	1.69	1.7846	1.7337		NA	N/A	1.65	1.53	1.7424	1.661	
Bankfull Max Depth (ft)	3.18	3.1	2.9	2.96	2.84	3.01		3.46	3.6	3.55	3.44	3.49	3.17		NA	N/A	3.31	3.21	3.34	3.44		NA	N/A	4.26	4.24	4.13	4.1		NA	N/A	2.83	2.86	2.62	2.62	
Bankfull Cross Sectional Area (ft^2)	53.931	48	46.77	44.18	44.842	46.654		51.907	53.6	56.69	55.12	51.741	46.106		NA	N/A	45.79	42.09	46.183	46.667		NA	N/A	57.77	55.77	52.27	51.4		NA	N/A	43.42	39.31	32.146	32.439	
Bankfull Width/Depth Ratio	13.011	15.4	17.14	14.66	14.532	23.68		11.346	11	12.08	13.47	11.072	10.251		NA	N/A	12.01	12.03	11.106	12.114		NA	N/A	16.86	19.53	16.413	17.102		NA	N/A	15.95	16.76	10.589	11.757	
Bankfull Entrenchment Ratio	2.7181	2.65	2.54	2.83	2.8205	2.1662		2.9668	2.97	2.75	2.64	3.0082	3.3118		NA	N/A	4.07	4.06	4.2123	4.0125		NA	N/A	2.95	2.79	3.141	3.1031		NA	N/A	2.25	3.15	3.2033	3.0262	
Bankfull Bank Height Ratio	1	1	0.86	0.92	1	0.8439		1	1	1.07	0.92	0.9226	1.0946		NA	N/A	0.89	0.85	0.8623	0.7703		NA	N/A	0.87	0.75	0.7458	0.7707		NA	N/A	0.93	0.87	1	0.9847	
Cross Sectional Area between end pins (ft^2)	151.1	131.77	130.6	128.29	138.79	136.91		160.07	146.86	151.17	148.68	149.87	144.77		NA	NA	88.887	85.31	86.947	86.355		NA	NA	87.254	79.74	75.709	77.461		NA	NA	258.52	250.16	253.7	254.14	
d50 (mm)	N/A	2.36	22.6	1.3	6.3	8.25		N/A	N/A	N/A	N/A	N/A	N/A		NA	N/A	42	15.6	0.4	35.714		NA	N/A	N/A	N/A	N/A	N/A		NA	N/A	12.4	18.1	30.2	10.85	

1 = Widths and depths for monitoring resurvey will be based on the baseline bankfull datum regardless of dimensional/depositional development. Input the elevation used as the datum, which should be consistent and based on the baseline datum established. If the performer has inherited the project and cannot acquire the datum used for prior years this must be discussed with EEP. If this cannot be resolved in time for a given years report submission a footnote in this should be included that states: "It is uncertain if the monitoring datum has been consistent over the monitoring history, which may influence calculated values. Additional data from a prior performer is being acquired to provide confirmation. Values will be recalculated in a future submission based on a consistent datum if determined to be necessary."

Exhibit Table 11b. Monitoring Data - Stream Reach Data Summary
Cane Creek Stream Mitigation Site/Project No. 69 Main Channel (2232 feet)

Parameter	Baseline (2006)						MY-1 (2007)						MY-2 (2008)						MY- 3 (2009)						MY- 4 (2010)						MY- 5 (2011)					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	26.49	26.49	26.49	26.49	N/A	1	27.066	27.07	27.066	27.0661	N/A	1	19.334	21.55	21.877	23.45	2.0778	3	18.764	22.24	22.5043	25.4513	3.3512	3	18.45	22.21	22.6478	25.52754	3.55932	3	19.529	25.51	23.776	33.238	7.01762	3
Floodprone Width (ft)	72	72	72	72	N/A	1	72	72	72	72	N/A	1	59.1	75.5	72	95.4	18.401	3	59.1	75.5	72	95.4	18.401	3	59.1	75.5	72	95.4	18.4014	3	59.1	75.5	72	95.4	18.4014	3
Bankfull Mean Depth (ft)	2.036	2.036	2.036	2.036	N/A	1	1.7951	1.795	1.7951	1.79514	N/A	1	1.6191	1.776	1.7567	1.952	0.1675	3	1.6952	1.767	1.73576	1.87024	0.0916	3	1.7424	1.846	1.75663	2.039165	0.16739	3	1.4036	1.676	1.661	1.9628	0.27986	3
[1]Bankfull Max Depth (ft)	3.18	3.18	3.18	3.18	N/A	1	3.05	3.05	3.05	3.05	N/A	1	2.48	2.81	2.64	3.31	0.4403	3	2.53	2.9	2.96	3.21	0.3439	3	2.62	2.933	2.84	3.34	0.36896	3	2.62	3.023	3.01	3.44	0.41016	3
Bankfull Cross Sectional Area (ft^2)	53.93	53.93	53.93	53.93	N/A	1	48.588	48.59	48.588	48.5876	N/A	1	33.964	38.39	35.421	45.79	6.4465	3	31.809	39.36	42.0884	44.1774	6.621	3	32.146	41.06	44.8424	46.18263	7.74616	3	32.439	41.92	46.654	46.667	8.21066	3
Width/Depth Ratio	13.01	13.01	13.01	13.01	N/A	1	15.077	15.08	15.077	15.0774	N/A	1	11.006	12.18	12.012	13.51	1.2609	3	11.069	12.59	12.0328	14.6629	1.86	3	10.589	12.08	11.1064	14.53213	2.1429	3	11.757	15.85	12.114	23.68	6.78297	3
Entrenchment Ratio	2.718	2.718	2.718	2.718	N/A	1	2.6602	2.66	2.6602	2.66015	N/A	1	3.0568	3.472	3.2911	4.068	0.5293	3	2.8289	3.406	3.14957	4.2392	0.7392	3	2.8205	3.412	3.2033	4.212326	0.71902	3	2.1662	3.068	3.0262	4.0125	0.92384	3
[1]Bank Height Ratio	1	1	1	1	N/A	1	1	1	1	1	N/A	1	0.8852	0.962	1	1	0.0663	3	0.8474	0.919	0.9223	0.98814	0.0704	3	0.8623	0.954	1	1	0.07952	3	0.7703	0.866	0.8439	0.9847	0.10894	3
Profile																																				
Riffle Length (ft)							55		49	43			8.8	26.5	17	73.1	18.91	22	2.41	28.89	22.93	94.05	23.18	28	5.86	29.25	24.14	56.19	16.64	21	3.83	34.74	26.65	98.94	26.2816	23
Riffle Slope (ft/ft)							0.004		0.006	0.008			0.002	0.020	0.020	0.052	0.015	20	0.002	0.019	0.012	0.077	0.019	22	0.001	0.018	0.011	0.082	0.023	14	0.001	0.015	0.011	0.050	0.014	21
Pool Length (ft)							24		57	89			17	69.05	58.5	132	35.17	22	18.99	49.3	36.21	147.1	30.49	29	16.98	63.57	43.58	155.53	40.1	23	18.65	63.58	52.41	176.96	37.6881	23
Pool Max depth (ft)																			3.15	3.83	3.79	4.5	0.36	29	2.33	3.31	3.28	4.62	0.58	23	2.7	3.713	3.65	4.66	0.51397	23
Pool Spacing (ft)							55		129	257			34	102.5	105	212	41.84	21	20.99	78.47	65.28	176.94	40.27	28	35	97.92	93.25	201.82	41.89	22	33.93	98.01	102.57	223.02	47.8743	22
Pattern																																				
Channel Beltwidth (ft)																																				
Radius of Curvature (ft)																																				
Rc:Bankfull width (ft/ft)																																				
Meander Wavelength (ft)																																				
Meander Width Ratio																																				

Pattern data will not typically be collected unless visual data, dimensional data or profile data indicate significant shifts from baseline

Additional Reach Parameters																																				
Rosgen Classification							C4						C4						C4						C4						C4					
Channel Thalweg length (ft)							2232						2288						2288						2285						2285					
Sinuosity (ft)							1.14						1.17						1.17						1.17						1.17					
Water Surface Slope (Channel) (ft/ft)							0.003						0.0026						0.0031						N/A						0.0027					
BF slope (ft/ft)							0.003						0.0026						0.003						0.0028						0.0025					
[3]Ri% / Ru% / P% / G% / S%													26%	-	68%	-	-		36%	-	64%	-	-		28%	-	66%	-	-		36%	2%	52%	10%	-	
[3]SC% / Sa% / G% / C% / B% / Be%													4%	19%	56%	13%	3%	6%	19%	23%	37%	19%	1%	1%	4%	35%	49%	11%	0%	1%	13%	19%	53%	15%	0%	1%
[3]d16 / d35 / d50 / d84 / d95 /													0.6	13.33	25.686	80.51	69.5		0.0385	2.947	11.6865	79.0085	141.93		0.33	8.375	12.2826	47.6344	83.3083		0.2551	6.784	18.271	50.608	120.923	
[2]% of Reach with Eroding Banks	N/A						5%						2%						0%						1%						<1%					
Channel Stability or Habitat Metric																																				
Biological or Other																																				

Shaded cells indicate that these will typically not be filled in.
1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile.
2 = Proportion of reach exhibiting banks that are eroding based on the visual survey from visual assessment table
3 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave
4. = Of value/needed only if the n exceeds 3

Appendix E. Hydrologic Data

Table 12. Verification of Bankfull Events

Verification of Bankfull Events Cane Creek / EEP #69			
Date of Data Collection	**Date of Occurrence**	**Method**	**Photo#**
Late 2005/Early 2006	Late 2005/Early 2006	Visual during construction	N/A
October 26, 2008	September 7, 2008	Wrack lines	None
July 24, 2009	June 6, 2009	Crest gauge	N/A
June 23, 2010	May 17, 2010	Visual observation	N/A
February 28, 2011	September 30, 2010	Visual Observation	1

Photo 1. Evidence of bankfull event observed on February 28, 2011.