FINAL

ANNUAL MONITORING REPORT
YEAR 1 (2012)
TATE FARM (RIPSHIN BRANCH)
STREAM/WETLAND RESTORATION SITE
ASHE COUNTY, NORTH CAROLINA
(EEP Project No. 372, Contract No. 004802)
Construction Completed December 2011

Submitted to:
North Carolina Department of Environment and Natural Resources
Ecosystem Enhancement Program
Raleigh, North Carolina

January 2013

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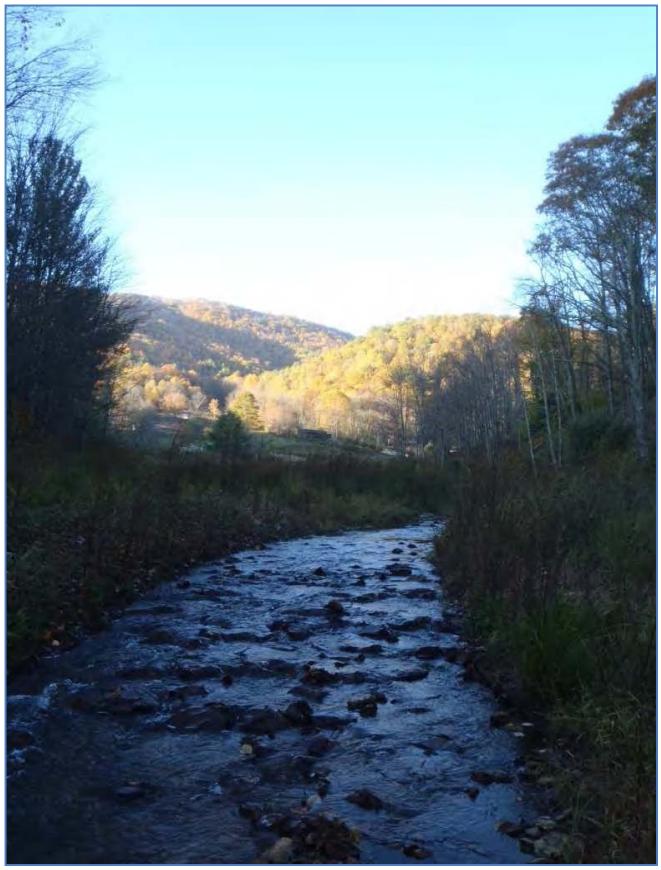

Submitted to:
North Carolina Department of Environment and Natural Resources
Ecosystem Enhancement Program
Raleigh, North Carolina

Prepared by:
Axiom Environmental, Inc.
218 Snow Avenue
Raleigh, North Carolina 27603

Axiom Environmental, Inc.

Ecosystem Enhancement PROGRAM

January 2013

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1.0 EXECUTIVE SUMMARY

The Tate Farm (Ripshin Branch) Stream and Wetland Restoration Site (hereafter referred to as the Site) is situated within US Geological Survey (USGS) hydrologic unit 05050001 of the Upper New River Basin and is in a portion of NC Division of Water Quality (NCDWQ) Priority Sub-basin 05-07-02. The project is located in the northwest corner of Ashe County, about 1 mile south of the Virginia state line and 3 miles east of the Tennessee state line (Figure 1, Appendix A). The Site is encompassed within a 61.92-acre easement located in a tract owned by Michael and Virginia Tate. The Site includes an unnamed tributary to Ripshin Branch (UT), Ripshin Branch proper, and associated floodplain wetlands (Figure 2, Appendix A). This report (compiled based on EEP's *Procedural Guidance and Content Requirements for EEP Monitoring Reports*, Version 1.4, dated 11/7/11) summarizes data for Year 1 (2012) monitoring.

The project goals are as follows:

- Improve stream water quality and ecological function by excluding livestock, restoring pool and riffle sequences, and restoring tree canopy and instream large woody debris.
- Enhance aquatic and terrestrial habitat in the stream corridor and adjacent wetlands.
- Enhance and/or restore the ecological function of riparian wetlands.
- Restore the riparian corridor (forested buffer) for watershed and wildlife benefits.
- Enhance habitat for native brook trout (*Salvelinus fontinalis*) and improve fishery potential.
- Increase biodiversity of the stream ecology, riparian buffers, and wetlands.

These goals will be accomplished through the implementation of the following objectives:

- Improve channel geomorphology toward reference conditions by providing watershed scaled and Rosgen-typed channel dimension, adding floodplain benches where floodplain access is not feasible, restoring sinuous pattern to straightened reaches where possible, and adjusting profile as needed to restore or maintain sediment transport equilibrium.
- Restore streamside floodprone area where appropriate (increase floodwater access to the floodplain).
- Reduce sediment and nutrient loading by reshaping and stabilizing banks, reducing bank scour, excluding livestock, and restoring riparian buffers.
- Enhance or restore wetland hydrology and vegetation in former pastures and filled wetlands.

During Year 1 (2012) monitoring, five vegetation plots were established and sampled. Vegetation Success Criteria (from approved *Ripshin Branch Stream & Wetland Restoration Plan* [NCEEP 2007]) includes the following:

- Survival of planted vegetation should exceed 80 percent after 5 years following planting (minimum 260 stems/acre).
- Planted vegetation stabilizing at 20 years with distinct canopy, subcanopy, and shrub layers.
- Establishment of herbaceous cover over 75 percent of the soil surface in restored wetlands and riparian areas.
- Plant biodiversity dominated by native species, with minimal ecological impact from invasive species.

Overall, vegetation exceeded success criteria with an average of 332 stems-per-acre across the Site. In addition, three of the five vegetation monitoring plots met, or exceeded success criteria of 320 stems-per-acre (minimum stem count after 1 year). Vegetation plots 2 and 4 were below success criteria with 283 and 121 stems-per-acre, respectively. Potential causes of the low stem counts at these plots could be excessive hydrology associated with wetland restoration and over competition by sedges and soft rush (*Carex* spp. and *Juncus effuses*, respectively).

A visual assessment and geomorphic survey were completed for the Site. The visual assessment indicated that project reaches were performing within established success criteria ranges as shown below. The only stream problem area includes a reach of moderate erosion located in the upper 150 to 200 linear feet of the UT. Erosion in this reach occurred during heavy rains immediately upon the completion of construction. Geomorphic measurements in this area indicate channel widening with subsequent sediment aggradation. This area will continue to be monitored for future channel erosion.

Stream Success Criteria (from approved *Ripshin Branch Stream & Wetland Restoration Plan* [NCEEP 2007]) is as follows:

- Channel morphology retains the design stream type over the majority of the reach.
- Coarsening of riffle bed material in newly constructed reaches.
- Pool/riffle spacing should remain fairly constant.
- Maintenance of bankfull width at riffles within 10 percent of the design.
- Maintenance of bank height ratios at 1:1.1.
- Bank stability over 90 percent of altered channel reaches.
- Dimension and profile stability over 90 percent of altered channel reaches.
- No significant channel aggradation or degradation.
- Minimal development of instream bars.
- Biological populations (invertebrate and fish) remain constant or increase and species composition indicates a positive trend.

Success criteria for stream restoration will be based on stream stability assessed using measurements of stream dimension, pattern, and profile; Site photographs; visual assessments; and vegetation sampling. It is too early in the 5-year annual monitoring period for Site measurements to determine if stream success criteria, in relation to restoration objectives, are being achieved. However, the stream appears to be functioning properly and emulates design conditions.

During Year 1 (2012) monitoring, six groundwater gauges were installed at the Site. Wetland hydrology success criteria (from approved *Ripshin Branch Stream & Wetland Restoration Plan* [NCEEP 2007]) is as follows:

- Hydrologic monitoring indicates groundwater within 12 inches of the ground surface for 10 percent of the growing season
- Increasing wetland vegetation

- Development of hydric soils
- Fulfill US Army Corps of Engineers (USACE) criteria for jurisdictional wetlands

Groundwater gauges were installed in mid October 2012; therefore, no groundwater gauge reporting is available for Year 1 (2012) monitoring. Groundwater gauge monitoring will be initiated during Year 2 (2013) monitoring.

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 tables and figures within this report's appendices. Narrative background and supporting information formerly found in these reports can be found in the Baseline Monitoring Report (formerly Mitigation Plan) and in the Mitigation Plan (formerly the Restoration Plan) documents available on the NC Ecosystem Enhancement Program (NCEEP) website. All raw data supporting the tables and figures in the appendices are available from NCEEP upon request.

2.0 METHODOLOGY

2.1 Vegetation Assessment

Five vegetation plots were established and marked during the Year 1 (2012) monitoring period. Plots were established by installing 4-foot, metal U-bar post at the corners and a 10-foot, 0.75 inch PVC at the origin. The plots are 10 meters square and are located randomly within the Site. These plots were surveyed in October for the Year 1 (2012) monitoring season *CVS-EEP Protocol for Recording Vegetation, Levels 1-2 Plot Sampling Only Version 4.2* (Lee et al. 2008) (http://cvs.bio.unc.edu/methods.htm); results are included in Appendix C. The taxonomic standard for vegetation used for this document was *Flora of the Southern and Mid-Atlantic States* (Weakley 2012).

2.2 Stream Assessment

Annual stream monitoring was conducted in October of 2012. Measurements were taken using a Topcon GTS 303 total station and Recon data collector. The raw total station file was processed using Carlson Survey Software into a Computer Aided Design (CAD) file. Coordinates were exported as a text/ASCII file to Microsoft Excel for processing and presentation of data. Pebble counts were completed using the modified Wolman method (Rosgen 1993).

Eight permanent cross-sections, six riffle and two pool, were established and will be used to evaluate stream dimension; locations are depicted on Figures 2, 2A, and 2B (Appendix B). Cross-sections are permanently monumented with 4-foot metal U-bar posts at each end point. Cross-sections will be surveyed to provide a detailed measurement of the stream and banks, including points on the adjacent floodplain, top of bank, bankfull, breaks in slope, edge of water, and thalweg. Data will be used to calculate width-depth ratios, entrenchment ratios, and bank height ratios for each cross-section. In addition, pebble counts were completed at cross-sections 4 and 8, and photographs will be taken at each permanent cross-section annually.

Two monitoring reaches were established (Unnamed Tributary and Ripshin Branch) and will be used to evaluate stream pattern and longitudinal profile; locations are depicted on Figures 2, 2A,

and 2B (Appendix B). Longitudinal profile measurements include average water surface slopes, facet slopes, and pool-to-pool spacing. Seventeen permanent photo points were established throughout the restoration reach; locations are depicted on Figures 2, 2A, and 2B (Appendix B). In addition, visual stream morphology and stability assessments were completed in each of the two monitoring reaches to assess the channel bed, banks, and in-stream structures.

3.0 REFERENCES

Ecosystem Enhancement Program (EEP). Unpublished. Procedural Guidance and Content Requirements for EEP Monitoring Projects, Version 1.4, dated 11/07/11. NC Department of Environment and Natural Resources. Available online at http://portal.ncdenr.org/c/document_library/get_file?p_l_id=1169848&folderId=2288101&name=DLFE-39268.pdf.

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation, Levels 1-2 Plot Sampling Only, Version 4.2. Available online at http://cvs.bio.unc.edu/methods.htm.

N.C. Ecosystem Enhancement Program. 2007. Ripshin Branch Stream & Wetland Restoration Plan - Ashe County, NC.

Rosgen. 1993. Applied Fluvial Geomorphology, Training Manual. River Short Course, Wildland Hydrology, Pagosa Springs, CO.

Weakley, Alan S. 2012. Flora of the Southern and Mid-Atlantic States. Available online at: http://www.herbarium.unc.edu/WeakleysFlora.pdf [September 28, 2012]. University of North Carolina Herbarium, North Carolina Botanical Garden, University of North Carolina, Chapel Hill, North Carolina.

APPENDIX A

PROJECT VICINITY MAP AND BACKGROUND TABLES

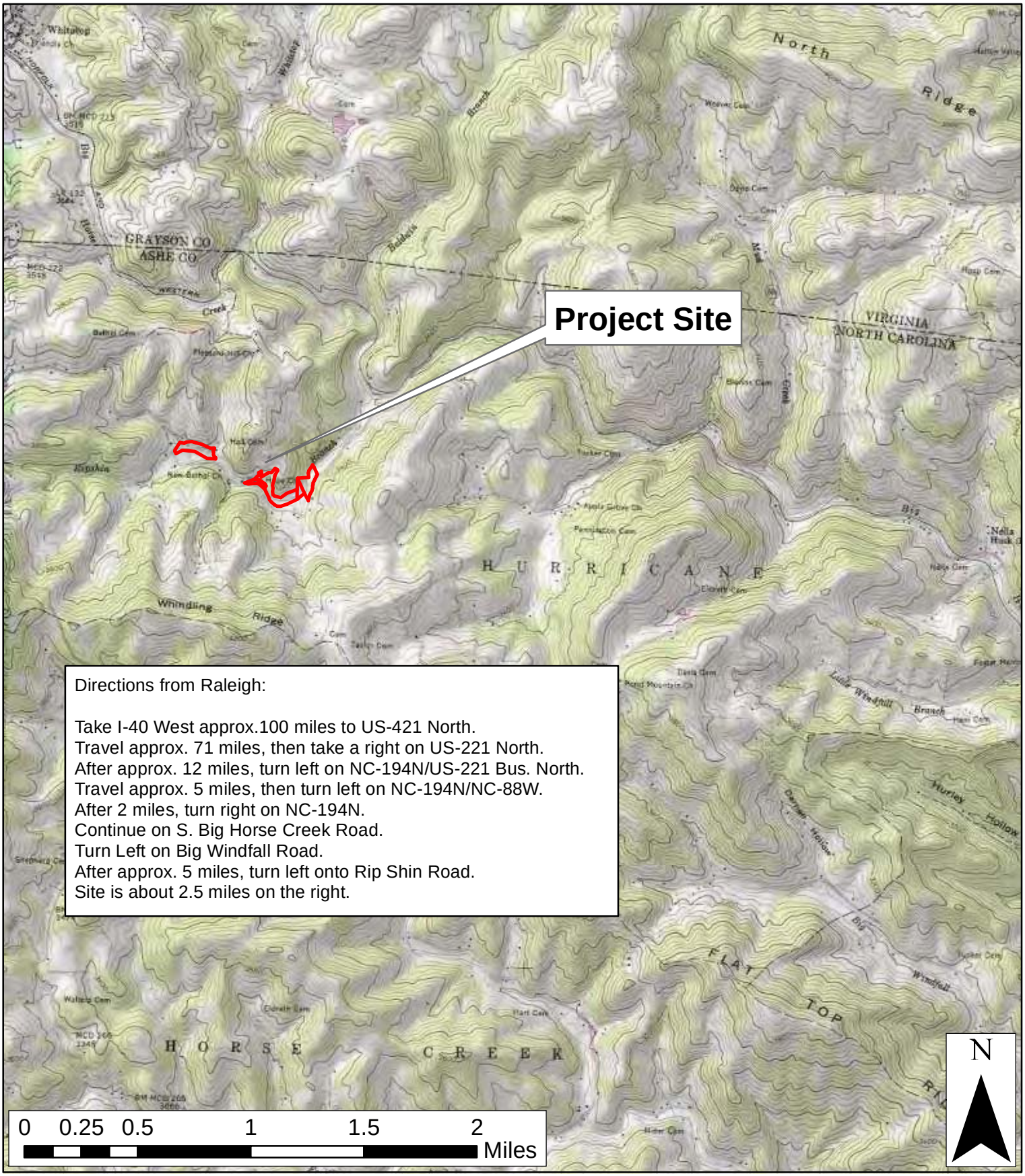
Figure 1. Vicinity Map

Table 1. Project Components and Mitigation Credits

Table 2. Project Activity and Reporting History

Table 3. Project Contacts Table

Table 4. Project Baseline Information and Attributes



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VICINITY MAP
TATE FARM (RIPSHIN BRANCH)
EEP PROJECT NUMBER 372
Ashe County, North Carolina

Dwn. by. KRJ	FIGURE 1
Date: October 2012	
Project: 12-004.13	

Table 1. Project Components and Mitigation Credits

Tate Farm (Ripshin Branch) Stream and Wetland Restoration Site (EEP Project Number 372)

Mitigation Credits					
	Stream		Riparian Wetland		Buffer
Type	Restoration	Restoration Equivalent	Restoration	Restoration Equivalent	
Totals	2106	518	3.8	1.99	

Projects Components							
Project Component/ Reach ID	Station Range	Existing Linear Footage/ Acreage	Priority Approach	Restoration/ Restoration Equivalent	Restoration Linear Footage/ Acreage	Mitigation Ratio	Comment
Reach 1A (Ripshin Br.)	00+00–08+00	800	Enhancement	E II	800	1:2.5	
Reach 1B (Ripshin Br.)	08+00-12+00	350	Priority II	R	400	1:1	
Reach 1C (Ripshin Br.)	12+00-14+85	285	Enhancement	E II	285	1:2.5	
Reach 2A (Ripshin Br.)	14+85-23+00	785	Priority II	R	815	1:1	
Ripshin Branch	--	518	Preservation	P	518	1:5	
Reach 3A (UT)	00+00-01+24	132	Enhancement	E I	124	1:1.5	
Reach 3B (UT)	01+24-09+12	688	Priority I	R	788	1:1	
Wetland UT		0		R	1.5	1:1	
Wetland UT		1.24		E	1.24	1:2	
Wetland Ripshin Branch		0		R	2.30	1:1	
Wetland Ripshin Branch		2.74		E	2.74	1:2	

Component Summation			
Restoration Level	Stream (linear footage)	Riparian Wetland (acres)	Buffer (square footage)
Restoration	2003	3.8	
Enhancement (Level I)	124		
Enhancement (Level II)	1085		
Preservation	518		
Wetland Enhancement		3.98	
Creation			
Totals	**3730**	**7.78**	
Mitigation Units	**2624 SMUs**	**5.78 WMUs**	

Table 2. Project Activity and Reporting History

Tate Farm (Ripshin Branch) Stream and Wetland Restoration Site (EEP Project Number 372)

Elapsed Time Since Grading Complete: 1 year 3 months
Elapsed Time Since Planting Complete: 0 year 11 months
Number of Reporting Years: 1

Activity or Deliverable	Data Collection Complete	Completion or Delivery
Restoration Plan		March 2007
Final Design – Construction Plans		September 2009
Construction		August 2011
Temporary S&E mix applied to entire project area		August 2011
Permanent seed mix applied to entire project area		August 2011
Containerized and B&B plantings for entire reach		December 2011
As-built Construction Plans		December 2011
Year 1 Monitoring (2012)	October 2012	December 2012
Year 2 Monitoring (2013)		
Year 3 Monitoring (2014)		
Year 4 Monitoring (2015)		
Year 5 Monitoring (2016)		

Table 3. Project Contacts Table

Tate Farm (Ripshin Branch) Stream and Wetland Restoration Site (EEP Project Number 372)

Designer	Ecologic Associates, P.C. Greensboro, NC 27404 Mark Taylor 336-382-9362
Construction Contractor	Land Mechanics Designs, Inc Willow Spring, NC 27529 Lloyd Glover 919-422-3392
Planting and Seeding Contractor	Habitat Assessment Restoration Program Charlotte, NC 28262
Surveyor	Stewart Proctor Raleigh, NC 27603 Herb Proctor 919-779-1855
Seed Mix Source	Green Resource Colfax, NC 27235 336-855-6363
Years 1-5 Monitoring Performers	Axiom Environmental, Inc. 218 Snow Avenue Raleigh, NC 27603 Grant Lewis 919-215-1693

Table 4. Project Baseline Information and Attributes

Tate Farm (Ripshin Branch) Stream and Wetland Restoration Site (EEP Project Number 372)

Project Information		
Project Name	Tate Farm (Ripshin Branch)	
Project County	Ashe	
Project Area (Acres)	61.92	
Project Coordinates (NAD83 2007)	1,037,279.65, 1,234,847,66	
Project Watershed Summary Information		
Physiographic Region	Blue Ridge	
Ecoregion	Southern Crystalline Ridges and Mountains	
Project River Basin	Upper New	
USGS 8-digit HUC	05050001	
USGS 14-digit HUC	05050001010050	
NCDWQ Subbasin	05-07-02	
Project Drainage Area (Sq. Mi.)	2.0	
Project Drainage Area Impervious Surface	<5%	
Watershed Type	Rural	
Reach Summary Information		
Parameters	**Reach 1 (UT)**	**Reach 2 (Ripshin Br.)**
Restored/Enhanced Length (Linear Feet)	2300	912
Drainage Area (Square Miles)	2.0	0.56
NCDWQ Index Number	05-07	
NCDWQ Classification	C, NSW, Tr	
Valley Type/Morphological Description	II/BC4	
Dominant Soil Series	Colvard and Toxaway	
Drainage Class	Well and Poorly Drained	
Soil Hydric Status	Nonhydric and Hydric	
Slope	0.02	0.02
FEMA Classification	NA	
Native Vegetation Community	Montane Alluvial Forest and Swamp Forest-Bog Complex	
Percent Composition of Exotic Invasives	<5%	<5%
Regulatory Considerations		
Regulation	**Applicable**	
Waters of the U.S. –Sections 404 and 401	Yes-Received Appropriate Permits	
Endangered Species Act	No Effect	
Historic Preservation Act	No	
CZMA/CAMA	NA	
FEMA Floodplain Compliance	NA	
Essential Fisheries Habitat	Trout	

APPENDIX B

VISUAL ASSESSMENT DATA

Figures 2 and 2A-2B. Current Conditions Plan View

Tables 5A-5B. Visual Stream Morphology Stability Assessment

Table 6. Vegetation Condition Assessment

Stream Fixed-Station Photographs

Vegetation Monitoring Photographs

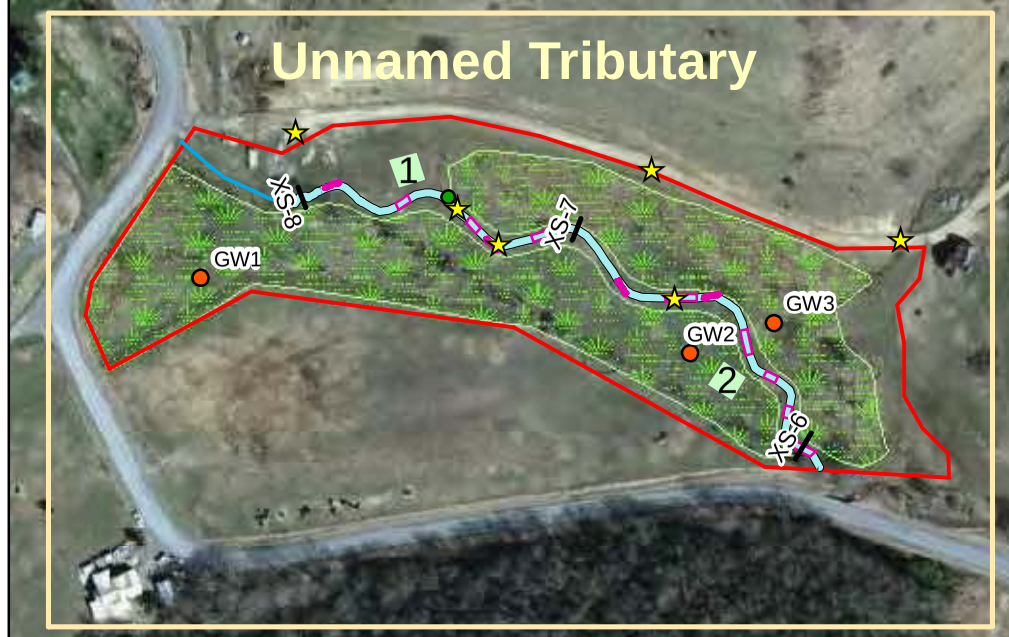

Fig. 2A

Fig. 2B

Legend

- Easement
- Wetland Area
- Stream
- Stream Monitoring Reach
- Cross Sections
- In-Stream Structures
- CVS Plots
- Groundwater Gauges
- Crest Gauges
- Photo Points

0 125 250 500 750 Feet

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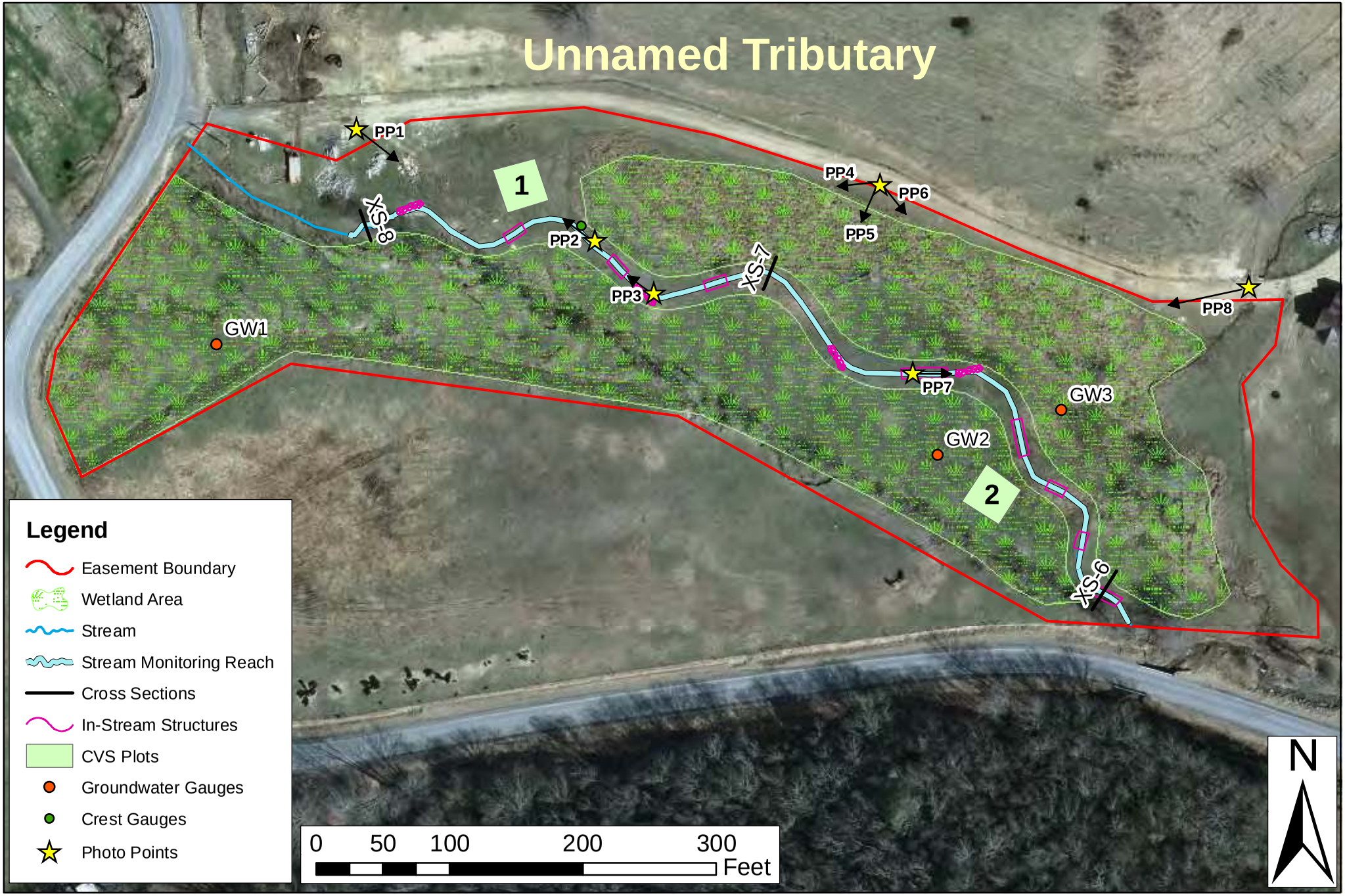
CURRENT CONDITIONS PLAN VIEW
TATE FARM (UT to RIPSHIN BRANCH)
EEP PROJECT NUMBER 372
Ashe County, North Carolina

Dwn. by. KRJ	FIGURE
Date: Sept. 2012	2
Project: 12-004.13	



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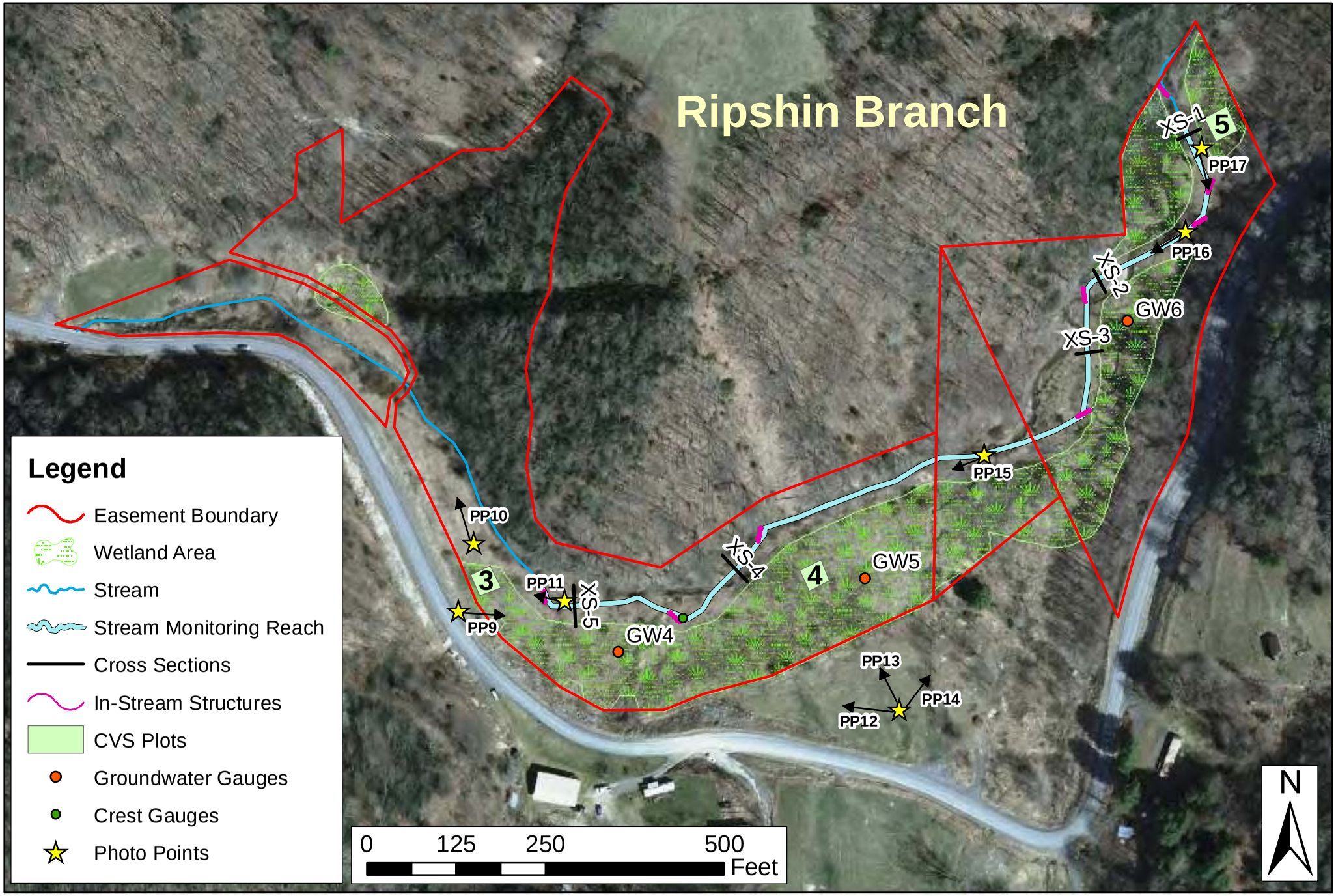
CURRENT CONDITIONS PLAN VIEW
TATE FARM (UT)
EEP PROJECT NUMBER 372
Ashe County, North Carolina

Dwn. by: KRJ
Date: Sept. 2012
Project: 12-004.13

FIGURE
2A



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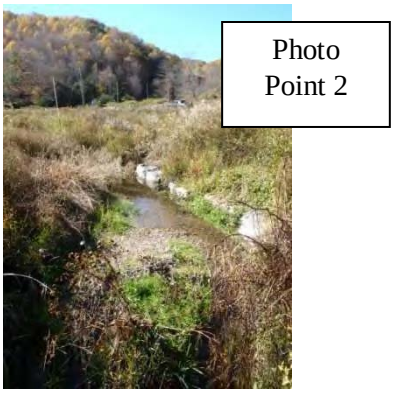
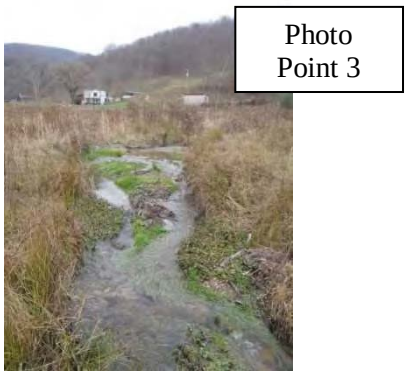
CURRENT CONDITIONS PLAN VIEW
TATE FARM (RIPSHIN BRANCH)
EEP PROJECT NUMBER 372
Ashe County, North Carolina

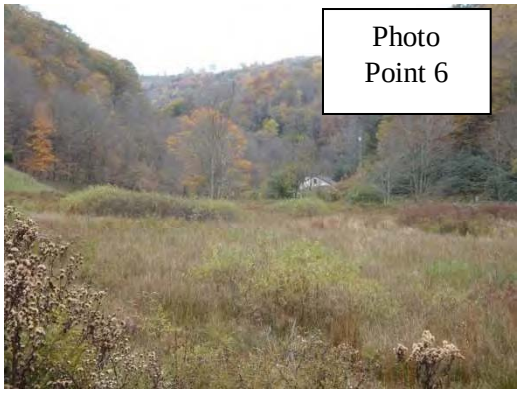
Dwn. by: KRJ
Date: Sept. 2012
Project: 12-004.13

FIGURE
2B

Tate Farm (Ripshin Branch)
Stream Fixed-Station Photographs
Taken October 2012



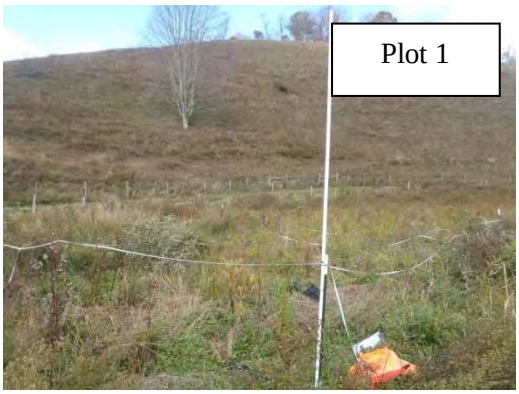


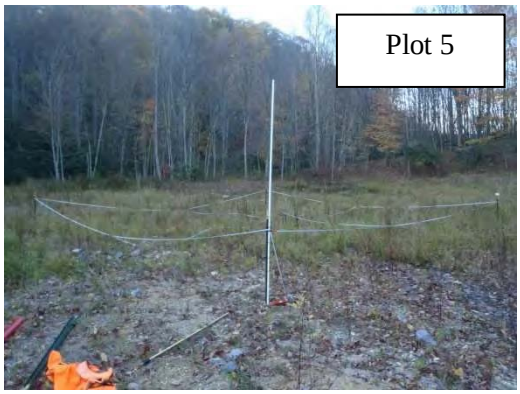


Tate Farm (Ripshin Branch)
Stream Fixed-Station Photographs
Taken October 2012
(continued)

Tate Farm (Ripshin Branch)
Stream Fixed-Station Photographs
Taken October 2012
(continued)

Tate Farm (Ripshin Branch)
Vegetation Monitoring Photographs
Taken October 2012





APPENDIX C

VEGETATION PLOT DATA

Table 7. Vegetation Plot Criteria Attainment

Table 8. CVS Vegetation Plot Metadata

Table 9. Total and Planted Stems by Plot and Species

Table 7. Vegetation Plot Criteria Attainment

Tate Farm (Ripshin Branch) Stream and Wetland Restoration Site (EEP Project Number 372)

Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
1	No	60%
2	Yes	
3	Yes	
4	No	
5	Yes	

Table 8. CVS Vegetation Plot Metadata

Tate Farm (Ripshin Branch) Stream and Wetland Restoration Site (EEP Project Number 372)

Report Prepared By	Corri Faquin
Date Prepared	10/19/2012 9:17
database name	Axiom-EEP-2012-A.mdb
database location	S:\CVS database\2012
computer name	KENAN
file size	57331712
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	372
project Name	Tate Farm
Description	Stream and Wetland Restoration
River Basin	New
length(ft)	
stream-to-edge width (ft)	
area (sq m)	
Required Plots (calculated)	
Sampled Plots	5

Table 9: Total and Planted Stems by Plot and Species
Tate Farm - EEP Project Code 372

			Current Plot Data (MY1 2012)																Annual Means		
			Plot 1			Plot 2			Plot 3			Plot 4			Plot 5			MY1 (2012)		
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
Alnus serrulata	hazel alder	Shrub													5	5	5	5	5	5
Aronia arbutifolia	Red Chokeberry	Shrub				2	2	2							3	3	3	5	5	5
Betula nigra	river birch	Tree	1	1	1				1	1	1				3	3	3	5	5	5
Cornus amomum	silky dogwood	Shrub	1	1	1	1	1	1				2	2	2				4	4	4
Fraxinus pennsylvanica	green ash	Tree	2	2	2	3	3	3	3	3	3							8	8	8
Ilex opaca	American holly	Tree				2	2	2										2	2	2
Platanus occidentalis	American sycamore	Tree							5	5	5	1	1	1	2	2	2	8	8	8
Prunus serotina	black cherry	Tree							1	1	1							1	1	1
Rhus	sumac	shrub									1									1
Viburnum dentatum	southern arrowwood	Shrub	3	3	3													3	3	3
		Stem count	7	7	7	8	8	8	10	10	11	3	3	3	13	13	13	41	41	42
		size (ares)	1			1			1			1			1			5		
		size (ACRES)	0.025			0.025			0.025			0.025			0.025			0.124		
		Species count	4	4	4	4	4	4	4	4	5	2	2	2	4	4	4	9	9	10
		Stems per ACRE	283.3	283.3	283.3	323.7	323.7	323.7	404.7	404.7	445.2	121.4	121.4	121.4	526.1	526.1	526.1	331.8	331.8	339.9

Color for Density

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

PnoLS = Planted stems excluding livestakes
P-all = Planted stems including livestakes
T = All planted and natural recruit stems

APPENDIX D

STREAM SURVEY DATA

Cross-section Plots

Longitudinal Profile Plots

Substrate Plots

Tables 10a-d. Baseline Stream Data Summary

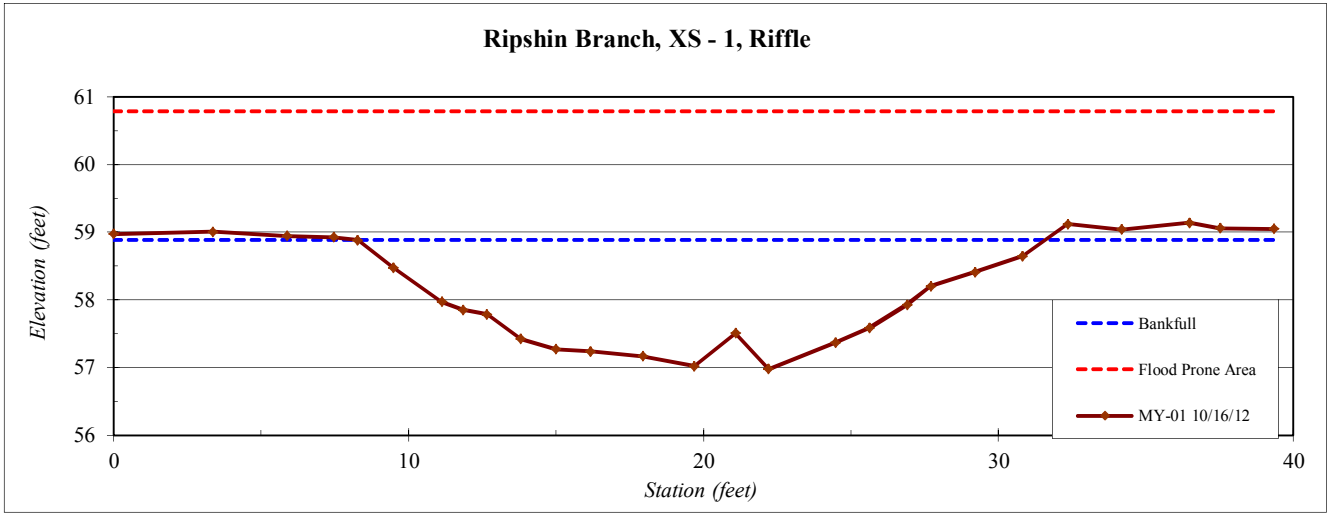
Tables 11a-d. Monitoring Data

River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 1, Riffle
Drainage Area (sq mi):	1.6
Date:	10/16/2012
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.00	58.97
3.37	59.01
5.88	58.94
7.46	58.93
8.28	58.89
9.48	58.48
11.12	57.97
11.85	57.85
12.66	57.79
13.81	57.42
15.01	57.27
16.18	57.24
17.94	57.17
19.69	57.02
21.09	57.51
22.21	56.98
24.49	57.37
25.63	57.59
26.90	57.93
27.71	58.20
29.20	58.41
30.82	58.65
32.35	59.12
34.18	59.04
36.47	59.14
37.52	59.06
39.33	59.05

SUMMARY DATA	
Bankfull Elevation:	58.9
Bankfull Cross-Sectional Area:	27.6
Bankfull Width:	23.4
Flood Prone Area Elevation:	60.8
Flood Prone Width:	>80
Max Depth at Bankfull:	1.9
Mean Depth at Bankfull:	1.2
W / D Ratio:	19.8
Entrenchment Ratio:	3.4
Bank Height Ratio:	1.0

Stream Type	B/C

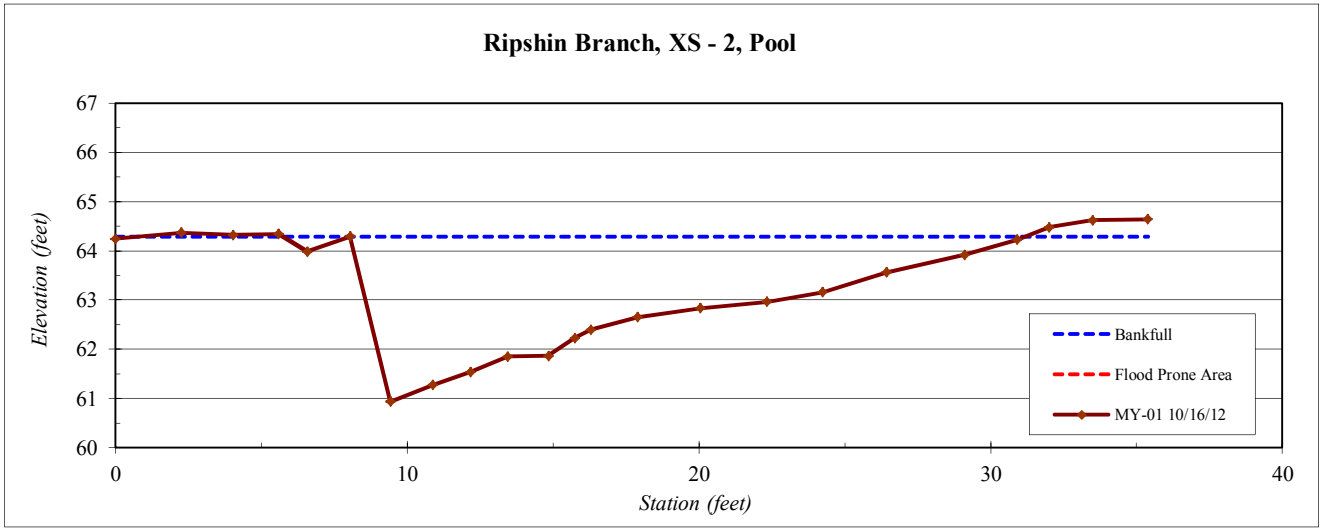


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 2, Pool
Drainage Area (sq mi):	1.6
Date:	10/16/2012
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.00	64.24
2.25	64.37
4.02	64.32
5.59	64.34
6.56	63.99
8.04	64.29
9.42	60.94
10.87	61.27
12.18	61.54
13.44	61.86
14.84	61.87
15.75	62.23
16.30	62.40
17.90	62.65
20.04	62.83
22.3	62.97
24.2	63.16
26.4	63.56
29.12	63.92
30.90	64.22
32.01	64.47
33.50	64.62
35.39	64.64

SUMMARY DATA	
Bankfull Elevation:	64.3
Bankfull Cross-Sectional Area:	36.1
Bankfull Width:	23.2
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	3.4
Mean Depth at Bankfull:	1.6
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	B/C

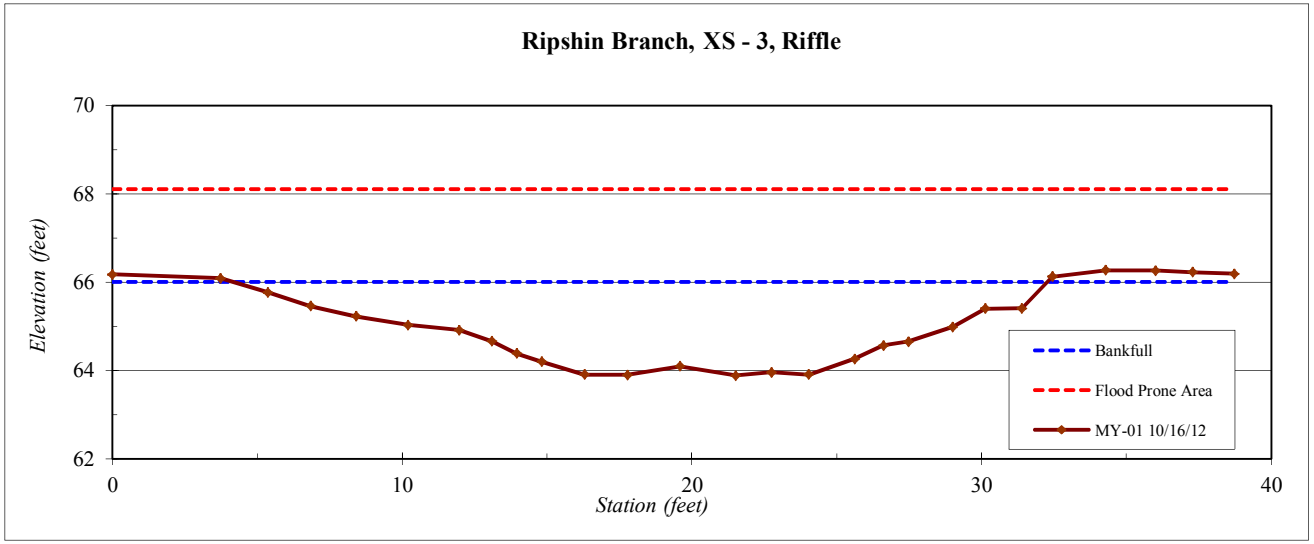


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 3, Riffle
Drainage Area (sq mi):	1.6
Date:	10/16/2012
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.00	66.18
3.72	66.09
5.36	65.77
6.84	65.46
8.40	65.23
10.20	65.03
11.96	64.92
13.10	64.66
13.96	64.39
14.82	64.20
16.29	63.91
17.79	63.91
19.60	64.10
21.52	63.89
22.7	63.96
24.0	63.91
25.6	64.27
26.6	64.57
27.5	64.66
29.0	64.99
30.1	65.40
31.4	65.41
32.4	66.13
34.3	66.27
36.0	66.26
37.3	66.22
38.7	66.19

SUMMARY DATA	
Bankfull Elevation:	66.0
Bankfull Cross-Sectional Area:	37.4
Bankfull Width:	28.1
Flood Prone Area Elevation:	68.1
Flood Prone Width:	>80
Max Depth at Bankfull:	2.1
Mean Depth at Bankfull:	1.3
W / D Ratio:	21.1
Entrenchment Ratio:	2.8
Bank Height Ratio:	1.0

Stream Type	B/C

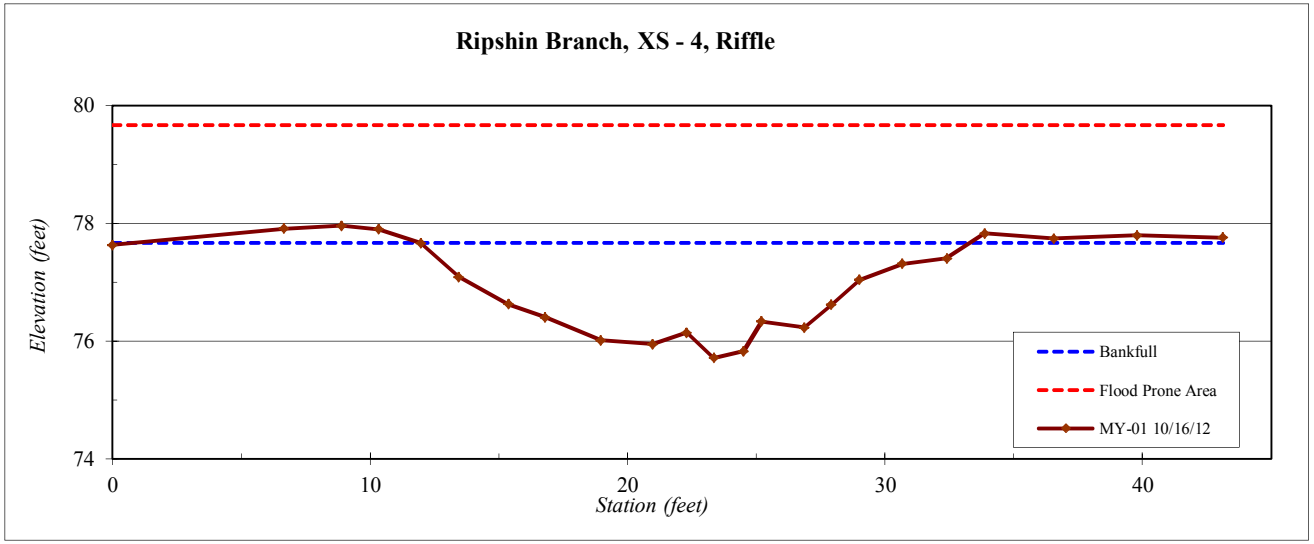


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 4, Riffle
Drainage Area (sq mi):	1.6
Date:	10/16/2012
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.00	77.63
6.66	77.91
8.88	77.96
10.34	77.90
11.96	77.66
13.45	77.09
15.37	76.63
16.80	76.40
18.97	76.01
20.98	75.95
22.30	76.14
23.35	75.71
24.51	75.83
25.21	76.33
26.9	76.23
27.9	76.62
29.0	77.04
30.7	77.31
32.4	77.40
33.9	77.83
36.6	77.74
39.8	77.79
43.1	77.76

SUMMARY DATA	
Bankfull Elevation:	77.7
Bankfull Cross-Sectional Area:	23.5
Bankfull Width:	21.4
Flood Prone Area Elevation:	79.7
Flood Prone Width:	>80
Max Depth at Bankfull:	2.0
Mean Depth at Bankfull:	1.1
W / D Ratio:	19.5
Entrenchment Ratio:	3.7
Bank Height Ratio:	1.0

Stream Type	B/C

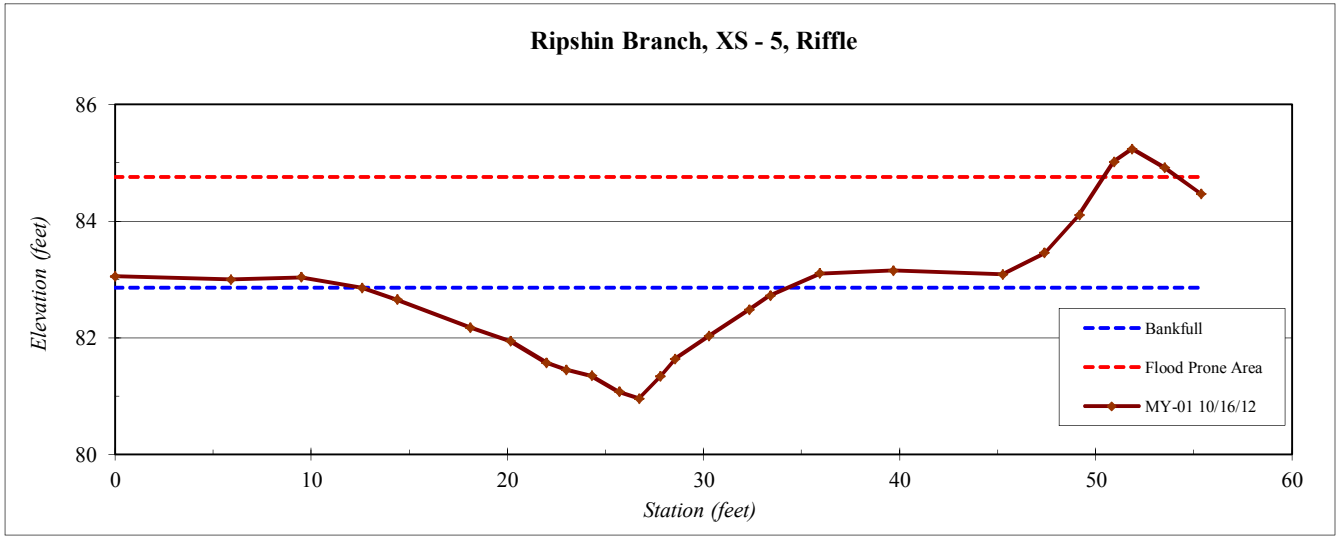


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 5, Riffle
Drainage Area (sq mi):	1.6
Date:	10/16/2012
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.0	83.1
5.9	83.0
9.5	83.0
12.6	82.9
14.4	82.7
18.1	82.2
20.2	81.9
22.0	81.6
23.0	81.5
24.3	81.4
25.7	81.1
26.7	81.0
27.8	81.3
28.6	81.64
30.3	82.03
32.3	82.49
33.4	82.72
35.9	83.10
39.7	83.15
45.3	83.09
47.4	83.45
49.2	84.11
50.9	85.01
51.9	85.23
53.5	84.92
55.4	84.46

SUMMARY DATA	
Bankfull Elevation:	82.9
Bankfull Cross-Sectional Area:	19.2
Bankfull Width:	21.7
Flood Prone Area Elevation:	84.8
Flood Prone Width:	>80
Max Depth at Bankfull:	1.9
Mean Depth at Bankfull:	0.9
W / D Ratio:	24.5
Entrenchment Ratio:	3.7
Bank Height Ratio:	1.0

Stream Type	B/C

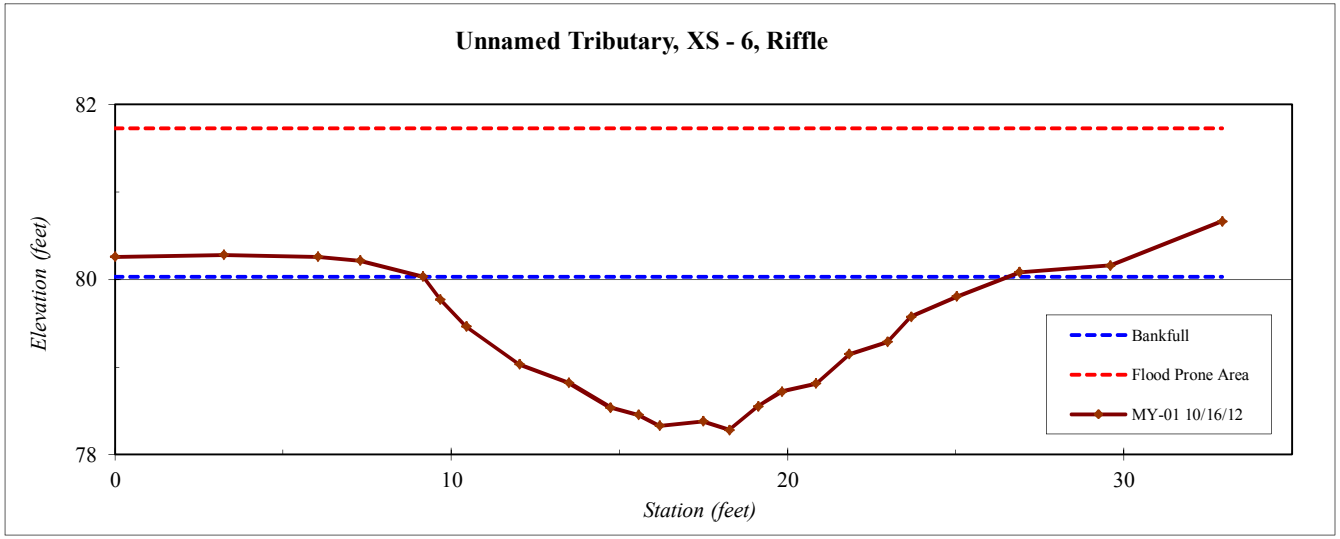


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 6, Riffle
Drainage Area (sq mi):	0.6
Date:	10/16/2012
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.0	80.3
3.2	80.3
6.0	80.3
7.3	80.2
9.2	80.0
9.7	79.8
10.4	79.5
12.0	79.0
13.5	78.8
14.7	78.5
15.6	78.5
16.2	78.3
17.5	78.4
18.3	78.28
19.1	78.55
19.8	78.72
20.9	78.81
21.8	79.15
23.0	79.29
23.7	79.58
25.0	79.81
26.9	80.09
29.6	80.16
32.9	80.66

SUMMARY DATA	
Bankfull Elevation:	80.0
Bankfull Cross-Sectional Area:	17.4
Bankfull Width:	17.4
Flood Prone Area Elevation:	81.7
Flood Prone Width:	>80
Max Depth at Bankfull:	1.7
Mean Depth at Bankfull:	1.0
W / D Ratio:	17.4
Entrenchment Ratio:	4.6
Bank Height Ratio:	1.0

Stream Type	B/C

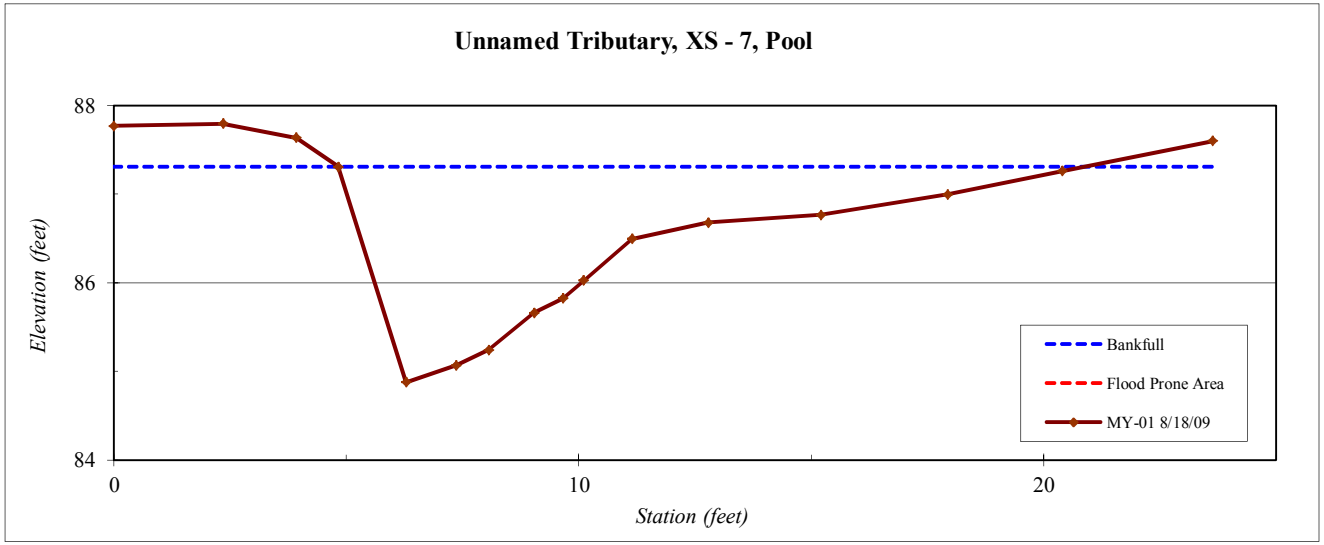


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 7, Pool
Drainage Area (sq mi):	0.6
Date:	10/16/2012
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.0	87.8
2.4	87.8
3.9	87.6
4.8	87.3
6.3	84.9
7.4	85.1
8.1	85.2
9.0	85.7
9.7	85.8
10.1	86.0
11.1	86.5
12.8	86.7
15.2	86.8
17.9	87.00
20.4	87.26
23.6	87.60

SUMMARY DATA	
Bankfull Elevation:	87.3
Bankfull Cross-Sectional Area:	14.5
Bankfull Width:	16.0
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	2.4
Mean Depth at Bankfull:	0.9
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	B/C

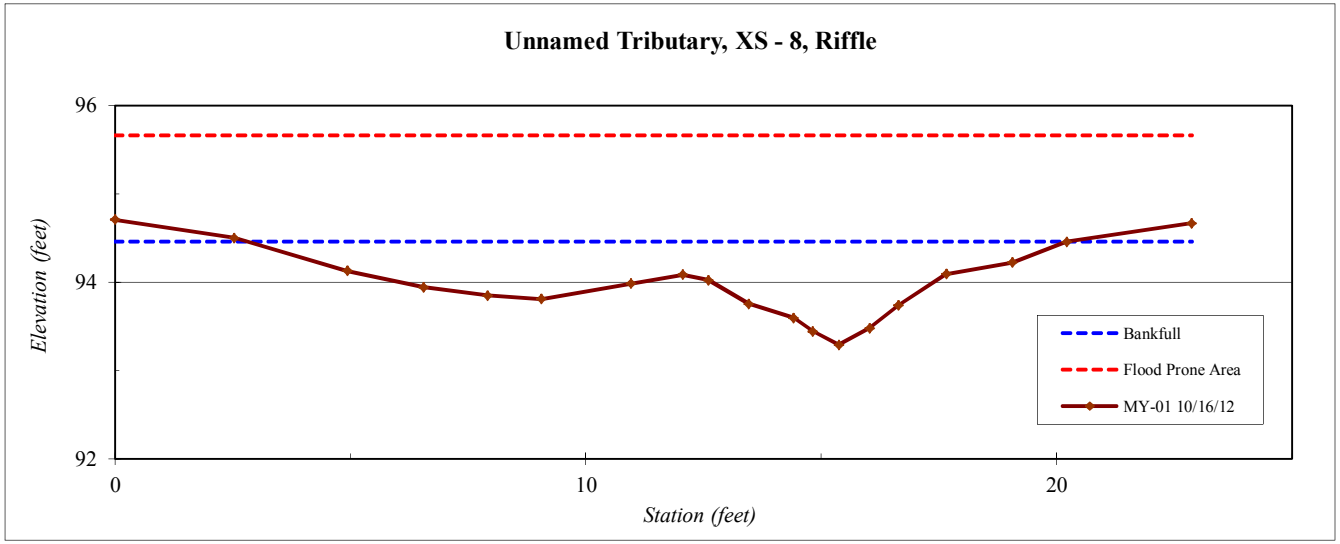


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 8, Riffle
Drainage Area (sq mi):	0.6
Date:	10/16/2012
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.0	94.7
2.5	94.5
4.9	94.1
6.6	93.9
7.9	93.8
9.1	93.8
11.0	94.0
12.1	94.1
12.6	94.0
13.5	93.8
14.4	93.6
14.8	93.4
15.4	93.3
16.0	93.48
16.6	93.74
17.7	94.09
19.1	94.22
20.2	94.46
22.9	94.67

SUMMARY DATA	
Bankfull Elevation:	94.5
Bankfull Cross-Sectional Area:	8.9
Bankfull Width:	17.4
Flood Prone Area Elevation:	95.7
Flood Prone Width:	>80
Max Depth at Bankfull:	1.2
Mean Depth at Bankfull:	0.5
W / D Ratio:	34.0
Entrenchment Ratio:	4.6
Bank Height Ratio:	1.0

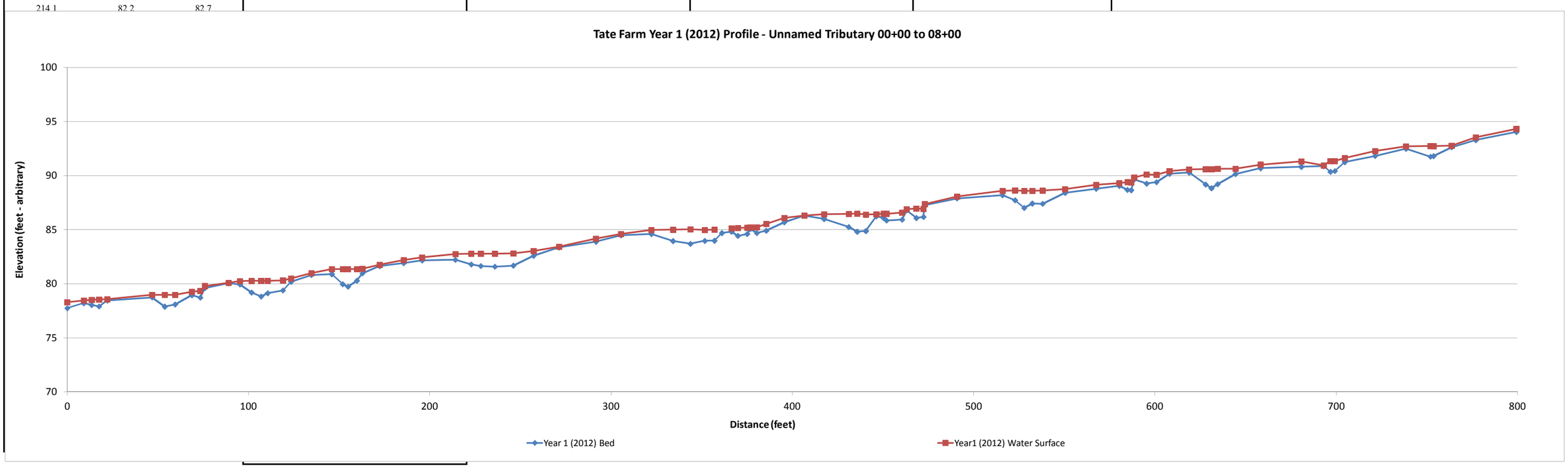
Stream Type	B/C



Project Name	Tate Farm - Profile
Reach	Unnamed Tributary Station 00+00 - 08+00
Feature	Profile
Date	10/10/12
Crew	Perkinson, Jernigan

2012 Year 1 Monitoring \Survey			2013 Year 2 Monitoring \Survey			2014 Year 3 Monitoring \Survey			2015 Year 4 Monitoring \Survey			2016 Year 5 Monitoring \Survey		
Station	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**
0.0	77.7	78.3												
9.1	78.2	78.5												
13.5	78.0	78.5												
17.5	77.9	78.5												
22.1	78.4	78.6												
46.8	78.7	79.0												
53.7	77.9	79.0												
59.5	78.1	79.0												
68.7	78.9	79.3												
73.4	78.7	79.3												
75.9	79.6	79.8												
89.0	80.1	80.1												
95.2	80.0	80.2												
101.7	79.2	80.3												
106.9	78.8	80.3												
110.6	79.1	80.3												
118.9	79.4	80.3												
123.5	80.2	80.5												
134.6	80.8	81.0												
145.9	80.9	81.4												
151.9	80.0	81.4												
154.8	79.7	81.3												
159.8	80.3	81.4												
162.8	81.0	81.4												
172.3	81.6	81.8												
185.5	81.9	82.2												
195.8	82.2	82.5												
214.1	82.2	82.7												

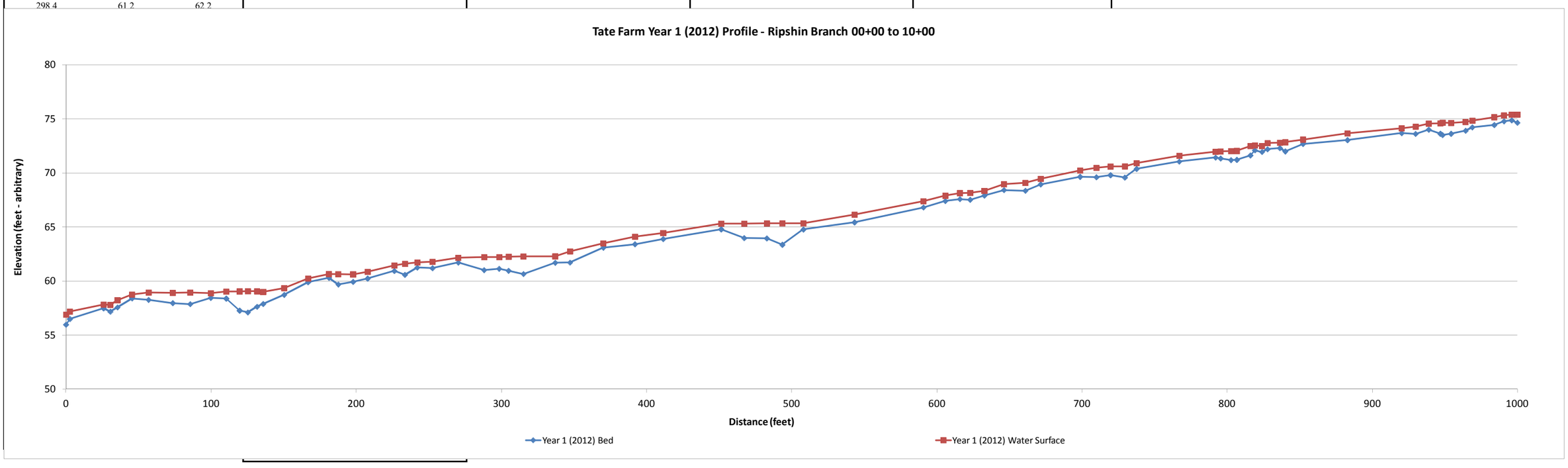
	2012	2013	2014	2015	2016
Avg. Water Surface Slope	0.0201				
Riffle Length	30				
Avg. Riffle Slope	0.0235				
Pool Length	21				
Pool to Pool Spacing	44.0				



Project Name	Tate Farm - Profile
Reach	Ripshin Branch Station 00+00 - 10+00
Feature	Profile
Date	10/10/12
Crew	Perkinson, Jernigan

2012 Year 1 Monitoring \Survey			2013 Year 2 Monitoring \Survey			2014 Year 3 Monitoring \Survey			2015 Year 4 Monitoring \Survey			2016 Year 5 Monitoring \Survey		
Station	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**
0.0	56.0	56.9												
2.7	56.5	57.2												
25.9	57.5	57.8												
30.5	57.2	57.8												
35.5	57.6	58.3												
45.5	58.4	58.8												
56.9	58.3	59.0												
73.5	58.0	58.9												
85.6	57.9	59.0												
99.7	58.5	58.9												
110.4	58.4	59.0												
119.6	57.3	59.1												
125.2	57.1	59.1												
131.6	57.6	59.1												
135.8	57.9	59.0												
150.3	58.7	59.4												
166.7	59.9	60.2												
181.1	60.3	60.7												
187.6	59.7	60.7												
197.8	59.9	60.6												
207.7	60.2	60.9												
226.2	60.9	61.5												
233.5	60.6	61.6												
242.0	61.3	61.7												
252.5	61.2	61.8												
270.3	61.7	62.2												
288.0	61.0	62.2												
298.4	61.2	62.2												

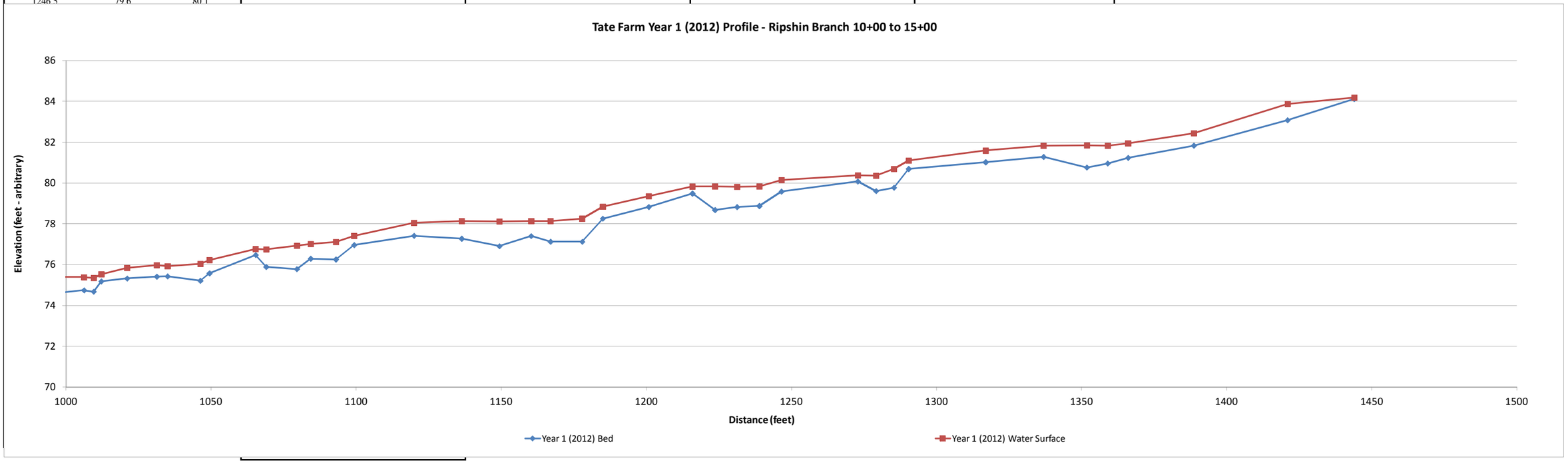
	2012	2013	2014	2015	2016
Avg. Water Surface Slope	0.0182				
Riffle Length	35				
Avg. Riffle Slope	0.0247				
Pool Length	28				
Pool to Pool Spacing	55.0				



Project Name	Tate Farm - Profile
Reach	Ripshin Branch Station 10+00 - 15+00
Feature	Profile
Date	10/10/12
Crew	Perkinson, Jernigan

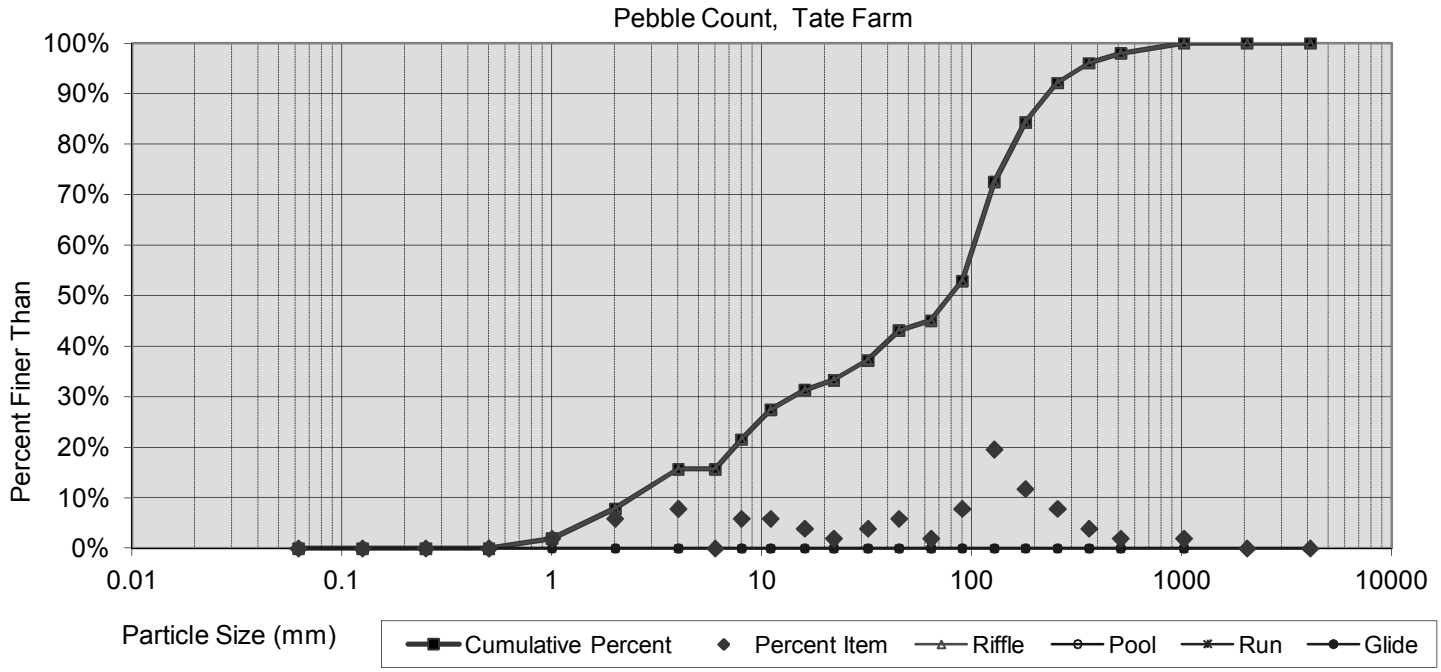
2012 Year 1 Monitoring \Survey			2013 Year 2 Monitoring \Survey			2014 Year 3 Monitoring \Survey			2015 Year 4 Monitoring \Survey			2016 Year 5 Monitoring \Survey		
Station	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**	**Station**	**Bed Elevation**	**Water Elevation**
999.9	74.6	75.4												
1006.2	74.7	75.4												
1009.5	74.7	75.4												
1012.2	75.2	75.5												
1021.1	75.3	75.8												
1031.3	75.4	76.0												
1035.0	75.4	75.9												
1046.3	75.2	76.0												
1049.5	75.6	76.2												
1065.4	76.5	76.8												
1069.0	75.9	76.8												
1079.6	75.8	76.9												
1084.3	76.3	77.0												
1093.0	76.3	77.1												
1099.3	77.0	77.4												
1119.9	77.4	78.1												
1136.3	77.3	78.1												
1149.4	76.9	78.1												
1160.3	77.4	78.1												
1167.0	77.1	78.1												
1177.9	77.1	78.3												
1185.0	78.3	78.8												
1200.8	78.8	79.4												
1215.9	79.5	79.8												
1223.6	78.7	79.8												
1231.2	78.8	79.8												
1238.9	78.9	79.8												
1246.5	79.6	80.1												

	2012	2013	2014	2015	2016
Avg. Water Surface Slope	0.0182				
Riffle Length	35				
Avg. Riffle Slope	0.0247				
Pool Length	28				
Pool to Pool Spacing	55.0				



	Pebble Count,
	Tate Farm
	New River

Note:	**Cross Section 4 - Ripshin Branch**

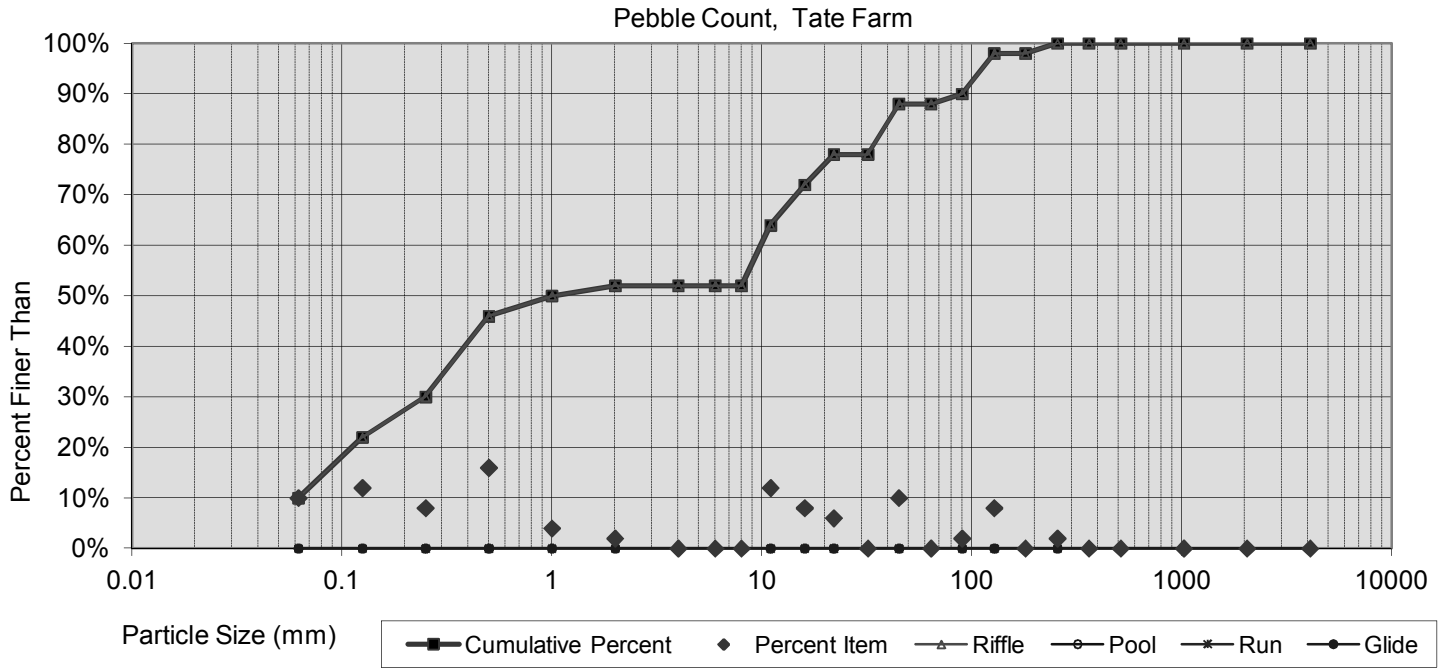


Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
6.093	25.80	79.2	178	329	0%	8%	37%	47%	8%	0%

Pebble Count,

	Tate Farm
	New River

Note:	**Cross Section 8 - Unnamed Tributary**



Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
0.088	0.31	1.0	39	112	10%	42%	36%	12%	0%	0%

Table 10a. Baseline Stream Data Summary (Ripshin Branch)
Tate Farm (Ripshin Branch) - EEP Project Number 372

Parameter	Gauge	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	Min	Mean	Med	Max	SD	Min	Max	Med	Min	Mean	Med	Max	SD
BF Width (ft)					21.0			24.0		14.4			17.1		23.0	25.0						
Floodprone Width (ft)					35			60		27			95		25	80						
BF Mean Depth (ft)					1.2			1.3		1.2			1.3		1.3	1.4						
BF Max Depth (ft)							1.9			1.7			1.9		2.7	2.9						
BF Cross Sectional Area (ft^2)					26.0			29.0		17.6			20.7		30.0	35.0						
Width/Depth Ratio					18.5			21.0		11.8			13.2		17.0	18.0						
Entrenchment Ratio					1.9			2.6		1.6			6.6		1.5	2.0						
Bank Height Ratio							1.8					1.2			1.0	1.2						
Profile																						
Riffle length (ft)																						
Riffle slope (ft/ft)							0.0040			0.0170			0.0420				0.0400					
Pool length (ft)					9.0			43.0		11.0			18.7		20.0	70.0						
Pool Max depth (ft)							3.6			0.9			2.6		3.5	3.6						
Pool spacing (ft)					33.0			253.0		25.7			69.3		80.0	130.0						
Pattern																						
Channel Beltwidth (ft)					7			80		20			41.7		29	150						
Radius of Curvature (ft)					10			160		25.3			185		55	135						
Rc:Bankfull width (ft/ft)					0.4			1		1.8			5.9		3	4.2						
Meander Wavelength (ft)					30			240		97.5			140		85	365						
Meander Width ratio					0.8			2.1		6.8			8		4.4	6.6						
Transport parameters																						
Reach Shear Stress (competency) lbs/ft^2																						
Max part size (mm) mobilized at bankfull																						
Stream Power (transport capacity) W/m^2																						
Additional Reach Parameters																						
Rosgen Classification					B4/F4/C4					B4/C4					B4/C4							
Bankfull Velocity (fps)					5.5										4.8 - 5							
Bankfull Discharge (cfs)					158																	
Valley Length (ft)					----					----												
Channel Thalweg Length (ft)					----					----					2300							
Sinuosity					1.2					1.1 - 1.2					1.1 - 1.3							
Water Surface Slope (ft/ft)					0.018-0.024					0.012 - 0.019					0.02							
BF slope (ft/ft)					----					----					----							
Bankfull Floodplain Area (acres)					----					----					----							
% of Reach with Eroding Banks					----					----												
Channel Stability or Habitat Metric					----					----												
Biological or Other					----					----												

Table 10b. Baseline Stream Data Summary (Substrate, Bed, Bank, and Hydrologic Containment Parameter Distributions)
Tate Farm (Ripshin Branch) - EEP Project Number 372 - Ripshin Branch

Parameter	Pre-Existing Condition							Reference Reach(es) Data							Design							Monitoring Baseline						
Ri%/RU%P%G%/S%																											
SC%/SA%/G%/C%/B%BE%																											
d16/d35/d50/d84/d95			0.2-0.3	4.0-12.0						0.5	3.0-5.0																
Entrainment Class <1.5/1.5-1.99/2.0-4.9/5.0-																											
Incision Class <1.2/1.2-1.49/1.5-1.99/>2.0																											

Table 10c. Baseline Stream Data Summary (Unnamed Tributary)
Tate Farm (Ripshin Branch) - EEP Project Number 372

Parameter	Gauge	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**	**Min**	**Mean**	**Med**	**Max**	**SD**	**Min**	**Max**	**Med**	**Min**	**Mean**	**Med**	**Max**	**SD**
BF Width (ft)							18.0					14.4					16.0					
Floodprone Width (ft)							28					95			16	80	50					
BF Mean Depth (ft)							0.9					1.2					0.9					
BF Max Depth (ft)							1.4					1.7			1.3	1.4						
BF Cross Sectional Area (ft^2)							16.3					17.6					14.0					
Width/Depth Ratio							21.8					11.8					18.0					
Entrenchment Ratio							1.6					6.6			1.0	2.5						
Bank Height Ratio							2.3					1.2					1.0					
Profile																						
Riffle length (ft)																						
Riffle slope (ft/ft)							0.0400					0.0170					0.0400					
Pool length (ft)					3.6			19.9				18.7					25.0					
Pool Max depth (ft)							1.4					2.6					1.9					
Pool spacing (ft)					11.0		80.0					69.0			50.0	90.0	60.0					
Pattern																						
Channel Beltwidth (ft)					12			33				41.7			35	100						
Radius of Curvature (ft)					2.5			25				25.3			40	200						
Rc:Bankfull width (ft/ft)							0.8					1.8			3.4	14						
Meander Wavelength (ft)					50			170				97.5			120	160						
Meander Width ratio							4.9					2.9			8.3	8.8						
Transport parameters																						
Reach Shear Stress (competency) lbs/ft^2																						
Max part size (mm) mobilized at bankfull																						
Stream Power (transport capacity) W/m^2																						
Additional Reach Parameters																						
Rosgen Classification							B4/F4					C4					B4/C4					
Bankfull Velocity (fps)							5.1										4.5					
Bankfull Discharge (cfs)							83.07															
Valley Length (ft)							----					----										
Channel Thalweg Length (ft)							----					----					912					
Sinuosity							1.2					1.2					1.0-1.2					
Water Surface Slope (ft/ft)							0.02					0.012					0.02					
BF slope (ft/ft)							----					----					----					
Bankfull Floodplain Area (acres)							----					----					----					
% of Reach with Eroding Banks							----					----										
Channel Stability or Habitat Metric							----					----										
Biological or Other							----					----										

Table 10d. Baseline Stream Data Summary (Substrate, Bed, Bank, and Hydrologic Containment Parameter Distributions)
Tate Farm (Ripshin Branch) - EEP Project Number 372 - Unnamed Tributary

Parameter	Pre-Existing Condition							Reference Reach(es) Data							Design							Monitoring Baseline						
Ri%/RU%P%G%/S%																											
SC%/SA%/G%/C%/B%BE%																											
d16/d35/d50/d84/d95	0.2	4.8	12.8	44.2	78.5			8.0	11.8	18.4	73.0	100.0															
Entrainment Class <1.5/1.5-1.99/2.0-4.9/5.0-																											
Incision Class <1.2/1.2-1.49/1.5-1.99/>2.0																											

Table 11a. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters - Cross Sections)

Tate Farm (Ripshin Branch) - EEP Project Number 372 - Ripshin Branch

Parameter	Cross Section 1 Riffle							Cross Section 2 Pool							Cross Section 3 Riffle							Cross Section 4 Riffle							Cross Section 5 Riffle						
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY5+	MY0	MY1	MY2	MY3	MY4	MY5	MY5+	MY0	MY1	MY2	MY3	MY4	MY5	MY5+	MY0	MY1	MY2	MY3	MY4	MY5	MY5+	MY0	MY1	MY2	MY3	MY4	MY5	MY5+
BF Width (ft)		23.4							23.2							28.1							21.4							21.7					
Floodprone Width (ft) (approx)		80.0							NA							80.0							80.0							80.0					
BF Mean Depth (ft)		1.2							1.6							1.3							1.1							0.9					
BF Max Depth (ft)		1.9							3.4							2.1							2.0							1.9					
BF Cross Sectional Area (ft^2)		27.6							36.1							37.4							23.5							19.2					
Width/Depth Ratio		19.8							NA							21.1							19.5							24.5					
Entrenchment Ratio		3.4							NA							2.8							3.7							3.7					
Bank Height Ratio		1.0							1.0							1.0							1.0							1.0					
d50 (mm)		----							79.2							----							----							----					

Table 11b. Monitoring Data - Stream Reach Data Summary

Tate Farm (Ripshin Branch) - EEP Project Number 372 - Ripshin Branch

Parameter	Baseline					MY-1					MY-2					MY-3					MY-4					MY-5				
Dimension and Substrate - Riffle Only	Min	Mean	Med	Max	SD	Min	Mean	Med	Max	SD	Min	Mean	Med	Max	SD	Min	Mean	Med	Max	SD	Min	Mean	Med	Max	SD	Min	Mean	Med	Max	SD
BF Width (ft)						21.4	23.7	22.6	28.1	3.1																			
Floodprone Width (ft)								80																					
BF Mean Depth (ft)						0.9	1.1	1.2	1.3	0.2																			
BF Max Depth (ft)						1.9	2.0	2.0	2.1	0.1																			
BF Cross Sectional Area (ft^2)						19.2	26.9	25.6	37.4	7.8																			
Width/Depth Ratio						19.5	21.2	20.6	24.1	2.2																			
Entrenchment Ratio						2.8	3.4	3.6	3.7	0.4																			
Bank Height Ratio								1.0																					
Profile -Downstream																													
Riffle length (ft)						5.3	35.1	26.3	107.8	28.6																			
Riffle slope (ft/ft)						0.0059	0.0247	0.0260	0.0445	0.0105																			
Pool length (ft)						8.6	27.7	24.7	77.0	16.2																			
Pool Max depth (ft)								3.4																					
Pool spacing (ft)						8.6	55.4	43.8	160.7	37.0																			
Pattern																													
Channel Beltwidth (ft)																													
Radius of Curvature (ft)																													
Rc:Bankfull width (ft/ft)																													
Meander Wavelength (ft																													
Meander Width ratio																													
Additional Reach Parameters																													
Rosgen Classification								B/C-type																					
Channel Thalweg Length (ft								1444																					
Sinuosity								1.2																					
Water Surface Slope (Channel) (ft/ft)								0.0182																					
BF slope (ft/ft)								----																					
Ri%/RU%/P%/G%/S%																													
SC%/SA%/G%/C%/B%/BE%																													
d16/d35/d50/d84/d95																													
% of Reach with Eroding Banks								0																					
Channel Stability or Habitat Metric								----																					
Biological or Other								----																					

Table 11c. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters - Cross Sections)

Tate Farm (Ripshin Branch) - EEP Project Number 372 - Unnamed Tributary

Parameter	Cross Section 6 Riffle							Cross Section 7 Pool							Cross Section 8 Riffle						
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY5+	MY0	MY1	MY2	MY3	MY4	MY5	MY5+	MY0	MY1	MY2	MY3	MY4	MY5	MY5+
BF Width (ft)		17.4							16.0							17.4					
Floodprone Width (ft) (approx		80.0							NA							80.0					
BF Mean Depth (ft)		1.0							0.9							0.5					
BF Max Depth (ft)		1.7							2.4							1.2					
BF Cross Sectional Area (ft^2)		17.4							14.5							8.9					
Width/Depth Ratio		17.4							NA							34.0					
Entrenchment Ratio		4.6							NA							4.6					
Bank Height Ratio		1.0							1.0							1.0					
d50 (mm)		----							----							1.0					

Table 11d. Monitoring Data - Stream Reach Data Summary

Tate Farm (Ripshin Branch) - EEP Project Number 372 - Unnamed Tributary

Parameter	Baseline					MY-1					MY-2					MY-3					MY-4					MY-5				
Dimension and Substrate - Riffle Only	Min	Mean	Med	Max	SD	Min	Mean	Med	Max	SD	Min	Mean	Med	Max	SD	Min	Mean	Med	Max	SD	Min	Mean	Med	Max	SD	Min	Mean	Med	Max	SD
BF Width (ft)								17.4																						
Floodprone Width (ft								80																						
BF Mean Depth (ft)						0.5	0.8	0.8	1.0	0.4																				
BF Max Depth (ft)						1.2	1.5	1.5	1.7	0.4																				
BF Cross Sectional Area (ft^2)						8.9	13.2	13.2	17.4	6.0																				
Width/Depth Ratio						17.4	26.1	26.1	34.8	12.3																				
Entrenchment Ratio								4.6																						
Bank Height Ratio								1.0																						
Profile - Upstream																														
Riffle length (ft						3.9	29.7	27.3	65	17.9																				
Riffle slope (ft/ft						0.0064	0.0235	0.0233	0.0436	0.0108																				
Pool length (ft)						7.1	20.8	19.0	43.2	10.8																				
Pool Max depth (ft)								2.4																						
Pool spacing (ft)						7.1	43.6	39.3	103.9	28.7																				
Pattern																														
Channel Beltwidth (ft																														
Radius of Curvature (ft)																														
Rc:Bankfull width (ft/ft																														
Meander Wavelength (ft																														
Meander Width ratio																														
Additional Reach Parameters																														
Rosgen Classificatior								B/C-type																						
Channel Thalweg Length (ft								799																						
Sinuosity								1.2																						
Water Surface Slope (Channel) (ft/ft								0.0201																						
BF slope (ft/ft)								----																						
Ri%/RU%P%G%/S%																														
SC%/SA%/G%/C%/B%BE%																														
d16/d35/d50/d84/d95																														
% of Reach with Eroding Banks								19																						
Channel Stability or Habitat Metric								----																						
Biological or Other								----																						

APPENDIX E

HYDROLOGY DATA

Table 12. Verification of Bankfull Events

Table 13. Wetland Hydrology Criteria Attainment Summary

Table 12. Verification of Bankfull Events

Tate Farm (Ripshin Branch) Stream and Wetland Restoration Site (EEP Project Number 372)

Date of Data Collection	Date of Occurrence	Method	Photo (if available)
NA	NA	No bankfull events were observed during the Year 1 (2012) monitoring period.	---

Table 13. Wetland Hydrology Criteria Attainment Summary

Tate Farm (Ripshin Branch) Stream and Wetland Restoration Site (EEP Project Number 372)

Gauge	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)				
	Year 1 (2012)*	Year 2 (2013)	Year 3 (2014)	Year 4 (2015)	Year 5 (2016)
1	--				
2	--				
3	--				
4	--				
5	--				
6	--				

* Groundwater Gauges were installed in October 2012; therefore, groundwater monitoring will be initiated during the Year 2 (2013) monitoring year.