FINAL

ANNUAL MONITORING REPORT
YEAR 2 (2013)
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 2014

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Prepared by:
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Raleigh, North Carolina 27603

Axiom Environmental, Inc.

Ecosystem Enhancement PROGRAM

January 2014

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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, associated floodplain wetlands, and additional tributaries found on the property (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 2 (2013) 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.

After construction, five vegetation plots were established and sampled. During Year 2 (2013) monitoring, thirteen additional vegetation plots were established and sampled. Vegetation Success Criteria (from the approved *Ripshin Branch Stream & Wetland Restoration Plan* [NCEEP 2007]) include 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 was slightly below success criteria with an average of 267 stems/acre across the Site. In addition, six of the eighteen vegetation monitoring plots met, or exceeded success criteria of 320 stems/acre (minimum stem count after 2 years). Vegetation plots 2 and 4 were below success criteria with 283 and 162 stems/acre, respectively. Potential causes of the low stem counts at these plots include excessive hydrology associated with wetland restoration and over competition by sedges and soft rush (*Carex* spp. and *Juncus effusus*, respectively). Additional plots below success criteria can be attributed to poor planted stem survival due to harsh, high elevation climate and poor soils. Supplemental planting throughout these areas is recommended for winter 2013/2014.

One vegetation area of concern was noted at the beginning of 2013. An overbank event scoured the floodplain and deposited gravel and silt along both banks at the downstream end of Ripshin Branch near Vegetation Plot 5, and a number of planted stems were buried by debris and sediment. This area appears to have stabilized, with woody stems reestablishing. However, it is still scoured and is characterized by poor, rocky soils.

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. Year 1 (2012) geomorphic measurements indicated channel widening with subsequent sediment aggradation in a 150-200 foot reach of the Unnamed Tributary due to an unusually heavy rain event. This area appears stable with vegetation established in year 2 (2013). It will continue to be monitored closely during subsequent monitoring years. Additionally, during a summer of 2013 heavy rain event, a boulder was dislodged in a right bank structure in the lower portion of Ripshin Branch. The boulder is still in place but is unstable, compromising the integrity of the structure. This structure is marked on Figure 2B (Appendix B).

During Monitoring Year 2 (2013), approximately 21,350 linear feet of additional stream was mapped onsite using sub-meter GPS. The locations of additional streams are depicted on Figures 2A-2F. NCDWQ Stream Identification Forms were used to determine the Perennial/Intermittent status of each reach. These forms are included in Appendix F.

Stream Success Criteria (from the 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, emulates design conditions, and is trending towards success.

During Year 2 (2013) monitoring, six groundwater gauges were installed at the Site. Wetland hydrology success criteria (from the 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 data is available for year 1 (2012) monitoring. All six groundwater gauges were saturated/inundated for well over 10 percent of the year 2 (2013) growing season.

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, and 13 additional plots were established and marked during the Year 2 (2013) monitoring period, yielding a total of 18 vegetation plots on the site. 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 or 20 meters by 5 meters and are located randomly within the Site. These plots were surveyed in August for the Year 2 (2013) 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 June of 2013. 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 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 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 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.

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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.

Weather Underground. 2013. Station at Jefferson, North Carolina. (online). Available: http://www.wunderground.com/history/airport/KGEV/2013/1/1/CustomHistory.html?dayend=7&monthend=6&yearend=2013&req_city=NA&req_state=NA&req_statename=NA [June 7, 2013]. Weather Underground.

APPENDIX A

PROJECT VICINITY MAP AND BACKGROUND TABLES

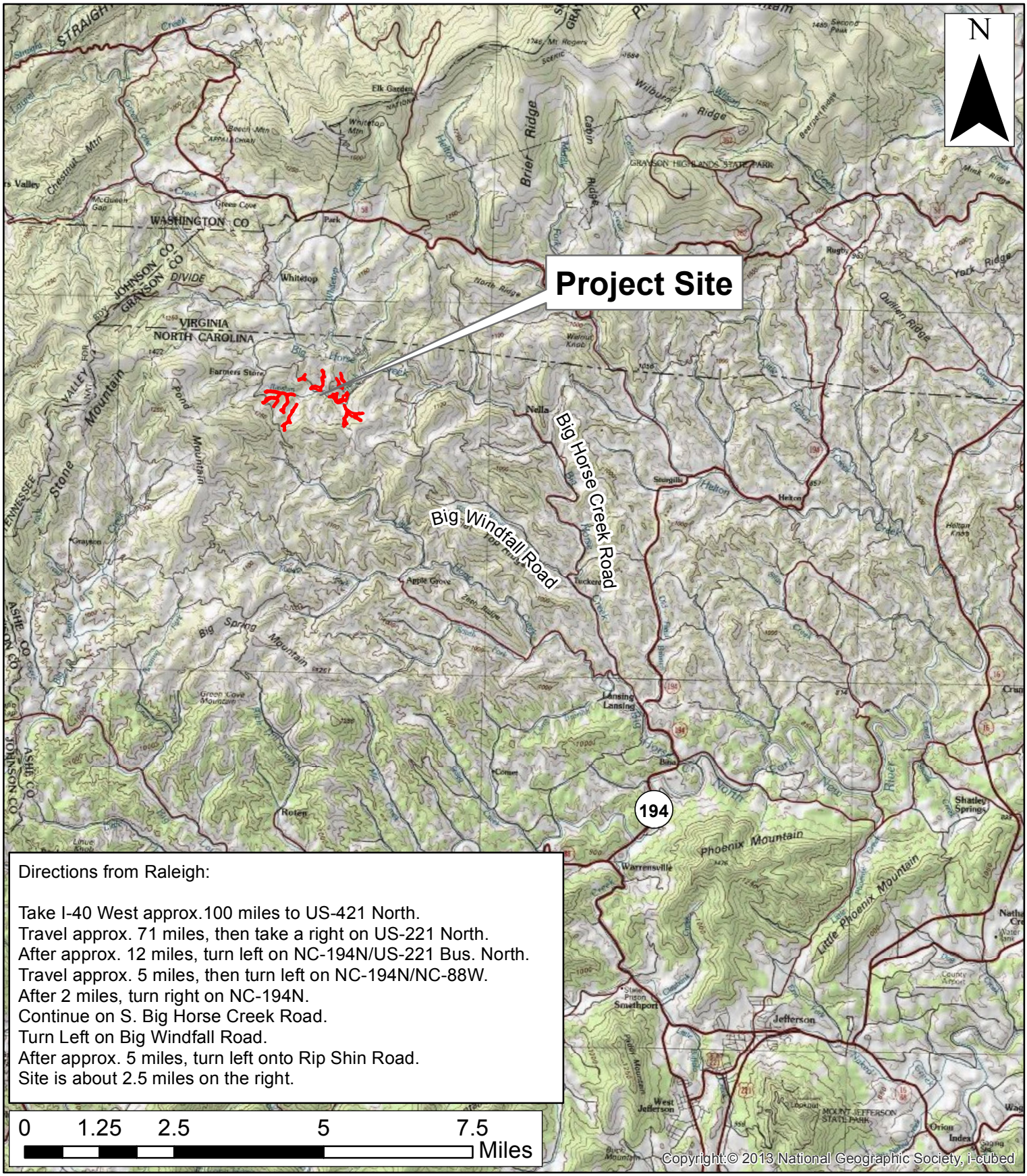
Figure 1. Vicinity Map

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: December 2013	
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	6483	2340	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. – Area 2)	00+00–08+00	800	Enhancement	E II	800	1:2.5	
Reach 1B (Ripshin Br. – Area 2)	08+00-12+00	350	Priority II	R	400	1:1	
Reach 1C (Ripshin Br. – Area 2)	12+00-14+85	285	Enhancement	E II	285	1:2.5	
Reach 2A (Ripshin Br. – Area 2)	14+85-23+00	785	Priority II	R	815	1:1	
Ripshin Branch – Area 2	--	518	Preservation	P	518	1:5	
Reach 3A (UT – Area 1)	00+00-01+24	132	Enhancement	E I	124	1:1.5	
Reach 3B (UT – Area 1)	01+24-09+12	688	Priority I	R	788	1:1	
Area 1 Tributaries		2419	Enhancement	E II	2419	1:2.5	
Area 1 Tributaries		889	Preservation	P	889	1:5	
Area 2 Tributaries		1362	Enhancement	E II	1362	1:2.5	
Area 2 Tributaries		1023	Preservation	P	1023	1:5	
Area 3 Tributaries		2500	Enhancement	E II	2500	1:2.5	
Area 3 Tributaries		949	Preservation	P	949	1:5	
Area 4 Tributaries		3367	Enhancement	E II	3367	1:2.5	
Area 4 Tributaries		8841	Preservation	P	8841	1:5	
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	

Table 1. Project Components and Mitigation Credits (continued)

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

Component Summation			
Restoration Level	**Stream (linear footage)**	**Riparian Wetland (acres)**	**Buffer (square footage)**
Restoration	2003	3.8	
Enhancement (Level I)	124		
Enhancement (Level II)	10733		
Preservation	12220		
Wetland Enhancement		3.98	
Creation			
Totals	**25080**	**7.78**	
Mitigation Units	**8823 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: 2 years 3 months
Elapsed Time Since Planting Complete: 1 year 11 months
Number of Reporting Years: 2

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)	November 2013	January 2014
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 (Ripshin Branch)**	**Reach 2 (UT)**	**Area 1 Tributaries**	**Area 2 Tributaries**	**Area 3 Tributaries**	**Area 4 Tributaries**
Restored/Enhanced Length (Linear Feet)	2300	912	2419	1362	2500	3367
Drainage Area (Square Miles)	2.0	0.56	NA	NA	NA	NA
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

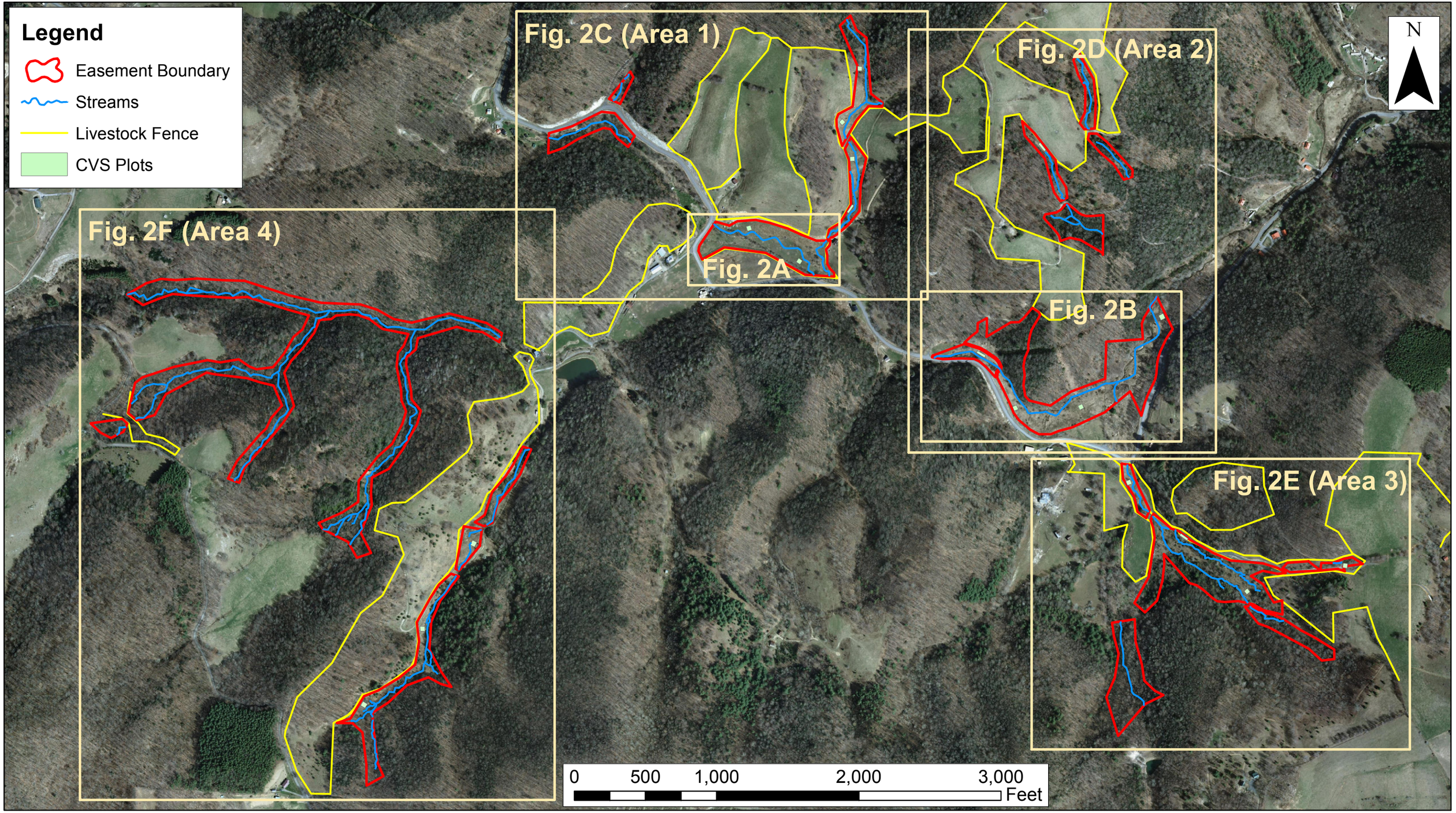
Figures 2 and 2A-2F. Current Conditions Plan View

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

Table 6. Vegetation Condition Assessment

Stream Fixed-Station Photographs

Vegetation Monitoring Photographs



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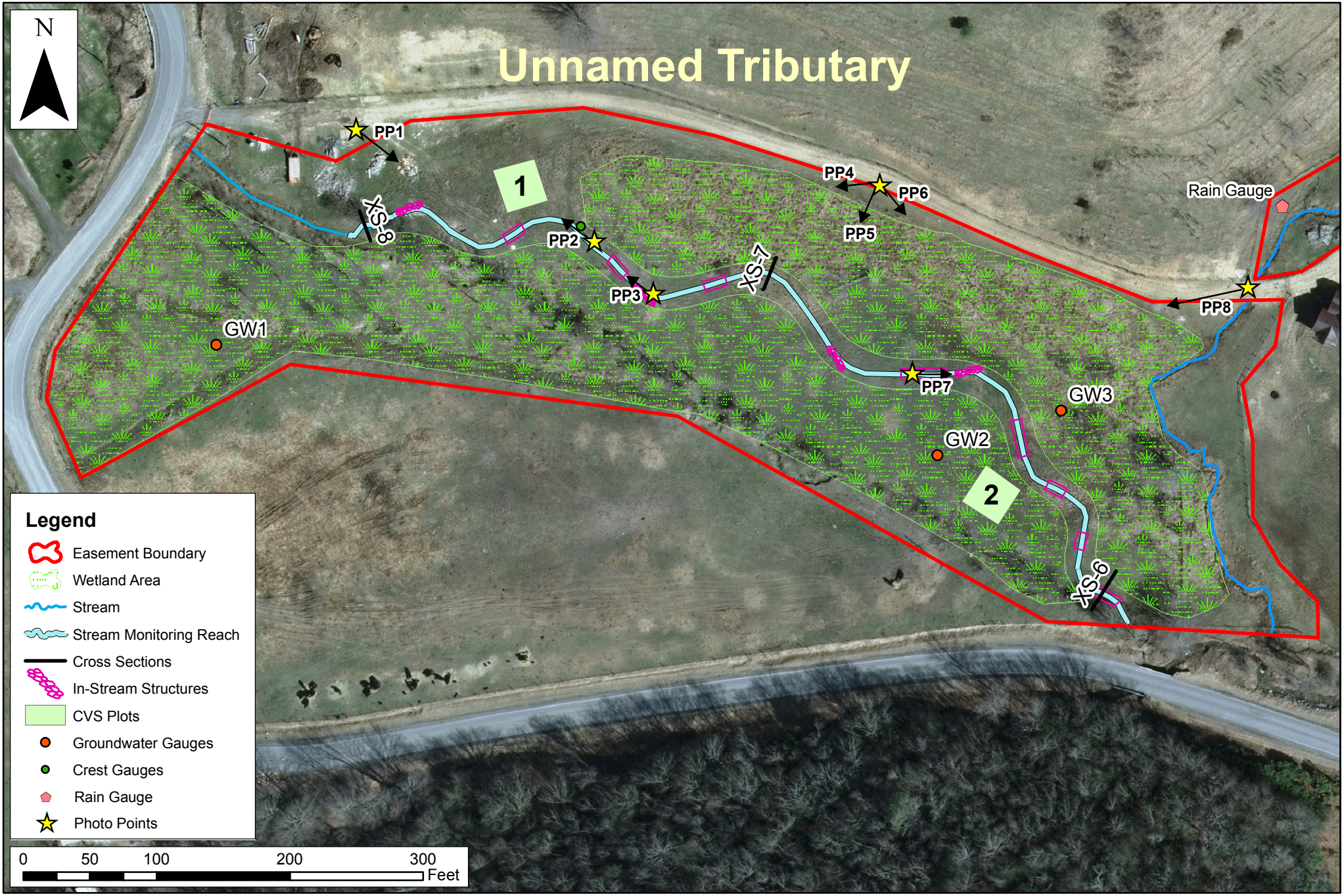
CURRENT CONDITIONS PLAN VIEW
TATE FARM
EEP PROJECT NUMBER 372
Ashe County, North Carolina

Dwn. by. KRJ	FIGURE
Date: December 2013	2
Project: 12-004.13	



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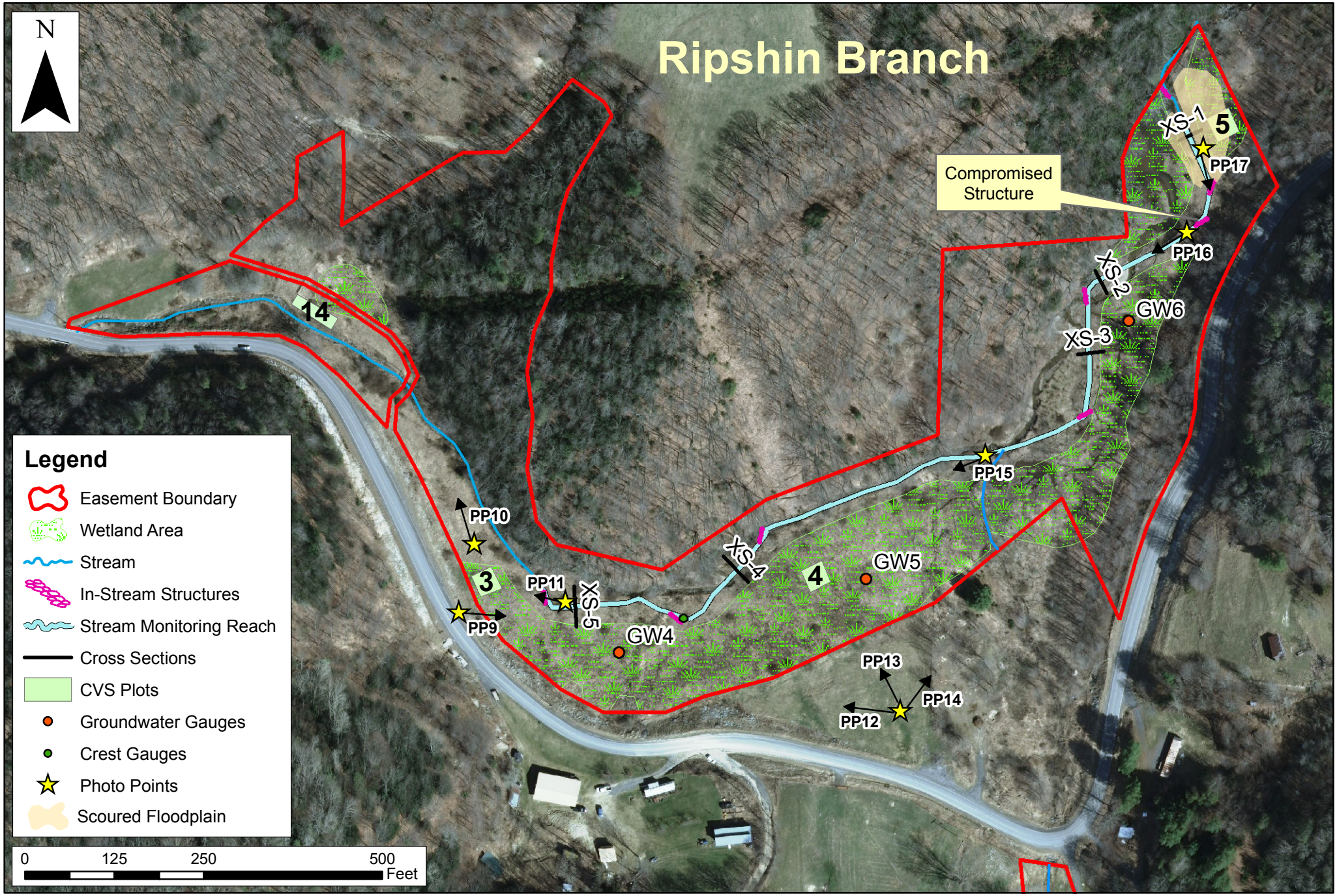
CURRENT CONDITIONS PLAN VIEW
TATE FARM (UT)
EEP PROJECT NUMBER 372
Ashe County, North Carolina

Dwn. by: KRJ
Date: December 2013
Project: 12-004.13

FIGURE
2A



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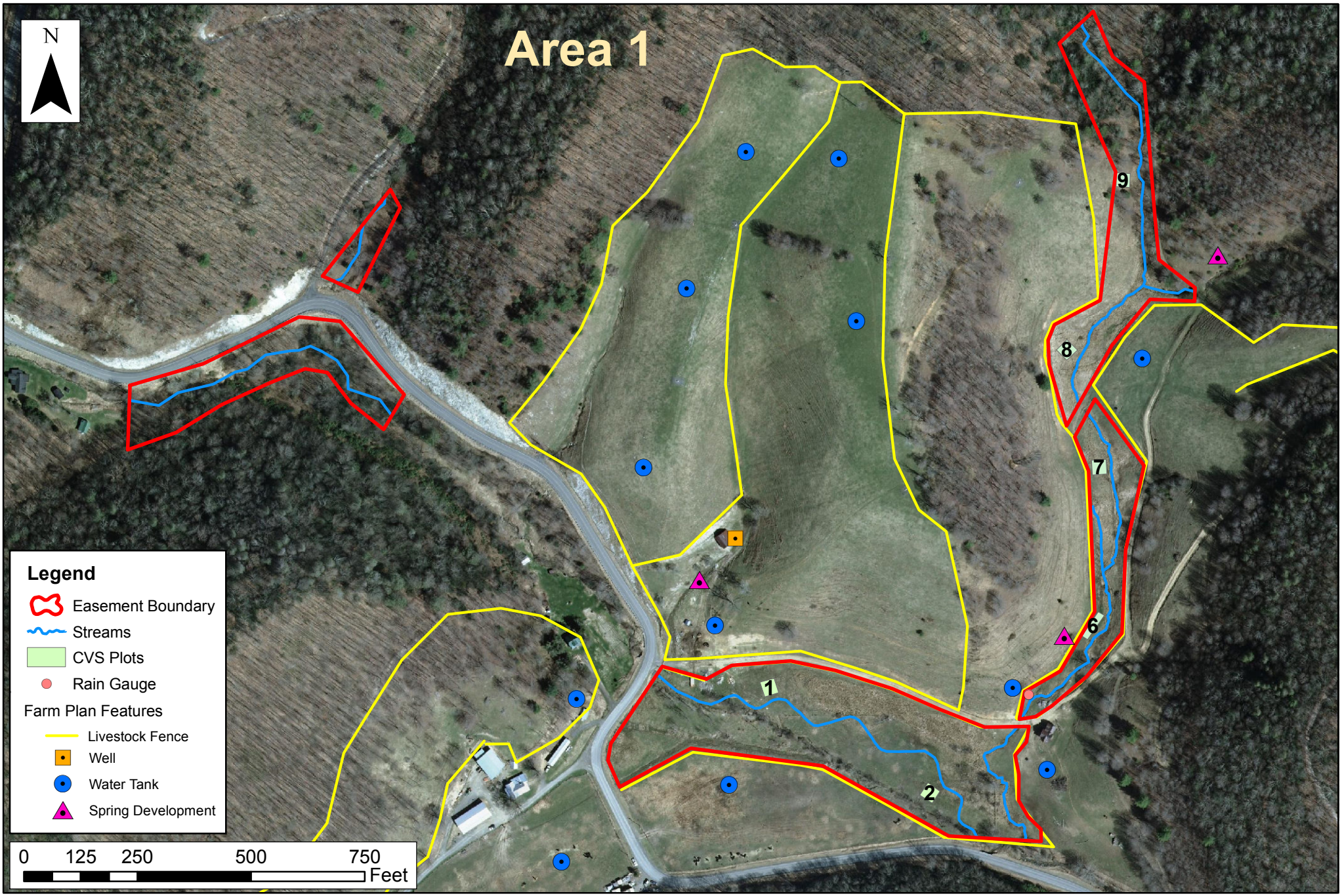
CURRENT CONDITIONS PLAN VIEW
TATE FARM (RIPSHIN BRANCH)
EEP PROJECT NUMBER 372
Ashe County, North Carolina

Dwn. by: KRJ
Date: December 2013
Project: 12-004.13

FIGURE
2B



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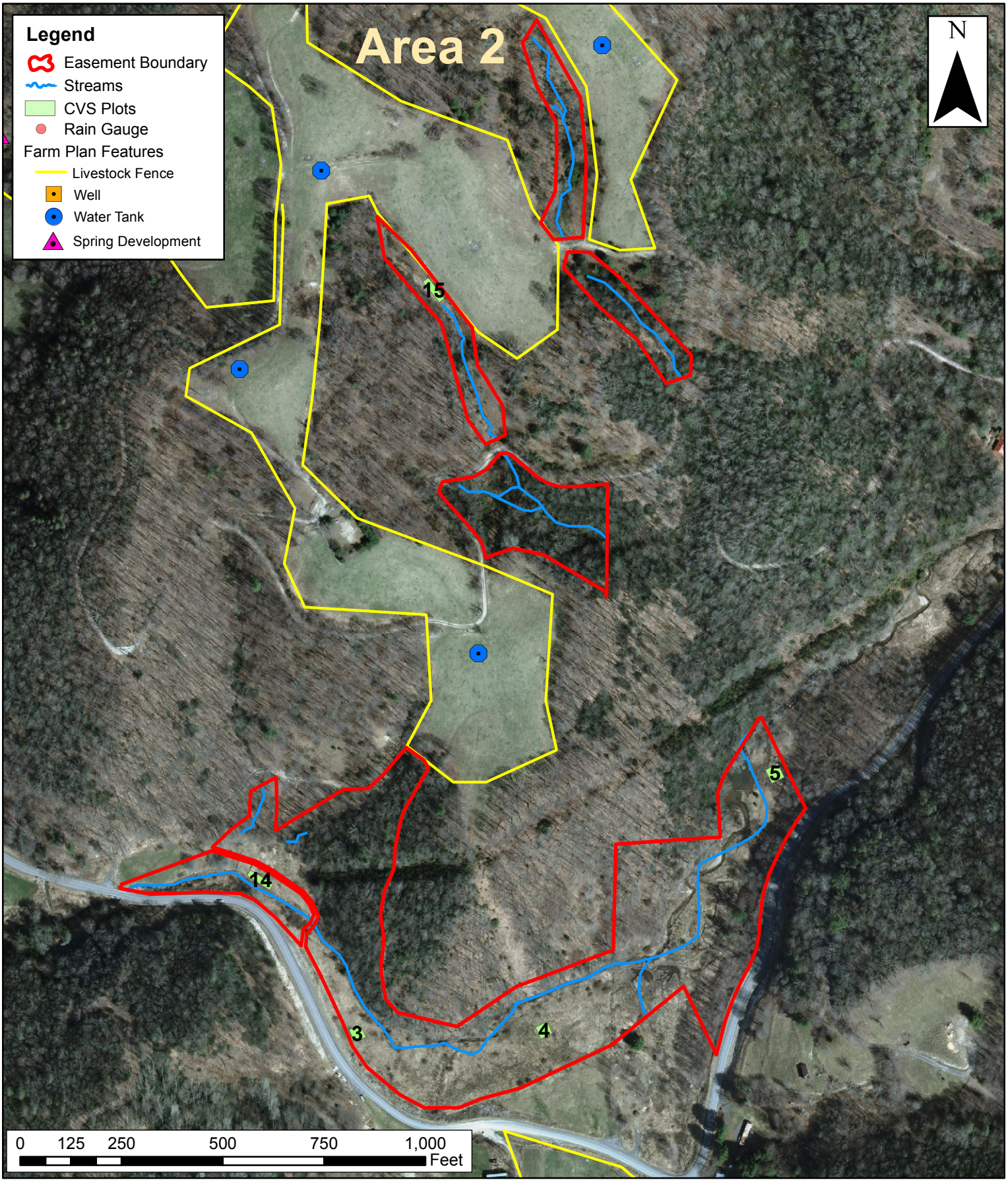
CURRENT CONDITIONS PLAN VIEW
TATE FARM (AREA 1)
EEP PROJECT NUMBER 372
Ashe County, North Carolina

Dwn. by.	KRJ
Date:	December 2013
Project:	12-004.13

FIGURE
2C



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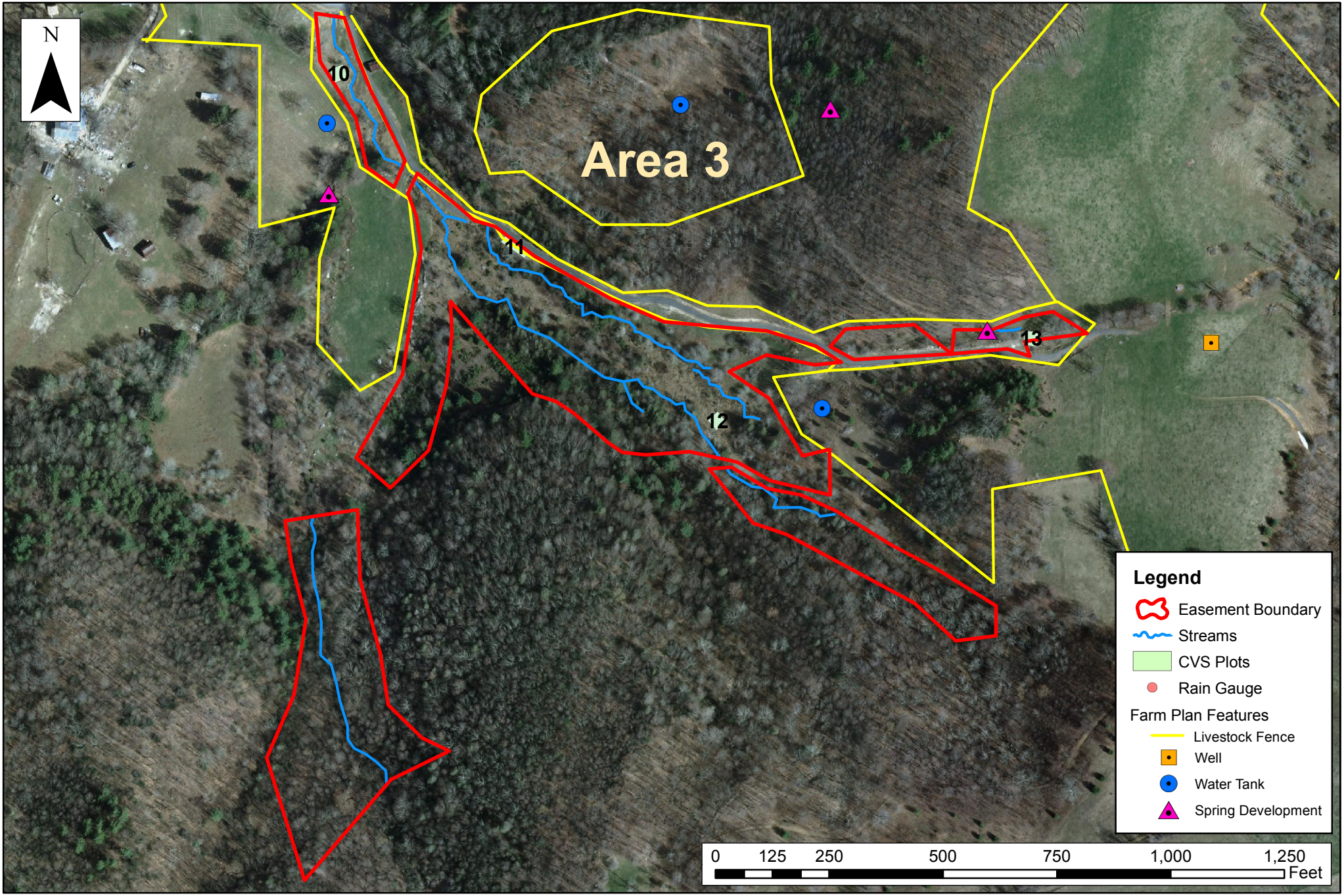
CURRENT CONDITIONS PLAN VIEW
TATE FARM (AREA 2)
EEP PROJECT NUMBER 372
Ashe County, North Carolina

Dwn. by.
KRJ

Date:
December 2013

Project:
12-004.13

FIGURE
2D



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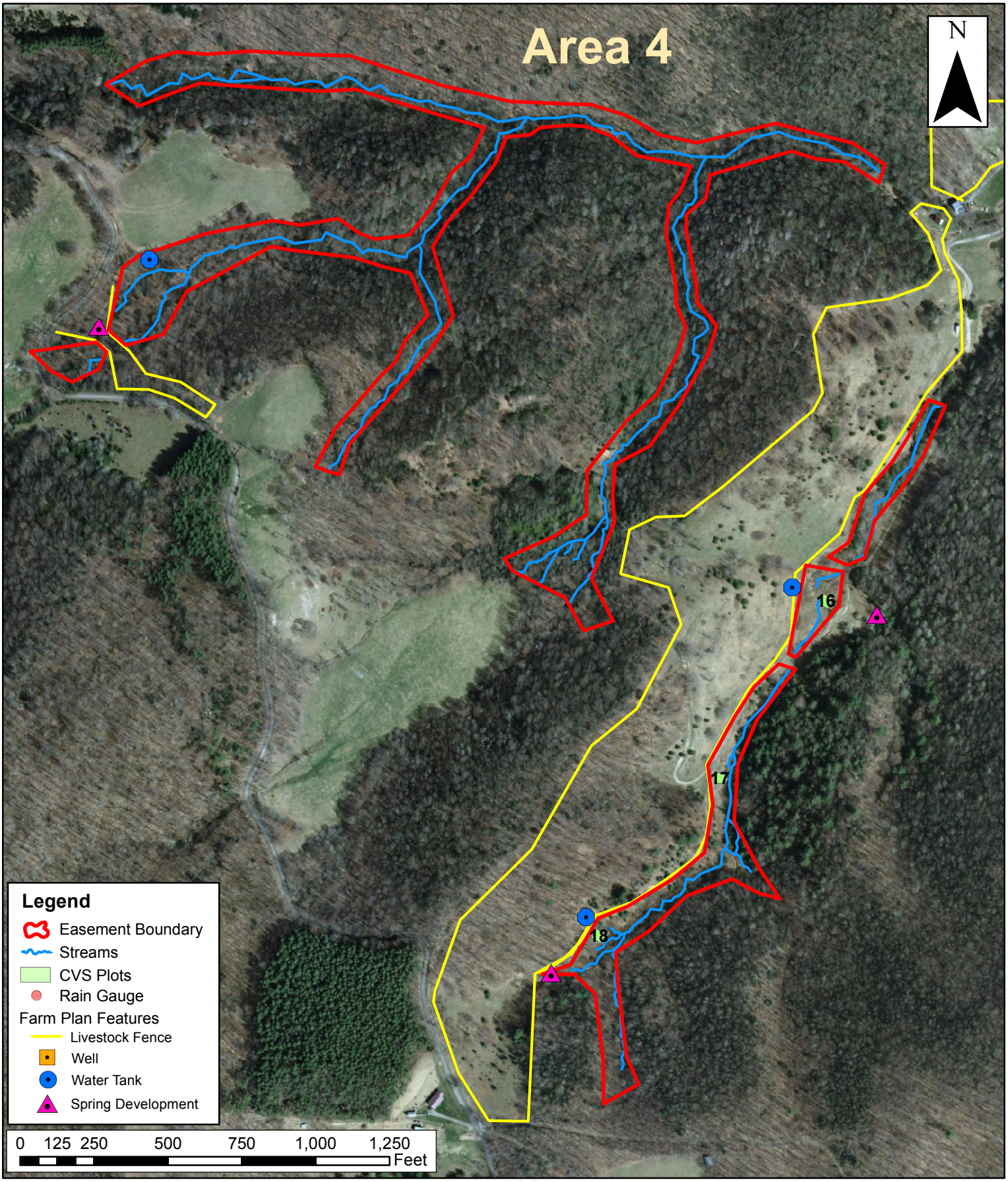
CURRENT CONDITIONS PLAN VIEW
TATE FARM (AREA 3)
EEP PROJECT NUMBER 372
Ashe County, North Carolina

Dwn. by: KRJ
Date: December 2013
Project: 12-004.13

FIGURE
2E



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CURRENT CONDITIONS PLAN VIEW
TATE FARM (AREA 4)
EEP PROJECT NUMBER 372
Ashe County, North Carolina

Dwn. by.
KRJ

Date:
December 2013

Project:
12-004.13

FIGURE
2F

Table 5A **Visual Stream Morphology Stability Assessment**

Reach ID **Unnamed Tributary**
Assessed Length **800**

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	12	12			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	10	10			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	10	10			100%			
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	10	10			100%			
		2. Thalweg centering at downstream of meander (Glide)	10	10			100%			
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	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.			0	0	100%			100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			100%
				Totals	0	0	100%	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	4	4			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	8	8			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	4	4			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	4	4			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	4	4			100%			

Table 5B **Visual Stream Morphology Stability Assessment**

Reach ID **Ripshin Branch**
Assessed Length **1444**

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	21	21			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	25	25			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	25	25			100%			
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	25	25			100%			
		2. Thalweg centering at downstream of meander (Glide)	25	25			100%			
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	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.			0	0	100%			100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			100%
				Totals	0	0	100%	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	7	8			88%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	0	0			NA			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	8	8			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	8	8			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	8	8			100%			

Table 6 Vegetation Condition Assessment

Planted Acreage[1] **17.48**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	Tan	2	0.22	1.3%
2. Low Stem Density Areas	Woody stem densities clearly below target levels.	0.1 acres	NA	NA	8.00	45.8%
			Total	2	8.22	47.0%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acres	NA	0	0.00	0.0%
			Cumulative Total	2	8.22	47.0%

Easement Acreage[2] **61.9**

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).	100 SF	NA	0	0.00	0.0%
5. Easement Encroachment Areas[3]	Areas or points (if too small to render as polygons at map scale).	none	NA	0	0.00	0.0%

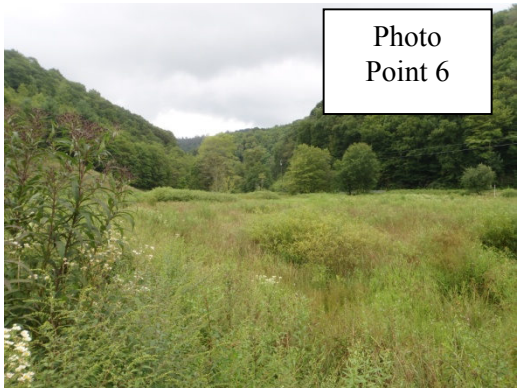
1 = Enter the planted acreage within the easement. This number is calculated as the easement acreage minus any existing mature tree stands that were not subject to supplemental planting of the understory, the channel acreage, crossings or any other elements not directly planted as part of the project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

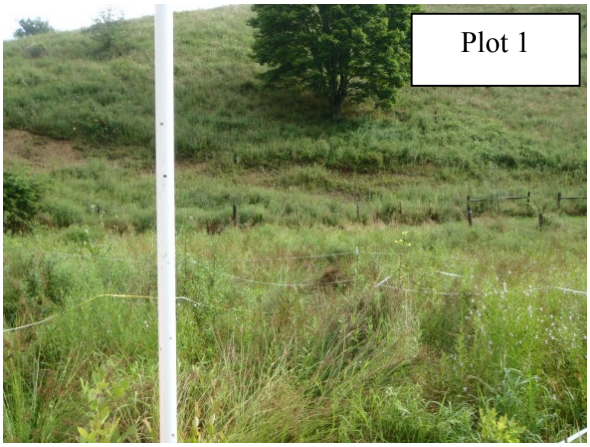
Tate Farm (Ripshin Branch)
Stream Fixed-Station Photographs
Taken August 2013

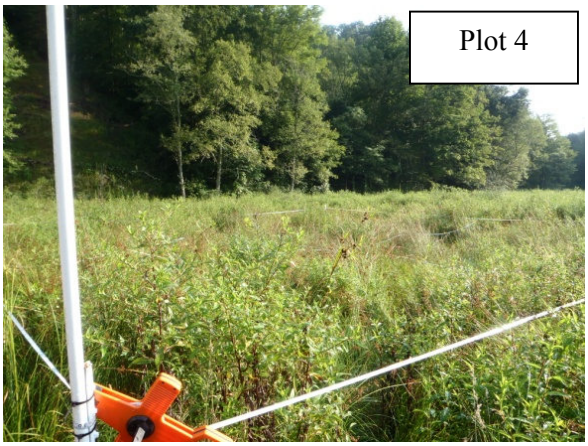


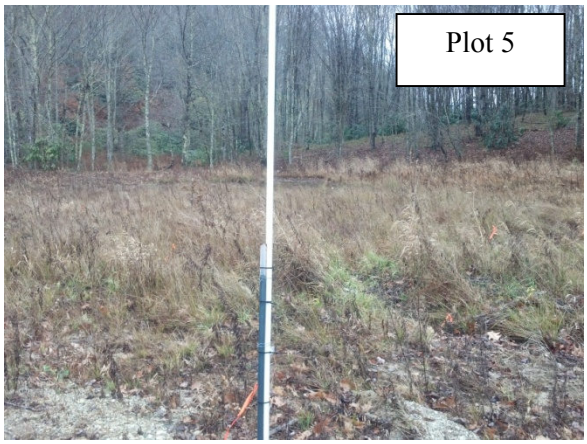
Tate Farm (Ripshin Branch)
Stream Fixed-Station Photographs
Taken August 2013
(continued)

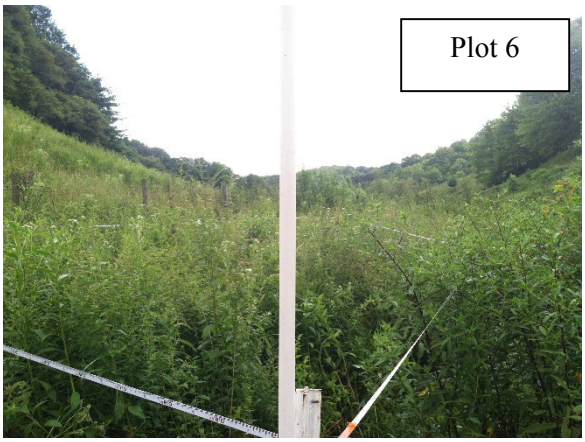
Tate Farm (Ripshin Branch)
Stream Fixed-Station Photographs
Taken August 2013
(continued)

Tate Farm (Ripshin Branch)
Vegetation Monitoring Photographs
Taken August 2013

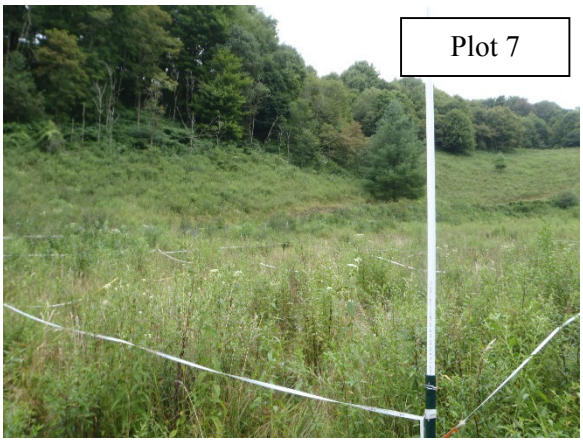


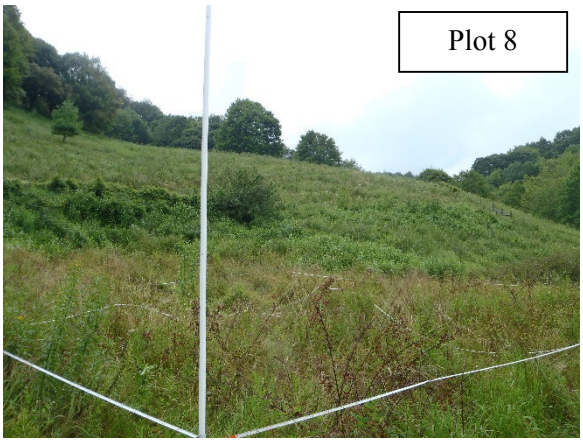


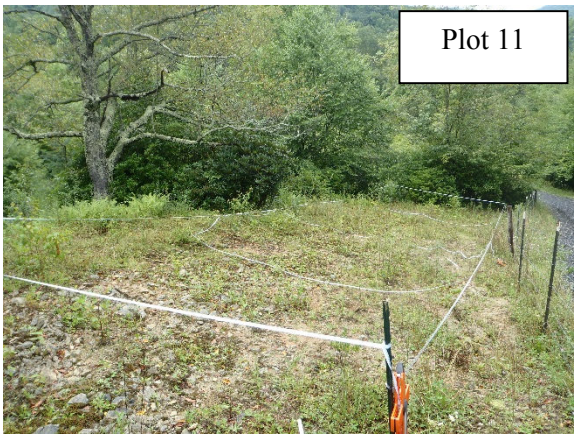




Tate Farm (Ripshin Branch)
Vegetation Monitoring Photographs
Taken August 2013
(Continued)







Tate Farm (Ripshin Branch)
Vegetation Monitoring Photographs
Taken August 2013
(Continued)

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 Based on Planted Stems

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

Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
1	Yes	33%
2	No	
3	Yes	
4	No	
5	Yes	
6	No	
7	No	
8	No	
9	Yes	
10	No	
11	Yes	
12	No*	
13	No	
14	Yes	
15	No	
16	No	
17	No	
18	No*	

*When including natural recruits such as Red Maple (*Acer rubrum*), Mountain Laurel (*Kalmia latifolia*), and Silky Willow (*Salix sericea*), these plots exceed 320 stems/acre.

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	11/19/2013 12:09
database name	Axiom-EEP-2013-A-v2.3.1-FINAL.mdb
database location	C:\Axiom\Business\CVS
computer name	CORRI-PC
file size	56041472
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	18

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

			Current Plot Data (MY2 2013)																														
			372-01-0001			372-01-0002			372-01-0003			372-01-0004			372-01-0005			372-01-0006			372-01-0007			372-01-0008			372-01-0009			372-01-0010			372-01-0011		
Scientific Name	**Common Name**	**Species Type**	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer pensylvanicum	striped maple	Shrub Tree																																
Acer rubrum	red maple	Tree			4																							1						
Aesculus flava	yellow buckeye	Tree																																
Alnus	alder	Shrub																																
Alnus serrulata	hazel alder	Shrub													4	4	4																	
Aronia arbutifolia	Red Chokeberry	Shrub				2	2	2							3	3	3																	
Betula lenta	sweet birch	Tree																																
Betula nigra	river birch	Tree	3	3	3				1	1	1				3	3	3				2	2	2	3	3	3								
Carpinus caroliniana	American hornbeam	Tree																																
Cornus amomum	silky dogwood	Shrub	1	1	1	1	1	1				2	2	2																				
Corylus americana	American hazelnut	Shrub																1	1	1							1	1	1					21
Crataegus	hawthorn	Tree																																
Crataegus phaenopyrum	Washington hawthorn	Shrub Tree																															2	2	2
Fagus grandifolia	American beech	Tree																										1						
Fraxinus pennsylvanica	green ash	Tree	5	5	5	2	2	2	4	4	4	1	1	1	1	1	1				1	1	1											
Ilex opaca	American holly	Tree				2	2	2																										
Kalmia	laurel																																	7
Kalmia latifolia	mountain laurel	Shrub Tree																																
Liriodendron tulipifera	tuliptree	Tree																									3	3	3					
Malus	apple	Tree																												1	1	1		
Pinus strobus	eastern white pine	Tree																																1
Platanus occidentalis	American sycamore	Tree							6	6	6	1	1	1	2	2	2													3	3	3		
Prunus serotina	black cherry	Tree							1	1	1																							
Quercus alba	white oak	Tree																																
Quercus rubra	northern red oak	Tree																									1	1	1					
Rhododendron	rhododendron																																	5
Rhododendron maximum	great laurel	Shrub																									1	1	1				4	4	4
Rhus	sumac	shrub																																
Salix	willow	Shrub or Tree																																
Salix nigra	black willow	Tree																																
Salix sericea	silky willow	Shrub																																
Sambucus canadensis	Common Elderberry	Shrub																																
Tsuga canadensis	eastern hemlock	Tree																									3	3	3					
Vaccinium corymbosum	highbush blueberry	Shrub																1	1	1							1	1	1				13	13	13
Viburnum dentatum	southern arrowwood	Shrub	3	3	3																													
		Stem count	12	12	16	7	7	7	12	12	12	4	4	4	13	13	13	2	2	2	3	3	3	3	3	3	10	10	12	4	4	4	19	19	53
		size (ares)	1			1			1			1			1			1			1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02		
		Species count	4	4	5	4	4	4	4	4	4	3	3	3	5	5	5	2	2	2	2	2	2	1	1	1	6	6	8	2	2	2	3	3	7
		Stems per ACRE	485.6	485.6	647.5	283.3	283.3	283.3	485.6	485.6	485.6	161.9	161.9	161.9	526.1	526.1	526.1	80.94	80.94	80.94	121.4	121.4	121.4	121.4	121.4	121.4	404.7	404.7	485.6	161.9	161.9	161.9	768.9	768.9	2145

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

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

Current Plot Data (MY2 2013)																								Annual Means					
			372-01-0012			372-01-0013			372-01-0014			372-01-0015			372-01-0016			372-01-0017			372-01-0018			MY2 (2013)			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	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer pensylvanicum	striped maple	Shrub Tree																											
Acer rubrum	red maple	Tree																					12			17			
Aesculus flava	yellow buckeye	Tree																											
Alnus	alder	Shrub																											
Alnus serrulata	hazel alder	Shrub																						4	4	4	5	5	5
Aronia arbutifolia	Red Chokeberry	Shrub																						5	5	5	5	5	5
Betula lenta	sweet birch	Tree																											
Betula nigra	river birch	Tree	1	1	1				1	1	1													14	14	14	5	5	5
Carpinus caroliniana	American hornbeam	Tree							1	1	1													1	1	1			
Cornus amomum	silky dogwood	Shrub							1	1	1													5	5	5	4	4	4
Corylus americana	American hazelnut	Shrub							4	4	4												3	6	6	30			
Crataegus	hawthorn	Tree			1										1	1	1						1	1	1	3			
Crataegus phaenopyrum	Washington hawthorn	Shrub Tree																						2	2	2			
Fagus grandifolia	American beech	Tree																					1			2			
Fraxinus pennsylvanica	green ash	Tree	1	1	1																			15	15	15	8	8	8
Ilex opaca	American holly	Tree							1	1	1													3	3	3	2	2	2
Kalmia	laurel				8																					15			
Kalmia latifolia	mountain laurel	Shrub Tree																											
Liriodendron tulipifera	tuliptree	Tree																					1	3	3	4			
Malus	apple	Tree																						1	1	1			
Pinus strobus	eastern white pine	Tree																					1			2			
Platanus occidentalis	American sycamore	Tree				2	2	2																14	14	14	8	8	8
Prunus serotina	black cherry	Tree							1	1	1				1	1	1							3	3	3	1	1	1
Quercus alba	white oak	Tree							1	1	1													1	1	1			
Quercus rubra	northern red oak	Tree																						1	1	1			
Rhododendron	rhododendron					1	1	1										1	1	1			2	2	2	9			
Rhododendron maximum	great laurel	Shrub	2	2	2																			7	7	7			
Rhus	sumac	shrub																											1
Salix	willow	Shrub or Tree																											
Salix nigra	black willow	Tree														2	2								2	2			
Salix sericea	silky willow	Shrub			7																					7			
Sambucus canadensis	Common Elderberry	Shrub							4	4	4													4	4	4			
Tsuga canadensis	eastern hemlock	Tree			1																			3	3	4			
Vaccinium corymbosum	highbush blueberry	Shrub									4													15	15	19			
Viburnum dentatum	southern arrowwood	Shrub							6	6	6													9	9	9	3	3	3
		Stem count	4	4	21	3	3	3	20	20	24	0	0	0	2	4	4	1	1	1	0	0	21	119	121	203	41	41	42
		size (ares)	1			1			1			1			1			1			1			18			5		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.44			0.12		
		Species count	3	3	7	2	2	2	9	9	10	0	0	0	2	3	3	1	1	1	0	0	7	22	23	28	9	9	10
		Stems per ACRE	161.9	161.9	849.8	121.4	121.4	121.4	809.4	809.4	971.2	0	0	0	80.94	161.9	161.9	40.47	40.47	40.47	0	0	849.8	267.5	272	456.4	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

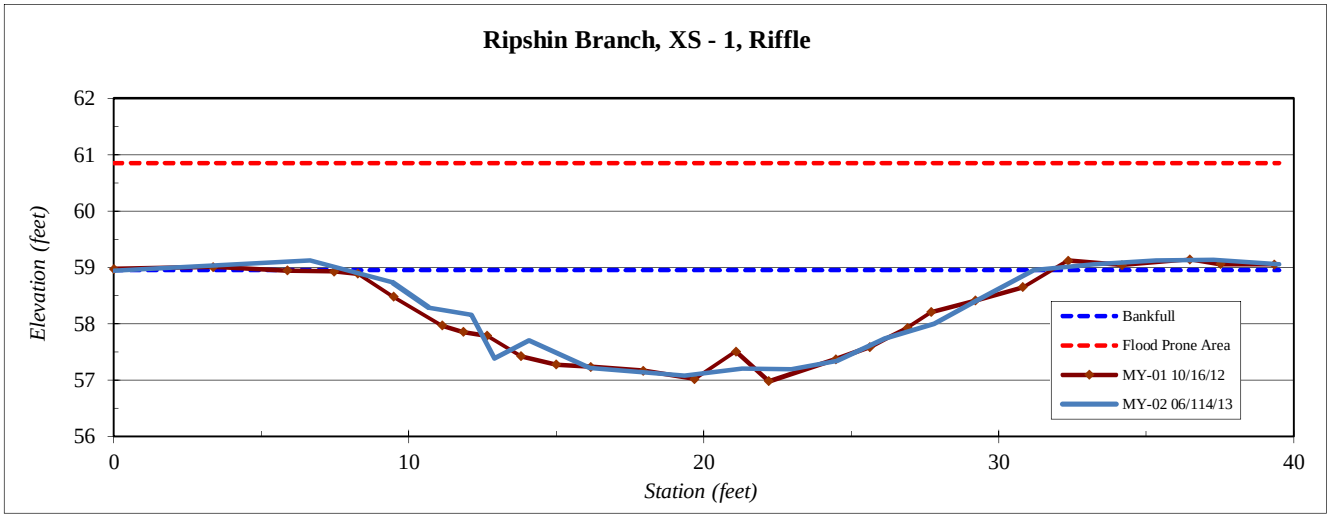
Tables 11a-d. Monitoring Data

River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 1, Riffle
Drainage Area (sq mi):	1.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.00	58.95
6.64	59.12
9.44	58.74
10.70	58.28
12.12	58.15
12.91	57.39
14.08	57.71
16.13	57.22
19.34	57.08
21.29	57.20
22.97	57.19
24.52	57.34
26.15	57.74
27.80	58.00
29.21	58.40
31.19	58.95
33.22	59.06
35.34	59.13
37.30	59.13
39.50	59.05

SUMMARY DATA	
Bankfull Elevation:	59.0
Bankfull Cross-Sectional Area:	27.9
Bankfull Width:	23.3
Flood Prone Area Elevation:	60.9
Flood Prone Width:	>80
Max Depth at Bankfull:	1.9
Mean Depth at Bankfull:	1.2
W / D Ratio:	19.5
Entrenchment Ratio:	3.4
Bank Height Ratio:	1.0

Stream Type	B/C

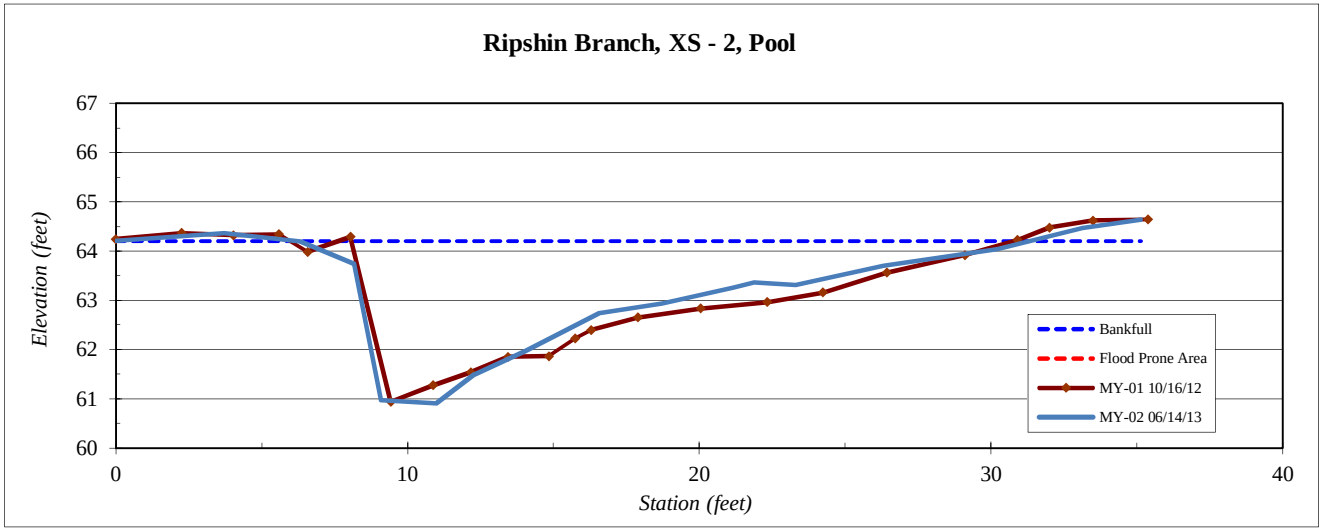


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 2, Pool
Drainage Area (sq mi):	1.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.00	64.21
3.70	64.37
6.33	64.20
8.17	63.74
9.09	60.97
11.00	60.91
12.30	61.49
14.05	61.98
16.58	62.74
18.71	62.94
21.17	63.25
21.89	63.36
23.31	63.31
26.31	63.70
30.21	64.03
33.1	64.47
35.1	64.64

SUMMARY DATA	
Bankfull Elevation:	64.2
Bankfull Cross-Sectional Area:	32.2
Bankfull Width:	25.0
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	3.3
Mean Depth at Bankfull:	1.3
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	B/C

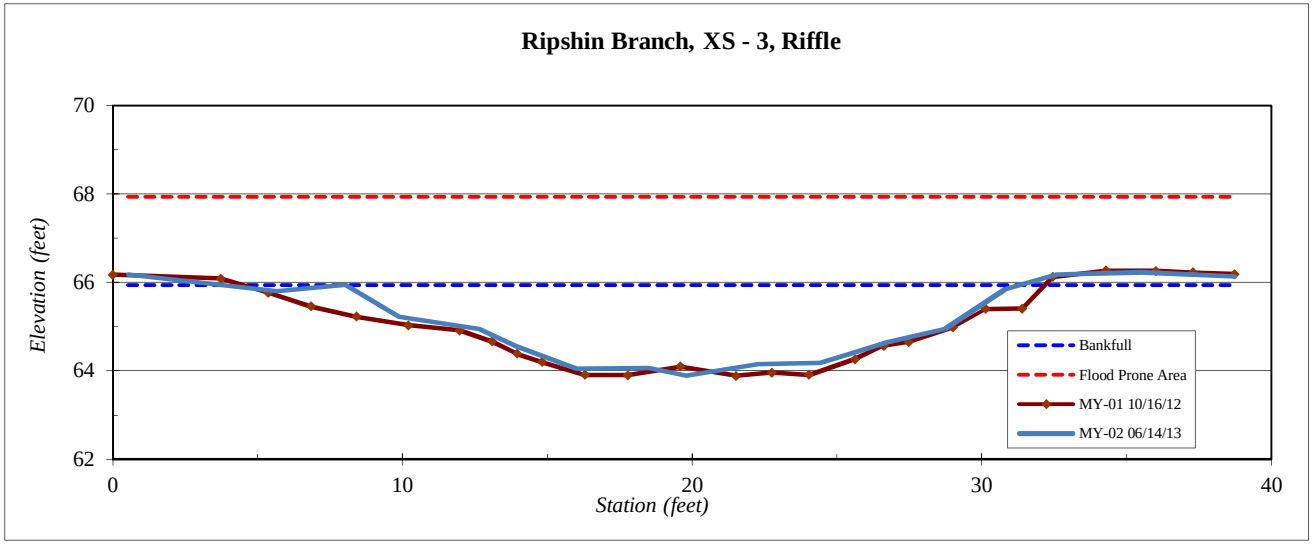


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 3, Riffle
Drainage Area (sq mi):	1.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.54	66.18
5.67	65.80
8.03	65.94
9.89	65.23
12.64	64.95
13.93	64.56
16.01	64.06
18.51	64.06
19.79	63.89
22.28	64.15
24.43	64.19
25.36	64.37
26.72	64.65
28.73	64.95
30.8	65.85
32.6	66.17
35.5	66.23
38.7	66.14

SUMMARY DATA	
Bankfull Elevation:	65.9
Bankfull Cross-Sectional Area:	30.7
Bankfull Width:	23.3
Flood Prone Area Elevation:	67.9
Flood Prone Width:	>80
Max Depth at Bankfull:	2.0
Mean Depth at Bankfull:	1.3
W / D Ratio:	17.7
Entrenchment Ratio:	3.4
Bank Height Ratio:	1.0

Stream Type	B/C

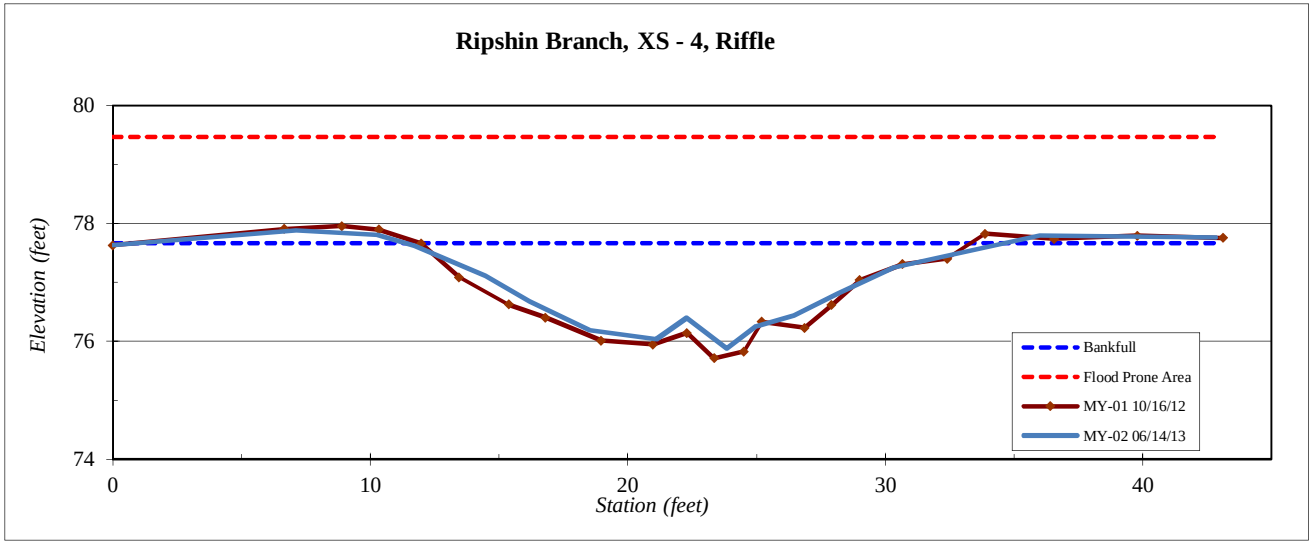


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 4, Riffle
Drainage Area (sq mi):	1.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.00	77.63
7.12	77.88
10.28	77.81
11.71	77.63
14.48	77.11
16.19	76.68
18.52	76.19
21.10	76.04
22.28	76.39
23.85	75.88
24.99	76.25
26.46	76.44
28.13	76.80
30.34	77.26
32.2	77.44
36.0	77.80
40.4	77.77
42.8	77.76

SUMMARY DATA	
Bankfull Elevation:	77.7
Bankfull Cross-Sectional Area:	21.0
Bankfull Width:	23.3
Flood Prone Area Elevation:	79.5
Flood Prone Width:	>80
Max Depth at Bankfull:	1.8
Mean Depth at Bankfull:	0.9
W / D Ratio:	25.9
Entrenchment Ratio:	3.4
Bank Height Ratio:	1.0

Stream Type	B/C

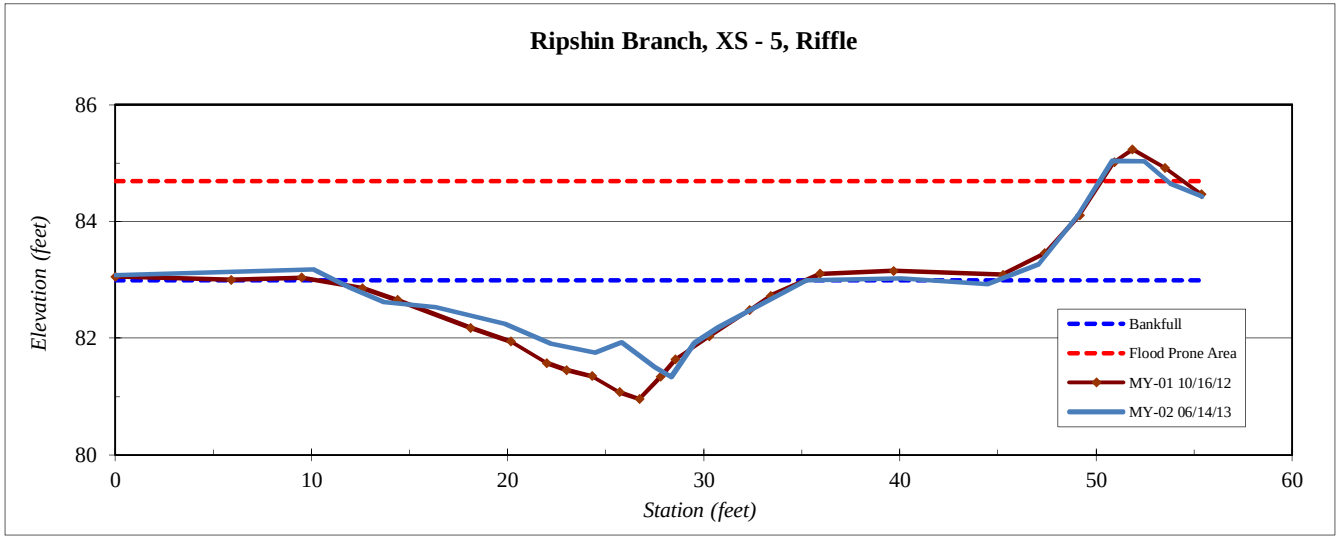


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 5, Riffle
Drainage Area (sq mi):	1.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.0	83.1
10.1	83.2
11.9	82.9
13.7	82.6
16.3	82.5
19.8	82.2
22.2	81.9
24.5	81.8
25.8	81.9
27.5	81.5
28.3	81.3
29.5	81.9
30.7	82.2
32.2	82.44
35.2	82.99
40.1	83.03
44.5	82.93
47.1	83.27
49.1	84.10
50.8	85.03
52.5	85.03
53.8	84.64
55.4	84.43

SUMMARY DATA	
Bankfull Elevation:	83.0
Bankfull Cross-Sectional Area:	18.0
Bankfull Width:	24.0
Flood Prone Area Elevation:	84.7
Flood Prone Width:	>80
Max Depth at Bankfull:	1.7
Mean Depth at Bankfull:	0.8
W / D Ratio:	32.0
Entrenchment Ratio:	3.3
Bank Height Ratio:	1.0

Stream Type	B/C

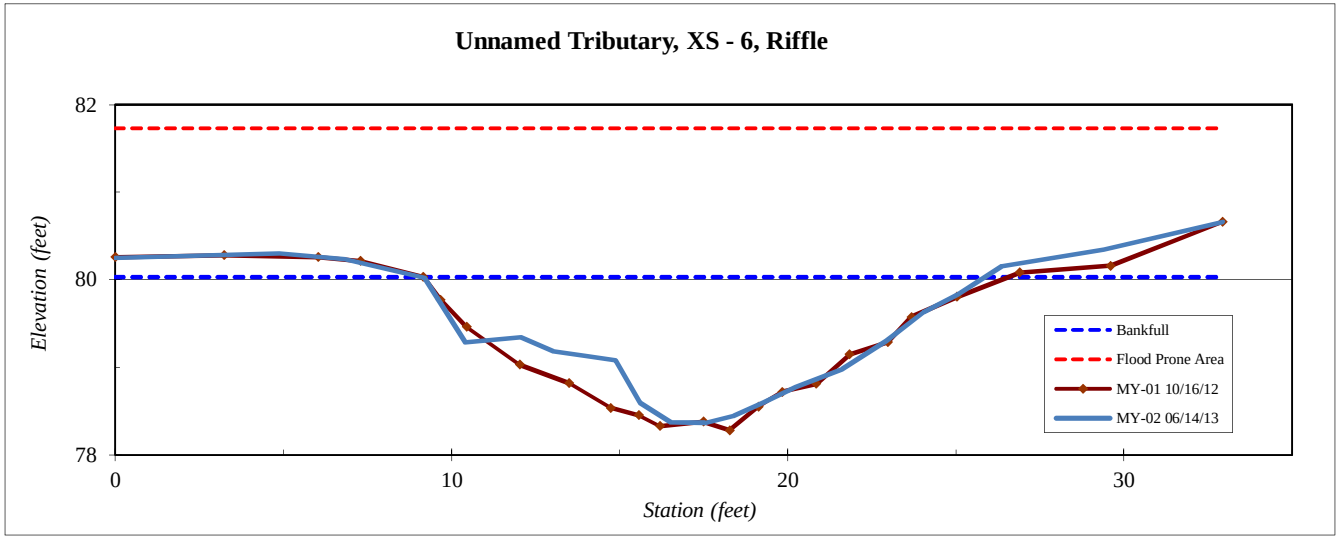


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 6, Riffle
Drainage Area (sq mi):	0.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.0	80.3
4.9	80.3
6.8	80.2
9.2	80.0
10.4	79.3
12.1	79.3
13.0	79.2
14.0	79.1
14.9	79.1
15.6	78.6
16.5	78.4
17.5	78.4
18.4	78.4
19.3	78.60
20.2	78.77
21.6	78.98
22.9	79.30
24.0	79.63
25.1	79.83
26.4	80.16
29.4	80.35
32.9	80.66

SUMMARY DATA	
Bankfull Elevation:	80.0
Bankfull Cross-Sectional Area:	15.8
Bankfull Width:	16.8
Flood Prone Area Elevation:	81.7
Flood Prone Width:	>80
Max Depth at Bankfull:	1.7
Mean Depth at Bankfull:	0.9
W / D Ratio:	17.9
Entrenchment Ratio:	4.8
Bank Height Ratio:	1.0

Stream Type	B/C

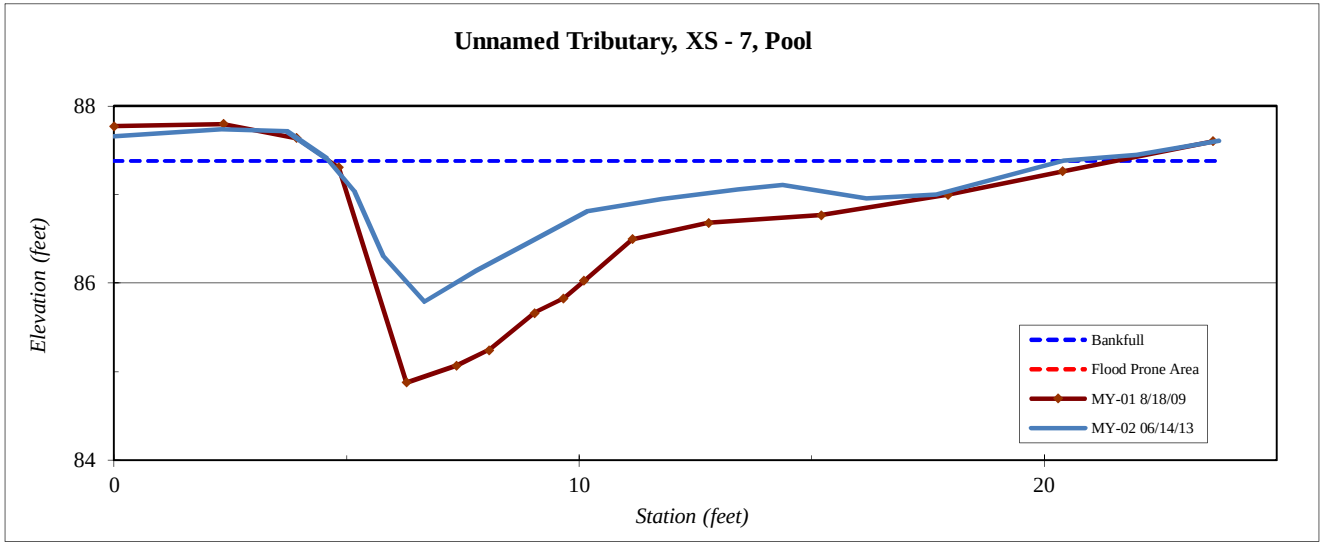


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 7, Pool
Drainage Area (sq mi):	0.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.0	87.7
2.3	87.7
3.7	87.7
4.6	87.4
5.2	87.0
5.8	86.3
6.7	85.8
7.8	86.1
8.9	86.4
10.2	86.8
11.8	86.9
13.4	87.1
14.4	87.1
16.2	86.96
17.7	87.00
20.4	87.38
22.0	87.45
23.8	87.61

SUMMARY DATA	
Bankfull Elevation:	87.4
Bankfull Cross-Sectional Area:	8.9
Bankfull Width:	15.8
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	1.6
Mean Depth at Bankfull:	0.6
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	B/C

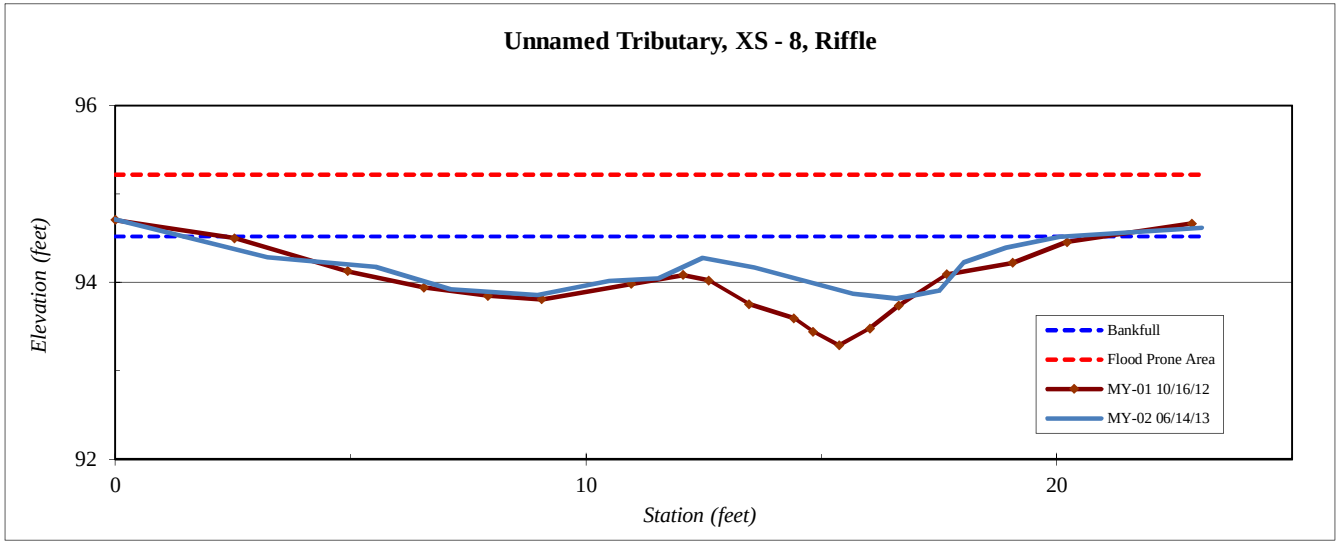


River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 8, Riffle
Drainage Area (sq mi):	0.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

Station	Elevation
0.0	94.7
3.2	94.3
5.5	94.2
7.1	93.9
9.0	93.9
10.5	94.0
11.5	94.0
12.5	94.3
13.6	94.2
15.7	93.9
16.6	93.8
17.5	93.9
18.0	94.2
18.9	94.39
20.1	94.52
23.1	94.62

SUMMARY DATA	
Bankfull Elevation:	94.5
Bankfull Cross-Sectional Area:	7.6
Bankfull Width:	18.7
Flood Prone Area Elevation:	95.2
Flood Prone Width:	>80
Max Depth at Bankfull:	0.7
Mean Depth at Bankfull:	0.4
W / D Ratio:	46.0
Entrenchment Ratio:	4.3
Bank Height Ratio:	1.0

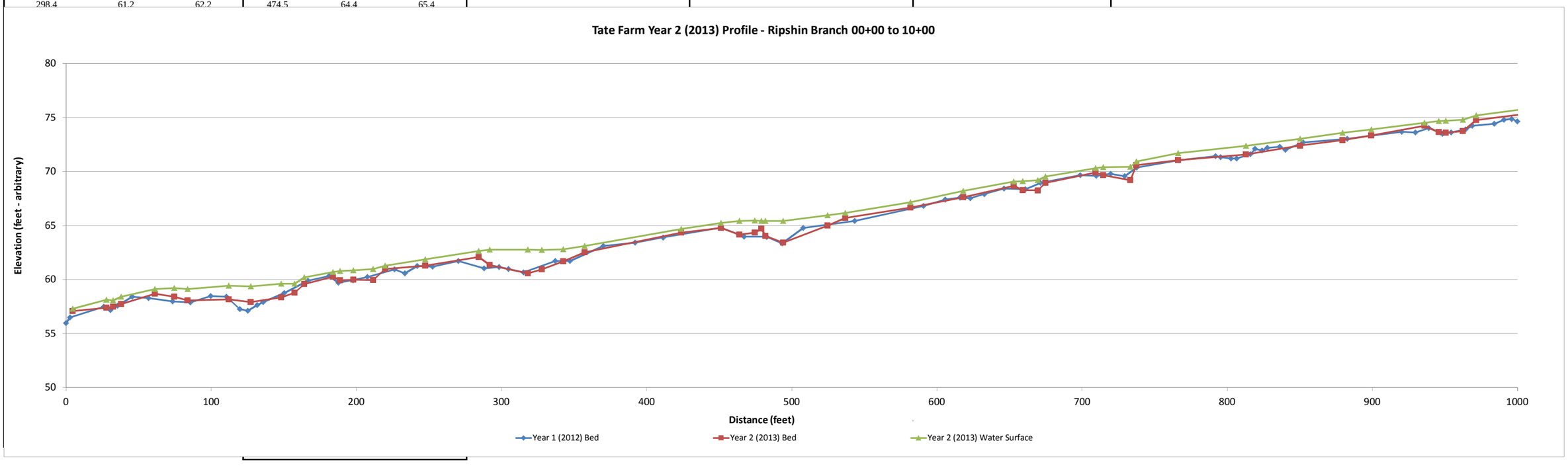
Stream Type	B/C



Project Name	Tate Farm - Profile
Reach	Ripshin Branch Station 00+00 - 10+00
Feature	Profile
Date	6/14/13
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	4.5	57.1	57.3									
2.7	56.5	57.2	27.8	57.4	58.1									
25.9	57.5	57.8	32.5	57.5	58.1									
30.5	57.2	57.8	38.0	57.7	58.4									
35.5	57.6	58.3	61.3	58.7	59.1									
45.5	58.4	58.8	74.6	58.4	59.2									
56.9	58.3	59.0	83.8	58.1	59.1									
73.5	58.0	58.9	112.1	58.1	59.4									
85.6	57.9	59.0	127.4	57.9	59.4									
99.7	58.5	58.9	148.2	58.3	59.6									
110.4	58.4	59.0	157.4	58.8	59.6									
119.6	57.3	59.1	164.2	59.6	60.2									
125.2	57.1	59.1	184.0	60.3	60.7									
131.6	57.6	59.1	188.7	59.9	60.8									
135.8	57.9	59.0	198.0	60.0	60.8									
150.3	58.7	59.4	211.5	60.0	61.0									
166.7	59.9	60.2	220.0	61.0	61.3									
181.1	60.3	60.7	247.4	61.3	61.9									
187.6	59.7	60.7	284.4	62.1	62.6									
197.8	59.9	60.6	291.9	61.3	62.8									
207.7	60.2	60.9	318.1	60.6	62.8									
226.2	60.9	61.5	327.9	61.0	62.7									
233.5	60.6	61.6	342.6	61.7	62.8									
242.0	61.3	61.7	357.3	62.5	63.1									
252.5	61.2	61.8	423.8	64.3	64.7									
270.3	61.7	62.2	451.3	64.8	65.2									
288.0	61.0	62.2	464.0	64.2	65.4									
298.4	61.2	62.2	474.5	64.4	65.4									

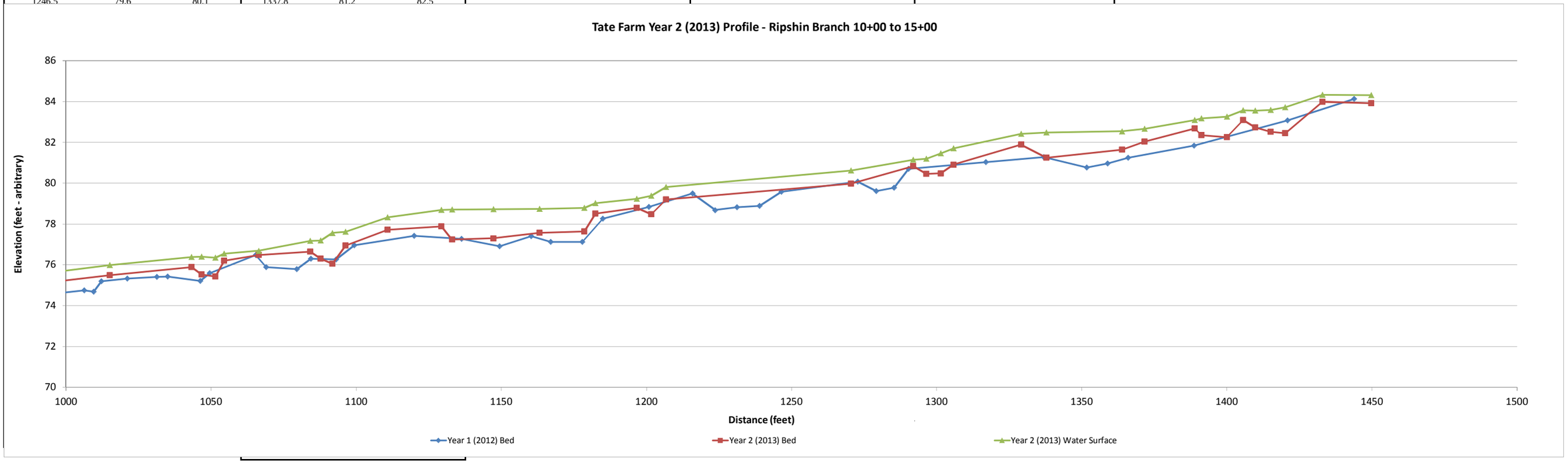
	2012	2013	2014	2015	2016
Avg. Water Surface Slope	0.0182	0.0189			
Riffle Length	35	33			
Avg. Riffle Slope	0.0247	0.0228			
Pool Length	28	28			
Pool to Pool Spacing	55	66			



Project Name	Tate Farm - Profile
Reach	Ripshin Branch Station 10+00 - 15+00
Feature	Profile
Date	6/14/13
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	971.6	74.8	75.2									
1006.2	74.7	75.4	1015.1	75.5	76.0									
1009.5	74.7	75.4	1043.2	75.9	76.4									
1012.2	75.2	75.5	1046.7	75.5	76.4									
1021.1	75.3	75.8	1051.5	75.4	76.3									
1031.3	75.4	76.0	1054.5	76.2	76.5									
1035.0	75.4	75.9	1066.4	76.5	76.7									
1046.3	75.2	76.0	1084.2	76.6	77.2									
1049.5	75.6	76.2	1087.8	76.3	77.2									
1065.4	76.5	76.8	1091.8	76.1	77.6									
1069.0	75.9	76.8	1096.4	76.9	77.6									
1079.6	75.8	76.9	1110.9	77.7	78.3									
1084.3	76.3	77.0	1129.4	77.9	78.7									
1093.0	76.3	77.1	1133.0	77.2	78.7									
1099.3	77.0	77.4	1147.3	77.3	78.7									
1119.9	77.4	78.1	1163.2	77.6	78.7									
1136.3	77.3	78.1	1178.6	77.6	78.8									
1149.4	76.9	78.1	1182.4	78.5	79.0									
1160.3	77.4	78.1	1196.6	78.8	79.2									
1167.0	77.1	78.1	1201.6	78.5	79.4									
1177.9	77.1	78.3	1206.7	79.2	79.8									
1185.0	78.3	78.8	1270.5	80.0	80.6									
1200.8	78.8	79.4	1292.0	80.8	81.1									
1215.9	79.5	79.8	1296.5	80.5	81.2									
1223.6	78.7	79.8	1301.5	80.5	81.5									
1231.2	78.8	79.8	1305.8	80.9	81.7									
1238.9	78.9	79.8	1329.1	81.9	82.4									
1246.5	79.6	80.1	1337.8	81.2	82.5									

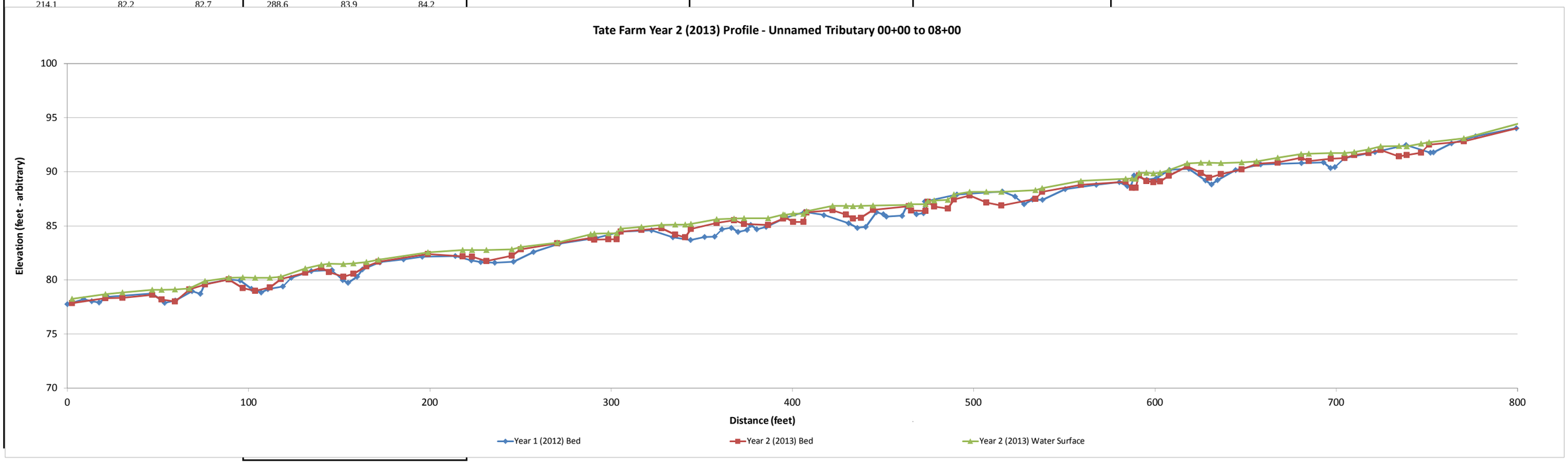
	2012	2013	2014	2015	2016
Avg. Water Surface Slope	0.0182	0.0189			
Riffle Length	35	33			
Avg. Riffle Slope	0.0247	0.0228			
Pool Length	28	28			
Pool to Pool Spacing	55	66			



Project Name	Tate Farm - Profile
Reach	Unnamed Tributary Station 00+00 - 08+00
Feature	Profile
Date	6/14/13
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	2.6	77.9	78.3									
9.1	78.2	78.5	21.0	78.3	78.7									
13.5	78.0	78.5	30.4	78.4	78.8									
17.5	77.9	78.5	46.8	78.6	79.1									
22.1	78.4	78.6	52.0	78.2	79.1									
46.8	78.7	79.0	59.3	78.0	79.1									
53.7	77.9	79.0	67.3	79.1	79.2									
59.5	78.1	79.0	76.0	79.6	79.9									
68.7	78.9	79.3	89.0	80.0	80.2									
73.4	78.7	79.3	96.9	79.2	80.2									
75.9	79.6	79.8	103.7	79.0	80.2									
89.0	80.1	80.1	111.7	79.3	80.2									
95.2	80.0	80.2	117.7	80.1	80.3									
101.7	79.2	80.3	131.2	80.7	81.1									
106.9	78.8	80.3	140.1	81.1	81.4									
110.6	79.1	80.3	144.3	80.7	81.5									
118.9	79.4	80.3	152.3	80.3	81.5									
123.5	80.2	80.5	157.9	80.6	81.5									
134.6	80.8	81.0	165.1	81.3	81.7									
145.9	80.9	81.4	171.6	81.7	81.9									
151.9	80.0	81.4	198.9	82.4	82.6									
154.8	79.7	81.3	218.1	82.2	82.8									
159.8	80.3	81.4	223.3	82.1	82.8									
162.8	81.0	81.4	231.1	81.7	82.8									
172.3	81.6	81.8	245.2	82.3	82.8									
185.5	81.9	82.2	250.2	82.8	83.0									
195.8	82.2	82.5	270.2	83.4	83.4									
214.1	82.2	82.7	288.6	83.9	84.2									

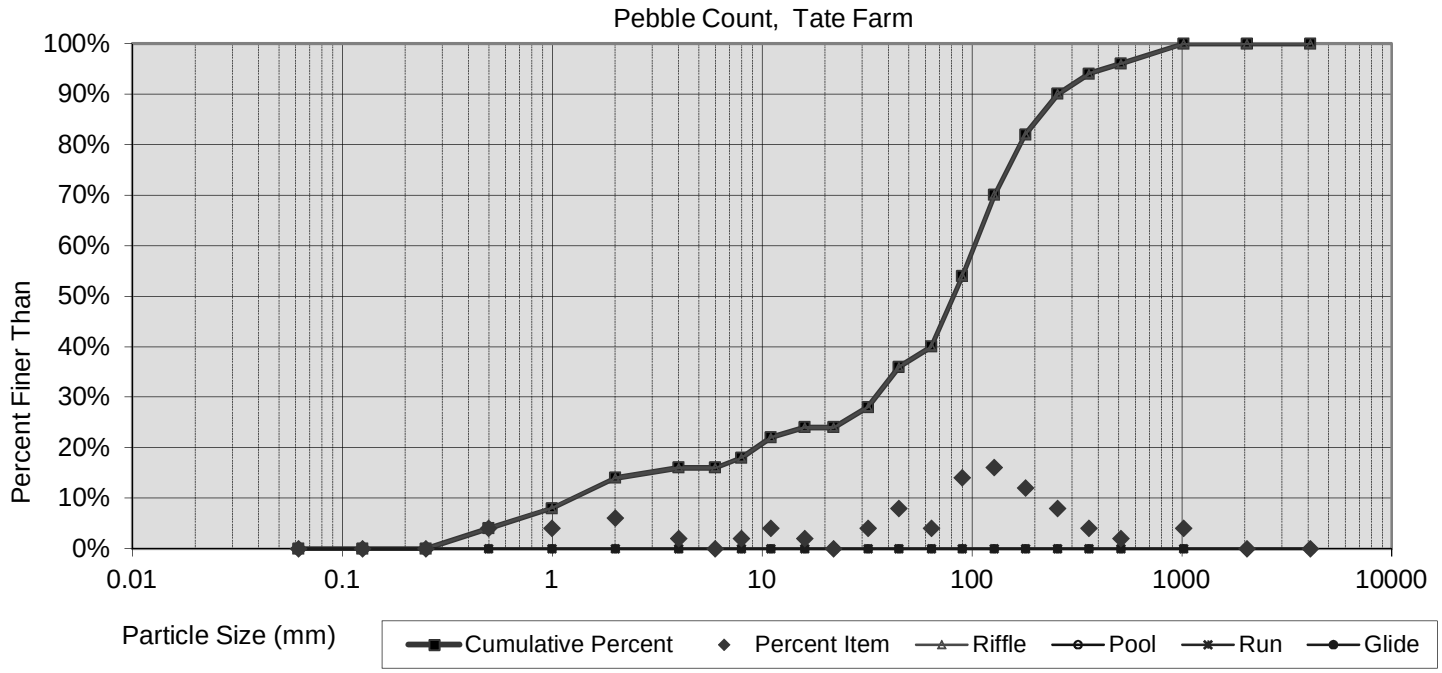
	2012	2013	2014	2015	2016
Avg. Water Surface Slope	0.0201	0.0205			
Riffle Length	30	22			
Avg. Riffle Slope	0.0235	0.0294			
Pool Length	21	24			
Pool to Pool Spacing	44	48			



Pebble Count,

	Tate Farm
	New River

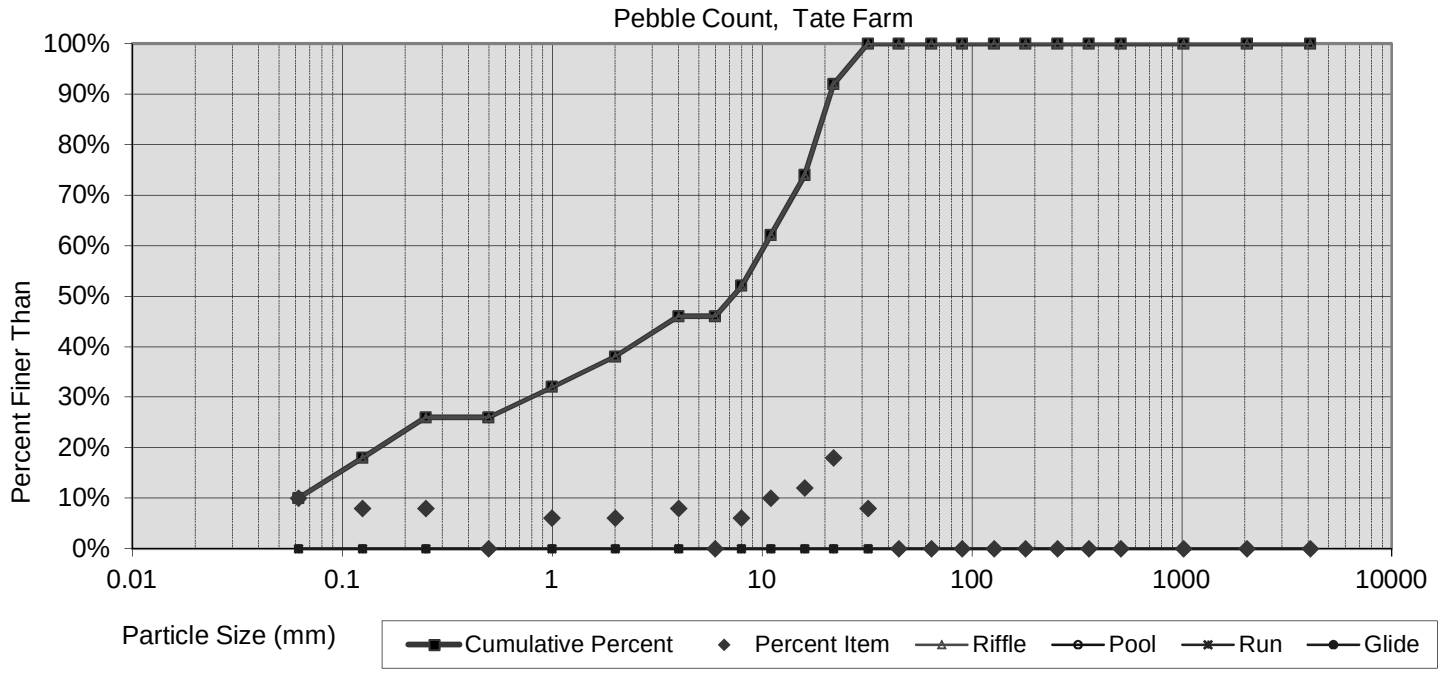
Note:	**Cross Section 4 - Ripshin Branch**



Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
6.000	43.12	81.6	197	431	0%	14%	26%	50%	10%	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
0.105	1.41	7.3	19	25	10%	28%	62%	0%	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	23.3						23.2	25.0						28.1	23.3						21.4	23.3						21.7	24.0				
Floodprone Width (ft) (approx)		80.0	80.0						NA	NA						80.0	80.0						80.0	80.0						80.0	80.0				
BF Mean Depth (ft)		1.2	1.2						1.6	1.3						1.3	1.3						1.1	0.9						0.9	0.8				
BF Max Depth (ft)		1.9	1.9						3.4	3.3						2.1	2.0						2.0	1.8						1.9	1.7				
BF Cross Sectional Area (ft^2)		27.6	27.9						36.1	32.2						37.4	30.7						23.5	21.0						19.2	18.0				
Width/Depth Ratio		19.8	19.5						NA	NA						21.1	17.7						19.5	25.9						24.5	32.0				
Entrenchment Ratio		3.4	3.4						NA	NA						2.8	3.4						3.7	3.4						3.7	3.3				
Bank Height Ratio		1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0						1.0	1.0				
d50 (mm)		----	----						79.2	81.6						----	----						----	----						----	----				

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	23.3	23.5	23.3	24	0.4																
Floodprone Width (ft)								80					80																	
BF Mean Depth (ft)						0.9	1.1	1.2	1.3	0.2	0.8	1.1	1.1	1.3	0.2															
BF Max Depth (ft)						1.9	2.0	2.0	2.1	0.1	1.7	1.9	1.9	2.0	0.1															
BF Cross Sectional Area (ft^2)						19.2	26.9	25.6	37.4	7.8	18.0	24.4	24.5	30.7	5.9															
Width/Depth Ratio						19.5	21.2	20.6	24.1	2.2	17.9	23.3	22.7	30.0	5.6															
Entrenchment Ratio						2.8	3.4	3.6	3.7	0.4	3.3	3.4	3.4	3.4	0.1															
Bank Height Ratio								1.0					1.0																	
Profile -Downstream																														
Riffle length (ft)						5.3	35.1	26.3	107.8	28.6	14.2	56.5	33	198.3	50.7															
Riffle slope (ft/ft)						0.0059	0.0247	0.0260	0.0445	0.0105	0.0145	0.0238	0.0228	0.0355	0.0065															
Pool length (ft)						8.6	27.7	24.7	77.0	16.2	10.1	34.1	27.8	102.9	25.5															
Pool Max depth (ft)								3.4					3.3																	
Pool spacing (ft)						8.6	55.4	43.8	160.7	37.0	24.3	84.0	65.9	234.1	54.6															
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					B/C-type																	
Channel Thalweg Length (ft)								1444					1449																	
Sinuosity								1.2					1.2																	
Water Surface Slope (Channel) (ft/ft)								0.0182					0.0189																	
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					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	16.8						16.0	15.8						17.4	18.7				
Floodprone Width (ft) (approx)		80.0	80.0						NA	NA						80.0	80.0				
BF Mean Depth (ft)		1.0	0.9						0.9	0.6						0.5	0.4				
BF Max Depth (ft)		1.7	1.7						2.4	1.6						1.2	0.7				
BF Cross Sectional Area (ft^2)		17.4	15.8						14.5	8.9						8.9	7.6				
Width/Depth Ratio		17.4	17.9						NA	NA						34.0	46.0				
Entrenchment Ratio		4.6	4.8						NA	NA						4.6	4.3				
Bank Height Ratio		1.0	1.0						1.0	1.0						1.0	1.0				
d50 (mm)		----	----						----	----						1.0	7.3				

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			16.8	17.8	17.8	18.7	1.3															
Floodprone Width (ft)								80					80																	
BF Mean Depth (ft)						0.5	0.8	0.8	1.0	0.4	0.4	0.7	0.7	0.9	0.4															
BF Max Depth (ft)						1.2	1.5	1.5	1.7	0.4	0.7	1.2	1.2	1.7	0.7															
BF Cross Sectional Area (ft^2)						8.9	13.2	13.2	17.4	6.0	7.6	11.7	11.7	15.8	5.8															
Width/Depth Ratio						17.4	26.1	26.1	34.8	12.3	18.7	32.7	32.7	46.8	19.9															
Entrenchment Ratio								4.6			4.3	4.5	4.5	4.8	0.3															
Bank Height Ratio								1.0					1.0																	
Profile - Upstream																														
Riffle length (ft)						3.9	29.7	27.3	65	17.9	8.79	26.5	22.4	53	14.8															
Riffle slope (ft/ft)						0.0064	0.0235	0.0233	0.0436	0.0108	0.0038	0.0305	0.0294	0.0639	0.0154															
Pool length (ft)						7.1	20.8	19.0	43.2	10.8	7.4	22.7	23.7	39.9	9.8															
Pool Max depth (ft)								2.4					1.6																	
Pool spacing (ft)						7.1	43.6	39.3	103.9	28.7	12.9	42.7	47.9	85.2	18.3															
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					B/C-type																	
Channel Thalweg Length (ft)								799					803																	
Sinuosity								1.2					1.2																	
Water Surface Slope (Channel) (ft/ft)								0.0201					0.0205																	
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					0																	
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

Groundwater Gauge Graphs

Table 12. Verification of Bankfull Events

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

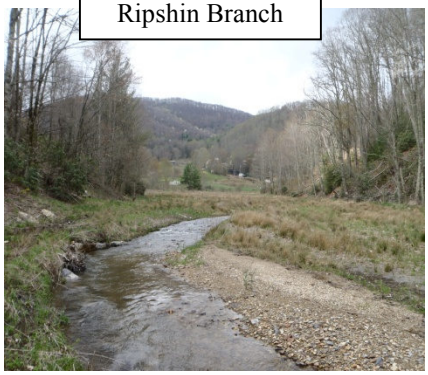
Date of Data Collection	Date of Occurrence	Method	Photo (if available)
June 7, 2013	January 17, 2013	Approximately 3.9 inches of rain documented* at a nearby rain station over a four day period from January 14-17, 2013.	---
April 28, 2013	January 30, 2013	Wrack and sediment observe on top of banks after approximately 4.2 inches of rain was documented* at a nearby rain station on January 30, 2013.	1-3
June 12, 2013	May 7, 2013	Approximately 4.34 inches of rain documented over three days at an onsite rain gauge.	---
June 12, 2013	May 24, 2013	Wrack observed in the floodplain after approximately 5.92 inches of rain was documented over eight days at an onsite rain gauge.	4
August 13, 2013	July 4, 2013	Approximately 4.13 inches of rain documented over two days at an onsite rain gauge.	---
August 13, 2013	August 10, 2013	Wrack and laid back vegetation observed in the flood plain after approximately 3.52 inches of rain was documented at an onsite rain gauge.	5

*Jefferson Weather Station (Weatherunderground 2013)

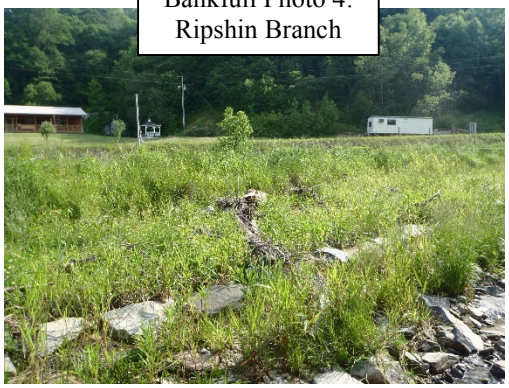
Bankfull Photo 1: Unnamed Tributary

Bankfull Photo 2: Unnamed Tributary

Bankfull Photo 3: Ripshin Branch



Bankfull Photo 4: Ripshin Branch



Bankfull Photo 5: Ripshin Branch

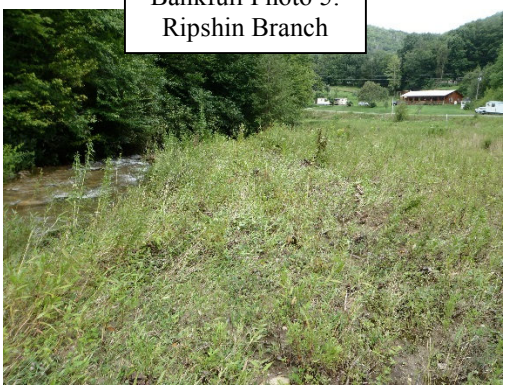


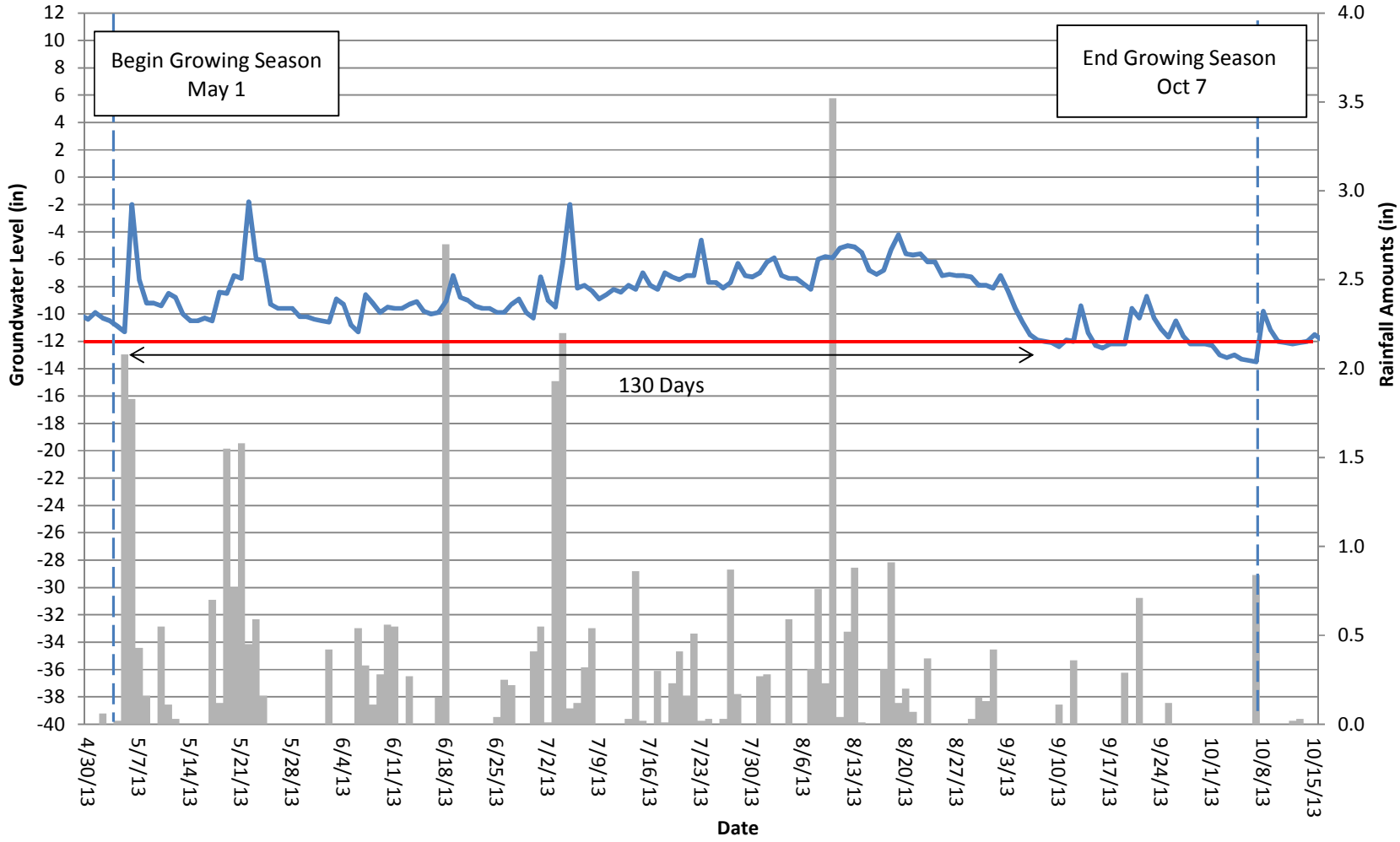
Table 13. Wetland Hydrology Criteria Attainment Summary

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

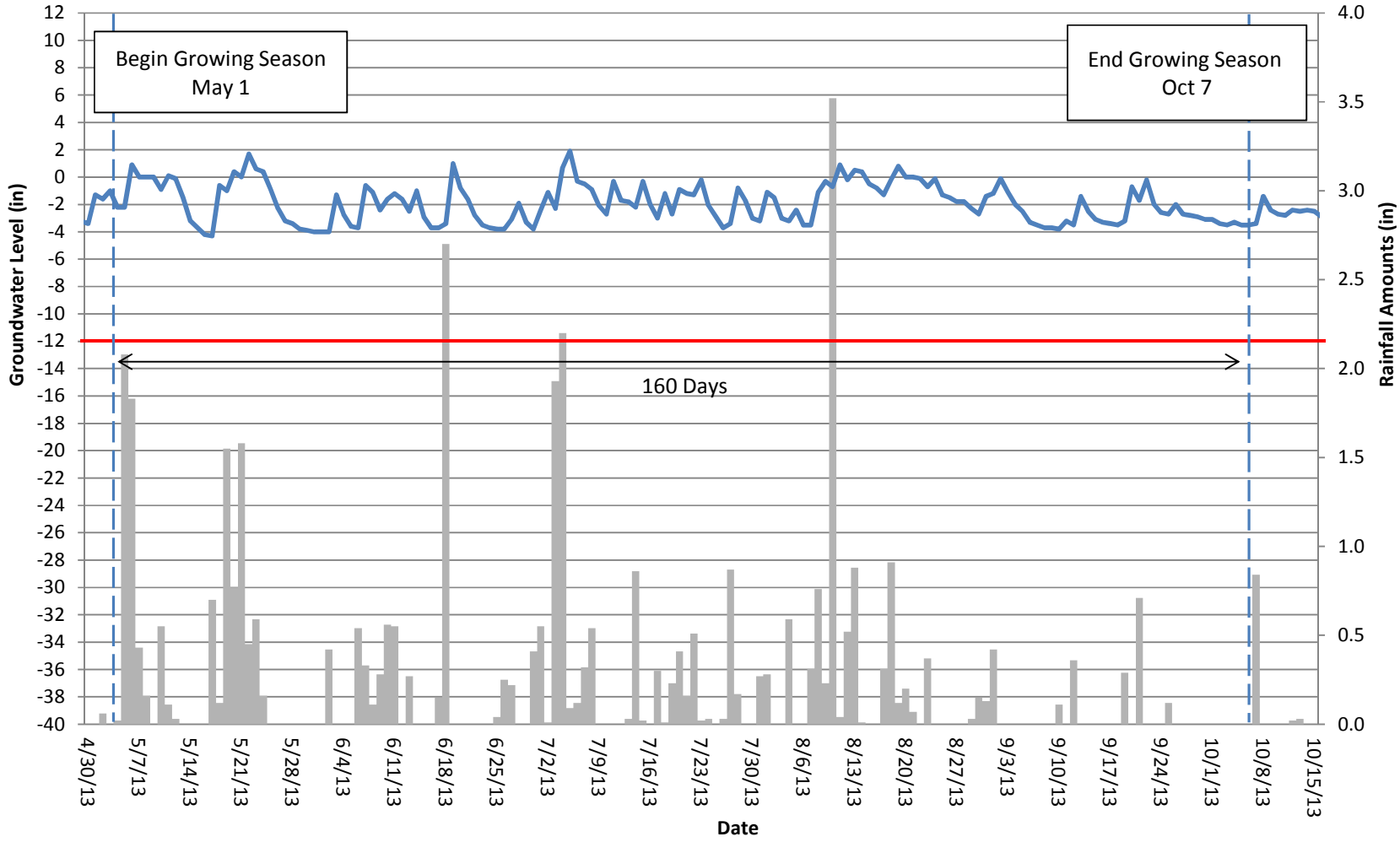
Gauge	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)				
	Year 1 (2012)*	Year 2 (2013)	Year 3 (2014)	Year 4 (2015)	Year 5 (2016)
1	--	130 Days (81%)			
2	--	160 Days (100%)			
3	--	160 Days (100%)			
4	--	152 Days (95%)			
5	--	160 Days (100%)			
6	--	160 Days (100%)			

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

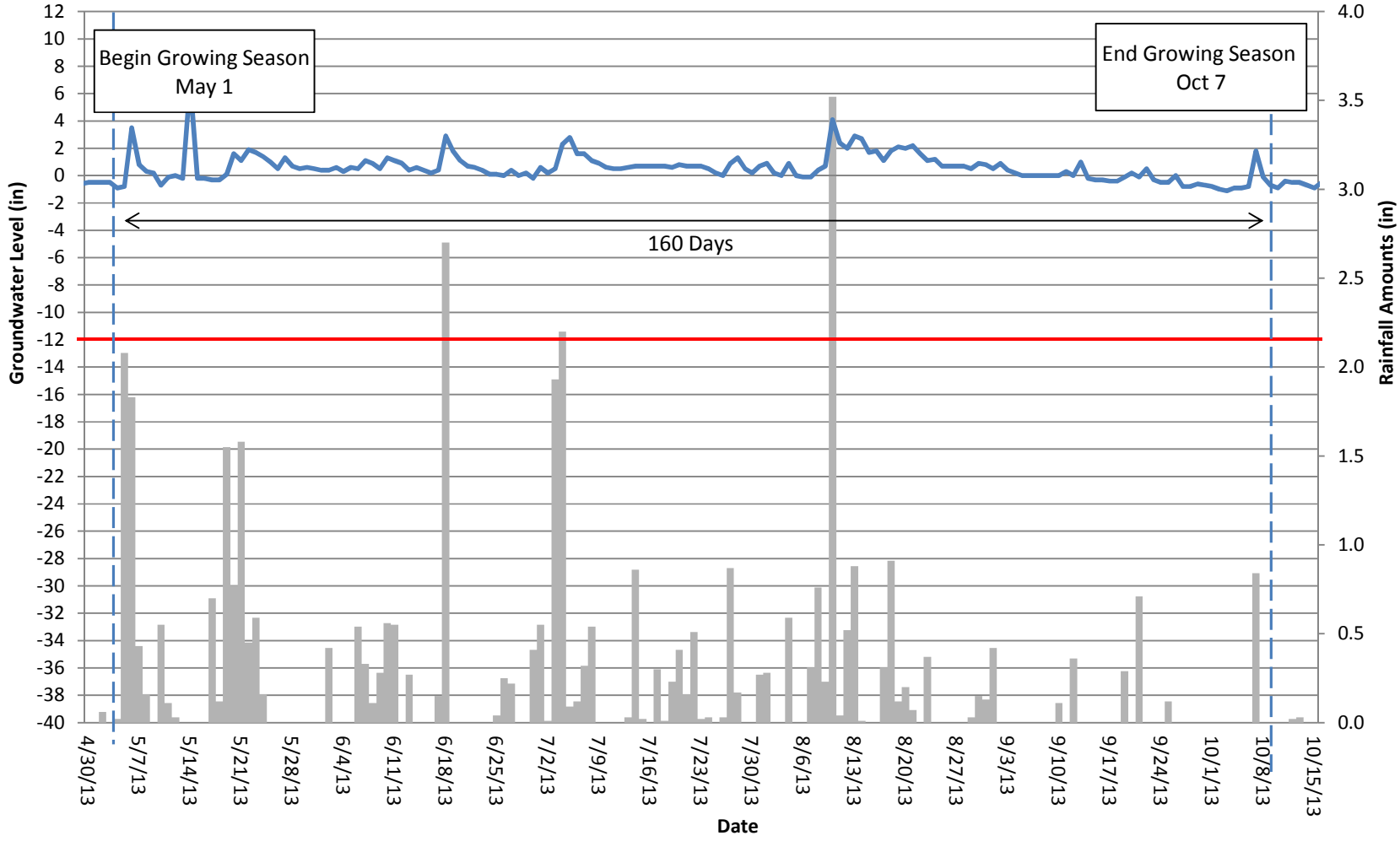
Tate Farm Groundwater Gauge 1
Year 2 (2013 Data)



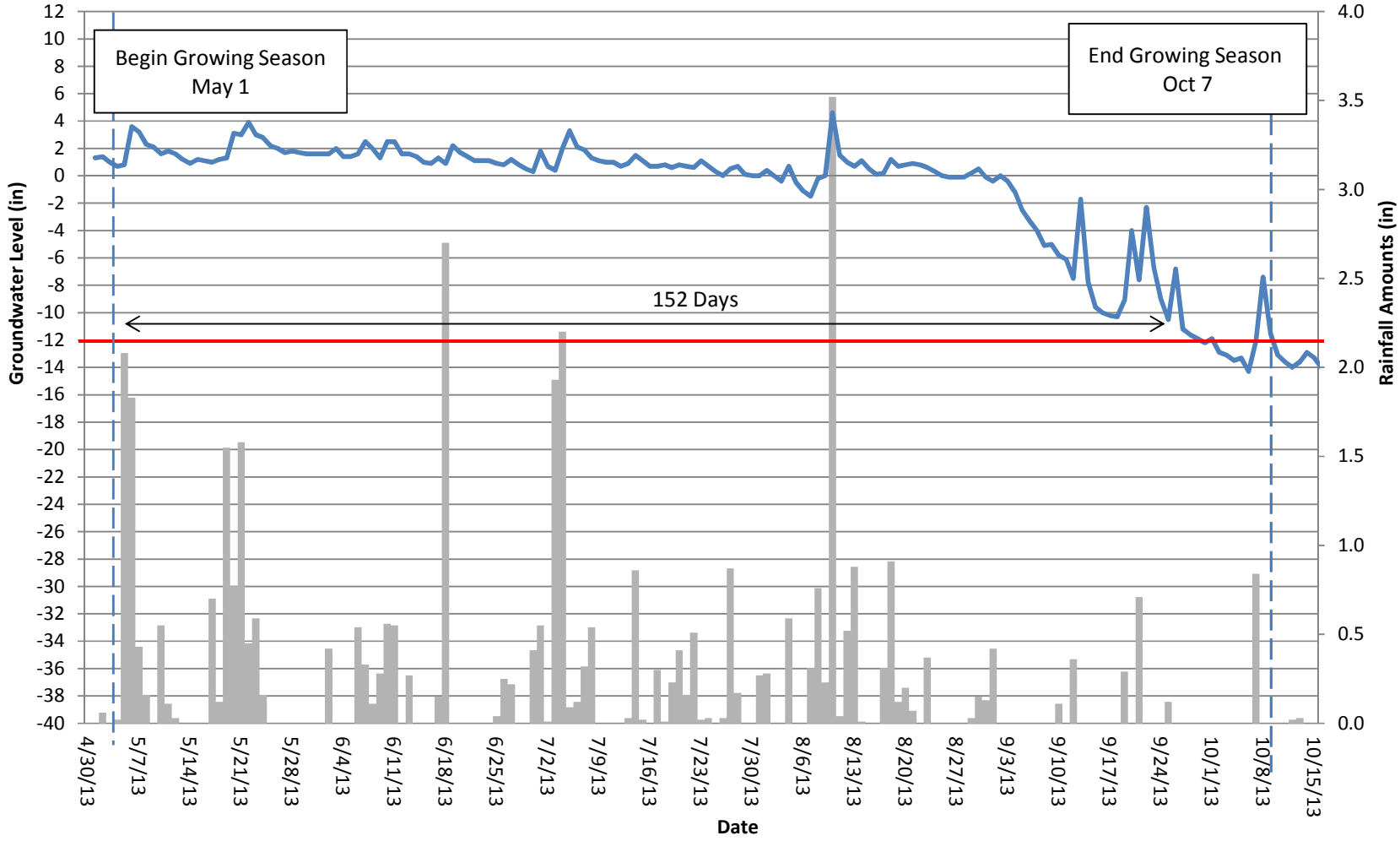
Tate Farm Groundwater Gauge 2
Year 2 (2013 Data)



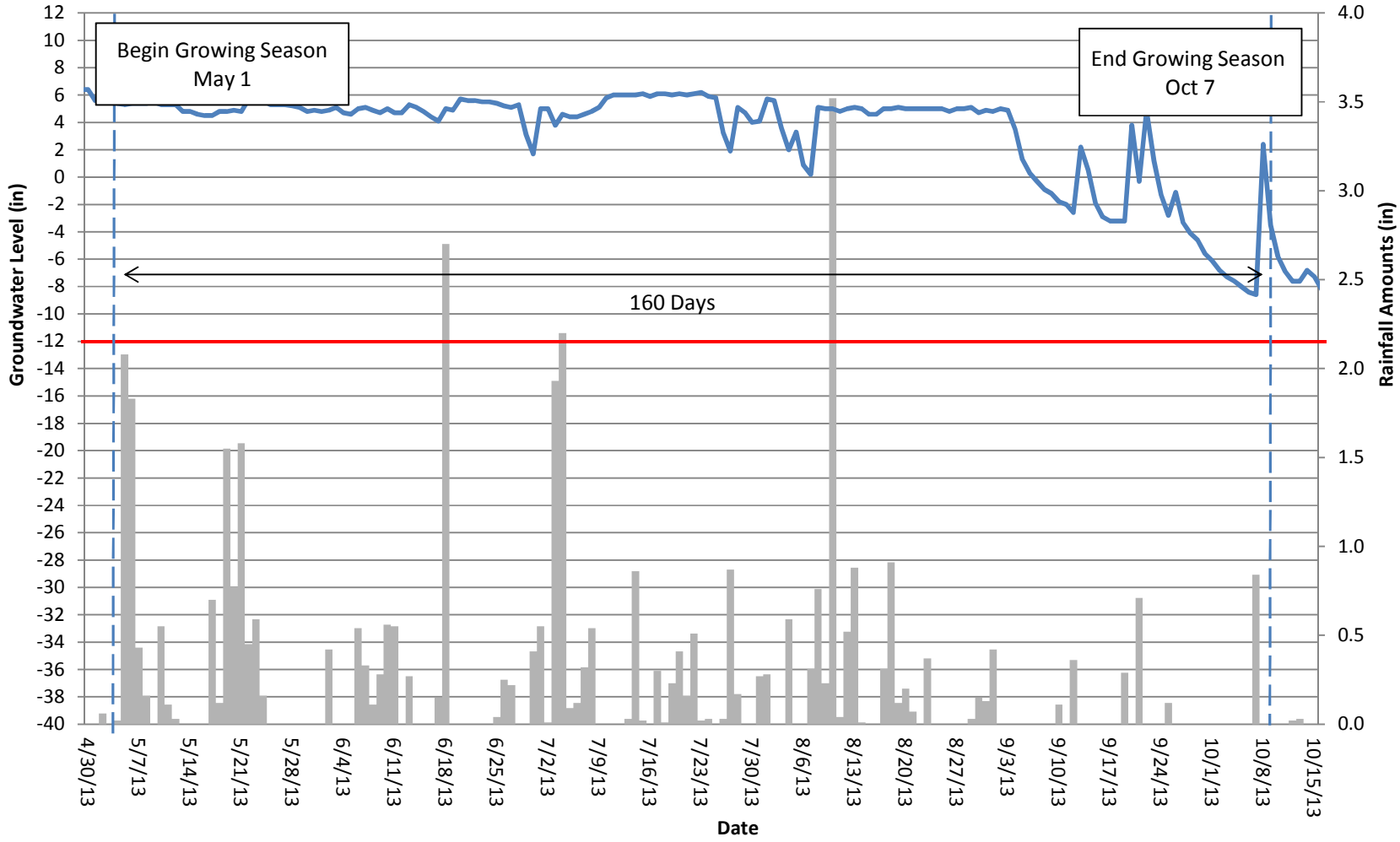
Tate Farm Groundwater Gauge 3
Year 2 (2013 Data)



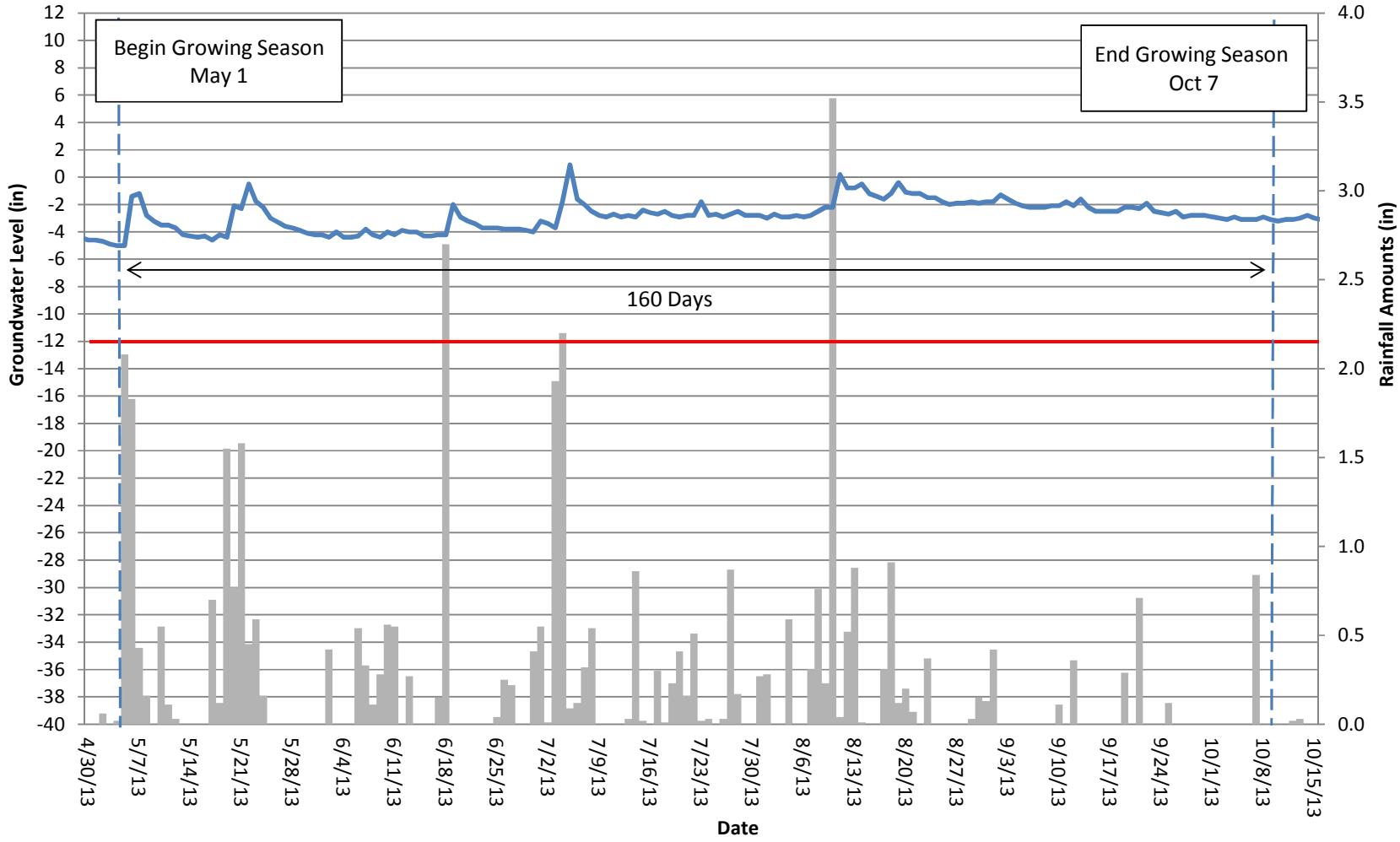
Tate Farm Groundwater Gauge 4
Year 2 (2013 Data)



Tate Farm Groundwater Gauge 5
Year 2 (2013 Data)



Tate Farm Groundwater Gauge 6
Year 2 (2013 Data)

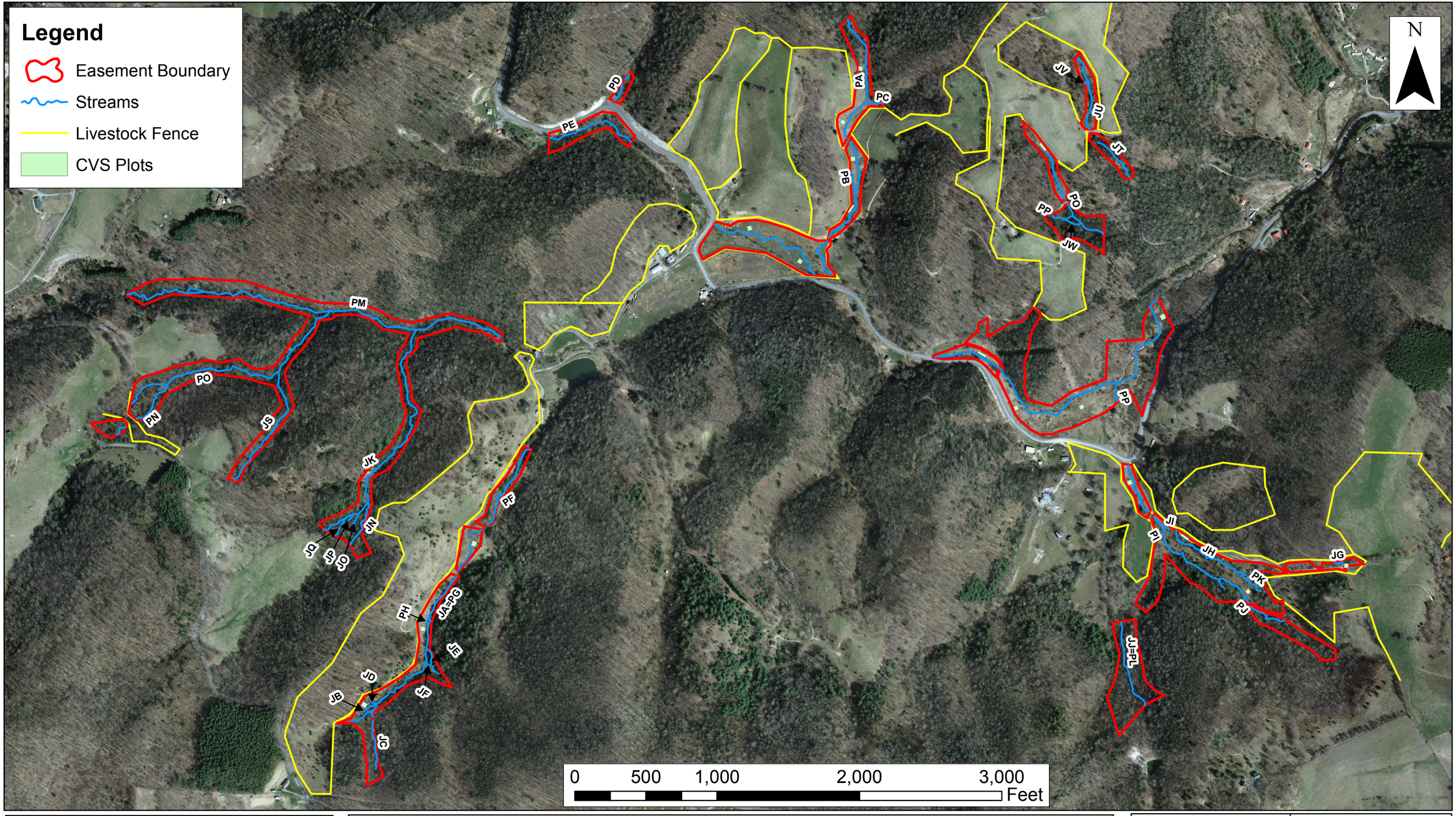


APPENDIX F

STREAM FORMS

Figure 3. NCDWQ Form Reaches

NCDWQ Stream Identification Forms



Axiom Environmental, Inc.
Axiom Environmental
218 Snow Avenue
Raleigh, NC 27603
(919) 215-1693

NC DWQ FORM REACHES
TATE FARM
EEP PROJECT NUMBER 372
Ashe County, North Carolina

Dwn. by. KRJ	FIGURE
Date: December 2013	3
Project: 12-004.13	

PA-20

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

Date:	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Parkinson/Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 21.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal =)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

PB-0

NC DWQ Stream Identification Form Version 4.11

Date: 11-09	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Parkinson/Arico	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 32.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong
1[a] Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 9)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

PC-03

NC DWQ Stream Identification Form Version 4.11

Date: 11-4-2013	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Parkinson Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 28	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 14.)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 5)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: mayflies - caddis fly caseness @ top and lower portion of reach

Sketch:

PC-041b

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

Date: 11-4-2013	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Peterson Axton	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 18.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 3)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

PD-04

NC DWQ Stream Identification Form Version 4.11

Date: 11-04-2013	**Project/Site:**	**Latitude:**
Evaluator:	**County:**	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 19.5	**Stream Determination (circle one)** **Ephemeral Intermittent Perennial**	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong
1[a] Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 0.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 7)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

PE-5

Date: 11-05	**Project/Site:** Tule Farm	**Latitude:**
Evaluator: Perkinson/Axiom	**County:** Ashe	**Longitude:**
Total Points: 44 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* Park

A. Geomorphology (Subtotal = 25)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 10)				
18. Fibrous roots in streambed	(3)	2	1	(0)
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	(1)	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

PF-05 ds

NC DWQ Stream Identification Form Version 4.11

Date: 11-05	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Parkinson - Axiom	**County:** Ashe	**Longitude:**
Total Points: 35.5 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 18)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	2	(3)
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 10)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 7.5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11 PF-2445

Date: 11-5	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Perkinson Ayers	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 19	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 6.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 4)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: small head cut, bedrock/gravel below PF-24 to 6.7

Sketch:

NC DWQ Stream Identification Form Version 4.11 PG-01

Date: 11-05	**Project/Site:** Tule	**Latitude:**
Evaluator: Perkinson Axiom	**County:** Alleghany	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 27.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 13.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2	(3)
8. Headcuts	(0)	1	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: [illegible]

Sketch:

NC DWQ Stream Identification Form Version 4.11

PH-04/5

Date: 11-05	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Perkinson - Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 26.5	**Stream Determination (circle one)** **Ephemeral Intermittent Perennial**	**Other** *e.g. Quad Name*:

A. Geomorphology (Subtotal = 13)	Absent	Weak	Moderate	Strong
1[a] Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7.5)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: [illegible]
[illegible] Salamander

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

PI/P5

Date: 11-05-2013	**Project/Site:** Tuteta.m	**Latitude:**
Evaluator: Perkinson/Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 33.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 18)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	(3)
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6.5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

PI-49 down

Date: 11-05-2013	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Perkinson Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 18	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal =)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Road cut. Opposite shore

Sketch:

NC DWQ Stream Identification Form Version 4.11

PI-49 up

Date: 11-5-2013	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Perkinson-Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 11.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 4)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	(0)	1	2	3
2. Sinuosity of channel along thalweg	(0)	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	(0)	1	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 5.5)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 3)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	1	(0)
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

PJ-UP

Date: 11-5-2013	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Parkinson / Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 24.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 10)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	(0)	1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 7.5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

PJ - Low

Date: 11-5-2013	**Project/Site:** Tule	**Latitude:**
Evaluator: Perkinson / Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 29.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 13.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 10)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	(0)	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 (Other = 0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

PK-15

NC DWQ Stream Identification Form Version 4.11

Date: 11-05-2013	**Project/Site:** Tate farm	**Latitude:**
Evaluator: Perkinson/Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 11)	Absent	Weak	Moderate	Strong
1[a] Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	(3)
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11 PK-1SDS

Date: 11-05	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Axiom - Parkinson	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 13.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 2)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	(0)	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	(0)	1	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 3.5)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Stream braids into wetland

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

PM-20

Date: 11-07-2013	**Project/Site:** Tule Turn	**Latitude:**
Evaluator: Parkinson - Axiom	**County:** Ashe	**Longitude:**
Total Points: 47.5 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** **Ephemeral Intermittent Perennial**	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 26)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	2	(3)
8. Headcuts	0	(1)	(2)	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	(1.5)
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 12.5)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	1	(1.5)
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	(0)	0.5	1	(1.5)
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Trout Stocked Here

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

PW start

Date: 11-6-2013	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Parkinson/Axiom	**County:** Alamance	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 26.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 14.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

14.5

B. Hydrology (Subtotal = 7.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 4.5)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	(0.5)	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

PW - P.

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

Date: 11-6-2013	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Perkinson / Akin	**County:** Alexander	**Longitude:**
Total Points: 34 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 17.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 10)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6.5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

Date: 11-6-2013	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Parkinson / Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 24	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 12.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 5)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

PO-1

Date: 11-6-2013	**Project/Site:** Tate-Fuquay	**Latitude:**
Evaluator: Perkinson/Axiom	**County:** Wake	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 21.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 11)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	(0)	1	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	1	2	(3)
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal =)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

PP - Tgf

NC DWQ Stream Identification Form Version 4.11

Date: 11-6-2013	**Project/Site:** Tule farm	**Latitude:**
Evaluator: Parkinson / Axiom	**County:** Ashe	**Longitude:**
Total Points: 35 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 19)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 7.5)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: restored channel [illegible]

Sketch:

PQ-09-1

NC DWQ Stream Identification Form Version 4.11

Date: 11-23-2013	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Perkinson/Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** **Ephemeral Intermittent Perennial**	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = _____)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = _____)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = _____)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

PR Ephemeral/Intermittent

Date: 11-23-2013	**Project/Site:** Tate farm	**Latitude:**
Evaluator: Perkinson/Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 18.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	(0)	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	(0)	1	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel		(No = 0)	Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 2.5)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?		(No = 0)	Yes = 3	

C. Biology (Subtotal = 7)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBL = 1.5 (Other = 0)		

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

PP @ wetland

NC DWQ Stream Identification Form Version 4.11

Date: 11-23-2013	**Project/Site:** Tate-Farm	**Latitude:**
Evaluator: Perkinson/Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 19.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1[a] Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 5.5)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: basin @ headcut loose gravel into gravel/cobble channel flowing to wetland

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/5/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jernigan	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 39	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:* JA - upstream

A. Geomorphology (Subtotal = 18.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 11)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	0.5	1	(1.5)
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

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NC DWQ Stream Identification Form Version 4.11

Date: 11/5/15	**Project/Site:** Tate	**Latitude:**
Evaluator: Jerrigan	**County:** Lee	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 30	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** JB *e.g. Quad Name:*

A. Geomorphology (Subtotal = 13.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 8)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	0.5	1	(1.5)
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 (Other = 0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/5/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jernigan	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 28.5	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:* JL Downstream

A. Geomorphology (Subtotal = 12)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 9.5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	1	(1.5)
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/5/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jennaar	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 15.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* Upper JC (above start point)

A. Geomorphology (Subtotal = 5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	(0)	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 2)				
12. Presence of Baseflow	(0)	1	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 6.5)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 7/5/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jerrigan	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 25	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:* JD

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 7)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	0.5	1	(1.5)
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/5/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jernigan	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 28.75	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:* JE

A. Geomorphology (Subtotal = 10.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 11.25)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

JT-02

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NC DWQ Stream Identification Form Version 4.11

Date: 11-9-5	**Project/Site:** Tulelagun	**Latitude:**
Evaluator: Axiom - Patterson	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 23.5	**Stream Determination (circle one)** **Ephemeral Intermittent Perennial**	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 6.5)	Absent	Weak	Moderate	Strong
1[a] Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 7.5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date:	Project/Site: Tate	Latitude:
Evaluator: Jernigan	County: Ashe	Longitude:
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 17.25	~~Stream Determination~~ (circle one) Ephemeral Intermittent Perennial	Other *e.g. Quad Name:* JF up

A. Geomorphology (Subtotal = 4)	Absent	Weak	Moderate	Strong
1[a] Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 7.25)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/5/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jernigan	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 26	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* JG-02

A. Geomorphology (Subtotal = 10)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 4.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 7.5)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/5/13	**Project/Site:** T[illegible]	**Latitude:**
Evaluator: T[illegible]	**County:** Pitt	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* JG D[illegible]

A. Geomorphology (Subtotal = 55)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 3)				
12. Presence of Baseflow	(0)	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 3)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/5/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jernigan	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 31.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* JH

A. Geomorphology (Subtotal = 15)	Absent	Weak	Moderate	Strong
1[a] Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 4)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 6.5)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

JT=PL

NC DWQ Stream Identification Form Version 4.11

Date: 11-6-2013	**Project/Site:** Tule	**Latitude:**
Evaluator: Jervis / Rogan	**County:** Ashe	**Longitude:**
Total Points: 30 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 5.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	(No = 0)		Yes = 3	

C. Biology (Subtotal = 10.5)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

JK - up

Date: 11-6-2013	**Project/Site:** Tyler	**Latitude:**
Evaluator: Jessica Axiom	**County:** Lee	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 19)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 10.5)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

OK-flow

Date: 11-6-2013	**Project/Site:**	**Latitude:**
Evaluator: Jerry / Axiom	**County:**	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: - upstream of headcut

Sketch:

NC DWQ Stream Identification Form Version 4.11

JL

Date: 11-6-2013	**Project/Site:** Tule	**Latitude:**
Evaluator: Dorrough / Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 24.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 12.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 9.5)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

JM

Date: 11-10-2013	**Project/Site:**	**Latitude:**
Evaluator: Jennison/Axiom	**County:**	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 20.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 6.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 7)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

JW

NC DWQ Stream Identification Form Version 4.11

Date: 11-6-2013	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Jerwisan / Axiom	**County:** Ashe	**Longitude:**
Total Points: 24 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 9)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

30

Date: 11-0-2013	**Project/Site:** Tute	**Latitude:**
Evaluator: Jennifer/Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11-6-2013	**Project/Site:** Tute	**Latitude:**
Evaluator: Axiom/Dorwisa	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* JP

A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 3)				
12. Presence of Baseflow	(0)	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 7.5)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Ruffe/ Seemed ephemeral

Sketch:

NC DWQ Stream Identification Form Version 4.11

JQ

Date: 11-6-2013	**Project/Site:** Tate	**Latitude:**
Evaluator: Jervison / Axiom	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 9)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

JR

NC DWQ Stream Identification Form Version 4.11

Date: 11-6-2013	**Project/Site:** Tate Farm	**Latitude:**
Evaluator: Jerwigan/Axiom	**County:** Ashe	**Longitude:**
Total Points: 17 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 6.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 4)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6.5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: mapped as dashed/ ephemeral

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/6/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jennings	**County:** Lenoir	**Longitude:**
Total Points: 27 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:* JS-02

A. Geomorphology (Subtotal = 12)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 5)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 10)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	1	(1.5)
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/6/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jennings	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 28.5	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:* JS (Lower)

A. Geomorphology (Subtotal = 14)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	2	(3)
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 5)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	0.5	(0)
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 9.5)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/6/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jernigan	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 31	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:* JT

A. Geomorphology (Subtotal = 14.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	(No = 0)		Yes = 3	

C. Biology (Subtotal = 11.5)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other (= 0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/6/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jerrigan	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 23	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:* JU

A. Geomorphology (Subtotal = 8.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6.5)				
18. Fibrous roots in streambed	(3)	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/6/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jernigan	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 21.5	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:* JV

A. Geomorphology (Subtotal = 7.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 8)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/7/13	**Project/Site:** Tate	**Latitude:**
Evaluator: Jernigan	**County:** Ashe	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 21.5	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:* JW

A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 4.5)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch: