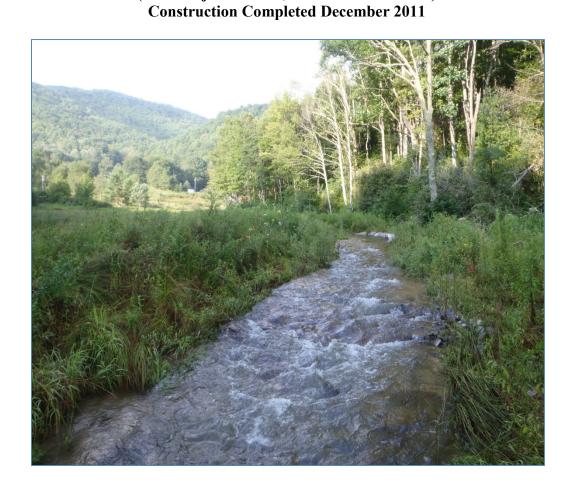
FINAL ANNUAL MONITORING REPORT YEAR 2 (2013) TATE FARM (RIPSHIN BRANCH) STREAM/WETLAND RESTORATION SITE ASHE COUNTY, NORTH CAROLINA (EEP Project No. 372, Contract No. 004802)



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



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

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





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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 Subbasin 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.

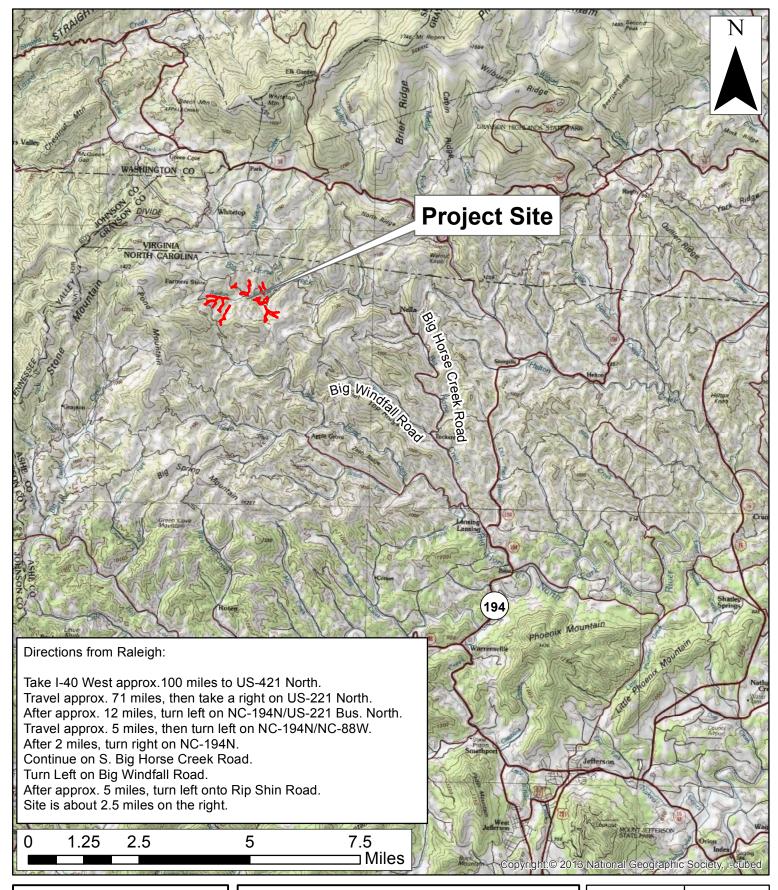
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APPENDIX A

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





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

Own. by. KRJ	FIGURE
Date: December 2013	1
Project: 12-004.13	ı

Table 1. Project Components and Mitigation Credits

	•	,			Aitigation Credi	ts					
		Stream Riparian Wetland					Riparian Wetland				
Type	R	estoration	Restorat	ion Equivalent	Res	toration	Restoration E	Equivalent	Buffer		
Totals		6483		2340		3.8	1.99)			
•			•	Pr	ojects Compone	nts		•			
Project Comp Reach II	D	Station Range	Existing Linear Footage/ Acreage	Priority Approach	Restoration/ Restoration Equivalent	Restoration Linear Footage/ Acreage	Mitigation Ratio	Сог	nment		
Reach 1A (Ripsh Area 2)	nin Br. –	00+00- 08+00	800	Enhancement	E II	800	1:2.5				
Reach 1B (Ripsh Area 2)	nin Br. –	08+00- 12+00	350	Priority II	R	400	1:1				
Reach 1C (Ripsh Area 2)	nin Br. –	12+00- 14+85	285	Enhancement	E II	285	1:2.5				
Reach 2A (Ripsh Area 2)	nin Br. –	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	ΕI	124	1:1.5				
Reach 3B (UT –	Area 1)	01+24- 09+12	688	Priority I	R	788	1:1				
Area 1 Tributa	aries		2419	Enhancement	ΕII	2419	1:2.5				
Area 1 Tributa	aries		889	Preservation	P	889	1:5				
Area 2 Tributa			1362	Enhancement	ΕII	1362	1:2.5				
Area 2 Tributa			1023	Preservation	P	1023	1:5				
Area 3 Tributa			2500	Enhancement	ΕII	2500	1:2.5				
Area 3 Tributa			949	Preservation	P	949	1:5				
Area 4 Tributa			3367	Enhancement	ΕII	3367	1:2.5				
Area 4 Tributa			8841	Preservation	P	8841	1:5				
Wetland U			0		R	1.5	1:1				
Wetland U			1.24		Е	1.24	1:2				
Wetland Ripshin			0		R	2.30	1:1				
Wetland Ripshin	Branch		2.74		E	2.74	1:2				

Table 1. Project Components and Mitigation Credits (continued)

	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

	Data Collection	Completion
Activity or Deliverable	Complete	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

Designer	Ecologic Associates, P.C.
G	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

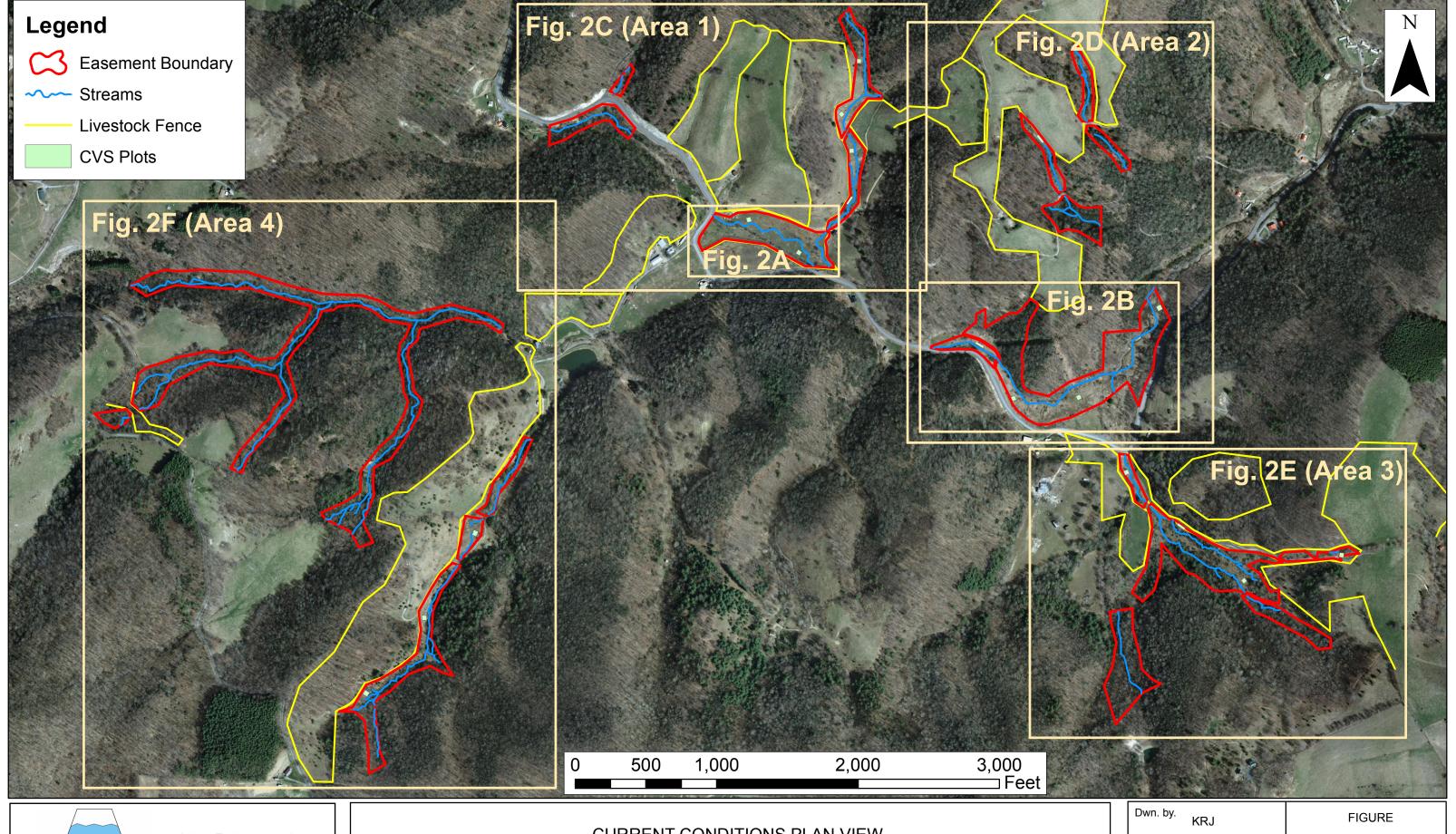
Table 4. Project Baseline Information and Attributes

Tate Farm (Ripshin Branch) Str				LEP Project	Number 3/2))
Project Information Project Name Tate Farm (Ripshin Branch)						
Project Name		apshin Brai	nch)			
Project County	Ashe					
Project Area (Acres)	61.92					
Project Coordinates (NAD83	1,037,279.65	, 1,234,847	,66			
2007)						
	Project Water	shed Sum	mary Inform	ation		
Physiographic Region	Blue Ridge					
Ecoregion	Southern Cry	stalline Ric	dges and Mou	ıntains		
Project River Basin	Upper New					
USGS 8-digit HUC	05050001					
USGS 14-digit HUC	05050001010	0050				
NCDWQ Subbasin	05-07-02					
Project Drainage Area (Sq. Mi.)	2.0					
Project Drainage Area	<5%					
Impervious Surface						
Watershed Type	Rural					
	Reach S	Summary I	nformation			
Parameters	Reach 1	Reach 2	Area 1	Area 2	Area 3	Area 4
	(Ripshin	(UT)	Tributaries	Tributaries	Tributaries	Tributaries
	Branch)	(-)				
Restored/Enhanced Length	Í	012	2410	12.62	2500	22.67
(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		l	l	I	
NCDWQ Classification	C, NSW, Tr					
Valley Type/Morphological	II/BC4					
Description						
Dominant Soil Series	Colvard and	Toxawav				
Drainage Class	Well and Poo		d			
Soil Hydric Status	Nonhydric ar					
Slope	0.02	0.02				
FEMA Classification	NA	0.02				
Native Vegetation Community	Montane All	uvial Fores	t and Swamp	Forest-Bog (`omnlex	
Percent Composition of Exotic	<5%	<5%	t una 5 wamp	Torest Bog C	оприя	
Invasives	370	370				
HIVUSIVES	Regula	atory Cons	iderations			
Regulation	Applicable	atory Cons	idel ations			
Waters of the U.S. –Sections	Yes-Received Appropriate Permits					
404 and 401	res-received Appropriate Permits					
Endangered Species Act	No Effect					
Historic Preservation Act	No Effect No					
CZMA/CAMA	NA					
FEMA Floodplain Compliance	NA NA					
Essential Fisheries Habitat	Trout					
Essential Fisheries Haultat	11001					

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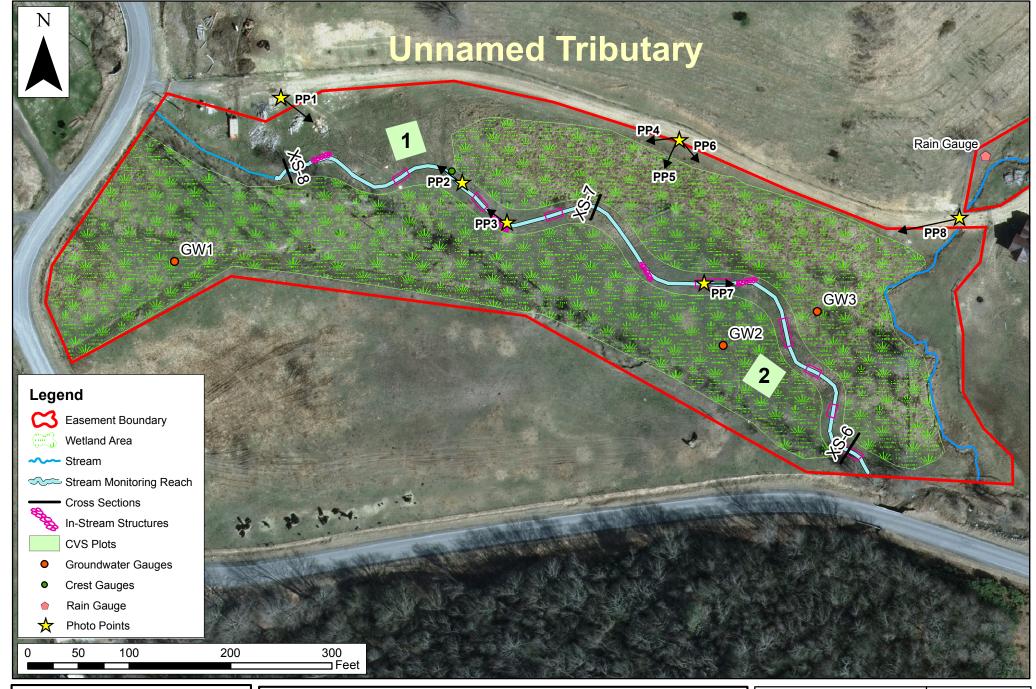
CURRENT CONDITIONS PLAN VIEW TATE FARM **EEP PROJECT NUMBER 372** Ashe County, North Carolina

Date:

December 2013

Project:

12-004.13



Axiom Environmental, Inc.

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

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KRJ

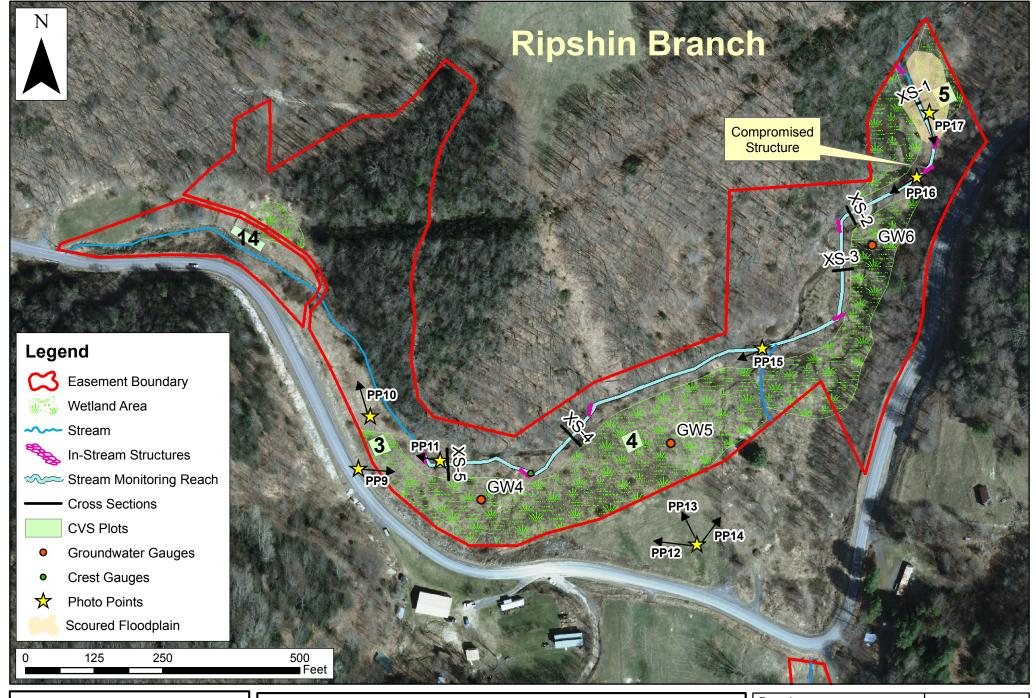
Date: December 2013

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

FIGURE

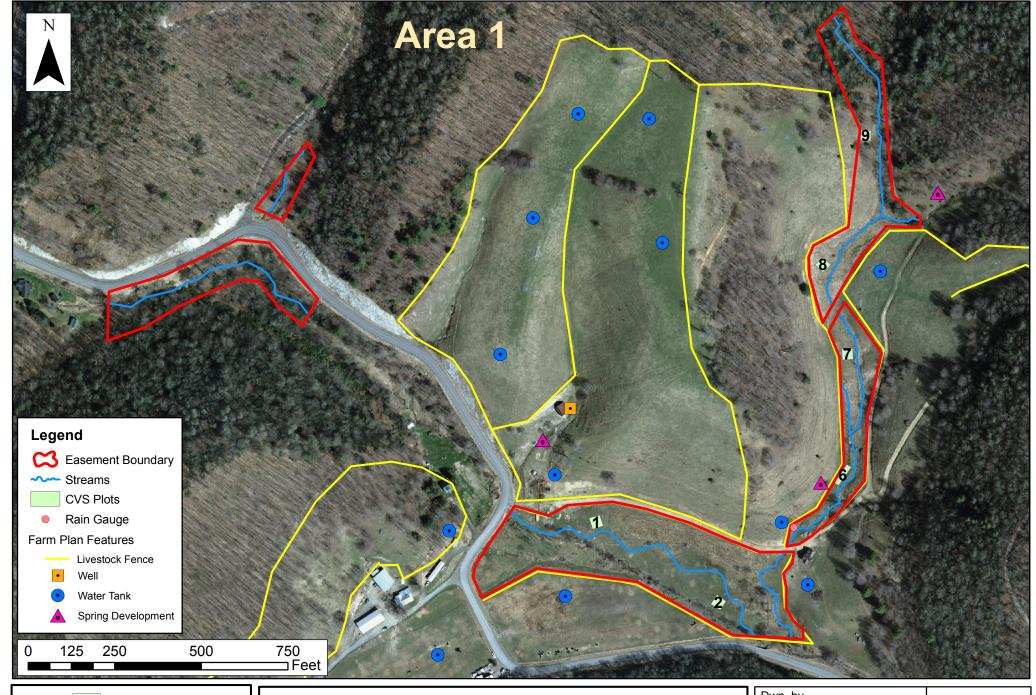
Date:

December 2013

Project:

12-004.13

2B



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

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

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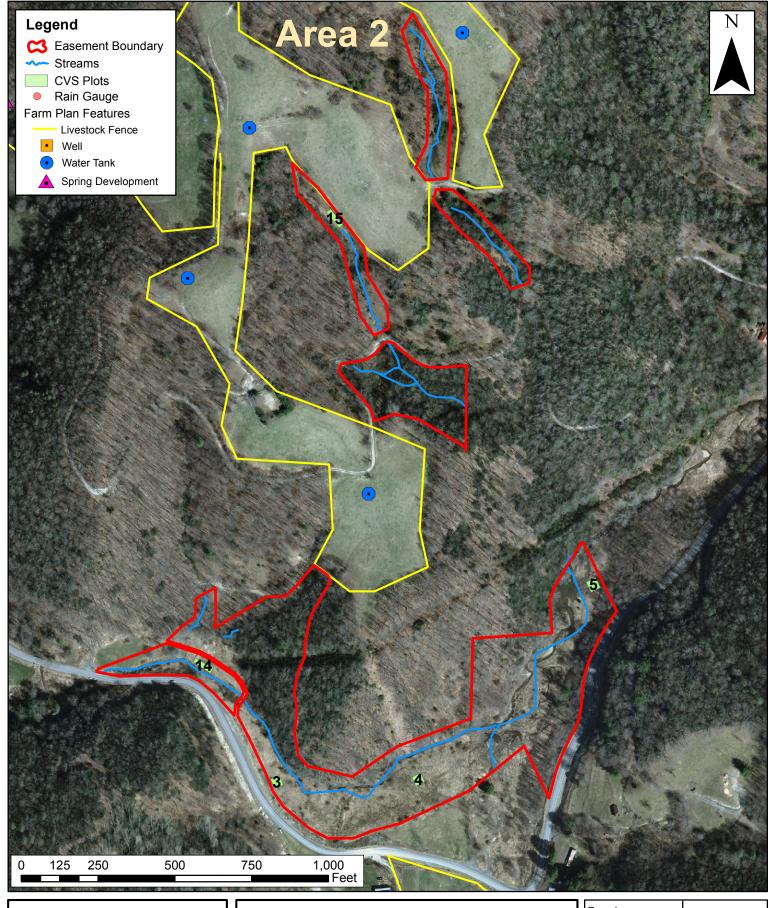
Date: December 2013

Project:

12-004.13

FIGURE

2C





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

Dwn. by. KRJ

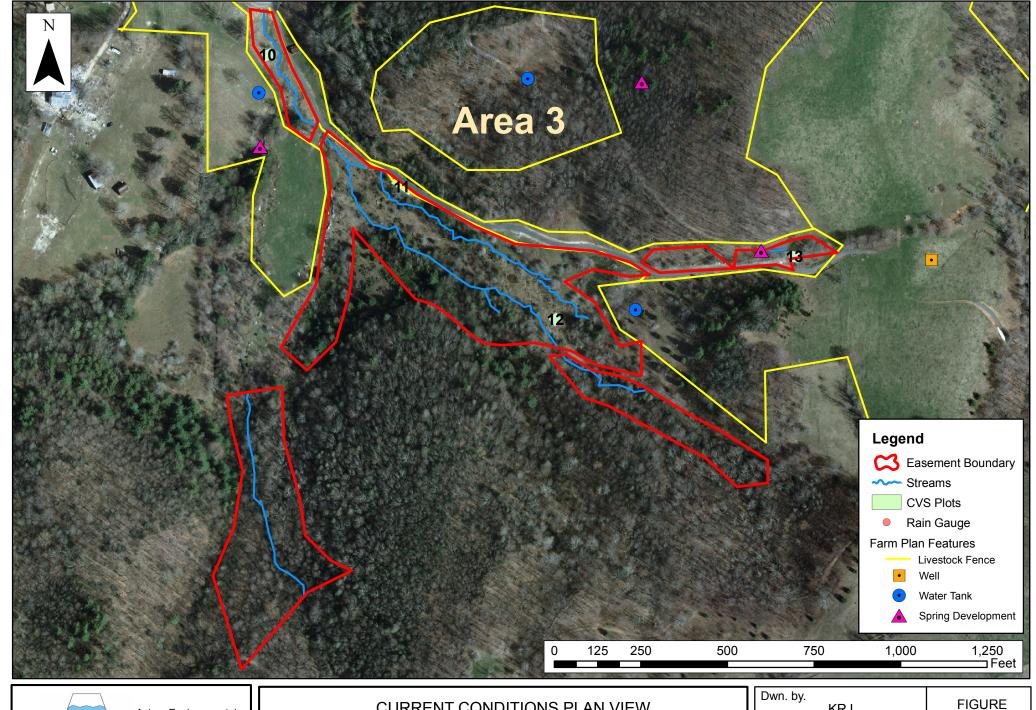
Date:

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

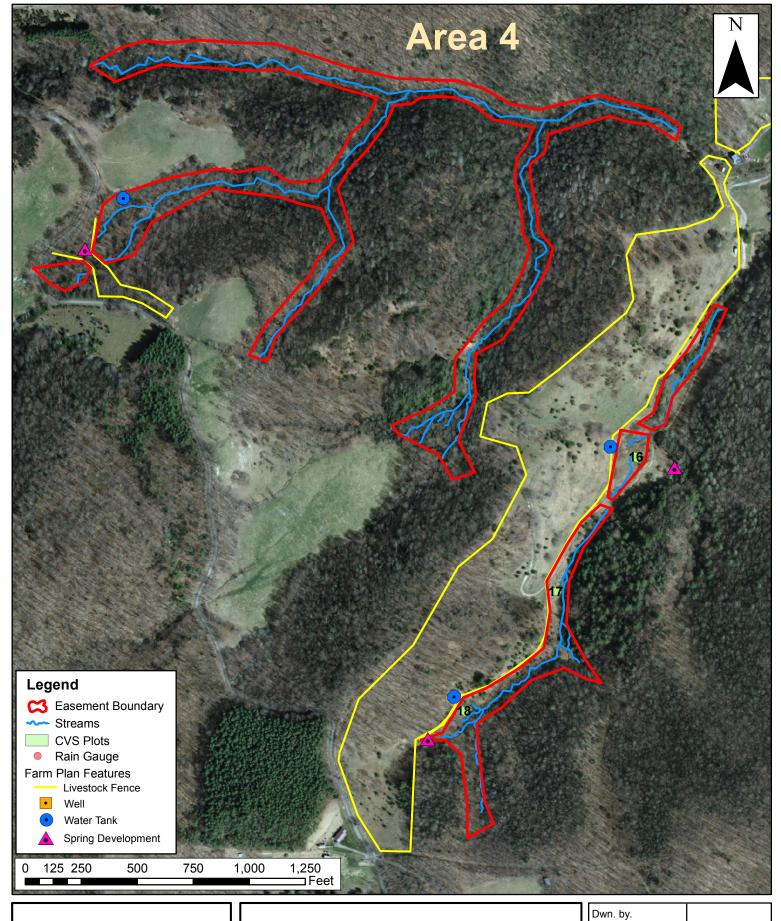
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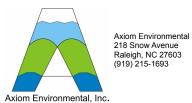
KRJ

Date:
December 2013

Project:
12-004.13

2E





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

KRJ

Date:

December 2013

Project: 12-004.13

2F

FIGURE

Visual Stream Morphology Stability Assessment Table 5A Reach ID **Unnamed Tributary** 800

Assessed Length

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
	Vertical Stability (Riffle and Run units)	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%			
		Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	Texture/Substrate - Riffle maintains coarser substrate	12	12			100%			
1. Bed	3. Meander Pool Condition	1. <u>Depth</u> Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	10	10			100%			
		Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	10	10			100%			
	4.Thalweg Position	Thalweg centering at upstream of meander bend (Run)	10	10			100%			
		2. Thalweg centering at downstream of meander (Glide)	10	10			100%			
	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			100%
2. Bank	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does <u>NOT</u> 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%
	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%			
3. Engineered Structures	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 <u>not</u> 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 Assessed Length Ripshin Branch 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
	Vertical Stability (Riffle and Run units)	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%			
		Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	Texture/Substrate - Riffle maintains coarser substrate	21	21			100%			
1. Bed	3. Meander Pool Condition	1. <u>Depth</u> Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	25	25			100%			
		Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	25	25			100%			
	4.Thalweg Position	Thalweg centering at upstream of meander bend (Run)	25	25			100%			
		Thalweg centering at downstream of meander (Glide)	25	25			100%			
	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			100%
2. Bank	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does <u>NOT</u> 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%
	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			
3. Engineered Structures	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 <u>not</u> 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 <u>Vegetation Condition Assessment</u>

Planted Acreage¹

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 Tot					8.22	47.0%

Easement Acreage² 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%

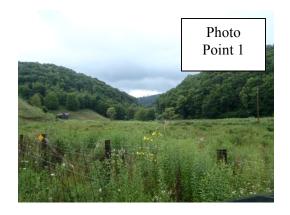
^{1 =} Enter the planted acreage within the easement. This number is calculated as the easement acreage minus any existing mature tree stands that were not subject to supplemental planting of the understory, the channel acreage, crossings or any other elements not directly planted as part of the project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

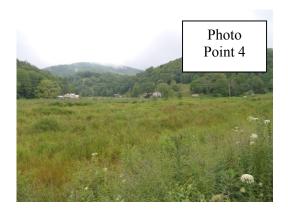
^{4 =} Invasives may occur in or out of planted areas, but still within the easement and will therefore be calculated against the overall easement acreage. Invasives of concern/interest are listed below. The list of high concern spcies are those with the potential to directly outcompete native, young, 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 regulating, but can be mapped, if in the judgement of the observer the timeframes discussed and therefore are not expected to be mapped with regulating, but can be mapped, if in the judgement of the observer the timeframes discussed and the potential in the projects history will warrant control, but potentially large coverages of Microstepium in the horizontally large coverages of Microstepium in the horizontal 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 litalics* are of particularly relative to mapping as points where isolated specimens are found, particularly for situations where the cordition 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 natrative section of the executive summary.

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





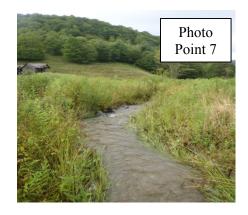




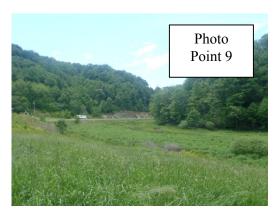




Tate Farm (Ripshin Branch) Stream Fixed-Station Photographs Taken August 2013 (continued)

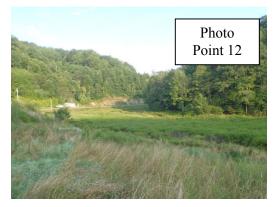






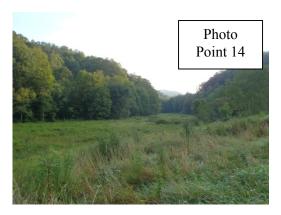


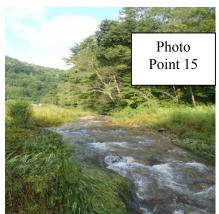




Tate Farm (Ripshin Branch) Stream Fixed-Station Photographs Taken August 2013 (continued)



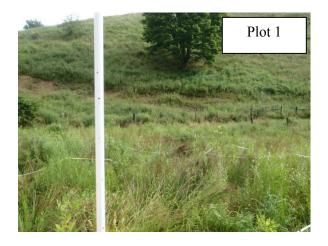




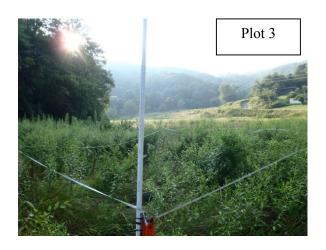


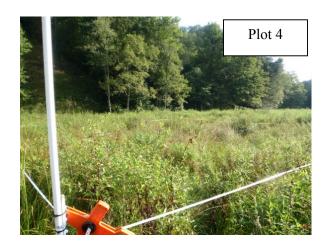


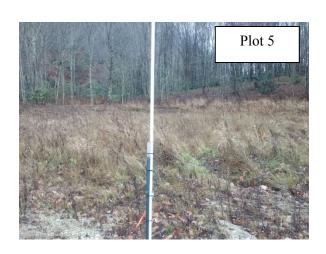
Tate Farm (Ripshin Branch) Vegetation Monitoring Photographs Taken August 2013

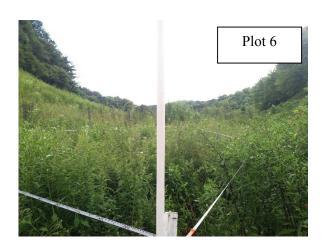






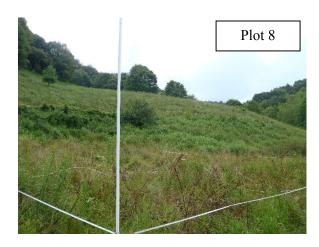


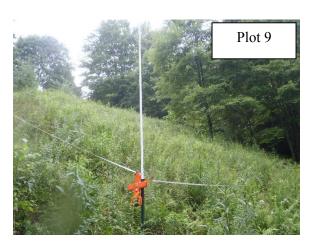




Tate Farm (Ripshin Branch) Vegetation Monitoring Photographs Taken August 2013 (Continued)





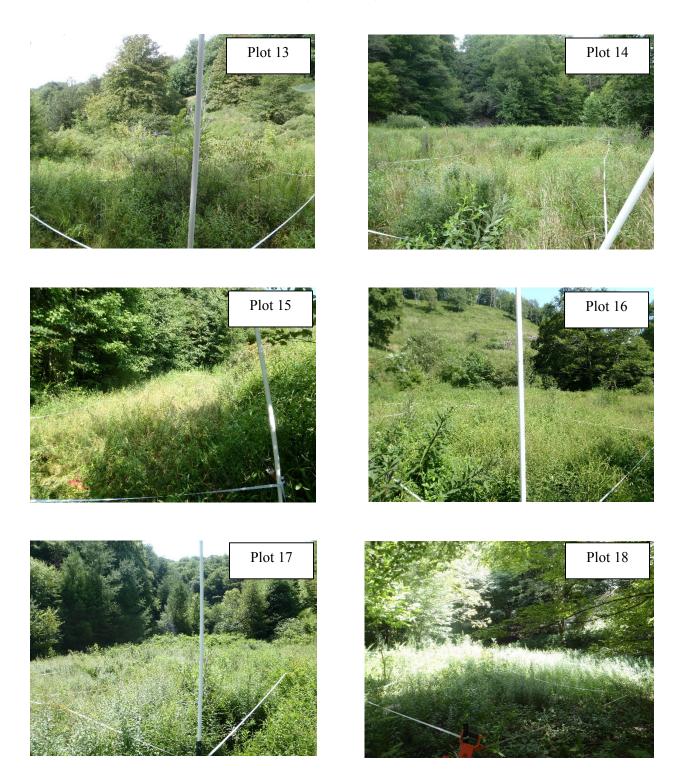








Tate Farm (Ripshin Branch) Vegetation Monitoring Photographs Taken August 2013 (Continued)



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

Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
1	Yes	
2	No	
3	Yes	
4	No	
5	Yes	
6	No	
7	No	
8	No	
9	Yes	220/
10	No	33%
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

ream and Wetland Restoration Site (EEP Project Number 3/2)
Corri Faquin
11/19/2013 12:09
Axiom-EEP-2013-A-v2.3.1-FINAL.mdb
C:\Axiom\Business\CVS
CORRI-PC
56041472
EETS IN THIS DOCUMENT
Description of database file, the report worksheets, and a summary of project(s) and project data.
Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
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.
List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Frequency distribution of vigor classes for stems for all plots.
Frequency distribution of vigor classes listed by species.
List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage values tallied by type for each species.
Damage values tallied by type for each plot.
A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
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.
372
Tate Farm
Stream and Wetland Restoration
New
18

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

Security Name Common Name Special Type Profit															Cur	rent Pl	ot Data	a (MY2 2	2013)												
More reformed Agricultural February																														2-01-0011	
Accordant from pelle Prec		Common Name		PnoLS P-all	Т	PnoLS	P-all T	Pr	noLS P	-all 1	T	PnoLS P-all T	PnoLS	P-all	Т	PnoLS	P-all	Т	PnoLS	P-all T	PnoLS	P-all	Т	PnoLS P-al	I T	PnoLS	P-al	I T	Pnol	LS P-a	II T
Associate force Simple Sim	Acer pensylvanicum	striped maple	Shrub Tree																												
Annus arriada hazel alider Shrub Manus servicia hazel alider Manus servicia	Acer rubrum	red maple	Tree		4																					1					
Alms servicide Sared Sared	Aesculus flava	· · · · · · · · · · · · · · · · · · ·																													
Anonia andurforial Red Chokeberry Shrub Shrub See Betula intra Sweet brich Tree	Alnus	alder	Shrub																												
Betula leitrata Prec	Alnus serrulata	hazel alder	Shrub										4	1 4	4	ļ															
Bestuh nigm fiver birch free 3 3 3 3 1 1 1 1 1 1	Aronia arbutifolia	Red Chokeberry	Shrub			2	2	2					3	3	3	3															
Carpins and norheam Tee	Betula lenta	sweet birch	Tree																												
Comus amomum allyky dogwood Shrub 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Betula nigra	river birch	Tree	3 3	3				1	1	1		3	3	3	3			2	2 2	3	3	3								
Corylus mentana American hazehut Shrub Crataegus phaenopyrum Mashington haxbrom Free Insufficial Shrub Mashington haxbrom Shrub Free Insufficial Shrub Free Insufficial Shrub Free Insufficial Shrub Free Insufficial Shrub Insuffic	Carpinus caroliniana	American hornbeam	Tree																												
Catalegis hawthorn Tree	Cornus amomum	silky dogwood	Shrub	1 1	. 1	1	1	1				2 2	2																		
Catalegus phaenopyrum Washington hawthorn Shnub Tree If regious phaenopyrum Ramina permay Namidia James and Shnub Tree James an	Corylus americana	American hazelnut	Shrub													1	. :	1 1	L					1	1	1					2
Regus grandifolia American beech Tree	Crataegus	hawthorn	Tree																												
Fagus gradifolia American beach Tree 15 5 5 2 2 2 4 4 4 1 1 1 1 1 1 1		Washington hawthorn	Shrub Tree																											2	2
Isex opaca American holly Tree		American beech	Tree																							1					
Kalmia Haurel Haure		green ash	Tree	5 5	5 5	2	2	2	4	4	4	1 1	1 1	1	1	L			1	1 1											
Kalmia Haurel Haure	Ilex opaca	American holly	Tree			2	2	2																							
Unidendron tulipifera tuliptree Tree		laurel																													
Malus apple Tree	Kalmia latifolia	mountain laurel	Shrub Tree																												
Malus Apple Tree	Liriodendron tulipifera	tuliptree	Tree																					3	3	3					
Platanus occidentalis American sycamore Tree	Malus		Tree																							1		1	1		
Prunus serotina black cherry Tree	Pinus strobus		Tree																												
Quercus alba white oak Tree Image: Companies of the	Platanus occidentalis	American sycamore	Tree						6	6	6	1 1	1 2	2 2	2	2										3		3	3		
Quercus alba white oak Tree Image: Companies of the	Prunus serotina	black cherry	Tree						1	1	1																				
Rhododendron rhododendron rhododendron rhododendron rhododendron maximum great laurel Shrub Shru																															
Rhododendron maximum great laurel Shrub	Quercus rubra	northern red oak	Tree																					1	1 :	1					
Rhus sumac shrub sumac shrub sumac shrub sumac shrub shrub or Tree solution in the street shall be sufficient to the street shows the street s	Rhododendron	rhododendron																													
Rhus sumac shrub sumac shrub sumac shrub sumac shrub shrub or Tree solution in the street shall be sufficient to the street shows the street s	Rhododendron maximum	great laurel	Shrub																					1	1 :	1				4	4
Salix nigra black willow Tree	Rhus		shrub																												
Salix sericea silky willow Shrub	Salix	willow	Shrub or Tree																												
Salix sericea silky willow Shrub	Salix nigra	black willow	Tree																												
Sambucus canadensis																Î													1		
Tsuga canadensis eastern hemlock Tree	Sambucus canadensis	Common Elderberry														Î													1		
Vaccinium corymbosum highbush blueberry Shrub Image: Control of the property of the		•	Tree							1			Ĭ			1	1		1		1			3	3	3	1				
Viburnum dentatum southern arrowwood Shrub 3 3 3 4 4 4 4 13 13 13 13 14 4 4 4 4 13 14	-	highbush blueberry	Shrub													1	. :	1 1	L					1	1 :	1			1	13	13 1
size (ares) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	•			3 3	3																										
			Stem count	12 12	16	7	7	7	12	12	12	4 4	4 13	3 13	13	3 2	2 2	2 2	2 3	3 3	3	3	3	10	10 12	2 4		4	4	19	19 5
size (ACRES) 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.0	size (ares) size (ACRES)		size (ares)	1		•	1			1		1		1	!		1			1		1		1			1				1
			0.02			0.02		(0.02		0.02		0.02			0.02			0.02		0.02		0.0	2	İ	0.0	2		0.	02	
				4 4	1 5	4	4	4	4	4	4	3 3	3 5	5 5	5	5 2	2 2	2 2	2 2	2 2	1	1	1	6	6	8 2		2	2	3	3
Stems per ACRE 485.6 485.6 647.5 283.3 283		485.6 485.6	647.5	283.3	283.3 28	33.3 4	185.6	485.6	485.6	161.9 161.9 161.	9 526.1	526.1	526.1	80.94	80.94	4 80.94	121.4	121.4 121.4	121.4	121.4	121.4	404.7 404	1.7 485.0	6 161.9	161	1.9 161	.9 768	3.9 76	8.9 214		

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)																	Annua	l Means	S							
				2-01-00			2-01-00	13	372-01-001			372-01-0015		15	372-01-0016				2-01-00			2-01-00	018	М	MY2 (2013		V	/Y1 (201	.2)
Scientific Name	Common Name	Species Type	Species Type PnoLS P-all T		T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS P-all T		PnoLS	noLS P-all T			PnoLS P-all T			P-all	T	PnoLS	P-all	Т	PnoLS	P-all	Т	
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	1
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	
Corylus americana	American hazelnut	Shrub							4	4	4												3	6	6	30			
Crataegus	hawthorn	Tree			1										1	1	1						1	1	1	3			i
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	
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			1
Pinus strobus	eastern white pine	Tree																					1			2			
Platanus occidentalis	American sycamore	Tree				2	2	2																14	14	14	8	8	- :
	black cherry	Tree							1	1	1				1	1	1							3	3	3	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																											
Salix	willow	Shrub or Tree																											1
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			ī
Tsuga canadensis	eastern hemlock	Tree			1																			3	3	4			ī
	highbush blueberry	Shrub									4													15	15	19			ī
Viburnum dentatum	southern arrowwood	Shrub							6	6	6													9	9	9	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	4
		size (ares)		1			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	9	9	10	0	0	0	2		3	1	1	1	0		7	22		28	9		1	
	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.	

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

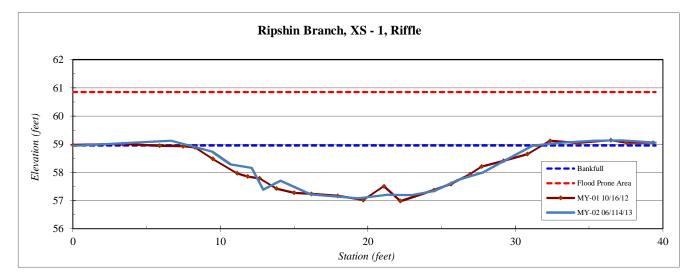
River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 1, Riffle
Drainage Area (sq mi):	1.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

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



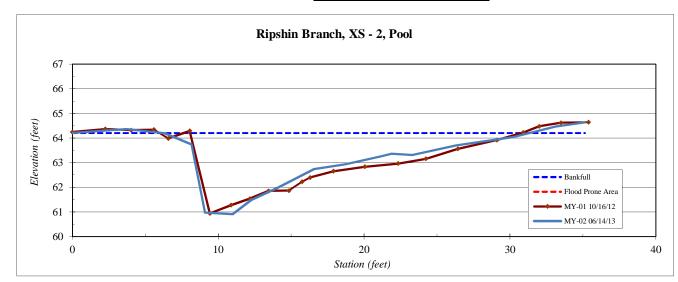
River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 2, Pool
Drainage Area (sq mi):	1.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

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
	1

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	7
-----------------	---



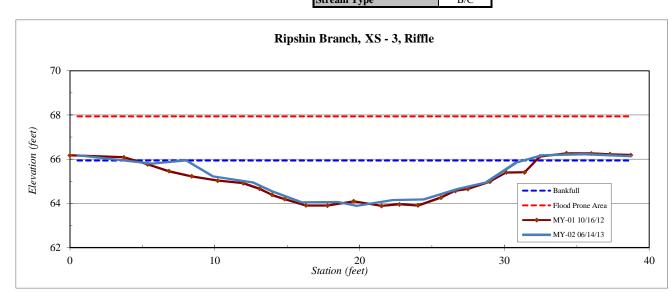
River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 3, Riffle
Drainage Area (sq mi):	1.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

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
-------------	-----



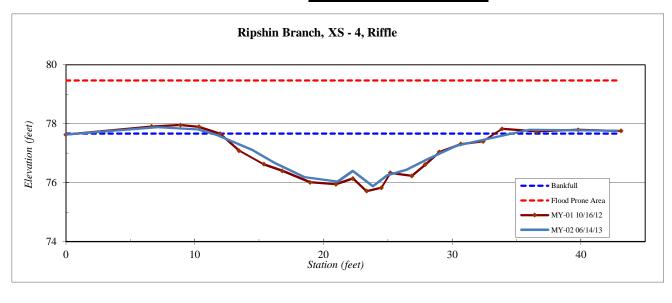
River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 4, Riffle
Drainage Area (sq mi):	1.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

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
-------------	-----



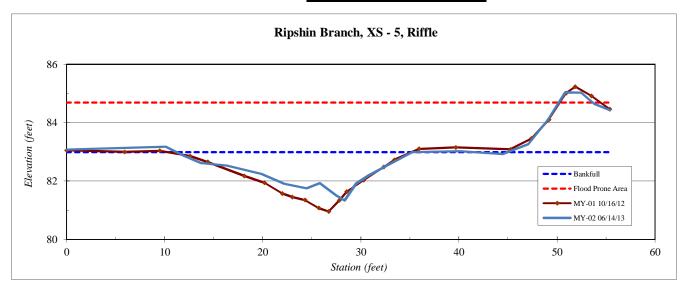
River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 5, Riffle
Drainage Area (sq mi):	1.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

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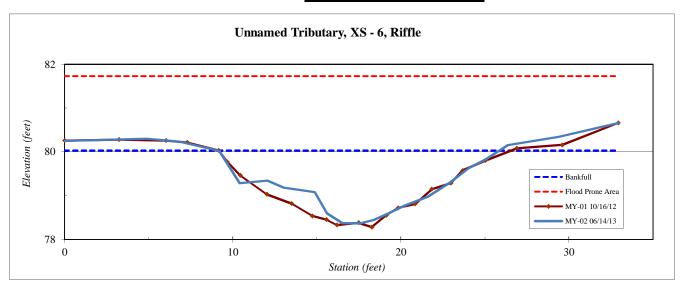
River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 6, Riffle
Drainage Area (sq mi):	0.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

C4-4:	El4:
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

Bankfull Elevation:80.0Bankfull Cross-Sectional Area:15.8Bankfull Width:16.8Flood Prone Area Elevation:81.7Flood Prone Width:>80Max Depth at Bankfull:1.7Mean Depth at Bankfull:0.9W / D Ratio:17.9Entrenchment Ratio:4.8		
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	SUMMARY DATA	
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	Bankfull Elevation:	80.0
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	Bankfull Cross-Sectional Area:	15.8
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	Bankfull Width:	16.8
Max Depth at Bankfull:1.7Mean Depth at Bankfull:0.9W / D Ratio:17.9Entrenchment Ratio:4.8	Flood Prone Area Elevation:	81.7
Mean Depth at Bankfull:0.9W / D Ratio:17.9Entrenchment Ratio:4.8	Flood Prone Width:	>80
W / D Ratio: 17.9 Entrenchment Ratio: 4.8	Max Depth at Bankfull:	1.7
Entrenchment Ratio: 4.8	Mean Depth at Bankfull:	0.9
	W / D Ratio:	17.9
D 111 14 D 4	Entrenchment Ratio:	4.8
Bank Height Ratio: 1.0	Bank Height Ratio:	1.0



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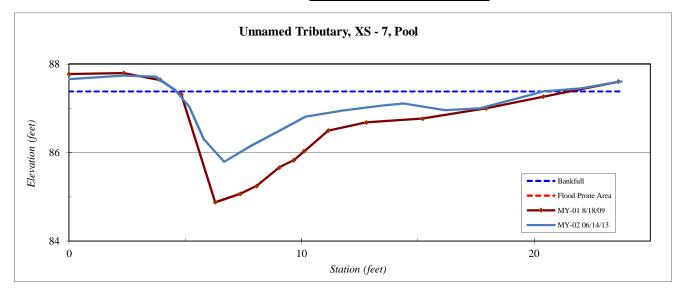
River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 7, Pool
Drainage Area (sq mi):	0.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

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



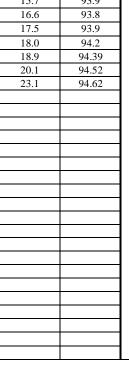
River Basin:	Upper New
Watershed:	Tate Farm
XS ID	XS - 8, Riffle
Drainage Area (sq mi):	0.6
Date:	6/14/2013
Field Crew:	Perkinson, Jernigan

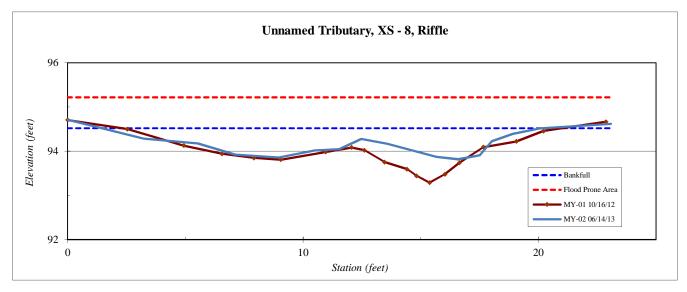
Station	Elevation
0.0	94.7
3.2	94.3
5.5	94.2
7.1	93.9
9.0	93.9
10.5	94.0
11.5	94.0
12.5	94.3
13.6	94.2
15.7	93.9
16.6	93.8
17.5	93.9
18.0	94.2
18.9	94.39
20.1	94.52
23.1	94.62

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

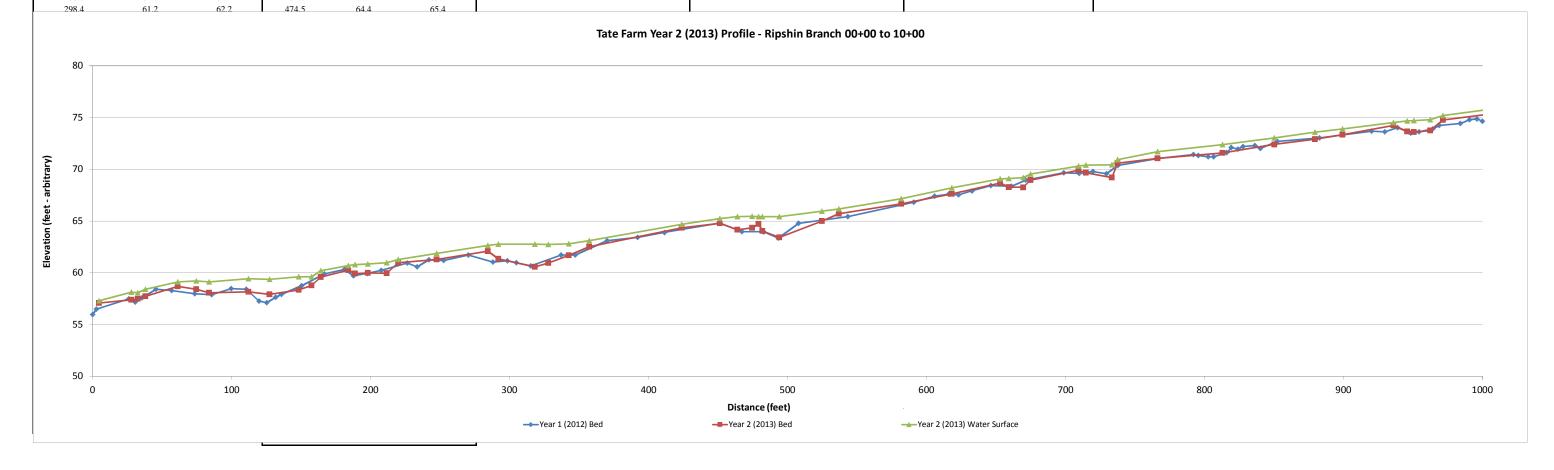




Project Name Reach Feature Date Crew Tate Farm - Profile Ripshin Branch Station 00+00 - 10+00 Profile 6/14/13 Perkinson, Jernigan

20.1	r critingon, veringu	_												
	2012			2013			2014			2015			2016	
Ve	ear 1 Monitoring \Su	rvev	,	Year 2 Monitoring \S	Survey	,	Year 3 Monitoring \S	urvev		Year 4 Monitoring \S	Survey	Year 5 Monitoring \S		Survey
Station	Bed Elevation		Station	Bed Elevation	Water Elevation	Station		Water Elevation	Station	Bed Elevation	Water Elevation	Station		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									ļ
150.3	58.7	59.4	211.5	60.0	61.0									
166.7	59.9	60.2	220.0	61.0	61.3									ļ
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									Į.
270.3	61.7	62.2	451.3	64.8	65.2									
288.0	61.0	62.2	464.0	64.2	65.4									!
									I					

	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 Reach

Tate Farm - Profile Ripshin Branch Station 10+00 - 15+00 Profile

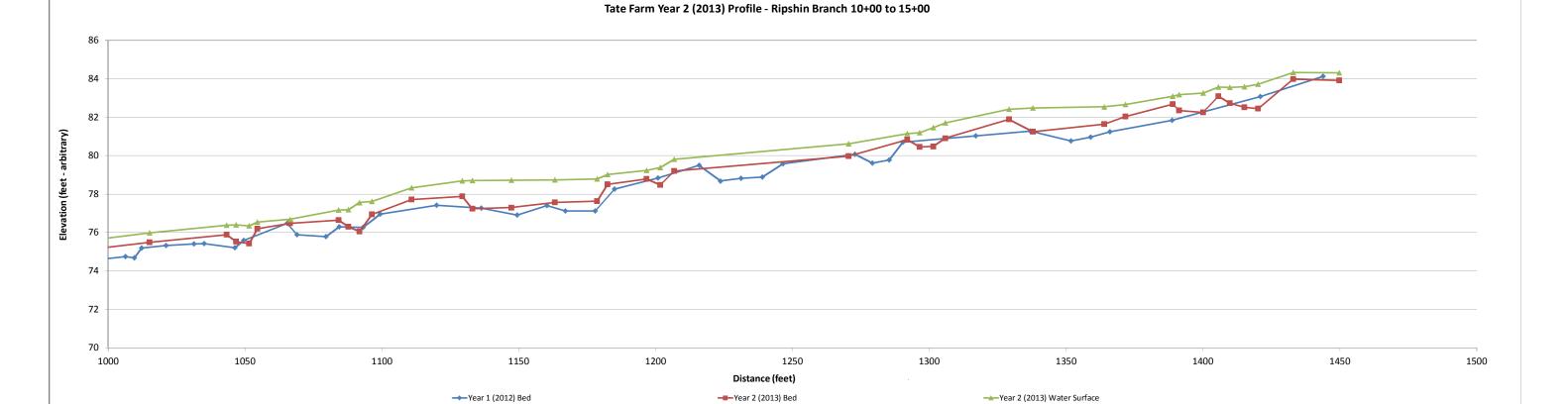
Feature

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		76.9	1110.9	77.7	78.3										
1084.3	76.3	77.0	1129.4	77.9	78.7										
1093.0		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		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										

→ Year 1 (2012) Bed

	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			



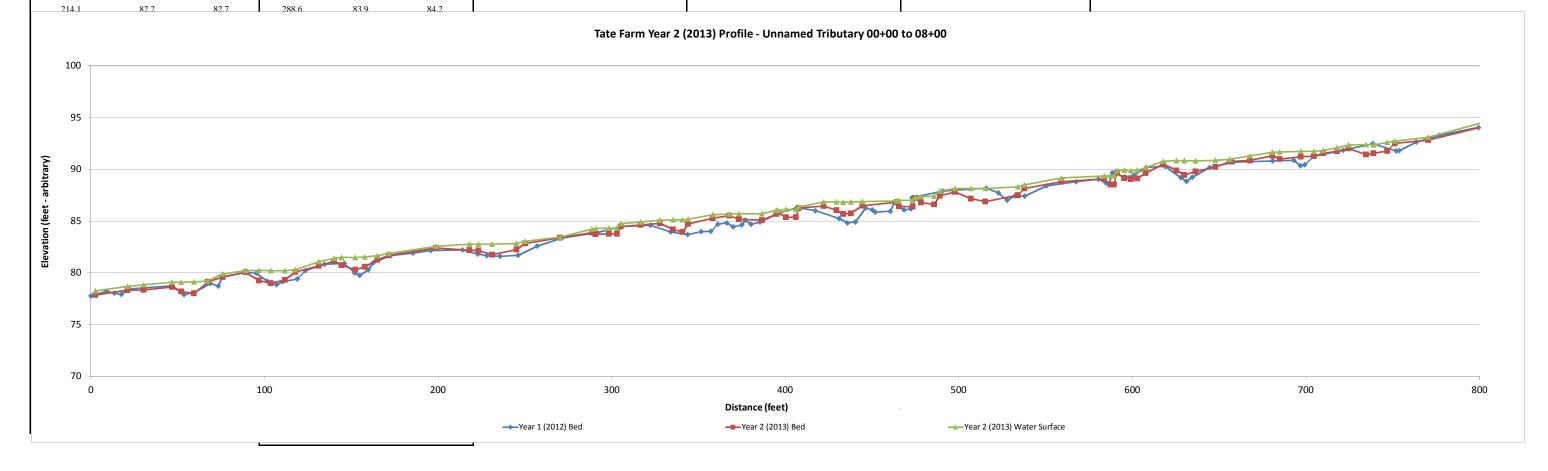
→ Year 2 (2013) Water Surface

Tate Farm - Profile Unnamed Tributary Station 00+00 - 08+00

Project Name Reach Feature Date Crew Profile 6/14/13 Perkinson, Jernigan

Crew	Perkinson, Jernigai	1													
Yes	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										

	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 Co	unt,							
			Tate Farm								
			New River								
		Note:	Cross Sec	tion 4 - Rip	shin Bran	ch					
					Pek	ble Count,	Tate Farm				
	100%										
	90%							,			
	80%										
	70%										
	60%										
an	50%							#			
Percent Finer Than	40%										
Fine	30%										
ent	20%										
Perc	10%							+ + •			
_	0%				* *						
		0.01	0.1		1	10		100	100	00	10000
		Particle Siz	ce (mm)	— ■ Cumi	ulative Perce	nt ◆ Per	cent Item -	——Riffle -	Pool -	≭ Run −	•—Glide
		Size per	rcent less th	an (mm)			Percer	nt by substra	ate type		
D	16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
6.0	000	43.12	81.6	197	431	0%	14%	26%	50%	10%	0%

		Pebble Co	unt,							
		Tate Farm								
		New River								
	Note:	 Cross Sec	tion 8 - Un	named Tril	hutary					
	Note.	01033 360	1011 0 - 011	illamed iiil	butary					
				Pek	oble Count,	Tate Farm				
100%										
90%						-				
80%										
70%										
60%										
₩ 50%										
Bercent Finer Than 30% 20% 20%										
ner										
i <u>E</u> 30%			<u></u>							
ট 20%						•				
"						*				
0%										
	0.01	0.1		1	10		100	100	00	10000
	Particle Siz	e (mm)	— ■Cum	ulative Perce	nt + Per	cent Item -	— <u></u> Riffle -	— Pool −	-≭-Run -	← Glide
	Size per	cent less th	an (mm)		1	Percer	nt by substra	ate 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 Cı	ırve		Pre-Exi	isting Co	ondition	l		Reference	Reach(es) Data			Design			Monit	oring Ba	seline	
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	2.0		110		1.2	0.0		1.0	1.2						
Profile					<u> </u>		110					1			1.0			<u> </u>	1			
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		ī							_			1	1			ı	ı	ı	ı	1		
Reach Shear Stress (competency) lbs/ft ²					<u> </u>											-		-				
Max part size (mm) mobilized at bankfull																		-				
Stream Power (transport capacity) W/m ²																						
Additional Reach Parameters																						
Rosgen Classification						I	34/F4/C	4]	B4/C4				B4/C4						
Bankfull Velocity (fps)							5.5									4.8 - 5						
Bankfull Discharge (cfs)		oxdot					158															
Valley Length (ft)																						
Channel Thalweg Length (ft)					<u> </u>											2300						
Sinuosity							1.2					.1 - 1.2				1.1 - 1.3						
Water Surface Slope (ft/ft)						0.	018-0.0	24			0.01	12 - 0.01	9			0.02						
BF slope (ft/ft)																						
Bankfull Floodplain Area (acres)																						
% of Reach with Eroding Banks					<u> </u>																	
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-Existi	ing Condition	on			Referen	nce Reach(e	s) Data				Design			Mo	nitoring	Baseli	ne	
						_					_									
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 C	urve		Pre-Ex	isting Co	ondition	l		Reference	Reach(e	es) Data			Design			Monit	oring Ba	seline	
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)						1										1						
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	1		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-Exist	ing Conditi	on				Refere	nce Reach(es) Data			Design			Mo	nitorin	g Base	line	
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

			Cr	oss Section	on 1					C	ross Secti	on 2					Cr	oss Sectio	n 3					Cr	oss Sectio	n 4					Cr	oss Sectio	n 5		
Parameter				Riffle							Pool							Riffle							Riffle							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

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						I		B/C-type			I		B/C-type								I					l I				
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)																										t				
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

			Cr	oss Sectio	n 6					Cr	oss Sectio	n 7					Cr	oss Sectio	n 8		
Parameter				Riffle							Pool							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	1							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	3							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







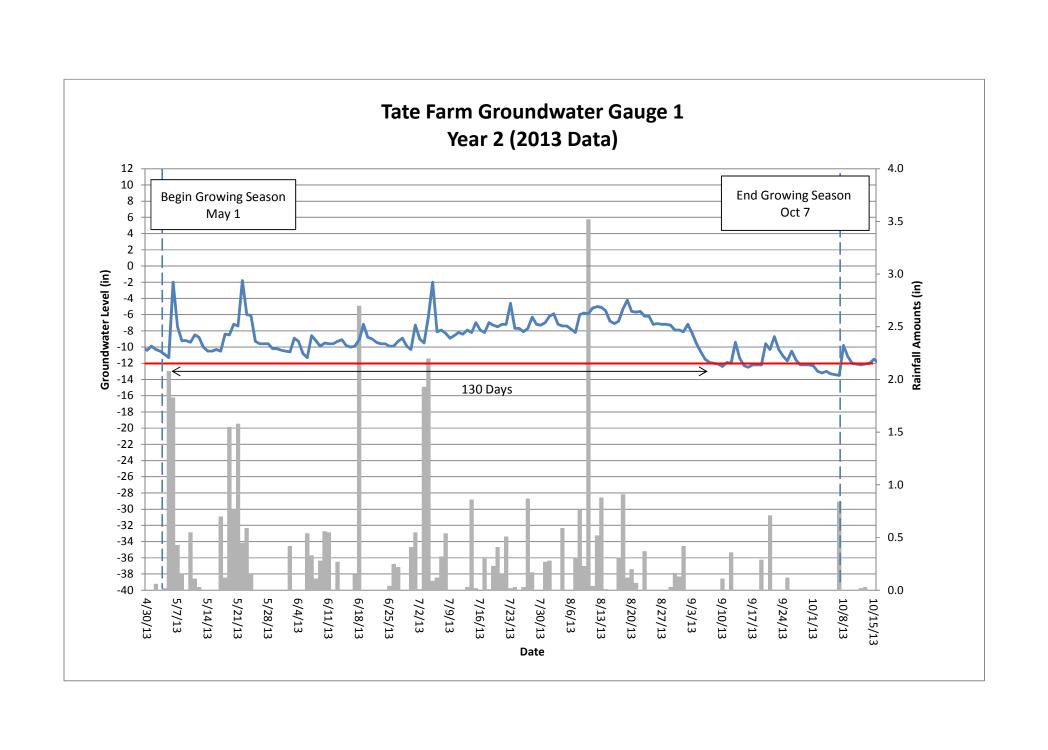


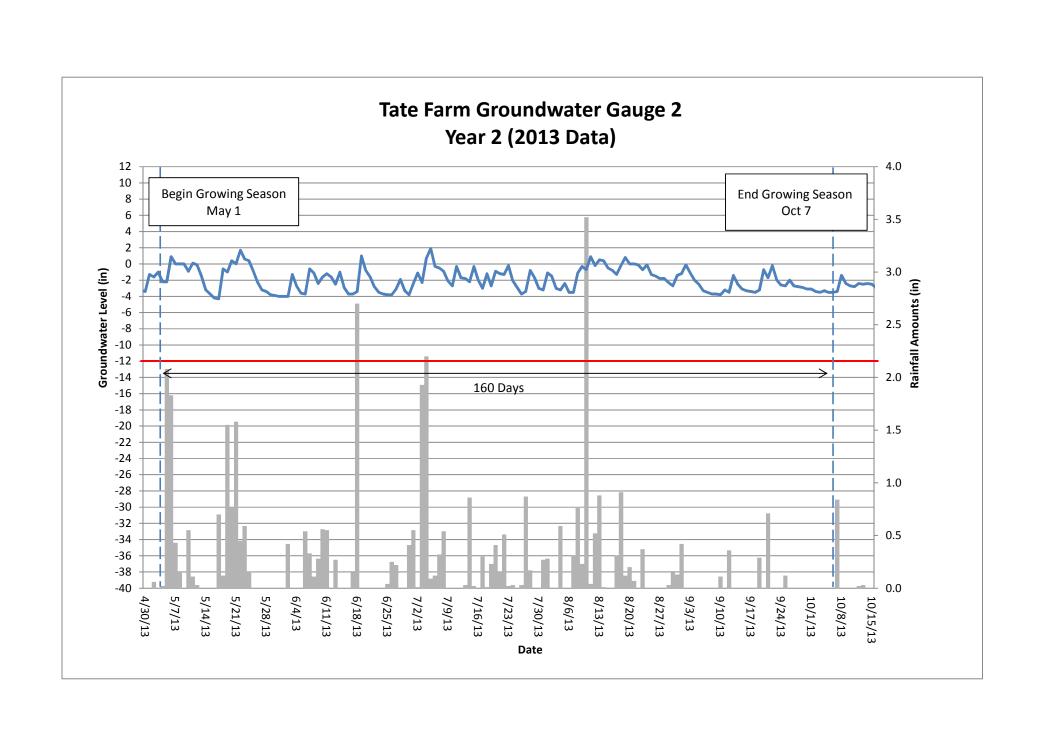
Table 13. Wetland Hydrology Criteria Attainment Summary

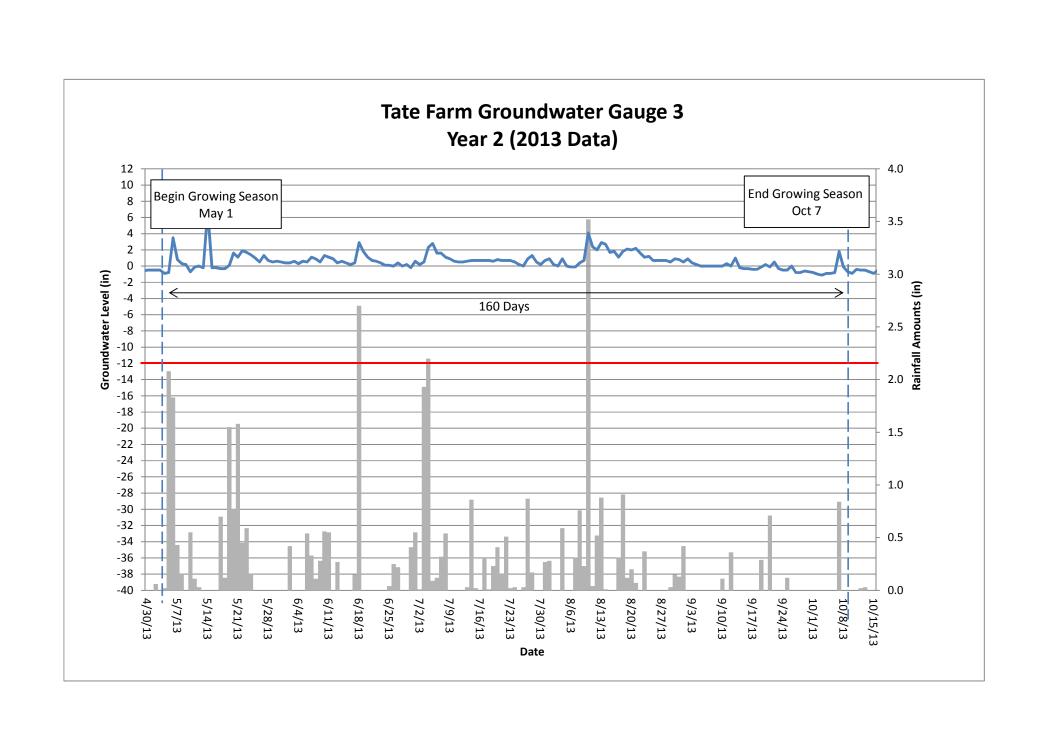
Tate Farm (Rinshin Branch) Stream and Wetland Restoration Site (EEP Project Number 372)

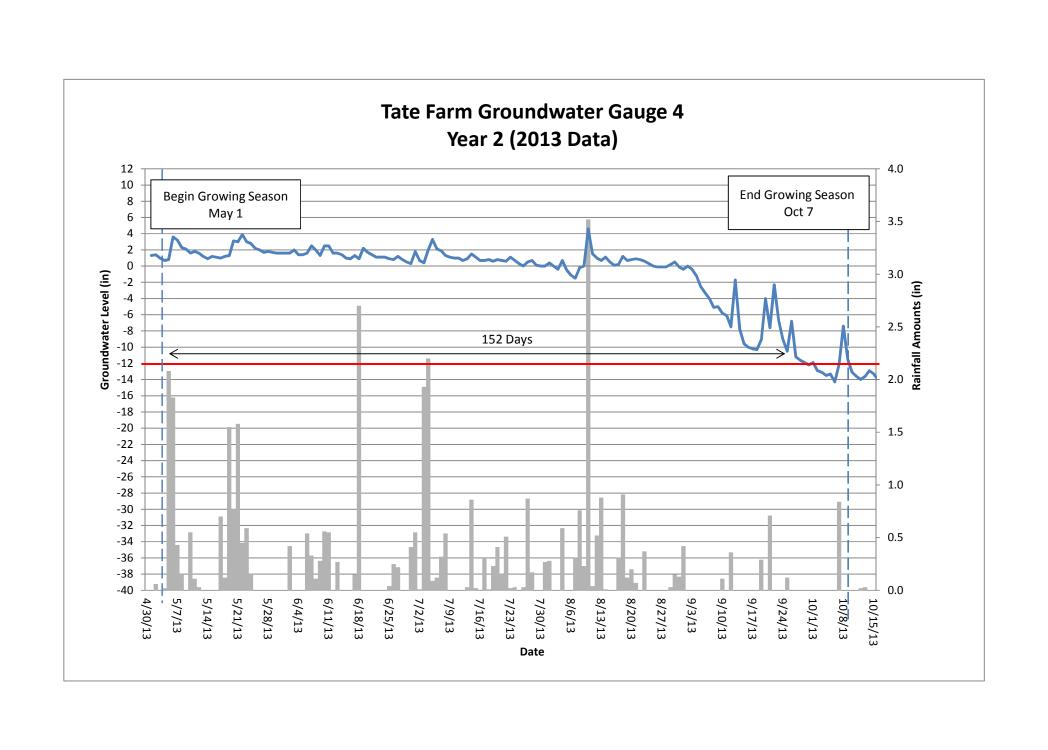
Gauge	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)							
	Year 1 (2012)*	Year 2 (2013)	Year 3 (2014)	Year 4 (2015)	Year 5 (2016)			
1		130 Days (81%)						
2		160 Days (100%)						
3		160 Days (100%)						
4		152 Days (95%)						
5		160 Days (100%)						
6		160 Days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

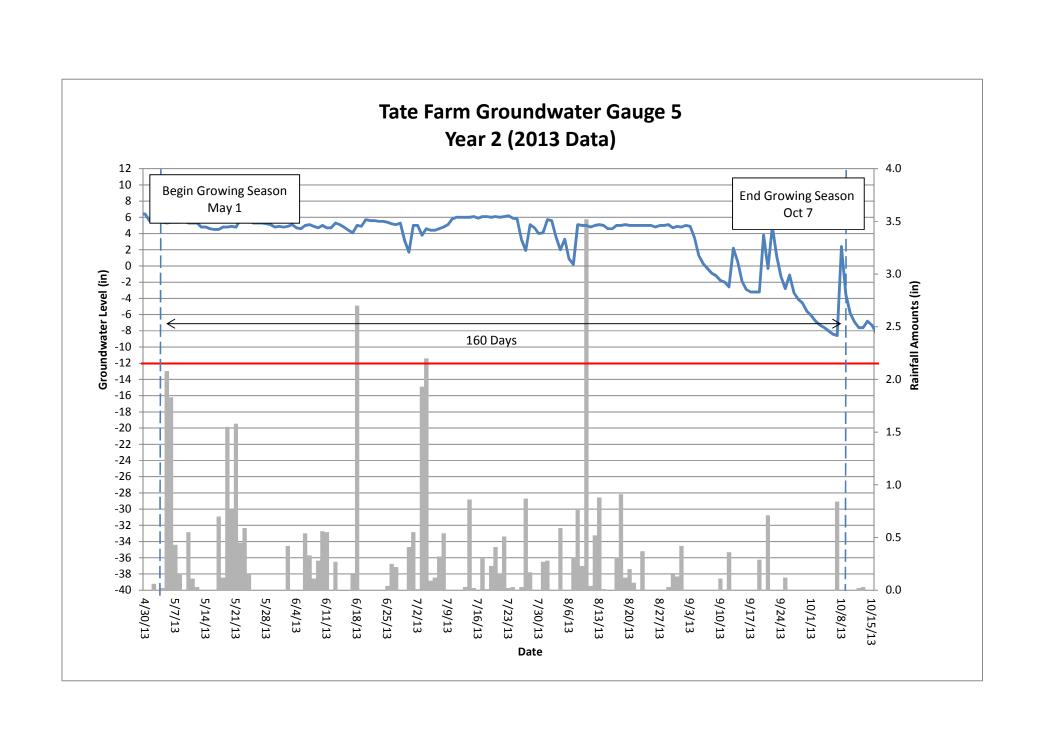
^{*} Groundwater Gauges were installed in October 2012; therefore, groundwater monitoring was initiated during the Year 2 (2013) monitoring year.

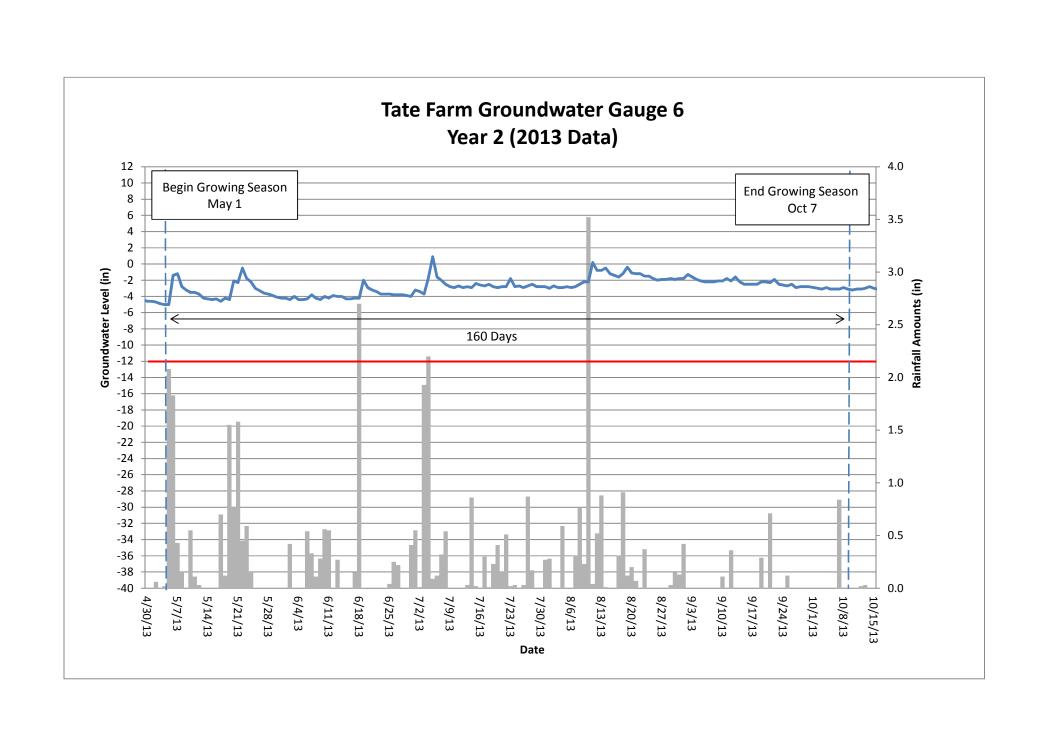






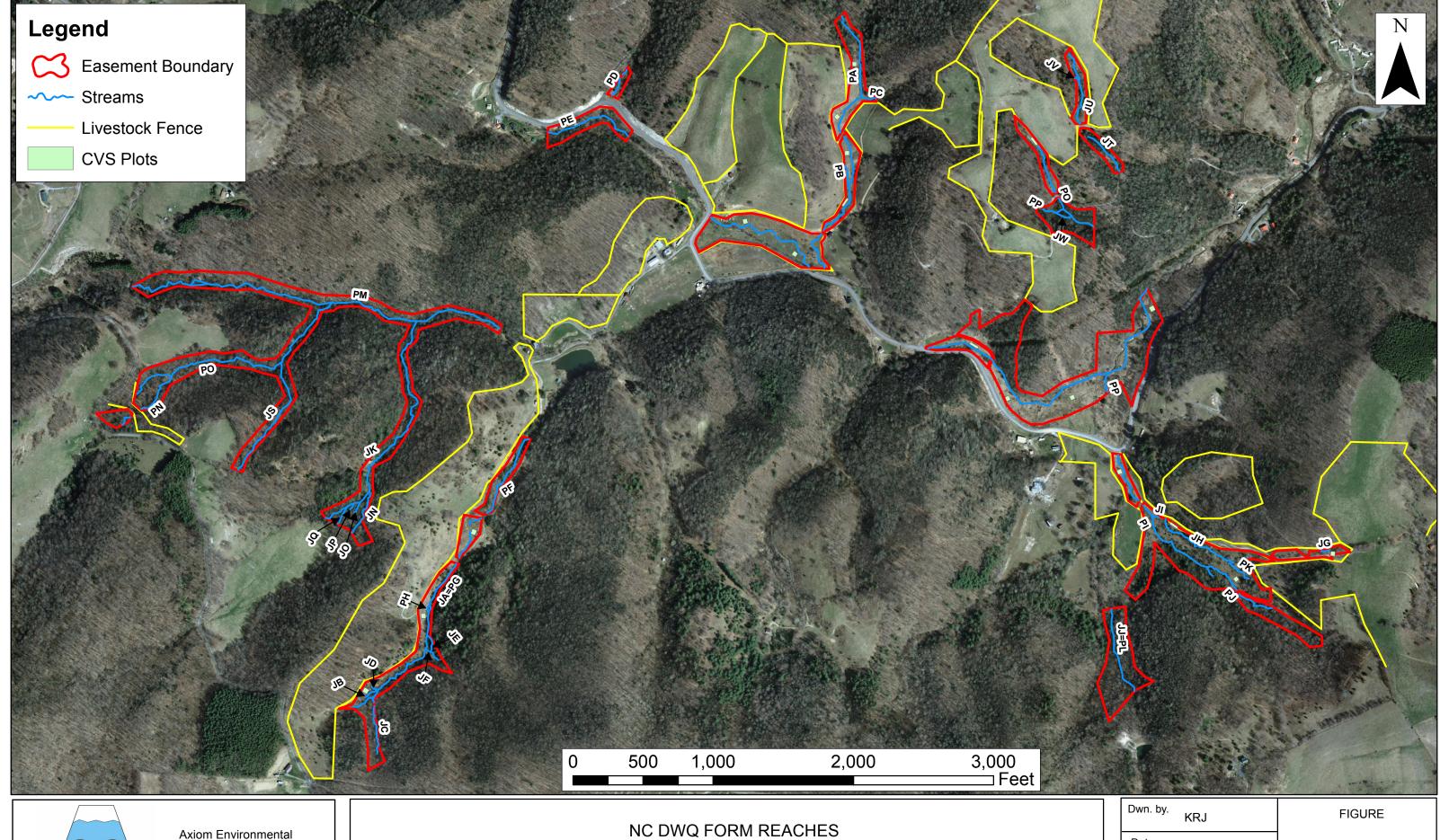






APPENDIX F STREAM FORMS

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

Date:

December 2013

Project:

12-004.13

3

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

ate:	Project/Site:	Tute Para	Latitude:	
valuator: Portinger/Axion	County: Ashc		Longitude:	
otal Points: tream is at least intermittent ≥ 19 or perennial if ≥ 30*	Stream Determi Ephemeral Inte	nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
. Geomorphology (Subtotal = 21,5)	Absent	Weak	Moderate	Strong
Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	1	(2)	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
Particle size of stream substrate	0	1	2	3
Active/relict floodplain	0	1	Ø	3
Depositional bars or benches	0	Φ	2	3
Recent alluvial deposits	0	0	2	3
Headcuts Crade control	0	1	Q	3
Grade control	0	0.5	Ø	1.5
Natural valley	0	0.5	1	1.57
. Second or greater order channel rtificial ditches are not rated; see discussions in manual	No_	= 0	Yes •	3
Hydrology (Subtotal =)			_	
			······································	
Presence of Baseflow	0	1	2	<u>③</u>
Iron oxidizing bacteria	0	(1)	2	3
Leaf litter	1.5	1	0.5	0
Sediment on plants or debris	0	0.5)	1	1.5
Organic debris lines or piles	0	0.5	1	1.5
Soil-based evidence of high water table?	No	= 0	Yes = 3	
Biology (Subtotal =) Fibrous roots in streambed				
Rooted upland plants in streambed	3	2)	1	00
Macrobenthos (note diversity and abundance)	3	2	1	0
Aquatic Mollusks	0	1	(2)	3
Fish	(O)	11	2	3
Crayfish		0.5	1	1.5
Amphibians	Ø	0.5	1	1.5
Algae	0	Q B	1	1.5
Wetland plants in streambed	6/	0.5	1	1.5
erennial streams may also be identified using other methods.	Soon 25 of manual	FACW = 0.75; OBL	= 1.5 Other = 0	
tes:	See p. 35 of manual,			
etch:				
	·			

NC DWQ Stream Identification Form Version 4.11

PB-0

Date: // - 0 4	Project/Site: / y /e for m		Latitude:	
Evaluator: Perking on Axica	County: As	he	Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determine Ephemeral Inter	nation (circle one) rmittent 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
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	②	3
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	0	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	0	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
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 1/5	·			
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	03)	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 = $\frac{Q}{Q}$)				
18. Fibrous roots in streambed	3	2		0
19. Rooted upland plants in streambed	3	2	11	0
20. Macrobenthos (note diversity and abundance)	0	1	②	3
21. Aquatic Mollusks	Q	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	2	1.5
24. Amphibians	0	0.5	_ <u></u>	1.5
25. Algae	0	0.5	1)	1.5
Wetland plants in streambed *perennial streams may also be identified using other method	(a. Cana a. 25 at annual a	FACW = 0.75; OBL	= 1.5 Other = 0	
Notes:	is. See p. 35 or manual.			
Troco.				
Sketch:				

PC-03

NC DWO Stream Identification Form Version 4.11

THE BY Q STITEMENT INCUSTION TO THE	V CI SIOM T.II	
Date: 11-4-2013	Project/Site: Tate Farm	Latitude:
Evaluator: Pertimo Ayrom	County: Ash	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

A. Geomorphology (Subtotal = $\frac{1}{2}$)	Absent	Weak	Moderate	Strong
1 ^{a.} Continuity of channel bed and bank	0	Ø	2	3
2. Sinuosity of channel along thalweg	0	<u>(1)</u>	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	Ø	2	3
Particle size of stream substrate	0	1	(D)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	(J)	2	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	Ø	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	<u>}0</u>	Yes	= 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	(7)	1.5	
16. Organic debris lines or piles	0	0.5	(V	1.5	
17. Soil-based evidence of high water table?	No = 0		Yes	Yes = 3)	
C. Biology (Subtotal =					
18. Fibrous roots in streambed	3	2	<u>(1)</u>	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	79	0.5	1	1.5	
23. Crayfish	Ø	0.5	1	1.5	
24. Amphibians	Ø	0.5	1	1.5	
25. Algae	Ø	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; C	DBL = 1.5 Other =	0	
*perennial streams may also be identified using other methods	s. See p. 35 of manua	al.		****	
Notes: marfles - coddisfly rasinss	Q 100 600	1 lawer Ou	the Done	1	

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

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

Date: 11-4-2013	Project/Site: Tate form		Latitude:		
Date: 11-4-2013 Evaluator: Perfumon Axion	County: A54	c	Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if $\geq 30^*$		nation (circle one) rmittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = g	Absent	Weak	Moderate	Strong	
1 ^a Continuity of channel bed and bank	0	Ø	2	3	
2. Sinuosity of channel along thalweg	0	Ø	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	Ø	2	3	
Particle size of stream substrate	0	0	2	3	
5. Active/relict floodplain	0	Ø .	2	3	
6. Depositional bars or benches	. 6	1	2	3	
7. Recent alluvial deposits	0	Ø	2	3	
8. Headcuts	0	①	2	3	
9. Grade control	0	(15)	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	(2)	1	2	3	
14. Leaf litter	1.5	1	(0,5)	0	
15. Sediment on plants or debris	(9)	0.5	1	1.5	
16. Organic debris lines or piles	9	0.5	1	1.5	
17. Soil-based evidence of high water table?		= 0	Yes=3		
C. Biology (Subtotal = 3					
18. Fibrous roots in streambed	3	2	(0	
19. Rooted upland plants in streambed	3	2	1	0	
20. Macrobenthos (note diversity and abundance)	9	1	2	3	
21. Aquatic Mollusks	Ø	1	2	3	
22. Fish	Ø	0.5	1	1.5	
23. Crayfish	0	O 3	1	1.5	
24. Amphibians	0	<u>(1)</u>	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OBL	= 1.5 Other = 0		
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Sketch:

Notes:

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NC DWQ Stream Identification Form Version 4.11

Date: 11-04-3013	Project/Site:	The home	Latitude:		
Evaluator: The Annual A	County:	ine:	Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if $\geq 30^*$		nation (circle one) mittent Perennial	Other e.g. Quad Name:		
//					
A. Geomorphology (Subtotal = 🖊 🔑 🔠)	Absent	Weak	Moderate	Strong	
1 ^a Continuity of channel bed and bank	0		. 2	3	
2. Sinuosity of channel along thalweg	0		2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)	
Particle size of stream substrate	0	·1	2	3	
5. Active/relict floodplain	0	1	2	3	
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		= 0	Yes		
a artificial ditches are not rated; see discussions in manual			103		
B. Hydrology (Subtotal =())					
12. Presence of Baseflow	0	1	2)	3	
13. Iron oxidizing bacteria	0	1		3/	
14. Leaf litter	1.5	1	0.5	9	
15. Sediment on plants or debris	0	0.5	10	1.5	
16. Organic debris lines or piles	0	0.5	1	1.5	
17. Soil-based evidence of high water table?	- 1	= 0	Yes		
C. Biology (Subtotal =)			100		
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; OBI	= 1.5 Other = 0		
*perennial streams may also be identified using other meth	ods. See p. 35 of manual.			<u></u>	
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		PE-	5
Date: 1 - 0 5	Project/Site:	ule farm	Latitude:	
Evaluator: Perkinson/Axiom	County: M_{S}	he	Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	Park
A. Geomorphology (Subtotal = 25	Absent	Weak	Moderate	Strong
1ª Continuity of channel bed and bank	0 .	1	2	(3)
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
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	. 0	1	2)	3
Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	Q	3
8. Headcuts	0	39	2	3
9. Grade control	0	0.5	1	(3)
10. Natural valley	0	0.5	1	(3)
11. Second or greater order channel	No	o = 0	€es :	3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = <u>9</u>				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria		1	2	3
14. Leaf litter	1.5	1)	0.5	0
15. Sediment on plants or debris	0	0.5	7	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?		0 = 0	(Yes	
C. Biology (Subtotal = $l\mathcal{O}$)			(100	
18. Fibrous roots in streambed	3	2	1	(0)
19. Rooted upland plants in streambed	9	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	0	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	<u> </u>	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	Ø	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBL	'	
*perennial streams may also be identified using other methods.	See p. 35 of manua		1.0 01101	
Notes:				
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Sketch:				

PF-05 ds

Date: //-05	Project/Site: Tute farm County: Ashe		Latitude:	
Evaluator: Pekinson-Axion			Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) mittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = $\frac{1}{2}$)	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)
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	<u>③</u>
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	3	3
6. Depositional bars or benches	0	1	②	3
7. Recent alluvial deposits	0	1	27	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	<u> </u>
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0 Yes = 3		= 3	
a artificial ditches are not rated; see discussions in manual			. 1910-2	
B. Hydrology (Subtotal = $\frac{100}{100}$)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	0	2	3
14. Leaf litter	1.5	D	0.5	0
15. Sediment on plants or debris	0	0.5	0	1.5
16. Organic debris lines or piles	0	0.5	0	1.5
17. Soil-based evidence of high water table?	No	= 0	Yes = 3)	
C. Biology (Subtotal = 7,5)				
		2	1	0
18. Fibrous roots in streambed	3	<u></u>		
18. Fibrous roots in streambed 19. Rooted upland plants in streambed	3	2	1	0
Rooted upland plants in streambed Macrobenthos (note diversity and abundance)	0		1	0
19. Rooted upland plants in streambed	3	2		
Rooted upland plants in streambed Macrobenthos (note diversity and abundance) Aquatic Mollusks Fish	③ 0 0	2 1	2	3
Rooted upland plants in streambed Macrobenthos (note diversity and abundance) Aquatic Mollusks Fish Crayfish	③ 0 <u>0</u>	2 1 1 0.5 0.5	2 2	3
19. Rooted upland plants in streambed 20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks 22. Fish 23. Crayfish 24. Amphibians	③ 0 9 9 0	2 1 1 0.5	2 1	3 3 1.5
Rooted upland plants in streambed Macrobenthos (note diversity and abundance) Aquatic Mollusks Fish Crayfish	③ 0 Ø Ø	2 1 1 0.5 0.5	2 1 1 1 1	3 3 1.5 1.5

Sketch:

ate: / (S	Project/Site: Tu	Helum	Latitude:	
valuator: Reference Ayrom	County: A 50	*r >	Longitude:	
otal Points: tream is at least intermittent ≥ 19 or perennial if ≥ 30*		nation (circle one) mittent Perennial	Other e.g. Quad Name:	
Geomorphology (Subtotal = <u></u> <u><u></u><u><u></u> (, 5 <u></u>)</u></u>	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	(Z)	3
Sinuosity of channel along thalweg	0	0	2	3
In-channel structure: ex. riffle-pool, step-pool,	0	(1)	Ž	3
ripple-pool sequence				
Particle size of stream substrate	0	0	2	3
Active/relict floodplain	0	1	2	3
Depositional bars or benches	D	1	2	3
Recent alluvial deposits	0	1	2	3
Headcuts	0	<u> </u>	2	3
Grade control	0	0.5	1	1.5
0. Natural valley	0	0.5	1	13
1. Second or greater order channel	No	= 0)	Yes =	= 3
artificial ditches are not rated; see discussions in manual				
. Hydrology (Subtotal = 6 😽)		···		
2. Presence of Baseflow	0	1	2	<u>(3)</u>
3. Iron oxidizing bacteria	Ø	1	2	3
4. Leaf litter	1.5	1	0.5	(
5. Sediment on plants or debris	0	O.5)	1	1.5
6. Organic debris lines or piles	9	0.5	1	1.5
7. Soil-based evidence of high water table?	No	= 0	Yeš	3
Biology (Subtotal = <u>4</u>				
B. Fibrous roots in streambed	3 -	2		0
9. Rooted upland plants in streambed	3	2	0	0
D. Macrobenthos (note diversity and abundance)		1	2	3
1. Aquatic Mollusks	0	1	2	3
2. Fish	9)	0.5	1	1.5
3. Crayfish	0	0.5	1	1.5
4. Amphibians	0	0.5	<u> </u>	1.5
5. Algae	9 1	0.5	1	1.5
6. Wetland plants in streambed		FACW = 0.75; OBL	_ = 1.5 Other = 0	
perennial streams may also be, identified using other methods	s. See p. 35 of manual.			

	Project/Site: T	11+ C	Latitude:	
Evaluator: Pekinson Axion	County: // 5	40	Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) mittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 355	Absent	Weak	Moderate	Strong
1ª. Continuity of channel bed and bank	0	1	(2)	3
Sinuosity of channel along thalweg	0	. 10	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	Ĵ	2	3
Particle size of stream substrate	0	1	<u> </u>	3
5. Active/relict floodplain	0	1	2	3
Depositional bars or benches	0	1	<u> </u>	3
7. Recent alluvial deposits	0	1	2`	3
8. Headcuts	O	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	I)	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 = $\frac{\%}{}$)				
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	<u> </u>
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	0	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2)	3
21. Aquatic Mollusks	o)	1	2	3
22. Fish	ŷ l	0.5	1	1.5
23. Crayfish	O'	0.5	1	1.5
24. Amphibians	Ø	0.5	1	1.5
	9	0.5	1	1.5
25. Algae			- 4.5 045 0	
25. Algae 26. Wetland plants in streambed		FACW = 0.75; OBL	_= 1.5 Other = 0	
	s. See p. 35 of manual.		.=1.5 Other=0	
26. Wetland plants in streambed			_ = 1.5	L + 2 × 5"

NC DWQ Stream Identification Form Version 4.11 Date: Project/Site: Tu-Latitude: County: Evaluator: Longitude: **Total Points:** Stream Determination (circle one) Other Stream is at least intermittent **Ephemeral Intermittent Perennial** e.g. Quad Name: if ≥ 19 or perennial if ≥ 30* A. Geomorphology (Subtotal = Absent Weak Moderate Strong 1^{a.} Continuity of channel bed and bank (1) 0 2 3 2. Sinuosity of channel along thalweg 0 Ô 2 3 3. In-channel structure: ex. riffle-pool, step-pool, 0 1 (2) 3 ripple-pool sequence 4. Particle size of stream substrate 0 2 3 1 5. Active/relict floodplain 0 2 3 6. Depositional bars or benches 0 a 2 3 7. Recent alluvial deposits (1) 0 2 3 8. Headcuts 0 3 1 9. Grade control 0 0.5 1.5 10. Natural valley 0 0.5 1.5 11. Second or greater order channel No = 0Yes = 3artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 7.5 12. Presence of Baseflow 0 $\overline{(1)}$ 13. Iron oxidizing bacteria 0 3 14. Leaf litter 1.5 **/1**) 0.5 0 15. Sediment on plants or debris 0.5 0 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 = **②** 18. Fibrous roots in streambed 3 0 19. Rooted upland plants in streambed 3 (2) 0 1 20. Macrobenthos (note diversity and abundance) 0 1 3 21. Aquatic Mollusks 1 2 3 22. Fish 0 0.5 1 1.5 23. Crayfish 0.5 1 1.5 24. Amphibians O 0.5 1.5 25. Algae 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		PIJPO	
Date: 11-05-2013	Project/Site:	ute form	Latitude:	
Evaluator: Perkinson/Axion	Project/Site:	ihe	Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	,		Other e.g. Quad Name:	
A. Geomorphology (Subtotal =	Absout	Work	Madarata	C4
A. Geomorphology (Subtotal = $\frac{1}{0}$) 1 ^a Continuity of channel bed and bank	Absent	Weak	Moderate	Strong
	0	1 1	<u>2</u>	
Sinuosity of channel along thalweg In-channel structure: ex. riffle-pool, step-pool,		l l		3
ripple-pool sequence	0	1	②	3
Particle size of stream substrate	0	1	Ø	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	P
9. Grade control	0	0.5	1	Q 5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	M	0=0	Yes :	
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	o = 0	Yes	= 3
C. Biology (Subtotal = 6.5)			And Street Street	
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,	77	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	Ø	0.5	1	1.5
23. Crayfish	Ø	0.5	1	1.5
24. Amphibians	0,	O S	1	1.5
25. Algae	(ō/	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 manua	ıl.		
Notes:				
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Sketch:				

NC DWQ Stream Identification Form	Version 4.11	P.L- 4	9 dour	
Date: 11-05-2013 Evaluator: Pe-Kinson Axion	Project/Site:	ate for n	Latitude:	
Evaluator: Pe- Hipson Axion	County: A 5	he	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
Sinuosity of channel along thalweg	0	①	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3
ripple-pool sequence				
4. Particle size of stream substrate	0	①	2	3
5. Active/relict floodplain	<u> </u>	1	2	3
6. Depositional bars or benches		1	2	3
7. Recent alluvial deposits	0 0	① ①	2	3
Headcuts Grade control	0	0.5	(1)	3 1.5
10. Natural valley	0	0.5	<u> </u>	1.5
11. Second or greater order channel		0.5	Yes	
^a artificial ditches are not rated; see discussions in manual			163	_ 3
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	9	0.5	1	1.5
16. Organic debris lines or piles		0.5	1	1.5
17. Soil-based evidence of high water table?		o = 0	Yes	
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	(O)	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; OBI	_ = 1.5 Other = 0	
*perennial streams may also be identified using other methods	. See p. 35 of manua	<u>l </u>		
Notes: year (ut , premine whose				
				
Sketch:				
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NC DWQ Stream Identification Form Version 4.11				
Date: 11-5-2013	Project/Site:	ute form	Latitude:	
Date: 11-5-2013 Evaluator: Perkinson-Axion	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
Sinuosity of channel along thalweg	Ø	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	Ø		, "No., Maritime	
ripple-pool sequence		1	2	3
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	0	2	3
9. Grade control	0	© 3	1	1.5
10. Natural valley	0	0.5	1	13
11. Second or greater order channel	M	5 = 10	Yes	= 3
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	Ó	0.5	1	1.5
16. Organic debris lines or piles	7	0.5	1	1.5
17. Soil-based evidence of high water table?	No	o = 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	(O)	1	2	3
22. Fish	Ø	0.5	1	1.5
23. Crayfish	Q	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	6)	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 manua			
Notes:				
			7.0	
Sketch:				

NC DWQ Stream Identification Form	Version 4.11		PJoup		
Date: 11-5-2013	Project/Site:	ite fa-m	Latitude:		
Evaluator: Par V. Nyou / Axion	County: Ash	e	Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* J 4 15		nation (circle one) rmittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 10)	Absent	Weak	Moderate	Strong	
1 ^a Continuity of channel bed and bank	0	1	27	3	
Sinuosity of channel along thalweg	0	Ø.	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	O	2	3	
Particle size of stream substrate	0	1	②	3	
5. Active/relict floodplain		1	2	3	
6. Depositional bars or benches	(0)	1	2	3	
7. Recent alluvial deposits	(i)	1	2	3	
8. Headcuts	Ő	1	3	3	
9. Grade control	0	0.5	<u> </u>	1.5	
10. Natural valley	0	0.5	9	1.5	
11. Second or greater order channel	(No) - 0)	Yes =	= 3	
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	10	2	3	
14. Leaf litter	1.5	1	(0.6)	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 = 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	(d)	1	2	3	
22. Fish	Ø	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	0.3	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 manua	<u>l.</u>			
Notes:					
and the state of t					
Ckatab					
Sketch:					

NC DWQ Stream Identification Form	Version 4.11		100-60	4
Date: 11-5-2013	Project/Site:	ule	Latitude:	
Evaluator: Perhinger / Axion	County: Ashe Longitu			
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 3.5)	Absent	Weak	Moderate	Strong
1ª Continuity of channel bed and bank	0	1	<u>(3</u>	3
Sinuosity of channel along thalweg	0	Ò	2	3
3. In-channel structure: ex. riffle-pool, step-pool,				
ripple-pool sequence	0	1	3	3
Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	9	1	2	3
7. Recent alluvial deposits	0	I	2	3
8. Headcuts	0	1	(3)	3
9. Grade control	0	0.5	①	1.5
10. Natural valley	0	0.5	1	(3)
11. Second or greater order channel	(No	0 = 0)	Yes	= 3
^a artificial ditches are not rated; see discussions in manual	**************************************			
B. Hydrology (Subtotal =())	· · · · · · · · · · · · · · · · · · ·			
12. Presence of Baseflow	0	1	2, .	68
13. Iron oxidizing bacteria	0	0	2	3
14. Leaf litter	1.5	Ø	0.5	0
15. Sediment on plants or debris	0	₹0.5	Ō	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	
*perennial streams may also be identified using other methods	s. See p. 35 of manua	l		
Notes:				
Skatah				
Sketch:				
İ				

NC DWQ Stream Identification Form	Version 4.11		PK-1	5
Date: 11-05-2013		ule farm	Latitude:	
Evaluator: Perkinson/Axiom	County: A51	h-e	Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal = 1/2)	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	<i>②</i>	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	Ø	3
Particle size of stream substrate	0	\mathcal{O}	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	_11	2	(3)
9. Grade control	0		1	1.5
10. Natural valley	0		1	1.5
11. Second or greater order channel	Nr	σ=0)	Yes	= 3
^a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\underline{\mathcal{Y}}$)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	1	Ø. 5)	0
15. Sediment on plants or debris	0	0.5	0	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No	o = 0	Yes	3>
C. Biology (Subtotal =)			<u> </u>	
18. Fibrous roots in streambed	3,	<i>Q</i> *	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	0	2	3
21. Aquatic Mollusks	Ø	1	2	3
22. Fish	O _	0.5	1	1.5
23. Crayfish	Ø	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; OBI	L = 1.5 Other = 0)
*perennial streams may also be identified using other methods	. See p. 35 of manua	al.		
Notes:				
Sketch:				

NC DWQ Stream Identification Form Version 4.11 PK-15D5				
Date: 11-05	Project/Site:	ate farm	Latitude:	
Evaluator: Axion - Pa-Kinson	County: A	he	Longitude:	
Evaluator: $f(x) = P + K(x) = 0$ Total Points: Stream is at least intermittent if ≥ 19 or perennial if $\geq 30^*$		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	
)	Aband	NAT- OF	*41 - wa4 a	C4
A. Geomorphology (Subtotal =)	Absent Ø	Weak	Moderate 2	Strong
1 ^a Continuity of channel bed and bank	0	(1)	2	3
Sinuosity of channel along thalweg In-channel structure: ex. riffle-pool, step-pool,				3
ripple-pool sequence	🐠	1	2	3
Particle size of stream substrate	<i>(d)</i>	1	2	3
Active/relict floodplain		1	2	3
Depositional bars or benches	8	1	2	3
Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	1 0	(0.5)	1	1.5
10. Natural valley	0	(0.5)	1	1.5
		(0 € 0 (0 € 0	Yes	
Second or greater order channel artificial ditches are not rated; see discussions in manual		0=0	res	= 3
B. Hydrology (Subtotal = 8				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	<u> </u>	3
14. Leaf litter	1.5	1	0.5	<u>(a)</u>
15. Sediment on plants or debris	(g)	0.5	 1	1.5
16. Organic debris lines or piles	 8	0.5	1	1.5
17. Soil-based evidence of high water table?		0.5	Yes	
C. Biology (Subtotal = 3,5)				
18. Fibrous roots in streambed	3	2	P	0
19. Rooted upland plants in streambed	3	2	<u> </u>	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks		1	2	3
22. Fish	0	0.5	<u>2</u> 1	1.5
23. Cravfish	0	Q.5)	1	1.5
24. Amphibians	0	0.5	<u>·</u>	
25. Algae	0	0.5	<u> </u>	1.5
26. Wetland plants in streambed		FACW = 0.75; OBI		1.5
*perennial streams may also be identified using other methods.	Soo p. 35 of manus		1.5 Other - C	,
Notes: Stream brails had action	. See p. 35 of manua	al.		
Moles. Stream Braws 140 Cathery				
Sketch:				
Shoton.				

NC DWQ Stream Identification Form Version 4.11			12M-20	
Date: 11-07-2013	Project/Site:	Tule lum	Latitude:	
Date: 11-07-2013 Evaluator: Parkinson - Axion	County:	Ishe	Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if $\geq 30^*$		Stream Determination (circle one) Ephemeral Intermittent Perennial		
A. Geomorphology (Subtotal = 6	Absent	Weak	Moderate	Strong
1ª. Continuity of channel bed and bank	0	1	2	(3)
Sinuosity of channel along thalweg	0	1	<u>(2)</u>	3
3. In-channel structure: ex. riffle-pool, step-pool,				
ripple-pool sequence	0	1	2	(3)
Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	ପ	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	ণ	O	3
9. Grade control	0	0.5	1	(18)
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	o = 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	<u>(15)</u>
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	No.	o = 0	Yes	
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	35
21. Aquatic Mollusks	Ø	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	Ø	0.5	1	(1.5)
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBI	_ = 1.5 Other = 0)
*perennial streams may also be identified using other methods.	See p. 35 of manua	al.		
Notes: + Tout Garyman Jorg				
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Sketch:				

NC DWQ Stream Identification Form	Version 4.11	PW	start		
Date: 1 - 01 3	Project/Site:	ule fu-m	Latitude:		
Evaluator: Perkinson/ Axiom	4	40	Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 145)	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,	0	1	2	3	
ripple-pool sequence					
Particle size of stream substrate	0	Ø	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0	Ø.	2	3	
7. Recent alluvial deposits	0	0	2	3	
8. Headcuts	0	1	3	3	
9. Grade control	0	0.5	11	(1.9	
10. Natural valley	0	0.5	<u></u>	1.5	
11. Second or greater order channel	N	5=0	Yes:	= 3	
^a artificial ditches are not rated; see discussions in manual	_				
B. Hydrology (Subtotal =)	<u>, </u>				
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?		o = 0	(Yes:		
C. Biology (Subtotal = 4,5)					
18. Fibrous roots in streambed	3	2	Ø.	0	
19. Rooted upland plants in streambed	3	2	Ø?	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 manua	*****			
Notes:					
Sketch:				ı	
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NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWO Stream Identification Form Version 4.11 la-n Date: Project/Site: Latitude: County: Longitude: **Evaluator: Total Points:** Stream Determination (circle one) Other Stream is at least intermittent **Ephemeral Intermittent Perennial** e.g. Quad Name: if ≥ 19 or perennial if ≥ 30* A. Geomorphology (Subtotal = **Absent** Weak **Moderate** Strong 1^a Continuity of channel bed and bank 0 Ø 2. Sinuosity of channel along thalweg 0 1 3. In-channel structure: ex. riffle-pool, step-pool, (3) 0 1 2 ripple-pool sequence **②** 4. Particle size of stream substrate 0 1 3 (1)3 5. Active/relict floodplain 0 2 (1 0 2 3 6. Depositional bars or benches 0 2 3 7. Recent alluvial deposits (19) **②** 0 8. Headcuts 1 3 0 9. Grade control 0 0.5 1.5 0 0.5 (1.5) 10. Natural valley 1 11. Second or greater order channel No = 0Yes = 3 ^a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = (3) 12. Presence of Baseflow 1 32 2 13. Iron oxidizing bacteria 0 3 Ø 0.5 14. Leaf litter 1.5 0 \bigcirc 15. Sediment on plants or debris 0 1.5 0.5 16. Organic debris lines or piles 0 0.5 1.5 17. Soil-based evidence of high water table? No = 0Yes = 3 C. Biology (Subtotal = 18. Fibrous roots in streambed 3 0 3 0 19. Rooted upland plants in streambed 0 (2) 20. Macrobenthos (note diversity and abundance) 3 1 67 21. Aquatic Mollusks 1 2 3 6 22. Fish 0.5 1 1.5 23. Crayfish 0/ 0.5 1.5 1 24. Amphibians 0 0.5 1 1.5 0) 1.5 25. Algae 0.5 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				P-Low		
Date: 11-6-2013	Project/Site:	4 E Farm	Latitude:			
Evaluator: Por Kinson/ Axion	County:	she	Longitude:			
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:			
A. Geomorphology (Subtotal = 10.5)	Absent	Weak	Moderate	Strong		
1ª. Continuity of channel bed and bank	0	1	2	3)		
Sinuosity of channel along thalweg	0	A	2	3		
3. In-channel structure: ex. riffle-pool, step-pool,	-					
ripple-pool sequence	0	1		3		
4. Particle size of stream substrate	0	1	2	3		
5. Active/relict floodplain	(0)	1	2	3		
6. Depositional bars or benches	6	1	2	3		
7. Recent alluvial deposits	0	1	(2)	3		
8. Headcuts	0	1)	2	3		
9. Grade control	0	0.5	1	(1.3		
10. Natural valley	0	0.5	1	1.5		
11. Second or greater order channel	N	o = O)	Yes =	= 3		
artificial ditches are not rated; see discussions in manual						
B. Hydrology (Subtotal = <u>6,5</u>)						
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	(9)	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?		o = 0	Yes			
C. Biology (Subtotal =)	1			<u> </u>		
18. Fibrous roots in streambed	3	2	<u>(1)</u>	0		
19. Rooted upland plants in streambed	3	2	$\frac{\mathcal{V}}{1}$	0		
20. Macrobenthos (note diversity and abundance)		0	2	3		
21. Aquatic Mollusks	6	1	2	3		
22. Fish	700	0.5	1	1.5		
23. Crayfish		0.5	1	1.5		
24. Amphibians	Ö	0.5	1	1.5		
25. Algae	1 0	0.5	1	1.5		
26. Wetland plants in streambed	, , , , , , , , , , , , , , , , , , ,	FACW = 0.75; OBI	= 1.5 Other =\0			
*perennial streams may also be identified using other methods	See n. 35 of manua		1.5 Onle	<u> </u>		
Notes:	. occ p. oo oi mande		******			
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Sketch:						

NC DWQ Stream Identification Form	Version 4.11		PO-		
Date: 11-6-2013	Project/Site:	We farm	Latitude:		
Evaluator: Perkinson Ariom	County:	9/4 (Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal =	Absent	Weak	Moderate	Strong	
1ª Continuity of channel bed and bank	0	1	2	3	
2. Sinuosity of channel along thalweg	0	<u>(1)</u>	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	7	1	2	3	
Active/relict floodplain	+ 8 +	1	2	3	
Depositional bars or benches	1 0	1	2	(3)	
7. Recent alluvial deposits	0	à	2	3	
8. Headcuts	0	7	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		o = 0)	Yes =		
a artificial ditches are not rated; see discussions in manual					
B. Hydrology (Subtotal =)					
12. Presence of Baseflow	0	12	2	3	
13. Iron oxidizing bacteria	0	<u>(1)</u>	2	3	
14. Leaf litter	1.5	1	0.5	(<u>0</u>)	
15. Sediment on plants or debris	9	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?		o = 0	Yes =		
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	<u>(1)</u>	2	3	
21. Aquatic Mollusks	(Ô ₂	1	2	3	
22. Fish	,6	0.5	1	1.5	
23. Crayfish	Ø .	0.5	1	1.5	
24. Amphibians	Ó	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 manua	l	The same of		
Notes:					
Sketch:					

NC DWQ Stream Identification Form	Version 4.11		PP-T	96	
Date: [1-6-2013	Project/Site: Tu	le farm	Latitude:		
Evaluator: Por Kinson Axion	County:	; he	Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = 19	Absent	Weak	Moderate	Strong	
1 ^a Continuity of channel bed and bank	0	1	<u>. වූ</u> ව	3	
2. Sinuosity of channel along thalweg	0	1	②	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	1	2	(3)	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	.0	1	<u> </u>	3	
7. Recent alluvial deposits	0	1	ହ	3	
8. Headcuts	0	(1)	2	3	
9. Grade control	0	0.5	1	1.5	
10. Natural valley	0	0.5	<u>(1)</u>	1.5	
11. Second or greater order channel	No	0=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	(O)	0.5	1	1.5	
16. Organic debris lines or piles	0	0.5	<u>(1)</u>	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	Ø	1	2	3	
22. Fish	00	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	0	95	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OBI	_ = 1.5 Other = 0)	
*perennial streams may also be identified using other methods					
Notes: restand chammal gu	1 11.09	France (100	100%		
Sketch:					

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	nation (circle one)	Longitude: Other e.g. Quad Name:	
Stream Determin Ephemeral Inter	nation (circle one)		
Absent	Stream Determination (circle one) Ephemeral Intermittent Perennial		
	Weak	Moderate	Strong
0	1	2	3
0	1	Ō	3
0	(1)	2	3
0	1	(2)	3
0	1)	2	3
0	1	2	3
0	1	0	3
0	1	2	3
0	© 5	1	1.5
0	0.5	1	1.5
(No		Yes =	- 3
		,	
0	1	2	3
0	1	2	3
1.5	1	0.5	0
0	0.5	1	1.5
0	0.5	1	1.5
No	= 0	Yes =	= 3
~			
3	2	1	0
3	2	1	0
0	1	2	3
0	1	2	3
0	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
0	0.5	1	1.5
		_ = 1.5 Other = 0	
See p. 35 of manual			
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 1 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0	0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 0 1 2 0 0 1 2 0 0 5 1 0 0 0.5 1 0 0.5 1 0 0.5 1 No=0 Yes= 3 2 1 1 0 0 1 2 0 0 1 2 0 0 1 2 0 0 0.5 1 No=0 Yes=

NC DWQ Stream Identification Form	Version 4.11		Pago	officelood
Date: 11-23-2013	Project/Site:	ile form	Latitude:	,
Evaluator: Perinsa/Axian	County: Act	e	Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1ª Continuity of channel bed and bank	0	N	2	3
Sinuosity of channel along thalweg	10	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	4	2	3
ripple-pool sequence	U U	. 1	2	
Particle size of stream substrate	0	1	<u> </u>	3
5. Active/relict floodplain	0	1,	0	3
6. Depositional bars or benches	0	(I)	2	3
7. Recent alluvial deposits	0	1	<i>②</i>	3
8. Headcuts	Ø,	1	2	3
9. Grade control	6	0.5	1	1.5
10. Natural valley	0	0.5	0	1.5
11. Second or greater order channel	N	ō=)	Yes :	= 3
^a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = $\frac{\partial \cdot 5}{\partial \cdot 5}$)			·	
12. Presence of Baseflow	0	()	2	3
13. Iron oxidizing bacteria	70	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	0.5	7	1.5
16. Organic debris lines or piles	0	0.5	<u>(1)</u>	1.5
17. Soil-based evidence of high water table?	N	0=0	Yes:	= 3
C. Biology (Subtotal =)			- WASSEL ALE TO	
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(37)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	Ø	1	2	3
22. Fish	1 0	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0,5)	1	1.5
25. Algae	10	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 6	
*perennial streams may also be identified using other method:	s. See p. 35 of manua			
Notes:				
Notes.				4-12
Sketch:				

NC DWQ Stream Identification Form Version 4.11		PPO incolar		
Date: 11-23-2013	Project/Site: 7	ute-fu-m	Latitude:	
Evaluator: Perkinson/Axiom	County:	he	Longitude:	
Total Points: Stream is at least intermittent if \geq 19 or perennial if \geq 30*		nation (circle one) ermittent 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
Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	<u> </u>	1	2	3
ripple-pool sequence	0	· · · · · · · · · · · · · · · · · · ·		3
Particle size of stream substrate	0	<u>(1)</u>	2	3
5. Active/relict floodplain	0	<u>O</u>	2	3
Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	0	2	3
8. Headcuts	0	11	(2)	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5		1.5
11. Second or greater order channel	(No	o = 0	Yes	= 3
^a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 5.5)				
12. Presence of Baseflow	0	O	2	3
13. Iron oxidizing bacteria	6/	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?	N	o = 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)	Ø	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; OB	L = 1.5 Other() €)
*perennial streams may also be identified using other methods	. See p. 35 of manua	al.		
Notes: hesia @ hea/cui 10050 sque	1 10 1 - 45	12/ (4may 1 36)	ceins dy wil	land .
Sketch:				

Date: 11/5/13	Project/Site:	Tate	Latitude:		
Date: 11/5/13 Evaluator: Jernigen	County: Asi	· C	Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if $\geq 30^*$	Stream Determin	nation (circle one) mittent Perennial	Other JA - upstree.g. Quad Name:		
A. Geomorphology (Subtotal = 14.5)	Absent	Weak	Moderate	Strong	
1ª Continuity of channel bed and bank	0	1	2	(3)	
Sinuosity of channel along thalweg	0	<u>(1)</u>	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
Particle size of stream substrate	0	1	2	(3)	
5. Active/relict floodplain	0	1)	3	3	
6. Depositional bars or benches	0	1	(2)	3	
7. Recent alluvial deposits	0	1		3	
8. Headcuts	0	1	(2)	3	
9. Grade control	0	0.5	\mathcal{O}	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)		70			
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	Q	
20. Macrobenthos (note diversity and abundance)	0	1	2	(3)	
21. Aquatic Mollusks	(0)	1	2	3	
22. Fish		0.5	1	1.5	
23. Crayfish	7	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 metho	ds. See p. 35 of manual	<u> </u>			
Notes:					
		44 true			
Sketch:					

NC DWQ Stream Identification Form	n version 4.11				
Date: 11/5/15	Project/Site:	Tute	Latitude:	·	
Evaluator: Jerragan	County:	re	Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennia			
A. Geomorphology (Subtotal = 13,5)	Absent	Weak	Moderate	Strong	
	Absent 0	1)	2	3	
1ª. Continuity of channel bed and bank	0		2	3	
Sinuosity of channel along thalweg In-channel structure: ex. riffle-pool, step-pool,	. U				
ripple-pool sequence	0	. 1	<u></u>	3	
Particle size of stream substrate	0	1	. /2)	3	
5. Active/relict floodplain	0	1	(2)	3	
6. Depositional bars or benches	0	(9)	2	3	
7. Recent alluvial deposits	(0)	1	2	3	
8. Headcuts	6	(1)	2	3	
9. Grade control	0	0.5	×1)	1.5_	
10. Natural valley	0	0.5	4	(1.5)	
11. Second or greater order channel	No	0=0	Yes	= 3	
artificial ditches are not rated; see discussions in manual				•	
B. Hydrology (Subtotal = <u>9,5</u>)					
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	o = 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)		(1)	2	3	
21. Aquatic Mollusks		<u></u>	2	3	
22. Fish	(0.5	11	1.5	
23. Crayfish	Ø	0.5	1	1.5	
24. Amphibians	0	(0.5)	1	1.5	
25. Algae	0	0.5	11	(1.5)	
26. Wetland plants in streambed		FACW = 0.75; O	BL = 1.5 Other = 0))	

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

Sketch:

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

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	<i>(</i> 1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
Particle size of stream substrate	0	1	2)	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0		2	3
9. Grade control	0	(05)	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	N	o = 0	Yes	= 3
^a artificial ditches are not rated; see discussions in manual		and the same of th		
B. Hydrology (Subtotal = \mathcal{F})				T
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?	N	o = 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	11	0
20. Macrobenthos (note diversity and abundance)	9	1	(2)	3
21. Aquatic Mollusks	/0/	1	2	. , 3
22. Fish	9	0.5	1	1.5
23. Crayfish	(6)	0.5	1	1.5
24. Amphibians	O	0.5	11	(1.5)
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 0	0
*perennial streams may also be identified using other method	ds. See p. 35 of manua	al.		
Notes:				

Sketch:

Date: 11/5/13	Project/Site: Tai-c.		Latitude:	
Evaluator: Terriagor	County: Ask	^c	Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name: Upper TC	
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
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(a)	1	2	3
4. Particle size of stream substrate	0	1	②	3
5. Active/relict floodplain	. 0.	0	2	3
6. Depositional bars or benches	(D)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	(0)	0.5	11	1.5
10. Natural valley	0	0.5	0	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		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	<u> </u>	0.5	1	1.5
17. Soil-based evidence of high water table?	No	o = 0	Yes = (3)	
C. Biology (Subtotal = 6.5)				,
18. Fibrous roots in streambed	3	2	Ð	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	<u> </u>	2	3
21. Aquatic Mollusks	(3)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(a)	0.5	1	1.5
24. Amphibians	0	<u>(0.5)</u>	11	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OBI	L = 1.5 Other = (D)
*perennial streams may also be identified using other methods	. See p. 35 of manua	1.		
Notes:				4
Sketch:				

Date: /S/13	Project/Site: -	Tate	Latitude:	
Evaluator: Territor	County: As	he	Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		am Determination (circle one) Other e.g. Quad Name:		TD
A. Geomorphology (Subtotal = 9)	Absent	Weak	Moderate	Strong
1ª Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0 1	<u> </u>	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	<u> </u>	2	3
4. Particle size of stream substrate	0	1	3	3
5. Active/relict floodplain	Q	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	9	1	2	3
8. Headcuts	0	0	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				111111111111111111111111111111111111111
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
13. Nooted upland plants in streambed				
20. Macrobenthos (note diversity and abundance)	0	1)	2	3
20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks		1	2	3
20. Macrobenthos (note diversity and abundance)	0	1 0.5	2	
20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks 22. Fish 23. Crayfish		1 0.5 0.5	2	3
20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks 22. Fish 23. Crayfish 24. Amphibians	(0) (0) (0) 0	1 0.5 0.5 0.5	2	3 1.5 1.5
20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks 22. Fish 23. Crayfish 24. Amphibians 25. Algae	0	1 0.5 0.5 0.5 0.5	2 1 1 1 1	3 1.5
20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks 22. Fish 23. Crayfish 24. Amphibians 25. Algae 26. Wetland plants in streambed	0 0 0	1 0.5 0.5 0.5 0.5 0.5 FACW = 0.75; OBI	2 1 1 1 1	3 1.5 1.5
20. Macrobenthos (note diversity and abundance) 21. Aquatic Mollusks 22. Fish 23. Crayfish 24. Amphibians 25. Algae	0 0 0	1 0.5 0.5 0.5 0.5 0.5 FACW = 0.75; OBI	2 1 1 1 1	3 1.5 1.5

Project/Site:	ate	Latitude:	
		Longitude:	
Stream Determi	nation (circle one)	Other e.g. Quad Name:	JE
Absent	Weak	Moderate	Strong
	1	(2)	3
	21)		3
-			-
0		2	3
0	1	(2)	3
0_	1	2	3
(0)	1	2	3
76)	1,	2	3
0	(1)	2	3
0	(0.5)	11	1.5
0	0.5	(1)	1.5
/No	o = 0 /	Yes =	= 3
E AND LE WAR	CORE SECTION OF THE S		
0	1	2	(3)
0	1	(2)	3_
1.5	1	0.5	(0)
0	0.5	1	1.5
56/	0.5	1	1.5
No	o = 0	Yes =	= 3
		Mary and the second of the second	
(3)	2	1	0
73/	2	1.	0
0	1	(2)	3
(6)	1	2	3
	0.5	1	1.5
(6)	0.5	1	1.5
6	(0.5)	11	1.5
		(1)	1.5
0	0.5	\	
0	0.5 FACW = 0.75; OBI		
ds. See p. 35 of manua	FACW = 0.75; OBI		
	Stream Determine Ephemeral (interest Ephemeral	Stream Determination (circle one) Ephemeral (intermittent Perennial)	County: Ashe Longitude:

n Determin	1	Longitude: Other e.g. Quad Name: Moderate 2 2 2 2 2 2 2 2 1 Yes =	Strong 3 3 3 3 3 3 1.5 1.5
Determineral Internations of the control of the con	Weak 1 1 1 1 1 0.5 0.5 0.5	Moderate 2 2 2 2 2 2 2 2 1 1 Yes =	3 3 3 3 3 3 3 3 1.5
0 0 0 0 0 0 0 0 0 0	1 D 1 1 1 1 1 0.5 0.5 0.5	2 2 2 2 2 2 2 2 2 2 2 1 1	3 3 3 3 3 3 3 3 1.5
0 0 0 0 0 0 0 0 0 0	1 D 1 1 1 1 1 0.5 0.5 0.5	2 2 2 2 2 2 2 2 2 2 2 1 1	3 3 3 3 3 3 3 3 1.5
0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 2 2 2 1 1 Yes =	3 3 3 3 3 3 1.5
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 0.5 0.5 0.5	2 2 2 2 2 2 2 1 1 Yes =	3 3 3 3 3 3 1.5
0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 0.5 0.5	2 2 2 2 2 2 2 1 1 Yes =	3 3 3 3 1.5
0 0 0 0 0 0 0 No	1 1 0.5 0.5 = 0	2 2 2 2 2 1 1 Yes =	3 3 3 1.5
0 0 0 0 0 0 No:	1 1 0.5 0.5 = 0	2 2 2 2 2 1 1 Yes =	3 3 3 1.5
0 0 0 0 No:	1 1 0.5 0.5 = 0	2 2 ① 1 Yes =	3 3 1.5
0 0 0 No	1 0.5 0.5 = 0	2 1 1 Yes =	3 1.5 1.9
0 0 No:	0.5 0.5 = 0	1 Yes =	1.5
0 No:	0.5	1 Yes =	1.3
0 0	1	1 Yes =	
0 0	1		
0	. 1		
0	. 1		
0	. 1		
		2	3
	(1)	2	3
	1	(0.5)	0
0	0.5	1	1.5
0	(0.5)	1	1.5
No:		Yes =	
3	<u>(2)</u>	1	0
	2	1	0
0	1	(2)	3
0	1	2	3
0)	0.5	1	1.5
0	0.5	1	1.5
<u>(a)</u>		1	1.5
<u> </u>	0.5	1	1.5
- 1		_ = 1.5 Other ⇒ 0	
5 of manual.	,		
	3 3 0 0 0 0 0	No = 0 3	No = 0 Yes = 3 2 1 3 2 1 0 1 2 0 0 0 5 1 0 0 0 0 0 0 0 0 0 0 0 0

NC DWQ Stream Identification Form Version 4.11

Date: Project/Site: Tate Latitude:

Evaluator: Je (Nicya A)

County: As he Longitude:

Total Points:

Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*

Longitude:

Other e.g. Quad Name: Tup

į.				,
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	70)	1	2	3
2. Sinuosity of channel along thalweg	(6)	1	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence		1	. 2	3
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	~62	1	2	3
8. Headcuts	(6)	Jn	2	3
9. Grade control	8	OB	1	1.5
10. Natural valley	0 /	70.5	1	1.5
11. Second or greater order channel	/ N	0 = 0	Yes	= 3
^a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	$\left(\begin{array}{c}2\end{array}\right)$	3
13. Iron oxidizing bacteria	0	71)	2	3
14. Leaf litter	1.5		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?	N	0 = 0	√Yes	= 3
C. Biology (Subtotal = 7.25)			6	
18. Fibrous roots in streambed	3	2	71/	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
	· / /		1	1

C. Diology (Subtotal = 1,2)					
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	\sim		2	3	
22. Fish	700	0.5	1	1.5	
23. Crayfish	70)	0.5	1	1.5	
24. Amphibians	0	(0.5)	1	1.5	
25. Algae	0	0.5	$\overline{(1)}$	1.5	
26. Wetland plants in streambed		FACW = 0.75; 0	BL = 1.5 Other = 0		
*nerennial streams may also be identified using other metho	de Soon 35 of manus	a (

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

Notes:

Sketch:

Date: 11/5/13	Project/Site:	ate	Latitude:		
Evaluator: Jernigan	County: A	P/	Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		nation (circle one) rmittent Perennial	Other e.g. Quad Name:	56-0	
A. Geomorphology (Subtotal = 10)	Absent	osent Weak Moderat	Moderate Str	Strong	
1 ^{a.} Continuity of channel bed and bank	0_	1	(2)	. 3	
2. Sinuosity of channel along thalweg	(0)	1	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3	
Particle size of stream substrate	0	1	(2)	3	
5. Active/relict floodplain	0	1	(2)	3	
6. Depositional bars or benches	0	11	2	3	
7. Recent alluvial deposits	70	1	2	3	
B. 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=0	Yes =	3	
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	67	0.5	1	1.5	
17. Soil-based evidence of high water table?	No	0 = 0	Yes =	3 🕽	
C. Biology (Subtotal = 7.5)			San Contraction of the Contracti		
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	702	0.5	1	1.5	
23. Crayfish	(0)	0.5	1	1.5	
24. Amphibians	0	0.5	J-1-	1.5	
25. Algae	0	0.5	(1)	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	>	
*perennial streams may also be identified using other method	ods. See p. 35 of manua	I.	The same of the sa		
Notes:	***				
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Sketch:					
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Date: 11/4/1/3	Project/Site:	Toil	Latitude:		
Evaluator:	County:	re	Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determin	nation (circle one) rmittent Perennial	Other e.g. Quad Name	: J6 Dog	
A. Geomorphology (Subtotal = 55)	Absent	Weak	Moderate	Strong	
1 ^a Continuity of channel bed and bank	0	<u>(1)</u>	2	3	
2. Sinuosity of channel along thalweg	0	(1)	2	3	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(i)	1	2	3	
Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain		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	1.3	1.5	
11. Second or greater order channel	No	0 = 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	6	1	2	3	
14. Leaf litter	1.5	1	0.5	(0)	
15. Sediment on plants or debris	(a)	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 = 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	Q)	0.5	1	1.5	
24. Amphibians		0.5	1	1.5	
25. Algae	0	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other = 0	Ò	
*perennial streams may also be identified using other meth	ods. See p. 35 of manua	l.		, , , ,	
Notes:					
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NC DWQ Stream Identification Form Version 4.11 Date: Project/Site: Latitude: Tate County: Longitude: **Evaluator:**

Total Points: Stream Determination (circle one) Ephemeral Intermittent Perennial Other 开 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* e.g. Quad Name:

A. Geomorphology (Subtotal = 15)	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	_1_	2	(3)
Sinuosity of channel along thalweg	0	(1)	2	3
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
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			= 3
a artificial ditches are not rated; see discussions in manual	barren was sp	April Sept 1		
B. Hydrology (Subtotal = $\frac{4}{3}$)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	11	0.5	
15. Sediment on plants or debris		0.5	1	1.5
16. Organic debris lines or piles	76)	0.5	1	1.5
17. Soil-based evidence of high water table?	No	No = 0		= 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)	þ	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22 Fish	10	0.5	1	1.5

19. Rooted upland plants in streambed	(3)	2	1	0	
20. Macrobenthos (note diversity and abundance)	9	1	(2)	3	
21. Aquatic Mollusks	(10)	1	2	3	
22. Fish	(0)	0.5	1	1.5	
23. Crayfish	6	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; C	BL = 1.5 Other =	0	
*perennial streams may also be identified using other metho	ds. See p. 35 of manu	ıal.			

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11					
Date: 1-6-2013	Project/Site:	Tule	Latitude:		
Evaluator: Derwigus / A Kign	County:	sue	Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent Perennial			
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	Ø	2	3	
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3	
ripple-pool sequence					
4. Particle size of stream substrate	0	1	2	3	
5. Active/relict floodplain	0	1	2	3	
6. Depositional bars or benches	0		2	3	
7. Recent alluvial deposits	9	1	2	3	
8. Headcuts		1	2	3	
9. Grade control	0	0.5	1	1.8	
10. Natural valley	0	0.5	1	(1.5)	
11. Second or greater order channel artificial ditches are not rated; see discussions in manual	T /IAC	0 = 0	Yes	= 3	
·					
B. Hydrology (Subtotal = 5.5)	1 1			\sim	
12. Presence of Baseflow	0	1	2	3	
13. Iron oxidizing bacteria	0	P	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		1.5	
17. Soil-based evidence of high water table?	No	0=0	Yes	= 3	
C. Biology (Subtotal = 10ι)			.		
18. Fibrous roots in streambed	3	2	11	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 1	0.5	1	1.5	
26. Wetland plants in streambed	<u> </u>	FACW = 0.75; OBI	L = 1.5 Other = 0)	
*perennial streams may also be identified using other methods.	See p. 35 of manua	<u>ıl.</u>			
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Sketch:					

NC DWQ Stream Identification Form Version 4.11						
Date: 11-6-2013	Project/Site:	ul e	Latitude:	•		
Evaluator: Dervisa. Axion	County: / 4,	a E.	Longitude:			
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:			
A. Geomorphology (Subtotal = 19	Absent	Weak	Moderate	Strong		
1ª. Continuity of channel bed and bank	0	1	2	(3)		
Sinuosity of channel along thalweg	0	1	2	3		
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	(3)		
ripple-pool sequence				<u></u>		
Particle size of stream substrate	0	1	2	(3)		
5. Active/relict floodplain	0	1)	2	3		
6. Depositional bars or benches	0	1	0	3		
7. Recent alluvial deposits	0	1	2	3		
8. Headcuts	0	0	2	3		
9. Grade control	0	0.5	1	1.5		
10. Natural valley	0	0.5	1	1		
11. Second or greater order channel	Nø = 0 Yes = 3					
^a artificial ditches are not rated; see discussions in manual						
B. Hydrology (Subtotal = 4/5)	- 					
12. Presence of Baseflow	0	11	2	(3/		
13. Iron oxidizing bacteria	0	Ø	2	3		
14. Leaf litter	1.5	0	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.	o = 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; OB	L = 1.5 Other = 0)		
*perennial streams may also be identified using other methods.	See p. 35 of manua	ıl.				
Notes:	· · · · · · · · · · · · · · · · · · ·					
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NC DWQ Stream Identification Form Version 4.11					
Date: //-6-2013	Project/Site:		Latitude:		
Evaluator:) erwiso / Assom	County:		Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent 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	
Sinuosity of channel along thalweg	0	71)	2	3	
3. In-channel structure: ex. riffle-pool, step-pool,		N		2	
ripple-pool sequence	0		2	3	
Particle size of stream substrate	0	G)	2	3	
5. Active/relict floodplain	9	1	2	3	
6. Depositional bars or benches	0 1	(1)	2	3	
7. Recent alluvial deposits	Ō/	1	2	3	
8. Headcuts	0	1	2	3	
9. Grade control	0	0.5	T)	1.5	
10. Natural valley	0	0.5	Θ	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	3	3	
13. Iron oxidizing bacteria	0	0	2	3	
14. Leaf litter	1.5	1	0.5	©	
15. Sediment on plants or debris		0.5	1	1.5	
16. Organic debris lines or piles	(A)	0.5	1	1.5	
17. Soil-based evidence of high water table?		o = 0	Yes		
C. Biology (Subtotal =)	<u>'</u>				
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	ā	2	3	
21. Aquatic Mollusks	Ø	1	2	3	
22. Fish	7	0.5	1	1.5	
23. Crayfish	6	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 manua				
Notes: - upsi and in head on					
		<u> </u>			
Sketch:					

Date: 11-6-2013	Project/Site: \(\alpha \)	le	Latitude:		
Evaluator: Jernisa / Axiam		County: AShe			
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determin	nation (circle one) mittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = $\frac{1}{2}$, $\frac{1}{2}$)	Absent	Weak	Moderate	Strong	
1 ^a Continuity of channel bed and bank	0	1	(2)	3	
2. Sinuosity of channel along thalweg	0	0	2	3	
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	<u>(2)</u>	3	
ripple-pool sequence					
4. Particle size of stream substrate	0	1	<u>(2</u> /	3	
5. Active/relict floodplain	0	(1)	2	3	
6. Depositional bars or benches	<u> </u>	1	2	3	
7. Recent alluvial deposits	6	1	2	3	
8. Headcuts	0	1	3	3	
9. Grade control	0	0.5		1.5	
10. Natural valley	0	0.5	1	(1.5)	
11. Second or greater order channel	N6	=0)	Yes :	= 3	
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 =					
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	Q)	3	
21. Aquatic Mollusks	8	1	2	3	
22. Fish	0/	0.5	1	1.5	
23. Crayfish	0	0.5	1	1.5	
24. Amphibians	Q	0.5	1	1.5	
25. Algae	6	0.5	1	1.5	
26. Wetland plants in streambed		FACW = 0.75; OBI	_ = 1.5 Other = 0		
*perennial streams may also be identified using other meth	ods. See p. 35 of manual				
Notes:					
Sketch:					

NC DWQ Stream Identification Form Version 4.11					
Date: [1-16-2013	Project/Site:	Latitude:			
Evaluator: Jewison /A Ylom	County:		Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:		
A. Geomorphology (Subtotal = $(g_{\mathfrak{c}})$	Absent	Weak	Moderate	Strong	
1ª. Continuity of channel bed and bank	0	(1) (1)	2	3	
Sinuosity of channel along thalweg	0		2	3	
In-channel structure: ex. riffle-pool, step-pool,	1 0				
ripple-pool sequence	(0)	1	2	3	
Particle size of stream substrate	0	<u> </u>	2	3	
5. Active/relict floodplain	0	(y	2	3	
6. Depositional bars or benches	Q ,	1	2	3	
7. Recent alluvial deposits	0	1	2	3	
8. Headcuts	0	(2)	2	3	
9. Grade control	0 1	0.5	1	1.5	
10. Natural valley	0	0.5	_0	1.5	
11. Second or greater order channel	No	o = -0″	Yes	= 3	
artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal =)					
12. Presence of Baseflow	0	1	1	3	
13. Iron oxidizing bacteria	0	1	D)	3	
14. Leaf litter	1.5	1	0.5	a	
15. Sediment on plants or debris	10	0.5	1	1.5	
16. Organic debris lines or piles	1 %	0.5	1	1.5	
17. Soil-based evidence of high water table?	No.	o = 0	/res	= 3)	
C. Biology (Subtotal =)				1	
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, OBI	_ = 1.5 Other = 0)	
*perennial streams may also be identified using other methods	. See p. 35 of manua	il			
Notes:			· · · · · · · · · · · · · · · · · · ·		
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NC DWQ Stream Identification Form	Version 4.11		JN	/
Date: 11-6-2013	Project/Site:	ute fair	Latitude:	
Evaluator: Je-Wisgin / Axiom	County: $\int_{0}^{\infty} \int_{0}^{\infty}$	he	Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent 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
Sinuosity of channel along thalweg	0	1	(Z)	3
In-channel structure: ex. riffle-pool, step-pool,				
ripple-pool sequence	0	0	2	3
Particle size of stream substrate	0	(1)	2	3
Active/relict floodplain	0	1	2	3
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	7	1.5
10. Natural valley	0	0.5	Û	1.5
11. Second or greater order channel	N ₁	0 = 0	Yes :	= 3
artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = \bigcirc)			~	
12. Presence of Baseflow	0	1	②	3
13. Iron oxidizing bacteria	0	0	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?	N	o = 0	Yes?	9
C. Biology (Subtotal =				
18. Fibrous roots in streambed	(3)	2	11	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	11	1.5
26. Wetland plants in streambed		FACW = 0.75; OBI	_ = 1.5 Other = 0)
*perennial streams may also be identified using other methods.	See p. 35 of manua	al.		
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NC DWQ Stream Identification Form	Version 4.11			\mathcal{O}
Date: 11-0-2013	Project/Site:	rute	Latitude:	
Evaluator:) Privisa- /Axion	County:	ihe	Longitude:	
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name:	·
q		<u> </u>		· · · · · · · · · · · · · · · · · · ·
A. Geomorphology (Subtotal = 1	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,	0		2	3
ripple-pool sequence 4. Particle size of stream substrate	0	(17	2	3
Active/relict floodplain	T Ö	1	2	3
6. Depositional bars or benches	 	1	2	3
Recent alluvial deposits		1	2	3
8. Headcuts	0	(3)	2	3
9. Grade control	0	0.5	Ž	1.5
10. Natural valley	0	0.5	- G	1.5
11. Second or greater order channel		6=0	Yes	
^a artificial ditches are not rated; see discussions in manual			103	-
B. Hydrology (Subtotal =)				
12. Presence of Baseflow	0	1	(2)	3
		(D)		-
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5		0.5	0
15. Sediment on plants or debris	0	0.5 0.5	1	1.5
Organic debris lines or piles Soil-based evidence of high water table?	T T	0.5	Yes	
C. Biology (Subtotal =	1	0 - 0	163	- 3)
18. Fibrous roots in streambed	7 /3/	2	1	0
19. Rooted upland plants in streambed	+ (3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	<u>2</u>	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	1	FACW = 0.75; OBI	= 1.5 Other = 0	
*perennial streams may also be identified using other methods.	See p. 35 of manua		1.0 04101 0	
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Date: ([-()-]-() []	Project/Site:	u+e	Latitude:	
Evaluator: A KIOM () RIWIS a-	County: Agl	16	Longitude:	
Total Points:	Stream Determin	nation (circle one)	Other	70
Stream is at least intermittent f ≥ 19 or perennial if ≥ 30*		mittent Perennial	e.g. Quad Name:) 1
= 19 or perennan = 30			<u> </u>	
A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
a. Continuity of channel bed and bank	0	1	(3)	3
. Sinuosity of channel along thalweg	0	1)	2	3
. In-channel structure: ex. riffle-pool, step-pool,	9	1	2	3
ripple-pool sequence Particle size of stream substrate	0	(1)	2	3
Active/relict floodplain	o	<u> </u>	2	3
Depositional bars or benches	 8 	. 1	2	3
. Depositional bars of benches . Recent alluvial deposits		1	2	3
Headcuts		<u></u>	2	3
Grade control		0.5	1	<u>3</u> 1.5
Natural valley	0	0.5	1	1.5
Second or greater order channel		=)0	Yes :	
artificial ditches are not rated; see discussions in manual		J°	103	- 0
3. Hydrology (Subtotal = 3)				
2. Presence of Baseflow	0, 1	1	2	3
3. Iron oxidizing bacteria	0	1	2	3
4. Leaf litter	1.5	1	0.5	0
5. Sediment on plants or debris	0	0.5	1	1.5
6. Organic debris lines or piles	0	0.5	1	1.5
7. Soil-based evidence of high water table?	1 -	= 0	Yes?	
C. Biology (Subtotal = 7.5)	1			2
8. Fibrous roots in streambed	Q	2	1	0
9. Rooted upland plants in streambed	3	2	1	0
Macrobenthos (note diversity and abundance)	0	<u>(1)</u>	2	3
1. Aquatic Mollusks	Q	1	2	3
2. Fish		0.5	1	1.5
3. Crayfish	0	0.5	1	1.5
4. Amphibians	0	(0.5)	1	1.5
5. Algae	d	0.5	1	1.5
6. Wetland plants in streambed		FACW = 0.75; OBL	= 1.5 Other = 0	
perennial streams may also be identified using other method	ods. See p. 35 of manual.			
belefinial streams may also be identified daing other metric				
lotes: \(\lambda \text{Mon} \) \(\lambda \text{Comp} \) \(\text{Comp} \text{Comp} \) \(\text{Comp} \text{Comp} \)				

Date: 1-6-2013	Project/Site:	1te	Latitude:		
Evaluator: Jernique / Axiom	County:	Longitude:			
Fotal Points: Stream is at least intermittent f ≥ 19 or perennial if ≥ 30*		nation (circle one) mittent Perennial	Other e.g. Quad Name:		
2				-	
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 3. In-channel structure: ex. riffle-pool, step-pool,	0		2	3	
ripple-pool sequence	0 '	<i>\(\psi\)</i>	2	3	
Particle size of stream substrate	0	1	(2)	3	
5. Active/relict floodplain	<u> </u>	1	2	3	
Depositional bars or benches	 <u>Q</u>	1	2	3	
7. Recent alluvial deposits		1	2	3	
B. Headcuts	0	(1)	2	3	
9. Grade control	0	0.5	<u> </u>	1.5	
10. Natural valley	0	0.5	- 1)	1.5	
11. Second or greater order channel		= 0	Yes =		
artificial ditches are not rated; see discussions in manual	140	- 0	163-	- 3	
B. Hydrology (Subtotal =)					
3. Hydrology (odbloldi	0	4	6/ 1		
2. Presence of Baseflow	0	1	(2/	3	
3. Iron oxidizing bacteria	0	(1)	2	3	
4. Leaf litter	1.5	1	0.5	0	
5. Sediment on plants or debris	0	0.5	1	1.5	
6. Organic debris lines or piles	0	0.5	1	1.5	
7. Soil-based evidence of high water table?	No.	= 0	Yes =	3)	
C. Biology (Subtotal = $\frac{Q}{Q}$	<u> </u>				
8. Fibrous roots in streambed	(3)	2	1	0	
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	
	0	(0.5)	1	1.5	
25. Algae					
25. Algae 26. Wetland plants in streambed		FACW = 0.75; OBL	<u>. = 1.5 Other = 0</u>		
	s. See p. 35 of manual		_= 1.5 Other = 0		

NC DWQ Stream Identification Form	Version 4.11		JIC			
Date: 1-6-2013	Project/Site: Ta	de from	Latitude:			
Evaluator:) er Wisa / Axiom	County: 145	hc)	Longitude:			
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*		ination (circle one) ermittent Perennial	Other e.g. Quad Name	Other e.g. Quad Name:		
(5						
A. Geomorphology (Subtotal = (9.5)	Absent	Weak	Moderate //	Strong		
1 ^{a.} Continuity of channel bed and bank	0	1 D		3		
Sinuosity of channel along thalweg In-channel structure: ex. riffle-pool, step-pool,			2	3		
ripple-pool sequence	((i)	2	3		
Particle size of stream substrate	0	1	2	3		
5. Active/relict floodplain	0	1	2	3		
6. Depositional bars or benches	ð	1	2	3		
7. Recent alluvial deposits	6)	1.	2	3		
8. Headcuts	ő	<i>(1)</i>	2	3		
9. Grade control	0	(0.5)	1	1.5		
10. Natural valley	0	0.5	(V)	1.5		
11. Second or greater order channel	N ₁	o <i>€</i> Ø	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	Ø		
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?		o = 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	<i>Ø</i>	1	2	3		
22. Fish	Ø	0.5	1	1.5		
23. Crayfish	6	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; OBI	_ = 1.5 Other = 0)		
*perennial streams may also be identified using other methods.	. See p. 35 of manua	1.				
Notes: mapped has deposed epher	e-a /					
	· · · · · · · · · · · · · · · · · · ·					
Obstale						
Sketch:						

NC DWQ Stream Identification Form Version 4.11

| 11/6/13 | Project/Site:

County: Ls				
	ne	Longitude:		
Stream Determin Ephemeral Inter	nation (circle one) mittent Perennial	Other e.g. Quad Name: T5-07		
Absent	Weak	Moderate	Strong	
- 0	1	(2)	3	
0	1	2	3	
0	1	2	3	
0	1	(2)	3	
(0)	1	2	3	
0	(1)	2	3	
(0)	1	2	3	
0	1	(2)	3	
0	0.5	(1)	1.5	
0	0.5	1	1.5	
No	= 0	Yes =	= 3	
0	1	2	3	
1 0		2	3	
1.5	1		<u> </u>	
	0.5		1.5	
1 6			1,5	
<u></u>				
(3)	2	1	0	
		1	0	
		(2)	3	
			3	
			1.5	
			15	
The second secon			1.5	
		<u>.</u>	1.5	
		= 1.5 Other ± 0		
See p. 35 of manual		- 1.0 04.101	2	
p	·			
	Absent - 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Absent Weak 0	Absent Weak Moderate 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1	

Stream Determ	ination (circle one) ermittent Perennial Weak	Longitude: Other e.g. Quad Name: Moderate	JS (Lower)
Absent 0	Weak 1	Moderate	
0	1		Strong
0		2	,
	4		(3)
0	1	(2)	3
	1	②	3
0_	1	(2)	3
(0)	1	2	3
	1	2	3
(0)	1	2	3
0	1	2	(3)
0	0.5	(1)	1.5
0	0.5	(1)	1.5
N	0=0	Yes	= 3
0	1	2	3
0	(1)	2	3
1.5	1		(0)
(0)	0.5	1	1.5
0	0.5	1	1.5
N	o = 0	Yes:	
			
(3)	2	1	0
3	2	1	0
0	1	(2)	3
0	1	2	3
	0.5	1	1.5
	0.5	1	1.5
0	0.5	(1)	1.5
0	(0.5)	1 _	1.5
· · · · · · · · · · · · · · · · · · ·		= 1.5 Other = 0	
s. See p. 35 of manua			
	0 0 0 0 0 0 0 0 0 1.5 0 0 0 0 0 0	0 1 0 0 1 0 0 0.5	0 1 2 0 1 2 0 0 1 2 0 0 1 2 0 0 0.5 0 0 0.5 0 0 0.5 1

2 2 2 2 3 2 3 2 5 1 1	rong 3 3 3 3 3 3 1 5 1.5
e.g. Quad Name: Ak Moderate Str	rong 3 3 3 3 3 3 1 5 1.5
2 2 2 2 2 2 2 2 2 2 5 1 5 1	3) 3 3 3 3 3 3 3 1.5
2 2 2 2 2 2 2 2 2 2 5 (1) 1 5 1 (1)	3) 3 3 3 3 3 3 3 1.5
2 2 2 2 2 2 2 5 1 5 1	3 3 3 3 3 3 1.5
2 2 2 2 2 5 1 1 5 1 (1	3 3 3 3 3 1.5
2 2 2 2 5 (1) 1 5 1 (1	3 3 3 3 1.5
2 2 5 (1) 1 5 1 (1	3 3 3 1.5
2 5 (1) 1 5 1 (1	3 3 1.5
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	3 L5 1.5
5 (1) 1 5 1 (1	1.5
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1.5
Yes = 3	
2	3)
	3
0.5	0
5 1 1	1.5
	1.5
Yes = 3	
	0
	0
	3
(2)	3
	.5
	.5
	.5
	.5
= 0.75; OBL = 1.5 Other = 0	
	5 1 1 5 1 5 5 1 1

bsent 0 0 0 0 0 0 0 0 0 0 0 0 0	Weak 1 1 1	Longitude: Other e.g. Quad Name: Moderate 2 2 2 2 2 2	Strong 3 3 3 3
bsent 0 0 0 0 0 0 0 0 0 0 0 0 0	Weak (1) (1) (1)	Moderate 2 2 2 2	Strong 3 3 3
0 0 0 0 0 0 0	① ① ①	2 2 2 2	3 3 3
0 0 0 0 0 0	1)	2 2 2	3
0 0 0 0 0 0 0 0	1	2 2	3
0 0 0 0 0 0		2	
0 0 0 0	1 1		2
0 0	1 1	2	3
0 0	1 1		3
0	1	2	3
0	<i>\</i> 1	2	3
	1	2	3
	0.5	(1)	1.5
0	0.5	1	1.5 (1.5)
(No	0 = 0	Yes =	
0	1	2	(3)
0	<u>(1)</u>	2	3
1,5	7)	0.5	0
3	0.5	1	1.5
0)	0.5	1	1.5
No	= 0	Yes =	
······			
3	2	$\overline{(1)}$	0
3)	2	1	0
Q	$\overline{(1)}$	2	3
a	1		3
0)	0.5	1	1.5
0			1.5
0			1.5
0			1.5
35 of manual			
	0 1,5 0 0 0 No	0 1) 1,5 1 0 0,5 0 0.5 No = 0	0 1 2 1.5 1 0.5 0 0.5 1 0 0.5 1 No = 0 3 2 1 3 2 1 0 1 2 0 1 2 0 1 2 0 0 1 2 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 1 0 0.5 0 1 0 0.5 0 1 FACW = 0.75; OBL = 1.5 Other € 0

ivaluator: Jerniaun	County: Ash		T	
-4-1 19-1-4-	1 22mm. 142W	Longitude:		
tream is at least intermittent ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one)		Other e.g. Quad Name:	
a. Geomorphology (Subtotal = 7.5_)	Absent	Weak	Moderate	Strong
a Continuity of channel bed and bank	0 Absent	1	2	3
Sinuosity of channel along thalweg		- 6 +	2	3
. In-channel structure: ex. riffle-pool, step-pool,				
ripple-pool sequence	0	1	2	3
. Particle size of stream substrate	0	1	(2)	3
. Active/relict floodplain	Q	(1)	2	3
. Depositional bars or benches	(Q)	1	2	3
. Recent alluvial deposits		1	2	3
. Headcuts		1	2	3
. Grade control		0.5	1	1.5
0. Natural valley	Ó	(0.5)	1	1.5
Second or greater order channel	No	= 0	Yes =	= 3
artificial ditches are not rated; see discussions in manual	-			
3. Hydrology (Subtotal =)			_	
2. Presence of Baseflow	0	1	2	3
3. Iron oxidizing bacteria	(2)	1	2	3
4. Leaf litter	1,5	(1)	0.5	0
5. Sediment on plants or debris	(0)	0.5	1	1.5
6. Organic debris lines or piles	(D)	0.5	1	1.5
7. Soil-based evidence of high water table?	No	= 0	Yes =	• 3
C. Biology (Subtotal = <u>{</u>				
8. Fibrous roots in streambed	(3)	2	1	0
9. Rooted upland plants in streambed	3	2	1	0
Macrobenthos (note diversity and abundance)	0	1)	2	3
1. Aquatic Mollusks	Q	1	2	3
2. Fish		0.5	1	1.5
3. Crayfish		0.5	1	1.5
4. Amphibians	0	(0.5)	1	1.5
5. Algae	0	<u>05</u>	1	1.5
6. Wetland plants in streambed		FACW = 0.75; OBI	_ = 1.5 Other € 0)
perennial streams may also be identified using other method	ds. See p. 35 of manual.			
otes:				
ketch:				

Date: (1/7/13	Project/Site:				
Date: 11/7/13 Evaluator: Jernique	County:	she	Longitude:		
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determ Ephemeral Inte	ination (circle one) ermittent Perennial	Other e.g. Quad Name: Ju		
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	
In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	
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)	ム	2	3	
8. Headcuts	Ó	(J)	2	3	
9. Grade control	0	0.5	1)	1.5	
10. Natural valley	0	0.5	<u>(1)</u>	1.5	
11. Second or greater order channel	No.	0=0)	Yes	= 3	
a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal = 4.5)					
12. Presence of Baseflow	0	D	2	3	
13. Iron oxidizing bacteria	0	1		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.	o = 0	Yes		
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	(8)	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 manua	ıl.			
Notes:					
	See p. 35 of manua				