

**Caviness Farm Stream Restoration Site
Randolph County, North Carolina**

**Year 4 Monitoring Report
EEP Project No. 73**



Submitted to:

NCDENR EEP
1619 Mail Service Center
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**CAVINESS FARM STREAM RESTORATION
2007 MONITORING REPORT**

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I. EXECUTIVE SUMMARY/PROJECT ABSTRACT

The following report summarizes the monitoring activities that have occurred in 2007 at the Caviness Farm Mitigation Site. The site is located in Randolph County, North Carolina. The project includes Tibbs Run and a tributary referred to as West Branch. The project is on an active cattle farm and the stream and riparian buffer have been fenced to exclude livestock. The site was designed during July 2003 and constructed in January 2004 by the North Carolina Department of Transportation (NCDOT) to provide 3,250 linear feet of mitigation credit. Per the letter from the Ecosystem Enhancement Program (EEP) to NCDOT dated August 25, 2004, the EEP has accepted the transfer of all offsite mitigation projects, including Caviness Farm (EEP project number 73). The EEP is responsible for fulfilling the remaining monitoring requirements and future remediation for this project. This report provides the monitoring results for the fourth year of monitoring. The Caviness Farm Site will be monitored through the Year 2008 or until success criteria are met. No hydrologic monitoring or stream survey is required for this project; however, vegetation monitoring and an annual visual inspection of the channel for stability of structures are required for five years.

The 2007 vegetation monitoring estimated an average density of 680 trees per acre, which is above the 320 trees per acre minimum requirement. Vegetation across the site including planted stems and natural regeneration vegetation appears to be well established. Areas exhibiting vegetative problems were observed, including exotic invasive species, mowing of vegetation within the buffer area, and stability of livestock exclusion fencing. Three exotic and invasive species were observed within the mitigation area. These include Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*), and Nepalese browntop (*Microstegium vimineum*). Nearly all occurrences of privet were observed below the crossing on the Western Tributary and below the ford on the main channel.

Portions of the fence between the buffer and pasture were observed to be damaged and are likely due to flood damage. Fencing along portions of the pasture are in need of repair or replacement. Additional areas of fencing appear to be degraded and will likely need repair in the future. EEP is investigating fencing issues with the landowner on-site and the problem areas are being addressed at this time. These areas were deemed minor because of the repairs and pose no threat to vegetation success or project goals.

The stream channel was visually inspected biannually during the spring and fall of 2007. The channel appears to be stable with herbaceous and woody vegetation covering the stream banks throughout the project reach, although some minor problem areas were observed. There were ten instances of some bank instability, which have remained unchanged since first observed in 2006. These do not represent an issue or threat to project success and total no more than 2% of the total project bank footage. Eight structures were deemed to have some issue in table VII, with 7 of those associated with these same aforementioned bank erosion issues. In short, 7 of these structures exhibited a lesser level of bank protection than intended, but after these initial adjustments there is no indication these areas are worsening and appear to have arrested. While there are localized areas of poor ground cover, the vegetative cover is extensive on this site and includes mature trees in the riparian area where many of these issues were noted between stations 21+00 and 32+00. The 8th structure is exhibiting some piping, without any evident loss of bed elevation above the structure. Collectively the issues are minor and represent no threat to the project. A debris jam located just upstream from a culvert crossing may present some future problems and is recommended for removal. A crest gauge was installed on-site in the fall of 2007.

Overall, the Caviness Farm Stream Restoration Site remains stable. Only isolated problems were observed during the 2007 monitoring activities. Minor areas of bank erosion exist along both stream reaches but are no threat to the project success. No remedial action is recommended for these areas at this time.

II. PROJECT BACKGROUND

A. LOCATION AND SETTING

The Caviness Farm Stream Restoration Site provides 3,250 linear feet of mitigation that includes 2,255 linear feet of Tibbs Run and 810 linear feet of a tributary referred to as West Branch. The site is located between Asheboro and Coleridge near the intersection of Tommy Cox Road (SR 2655) and NC 42 in the southeastern portion of Randolph County, North Carolina (**Figure 1**). To access the site take US 64 west through Siler City. At Ramseur take NC 22 south to NC 42 in Coleridge. Turn west and follow NC 42 about 3 miles. The site is on the north side of NC 42 just east of Tommy Cox Road. These streams are tributaries to the Haw River (USGS 8-digit hydrologic unit 03030003).

B. PROJECT RESTORATION COMPONENTS

Tibbs Run and its tributary, West Branch, are on an active cattle farm. The stream segments and adjacent floodplains were subject to unrestricted grazing. The upper reach of Tibbs Run was only slightly incised and retained much of its natural meander pattern. A mature tree canopy is present over much of the reach. The lower reach of Tibbs Run was more deeply incised and exhibited excessive erosion. The stream was bounded by active pasturelands, and riparian vegetation consisted only of early successional herbaceous vegetation. The mitigation plan consists of a Priority 1 restoration of both Tibbs Run and West Branch, along with establishment of a 50-foot vegetated buffer with cattle exclusion fencing. The purpose of this report is to detail the vegetation monitoring and visual stream assessment in 2007 at the Caviness Farm Restoration Site. No hydrologic monitoring is required for this site. **Table I** describes the project restoration components.

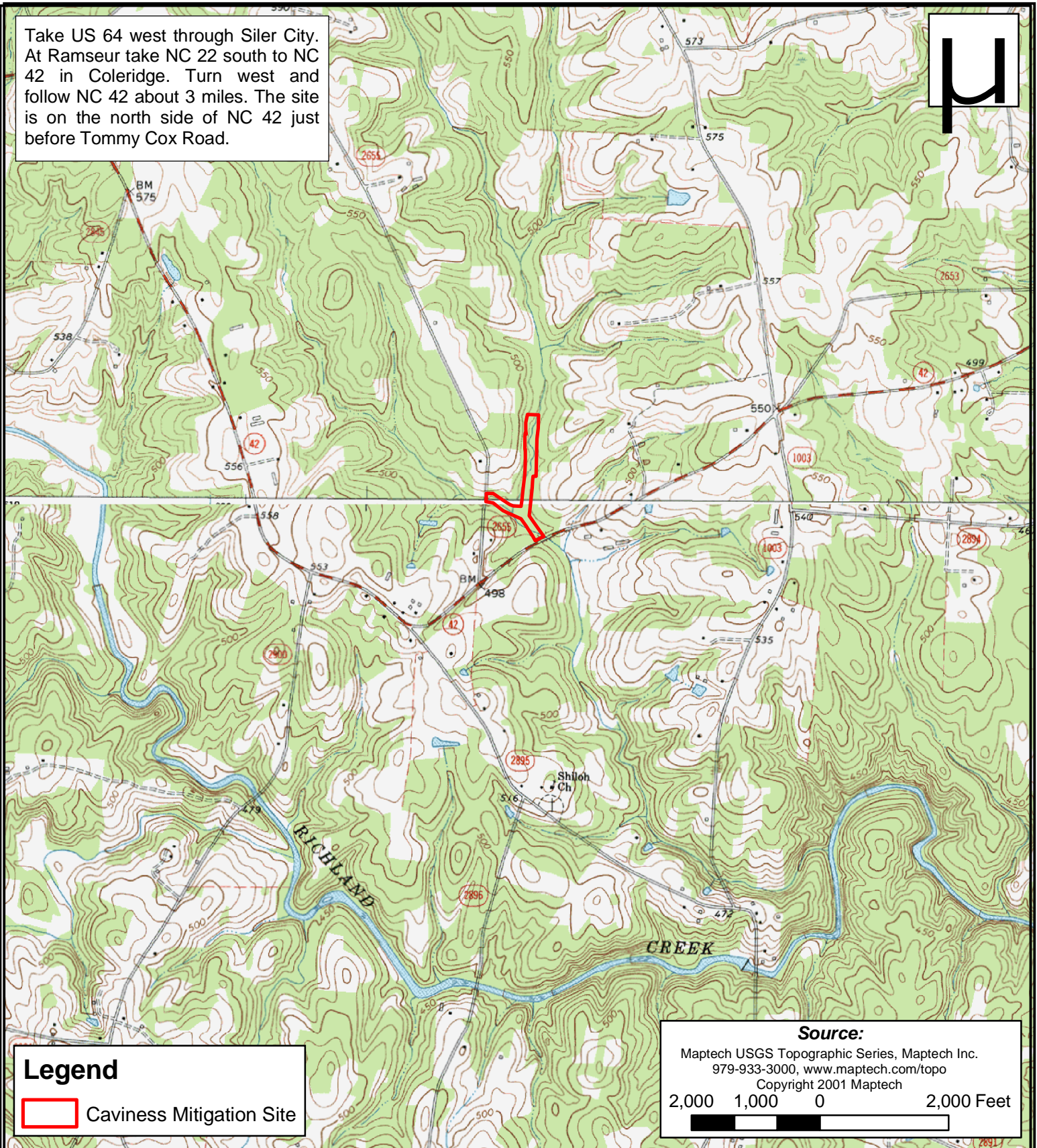
Table I. Project Restoration Components Caviness Farm (Tibbs Run) Stream Restoration/Project No. 73					
Project Segment	Mitigation Type	Approach	Linear Feet or Acres	Station	Comment
Tibbs Run	R	P1	2,255 ft	10+00 to 32+55	
West Branch	R	P1	810 ft	50+00 to 58+10	
Tibbs Run + West Branch Total buffer area			11 acres		

R=Restoration, P1=Priority 1


C. PROJECT HISTORY AND BACKGROUND

The Caviness Farm Site was constructed to provide 3,065 linear feet of mitigation credit for stream impacts associated with Transportation Improvement Program (TIP) number U-2524. Per the letter from the Ecosystem Enhancement Program (EEP) to NCDOT dated August 25, 2004,

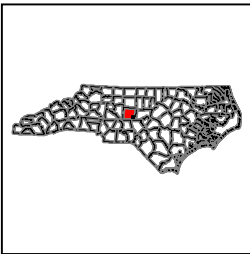
Take US 64 west through Siler City.
 At Ramseur take NC 22 south to NC
 42 in Coleridge. Turn west and
 follow NC 42 about 3 miles. The site
 is on the north side of NC 42 just
 before Tommy Cox Road.



Legend

 Caviness Mitigation Site

Source:
 Maptech USGS Topographic Series, Maptech Inc.
 979-933-3000, www.maptech.com/topo
 Copyright 2001 Maptech
 2,000 1,000 0 2,000 Feet



**FIGURE 01
 VICINITY MAP**
 Caviness Stream Mitigation Site
 Randolph County, North Carolina
 Map Produced: November 2007

the EEP has accepted the transfer of all offsite mitigation projects, including Caviness. The EEP project number for Caviness Farm is 73. EEP is responsible for fulfilling the remaining monitoring requirements and future remediation for this project. The construction of Caviness Farm was completed in early 2004. Year 1 monitoring took place in 2004. Additional details regarding the timeline of the project are provided in **Table II** below.

Table II. Project Activity and Reporting History Caviness Farm (Tibbs Run) Stream Restoration Site/Project No. 73		
Activity or Report	Data Collection Complete	Actual Completion or Delivery
Restoration Plan	NA*	May 2001
Final Design-90%	NA*	July 2003
Construction	NA*	January 2004
Mitigation Plan/As-built (Year 0 Monitoring-baseline) 2004		2004
Year 1 Monitoring 2004		2004
Year 2 Monitoring	November 2005	December 2005
Year 3 Monitoring Fall 2006	November 2006	December 2006
Year 4 Monitoring Fall 2007	October 2007	December 2007
Year 5 Monitoring Fall 2008		

*Historical project documents necessary to provide this data were not available at the time of this report submission

Table III. Project Contact Table Caviness Farm (Tibbs Run) Stream Restoration Site/Project No. 73	
Designer	HSMM 1305 Navaho Drive, Suite 303 Raleigh, NC 27609
Primary project design POC	Roy Currin (919) 878-5250
Construction Contractor	NCDOT
Monitoring Performers 2004	NCDOT
Monitoring Performers 2005	Earth Tech 701 Corporation Center Drive, Suite 475 Raleigh, NC 27607
Monitoring Performers 2006-2007	WK Dickson and Co., Inc. 3101 John Humphries Wynd Raleigh, NC 27612
Stream Monitoring POC	Mr. Daniel Ingram (919) 782-0495
Vegetation Monitoring POC	Mr. Daniel Ingram (919) 782-0495

D. MONITORING PLAN VIEW

Photographs were taken throughout the monitoring season to document the evolution of the restored stream channel. The locations of all photo points and vegetation plots are shown in **Appendix D** (Monitoring Plan View). There are 20 permanent photo points located at various points along the length of the channel. Three vegetation-monitoring plots, 50 feet by 50 feet in

size, were randomly located within the riparian buffer of the Caviness Farm Stream Restoration project.

III. PROJECT CONDITION AND MONITORING RESULTS

Monitoring results are discussed below. An initial visual survey was conducted in March 2007 with a more detailed monitoring survey (evaluation of vegetation plots) conducted in October 2007.

A. VEGETATION ASSESSMENT

Planted zones related to the stream restoration consist of the riparian buffer zone and the stream banks. The riparian buffer zone initiates at the top of the bank and continues out perpendicular to the immediate channel following the general pattern of the meandering channel. The planted stream bank initiates at the normal base flow elevation and extends to the top of bank or interface

Table IV. Project Background Table Caviness Farm (Tibbs Run) Stream Restoration Site/Project No. 73	
Project County	Randolph
Drainage Area	
Tibbs Run	3.3 sq. mi.
West Branch	1.13 sq mi
Drainage impervious cover estimate (%)	
Tibbs Run	<1%
West Branch	<1%
Stream order	
Tibbs Run	3rd order
West Branch	2nd order
Physiographic region	Piedmont
Ecoregion	Carolina Slate Belt (45c)
Rosgen classification of As-built	E5
Dominant soil types	Georgeville silt loam Cecil sandy clay loam Appling sandy loam Vance sandy loam
Reference site ID	North Branch of Deaton Tributary to Sandy Creek Tributary to Tibbs Run Mud Lick Creek
USGS HUC for Project and reference	3030003
NCDWQ sub-basin for project and reference	03-06-09
NCDWQ classification for project and reference	C (Tibbs Run) WS-III (Tributary to Sandy Creek)*
Any portion of project segment upstream of a 303d listed segment	No
Percent of project easement fenced	100%

with the floodplain. This site contains of approximately 11 acres of planted trees. Success Criteria states that there must be a minimum of 320 trees per acre living after three years and 260

trees per acre after five years. Appendix A contains a site map and 2007 vegetation plot photos. Vegetative success Criteria states that there must be a minimum of 320 trees per acre living after three years and 260 trees per acre after five years. The following species were planted:

<u>Scientific Name</u>	<u>Common Name</u>
<i>Fraxinus pennsylvanica</i>	Green Ash
<i>Platanus occidentalis</i>	Sycamore
<i>Quercus falcata</i>	Southern Red Oak
<i>Quercus alba</i>	White Oak
<i>Quercus phellos</i>	Willow Oak

1. Soil Data

Table V. Preliminary Soil Data					
Caviness Farm (Tibbs Run) Stream Restoration Site/Project No. 73					
Series	Max Depth (in.)	% Clay on Surface	K	T	OM %
Georgeville	63	5-27	0.43	4	0.5-2.0
Cecil	75	5-20	0.28	4	0.5-1.0
Appling	65	5-20	0.24	4	0.5-2.0
Vance	72	8-20	0.24	3	0.5-2.0

2. Vegetative Problem Areas

Areas exhibiting vegetative problems were observed, including exotic invasive species, mowing of vegetation within the buffer area, and stability of livestock exclusion fencing (**Appendix B**). Three exotic and invasive species were observed within the mitigation area. These include Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*), and Nepalese browntop (*Microstegium vimineum*). The Japanese honeysuckle and browntop are locally significant. Nearly all occurrences of the privet were observed below the crossing on the Western Tributary and below the ford on the main channel. This large privet previously identified in VP 2 is still present and producing fruits.

Within Plot 3 the area where previously observed mowing occurred within the easement appears to have mostly recovered. Fencing along the pasture in this area shows signs of repair and replacement. This is likely due to flood damage. Wrack lines were observed along the fence line upstream of this site. The fencing along the crossing ford below VP 3 is damaged or absent due to high flows and needs repair. Fencing in a number of areas needs repair and maintenance.

Portions of the fence between the buffer and pasture were observed to be damaged. Portions of the fence were observed to have been repaired. Additional areas of fencing appear to be degraded and will likely need repair in the future. These areas were deemed minor because of the repairs and pose no threat to vegetation success or project goals.

Because the vegetation is poorly established from Station 24+00 to the downstream end every structure over much of this length is failing to some extent. Specific areas of bare banks and failures are marked on the Current Conditions Plan View in **Appendix B**. All vegetative problem areas and the vegetative plan view are provided are described in **Appendix A**.

3. Stem Counts

Stem counts were conducted on October 31, 2007 applying the NCDOT Stem Counting Protocol and using Radford's *Manual of the Vascular Flora of the Carolinas* for taxonomic identification. The 2007 vegetation monitoring of the site shows a calculated average tree density of 680 trees per acre (**Table VI**). This is only slightly less than the previous monitoring year and the average is above the minimum success criteria of 320 trees per acre after year 3. No additional plantings are needed at this time.

The number of stems in Plots 1 and 3 increased slightly and stems in Plot 2 decreased. The change in Plot 1 (plus 1 stem) may be due to counting errors or a stem that was missed in the previous monitoring year. The change in Plot 3 (plus 4 stems) may be due to counting error or stems that were not tallied in Year 3. The species showing the largest change is white oak. The white oaks have been small in previous monitoring efforts and some stems were mowed during the summer of 2005. This plot is very dense with blackberry over portions that are beginning to thin. The tendency of oak to resprout and the dense blackberry are likely causes of this error.

Exhibit Table VI: Stem counts for each species arranged by plot. Caviness Farm (Tibbs Run) Stream Restoration Site/Project No. 73								
Species		Plots (50 t x50 ft)			Year 1 Totals (2004)	Year 2 Totals (2005)	Year 3 Totals (2006)	Year 4 Totals (2007)
Scientific Name	Common Name	VP1	VP2	VP3				
Shrubs								
No Shrubs were planted								
Trees								
<i>Fraxinus pennsylvanica</i>	Green ash	1	20	10	27	39	32	31
<i>Platanus occidentalis</i>	Sycamore	12	24	7	39	49	48	43
<i>Quercus alba</i>	White oak	12	7	10	31	35	24	29
<i>Quercus falcata</i>	Southern red oak	3	0	0	19	5	4	3
<i>Quercus phellos</i>	Willow oak	6	0	5	0	13	11	11
Planted Stem Survival Summary Data		Stems per Plot			Average # Stems			
Initial Stems Planted		41	55	55	50.3			
Year 1		38	52	45	45.0			
Year 2		35	65	40	46.7			
Year 3		33	58	28	39.7			
Year 4		34	51	32	39.0			
		Percent Survival			Average			
Year 1		93%	95%	82%	90%			
Year 2		85%	118%	73%	92%			
Year 3		80%	105%	51%	79%			
Year 4		83%	93%	58%	78%			
		Stems per Acre			Average			
Initial Planting Density		714	958	958	877			
Year 1		662	906	784	784			
Year 2		610	1133	697	813			
Year 3		575	1011	488	691			
Year 4		592	889	558	680			

Plot size is 2500 square feet (0.574 ac) *Survival based on initial planted stem count

4. Vegetation Plot Photos

Photos of the vegetation plots are located in **Section A-2 of Appendix A**.

5. General Site Vegetation Notes

Vegetation across the site including planted stems and natural regeneration vegetation appears to be well established. Natural regeneration of seedlings from mature trees along the project is present throughout the buffer area. Many seedlings found in the plots that are due to this natural recruitment include American sycamore, green ash, black willow (*Salix nigra*), box elder (*Acer negundo*), sweet gum (*Liquidambar styraciflua*), and tulip poplar (*Liriodendron tulipifera*). The western channel above the crossing has silky willow (*Salix sericea*) along the banks.

The herbaceous cover at the site is good where not affected by larger trees or dense seedlings. Herbaceous species observed include annual ragweed (*Ambrosia artemisiifolia*), beggar's tick (*Bidens* sp.), dog fennel (*Eupatorium capillifolium*), jewelweed (*Impatiens capensis*), tall pasture

fescue (*Lolium arundinaceum*), arrowleaf tearthumb (*Polygonum sagittatum*), and blackberry (*Rubus* sp.). The fescue is only significant along the fence line.

B. STREAM ASSESSMENT

1. Success Criteria

Success Criteria

Per the draft planning document dated September 2001, photographs taken throughout the monitoring period will be used to subjectively evaluate channel aggradation or degradation, bank erosion, growth of riparian vegetation and the effectiveness of erosion control measures. Longitudinal photos taken will indicate the absences of developing bars within the channel or an excessive increase in channel depth. As a Priority 1 project this stream should provide long-term stability to the channel and result in regular bankfull discharge in within the project. No documentation of cross-sections or profiles is required and none have been performed for this annual monitoring report or for the 2005 and 2006 annual monitoring reports.

2. Stream Description

Tibbs Run and its tributary, West Branch, are on an active cattle farm. The stream and riparian buffer have been fenced to exclude livestock. The stream was bounded by active pasturelands, and riparian vegetation consisted only of early successional herbaceous vegetation. The project consists of a Priority 1 restoration on both Tibbs Run and West Branch, along with establishment of a 50-foot vegetated buffer with cattle exclusion fencing. The proposed design for these channels was an E5 stream type. Only photographic documentation and subjective evaluation of channel aggradation or degradation, bank erosion is required.

3. Stream Problem Areas

In the course of 2007 monitoring activities 14 problem areas were identified. These areas are discussed below in **Table VII** and can be located on the Caviness Farm Current Conditions Plan View figures in **Appendix B** along with photos of each problem.

Table VII. Integrated Project Problem Areas Caviness Farm (EEP Project No. 73) October 2007			
Feature Issue	Station Numbers	Suspected Cause	Problem Area
Damaged Fence	13+00	Improper fence installation	PA #1
Damaged Fence	18+75	Improper fence installation across stream at crossing and high flow event	PA #2
R Bank Erosion	18+90	Upstream from cross vane	PA #3
Erosion at Cross Vane	50+50	Incorrect installation, erosion behind arm of cross vane	PA #4
L Bank Erosion Behind Log Vane	20+50	Lack of bank stabilization, incorrect structure installation	PA #5
Bank Erosion Behind Rock Vane	21+50	Incorrect installation, lack of bank stabilization	PA #6
Bank Erosion Behind Log Vane	22+50	Incorrect installation, lack of bank stabilization	PA #7
L Bank Erosion at Cross Vane	25+60	Incorrect installation, lack of bank stabilization	PA #8
Bank Erosion/ Undercut Bank	27+00	Undercut bank	PA #9
L Bank Erosion at Cross Vane	27+80	Incorrect installation, lack of bank stabilization	PA #10
Bank Erosion	30+90	Lack of bank stabilization, high flow events	PA #11
Bank Erosion at Cross Vane	32+00	Incorrect installation, lack of bank stabilization	PA #12
Cross Vane Failure	51+25	Improper installation, header rock set at too high of an elevation, water flowing underneath header rock	PA #13
Debris Jam	54+00	High flow event	PA #14

The current problem areas for the year 2007 are considered to be no threat to the success of this project however, the displaced boulders from the rock cross vanes could create debris jams or other forms of bed erosion such as scouring and head cuts. Other minor areas of erosion and aggradation were noted during field investigations. These areas were deemed minor and no threat to channel stability or project goals.

4. Stream Conclusions

Overall, the Caviness Farm Stream Restoration Site remains stable. There were ten instances of some bank instability, which have remained unchanged since first observed in 2006. These do not represent an issue or threat to project success and total no more than 2% of the total project bank footage. Eight structures were deemed to have some issue in table VII, with 7 of those associated with these same aforementioned bank erosion issues. In short, 7 of these structures exhibited a lesser level of bank protection than intended, but after these initial adjustments there is no indication these areas are worsening and appear to have arrested. While there are localized areas of poor ground cover, the vegetative cover is extensive on this site and includes mature trees in the riparian area where many of these issues were noted between stations 21+00 and 32+00. The 8th structure is exhibiting some piping, without any evident loss of bed elevation above the structure. Collectively the issues are minor and represent no threat to the project. The

debris jam located just upstream from a culvert crossing may present some future problems and is recommended for removal. Some of the areas having damaged fences appear to have been repaired by the landowner. No corrective actions are recommended to fix these structures because it is no threat to project success.

6. Fixed Photo Station Photos

Photos from established photo points were collected on October 17, 2007 during the stream monitoring activities. These photos are included in Appendix B.

7. Stream Problem Area Photos

Representative photos of each category of stream problem area were taken and are shown in Appendix B.

IV. RECOMMENDATIONS

There are no recommendations for the Caviness Farm Stream Restoration Site.

V. REFERENCES

References:

USACOE (2003) *Stream Mitigation Guidelines*. USACOE, USEPA, NCWRC, NCDENR-DWQ
USACOE (1987) *Corps of Engineers Wetlands Delineation Manual*. Tech report Y-87-1.

AD/A176.

Rosgen, D.L. (1996) *Applied River Morphology*. Wildland Hydrology Books, Pagosa Springs, Co.

Radford, A.E., H.E. Ahles and F.R. Bell. 1968. *Manual of the Vascular Flora of the Carolinas*. The University of North Carolina Press, Chapel Hill, North Carolina.

APPENDIX A

Vegetation Raw Data

Vegetation Monitoring Plot Photos

Appendix A. Vegetation Monitoring Plot Photos



Photo 1. Vegetation plot 1. Taken from NE corner, looking SW into plot.



Photo 2. Vegetation plot 1. Taken from NW corner, looking SE into plot.

Appendix A. Vegetation Monitoring Plot Photos



Photo 3. Vegetation plot 2. Taken from SE corner, looking NW into plot.



Photo 4. Vegetation plot 2. Taken from NW corner, looking SE into plot.

Appendix A. Vegetation Monitoring Plot Photos



Photo 5. Vegetation plot 3. Taken from SW corner, looking NE into plot.



Photo 6. Vegetation plot 3. Taken from NW corner, looking SE into plot.

APPENDIX B

Geomorphologic Raw Data

- B-1 Integrated Project Problem Areas Table
- B-2 Stream Photo-Station Photos
- B-3 Representative Stream Problem Area Photos
- B-4 Current Conditions Plan View

Table B.1. Integrated Project Problem Areas Caviness (EEP Project No. 73) October 2007			
Feature Issue	Station Numbers	Suspected Cause	SPA in Figure
Damaged Fence	13+00	Improper fence installation	PA #1
Damaged Fence	18+75	Improper fence installation	PA #2
R Bank Erosion	18+90	Upstream from cross vane	PA #3
Erosion at Cross Vane	50+50	Incorrect installation, erosion behind arm of cross vane	PA #4
L Bank Failure Behind Log Vane	20+50	Lack of bank stabilization, incorrect structure installation	PA #5
Bank Failure Behind Rock Vane	21+50	Incorrect installation, lack of bank stabilization	PA #6
Bank Failure Behind Log Vane	22+50	Incorrect installation, lack of bank stabilization	PA #7
L Bank Erosion at Cross Vane	25+60	Incorrect installation, lack of bank stabilization	PA #8
Bank Erosion/ Undercut Bank	27+00	Undercut bank	PA #9
L Bank Erosion at Cross Vane	27+80	Incorrect installation, lack of bank stabilization	PA #10
Bank Failure	30+90	Lack of bank stabilization, high flow events	PA #11
Bank Failure at Cross Vane	32+00	Incorrect installation, lack of bank stabilization	PA #12
Cross Vane Failure	51+25	Improper installation, header rock set at too high of an elevation, water flowing underneath header rock	PA #13
Debris Jam	54+00	High flow event	PA #14

Continued monitoring of these problem areas is recommended.

It is recommended that PA #14 be investigated for effect on stream stability and possible removal.

No Remedial actions are recommended at this time.

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 1 – facing upstream. 11+10



Photo Point 1 – facing downstream. 11+10

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 2 – facing upstream. 12+50



Photo Point 2 – facing downstream. 12+50

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 3 – facing upstream. 14+34



Photo Point 3 – facing downstream. 14+34

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 4 – facing upstream. 17+10



Photo Point 4 – facing downstream. 17+10

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 5 – facing upstream. 19+25



Photo Point 5 – facing downstream. 19+25

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 6 – facing upstream. 20+80



Photo Point 6 – facing downstream. 20+80

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 7 – facing upstream. 22+70



Photo Point 7 – facing downstream. 22+70

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 8 – facing upstream. 24+15



Photo Point 8 – facing downstream. 24+15

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 9 – facing upstream. 25+60



Photo Point 9 – facing downstream. 25+60

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 10 – facing upstream. 27+00



Photo Point 10 – facing downstream. 27+00

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 11 – facing upstream. 27+80



Photo Point 11 – facing downstream. 27+80

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 12 – facing upstream. 29+40



Photo Point 12 – facing downstream. 29+40

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 13 – facing upstream. 29+90



Photo Point 13 – facing downstream. 29+90

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 14 – facing upstream. 32+00



Photo Point 14 – facing downstream. 32+00

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 15 – facing upstream. 50+80



Photo Point 15 – facing downstream. 50+80

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 16 – facing upstream. 51+00



Photo Point 16 – facing downstream. 51+00

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 17 – facing upstream. 53+00



Photo Point 17 – facing downstream. 53+00

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 18 – facing upstream. 55+40



Photo Point 18 – facing downstream. 55+40

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 19 – facing upstream. 56+30



Photo Point 19 – facing downstream. 56+30

Appendix B, Section B-2. Stream Photo-station Photos



Photo Point 20 – facing upstream. 57+50



Photo Point 20 – facing downstream. 57+50

Appendix B, Section B-3. Representative Stream Problem Area Photos



SPA 1. Damaged fence.

Appendix B, Section B-3. Representative Stream Problem Area Photos



SPA 2. Damaged fence.



SPA 3. Right bank erosion.

Appendix B, Section B-3. Representative Stream Problem Area Photos



SPA 4. Erosion at cross vane.



SPA 5. Left bank failure behind rock vane.

Appendix B, Section B-3. Representative Stream Problem Area Photos



SPA 6. Bank failure behind rock vane.



SPA 7. Bank failure behind log vane.

Appendix B, Section B-3. Representative Stream Problem Area Photos



SPA 8. Left bank erosion at cross vane.



SPA 9. Bank erosion/Undercut bank.

Appendix B, Section B-3. Representative Stream Problem Area Photos



SPA 10. Left bank erosion at cross vane.



SPA 11. Bank failure.

Appendix B, Section B-3. Representative Stream Problem Area Photos



SPA 12. Bank failure at cross vane.



SPA 13. Cross vane failure.

Appendix B, Section B-3. Representative Stream Problem Area Photos



SPA 14. Debris jam.



Legend

- Caviness Easement
- Restored Stream
- Stream Photo Points
- Vegetation Plots
- Stream Crossings

Structure Types

- J J-Hook
- : Log Vane
- ü Rip Rap
- , Rock Cross Vane
-] Rootwad

Structure Conditions

- Stable and Functional
- Stable and Not Functional
- Unstable and Functional
- Unstable and Not Functional

Riparian Buffer Conditions

		Target Community		
		Present	Marginal	Absent
Invasive Species	Absent	No Fill		
	Present			
	Common			

**Caviness Current Conditions Plan View
Year 4 Monitoring
November 2007**

