# FINAL
# ANNUAL MONITORING REPORT
## UT TO HAW BECKOM RESTORTION SITE
## ALAMANCE COUNTY, NORTH CAROLINA
**(EEP Project No. 92694, Contract No. 004545)**

Monitoring Year 2 of 5 (2012)

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

August 2012

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Prepared by:
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Axiom Environmental, Inc.

Ecosystem Enhancement PROGRAM

August 2012

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## 1.0 EXECUTIVE SUMMARY

The North Carolina Ecosystem Enhancement Program (NCEEP) has completed stream and wetland enhancement and preservation at the UT to Haw Beckom Restoration Site (hereafter referred to as the "Site") to assist in fulfilling stream and wetland mitigation goals in the area. The Site is located approximately 4 miles north of Burlington, in Alamance County, North Carolina. This portion of Alamance County is located within Cape Fear River Basin Hydrologic Unit and Targeted Local Watershed 03030002030010. This report (compiled based on EEP's *Procedural Guidance and Content Requirements for EEP Monitoring Reports* Version 1.3 dated 1/15/10) summarizes data for year 2 (2012) monitoring.

Site drainage features provide water quality function to an approximately 385-acre (0.6-square mile) watershed. The Site is located within a NCEEP Targeted Local Watershed; in addition, this Site was identified for preservation as part of Site 15 (Travis & Tickle 15.2) in the 2008 NCEEP *Little Alamance and Travis and Tickle Creek Local Watershed Plan* (pages 72-73). Site streams drain to a section of the Haw River, which is currently on North Carolina's 2010 final 303(d) list for impaired ecological/biological integrity of benthic communities.

Prior to construction, Site land use consisted of cleared pasture for livestock grazing and disturbed forest. Site streams were characterized by eroding stream banks and a riparian buffer dominated by active livestock pasture and disturbed forest.

The primary goals of this mitigation project were obtained through removal of livestock from streams, buffers, and wetlands; reforestation of pasture land with native species; and installation of forded crossings to safely move animals and equipment across the Site. The goals of this project focused on improving water quality, enhancing flood attenuation, and restoring aquatic and riparian habitat and include the following.

- Reducing nonpoint sources of pollution by 1) fencing livestock from stream channels, buffers, and wetlands; 2) ceasing the application of agricultural herbicides, pesticides, and fertilizers; and 3) providing a vegetative buffer adjacent to streams and wetlands to treat surface runoff prior to entering Site streams and ultimately the Haw River.
- Reducing sedimentation/siltation within onsite and downstream receiving waters by a) reducing bank erosion associated with livestock hoof shear on Site streams, b) filtering surface runoff and reducing particulate matter deposition into tributaries, and c) providing a forested vegetative buffer adjacent to Site streams and wetlands.
- Promoting floodwater attenuation and improving stream stability by revegetating Site floodplains to reduce floodwater velocities through increased frictional resistance on floodwaters crossing Site floodplains.
- Providing increased habitat for aquatic wildlife by 1) increasing organic matter, carbon export, and woody debris in the stream corridor and 2) restoring shade to Site open waters.
- Providing wildlife habitat including a minimum of a 50-foot forested riparian corridor from the top of each stream bank within a region of the state increasingly dissected by residential/agricultural land use.
- Protecting a Site identified in the 2008 Piedmont Triad Council of Government *Little Alamance, Travis, and Tickle Creek Watersheds Restoration Plan* (PTCG 2008) for preservation due to its location within a remote, rural area with increasing development pressure and appeal to developers.

This project was constructed between December 23, 2010 and January 6, 2011. All stream channels have a minimum of a 50-foot wide riparian buffer from the top of each stream bank, which was verified in the field on January 22, 2011. The project consisted of enhancement (level II) of 2200 linear feet of stream and enhancement of 1.75 acres of riparian wetlands by removing livestock and reforesting with native species. The project includes preservation of 1465 linear feet of perennial stream and 0.05 acre of riparian wetlands. Site activities provide 1173 Stream Mitigation Units and 0.89 riparian riverine Wetland Mitigation Units. The Site will be protected by a permanent conservation easement held by the State of North Carolina.

Success criteria for stream enhancement will include 1) success of riparian vegetation, 2) bank stability, and 3) documentation of two bankfull channel events. One bankfull event was documented to date during year 3 monitoring (2012) for a total of three documented bankfull events with at least one event documented to occur in each monitoring year.

Vegetation success criteria dictate that an average density of 320 stems per acre must be surviving in the first three monitoring years. Subsequently, 290 stems per acre must be surviving in year 4 and 260 stems per acre in year 5. Stem counts will be based on an average of the evaluated vegetation plots. Based on the number of stems counted, average densities were measured at 737 stems per acre surviving in year 2 (2012). The dominant species identified at the Site were planted stems of cherrybark oak (*Quercus pagoda*), swamp chestnut oak (*Quercus michauxii*), and American elm (*Ulmus americana*). In addition, each individual vegetation plot met success criteria when counting planted stems alone.

In general herbaceous grasses within the Site, primarily tearthumb (Polygonum sagittatum) in wetter areas and fescue (*Festuca* sp.) in drier areas, is vigorous and overtopping many of the smaller planted trees. As a result some of the smaller trees died due to grasses and some of the larger trees died over the summer of 2011 from dry, hot conditions. Despite these conditions, the majority of living planted trees are doing well. These issues should continue to be monitored closely in subsequent monitoring years. The Site was replanted as part of planting warranty on November 1, 2011 including 369 bare root seedlings were planted in Swamp Forest areas and 28 bare root seedlings were planted in floodplain areas of the Site. Planted species and number of stems of each are as follows.

**Swamp Forest (bare root trees)**
45 swamp chestnut oak (*Quercus michauxii)*
135 sycamore (*Platanus occidentalis*)
99 American elm (*Ulmus americana*)
90 willow oak (*Quercus phellos*)
**TOTAL 369 trees**

**Floodplain (bare root trees)**
13 sycamore (*Platanus occidentalis*)
10 American elm (*Ulmus americana*)
5 silky dogwood (*Cornus amomum*)
**TOTAL 28 trees**

Success criteria for wetland enhancement will include success of riparian vegetation. Wetland enhancement areas are jurisdictional; therefore, hydrology is not being monitored.

Beaver continue to be active within the upstream portion of the Site. APHIS personnel are providing beaver management and continue to trap at the Site. Beaver dam locations are depicted on the attached figure. Proactive measures to control beaver should continue, as necessary.

Summary information and 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 mitigation and restoration plan documents available on EEPs website. All raw data supporting the tables and figures in the appendices is available from EEP upon request.

## 2.0 METHODOLOGY

### 2.1 Stream Assessment

Annual stream monitoring will include vegetation survival (Section 2.2 Vegetation Assessment) and a photographic record of post-construction conditions. Photographs of the enhancement (level II) reach will be taken for each year of the monitoring period. In addition, visual assessments of the stream will be conducted by walking the length of stream and bankfull flow events will be documented during the monitoring period.

### 2.2 Vegetation Assessment

Five vegetation plots were established and marked after construction with four foot metal U-bar post demarking the corners with a ten foot, three-quarter inch PVC at the origin. The plots are 10 meters square and are located randomly within the Site. These plots were surveyed in June 2012 for the year 2 (2012) monitoring season using the *CVS-EEP Protocol for Recording Vegetation, 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 Carolinas, Virginia, Georgia, and Surrounding Areas* (Weakley 2008).

## 3.0 REFERENCES


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APPENDIX A

PROJECT VICINITY MAP AND BACKGROUND TABLES

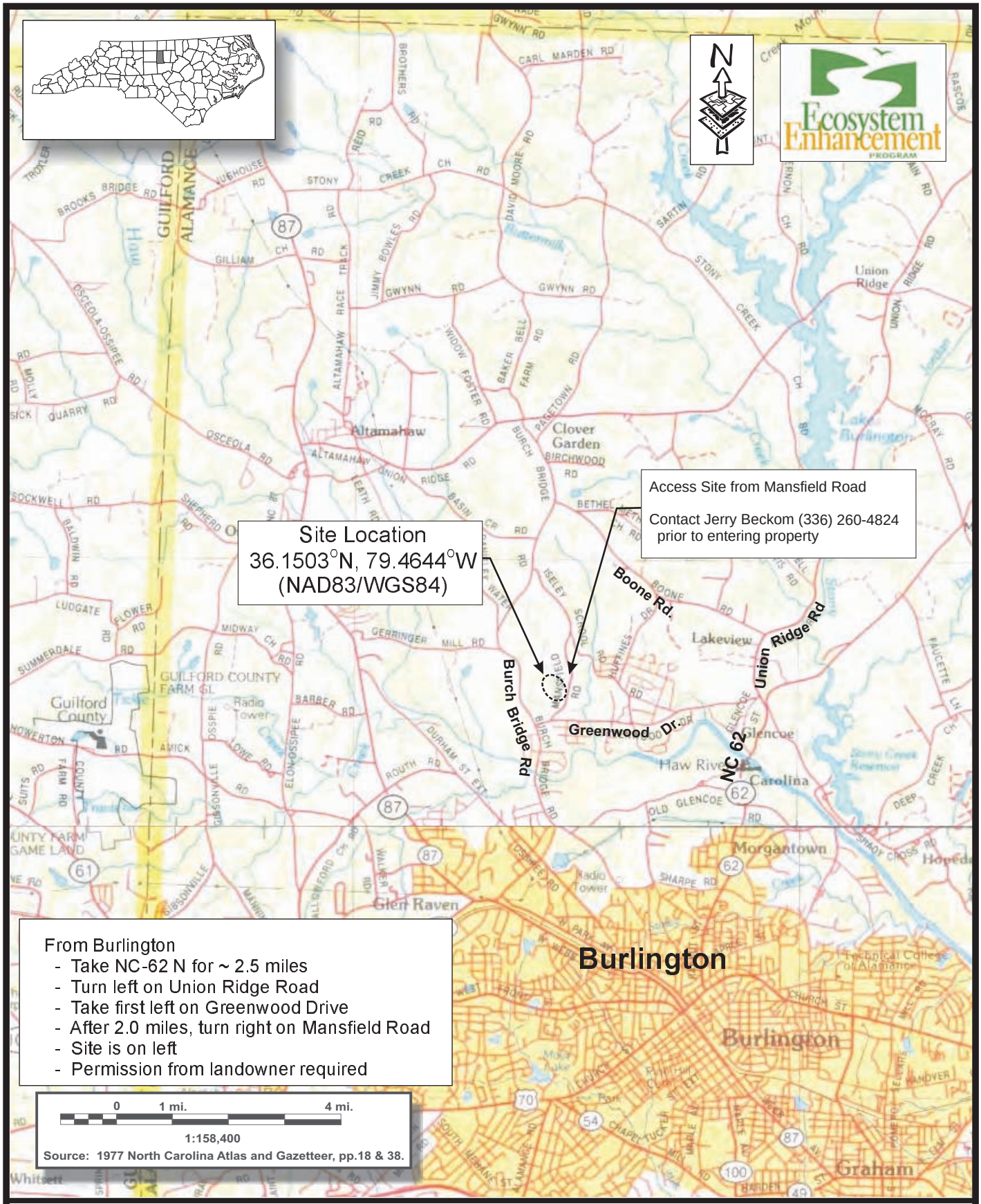
Figure 1. Vicinity Map

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

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SITE LOCATION
UT TO HAW (BECKOM) SITE (EEP #92694)
Alamance County, North Carolina

| | |
|---|---|
| Dwn. by: | WGL |
| Ckd by: | CLF |
| Date: | January 2009 |
| Project: | 09-025 |

FIGURE
1

## Table 1. Project Components and Mitigation Credits
## UT to Haw (Beckom) Site, EEP Project No. 92964

| **Mitigation Credits** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Stream | | Riparian Wetland | | Non-Riparian Wetland | Buffer | Nitrogen Offset | Phosphorus Nutrient Offset |
| **Type** | R | RE | R | RE | -- | -- | -- | -- |
| **Totals** | -- | 1173 SMUs | -- | 0.89 WMUs | -- | -- | -- | -- |

| **Project Components** | | | | | | |
|---|---|---|---|---|---|---|
| **Project Component/ Reach ID** | **Station/Location** | **Existing Footage** | **Approach** | **Restoration or Restoration Equivalent** | **Restoration Footage/ Acreage** | **Mitigation Ratio** |
| Main Channel | -- | 1550 | -- | Enhancement (Level II)/ | 1550 | 2.5:1 |
| | -- | 635 | -- | Preservation | 635 | 5:1 |
| UT1 | -- | 15 | -- | Enhancement (Level II) | 15 | 2.5:1 |
| | -- | 665 | -- | Preservation | 665 | 5:1 |
| UT2 | -- | 635 | -- | Enhancement (Level II) | 635 | 2.5:1 |
| UT3 | -- | 165 | -- | Preservation | 165 | 5:1 |
| Wetland 1 | -- | 1.15 | -- | Enhancement | 1.15 | 2:1 |
| Wetland 2 | -- | 0.25 | -- | Enhancement | 0.25 | 2:1 |
| Wetland 3 | -- | 0.05 | -- | Enhancement | 0.05 | 2:1 |
| Wetland 4 | -- | 0.15 | -- | Enhancement | 0.15 | 2:1 |
| Wetland 5 | -- | 0.05 | -- | Enhancement | 0.05 | 2:1 |
| Wetland 6 | -- | 0.10 | -- | Enhancement | 0.10 | 2:1 |
| Wetland 7 | -- | 0.01 | -- | Preservation | 0.01 | 5:1 |
| Wetland 8 | -- | 0.04 | -- | Preservation | 0.04 | 5:1 |

| **Component Summation** | | | |
|---|---|---|---|
| **Restoration Level** | **Stream (linear footage)** | **Riverine Riparian Wetland (acreage)** | **Planted Riparian Buffer (acreage)** |
| Enhancement (Level II) | 2200 | -- | -- |
| Enhancement | -- | 1.75 | -- |
| Preservation | 1465 | 0.05 | -- |
| **Totals** | **3665** | **1.8** | **5.1** |
| **Mitigation Units** | **1173 SMUs** | **0.89 WMUs** | **--** |

## Table 2. Project Activity and Reporting History
## UT to Haw (Beckom) Site, EEP Project No. 92964

| **Activity or Report** | **Data Collection Complete** | **Completion or Delivery** |
|---|---|---|
| Mitigation Plan | March 2010 | March 2010 |
| Soil Amendments, Site Planting, & Baseline Monitoring Document | January 2011 | January 2011 |
| Year 1 (2011) Annual Monitoring | September 2011 | October 2011 |
| Year 2 (2012) Annual Monitoring | June 2012 | August 2012 |

## Table 3. Project Contacts Table
## UT to Haw (Beckom) Site, EEP Project No. 92964

| | |
|---|---|
| Designer | Axiom Environmental<br>218 Snow Ave<br>Raleigh,NC 27603<br>Grant Lewis (919-215-1693) |
| Planting and Soil Amendment Contractor | Riverworks Inc.<br>PO Box 31768<br>Raleigh NC 27622<br>George Morris (919-459-9043) |

## Table 4. Project Baseline Information and Attributes
## UT to Haw (Beckom) Site, EEP Project No. 92964

| Project Information | | | |
|---|---|---|---|
| Project name | | UT to Haw Beckom | |
| County | | Alamance | |
| Project Area | | 10 acres | |
| Project Coordinates | | 36.1503°N, -79.4644°W | |
| **Project Watershed Summary Information** | | | |
| Physiographic Province | | Southern Outer Piedmont | |
| River Basin | | Cape Fear | |
| USGS Hydrologic Unit 8-digit | 03030002 | USGS Hydrologic Unit 14-digit | 03030002030010 |
| DWQ Sub-Basin | | 03-06-02 | |
| Project Drainage Area | | 385 acres | |
| Project Drainage Area Percentage Impervious Surface | | <5 | |
| CGIA Land Use Classification | | Managed Herbaceous Cover, Hardwood Swamps | |

| Reach Summary Information | | | | |
|---|---|---|---|---|
| **Parameters** | **Main Channel** | **UT 1** | **UT 2** | **UT 3** |
| Length of reach (linear feet) | 2185 | 680 | 635 | 165 |
| Valley classification | VIII | VIII | VIII | VIII |
| Drainage area (acres) | 150 | 75 | 50 | 30 |
| NCDWQ stream identification score | 42 | 51 | 60 | 68 |
| NCDWQ Water Quality Classification | WS-V | | | |
| Morphological Description (stream type) | - | - | - | - |
| Evolutionary trend | - | - | - | - |
| Underlying mapped soils | Local Alluvial Land | | | |
| Drainage class | Poorly drained | | | |
| Soil Hydric status | Hydric | | | |
| Slope | .009 feet | .005 feet | .025 feet | .024 feet |
| FEMA classification | - | - | - | |
| Percent composition of exotic invasive vegetation | <5 | <5 | <5 | <5 |

| Wetland Summary Information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Parameters** | **Wetland 1** | **Wetland 2** | **Wetland 3** | **Wetland 4** | **Wetland 5** | **Wetland 6** | **Wetland 7** | **Wetland 8** |
| Size of Wetland (acres) | 1.15 acres | 0.25 acres | 0.05 acres | 0.15 acres | 0.05 acres | 0.10 acres | 0.01 acres | 0.04 acres |
| Wetland Type | Riparian | | | | | | | |
| Drainage class | Poorly Drained | | | | | | | |
| Soil Hydric Status | Hydric | | | | | | | |
| Source of Hydrology | Overbank and over-land flow | | | | | | | |
| Native Vegetation Community | Piedmont/Mountain Swamp Forest | | | | | | P/M BHF* | P/M BHF* |
| Percent composition of exotic invasive vegetation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Regulatory Considerations | | | |
|---|---|---|---|
| **Regulation** | **Applicable** | **Resolved?** | **Supporting Document** |
| Waters of the United States – Section 404 | No | | |
| Waters of the United States – Section 401 | No | | |
| Endangered Species Act | No | | |
| Historic Preservation Act | No | | |
| Coastal Management Zone Act (CZMA)/ Coastal Area Management Act (CAMA) | No | | |
| FEMA Floodplain Compliance | No | | |
| Essential Fisheries Habitat | No | | |

***Piedmont/Mountain Bottomland Hardwood Forest (Schafale and Weakley)**

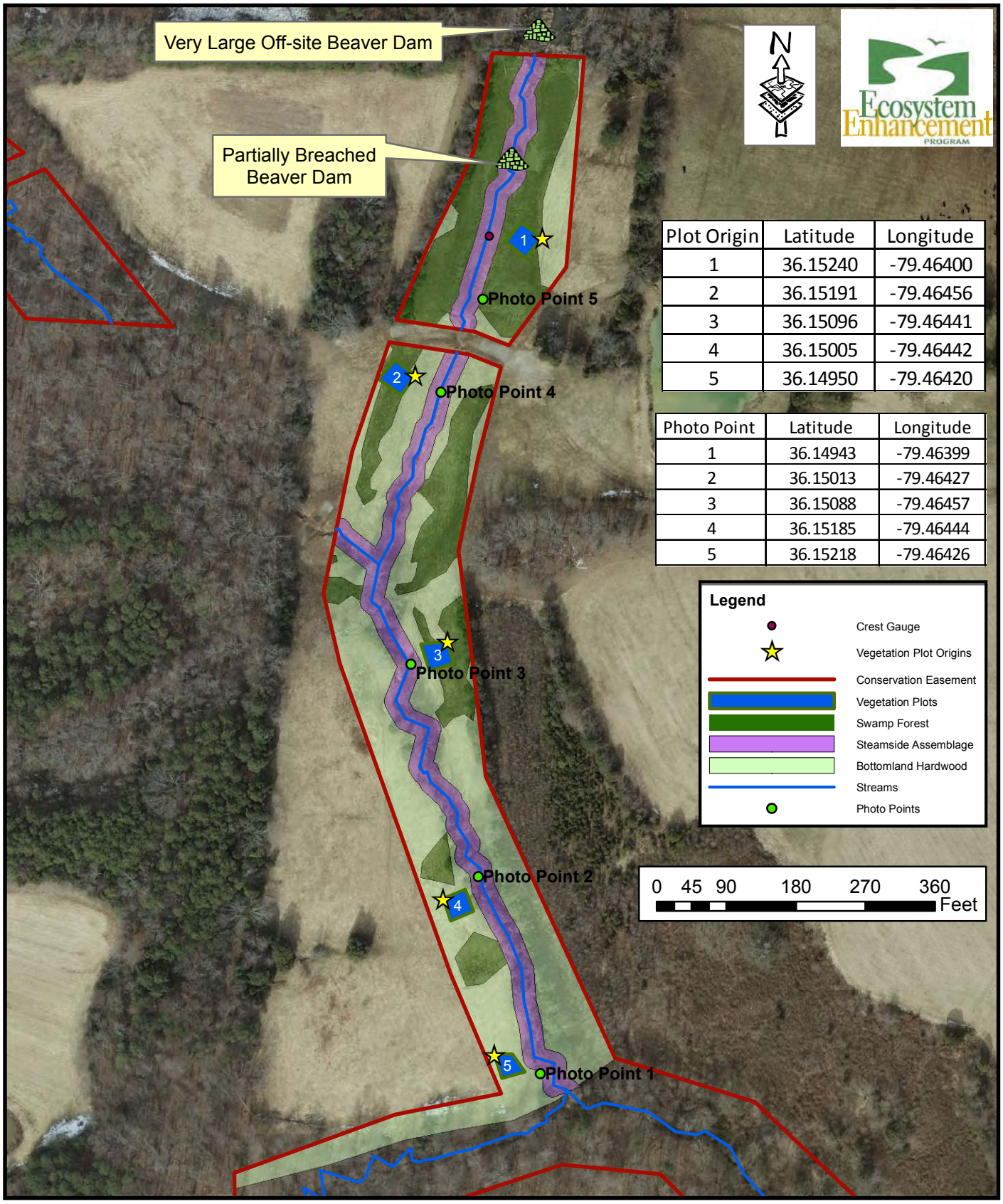
APPENDIX B

VISUAL ASSESSMENT DATA

Figure 2. Current Conditions Plan View

Table 5. Vegetation Condition Assessment Table

Vegetation Monitoring Plot Photos




| Plot Origin | Latitude | Longitude |
|---|---|---|
| 1 | 36.15240 | -79.46400 |
| 2 | 36.15191 | -79.46456 |
| 3 | 36.15096 | -79.46441 |
| 4 | 36.15005 | -79.46442 |
| 5 | 36.14950 | -79.46420 |

| Photo Point | Latitude | Longitude |
|---|---|---|
| 1 | 36.14943 | -79.46399 |
| 2 | 36.15013 | -79.46427 |
| 3 | 36.15088 | -79.46457 |
| 4 | 36.15185 | -79.46444 |
| 5 | 36.15218 | -79.46426 |

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MONITORING PLAN VEIW
UT TO HAW BECKOM SITE
Alamance County, North Carolina

Dwn. by: ND/CLF
Date: May 2012
Project: 09-025

FIGURE 2

**Table 5** **Vegetation Condition Assessment**

**UT Haw Beckom/EEP Project Number 92694**

**Planted Acreage**[1] **5.1**

| Vegetation Category | Definitions | Mapping Threshold | CCPV Depiction | Number of Polygons | Combined Acreage | % of Planted Acreage |
|---|---|---|---|---|---|---|
| 1. Bare Areas | NA | NA | NA | NA | NA | NA |
| 2. Low Stem Density Areas | NA | NA | NA | NA | NA | NA |
| | | | Total | 0 | 0.00 | 0.0% |
| 3. Areas of Poor Growth Rates or Vigor | Herbaceous vegetation within the Site is vigorous most noteably in the northern portion of the Site. This ha resulted in overtopping of smaller trees. | NA | NA | NA | 2.00 | 39.2% |
| | | | Cumulative Total | 0 | 2.00 | 39.2% |

**Easement Acreage**[2] **10**

| Vegetation Category | Definitions | Mapping Threshold | CCPV Depiction | Number of Polygons | Combined Acreage | % of Easement Acreage |
|---|---|---|---|---|---|---|
| 4. Invasive Areas of Concern [4] | NA | NA | NA | NA | NA | NA |
| | | | | | | |
| 5. Easement Encroachment Areas [3] | NA | NA | NA | NA | NA | NA |

**UT Haw (Beckom) 2012 Year 2**

**Vegetation Monitoring Photographs**

**Taken June 2012**





APPENDIX C

VEGETATION PLOT DATA

Table 6. Vegetation Plot Criteria Attainment

Table 7. CVS Vegetation Plot Metadata

Table 8. Total Planted and Natural Recruit Stems by Plot and Species

**Table 6. Vegetation Plot Criteria Attainment**
**UT to Haw (Beckom) Site, EEP Project No. 92964**

| Vegetation Plot ID | Vegetation Survival Threshold Met? | Tract Mean |
|---|---|---|
| 1 | Yes | 100% |
| 2 | Yes | |
| 3 | Yes | |
| 4 | Yes | |
| 5 | Yes | |

**Table 7. CVS Vegetation Plot Metadata**
**UT to Haw (Beckom) Site, EEP Project No. 92964**

| | |
|---|---|
| **Report Prepared By** | Corri Faquin |
| **Date Prepared** | 7/18/2012 9:58 |
| **database name** | Axiom-EEP-2012-A.mdb |
| **database location** | C:\Axiom\Business\CVS |
| **computer name** | CORRI-PC |
| **file size** | 49704960 |
| **DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------** | |
| **Metadata** | Description of database file, the report worksheets, and a summary of project(s) and project data. |
| **Proj, planted** | Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes. |
| **Proj, total stems** | Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems. |
| **Plots** | List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.). |
| **Vigor** | Frequency distribution of vigor classes for stems for all plots. |
| **Vigor by Spp** | Frequency distribution of vigor classes listed by species. |
| **Damage** | List of most frequent damage classes with number of occurrences and percent of total stems impacted by each. |
| **Damage by Spp** | Damage values tallied by type for each species. |
| **Damage by Plot** | Damage values tallied by type for each plot. |
| **ALL Stems by Plot and spp** | A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded. |
| **PROJECT SUMMARY----------** | |
| **Project Code** | 92694 |
| **project Name** | UT Haw (Beckom) |
| **Description** | buffer and wetland mitigation |
| **River Basin** | |
| **length(ft)** | |
| **stream-to-edge width (ft)** | |
| **area (sq m)** | |
| **Required Plots (calculated)** | |
| **Sampled Plots** | 5 |

**Table 8. Total Planted and Natural Recruits Stems by Plot and Species**

**UT to Haw (Beckom)**

| | | | Current Plot Data (MY2 2012) | | | | | | | | | | | | | | | Annual Means | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | E92694-AXE-0001 | | | E92694-AXE-0002 | | | E92694-AXE-0003 | | | E92694-AXE-0004 | | | E92694-AXE-0005 | | | MY2 (2012) | | | MY1 (2011) | | | MY0 (2011) | | |
| **Scientific Name** | **Common Name** | **Species Type** | **PnoLS** | **P-all** | **T** | **PnoLS** | **P-all** | **T** | **PnoLS** | **P-all** | **T** | **PnoLS** | **P-all** | **T** | **PnoLS** | **P-all** | **T** | **PnoLS** | **P-all** | **T** | **PnoLS** | **P-all** | **T** | **PnoLS** | **P-all** | **T** |
| Acer rubrum | red maple | Tree | | | | | | | | | | | | 1 | | | 1 | | | 2 | | | | | | |
| Carya | hickory | Tree | | | | | | | | | | | | | | | 1 | | | 1 | | | | | | |
| Cephalanthus occidentalis | common buttonbush | Shrub | 5 | 5 | 5 | | | 41 | | | | | | | | | | 5 | 5 | 46 | 6 | 6 | 31 | 2 | 2 | 2 |
| Cornus amomum | silky dogwood | Shrub | | | | | | | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 4 | 4 | 4 | 1 | 1 | 1 | 3 | 3 | 3 |
| Diospyros virginiana | common persimmon | Tree | | | | | | | | | | | | 3 | | | 35 | | | 38 | | | 21 | | | |
| Fraxinus pennsylvanica | green ash | Tree | 5 | 5 | 5 | | | | 1 | 1 | 1 | 3 | 3 | 4 | | | | 9 | 9 | 10 | 9 | 9 | 9 | 11 | 11 | 11 |
| Liquidambar styraciflua | sweetgum | Tree | | | | | | | | | 5 | | | 3 | | | | | | 8 | | | 2 | | | |
| Platanus occidentalis | American sycamore | Tree | 2 | 2 | 2 | 1 | 1 | 1 | 6 | 6 | 8 | 1 | 1 | 1 | 5 | 5 | 5 | 15 | 15 | 17 | 7 | 7 | 7 | 12 | 12 | 12 |
| Quercus | oak | Tree | | | | | | | | | | | | | | | | | | | 2 | 2 | 2 | 20 | 20 | 20 |
| Quercus alba | white oak | Tree | | | | | | | | | | 1 | 1 | 1 | | | | 1 | 1 | 1 | | | | | | |
| Quercus michauxii | swamp chestnut oak | Tree | 2 | 2 | 2 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 5 | 5 | 5 | 19 | 19 | 19 | 18 | 18 | 18 | 11 | 11 | 11 |
| Quercus minima | dwarf live oak | Shrub | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | | | |
| Quercus pagoda | cherrybark oak | Tree | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 14 | 14 | 14 | 17 | 17 | 17 | 23 | 23 | 23 |
| Quercus phellos | willow oak | Tree | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | | | | | | | 5 | 5 | 5 | 8 | 8 | 8 | 10 | 10 | 10 |
| Ulmus | elm | Tree | | | | | | 3 | | | 2 | | | 1 | | | 17 | | | 23 | | | 2 | | | |
| Ulmus alata | winged elm | Tree | | | | 1 | 1 | 1 | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Ulmus americana | American elm | Tree | 1 | 1 | 1 | | | | 3 | 3 | 3 | 6 | 6 | 6 | 8 | 8 | 8 | 18 | 18 | 18 | 15 | 15 | 15 | 16 | 16 | 16 |
| | | **Stem count** | 20 | 20 | 20 | 12 | 12 | 56 | 20 | 20 | 29 | 19 | 19 | 28 | 20 | 20 | 74 | 91 | 91 | 207 | 85 | 85 | 135 | 108 | 108 | 108 |
| | | **size (ares)** | 1 | | | 1 | | | 1 | | | 1 | | | 1 | | | 5 | | | 5 | | | 5 | | |
| | | **size (ACRES)** | 0.02 | | | 0.02 | | | 0.02 | | | 0.02 | | | 0.02 | | | 0.12 | | | 0.12 | | | 0.12 | | |
| | | **Species count** | 7 | 7 | 7 | 5 | 5 | 7 | 7 | 7 | 9 | 7 | 7 | 11 | 5 | 5 | 9 | 10 | 10 | 15 | 11 | 11 | 14 | 9 | 9 | 9 |
| | | **Stems per ACRE** | 809.4 | 809.4 | 809.4 | 485.6 | 485.6 | 2266 | 809.4 | 809.4 | 1174 | 768.9 | 768.9 | 1133 | 809.4 | 809.4 | 2995 | 736.5 | 736.5 | 1675 | 688 | 688 | 1093 | 874.1 | 874.1 | 874.1 |

**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 = Planted stems and natural recruits

Total includes stems of natural recruits

APPENDIX D

STREAM DATA

Fixed-Station Photos

**UT Haw (Beckom) 2012 Year 2**
**Fixed-Station Photos**
**Taken June 7, 2012**

Photo Point 1

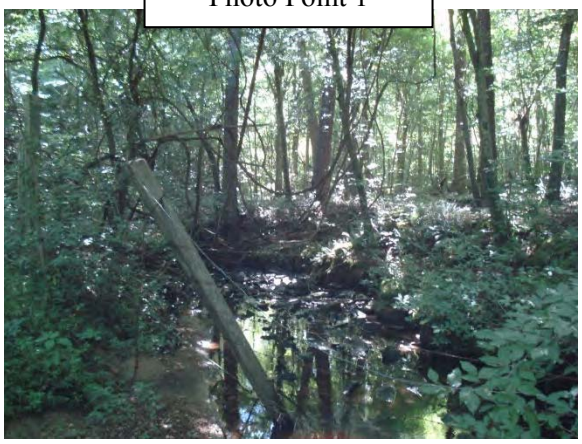


Photo Point 2

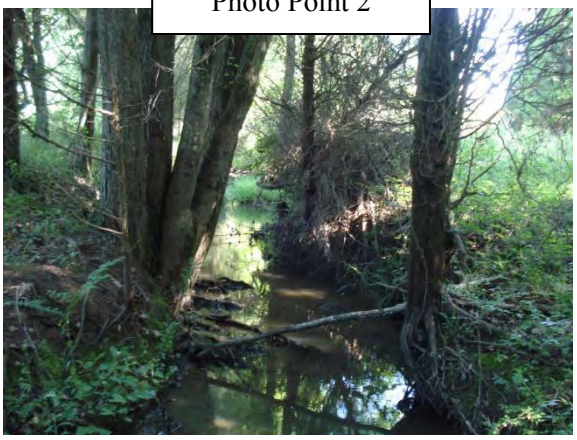


Photo Point 3

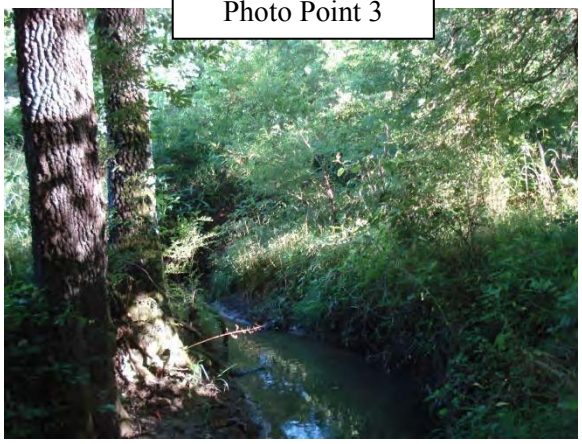


Photo Point 5

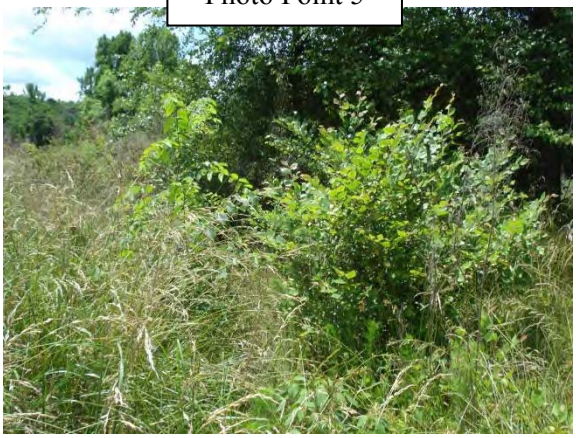
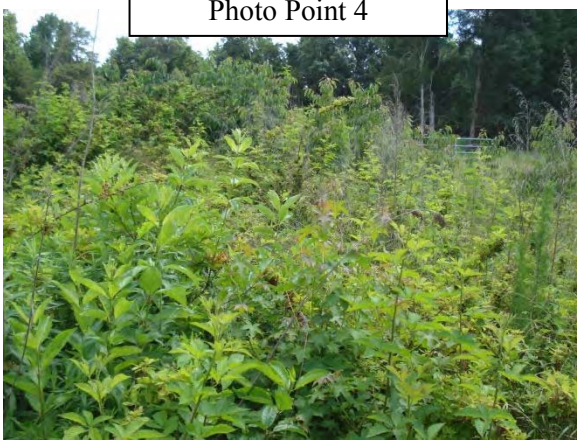


Photo Point 4



APPENDIX E

HYDROLOGY DATA

Table 9. Verification of Bankfull Events

**Table 9. Verification of Bankfull Events**

**UT to Haw (Beckom) Site, EEP Project No. 92964**

| Date of Data Collection | Date of Occurrence | Method | Photo (if available) |
|---|---|---|---|
| September 30, 2011 | June 28, 2011 | Total of 2.83 inches* of rain reported to fall over 2 days (June 27-28, 2011) | -- |
| September 30, 2011 | September 24, 2011 | Total of 3.61 inches* of rain reported to fall over 4 days (September 21-24, 2011) with an additional 0.85 inches* of rain the following 3 days (Septe 25-27, 2011) | -- |
| July 18, 2012 | July 11, 2012 | Total of 4.84 inches* of rain reported to fall over 3 days (July 9-11, 2012) | -- |

* Reported at KBUY Weather Station in Burlington.