

# **Blounts Creek Stream Project Mitigation Plan**

**Cumberland County, North Carolina**

**State Construction Office Contract Number D05013**

**Prepared For: NCDENR-EEP**

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# Acronyms and Abbreviations

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BdD	Blaney-urban complex
BEHI	Bank Erosion Hazard Index
BCSP	Blounts Creek Stream Project
EEP	Ecosystem Enhancement Program
ft	feet
ft <sup>2</sup>	square feet
GdB	Gilead loamy sands
HUC	Hydrologic Unit Code
Jt	Johnston loams
LF	linear feet
mi <sup>2</sup>	square miles
NBS	Near Bank Stress
NC CGIA	North Carolina Center for Geographic Information Analysis
NCDWQ	North Carolina Division of Water Quality
NRCS	Natural Resources Conservation Service
SMU	Stream Mitigation Unit
USACE	U.S. Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey

# Executive Summary

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The Blounts Creek Stream Project (BCSP) is located approximately one mile southwest of downtown Fayetteville, North Carolina. The BCSP is located in Cumberland County within the Cross Creek watershed, Hydrologic Unit Code (HUC) 03030004000050, of the Cape Fear River basin.

The Blounts Creek watershed is typical of many urban watersheds in that the streams, wetlands, and plant communities have been significantly altered by human activity within the watershed. The watershed land use includes a mix of high density residential and commercial development. The stream has been impacted by the construction of a sewer line right-of-way (ROW) parallel to Blounts Creek, multiple utility crossings, stormwater outfalls, a breached dam with a roadway on top, logging activity, and channel modification.

Permanent conservation easements have been purchased from five landowners. All restoration activities were planned to be conducted within these easements. A boundary survey was conducted to determine the exact boundaries of properties that previously were defined by the location of the stream channel. Task 1 identified in the scope of work in the Request for Proposals (RFP) included performing a screening analysis and feasibility study using the Categorical Exclusion form. Task 1 also included public notification via notice in a newspaper and conducting public meetings if they are needed. These tasks have been completed. Task 2 identified in the scope of work in the RFP provided to protect the site via permanent conservation easements to be held by EEP (or approved State Agency) in perpetuity. Tasks 1 and 2 have been completed. As part of restoration activities, Task 3 includes developing a site specific restoration plan for EEP review and approval. During development of the site specific restoration plan many conditions regarding the project changed and affected the feasibility of the BCSP as a restoration project. Provisions in the RFP provided the Department the right to terminate the contract after Tasks 1 and 2 were complete should the site be rejected as a result of adverse findings after these two tasks.

Due to the changing conditions associated with the Blounts Creek project, CH2M HILL believes that the project is no longer an appropriate candidate for construction. However, it is our opinion, and the Ecosystem Enhancement Program concurs that this site and the work performed to date are of value to the Ecosystem Enhancement Program as a preservation project rather than a restoration project as originally proposed. This would have a dual value of meeting the criteria for preservation and doing so in a valued urban watershed. By preserving the 27.6 acres of rare open space (including 13.1 acres of wetlands), the water quality benefits and wildlife habitat will be preserved in perpetuity from development pressures that are currently encroaching. This will eliminate the need for future mitigation since no development can occur in the conservation easements.

To support the conversion of the project to preservation credits, this report based on the restoration plan has been developed summarizing the environmental conditions and proposed preservation credits as part of project close out.

# 1.0 Project Background and Location

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## 1.1 Background

The Blounts Creek watershed is typical of many urban watersheds in that the streams, wetlands, and plant communities have been significantly altered by human activity within the watershed. The watershed land use includes a mix of high density residential and commercial development. The stream has been impacted by the construction of a sewer line right-of-way (ROW) parallel to Blounts Creek, multiple utility crossings, stormwater outfalls, a breached dam with a roadway on top, logging activity, and channel modification. The primary cause of degradation within the Blounts Creek watershed is associated with the urban development that has occurred over the past 40 years, particularly the increased amount of impervious surface within the watershed that has significantly altered hydrology and the lack of any comprehensive stormwater management.

Blounts Creek was identified as a candidate for restoration through discussions with staff from the Public Works Commission (PWC) of the City of Fayetteville. PWC is very active in efforts to protect the Cape Fear River Basin through its operations and membership in the Middle Cape Fear River Basin Association (MCFRBA). Portions of the Cross Creek watershed are identified by the Division of Water Quality (DWQ) in the Basinwide Assessment Report (NC DENR, 2004) and on the 2006 draft 303(d) list (NC DENR, 2006) as impaired for biological integrity. A stressor study completed by DWQ indicated that altered hydrology and sedimentation are major stressors to the benthic community in Cross Creek. PWC recognized the degraded nature of Blounts Creek and the contribution to the issues identified in the Cross Creek watershed.

The primary goal of this project was to restore degraded sections of the Blounts Creek channel and riparian corridor to improve water quality and improve instream and riparian habitat. The restoration activities planned for each reach were designed to complement the activities that will be implemented upstream and downstream of each reach and are essential for the overall success of the project.

The project goals will be achieved through the establishment of the appropriate stream pattern, dimension, and profile of Blounts Creek and Bugaboo Branch based on current hydrological conditions. The riparian corridor will also be protected and enhanced with native species suited to this region of the sandhills.

Blounts Creek is an ideal candidate for restoration because of the issues identified above and some unique characteristics. First, the Blounts Creek watershed is approaching build out so that most of the significant hydrological alteration has already occurred. Second, the availability of land on the south side of creek provides some flexibility to address many of the channel stability and riparian and aquatic habitat issues and restore a stable plan, profile, and dimension to the creek. Finally, the assistance of local partners to make this project happen helps to assure success of this urban stream restoration effort.

## 1.2 Location of Project Site

The Blounts Creek Stream Project (BCSP) site is approximately 1 mile southwest of downtown Fayetteville, North Carolina (NC) between I-95 Business to the east, Owen Drive (SR 1007) to the south and west, and Robeson Street (SR 3828) to the north. Traveling south on I-95 Business from Fayetteville, exit at Owen Drive heading east. Follow Owen Drive east to Coronado Parkway.

Coronado Parkway parallels Blounts Creek on the south. The downstream end of the project is located about 400 ft downstream of where Dark Branch intersects Blounts Creek near the intersection of Delaware Drive and Duvall Street. A map showing the location of the BCSP is presented on Figure 1.1.

## 1.3 Changes to Project Conditions

Project conditions have changed significantly, primarily due to activities of third parties outside the control of CH2M HILL and EEP, from the conditions under which the project was proposed (October 2004) and contracted (October 2005). Some of the significant changes include the following:

- 55% of the project length will be adversely impacted by planned development within the next 5 years. These development plans were not available to the parties during the proposal process and at the time of contracting no permits had been applied for. Consequently, development activity has created significant interference with the project.
- Three of the properties with conservation easements have changed hands at least once in the last six months and 2-3 times since the proposal was accepted, with each new landowner having changing development plans that impact the project.
- Current proposed development activities adjacent to the project will change the modeled watershed conditions due to the increased imperviousness, increased stormwater volume, and planned construction activity.
- Adjacent development activities have a high probability of impacting the success of new plantings and the stability of the restored stream channel.
- Reduced conservation easement size along Bugaboo Creek to accommodate road construction by developer narrows riparian corridor width and increases the chance of potential impacts.
- Restoration in the lakebed constituted 1585 credits, or approximately 21% of the credits for the project. Moreover, restoration in the lakebed encompasses the middle (1/5<sup>th</sup>) of the project and is important to functionality in the downstream reaches of the project.
- Fall 2007 construction is required in order to work with the adjacent property's construction schedule. Any delays in permitting will shift the construction into 2008.
- New scope associated with repaving the road to install new culverts after the developer has improved the road along the lakebed which will increase project cost.

## 1.4 Preservation Credits

Due to the significance of these material changes stated in section 1.3, CH2M HILL believes this project no longer meets the conditions described in the contract with EEP. Notwithstanding these material adverse changes, the established conservation easements provide welcome open space and vegetated riparian corridors in an urban neighborhood that is almost at build-out. CH2M HILL proposes that the EEP obtain preservation credits for the area within the easements for the following reasons:

- Protects 27.6 acres of rare open space in an urbanizing watershed that is almost at build out. This open space is currently being used as habitat by songbirds, wild turkey, muskrat and other wildlife.
- Protects 13.1 acres of urban wetlands.

- The lake bed wetland provides water quality benefits (reductions in sediment load and nutrients and reduction in downstream scour rates) by treating stormwater generated by 1,606 acres (2.5 square miles) of urban watershed. The entire easement area receives stormwater from 4.3 square miles of watershed.
- The conservation easement protects the entire wetland area of the lake bed from development. Currently the lake bed provides flood storage and reduces downstream flood elevations.
- A well established urban riparian area is present in large portions of the easement upstream and downstream of the old lake bed. Large areas within the easements contain native vegetation some of which are large sized hardwood trees.
- Conservation easements prevent the wetland in the old lakebed and the riparian wetland areas from being filled during construction and creating the need for additional mitigation.
- The average riparian width protected in the Blounts Creek conservation easements is over 50 feet in an urban watershed. This protected width exceeds the 30 feet required by the City of Fayetteville for any development other than low density development.
- Easements obtained on the majority of remaining open space adjacent to Blounts Creek, prevent removal of riparian vegetation by future development.

Although CH2M HILL does not recommend project construction at this time, we do believe that the easements obtained in connection with the project preserve a significant quantity of rare open space and wetlands within an urbanizing area. Conservation easements have been obtained on five properties (27.6 acres) in the proposed project area and are now under State ownership. These easements contain vegetated riparian corridors, riparian wetlands, and a grass/shrub wetland that formed in an old lakebed. CH2M HILL believes that the easements should generate 1525 preservation credits for EEP . The USACE allows preservation to be used as flexible stream mitigation in urban watersheds (USACE 2003). Preservation credits were calculated by taking the length of stream channel in each of the conservation easements and using a 5:1 mitigation activity multiplier. The mitigation activity multiplier is based on the recognition that for a given reach or wetland area, functional improvements associated with mitigation activities are less for preservation activities compared to Level I Restoration activities (USACE 2003).

Reach	Existing Channel (LF)	Preservation Ratio	Preservation Credit
1	428	5:1	85.6
2	2241	5:1	448.2
3	306	5:1	61.2
4	350	5:1	70.0
5	1175	5:1	235.0
6	1296	5:1	259.2
7	1389	5:1	277.8
8	352	5:1	70.4
<b>Total</b>	<b>7537</b>		<b>1507.4</b>

Additional preservation credits were calculated from the area of wetlands and riparian corridor included in the conservation easements. A ratio of 5:1 for the wetland areas was used to calculate preservation credit. A 1:1 ratio was used to calculate the amount of preservation credit for the riparian corridor included in the conservation easements.

<b>Type</b>	<b>Area (Ac)</b>	<b>Preservation Ratio</b>	<b>Preservation Credit</b>
Wetland Area	13.1	5:1	2.6
Riparian Corridor Area	14.5	1:1	14.5
Total	27.6		17.1

The total amount of conservation credits for this project is 1525, which is the sum of the stream, wetland and riparian corridor credits.

# 2.0 Environmental Conditions

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## 2.1 Drainage Area

Blounts Creek, one of four major tributaries to Cross Creek, is a perennial, warm water stream. The BCSP, which includes the main stem of Blounts Creek, Bugaboo and Dark Branches, and several unnamed tributaries, has a drainage area of 4.28 square miles, measured at the downstream end of the project area (Figure 2.1 and Table 2.1). The land use/land cover within the Blounts Creek drainage area is primarily high-density residential/commercial development (52 percent). The remainder of the watershed is 35 percent forest/shrubland, 9 percent agriculture/pasture, and 4 percent wetland/open water (BasinPro8, 1996). See Table 2.2 for land use data. The amount of impervious surface within the Blounts Creek watershed is approximately 35 percent.

The project encompasses approximately 1.5 miles of stream channel beginning approximately 0.25 mile east of Owen Drive and ending near the intersection of Delaware Drive and Duvall Street. Blounts Creek is a second order stream for the majority of the project length, becoming a third order stream at its confluence with Dark Branch, approximately 400 ft upstream of the project termination.

## 2.2 Project Site Streams

All reaches of the BCSP are perennial as determined using DWQ's stream classification form (used to identify intermittent and perennial streams). The stream scored a total of 48 points using the NCDWQ Stream Classification Form. A score greater than or equal to 19 points means the stream is at least intermittent. Blounts Creek and Bugaboo Branch flow year-round; however, due to the channel modification and degradation, some of the primary field indicators associated with perennial streams listed on the Stream Classification Form are not present in some reaches. Appendix 3 contains the NCDWQ stream classification form for the Blounts Creek project area.

The BCSP has been subdivided into eight reaches according to geographic, geomorphic, or easement acquisition differences. As shown on Figure 2.2, reach numbering along the main stem of Blounts Creek is from downstream (Reach 1) to upstream (Reach 7). Reach 8 is on Bugaboo Branch, a tributary to Blounts Creek. The existing conditions of these reaches are described below.

CH2M HILL staff performed a Rosgen Level II Stream Channel Classification based on field data and full topographic survey information. Table 2.3 illustrates the measured parameters that determine Rosgen stream type for each of the reaches. Further reach descriptions are provided below.

Table 2.3 presents the classifications of the project reaches described below. Segments of Reaches 5 and 6 exhibit desirable channel shape and pattern, these areas along with the reference reach conditions were used as models for the stream design. The lower portion of Reach 6 exhibits characteristics of a stable C/E5 channel.

Reach 1 is delineated from the confluence with Dark Branch to the end of the project reach. The upper end of Reach 1 has full access to its densely vegetated floodplain. However, approximately halfway down the length of the reach, the stream has an extreme head-cut through gray clay; it was measured as 6.5 ft deep during the spring 2006 field data collection. Reach 2 is classified as an E5 channel due to its access to a densely vegetated floodplain on the south side and the low width/depth ratio of the channel. The reach has been straightened and portions of the left bank have been heavily

armored with walls and riprap to protect against bank scour, slumping, and lateral migration. Reach 3, is a severely degraded section of Blounts Creek located just downstream of an extensive head-cut that has already moved through this reach. Downstream of the head-cut, Reach 3 has a tremendous accumulation of large woody debris that has fallen into the channel from above or floated downstream from the advancing head-cut during storm events. The stream bottom contains large clumps of roots, peat, and unconsolidated sand. The upstream end of Reach 4 is at the mouth of the 60-inch culvert at Lake Club Drive. A cross-section from the upper end of Reach 4 was used to classify this reach (Table 2.3). The high width/depth ratio paired with a high entrenchment ratio describes a C5 stream type. Reach 5 includes the stream encompassed by the old lake bed. Once the lake was drawn down in 1993, Blounts Creek carved a moderately sinuous, low width/depth channel across the flat lake bed. There are springs within the lake bed, and the peaty floodplain is frequently saturated, which produce a “wet meadow”. The upper end of Reach 6 has been straightened, but downstream of the overhead utility easement crossing, Blounts Creek becomes moderately sinuous. The lower portion of Reach 6 has access to densely vegetated floodplains on each side of the stream. The uppermost reach of the project is Reach 7, which also has been straightened. The trapezoidal channel has vegetated banks, too high for the bankfull flow to rise out of the banks. Reach 8 is on Bugaboo Branch, a tributary that enters Blounts Creek midway down Reach 2. Reach 8 has been straightened and armored with riprap.

## 2.3 Vegetation

Blounts Creek is located in the Atlantic Southern Loam Plains Ecoregion of the Coastal Plain physiographic province of North Carolina. This ecoregion is characterized by a gently rolling topography dissected by many small, low- to moderate-gradient sandy bottom streams. Mesic pine flatwoods, pine/scrub oak forest, oak-hickory forest, and mixed hardwood forest characterize the vegetation of this ecoregion. These mesic areas are laced with coastal plain bottomland hardwood forests and coastal plain small stream swamps.

Two communities, coastal plain bottomland forest and coastal plain mesic forest, dominate the project site, although both have been altered by human impact (Schafale and Weakley, 1990).

The dominant woody vegetation observed in the wetter riparian areas within the project site includes black gum (*Nyssa sylvatica*), red maple (*Acer rubrum*), ironwood (*Carpinus caroliniana*), sweetbay magnolia (*Magnolia virginiana*), wax myrtle (*Myrica cerifera*), sweet pepperbush (*Clethra alnifolia*), titi (*Cyrilla racemiflora*) and Chinese privet (*Ligustrum sinense*). The herbaceous vegetation in the riparian wetlands includes giant cane (*Arundaria gigantea*), greenbrier (*Smilax sp.*), honeysuckle (*Lonicera japonica*), Japanese stilt grass (*Microstegium vimineum*), and royal fern (*Osmunda regalis*).

The mesic forest communities are found along a narrow band at the outside edges of the project site corridor. These areas have also been disturbed. Species found in areas that have regenerated after past logging activities currently include sweet gum (*Liquidambar styraciflua*), red maple, loblolly pine, sweetbay magnolia, Chinese privet (*Ligustrum sinense*), *Smilax laurifolium*, and honeysuckle. A dense understory of Chinese privet (*Ligustrum sinense*) has become established in these areas, limiting natural regeneration of native plant species.

## 2.4 Jurisdictional Wetlands

The BCSP site contains approximately 13.1 acres of wetlands within the permanent conservation easement. The wetland acreage was identified and characterized during the jurisdictional wetland delineation in January 2006. Wetland areas were topographically surveyed and maps were submitted to the U.S. Army Corps of Engineers (USACE) for approval in September 2006. Figure 2.3 highlights all wetland areas within the project area. Of the wetland acreage present on the project site, there are two main wetland types: freshwater marsh and riparian bottomland forest. The area of freshwater marsh is found in the remnant lake bed located on the project site in Reach 5 (Figure 2.2). The lake was drained in 1992 when NCDENR issued a Dam Safety Order due to the dam's instability.

Appendix 2 contains the USACE wetland determination forms completed by CH2M HILL field staff between January 17 and January 23, 2006. These forms were used to determine the extents of wetlands within the project area. Figure 2.1 in Appendix 2 identifies the areas associated with each wetland determination form. The wetland boundaries were delineated and surveyed before design began in an effort to minimize impacts to these wetlands. Wetland maps were submitted to USACE in September 2006 for approval of the jurisdictional boundaries. These have not yet been signed due to pending regulatory changes related to isolated wetlands.

## 2.5 Wetland Plant Community Characterization

The lake bed has been extensively colonized by Japanese stilt grass, an invasive exotic grass species. This area also includes cattail (*Typha latifolia*), rush (*Juncus effusus*), black willow (*Salix nigra*), hazel alder (*Alnus serrulata*), and various sedge species. An area south of the lake bed contains wetlands dominated by woody shrubs and trees. The source of water in this area is groundwater seepage.

The remainder of the wetlands within the project site are predominantly riparian wetlands. The dominant woody vegetation in these areas, within the project site, includes black gum, loblolly pine, red maple, ironwood, sweetbay, wax myrtle, and the invasive exotic shrub Chinese privet (*Ligustrum sinense*). The wetland area northeast of Lake Club Drive has been logged within the past 20 years and allowed to naturally regenerate. A dense understory of Chinese privet (*Ligustrum sinense*) has become established in this area, limiting natural regeneration of native plant species. The herbaceous vegetation in the riparian wetlands includes giant cane, greenbrier, royal fern, and non-native species such as honeysuckle and Japanese stilt grass.

Much of the riparian wetlands throughout the project site receive most of their water from rainfall and drainage rather than overbank flooding, especially areas directly adjacent to Blounts Creek. Currently, there is a relic wetland area immediately below Lake Club Drive, evidenced by the hydrophytic vegetation and pronounced tree buttressing. However, during the delineation project staff observed that the hydrology was no longer present and the soils showed no indications of reduced conditions. In two relatively large areas, the riparian wetland is intact and connected to the creek: (1) the wetland acreage from the powerline ROW in the middle of Reach 6 (Figure 2.2) to the point where it meets the freshwater marsh and (2) an area of open wetland dominated by black gum at the furthest downstream portion of the project site.

## **2.6 Endangered/Threatened Species**

No unique natural resources are located within the project area and no data currently locate any federally listed or threatened species within the project area (data source: NC CGIA, BasinPro 8.0).

Table 2.4 provides a list of species identified as threatened or endangered for Cumberland County from the United States Fish and Wildlife Service (USFWS) (website accessed February 20, 2006, <http://nc-es.fws.gov/es/countyfr.html>). Based on site visits and the habitats present at the project site, none of these species is likely present on the site.

## **2.7 Historical Land Use and Development Trends**

The land use/land cover within the Blounts Creek drainage area is primarily high-density residential/commercial development (52 percent). The remainder of the watershed is 35 percent forest/shrubland, 9 percent agriculture/pasture, and 4 percent wetland/open water (BasinPro8, 1996). See Table 2.2 for land use data. The amount of impervious surface within the Blounts Creek watershed is approximately 35 percent. The soils adjacent to Blounts Creek (Figure 2.4) are predominantly Johnston loams (Jt; hydric). Blaney-Urban complex (BdD) and Gilead loamy sands (GdB) are found in the upstream portions of the project area (NRCS Soil Survey of Cumberland and Hoke Counties).

Within the immediate watershed of the BCSP there are existing plans for the development of condominiums and single-family homes. The permanent conservation easement will provide protection for the stream and riparian corridor.

## **2.8 Cultural Resources**

There is no indication of existing historic structures or archaeological remains located within the project area. The State Historic Preservation Office conducted a review of the project area and indicated no awareness of any historic resources that will be impacted by this project.

## 3.0 References

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Natural Resource Conservation Service (NRCS) *Soil Survey of Cumberland and Hoke Counties*.

North Carolina CGIA BasinPro 8.1 and CGIA data, 2005.

North Carolina Department of Environment and Natural Resources, Division of Water Quality, *Cape Fear River Basin Assessment Report*, 2004.

North Carolina Department of Environment and Natural Resources, Division of Water Quality, *Draft 303(d) Report*, 2006.

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Schafale and Weakley, *Classification of the Natural Communities of North Carolina, Third Approximation, 1990, North Carolina Natural Heritage Program*, Division of Parks and Recreation, Department of Environment and Natural Resources, MSC 1615, Raleigh, NC 27611

United States Fish and Wildlife Service Website accessed February 20, 2006,  
<http://nc-es.fws.gov/es/countyfr.html>

United States Army Corps of Engineers, Wilmington District. 2003. Stream Mitigation Guidelines

# 4.0 Tables

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**TABLE 2.1**  
 Drainage Areas  
*Project Number D05013 (Blounts Creek)*

Reach ID	Drainage Area (Acres / Square Miles)
Reach 1	2,739 / 4.28
Reach 2	1,933 / 3.02
Reach 3	1,696 / 2.65
Reach 4	1,696 / 2.65
Reach 5	1,606 / 2.51
Reach 6	1,165 / 1.82
Reach 7	1,120 / 1.75
Reach 8	230 / 0.36

Source: BasinPro8, 1996

**TABLE 2.2**  
 Land Use of Blounts Creek Watershed  
*Project Number D05013 (Blounts Creek)*

Land Use	Acreage	Percentage
Low Density Residential (1/2 - 1 acre lot)	112.9	4.1%
Medium Density Residential (1/8 - 1/2 acre lot)	1136.5	41.5%
High Density Residential (<1/8 acre lot)	101.0	3.7%
Commercial/Industrial	708.8	25.9%
Transportation	28.3	1.0%
Open Space	186.2	6.8%
Woods/Grass	466.3	17.0%
<b>Total</b>	<b>2,739.9</b>	

Source: BasinPro8, 1996

**TABLE 2.3**  
Stream Channel Classification – Blounts Creek Existing Condition Reaches  
*Project Number D05013 (Blounts Creek)*

Classification Parameter	Riffle Measurements of Existing Condition Reaches							
	1	2	3	4	5	6	7	8
Drainage Area, mi <sup>2</sup>	4.28	3.02	2.65	2.65	2.51	1.82	1.75	0.36
Reach Length, ft	428	2241	306	350	1175	1296	1389	352
Bankfull Width, ft	13.76	14.95	15.28	18.27	6.76	10.54	11.57	5.97
Bankfull Mean Depth, ft	1.40	2.48	1.91	1.41	0.64	2.07	1.64	1.36
Bankfull Cross-section Area, ft <sup>2</sup>	19.22	37.02	29.24	25.77	4.32	21.84	19.02	8.10
<b>Width/Depth Ratio</b>	<b>9.83</b>	<b>6.03</b>	<b>6.00</b>	<b>12.96</b>	<b>10.56</b>	<b>5.09</b>	<b>7.05</b>	<b>4.39</b>
Maximum Depth, ft	3.73	3.26	2.60	2.30	1.59	2.87	1.98	1.78
Width of Flood-prone Area, ft	300+	300+	21.70	129.60	250	300	14.66	8.20
<b>Entrenchment Ratio</b>	<b>&gt;22</b>	<b>&gt;20</b>	<b>1.22 *</b>	<b>7.09</b>	<b>36.98</b>	<b>28.46</b>	<b>1.27</b>	<b>1.37</b>
Channel Materials (Particle Size Index, mm)	Coarse Sand	Coarse Sand	Coarse Sand	Coarse Sand	Coarse Sand	Coarse Sand	Coarse Sand	Coarse Sand
Water Surface Slope, ft/ft	0.008	0.002	0.004	0.02	0.0049	0.00653	0.002	0.013
Sinuosity	1.01	1.00	1.04	1.11	1.07	1.14	1.007	1.01
<b>Stream Type</b>	<b>E5</b>	<b>E5</b>	<b>G5c</b>	<b>C5</b>	<b>E5</b>	<b>C/E5</b>	<b>G5c</b>	<b>G5c</b>

Data analyzed using RIVERMorph software

\* The Continuum of Physical Properties” was applied to Reach 3’s Entrenchment Ratio, sliding the calculated value of 1.42 +/- 2.0 units to 1.22.

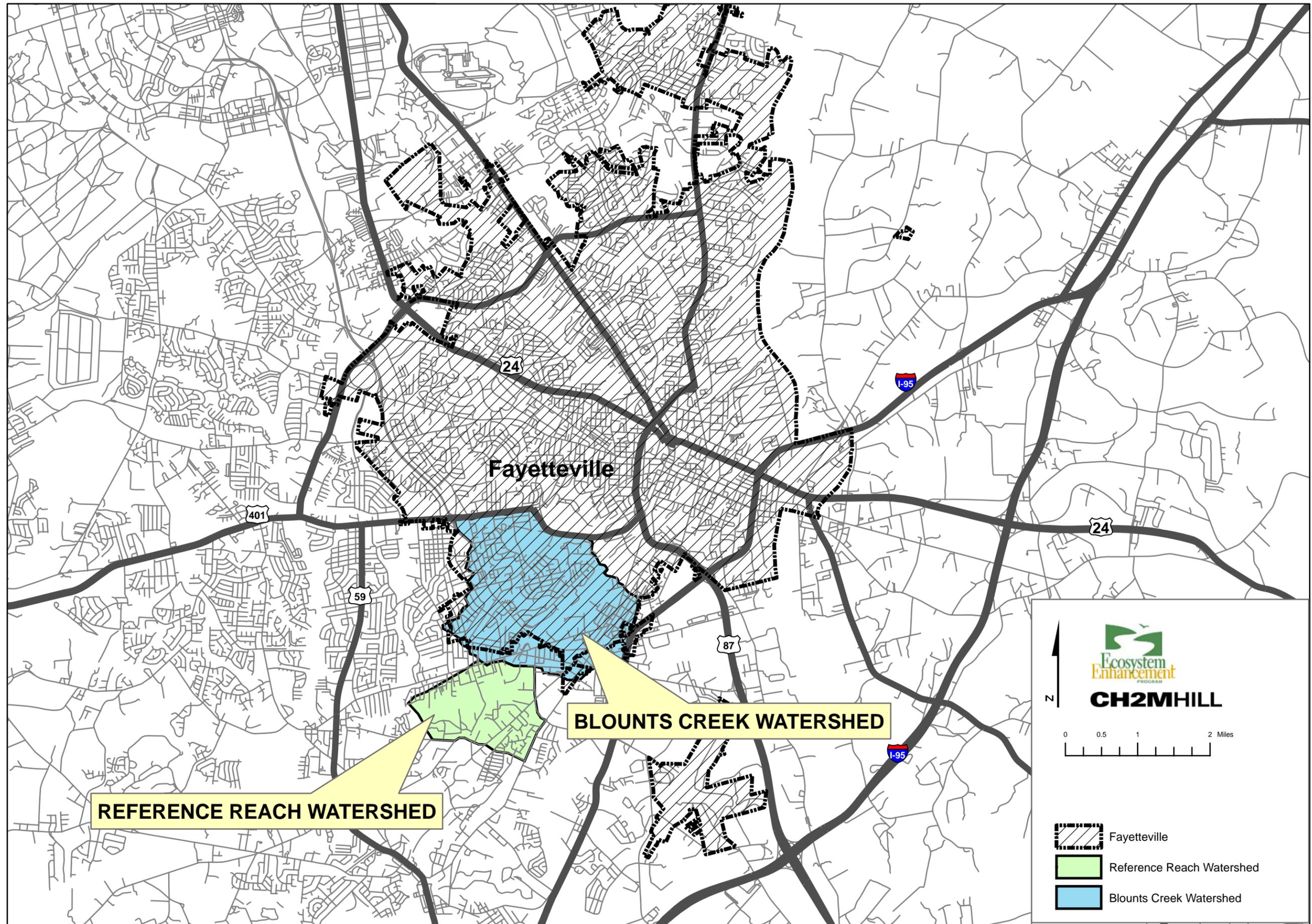
**TABLE 2.4**  
USFW Threatened and Endangered Species in Cumberland County  
*Project Number D05013 (Blounts Creek)*

Common Name	Species	Status
American alligator	<i>Alligator mississippiensis</i>	Threatened
Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered
Saint Francis’ satyr	<i>Neonympha mitchelli francisci</i>	Endangered
American chaffseed	<i>Schwalbea americana</i>	Endangered
Michaux’s sumac	<i>Rhus michauxii</i>	Endangered
Pondberry	<i>Lindera melissifolia</i>	Endangered
Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	Endangered

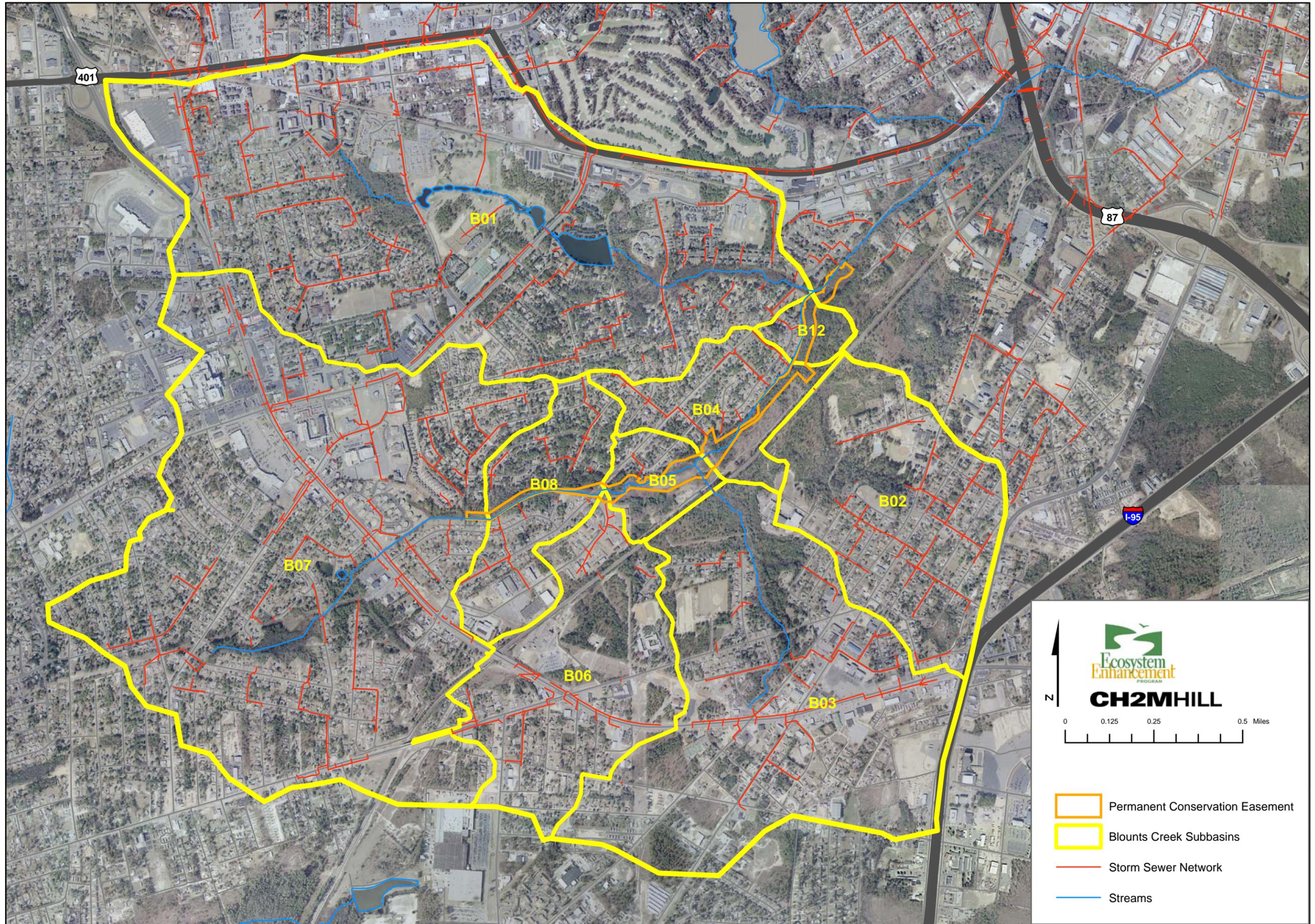
Source: USFWS website accessed February 20, 2006

## 5.0 Figures

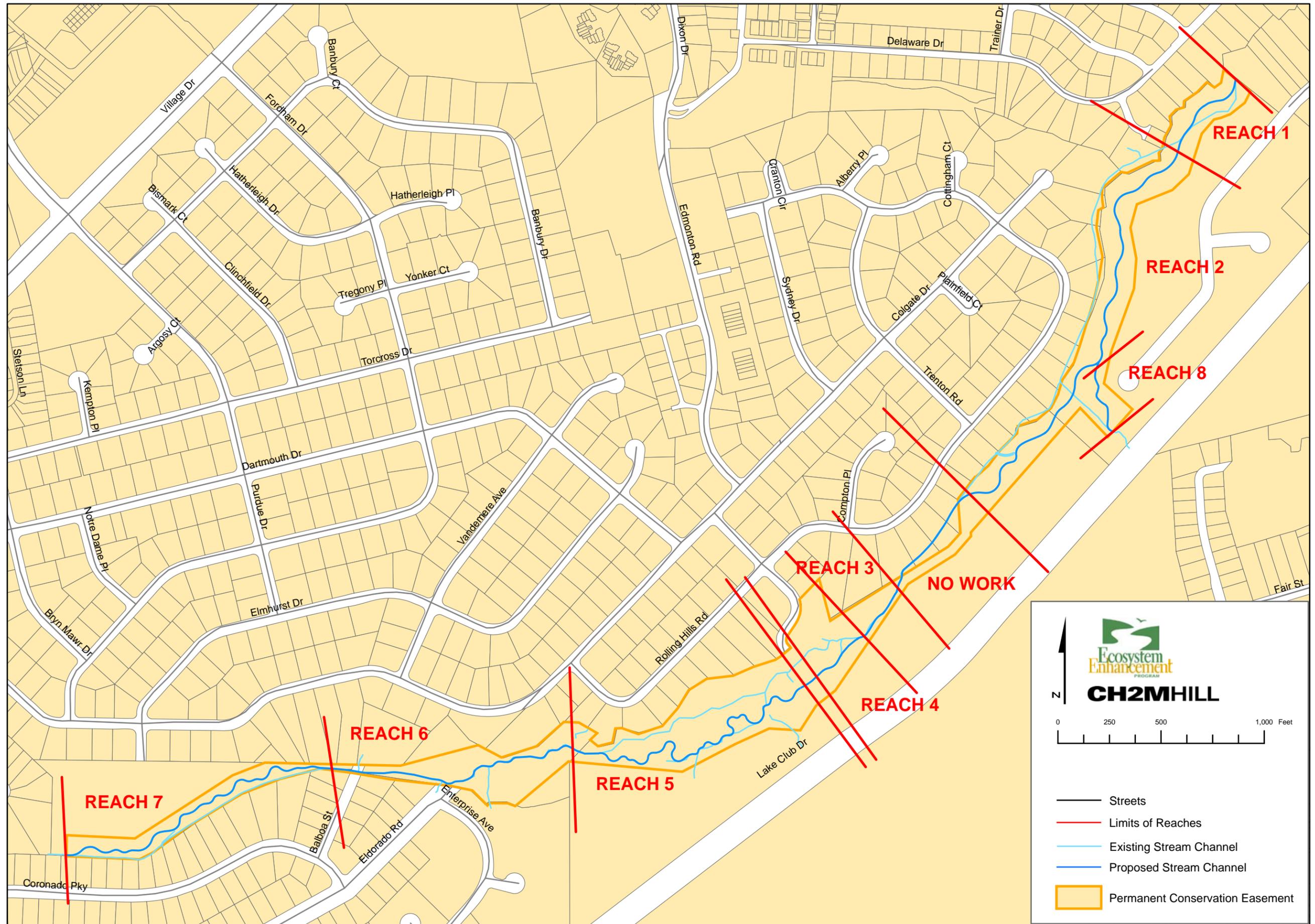
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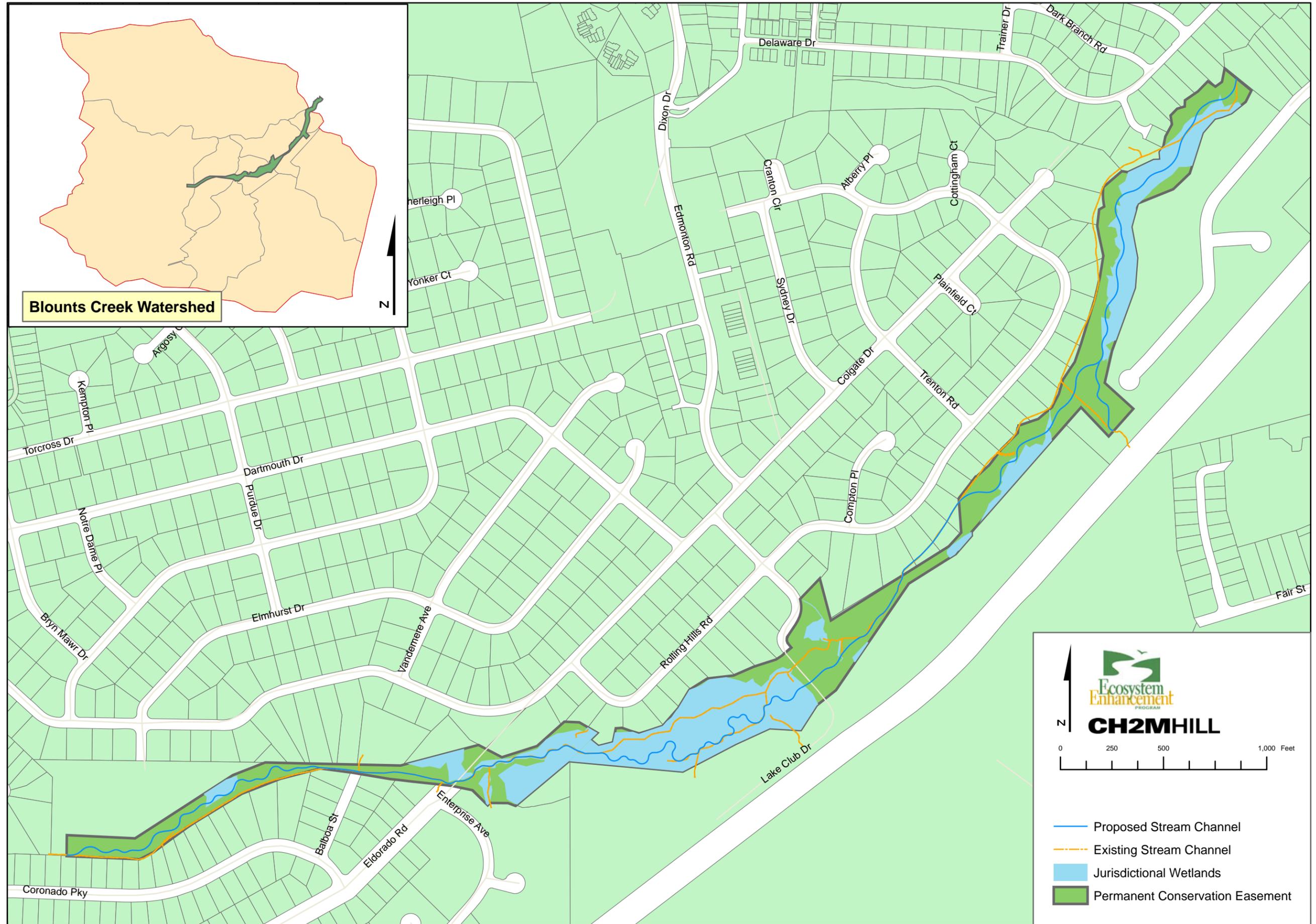
**FIGURE 1.1**  
 Project Site Vicinity Map  
 Project Number D05013 (Blounts Creek) - Cumberland County



**FIGURE 2.1**  
 Project Site Watershed Map  
 Project Number D05013 (Blounts Creek) - Cumberland County



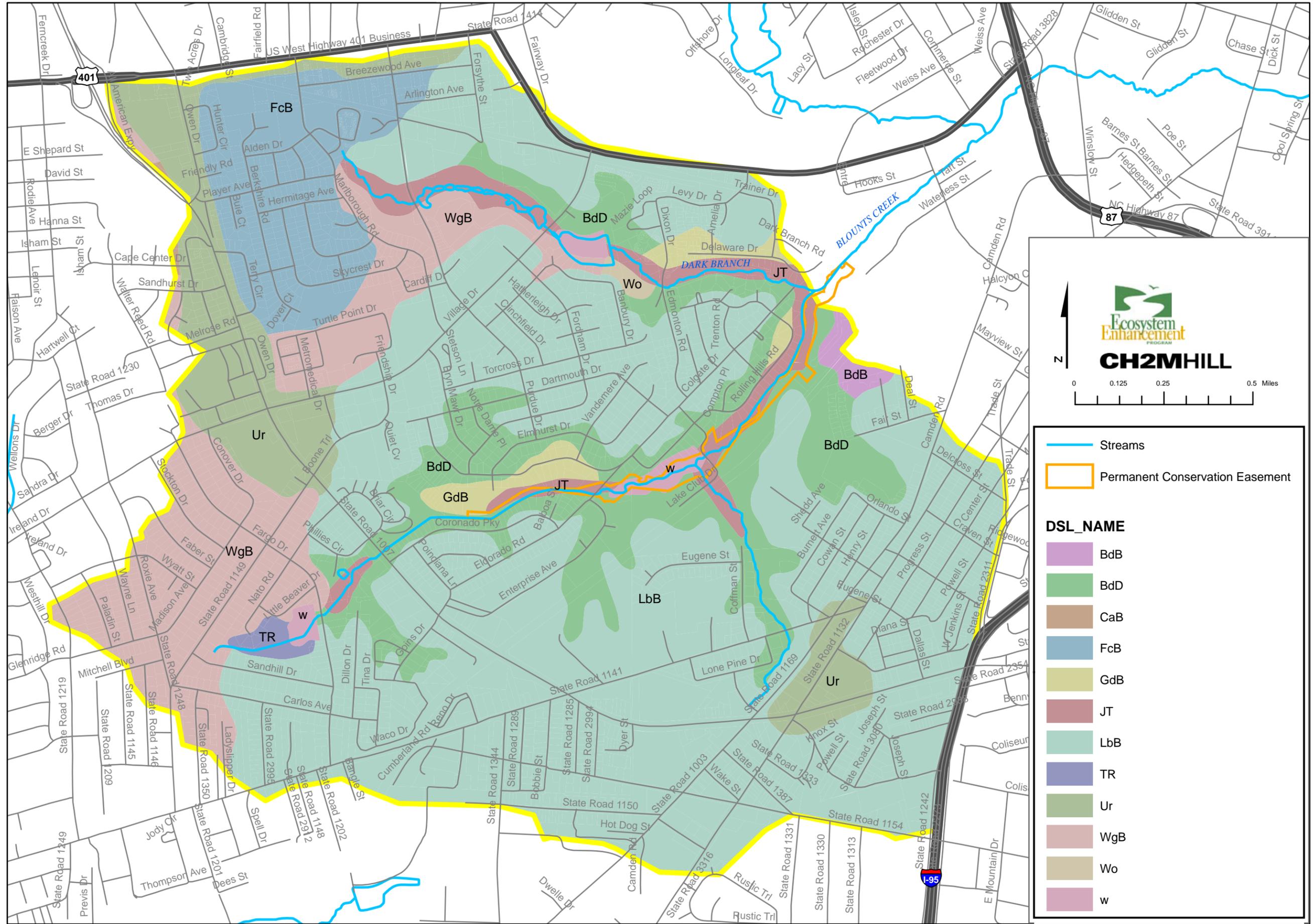
**FIGURE 2.2**  
 Project Stream Reaches  
 Project Number D05013 (Blounts Creek) - Cumberland County



**FIGURE 2.3**

Project Site Wetland Delineation map

Project Number D05013 (Blounts Creek) - Cumberland County



**FIGURE 2.4**  
Project Site NRCS Soils Map  
Project Number D05013 (Blounts Creek) - Cumberland County

# 6.0 Appendices

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**Appendix 1**  
**NCDWQ Stream Classification Forms for Blounts Creek**  
**Project Area**

# NCDWQ Stream Classification Form

Project Name: BLOWNTS CREEK River Basin: CAPE FEAR County: CUMBERLAND Evaluator: STEVE MILLER  
 DWQ Project Number: STREAM RESTORATION Nearest Named Stream: BLOWNTS CREEK Latitude: 35° 01' 48" Signature: [Signature]  
 Date: FEBRUARY 2005 USGS QUAD: FAYETTEVILLE, N.C. Longitude: 78° 54' 12" Location/Directions: BETWEEN OWEN DR, COLGATE DR, WATERLESS ST AND CSX R.R.

\*PLEASE NOTE: If evaluator and landowner agree that the feature is a man-made ditch, then use of this form is not necessary. Also, if in the best professional judgement of the evaluator, the feature is a man-made ditch and not a modified natural stream—this rating system should not be used\*

## Primary Field Indicators: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Riffle-Pool Sequence?	0	1	2	3
2) Is The USDA Texture In Streambed Different From Surrounding Terrain?	0	1	2	3
3) Are Natural Levees Present?	0	1	2	3
4) Is The Channel Sinuous?	0	1	2	3
5) Is There An Active (Or Relic) Floodplain Present?	0	1	2	3
6) Is The Channel Braided?	0	1	2	3
7) Are Recent Alluvial Deposits Present?	0	1	2	3
8) Is There A Bankfull Bench Present?	0	1	2	3
9) Is A Continuous Bed & Bank Present?	0	1	2	3
(*NOTE: If Bed & Bank Caused By Ditching And WITHOUT Sinuosity Then Score = 0*)				
10) Is A 2 <sup>nd</sup> Order Or Greater Channel (As Indicated On Topo Map And/Or In Field) Present?	Yes=3		No=0	

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: 20

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is There A Groundwater Flow/Discharge Present?	0	1	2	3

PRIMARY HYDROLOGY INDICATOR POINTS: 2

III. Biology	Absent	Weak	Moderate	Strong
1) Are Fibrous Roots Present In Streambed?	3	2	1	0
2) Are Rooted Plants Present In Streambed?	3	2	1	0
3) Is Periphyton Present?	0	1	2	3
4) Are Bivalves Present?	0	1	2	3

PRIMARY BIOLOGY INDICATOR POINTS: 9

## Secondary Field Indicators: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Head Cut Present In Channel?	0	.5	1	1.5
2) Is There A Grade Control Point In Channel?	0	.5	1	1.5
3) Does Topography Indicate A Natural Drainage Way?	0	.5	1	1.5

SECONDARY GEOMORPHOLOGY INDICATOR POINTS: 3

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is This Year's (Or Last's) Leaf litter Present In Streambed?	1.5	1	.5	0
2) Is Sediment On Plants (Or Debris) Present?	0	.5	1	1.5
3) Are Wrack Lines Present?	0	.5	1	1.5
4) Is Water In Channel And >48 Hrs. Since Last Known Rain? (*NOTE: If Ditch Indicated In #9 Above Skip This Step And #5 Below*)	0	.5	1	1.5
5) Is There Water In Channel During Dry Conditions Or In Growing Season?	0	.5	1	1.5
6) Are Hydric Soils Present In Sides Of Channel (Or In Headcut)?	Yes=1.5		No=0	

SECONDARY HYDROLOGY INDICATOR POINTS: 8

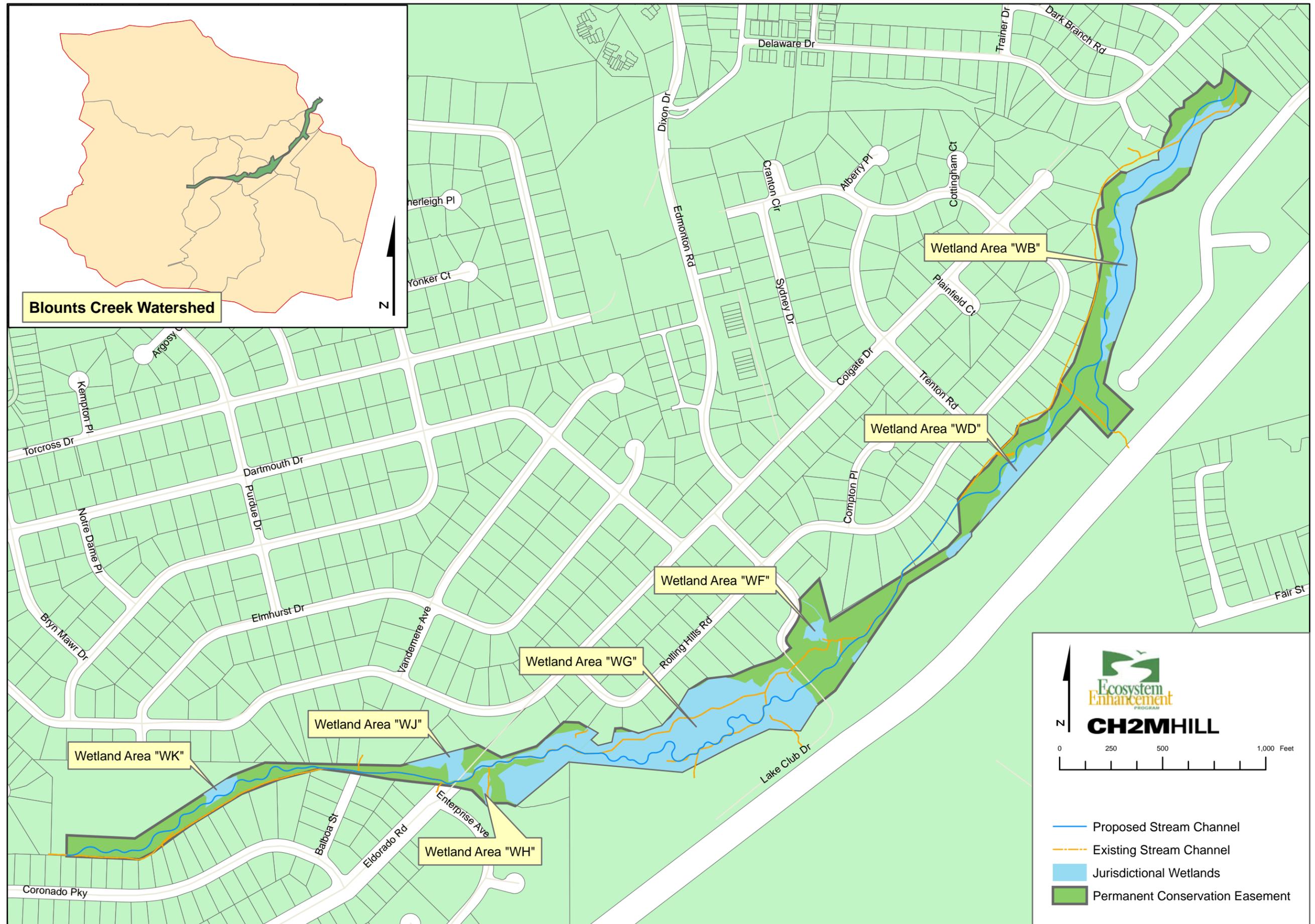
III. Biology	Absent	Weak	Moderate	Strong		
1) Are Fish Present?	0	.5	1	1.5		
2) Are Amphibians Present?	0	.5	1	1.5		
3) Are Aquatic Turtles Present?	0	.5	1	1.5		
4) Are Crayfish Present?	0	.5	1	1.5		
5) Are Macroinvertebrates Present?	0	.5	1	1.5		
6) Are Iron Oxidizing Bacteria/Fungus Present?	0	.5	1	1.5		
7) Is Filamentous Algae Present?	0	.5	1	1.5		
8) Are Wetland Plants In Streambed?	SAV 2	Mostly OBL 1	Mostly FACW .75	Mostly FAC .5	Mostly FACU 0	Mostly UPL 0

(\*NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAV Present\*)

*SECONDARY BIOLOGY INDICATOR POINTS:* 6

***TOTAL POINTS** (Primary + Secondary) = 48 (If Greater Than Or Equal To 12 Points The Stream Is At Least Intermittent)*

**Appendix 2**  
**Completed USACE Wetland Determination Forms**



**FIGURE APP 2.1**

Project Site Wetland Delineation map  
 Project Number D05013 (Blounts Creek) - Cumberland County

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Determination Manual)**

<b>Project / Site:</b> <u>Blount's Creek</u> <b>Applicant / Owner:</b> _____ <b>Investigator:</b> <u>Scott Freeman/Jaime Robinson</u>	<b>Date:</b> <u>1/17/06</u> <b>County:</b> <u>Cumberland</u> <b>State:</b> <u>NC</u>
<b>Do normal circumstances exist on the site?</b> Yes <input checked="" type="checkbox"/> No _____ <b>Is the site significantly disturbed (Atypical situation)?</b> Yes _____ No _____ <b>Is the area a potential problem area?</b> Yes _____ No _____ (explain on reverse if needed)	<b>Community ID:</b> <u>WB</u> <b>Transect ID:</b> <u>Upland</u> <b>Plot ID:</b> _____

**VEGETATION**

<u>Dominant Plant Species</u>	<u>Stratum</u>	<u>Indicator</u>	<u>Dominant Plant Species</u>	<u>Stratum</u>	<u>Indicator</u>
1. <u><i>Pinus sp.</i></u>	<u>T</u>	_____	9. _____	_____	_____
2. <u><i>Magnolia virginiana</i></u>	<u>T</u>	_____	10. _____	_____	_____
3. <u><i>Acer rubrum</i></u>	<u>T</u>	_____	11. _____	_____	_____
4. <u><i>Quercus</i></u>	<u>T</u>	_____	12. _____	_____	_____
5. <u><i>Smilax sp</i></u>	<u>V</u>	<u>FAC</u>	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

**Percent of Dominant Species that are OBL, FACW, or FAC excluding FAC-).** 1/5 = 20%

**Remarks:** Little herb layer due to season. Pine needles  
 Pine: 3 needles and whirled ~6" long

**HYDROLOGY**

<input type="checkbox"/> <b>Recorded Data (Describe In Remarks):</b> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other  <input type="checkbox"/> <b>No Recorded Data Available</b>  <b>Field Observations:</b>  <b>Depth of Surface Water:</b> <u>none</u> (in.)  <b>Depth to Free Water in Pit:</b> <u>none</u> (in.)  <b>Depth to Saturated Soil:</b> <u>3</u> (in.)	<b>Wetland Hydrology Indicators</b>  <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12" <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands  <b>Secondary Indicators:</b> <input checked="" type="checkbox"/> Oxidized Roots Channels in Upper 12" <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Remarks:</b>   	

**SOILS**

**Map Unit Name**

(Series and Phase): Blaney B<sub>d</sub>D/B<sub>d</sub>B **Drainage Class:** Well Drained

**Taxonomy (Subgroup):** Arenic Hapludult

**Confirm**

**Mapped Type? Yes** X **No** \_\_\_\_\_

**Profile Description:**

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2	O				Loam
1-8	A	10YR 3/1			Clayey Sand
8-12	B	2.5 YR 5/2			Clayey Sand

**Hydric Soil Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Histosol                               | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon                        | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor                          | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime                  | <input type="checkbox"/> Listed On Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions                    | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

**Remarks:**

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampling Point	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soils Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

**Remarks:**

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Determination Manual)**

<b>Project / Site:</b> <u>Blount's Creek</u> <b>Applicant / Owner:</b> _____ <b>Investigator:</b> <u>Scott Freeman/Jaime Robinson</u>	<b>Date:</b> <u>1/17/06</u> <b>County:</b> <u>Cumberland</u> <b>State:</b> <u>NC</u>
<b>Do normal circumstances exist on the site?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <b>Is the site significantly disturbed (Atypical situation)?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> <b>Is the area a potential problem area?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (explain on reverse if needed)	<b>Community ID:</b> <u>WB</u> <b>Transect ID:</b> <u>Wetland</u> <b>Plot ID:</b> _____

**VEGETATION**

<u>Dominant Plant Species</u>	<u>Stratum</u>	<u>Indicator</u>	<u>Dominant Plant Species</u>	<u>Stratum</u>	<u>Indicator</u>
1. <u><i>Acer rubrum</i></u>	<u>T</u>	<u>FAC</u>	9. _____	_____	_____
2. <u><i>Foresteria</i></u>	<u>S</u>	_____	10. _____	_____	_____
3. <u><i>Carpinus Caroliniana</i></u>	<u>S</u>	<u>FAC</u>	11. _____	_____	_____
4. <u><i>Magnolia virginiana</i></u>	<u>S</u>	<u>FACW+</u>	12. _____	_____	_____
5. <u><i>Smilax rotundiflora</i></u>	<u>V</u>	<u>FAC</u>	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

**Percent of Dominant Species that are OBL, FACW, or FAC excluding FAC-).** 4/5 = 80%

**Remarks:** Little herb layer due to season and pine needle build up

**HYDROLOGY**

<p>___ <b>Recorded Data (Describe In Remarks):</b></p> <p style="padding-left: 20px;">___ Stream, Lake, or Tide Gauge</p> <p style="padding-left: 20px;">___ Aerial Photographs</p> <p style="padding-left: 20px;">___ Other</p> <p><input checked="" type="checkbox"/> <b>No Recorded Data Available</b></p> <p><b>Field Observations:</b></p> <p style="padding-left: 20px;"><b>Depth of Surface Water:</b> <u>0-2</u> (in.)</p> <p style="padding-left: 20px;"><b>Depth to Free Water in Pit:</b> <u>2</u> (in.)</p> <p style="padding-left: 20px;"><b>Depth to Saturated Soil:</b> <u>0</u> (in.)</p>	<p><b>Wetland Hydrology Indicators</b></p> <p><b>Primary Indicators:</b></p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12"</p> <p><input checked="" type="checkbox"/> Water Marks</p> <p>___ Drift Lines</p> <p>___ Sediment Deposits</p> <p>___ Drainage Patterns in Wetlands</p> <p><b>Secondary Indicators:</b></p> <p><input checked="" type="checkbox"/> Oxidized Roots Channels in Upper 12"</p> <p><input checked="" type="checkbox"/> Water-Stained Leaves</p> <p>___ Local Soil Survey Data</p> <p>___ FAC-Neutral Test</p> <p>___ Other (Explain in Remarks)</p>
<p><b>Remarks:</b></p>	

**SOILS**

**Map Unit Name****(Series and Phase):** Johnston/Blaney JT/BdD **Drainage Class:** WellDrained**Taxonomy (Subgroup):** Cumulic Humaquepts **Confirm Mapped Type? Yes**  **No** **Profile Description:**

<b>Depth (inches)</b>	<b>Horizon</b>	<b>Matrix Colors (Munsell Moist)</b>	<b>Mottle Colors (Munsell Moist)</b>	<b>Mottle Abundance/Contrast</b>	<b>Texture, Concretions, Structure, etc.</b>
<u>0-1</u>	<u>O</u>	<u></u>	<u></u>	<u></u>	<u>Loam</u>
<u>1-6</u>	<u>A</u>	<u>10 YR 2/1</u>	<u></u>	<u></u>	<u>Sandy Loam</u>
<u>6-12</u>	<u>B</u>	<u>10 YR 5/1</u>	<u></u>	<u></u>	<u>Clayey Sand</u>
<u></u>	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>
<u></u>	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>
<u></u>	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>
<u></u>	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>
<u></u>	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>

**Hydric Soil Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Histosol                               | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon                        | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor                          | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime                  | <input type="checkbox"/> Listed On Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions                    | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

**Remarks:**

N 35 02.288  
W 78 54.174  
Near WB 107

**WETLAND DETERMINATION**

<b>Hydrophytic Vegetation Present?</b>	<b>Yes</b> <input checked="" type="checkbox"/> <b>No</b> <input type="checkbox"/>	<b>Is the Sampling Point</b>
<b>Wetland Hydrology Present?</b>	<b>Yes</b> <input checked="" type="checkbox"/> <b>No</b> <input type="checkbox"/>	<b>Within a Wetland?</b> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b> <input type="checkbox"/>
<b>Hydric Soils Present?</b>	<b>Yes</b> <input checked="" type="checkbox"/> <b>No</b> <input type="checkbox"/>	

**Remarks:**

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Determination Manual)**

<b>Project / Site:</b> <u>Blount's Creek</u> <b>Applicant / Owner:</b> _____ <b>Investigator:</b> <u>Scott Freeman/Jaime Robinson</u>	<b>Date:</b> <u>1/19/06</u> <b>County:</b> <u>Cumberland</u> <b>State:</b> <u>NC</u>
Do normal circumstances exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Is the site significantly disturbed (Atypical situation)? Yes _____ No <input checked="" type="checkbox"/> Is the area a potential problem area? Yes _____ No <input checked="" type="checkbox"/> (explain on reverse if needed)	<b>Community ID:</b> <u>WD</u> <b>Transect ID:</b> _____ <b>Plot ID:</b> <u>Wetland</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Acer rubrum</u>	<u>T</u>	<u>FACW</u>	9. _____	_____	_____
2. <u>Nyssa sylvatica</u>	<u>T</u>	<u>FAC</u>	10. _____	_____	_____
3. <u>Pinus taeda</u>	<u>S</u>	<u>FAC</u>	11. _____	_____	_____
4. <u>Arundinaria gigantea</u>	<u>H</u>	<u>FACW</u>	12. _____	_____	_____
5. <u>Smilax</u>	<u>V</u>	<u>OBL</u>	13. _____	_____	_____
6. <u>Smilax lauriflora</u>	<u>V</u>	<u>FACW+</u>	14. _____	_____	_____
7. <u>Nyssa sylvatica</u>	<u>S</u>	<u>FAC</u>	15. _____	_____	_____
8. <u>Fern Unknown</u>	_____	_____	16. _____	_____	_____

**Percent of Dominant Species that are OBL, FACW, or FAC excluding FAC-).** 7/8 = 88%

**Remarks:** Portions logged less than ten years ago. Little herb layer due to season

**HYDROLOGY**

<p>___ Recorded Data (Describe In Remarks):          ___ Stream, Lake, or Tide Gauge          ___ Aerial Photographs          ___ Other</p> <p>___ No Recorded Data Available</p> <p><b>Field Observations:</b></p> <p>Depth of Surface Water: <u>none</u> (in.)</p> <p>Depth to Free Water in Pit: <u>1</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	<p><b>Wetland Hydrology Indicators</b></p> <p><b>Primary Indicators:</b>          ___ Inundated  <input checked="" type="checkbox"/> Saturated in Upper 12"          ___ Water Marks          ___ Drift Lines          ___ Sediment Deposits  <input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p><b>Secondary Indicators:</b>          ___ Oxidized Roots Channels in Upper 12"  <input checked="" type="checkbox"/> Water-Stained Leaves          ___ Local Soil Survey Data          ___ FAC-Neutral Test          ___ Other (Explain in Remarks)</p>
<b>Remarks:</b> .	

**SOILS**

**Map Unit Name**

(Series and Phase): Blaney BdD **Drainage Class:** Well Drained

**Taxonomy (Subgroup):** Arenic Hapludult

**Confirm**

**Mapped Type?** Yes \_\_\_\_\_ No X

**Profile Description:**

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1					Loam
1-12		10 YR 2/1			Muck/Loam

**Hydric Soil Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Histosol                               | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon                        | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor                          | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime                  | <input type="checkbox"/> Listed On Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions                    | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

**Remarks:**

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampling Point	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	Within a Wetland?	Yes <u>X</u> No _____
Hydric Soils Present?	Yes <u>X</u>	No _____		
<b>Remarks:</b> Near WD 126				

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Determination Manual)**

<b>Project / Site:</b> <u>Blount's Creek</u> <b>Applicant / Owner:</b> _____ <b>Investigator:</b> <u>Scott Freeman/Adam Sharpe</u>	<b>Date:</b> <u>1/20/06</u> <b>County:</b> <u>Cumberland</u> <b>State:</b> <u>NC</u>
Do normal circumstances exist on the site? Yes _____ No <u>X</u> Is the site significantly disturbed (Atypical situation)? Yes _____ No <u>X</u> Is the area a potential problem area? Yes <u>X</u> No _____ (explain on reverse if needed)	<b>Community ID:</b> <u>WF</u> <b>Transect ID:</b> _____ <b>Plot ID:</b> <u>Wetland</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u><i>Pinus taeda</i></u>	<u>T</u>	<u>FAC</u>	9. _____	_____	_____
2. <u><i>Smilax lauriflora</i></u>	<u>V</u>	<u>FACW+</u>	10. _____	_____	_____
3. <u><i>Acer rubrum</i></u>	<u>T</u>	<u>FACW</u>	11. _____	_____	_____
4. <u><i>Ligustrum sinense</i></u>	<u>S</u>	<u>FAC</u>	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW, or FAC excluding FAC-. 4/4 = 100%

Remarks: ...Little herb layer due to season

**HYDROLOGY**

<p>___ Recorded Data (Describe In Remarks):          ___ Stream, Lake, or Tide Gauge          ___ Aerial Photographs          ___ Other</p> <p>___ No Recorded Data Available</p> <p><b>Field Observations:</b></p> <p>Depth of Surface Water: <u>none</u> (in.)</p> <p>Depth to Free Water in Pit: <u>6</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	<p><b>Wetland Hydrology Indicators</b></p> <p><b>Primary Indicators:</b></p> <p>___ Inundated  <u>X</u> Saturated in Upper 12"          ___ Water Marks          ___ Drift Lines          ___ Sediment Deposits          ___ Drainage Patterns in Wetlands</p> <p><b>Secondary Indicators:</b></p> <p><u>X</u> Oxidized Roots Channels in Upper 12"          ___ Water-Stained Leaves          ___ Local Soil Survey Data          ___ FAC-Neutral Test          ___ Other (Explain in Remarks)</p>
Remarks: .	

**SOILS**

**Map Unit Name**

(Series and Phase): Johnston JT **Drainage Class:** Poorly Drained

**Taxonomy (Subgroup):** Cumulic Humaquepts **Confirm Mapped Type? Yes**  **No**

**Profile Description:**

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5		7.5 YR 3/1			Clayey Loam
5-12		7.5 YR 4/1	2.5 Y 6/3	Common distinct	Sandy Loam

**Hydric Soil Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Histosol                               | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon                        | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor                          | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime                  | <input type="checkbox"/> Listed On Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions                    | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

**Remarks:**

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampling Point Within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Hydric Soils Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
<b>Remarks:</b>			
N 35 01.754 W 78 54.501			

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Determination Manual)**

<b>Project / Site:</b> <u>Blount's Creek</u> <b>Applicant / Owner:</b> _____ <b>Investigator:</b> <u>Scott Freeman/Adam Sharpe</u>	<b>Date:</b> <u>1/20/06</u> <b>County:</b> <u>Cumberland</u> <b>State:</b> <u>NC</u>
<b>Do normal circumstances exist on the site?</b> Yes _____ No _____ <b>Is the site significantly disturbed (Atypical situation)?</b> Yes _____ No _____ <b>Is the area a potential problem area?</b> Yes _____ No _____ (explain on reverse if needed)	<b>Community ID:</b> <u>WG</u> <b>Transect ID:</b> _____ <b>Plot ID:</b> <u>Wetland 400</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Arundinaria gigantea</u>	<u>S</u>	<u>FACW</u>	9. _____	_____	_____
2. <u>Ligustrum sinense</u>	<u>S</u>	<u>FAC</u>	10. _____	_____	_____
3. <u>Smilax sp.</u>	<u>V</u>	<u>OBL</u>	11. _____	_____	_____
4. <u>Magnolia virginiana</u>	<u>S</u>	<u>FACW+</u>	12. _____	_____	_____
5. <u>Magnolia virginiana</u>	<u>T</u>	<u>FACW+</u>	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW, or FAC excluding FAC-). 5/5 = 100%

Remarks: ...Little herb layer due to season

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe In Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other  <input type="checkbox"/> No Recorded Data Available  <b>Field Observations:</b>  Depth of Surface Water: <u>none</u> (in.)  Depth to Free Water in Pit: <u>0</u> (in.)  Depth to Saturated Soil: <u>0</u> (in.)	<b>Wetland Hydrology Indicators</b>  <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12" <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands  <b>Secondary Indicators:</b> <input checked="" type="checkbox"/> Oxidized Roots Channels in Upper 12" <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Remarks: .	

**SOILS**

**Map Unit Name**

(Series and Phase): Blaney BdD **Drainage Class:** Well Drained

**Taxonomy (Subgroup):** Arenic Hapludult

**Confirm**

**Mapped Type?** Yes \_\_\_\_\_ **No** X \_\_\_\_\_

**Profile Description:**

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	A	5 YR 2.5/1			Loam
1-5		7.5 YR 3/1			Loamy Sand
5-12		5 YR 5/1			Sand

**Hydric Soil Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Histosol                               | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon                        | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor                          | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime                  | <input type="checkbox"/> Listed On Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions                    | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

**Remarks:**

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampling Point	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	Within a Wetland?	Yes <u>X</u> No _____
Hydric Soils Present?	Yes <u>X</u>	No _____		
<b>Remarks:</b>				
Near WG 412				

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Determination Manual)**

<b>Project / Site:</b> <u>Blount's Creek</u> <b>Applicant / Owner:</b> _____ <b>Investigator:</b> <u>Scott Freeman/Adam Sharpe</u>	<b>Date:</b> <u>1/20/06</u> <b>County:</b> <u>Cumberland</u> <b>State:</b> <u>NC</u>
Do normal circumstances exist on the site? Yes <input checked="" type="checkbox"/> No _____ Is the site significantly disturbed (Atypical situation)? Yes _____ No <input checked="" type="checkbox"/> Is the area a potential problem area? Yes _____ No <input checked="" type="checkbox"/> (explain on reverse if needed)	<b>Community ID:</b> <u>WG</u> <b>Transect ID:</b> _____ <b>Plot ID:</b> <u>Main</u> <u>Wetland</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Typha</u>	<u>S</u>	<u>OBL</u>	9. _____	_____	_____
2. <u>Juncus</u>	<u>H</u>	<u>OBL</u>	10. _____	_____	_____
3. <u>Salix nigra</u>	<u>S</u>	<u>OBL</u>	11. _____	_____	_____
4. <u>Microstegium vimineum</u>	<u>H</u>	<u>FAC+</u>	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW, or FAC excluding FAC-. 4/4 = 100%

Remarks: Little herbs due to season.

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe In Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other  <input type="checkbox"/> No Recorded Data Available  <b>Field Observations:</b>  Depth of Surface Water: <u>none</u> (in.)  Depth to Free Water in Pit: <u>0</u> (in.)  Depth to Saturated Soil: <u>0</u> (in.)	<b>Wetland Hydrology Indicators</b>  <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12" <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands  <b>Secondary Indicators:</b> <input type="checkbox"/> Oxidized Roots Channels in Upper 12" <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Remarks: _____	

**SOILS**

**Map Unit Name**

**(Series and Phase):** Johnston / Water **Drainage Class:** Poorly Drained

**Taxonomy (Subgroup):** Cumulic Humaquepts **Confirm Mapped Type? Yes** **No**

**Profile Description:**

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O				Loam
1-6	A	10 YR 3/1			Loamy Clay
6-12		2.5 Y 7/1			Sandy

**Hydric Soil Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Histosol                               | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon                        | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor                          | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime                  | <input type="checkbox"/> Listed On Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions                    | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

**Remarks:**

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampling Point Within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Hydric Soils Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
<b>Remarks:</b>			

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Determination Manual)**

<b>Project / Site:</b> <u>Blounts Creek</u> <b>Applicant / Owner:</b> _____ <b>Investigator:</b> <u>Scott Freeman/Jaime Robinson</u>	<b>Date:</b> <u>1-17-06</u> <b>County:</b> <u>Cumberland</u> <b>State:</b> <u>NC</u>
Do normal circumstances exist on the site? Yes _____ No _____ Is the site significantly disturbed (Atypical situation)? Yes _____ No _____ Is the area a potential problem area? Yes _____ No _____ (explain on reverse if needed)	<b>Community ID:</b> <u>WH</u> <b>Transect ID:</b> <u>Wetland</u> <b>Plot ID:</b> <u>   </u>

**VEGETATION**

<u>Dominant Plant Species</u>	<u>Stratum</u>	<u>Indicator</u>	<u>Dominant Plant Species</u>	<u>Stratum</u>	<u>Indicator</u>
1. _____	_____	_____	9. _____	_____	_____
2. _____	_____	_____	10. _____	_____	_____
3. _____	_____	_____	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW, or FAC excluding FAC-). \_\_\_\_\_

**Remarks:**  
 A Wetland determination form was not completed for this area fo is was determinfd in field to be equivalent to wetland area "WF"

**HYDROLOGY**

<input type="checkbox"/> <b>Recorded Data (Describe In Remarks):</b> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other  <input type="checkbox"/> <b>No Recorded Data Available</b>  <b>Field Observations:</b>  Depth of Surface Water: _____(in.)  Depth to Free Water in Pit: _____(in.)  Depth to Saturated Soil: _____(in.)	<b>Wetland Hydrology Indicators</b>  <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12" <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands  <b>Secondary Indicators:</b> <input type="checkbox"/> Oxidized Roots Channels in Upper 12" <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Remarks:</b>  _____  _____	

**SOILS**

Map Unit Name  
(Series and Phase): \_\_\_\_\_ Drainage Class: \_\_\_\_\_

Taxonomy (Subgroup): \_\_\_\_\_ Confirm Mapped Type? Yes \_\_\_ No \_\_\_

**Profile Description:**

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

**Hydric Soil Indicators:**

- |  |   |
|--|---|
| <input type="checkbox"/> Histosol                    | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon             | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor               | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime       | <input type="checkbox"/> Listed On Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions         | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

Remarks:

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?	Yes ___ No ___	Is the Sampling Point	
Wetland Hydrology Present?	Yes ___ No ___	Within a Wetland?	Yes ___ No ___
Hydric Soils Present?	Yes ___ No ___		

Remarks:

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Determination Manual)**

<b>Project / Site:</b> <u>Blount's Creek</u> <b>Applicant / Owner:</b> _____ <b>Investigator:</b> <u>Scott Freeman/Jaime Robinson</u>	<b>Date:</b> <u>1/23/06</u> <b>County:</b> <u>Cumberland</u> <b>State:</b> <u>NC</u>
Do normal circumstances exist on the site? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Is the site significantly disturbed (Atypical situation)? Yes _____ No <input checked="" type="checkbox"/> Is the area a potential problem area? Yes _____ No <input checked="" type="checkbox"/> (explain on reverse if needed)	<b>Community ID:</b> <u>WJ</u> <b>Transect ID:</b> _____ <b>Plot ID:</b> <u>Upland</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Ligustrum sinense</u>	_____	<u>FAC</u>	9. _____	_____	_____
2. <u>Pinus taeda</u>	_____	<u>FAC</u>	10. _____	_____	_____
3. <u>Arundinaria gigantea</u>	_____	<u>FACW</u>	11. _____	_____	_____
4. <u>Smilax laurifoli</u>	_____	<u>FACW+</u>	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW, or FAC excluding FAC-. 4/4 = 100%

Remarks:

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe In Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other  <input type="checkbox"/> No Recorded Data Available  <b>Field Observations:</b>  Depth of Surface Water: <u>none</u> (in.)  Depth to Free Water in Pit: <u>12+</u> (in.)  Depth to Saturated Soil: <u>0</u> (in.)	<b>Wetland Hydrology Indicators</b>  <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12" <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands  <b>Secondary Indicators:</b> <input checked="" type="checkbox"/> Oxidized Roots Channels in Upper 12" <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Remarks:</b> Rained within last 24 hours	

**SOILS**

**Map Unit Name**

**(Series and Phase):** Johnston JT **Drainage Class:** Poorly Drained

**Taxonomy (Subgroup):** Cumulic Humaquepts **Confirm Mapped Type? Yes\_ No\_ X**

**Profile Description:**

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3		10YR 3/2			Loamy Clay
3-9		10 YR 3/1			Sandy Clay
9-12		10 YR 6/2			Clayey Sand

**Hydric Soil Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Histosol                               | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon                        | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor                          | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime                  | <input type="checkbox"/> Listed On Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions                    | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

**Remarks:**

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u>    </u>	Is the Sampling Point	
Wetland Hydrology Present?	Yes <u>X</u>	No <u>    </u>	Within a Wetland?	Yes <u>    </u> No <u>X</u>
Hydric Soils Present?	Yes <u>X</u>	No <u>    </u>		
<b>Remarks:</b> Saturation in upper 12" was due to recent rains and not persistent hydrology				

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Determination Manual)**

<b>Project / Site:</b> <u>Blount's Creek</u> <b>Applicant / Owner:</b> _____ <b>Investigator:</b> <u>Scott Freeman/Adam Sharpe</u>	<b>Date:</b> <u>1/23/06</u> <b>County:</b> <u>Cumberland</u> <b>State:</b> <u>NC</u>
<b>Do normal circumstances exist on the site?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <b>Is the site significantly disturbed (Atypical situation)?</b> Yes _____ No <input checked="" type="checkbox"/> <b>Is the area a potential problem area?</b> Yes _____ No <input checked="" type="checkbox"/> (explain on reverse if needed)	<b>Community ID:</b> <u>WJ</u> <b>Transect ID:</b> _____ <b>Plot ID:</b> <u>Wetland</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Smilax laurifolia</u>	<u>V</u>	<u>FACW+</u>	9. _____	_____	_____
2. <u>Arundinaria gigantea</u>	<u>H</u>	<u>FACW</u>	10. _____	_____	_____
3. <u>Magnolia virginiana</u>	<u>S</u>	<u>FACW+</u>	11. _____	_____	_____
4. <u>Nyssa silvatica</u>	<u>T</u>	<u>FAC</u>	12. _____	_____	_____
5. <u>Lonicera japonica</u>	<u>S</u>	<u>FAC -</u>	13. _____	_____	_____
6. <u>Pinus taeda</u>	<u>T</u>	<u>FAC</u>	14. _____	_____	_____
7. <u>Magnolia virginiana</u>	<u>T</u>	<u>FACW+</u>	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW, or FAC excluding FAC-). 6/7 = 86%

**Remarks:** Little herbs due to season.

**HYDROLOGY**

<input type="checkbox"/> <b>Recorded Data (Describe In Remarks):</b> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other  <input type="checkbox"/> <b>No Recorded Data Available</b>  <b>Field Observations:</b>  <b>Depth of Surface Water:</b> <u>none</u> (in.)  <b>Depth to Free Water in Pit:</b> <u>1</u> (in.)  <b>Depth to Saturated Soil:</b> <u>0</u> (in.)	<b>Wetland Hydrology Indicators</b>  <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12" <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands  <b>Secondary Indicators:</b> <input type="checkbox"/> Oxidized Roots Channels in Upper 12" <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
--	--

**Remarks:** Pockets of standing water. Rained within last 24 hours

**SOILS**

**Map Unit Name**

(Series and Phase): Johnston JT **Drainage Class:** Poorly Drained

**Taxonomy (Subgroup):** Cumulic Humaquepts **Confirm Mapped Type? Yes** X **No**     

**Profile Description:**

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	A	7.5 YR 3/2			Loam
1-12		10 YR 2/1			Clayey Loam

**Hydric Soil Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Histosol                               | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon                        | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor                          | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime                  | <input type="checkbox"/> Listed On Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions                    | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

Remarks:

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u>    </u>	Is the Sampling Point
Wetland Hydrology Present?	Yes <u>X</u>	No <u>    </u>	Within a Wetland? Yes <u>X</u> No <u>    </u>
Hydric Soils Present?	Yes <u>X</u>	No <u>    </u>	
Remarks:			
Near WJ 105			

**DATA FORM**  
**ROUTINE WETLAND DETERMINATION**  
**(1987 COE Wetlands Determination Manual)**

<b>Project / Site:</b> <u>Blounts Creek</u> <b>Applicant / Owner:</b> _____ <b>Investigator:</b> <u>Scott Freeman/Jaime Robinson</u>	<b>Date:</b> <u>1-17-06</u> <b>County:</b> <u>Cumberland</u> <b>State:</b> <u>NC</u>
Do normal circumstances exist on the site? Yes _____ No _____ Is the site significantly disturbed (Atypical situation)? Yes _____ No _____ Is the area a potential problem area? Yes _____ No _____ (explain on reverse if needed)	<b>Community ID:</b> <u>WK</u> <b>Transect ID:</b> <u>Wetland</u> <b>Plot ID:</b> <u>   </u>

**VEGETATION**

<u>Dominant Plant Species</u>	<u>Stratum</u>	<u>Indicator</u>	<u>Dominant Plant Species</u>	<u>Stratum</u>	<u>Indicator</u>
1. _____	_____	_____	9. _____	_____	_____
2. _____	_____	_____	10. _____	_____	_____
3. _____	_____	_____	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW, or FAC excluding FAC-). \_\_\_\_\_

**Remarks:**  
 A Wetland determination form was not completed for this area fo is was determinfd in field to be equivalent to wetland area "WJ"

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe In Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other  <input type="checkbox"/> No Recorded Data Available  <b>Field Observations:</b>  Depth of Surface Water: _____(in.)  Depth to Free Water in Pit: _____(in.)  Depth to Saturated Soil: _____(in.)	<b>Wetland Hydrology Indicators</b>  <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12" <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands  <b>Secondary Indicators:</b> <input type="checkbox"/> Oxidized Roots Channels in Upper 12" <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Remarks:</b>	

**SOILS**

Map Unit Name  
(Series and Phase): \_\_\_\_\_ Drainage Class: \_\_\_\_\_

Taxonomy (Subgroup): \_\_\_\_\_ Confirm Mapped Type? Yes \_\_\_ No \_\_\_

**Profile Description:**

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

**Hydric Soil Indicators:**

- |  |   |
|--|---|
| <input type="checkbox"/> Histosol                    | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon             | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor               | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime       | <input type="checkbox"/> Listed On Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions         | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

Remarks:

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present?	Yes ___ No ___	Is the Sampling Point	
Wetland Hydrology Present?	Yes ___ No ___	Within a Wetland?	Yes ___ No ___
Hydric Soils Present?	Yes ___ No ___		

Remarks: