



# Prospectus

July 20, 2015

## Falling Creek Mitigation Site

Wayne County, NC

Neuse River Basin

HUC 03020201

USACE Action ID No. 2015-00940

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### **PREPARED BY:**

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**July 20, 2015**

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# **Falling Creek Mitigation Bank**

## **Prospectus**

Wildlands Holdings III, LLC. ("Sponsor") proposes to develop the Falling Creek Mitigation Bank ("Bank"). Wildlands Holdings III, LLC is wholly owned by Wildlands Engineering, Inc. (Wildlands) and was developed for the sole purpose of holding the proposed Bank. The Bank will be planned and designed in one phase encompassing land along Falling Creek and multiple tributaries on ten parcels in Wayne County, NC. The purpose of the Bank is to provide stream and wetland mitigation credits to compensate for impacts to Waters of the United States and/or State Waters within the service area, Hydrologic Unit 03020201 (Neuse 01), as depicted in Figure 1.

### **1.0 MITIGATION BANK INTRODUCTION AND OBJECTIVES**

#### **1.1 Introduction**

The 260 acre Bank is located on lands that have been historically utilized for livestock production including cattle and hogs. Landuse at the Bank has remained essentially unchanged since at least 1959 based on review of historic aerial photographs (Appendix A). Cattle have direct access to all stream and wetland features on the property with the exception of the areas designated for preservation. The streams range from ditched and straightened channels with significant bank erosion and mass wasting to streams with near reference condition dimension and pattern but significant cattle impacts. Wetlands have been degraded due to ditching, stream channelization, and livestock trampling.

The Sponsor proposes to restore 16,585 linear feet (LF), enhance 6,974 LF, and preserve 7,735 LF of perennial and intermittent stream channels, and to rehabilitate 19.3 acres, reestablish 11.2 acres, enhance 7.0 acres and preserve 173.8 acres of riparian wetlands. The bank will also include the reestablishment and protection of riparian buffers throughout the site and the incorporation of Best Management Practices to treat runoff from agricultural fields.

#### **1.2 Bank Location**

The proposed Bank (35.2667° N, 78.1881 °W) is located in southern Wayne County, NC approximately 9.5 miles northeast of Newton Grove and 8.5 miles northwest of Mt. Olive (Figure 2). The Bank is within the 14-digit Hydrologic Unit Code (HUC) 03020201170010 and the NC DWQ Subbasin 03-04-12.

To get to the Bank from Raleigh, NC take I-40 east approximately 42 miles to Exit 341 for NC 50/55. Turn left on NC 50/55 towards Newton Grove and continue for approximately one mile. At the traffic circle, take the fourth exit onto US 13 North and continue for approximately four miles. Turn right on Dobbersville Road and continue for approximately one mile. Turn left on Raynor Mill Road and continue for approximately one mile. Turn left on Corbett Hill Road and the site will be on the left in approximately one mile.

#### **1.3 Goals and Objectives**

The proposed stream, wetland, and riparian buffer mitigation project described above will provide numerous ecological benefits within the Neuse River Basin. Project benefits range from being site



specific (e.g. local aquatic and terrestrial habitat) to those that impact the watershed as a whole (e.g. reduction in nutrient and sediment loads).

The project goals and related objectives are described in Table 1. Project goals are desired project outcomes and are verifiable through visual assessment and/or measurement. Objectives are activities that will result in the accomplishment of goals. The project will be monitored after construction to demonstrate success. A detailed monitoring program will be described in the draft Mitigation Plan.

**TABLE 1. Mitigation Goals and Objectives**  
*Falling Creek Mitigation Site*

Goal	Objective	Expected Outcomes
Exclude cattle from project streams	Install fencing around conservation easements adjacent to cattle pastures	Reduce pollutant inputs including fecal coliform, nitrogen, and phosphorous.
Stabilize eroding stream banks	Reconstruct stream channels with stable dimensions. Add bank revetments and in-stream structures to protect restored/enhanced streams.	Reduce inputs of sediment into streams.
Construct stream channels with that are laterally and vertical stable	Construct stream channels that will maintain a stable pattern and profile considering the hydrologic and sediment inputs to the system, the landscape setting, and the watershed conditions.	Return a network of streams to a stable form that is capable of supporting hydrologic, biologic, and water quality functions.
Improve instream habitat	Install habitat features such as constructed riffles and brush toes into restored/enhanced streams. Add woody materials to channel beds. Construct pools of varying depth.	Improve aquatic communities in project streams.
Reconnect channels with floodplains so that floodplains are inundated relatively frequently	Reconstructing stream channels with appropriate bankfull dimensions and depth relative to the existing floodplain.	Raise local groundwater elevations. Inundate floodplain wetlands and vernal pools. Reduce shear stress on channels during larger flow events.
Restore and enhance native floodplain forest	Plant native tree and understory species in riparian zone	Create and improve forested riparian habitats. Provide a canopy to shade streams and reduce thermal loadings. Create a source of woody inputs for streams. Reduce flood flow velocities on floodplain and allow pollutants and sediment to settle.
Permanently protect the project site from harmful uses.	Establish a conservation easement on the site.	Ensure that development and agricultural uses that would damage the site or reduce the benefits of project are prevented.

## 1.4 Qualifications of Bank Sponsor

Wildlands Holdings III, LLC., the Bank Sponsor, proposes to develop the Falling Creek Mitigation Bank. Wildlands Holdings III, LLC is wholly owned by Wildlands Engineering, Inc. and was developed for the sole purpose of holding the proposed Bank. Wildlands Engineering, Inc. is a multidisciplinary group of professionals that bring together the expertise necessary to create outstanding ecological restoration projects in a timely and cost effective manner. To execute stream, wetland, and riparian buffer mitigation projects, Wildlands assembles a team of project specific subcontractors to perform surveying, construction services, and planting. Each of these subcontractors has substantial experience in stream and buffer restoration in North Carolina and a substantial full time professional staff presence in North Carolina. For this project, Wildlands will serve as both the **Bank Sponsor** and **Authorized Agent**.

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## 2.0 ESTABLISHMENT AND OPERATION OF MITIGATION BANK

### 2.1 Ownership Agreements and Long-Term Strategy

The Bank Sponsor has signed option agreements with each of the landowners to record conservation easements on all land proposed as the Bank. Upon completion of the review process for the bank prospectus, the Sponsor will submit a detailed mitigation plan and mitigation banking instrument for the site. The instrument will provide detailed information regarding bank operation including the long term management of the site. Once the final mitigation plan is approved and the accompanying instrument executed by members of the Interagency Review Team (IRT), the Sponsor will record conservation easements on the Bank site.

The provider for long term management of the site is anticipated to be Unique Places to Save (UP2Save). UP2Save is a 501C3 nonprofit committed to land conservation through conservation planning and management. The funding mechanism for long term management will be a stewardship endowment funded by Wildlands. Contact information for UP2Save is listed below.

Unique Places to Save  
206 Causeway Drive #206  
Wrightsville Beach, NC 28480  
Phone: (910)707-3622  
Email: [info@uniqueplacestosave.org](mailto:info@uniqueplacestosave.org)

### 2.2 Landowners Information

The Bank is located on several adjacent parcels in Mount Olive, NC. Table 2 lists the landowner's name, parcel identification number, deed book, page number, and landowner's address associated with each parcel. Landowner authorization forms can be found in Appendix E.



**TABLE 2. Landowner Information**  
Falling Creek Mitigation Bank

Landowner	PIN	County	Deed Book and Page Number	Address
Edison Rose Grady	2545244526	Wayne	1487-155	499 Corbett Hill Rd, Mount Olive, NC 28365
John Keith Thornton and Edgar Gene Thornton	2545224899	Wayne	1562-843	971 Grantham School Road, Mount Olive NC 28365
	2545435721	Wayne	2704-422	
	2545659261	Wayne	1315-589	
	2545633507	Wayne	1249-283	
	2545845592	Wayne	1249-279	
	2545826561	Wayne	2360-834	
	2545726289	Wayne	1152-624	
	2545613762	Wayne	2513-390	
	2545515813	Wayne	2566-484	
	2545623814	Wayne	2941-140	
Stanley E. Thornton	2545344583	Wayne	2247-365	465 Corbett Hill Road, Mount Olive, NC 28365

## 2.3 Proposed Service Area

The Bank will be established to provide mitigation to compensate for impacts to Waters of the United States and/or State Waters within the service area depicted in Figure 3. This service area shall include the Neuse 01 (Hydrologic Unit 03030201), including the City of Raleigh, Falls Lake, Wake Forest, Hillsborough, Creedmoor, Rolesville, Garner, Knightdale, Cary, Clayton, Smithfield, and portions of the city of Durham, Morrisville, Holly Springs, and Fuquay-Varina.

## 2.4 Need and Feasibility of Mitigation Bank

### 2.4.1 Need

#### *Basinwide*

The Neuse 01 riverbasin, as described in the North Carolina Division of Water Resources (NCDWR) 2009 Neuse River Basinwide Water Quality Plan (RPWQP), is undergoing a rapid population growth. The populations of Wake County, Johnston County and Wayne County are anticipated to increase by 76%, 79% and 11% respectively between 2000 and 2020. This increase in population increases developmental pressures, changes in land use, and the need for expanded infrastructure (roads, utilities, etc.), all of which create the necessity for mitigation banks in this region. Providing a mitigation bank will allow unavoidable impacts to Waters of the United States to be mitigated for appropriately and allow the economic growth of this region to continue while the environment and water quality remain a priority.

In addition to private development, specific customers for the bank credits could include NCDOT and the various municipalities located in Neuse 01 as described in Section 2.2. Figure 7 depicts the potential projects set forth by NCDOT for fiscal years 2015-2025 within the Neuse 01 watershed. This includes the I-540 expansion and projects along various state, regional, and division highways.



### *Local Subbasin*

The proposed Bank is located in DWR subbasin 03-04-12. There are no current local or state watershed plans associated with this subbasin. The watershed is dominated by forested land (52%) and agricultural land (41%). Although few water quality studies have been reported in the subbasin, the RBWQP indicates that water quality is likely impacted by the large amount of animal operations within the watershed. NCDWR current data (1/5/2015) lists 22 permitted animal facilities within the subbasin. This is the largest concentration of animal operations within a subbasin in Neuse 01.

An example of the impact of animal operations can be seen within the project limits, as Falling Creek transitions to a State 303(d) listed impaired stream downstream of Grantham School Road (Listed as of 2012). Falling Creek is listed due to low oxygen levels, which is likely a result of high amounts of organic matter, nutrients, and sediment entering the system from agricultural fields and animal operations. There are 13 animal facilities above Grantham School Road within the Falling Creek watershed, one of which is within the project limits.

### **2.4.2 Feasibility**

An environmental radius report was performed by Environmental Data Resources Inc (EDR) for the potential Bank site. The report found no records of registered storage tanks, brownfield sites, hazardous waste sites, solid waste disposal sites, federally listed sites, or RCRA facilities within one mile of the potential Bank. This ensures there are no potential sources of contaminants that would affect the soil and water quality on site.

The Bank is located in a rural watershed where the dominant land uses are agricultural, forested, and silviculture. There are currently no developmental pressures in the region that suggest future changes in land use that might alter the watershed and/or add additional stressors to the project.

Based on the preliminary existing conditions assessments performed at the project site between Fall, 2014 and Spring, 2015, the Sponsor is confident that the site has substantial potential for the development of a viable mitigation bank. The bank provides restoration, enhancement, and preservation of streams and wetlands that encompass three subwatersheds to Falling Creek. The project can be of substantial impact to the local Falling Creek Watershed and the Neuse River Basin. Although there are no official RBWQP goals to address, the restoration plan for the Bank does address issues associated with livestock operations, which was noted as a potential stressor in the RBWQP, by eliminating livestock access to all project streams.

## **3.0 ECOLOGICAL SUITABILITY OF SITE**

### **3.1 Bank Site Characterization**

For ease of communication, the Bank has been split into two portions, bisected by Grantham School Road that are hereafter referred to as Falling Creek West and Falling Creek East (Figure 5). All stream reaches within the Bank are unnamed tributaries to Falling Creek. These unnamed tributaries have been given names by Wildlands for this Prospectus and the duration of the project as shown in Figures 5a and 5b. Cross-sections have been field surveyed on all reaches proposed for



enhancement and/or restoration. Data for these are located in Appendix C, and locations of each cross-section are depicted in Figure 6.

The 260 acre Bank is located on an active livestock operation comprised primarily of pastures used for grazing cattle. Surrounding land use consists of agriculture, silviculture, and forest with light residential homes. Aerial photographs show little land use change over time and there are no developmental pressures indicating that land use will change in the future. Livestock have access to the majority of streams and wetlands, which serve as their sole water source on the property. Cattle are excluded from the downstream reaches of the project where the streams enter the forested floodplain of Falling Creek. The streams range from ditched and straightened channels with significant bank erosion and mass wasting to streams with near reference condition dimension and pattern but significant cattle impacts. Wetlands have been degraded due to ditching, stream channelization, and cattle trampling. The existing conditions of each stream reach are described in section 3.1.1, wetlands in 3.1.2 and vegetation in 3.2.3.

### 3.1.1 Existing Streams

#### a. Falling Creek West

Falling Creek West is bound on the south side by Corbett Hill Rd, the east side by Grantham School Road, and the north side by Falling Creek. The three main stream systems, west to east, are Coriander Creek, Grady Branch, and Mourning Dove Branch. The streams flow through agricultural pastures into the forested floodplain of Falling Creek. It is possible that Coriander Creek and Mourning Dove Branch connect before reaching Falling Creek. This will be field verified with sub-meter GPS during the Mitigation Plan phase of the project. The entire site is actively used for agriculture. Livestock have access to the majority of streams south of the Falling Creek floodplain. There is an active Hog facility in the central region of the project, east of Grady Branch. These stream systems are described in more detail below, summarized in Table 3a, and depicted in Figure 5a and Figure 6.

**TABLE 3a. Stream Existing Conditions Falling Creek West**  
Falling Creek Mitigation Bank

Stream Reach	Existing Length	P/I	Existing Condition Impairment
Adams Branch	461	P	incised, unstable pattern, mass wasting bank material, livestock access, lack of riparian vegetation
Coriander Creek - R1	2923	P	Previously channelized, lacks bedform diversity, livestock access, trampled banks, lack of understory and riparian vegetation
Coriander Creek - R2	2324	P	No major impairment
Finch Creek - R1	106	I	Livestock trampling on banks, lack of understory vegetation
Finch Creek - R2	274	I	Incised, lack of riparian vegetation, livestock access
Grady Branch - R1	2739	I	Severe incision, lack of riparian vegetation, livestock access, mass wasting of bank material
Grady Branch - R2	857	I	Incised, lack of understory vegetation, livestock access, mass wasting of bank material

Stream Reach	Existing Length	P/I	Existing Condition Impairment
Grady Branch - R3	887	I	mild incision, livestock access, trampled banks, lack of riparian vegetation
Gurley Branch	429	I	Severe incision, livestock access, lack of riparian vegetation, mass wasting of bank material
Mourning Dove Branch - R1	1034	I	Severe incision, livestock access, previously ditched, mass wasting of bank material, lack of riparian vegetation
Mourning Dove Branch - R2	2638	I	No major impairment
Reddit Creek	281	I	banks trampled by livestock access, sedimentation
Snook Branch	79	I	banks trampled by livestock access
Thornton Creek - R1	884	I	banks trampled by livestock
Thornton Creek - R2	599	I	incised, previously straightened, severe bank erosion, livestock access

### *Coriander Creek*

Coriander Creek is the westernmost stream system within the Bank. The upstream reach of the stream is located in a sparsely wooded area that has been highly impacted by cattle, as evidenced by a lack of vegetative understory and bank trampling. The first 200 feet of channel appear to be hydraulically connected to the floodplain, however the channel becomes more incised as it moves downstream. Sections of severe erosion are interspersed throughout this area. Coriander Creek is flanked by wetlands in either floodplain that drain into the reach through small headcuts.

Downstream of Adams Branch, Coriander Creek transitions from a forested riparian buffer to an open agricultural pasture. This reach has been historically channelized and relocated to its westernmost valley wall. While the channel is not incised, it lacks a natural meandering pattern, aquatic habitat, and bedform diversity. As Coriander Creek flows downstream towards the floodplain of Falling Creek its width to depth ratio increases, its channel slope decreases and its floodplain widens. This decrease in channel slope has caused a significant increase in sediment deposition. Sediment deposition within the first 200 feet of forested area is so great that it has buried the forest understory and is endangering the existing trees. At this point Coriander Creek transitions into a braided system, creating several flow paths through the deposited sediment.

The forested downstream reach of Coriander Creek, within the Falling Creek floodplain, is a braided, anabranching system of shallow and wide channels that thread through a mature bottomland hardwood forest.

### *Finch Creek*

Finch creek enters the site on the western project boundary and flows east towards Coriander Creek. The upstream end of the reach has a stable dimension and planform, however there is evidence of livestock impact on the banks. The stream meanders through a narrow width of mature trees ( $\leq 15$  feet) with an understory of pasture grasses. The remainder of the riparian buffer is pasture. There is a headcut just upstream of the culvert crossing, after which the stream becomes incised and resembles a ditch. This reach has been straightened and there is a distinct lack of bedform diversity. The riparian buffer also has diminished at this point and the primary vegetation



is pasture grasses. The downstream end of Finch Creek intersects a ditch running south to north at the edge of the pasture, which has cut it off from its natural connection to Coriander Creek.

#### *Adams Branch*

Adams Branch enters the site on the western boundary and flows east into Coriander Creek approximately 425 feet upstream of Finch Creek. It is an incised system with unstable planform that follows an often tortuous path causing high shear stress on banks and mass wasting of bank material. The bed material is comprised of sand and small gravel.

#### *Grady Branch*

Grady Creek enters the site at the southern boundary along Corbet Hill Road. The channel parallels the farm road before meandering towards the center of the valley. Grady Branch is severely entrenched, incised, and confined in a ditch-like channel. There is evidence of sloughing of bank material throughout the upstream reach. In some areas, a bench has formed at the bottom of the gully, however it lacks stability as the channel is still actively incising. Riparian buffer in the upstream reaches consist of pasture grasses and are actively used for cattle grazing.

Once Grady Branch flows into the wooded riparian area (downstream of its intersection with Gurley Creek) it becomes only mildly incised. It is hydraulically connected to the floodplain and has a stable pattern that can be used as reference during design. Grady Branch appears to be successfully moving a large amount of sand through the system while remaining relatively stable. Livestock do have access to this area, which is the primary source of stress to this reach. The riparian area has mature trees, but lacks an understory, and there is evidence of minor bank failures from cattle crossing.

As Grady Branch continues downstream and exists the wooded riparian area, entering into the agricultural pasture, it pushes up against the right valley wall. It maintains this position until it crosses into the center of the valley to its confluence with Coriander Creek. This reach of Grady Branch is characterized by moderate incision, eroded banks, bank trampling from livestock, and a lack of adequate streambank and riparian vegetation.

#### *Gurley Branch*

Gurley Branch enters the site at the southern boundary along Corbet Hill Road, west of Grady Branch. It is a severely incised and entrenched ditched system that travels south through an active livestock pasture. This reach is undergoing a recurring process of bank failure whereby water flowing through Gurley Branch erodes the bottom third of the streambank and creates an undercut bank. This bank eventually collapses and the sediment from the bank travels downstream and deposits in the stream channel and floodplain. This is one source of excess sediment found in the floodplains of Coriander Creek. The lack of riparian vegetation also contributes to the lack of stability within the system. All of the aforementioned factors and processes have left Gurley Creek with poor aquatic and riparian habitats.

#### *Thornton Creek*

Thornton Creek originates in forested headwater wetlands that capture runoff from the surrounding agricultural fields. The upstream reach has a stable meander pattern and is hydrologically connected to its floodplain. Livestock access to the channel has resulted in trampling of bank material and a lack of an understory in the riparian area. A large headcut (~ 5 feet) is



located halfway down the project reach, after which the stream becomes incised and less stable. The channel incision has resulted in severe bank erosion and mass wasting of bank material. This material is deposited throughout the channel. The channel is pressed against the left valley wall and the left bank is located against the agricultural field with no riparian buffer. The right bank remains forested. Thornton Creek drains into Mourning Dove Branch near the project boundary.

#### *Snook Branch*

Snook Branch is a small stream whose drainage area is the livestock pastures east of the Hog facilities. There is a knick point between the field and woods below which a small steep sandbed channel forms. Snook Branch flows east to west and discharges into Grady Branch just south of the hog lagoon.

#### *Redditt Creek*

Redditt Creek originates at a spring head in a wooded area adjacent to an agricultural field. Cattle have access to this area, as evidenced by the continual erosion of this small channel upstream into the field and the trampled banks within the reach.

#### *Mourning Dove Branch*

Mourning Dove Branch originates from roadside ditches draining along Grantham School Road and flows northwest across a livestock pasture. The stream has been ditched and is incised, with banks greater than six feet in height. Erosion along the channel length has led to bank failure and mass wasting of bank material. A small bench has formed along the bottom of the channel as it begins to change from a process of widening to one of aggradation. The lack of vegetation and bedform diversity has resulted in poor aquatic and terrestrial habitat along the reach.

Mourning Dove Branch flows into a riparian area as it leaves and then re-enters the Bank property. A headcut is located at the point of re-entry. This portion of the channel is highly impacted by livestock, with some sections of bank completely destroyed by trampling. There is also a large amount of sediment deposition in this area and minimal riparian vegetation.

As Mourning Dove Branch flows into the floodplain of Falling Creek it becomes a shallow braided system with a series of wide and shallow channels. The floodplain is generally saturated and contains a fair amount of sediment deposition.

### **b. Falling Creek East**

Falling Creek West is bound on the south west by Grantham School Road, on the south side by McArthur Pond Road, and on the north side by Falling Creek. The main stream system has been named Sadler's Branch. Its headwaters are in an agricultural field and it flows north through pasture and forested areas, bound on all sides by agricultural fields. Cattle have access to everything south of the Falling Creek floodplain and Hog facilities are located in the northwest region of the site. These stream systems are described in more detail below, summarized in Table 3b, and depicted in Figure 5b and Figure 6.



**TABLE 3b. Stream Existing Conditions Falling Creek East**  
Falling Creek Mitigation Bank

Stream Reach	Existing Length	P/I	Existing Condition Impairment
Anise Branch - R1	42	I	Banks trampled by livestock, lack of understory vegetation
Anise Branch - R2	144	I	Moderate incision, livestock trampling, lack of understory vegetation
Chicory Creek	1351	I	Lack of understory vegetation, livestock trampling of banks, sedimentation
Cornet Creek	386	P	Moderate incision, livestock trampling, lack of understory vegetation, sedimentation
Sadler's Branch - R1	2572	P	Transitions from severe incision to moderate incision, lack of adequate riparian vegetation, bank trampling from livestock
Sadler's Branch - R2	1324	P	Minor incision, lack of understory vegetation, livestock trampling
Sadler's Branch - R3	912	P	Impounded by remnant farm pond dam, lack of riparian buffer, channelized.
Sadler's Branch - R4	571	P	No major impairment
Tarragon Creek - R1	334	I	Severe incision, livestock access, lack of understory vegetation
Tarragon Creek - R2	599	I	moderate incision, livestock access, lack of understory vegetation
Whitetail Creek	177	P	moderate incision, lack of understory vegetation

#### *Sadler's Branch*

Sadler's Branch originates upstream of Grantham School Road and enters the site through a roadway culvert before flowing northeast towards Falling Creek. It is the mainstem of the stream system on Falling Creek East. The upstream portion flows through an agricultural field used for livestock grazing and pasture. The upstream reach is severely incised (banks > 6 feet) with evidence of ongoing bank failure along its length. Bank failure can be attributed to cattle access as well as erosive flows from runoff. The eroded channels draining the fields are lined with Cattail and green briar. As Sadler's branch enters the forested area the incision gradually decreases from severe to moderate and floodplain connectivity varies along the length. There are some riffle pool sequences and several debris jams within the channel. Banks in this reach are eroded due to shear stress in the channel, lack of bank vegetation and livestock access.

Downstream of the confluence between Anise Branch and Sadler's Branch, the incision along Sadler's Branch reduces from moderate to minor. Floodplain access increases in the downstream direction and once the stream is downstream of its confluence with Cornet creek the channel becomes fully hydrologically connected to its floodplain. The pattern is well developed and stable and the channel dimensions appear stable with the exception of cattle impacts. The channel is



comprised of sand with traces of small gravel. The sand is very mobile in the system and is deposited in the floodplain throughout the downstream end of Sadler's Branch.

Just downstream of the farm crossing, and the confluence with Tarragon Creek, Sadler's Branch becomes a braided system. This system has one primary channel and several small channels throughout the wide floodplain. Eventually this braided system transitions to a wide flooded area within a former pond bed with a large corresponding floodplain for several hundred feet before transitioning back to a single thread channel at the location of an old earthen dam. This portion of Sadler's Branch had been ponded in the early 2000's and has since been breached (according to historical aerial photographs).

#### *Tarragon Creek*

Tarragon Creek is located in the northwestern portion of Falling Creek East. The stream flows west to east and drains into Sadler's Branch. The upstream portion of Tarragon Creek is incised and the outer meander bends are eroded. Some lower benches have formed within the channel. It is a sandbed system with a few riffle pool sequences containing small gravel. Large specimen trees and approximately 50 feet of riparian buffer are located along the right side of the stream, however the left side abuts an agricultural pasture comprised primarily of fescue.

As Tarragon Creek flows downstream it becomes less incised and the stream regains access to the floodplain. A riparian buffer is also established along the left bank, contributing to the addition of woody debris to the system, and overall stream health.

#### *Anise Branch*

Anise Branch is a small tributary to Sadler's Branch that drains an agricultural field. The upstream end is relatively stable in dimension, but has been trampled by livestock access. A headcut is located approximately 50 feet downstream of the edge of the field, after which the channel becomes moderately incised. There is erosion on the top third of the stream banks that indicates the stream has been susceptible to bank failure. The riparian area of Anise Branch is forested with the same species composition of Sadler's Branch.

#### *Whitetail Creek*

Whitetail Creek flows east to west and discharges into Sadler's Branch just upstream of the northernmost culvert crossing. The headwater seep is located on the neighboring parcel in a wooded area. The stream then flows through an agricultural field, where it becomes heavily degraded due to incision, lack of riparian buffer, and livestock access. Whitetail Creek enters the project site as it transitions back to wooded conditions. It remains moderately incised but riparian vegetation have reduced the levels of erosion and incision.

#### *Cornet Creek*

The headwaters of Cornet Creek are located on an adjacent parcel in an agricultural field. The stream then travels into a wooded area before entering the Bank. The stream is moderately incised at the upstream end of the project reach and reduces in incision as it travels downstream towards its confluence with Sadler's Branch. The channel has a tight meander pattern with some hairpin turns that have been bypassed in the recent past leaving small side oxbows. Livestock access is evident through trampled banks and bed throughout the project reach. The trampling has led to



sediment deposition (primarily sand) in the downstream portions of the reach. The riparian area is forested.

#### *Chicory Creek*

Chicory Creek starts at a headwater wetland located in the southwest region of Falling Creek East near Grantham School Road. It is a forested wetland complex with a small single thread channel traversing the length of the valley. Small sections are moderately incised, but the majority of the channel has no incision and is hydraulically connected to its floodplain. Cattle have access to this area which has led to the degradation of banks and the associated riparian wetlands.

### **3.1.2 Wetlands**

Floodplains within the proposed project area are a mosaic of existing wetlands and drained hydric soils. Existing wetlands typically drain from the toe of slope, spread out over the floodplains, and connect to incised stream channels via ditches. These ditches are often dredged due to sediment accumulation and many of them have completely drained the adjacent hydric soils. There is an estimated 202.5 acres of existing wetlands with 176 being proposed for preservation (no jurisdictional determination has been performed at this point). It is estimated that there are 10.4 acres of drained hydric soils on site proposed for restoration. The remaining acreage of wetland is proposed for enhancement and rehabilitation depending on the extent of existing vegetation and cattle impacts.

Livestock have full access to the wetlands (except wetlands proposed for preservation), which has impeded the growth of aquatic vegetation, allowed for the continual deposition of cattle waste, and minimized the ability of the wetlands to cycle nutrients. Groundwater wells were installed on site in February, 2015 and located in potential areas of wetlands reestablishment. Additional wells are to be installed in Summer 2015. Locations of existing and future wells are provided on Figure 6. A summary of wetland areas is located in Table 4, below, and they are depicted in Figures 5a and 5b.

**TABLE 4. Existing Wetland Conditions**  
Falling Creek Mitigation Bank

Wetland Area	Existing Acreage	Wetland Type	Existing Condition Impairment
A	3.21	Riparian	Livestock trampling, lack of understory vegetation, sedimentation
C	29.12	Riparian	No major impairment
D	26.40	Riparian	No major impairment
E	8.65	Riparian	No major impairment
F	1.07	Riparian	Livestock trampling, lack of understory vegetation, sedimentation, hydrologically disconnected from stream
G	0.95	Riparian	Livestock trampling, lack of understory vegetation, sedimentation

Wetland Area	Existing Acreage	Wetland Type	Existing Condition Impairment
I	1.57	Riparian	Livestock trampling, lack of understory vegetation, sedimentation, hydrologically disconnected from stream
J	0.82	Riparian	Livestock trampling, lack of understory vegetation, sedimentation
K (Falling Creek East)	1.98	Riparian	Livestock trampling, lack of understory vegetation, sedimentation
L (Falling Creek East)	16.63	Riparian	Livestock trampling, lack of understory vegetation, portions are hydrologically disconnected from stream
M (Falling Creek East)	109.61	Riparian	No major impairment

### 3.1.3 Soils

Floodplain soils in the project area are primarily sandy loams. They are deep soils (depth to bedrock > 80 inches) that frequently pond and hold water at the surface. As you move up gradient in the landscape, the soils are comprised of marine deposits that flood less frequency but maintain a loamy texture. The predominant floodplain soils on site are described in Table 5, below and depicted in Figure 7.

**TABLE 5. Floodplain Soil Types and Descriptions**  
Falling Creek Mitigation Bank

Soil Name	Location	Description
<b>Johnston Loam - Js</b>	Mapped along the floodplain of Coriander Creek, Mourning Dove Branch and Falling Creek.	Johnston Loam soils are found in floodplains. They are very poorly drained alluvial soils and are frequently ponded with the water table at the soil surface.
<b>Bibb Sandy Loam - Bb</b>	Mapped along Coriander Creek, Mourning Dove Branch, Finch Creek, Cornet Creek, Thornton Creek and Anise Branch.	Bib Sandy Loams are located in alluvial floodplains. They are deep (>80"), very poorly drained, and subject to frequent flooding.
<b>Lynchburg Sandy Loam - Ly</b>	Mapped along Thornton Creek, Mourning Dove Branch, Sadler's Branch, Bradford Branch and Chicory Creek.	Lynchburg Sandy Loams are found on summits of flats on marine terraces or broad interstream divides. They are somewhat poorly drained but rarely ponded.
<b>Wagram Loamy Sand, WaB</b>	Mapped along Grady Branch Thornton Creek, Mourning Dove Branch, Tarragon Creek and Sadler's Branch	Wagram Loamy Sands are found on marine terraces in broad interstream divides. They are well drained, loamy marine deposits that are not frequently flooded or ponded.

Source: Wayne County Soil Survey, USDA-NRCS, <http://efotg.nrcs.usda.gov>



### 3.1.4 Existing Vegetation

#### *Pasture Areas*

Falling Creek West riparian areas are predominately livestock pasture with the exception of the upstream end of Coriander Creek, the central reach of Grady Branch and the majority of Thornton Creek. The upstream portion of Sadler's Branch on Falling Creek East is in livestock pasture. The livestock pastures at the Bank site are dominated by fescue grasses (*Festuca spp.*) and broomsedge (*Andropogon virginicus*). Wetter areas in low lying fields and along creek and ditch banks are generally dominated by common rush (*Juncus effuses*) and hydric sedges (*Carex spp.*).

#### *Forested Areas impacted by Cattle*

The riparian areas on Falling Creek West vary between cleared pasture and forested with cattle impacts. Vegetation along Coriander, Finch, and Thornton Creeks and Adams Branch is a mix of pine and hardwood species including loblolly pine (*Pinus taeda*), water oak (*Quercus nigra*), willow oak (*Quercus phellos*), tulip poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), american holly (*Ilex opaca*), and southern red oak (*Quercus falcata*). The forested riparian area along Grady Branch is generally wetter than the other forested areas and does not contain loblolly pine but does contain a similar mix of hardwood species including water oak, willow oak, swamp chestnut oak (*Quercus michauxii*), tulip poplar, sweetgum, red maple, and sweetbay (*Magnolia virginiana*). Mid and understory strata are absent due to cattle impacts.

With the exception of the upstream end of Sadler's Branch, Falling Creek east riparian areas are predominately forested with direct cattle access. Canopy vegetation along Sadler's Branch and its tributaries is relatively mature and the riparian area is generally very wet. Tree composition is similar to Grady Branch including water oak, willow oak, swamp chestnut oak, tulip poplar, sweetgum, red maple, wax myrtle, and sweetbay. Invasive species include Chinese privet (*Ligustrum sinense*) and multiflora rose (*Rosa multiflora*). Mid and understory strata are absent due to cattle impacts. Chickory Creek floodplain vegetation is younger than Sadler's Branch and is dominated by tulip poplar with loblolly pine along the field margins.

#### *Forested Areas unimpacted by Cattle*

Livestock are excluded from the Falling Creek floodplain through a combination of electric and barbed wire fence. While portions of the Falling Creek floodplain were logged as recently as 1993, these areas have regenerated with native hardwood vegetation and include multiple strata (canopy, understory, and herbaceous). Canopy vegetation consists of water oak, willow oak, swamp chestnut oak, tulip poplar, sweetgum, red maple, and sweetbay. Understory species include black willow (*Salix nigra*) and tag alder (*Alnus serrulata*) with American Holly on hummocks. Herbaceous layer species include river cane (*Arundinaria gigantea*), common rush, and hydric sedges.

### 3.1.5 Threatened and Endangered Species

Wildlands utilized the US Fish and Wildlife Service (USFWS) and NC Natural Heritage Program (NHP) databases to search for federally listed threatened and endangered plant and animal species in Wayne County, NC. Six animal species identified as threatened or endangered are currently listed



in Wayne County (Table 6). The North Carolina Heritage Program also lists 30 rare and watch list plant and animal species within Wayne County.

**TABLE 6. Listed Threatened and Endangered Species in Wayne County, NC**  
Falling Creek Mitigation Bank

Species		Federal Status	State Status
Common Name	Scientific Name		
Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered	Endangered
Triangle Floater	<i>Alasmidonta undulate</i>	Not Listed	Threatened
Yellow Lance	<i>Elliptio lanceolata</i>	Species of Concern	Endangered
Roanoke Slabshell	<i>Elliptio roanokensis</i>	Not Listed	Threatened
Eastern Lampmussel	<i>Lampsilis radiata</i>	Not Listed	Threatened
Carolina Madtom	<i>Noturus furiosus</i>	Species of Concern	Threatened

In a letter dated May 26, 2015, the USFWS stated that their review of the project location indicated that no federally listed species under the Service Jurisdiction are likely to occur within the project area. It is their determination that actions proposed in this prospectus are not likely to adversely affect species designated as threatened, endangered, or their designated critical habitat.

### 3.1.6 Cultural Resources / Conservation Lands / Natural Heritage Areas

The site is not located near any sites listed on the National Register with the State Historic Preservation Office (SHPO). The archaeological site files at the North Carolina Office of State Archaeology (OSA) have not been reviewed at this time. All appropriate cultural resource agencies will be contacted for their review and comment prior to any land disturbing activity.

There are no natural heritage areas listed near the project. The site is also not contiguous with an existing conservation easement, however the North Carolina Department of Soil and Water Conservation has a conservation easement on a property 3.75 miles upstream of the project along Falling Creek's floodplain.

### 3.1.7 FEMA Floodplain Compliance

The FEMA floodplain on this site is associated with Falling Creek, which is located along the northern project boundary. As the area within the floodplain is being proposed as preservation, no floodplain development permit or FEMA modeling will be required for this project.

### 3.1.8 Existing Site Constraints

The Bank is located on an active livestock operation, which has several existing stream crossings that allow livestock pasture access. There are currently stream crossings located along Adams Branch, Coriander Creek, Grady Branch, Thornton Creek, and three on Sadler's Branch. Several of these stream crossings are undermined or undersized. Care will be taken in the mitigation plan to minimize the amount of crossings that will be included in the final project and to improve the conditions of existing crossings so that they are not a constraint to aquatic organism passage or sediment transport.

The only utility easement of note on the project is located along the gravel drive that bisects the Thornton property along Grady Branch. This easement is located outside of the proposed conservation easement and should not be a constraint to construction or maintenance. No beaver activity has been noted on the site.

## **4.0 MITIGATION WORK PLAN**

### **4.1 Streams**

The proposed Bank includes a combination of stream restoration, enhancement level II and preservation activities. Activities have been selected to provide the highest degree of ecological uplift to the system. Figure 5 provides an overview of stream restoration activities on the site, while Figure 5a shows Falling Creek West and Figure 5b shows Falling Creek East.

#### *Preservation*

Preservation is being proposed on Coriander Creek, Mourning Dove Branch, and Sadler's Branch from the point they cross into the floodplain of Falling Creek until their confluences with Falling creek (Figure 5, 5a, and 5b). The purpose of the proposed preservation is to protect these stream reaches from Livestock impacts, logging, and to provide maximum protection to streams, wetlands and riparian areas for three subwatersheds to Falling Creek. This whole-watershed approach will ensure water quality benefits attained upstream through restoration activities will not be compromised before the water reaches Falling Creek. It also provides a continuous aquatic and terrestrial habitat corridor to a larger stream system.

#### *Enhancement II*

Enhancement II activities have been proposed for several stream reaches on site including Grady Branch, Thornton Creek, Snook Branch, Reddit Creek, Sadler's Branch, Chicory Creek, Whitetail Creek, Anise Creek, Cornet Creek, and Tarragon Creek. These reaches are characterized by small channels either connected to their floodplains or minorly incised, with wide, often saturated floodplains. These reaches all have a riparian buffer on one or more stream banks. These reaches are also highly impacted by livestock access. There is evidence of bank trampling throughout the reaches and the riparian areas lack a developed understory. Fencing out the cattle will enhance water quality and improve aquatic and terrestrial habitat along these reaches. Other enhancement activities include bank repair, introduction of habitat features, supplemental riparian planting, and the construction of stormwater best management practices (BMPs) that will treat areas of concentrated flow running off the agricultural fields.

#### *Restoration*

Restoration is being proposed on stream reaches that are incised, highly eroded, and lack a stable pattern, habitat features, and/or a riparian buffer. Reaches proposed for restoration include portions or all of Gurley Branch, Grady Branch, Coriander Creek, Adams Branch, Finch Creek, Thornton Creek, Mourning Dove Branch, Sadler's Branch, and Tarragon Creek (Figure 5). All restoration reaches will be designed to create a new stable, functional stream channel based on reference reach and sediment transport analysis. Dimension, pattern and profile will be designed on all restoration reaches to provide stable, well-vegetated bank slopes, a well-connected floodplain that allows for frequent overbank flooding, and improvements to aquatic habitat enabling biological lift. Establishing vertical and lateral stability will provide hydrologic connectivity between streams floodplains and riparian wetlands. A diverse bedform will be established using in-



stream structures appropriate for the geomorphic setting. Rosgen Priority I restoration will be designed on all applicable reaches. In stream monitoring wells will be installed at the upstream end of any intermittent reaches proposed for Priority 1 restoration in order to document that they have flowing water for at least 30 days during the year, as requested by NCDWR. Locations of these wells are shown in Figure 6. The severely incised reaches of Grady Branch, the upstream reach of Sadler's Branch, and the upstream reach of Mourning Dove branch may require Priority II restoration due to site constraints and the existing degree of incision.

#### *Stream Crossings*

Care was taken in the creation of this project to minimize stream crossings to that which is necessary for the landowners to maintain their livestock operation. Currently crossings are proposed along Coriander Creek, Adams Branch, Grady Branch, Thornton Creek, and Sadler's Branch. Most of these are existing crossings that are undersized, have failed due to severe incision of the stream, and are a hazard both to livestock. These crossings will be replaced with culverts sized to provide adequate sediment transport and aquatic organism passage. The crossing on Thornton and one on Sadler's branch are 20 foot internal crossings for pipes that carry wastewater from the hog lagoons. All crossings are proposed as internal to the easements and are depicted in Figures 5a and 5b.

### **4.2 Wetlands**

A combination of wetland rehabilitation and wetland reestablishment will be used in the Site design. All wetland rehabilitation areas currently contain hydric soils, therefore no additional grading in these areas will be necessary. The streams will be designed to avoid impacts to any areas that are determined to be jurisdictional wetland. Filling abandoned channel sections and creating a small stream system highly connected to its floodplain with frequent overbank events will increase the likelihood of wetland hydrologic success. Areas with overburden may be excavated to remove material and better establish floodplain hydrology. Shallow water and deeper pools will exist throughout the floodplain wetlands. Generous placement of woody debris and disking of the soil will create a heterogeneous wetland landscape.

A natural Coastal Plain bottomland forest community will be established in the wetland rehabilitation and reestablishment areas. The vegetation planted will be selected based on species identified within appropriate reference locations and professional experience based on site conditions. Livestock exclusion fencing will be placed around wetlands proposed for preservation, rehabilitation and reestablishment. The entire Site will be bounded by a conservation easement.

### **4.3 Best Management Practices**

The project site is located on an active animal operation. Hog houses and cattle pastures are located on Falling Creek West and Falling Creek East. Such operations were highlighted in the 2009 Neuse River Basinwide Water Quality Plan as locations for the implementation of best management practices (BMPs) in order to improve water quality within the subbasin.

There are several locations on site where runoff from the pastures becomes concentrated flow. These are prime locations to install best management practices that will treat pasture runoff before it enters into the stream network, thereby reducing nutrient and sediment inputs to the system. Appropriate BMPs will be chosen based on the position in the landscape, degree of treatment desired, and the size of the drainage area. Potential BMPs include pocket wetlands and bioswales.



All BMPs will be fenced to provide cattle exclusion. No credit is being applied directly to the BMPs. The BMPs are considered part of the overall restoration approach of the stream to which they drain. The use of BMPs went into the development of the Credit Ratio for each stream reach.

#### 4.4 Vegetation Plan

The project area will be planted and seeded with a combination of early and later successional native vegetation chosen to create a Coastal Plain Bottomland Forest community. The specific species composition will be selected based on the community type, observations of the occurrence of species in the existing buffer, and best professional judgment on species establishment and anticipated site conditions in the early years following project implementation.

Potential species to be planted in the wetland areas of the project include Bald Cypress (*Taxodium distichum*), Willow Oak (*Quercus phellos*), Sycamore (*Platanus occidentalis*), River Birch (*Betula nigra*), Swamp Tupelo (*Nyssa biflora*), Swamp Chestnut Oak (*Quercus michauxii*), and Green Ash (*Fraxinus pennsylvanica*). Potential species to be planted in the riparian buffer areas include Bald Cypress, Willow Oak, Sycamore, River Birch, Tulip Poplar (*Liriodendron tulipifera*), Swamp Chestnut Oak, and Green Ash.

#### 5.0 DETERMINATION OF MITIGATION CREDITS

Use of credits from the Bank to offset stream, riparian wetland, and riparian buffer impacts authorized by federal permits or state water quality certifications must be in compliance with the Clean Water Act, Section 404(b)(1) guidelines and other applicable state and federal legislation, regulations, and policies. Prior to the release of credits, the following requirements will be met: IRT approval of the final mitigation plan and execution of the banking instrument, recordation of the conservation easement, and establishment of appropriate financial assurances. A summary of the proposed credits is included in Tables 7 and 8. A proposed credit release schedule is provided in Table 9 following the current IRT Mitigation Banking Instrument Template.

**TABLE 7. Proposed Stream Mitigation Units**  
Falling Creek Mitigation Bank

Stream Reach	Mitigation Type	Existing Length	Proposed Length	Mitigation Factor	Stream Mitigation <sup>1</sup> Unit
<b>Preservation</b>					
Coriander Creek - R2	P	2,324	3,254	7.5	434
Mourning Dove Branch - R2	P	2,638	3,682	7.5	491
Sadler's Branch – R4	P	571	799	7.5	107
<b>Subtotal</b>					<b>1,031</b>
<b>Enhancement 2</b>					
Chicory Creek	E2 <sup>2</sup>	1,351	1,554	2.5	621
Cornet Creek	E2	386	427	2.5	171
Finch Creek - R1	E2	106	130	2.5	52
Grady Branch - R2	E2	857	975	2.5	390

Stream Reach	Mitigation Type	Existing Length	Proposed Length	Mitigation Factor	Stream Mitigation <sup>1</sup> Unit
Reddit Creek	E2	281	300	2.5	120
Sadler's Branch – R3	E2	1,324	1,501	2.5	600
Snook Branch	E2	79	85	2.5	34
Tarragon Creek - R2	E2	599	740	2.5	296
Thornton Creek - R1	E2	884	1,019	2.5	408
Whitetail Creek	E2	177	200	2.5	80
Anise Branch - R1	E2	42	44	2.5	18
<b>Subtotal</b>					<b>2,790</b>
<b>Restoration</b>					
Anise Branch - R2	R <sup>3</sup>	144	154	1	154
Coriander Creek - R1	R	2,923	3,618	1	3,618
Finch Creek - R2	R	274	297	1	297
Grady Branch - R1	R	2,739	3,240	1	3,240
Grady Branch - R3	R	887	948	1	948
Gurley Branch	R	429	530	1	530
Mourning Dove Branch - R1	R	1,034	1,298	1	1,298
Sadler's Branch – R3	R	912	1,040	1	1,040
Sadler's Branch – R1	R	2,572	3,305	1	3,305
Tarragon Creek - R1	R	334	394	1	394
Thornton Creek - R2	R	599	1,267	1	1,267
Adams Branch	R	461	495	1	495
<b>Subtotal</b>					<b>16,585</b>
<b>Total</b>					<b>20,406</b>

USACE Mitigation Guidelines allow for credit ratios for preservation in the range of 5:1 to 10:1. For the stream preservation areas on Coriander Creek, Mourning Dove Branch and Sadler's Branch, located within the Falling Creek 100-year floodplain, a credit ratio of 7.5:1 is being requested.

The enhancement work proposed includes combinations of the following activities: culvert removal/repair, bank grading and stabilization, installation of instream structures to provide stability and enhance aquatic habitat, fencing out of livestock, and enhancing or restoring the associated riparian buffer. As the enhancement areas tie together large portions of the project and provide extensive aquatic and terrestrial habitat corridors as well as opportunity to improve water quality a credit ratio of 2.5 is being requested for all enhancement reaches.

A credit ratio of 1:1 is being requested for all restoration reaches. Restoration will include the design and implementation of a stable bankfull pattern, cross-section, and profile. This work will involve hydrologic reconnection of the streams with their floodplains, the implementation of instream structures, and the exclusion of livestock.



**TABLE 8. Proposed Wetland Mitigation Units**  
Falling Creek Mitigation Bank

Wetland ID	Mitigation Type	Acreage	Mitigation Factor	Wetland Mitigation Units <sup>1</sup>
A	Enhance	3.21	2.5	0.8
B	Reestab	10.38	1.0	10.38
C	Pres	29.12	7.5	3.9
D	Pres	26.40	7.5	3.5
E	Pres	8.65	7.5	1.2
F	Rehab	1.07	1.5	0.7
G	Enhance	0.95	2.5	0.4
H	Reestab	0.82	1.0	0.82
I	Rehab	1.57	1.5	1.0
J	Enhance	0.82	2.5	0.3
K (East)	Enhance	1.98	2.5	0.8
L (East)	Rehab	16.63	1.5	11.1
M (East)	Pres	109.61	7.5	14.6
<b>Total</b>				<b>49.5</b>

1. All wetland Mitigation Units are designated as Riparian Wetlands

A credit ratio of 7.5:1 is being proposed for the wetland preservation areas along Sadler's Branch, Coriander Creek, and Mourning Dove Branch. Livestock will be fenced out from the wetlands providing protection for the riparian wetlands. A credit ratio of 2.5:1 is being proposed in all wetland enhancement areas. Wetland enhancement areas are characterized by a limited forested canopy with a highly impacted understory, often sediment laden and trampled by livestock. Activities in enhancement areas include the fencing out of livestock and the establishment of a forested wetland understory. A credit ratio of 1.5:1 is being requested for wetland rehabilitation areas. Activities in these areas include reestablishing a forested wetland and fencing out livestock. A ratio of 1:1 is being requested for reestablishment. Activities in reestablishment areas include the restoration of hydrology by raising streambeds and plugging agricultural ditches, the fencing out of livestock, and the establishment of a forested wetland.

## 6.0 CREDIT RELEASE SCHEDULE

All credit releases will be based on the total credit generated as reported by the as-built survey of the mitigation site. Under no circumstances shall any mitigation project be debited until the necessary DA authorization has been received for its construction or the District Engineer (DE) has otherwise provided written approval for the project in the case where no DA authorization is required for construction of the mitigation project. The DE, in consultation with the Interagency Review Team (IRT), will determine if performance standards have been satisfied sufficiently to meet the requirements of the release schedules below. In cases where some performance



standards have not been met, credits may still be released depending on the specifics of the case. Monitoring may be required to restart or be extended, depending on the extent to which the site fails to meet the specified performance standard. The release of project credits will be in compliance with the Monitoring Requirements and Performance Standards for Compensatory Mitigation in North Carolina, February 9, 2013. These guidelines are described below:

**TABLE 9a. Forested Wetland Credit Release Schedule**  
Falling Creek Mitigation Bank

Forested Wetlands Credit Release Schedule			
Credit Release Milestone	Credit Release Activity	Interim Release	Total Released
1	Site Establishment	15%	15%
2	Completion of an initial physical and biological improvements made pursuant to the Mitigation Plan	15%	30%
3	First year monitoring report demonstrates interim performance standards are being met	10%	40%
4	Second year monitoring report demonstrates interim performance standards are being met	10%	50%
5	Third year monitoring report demonstrates interim performance standards are being met	15%	65%
6*	Fourth year monitoring report demonstrates interim performance standards are being met	5%	70%
7	Fifth year monitoring report demonstrates interim performance standards are being met	15%	85%
8*	Sixth year monitoring report demonstrates interim performance standards are being met	5%	90%
9	Seventh year monitoring report demonstrates performance standards have been met	10%	100%

\*Please note that vegetation plot data may not be required with monitoring reports submitting during these monitoring years unless otherwise required by the Mitigation Plan or directed by the USACE in consultation with the IRT.

**TABLE 9b. Stream Credit Release Schedule**  
Falling Creek Mitigation Bank

Stream Credit Release Schedule			
Credit Release Milestone	Credit Release Activity	Interim Release	Total Released
1	Site Establishment	15%	15%
2	Completion of all initial physical and biological improvements made pursuant to the Mitigation Plan	15%	30%
3	First year monitoring report demonstrates performance standards are being met	10%	40%
4	Second year monitoring report demonstrates performance standards are being met	10%	50% (60% <sup>**</sup> )
5	Third year monitoring report demonstrates performance standards are being met	10%	60% (70% <sup>**</sup> )
6*	Fourth year monitoring report demonstrates performance standards are being met	5%	65% (75% <sup>**</sup> )
7	Fifth year monitoring report demonstrates performance standards are being met and project has received closeout approval	10%	75% (85% <sup>**</sup> )
8*	Sixth year monitoring report demonstrates performance standards are being met	5%	80% (90% <sup>**</sup> )
9	Seventh year monitoring report demonstrates performance standards are being met and project has received closeout approval	10%	90% (100% <sup>**</sup> )

\* 10% reserve of credits to be held back until the bankfull event performance standard has been met

If the monitoring of the site is successful by year 5 and no concerns have been identified regarding vegetation, hydrology, stream stability, or encroachments, the Sponsor may propose to terminate monitoring for the site for years 6 and 7 and request a project closeout. In the case of approved early project closeout, all remaining credits shall be released.

### 6.1 Initial allocation of released credits

If deemed appropriate by the IRT, fifteen percent (15%) of the Bank's total stream credits shall be available for sale immediately upon completion of all of the following:

1. Execution of this MBI by the Sponsor, the DE, and other agencies eligible for membership in the IRT who choose to execute this agreement;
2. Approval of the final Mitigation Plan;
3. Mitigation bank site has been secured;
4. Delivery of the financial assurance described in Section IX of this MBI; and
5. Recordation of the long-term protection mechanism described in Section X of this MBI, as well as a title opinion covering the property acceptable to the DE.
6. 404 permit verification for construction of the site, if required.



Subject to the Sponsor's continued satisfactory completion of all required success criteria and monitoring, additional stream credits will be available for sale by the Sponsor on the following schedule:

## **6.2 Subsequent Credit Releases**

The following conditions apply to the subsequent release of credits.

- a. A reserve of 10% of a site's total stream credits shall be released after four bankfull events have occurred, in separate years, provided the channel is stable and all other performance standards are met. In the event that less than four bankfull events occur during the monitoring period, release of these reserve credits are at the discretion of the IRT
- b. The sponsor must complete the initial physical and biological improvements to the site pursuant to the Mitigation Plan no later than the first growing season following the initial debiting of credits generated by the site.
- c. After the second milestone, the credit releases are scheduled to occur on an annual basis, assuming that the annual monitoring report has been provided to the USACE in accordance with Section IV of the Monitoring Requirements and Performance Standards for Compensatory Mitigation in North Carolina, February 9, 2013, and that interim performance standards are being met and that no other concerns have been identified on site during the visual monitoring. All credit releases require written approval from the USACE in consultation with the IRT.
- d. The final 10% of credits will be available for sale only upon determination by the IRT of functional success as defined in the Mitigation Plan.

## **7.0 MAINTENANCE AND LONG-TERM SUSTAINABILITY**

### **7.1 Maintenance**

#### *Routine Maintenance*

The Site shall be monitored on a regular basis and a physical inspection of the Site shall be conducted at a minimum of once per year throughout the post-construction monitoring period until performance standards are met. These site inspections may identify site components and features that require routine maintenance. Routine maintenance will be conducted to rectify identified deficiencies and may include the following:



**TABLE 10. Maintenance Plan**  
Falling Creek Mitigation Bank

Component / Feature	Maintenance through project close-out
Stream	Routine channel maintenance and repair activities may include chinking of in-stream structures to prevent piping, securing loose coir matting, and supplemental installations of live stakes and other target vegetation along the channel. Areas where stormwater and floodplain flows intercept the channel may also require maintenance to prevent bank failures and head-cutting. Beaver dams that inundate the streams channels shall be removed and the beaver shall be trapped.
Vegetation	Vegetation shall be maintained to ensure the health and vigor of the targeted community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be controlled by mechanical and/or chemical methods. Any vegetation control requiring herbicide application will be performed in accordance with the NC Department of Agriculture (NCDA) rules and regulations.
Site Boundary	Site boundaries shall be identified in the field to ensure clear distinction between the mitigation site and adjacent properties. Boundaries may be identified by fence, marker, bollard, post, tree-blazing, or other means as allowed by site conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as-needed basis.

## 7.2 Adaptive Management

If, during the course of annual monitoring it is determined the site's ability to achieve site performance standards as outlined in the Mitigation Banking Instrument are jeopardized, the Sponsor will notify the Interagency Review Team (IRT) of the need to develop a Plan of Corrective Action. The Plan of Corrective Action may be prepared using in-house technical staff or may require engineering and consulting services. Once the Corrective Action Plan is prepared and finalized the Sponsor will:

- Notify the USACE as required by the Nationwide 27 permit general conditions.
- Revise performance standards, maintenance requirements, and monitoring requirements as necessary and/or required by the USACE.
- Obtain other permits as necessary.
- Implement the Corrective Action Plan.
- Provide the USACE a Record Drawing of Corrective Actions. This document shall depict the extent and nature of the work performed.

## 7.3 Long Term Management Provisions

The Bank Sponsor will institute a Long Term Management Plan responsible for assessing the condition of the mitigation site and implementing maintenance provisions to maintain performance of the site. The proposed conservation easement will help to ensure that only IRT-allowable activities take place. This easement will be transferred to an IRT approved non-profit organization once monitoring success criteria have been achieved.

To monitor the project's continued success, the Long Term Management Plan will be implemented following the seven-year monitoring period. All components of the restoration and enhancement project will be inspected annually or less frequently as needed to ensure that the project remains



stable in perpetuity. Sources of instability or other deficiencies will be addressed. Invasive species will be managed annually or less frequently as needed to ensure the long term survivability of the planned native vegetation community. All reporting will be documented and kept on file for future reference.

## 8.0 REFERENCES

Natural Resources Conservation Service (NRCS), 2011. Web Soil Survey.

<http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>

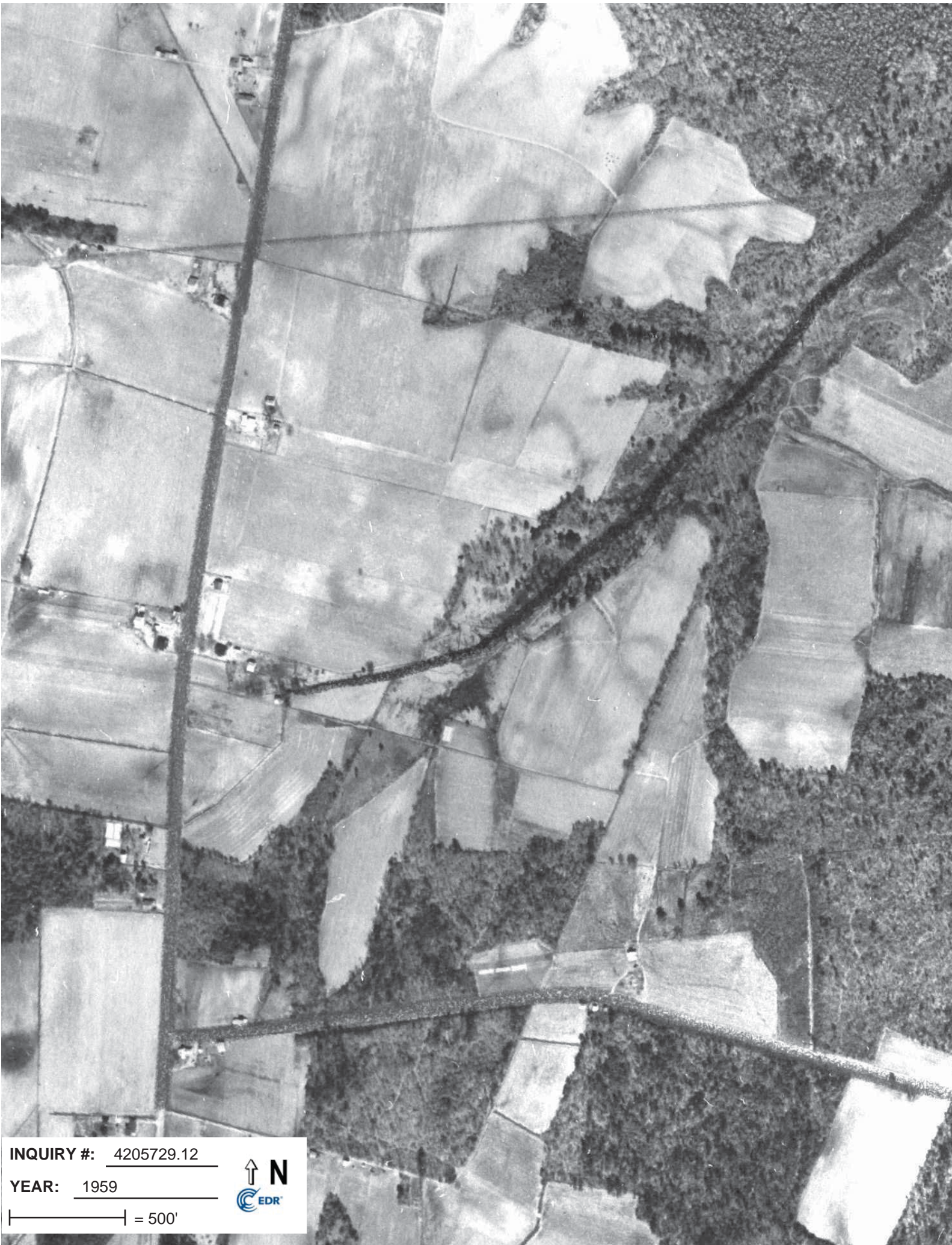
North Carolina Division of Water Quality (NCDWQ), 2011. Surface Water Classifications.

<http://portal.ncdenr.org/web/wq/ps/csu/classifications>

North Carolina Division of Water Resources (NCDWR). 2009. Neuse River Basinwide Water Quality Plan (RPWQP), at: <http://www.ncwater.org/basins/neuse/index01072015.php>



APPENDIX A  
HISTORICAL AERIAL PHOTOS



INQUIRY #: 4205729.12

YEAR: 1959

| = 500'





INQUIRY #: 4205729.12

YEAR: 1959

| = 500'





INQUIRY #: 4205729.12

YEAR: 1983

| = 500'





INQUIRY #: 4205729.12

YEAR: 1983

| = 500'





INQUIRY #: 4205729.12

YEAR: 2009

| = 500'





INQUIRY #: 4205729.12

YEAR: 2009

| = 500'





INQUIRY #: 4205729.5

YEAR: 1959

| = 500'



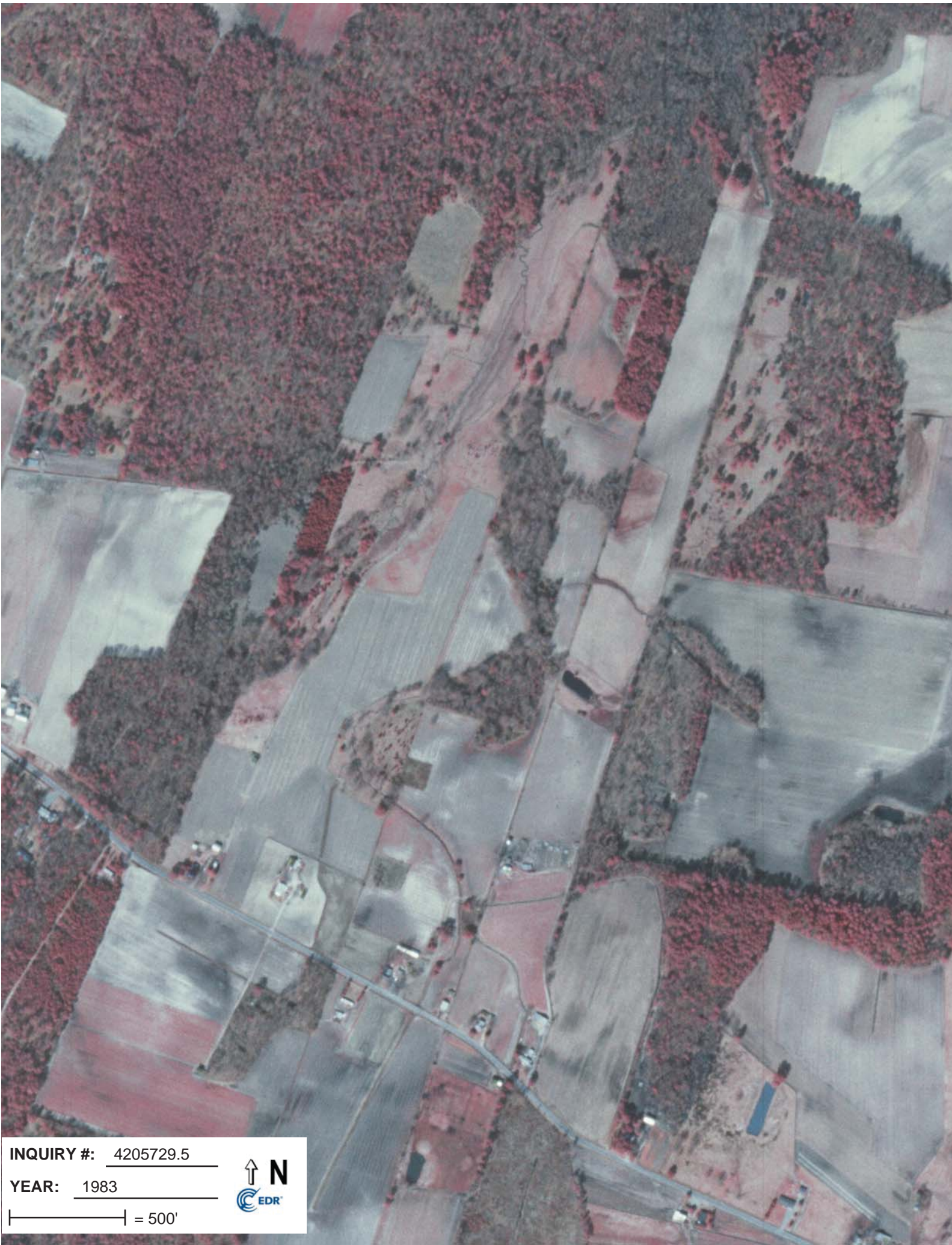


INQUIRY #: 4205729.5

YEAR: 1959

| = 500'





INQUIRY #: 4205729.5

YEAR: 1983

| = 500'





INQUIRY #: 4205729.5

YEAR: 1983

| = 500'





INQUIRY #: 4205729.5

YEAR: 2012

| = 500'





INQUIRY #: 4205729.5

YEAR: 2012

| = 500'



## APPENDIX B

### PHOTO LOG

## Falling Creek West



Coriander Creek, upstream. Restoration Reach



Coriander Creek, downstream of Confluence with Adams Branch. Restoration Reach



Coriander Creek, downstream end. Preservation Reach

## Falling Creek West



Adams Branch. Restoration Reach



Finch Creek, upstream. Enhancement II Reach



Gurley Branch. Restoration Reach.

## Falling Creek West



Grady Branch. Enhancement II Reach



Mourning Dove Branch, Restoration Reach



Thornton Creek. Enhancement II Reach

## Falling Creek East



Sadler's Branch, upstream. Restoration Reach



Sadler's Brach. Enhancement II Reach



Chicory Creek. Enhancement II Reach

## Falling Creek East



Anise Branch. Enhancement II/Restoration Reach Break.



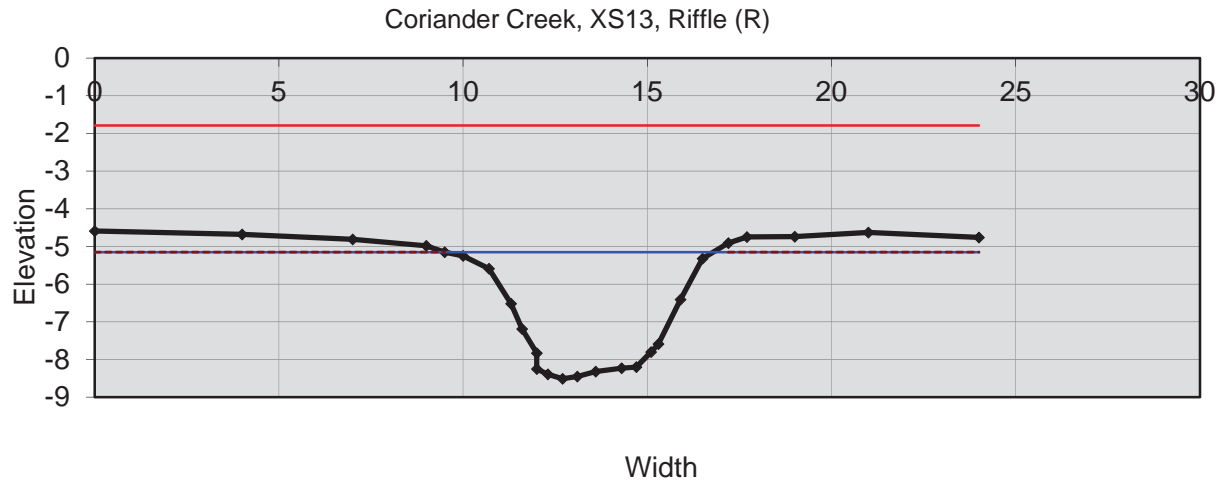
Cornet Creek. Enhancement II Branch



Tarragon Creek. Restoration Reach

APPENDIX C

SURVEYED CROSS-SECTIONS

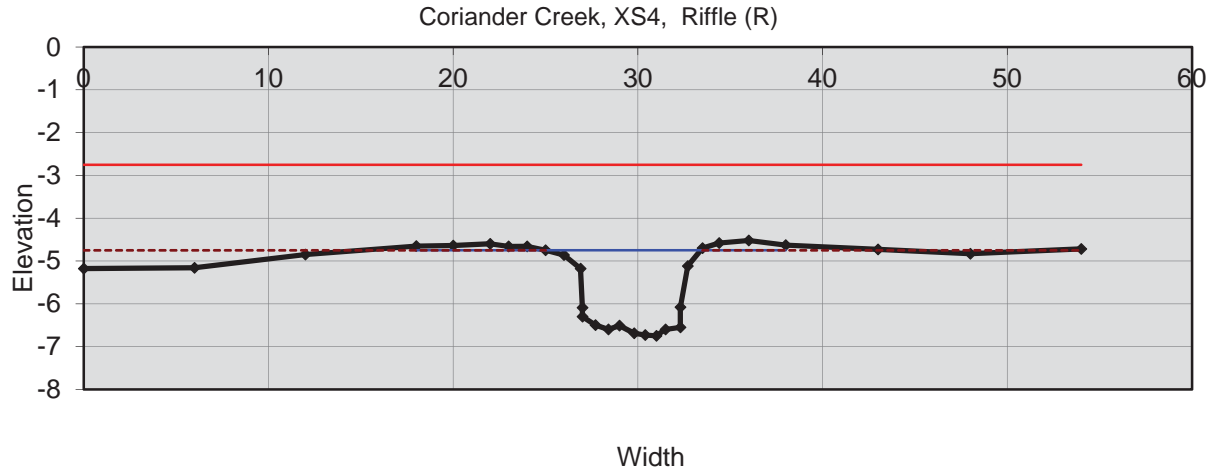


#### Bankfull Dimensions

14.1	x-section area (ft.sq.)
7.3	width (ft)
1.9	mean depth (ft)
3.4	max depth (ft)
10.8	wetted parimeter (ft)
1.3	hyd radi (ft)
3.8	width-depth ratio

#### Flood Dimensions

24.0	W flood prone area (ft)
3.3	entrenchment ratio
3.4	low bank height (ft)
1.0	low bank height ratio

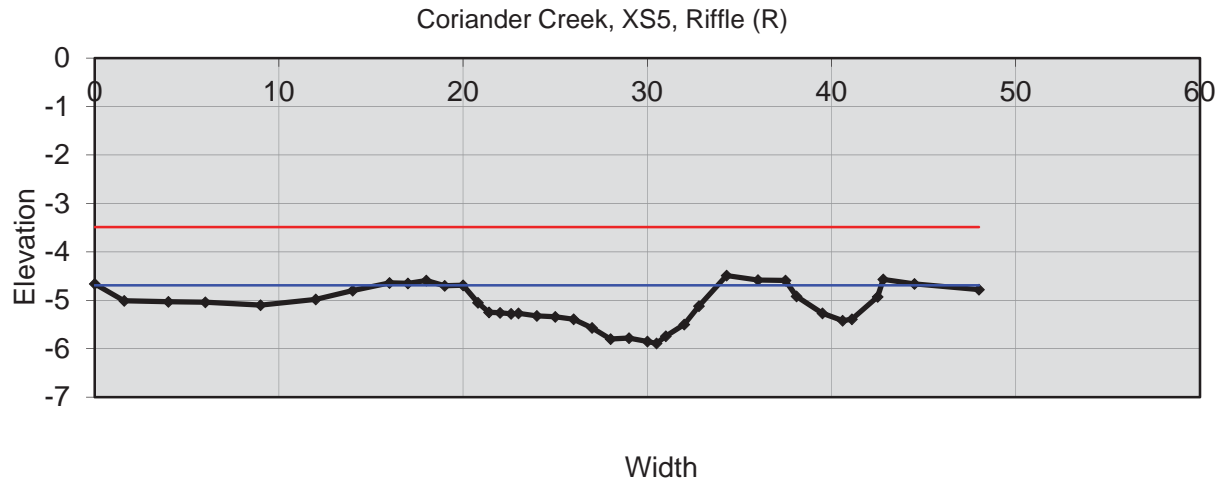


#### Bankfull Dimensions

10.6	x-section area (ft.sq.)
8.4	width (ft)
1.3	mean depth (ft)
2.0	max depth (ft)
10.8	wetted parimeter (ft)
1.0	hyd radi (ft)
6.6	width-depth ratio

#### Flood Dimensions

100.0	W flood prone area (ft)
11.9	entrenchment ratio
2.0	low bank height (ft)
1.0	low bank height ratio

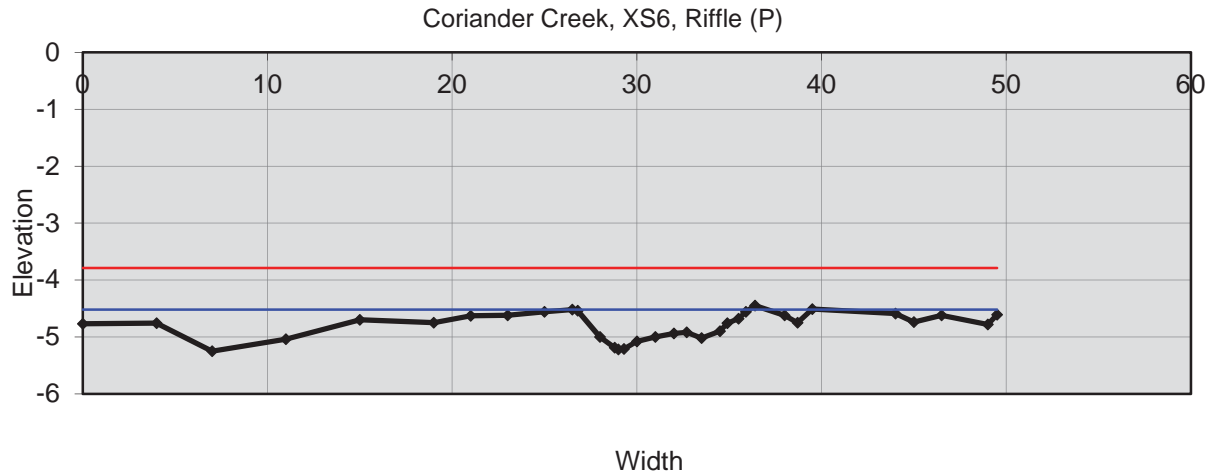


#### Bankfull Dimensions

16.9	x-section area (ft.sq.)
37.8	width (ft)
0.4	mean depth (ft)
1.2	max depth (ft)
38.5	wetted parimeter (ft)
0.4	hyd radi (ft)
84.3	width-depth ratio

#### Flood Dimensions

100.0	W flood prone area (ft)
2.6	entrenchment ratio
1.2	low bank height (ft)
1.0	low bank height ratio

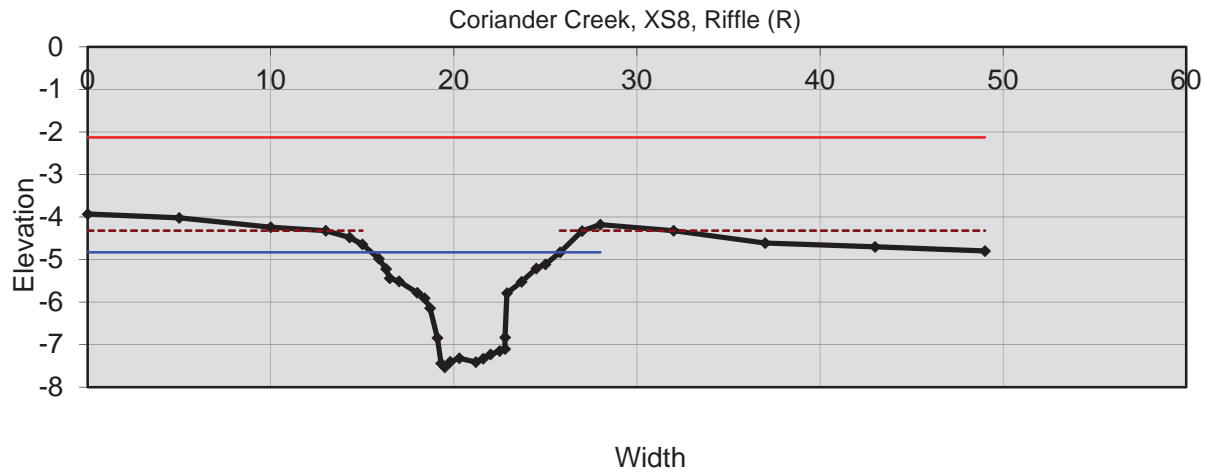


#### Bankfull Dimensions

13.1	x-section area (ft.sq.)
47.9	width (ft)
0.3	mean depth (ft)
0.7	max depth (ft)
48.3	wetted parimeter (ft)
0.3	hyd radi (ft)
175.7	width-depth ratio

#### Flood Dimensions

200.0	W flood prone area (ft)
4.2	entrenchment ratio
0.7	low bank height (ft)
1.0	low bank height ratio

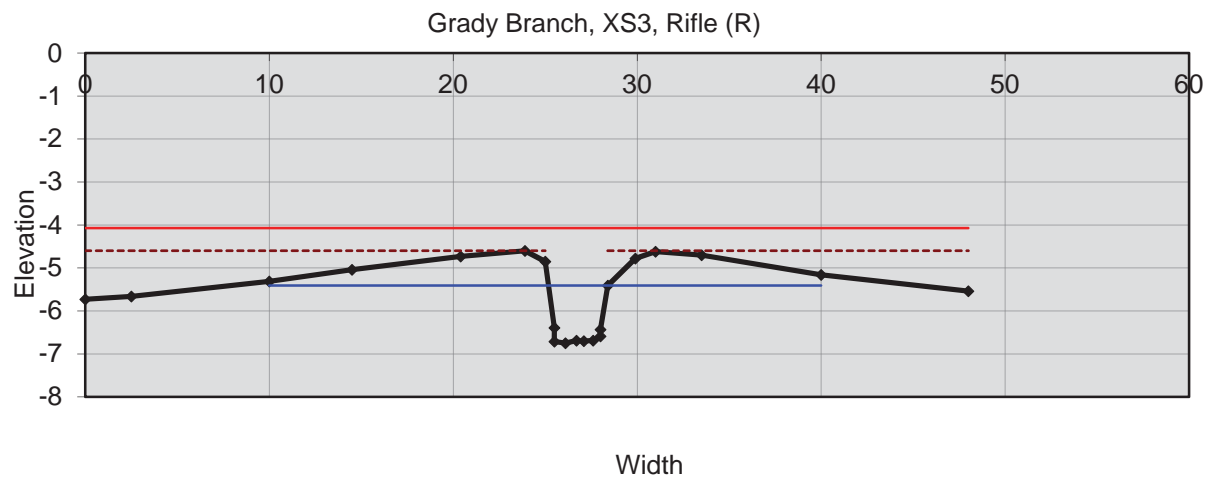


#### Bankfull Dimensions

13.5	x-section area (ft.sq.)
10.3	width (ft)
1.3	mean depth (ft)
2.7	max depth (ft)
12.9	wetted parimeter (ft)
1.0	hyd radi (ft)
7.8	width-depth ratio

#### Flood Dimensions

100.0	W flood prone area (ft)
9.7	entrenchment ratio
3.2	low bank height (ft)
1.2	low bank height ratio

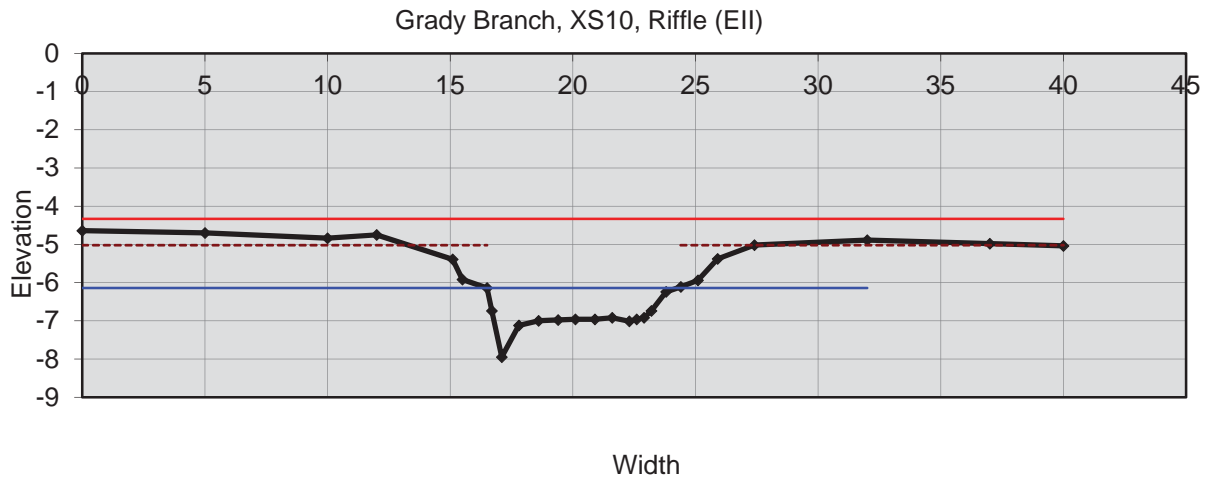


#### Bankfull Dimensions

3.6	x-section area (ft.sq.)
3.2	width (ft)
1.1	mean depth (ft)
1.3	max depth (ft)
5.1	wetted parimeter (ft)
0.7	hyd radi (ft)
2.9	width-depth ratio

#### Flood Dimensions

100.0	W flood prone area (ft)
31.1	entrenchment ratio
2.2	low bank height (ft)
1.6	low bank height ratio

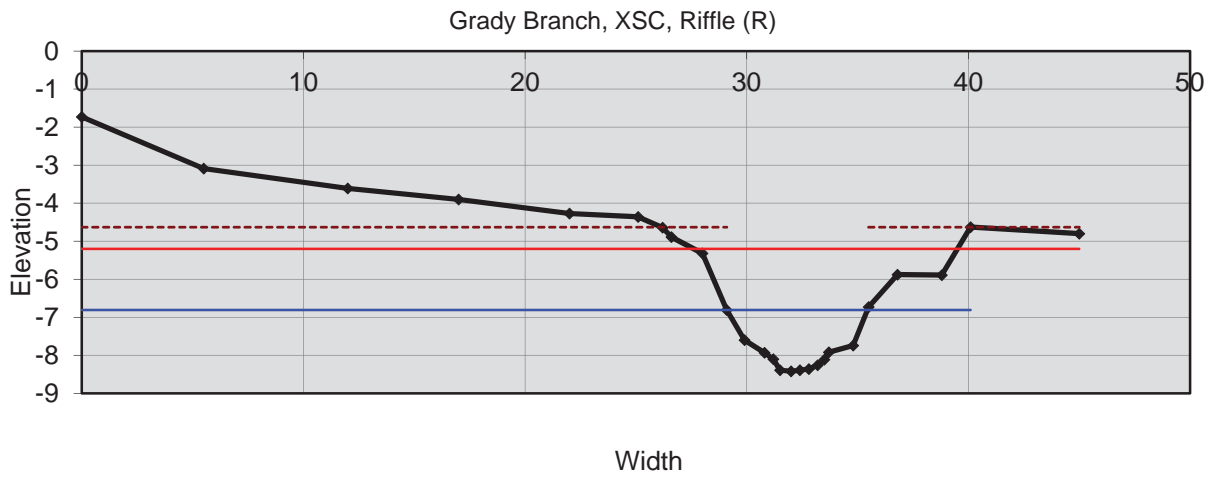


#### Bankfull Dimensions

6.2	x-section area (ft.sq.)
7.8	width (ft)
0.8	mean depth (ft)
1.8	max depth (ft)
9.7	wetted parimeter (ft)
0.6	hyd radi (ft)
9.7	width-depth ratio

#### Flood Dimensions

100.0	W flood prone area (ft)
12.9	entrenchment ratio
2.9	low bank height (ft)
1.6	low bank height ratio

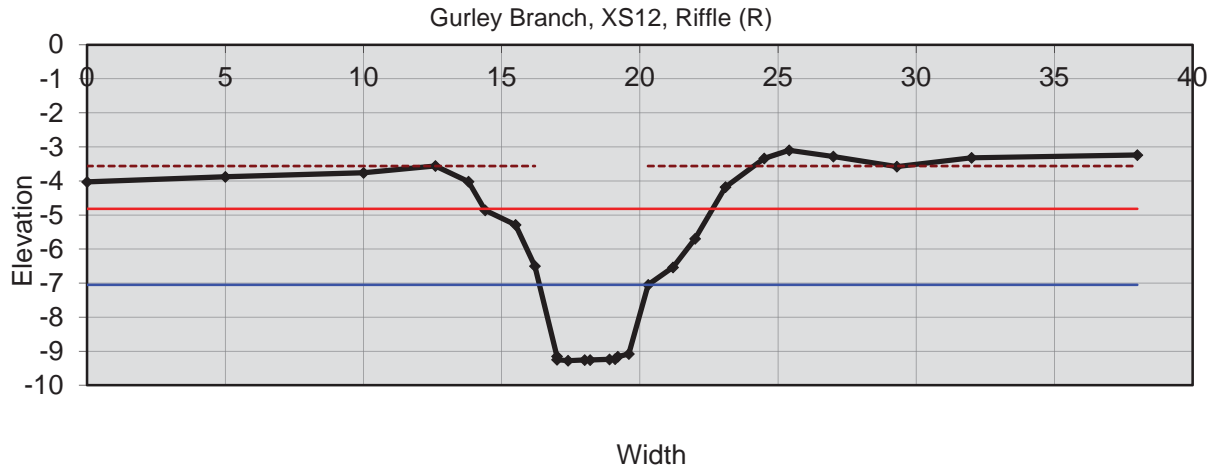


#### Bankfull Dimensions

6.8	x-section area (ft.sq.)
6.3	width (ft)
1.1	mean depth (ft)
1.6	max depth (ft)
7.5	wetted parimeter (ft)
0.9	hyd radi (ft)
5.9	width-depth ratio

#### Flood Dimensions

11.9	W flood prone area (ft)
1.9	entrenchment ratio
3.8	low bank height (ft)
2.4	low bank height ratio

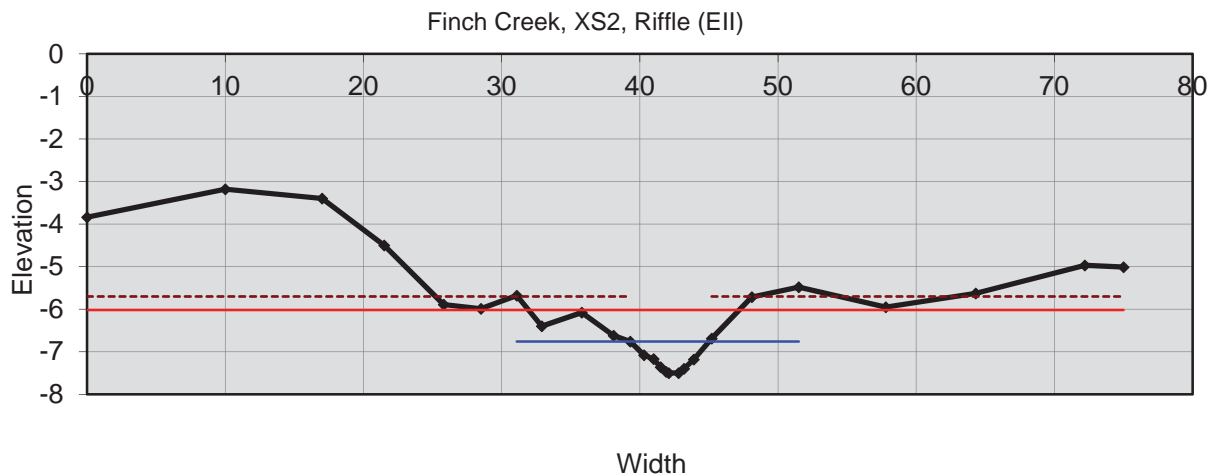


#### Bankfull Dimensions

7.1	x-section area (ft.sq.)
3.9	width (ft)
1.8	mean depth (ft)
2.2	max depth (ft)
7.1	wetted parimeter (ft)
1.0	hyd radi (ft)
2.2	width-depth ratio

#### Flood Dimensions

8.3	W flood prone area (ft)
2.1	entrenchment ratio
5.7	low bank height (ft)
2.6	low bank height ratio

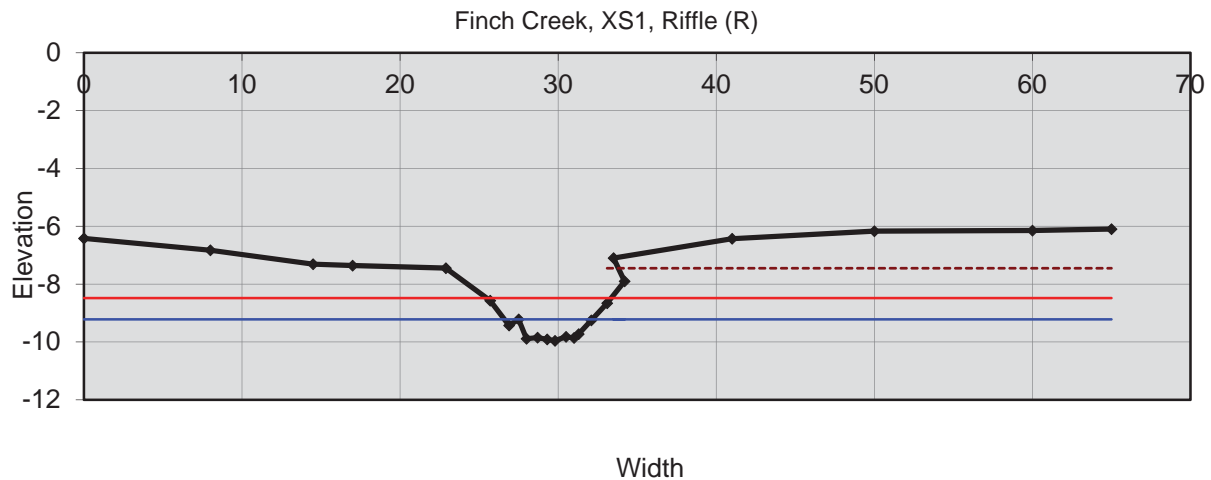


#### Bankfull Dimensions

2.5	x-section area (ft.sq.)
5.7	width (ft)
0.4	mean depth (ft)
0.7	max depth (ft)
5.9	wetted parimeter (ft)
0.4	hyd radi (ft)
13.2	width-depth ratio

#### Flood Dimensions

15.2	W flood prone area (ft)
2.7	entrenchment ratio
1.8	low bank height (ft)
2.4	low bank height ratio

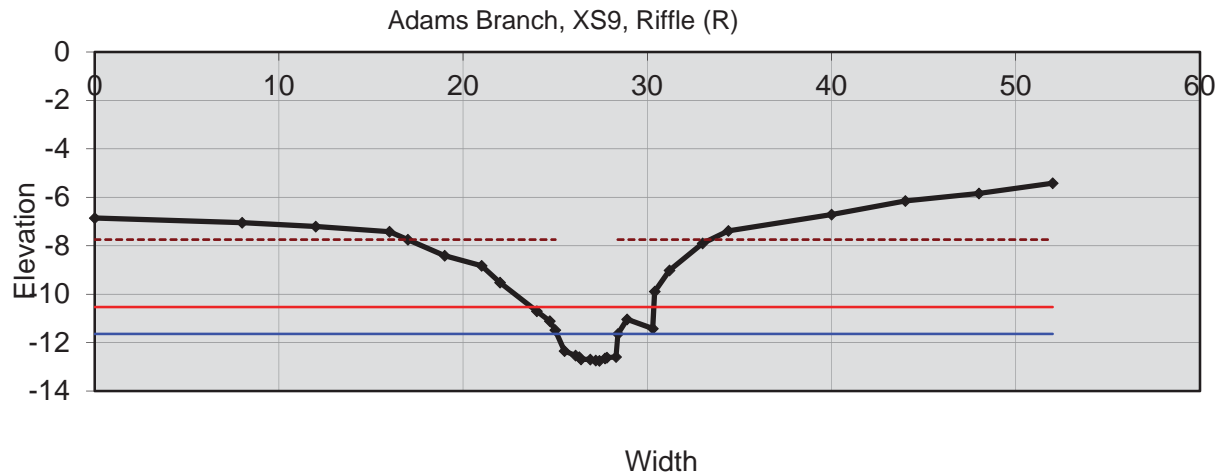


#### Bankfull Dimensions

2.6	x-section area (ft.sq.)
5.5	width (ft)
0.5	mean depth (ft)
0.7	max depth (ft)
6.2	wetted parimeter (ft)
0.4	hyd radi (ft)
11.7	width-depth ratio

#### Flood Dimensions

7.9	W flood prone area (ft)
1.4	entrenchment ratio
2.5	low bank height (ft)
3.4	low bank height ratio

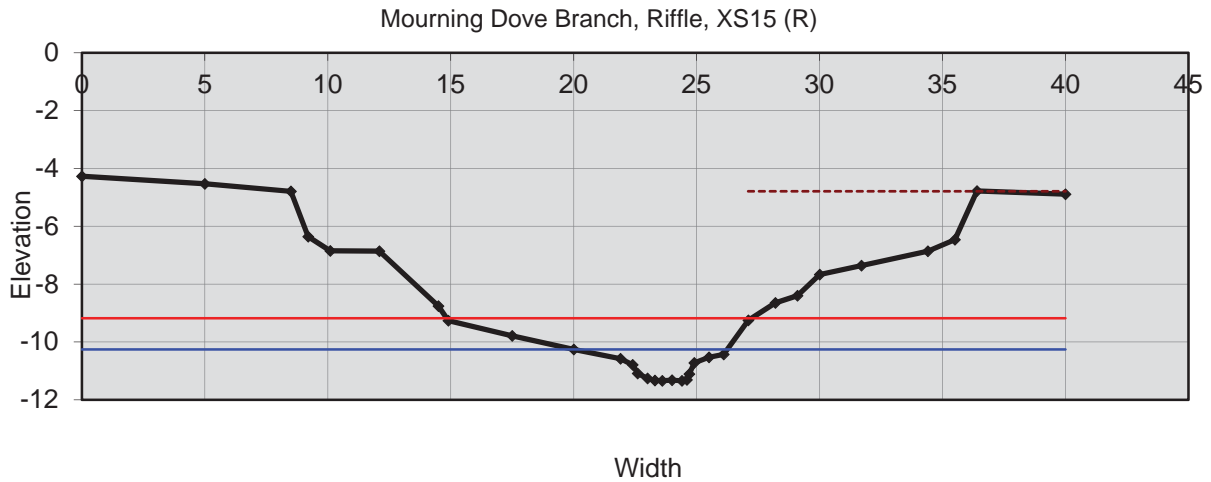


#### Bankfull Dimensions

2.9	x-section area (ft.sq.)
3.3	width (ft)
0.9	mean depth (ft)
1.1	max depth (ft)
4.7	wetted parimeter (ft)
0.6	hyd radi (ft)
3.7	width-depth ratio

#### Flood Dimensions

6.6	W flood prone area (ft)
2.0	entrenchment ratio
5.0	low bank height (ft)
4.5	low bank height ratio

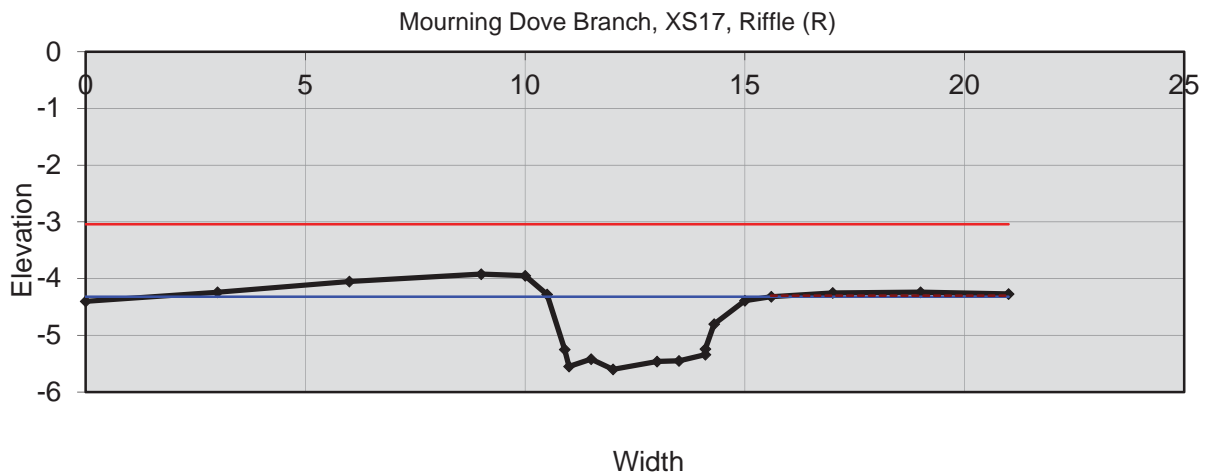


#### Bankfull Dimensions

3.3	x-section area (ft.sq.)
6.2	width (ft)
0.5	mean depth (ft)
1.1	max depth (ft)
7.0	wetted parimeter (ft)
0.5	hyd radi (ft)
11.8	width-depth ratio

#### Flood Dimensions

12.4	W flood prone area (ft)
2.0	entrenchment ratio
6.6	low bank height (ft)
6.1	low bank height ratio

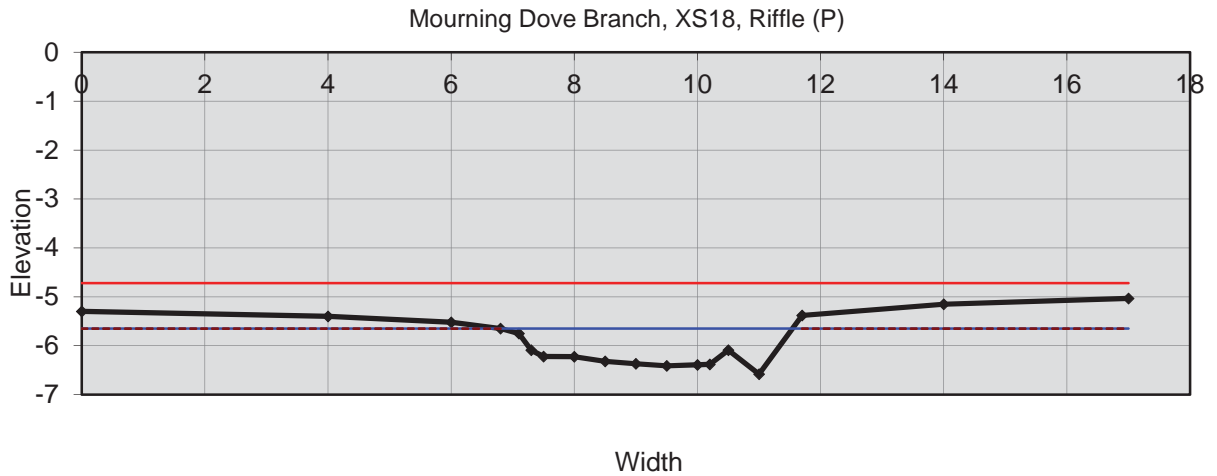


#### Bankfull Dimensions

4.3	x-section area (ft.sq.)
6.6	width (ft)
0.7	mean depth (ft)
1.3	max depth (ft)
8.0	wetted parimeter (ft)
0.5	hyd radi (ft)
10.1	width-depth ratio

#### Flood Dimensions

100.0	W flood prone area (ft)
15.2	entrenchment ratio
1.3	low bank height (ft)
1.0	low bank height ratio

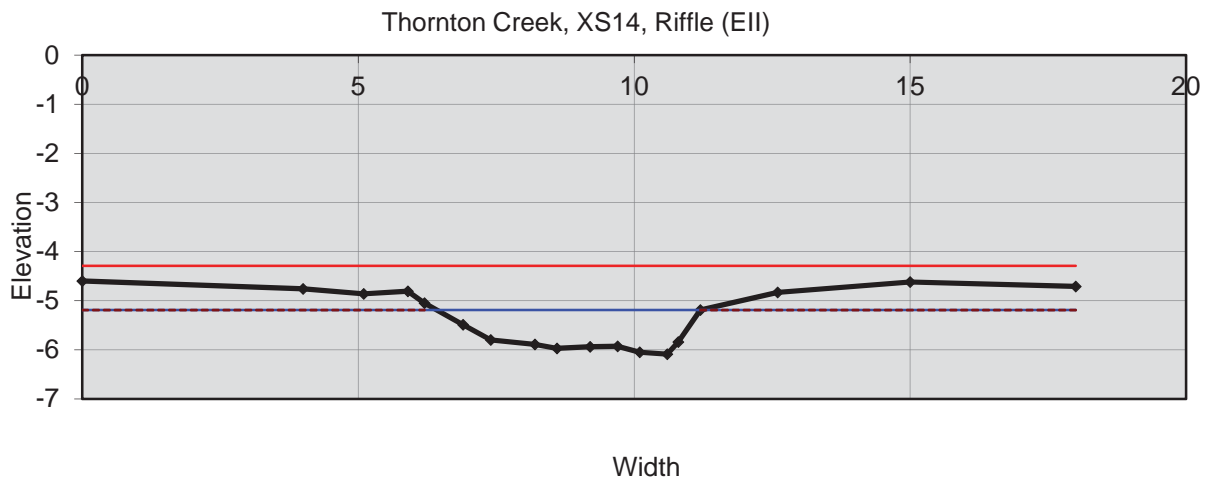


#### Bankfull Dimensions

2.8	x-section area (ft.sq.)
4.7	width (ft)
0.6	mean depth (ft)
0.9	max depth (ft)
5.9	wetted parimeter (ft)
0.5	hyd radi (ft)
8.1	width-depth ratio

#### Flood Dimensions

100.0	W flood prone area (ft)
21.1	entrenchment ratio
0.9	low bank height (ft)
1.0	low bank height ratio

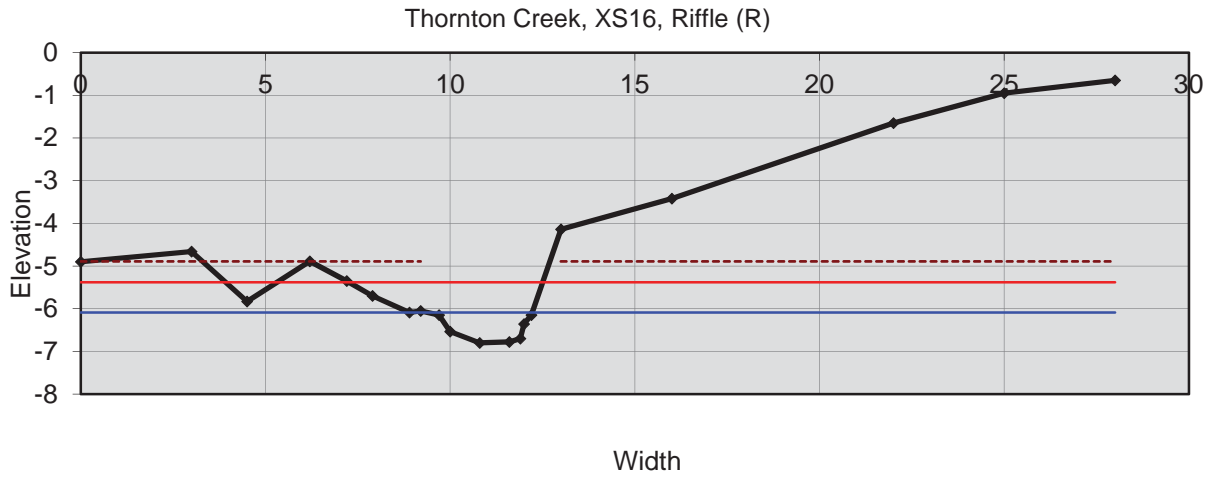


#### Bankfull Dimensions

3.0	x-section area (ft.sq.)
4.8	width (ft)
0.6	mean depth (ft)
0.9	max depth (ft)
5.5	wetted parimeter (ft)
0.5	hyd radi (ft)
7.6	width-depth ratio

#### Flood Dimensions

50.0	W flood prone area (ft)
10.5	entrenchment ratio
0.9	low bank height (ft)
1.0	low bank height ratio



#### Bankfull Dimensions

1.4	x-section area (ft.sq.)
2.8	width (ft)
0.5	mean depth (ft)
0.7	max depth (ft)
3.5	wetted parimeter (ft)
0.4	hyd radi (ft)
5.8	width-depth ratio

#### Flood Dimensions

6.6	W flood prone area (ft)
2.4	entrenchment ratio
1.9	low bank height (ft)
2.7	low bank height ratio

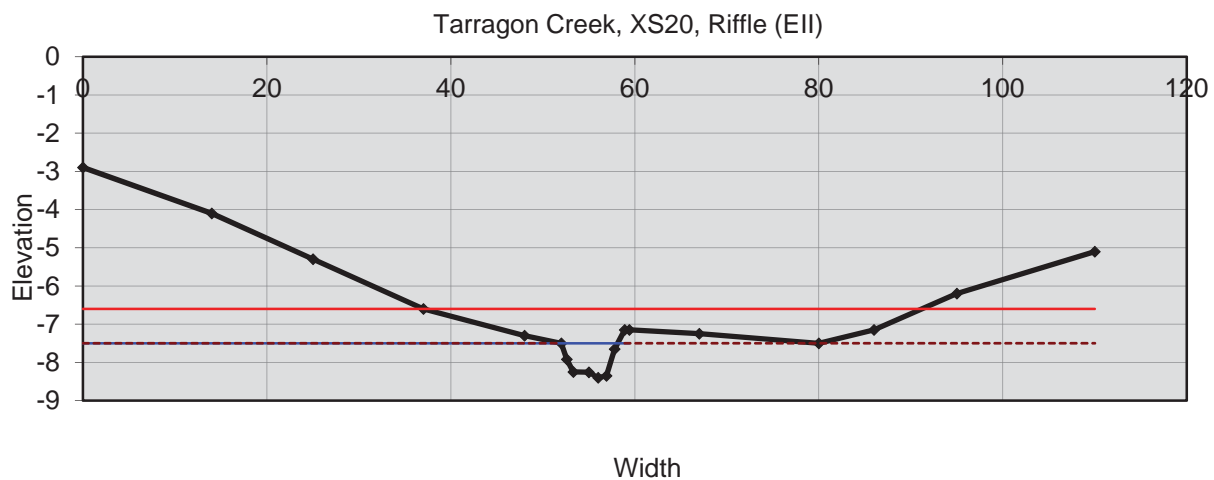


#### Bankfull Dimensions

4.2	x-section area (ft.sq.)
3.7	width (ft)
1.2	mean depth (ft)
1.5	max depth (ft)
5.4	wetted parimeter (ft)
0.8	hyd radi (ft)
3.2	width-depth ratio

#### Flood Dimensions

6.7	W flood prone area (ft)
1.8	entrenchment ratio
4.4	low bank height (ft)
3.0	low bank height ratio

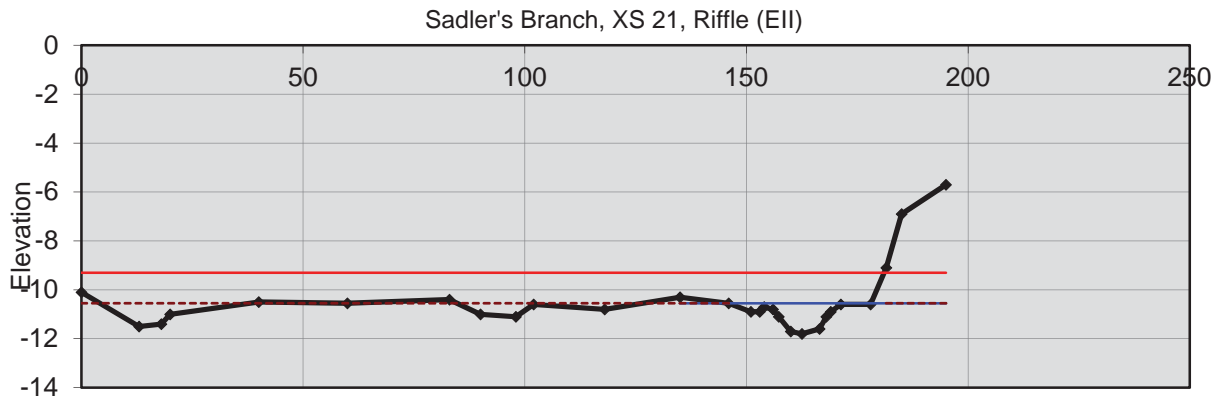


#### Bankfull Dimensions

3.9	x-section area (ft.sq.)
6.1	width (ft)
0.6	mean depth (ft)
0.9	max depth (ft)
6.6	wetted parimeter (ft)
0.6	hyd radi (ft)
9.6	width-depth ratio

#### Flood Dimensions

54.2	W flood prone area (ft)
8.8	entrenchment ratio
0.9	low bank height (ft)
1.0	low bank height ratio



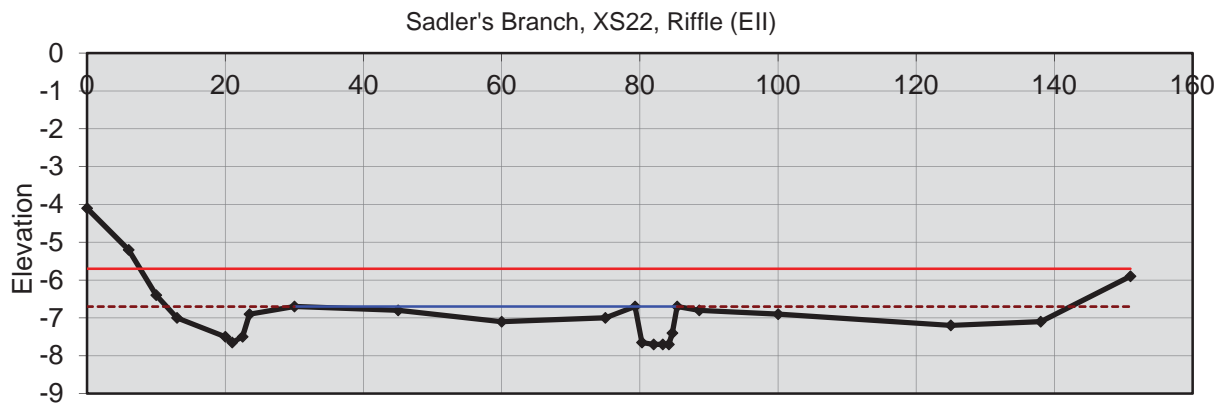
Width

#### Bankfull Dimensions

15.1	x-section area (ft.sq.)
32.1	width (ft)
0.5	mean depth (ft)
1.3	max depth (ft)
32.4	wetted parimeter (ft)
0.5	hyd radi (ft)
68.4	width-depth ratio

#### Flood Dimensions

200.0	W flood prone area (ft)
6.2	entrenchment ratio
1.3	low bank height (ft)
1.0	low bank height ratio



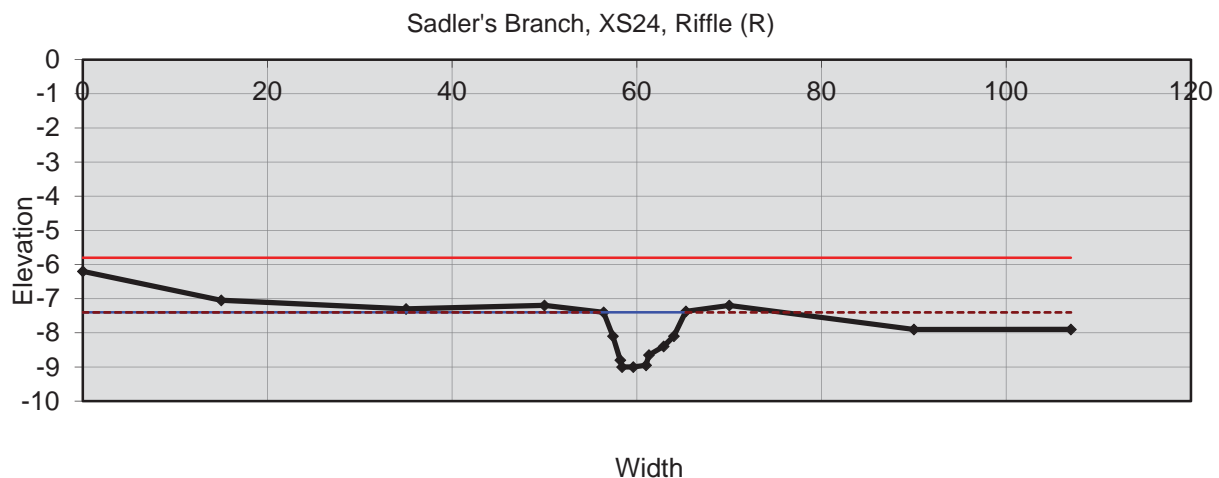
Width

#### Bankfull Dimensions

15.4	x-section area (ft.sq.)
55.4	width (ft)
0.3	mean depth (ft)
1.0	max depth (ft)
56.2	wetted parimeter (ft)
0.3	hyd radi (ft)
199.3	width-depth ratio

#### Flood Dimensions

143.0	W flood prone area (ft)
2.6	entrenchment ratio
1.0	low bank height (ft)
1.0	low bank height ratio

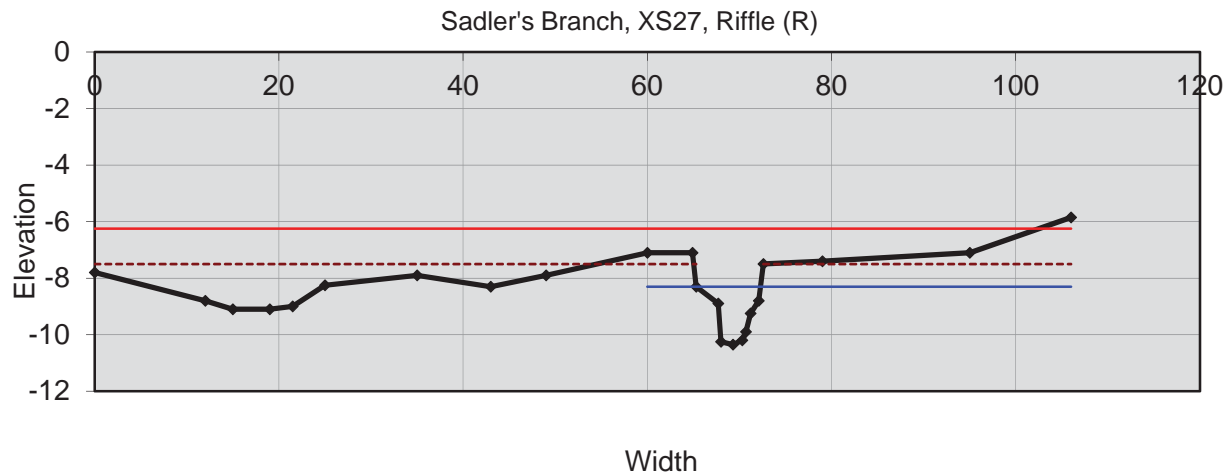


#### Bankfull Dimensions

9.2	x-section area (ft.sq.)
8.8	width (ft)
1.0	mean depth (ft)
1.6	max depth (ft)
9.8	wetted parimeter (ft)
0.9	hyd radi (ft)
8.5	width-depth ratio

#### Flood Dimensions

200.0	W flood prone area (ft)
22.6	entrenchment ratio
1.6	low bank height (ft)
1.0	low bank height ratio

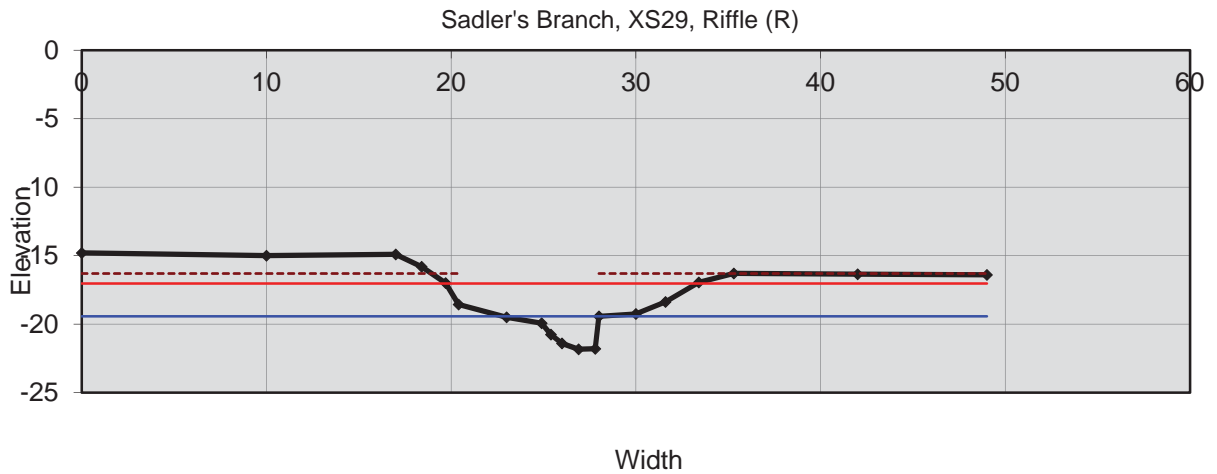


#### Bankfull Dimensions

7.7	x-section area (ft.sq.)
7.0	width (ft)
1.1	mean depth (ft)
2.1	max depth (ft)
9.0	wetted parimeter (ft)
0.9	hyd radi (ft)
6.3	width-depth ratio

#### Flood Dimensions

102.5	W flood prone area (ft)
14.7	entrenchment ratio
2.9	low bank height (ft)
1.4	low bank height ratio

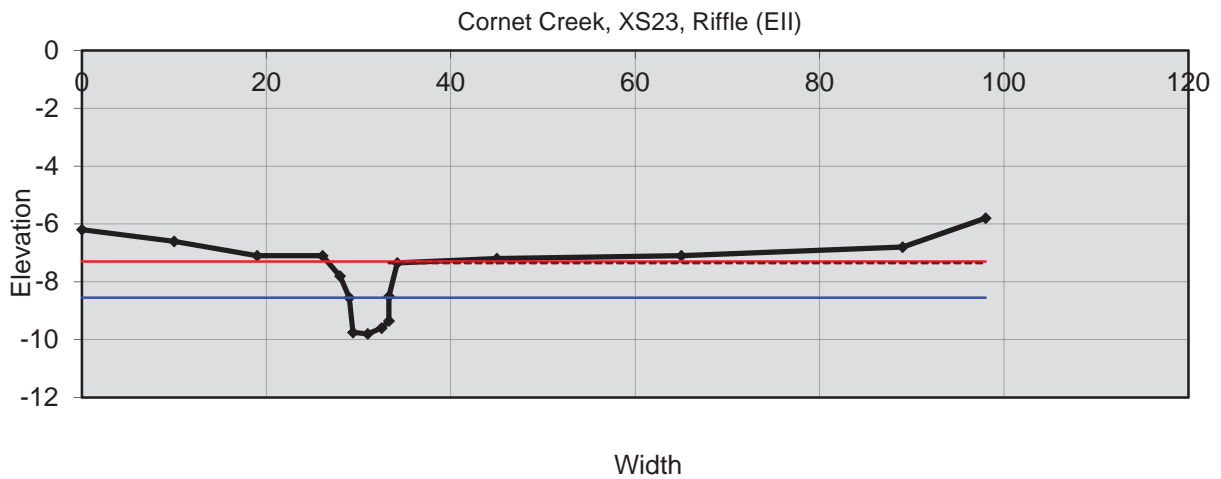


#### Bankfull Dimensions

6.3	x-section area (ft.sq.)
5.2	width (ft)
1.2	mean depth (ft)
2.4	max depth (ft)
8.3	wetted parimeter (ft)
0.8	hyd radi (ft)
4.3	width-depth ratio

#### Flood Dimensions

13.6	W flood prone area (ft)
2.6	entrenchment ratio
5.5	low bank height (ft)
2.3	low bank height ratio

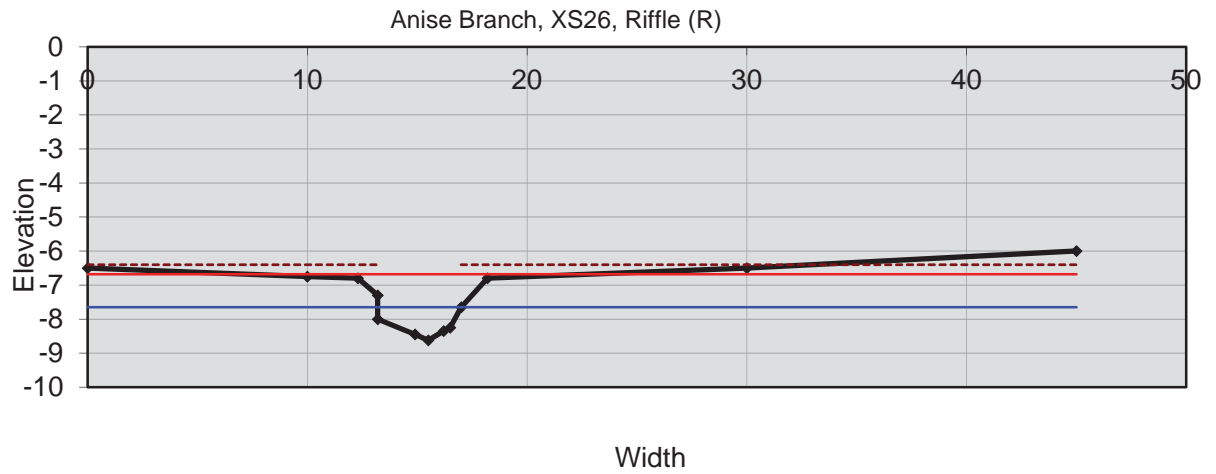


#### Bankfull Dimensions

4.7	x-section area (ft.sq.)
4.3	width (ft)
1.1	mean depth (ft)
1.3	max depth (ft)
6.0	wetted parimeter (ft)
0.8	hyd radi (ft)
4.0	width-depth ratio

#### Flood Dimensions

11.2	W flood prone area (ft)
2.6	entrenchment ratio
2.5	low bank height (ft)
2.0	low bank height ratio



#### Bankfull Dimensions

2.4	x-section area (ft.sq.)
3.8	width (ft)
0.6	mean depth (ft)
1.0	max depth (ft)
4.6	wetted parimeter (ft)
0.5	hyd radi (ft)
5.9	width-depth ratio

#### Flood Dimensions

15.7	W flood prone area (ft)
4.1	entrenchment ratio
2.2	low bank height (ft)
2.3	low bank height ratio

APPENDIX D

REGULATORY AGENCY COORDINATION



March 16, 2015

**Dale Suiter**

US Fish and Wildlife Service  
P.O. Box 33726  
Raleigh, NC 27636

Subject: Falling Creek Mitigation Bank in Wayne County, NC

Dear Mr. Suiter,

The Falling Creek Mitigation Bank is being developed to provide in-kind mitigation for unavoidable stream channel, wetland, and buffer impacts. Several sections of channel and riparian wetlands have been identified as significantly degraded. The project will include preservation of stream channels and wetlands, stream enhancement, stream restoration, wetland rehabilitation, wetland restoration, and restoration of riparian buffers. The site has historically been disturbed due to agricultural use, primarily livestock production.

We have already obtained an updated species list for Wayne County from your website (<http://www.fws.gov/raleigh/species/cntylist/wayne.html>). The red-cockaded woodpecker (*Picoides borealis*) is listed as the only endangered species within the county. We are requesting that you provide any known information on this species within the county. The USFWS will be contacted if suitable habitat for any listed species is found or if we can determine that the project may affect one or more federally listed species or designated critical habitat.

Please provide comments on any possible issues that might emerge with respect to endangered species, migratory birds or other trust resources from the construction of a stream, wetland, and riparian buffer project on the subject property. A USGS map showing the approximate property lines and area of potential ground disturbance/stream restoration area is enclosed.

If we have not heard from you in 30 days we will assume that you do not have any comments regarding associated laws and that you do not have any information relevant to this project at the current time.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the extent of site disturbance associated with this project.

Sincerely,

**Angela N. Allen**, Assistant Project Manager

[aallen@wildlandseng.com](mailto:aallen@wildlandseng.com)

919-851-9986 x 106





# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Raleigh ES Field Office  
Post Office Box 33726  
Raleigh, North Carolina 27636-3726

April 17, 2015

Angela Allen  
Wildlands Engineering  
312 West Millbrook Road, Suite 225  
Raleigh, NC 27609

Re: Falling Creek Mitigation Bank- Wayne County, NC

Dear Ms. Allen:

This letter is to inform you that a list of all federally-protected endangered and threatened species with known occurrences in North Carolina is now available on the U.S. Fish and Wildlife Service's (Service) web page at <http://www.fws.gov/raleigh>. Therefore, if you have projects that occur within the Raleigh Field Office's area of responsibility (see attached county list), you no longer need to contact the Raleigh Field Office for a list of federally-protected species.

Our web page contains a complete and frequently updated list of all endangered and threatened species protected by the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act), and a list of federal species of concern<sup>1</sup> that are known to occur in each county in North Carolina.

Section 7 of the Act requires that all federal agencies (or their designated non-federal representative), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species. A biological assessment or evaluation may be prepared to fulfill that requirement and in determining whether additional consultation with the Service is necessary. In addition to the federally-protected species list, information on the species' life histories and habitats and information on completing a biological assessment or evaluation and can be found on our web page at <http://www.fws.gov/raleigh>. Please check the web site often for updated information or changes.

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<sup>1</sup> The term "federal species of concern" refers to those species which the Service believes might be in need of concentrated conservation actions. Federal species of concern receive no legal protection and their designation does not necessarily imply that the species will eventually be proposed for listing as a federally endangered or threatened species. However, we recommend that all practicable measures be taken to avoid or minimize adverse impacts to federal species of concern.

If your project contains suitable habitat for any of the federally-listed species known to be present within the county where your project occurs, the proposed action has the potential to adversely affect those species. As such, we recommend that surveys be conducted to determine the species' presence or absence within the project area. The use of North Carolina Natural Heritage program data should not be substituted for actual field surveys.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a federally-protected species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on federally listed species, then you are not required to contact our office for concurrence (unless an Environmental Impact Statement is prepared). However, you should maintain a complete record of the assessment, including steps leading to your determination of effect, the qualified personnel conducting the assessment, habitat conditions, site photographs, and any other related articles.

With regard to the above-referenced project, we offer the following remarks. Our comments are submitted pursuant to, and in accordance with, provisions of the Endangered Species Act.

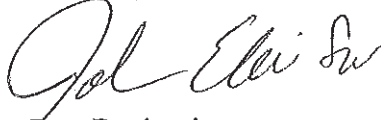
Based on the information provided and other information available, it appears that the proposed action is not likely to adversely affect any federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act at these sites. We believe that the requirements of section 7(a)(2) of the Act have been satisfied for your project. Please remember that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

However, the Service is concerned about the potential impacts the proposed action might have on aquatic species. Aquatic resources are highly susceptible to sedimentation. Therefore, we recommend that all practicable measures be taken to avoid adverse impacts to aquatic species, including implementing directional boring methods and stringent sediment and erosion control measures. An erosion and sedimentation control plan should be submitted to and approved by the North Carolina Division of Land Resources, Land Quality Section prior to construction. Erosion and sedimentation controls should be installed and maintained between the construction site and any nearby down-gradient surface waters. In addition, we recommend maintaining natural, vegetated buffers on all streams and creeks adjacent to the project site.

The North Carolina Wildlife Resources Commission has developed a Guidance Memorandum (a copy can be found on our website at (<http://www.fws.gov/raleigh>) to address and mitigate secondary and cumulative impacts to aquatic and terrestrial wildlife resources and water quality. We recommend that you consider this document in the development of your projects and in completing an initiation package for consultation (if necessary).

We hope you find our web page useful and informative and that following the process described above will reduce the time required, and eliminate the need, for general correspondence for species' lists. If you have any questions or comments, please contact John Ellis of this office at (919) 856-4520 ext. 26.

Sincerely,

A handwritten signature in cursive script, appearing to read "Pete Benjamin".

Pete Benjamin  
Field Supervisor

## List of Counties in the Service's Raleigh Field Office Area of Responsibility

Alamance	Perquimans
Beaufort	Person
Bertie	Pitt
Bladen	Randolph
Brunswick	Richmond
Camden	Robeson
Carteret	Rockingham
Caswell	Sampson
Chatham	Scotland
Chowan	Tyrrell
Columbus	Vance
Craven	Wake
Cumberland	Warren
Currituck	Washington
Dare	Wayne
Duplin	Wilson
Durham	
Edgecombe	
Franklin	
Gates	
Granville	
Greene	
Guilford	
Halifax	
Harnett	
Hertford	
Hoke	
Hyde	
Johnston	
Jones	
Lee	
Lenoir	
Martin	
Montgomery	
Moore	
Nash	
New Hanover	
Northampton	
Onslow	
Orange	
Pamlico	
Pasquotank	
Pender	



March 16, 2015

**Shannon Deaton**

North Carolina Wildlife Resource Commission  
Division of Inland Fisheries  
1721 Mail Service Center  
Raleigh, NC 27699

Subject: Falling Creek Mitigation Bank in Wayne County, NC

Dear Ms. Deaton,

The purpose of this letter is to request review and comment on any possible issues that might emerge with respect to fish and wildlife issues associated with a potential stream, wetland, and riparian buffer project on the attached site. A USGS map showing the approximate property lines and areas of potential ground disturbance (stream and wetland restoration section) is enclosed.

The Falling Creek Mitigation Bank is being developed to provide in-kind mitigation for unavoidable stream channel, wetland, and buffer impacts. Several sections of channel and riparian wetlands have been identified as significantly degraded. The project will include preservation of stream channels and wetlands, stream enhancement, stream restoration, wetland rehabilitation, wetland restoration, and restoration of riparian buffers. The site has historically been disturbed due to agricultural use, primarily livestock production.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the extent of site disturbance associated with this project.

Sincerely,

**Angela N. Allen**, Assistant Project Manager

[aallen@wildlandseng.com](mailto:aallen@wildlandseng.com)

919-851-9986 x 106





## ▣ North Carolina Wildlife Resources Commission ▣

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Gordon Myers, Executive Director

April 10, 2015

Angela N. Allen, Assistant Project Manager  
Wildlands Engineering  
312 West Millbrook Road, Suite 225  
Raleigh, NC 27609

Subject: Falling Creek Mitigation Bank, Wayne County, North Carolina.

Dear Ms. Allen,

Biologists with the North Carolina Wildlife Resources Commission have reviewed the subject information. Our comments are provided in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667e) and North Carolina General Statutes (G.S. 113-131 et seq.).

The proposed Mitigation Bank has been proposed to provide in-kind mitigation for unavoidable stream channel, wetland and buffer impacts. Several sections of channel and riparian wetlands throughout the site have been identified as significantly degraded from past agricultural activities, specifically livestock production. The project site includes Falling Creek and tributaries to Falling Creek. Falling Creek is a tributary to the Neuse River in the Neuse River basin.

Stream restoration projects often improve water quality and aquatic habitat. Establishing native, forested buffers in riparian areas will help protect water quality, improve aquatic and terrestrial habitats and provide a travel corridor for wildlife species. Sediment and erosion control measures should be installed prior to any land disturbance or construction. The use of biodegradable and wildlife-friendly sediment and erosion control devices is strongly recommended. Silt fencing, fiber rolls and/or other products should have loose-weave netting that is made of natural fiber materials with movable joints between the vertical and horizontal twines. Silt fencing that has been reinforced with plastic or metal mesh should be avoided as it impedes the movement of terrestrial wildlife species. Excessive silt and sediment loads can have detrimental effects on aquatic resources including destruction of spawning habitat, suffocation of eggs and clogging of gills.

Provided measures are taken to minimize erosion and sedimentation from restoration activities, we do not anticipate significant adverse impacts to aquatic and terrestrial wildlife resources.

Thank you for the opportunity to review and comment on this project. If I can be of further assistance, please contact me at (910) 409-7350 or [gabriela.garrison@ncwildlife.org](mailto:gabriela.garrison@ncwildlife.org).

Page 2

April 10, 2015  
Falling Creek Mitigation Bank

Sincerely,

A handwritten signature in blue ink that reads "Gabriela Garrison". The signature is written in a cursive, flowing style.

Gabriela Garrison  
Eastern Piedmont Coordinator  
Habitat Conservation Program



March 13, 2015

**Renee Gledhill-Earley**  
State Historic Preservation Office  
4617 Mail Service Center  
Raleigh, NC 27699-4617

Subject: Falling Creek Mitigation Bank in Wayne County, NC

Dear Ms. Gledhill-Earley,  
Wildlands Engineering, Inc. requests review and comment on any possible issues that might emerge with respect to archaeological or cultural resources. Associated with a potential stream restoration project on the Falling Creek Mitigation Site (USGS site map and aerial map with approximate areas of potential ground disturbance are enclosed).

The Falling Creek Mitigation Bank is being developed to provide in-kind mitigation for unavoidable stream channel, wetland, and buffer impacts. Several sections of channel and riparian wetlands have been identified as significantly degraded. The project will include preservation of stream channels and wetlands, stream enhancement, stream restoration, wetland rehabilitation, wetland restoration, and restoration of riparian buffers. The site has historically been disturbed due to agricultural use, primarily livestock production. No architectural structures or archaeological artifacts have been observed or noted during preliminary surveys of the site for restoration purposes.

We ask that you review the site based on the attached information to determine the presence of any historic properties.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the extent of site disturbance associated with this project.

Sincerely,

**Angela N. Allen**, Assistant Project Manager

[aallen@wildlandseng.com](mailto:aallen@wildlandseng.com)

919-851-9986 x 106





North Carolina Department of Environment and Natural Resources

Pat McCrory  
Governor

Donald R. van der Vaart  
Secretary

April 14, 2015

**DWQ # 15-0190**  
Wayne County

Edison R. Grady  
499 Corbett Hill Road  
Mount Olive, NC 28365

John and Edgar Thornton  
971 Grantham School Road  
Mount Olive, NC 28365

Subject Property: Falling Creek Mitigation Bank  
UTs to Falling Creek, Neuse River Basin

On-Site Determination for Applicability to the Neuse River Riparian Area Protection Rules (15A NCAC 2B .0233)

Dear Mrs. Grady and Messrs. Thornton:

On April 7, 2015, at request your consultant Mr. John Hutton of Wildlands Engineering, Inc., Anthony Scarbraugh conducted on-site determinations to review unnamed tributaries (UTs) to Falling Creek located on the two subject properties (known as West Falling Creek Mitigation Bank Property and East Falling Creek Mitigation Bank Property) for applicability to the Neuse Buffer Rules (15A NCAC 2B .0233. The features are labeled as "15-0190 A through 15-0190 Y" on the attached map(s) initialed by Mr. Scarbraugh on April 14, 2015. The subject properties are located near 444 Corbett Hill Road and 368 Corbett Hill Road near the Town of Mount Olive, Wayne County, respectively.

At your request, Mr. Scarbraugh conducted on-site determinations as stated above. During his review, he evaluated the streams using the DWR Stream Classification Form.

Feature	Not Subject to Buffers	Subject to Buffers	E/I/P*	Start@	Stop@
15-0190 A		X	I	35.26209 N, 78.18913 W	Approximate location shown of map
15-0190 B		X	I	35.26326 N, 78.18822 W	Approximate location shown of map
15-0190 C		X	I	35.26535 N, 78.18790 W	Approximate location shown of map
15-0190 D	X		E	35.26626 N, 78.18739 W	Approximate location shown of map
15-0190 E	X		E	35.26703 N, 78.18717 W	Approximate location shown of map
15-0190 F		X	I	35.26820 N, 78.18687 W	Approximate location shown of map
15-0190 G	X		E (Ditch)	35.26953 N, 78.18743 W	Approximate location shown of map

Division of Water Resources – Water Quality Regional Operations Section – Washington Regional Office

943 Washington Square Mall, Washington, NC 27889

Phone: 252-946-6481 \ Fax: 252-975-3716 \ Internet: [www.ncdenr.gov](http://www.ncdenr.gov)

An Equal Opportunity \ Affirmative Action Employer – Made in part by recycled paper

15-0190 H	X		E (Ditch)	35.27152 N, 78.18607 W	Approximate location shown of map
15-0190 I		X	I	35.27062 N, 78.18884 W	Approximate location shown of map
15-0190 J	X		E (Ditch)	35.26983 N, 78.18790 W	Approximate location shown of map
15-0190 K	X		E (Ditch)	35.26921 N, 78.18838 W	Approximate location shown of map
15-0190 L		X	P	35.26876 N, 78.19021 W	Approximate location shown of map
15-0190 M		X	P	35.26640 N, 78.19149 W	Approximate location shown of map
15-0190 N		X	I	35.26275 N, 78.19062 W	Approximate location shown of map
15-0190 O		X	I	35.26751 N, 78.18418 W	Approximate location shown of map
15-0190 P	X		Not Present	35.26882 N, 78.18018 W	Approximate location shown of map
15-0190 Q		X	I	35.26897 N, 78.18013 W	Approximate location shown of map
15-0190 R	X		E (Ditch)	35.26467 N, 78.17746 W	Approximate location shown of map
15-0190 S		X	P	35.26390 N, 78.17872 W	Approximate location shown of map
15-0190 T		X	I	35.26254 N, 78.17802 W	Approximate location shown of map
15-0190 U	X		E	35.26476 N, 78.17538 W	Approximate location shown of map
15-0190 V		X	I	35.26619 N, 78.17305 W	Approximate location shown of map
15-0190 W		X	P	35.26706 N, 78.17113 W	Approximate location shown of map
15-0190 X		X	P	35.26811 N, 78.17052 W	Approximate location shown of map
15-0190 Y		X	I	35.26945 N, 78.17312 W	Approximate location shown of map

- E/I/P – Ephemeral/Intermittent/Perennial

The Division of Water Resources (DWR) has determined that a portion of features labeled as "15-0190 A, 15-0190 B, 15-0190 C, 15-0190 F, 15-0190 I, 15-0190 L, 15-0190 M, 15-0190 N, 15-0190 O, 15-0190 Q, 15-0190 S, 15-0190 T, 15-0190 V, 15-0190 W, 15-0190 X, and 15-0190 Y" on the attached map(s), and highlighted in blue are subject to the Neuse Buffer Rules. The portion of the features labeled as "15-0190 O and 15-0190 Q" and highlighted in red and circled on the attached map(s), is not subject to the Neuse Buffer Rules. The portion of the features labeled as "15-0190 D, 15-0190 E, 15-0190 G, 15-0190 H, 15-0190 J, 15-0190 K, 15-0190 P, 15-0190 R, and 15-0190 U" on the attached map(s), and highlighted in red is not subject to the Neuse Buffer Rules. The features and the associated buffers should be identified on any future plans for this property. The owner (or future owners) should notify the DWR (and other relevant agencies) of this decision in any future correspondences concerning this property. This on-site determination shall expire five (5) years from the date of this letter.

Landowners or affected parties that dispute a determination made by the DWR or Delegated Local Authority that a surface water exists and that it is subject to the buffer rule may request a determination by the Director. A request for a determination by the Director shall be referred to the Director in writing c/o Karen Higgins, DWR 401 & Buffer Permitting Unit, 1617 Mail Service Center, Raleigh, NC 27699-1650. Individuals that dispute a determination by the DWR or Delegated Local Authority that "exempts" a surface water from the buffer rule may ask for an adjudicatory hearing. You must act within 60 days of the date that you receive this letter. Applicants are hereby notified that the 60-day statutory appeal time does not start until the affected party (including downstream and adjacent landowners) is notified of this decision. DWR recommends that the applicant conduct this notification in order to be certain that third party appeals are made in a timely manner. To ask for a hearing, send a written petition, which conforms to Chapter 150B of the North Carolina General Statutes to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. This determination is final and binding unless you ask for a hearing within 60 days.

This letter only addresses the applicability to the buffer rules and does not approve any activity within the buffers. Nor does this letter approve any activity within Waters of the United States or Waters of the State. If you have any additional questions or require additional information please call Anthony Scarbraugh in the Washington Regional Office at (252) 948-3924.

Sincerely,

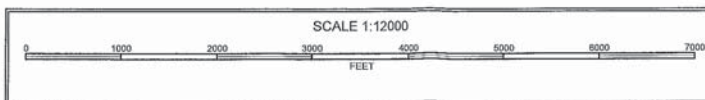
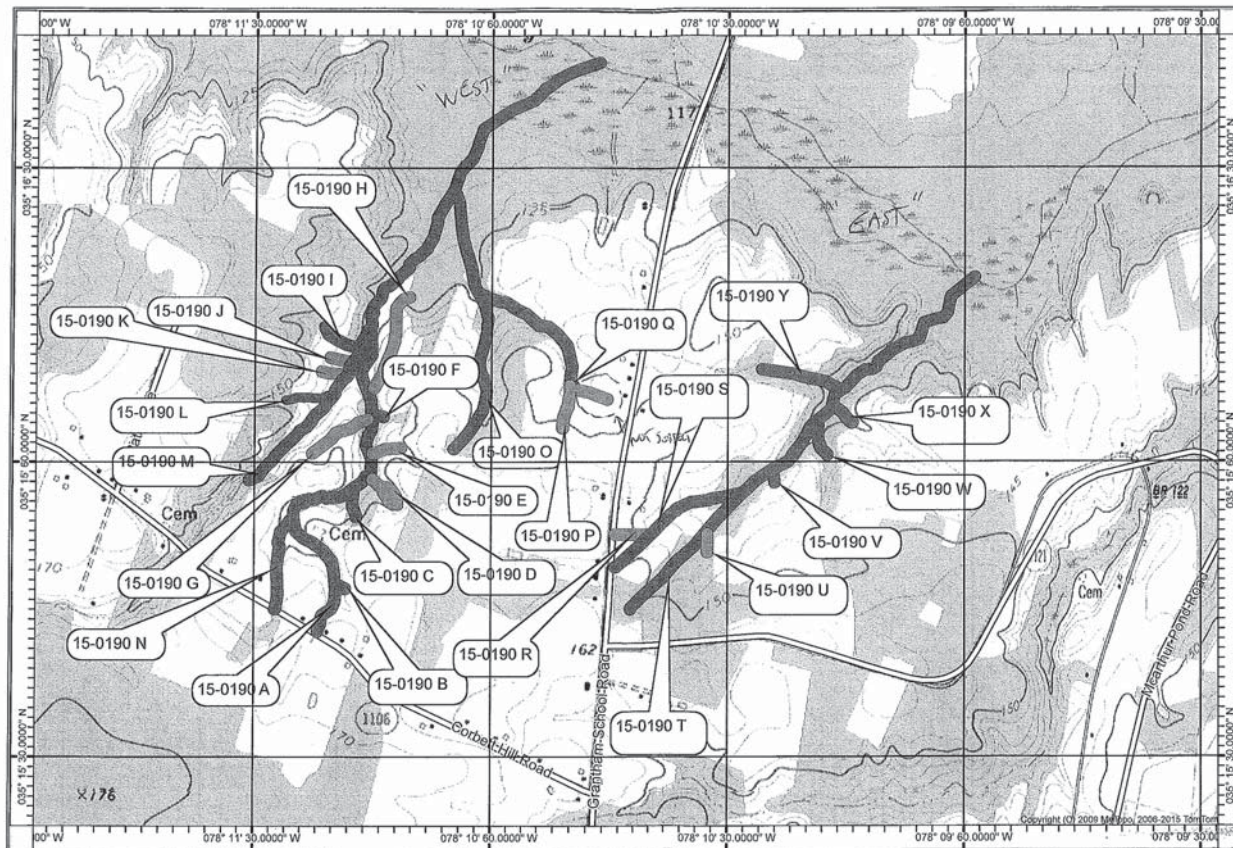


Robert Tankard, Assistant Regional Supervisor  
Water Quality Regional Operations Section  
Division of Water Resources, NCDENR

Attachments: USGS Topographic 1:24,000 Quadrangle Map "Grantham"  
copy of sheet 29, 1974 version of Wayne County Soil Survey

cc: DWR 401 & Buffer Permitting Unit  
File Copy  
Katie Merritt, 401 & Wetland Permitting Unit  
Daniel Taylor, Wildlands Engineering, Inc.,  
312 West Millbrook Road, Suite 225, Raleigh, NC 27609

Filename 15-0190



North Carolina Environmental  
Management Commission  
Division of Water Resources  
For: News Basin Buffer  
Date: 5-10-2011  
Reviewed by: AT



APPENDIX E

LANDOWNER AUTHORIZATION FORMS

## EXHIBIT D: Landowner Authorization Form

### NORTH CAROLINA ECOSYSTEM ENHANCEMENT PROGRAM LANDOWNER AUTHORIZATION FORM

PROPERTY LEGAL DESCRIPTION:

Deed Book: 1487 Page: 155 County: Wayne

Parcel ID Number: 2545244526

Street Address: 444 Corbett Hill Rd.  
Mount Olive, NC 28365

Property Owner (please print): Pat Grady

The undersigned, registered property owner(s) of the above property, do hereby authorize Wildlands Engineering, Inc., the NC Department of Environment and Natural Resources, and the US Army Corps of Engineers, their employees, agents or assigns to have reasonable access to the above referenced property for the evaluation of the property as a potential stream, wetland and/or riparian buffer mitigation project, including conducting stream and/or wetland determinations and delineations, as well as issuance and acceptance of any required permit(s) or certification(s).

Property Owners(s) Address: 499 Corbett Hill Rd.  
(if different from above) Mount Olive, NC 28365

Property Owner Telephone Number: 704-332-7754

I/We hereby certify the above information to be true and accurate to the best of my/our knowledge.

Edison Rose Grady 11-3-14  
(Property Owner Authorized Signature) (Date)

\_\_\_\_\_  
(Property Owner Authorized Signature) (Date)

## EXHIBIT D: Landowner Authorization Form

### NORTH CAROLINA ECOSYSTEM ENHANCEMENT PROGRAM LANDOWNER AUTHORIZATION FORM

**PROPERTY LEGAL DESCRIPTION:** Two parcels of approximately 68.11 acres and 58.64, located at 368 Corbett Hill Road and off Grantham School Road in the city of Mount Olive, County of Wayne, State of North Carolina.

Deed Book: 1562 and 2704

Page: 843 and 422

County: Wayne

Parcel ID Number: 2545224899 and 2545435721

Street Address: 368 Corbett Hill Road and off Grantham School Road

Property Owner (please print): John Keith Thornton and Edgar Gene Thornton

The undersigned, registered property owner(s) of the above property, do hereby authorize Wildlands Engineering, Inc., the NC Department of Environment and Natural Resources, and the US Army Corps of Engineers, their employees, agents or assigns to have reasonable access to the above referenced property for the evaluation of the property as a potential stream, wetland and/or riparian buffer mitigation project, including conducting stream and/or wetland determinations and delineations, as well as issuance and acceptance of any required permit(s) or certification(s).

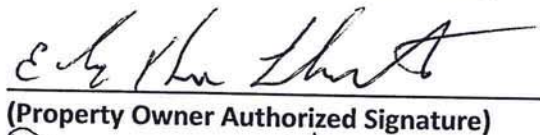
Property Owners(s) Address: 971 Grantham School Road, Mount Olive, NC 28365

Property Owner Contact Number: 704-332-7754

I/We hereby certify the above information to be true and accurate to the best of my/our knowledge.

  
(Property Owner Authorized Signature)

12-23-14  
(Date)

  
(Property Owner Authorized Signature)

12-23-14  
(Date)



12-23-14

## EXHIBIT D: Landowner Authorization Form

### NORTH CAROLINA ECOSYSTEM ENHANCEMENT PROGRAM LANDOWNER AUTHORIZATION FORM

PROPERTY LEGAL DESCRIPTION: PINs 2545659261, 2545633507, 2545845592, 2545826561, 2545726289, 2545613762, 2545515813 and 2545623814 recorded in book 1315 at page 589, book 1249 at page 283, book 1249 at page 279, book 2360 at page 834, book 1152 at page 624, book 2513 at page 390, book 2566 at page 484, and book 2941 at page 140. Parcels area located off of Grantham School Road in the city of Mount Olive, County of Wayne, State of North Carolina.

Deed Book: see above

Page: see above

County: Wayne

Parcel ID Number: see above

Street Address: off Grantham School Road

Property Owner (please print): John Keith Thornton and Edgar Gene Thornton

The undersigned, registered property owner(s) of the above property, do hereby authorize Wildlands Engineering, Inc., the NC Department of Environment and Natural Resources, and the US Army Corps of Engineers, their employees, agents or assigns to have reasonable access to the above referenced property for the evaluation of the property as a potential stream, wetland and/or riparian buffer mitigation project, including conducting stream and/or wetland determinations and delineations, as well as issuance and acceptance of any required permit(s) or certification(s).

Property Owners(s) Address: 971 Grantham School Road, Mount Olive, NC 28365

Property Owner Contact Number: 704-332-7754

I/We hereby certify the above information to be true and accurate to the best of my/our knowledge.

  
(Property Owner Authorized Signature)

\_\_\_\_\_  
(Date)

  
(Property Owner Authorized Signature)

\_\_\_\_\_  
(Date)

## EXHIBIT D: Landowner Authorization Form

### NORTH CAROLINA ECOSYSTEM ENHANCEMENT PROGRAM LANDOWNER AUTHORIZATION FORM

**PROPERTY LEGAL DESCRIPTION:** Approximately 26, located off Corbett Hill Road and off Grantham School Road in the city of Mount Olive, County of Wayne, State of North Carolina.

**Deed Book:** 2247

**Page:** 365

**County:** Wayne

**Parcel ID Number:** 2545344583

**Street Address:** off Corbett Hill Road

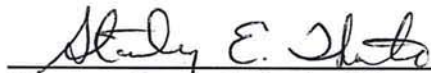
**Property Owner (please print):** Stanley E. Thornton

The undersigned, registered property owner(s) of the above property, do hereby authorize Wildlands Engineering, Inc., the NC Department of Environment and Natural Resources, and the US Army Corps of Engineers, their employees, agents or assigns to have reasonable access to the above referenced property for the evaluation of the property as a potential stream, wetland and/or riparian buffer mitigation project, including conducting stream and/or wetland determinations and delineations, as well as issuance and acceptance of any required permit(s) or certification(s).

**Property Owners(s) Address:** 465 Corbett Hill Road, Mount Olive, NC 28365

**Property Owner Contact Number:** 704-332-7754

I/We hereby certify the above information to be true and accurate to the best of my/our knowledge.



(Property Owner Authorized Signature)

01-29-2015

(Date)

APPENDIX F

CORPORATE BACKGROUND AND EXPERIENCE

## F.1 Corporate Background

The Wildlands Team is a multidisciplinary group of professionals that brings together the expertise necessary to create outstanding ecological restoration projects in a timely and cost effective manner. Wildlands, the primary offeror, is located in Charlotte, NC. Wildlands has offices in Charlotte, Raleigh, Asheville, Charleston, SC, and Fairfax, VA. Our 32 employees dedicated to environmental restoration have positioned Wildlands as a leader in ecosystem restoration in the southeastern United States.

Wildlands has teamed with Turner Surveying (Turner) for survey and easement services. Turner is a well-established professional land surveying firm based out of Raleigh, NC. Turner has worked on a variety of projects with Wildlands staff and their experience includes geomorphic assessment surveys, GPS control for NC State Plane survey work, boundary surveys for property net verification, easement platting, legal descriptions, and easement monumentation. Early coordination and frequent communication ensures that everyone understands their role in the project and can complete tasks in a timely and efficient manner.

Wildlands will use one of the following five contractors:

- Backwater Environmental
- Fluvial Solutions, Inc.
- Land Mechanic Designs, Inc.
- North State Environmental, Inc.
- River Works, Inc.



## F.2 Ability to Complete all Phases of the Proposed Project

Wildlands' success is owed to the skills and abilities of its diverse and talented staff. Wildlands' staff expertise includes planning, ecology, biology, economics, landscape architecture, civil engineering, real estate, AutoCAD, GIS, land management, environmental consulting, and habitat construction. Our collection of professionals allows for a seamless approach to planning, permitting, design, construction, and management of restoration projects. We fully understand the permitting process at the federal, state, and local level. Wildlands has not been found to be out-of-compliance with any required project permits. Wildlands has four NC Certified Floodplain Managers (CFMs) on staff to address local, state, and FEMA floodplain permitting requirements. We have extensive experience with categorical exclusions, 401/404 permitting, and sediment and erosion control plans.

## F.3 Similar Projects

Wildlands has completed numerous projects involving stream restoration, wetland restoration, and mitigation banking. Several of these projects are summarized in this section.

### **Hopewell Stream Mitigation Site – Randolph County, NC.**

Wildlands recently constructed a full-delivery project in Randolph County on unnamed tributaries to Little River in January, 2015. The project provided 7,436 SMUs for NCDMS

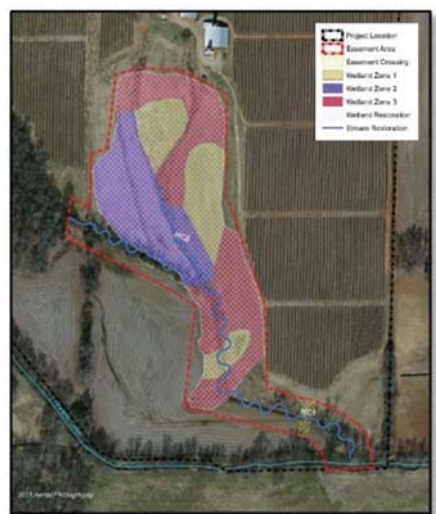


in the Yadkin River Basin. Stream restoration, enhancement, and preservation will occur on 12,519 LF of perennial and intermittent streams that were accessed by over 250 head of cattle. The project includes existing site assessment, conservation easement acquisition, permitting, stream restoration design, construction, and seven years of post-construction monitoring of geomorphic stability and vegetation. Wildlands is currently in the modeling phase of this project.

**Agony Acres Stream and Buffer Mitigation Site – Guilford County, NC.** Wildlands is currently performing ecological restoration work for DMS at a full-delivery site in Guilford County, north of the Town of Gibsonville. The project will provide 6,488 SMUs and 3.0 BMUs on four unnamed tributaries to Reedy Fork in the Cape Fear River Basin. The project includes categorical exclusion documentation, existing conditions assessment, landowner coordination, conservation easement acquisition, stream restoration design, permitting, construction, and seven years of post-construction monitoring. Construction was completed in summer 2014.



**Norkett Branch Stream Mitigation Site – Union County, NC.** Wildlands is developing a full-delivery project in rural Union County on Norkett Branch and four tributaries. The project will provide 10,098 SMUs for DMS in the Yadkin River Basin. The project includes existing site assessment, conservation easement acquisition, permitting, stream restoration design, construction, and seven years of post-construction monitoring of geomorphic stability and vegetation. Detailed hydraulic modeling was completed for a CLOMR approval. Two storm water BMPs were constructed to treat headwater agricultural runoff and will provide SMU credit. Construction was completed in early 2014.



**Owl's Den Mitigation Site – Lincoln County, NC.** Wildlands is currently constructing a full-delivery project in Lincoln County on two unnamed tributaries to Howards Creek. The project will provide 2,400 SMUs and 8.0 WMUs for DMS. The project includes existing site assessment, conservation easement acquisition, permitting, stream and wetland restoration design, construction, and seven years of post-construction monitoring of geomorphic stability and vegetation. Detailed hydrologic modeling is being completed to study wetland-groundwater connections. Wetland work will include rehabilitation and re-establishment areas.



#### Devil's Racetrack Mitigation Site – Johnston County, NC.



Wildlands is currently performing ecological restoration work at a site in Johnston County, east of the Town of Four Oaks. The full-delivery project will provide 18,527 SMUs and 67 Riparian WMUs on several unnamed tributaries to the Neuse River for DMS. The project includes categorical exclusion documentation, existing conditions assessment, landowner coordination, conservation easement acquisition, stream and wetland restoration design, permitting, construction, and seven years of post-construction monitoring. Wildlands has completed

the categorical exclusion documentation, design, permitting, and easement acquisition for this site. Construction of the project was completed in early 2014.

#### F.4 Lead Consultant and Team Members

Wildlands is a licensed engineering firm in NC and will act as prime consultant for this contract. Staff from our three NC offices and our Charleston, SC will complete this project. Wildlands has teamed with Turner to offer the best possible team to NCDMS.

Lead Consultant	
 <b>WILDLANDS</b> ENGINEERING	<b>Wildlands Engineering, Inc.</b> <b>Headquarters – Charlotte, NC Office Location</b> 1430 South Mint Street, Suite 104 Charlotte, NC 28203 (P) 704-332-7754 (F) 704-332-3306 <b>Firm Contact</b> Shawn Wilkerson, President swilkerson@wildlandseng.com
	North Carolina S-Corporation Federal Identification Number: 56-0651376
	<b>Raleigh, NC Office Location</b> Wildlands Engineering, Inc. 5605 Chapel Hill Road, Suite 122 Raleigh, NC 27607 (P) 919-851-9986 (F) 919-851-9987
Team Members	
 <b>TURNER LAND SURVEYING, PLLC</b> A WBE/DBE Certified & Veteran Owned Company	<b>Turner Land Surveying</b> P.O. Box 241023 Raleigh, NC 27629 (P) 919-875-1378 <b>Firm Contact</b> David S. Turner, PLS dturner119@nc.rr.com <b>Services to be Provided:</b> Professional surveying services

#### F.5 Project Manager Experience

Mr. John Hutton is Vice President and Senior Project Manager for Wildlands with fourteen years of experience in the assessment and restoration of streams and wetlands. He serves as the senior technical advisor for wetlands restoration within the firm. Mr. Hutton has managed numerous large-



scale restoration projects for a variety of public and private clients throughout the Southeast including over 20 miles of restored stream and over 350 acres of restored wetlands. He has been responsible for all aspects of stream and wetland restoration projects including site searches, feasibility studies, mitigation planning, mitigation design, construction management, and post construction monitoring. Mr. Hutton has also served as project manager on a number of watershed and water quality projects throughout the Southeast.

## F.6 Key Personnel Resumes (Prime and Sub)

This section provides resumes for the Wildlands project manager and the managing staff for our survey subcontractor on this project.

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### ***John Hutton***

Mr. Hutton is Vice President and Senior Project Manager for Wildlands and has fourteen years of experience in the assessment and restoration of streams and wetlands. He serves as the senior technical advisor for wetlands restoration within the firm. Mr. Hutton has managed numerous large-scale restoration projects for a variety of public and private clients throughout the Southeast including over 20 miles of restored stream and over 350 acres of restored wetlands. He has been responsible for all aspects of stream and wetland restoration projects including site searches, feasibility studies, mitigation planning, mitigation design, construction management, and post construction monitoring. Mr. Hutton has also served as project manager on a number of watershed and water quality projects throughout the Southeast.

<b>Job Classification:</b>	Vice President/Senior Project Manager
<b>Responsibilities for this Project:</b>	Principal-in-Charge and QA/QC Manager
<b>Professional Registrations:</b>	none
<b>Total Years of Experience:</b>	14 years

<b>Education:</b>	MS, 2000, Biological Sciences, Old Dominion University BSA, 1996, Botany, University of Georgia
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<b>Additional Training:</b>	RiverMorph Application Training, 2005 Rosgen Levels I through IV, 2001- 2004 Wetland Identification and Delineation Course, 2000 Wetland Construction and Restoration, 2001
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### **Project experience at Wildlands includes:**

#### *Aqony Acres Full-Delivery Project – Guilford County, NC.*

Mr. Hutton is serving as Project Manager for this ecological restoration project near Gibsonville, NC. The project will provide 6,488 SMUs and 63 BMUs along several unnamed tributaries to Reedy Fork in the Cape Fear River basin. The project includes categorical exclusion documentation, existing conditions assessment, landowner coordination, conservation easement acquisition, stream restoration, buffer restoration, permitting, construction, and seven years of post-construction monitoring. Mr. Hutton is overseeing the design direction as well as coordinating closely with the landowners.

#### *Devil's Racetrack Mitigation Full Delivery Project – Johnston County, NC.*

Mr. Hutton is serving as Project Manager for this ecological restoration project near Four Oaks, NC. The project will provide 18,527 SMUs and 67 Riparian WMUs along several unnamed tributaries to the



Neuse River in the Neuse River basin. The project includes categorical exclusion documentation, existing conditions assessment, landowner coordination, conservation easement acquisition, stream restoration, wetland restoration, permitting, construction, and seven years of post-construction monitoring. Mr. Hutton is overseeing the design direction as well as coordinating closely with the landowner.

*Underwood Stream and Wetland Mitigation – Chatham County, NC.*

Mr. Hutton is serving as principal-in-charge for this ecological restoration project near Siler City, NC. The project will provide 6,192 SMUs, 10.1 Riparian WMUs and 1.9 Non-Riparian WMUs along South Fork Cane Creek and several unnamed tributaries in the Cape Fear River basin. The project includes categorical exclusion documentation, existing conditions assessment, landowner coordination, conservation easement acquisition, stream restoration and enhancement, wetland restoration, creation, and enhancement, permitting, construction, and five years of post-construction monitoring. The project was constructed in the winter of 2012/2013 and is currently in its first year of monitoring.

*Malbone Wetland Mitigation – City of Virginia Beach, VA.*

Mr. Hutton is serving as the project manager for this design-build wetland mitigation project for the Virginia Department of Transportation in Virginia Beach, Virginia. The site was selected for enhancement and creation of three wetland types (emergent, scrub-shrub, and forested) to mitigate for wetland impacts resulting from the proposed widening of Princess Anne Road and the construction of Nimmo Parkway. Approximately 24 acres of wetlands were restored, created, and enhanced. This included 16 acres of palustrine forested wetland creation, 3 acres of palustrine emergent wetland creation, 0.1 acres of scrub-shrub wetland creation, and 5 acres of palustrine emergent wetlands enhancement. Construction and planting was completed in winter 2010/2011 and the project is currently in year 3 of the 10-year post construction monitoring phase. The project includes USDA soil classification, groundwater monitoring well installation and monitoring, wetland hydrologic modeling, grading design, permitting, construction document development, construction oversight, as-built plan development, baseline monitoring, post-construction monitoring to document hydrologic and vegetative success, and remediation, if necessary.

*Cannon Creek Full-Delivery Project – Berkely County, SC.*

Mr. Hutton is serving as Project Manager for this ecological restoration project near Moncks Corner, SC. The project will provide 13,500 stream credits on Cannon Creek in the A.C.E. River basin. The project includes Permittee Responsible Mitigation Plan development, existing conditions assessment, landowner coordination, conservation easement acquisition, stream restoration, permitting, construction, and seven years of post-construction monitoring. Mr. Hutton is overseeing the design direction as well as coordinating closely with the landowner.

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**Turner Surveying – Surveyor**

***David Turner, PLS***

Mr. Turner has 15 years of experience in the field of surveying, including boundary surveys, topographic surveys, construction surveys, GPS surveys, and stream and wetland restoration assessment and monitoring. Mr. Turner has been a Registered Land Surveyor in the state of North Carolina for 6 years and has completed work on numerous large-scale restoration and infrastructure projects. Mr. Turner was an Airborne Ranger with the 3rd Battalion out of Ft. Benning in Georgia from 1990-1995.

**Professional Registration/Training:** Professional Land Surveyor NC L-4551

**Related Project Experience:**



Devil's Racetrack Full-Delivery Project – Johnston County, NC. Mr. Turner is overseeing topographic and property net surveys for the Devil's Racetrack project. The project will provide 18,527 SMUs and 67 WMUs on unnamed tributaries to the Neuse River in the Neuse River basin. Turner is currently conducting survey and conservation easement documents for the project. They will work with WEI to provide as-built documentation.

Byrds Creek Full-Delivery Project – Person County, NC. Mr. Turner is overseeing topographic and property net surveys for the Byrds Creek project. The project will provide 5,387 SMUs on Byrds Creek and several unnamed tributaries in the Neuse River basin. Turner is currently conducting survey and conservation easement documents for the project. They will work with WEI to provide as-built documentation.

Jumping Run Creek – Harnett County, NC. Mr. Turner oversaw construction stakeout and as-built survey for the Jumping Run Creek repair project. The project included approximately 1,100 feet of channel repair to an existing DMS project. The project was completed and record drawings approved in August 2011.

Bailey Fork Full-Delivery Project – Burke County, NC. Mr. Turner oversaw topographic and property net surveys for the Bailey Fork project. The project 5,500 feet of stream restoration on Bailey Fork and several unnamed tributaries in the Catawba River basin. Mr. Turner completed Conservation Easements for the project as well as as-built and monitoring surveys.

Fred Fletcher Park Water Garden – Wake County, NC. Mr. Turner oversaw the as-built survey for the Fred Fletcher Park Water Garden project located in downtown Raleigh. This project is a large water quality BMP that filters runoff from a highly impervious urban watershed.

## **F.7 DBE/HUB participation**

Two of our potential contractors are woman-owned businesses: Land Mechanic Designs, Inc. and North State Environmental, Inc.

