Public Notice

U.S. Army Corps of Engineers, Norfolk District

February 8, 2008

CENAO-REG
2007-04438

FEDERAL PUBLIC NOTICE

The District Engineer has received a prospectus to establish a compensatory stream mitigation bank for Federal consideration as described below:

BANK SPONSOR

Lone Oak Mitigation, LLC
c/o Acer Engineering, PLLC
Attn: John Hutton
5605 Chapel Hill Road, Ste. 122
Raleigh, NC 27607

WATERWAY AND LOCATION OF THE PROPOSED WORK: The project is located in the James River watershed at Ballinger Creek, Joe Creek and tributaries, in Albemarle County, Virginia.

PROPOSED WORK AND PURPOSE: Restoration is proposed for 19,199 linear feet of stream channel and enhancement is proposed for 8,326 linear feet of stream channel. The proposal also includes riparian buffers approximately 200 foot wide along most streams banks with the exception of narrower buffers in several areas due to project constraints. The purpose of the project is to provide compensation for unavoidable impacts to waters of the United States and/or State waters, that result from development projects authorized under Section 401 and 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act and Section 62.1-44.15:5 of the Code of Virginia provided such activities have met all applicable requirements and are authorized by the appropriate agencies.

The primary geographic service area being proposed for the Mitigation Bank includes portions of the Hydrologic Unit Codes (HUCs) 02080203, and 02080204, 02080205, and 02080207, including

This mitigation bank may be one of a number of practicable options available to applicants to compensate for unavoidable impacts to waters of the U. S. associated with permits issued under the authority of Section 404 and 401 of the Clean Water Act (Public Law 95-217) in central Virginia.

The actual approval of the use of this mitigation bank for a specific project is the decision of the Corps pursuant to Section 404 of the Clean Water Act and by the Department of Environmental Quality pursuant to Section 401 of the Clean Water Act and Title 62.1 of the Code of Virginia. The Corps and the Department of Environmental Quality provide no guarantee that any particular individual or general permit will be granted authorization to use this mitigation bank

to compensate for unavoidable wetland impacts associated with a proposed permit, even though compensatory mitigation may be available.

AUTHORITY: A Public Notice is recommended pursuant to Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (60 Federal Register Number 228).

FEDERAL EVALUATION OF PROPOSAL: The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate this proposed mitigation bank. The Corps of Engineers in evaluating this proposal will consider any comments received. Comments are used to assess impacts on endangered species, historic properties, water quality, conservation, economics, aesthetics, general environmental concerns, wetlands, fish and wildlife values, flood hazards, flood plain values, land use classification, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, and consideration of property ownership. Preliminary review indicates that: (l) no environmental impact statement will be required; (2 a mussel survey will be conducted to determine any species listed as threatened or endangered under the Endangered Species Act of 1973 (PL 93-205); and (3) cultural or historic resources considered eligible or potentially eligible for listing on the National Register of Historic Places may be on the property or in the vicinity of the proposed bank. Additional information might change any of these preliminary findings.

STATE EVALUATION OF PROPOSAL: To comply with Section 401 of the Clean Water Act (the Act), any applicant for a Corps permit for a proposal which may result in a discharge to State waters must provide the Corps with a certification from the Virginia Department of Environmental Quality, Water Division. They must certify that water quality will be maintained in accordance with Virginia Department of Environmental Quality, Water Division Law (state law) and that the activity will comply with the applicable provisions of Sections 301, 302, 303, and 306 and 307 of the Act. A certification must set forth any effluent limitations and other limitations, conditions and/or requirements needed to assure compliance with the Act itself and with other appropriate requirements of state law. In Virginia, the 401 Water Quality Certification is issued as a Virginia Water Protection Permit.

COMMENT PERIOD: Comments should be made in writing, addressed to the Norfolk District, Corps of Engineers (ATTN: CENAO- REG), Central Virginia Regulatory Field Office, 444 Abby Lane, Howardsville, VA. 24562 and should be received by close of business on March 7, 2008.

If you have any questions about this project or the permit process, please call Nora Iseli at (434) 263-8247 or email nora.m.iseli@usace.army.mil

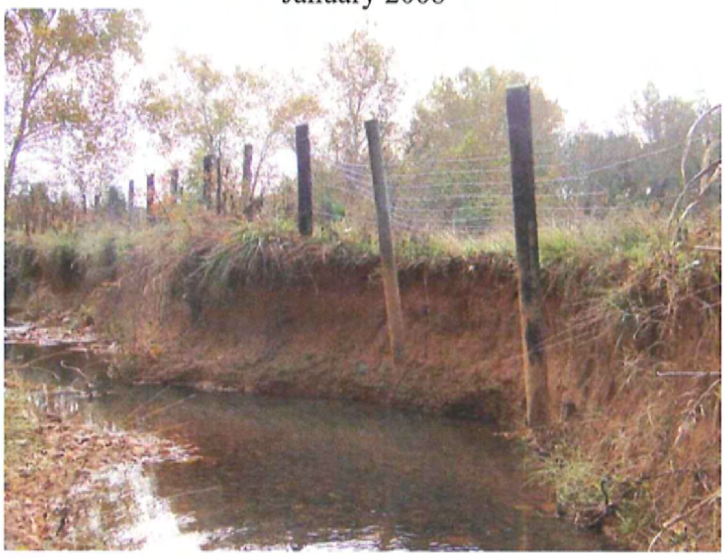
FOR THE DISTRICT COMMANDER:

Michael A. Schwinn
Chief, Western Virginia
Regulatory Section

Attachment:
Location Map

MITIGATION BANK PROSPECTUS
PROPOSED LONE OAK MITIGATION BANK
ALBEMARLE COUNTY, VIRGINIA
Acer Project No: 2129-07

January 2008



Prepared For
The Mitigation Banking Review Team
U.S. Army Corps of Engineers, Norfolk District
VA Department of Environmental Quality, Central Office
U.S. Environmental Protection Agency, Region 3
U.S. Fish and Wildlife Service
VA Department of Conservation and Recreation
VA Department of Game and Inland Fisheries

Prepared By
ACER

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John Hutton
Senior Project Manager

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1.0 INTRODUCTION

The proposed Lone Oak Mitigation Bank (subject site) is approximately 250 acres and is located west of the intersection of Porters Road and James River Road in Albemarle County, Virginia (Figure 1). James River Road borders the property to the west, Porter Road to the north, and Chestnut Grove Road to the southwest. The subject site is located within the Upper James River basin (HUC 02080203). Ballinger Creek, the largest creek on the project site, is listed on the VA Department of Environmental Quality (DEQ) 303d list of impaired water bodies. The Creek is listed due to fecal coliform. The project site is the largest cattle farm on Ballinger Creek and all cattle would be removed from the streams and riparian buffer as part of the restoration plan. Additionally, the Thomas Jefferson Soil and Water Conservation District recently held a stakeholders meeting to discuss sedimentation problems in Ballinger Creek.

Bank Sponsor: Lone Oak Mitigation, LLC
91 West Hightower Drive
Dawsonville, Georgia 30328

Sponsor's Agent: Acer Engineering, PLLC
Attn: John Hutton
5605 Chapel Hill Road, Ste, 122
Raleigh, NC 27607

Written Directions to Location: From Scottsville, VA proceed west on Warren Road. Warren road will become James River Road. Continue west on James River Road to the intersection with Porter Road. The entrance to the site is located on James River Road approximately ½ mile southwest of the intersection with Porter Road.

1.1 Bank Goals and Objectives

The proposed mitigation project will provide numerous ecological benefits within the James River Basin. While many of these benefits are limited to the project area, others, such as pollutant removal and improved aquatic and terrestrial habitat have more far-reaching effects. Expected improvements to water quality and ecological processes are outlined below in Table 1 as project goals.

Table 1. Expected Improvements to Water Quality and Ecological Processes.

Benefits Related to Water Quality	
Nutrient removal	**Benefit will be achieved removal of cattle from the streams and from filtering of runoff through buffer zones. Benefit will also be achieved through filtering of flood flows through restored floodplain areas, where flood flows will spread through native vegetation.**
Sediment removal	**Benefit will be achieved through stabilization of eroding streambanks by increased woody rootmass and reduction of channel incision. Benefit will also be achieved through filtering of flood flows through restored floodplain areas, where flood flows will spread through native vegetation.**
Increase dissolved oxygen concentrations	**Benefit will be achieved by in-stream structures that promote aeration of water.**
Streambank stability	**Benefit will be achieved through the stabilization of eroding streambanks using bioengineering and/or natural channel design techniques.**
Benefits Related to Ecological Processes	
Improved in-stream cover	**Benefit will be achieved through the construction of in-stream structures designed to improve bedform diversity and to trap detritus.**
Addition of large woody debris	**Benefit will be achieved through the addition of wood structures as part of the restoration design. Such structures may include log vanes, root wads, and rock structures that incorporate woody debris.**
Restoration of terrestrial habitat	**Benefit will be achieved through the restoration of adjacent buffer and riparian habitats as part of the project.**
Improved aesthetics	**Benefit will be achieved through the restoration of native plant species and stabilization of eroding and unstable areas.**

2.0 SITE DESCRIPTION

The subject site is located at Latitude N37° 47’ 12.5” and Longitude W78° 35’ 54”. A large portion of the property is located within the 100-year floodplain of the both Ballinger and Joe Creeks. Several other smaller, perennial drainages and tributaries to both Ballinger and Joe Creeks are also located across the property. Topography, as indicated on the *Esmont, GA* USGS 7.5-minute topographic quadrangle is relatively flat within the floodplain limits and then rolling hills outside of the floodplain limits with small tributary valleys bisecting the property (Figure 2). The property is mostly undeveloped with open pasture/hay/agricultural fields within the floodplain limits and mixed oak-pine forest in the uplands (Figure 3).

3.0 EXISTING CONDITIONS

3.1 Hydrology

Natural floodplain contours and stream valleys have been altered across the site from intensive land management and agriculture. Portions of both Ballinger and Joe Creeks have downcut over time and are now moderately incised systems within the floodplain. The down cutting of the channels are most likely the result of several factors, including (1) lack of deep-rooted, native riparian vegetation along the stream banks, (2) cattle

trampling, hoof shear, and grazing, and (3) intensive land management practices. Since these channels are now moderately incised, the local water table has been effectively lowered across the site negatively impacting both surface and groundwater hydrology of both stream and wetland systems. Furthermore, several linear ditches and swales are located throughout the floodplain and effectively drain flood, surface and groundwater inputs from the floodplain.

3.2 Streams

The project will involve sections of Ballinger and Joe Creeks and three unnamed tributaries to these creeks. The project streams are all moderate gradient systems with estimated bankfull slope ranging from 0.005 to 0.020 ft/ft. All five creeks have been determined to be perennial streams and range in drainage area from 0.2 mi^2 to 14.9 mi^2. Ballinger Creek runs from north to south through the eastern end of the property and Joe Creek flows west to east through the project before intersecting Ballinger Creek (Figure 3). The unnamed tributaries on the site are named according to their geographic location within the project area (Southwest Branch, Northeast Branch, and Southeast Branch). Project stream data is summarized in Table 2 below. Unified Stream Methodology (USM) stream assessment forms for each reach are included in Appendix A.

Photo 1. Cattle access and wallowing area at the upstream end of Joe Creek.

Ballinger Creek is listed on the VA DEQ 303d list of impaired water bodies. The Creek is listed due to high fecal coliform counts. The project site is the largest cattle farm on Ballinger Creek and is a likely source of impairment for the reach.

The incised conditions, significant bank erosion, and the lack of natural stream pattern indicate that the streams were likely channelized and straightened at some point in the past to improve drainage. As a result of this channelization and past land use, the streams are highly degraded (Photos 1 through 4). Please refer to Appendix B for additional site photographs of potential stream and riparian buffer restoration and preservation areas.

Photo 2. Ballinger Creek bank erosion and pattern adjustment.

All of the streams on the site are degraded due to past channelization, incision, cattle access, and a general lack of riparian vegetation in many locations. All areas targeted for restoration are classified as "G," "F," or incised "E" or "C" stream types using the Rosgen stream classification method. Bed material is dominated by large gravel and cobble. Although large material is the dominant bed material in all project streams, the pore spaces between the materials have become imbedded with fine materials. Along the reaches targeted for restoration, bank erosion and cattle are the primary sources of fine particles and nutrients into the system.

Ballinger Creek runs from north to south through the eastern end of the property. It has an intermittent buffer that is rarely more than 15 feet wide on one side of the stream and many locations have sparsely spaced vegetation or none at all. The buffer is significantly wider at the downstream end of the project site with mature bottomland hardwood trees; however the stream is still in poor condition. Invasive exotics, such as privet and multiflora rose, are present in some areas. The channel is moderately incised (bank height ratios ~ 1.3) however bedrock seams prevent further degradation throughout the reach. Lateral instability is evident throughout the reach with high to extreme bank erosion rates present throughout approximately 75 percent of the channel. A large transmission line crosses Ballinger Creek just upstream of the crossing at James River Road.

Joe Creek comes onto the western edge of the property from a forested valley and flows east across open cattle pasture. Joe Creek combines with several smaller tributary streams including Southwest Branch and runs along the Lone Oak Farm property line for 1,600 linear feet (lf) before flowing back into the interior of the farm. The creek runs through a relatively mature forested floodplain for approximately 3,500 lf and then through open pasture for another 1,300 lf before entering Ballinger Creek. Cattle have access to the stream in all areas of open pasture and have caused severe bank erosion and channel widening. The section within the forested floodplain appears to have been impacted at some point in the past but has not been maintained for an estimated 50-60 years based on floodplain vegetation and historic aerial photography. This section of

Photo 3. Southwest Branch bank erosion and pattern adjustment.

channel has reestablished a meandering pattern but has not yet reached a point of equilibrium. Severe bank erosion is present throughout the reach, particularly around the outside of meander bends. The channel is moderately incised throughout (bank height ratios ~ 1.2-1.6).

Southwest branch comes onto the western edge of the property from a forested valley and flows east and north across open cattle pasture. Cattle have access to the stream in all areas of open pasture and have caused severe bank erosion and channel widening. The channel is moderately incised throughout (bank height ratios ~ 1.2-1.6). Bank erosion is evident throughout the reach, though not as severe as Joe Creek and Ballinger Creek due to its smaller size and flow.

Northeast branch begins at a springhead within the project site and then flows through a confined valley and a farm pond before entering Ballinger Creek. Cattle have access to the stream in all areas of open pasture and have caused severe bank erosion and channel widening. Cattle have trampled the banks and have removed all of the native vegetation.

Photo 4. Cattle impacts on Northeast Branch.

Southeast branch comes out of a farm pond on the eastern side of the project area. A fifteen foot riparian buffer is maintained along this stream

resulting in moderate to good in-channel conditions throughout the majority of the reach. Cattle have access to the stream in several locations and have resulted in minor bank erosion. A second farm pond restricts flow and fish passage along the channel. The channel is un-incised throughout however a heacut has formed at the downstream end of the channel where a four-foot drop is present over several tree roots. If left in its current condition, this headcut will migrate upstream resulting in significant bank loss and channel degradation.

Table 2. Existing Condition Stream Data.

Reach Name	Existing Stream Length (feet)	Watershed Drainage Area (miles^2)	Estimated Bankfull Width (feet)	Estimated Bankfull Depth (feet)
Ballinger Creek	**8,197**	**14.9**	**35**	**3.5**
Joe Creek	**8,571**	**1.1-2.0**	**15-20**	**1.5-2.0**
Southwest Branch	**1,392**	**0.25**	**8**	**0.8-1.2**
Northeast Branch	**2,829**	**0.21**	**8**	**0.8-1.2**
Southeast Branch	**5,119**	**0.33**	**9**	**0.8-1.2**

3.3 Watershed Characterization

The Lone Oak Mitigation Bank is located west of Scottsville, in Albemarle County, Virginia (Figure 1), in the James River Basin (HU 02080203). Ballinger Creek drains into the James River approximately 2.5 miles downstream of the project site. The project watershed is made up primarily of forested and agricultural land. The majority of the watershed is within the Totier Creek Agricultural/Forest District and the entire watershed is zoned rural. These designations limit parcel sizes to a minimum of 21 acres with most parcels being significantly larger. These restrictions mean that impervious surface will not increase in the watershed to any significant degree. Impervious surface within a watershed not only threatens water quality but can result in significant changes to a stream's hydrograph.

The Ballinger Creek watershed is estimated to be 70% forested, 25% agricultural, and 5% low density residential. Based on zoning and land use plans for Albemarle County, no significant changes are expected in this watershed. The land immediately surrounding the mitigation property is under a deed restriction limiting the number of parcels within this 1,300-acre tract to 13. The land immediately to the north of the mitigation property is owned by the Wildlife Foundation of Virginia, Inc. which purchases land to preserve wildlife habitats and hunting opportunities in Virginia.

3.4 Vegetation

Native vegetation within the floodplain limits on the subject site has been significantly disturbed from past land use practices. Floodplain areas are currently a combination of grass/forb communities, hayfields, and agricultural fields and row crops. Several large

overstory trees are scattered across the floodplain and along the immediate streambank and include American sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), yellow poplar (*Liriodendron tulipifera*), and water oak (*Quercus nigra*). Several areas of forested riparian buffer do exist along on the site and are composed mainly of mixed oak-pine forest.

4.0 SCOPE OF STUDY

4.1 Field Investigation

Acer conducted preliminary field investigations of current on-site environmental conditions at the subject site on November 1, 2007. This investigation was performed to properly assess the mitigation bank potential, including a cursory evaluation of the current land use practices, hydrology, soils, and vegetation of the subject site.

4.2 Literature Review

In addition to the on-site studies and field investigation, Acer also utilized USGS topographic maps, aerial orthophotos, USDA soil survey maps and data, and U.S. Fish and Wildlife National Wetland Inventory (NWI) maps. These resources were used to aid in the feasibility study and partially validate on-site investigations.

4.3 Report Preparation

Data gathered and analyzed from both field investigations and literature review was used to prepare the prospectus for the subject site.

5.0 STUDY RESULTS

Based on the results of the preliminary investigations it was determined that the subject site has stream mitigation potential that could potentially be considered for development of a viable commercial mitigation bank. Stream mitigation credit could potentially be generated from steam restoration and enhancement as well as riparian buffer restoration and preservation. Actions required to develop the subject site into a mitigation bank would require altering current land use practices to sustain stable long-term stream, and riparian environments.

5.1 Potential Stream Mitigation

<u>Stream Restoration</u>

The plan for the Lone Oak Mitigation Site involves the restoration of dimension, pattern, and profile to approximately 19,199 linear feet and enhancement of 8,326 linear feet of existing perennial stream channel (Figure 4). As a result of the proposed restoration activities, total stream length within the project area will be increased from

approximately 26,108 feet to 27,525 feet. All streams to be restored have been impacted by channelization, cattle access, and past land use disturbances.

Photo 5. Boulder structures in a stream 5 years after construction.

The proposed stream restoration designs will primarily include Rosgen Priority Level I and II approaches. A Priority Level I approach involves the construction of a new meandering channel on the abandoned stream floodplain. This approach requires that the streambed be raised when applied to incised channels. A Priority Level II approach involves the excavation of a floodplain at a lower elevation, such that the bed elevation of the stream does not change or changes only slightly. This approach may be required at tie-in points to ensure that the grade of the restored stream ties in with the grade of the existing channels.

Photo 6. Example of a stream restored through a mature forest. Larger trees were preserved and understory trees and shrubs were replanted.

The stream types for the restored streams will be Rosgen "B," "E," or "C" channels with design dimensions based on those of reference reaches and past projects. Where abandoned, the old stream channels will be backfilled using fill material generated by the grading of Priority Level II areas and the excavation of new meandering channels. Any excess fill material that is

developed during construction will be disposed of on-site in designated disposal areas.

The proposed stream enhancement approach will include construction of in-stream structures, re-grading of eroding stream banks, and establishment of vegetation on stream banks. Where headcuts are present in the enhancement reaches, stream profile will be adjusted and instream structures will be used to provide grade control (Photo 5). Banks will be re-graded and matted where necessary in the enhancement areas.

On-line farm ponds will be removed on Northeast and Southeast branches. The ponds will be dewatered several months prior to construction to allow the ground to dry. The dams will be removed completely and the streams will be restored through the old pond-bed. Acer will contact the Division of Conservation Resources Dam Safety division to determine whether a permit is required to remove the dams.

In project areas where there are existing mature trees, select trees that are healthy and will not constrain restoration will be left to provide seed sources for volunteer vegetation and habitat (Photo 6). Trees that are harvested during construction will be used for log vanes, root wads, and other woody in-stream structures.

The restoration designs will allow stream flows larger than bankfull flows to spread onto a restored floodplain, dissipating flow energies and reducing the stress on streambanks. In-stream structures will be used to control streambed grade, reduce stresses on streambanks, and promote bedform sequences and habitat diversity. The in-stream structures may consist of root wads, constructed riffles, cross-vanes, log vanes, J-hooks, and log weirs. When possible, wood will be incorporated into the structures to promote a diversity of habitat features in the restored channels. Streambanks will be stabilized with a combination of erosion matting, bare-root plantings, and live staking.

Whenever possible, the new stream channels will be constructed “in the dry” and all stabilization practices will be in place prior to routing stream flow into the new sections of channel. When necessary, pump-around systems will be utilized during construction. When stream flow is routed into the new channel sections, plugs will be installed in the old channel to re-direct the water into the new channel. After the flow has been routed from the former channel, the process of filling the old channel with soil will begin immediately.

Riparian Buffer Restoration

The subject site has excellent potential for riparian buffer restoration. Approximately 250 acres of riparian buffer will be protected with permanent conservation easements. Of these 250 acres, approximately 174 acres will involve buffer restoration. In general, buffer widths will be 200 feet from the top of the stream bank, with narrower buffers in several areas based on project constraints.

Riparian buffer restoration would involve removing any invasive vegetation from the restoration area and replanting appropriate native tree and shrub species along the riparian buffer corridor. Herbaceous riparian vegetation will also be planted but will

generally re-establish naturally. Intensive vegetation management and a rigorous herbicide schedule will need to be implemented over the first few years of tree establishment in the riparian buffer restoration areas to prevent establishment of invasive species that will out-compete the planted native vegetation.

Riparian Buffer Preservation

The remainder of well-vegetated riparian buffers on the subject site would be considered for riparian buffer preservation. Preserved riparian buffers are considered fully functional and stable within the landscape. Riparian buffers proposed as preservation must have a minimum buffer width of 50 feet and may attain a maximum buffer width of 200 feet.

The following table summarizes the stream mitigation potential of the subject site as currently configured:

Table 3. Mitigation Summary.

Reach Name	Restoration Approach	Design Stream Length (feet)	Estimated Credits Generated
Ballinger Creek	**Priority I Restoration**	**9,182**	**12,544**
Joe Creek	**Priority I Restoration**	**8,680**	**13,222**
Southwest Branch	**Priority I Restoration**	**1,715**	**2,994**
Northeast Branch	**Stream Enhancement**	**2,829**	**3,952**
Southeast Branch	**Stream Enhancement**	**5,119**	**5,631**
	Total	**27,525**	**38,343**

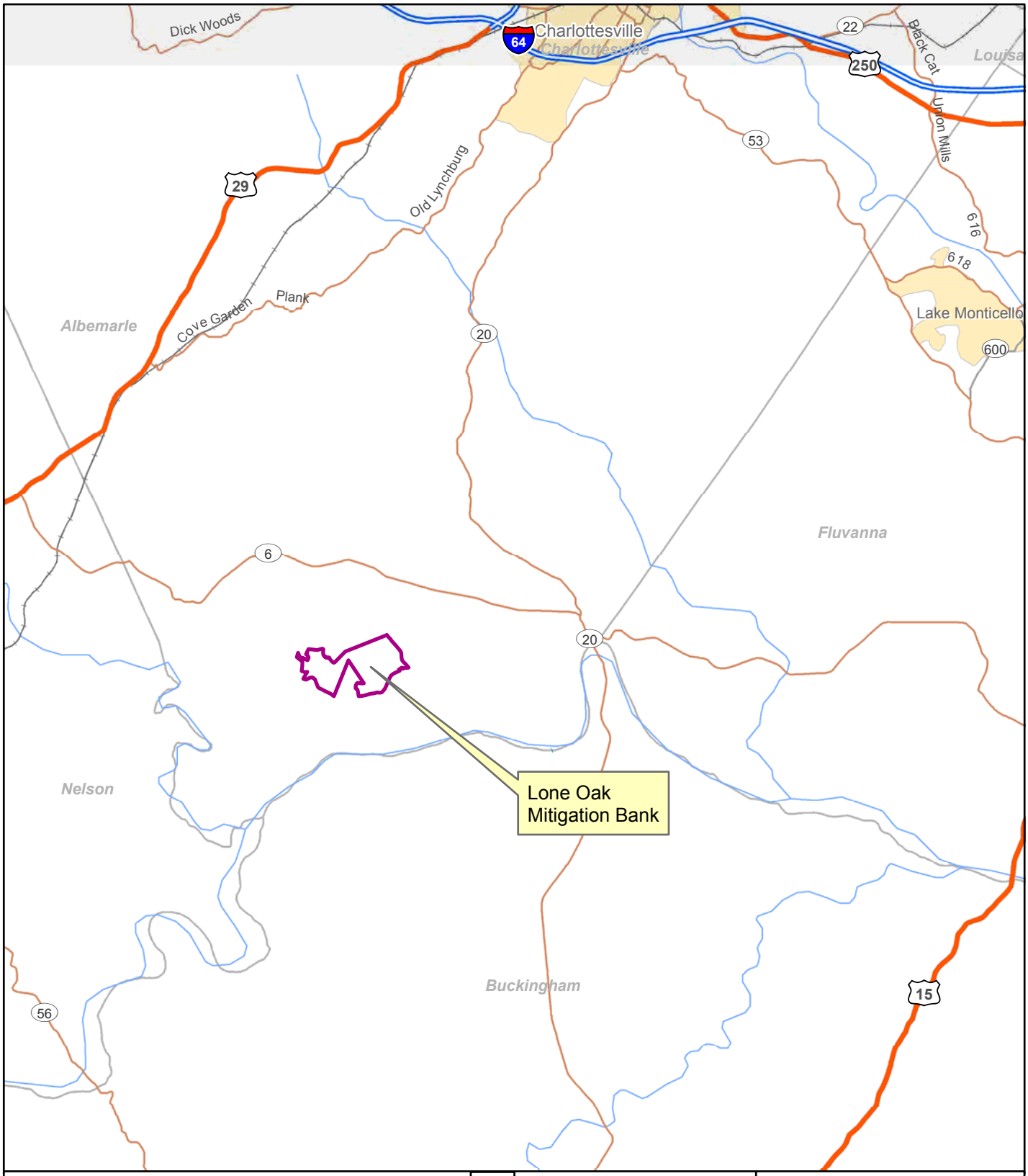
Stream credits shown in the table above were calculated using the USM stream compensation credit forms. These forms are included in Appendix A. Figure 5 shows the proposed primary and secondary service areas of the mitigation bank.

The results of this study are based on findings from the preliminary field investigation and literature research only. Recommendations and alternatives described above should not be considered final and are subject to change as baseline studies are completed and more detailed site information is obtained. The banker also retains the right to construct several stabilized streams crossings at locations that are not yet determined. No stream credit would be generated at these locations.

6.0 REFERENCES

USACE & VA DEQ. 2007. Unified Stream Methodology. U.S. Army Corps of Engineers, Norfolk District and VA Department of Environmental Quality. Internet Resource.

FIGURES



Lone Oak Tract
Mitigation Bank Prospectus
Albemarle County, VA

0 2.5 5 7.5 Miles

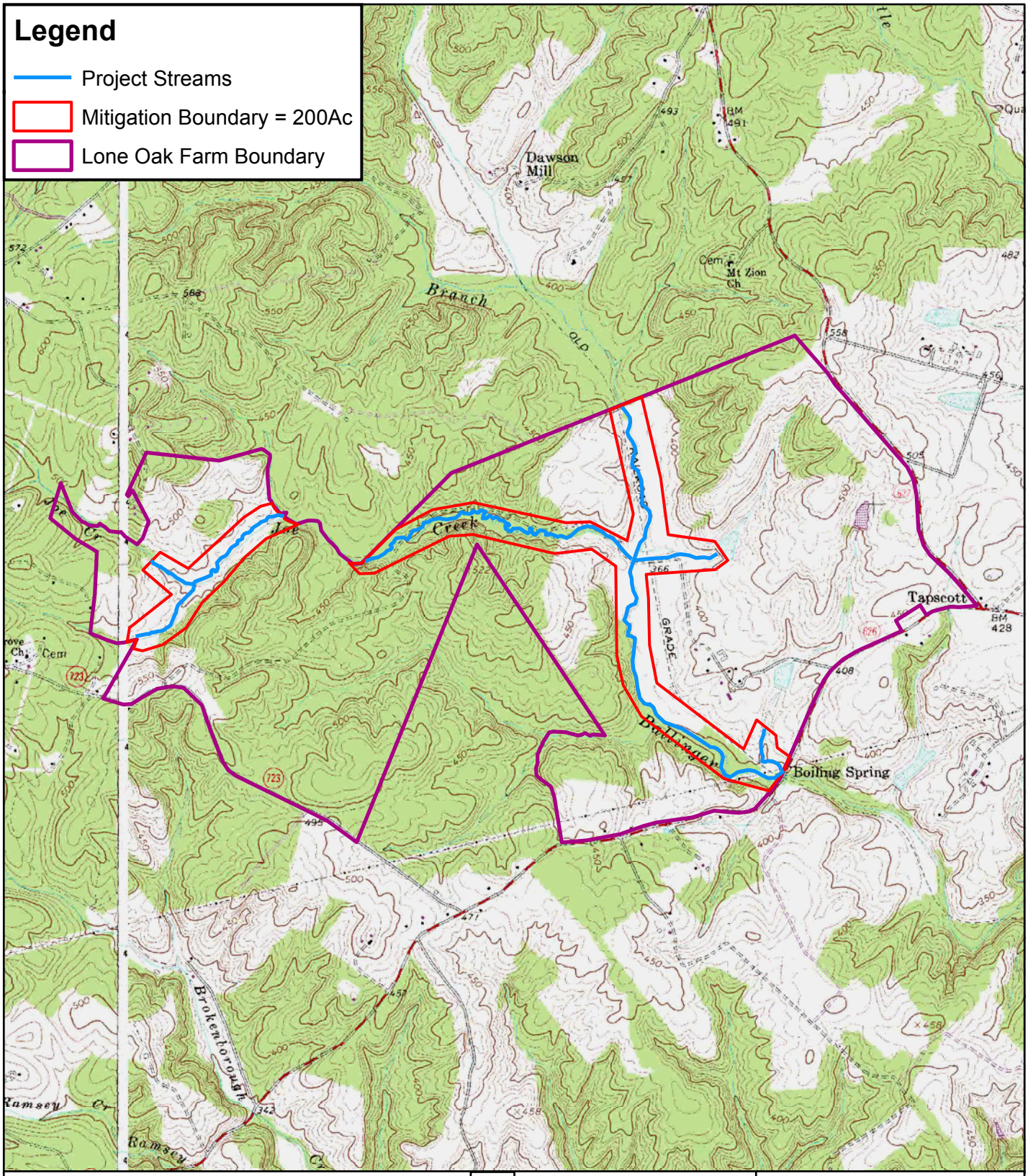
N

Prepared For:
Lone Oak Mitigation, LLC
91 West Hightower Drive
Dawsonville, Georgia 30328

Figure 1
Project Location
Drawn By: JWH

1325 Capital Circle
Suite C
Lawrenceville, Georgia, 30043
Phone 770.682.9731
Fax 770.682.6164
www.acerenvironmental.org

Acer
Project No: 2129-04
09-2007



Lone Oak Tract
Mitigation Bank Prospectus
Albemarle County, VA

0 2,000 4,000 6,000 Feet

N

Prepared For:
Lone Oak Mitigation, LLC
91 West Hightower Drive
Dawsonville, Georgia 30328

Figure 2
Topographic Map
Drawn By: JWH

1325 Capital Circle
Suite C
Lawrenceville, Georgia, 30043
Phone 770.682.9731
Fax 770.682.6164
www.acerenvironmental.org

Acer
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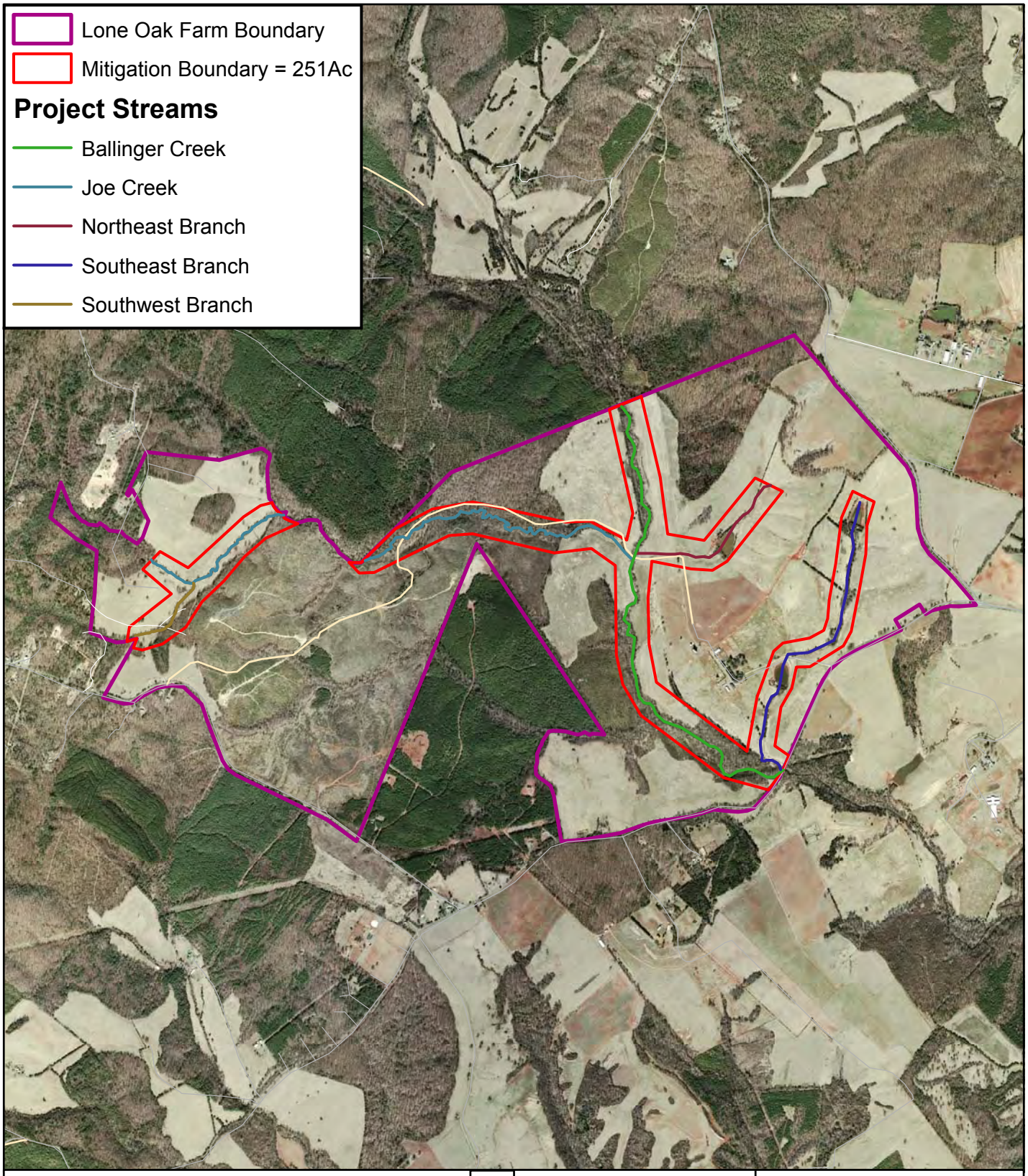

Lone Oak Tract
Mitigation Bank Prospectus
Albemarle County, VA

0 2,000 4,000 6,000 Feet

N

Prepared For:
Lone Oak Mitigation, LLC
91 West Hightower Drive
Dawsonville, Georgia 30328

Figure 3
Existing Conditions Map
Drawn By: JWH

1325 Capital Circle
Suite C
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Phone 770.682.9731
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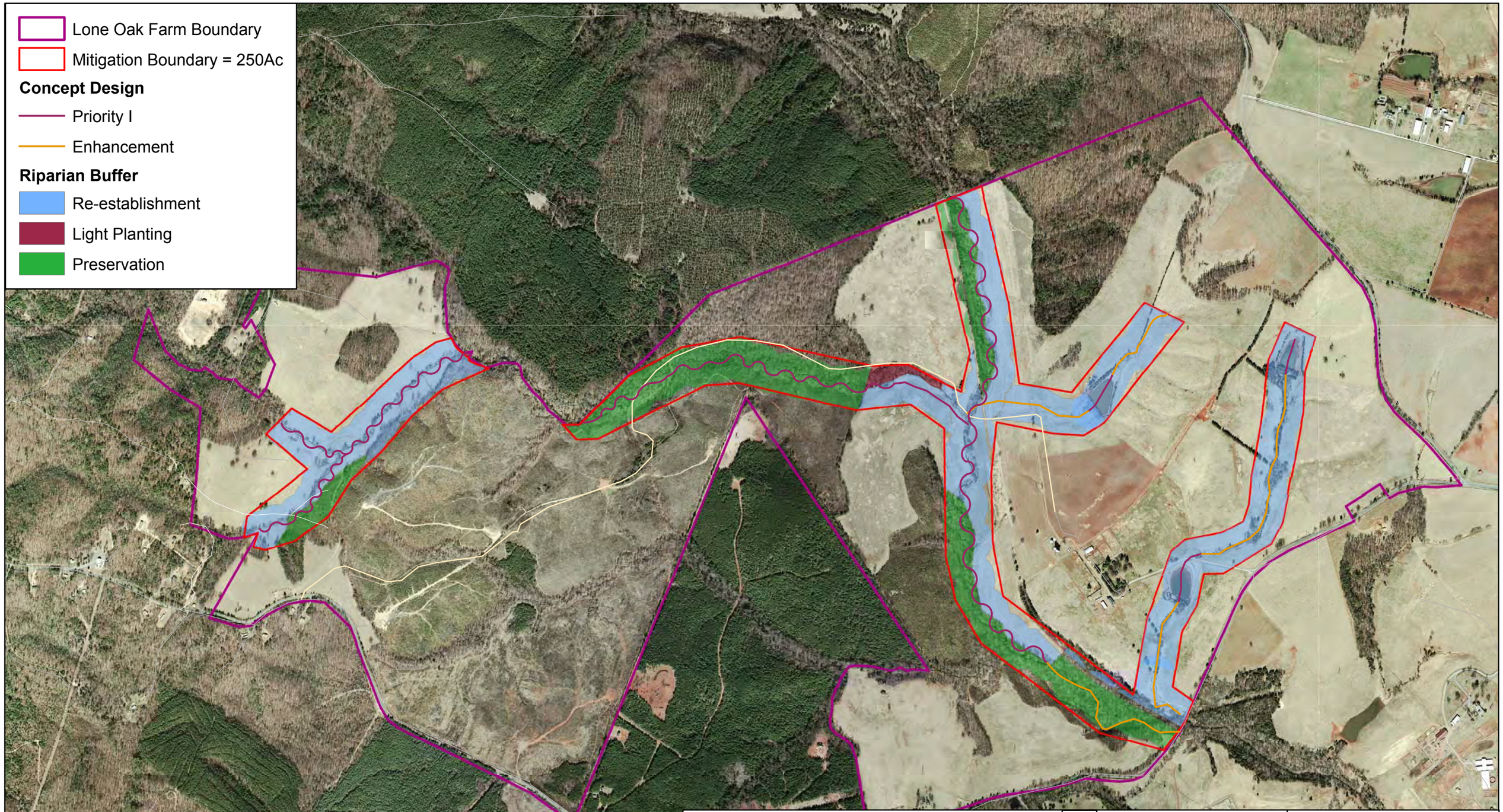
www.acerenvironmental.org

Acer
Project No: 2129-04
09-2007



Lone Oak Tract
Mitigation Bank Prospectus
Albemarle County, Virginia

0 500 1,000 2,000 3,000 Feet

N

Prepared For:
Lone Oak Mitigation, LLC
91 West Hightower Drive
Dawsonville, Georgia 30328

Figure 4
Proposed Conditions Map
Drawn By: JWH

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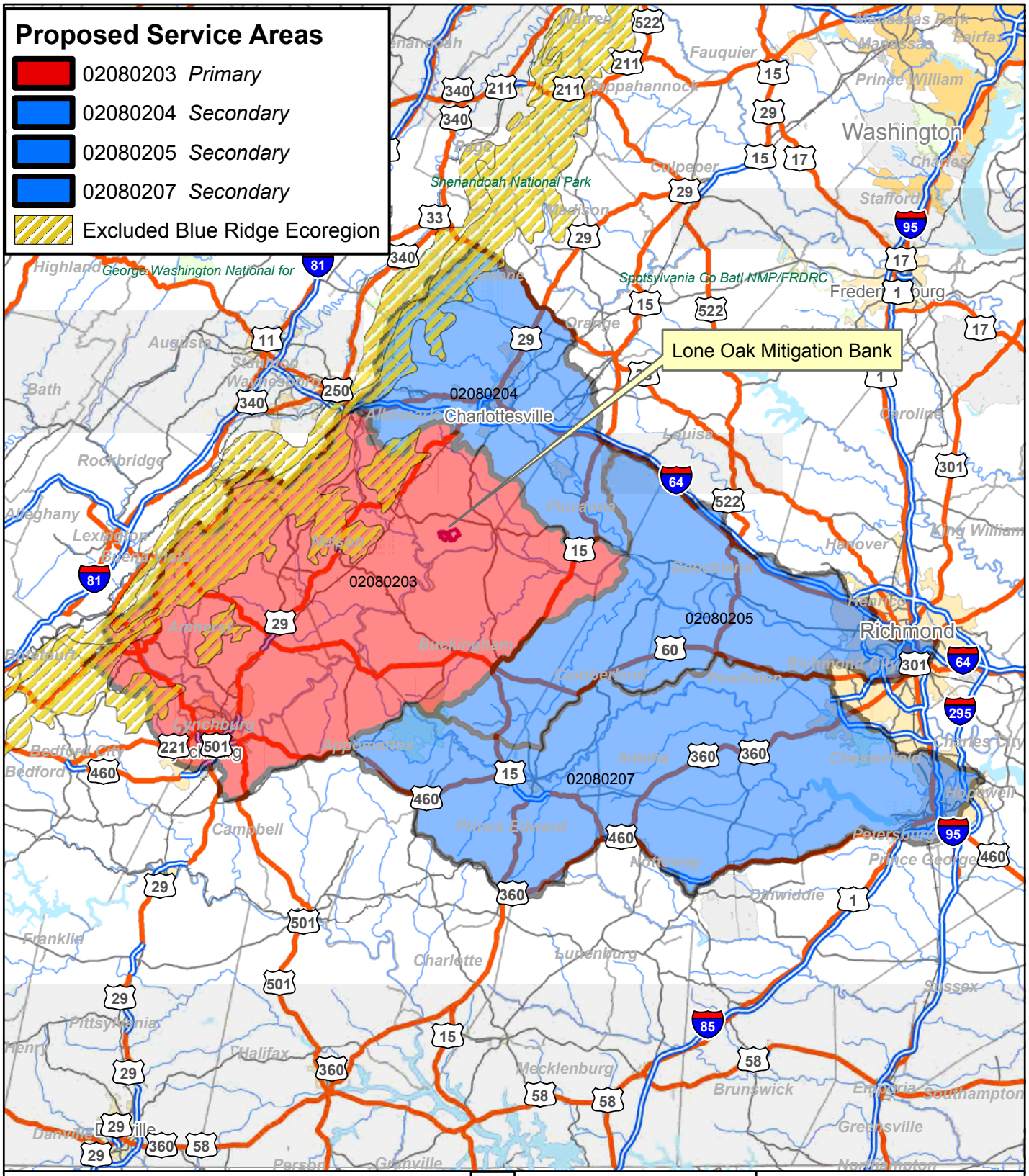
Acer
Project No: 2129-07
11-08-07



Lone Oak Tract
Mitigation Bank Prospectus
Albemarle County, VA

0 25 50 Miles

N

Prepared For:
Lone Oak Mitigation, LLC
91 West Hightower Drive
Dawsonville, Georgia 30328

Figure 5
Proposed Service Area Map
Drawn By: JWH

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www.acerenvironmental.org

Acer
Project No: 2129-04
09-2007

Appendix A USM Forms

Stream Assessment Form (Form 1)

Unified Stream Methodology for use in Virginia

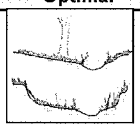
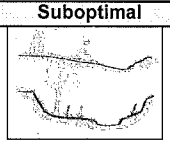
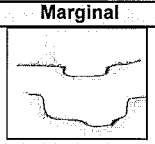
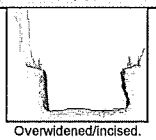
For use in wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
	Lone Oak							

Name(s) of Evaluator(s)	Steam Name and Information
JH	Ballinger Creek

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Conditional Category

	Optimal	Suboptimal	Marginal	Poor	Severe	
Channel Condition	 Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	 Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	 Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute	 Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or channelized), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.	CI
Score	3	2.4	2	1.6	1	

NOTES>> See photos/notes on aerial

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category

	Optimal	Suboptimal		Marginal		Poor	
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover. Wetlands located within the riparian areas.	**High Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	**High Marginal:** Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	**Low Marginal:** Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	**High Poor:** Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

NOTES>>

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Riparian Area>							0%	
	Score >								
									CI= (Sum % RA * Scores*0.01)/2
Left Bank	% Riparian Area>							0%	Rt Bank CI > 0.00 — CI
	Score >								Lt Bank CI > 0.00 — 0.00

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle poole complexes, stable features.

NOTES>>

Conditional Category

	Optimal	Suboptimal	Marginal	Poor	
Instream Habitat/ Available Cover	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	CI
Score	1.5	1.2	0.9	0.5	

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
							500	1

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>>

	Conditional Category					
	Negligible	Minor		Moderate		Severe
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.
SCORE	1.5	1.3	1.1	0.9	0.7	0.5

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>	0.00
RCI= (Sum of all CI's)/5	
COMPENSATION REQUIREMENT (CR) >>	0
CR = RCI X LF X IF	

INSERT PHOTOS:

Photos

begin through 189 = one side open pasture

211 = wetland seep

188 - 170 = Mature fp both sides

Note: potential for road failure in ~~[illegible]~~ 171

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

Unified Stream Methodology for use in Virginia

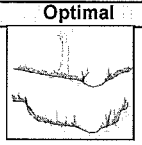
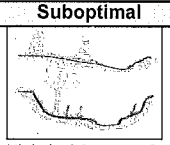
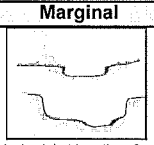
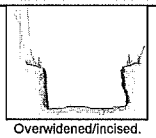
For use in wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
	Lone Oak							

Name(s) of Evaluator(s)	Steam Name and Information
	S.E. Tributary - A) Above headcut B) below

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Conditional Category

	Optimal	Suboptimal	Marginal	Poor	Severe	
						
Channel Condition	Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or channelized), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.	CI
Score	3	2.4 A	2	1.6	1 B	
NOTES>>						

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category

	Optimal	Suboptimal		Marginal		Poor		NOTES>>
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover. Wetlands located within the riparian areas.	**High Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	**High Marginal:** Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	**Low Marginal:** Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	**High Poor:** Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
		High	Low	High	Low	High	Low	
Condition Scores	1.5	1.2	1.1	0.85 B	0.75 A	0.6	0.5	

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Riparian Area>							0%	
	Score >								
									CI= (Sum % RA * Scores*0.01)/2
Left Bank	% Riparian Area>							0%	Rt Bank CI > 0.00 — CI
	Score >								Lt Bank CI > 0.00 — 0.00

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle pools complexes, stable features.

Conditional Category

	Optimal	Suboptimal	Marginal	Poor	NOTES>>	
Instream Habitat/ Available Cover	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.		CI
Score	1.5	1.2 A	0.9 B	0.5		

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
							500	1

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>>

	Conditional Category					
	Negligible	Minor		Moderate		Severe
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.
SCORE	1.5	1.3	1.1	0.9 A	0.7	0.5 B

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>	0.00

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>	0

CR = RCI X LF X IF

INSERT PHOTOS:

photos 170 - 166

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

Unified Stream Methodology for use in Virginia

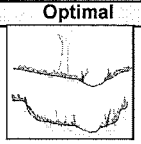
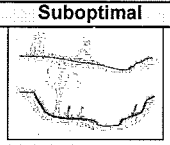
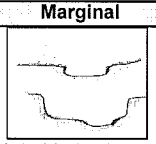
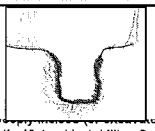
For use in wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
	Lone Oak							

Name(s) of Evaluator(s)	Steam Name and Information
	Joe Creek below Culv.

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Conditional Category

	Optimal	Suboptimal	Marginal	Poor	Severe	
Channel Condition	 Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	 Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	 Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	 Deeply incised (or channelized), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.	CI
Score	3	2.4	2	1.6	1	

NOTES>> Pattern is in adjustment. Bank erosion on outside of all bends

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category

	Optimal	Suboptimal		Marginal		Poor	
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover. Wetlands located within the riparian areas.	**High Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	**High Marginal:** Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	**Low Marginal:** Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	**High Poor:** Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

NOTES>>

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Riparian Area>							0%	
	Score >								
									CI= (Sum % RA * Scores*0.01)/2
Left Bank	% Riparian Area>							0%	Rt Bank CI > 0.00 — CI
	Score >								Lt Bank CI > 0.00 — 0.00

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle pool complexes, stable features.

NOTES>>

Conditional Category

	Optimal	Suboptimal	Marginal	Poor	
Instream Habitat/ Available Cover	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	CI
Score	1.5	1.2	0.9	0.5	

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
							500	1

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>>

	Conditional Category					
	Negligible	Minor		Moderate		Severe
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.
SCORE	1.5	1.3	1.1	0.9	0.7	0.5

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>	0.00

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>	0

CR = RCI X LF X IF

INSERT PHOTOS:

photos ___ - 115

Channel is not incised or only moderately incised.

Pattern is adjusting; numerous low radii bends, inadequate beltwidth, poor pool-pool, riffles have turned back up valley; inadequate transport competency

Restorat strategy build new channel but work w/ existing features

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

Unified Stream Methodology for use in Virginia

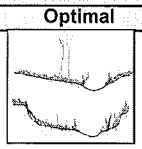
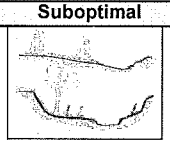
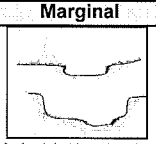
For use in wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
	Lone Oak							

Name(s) of Evaluator(s)	Steam Name and Information
	SW Trib

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Conditional Category

	Optimal	Suboptimal	Marginal	Poor	Severe	
Channel Condition	 Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	 Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	 Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute	Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	Deeply incised (or undercut), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.	CI
Score	3	2.4	2	1.6	1	
NOTES>>						

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category

	Optimal	Suboptimal		Marginal		Poor	
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover. Wetlands located within the riparian areas.	**High Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	**High Marginal:** Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	**Low Marginal:** Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	**High Poor:** Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

NOTES>>

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Riparian Area>							0%
	Score >							
Left Bank	% Riparian Area>							0%
	Score >							

CI= (Sum % RA * Scores*0.01)/2

Rt Bank CI >	0.00	CI
Lt Bank CI >	0.00	0.00

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle pools complexes, stable features.

Conditional Category

	Optimal	Suboptimal	Marginal	Poor	
Instream Habitat/ Available Cover	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	CI
Score	1.5	1.2	0.9	0.5	

NOTES>>

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
							500	1

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>>

	Conditional Category					
	Negligible	Minor		Moderate		Severe
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.
SCORE	1.5	1.3	1.1	0.9	0.7	0.5

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>	0.00

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>	0

CR = RCI X LF X IF

INSERT PHOTOS:

Photos:

114 - 90

- lower bank erosion rates mostly due to lower flow
- cattle in stream
- valley wide enough for meandering channel
- slope ~ 0.9%
- def perennial (was dry @ height of drought)

DESCRIBE PROPOSED IMPACT:

Stream Assessment Form (Form 1)

Unified Stream Methodology for use in Virginia

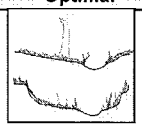
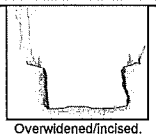
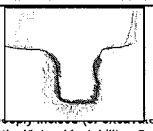
For use in wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
	Lone Oak							

Name(s) of Evaluator(s)	Steam Name and Information
	Joe Creek in upper field

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

Conditional Category

	Optimal	Suboptimal	Marginal	Poor	Severe	
Channel Condition	 Very little incision or active erosion; 80 100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute	 Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	 [illegible], vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.	CI
Score	3	2.4	2	1.6	1	
NOTES>>			1.8			

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category

	Optimal	Suboptimal		Marginal		Poor	
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover. Wetlands located within the riparian areas.	**High Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	**High Marginal:** Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	**Low Marginal:** Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	**High Poor:** Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.
		High	Low	High	Low	High	Low
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5

NOTES>>

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Riparian Area>							0%
	Score >							
Left Bank	% Riparian Area>							0%
	Score >							

CI= (Sum % RA * Scores*0.01)/2

Rt Bank CI >	0.00	CI
Lt Bank CI >	0.00	0.00

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle poole complexes, stable features.

NOTES>>

Conditional Category

	Optimal	Suboptimal	Marginal	Poor	
Instream Habitat/ Available Cover	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	CI
Score	1.5	1.2	0.9	0.5	

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
							500	1

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>>

	Conditional Category					
	Negligible	Minor		Moderate		Severe
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.
SCORE	1.5	1.3	1.1	0.9	0.7	0.5

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.

THE REACH CONDITION INDEX (RCI) >>	0.00

RCI= (Sum of all CI's)/5

COMPENSATION REQUIREMENT (CR) >>	0

CR = RCI X LF X IF

INSERT PHOTOS:

Photos: 89 -

DESCRIBE PROPOSED IMPACT:

Compensation Crediting Form (Form 3)

Unified Stream Methodology for use in Virginia

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	Reach #	Reach Length
2129-07	Lone Oak	Albemarle Co.		02080203	1/1/2008	NE Branch	2,829

Name(s) of Evaluator(s)	Steam Name and Information

		Project Credits
Restoration: Includes Priority 1, 2, and 3 restoration activities. Does not include buffer width.	Credit per foot	533
List Reaches that will receive full Restoration:	Total length of Full Restoration 533 — 1	
	Credits = Stream Length X 1.0	
Enhancement With Instream Structures: Addressing Streambank Stability, Grade Control (Vanes, Weirs, Step-Pools), Constructed Riffles	Credit per foot	
Discuss Length Affected by Instream Structures (justify length):	Length Affected by Instream Structures — 0.3	0
	Credits = Stream Length X 0.3	

Enhancement: Addressing Streambank Stability, Entrenchment Ratios, Access to Floodplain

Mitigation Categories

	Mechanical Bank Work			Biological Bank Work	
	Credit Per Structure	Pick One Per Length		May Be Cumulative Per Length	
Activities	**Habitat Structures**	**Create Bankfull Bench**	**Lay Back Banks**	**Bio-Remediation Techniques**	**Stream Bank Plantings ONLY**
Credit per foot per bank	0.1	0.15	0.1	0.1	0.09
Right Bank — Length	2296				2296
Right Bank — Credit>	0.19				
Left Bank — Length	2296				2296
Left Bank — Credit >	0.19				

CREDITS			
Rt Bank >	436.24	Credit	
Lt Bank >	436.24	*SUM of banks*	872

Σ(Length X Credit) for all areas (banks done separately)

Riparian Areas: Assess the proposed 100 foot buffer on both banks based on the activity proposed. Enter the percentage of area and the credit below. (Widths of buffer above 100' will be determined below)

Activities	Buffer Re-establishment (removal of invasives)	Buffer Planting - Heavy	Buffer Planting - Light	Preservation ONLY. No work proposed High Quality	Preservation ONLY. No work proposed Low Quality	Buffer area not within preservation width but within the first 100'
Credit for inner 100'	0.4	0.38	0.29	0.14	0.07	0
Credit for outer 100'	0.2	0.19	0.15	0.07		0

Calculation of "Goal" riparian buffer for each side (SAR length times 100') >>>> 282,900 square feet

Insert area in square feet for a given activity: Percentage of "Goal">>>> 0.00%

WITHIN FIRST 100' - Mitigation Categories

Missing one vegetative community	Subtract 0.03	Ensure the sums of % Riparian Blocks equal 100	
Missing two vegetative communities	Subtract 0.06		

Right Bank	% Area	100%						100%				
	Credit>	0.4										
Left Bank	% Area	100%						100%	Rt Bank >	0.40	Credit	
	Credit >	0.4							Lt Bank >	0.40	0.40	1131.6

Σ(% Area X Credit) for all areas (banks done separately)
AVE of credit for banks X length of project

WITHIN SECOND 100' - Mitigation Categories

Missing one vegetative community	Subtract 0.03	Ensure the sums of % Riparian Blocks equal 100	
Missing two vegetative communities	Subtract 0.06		

Right Bank	% Area	100%						100%				
	Credit>	0.2										
Left Bank	% Area	100%						100%	Rt Bank >	0.20	Credit	
	Credit >	0.2							Lt Bank >	0.20	0.20	565.8

Σ(% Area X Credit) for all areas (banks done separately)
AVE of credit for banks X length of project

Adjustment Factors: These factors are applied as a multiplier to length of a reach for which they apply

Adjustment Factor Categories

Activity	Rare, Threatened, or Endangered Species or Communities	Livestock Exclusion	Watershed Preservation
Credit	0.1 - 0.3	0.1 - 0.3	0.1 - 0.3

Credits are cumulative and can apply to more than one reach. Each reach can have more than one Adjustment Factors

Stream Length Affected	2829						
Credit>	0.3						

Credits > 849

ΣLength X Credit) for all areas

Total Compensation Credit Provided by Project 3952

Compensation Crediting Form (Form 3)

Unified Stream Methodology for use in Virginia

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	Reach #	Reach Length
2129-07	Lone Oak	Albemarle Co.		02080203	1/1/2008	SE Branch	5119

Name(s) of Evaluator(s)	Steam Name and Information

Restoration: Includes Priority 1, 2, and 3 restoration activities. Does not include buffer width.

List Reaches that will receive full Restoration:

Total length of Full Restoration: 1061 — Credit per foot: 1 — Project Credits: 1061

Credits = Stream Length X 1.0

Enhancement With Instream Structures: Addressing Streambank Stability, Grade Control (Vanes, Weirs, Step-Pools), Constructed Riffles

Discuss Length Affected by Instream Structures (justify length):

Length Affected by Instream Structures: — Credit per foot: 0.3 — Project Credits: 0

Credits = Stream Length X 0.3

Enhancement: Addressing Streambank Stability, Entrenchment Ratios, Access to Floodplain

Mitigation Categories

	Mechanical Bank Work			Biological Bank Work	
	Credit Per Structure	Pick One Per Length		May Be Cumulative Per Length	
Activities	Habitat Structures	Create Bankfull Bench	Lay Back Banks	Bio-Remediation Techniques	Stream Bank Plantings ONLY
Credit per foot per bank	0.1	0.15	0.1	0.1	0.09
Right Bank — Length	4058				4058
Right Bank — Credit>	0.09				
Left Bank — Length	4058				4058
Left Bank — Credit >	0.09				

CREDITS			
Rt Bank >	365.22	Credit	
Lt Bank >	365.22	*SUM of banks*	730

Σ(Length X Credit) for all areas (banks done separately)

Riparian Areas: Assess the proposed 100 foot buffer on both banks based on the activity proposed. Enter the percentage of area and the credit below. (Widths of buffer above 100' will be determined below)

Activities	Buffer Re-establishment (removal of invasives)	Buffer Planting - Heavy	Buffer Planting - Light	Preservation ONLY. No work proposed High Quality	Preservation ONLY. No work proposed Low Quality	Buffer area not within preservation width but within the first 100'
Credit for inner 100'	0.4	0.38	0.29	0.14	0.07	0
Credit for outer 100'	0.2	0.19	0.15	0.07		0

Calculation of "Goal" riparian buffer for each side (SAR length times 100') >>>> 511,900 square feet

Insert area in square feet for a given activity: Percentage of "Goal">>>> 0.00%

WITHIN FIRST 100' - Mitigation Categories

Missing one vegetative community — Subtract 0.03

Missing two vegetative communities — Subtract 0.06

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Area	100%						100%				
	Credit>	0.4										
Left Bank	% Area	100%						100%	Rt Bank >	0.40	Credit	
	Credit >	0.4							Lt Bank >	0.40	0.40	2047.6

Σ(% Area X Credit) for all areas (banks done separately)
AVE of credit for banks X length of project

WITHIN SECOND 100' - Mitigation Categories

Missing one vegetative community — Subtract 0.03

Missing two vegetative communities — Subtract 0.06

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Area	100%						100%				
	Credit>	0.2										
Left Bank	% Area	100%						100%	Rt Bank >	0.20	Credit	
	Credit >	0.2							Lt Bank >	0.20	0.20	1023.8

Σ(% Area X Credit) for all areas (banks done separately)
AVE of credit for banks X length of project

Adjustment Factors: These factors are applied as a multiplier to length of a reach for which they apply

Adjustment Factor Categories

Activity	Rare, Threatened, or Endangered Species or Communities	Livestock Exclusion	Watershed Preservation
Credit	0.1 - 0.3	0.1 - 0.3	0.1 - 0.3

Credits are cumulative and can apply to more than one reach. Each reach can have more than one Adjustment Factors

Stream Length Affected	5119					
Credit>	0.15					

Credits > 768

ΣLength X Credit) for all areas

Total Compensation Credit Provided by Project 5631

Compensation Crediting Form (Form 3)

Unified Stream Methodology for use in Virginia

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	Reach #	Reach Length
2129-07	Lone Oak	Albemarle Co.		02080203	1/1/2008	SW Branch	1715

Name(s) of Evaluator(s)	Steam Name and Information

			Project Credits
Restoration: Includes Priority 1, 2, and 3 restoration activities. Does not include buffer width.		Credit per foot	1715
List Reaches that will receive full Restoration:	Total length of Full Restoration: 1715 (*Credits = Stream Length X 1.0*)	1	
Enhancement With Instream Structures: Addressing Streambank Stability, Grade Control (Vanes, Weirs, Step-Pools), Constructed Riffles		Credit per foot	
Discuss Length Affected by Instream Structures (justify length):	Length Affected by Instream Structures: (*Credits = Stream Length X 0.3*)	0.3	0

Enhancement: Addressing Streambank Stability, Entrenchment Ratios, Access to Floodplain

Mitigation Categories											
	Mechanical Bank Work							Biological Bank Work			
	Credit Per Structure	Pick One Per Length						May Be Cumulative Per Length			
Activities	Habitat Structures	Create Bankfull Bench		Lay Back Banks				Bio-Remediation Techniques		Stream Bank Plantings ONLY	
Credit per foot per bank	0.1	0.15		0.1				0.1		0.09	
Right Bank – Length									0		
Right Bank – Credit>											
										CREDITS	
Left Bank – Length									0	Rt Bank > 0.00	Credit
Left Bank – Credit >										Lt Bank > 0.00	*SUM of banks* 0

Σ(Length X Credit) for all areas (banks done separately)

Riparian Areas: Assess the proposed 100 foot buffer on both banks based on the activity proposed. Enter the percentage of area and the credit below. (Widths of buffer above 100' will be determined below)

Activities	Buffer Re-establishment (removal of invasives)	Buffer Planting - Heavy	Buffer Planting - Light	Preservation ONLY. No work proposed High Quality	Preservation ONLY. No work proposed Low Quality	Buffer area not within preservation width but within the first 100'
Credit for inner 100'	0.4	0.38	0.29	0.14	0.07	0
Credit for outer 100'	0.2	0.19	0.15	0.07		0

Calculation of "Goal" riparian buffer for each side (SAR length times 100') >>>> 171,500 square feet

Insert area in square feet for a given activity: 343000 Percentage of "Goal">>>> 200.00%

WITHIN FIRST 100' - Mitigation Categories

Missing one vegetative community						Subtract 0.03		Ensure the sums of % Riparian Blocks equal 100				
Missing two vegetative communities						Subtract 0.06						
Right Bank	% Area	80%	20%						100%			
Right Bank	Credit>	0.14	0.4									
										CREDITS		
Left Bank	% Area	100%							100%	Rt Bank >	0.19	Credit
Left Bank	Credit >	0.4								Lt Bank >	0.40	0.30	507.64

Σ(% Area X Credit) for all areas (banks done separately)
AVE of credit for banks X length of project

WITHIN SECOND 100' - Mitigation Categories

Missing one vegetative community						Subtract 0.03		Ensure the sums of % Riparian Blocks equal 100				
Missing two vegetative communities						Subtract 0.06						
Right Bank	% Area	80%	20%						100%			
Right Bank	Credit>	0.07	0.2									
										CREDITS		
Left Bank	% Area	100%							100%	Rt Bank >	0.10	Credit
Left Bank	Credit >	0.2								Lt Bank >	0.20	0.15	257.25

Σ(% Area X Credit) for all areas (banks done separately)
AVE of credit for banks X length of project

Adjustment Factors: These factors are applied as a multiplier to length of a reach for which they apply

Adjustment Factor Categories							
Activity		Rare, Threatened, or Endangered Species or Communities		Livestock Exclusion		Watershed Preservation	
Credit		0.1 - 0.3		0.1 - 0.3		0.1 - 0.3	
Credits are cumulative and can apply to more than one reach. Each reach can have more than one Adjustment Factors							
Stream Length Affected		1715					
	Credit>	0.3					

Credits > 515

ΣLength X Credit) for all areas

Total Compensation Credit Provided by Project	**2994**

Compensation Crediting Form (Form 3)

Unified Stream Methodology for use in Virginia

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	Reach #	Reach Length
2129-07	Lone Oak	Albemarle Co.		02080203	1/1/2008	Ballinger	9182

Name(s) of Evaluator(s)	Steam Name and Information

Restoration: Includes Priority 1, 2, and 3 restoration activities. Does not include buffer width.

			Project Credits
		Credit per foot	7210
List Reaches that will receive full Restoration:	Total length of Full Restoration 7210	1	
	Credits = Stream Length X 1.0		

Enhancement With Instream Structures: Addressing Streambank Stability, Grade Control (Vanes, Weirs, Step-Pools), Constructed Riffles

		Credit per foot	
Discuss Length Affected by Instream Structures (justify length):	Length Affected by Instream Structures 1185	0.3	355.5
In-stream structures will be used to stabilize 60% of the 1972 lf of stream channel at the downstream end of the project.	*Credits = Stream Length X 0.3*		

Enhancement: Addressing Streambank Stability, Entrenchment Ratios, Access to Floodplain

Mitigation Categories											
	Mechanical Bank Work						Biological Bank Work				
	Credit Per Structure	Pick One Per Length					May Be Cumulative Per Length				
Activities	Habitat Structures	Create Bankfull Bench		Lay Back Banks			Bio-Remediation Techniques		Stream Bank Plantings ONLY		
Credit per foot per bank	0.1	0.15		0.1			0.1		0.09		
Right Bank Length								0			
Right Bank Credit>											
									CREDITS		
Left Bank Length								0	Rt Bank >	0.00	Credit
Left Bank Credit >									Lt Bank >	0.00	*SUM of banks* 0
									Σ(Length X Credit) for all areas (banks done separately)		

Riparian Areas: Assess the proposed 100 foot buffer on both banks based on the activity proposed. Enter the percentage of area and the credit below. (Widths of buffer above 100' will be determined below)

Activities	Buffer Re-establishment (removal of invasives)	Buffer Planting - Heavy	Buffer Planting - Light	Preservation ONLY. No work proposed High Quality	Preservation ONLY. No work proposed Low Quality	Buffer area not within preservation width but within the first 100'
Credit for inner 100'	0.4	0.38	0.29	0.14	0.07	0
Credit for outer 100'	0.2	0.19	0.15	0.07		0

Calculation of "Goal" riparian buffer for each side (SAR length times 100') >>>> 918,200 square feet

Insert area in square feet for a given activity: 1836400 Percentage of "Goal">>>> 200.00%

WITHIN FIRST 100' - Mitigation Categories												
Missing one vegetative community						Subtract 0.03	Ensure the sums of % Riparian Blocks equal 100					
Missing two vegetative communities						Subtract 0.06						
Right Bank	% Area	78%	22%					100%				
Right Bank	Credit>	0.4	0.14									
									CREDITS			
Left Bank	% Area	16%	84%					100%	Rt Bank >	0.34	Credit	
Left Bank	Credit >	0.4	0.14						Lt Bank >	0.18	0.26	2407.52
									Σ(% Area X Credit) for all areas (banks done separately)			
									AVE of credit for banks X length of project			

WITHIN SECOND 100' - Mitigation Categories												
Missing one vegetative community						Subtract 0.03	Ensure the sums of % Riparian Blocks equal 100					
Missing two vegetative communities						Subtract 0.06						
Right Bank	% Area	78%	22%					100%				
Right Bank	Credit>	0.2	0.07									
									CREDITS			
Left Bank	% Area	16%	84%					100%	Rt Bank >	0.17	Credit	
Left Bank	Credit >	0.2	0.07						Lt Bank >	0.09	0.13	1193.66
									Σ(% Area X Credit) for all areas (banks done separately)			
									AVE of credit for banks X length of project			

Adjustment Factors: These factors are applied as a multiplier to length of a reach for which they apply

Adjustment Factor Categories							
Activity		Rare, Threatened, or Endangered Species or Communities	Livestock Exclusion	Watershed Preservation			
Credit		0.1 - 0.3	0.1 - 0.3	0.1 - 0.3			
Credits are cumulative and can apply to more than one reach. Each reach can have more than one Adjustment Factors							
Stream Length Affected		9182					
	Credit>	0.15					

Credits > 1377

ΣLength X Credit) for all areas

Total Compensation Credit Provided by Project	12544

Compensation Crediting Form (Form 3)

Unified Stream Methodology for use in Virginia

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	Reach #	Reach Length
2129-07	Lone Oak	Albemarle Co.		02080203	1/1/2008	Joe Creek 1	3440

Name(s) of Evaluator(s)	Steam Name and Information
	Joe Creek in upper field.

Project Credits

Restoration: Includes Priority 1, 2, and 3 restoration activities. Does not include buffer width.

Credit per foot: 3440

List Reaches that will receive full Restoration:

Total length of Full Restoration: 3440 | Credit per foot: 1

Credits = Stream Length X 1.0

Enhancement With Instream Structures: Addressing Streambank Stability, Grade Control (Vanes, Weirs, Step-Pools), Constructed Riffles

Credit per foot

Discuss Length Affected by Instream Structures (justify length):

Length Affected by Instream Structures: | Credit per foot: 0.3 | **0**

Credits = Stream Length X 0.3

Enhancement: Addressing Streambank Stability, Entrenchment Ratios, Access to Floodplain

Mitigation Categories

	Mechanical Bank Work			Biological Bank Work	
	Credit Per Structure	Pick One Per Length		May Be Cumulative Per Length	
Activities	Habitat Structures	Create Bankfull Bench	Lay Back Banks	Bio-Remediation Techniques	Stream Bank Plantings ONLY
Credit per foot per bank	0.1	0.15	0.1	0.1	0.09
Right Bank – Length					0
Right Bank – Credit>					
Left Bank – Length					0
Left Bank – Credit >					

CREDITS			
Rt Bank >	0.00	Credit	
Lt Bank >	0.00	*SUM of banks*	0

Σ(Length X Credit) for all areas (banks done separately)

Riparian Areas: Assess the proposed 100 foot buffer on both banks based on the activity proposed. Enter the percentage of area and the credit below. (Widths of buffer above 100' will be determined below)

Activities	Buffer Re-establishment (removal of invasives)	Buffer Planting - Heavy	Buffer Planting - Light	Preservation ONLY. No work proposed High Quality	Preservation ONLY. No work proposed Low Quality	Buffer area not within preservation width but within the first 100'
Credit for inner 100'	0.4	0.38	0.29	0.14	0.07	0
Credit for outer 100'	0.2	0.19	0.15	0.07		0

Calculation of "Goal" riparian buffer for each side (SAR length times 100') >>>> 344,000 square feet

Insert area in square feet for a given activity: | Percentage of "Goal">>>> 0.00%

WITHIN FIRST 100' - Mitigation Categories

Missing one vegetative community	Subtract 0.03
Missing two vegetative communities	Subtract 0.06

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Area	100%						100%
	Credit>	0.4						
Left Bank	% Area	100%						100%
	Credit >	0.4						

CREDITS			
Rt Bank >	0.40	Credit	
Lt Bank >	0.40	0.40	1376

Σ(% Area X Credit) for all areas (banks done separately)
AVE of credit for banks X length of project

WITHIN SECOND 100' - Mitigation Categories

Missing one vegetative community	Subtract 0.03
Missing two vegetative communities	Subtract 0.06

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Area	100%						100%
	Credit>	0.2						
Left Bank	% Area	100%						100%
	Credit >	0.2						

CREDITS			
Rt Bank >	0.20	Credit	
Lt Bank >	0.20	0.20	688

Σ(% Area X Credit) for all areas (banks done separately)
AVE of credit for banks X length of project

Adjustment Factors: These factors are applied as a multiplier to length of a reach for which they apply

Adjustment Factor Categories

Activity	Rare, Threatened, or Endangered Species or Communities	Livestock Exclusion	Watershed Preservation
Credit	0.1 - 0.3	0.1 - 0.3	0.1 - 0.3

Credits are cumulative and can apply to more than one reach. Each reach can have more than one Adjustment Factors

Stream Length Affected		1450					
	Credit>	0.3					

Credits > 435

ΣLength X Credit) for all areas

Total Compensation Credit Provided by Project: 5939

Compensation Crediting Form (Form 3)

Unified Stream Methodology for use in Virginia

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	Reach #	Reach Length
2129-07	Lone Oak	Albemarle Co.		02080203	1/1/2008	Joe Creek 2	5240

Name(s) of Evaluator(s)	Steam Name and Information
	Joe Creek downstream.

Restoration: Includes Priority 1, 2, and 3 restoration activities. Does not include buffer width.

			Credit per foot	Project Credits
List Reaches that will receive full Restoration: 50% of reach will involve restoration	Total length of Full Restoration	5240	1	5240
	Credits = Stream Length X 1.0			

Enhancement With Instream Structures: Addressing Streambank Stability, Grade Control (Vanes, Weirs, Step-Pools), Constructed Riffles

			Credit per foot	
Discuss Length Affected by Instream Structures (justify length):	Length Affected by Instream Structures		0.3	0
	Credits = Stream Length X 0.3			

Enhancement: Addressing Streambank Stability, Entrenchment Ratios, Access to Floodplain

Mitigation Categories												
	Mechanical Bank Work							Biological Bank Work				
	Credit Per Structure	Pick One Per Length						May Be Cumulative Per Length				
Activities	Habitat Structures	Create Bankfull Bench		Lay Back Banks				Bio-Remediation Techniques		Stream Bank Plantings ONLY		
Credit per foot per bank	0.1	0.15		0.1				0.1		0.09		
Right Bank	Length								0			
	Credit>											
										CREDITS		
Left Bank	Length								0	Rt Bank >	0.00	Credit
	Credit >									Lt Bank >	0.00	*SUM of banks* 0

Σ(Length X Credit) for all areas (banks done separately)

Riparian Areas: Assess the proposed 100 foot buffer on both banks based on the activity proposed. Enter the percentage of area and the credit below. (Widths of buffer above 100' will be determined below)

Activities	Buffer Re-establishment (removal of invasives)	Buffer Planting - Heavy	Buffer Planting - Light	Preservation ONLY. No work proposed High Quality	Preservation ONLY. No work proposed Low Quality	Buffer area not within preservation width but within the first 100'
Credit for inner 100'	0.4	0.38	0.29	0.14	0.07	0
Credit for outer 100'	0.2	0.19	0.15	0.07		0

Calculation of "Goal" riparian buffer for each side (SAR length times 100') >>>> 524,000 square feet

Insert area in square feet for a given activity: Percentage of "Goal">>>> 0.00%

WITHIN FIRST 100' - Mitigation Categories

Missing one vegetative community						Subtract 0.03		Ensure the sums of % Riparian Blocks equal 100				
Missing two vegetative communities						Subtract 0.06						
Right Bank	% Area	73%	27%						100%			
	Credit>	0.14	0.4									
										CREDITS		
Left Bank	% Area	73%	19%	8%					100%	Rt Bank >	0.21	Credit
	Credit >	0.14	0.29	0.4						Lt Bank >	0.19	0.20 1046.69

Σ(% Area X Credit) for all areas (banks done separately)
AVE of credit for banks X length of project

WITHIN SECOND 100' - Mitigation Categories

Missing one vegetative community						Subtract 0.03		Ensure the sums of % Riparian Blocks equal 100				
Missing two vegetative communities						Subtract 0.06						
Right Bank	% Area	73%	27%						100%			
	Credit>	0.07	0.2									
										CREDITS		
Left Bank	% Area	73%	19%	8%					100%	Rt Bank >	0.11	Credit
	Credit >	0.07	0.15	0.2						Lt Bank >	0.10	0.11 576.4

Σ(% Area X Credit) for all areas (banks done separately)
AVE of credit for banks X length of project

Adjustment Factors: These factors are applied as a multiplier to length of a reach for which they apply

Adjustment Factor Categories							
Activity		Rare, Threatened, or Endangered Species or Communities	Livestock Exclusion	Watershed Preservation			
Credit		0.1 - 0.3	0.1 - 0.3	0.1 - 0.3			
Credits are cumulative and can apply to more than one reach. Each reach can have more than one Adjustment Factors							
Stream Length Affected		1400					
	Credit>	0.3					

Credits > 420

ΣLength X Credit) for all areas

Total Compensation Credit Provided by Project	**7283**

Compensation Summary Form (Form 4)

Unified Stream Methodology
for use in Virginia

Project #	Applicant	Date
2129-07	Lone Oak Mitigation, LLC	1/1/2008

Evaluators	HUC	Locality
JWH/DMT	2080203	Albemarle Co.

Stream Name	Reach ID	Comp. Length (L_c) (feet)	Total Compensation Credit (Total CC) (From Form 3)
Northeast Branch		2829	3952
Southeast Branch		5119	5631
Southwest Branch		1715	2994
Ballinger Creek		9182	12544
Joe Creek 1		3440	5939
Joe Creek 2		5240	7283
	Totals	**27525**	**38343**

Note: Round all feet & CC's to the nearest whole number.

Appendix B Representative Site Photographs

Ballinger Creek – Bank Erosion

Ballinger Creek – Bank Erosion

Ballinger Creek – Bank Erosion

Ballinger Creek - Bar formation causing high near-bank stress

Ballinger Creek – Bank Erosion

Ballinger Creek – Bar formation causing high near-bank stress

Upper Joe Creek - Channel widening and cattle

Upper Joe Creek - Cattle

Upper Joe Creek – Bank erosion

Lower Joe Creek – Bank erosion and cattle

Lower Joe Creek – Channel widening

Lower Joe Creek – Bank erosion

Southwest Branch

Southwest Branch

Southeast Branch - above project area

Southeast Branch - headcut

Northeast Branch - Cattle

Northeast Branch - Cattle