Marsh Resources, Inc
Potomac River Mitigation Bank

Addendum to Bender Farm Mitigation Site Plan

Permit No. 03-N0183

Prepared for:
Marsh Resources Inc.
Houston, Texas

MARSH RESOURCES INC.

Prepared by:
Acorn Environmental, Inc.
Severna Park, Maryland

October 2012

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A. Project Description

Marsh Resources, Inc. (Marsh) constructed the Bender Farm Wetland Mitigation Site in November 2006 under an umbrella mitigation banking instrument (MBI) for the Potomac River Mitigation Bank. The Bender Farm Mitigation Site is located within HUC 02070010, approximately two miles south of Catlett at the end of Laws Ford Road. (Figure 1- Vicinity Map). The site was designed to provide 17.15 wetland credits, and was the fourth project constructed by Marsh under the MBI.

The purpose of this Addendum is to revise the credit plan to convert a portion of released wetland credits to stream credits, and to establish the success criteria and monitoring requirements for providing stream credits on the Bender Farm mitigation site.

B. Proposed Stream Credits

The Sponsor proposes to establish 307 stream credits on the Bender Farm mitigation site as shown in Exhibit 2. USM Form 1 and Form 3 are provided in Exhibit 3 to support the number of proposed credits

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C. Proposed Wetland Credits

The IRT previously released 16.12 wetland credits at Bender Farm. Establishing 307 stream credits on the site would reduce the total number of available wetland credits to 14.75 credits. This credit adjustment also includes 1.1 acres of the site where wetland credits were not released due to insufficient wetland hydrology. We propose to change this 1.1 acre from wetland establishment (1:1) to forested floodplain preservation (15:1). Proposed adjustments to the credit plan are summarized below and shown on Exhibit 2.

Table 1 – Proposed Credit Adjustments

Zone	Habitat	Original Acres	Proposed Acres	Ratio	Original Credits	Proposed Credits
A	Wetland Establishment (scrub-shrub/emergent)	0.47	0.36	1:1	0.47	0.36
B	Wetland Establishment (forested)	16.23	14.21	1:1	16.23	14.21
C	Forested Floodplain Preservation	4.60	0.68	15:1	0.31	0.05
D	Upland Preservation	2.72	2.61	20:1	0.14	0.13
	Total	24.02			17.15	14.75
E	Stream Buffer	0	6.16		0	307

B. Success Criteria

The following criteria will be used to determine the success of stream buffer establishment and preservation. The success criteria reflect the most recent version of the interagency banking template.

1. Preservation Areas, including Buffer areas

   a) Proof of recordation of the restrictive covenant. Proof of recordation is provided in the Bender Farm Site Plan dated December 7, 2005.

   b) The final monitoring report shall document that all preserved areas, including Buffers are intact in their approved condition

   c) No more than 5% cover per stream segment, and/or buffer cell, field, or block may be made up by those species such as *Typha latifolia, Phragmites australis, Lonicera japonica, Pueraria lobata, or Ailanthus altissimus listed as highly invasive on the Virginia Department of Conservation and Recreation's Invasive Alien Plant list. This list of invasive plants may be found at* http://www.dcr.virginia.gov/natural_heritage/documents/invlist.pdf

2. Restoration, creation, and enhancement Buffer areas

   a) A minimum of *400* woody stems of native trees and shrubs per acre (including volunteers) from the top of the stream bank landward and/or within the wetland shall be achieved by the end of the first growing season following planting and maintained each monitoring year until canopy coverage is 30%. Canopy coverage shall be at least 30% each monitoring year thereafter.

   b) Native non-invasive herbaceous plant coverage shall be at least 60% by the end of the first growing season, and at least 80% each monitoring year thereafter. Any seeds used for plant establishment should conform to the Virginia Seed Law (Sections 3.1-262 Code of Virginia) and Virginia Seed Regulations (2 VAC 5-290-10 et seq) and shall be free of tall fescue, Bermuda grass, and other allelopathic turf grass species, as well as plant species on the Virginia Department of Conservation and Recreation's Invasive Alien Plant List.

   c) No more than 5% cover per stream segment, and/or buffer cell, field, or block may be made up by invasive species such as *Typha latifolia, Phragmites australis, Lonicera japonica, Pueraria lobata, or Ailanthus altissimus. Invasive species are identified on the Virginia Department of Conservation and Recreation's Invasive Alien Plant list.*

   d) The final monitoring report shall contain documentation by cell, field, or block that demonstrates that all vegetation within the buffer area is healthy and thriving and the average tree height of all planted trees is at least 5 feet in height in each cell, field, or block.

3. Stream Channel Preservation

   a) For the linear footage where no in-stream work was accomplished (regardless of riparian buffer activities), the following monitoring shall occur:

      - Two permanent cross-sections shall be established to ensure that the same locations are used each monitoring year (one cross-section per 1000 linear feet). A stream gage shall be placed in each stream to document bankfull events. Cross-sectional measurements shall include streambanks, streambed, water surface, bankfull, and adjacent floodplain elevations.

   b) The following will be documented at each cross-section:

      - Ground level photographs shall be provided with each monitoring report for the purpose of documenting vegetation and stream stability. The photographs will be taken twice annually (summer/winter) at representative cross-sections and will clearly show the channel upstream and downstream, the riparian buffer area, and each stream bank.

C. Monitoring Provisions

The Sponsor agrees to perform all necessary work to monitor the stream buffer to demonstrate compliance with the Success Criteria provided in this Addendum. Monitoring may be terminated or the extent of monitoring may be reduced over part or the entire site at the discretion of the IRT.

Timing. Monitoring activities shall occur during the growing season, and at least once during the 1st, 2nd, 3rd, and 5^{th}, 7^{th} and 10^{th} growing seasons following completion of planting. The 5^{th} monitoring report for Bender Farm was submitted in 2011. Additional monitoring for stream credits will be completed in 2013 during the 7^{th} growing season and 2016 during the 10^{th} growing season.

In addition, monitoring shall adhere to the following schedules:

a) For any year in which planting was conducted, monitoring of woody vegetation shall take place no sooner than 1 year following planting.

b) Monitoring of vegetation (herbaceous and woody species) shall be conducted during the growing season.

c) If all performance criteria have not been met in the 10^{th} year, then a monitoring report shall be required for each consecutive year until two sequential annual reports indicate that all criteria have been successfully satisfied.

1. Stream Buffer Preservation: The monitoring program for *stream, buffer preservation areas* shall consist of:

   - Visual Observations: Visual observations shall be provided with each monitoring report through a written discussion of the buffer condition, any

significant changes to the buffer, and photographic documentation, as necessary to further describe the buffer condition.

2. Stream Buffer Restoration/Establishment: The monitoring program for *stream buffer restoration/establishment/reestablishment* areas shall consist of:

    a) Visual Description: Visual descriptions shall be provided with each monitoring report by one of the following means: (I) ground level photographs, taken facing north, south, east and west, from stations located adjacent to each vegetation plot (permanent markers shall be established to ensure that the same locations (and view directions) are monitored in each monitoring period), or (ii) one color aerial photograph (8" x 10" or larger) depicting the entire site.

    b) Vegetation. Sample plots shall be located on a stratified random basis over the site in order to sample the stream buffer at locations adjacent to each photo location marker. The planted buffer area is 2.2 acres; therefore, seven plots (3 plots/acre) will be sampled. Each plot will be sampled within a 20.4 foot radius (1300 square feet). The vegetation data shall be collected during the growing season and shall include:

        - Dominant vegetation species identification;
        - Coverage assessment;
        - Number of woody plant stems (total and #/acre);
        - Percent survival of planted species; and
        - An invasive/noxious species assessment, including percent cover;
        - Average height of planted woody species in each sample and percent change in height since previous monitoring event.

E. Financial Assurances

The Sponsor established two escrow accounts when the Bender Farm Bank site was approved by the IRT in 2006, an Emergency Escrow Account and Endowment Escrow Account. The Emergency Escrow was fully funded with a $40,000 deposit. No additional funds will be deposited into the Emergency Escrow since all planting was completed in 2006 and subsequent monitoring has confirmed successful establishment of vegetation throughout the site.

If remediation is needed during the Sponsor's maintenance and monitoring period, the required work will be paid for by the Sponsor and will not make use of funds from the Emergency Escrow Account. When the conditions to close the Bender Farm Bank Site have been met and approved by the IRT, all remaining funds in the Emergency Escrow Account will be returned to the Sponsor.

The Endowment Escrow was fully funded with a $20,000 deposit. The existing conservation easement includes the non-credited riparian buffer, and the easement will be transferred to the long-term steward after the bank is closed. The entire site, including the

non-credited riparian buffer, was considered when determining the amount of the Endowment Escrow account. Planting the riparian buffer would not increase cost to the long-term steward since their primary responsibility on this site would be to protect the easement from encroachment, which is necessary with or without planting the riparian buffer. At the end of the monitoring period, the $20,000.00 plus interest will be turned over to a nonprofit steward to provide for the long-term management of the site in accordance with Section V.(F) of the Banking Instrument (Long-Term Ownership and Preservation).

F. Schedule of Credit Availability

Proposed stream credits are associated with a conversion of existing wetland credits that were previously released by the IRT. Therefore, all 307 stream credits would be available for release upon approval of this addendum.

F. Approvals

IN WITNESS WHEREOF, the parties hereto have executed this modification to the Bender Farm Mitigation Site Development Plan on the date herein below last written.

_____ _____
Marsh Resources, Inc. Date

By: _____
Its: _____

INTERAGENCY REVIEW TEAM

By the IRT Co-Chair:

_____ _____
U.S Army Corps of Engineers, Norfolk District Date

By: _____
Its: _____

By the IRT Co Chair:

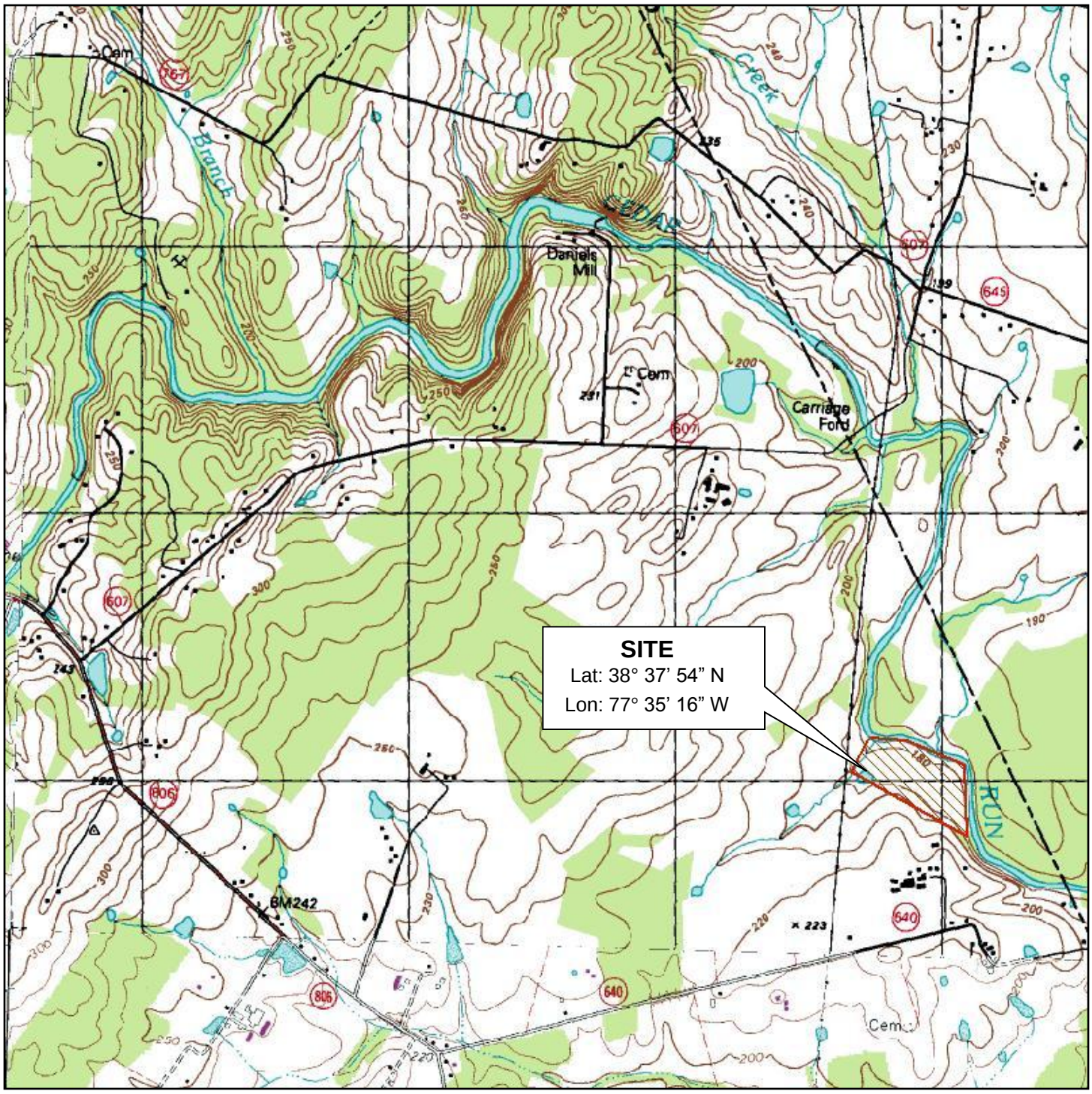
_____ _____
Virginia Department of Environmental Quality Date

By: _____
Its: _____

If this Mitigation Bank Site is transferred to a new Bank Sponsor, the terms and conditions of this modification will continue to be binding on the new Bank Sponsor. To validate the transfer of this modification and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

_____ _____
Transferee Date

By: _____
Its: _____



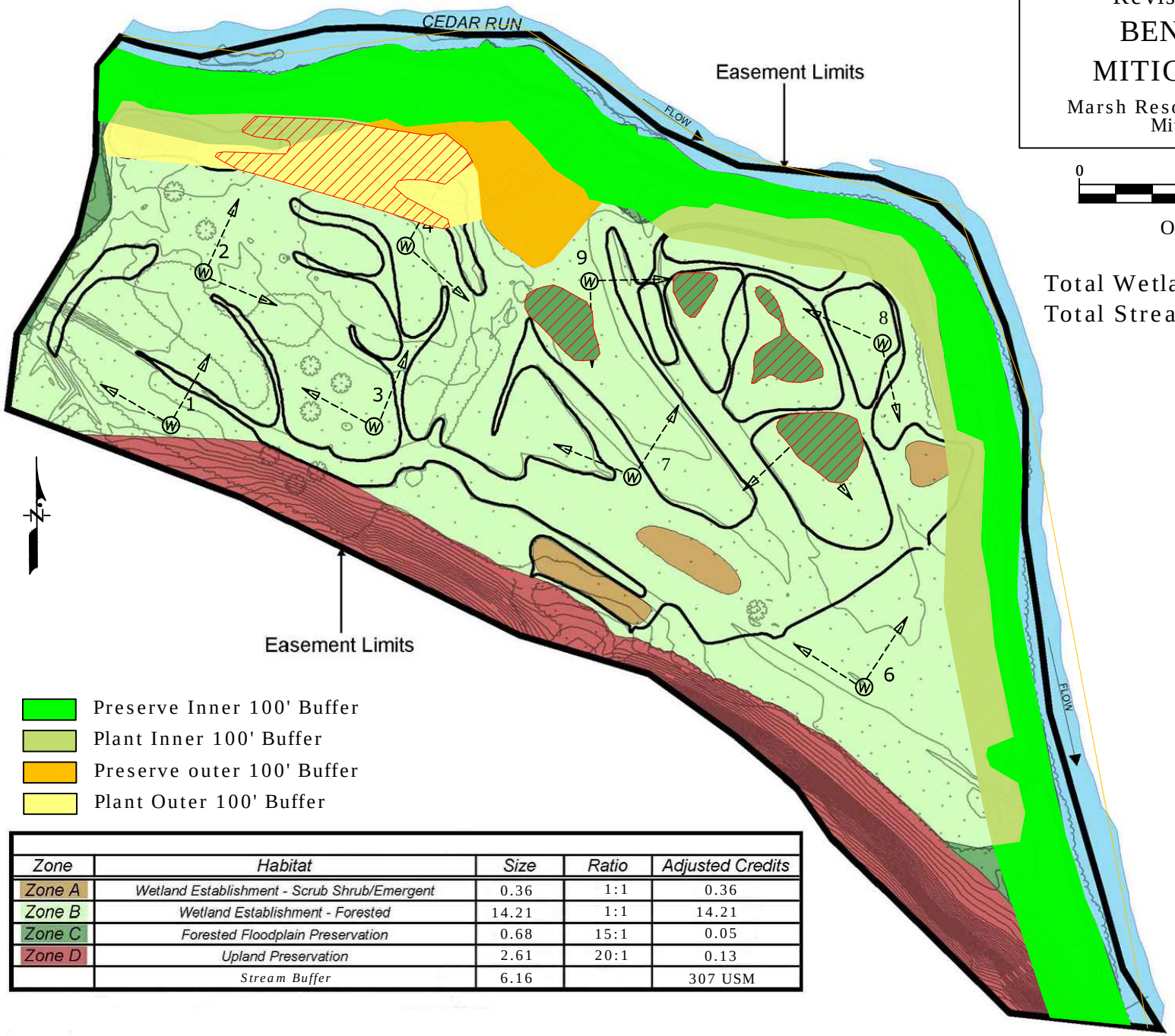
Source: USGS Nokesville Quad (1997)

MARSH RESOURCES INC.	**Bender Farm Mitigation Site** **SITE VICINITY** **Fauquier County, Virginia**	**Exhibit 1** **1 in = 2000 ft**

Revised Credit Plan

BENDER FARM MITIGATION SITE

Marsh Resources Potomac River Mitigation Bank



0 200' 400'

October, 2012

Total Wetland Credits = 14.75
Total Stream Credits = 307

Preserve Inner 100' Buffer
Plant Inner 100' Buffer
Preserve outer 100' Buffer
Plant Outer 100' Buffer

Zone	Habitat	Size	Ratio	Adjusted Credits
Zone A	Wetland Establishment - Scrub Shrub/Emergent	0.36	1:1	0.36
Zone B	Wetland Establishment - Forested	14.21	1:1	14.21
Zone C	Forested Floodplain Preservation	0.68	15:1	0.05
Zone D	Upland Preservation	2.61	20:1	0.13
	Stream Buffer	6.16		307 USM

Wetland Credit Not Released = 1.1 acre

Stream Assessment Form (Form 1)

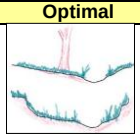
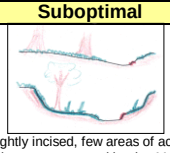
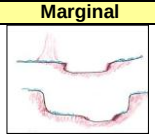
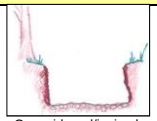
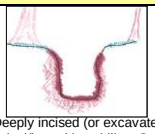
Unified Stream Methodology for use in Virginia

For use in wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
	Bender Farm Mitigation Site	Fauquier		02070010	Sept, 2012	1	2365	

Name(s) of Evaluator(s)	Stream Name and Information
G. Jellick	Cedar Run

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	 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 excavated), 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	2.0
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							NOTES>>
	Optimal	Suboptimal		Marginal		Poor		
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. 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% 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	

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>	70%	30%					100%		
	Score >	1.2	0.85							
									CI= (Sum % RA * Scores*0.01)/2	
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI > 1.10	CI
	Score >	1.5							Lt Bank CI > 1.50	1.30

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.

	Conditional Category				NOTES>>
	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	1.50

Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
							2365	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**	**1.50**

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) >>	**1.26**
RCI= (Sum of all CI's)/5	
COMPENSATION REQUIREMENT (CR) >>	**0**
CR = RCI X LF X IF	

INSERT PHOTOS:

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
	Bender Farm Mitigation Bank	Fauquier				1	2365

Name(s) of Evaluator(s)	Steam Name and Information
G. Jellick	Cedar Run

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 = Credits = Stream Length X 1.0

Credit per foot: 1 — Project Credits: 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 = Credits = Stream Length X 0.3

Credit per foot: 0.3 — Project Credits: 0

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

Mitigation Categories

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

Right Bank	Length							0			
	Credit>										
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 *High Quality, Restoration, Enhancement*	Preservation *Low Quality*	Buffer area not within preservation width
Credit for 0'-100'	0.4	0.38	0.29	0.14	0.07	0
Credit for beyond 100'	0.2	0.19	0.15	0.07		0

Calculation of "Goal" riparian buffer for each side (SAR length times 100') >>>> 228,358 square feet

WITHIN FIRST 100' - Mitigation Categories

One vegetative community maintained	Subtract 0.03
Two vegetative communities maintained	Subtract 0.06

Ensure the sums of % Riparian Blocks equal 100

Right Bank	Area #	1	2								
	Sq. Footage	160830	67392								
	% Area	70%	30%	0%	0%	0%	0%	100%			
	Credit>	0.14	0.38								
Left Bank	Area #										
	Sq. Footage										
	% Area	0%	0%	0%	0%	0%	0%	0%	Rt Bank >	0.21	Credit
	Credit>								Lt Bank >	0.00	0.11 — 260

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

Outside First 100' - Mitigation Categories

One vegetative community maintained	Subtract 0.03
Two vegetative communities maintained	Subtract 0.06

Right Bank	Area #										
	Sq. Footage	16730	28717								
	% Area	7%	13%	0%	0%	0%	0%	20%			
	Credit>	0.07	0.19								
Left Bank	Area #										
	Sq. Footage										
	% Area	0	0	0	0	0	0	0%	Rt Bank >	0.03	Credit
	Credit >								Lt Bank >	0.00	0.02 — 47.3

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
Stream Length Affected			
Credit>			

Record AF length /credit beneath the AF activity. Provide a narrative explanation of the applicable site conditions that warrant an adjustment and justify the AF credit chosen.

Credits > 0

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

ΣLength X Credit) for all areas

Total Compensation Credit Provided by Project: 307