



DEPARTMENT OF THE ARMY
SAVANNAH DISTRICT, CORPS OF ENGINEERS
1590 ADAMSON PARKWAY, SUITE 200
MORROW, GEORGIA 30260-1777

REPLY TO
ATTENTION OF

Regulatory Division
SAS-2007-00310

FEB 21 2014

PUBLIC NOTICE
Savannah District

The U.S. Army Corps of Engineers, Savannah District, has received a notice from Whooping Creek Meadows, LLC requesting a Major Modification to the previously approved *Carrollton Mills Mitigation Bank Final Banking Instrument Carroll County, Georgia*.

Application Number: SAS-2007-00310

Applicant: Mr. John Paulk, Jr.
Whooping Creek Meadows, LLC.
100 Glen Eagles Court
Carrollton, Georgia 30117

Agent: Mr. Steve Glickauf
Corblu Ecology Group, LLC.
1305 Lakes Parkway, Suite 129
Lawrenceville, Georgia 30043

This public notice does not imply, on the parts of the U.S. Army Corps of Engineers or other agencies, either favorable or unfavorable opinion of the work to be performed, but is issued to solicit comments regarding the factors on which final decisions will be based.

Location of Proposed Work: The Carrollton Mills Mitigation Bank is located on a 142-acre tract approximately 10 miles south of Carrollton in Carroll County, Georgia (latitude 33.6002 and longitude -84.2749).

Geographic Service Area: The Geographic Service Area (GSA) is the defined area within which this bank can reasonably be expected to provide appropriate compensation for impacts to aquatic resources. The GSA for this bank includes the Middle Chattahoochee Basin, 8-digit Hydrologic Unit Codes (HUC) 03120002 as the Primary service area in Georgia. The Upper Tallapoosa River, HUC 03150108; the Upper Flint River, HUC 03130005; and the Upper Chattahoochee River located downstream of the Buford Dam/Lake Sidney Lanier, HUC 03130001 as the Secondary service area in Georgia. No Proposed changes to current GSAs. See the enclosed HUC-8 Map.

Description of the Current Banking Instrument: On June 8, 2008, the Carrollton Mills Mitigation Bank Final Banking Instrument was approved by the Interagency Review Team (IRT). The Bank Sponsor, Whooping Creek Meadows LLC., has successfully completed the stream, wetland, riparian buffer, and upland buffer restoration portions of the project and has submitted both Year 1 and Year 2 Post Construction Monitoring Reports. According to the approved banking instrument (BI) entitled *Carrollton Mills Mitigation Bank Final Banking Instrument Carroll County, Georgia*, mitigation activities within the bank have the potential to generate a total of 196,801.3 stream/riparian buffer credits and 114.7 wetland/upland buffer credits. Of this, 88,560.99 stream/riparian buffer credits and 51.63 wetland/upland buffer credits have been released after achieving previously established success criteria and various bank milestones including: BI approval, recording of restrictive covenant, restoration construction, and the first year of monitoring (2012). Annual monitoring reports were submitted for Year 1 (2012) and Year 2 (2013) following stream and wetland restoration implementation; however, the requested credit release for Year 2 has been delayed due to hydrology success and compliance issues within Wetland Units 1 and 3.

Proposed Modification Summary: Whooping Creek Meadows, LLC is submitting a Major Modification to the Final Banking Instrument dated June 8, 2008, for the Carrollton Mills Mitigation Bank located in Carroll County, Georgia. This modification addresses hydrology success and compliance issues within Wetland Units 1 and 3, which has delayed the Monitoring Year 2 Credit Release. This modification proposes to remove the credit generating portions of Wetland Unit 3 that are not functioning as wetlands and replace those areas with restored wetland areas that are currently included within riparian buffers. As a result of the conversion, riparian buffer credits will be converted to wetland credits and adjustments will be made to credit ledgers. Specifically, 6.8 acres from Wetland-3 that are not functioning as wetland will be removed, resulting in a decrease of 27.13 wetland credits from Wetland-3. Seven restored wetland areas currently classified as riparian buffer totaling 18-acres of wetland will be converted from riparian buffer to wetland credits resulting in the generation of 58.95 wetland credits. The conversion will result in the addition of 31.62 wetland credits and the reduction of 17,481.20 stream credits. This modification also proposes to update the performance and success criteria to better measure wetland hydrology within Wetland Units 1 and 3 and includes an updated adaptive management plan, a wetland acreage substitution plan, updated annual monitoring, performance standards and success criteria and an updated credit release schedule. This modification also proposes to slightly modify the timing, intensity, and duration of annual stream restoration monitoring and reporting for the Bank. This modification also proposes to clarify and improve upon the previously established and approved stream restoration performance and success criteria for the Bank. This BI modification has been developed in accordance to the “*Guidelines on the Establishment and Operation of Wetland Mitigation Banks in Georgia*” (USACE 2004), “*Draft Guidelines to Establish and*

Operate Mitigation Banks in Georgia" (USACE 2010) and the "*Compensatory Mitigation for Losses of Aquatic Resources*" published in the Federal Register on April 10, 2008.

Oversight: This mitigation bank may be considered one of a number of practicable alternatives available to applicants to compensate for unavoidable impacts associated with permits issued under the authority of Sections 404 and 401 of the Clean Water Act for projects located within the prescribed GSA.

Oversight of this compensatory mitigation bank will be by a group of Federal and State agency representatives collectively referred to as the Interagency Review Team (IRT). The IRT shall be chaired by the Savannah District, U.S. Army Corps of Engineers and is comprised of representatives from the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the Georgia Department of Natural Resources, Environmental Protection Division.

The actual approval of the use of this mitigation bank for a specific project is the decision of the U.S. Army Corps of Engineers pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. The U.S. Army Corps of Engineers provides no guarantee that any particular individual or general permit will be granted authorization to use this compensatory mitigation bank to compensate for unavoidable impacts associated with a proposed permit, even though mitigation from this bank may be available.

Authority: A public notice regarding the proposed mitigation bank is required pursuant to Title 33 Code of Federal Regulations Parts 325 and 332 and Title 40 Code of Federal Regulations Part 230, entitled "Compensatory Mitigation for Losses of Aquatic Resources, Final Rule", published in the Federal Register on April 10, 2008.

Consideration of Public Comments: The U.S. Army Corps of Engineers is soliciting comments from the public; federal, state, and local agencies and officials; Native American Tribes; and other interested parties in order to consider and evaluate this proposed mitigation bank. The Banking Instrument Modification is being attached to this public notice and can also be seen at the U.S. Army Corps of Engineers, Savannah District, Regulatory Division, 1590 Adamson Parkway, Suite 200, Morrow, Georgia 30260-1777. Written comments received will be considered by the U.S. Army Corps of Engineers in evaluating this proposal. Comments are used to assess impacts on endangered species, historic properties, conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards and flood plain values (in accordance with Executive Order 11988), land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs,

consideration of property ownership, and, in general, the needs and welfare of the public.

Preliminary review, provided by the bank's sponsor, indicates that: 1) An environmental impact statement will not be required; 2) No species of fish, wildlife, or plant (or their critical habitat) listed as endangered or threatened under the Endangered Species Act of 1973 (PL 93-205) will be affected; and, 3) No cultural or historical resources considered eligible or potentially eligible for listing on the National Register of Historic Places will be affected according to a website review of known listed properties. Additional information may change any of these preliminary findings.

Comment Period: Anyone wishing to comment on this proposal should submit comments in writing to the Commander, U.S. Army Corps of Engineers, Savannah District, Regulatory Division, Attention: Mark G. McIntosh, 1590 Adamson Parkway, Suite 200, Morrow, Georgia 30260-1777 **no later than 30-days** from the date of this notice. Please refer to the mitigation bank name (Carrollton Mills Mitigation Bank) and the Regulatory Division file number (SAS-2007-00310) in your comments.

If you have any further questions concerning this matter, please contact Mark G. McIntosh, Regulatory Specialist, of the Piedmont Branch at mark.g.mcintosh@usace.army.mil

1. Enclosure

1. Banking Instrument Modification for Carrollton Mills Mitigation Bank in Carroll County, Georgia.



November 22, 2013

Mr. Mark McIntosh
U.S. Army Corps of Engineers
Savannah District – North Area Section
1590 Adamson Parkway, Suite 200
Morrow, Georgia 30260

RE: Submittal of Banking Instrument Modification for Carrollton Mills Mitigation Bank
in Carroll County, Georgia.
USACE File No: 200700310

Dear Mr. McIntosh:

On behalf of the Bank sponsor Whooping Creek Meadows, LLC, Corblu Ecology Group, LLC (Corblu) is submitting the Banking Instrument Modification dated November 23, 2013 for the Carrollton Mills Mitigation Bank located in Carroll County, Georgia. This modification addresses hydrology success and compliance issues within Wetland Units 1 and 3 as discussed at the Year 2 monitoring IRT site visit and the IRT meeting on September 11, 2013. This modification proposes to remove the credit generating portions of Wetland Unit 3 that are not determined to be wetland at this time and replace those areas with restored wetland areas that are currently included within riparian buffers. This modification also proposes to update the performance and success criteria to better measure wetland hydrology within Wetland Units 1 and 3 and includes an updated adaptive management plan, a wetland acreage substitution plan, updated annual monitoring and performance and success criteria, and an updated credit release schedule.

At this time, the Bank sponsor respectfully requests streamlined approval of the BI modification for the Carrollton Mills Mitigation Bank in order to implement the proposed corrective actions and adaptive management plan for the Bank. Upon approval, the bank sponsor respectfully requests the release of year 2 monitoring and success credit release as outlined in the attached modification. If you have any questions concerning this project please do not hesitate to contact me at 770-682-9731. Thank you for your consideration regarding this request.

Sincerely,

A handwritten signature in black ink that reads "Steve Glickauf".

Steve Glickauf

Attachments

cc: Ms. Sandy Abbott, USFWS
Ms. Constance Tallman, USEPA
Mr. Stephen Wiedl, GADNR
Mr. Justin Hammonds, USACE
Mr. John Paulk, Whooping Creek Meadows, LLC

Carrollton Mills Mitigation Bank
Banking Instrument Modification
Carroll County, Georgia
USACE #: 200700310

Prepared For:

Interagency Review Team

U.S. Army Corps of Engineers, Savannah District
U.S. Environmental Protection Agency, Region 4
U.S. Fish and Wildlife Service, Region 4
Georgia Department of Natural Resources

Bank Sponsor

Whooping Creek Meadows, LLC
100 Glen Eagles Court
Carrollton, Georgia 30117



Prepared by:

Corblu Ecology Group, LLC
1305 Lakes Parkway, Suite 129
Lawrenceville, Georgia 30043



Executive Summary

This Banking Instrument (BI) Modification (modification) to the approved Carrolton Mills Mitigation Bank (Bank) has been developed to ensure Bank compliance and provide a framework for future monitoring and reporting for the Bank. The Bank was approved by the Interagency Review Team (IRT) in June 2009. The Bank Sponsor has successfully completed the stream, wetland, riparian buffer, and upland buffer restoration portion of the project and has submitted both year 1 and year 2 post construction monitoring reports.

Annual monitoring reports were submitted in years 1 (2012) and 2 (2013) following stream and wetland restoration implementation; however, the requested credit release for year 2 has been delayed due to hydrology success and compliance issues within Wetland Unit 1 and Wetland Unit 3. Overall, the hydrologic performance of Wetland Unit 1 has been significantly wetter than the comparison reference wetland. This modification proposes to update the performance and success criteria to account for wetter than reference conditions. Overall, the hydrological performance of Wetland 3 has not been meeting the success criteria as outlined in the approved BI. However, there are areas within Wetland 3 that are either meeting the success criteria as outlined in the BI or appear to be developing wetland hydrology. The success criteria for wetland hydrology outlined in the BI only takes into account groundwater hydrology (subsurface monitoring wells) and ignores surface inundation and soil saturation.

This modification proposes to remove the credit generating portions of Wetland 3 that are not determined to be wetland at this time and replace those areas with restored wetland areas that are currently included within riparian buffers. This modification also proposes to update the performance and success criteria to better measure wetland hydrology within Wetland 3 and includes an updated adaptive management plan, a wetland acreage substitution plan, updated annual monitoring and performance and success criteria, and an updated credit release schedule. This BI modification has been developed in accordance to the “*Guidelines on the Establishment and Operation of Wetland Mitigation Banks in Georgia*” (USACE 2004), “*Draft Guidelines to Establish and Operate Mitigation Banks in Georgia*” (USACE 2010) and the “*Compensatory Mitigation for Losses of Aquatic Resources*” published in the Federal Register on April 10, 2008.

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1 Introduction

1.1 Bank Overview

The Carrollton Mills Mitigation Bank (Bank) is located in Carroll County, Georgia (Figure 1). The Bank was approved by the Interagency Review Team (IRT) in June 2009. The Bank Sponsor has successfully completed the stream and wetland restoration portions of the project and is currently in its third year of monitoring.

According to the approved final BI, Mitigation activities within the Bank have the potential to generate a total of 196,801.3 stream/riparian buffer credits and 114.7 wetland/upland buffer credits. Of this, 88,560.99 stream/riparian buffer credits and 51.63 wetland/upland buffer credits have been released after achieving previously established success criteria and various bank milestones including Banking Instrument (BI) approval, recording of restrictive covenant, restoration construction, and the first year of monitoring (2012). Annual monitoring reports were submitted in years 1 (2012) and 2 (2013) following stream and wetland restoration implementation; however, the requested credit release for year 2 has been delayed due to hydrology success and compliance issues within Wetland Units 1 and 3. Overall, the hydrologic performance of Wetland Unit 1 has been significantly wetter than the comparison reference wetland. This modification proposes to update the performance and success criteria to account for wetter than reference conditions. Overall, the hydrological performance of Wetland Unit 3 has not been meeting the success criteria as outlined in the approved BI. However there are areas within Wetland Unit 3 that are either meeting the success criteria as outlined in the BI or appear to be developing wetland hydrology. The success criteria for wetland hydrology outlined in the BI only takes into account groundwater hydrology (subsurface monitoring wells) and ignores surface inundation and soil saturation. This modification proposes to remove the credit generating portions of Wetland Unit 3 that are not determined to be wetland and replace those areas with restored wetland areas that are currently included within riparian buffers. This modification also proposes to update the performance and success criteria to better measure wetland hydrology within Wetland Unit 3 and includes an updated adaptive management plan, a wetland acreage substitution plan, updated annual monitoring and performance and success criteria, and an updated credit release schedule. This BI modification has been developed in accordance to the “*Guidelines on the Establishment and Operation of Wetland Mitigation Banks in Georgia*” (USACE 2004), “*Draft Guidelines to Establish and Operate Mitigation Banks in Georgia*” (USACE 2010) and the “*Compensatory Mitigation for Losses of Aquatic Resources*” published in the Federal Register on April 10, 2008.

1.2 Ownership/Bank Sponsor

Whooping Creek Meadows, LLC is the Bank Sponsor and owns the underlying real property constituting the Bank. Corblu Ecology Group, LLC is the consultant for the Bank and is authorized to act as their agent on all matters relating to the review, modification, approval, management, and monitoring of the Bank.

Bank Sponsor

Whooping Creek Meadows, LLC
Attn: Mr. John Paulk
100 Glen Eagles Court
Carrollton, Georgia 30117

Agent/Consultant

Corblu Ecology Group, LLC
Attn: Mr. Steve Glickauf
1305 Lakes Parkway, Suite 129
Lawrenceville, Georgia 30043
Phone: 770-682-9731
sglickauf@corblu.com

1.3 Banking Instrument Modification

This modification will specifically address a corrective action plan to correct current deficiencies in the wetland restoration prescription and associated credit generation; and will also serve to revise wetland restoration acreage, annual wetland hydrology monitoring criteria, and to provide additional performance standards as part of an adaptive management plan for the Bank. While revisions and modifications to the approved BI from June 2009 are not necessary for all previously approved monitoring requirements and performance and success criteria, it was determined to be in the best interest of the Bank that annual monitoring requirements and performance standards be modified for wetland hydrology, to the extent practicable, to improve upon the previously established standards for the Bank.

1.4 Service Area

The Geographic Service Area of the Bank utilizes the Interagency Review Team's (IRT) standard service area for the Middle Chattahoochee Basin that services portions of the Upper Chattahoochee, Upper Flint, and Upper Tallapoosa Basins (Figure 2). The proposed primary service area is for Hydrologic Unit Code (HUC) 03120002 (Middle Chattahoochee). The secondary service areas are in HUCs 03130005 (Upper Flint), 03150108 (Upper Tallapoosa), and the portion of the 03130001 (Upper Chattahoochee) below Buford Dam.

The primary service area for the Bank is limited to the primary HUC area for most impacts resulting in Individual Permits and Nationwide Permits and the secondary service areas for most impacts resulting in Nationwide Permits and linear projects. In the event that all credits in a project's primary service area are sold out or unavailable, the Bank may be considered for mitigation provided it is approved in advance.

2 Corrective Action Plan

The corrective action plan was developed based on requests from the Interagency Review Team (IRT) to address areas of Wetland 3 (wetland restoration) which are underperforming. Overall, the hydrological performance of Wetland 3 has not been meeting the success criteria as outlined in the approved BI. However there are areas within Wetland 3 that are either meeting the success criteria as outlined in the BI or appear to be developing wetland hydrology. The success criteria for wetland hydrology outlined in the BI only takes into account groundwater hydrology (subsurface monitoring wells) and ignores surface inundation and soil saturation. This modification proposes to remove the credit generating portions of Wetland 3 that are not determined to be wetland and replace those areas with restored wetland areas that are currently included within riparian buffers. These riparian buffer credits will be converted to wetland credits and adjustments will be made to credit ledgers. Figure 3 shows the proposed corrective action areas and provides a general overview of the correction action plan as described below. The following provides a description of the proposed corrective actions to be implemented for wetland substitution within the approved Bank.

2.1 Wetland Corrective Actions

2.1.1 Wetland 3

Years 1 and 2 hydrological monitoring data indicated that portions of Wetland Unit 3 was not performing within the success criteria set forth in the BI. Specific areas within Wetland Unit 3 were meeting performance standards, but as a whole the wetland was not compliant with the final BI. An assessment was conducted on Wetland Unit 3 to identify the extent of actual wetland areas and non-wetland areas. Eight wetland areas of various sizes were identified totaling 4.3 acres, leaving approximately 6.8 acres of Wetland 3 as non-wetland (Figure 3). Removing these 6.8 acres of wetland restoration will result in a decrease of 27.13 wetland credits from Wetland Unit 3.

Upon further investigation of the Bank site, additional restored wetlands were identified within riparian buffers that were not included in the final BI as restored wetlands. Seven wetlands (2-1, 2-2, 2-3, 2-4, 2-8, 2-9, and 4-5) were identified totaling approximately 18.0 acres (Figure 3). These seven wetland areas are currently being included in the calculations as riparian buffer, however; this modification proposes to extract these seven wetlands from the riparian buffer credit calculations and re-classify them as restored wetlands for wetland credit generation. Credits generated from these additional wetlands, their associated upland buffers, and the original wetlands and buffers total 153.71 wetland credits. A reduction of 17,481.2 stream credits will occur to compensate for the conversion of these riparian buffer areas to wetlands. After the conversion of riparian buffer credits to wetland restoration credits, all streams will have at least the minimum 25 foot riparian buffer as required by the current SOP guidelines.

Based on IRT input, it was determined that approximately 6.8 acres of Wetland 3 (27.13 wetland credits) that was originally deemed wetland restoration during the design and BI

process be replaced with 18.0 acres from restored wetland units 2-1, 2-2, 2-3, 2-4, 2-8, 2-9, and 4-5 (58.95 wetland credits) currently included within riparian buffer areas. These wetland credits will be used to replace the credits associated with the failing portions of Wetland 3. Section 5 of this modification provides additional information on the wetland and riparian credit exchanges including updated credit generation and credit release tables.

3 Monitoring and Performance and Success Criteria

3.1 Monitoring Schedule

As of July 2013, the Bank has submitted years 1 and 2 monitoring reports and based on the performance and success criteria outlined in the final BI, the IRT has released all stream and wetland credits for the Bank only for year 1. The year 2 credit release is pending the approval of this modification. Year 3 monitoring is currently being conducted and the monitoring schedule or protocol will be adjusted, if needed, as per this modification. No additional years of monitoring beyond year 7 for wetlands will occur as a result of this modification to the Bank.

This modification is proposing to clarify what is to be reported, to update the performance and success criteria associated with the wetland restoration portion of the mitigation bank, and adjustments to water quality and fisheries monitoring. Table 3-1 provides an outline of the monitoring schedule as identified in the BI with the requested changes to the monitoring criteria revisions noted.

Annual monitoring reports will be submitted to each member of the IRT based on the original monitoring schedule set forth in the final BI. The Bank Sponsor is currently in the third year of monitoring, with the year 3 report to be submitted in June of 2014. At this time, the Bank is proposing to continue monitoring the site for five years (years 3-7) following implementation of the corrective action plan.

Table 3-1 Modified Mitigation Monitoring Schedule

Required Monitoring	Monitoring Event							
	0	1	2	3*	4	5	6	7
Calendar Year	2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Cross Sections	X	X	--	X	--	X	--	X
Longitudinal Profiles	X	X	--	X	--	X	--	X
BEHI Assessment	X	X	X	--	--	X	--	X
Macroinvertebrate Survey	X	X	X	--		X		X
Fish Surveys	X	X	--	X	--	X	--	X
Water Quality Chemical Parameters ²	X	X	--	X	--	X	--	X
Riparian Buffer Vegetation ³	X	X	X	X	X	X	X	X
Wetland Vegetation ⁴	X	X	X	X	X	X	X	X
Wetland	X	X	X	X	X	X	X	X

Required Monitoring	Monitoring Event							
	0	1	2	3*	4	5	6	7
Calendar Year	2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Hydrology ⁵								
IRT Site Visit	X	X	X	X	X	X	X	X
Reporting to IRT	X	X	X	X	X	X	X	X

*Year 3 monitoring currently being conducted.
¹Future fish surveys not required on UT1, UT2, and UT3 due to watershed size less than 1 square mile for all streams.
²Water Quality sampling revised to in-situ samples in years 2 and 5 and the full suite of laboratory analysis of samples in years 0, 1, and 7.
³Riparian Buffer plots reduced by 5 plots due to riparian buffer-to-wetland conversion.
⁴Wetland vegetation plots increased by 5 plots due to riparian buffer-to-wetland conversion.
⁵Number of wetland hydrology wells increased by 8 wells to accommodate newly designated wetland areas.
X = Original criteria

3.2 Baseline and Previous Years Monitoring Data

One of the main goals of this modification is to provide restored wetland areas that meet the performance and success criteria set forth in the BI. Since portions of Wetland 3 are being removed and replaced with better performing wetland areas on-site, the monitoring activities will have to be adjusted to accommodate these changes. As part of the corrective action plan several adjustments are being made to the monitoring activities and success criteria established in the final BI. In most cases, these changes will be in notation only and original baseline data will remain valid for comparisons. In the case where new monitoring locations are installed, the first year of monitoring of these individual locations will become the baseline for future year comparisons.

3.3 Wetland Restoration Monitoring and Success Criteria

3.3.1 Wetland Vegetation Plots

Eight original wetland vegetation plots were established during baseline to assess conditions within wetland units 1 through 4. Due to a lack of performance and success within portions of Wetland Unit 3, it has been re-assessed and reduced into eight smaller wetland units (3-6, 3-7, 3-10, 3-11, 3-12, 3-13, 3-14, and 3-15). Also, seven other wetland units (2-1, 2-2, 2-3, 2-4, 2-8, 2-9, and 4-5) were identified within riparian buffers in other locations within the bank that will be converted to wetland. To be able to assess these newly designated wetland areas appropriately, wetland vegetation monitoring plots will be adjusted to be completely contained within these areas (Figure 4). Additional plots will be installed, if deemed necessary.

The locations of the three existing wetland vegetation plots located in Wetland Unit 3 will be adjusted slightly to ensure that the plots are entirely contained within the newly

designated wetlands 3-12, 3-13, and 3-15. Monitoring activities within these plots will continue as set forth in the final BI.

Seven new wetland areas were identified within existing riparian buffers. These areas will be converted from riparian buffer to wetland, therefore, also converting the riparian vegetation plots within areas (RP7, RP8, RP9, RP 12, and RP13) to wetland vegetation plots (WP7, WP8, WP9, WP 12, and WP13). This change is in nomenclature only, since the monitoring activities within these plots will remain the same. Where needed, plot locations may be shifted slightly to ensure the entire plot is within the wetland boundary, but no major changes will be incurred to the existing plots. Since no major changes will occur to the existing vegetation plots, comparisons of monitoring data in future years will still be appropriate and relevant.

Monitoring Locations

A total of eight permanent wetland vegetation monitoring plots were originally established and included in past monitoring reports. Of the original eight monitoring plots, five (WP1, WP2, WP5, WP10 and WP11) will remain unchanged. The locations of the three remaining monitoring plots (WP14, WP16, and WP18) in Wetland Unit 3 will be adjusted slightly to ensure that they fall entirely within the new wetland areas designated in this modification. Monitoring activities within these three plots will remain unchanged and comparisons with previous years monitoring data will still be possible.

Riparian vegetation plots RP7, RP8, RP9, RP 12, and RP13 are located within the newly designated wetland areas and will be converted to wetland plots (WP7, WP8, WP9, WP12, and WP13). Plot locations will remain the same except for Plot 13, which will be adjusted slightly to ensure that it falls entirely within the boundary of wetland 2-1.

Performance and Success Criteria

Performance and success criteria for the wetland vegetation plots will remain the same as described in the final BI. No changes in wetland vegetation monitoring activities or data reporting will occur as a result of this modification.

3.3.2 Wetland Hydrologic Monitoring and Success Criteria

Factors considered in establishing hydrologic success criteria include the site-specific water budget, soil types, and target wetland systems. Wetland hydrology for mitigation banks has typically been monitored and measured by comparing groundwater hydrology (piezometers) with reference wetland groundwater hydrology. While this method works well for measuring groundwater it ignores surface water inundation and subsequent soil saturation which are also inherently important aspects of wetland hydrology. Measuring surface inundation can be accomplished by measuring surface water with a staff gauge or establishing a piezometer to only record measurements in the top one or two inches below the soil surface. Measuring soil saturation and obtaining accurate results to determine if the hydrology of a wetland is modifying the

physiochemical environment of the soil can be much more difficult to accomplish. Wetland Units 1 and 3 are not entirely meeting the groundwater hydrologic success criteria as identified in the BI. Wetland Unit 1 is significantly wetter than the comparison reference wetland, and Wetland Unit 3 is not as “wet” as the reference wetland. The following describes the wetland hydrology monitoring modifications that will update those identified in the final BI.

Groundwater Hydrology

Groundwater hydrology will continue to be monitored through the use of automatic monitoring wells during each growing season for the first 7 years of hydrologic monitoring following construction or until successful groundwater hydrology is shown, whichever comes first. Years 1 and 2 post construction, had 7 wells monitoring Wetland Units 1 (wells 2, 6, and 8) and 3 (wells 1, 3, 7 and 9) with one additional reference well. For the modification, only the location of well 8 will change from the original monitoring placement. This well was in the wettest portion of Wetland Unit 1 and was significantly wetter than the reference wetland both for total number of days saturated and longest consecutive days saturated. In order to capture some of the less wet portion of wetland unit 1, this well was moved in June 2013 (Figure 5). If during the remaining 5 years of wetland monitoring additional wetland reference wells may be added if necessary.

Wetland Units 2-1, 2-2, 2-3, and 2-4 will each have a piezometer added to measure groundwater hydrology with the addition of Wetland Unit 2 wetlands (2-1, 2-2, 2-3, 2-4, 2-8, and 2-9). Wetland Units 3-13 and 3-15 will each have an additional piezometer added to measure groundwater hydrology with the overall changes to Wetland Unit 3.

Surface Inundation

Measuring surface inundation will be accomplished by establishing a piezometer to only record surface water in the top one or two inches below the existing ground. In order to measure surface inundation a total of two shallow piezometers will be installed in Wetland Unit 3-13 and in Wetland Unit 3-15. Surface water inundation measurements will be recorded daily throughout the monitoring year.

Performance and Success

Original Success Criteria: To meet the minimum hydrologic success criteria, the monitoring data must show that the site has been inundated or saturated within 12 inches of the soil surface for 7 percent of the growing season consecutively (14 days) and 12.5 percent of the growing season cumulatively (24 days). The targeted hydroperiod is based on the current degree of impairment (see Table 8-1), the type of wetland system being restored, and predictions based on past project comparisons. For wetland restoration units one and three restored hydrology shall match the degree, duration, and periodicity of saturation/inundation of the reference site hydrology within 50% of its measured value or restored historical level as indicated in the hydrologic restoration design. Reference site hydrology will be evaluated on an annual basis. Restored hydrology shall match the range of reference hydrology in regard to hydroperiod duration, inundation and groundwater saturation frequency, and increases

in overall groundwater elevations. Additional reference hydrologic sites may be chosen to accurately reflect climatic conditions.

Modified Success Criteria: To meet the minimum hydrologic success criteria for Wetland Units 1, 2-1, 2-2, 2-3, 2-4, 3-13, 3-14 and 3-15, the groundwater hydrology monitoring data and/or surface inundation monitoring data must show that the site has been either inundated or saturated within 12 inches of the soil surface for 7 percent of the growing season consecutively (14 days) or 12.5 percent of the growing season cumulatively (24 days).

Should drier than normal conditions exist on the site, the restored hydrology for these areas shall match the degree, duration, and periodicity of saturation/inundation of the reference site hydrology within 50% of its measured or restored historical level as indicated in the hydrologic restoration design (from final BI).

WETS tables for the Carroll County will be utilized to determine normal precipitation. If normal precipitation does not occur on the site during the majority of monitoring years, and at the discretion of the IRT, the site may be found to meet the hydrologic success criteria based on comparison of monitoring data taken from the site with monitoring data taken from the established reference site.

3.4 Stream Restoration Monitoring and Success Criteria

3.4.1 Chemical Parameters/Water Quality

Original Monitoring Protocol: Currently, monitoring of chemical parameters and water quality is being performed on each stream within the Bank during wet and dry periods for monitoring years 1, 3, 5 and 7. Measurements include dissolved oxygen, water temperature, pH, conductivity, fecal coliform, ammonia-N, nitrite-N, nitrate-N, phosphorus, total kjeldahl nitrogen, and turbidity. These samples are collected and processed by an independent laboratory.

Modified Monitoring Protocol: This modification proposes to adjust monitoring activities to align it more closely with the current mitigation banking guidelines. This would include reducing the sampling parameters for monitoring years 3 and 5 to in-situ water quality sampling for pH, water temperature, dissolved oxygen, and turbidity only. The full suite of chemical measurements will be performed for monitoring year 7. All sampling will continue to measure chemical parameters and water quality during both wet and dry periods annually (one wet and one dry sample per monitoring year) to evaluate the effectiveness of the reach-wide restoration efforts. Monitoring will occur in the same locations as stated in the BI.

Performance and Success Criteria

Original Success Criteria: The restored stream systems shall exhibit overall stability in water quality parameters including dissolved oxygen, water temperature, pH,

conductivity, fecal coliform, ammonia-N, nitrite-N, nitrate-N, phosphorus, total kjeldahl nitrogen, and turbidity. Restored streams shall exhibit water chemistry indicative of natural and reference condition streams by removal of common pollutants found in Metropolitan Atlanta-area streams.

Modified Success Criteria: Performance and success criteria for chemical parameters and water quality will remain the same as described in the final BI, only the timing and amount of sampling will change based on this modification.

3.4.2 Fisheries

This modification proposes that for first or second order streams with watersheds less than one square-mile, future fisheries monitoring and annual reporting will not be required after monitoring year 2. This would include UT1, UT2 and UT3. Fisheries monitoring and reporting will continue to be conducted on Cavender Creek and Whooping Creek for monitoring years 3, 5, and 7.

Performance and Success Criteria

Original Success Criteria: The restored stream systems shall have biological parameters resembling the reference reach comparison including fish and other macroinvertebrate aquatic life by the end of the monitoring period. Increases in fish IBI, IWB, and habitat assessment scores as well as benthic macroinvertebrate taxa richness, EPT index, site metric scores, and habitat assessment scores from the restored reaches should show measured increases over the course of the monitoring period.

Modified Success Criteria: Increases in fish IBI, IWB, and habitat assessment scores as well as benthic macroinvertebrate taxa richness, EPT index, site metric scores, and habitat assessment scores from the restored reaches should show measured increases over the course of the monitoring period.

3.4.3 Riparian Buffer Vegetation

Twelve original riparian vegetation plots were established during baseline to assess conditions within the restored and preserved riparian buffers along stream reaches within the Bank. Due to a lack of performance and success within portions of Wetland Unit 3, this modification proposes to re-classify portions of the riparian buffers that have wetland characteristics as wetland and remove them from riparian buffer calculations. In doing so, five riparian buffer vegetation plots located within these areas (RP7, RP8, RP9, RP 12, and RP13) will be converted to wetland vegetation plots. The remaining seven riparian buffer vegetation plots (RP3, RP4, RP6, RP15, RP17, RP 19, and RP20) will not change. The location of RP4 will be shifted slightly so that the plot will fall entirely in the riparian, since a portion of it currently falls within wetland 4-5. Monitoring and reporting of these plots will continue as set forth in the final BI.

Performance and Success Criteria

Performance and success criteria for the riparian buffer vegetation plots will remain the same as described in the final BI. No changes in riparian buffer vegetation monitoring activities or data reporting will occur as a result of this modification.

3.5 Summary of Annual Monitoring and Performance and Success Criteria

As described above, this modification proposes to slightly modify the timing, intensity, and duration of annual monitoring and reporting for the Bank. This modification also proposes to clarify and improve upon the previously established and approved performance and success criteria for the Bank. As such, it is proposed that this modification shall serve as the primary document to establish the annual monitoring schedule, its components, and to provide enhanced performance standards to be used in order to better evaluate the overall future success of the Bank.

4 Adaptive Management Plan

4.1 Adaptive Management Plan

The Bank Sponsor will be the manager/operator of the Bank. The Bank Sponsor maintains the right to seek the support of certified private consultants and contractors to aid in the management and operation of the Bank. This will include all accounting procedures and tracking of credits and debits, scheduling mitigation improvement and remediation projects, monitoring the performance and success of the Bank, and submitting the annual report to the IRT. The Bank Sponsor will provide all funding for the management and operation of the Bank. The Carrollton Mills Mitigation Bank is a proposed commercial mitigation bank; therefore, the Bank Sponsor shall determine the sales price per credit at their sole discretion.

The Bank Sponsor will arrange annual inspections of the Bank for the IRT throughout the remainder of the required monitoring period, unless otherwise instructed or deemed unnecessary by members of the IRT.

In preparing an adaptive management plan for habitat to be preserved in perpetuity, it must be acknowledged that there will undoubtedly be future changes in site conditions and/or developments in habitat management that may affect how the management plan objectives are met. This management plan can only provide guidance for adopting new technologies or practices as they are developed. Ultimately, the Bank Sponsor, in coordination with the IRT, must determine the appropriate management decision for a given situation. The management strategies, approved uses, and restrictions described in the following sections are intended to provide a framework for the management and operation of the Bank. Before considering any management action, the Bank Sponsor must consider the management plan objectives, which is to ensure that the protected habitats within the Bank are maintained in good condition such that they continue to support the flora and fauna and overall ecosystem stability of the wetland and streams. Furthermore, it is not possible for the adaptive management plan to anticipate all possible conditions. Therefore, if a condition arises which is not specifically addressed by this adaptive management plan, the Bank Sponsor may, upon review and approval by the IRT, adopt techniques not described herein for the benefit of the Bank.

4.1.1 Responsible Parties

Bank Sponsor will be responsible for the overall Bank development including the permitting, implementation, remedial or corrective actions, and annual monitoring of the Bank.

4.1.2 Site Prescription and Credit Adjustments

It is not anticipated that the additional site prescriptions will change significantly following approval of the BI modification through implementation. Changes to credit

totals based on this modification will be adjusted accordingly in the year 2 credit release.

4.1.3 Monitoring Schedule

To ensure the success of the mitigation plan, monitoring of the Bank shall occur for a period of no less than seven years from the date of initial restoration construction and vegetation planting in restoration and enhancement areas. The initial construction/ planting credit release occurred in February 2011. The first year monitoring report was submitted in August 2012 with a subsequent credit release occurring in November 2012. The second year monitoring report was submitted in June 2013 with a credit release pending the approval of this modification to account for the reduced Wetland 3 size and the addition of the riparian buffer wetlands. The Bank is currently in its third year of monitoring with a report due to be submitted in June 2014. At this time, the Bank Sponsor is proposing to continue monitoring the site for an additional five years (monitoring years 3-7) with the year 3 annual monitoring report due in June 2014 and the final year 7 monitoring report occurring by June 2018. Annual monitoring reports will be submitted to each member of the IRT by the following June of each monitoring year. A summary of the monitoring schedule is provided in Table 4-1 below.

Table 4-1 Modified Annual Monitoring Schedule

Monitoring Year	Anticipated/Scheduled Submittal Date	Status
Year 1	August 2012	Completed
Year 2	June 2013	Completed
Year 3	June 2014	Pending
Year 4	June 2015	Pending
Year 5	June 2016	Pending
Year 6	June 2017	Pending
Year 7	June 2018	Pending

4.1.4 Governing Guidelines

The 2009 Banking Instrument was developed and approved under the Savannah District’s USACE “*Guidelines on the Establishment and Operation of Wetland Mitigation Banks in Georgia*” (USACE 2004), the March 2004 “*Standard Operating Procedures for Determining Mitigation in Georgia*” (SOP), and the “*Compensatory Mitigation for Losses of Aquatic Resources*” published in the Federal Register April 10, 2008. Where applicable, components of the Bank will continue to operate under those guidelines and as provided for in this modification. However, this modification also provides an opportunity for the Bank Sponsor to improve upon the previously established and approved final BI by enhancing, clarifying, and providing more consistent reporting protocols and performance standards for the Bank. Wherever possible, the Bank has integrated components of the more recent “*Draft Guidelines to Establish and Operate Mitigation Banks in Georgia*” (USACE 2010) that was developed in accordance with the “*Compensatory Mitigation for Losses of Aquatic Resources*” published in the Federal

Register April 10, 2008. Additionally, in the event that future revised guidelines or SOP either becomes available or is required for this Bank prior to its final modification approval, the Bank Sponsor reserves the right to amend, revise, and adjust the annual monitoring and performance and success criteria components of this BI accordingly and with the approval of the IRT.

4.1.5 Contingency and Remedial Actions

In the event that the Bank fails to provide expected stream, riparian buffer, and wetland functions and values during the monitoring period, the cause of the failure will be determined and a remedial or corrective action plan will be developed for submission to the IRT outlining the corrective measures to be taken. The Bank will continue to evaluate and perform any necessary maintenance of restored streams, riparian buffers and wetlands until the performance standards are met. Maintenance activities shall seek to maintain the stream, buffer, and wetland functions and values consistent with the performance and success criteria as set forth in this modification.

Stream Geomorphology

There should be little change in as-built cross sections and channel profile over the monitoring period. If changes do take place they should be evaluated to determine if they represent a movement toward a more unstable condition (e.g., down-cutting, erosion, channel aggradation or degradation, unnatural channel migration, etc.). Should such a condition exist, the cause of instability will be assessed and appropriate remedial and corrective actions will be prescribed.

Streambank Stability

Post restoration streambank stability assessments should show an immediate reduction in overall stream sedimentation rates and then stabilize over the course of the monitoring period as stream banks and riparian buffer areas become stabilized and establish deep rooted woody vegetation. In the event the restored reaches do not stabilize and reduce bank erosion and sedimentation to a significant level, the restored channels will be further assessed for deficiencies/failures and corrective actions will be recommended and implemented.

Biological Parameters

Fish and macroinvertebrate monitoring should show gradual increases in overall biodiversity including diversity, abundance, habitat, and site metric scores over the course of the monitoring period until they reach steady-state equilibrium with the restored channels. Improvements in fish and macroinvertebrate biodiversity is not expected to significantly increase immediately following construction as restored channels and buffers will need to stabilize, flush, and establish planting and recruited vegetation and cover over time. Should biological parameters not gradually increase

over time an assessment of the restored reaches and buffers will be performed and corrective actions will be recommended and implemented.

Chemical Parameters/Water Quality

Results of the water quality monitoring will be used to evaluate the components of the water column that support aquatic flora and fauna, to determine limiting factor nutrients, and to evaluate specific pollutants and indicators of pollutants. Should monitoring indicate increased pollutant loads or deficiencies in water quality the sampling results will be further assessed to determine the local site and watershed conditions. Additional water quality sampling may be performed, if necessary, to properly assess water quality and determine any causes of impairment.

Wetland Hydrology

If the rainfall data for any given year during the monitoring period is not normal, and if the desired hydrology for the project site is not on a trajectory to achieve success, then reference wetland data will be assessed to determine if there is a positive correlation between the underperformance of the restoration site and the natural hydrology of the reference site. This evaluation may include, if necessary, the selection of additional reference wetlands in which to monitor hydrology for comparison to the mitigation site. This evaluation may be made at the discretion of the IRT. Should groundwater or surface inundation monitoring not show that at least a portion of the top 12 inches of soil is not saturated then the soil may be tested to determine if it meets anaerobic conditions. If a positive reaction of the soil to alpha-alpha-Dipyridyl is the dominant condition of a specific soil layer (or other appropriate methodology for determining hydric soil conditions) for at least two of three samples then hydric soil conditions exist and the restoration of wetland hydrology would be determined to be successful.

Riparian/Wetland Vegetation

If vegetative survival of the planted riparian buffer and wetland restoration areas are not met, additional tree/shrub saplings will be planted to achieve the proper vegetative survival rate. In the event that seedlings/saplings are being grazed and/or damaged by wildlife, protective collars may be applied to stems or other appropriate protective measures may be taken to prevent damage.

4.2 Force Majeure

The Bank is vulnerable to acts of nature such as wildfires, climatic instability, depredation by wildlife (e.g., beaver, deer, voles, etc.), disease, adverse flooding, fluviogeomorphic change, and gross vandalism such as arson that are beyond the control of the Bank Sponsor to prevent or mitigate. The occurrence of any such act may necessitate changes to the Bank, including revision of the BI, performance goals or other management plans to allow for activities that would offset and/or counteract the negative environmental impacts of that act. Depending upon the circumstances, it may

be appropriate to let nature take its course, particularly when acceptable environmental conditions would be expected to eventually reestablish. If any such act occurs, then the IRT, in consultation with the Bank Sponsor, shall determine what changes will be in the best interest of the Bank and its habitats. Any change to the Bank necessitated by an act of nature or gross vandalism, beyond the control of the Bank Sponsor, shall be specified in an appropriate document and require the approval of the IRT or the appropriate resource agency.

4.3 Default and Closure

In the event the Bank Sponsor defaults (i.e. fails to meet milestones, perform necessary repair and maintenance, provide timely monitoring reports, or any other responsibility identified in the final BI or this modification), the USACE will notify the Bank Sponsor in writing that the Bank is out of compliance and request a response within 30 days detailing how the discrepancies will be corrected. If no satisfactory resolution is reached, the USACE will close the subject bank and all remaining credits, either released or not, will be null and void. The Bank will no longer be an acceptable source of compensatory mitigation for Department of the Army permits. If the default and closure clause is activated, the USACE will make a determination as to what additional work or repair needs to take place to achieve the mitigation plan's objective.

4.4 Annual Reporting

The Bank Sponsor shall report to the IRT, not less than annually, on the performance of the Bank and the status of the Bank's mitigation credit ledger through the credit life of the Bank. The Bank Sponsor shall prepare and forward a report to the IRT outlining the Bank's activities for the preceding 12-month period and what is proposed for the proceeding 12-month period. The annual report will generally include the following information:

- The monitoring results of the Bank for the previous 12-month period;
- A description of how the Bank meets the mitigation performance and success criteria;
- An overview of the Bank accounting including the credit ledger showing the number of credits released that year and the number of credits used;
- The commercial source of planting stock whenever planting is required and;
- A projection of the work to be performed during the next 12-month period.

The monitoring report shall include information relating to: site design and construction; vegetation data; fixed-point snapshot data of the mitigation area; physical, biological, and chemical parameters of the restored streams and riparian buffers; wetland hydrology data; maintenance activities performed; adaptive management needs; and recommended corrective measures, if any, to design standards, specifications, and maintenance protocols. A summary of the mitigation monitoring schedule can be seen in Table 3-1.

5 Credit Release Schedule

5.1 SOP Worksheet and Credit Table Modifications

As discussed throughout this modification, Wetland Unit 3 is being reduced in size, and portions of the existing riparian buffers are being converted to wetland to reflect the on-site conditions of Wetland Unit 3. As a result, SOP calculations have been performed to reflect the reduction of acreage for Wetland Unit 3 and conversion of riparian credits to wetland credits. New SOP tables have been created to reflect these changes (Appendix B).

5.1.1 Wetland Restoration Credit Factors

This modification proposes to revise the original number of stream and wetland credits to compensate for the removal of portions of Wetland Unit 3 and the conversion of riparian buffer to wetland. No changes to the credit generation factors originally used in the BI to Wetland Units 1, 2, 3-6, 3-7, 3-10, 3-11, 3-12, 3-13, 3-14 or 3-15 are to occur. However the additional wetland units associated with wetland 2 (units 2-1, 2-2, 2-3, 2-4, 2-8, and 2-9) never had the credit generation factors properly vetted since these areas were originally proposed as riparian buffers. Wetland credits for these areas were calculated in accordance with the most recent approved USACE Standard Operating Procedure (SOP) Worksheets for Calculating Compensatory Mitigation for Wetlands, Open Waters, and Streams (Appendix B). The following describes the wetland restoration credit factors for the addition of Wetland Units 2-1, 2-2, 2-3, 2-4, 2-8, and 2-9.

Net Improvement Vegetation: Wetland restoration areas where all native hydric vegetation has been completely removed and replaced with Bermuda grass for sod farming is proposed with a net improvement factor of 1.3

Net Improvement Hydrology: During the original BI process, analysis of soil and groundwater data was used to spatially assign appropriate wetland restoration units based on potential for hydrologic improvement across the site. The analysis was used to determine the degree of hydrologic impairment and associated hydrologic net benefit multipliers was conducted using the extensive baseline ground water well monitoring data for the Bank.

The assessment was based on growing season hydrologic data provided from the initial 12 automatic ground water wells (Figure 5). Both reference and impaired wells were surveyed at existing ground elevation to provide an accurate comparison of hydrology between reference condition and impairment condition. Wetland hydroperiod duration and longest consecutive hydroperiod length were then compared between the reference well and the set of impairment wells. The departure from reference condition hydroperiod and longest consecutive hydroperiod was then calculated for each impaired well and derived as a percentage of impairment compared to the reference condition. The percent impairment for both hydroperiod and longest consecutive days was then

averaged into a single percent impairment to be used as a scaling factor for hydrologic net improvement multipliers. Table 5-1 shows hydrologic impairment and corresponding net improvement factor.

Table 5-1 Hydrologic Impairment and net Improvement Factor

Well No.	Days in Hydroperiod	Longest Consecutive Days in Hydroperiod	Adjusted Consecutive Days (Values adjusted to account for artificial irrigation)	Percent (%) Compared to Reference Well	Hydrologic Impairment (%)	Corresponding Net Improvement Factor (% Hydrologic Impairment * 1.4)
1	0	0	0	0.00	100.00	1.4
2	0	0	0	0.00	100.00	1.4
3	0	0	0	0.00	100.00	1.4
4	31	16	6	90.66	9.34	0.1
6	15	3	1	17.00	83.00	1.2
7	0	0	0	0.00	100.00	1.4
8	6	3	1	17.00	83.00	1.2
9	28	4	2	22.67	77.33	1.1
10	50	35	14	198.32	-98.32	0.1
11	32	8	3	45.33	54.67	0.8
12	35	35	14	198.32	-98.32	0.1
Reference	15	7				

Wells were then grouped into hydrologic units based on wetland restoration potential. For each well in a particular unit, the average impairment percentage was used to determine the corresponding hydrologic net improvement multiplier on a percentage basis. The net improvement multipliers were then averaged into a single factor for each unit. This averaged factor was used as the hydrologic net improvement multiplier for credit calculations. For the purposes of this modification only wetlands associated Wetland Unit 2 is being provided in Table 5-2.

Table 5-2 Hydrology SOP Credit Factor

Well No.	Hydrologic Impairment (%)	Corresponding Net Improvement Hydrology SOP Credit Factor
Proposed Wetland Unit 2		
10	0	0.1
11	15	0.8
Average Factor Wetland Units 2-1, 2-2, 2-3, 2-4, 2-8, 2-9		0.5

Credit Schedule: Schedule 4 (0.1) will be used where no more than 15% of the total credits are released upon recording a restrictive covenant over the bank site and at least 20% of the total credits are held until final determination of success.

Kind: Category 1 (0.6) is in-kind mitigation. In-kind mitigation means the replacement of the impacted aquatic site with one of the same hydrologic regime and plant community (same species composition).

Maintenance: No maintenance (0.3) is expected following vegetation planting and implementation of hydrologic improvements across the site. Any structures that may be required will be designed for long-term structural stability and the mitigation area is expected to continue developing into the preferred habitat without any human intervention after the monitoring period is complete.

Monitoring and Contingencies Plan: Excellent (0.4) is proposed where there will be at least seven years of monitoring (including years 1 and 2 which were previously accomplished). This monitoring will include vegetation survival monitoring (including a commitment to replant if success is not achieved), extensive hydrological monitoring, collection of suitable baseline data, reference site comparison monitoring, and submission of an annual status report until all credits are sold.

Control: A restrictive covenant (0.1) has already been placed on the entire mitigation site.

Upland Buffer Credit Factors

Upland buffer credit was originally only established for Wetland Units 2 and 4. With the changes to Wetland Units 2, 3 and 4, and the reduction of riparian buffer there are now 12 upland buffers surrounding various wetlands (Figure 3). The total jurisdiction boundary for all upland buffers was calculated along with the linear feet of jurisdictional boundary buffered. The acres of upland buffer (A1) and aquatic mitigation area (A2) were calculated using the buffered jurisdictional boundary. The percent of jurisdictional boundary protected by upland buffer ranged from 13% up to 100% and the upland buffer factor and buffer enhancement factor used correspond accordingly.

5.1.2 Credit Table Modifications

As a result of this modification, stream/riparian buffer credits will be reduced from 196,801.3 to 179,320.1 and wetland/upland buffer credits will increase from 114.7 to 153.71. Of this, 88,560 stream credits (49.57%) and 51.63 wetland credits (31.97%) have been released after achieving previously established success criteria and various bank milestones in years 0 and 1 (2009-2013). Years 1 and 2 annual monitoring reports were submitted following stream and wetland implementation (2009-2012); however, the requested credit releases were only approved for year 1. The year 2 credit release has not occurred and is pending based on the approval and implementation of this modification. Also, this modification proposes to update the credit release amounts to account for the changes in credit totals (Table 5-7).

All stream and wetland credit generation changes that result from this modification are detailed below in Tables 5-1 through 5-5 with the modified SOP tables provided in Appendix B.

Table 5-3 Stream Restoration Summary as per the Final BI*

Reach	Reported Length (final BI)	Approved Credits (RIBITS)	Design Approach
Whooping Creek	2,650	13,912.5	Priority III
Cavender Creek	3,206	29,655.5	Priority I
UT1	3,045	28,166.25	Priority I
UT1B	150	1,387.5	Priority I
UT2	513	4,745.25	Priority I
UT3	4,617	42,707.25	Priority I
Total	14,181	120,574.3	N/A

*No change to the stream restoration portion of the bank during this modification

Table 5-4 Riparian Buffer Summary as per the Final BI

Riparian Reach	Reported Length (final BI)	Approved Credits (final BI)	Design Approach
Whooping Creek Section 1	600	1,230	Preservation
Whooping Creek Section 2	218	316.1	Restoration/Preservation
Whooping Creek Section 3	1,832	7,328	Restoration/Preservation
Whooping Creek Section 4	1,250	1,625	Restoration/Preservation
Cavender Creek Section 1	878	4,741.2	Restoration
Cavender Creek Section 2	1,265	8,254.1	Restoration
Cavender Creek Section 3	770	4,158	Restoration
Cavender Creek Section 4	300	1,215	Restoration
UT1 Section 1	400	1,800	Restoration
UT1 Section 2	1,250	7,687.5	Restoration

Riparian Reach	Reported Length (final BI)	Approved Credits (final BI)	Design Approach
UT1 Section 3	340	2,346	Restoration
UT1 Section 4	520	1,755	Restoration
UT1 Section 5	380	1,653	Restoration
UT2	450	1,687.5	Restoration
UT3 Section 1	1,375	9,487.5	Restoration
UT3 Section 2	575	2,803.1	Restoration
UT3 Section 3	2,075	14,317.5	Restoration
UT3 Section 4	592	2,886	Restoration
UT1	110	154	Preservation
UT1B	150	187.5	Preservation
UT2	350	595	Preservation
Total	15,680	76,227	N/A

Table 5-5 Wetland Area and Credits Summary as per the Final BI

Wetland Area	Area (Ac)	Wetland Credits	Design Approach
Wetland Restoration/Enhancement			
Wetland 1	12.3	50.06	Restoration (Vegetation & Hydrology)
Wetland 2	6	16.8	Restoration (Vegetation only)
Wetland 3	11	45.43	Restoration (Vegetation & Hydrology)
Wetland 4	0.7	1.96	Restoration (Vegetation only)
Total	30	114.25	N/A
Upland Buffer			
Wetland 2 Upland Buffer	2	0.28	Upland Buffer
Wetland 4 Upland Buffer	1.5	0.19	Upland Buffer
Total Upland Buffer	3.5	0.47	Upland Buffer
Wetland Totals	33.5	114.7	N/A

Table 5-6 Modified Riparian Buffer Summary

Riparian Reach	Reported Length	Proposed Credits	Design Approach
Whooping Creek Section 1	600	1,230	Restoration/ Preservation
Whooping Creek Section 2	218	316.10	Restoration/ Preservation
Whooping Creek Section 3	1,832	7,328	Restoration/ Preservation
Whooping Creek Section 4	1,250	1,625	Restoration
Cavender Creek Section 1	878	4,741.20	Restoration
Cavender Creek Section 2	537	3,705.30	Restoration
Cavender Creek Section 3	719	4,152.23	Restoration
Cavender Creek Section 4	420	2,268.00	Restoration
Cavender Creek Section 5	359	1,938.60	Restoration
Cavender Creek Section 6	300	1,215.00	Restoration/ Preservation
UT1	110	154	Preservation
UT1 Section 1	400	1800	Restoration/ Preservation
UT1 Section 2	152	281.2	Restoration
UT1 Section 3	1,226	1,042.10	Restoration
UT1 Section 4	131	373.35	Restoration
UT1 Section 5	81	558.9	Restoration
UT1 Section 6	520	1,482	Restoration
UT1 Section 7	380	1,653	Restoration
UT1B	150	187.5	Preservation
UT2	350	595	Preservation
UT2 Section 1	254.6	1,604	Restoration/ Preservation
UT2 Section 2	195.4	156.32	Restoration
UT3 Section 1	349.3	2,200.59	Restoration/ Preservation
UT3 Section 2	1,025.70	2,923.25	Restoration
UT3 Section 3	575	1,638.75	Restoration
UT3 Section 4	972.3	2,771.06	Restoration
UT3 Section 5	1,102.70	7,608.63	Restoration
UT3 Section 6	592	3,196.80	Restoration
Total	15,680	58,745.85	N/A

Table 5-7 Modified Wetland Area and Credits Summary

Wetland Area	Area (Ac)	Wetland Credits	Design Approach
Wetland Restoration/Enhancement			
Wetland 1	12.30	50.06	Restoration (Vegetation & Hydrology)
Wetland 2	6.00	16.80	Restoration (Vegetation only)
Wetland 2-1	2.50	9.00	Restoration (Vegetation & Hydrology)
Wetland 2-2	3.40	11.22	Restoration (Vegetation & Hydrology)
Wetland 2-3	4.50	14.85	Restoration (Vegetation & Hydrology)
Wetland 2-4	3.80	12.54	Restoration (Vegetation & Hydrology)
Wetland 2-8	0.30	0.99	Restoration (Vegetation & Hydrology)
Wetland 2-9	1.10	3.63	Restoration (Vegetation & Hydrology)
Wetland 3-6	0.10	0.41	Restoration (Vegetation & Hydrology)
Wetland 3-7	0.05	0.21	Restoration (Vegetation & Hydrology)
Wetland 3-10	0.05	0.21	Restoration (Vegetation & Hydrology)
Wetland 3-11	0.07	0.29	Restoration (Vegetation & Hydrology)
Wetland 3-12	0.20	0.83	Restoration (Vegetation & Hydrology)
Wetland 3-13	2.02	8.34	Restoration (Vegetation & Hydrology)
Wetland 3-14	0.24	0.99	Restoration (Vegetation & Hydrology)
Wetland 3-15	1.70	7.02	Restoration (Vegetation & Hydrology)
Wetland 4	0.70	1.96	Restoration (Vegetation only)
Wetland 4-5	2.40	6.72	Restoration (Vegetation & Hydrology)
Total	41.43	146.07	N/A
Upland Buffer			
Wetland 2 UB	2	0.28	Upland Buffer
Wetland 2-1 UB	1	0.36	Upland Buffer
Wetland 2-4 UB	0.72	0.41	Upland Buffer
Wetland 3-6 UB	0.35	0.29	Upland Buffer
Wetland 3-7 UB	0.04	0.01	Upland Buffer
Wetland 3-10 UB	0.24	0.20	Upland Buffer
Wetland 3-11 UB	0.6	0.61	Upland Buffer
Wetland 3-12 UB	0.58	0.61	Upland Buffer
Wetland 3-13 UB	1.2	1.16	Upland Buffer
Wetland 3-14 UB	1.02	0.84	Upland Buffer
Wetland 3-15 UB	3.02	2.58	Upland Buffer
Wetland 4-5 UB	1.8	0.30	Upland Buffer
Total Upland Buffer	12.57	7.64	
Wetland Totals	54.00	153.71	

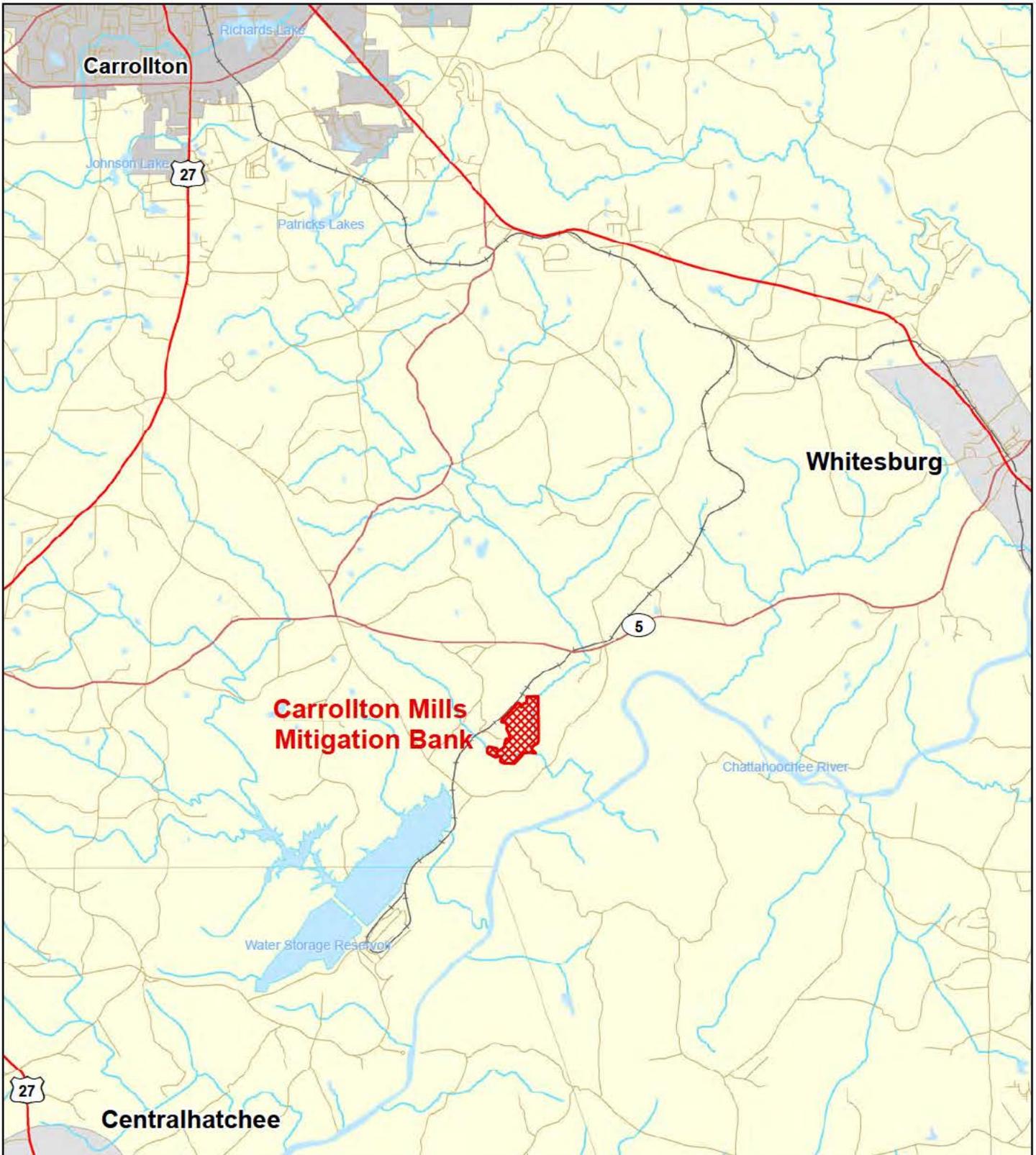
5.2 Credit Release Schedule

The proposed modified credit release schedule presented in Table 5-8 incorporates both past credit releases and proposed future credit releases that correlate to the corrective action plan as identified in this modification. The Year 2 credit release percentages and values for stream and wetland credits have been adjusted to compensate for the credit conversions and to place the schedule back on track with initial release percentages at year 3.

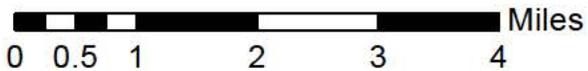
Table 5-8 Modified Credit Release Schedule

Action	Completed/ Anticipated Date	Final BI			BI Amendment/Modification			
		% Release	Wetland Credits	Stream Credits	Wetland		Stream	
					% Release	Credits	% Release	Credits
BI, RC	6/12/2009	15	17.21	29,520	11.20	17.21	16.46	29520.00
Construction Completed	9/8/2011	15	17.21	39,360.27	11.20	17.21	21.95	39360.27
Planting	5/1/2012	10	11.47	9,840.65	7.46	11.47	5.49	9840.65
1 st Year Monitoring w/ Success	12/4/2013	5	5.74	9,840.07	3.73	5.74	5.49	9840.07
2 nd Year Monitoring w/ Success	Pending	5	5.74	9,840.07	16.41	25.22	0.43	765.81
3 rd Year Monitoring w/ Success	6/2014	10	11.47	19,680.13	10.00	15.37	9.9628321	17865.36
4 th Year Monitoring w/ Success	6/2015	10	11.47	19,680.13	10.00	15.37	9.9628321	17865.36
5 th Year Monitoring w Success	6/2016	5	5.74	9,840.07	5.00	7.69	4.9814161	8932.68
6 th Year Monitoring w/ success	6/2017	5	5.74	9,840.07	5.00	7.69	4.9814161	8932.68
7 th Year Monitoring w/ Success	6/2018	20	22.94	39,360.26	20.00	30.74	19.925664	35730.72
Totals	N/A	100%	114.7	196,801.3	100%	153.71	100%	179,320.10

Appendix A Figures



**Carrollton Mills Mitigation Bank
Carroll County, Georgia**



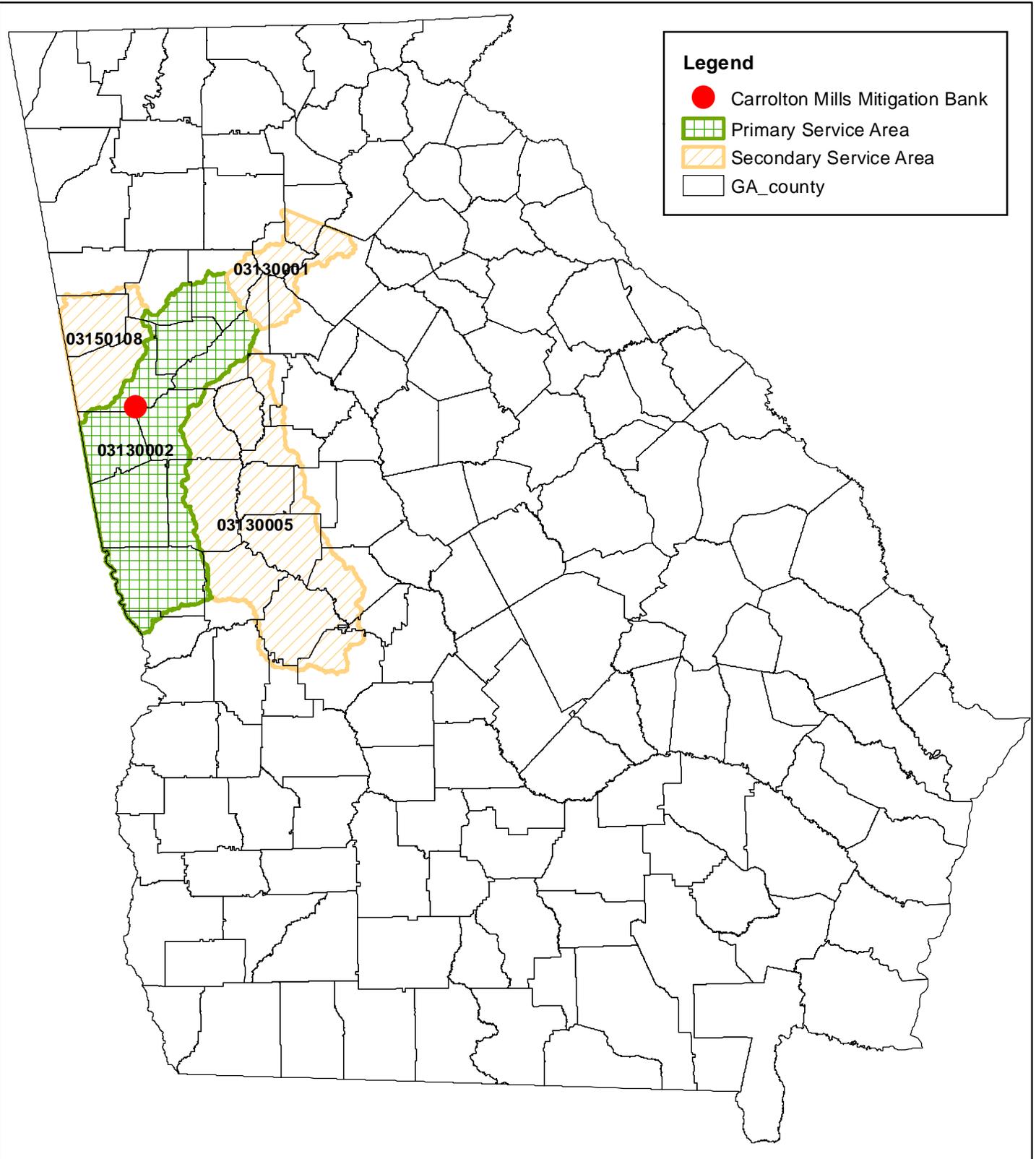
Prepared For:
Whooping Creek Meadows
100 Glen Eagles Court
Carrollton, Georgia 30117
(770) 214-7617

**Figure 1
Location Map**



1305 Lakes Parkway
Suite 129
Lawrenceville, Georgia, 30043
Phone 770.682.9731
Fax 770.682.6164
www.corblu.com

Project No. 24607



Legend

- Carrollton Mills Mitigation Bank
- Primary Service Area
- Secondary Service Area
- GA_county

**Carrollton Mills Mitigation Bank
Carroll County, Georgia**

N



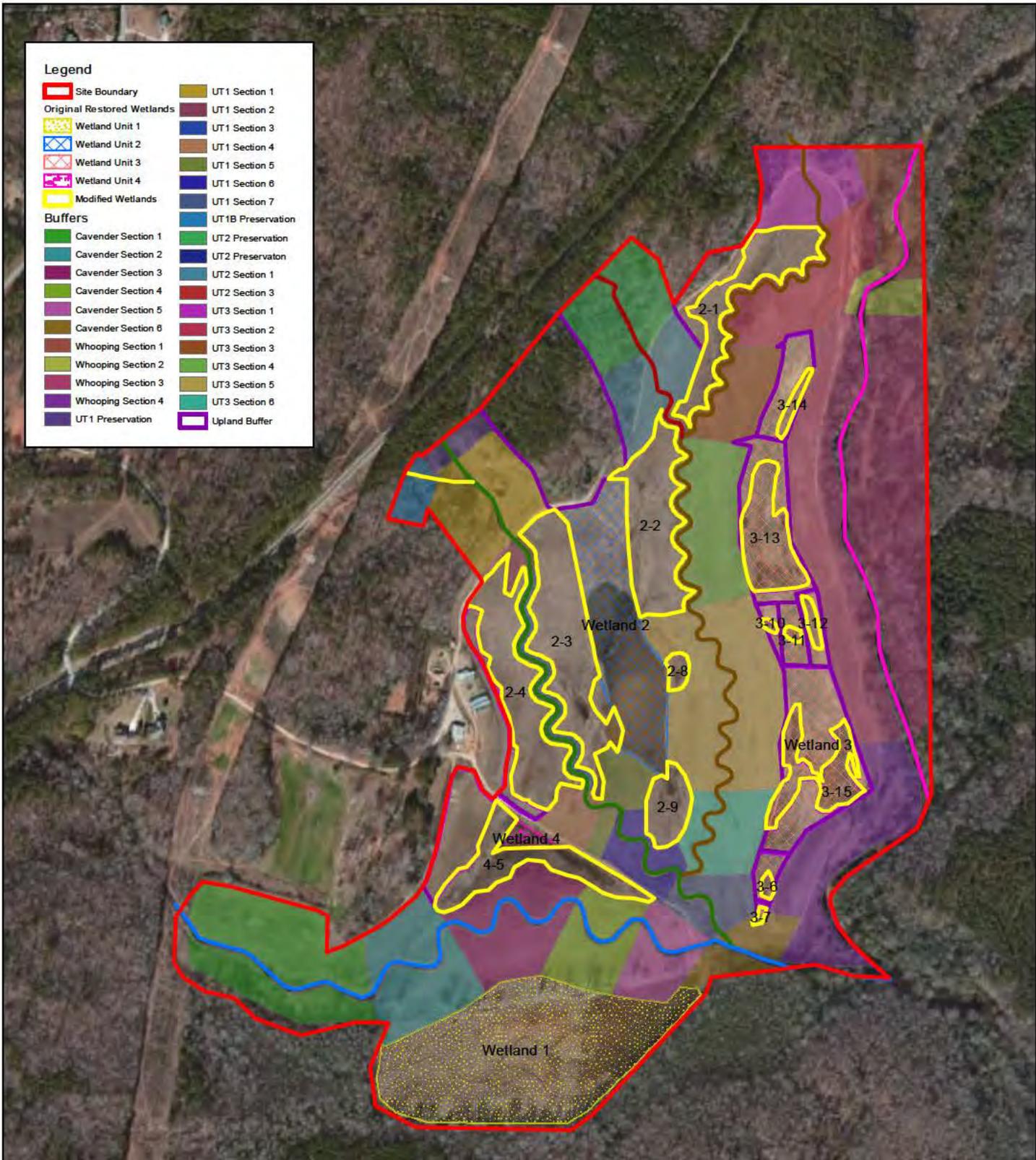
Prepared For:
Whooping Creek Meadows
100 Glen Eagles Court
Carrollton, Georgia 30117
(770) 214-7617

**Figure 2
Service Area Map**



1305 Lakes Parkway
Suite 129
Lawrenceville, Georgia, 30043
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Project No: 24607



**Carrollton Mills Mitigation Bank
Carroll County, Georgia**



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100 Glen Eagles Court
Carrollton, Georgia 30117
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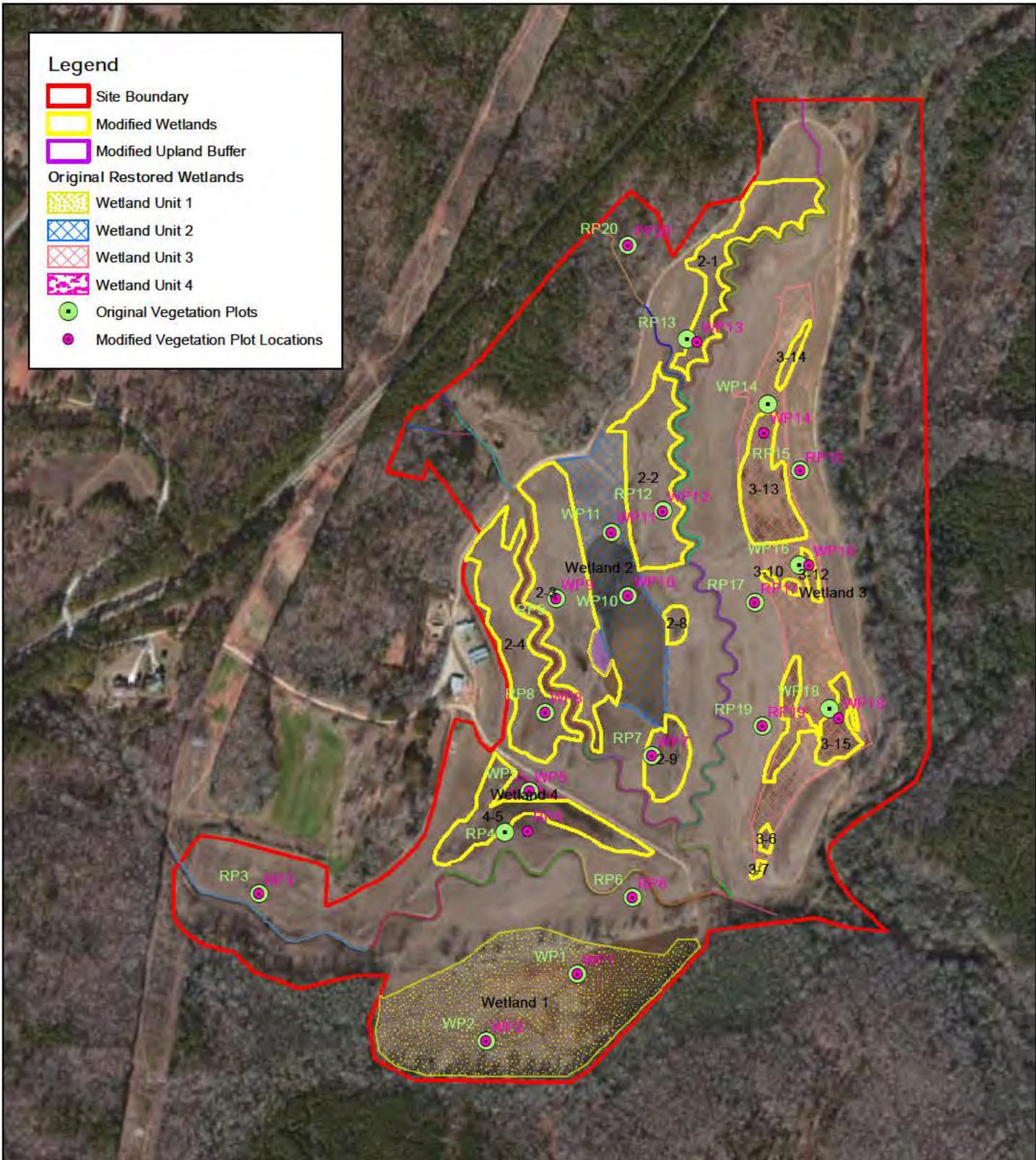
**Figure 3
Modified Wetland and
Buffer Locations**

0 500 1,000 1,500 Feet



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Fax 770.682.6164
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Project No.: 24607



Legend

- Site Boundary
- Modified Wetlands
- Modified Upland Buffer
- Original Restored Wetlands**
- Wetland Unit 1
- Wetland Unit 2
- Wetland Unit 3
- Wetland Unit 4
- Original Vegetation Plots
- Modified Vegetation Plot Locations

Carrollton Mills Mitigation Bank
Carroll County, Georgia



Prepared For:
 Whooping Creek Meadows
 100 Glen Eagles Court
 Carrollton, Georgia 30117
 (770) 214-7617

Figure 4
Modified Vegetation
Plot Locations Map

0 500 1,000 1,500
 Feet

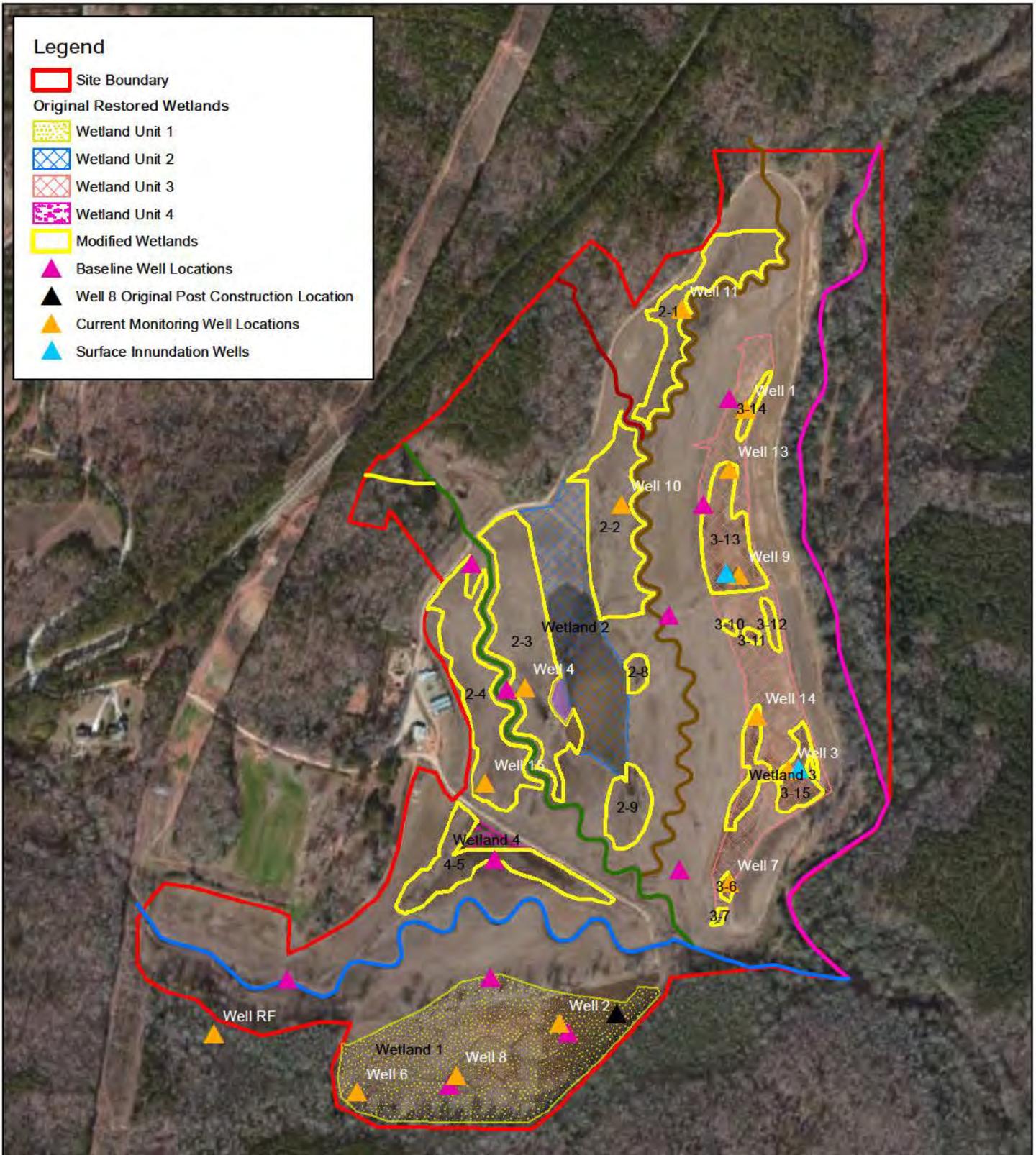


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 Fax 770.682.6164
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Project No: 24607

Legend

- Site Boundary
- Original Restored Wetlands**
- Wetland Unit 1
- Wetland Unit 2
- Wetland Unit 3
- Wetland Unit 4
- Modified Wetlands
- ▲ Baseline Well Locations
- ▲ Well 8 Original Post Construction Location
- ▲ Current Monitoring Well Locations
- ▲ Surface Inundation Wells



**Carrollton Mills Mitigation Bank
Carroll County, Georgia**



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100 Glen Eagles Court
Carrollton, Georgia 30117
(770) 214-7617

**Figure 5
Modified Groundwater
Well Locations Map**

0 500 1,000 1,500
Feet



1305 Lakes Parkway
Suite 129
Lawrenceville, Georgia, 30043
Phone 770.682.9731
Fax 770.682.6164
www.corblu.com

Project No: 24607

Appendix B Modified SOP Worksheets

Stream Restoration Credit Calculations
Carrollton Mills Mitigation Bank - Modification

Worksheet 2: Stream Channel Restoration, Stream Relocation, and Streambank Restoration Worksheet

Net Benefit	All proposals must include at least a 25' riparian buffer on both banks Buffers $\geq 50'$ +2'/%slope also may generate riparian credit (see buffer worksheet)				
	Streambank Stabilization	Structure Removal	Stream Channel Restoration and Stream Relocation		
	2.0	4.0 - 8.0	Priority 4 1.0	Priority 3 4.0	Priority 1 or 2 8.0
Monitoring/ Contingenc	Minimal (Required) 0	Moderate 0.3		Substantial 0.4	Excellent 1
Priority Area	Tertiary 0.05		Secondary 0.2		Primary 1
Control	RC on restored channel and 25' buffer (required) 0.1	Required RC + CE or GPP 0.3		Required RC + CE + GPP 0.5	
Mitigation Timing	Schedule 3 0		Schedule 2 (Use for all banks) 0.1		Schedule 1 0.5

Factors	Whooping Creek	Cavender Creek	UT1	UT1B	UT2	UT3
	Representative Photographs and Completed Geomorphic Measurements Tables are included within the Banking Instrument					
Net Benefit	4	8	8	8	8	8
Monitoring/Contingenc y (at least minimal M&C required)	1	1	1	1	1	1
Priority Area	0.05	0.05	0.05	0.05	0.05	0.05
Control (at least a RC required)	0.1	0.1	0.1	0.1	0.1	0.1
Mitigation Timing	0.1	0.1	0.1	0.1	0.1	0.1
Sum of Factors M =	5.25	9.25	9.25	9.25	9.25	9.25
Feet Stream in Reach (do not count each bank separately) LF =	2650	3206	3045	150	513	4617
M X LF =	13,912.50	29,655.50	28,166.25	1,387.50	4,745.25	42,707.25

Total Channel Restoration/Relocation Credits Generated = (M X LF) = 120,574.3

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Riparian Restoration Credit Calculations
Carrollton Mills Mitigation Bank - Modification

Worksheet 3: Riparian Restoration and Preservation Worksheet

Net Benefit - select value for each stream side	Riparian Restoration/ Preservation Factors – MBW = Minimum Buffer Width = 50'+2'/% slope Select Values from Table 1			
System Credit Condition 1	Condition 1: MWB restored or protected on both streambanks To Calculate Value: Average of the Net Benefit values for Stream Side A and Stream Side B			
System Credit Condition 2	RC Placed on Channel 0 05		RC and CE Placed on Channel 0 1	
M&C - select value for each stream side	Mimimal (Required) 0	Moderate 0 2	Substantial 0 25	Excellent 0 3
Priority Area	Tertiary 0 05		Secondary 0 2	Primary 0 7
Control	RC on restored channel and 25' buffer (required) 0 1	Required RC + CE or GPP 0 3	Required RC + CE + GPP 0 5	
Mitigation Timing - select value for each stream side	Schedule 3 0	Schedule 2 (Use for all banks) 0 05	Schedule 1 0 15	

Riparian Reaches		Whooping Creek Section 1	Whooping Creek Section 2	Whooping Creek Section 3	Whooping Creek Section 4
Simon Channel Evolution Stage					
Rosgen Stream Type/D50					
Criteria for Selecting Existing Condition for Each Reach					
Bankfull Width and Depth		Width: Depth:	Width: Depth:	Width: Depth:	Width: Depth:
Bankfull Indicators (photographs attached showing bankfull for each reach)					
Factors		Whooping Creek Section 1	Whooping Creek Section 2	Whooping Creek Section 3	Whooping Creek Section 4
Net Benefit	Stream Side A (LB)	0	0 3	0 3	0
	Stream Side B (RB)	1	0 3	2	0 8
System Credit: Condition 1 Met		0 5	0 3	1 15	0
System Credit: Condition 2 met (applicable only if Condition 1 met)		0 05	0 05	0 05	0
M&C (at least minimal M&C required)	Stream Side A	0 3	0 3	0 3	0 3
	Stream Side B	0	0	0	0
Priority Area		0 05	0 05	0 05	0 05
*Control (at least a RC required)		0 1	0 1	0 1	0 1
*Mitigation Timing (none for riparian preservation)	Stream Side A	0 05	0 05	0 05	0 05
	Stream Side B	0	0	0	0
Sum of Factors M =		2 05	1 45	4	1 3
Linear Feet of Stream Buffered (do not count each bank separately) LF =		600	218	1832	1250
M X LF =		1230 0	316 1	7328 0	1625 0

Total Riparian Restoration Credits Generated = (M X LF) = 10,499.1

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Riparian Restoration Credit Calculations
Carrollton Mills Mitigation Bank - Modification

Worksheet 3: Riparian Restoration and Preservation Worksheet

Net Benefit - select value for each stream side	Riparian Restoration/ Preservation Factors – MBW = Minimum Buffer Width = 50'+2'/% slope Select Values from Table 1			
System Credit Condition 1	Condition 1: MWB restored or protected on both streambanks To Calculate Value: Average of the Net Benefit values for Stream Side A and Stream Side B			
System Credit Condition 2	RC Placed on Channel 0.05		RC and CE Placed on Channel 0.1	
M&C - select value for each stream side	Mimimal (Required) 0	Moderate 0.2	Substantial 0.25	Excellent 0.3
Priority Area	Tertiary 0.05		Secondary 0.2	Primary 0.7
Control	RC on restored channel and 25' buffer (required) 0.1	Required RC + CE or GPP 0.3		Required RC + CE + GPP 0.5
Mitigation Timing - select value for each stream side	Schedule 3 0	Schedule 2 (Use for all banks) 0.05		Schedule 1 0.15

Riparian Reaches		Cavender Creek Section 1	Cavendar Creek Section 2	Cavendar Creek Section 3	Cavender Creek Section 4	Cavender Creek Section 5	Cavender Creek Section 6
Simon Channel Evolution Stage							
Rosgen Stream Type/D50							
Criteria for Selecting Existing Condition for Each Reach							
Bankfull Width and Depth		Width:	Width:	Width:	Width:	Width:	Width:
		Depth:	Depth:	Depth:	Depth:	Depth:	Depth:
Bankfull Indicators (photographs attached showing bankfull for each reach)							
Factors		Cavender Creek Section 1	Cavendar Creek Section 2	Cavendar Creek Section 3	Cavender Creek Section 4	Cavender Creek Section 5	Cavender Creek Section 6
Net Benefit	Stream Side A LB	2	2	1.25	1	1	2
	Stream Side B RB	1	2	2	2	2	0.1
System Credit: Condition 1 Met		1.5	2	1.625	1.5	1.5	1.05
System Credit: Condition 2 met (applicable only if Condition 1 met)		0.05	0.05	0.05	0.05	0.05	0.05
M&C (at least minimal M&C required)	Stream Side A	0.3	0.3	0.3	0.3	0.3	0.3
	Stream Side B	0.3	0.3	0.3	0.3	0.3	0.3
Priority Area		0.05	0.05	0.05	0.05	0.05	0.05
*Control (at least a RC required)		0.1	0.1	0.1	0.1	0.1	0.1
*Mitigation Timing (none for riparian preservation)	Stream Side A	0.05	0.05	0.05	0.05	0.05	0.05
	Stream Side B	0.05	0.05	0.05	0.05	0.05	0.05
Sum of Factors M =		5.4	6.9	5.775	5.4	5.4	4.05
Linear Feet of Stream Buffered (do not count each bank separately) LF =		878	537	719	420	359	300
M X LF =		4741.2	3705.3	4152.2	2268.0	1938.6	1215.0

Total Riparian Restoration Credits Generated = (M X LF) = 18,020.3

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Riparian Restoration Credit Calculations
Carrollton Mills Mitigation Bank - Modification

Worksheet 3: Riparian Restoration and Preservation Worksheet

Net Benefit - select value for each stream side	Riparian Restoration/ Preservation Factors – MBW = Minimum Buffer Width = 50'+2'/% slope Select Values from Table 1			
System Credit Condition 1	Condition 1: MWB restored or protected on both streambanks To Calculate Value: Average of the Net Benefit values for Stream Side A and Stream Side B			
System Credit Condition 2	RC Placed on Channel 0.05		RC and CE Placed on Channel 0.1	
M&C - select value for each stream side	Miminal (Required) 0	Moderate 0.2	Substantial 0.25	Excellent 0.3
Priority Area	Tertiary 0.05		Secondary 0.2	Primary 0.7
Control	RC on restored channel and 25' buffer (required) 0.1	Required RC + CE or GPP 0.3	Required RC + CE + GPP 0.5	
Mitigation Timing - select value for each stream side	Schedule 3 0	Schedule 2 (Use for all banks) 0.05	Schedule 1 0.15	

Riparian Reaches		UT1 Section 1	UT1 Section 2	UT1 Section 3	UT1 Section 4	UT1 Section 5	UT1 Section 6	UT1 Section 7
Simon Channel Evolution Stage								
Rosgen Stream Type/D50								
Criteria for Selecting Existing Condition for Each Reach								
Bankfull Width and Depth		Width Depth						
Bankfull Indicators (photographs attached showing bankfull for each reach)								
Factors		UT1 Section 1	UT1 Section 2	UT1 Section 3	UT1 Section 4	UT1 Section 5	UT1 Section 6	UT1 Section 7
Net Benefit	Stream Side A (LB)	1.6	0	0	0	2	0.3	2
	Stream Side B (RB)	0.8	1	0	2	2	1	0.3
System Credit: Condition 1 Met		1.2	0	0	0	2	0.65	1.15
System Credit: Condition 2 met (applicable only if Condition 1 met)		0.05	0	0	0	0.05	0.05	0.05
M&C (at least minimal M&C required)	Stream Side A	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	Stream Side B	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Priority Area		0.05	0.05	0.05	0.05	0.05	0.05	0.05
*Control (at least a RC required)		0.1	0.1	0.1	0.1	0.1	0.1	0.1
*Mitigation Timing (none for riparian preservation)	Stream Side A	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Stream Side B	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Sum of Factors M =		4.5	1.85	0.85	2.85	6.9	2.85	4.35
Linear Feet of Stream Buffered (do not count each bank separately) LF =		400	152	1226	131	81	520	380
M X LF =		1800.0	281.2	1042.1	373.4	558.9	1482.0	1653.0

Total Riparian Restoration Credits Generated = (M X LF) = 7,190.6

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Riparian Restoration Credit Calculations
Carrollton Mills Mitigation Bank - Modification

Worksheet 3 Riparian Restoration and Preservation Worksheet

Net Benefit - select value for each stream side	Riparian Restoration/ Preservation Factors – MBW = Minimum Buffer Width = 50 +2 % slope Select Values from Table 1			
System Credit Condition 1	Condition 1 MWB restored or protected on both streambanks To Calculate Value Average of the Net Benefit values for Stream Side A and Stream Side B			
System Credit Condition 2	RC Placed on Channel 0.05		RC and CE Placed on Channel 0.1	
M&C - select value for each stream side	Miminal (Required) 0	Moderate 0.2	Substantial 0.25	Excellent 0.3
Priority Area	Tertiary 0.05		Secondary 0.2	Primary 0.7
Control	RC on restored channel and 25' buffer (required) 0.1	Required RC + CE or GPP 0.3	Required RC + CE + GPP 0.5	
Mitigation Timing - select value for each stream side	Schedule 3 0	Schedule 2 (Use for all banks) 0.05	Schedule 1 0.15	

Riparian Reaches		UT2 Section 1	UT2 Section 2	UT3 Section 1	UT3 Section 2	UT3 Section 3	UT3 Section 4	UT3 Section 5	UT3 Section 6
Simon Channel Evolution Stage									
Rosgen Stream Type/D50									
Criteria for Selecting Existing Condition for Each Reach									
Bankfull Width and Depth	Width								
	Depth								
Bankfull Indicators (photographs attached showing bankfull for each reach).									
Factors		UT2 Section 1	UT2 Section 2	UT3 Section 1	UT3 Section 2	UT3 Section 3	UT3 Section 4	UT3 Section 5	UT3 Section 6
Net Benefit	Stream Side A (LB)	2	0	1.6	2	2	2	2	2
	Stream Side B (RB)	1.6	0	2	0	0	0	2	1
System Credit Condition 1 Met		1.8	0	1.8	0	0	0	2	1.5
System Credit Condition 2 met (applicable only if Condition 1 met)		0.05	0	0.05	0	0	0	0.05	0.05
M&C (at least minimal M&C required)	Stream Side A	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	Stream Side B	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Priority Area		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
*Control (at least a RC required)		0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.1
*Mitigation Timing (none for riparian preservation)	Stream Side A	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Stream Side B	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Sum of Factors	M =	6.3	0.8	6.3	2.85	2.85	2.85	6.9	5.4
Linear Feet of Stream Buffered (do not count each bank separately)	LF =	254.6	195.4	349.3	1025.7	575	972.3	1102.7	592
M X LF =		1603.98	156.32	2200.59	2923.245	1638.75	2771.055	7608.63	3196.8

Total Riparian Restoration Credits Generated = (M X LF) = **22,099.4**

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Riparian Preservation Credit Calculations
 Carrollton Mills Mitigation Bank - Modification

Worksheet 3: Riparian Restoration and Preservation Worksheet

Net Benefit - select value for each stream side	Riparian Restoration/ Preservation Factors – MBW = Minimum Buffer Width = 50'+2'/% slope Select Values from Table 1			
System Credit Condition 1	Condition 1: MWB restored or protected on both streambanks To Calculate Value: Average of the Net Benefit values for Stream Side A and Stream Side B			
System Credit Condition 2	RC Placed on Channel 0.05		RC and CE Placed on Channel 0.1	
M&C - select value for each stream side	Mimimal (Required) 0	Moderate 0.2	Substantial 0.25	Excellent 0.3
Priority Area	Tertiary 0.05		Secondary 0.2	Primary 0.7
Control	RC on restored channel and 25' buffer (required) 0.1	Required RC + CE or GPP 0.3	Required RC + CE + GPP 0.5	
Mitigation Timing - select value for each stream side	Schedule 3 0	Schedule 2 (Use for all banks) 0.05	Schedule 1 0.15	

Riparian Reaches		UT1	UT1-B	UT2
Simon Channel Evolution Stage				
Rosgen Stream Type/D50				
Criteria for Selecting Existing Condition for Each Reach				
Bankfull Width and Depth		Width: Depth:	Width: Depth:	Width: Depth:
Bankfull Indicators (photographs attached showing bankfull for each reach)				
Factors		UT1	UT1-B	UT2
Net Benefit	Stream Side A (LB)	0.3	0	0.3
	Stream Side B (RB)	0.1	0.3	0.3
System Credit: Condition 1 Met		0.2	0.15	0.3
System Credit: Condition 2 met (applicable only if Condition 1 met)		0.05	0.05	0.05
M&C (at least minimal M&C required)	Stream Side A	0.3	0.3	0.3
	Stream Side B	0.3	0.3	0.3
Priority Area		0.05	0.05	0.05
*Control (at least a RC required)		0.1	0.1	0.1
*Mitigation Timing (none for riparian preservation)	Stream Side A	0	0	0
	Stream Side B	0	0	0
Sum of Factors M =		1.4	1.25	1.7
Linear Feet of Stream Buffered (do not count each bank separately) LF =		110	150	350
M X LF =		154	187.5	595

Total Riparian Restoration Credits Generated = (M X LF) = 936.5

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**Wetlands and Open Waters
Mitigation Worksheets
Carrollton Mills Mitigation Bank - Modification**

RESTORATION/ENHANCEMENT MITIGATION FACTORS

Factor	Options				
	Net Improvement Vegetation	Minimal Enhancement 0 1		Complete Restoration -----1 4	
Net Improvement Hydrology	Minimal Enhancement 0 1		Complete Restoration -----1 4		
Credit Schedule	Schedule 5 0	Schedule 4 0 1	Schedule 3 0 2	Schedule 2 0 3	Schedule 1 0 4
Kind	Category 2 0 2	Category 1 0 6			
Maintenance	High 0	Moderate 0 1	Low 0 2	None 0 3	
Monitoring and Contingencies Plan	N A 0	Minimum 0 1	Moderate 0 2	Substantial 0 3	Excellent 0 4
Control	RC 0 1	RC+CE or GPP 0 3	RC+CE+GPP 0 5		

Proposed Restoration/Enhancement Mitigation Worksheet

Factors	Wetland 1	Wetland 2	Wetland 3	Wetland 4	Wetland 4-5
Net Improvement Vegetation	1 3	1 3	1 3	1 3	1 3
Net Improvement Hydrology	1 27	0	1 33	0	0
Credit Schedule	0 1	0 1	0 1	0 1	0 1
Kind	0 6	0 6	0 6	0 6	0 6
Maintenance	0 3	0 3	0 3	0 3	0 3
M and C Plan	0 4	0 4	0 4	0 4	0 4
Control	0 1	0 1	0 1	0 1	0 1
Sum of m Factors	4 07	2 8	4 13	2 8	2 8
Mitigation Area	12 30	6 00	0 00	0 70	2 40
M x A =	50 06	16 80	0 00	1 96	6 72

Total Restoration/Enhancement Credits = $\sum (M \times A) =$ 75 54

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**Wetlands and Open Waters
Mitigation Worksheets
Carrollton Mills Mitigation Bank - Modification**

RESTORATION/ENHANCEMENT MITIGATION FACTORS

Factor	Options				
Net Improvement Vegetation	Minimal Enhancement 0.1 -----to-----		Complete Restoration -----1.4		
Net Improvement Hydrology	Minimal Enhancement 0.1 -----to-----		Complete Restoration -----1.4		
Credit Schedule	Schedule 5 0	Schedule 4 0.1	Schedule 3 0.2	Schedule 2 0.3	Schedule 1 0.4
Kind	Category 2 0.2	Category 1 0.6			
Maintenance	High 0	Moderate 0.1	Low 0.2	None 0.3	
Monitoring and Contingencies Plan	N.A. 0	Minimum 0.1	Moderate 0.2	Substantial 0.3	Excellent 0.4
Control	RC 0.1	RC+CE or GPP 0.3	RC+CE+GPP 0.5		

Proposed Restoration/Enhancement Mitigation Worksheet

Factors	Wetland 2-1	Wetland 2-2	Wetland 2-3	Wetland 2-4	Wetland 2-8	Wetland 2-9
Net Improvement Vegetation	1.3	1.3	1.3	1.3	1.3	1.3
Net Improvement Hydrology	0.8	0.5	0.5	0.5	0.5	0.5
Credit Schedule	0.1	0.1	0.1	0.1	0.1	0.1
Kind	0.6	0.6	0.6	0.6	0.6	0.6
Maintenance	0.3	0.3	0.3	0.3	0.3	0.3
M and C Plan	0.4	0.4	0.4	0.4	0.4	0.4
Control	0.1	0.1	0.1	0.1	0.1	0.1
Sum of m Factors	3.6	3.3	3.3	3.3	3.3	3.3
Mitigation Area	2.50	3.40	4.50	3.80	0.30	1.10
M x A =	9.00	11.22	14.85	12.54	0.99	3.63

Total Restoration/Enhancement Credits = $\sum (M \times A) =$ 52.23

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**Wetlands and Open Waters
Mitigation Worksheets
Carrollton Mills Mitigation Bank - Modification**

RESTORATION/ENHANCEMENT MITIGATION FACTORS

Factor	Options				
Net Improvement Vegetation	Minimal Enhancement 0.1		Complete Restoration 1.4		
Net Improvement Hydrology	Minimal Enhancement 0.1		Complete Restoration 1.4		
Credit Schedule	Schedule 5 0	Schedule 4 0.1	Schedule 3 0.2	Schedule 2 0.3	Schedule 1 0.4
Kind	Category 2 0.2	Category 1 0.6			
Maintenance	High 0	Moderate 0.1	Low 0.2	None 0.3	
Monitoring and Contingencies Plan	N.A. 0	Minimum 0.1	Moderate 0.2	Substantial 0.3	Excellent 0.4
Control	RC 0.1	RC+CE or GPP 0.3	RC+CE+GPP 0.5		

Proposed Restoration/Enhancement Mitigation Worksheet

Factors	Wetland 3-6	Wetland 3-7	Wetland 3-10	Wetland 3-11	Wetland 3-12	Wetland 3-13	Wetland 3-14	Wetland 3-15
Net Improvement Vegetation	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Net Improvement Hydrology	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
Credit Schedule	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Kind	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Maintenance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
M and C Plan	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Control	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sum of m Factors	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13
Mitigation Area	0.10	0.05	0.05	0.07	0.20	2.02	0.24	1.70
M x A =	0.41	0.21	0.21	0.29	0.83	8.34	0.99	7.02

Total Restoration/Enhancement Credits = $\sum (M \times A) =$ 18.30

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**Wetlands and Open Waters
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**MINIMUM UPLAND BUFFER WIDTHS FOR
MITIGATION CREDIT †**

Adjacent Land Use Category	Minimum Width
Single Family Residential	50 feet
Multi-Family	75 feet
Commercial	75 feet
Industrial	100 feet
Landfill	100 feet
Other Categories	case-by-case

† widths are based on linear, constant elevation measurement

BUFFER MITIGATION FACTORS

Factors	Options				
Upland Buffer Factor (U1)	>95% 1.0	68% to 95% 0.8	50% to 67% 0.6	33% to 49% 0.3	<33% 0.1
Buffer Enhancement Factor (U2)	>95% 0.15	50% to 95% 0.1	<50% 0.05		

UPLAND BUFFER CREDIT WORKSHEET

	Wetland 2	Wetland 2-1	Wetland 2-4	Wetland 3-6	Wetland 3-7
Total Jurisdictional Boundary (B1)*	2134	2852	3123	278	223
Buffered Jurisdictional Boundary (B2)	285	700	1060	248	65.3
(B2 /B1) x 100 = % Buffered	13	25	34	89	29
Acres of Upland Buffer (A1)	2	1	0.72	0.35	0.04
Upland Buffer Factor (U1)	0.1	0.1	0.3	0.8	0.1
A1 x U1 = C1	0.20	0.10	0.22	0.28	0.00
Aquatic Mitigation Area Acres (A2)	1.5	2.6	3.8	0.1	0.05
Buffer Enhancement Factor (U2)	0.05	0.1	0.05	0.1	0.05
A2 x U2 = C2	0.075	0.26	0.19	0.01	0.0025
C1 + C2 = D	0.28	0.36	0.41	0.29	0.01

Total Buffer Credit = $\sum (D_{1-5}) =$ 1.34

* B1 = Total linear feet of jurisdictional boundary of each proposed restoration, enhancement, preservation and/or creation area.

*B2 = Total linear feet of jurisdictional boundary proposed to be buffered for each restoration, enhancement, preservation, and/or creation area.

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**Wetlands and Open Waters
Mitigation Worksheets
Carrolton Mills Mitigation Bank - Modification**

**MINIMUM UPLAND BUFFER WIDTHS FOR
MITIGATION CREDIT †**

Adjacent Land Use Category	Minimum Width
Single Family Residential	50 feet
Multi-Family	75 feet
Commercial	75 feet
Industrial	100 feet
Landfill	100 feet
Other Categories	case-by-case

† widths are based on linear, constant elevation measurement

BUFFER MITIGATION FACTORS

Factors	Options				
Upland Buffer Factor (U1)	>95% 1.0	68% to 95% 0.8	50% to 67% 0.6	33% to 49% 0.3	<33% 0.1
Buffer Enhancement Factor (U2)	>95% 0.15	50% to 95% 0.1	<50% 0.05		

UPLAND BUFFER CREDIT WORKSHEET

	Wetland 3-10	Wetland 3-11	Wetland 3-12	Wetland 3-13	Wetland 3-14
Total Jurisdictional Boundary (B1)*	194	218	506	1466	658
Buffered Jurisdictional Boundary (B2)	153	218	506	1326	620
(B2 /B1) x 100 = % Buffered	79	100	100	90	94
Acres of Upland Buffer (A1)	0.24	0.6	0.58	1.2	1.02
Upland Buffer Factor (U1)	0.8	1	1	0.8	0.8
A1 x U1 = C1	0.192	0.6	0.58	0.96	0.816
Aquatic Mitigation Area Acres (A2)	0.05	0.07	0.2	2.02	0.24
Buffer Enhancement Factor (U2)	0.1	0.15	0.15	0.1	0.1
A2 x U2 = C2	0.005	0.011	0.030	0.202	0.024
C1 + C2 = D	0.20	0.61	0.61	1.16	0.84

Total Buffer Credit = $\sum (D_{1-5}) =$ 3.4195

* B1 = Total linear feet of jurisdictional boundary of each proposed restoration, enhancement, preservation and/or creation area.

*B2 = Total linear feet of jurisdictional boundary proposed to be buffered for each restoration, enhancement, preservation, and/or creation area.

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March 2004 Attachment B

**Wetlands and Open Waters
Mitigation Worksheets
Carrollton Mills Mitigation Bank - Modification**

**MINIMUM UPLAND BUFFER WIDTHS FOR
MITIGATION CREDIT †**

Adjacent Land Use Category	Minimum Width
Single Family Residential	50 feet
Multi-Family	75 feet
Commercial	75 feet
Industrial	100 feet
Landfill	100 feet
Other Categories	case-by-case

† widths are based on linear, constant elevation measurement

BUFFER MITIGATION FACTORS

Factors	Options				
Upland Buffer Factor (U1)	>95% 1.0	68% to 95% 0.8	50% to 67% 0.6	33% to 49% 0.3	<33% 0.1
Buffer Enhancement Factor (U2)	>95% 0.15	50% to 95% 0.1	<50% 0.05		

UPLAND BUFFER CREDIT WORKSHEET

	Wetland 3-15	Wetland 4-5			
Total Jurisdictional Boundary (B1)*	2566	2604			
Buffered Jurisdictional Boundary (B2)	2355.2	528.5			
(B2 /B1) x 100 = % Buffered	92	20			
Acres of Upland Buffer (A1)	3.02	1.8			
Upland Buffer Factor (U1)	0.8	0.1			
A1 x U1 = C1	2.42	0.18			
Aquatic Mitigation Area Acres (A2)	1.66	2.4			
Buffer Enhancement Factor (U2)	0.1	0.05			
A2 x U2 = C2	0.166	0.12			
C1 + C2 = D	2.58	0.30			

Total Buffer Credit = $\sum (D_{1-5}) =$ 2.88

* B1 = Total linear feet of jurisdictional boundary of each proposed restoration, enhancement, preservation and/or creation area.

*B2 = Total linear feet of jurisdictional boundary proposed to be buffered for each restoration, enhancement, preservation, and/or creation area.

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