

**EVERETTS LAKE MITIGATION BANK FEASIBILITY STUDY
Summary of Findings**

Richmond County, North Carolina



*Aerial photograph of Everetts Lake captured by
EcoScience personnel in 2006.*

April 2008

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Summary of Findings**

Richmond County, North Carolina

1.0 INTRODUCTION

1.1 Project Background

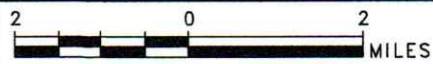
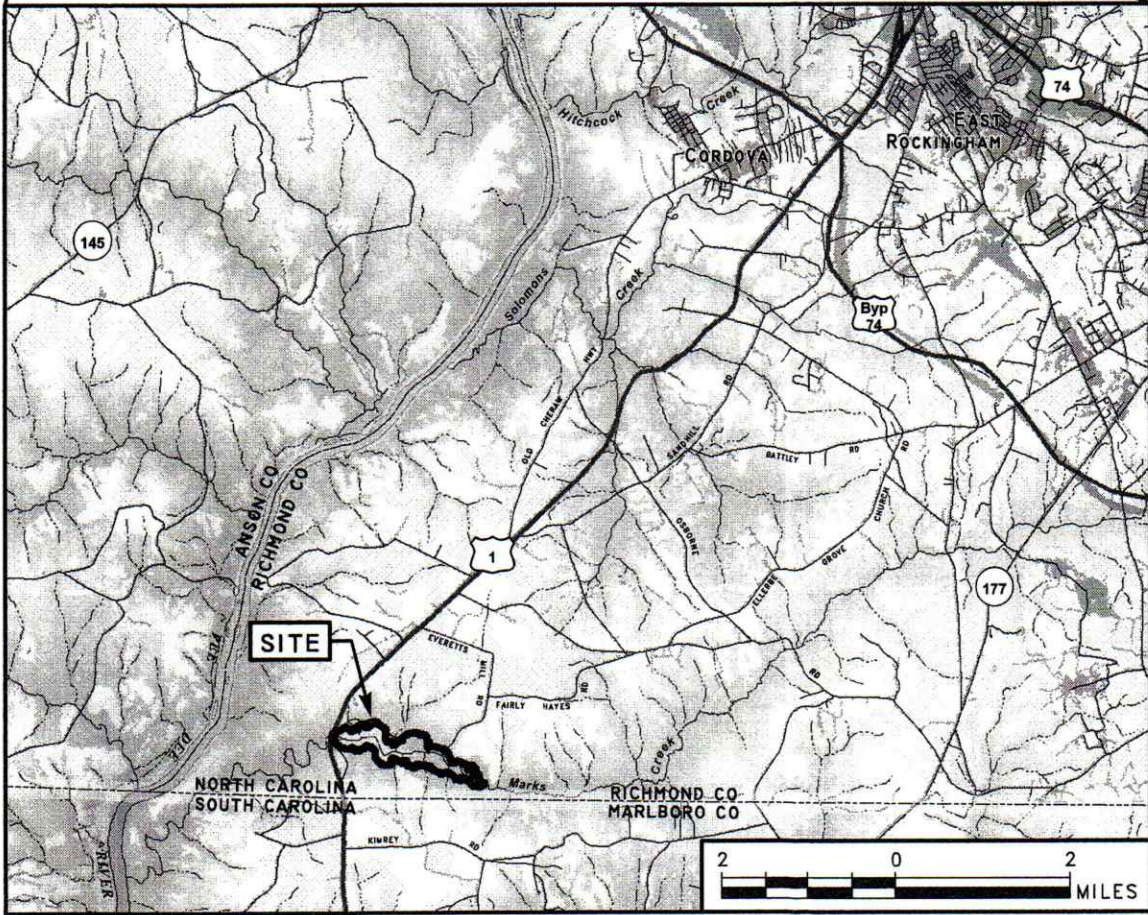
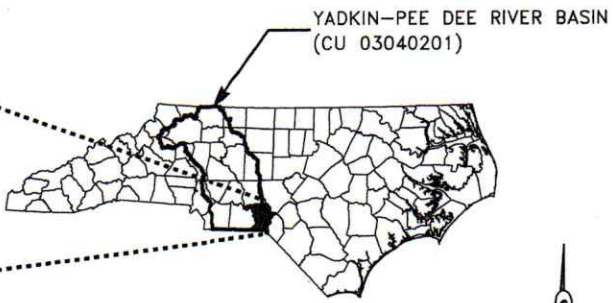
Everetts Lake Corporation (Mr. Jerry Gattis, proprietor) enlisted the services of EcoScience: A Division of PBS&J (EcoScience) in October 2007 to conduct a Mitigation Bank (Bank) Feasibility Study (Study) involving the removal of the Everetts Lake Dam (Dam). EcoScience's approach to completing the Study included three main tasks: 1) a Red Flag Investigation, 2) a Detailed Site Assessment, and 3) a Mitigation Bank Preliminary Cost/Benefit Analysis. This document summarizes the work conducted by EcoScience during the Bank Study.


1.2 Location and Setting

Everetts Lake (Lake) is located approximately 11 miles southwest of the Town of Rockingham near U.S. Highway 1 (US 1) just north of the North Carolina/South Carolina border in Richmond County, NC (Figure 1, see next page). Historically, the property (Site) boundary was established in legal description, and a detailed land survey was not completed. The Site, owned by Everetts Lake Corporation, reportedly includes the land immediately adjacent to the Dam as well as the land upstream of the Dam below the mean high water mark (MHW) of the Lake. In addition, portions of land on the northern side of the Lake between the MHW and Everetts Mill Road are believed to be owned by Everetts Lake Corporation. In this document, mitigation estimates were based on an estimated Site boundary determined using field measurements which established the MHW at 178.8 feet (North American Vertical Datum of 1988 [NAVD]). Light Detection and Ranging (LiDAR) data were then used to determine the area contained at or below the MHW. The estimated Site boundary differs from the Richmond County parcel data, which represents an interpretation of the legal description (Figure 2, see page 3). However, the Richmond County parcel data depicts the Site's area as ± 248 acres while county tax records indicate the Site is ± 270 acres. Due to boundary discrepancies, a formal survey of the property would be required for a more precise estimate of the potential stream and wetland mitigation units at the Site.

The Site is situated in the floodplain of Marks Creek, which has been impounded by the Dam for approximately 200 years. The Dam is located just upstream of the US 1 causeway and is near a distinct geologic divide between sandstone deposits typical of the Southeastern Plains ecoregion and metamorphic/intrusive rocks typical of the Piedmont ecoregion. The geologic break is believed to have caused a natural constriction at or near the location of the Dam in the Marks Creek valley.

The estimated Site boundary is comprised of approximately 263 acres, and includes the 106-acre Lake, portions of Marks Creek, several tributaries to Marks Creek, and over 120 acres of forested riparian wetlands, seepage wetlands, and marsh wetlands.



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PREPARED FOR:
 EVERETTS LAKE CORPORATION
 MR. JERRY GATTIS

SITE LOCATION
 EVERETTS LAKE MITIGATION SITE
 RICHMOND COUNTY, NORTH CAROLINA

DWN BY: DGJ
 CKD BY: MTC
 DATE: APR 2008
 ESC PROJECT: 07-380.00

FIGURE
1

LEGEND

-  SITE BOUNDARY (MHWM and LIDAR) ± 263.3 acres
-  SITE BOUNDARY (COUNTY PARCEL DATA)* ± 248.5 acres

*Richmond County property tax based on ownership of 273.0 acres.



DWN BY:	DGJ
CD BY:	MTC
DATE:	APR 2008
ESC PROJECT:	07-380.00

PROPERTY BOUNDARY COMPARISON
EVERETTS LAKE MITIGATION SITE
 RICHMOND COUNTY, NORTH CAROLINA

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2.0 SUMMARY OF FINDINGS

2.1 Red Flag Investigation

The purpose of the Red Flag Investigation was to determine if there are any issues that could make the establishment of a Bank at the Site not feasible. EcoScience investigated three main issues:

- the status and applicability of the North Carolina Dam Removal Guidelines,
- permitting associated with the potential conversion of jurisdictional areas, and
- the potential alteration of Site hydrology resulting in damage to the US 1 causeway located immediately downstream.

EcoScience contacted various agencies to discuss the status and applicability of the North Carolina Dam Removal Guidelines. Informal conversations with the United States Environmental Protection Agency (USEPA) and the North Carolina Wildlife Resources Commission (NCWRC) confirmed that the NC Dam Removal Guidelines (Guidelines) are currently under review, but that smaller dam removal projects involving a single landowner where the dam is not associated with a "run-of-the-river" impoundment are not intended to be completed in accordance with the Guidelines. In addition, the USEPA and the NCWRC expressed support for dam removal projects that are not related to the Guidelines and encouraged the presentation of such mitigation concepts to a Mitigation Banking Review Team (MBRT).

EcoScience contacted the United States Army Corps of Engineers (USACE) to discuss potential permitting issues associated with the conversion of jurisdictional areas. USACE personnel stated that conversions of one jurisdictional area to another would be allowed, however ratios and conversion factors would need to be addressed once a Mitigation Banking Prospectus (Prospectus) had been reviewed by a MBRT. In addition, conversion of jurisdictional areas to upland would also need to be considered during the review of the Prospectus. Based on conversations with USACE staff, potential jurisdictional wetland type conversions resulting in the establishment of historic (or reference) conditions at the Site would be accepted as mitigation.

EcoScience contacted the North Carolina Department of Transportation (NCDOT) district office to discuss the legalities of the Dam removal with regard to potential alteration of Site hydrology and resulting damage to the US 1 causeway downstream. NCDOT personnel stated that more information regarding the post-dam removal hydrology would be required in order to assess the potential damage. In addition, NCDOT staff requested that notification of the dam removal be provided as a courtesy and that coordination with NCDOT engineers would be preferred. However, there are no known legal requirements stipulating that the Dam must remain in place for continued use of the existing US 1 causeway. If Dam removal results in the need to re-engineer or re-construct the US 1 causeway, it is expected that associated costs would be the responsibility of the NCDOT. However, if Dam removal results in public safety concerns with the US 1 causeway or other complications with the road crossing, regulatory agencies may require coordination with the NCDOT for mitigation to be claimed at the Site.

2.2 Detailed Site Assessment

The purpose of the Detailed Site Assessment was to determine, to the most accurate extent possible, the amount (units) of available stream and wetland mitigation at the Site if the Dam were removed. In order to estimate the potential stream and wetland mitigation units at the Site, EcoScience conducted field investigations as well as office-based Geographic Information System (GIS) and Computer-Aided Design (CAD) analyses.

2.2.1 Field Investigations

EcoScience conducted a bathymetric survey of the Lake using Trimble GeoXT Global Positioning System (GPS) equipment in combination with an Ohmex Sonarmite portable echosounder. Horizontal accuracy of the GPS is reported to be sub-meter and vertical accuracy of the echosounder is reported to be ± 2.5 centimeters. Total station survey equipment was used to establish elevation control and was tied to the Marks 1997 National Geodetic Survey (NGS) marker located immediately southwest of the Site. Over 100,000 lakebed elevation points were recorded over a three day period. Bathymetric survey coverage is depicted on Figure 3 (see next page).

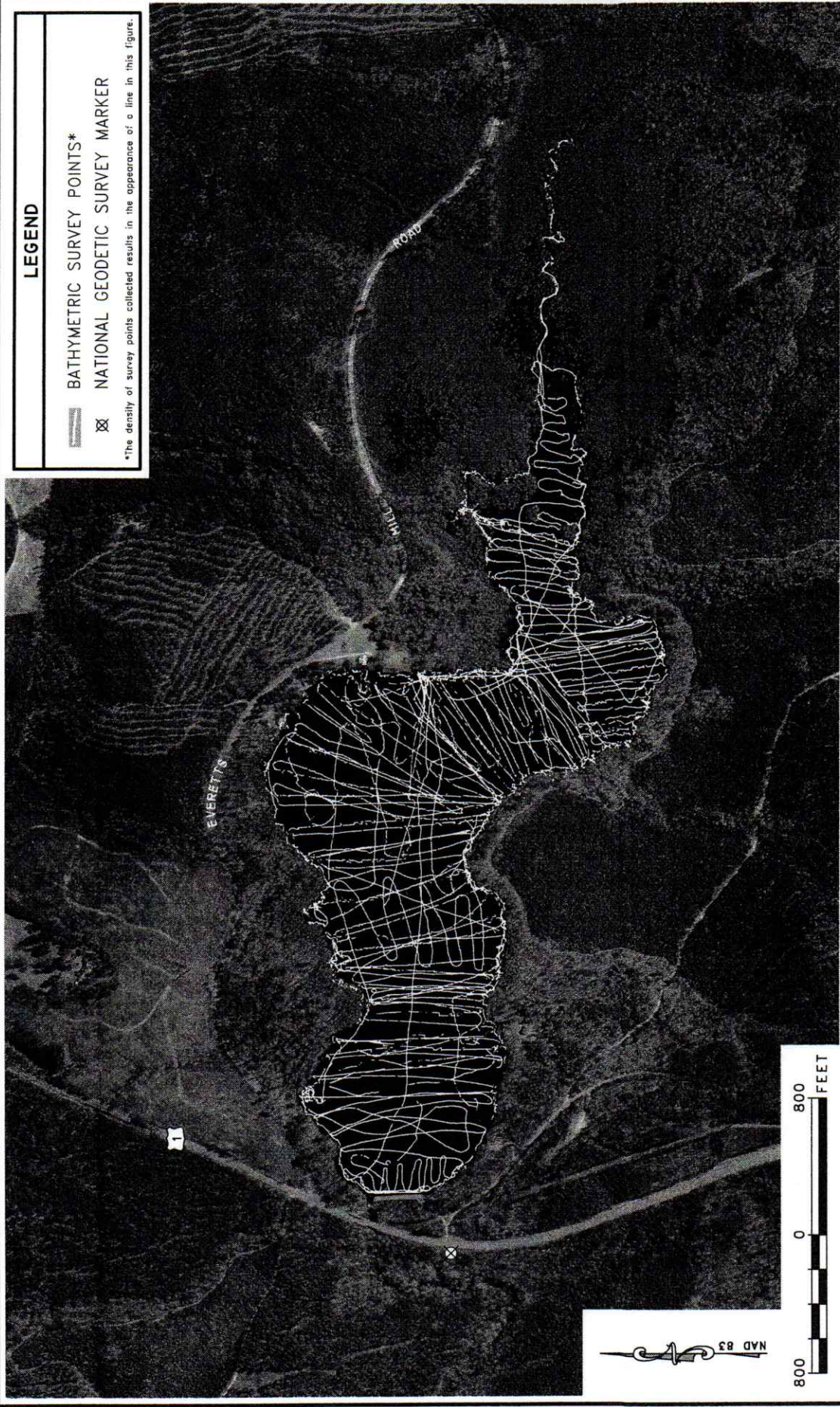
In addition to the bathymetric survey, EcoScience conducted field investigations of the natural stream and wetland communities up- and downstream of the Lake to further define the historic extent of Marks Creek and its associated floodplain. EcoScience also investigated areas within the impoundment during the winter drawdown of the Lake (approximately five feet below MHWM).

LEGEND

 BATHYMETRIC SURVEY POINTS*

 NATIONAL GEODETIC SURVEY MARKER

*The density of survey points collected results in the appearance of a line in this figure.



NAD 83

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EVERETTS LAKE CORPORATION
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PREPARED BY:



DWN BY:

DGJ

CAD BY:

MTC

DATE:

APR 2008

ESC PROJECT:

07-380.00

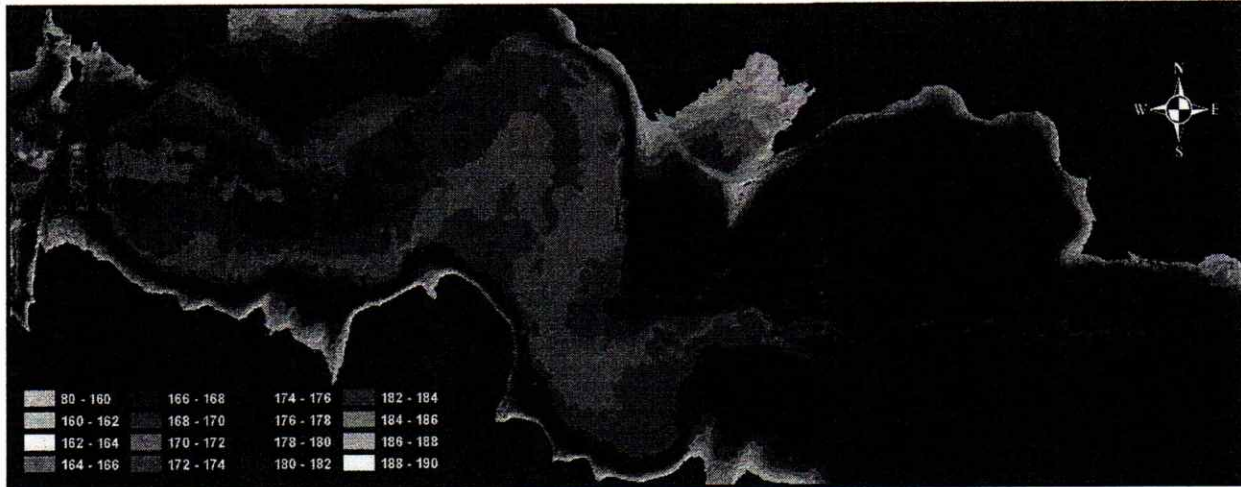
FIGURE

3

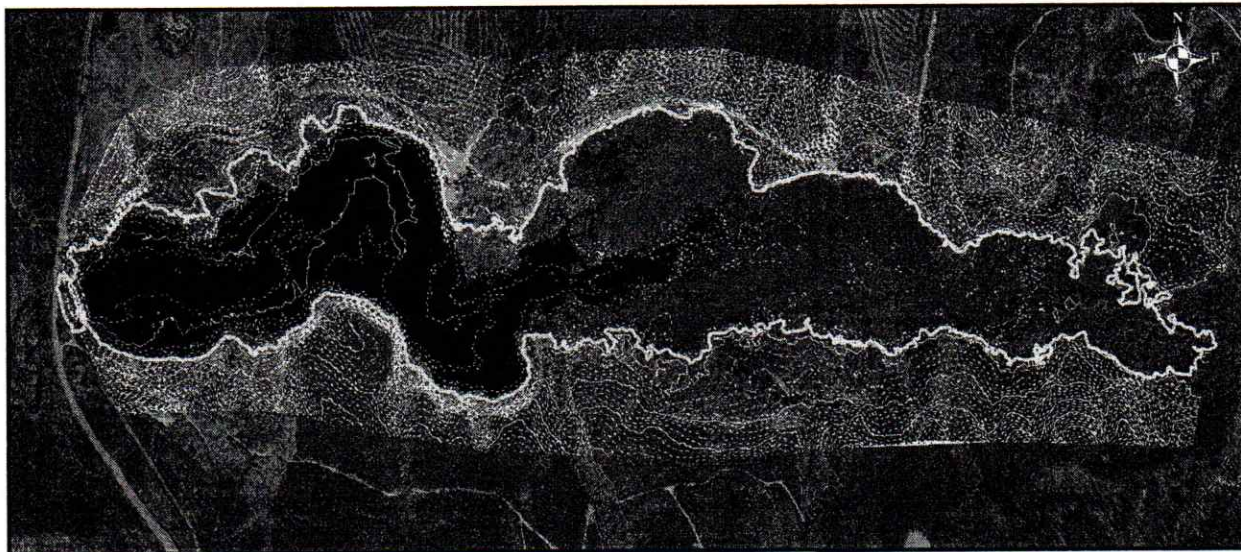
BATHYMETRIC SURVEY POINTS
EVERETTS LAKE MITIGATION SITE
RICHMOND COUNTY, NORTH CAROLINA

2.2.2 Office-based Analyses

Bathymetric survey data collected in the field were post-processed and merged with LiDAR elevation data to create a seamless terrain model of the ground and lakebed at the Site (see below). The terrain model was used in approximating the location and extent of inundated streams, floodplains, and wetlands at the Site.



Using GIS and CAD, contours were derived from the terrain model to assist in determining the historic valley shape of the Marks Creek floodplain and associated streams and wetlands (see below).



A GIS terrain analysis was performed to define low areas where stream channels may occur. Potential stream channels identified by the analysis were investigated in the field during the winter drawdown period.

2.2.3 Estimation of Potential Mitigation Units

Potential mitigation units were estimated based on data collected during field investigations and office-based analyses. Estimated potential mitigation units could shift up or down based on regulatory guidance and/or more detailed Site investigations. In addition, given recent guidance (Guidance) from the USEPA and USACE regarding *Compensatory Mitigation for Losses of Aquatic Resources* (pending official publication in the Federal Register scheduled for April 10, 2008), changes may occur to currently accepted mitigation strategies, which could increase or decrease the estimated potential mitigation units at the Site.

Stream Mitigation Units

Existing stream channels up- and downstream of the Lake were digitized using aerial photography to determine stream channel pattern parameters characteristic of the area. Digitized stream segments from up- and downstream of the Lake were combined to create a "conceptual stream channel" within the open water extent of the Lake. The conceptual stream channel was fit to the approximated valley floor, as represented by the post-processed bathymetric survey data and the seamless terrain model. Table 1 summarizes the estimated stream mitigation units (see below) and Figure 4 depicts the estimated stream length affected by the Dam (see page 11).

Table 1. Estimated Stream Mitigation Units

System Name	Mitigation Type*	Length (Linear Feet)	Mitigation Ratio*	Mitigation Units
Marks Creek	Restoration	9,629	1:1	9,629
UT to Marks Creek (1)	Restoration	969	1:1	969
UT to Marks Creek (2)	Restoration	1,000	1:1	1,000
UT to Marks Creek (3)	Restoration	628	1:1	628
UT to Marks Creek (4)	Restoration	861	1:1	861
Marks Creek	Preservation	4,095	5:1	819
Total Estimated Stream Mitigation Units				13,906
*Mitigation Type and Mitigation Ratio will ultimately be decided by the MBRT and may increase or decrease stream mitigation units at the Site.				

The estimated quantity of potential stream mitigation units could increase or decrease depending upon several factors. Stream restoration may be accepted by a MBRT for the entire length of Marks Creek contained within the Site (below the MHWM). However, existing beaver activity (see Figure 4) in upstream segments of Marks Creek (within the Site) may require management in order to receive stream mitigation credit at these locations (preservation, enhancement, or restoration). In addition, upon dam removal, the developing stream channel sinuosity may differ from the estimated conceptual stream channel, which could result in an increase or decrease of stream length within the open water extent of the Lake.

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Wetland Mitigation Units

Existing wetlands within the Site were digitized using aerial photography and generally verified during field investigations. The historic Marks Creek floodplain was estimated using the seamless terrain model and bathymetric contour elevation data. Riparian wetlands are expected to reestablish within the historic Marks Creek floodplain, which is currently inundated by the Lake. A majority of the existing wetlands located along the fringe of the Lake outside/upslope of the historic Marks Creek floodplain are expected to convert to upland areas. Some fringe wetlands may maintain wetland hydrology through hillslope seepage. In addition, following dam removal, portions of the Lake are expected to convert to upland areas. Table 2 summarizes the estimated wetland mitigation units (see below) and Figure 5 depicts the estimated wetland area affected by the Dam (see next page).

Table 2. Estimated Wetland Mitigation Units

System Name	Mitigation Type*	Acres	Mitigation Ratio*	Mitigation Units
Historic Marks Creek Floodplain ¹	Restoration	67	1:1	67
Existing Wetland ²	Preservation	123	5:1	24
Fringe Wetland Loss ³	NA	11	~2:1	~ -22
Total Estimated Wetland Mitigation Units				± 69
<p>*Mitigation Type and Mitigation Ratio will ultimately be decided by the MBRT and may increase or decrease wetland mitigation units at the Site. ¹Historic Marks Creek Floodplain restoration is expected to be riverine/riparian wetland restoration. ²Existing Wetlands are comprised of both riverine/riparian and non-riverine wetlands. ³Fringe Wetland Loss debit ratio would be determined during the review of a Prospectus by a MBRT.</p>				

Based on conversations with USACE personnel, it is expected that inundated open water areas that convert back to historically vegetated wetlands following dam removal and vegetation planting will be accepted as wetland restoration. However, fringe wetlands that convert to uplands would be considered a "loss" and would be debited against the wetland mitigation total. In addition, wetland preservation areas depicted in Figure 5 may be accepted by a MBRT as wetland enhancement if dam removal results in the restoration of historic/reference wetland hydrologic conditions within the Marks Creek floodplain and vegetation communities shift toward historic/reference conditions.

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REVISIONS

COUNTY:

EVERETTS LAKE CORPORATION
MR. JERRY GATTIS

PROJECT:

EVERETTS LAKE MITIGATION SITE

RICHMOND COUNTY, NORTH CAROLINA

TITLE:

ESTIMATED WETLAND AREA AFFECTED BY DAM

DWG BY: DGJ DATE: APR 2008

CHE BY: MTC SCALE: 1" = 700'

ESC PROJECT NO. 07-380.00

FIGURE

5

TERRAIN MODEL LEGEND

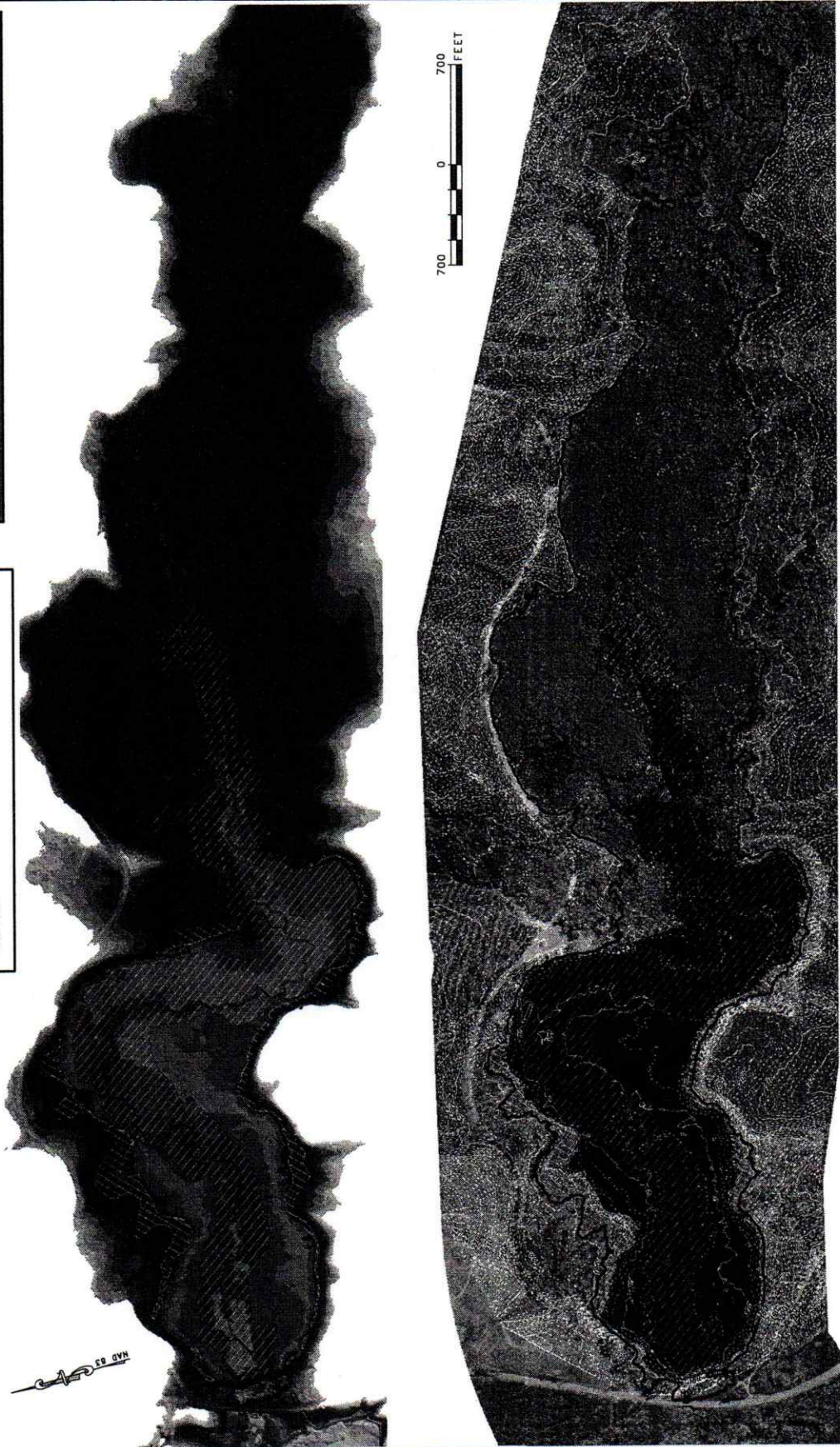
80 - 150	164 - 186	174 - 176	181 - 184
150 - 152	186 - 190	176 - 178	184 - 186
152 - 154	190 - 192	178 - 180	186 - 188
154 - 156	192 - 194	180 - 182	188 - 190

MITIGATION LEGEND

	± 67 acres
	± 123 acres
	± 11 acres

LEGEND

SITE BOUNDARY (MHWM and LIDAR) ± 263.3 acres



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3.0 MITIGATION BANK PRELIMINARY COST/BENEFIT ANALYSIS

The purpose of the Mitigation Bank Preliminary Cost/Benefit Analysis was to determine the potential Bank Geographic Service Area (GSA), evaluate the potential value of a Bank at the Site, estimate the potential market demand for mitigation units within the GSA, and speculate on the approximate amount of competition for a Bank at the Site. Direct costs associated with creating the Bank were not part of the Mitigation Bank Preliminary Cost/Benefit Analysis.

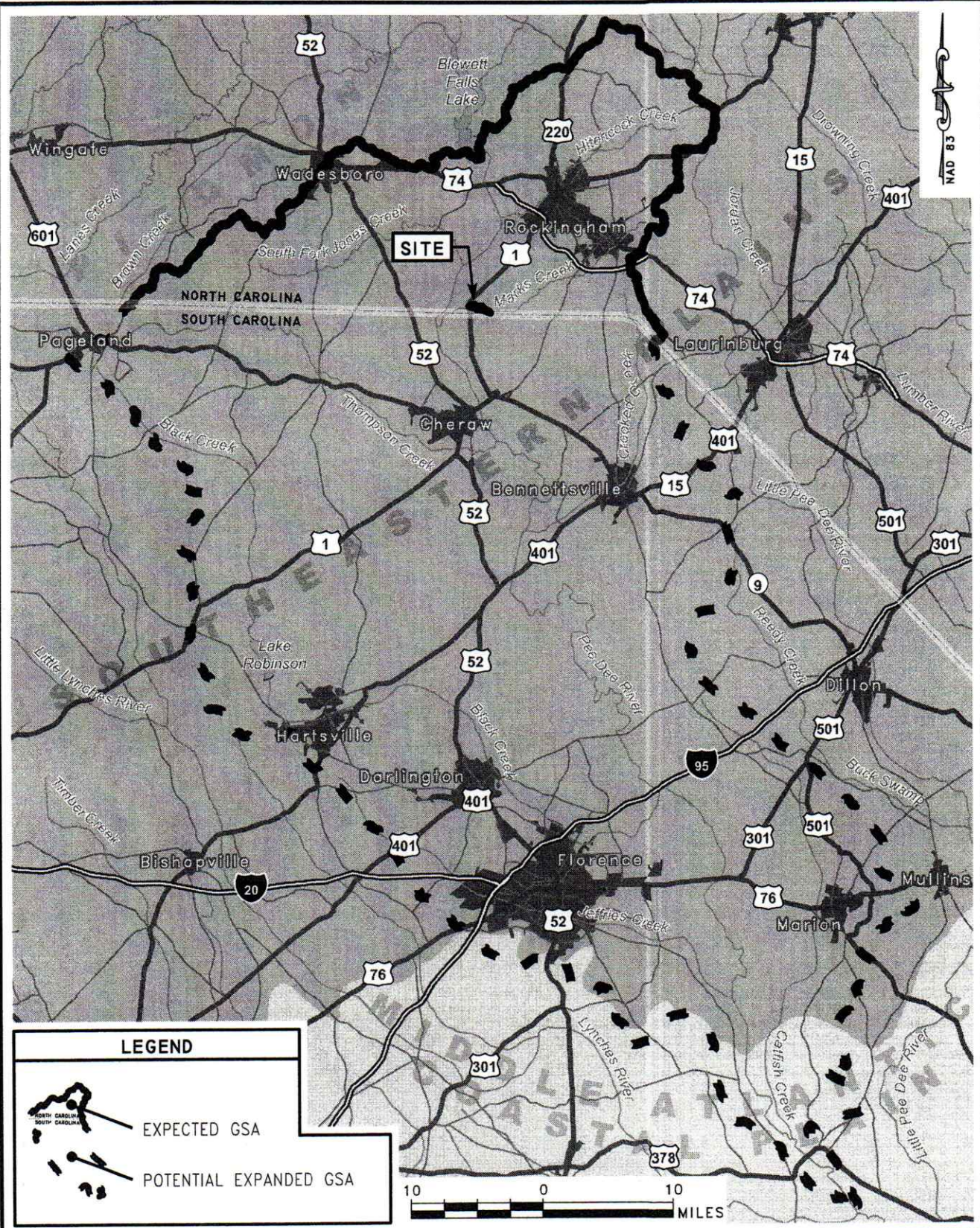
3.1 Potential Bank Geographic Service Area

According to the USACE, "the GSA of a bank is the designated area wherein a bank can reasonably be expected to provide appropriate compensation for impacts to wetland or other aquatic resources." Customarily, regulatory agencies in North Carolina have used a watershed based approach where the GSA for a Bank is defined by the 8-digit USGS Hydrologic Unit Code (HUC) within which it is located. In addition, "should a distinct break in a physiographic ecoregion exist within a given 8-digit HUC, at the discretion of the MBRT, the size and location of the GSA may be limited to the 8-digit HUC and the specific physiographic ecoregion within which the bank property is located." On a case-by-case basis, use of a Bank to compensate for impacts beyond the GSA may be considered by the USACE or other permitting agency.


The Site occurs within the 8-digit HUC 03040201 (Site HUC) of the Yadkin-Pee Dee River Basin and is located in the Southeastern Plains ecoregion (Level III). Within North Carolina, the Site HUC occurs entirely within the Southeastern Plains and Piedmont ecoregions (Level III). While much of the Site is characterized by features typical of the Southeastern Plains, portions also exhibit characteristics of the Piedmont. As a result, the Site GSA is not expected to be restricted to the Southeastern Plains and is expected to include the entire Site HUC within North Carolina (at a minimum).


In addition, given the recent Guidance from the USEPA and USACE, opportunities may exist for the expansion of the GSA into South Carolina within the Site HUC. An overall theme of the guidance calls for watershed-based mitigation decisions and the use of "innovative approaches or strategies for determining more effective compensatory mitigation requirements that provide greater benefits for the aquatic environment." In the spirit of the guidance, USACE Wilmington (NC) and Charleston (SC) districts may agree to collaborative participation in administering a Bank GSA that extends across state lines. The potential Bank GSA is depicted on Figure 6 (see next page). On Figure 6, the "Expected GSA" represents the Site HUC boundary within North Carolina and the "Potential Expanded GSA" represents the entire Site HUC as it extends into South Carolina.


NAD 83



LEGEND

 EXPECTED GSA

 POTENTIAL EXPANDED GSA

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**POTENTIAL BANK
 GEOGRAPHIC SERVICE AREA (GSA)
 EVERETTS LAKE MITIGATION SITE
 RICHMOND COUNTY, NORTH CAROLINA**

DWN BY: DGJ
 CRD BY: MTC
 DATE: APR 2008
 ESC PROJECT: 07-380.00

FIGURE
6

3.2 Potential Bank Value

In order to estimate an approximate value for the establishment of a Bank at the Site, EcoScience used the North Carolina Department of Environment and Natural Resources (NCDENR) Ecosystem Enhancement Program (EEP) schedule of fees. The EEP schedule of fees represents the amount of money that a jurisdictional permit applicant must pay into the "in-lieu-fee" NCDENR Wetlands Trust Fund (WTF) to fulfill compensatory-mitigation requirements. Table 3 summarizes the potential Bank value based on the estimated mitigation units at the Site and the EEP schedule of fees (retrieved from <http://www.nceep.net/pages/fee.htm>, March 31, 2008).

Table 3. Estimated Potential Bank Value

Fee Category	Unit	Fee Per Unit	Mitigation Units	Value
Stream	Linear foot	\$245	13,906	\$3,406,970
Non-riparian Wetland	Acre	\$14,676	4	\$58,704
Riparian Wetland	Acre	\$29,351	65	\$1,907,815
Total Estimated Potential Bank Value				\$5,373,489

While the schedule of fees represents the amount of money the EEP receives to complete mitigation activities in-lieu of permit applicants completing the activities themselves, the schedule of fees does not necessarily represent the market value of mitigation units. In North Carolina, private mitigation banking groups (bankers) commonly compete with the EEP for the sell of mitigation units (credits) and may be forced to lower the price of credits in order to do business with permit applicants in need of mitigation. In addition, the Total Estimated Potential Bank Value represented in Table 3 does not take into consideration the time value of money, the MBRT approved credit release schedule, or the fact that credits released by the MBRT for sale to mitigation customers will be contingent upon monitored success of the project for five years following construction.

3.3 Potential Market Demand

In order to estimate the Potential Market Demand for a Bank in the area, EcoScience conducted a cursory investigation into the potential future mitigation needs of the NCDOT and assessed the general growth trends in the area using publicly available data.

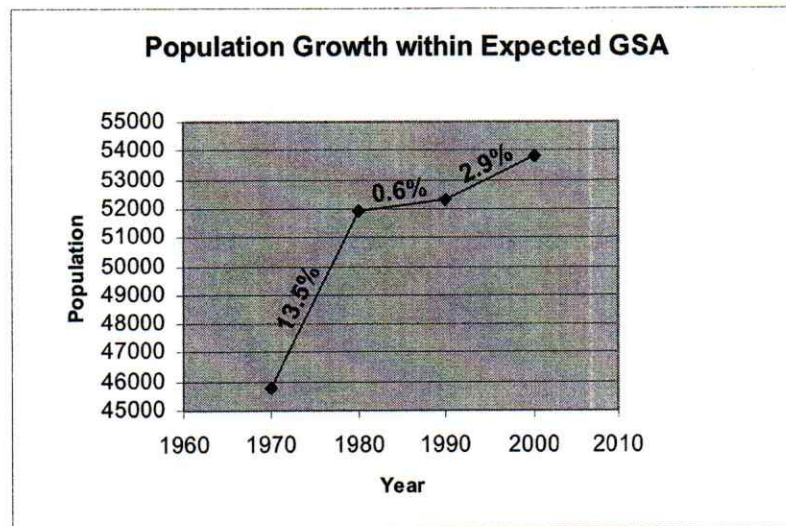
3.3.1 NCDOT Mitigation Needs

Based on conversations with NCDOT Natural Environment Indirect and Cumulative Impact/On-Site Mitigation Group personnel, NCDOT short range future mitigation needs are currently being met by the EEP. However, the EEP has received criticism for inaccurate accounting of mitigation offset credits paid into the WTF versus mitigation activities underway/completed on the ground. As a result, NCDOT personnel speculated that additional mitigation may be needed in the area in the near future. Additionally, several NCDOT new location and/or improvement road projects are proposed in the area to begin within the next 7-10 years (State Transportation Improvement Program information available at: <http://www.ncdot.org/PLANNING/development/tip/TIP/>).

3.3.2 General Growth Trends in the Area

EcoScience assessed general growth trends in the area using publicly available GIS datasets including U.S. Department of Commerce (USDOC) Census data and the Multi-Resolution Land Characteristics Consortium (MRLC) National Land Cover Dataset (NLCD). USDOC Census data was used to evaluate the general population growth in the area from 1970-2000 and may serve as a general indicator for trends in urban development. Urban development could result in impacts to streams and wetlands, which would require stream and wetland mitigation. In addition, MRLC NLCD data was used to evaluate the approximate amount of wetland converted to urban land uses from 1992-2001.

Based on population surveys conducted by the USDOC, the total population within the Expected GSA has increased nearly three percent (3%) from 1990-2000 (see below).



In addition, the NLCD reports that approximately 74 acres of wetland were converted to urban land uses from 1992-2001. While neither the USDOC nor the NLCD dataset indicate heavy growth in the area, Anson and Richmond County are expected to grow steadily following the completion of I-74 and the construction of I-73, which will connect to I-74 near Hamlet, North Carolina. Future growth in the area could result in impacts to streams and wetlands, which may present opportunities for bankers to sell stream and wetland mitigation credits.

3.4 Potential Bank Competition

Based on data from the USACE Wilmington and Charleston districts, there are currently no approved private Banks within the Site HUC in North or South Carolina. However, six EEP mitigation sites are within the Site HUC in North Carolina. Five of the six EEP mitigation sites have stream mitigation credits totaling approximately 20,449 credits and four of the six EEP mitigation sites have wetland mitigation credits totaling approximately 58.54 credits. The amount of unused credits held in reserve by the EEP for the six sites is unknown.