HEATH RIPARIAN BUFFER MITIGATION SITE
FINAL BUFFER RESTORATION PLAN
CRAVEN COUNTY, NORTH CAROLINA
EEP CONTRACT NO. 002280

Prepared for:

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
ECOSYSTEM ENHANCEMENT PROGRAM
RALEIGH, NORTH CAROLINA

Prepared by:

Restoration Systems, L.L.C.
1101 Haynes Street, Suite 211
Raleigh, North Carolina 27604

April 2010

EXECUTIVE SUMMARY

Restoration Systems, L.L.C. has contracted with EEP (FDP contract #002280) through the Full Delivery Process (RFP #16-001383) to provide 60 Riparian Buffer Mitigation Units through the completion of the **Heath Riparian Buffer Mitigation Site** (Site) located approximately 3.4 miles southeast of Dover in Craven County. The Site encompasses 60.632-acres of land, which has been ditched and cleared for row crop production. The surface area of the water in the ditches within the Site boundaries totals 0.632 acres and is excluded from the area used to generate mitigation units as defined in RFP #16-001383 and Contract No. 002280. A Deed of Conservation Easement and Survey of the Site were recorded with the Craven County Register of Deeds on March 18, 2010. In accordance with NCDWQ's Buffer Interpretation/Clarification #2008-019 an additional 0.55 acres of restored buffer within the Conservation Easement cannot be used to generate Riparian Buffer Mitigation Units. Therefore the total number of mitigation units provided by the Site upon completion will be 59.45 acres.

The Site is situated along unnamed tributaries to Core Creek, a major tributary to the Neuse River. The Site is located within DWQ sub-basin 03-04-08 of the Neuse River Basin and is encompassed within USGS 14-digit Hydrologic Unit and Targeted Local Watershed 03020202080010. Site streams drain to Core Creek (Stream Index Number 27-90). Core Creek has a best usage designation of **C, Sw, NSW** and sections are listed as impaired. Sections of Core Creek to which the Site drains are listed on the draft 2008 303(d) list for impaired biological integrity and low dissolved oxygen. Impairment results from agricultural crop production.

The surrounding landscape is characterized primarily by agricultural land and silviculture stands. Agricultural land is farmed extensively where soils provide adequate drainage. Agricultural and silviculture fields are fairly contiguous in areas where drainage systems have been implemented. Site land use is characterized by agricultural row-crop production. Row crops identified during field investigations include soybeans. Ditches vary from 2 to 4 feet in depth and exhibited flow during Site visits.

This Restoration Plan defines specific goals and objectives associated with the restoration of native forest on former agricultural fields located within the Site boundaries. The primary goals of this buffer restoration plan include 1) enhancement of water quality functions (reduce nonpoint source sedimentation and nutrient inputs), 2) restoration of natural vegetation buffers along onsite ditches, and 3) creation of wildlife habitat associated with a riparian corridor. Upon successful completion of this Restoration Plan, the Site will be monitored to ensure successful vegetation density of 320 stems per acre through the five years.

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HEATH RIPARIAN BUFFER MITIGATION SITE
FINAL RESTORATION PLAN
CRAVEN COUNTY, NORTH CAROLINA

PART 1: INTRODUCTION

This Restoration Plan describes the **Heath Riparian Buffer Mitigation Site** (Site) and is designed specifically to assist in fulfilling North Carolina Department of Environment and Natural Resources (NCDENR) Ecosystem Enhancement Program (EEP) restoration goals. The Site is located approximately 3.4 miles southeast of Dover, in Craven County (Figure 1, Appendix A). This portion of Craven County is located centrally within Neuse River Basin 8-digit Cataloging Unit 03020202 (Figure 2, Appendix A).

The following criteria are required to provide Riparian Buffer Mitigation Units as requested under this solicitation:

- Protect the Site in perpetuity with a conservation easement.
- Revegetate the Site.
- Monitor the Site successfully for 5 years.

This document provides a buffer restoration plan summarizing activities proposed within the Site. The Site encompasses 60.632 acres of land utilized for timber and agricultural row crop production. Within the Conservation Easment, 0.632 acres of land include the surface area of the water within the ditches at the time of surveying and will not be used to generate Riparian Buffer Mitigation Units. In accordance with NCDWQ Buffer Interpretation/Clarificaiton #2008-019, 0.55 acres of restored buffer within the Conservation Easement cannot generate Buffer Mitigation Units. Therefore the total number of Buffer Mitigation Units provided upon completion of the Site will be 59.45 acres. This plan includes 1) project goals and objectives, 2) descriptions of existing conditions, 3) restoration plans, and 4) vegetation monitoring plans.

PART 2: PROJECT GOALS AND OBJECTIVES

The following project is proposed to provide 60 Riparian Buffer Mitigation Units, as calculated in accordance with the requirements stipulated in EEP Request for Proposal #16-001383.

The primary goals of this buffer restoration project focus on improving water quality, enhancing flood attenuation, and restoring aquatic and riparian habitat and will be accomplished by the following.

1. Removing nonpoint sources of pollution associated with agricultural production including a) cessation of broadcasting fertilizers, pesticides, and other agricultural materials into and adjacent to Site ditches, or other open waterways and b) providing a vegetative buffer adjacent to waterways to treat surface runoff which may be laden with sediment and/or agricultural pollutants.
2. Reducing sedimentation within on-site and downstream receiving waters by a) increasing retention time for surface waters entering and leaving the Site, b) reducing bank erosion associated with vegetation maintenance and

agricultural plowing to Site ditches, and c) planting a forested vegetative buffer adjacent to Site ditches.
3. Promoting floodwater attenuation by ripping soils and revegetating Site floodplains, increasing frictional resistance on lateral surface flow across the Site.
4. Providing terrestrial wildlife habitat including a natural forested corridor in an area that is currently cleared of natural vegetation and highly dissected by agricultural practices.

PART 3: EXISTING CONDITIONS

3.1 PHYSIOGRAPHY, TOPOGRAPHY, AND LAND USE

The Site is located in the Carolina Flatwoods and Mid-Atlantic Floodplains/Low Terrace Ecoregion of North Carolina within United States Geological Survey (USGS) Cataloging Unit 03020202080010 of the Neuse River Basin (North Carolina Division of Water Quality [NCDWQ] sub-basin number 03-04-08). Regional physiography is characterized by flat plains on lightly dissected marine terraces, major river floodplains and associated terraces, swamps, Carolina bays, oxbow lakes, ponds, and low gradient streams with sand and silt substrates. On-site elevations are relatively flat, averaging approximately 16 feet National Geodetic Vertical Datum (NGVD) across the Site (USGS Dover, North Carolina 7.5-minute topographic quadrangle).

The Site offers the potential of providing water quality functions to a 0.1-square mile watershed at the Site outfall. The watershed is entirely characterized by agriculture land utilized for row crop production, which is farmed extensively where soils provide adequate drainage. Impervious surfaces account for less than 2 percent of the upstream drainage area. The Site is entirely dominated by agricultural land with no impervious surfaces.

3.2 WATER QUALITY

The Site is located within NCDWQ subbasin 03-04-08 of the Neuse River Basin and is encompassed within USGS 14-digit Hydrologic Unit and Targeted Local Watershed 03020202080010. Site streams drain to Core Creek (Stream Index Number 27-90). Core Creek has a best usage designation of **C, Sw, NSW** (NCDWQ 2008b) and downstream sections are listed as impaired. Streams with a best usage designation of **C** are suitable for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation includes wading, boating, and other uses not involving human body contact with waters on an organized or frequent basis. The supplemental classification **Sw** (Swamp Waters) is intended for waters which have low velocities and other natural characteristics which are different from adjacent streams. The supplemental classification of **NSW** (Nutrient Sensitive Waters) is intended for waters needing additional nutrient management due to their being subject to excessive growth of microscopic or macroscopic vegetation.

According to the NCDWQ June 2008 Draft Neuse River Basinwide Water Quality Plan, a stressor study completed on Core Creek found high levels of nutrients and identified pesticides and organics in the sediment, likely due to runoff from the many agricultural fields in the area. These pesticides were related to fish kills in the Core Creek area on April 23, 2003 and May 3, 2003. The numerous agricultural fields located in the watershed contribute to significant sedimentation of Core Creek due to nonpoint source

runoff after rainfall events. Additionally, nutrient inputs from farmland and a few animal operations probably contribute to nutrient enrichment and subsequent biological impacts or impairment. NCDWQ recommends continued implementation of agricultural BMPs in this watershed to continue the effort in reducing sedimentation and nutrient loading to the Neuse River Estuary. The proposed project is supportive of the reduction in sediment and nutrients, which will serve to address existing deficiencies with the watershed, and will assist NCEEP in meeting goals within the Targeted Local Watershed 03020202080010.

3.3 SOILS

Soils that occur within the Project, according to the *Soil Survey of Craven County, North Carolina* (NRCS 1989) are depicted in Figure 3 (Appendix A) and described in Table 1.

Table 1. NRCS Soils Mapped within the Site

Soil Series	Family	Description
Rains	*Typic Paleaquults*	This series consists of poorly drained, moderately permeable soils on flats, Carolina bays and interstream divides. Depth to seasonal high water table occurs at 0.5 to 1.5 feet. HYDRIC A
Pantego	*Umbric Paleaquults*	This series consists of very poorly-drained soils that formed in moderately fine textured sediments and are found on flats and interstream divides. HYDRIC A

PART 4: RESTORATION PLAN

The primary goals of this buffer restoration project include 1) enhancement of water quality functions (reduce nonpoint source sedimentation and nutrient inputs), 2) restoration of natural vegetation buffers along onsite ditches, and 3) creation of wildlife habitat associated with a riparian corridor.

Restoration of forest and stream-side habitat allows for development and expansion of characteristic species across the landscape. Ecotonal changes between community types contribute to diversity and provide secondary benefits, such as enhanced feeding and nesting opportunities for mammals, birds, amphibians, and other wildlife.

4.1 VEGETATION PLAN

Onsite observations and community descriptions from *Classification of the Natural Communities of North Carolina* (Schafale and Weakley 1990) were used to develop the primary plant community associations that will be promoted during community restoration efforts. Areas will be planted with species characteristic of the Coastal Plain Bottomland Hardwood Forest (Table 2).

Bare-root seedlings of tree and shrub species will be planted within the Site at a density of approximately 1000 stems per acre. Planting will be performed between December 1 and March 15 to allow plants to stabilize during the dormant period and set root during the spring season. A total of 60,200 diagnostic tree and shrub seedlings will be planted in support of Site buffer restoration (Table 2).

Table 2. Vegetation Plan

Plant Common Name	Species Name	Number Planted (% of Total)
Green ash	*Fraxinus pennsylvanica*	9,500(15)
Mockernut hickory	*Carya tomentosa*	6,300 (10)
Water oak	*Quercus nigra*	6,300 (10)
Willow oak	*Quercus phellos*	9,500 (15)
Chestnut oak	*Quercus michauxii*	9,500 (15)
Black gum	*Nyssa sylvatica*	3,200 (5)
Sugarberry	*Celtis laevigata*	3,200 (5)
American elm	*Ulmus americana*	6,300(15)
Sweetbay magnolia	*Magnolia virginiana*	3,200 (5)
Ironwood	*Carpinus caroliniana*	3,200 (5)
TOTAL		**60,200**

Final distribution and densities will be reported in the detailed mitigation plan.

4.2 GRADING PLAN

Existing ditches are very stable conveyances except for minor areas of bank erosion. Prior to planting, soils will be ripped in linear bands perpendicular to the direction of surface water flows. The established micro-topography on leveled surfaces will promote diffuse flow and surface water storage. In addition, subsurface hardpans may be eliminated to promote vegetation growth/survival and to increase groundwater recharge rates. All vegetative buffers will be a minimum of 50 feet in width.

4.3 FERTILIZATION PLAN

No fertilization activities are proposed for the Site. The application of fertilizers may compound water quality degradation within onsite and downstream receiving waters.

4.4 PROJECT PHASING

A tentative phasing schedule for the proposed project is presented below:

Task	Description	Weeks from Contract Execution
Task 1	Environmental Screening (CE Document)	5
Task 2	Conservation Easement Recorded	36
Task 3	Develop Approved Restoration Plan	54
Task 4	Mitigation Site Earthwork	35*
Task 5	Site Planting	35*
	Install Monitoring Equipment	40*
Task 6	Prepare Mitigation Plan and As Built Drawings	60*
Task 7	Submit Year 1 Monitoring Report	Dec. after implementation
Task 8	Submit Year 2 Monitoring Report	Dec.– 2 yrs after implementation
Task 9	Submit Year 3 Monitoring Report	Dec.– 3 yrs after implementation

Task 10	Submit Year 4 Monitoring Report	Dec.– 4 yrs after implementation
Task 11	Submit Year 5 Monitoring Report	Dec.– 5 yrs after implementation

* Time frame is dependent upon seasonal conditions at completion of Site implementation.

4.5 MONITORING AND SUCCESS CRITERIA

The Monitoring Plan ensures vegetation growth and survival. Monitoring of restoration efforts will be performed for 5 years or until success criteria are fulfilled.

Vegetation monitoring will follow the 2006 *CVS-EEP Vegetation Monitoring Protocol* set forth by EEP (Lee et al. 2006). After planting has been completed, an initial evaluation will be performed to verify planting methods and to determine initial species composition and density. Supplemental planting and additional Site modifications will be implemented, if necessary.

During quantitative vegetation sampling between June 1 and September 31 of the first year, 10-meter by 10-meter square sample plots will be randomly placed within the Site. In each sample plot, vegetation sampling will follow Levels 1-2 CVS-EEP sampling methods (Lee et al. 2006).

Vegetation Success Criteria

Success criteria have been established to verify that the vegetation component supports community elements necessary for forest development. Success criteria are dependent upon the density and growth of characteristic forest species. An average density of 320 stems per acre must be surviving after five monitoring years.

5.0 REFERENCES

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2006. CVS-EEP Protocol for Recording Vegetation. Version 4.0. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, North Carolina.

North Carolina Division of Water Quality (NCDWQ). 2007a. Final North Carolina Water Quality Assessment and Impaired Waters List (2006 Integrated 305(b) and 303(d) Report) (online). Available:http://h2o.enr.state.nc.us/tmdl/documents/303d_Report.pdf [November 10, 2008]. North Carolina Department of Environment and Natural Resources, Raleigh, North Carolina.

North Carolina Division of Water Quality (NCDWQ). 2007b. Redbook, Surface Waters and Wetlands Standards. North Carolina Department of Environment and Natural Resources, Division of Water Quality. Raleigh, North Carolina.

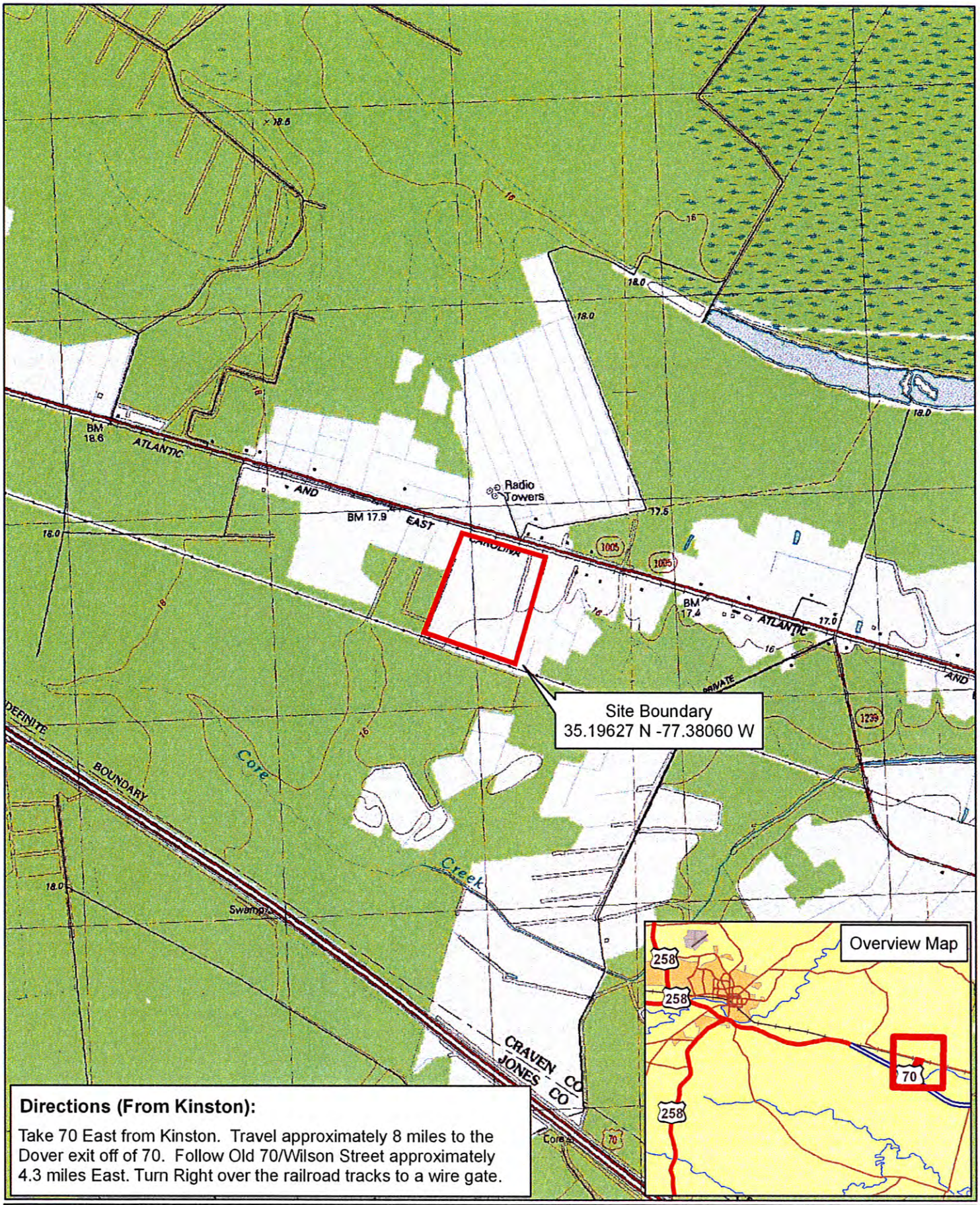
North Carolina Division of Water Quality (NCDWQ). 2008a. Draft North Carolina Water Quality Assessment and Impaired Waters List (2008 Integrated 305(b) and 303(d) Report). Public Review (online). Available: http://h2o.enr.state.nc.us/tmdl/documents/B.Draft2008303dList.pdf. [November 10, 2008]. North Carolina Department of Environment and Natural Resources, Raleigh, North Carolina.

North Carolina Division of Water Quality (NCDWQ). 2008b. Draft Basinwide Planning Program: Neuse River Basinwide Water Quality Plan - June 2008. North Carolina Department of Environment and Natural Resources, Raleigh, North Carolina.

Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina: Third Approximation. North Carolina Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health, and Natural Resources. Raleigh, North Carolina.

United States Department of Agriculture (USDA). 1989. Soil Survey of Craven County, North Carolina. Natural Resources Conservation Service.

Appendix A
Figures



Directions (From Kinston):

Take 70 East from Kinston. Travel approximately 8 miles to the Dover exit off of 70. Follow Old 70/Wilson Street approximately 4.3 miles East. Turn Right over the railroad tracks to a wire gate.

Restoration Systems, LLC
1101 Haynes St. Suite 211
Raleigh, NC 27604
tel: 919.755.9490

Figure 1: Site Location

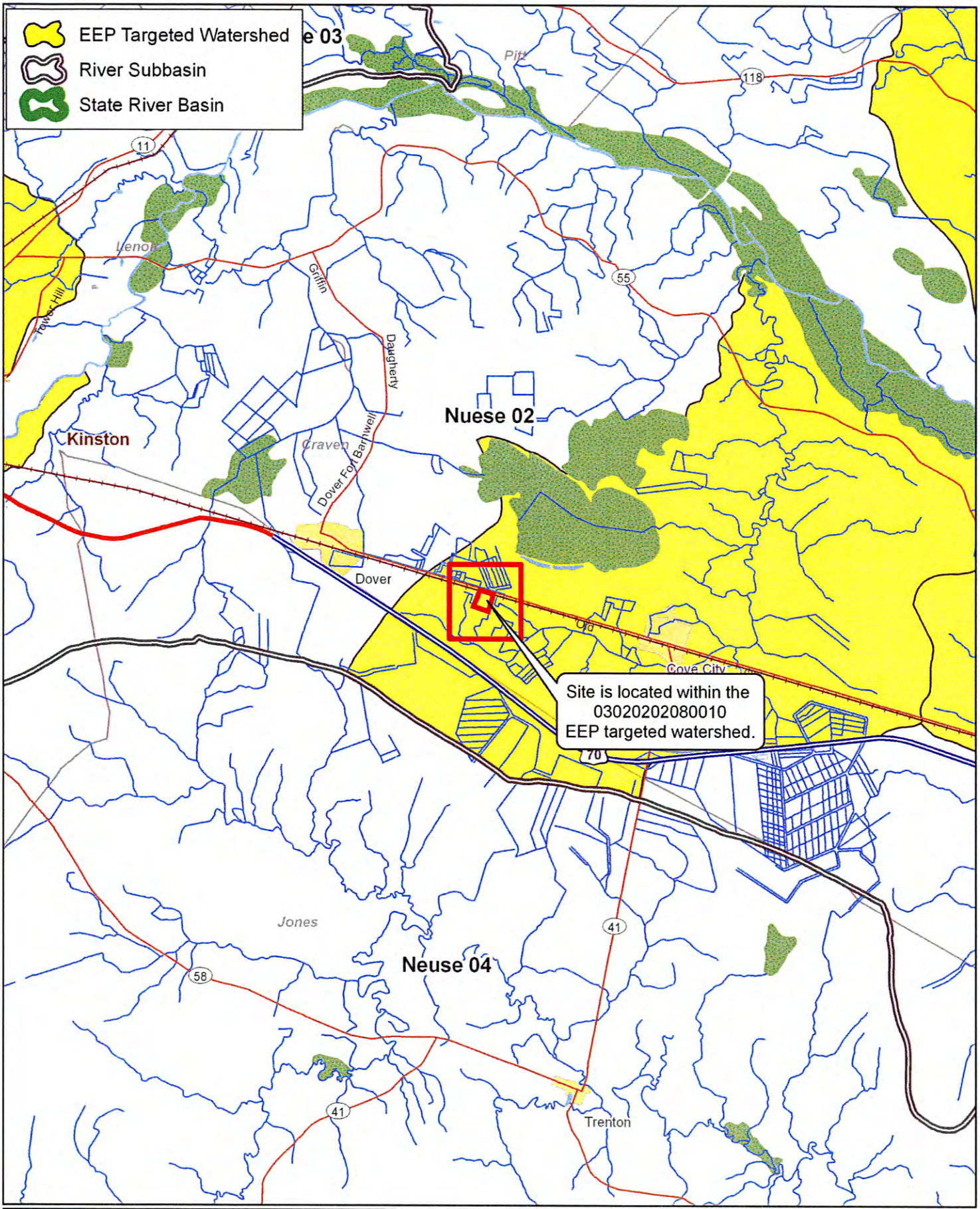
Heath Riparian Buffer Mitigation Site
Craven County, NC

1:24,000

N

0 470 940 1,880 2,820 3,760

Feet



Restoration Systems, LLC 1101 Haynes St. Suite 211 Raleigh, NC 27604 tel: 919.755.9490	**Figure 2:** Watershed Location	**Heath Riparian Buffer Mitigation Site** **Neuse 02** **Craven County, NC**	1:150,000 N 0 0.5 1 2 3 4 Miles

Restoration Systems, LLC
1101 Haynes St. Suite 211
Raleigh, NC 27604
tel: 919.755.9490

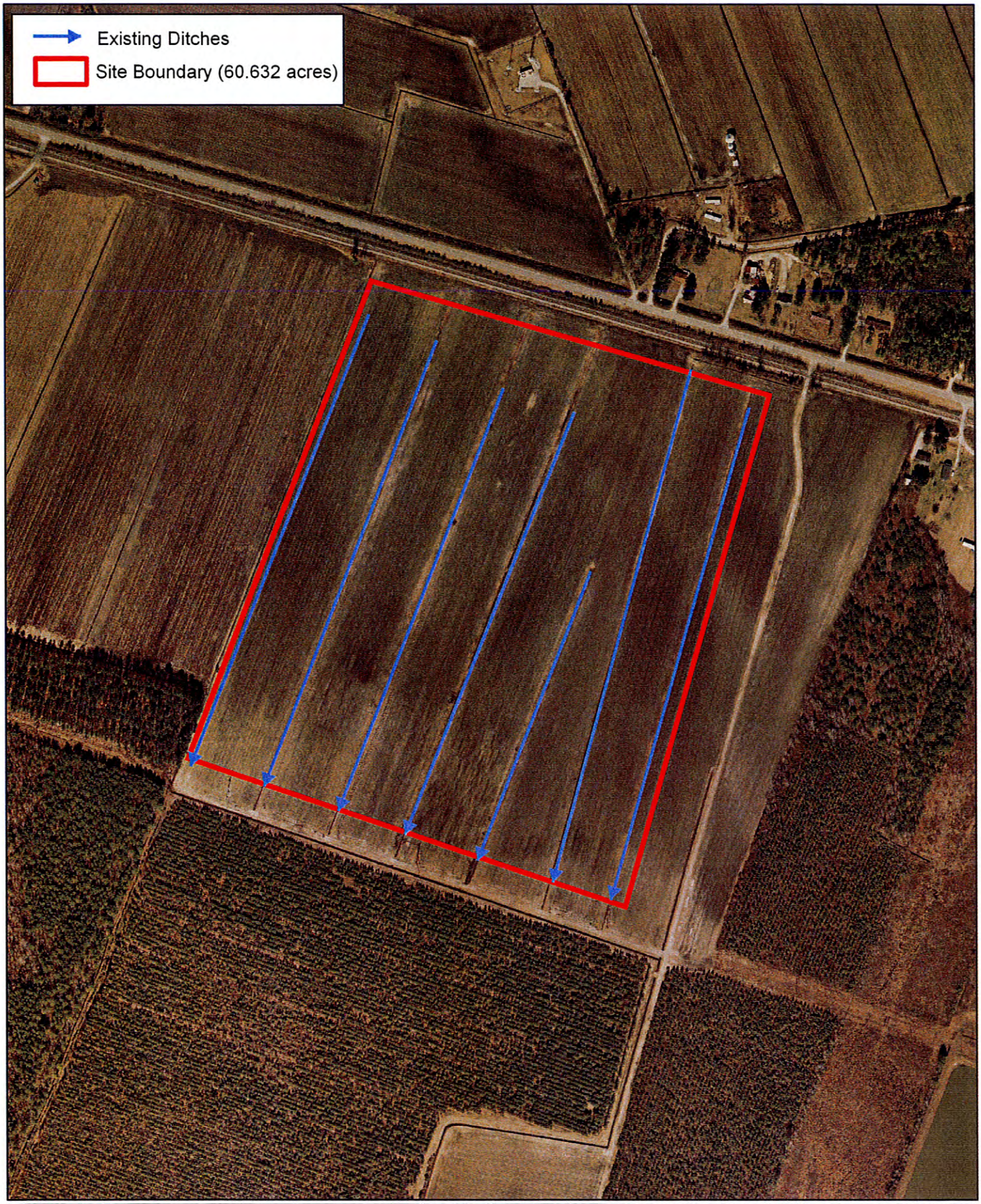
Figure 3:
Soils

Heath Riparian Buffer
Mitigation Site
Craven County, NC

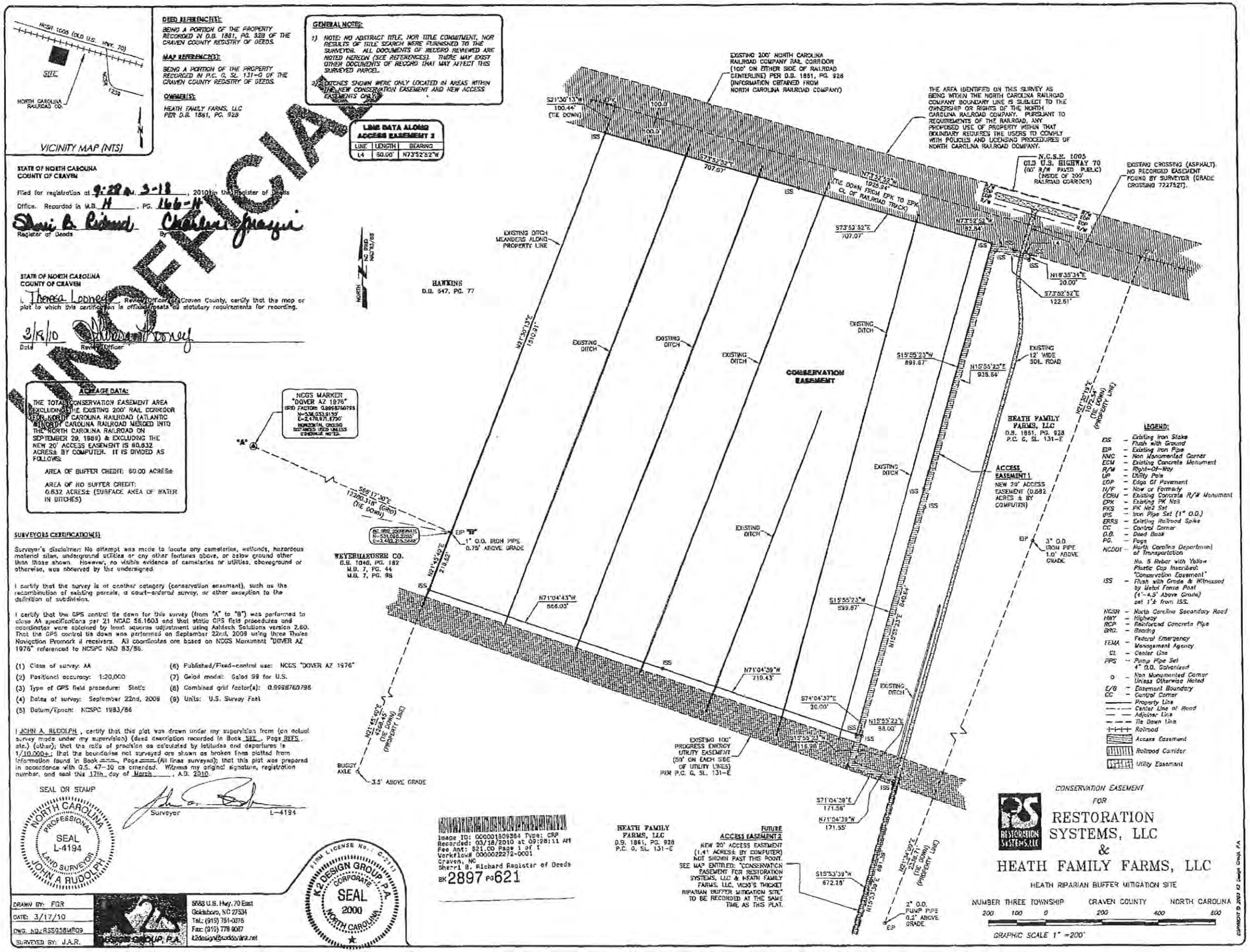
1:5,000

N

0 95 190 380 570 760
Feet



Restoration Systems, LLC 1101 Haynes St. Suite 211 Raleigh, NC 27604 tel: 919.755.9490	**Figure 4:** Existing Conditions	**Heath Riparian Buffer Mitigation Site** **Craven County, NC**	1:5,000 N 0 100 200 400 600 800 Feet


VICINITY MAP (NTS)
SITE
NCSR 1005 (OLD U.S. HWY. 70)
NCSR 1236
NORTH CAROLINA RAILROAD CO.
DEED REFERENCE(S):
BEING A PORTION OF THE PROPERTY RECORDED IN D.B. 1851, PG. 928 OF THE CRAVEN COUNTY REGISTRY OF DEEDS.
MAP REFERENCE(S):
BEING A PORTION OF THE PROPERTY RECORDED IN P.C. C, SL. 131-G OF THE CRAVEN COUNTY REGISTRY OF DEEDS.
OWNER(S):
HEATH FAMILY FARMS, LLC PER D.B. 1851, PG. 928
GENERAL NOTES:
1) NOTE: NO ABSTRACT, TITLE, NOR TITLE COMMITMENT, NOR RESULTS OF TITLE SEARCH WERE FURNISHED TO THE SURVEYOR. ALL DOCUMENTS OF RECORD REVIEWED ARE NOTED HEREON (SEE REFERENCES). THERE MAY EXIST OTHER DOCUMENTS OF RECORD THAT MAY AFFECT THIS SURVEYED PARCEL.
2) ALL PATCHES SHOWN WERE ONLY LOCATED IN AREAS WITHIN THE NEW CONSERVATION EASEMENT AND NEW ACCESS EASEMENTS ONLY.
LINE DATA ALONG ACCESS EASEMENT 2
LINE | LENGTH | BEARING
L4 | 50.00' | N73°52'52"W
STATE OF NORTH CAROLINA
COUNTY OF CRAVEN
Filed for registration at 9:28 A.M. 3-18, 2010 in the Register of Deeds Office. Recorded in M.B. H, PG. 166-H
Sheri B. Richard, Register of Deeds
STATE OF NORTH CAROLINA
COUNTY OF CRAVEN
I, Theresa Looney, Review Officer of Craven County, certify that the map or plat to which this certification is affixed meets all statutory requirements for recording.
3/8/10 Date
Review Officer
ACREAGE DATA:
THE TOTAL CONSERVATION EASEMENT AREA EXCLUDING THE EXISTING 200' RAIL CORRIDOR FOR NORTH CAROLINA RAILROAD (ATLANTIC & NORTH CAROLINA RAILROAD MERGED INTO THE NORTH CAROLINA RAILROAD ON SEPTEMBER 29, 1989) & EXCLUDING THE NEW 20' ACCESS EASEMENT IS 80.632 ACRES± BY COMPUTER. IT IS DIVIDED AS FOLLOWS:
AREA OF BUFFER CREDIT: 80.00 ACRES±
AREA OF NO BUFFER CREDIT: 0.632 ACRES± (SURFACE AREA OF WATER IN DITCHES)
SURVEYOR'S CERTIFICATION(S)
Surveyor's disclaimer: No attempt was made to locate any cemeteries, wetlands, hazardous material sites, underground utilities or any other features above, or below ground other than those shown. However, no visible evidence of cemeteries or utilities, aboveground or otherwise, was observed by the undersigned.
I certify that the survey is of another category (conservation easement), such as the recombination of existing parcels, a court-ordered survey, or other exception to the definition of subdivision.
I certify that the GPS control tie down for this survey (from "A" to "B") was performed to class AA specifications per 21 NCAC 56.1603 and that static GPS field procedures and coordinates were obtained by least squares adjustment using Ashtech Solutions version 2.60. That the GPS control tie down was performed on September 22nd, 2009 using three Thales Navigation Promark II receivers. All coordinates are based on NCGS Monument "DOVER AZ 1976" referenced to NCSPC NAD 83/86.
(1) Class of survey: AA
(2) Positional accuracy: 1:20,000
(3) Type of GPS field procedure: Static
(4) Dates of survey: September 22nd, 2009
(5) Datum/Epoch: NCSPC 1983/86
(6) Published/Fixed-control use: NCGS "DOVER AZ 1976"
(7) Geoid model: Geoid 99 for U.S.
(8) Combined grid factor(s): 0.9998760795
(9) Units: U.S. Survey Feet
I JOHN A. RUDOLPH, certify that this plat was drawn under my supervision from (an actual survey made under my supervision) (deed description recorded in Book SEE, Page REFS, etc.) (other); that the ratio of precision as calculated by latitudes and departures is 1/10,000+; that the boundaries not surveyed are shown as broken lines plotted from information found in Book ----, Page ---- (All lines surveyed); that this plat was prepared in accordance with G.S. 47-30 as amended. Witness my original signature, registration number, and seal this 17th day of March, A.D. 2010.
SEAL OR STAMP
NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN A RUDOLPH
Surveyor L-4194
DRAWN BY: FGR
DATE: 3/17/10
DWG. NO.: RSS058MR09
SURVEYED BY: J.A.R.
K2 DESIGN GROUP, P.A.
5583 U.S. Hwy. 70 East
Goldsboro, NC 27534
Tel.: (919) 751-0376
Fax: (919) 778 9067
k2design@outlook.net
FIRM LICENSE No.: C-2511
K2 DESIGN GROUP, P.A. CORPORATE SEAL 2000 NORTH CAROLINA
UNOFFICIAL DOCUMENT
Image ID: 000001809364 Type: CRP
Recorded: 03/18/2010 at 09:28:11 AM
Fee Amt: $21.00 Page 1 of 1
Workflow# 0000022272-0001
Craven, NC
Sheri B. Richard Register of Deeds
BK 2897 PG 621
EXISTING 200' NORTH CAROLINA RAILROAD COMPANY RAIL CORRIDOR (100' ON EITHER SIDE OF RAILROAD CENTERLINE) PER D.B. 1851, PG. 928 (INFORMATION OBTAINED FROM NORTH CAROLINA RAILROAD COMPANY)
THE AREA IDENTIFIED ON THIS SURVEY AS BEING WITHIN THE NORTH CAROLINA RAILROAD COMPANY BOUNDARY LINE IS SUBJECT TO THE OWNERSHIP OR RIGHTS OF THE NORTH CAROLINA RAILROAD COMPANY. PURSUANT TO REQUIREMENTS OF THE RAILROAD, ANY PROPOSED USE OF PROPERTY WITHIN THAT BOUNDARY REQUIRES THE USERS TO COMPLY WITH POLICIES AND LICENSING PROCEDURES OF NORTH CAROLINA RAILROAD COMPANY.
N.C.S.R. 1005 OLD U.S. HIGHWAY 70 (60' R/W PAVED PUBLIC) (INSIDE OF 200' RAILROAD CORRIDOR)
EXISTING CROSSING (ASPHALT) NO RECORDED EASEMENT FOUND BY SURVEYOR (GRADE CROSSING 722752T).
EXISTING DITCH MEANDERS ALONG PROPERTY LINE
HAWKINS D.B. 647, PG. 77
NORTH
S21°30'13"W 100.44' (TIE DOWN)
S73°52'52"E 707.07'
N73°52'52"W 1926.84' (TIE DOWN FROM EPK TO EPK ON CL OF RAILROAD TRACK)
N73°52'52"W 182.84'
N18°35'34"E 20.00'
S73°52'52"E 122.61'
N21°30'13"E 1510.47'
EXISTING DITCH
CONSERVATION EASEMENT
S15°55'23"W 891.87'
N15°55'23"E 938.84'
EXISTING 12' WIDE SOIL ROAD
HEATH FAMILY FARMS, LLC D.B. 1851, PG. 928 P.C. C, SL. 131-E
ACCESS EASEMENT 1 NEW 20' ACCESS EASEMENT (0.632 ACRES ± BY COMPUTER)
N21°30'13"E 1510.47' (TIE DOWN) (PROPERTY LINE)
NCGS MARKER "DOVER AZ 1976" GRID FACTOR: 0.9998760795 N=536,053.9159 E=2,476,971.1795 HORIZONTAL CROSS DISTANCES (GRID UNLESS OTHERWISE NOTED.
"A"
S65°12'30"E 12,280.31ft (GRID) (TIE DOWN)
NC GRID COORDINATE N=531,090.2295 E=2,482,215.5565
EIP "B" 1" O.D. IRON PIPE 0.75' ABOVE GRADE
WEYERHAEUSER CO. D.B. 1046, PG. 182 M.B. 7, PG. 44 M.B. 7, PG. 98
N21°45'40"E 4,604.42' (TIE DOWN) (PROPERTY LINE)
BUGGY AXLE 3.5' ABOVE GRADE
N21°45'40"E 219.62'
N71°04'43"W 866.03'
N71°04'39"W 719.43'
EXISTING 100' PROGRESS ENERGY UTILITY EASEMENT (50' ON EACH SIDE OF UTILITY LINES) PER P.C. C, SL. 131-E
S74°04'37"E 20.00'
N15°55'23"E 98.00'
S15°55'23"W 116.98'
S71°04'39"E 171.56'
N71°04'39"W 171.55'
S15°53'39"W 672.28'
N15°53'39"E 641.39'
S15°55'23"W 899.67'
N15°55'23"E 640.64'
HEATH FAMILY FARMS, LLC D.B. 1851, PG. 928 P.C. C, SL. 131-E
FUTURE ACCESS EASEMENT 2 NEW 20' ACCESS EASEMENT (1.41 ACRES± BY COMPUTER) NOT SHOWN PAST THIS POINT. SEE MAP ENTITLED: "CONSERVATION EASEMENT FOR RESTORATION SYSTEMS, LLC & HEATH FAMILY FARMS, LLC, WOMO'S THICKET RIPARIAN BUFFER MITIGATION SITE" TO BE RECORDED AT THE SAME TIME AS THIS PLAT.
EIP 3" O.D. IRON PIPE 1.0' ABOVE GRADE
EIP 2" O.D. PUMP PIPE 0.2' ABOVE GRADE
LEGEND:
EIS – Existing Iron Stake
EIP – Existing Iron Pipe
NNC – Non Monumented Corner
ECM – Existing Concrete Monument
R/W – Right-Of-Way
UP – Utility Pole
EOP – Edge Of Pavement
N/F – Now or Formerly
ECRM – Existing Concrete R/W Monument
EPK – Existing PK Nail
PKS – PK Nail Set
IPS – Iron Pipe Set (1" O.D.)
ERRS – Existing Railroad Spike
CC – Control Corner
D.B. – Deed Book
PG. – Page
NCDOT – North Carolina Department of Transportation No. 5 Rebar with Yellow Plastic Cap Inscribed: "Conservation Easement"
ISS – Flush with Grade & Witnessed by Metal Fence Post (4'-4.5' Above Grade) set 1'± from ISS.
NCSR – North Carolina Secondary Road
HWY – Highway
RCP – Reinforced Concrete Pipe
BRG. – Bearing
FEMA – Federal Emergency Management Agency
CL – Center Line
PPS – Pump Pipe Set 4" O.D. Galvanized
○ – Non Monumented Corner Unless Otherwise Noted
E/B – Easement Boundary
CC – Control Corner
Property Line
Center Line of Road
Adjoiner Line
Tie Down Line
Railroad
Access Easement
Railroad Corridor
Utility Easement
CONSERVATION EASEMENT FOR RESTORATION SYSTEMS, LLC & HEATH FAMILY FARMS, LLC
HEATH RIPARIAN BUFFER MITIGATION SITE
NUMBER THREE TOWNSHIP CRAVEN COUNTY NORTH CAROLINA
200 100 0 200 400 800
GRAPHIC SCALE 1" =200'

Appendix B
EEP Floodplain Checklist

EEP Floodplain Requirements Checklist

This form was developed by the National Flood Insurance program, NC Floodplain Mapping program and Ecosystem Enhancement Program to be filled for all EEP projects. The form is intended to summarize the floodplain requirements during the design phase of the projects. The form should be submitted to the Local Floodplain Administrator with three copies submitted to NFIP (attn. Edward Curtis), NC Floodplain Mapping Unit (attn. John Gerber) and NC Ecosystem Enhancement Program.

Project Location

Name of project:	Heath Riparian Buffer Mitigation Site
Name if stream or feature:	Unnamed tributaries to Core Creek
County:	Craven
Name of river basin:	Neuse 03020202080010
Is project urban or rural?	rural
Name of Jurisdictional municipality/county:	Craven County
DFIRM panel number for entire site:	4582
Consultant name:	Barrett Jenkins
Phone number:	919-334-9118
Address:	1101 Haynes Street, Suite 211 Raleigh, NC 27604

Design Information

Restoration Systems, L.L.C. has contracted with EEP (FDP contract #002280) through the Full Delivery Process (RFP #16-001383) to provide 60 Riparian Buffer Mitigation Units through the completion of the **Heath Riparian Buffer Mitigation Site** (Site) located approximately 3.4 miles southeast of Dover in Craven County. The Site encompasses 60.632-acres of land, which has been ditched and cleared for row crop production. The Site is situated along unnamed tributaries to Core Creek, a major tributary to the Neuse River. The Site is located within DWQ sub-basin 03-04-08 of the Neuse River Basin and is encompassed within USGS 14-digit Hydrologic Unit and Targeted Local Watershed 03020202080010. The primary goals of this buffer restoration project focus on improving water quality, enhancing flood attenuation, and restoring aquatic and riparian habitat. Restoration activities include recording of a permanent conservation easement and reforestation of Site. There are no stream or wetland restoration components to the project, only buffer restoration.

Floodplain Information

Is project located in a Special Flood Hazard Area (SFHA)?

○ Yes ◉ No

If project is located in a SFHA, check how it was determined:

☐ Redelineation

☐ Detailed Study

☐ Limited Detail Study

☐ Approximate Study

☐ Don't know

List flood zone designation:

Check if applies:

☐ AE Zone

- ○ Floodway
- ○ Non-Encroachment
- ◉ None

☐ A Zone

- ○ Local Setbacks Required
- ○ No Local Setbacks Required

If local setbacks are required, list how many feet:

Does proposed channel boundary encroach outside floodway/non-encroachment/setbacks?

○ Yes ◉ No

Land Acquisition (Check)

☐ State owned (fee simple)

☐ Conservation easment (Design Bid Build)

☑ Conservation Easement (Full Delivery Project)

Note: if the project property is state-owned, then all requirements should be addressed to the Department of Administration, State Construction Office (attn: Herbert Neily, (919) 807-4101)

Is community/county participating in the NFIP program?

◉ Yes ○ No

Note: if community is not participating, then all requirements should be addressed to NFIP (attn: Edward Curtis, (919) 715-8000 x369)

Name of Local Floodplain Administrator: Chad Strawn
Phone Number: 252 636 6618

Floodplain Requirements

This section to be filled by designer/applicant following verification with the LFPA

☑ No Action

☐ No Rise

☐ Letter of Map Revision

☐ Conditional Letter of Map Revision

☐ Other Requirements

List other requirements:

Comments:

Name: Barrett Jenkins Signature: [signature]

Title: Project Manager Date: 4/19/2010

Appendix C
DWQ Buffer Interpretation/Clarification #2008-019

Michael F. Easley
Governor

William G. Ross, Jr., Secretary
Department of Environment and Natural Resources

Coleen, H. Sullins, Director
Division of Water Quality

August 19, 2008
Buffer Interpretation/Clarification #2008-019

MEMORANDUM

RE: The Division of Water Quality's (DWQ's) stance on whether diffuse flow of stormwater through the newly restored buffers on mitigation sites should be a requirement. Diffuse flow is a requirement for buffer restoration or enhancement in the Neuse River Basin Buffer Rule 15A NCAC 02B.0242(9)(d)(iii), the Tar-Pamlico River Basin Buffer Rule 15A NCAC 02B.0260(9)(d)(iii), and the Catawba River Basin Buffer Rule 15A NCAC 02B.0244 (9)(d)(iii).

Diffuse flow is a requirement for all sites in a buffered basin for buffer mitigation and for for sites providing nutrient offset credit as well.

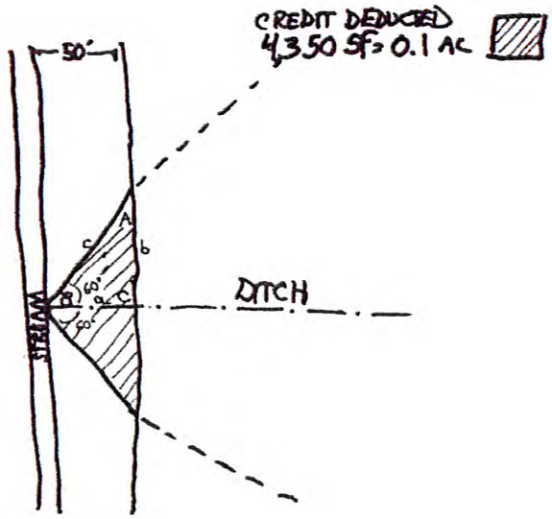
Current Policy: According to the Mitigation rules in the Neuse, Tar-Pamlico and Catawba buffer rules, a grading plan must be provided for buffer mitigation sites. In addition, those rules state that "The site shall be graded in a manner to ensure diffuse flow through the riparian buffer".

Problem: The question has been raised as to whether stormwater carried by lateral ditches that enter buffered streams should provide diffuse flow prior to that stormwater entering the restored buffers.

Solution: The Neuse, Tar-Pamlico and Catawba buffer rules with respect to buffer mitigation sites contain a very clear requirement that states that diffuse flow of stormwater must be maintained through the buffer. Unless otherwise approved by DWQ, all buffer mitigation sites must provide diffuse flow of stormwater from ditches and similar conveyances through the restored buffer.

Where such diffuse flow cannot be attained and where DWQ agrees that such treatment is not possible, deduction of buffer credit will be calculated as follows:

SCENARIO 1



401 Wetlands Certification Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1650
2321 Crabtree Boulevard, Suite 250, Raleigh, North Carolina 27604
Phone: 919-733-1786 / FAX 919-733-6893 / Internet: http://h2o.enr.state.nc.us/ncwetlands

A, B and C are angles. a, b, and c are distances (lengths)

DWQ believes that using an immediate drainage area extending at a 60-degree angle from the point of discharge to the stream is a reasonable approach to the issue of determining the area which is not draining through the restored buffer. To calculate the area of buffer being "short-circuited" by the ditch, the area of the right triangles shown in the figure above must be determined.

a = 50'
A = 30°
B = 60°

b = a cot A
b = 50 (1.732)
b = 86.6' (87')

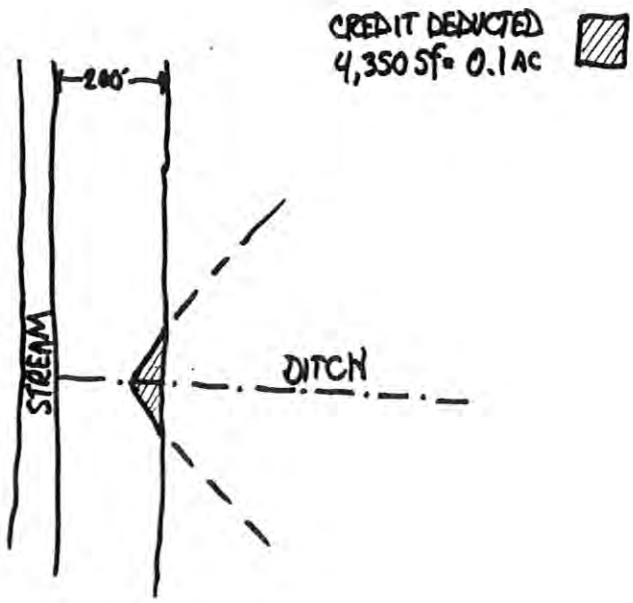
The area to be excluded from credit would be the area of the two right triangles:

Area = (a x b)/2
Area = (50 feet x 87feet)/2
Area = 2,175 SF

Total deducted area = 2,175 x 2 = 4,350 SF or 0.1 acres.

The example shown above assumes a buffer width of 50 feet from the top of bank (riparian buffer mitigation site). For nutrient offset sites, credit can be generated out to 200 feet from the top of bank. The policy applies to sites with larger buffers as follows:

SCENARIO 2



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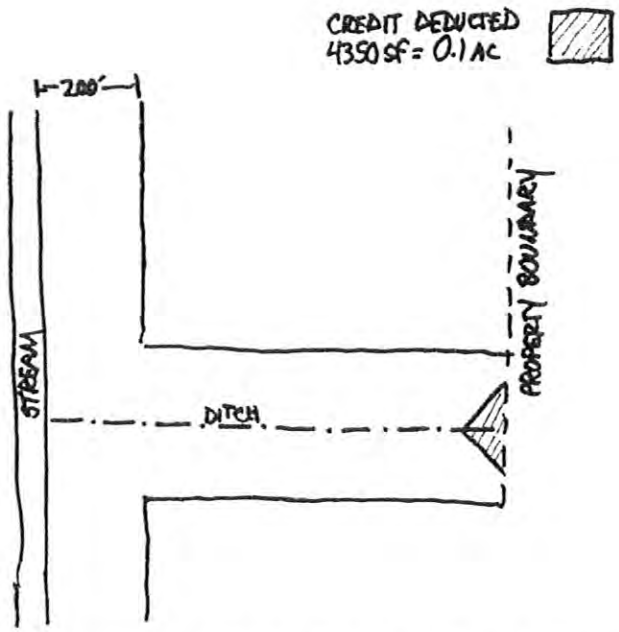
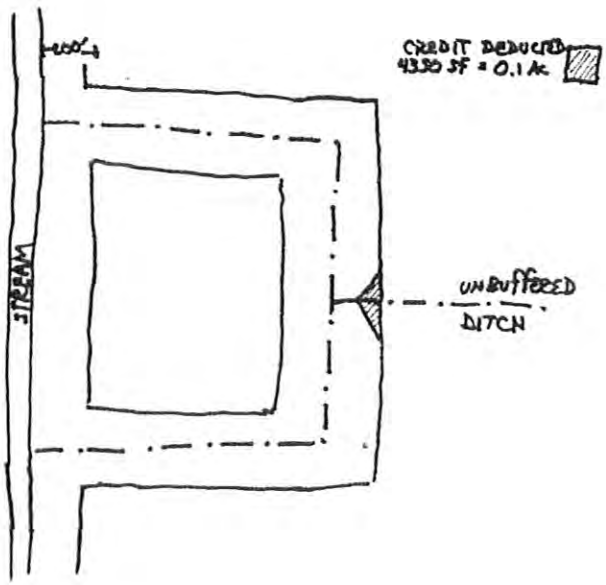
If a ditch leading to a buffered stream is buffered, then no credit is deducted from the stream buffer. If the upstream origin of the ditch is within the buffer, no credit is deducted. If the upstream origin of the ditch is not buffered (e.g. if the ditch begins upstream offsite), the credit deduction is applied to the most upstream portion of the ditch on the property.

SCENARIO 3



Where a network of interconnecting ditches occurs on a site, and all of the ditches are buffered, the only credit deduction would be at the point where an unbuffered ditch enters the project:

SCENARIO 4



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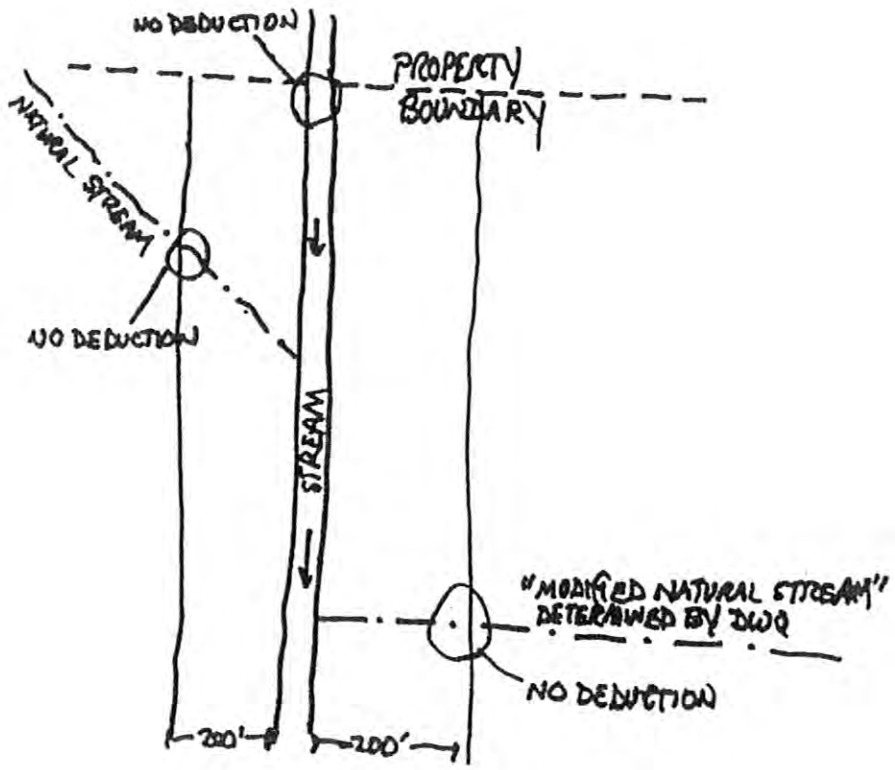
Where a natural stream enters the project site, no deduction of credit will occur. Also, when a natural stream or a modified natural stream flow into a buffered stream, no deduction of credit will occur. The modified natural stream must be subject to the buffer rules, and must be verified to be a modified natural stream (as opposed to a ditch) through an on-site determination by DWQ personnel.

SCENARIO 5



For any additional questions or clarifications on this issue, please contact Eric Kulz or Amy Chapman at (919) 733-1786.

Signature: _____ Date: 8/19/2008

Signature: _____ Date: 8/19/2008

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