

NATURAL RESOURCES TECHNICAL REPORT

**Replace Bridge No.'s 133 & 134 on SR 1722 (Three Bridge Road) over Black River
Harnett County, North Carolina**

**TIP B-4544
WBS Element No. 38406.1.2**



**THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Project Development and Environmental Analysis Unit
Natural Environment Section**

June 2013

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1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) proposes to replace bridge numbers 133 and 134 on SR 1722 (Three Bridge Road) over the Black River (TIP B-4544) in Harnett County (Figure 1). The following Natural Resources Technical Report (NRTR) has been prepared to assist in the preparation of a Categorical Exclusion (CE) for the proposed project.

2.0 METHODOLOGY AND QUALIFICATIONS

All work was conducted in accordance with the NCDOT Natural Environment Section standard operating procedures and July 2012 NRTR template. Field work was conducted on March 5, 2013. Jurisdictional areas identified in the study area have not yet been verified by the U.S. Army Corps of Engineers (USACE) or North Carolina Division of Water Quality (NCDWQ). The principal personnel contributing to this document were:

Principal

Investigator: Brian Dustin
Education: B.S. Forestry, 2003
Experience: Environmental Scientist, Mulkey, Inc. 2007 - 2008; 2010 - Present
Environmental Biologist, H.W. Lochner 2003 -2007
Responsibilities: Wetland and stream delineations, stream assessment, GPS, natural community assessment; protected species habitat surveys

Additional personnel who contributed to portions of the field work and/or documentation for this project were Christopher Dustin and Mark Mickley. Appendix D lists the qualifications of these contributors.

3.0 PHYSICAL RESOURCES

The study area lies in the coastal plain physiographic region of North Carolina (Figure 2). Topography in the project vicinity ranges from gently rolling hills to flat, well-defined stream valleys. The elevation of the study area is constant at approximately 180 feet above mean sea level. Land use in the project vicinity consists primarily of agriculture interspersed with rural residences along roadways and forestland along stream corridors. Some commercial development and denser residential development occurs southeast of the study area near Dunn, NC.

3.1 Soils

The Harnett County Soil Survey identifies four soil types within the study area (Table 1).

Table 1. Soils in the study area

Soil Series	Mapping Unit	Drainage Class	Hydric Status
Altavista fine sandy loam, 0-3% slopes	AtA	Moderately Well Drained	Nonhydric
Augusta fine sandy loam	Au	Somewhat Poorly Drained	Hydric*
Roanoke loam	Ro	Poorly Drained	Hydric
Wehadkee loam	Wh	Poorly Drained	Hydric

* - Soils which are primarily nonhydric, but which may contain hydric inclusions

3.2 Water Resources

Water resources in the study area are part of the Cape Fear River basin [U.S. Geological Survey (USGS) Hydrologic Unit 03030004]. One stream, Black River, is shown as a perennial stream on the Dunn USGS quadrangle map; however, conditions at the site were that of a wetland/stream complex or flowing swamp system (Table 2). The approximate location of Black River is shown in Figure 3. The physical characteristics of this stream are provided in Table 3.

Table 2. Water resources in the study area

Stream Name	*Map ID	NCDWQ Index Number	Best Usage Classification
Black River	Black River	18-68-12-1	C;Sw

* Mapped location approximated from aerial photography due to flooded/swamp condition during field investigations.

Table 3. Physical characteristics of water resources in the study area

Map ID	*Bank Height (ft)	*Bankful Width (ft)	Water Depth (in)	Channel Substrate	Velocity	Clarity
Black River	n/a	n/a	36-48	Sand	Moderate	Clear

* To be determined by NCDOT Location Surveys at a later date due to flooded/swamp condition during field investigations.

There are no designated NC Wildlife Resources Commission (NCWRC) trout waters, anadromous fish waters, or Primary Nursery Areas (PNA) within 1.0 mile downstream of the study area. There are no High Quality Waters (HQW), Outstanding Resource Waters (ORW), water supply watersheds (WS-I or WS-II) or North Carolina 303(d) listed streams within 1.0 mile downstream of the study area. Additionally, there are no benthic and/or fish monitoring sites within 1.0 mile downstream of the study area.

One pond is located in the study area in the southeast quadrant (Figure 3). This pond consists of an artificially excavated pit that is sustained by high groundwater levels. Approximately 0.03 acres of the pond are located in the study area. It has a surface water connection to Wetland WA and ultimately the Black River outside of the study area.

4.0 BIOTIC RESOURCES

4.1 Terrestrial Communities

Two terrestrial communities were identified in the study area: maintained/disturbed and coastal plain bottomland hardwood forest. Figure 4 shows the location and extent of these terrestrial communities in the study area. A brief description of each community type follows. Scientific names of all species identified are included in Appendix B.

4.1.1 Maintained/Disturbed

Maintained/disturbed areas are present throughout the study area, exclusively along roadside shoulders where the vegetation is periodically mowed. The vegetation in this community is comprised of low growing grasses and herbs, including fescue, clover, wild onion, broomsedge, and henbit. Vines include greenbrier and Japanese honeysuckle.

4.1.2 Coastal Plain Bottomland Hardwood Forest (Brownwater Subtype)

The coastal plain bottomland hardwood forest (brownwater subtype) occurs in the study area along the Black River. Dominant tree species include sweet gum, red maple, loblolly pine, and yellow poplar. Dominant species in the shrub/sapling layer include American holly, Chinese privet, and spicebush. The herb layer consists of netted chain fern and sedges. Vines include greenbrier and Japanese honeysuckle. Wetland WA occurs within this community and is classified as a bottomland hardwood forest using the North Carolina Wetland Assessment Method (NCWAM) classification.

4.1.3 Terrestrial Community Impacts

Terrestrial communities in the study area may be impacted by project construction as a result of grading and paving of portions of the study area. At this time, decisions regarding the final location and design of the proposed bridge replacement have not been made. Therefore, community data are presented in the context of total coverage of each type within the study area (Table 4). Once a final alignment and preliminary design have been determined, probable impacts to each community type will be calculated.

Table 4. Coverage of terrestrial communities in the study area

Community	Coverage (ac.)
Maintained/ Disturbed	2.1
Coastal Plain Bottomland Forest	4.8
Total	6.9

4.2 Terrestrial Wildlife

Terrestrial communities in the study area are comprised of both natural and disturbed habitats that may support a diversity of wildlife species (those species actually observed are indicated with *). Mammal species that commonly exploit forested habitats and stream corridors found within the study area include species such as beaver*, eastern cottontail, raccoon, Virginia opossum, and white-tailed deer. Birds that commonly use

forest and forest edge habitats include the American crow*, blue jay, Carolina chickadee, and tufted titmouse. Birds that may use the open habitat, wetlands, or water bodies within the study area include belted kingfisher, turkey vulture, great blue heron*, Canada goose*, and wood ducks*. Reptile and amphibian species that may use terrestrial communities located in the study area include the black racer, eastern box turtle, eastern fence lizard, and five-lined skink.

4.3 Aquatic Communities

Aquatic communities in the study area consist of forested swamp and one pond. The slow moving water in the swamp forest could support various fish, reptiles, and amphibian species. Species that might exist in the swamp include bowfin, chain pickerel, carp, snapping turtle, crayfish, bullfrogs, green tree-frog, brown watersnake, cottonmouth, and redbelly watersnake. Pond habitats could support bluegill, catfish, bullfrog, and banded water snake.

4.4 Invasive Species

Two species from the NCDOT Invasive Exotic Plant List for North Carolina were found to occur in the study area. The species identified were Chinese privet (Threat) and Japanese honeysuckle (Moderate Threat). NCDOT will manage invasive plant species as appropriate.

5.0 JURISDICTIONAL ISSUES

5.1 Clean Water Act Waters of the U.S.

One jurisdictional stream, Black River, is identified in the study area as a perennial stream on the Dunn USGS quadrangle map (Table 5). The approximate location of this stream is shown on Figure 3. The physical characteristics and water quality designations of this jurisdictional stream are detailed in Section 3.2. Black River has been designated as warm water streams for the purposes of stream mitigation.

Table 5. Jurisdictional characteristics of water resources in the study area

Map ID	*Length (ft.)	Classification	Compensatory Mitigation Required	River Basin Buffer
Black River	n/a	Perennial	Yes	Not Subject

* To be determined by NCDOT Location Surveys at a later date due to flooded/swamp condition during field investigations.

One jurisdictional wetland was identified within the study area (Figure 3). Wetland classification and quality rating data are presented in Table 6. The wetland in the study area is within the Cape Fear River basin (USGS Hydrologic Unit 03030004). USACE wetland delineation forms and NCDWQ wetland rating forms for this site are included in Appendix C. Descriptions of the terrestrial community at this wetland site are presented in Section 4.1. Wetland WA is included within the coastal plain bottomland hardwood forest community.

Table 6. Jurisdictional characteristics of wetlands in the study area

Map ID	NCWAM Classification	Hydrologic Classification	NCDWQ Wetland Rating	Area (ac.)
WA	Bottomland Hardwood Forest	Riparian	67	3.2

5.2 Clean Water Act Permits

The proposed project has been designated as a Categorical Exclusion (CE) for the purposes of National Environmental Policy Act (NEPA) documentation. As a result, a Nationwide Permit (NWP) 23 will likely be applicable. A NWP No. 33 may also apply for temporary construction activities such as stream dewatering, work bridges, or temporary causeways that are often used during bridge construction or rehabilitation. The USACE holds the final discretion as to what permit will be required to authorize project construction. If a Section 404 permit is required then a Section 401 Water Quality Certification (WQC) from the NCDWQ will be needed.

5.3 Coastal Area Management Act Areas of Environmental Concern

The project is not in a Coastal Area Management Act (CAMA) county and therefore this project will not require a CAMA permit.

5.4 Construction Moratoria

The Black River is not designated as trout waters, anadromous fish spawning area, or primary nursery area within the project study area. Therefore, no construction moratoria apply.

5.5 N.C. River Basin Buffer Rules

The project does not occur within a buffered basin; therefore no NC River Basin Buffer Rules apply to the project.

5.6 Rivers and Harbors Act Section 10 Navigable Waters

There are no streams within the study area designated by the USACE as a Navigable Water under Section 10 of the Rivers and Harbors Act.

5.7 Wetland and Stream Mitigation

5.7.1 Avoidance and Minimization of Impacts

There are no North Carolina 303(d) listed streams, High Quality Waters or Outstanding Resource Waters within the project study area or within 1.0 mile of the project study area.

The NCDOT will attempt to avoid and minimize impacts to wetlands to the greatest extent practicable in choosing a preferred alternative and during project design. At this

time, no final decisions have been made with regard to the location or design of the preferred alternative.

5.7.2 Compensatory Mitigation of Impacts

The NCDOT will investigate potential on-site stream and wetland mitigation opportunities once a final decision has been rendered on the location of the preferred alternative. If on-site mitigation is not feasible, mitigation will be provided by North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP).

5.8 Endangered Species Act Protected Species

As of September 22, 2010 the United States Fish and Wildlife Service (USFWS) lists three federally protected species for Harnett County (Table 7). A brief description of each species' habitat requirements follows, along with the Biological Conclusion rendered based on survey results in the study area. Habitat requirements for each species are based on the current best available information from referenced literature and/or USFWS.

Table 7. Federally protected species listed for Harnett County.

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	No	No Effect
<i>Notropis mekistocholas</i>	Cape Fear shiner	E	No	No Effect
<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E	No	No Effect

E - Endangered

Red-cockaded woodpecker

USFWS Recommended Survey Window: year round; November-early March (optimal)

Habitat Description: The red-cockaded woodpecker (RCW) typically occupies open, mature stands of southern pines, particularly longleaf pine, for foraging and nesting/roosting habitat. The RCW excavates cavities for nesting and roosting in living pine trees, aged 60 years or older, which are contiguous with pine stands at least 30 years of age to provide foraging habitat. The foraging range of the RCW is normally no more than 0.5 mile.

Biological Conclusion: No Effect

Suitable foraging habitat for RCW consisting of pine and mixed pine stands greater than 30 years old does not exist within the study area. No RCW cavity trees were observed during site review. A review of North Carolina Natural Heritage Program (NCNHP) records, updated April 2013 indicates no known RCW occurrence within 1.0 mile of the study area.

Cape Fear shiner

USFWS optimal survey window: year round

Habitat Description: The Cape Fear shiner is generally associated with gravel, cobble, and boulder substrates, and has been observed in slow pools, riffles, and slow runs. These areas occasionally support water willow (*Justicia americana*), which may be used as cover or protection from predators (e.g. flathead catfish (*Pylodictis olivaris*), bass (*Micropterus spp.*) and crappie (*Pomoxis spp.*)). The Cape Fear shiner can be found swimming in schools of other minnow species but is never the most abundant species. During the spawning season, May through July, the Cape Fear shiner adults move to slower flowing pools to lay eggs on the rocky substrate. Juveniles are often found in slack water, among large rock outcrops of the midstream, and in flooded side channels and pools. Cape Fear shiners are sexually mature after their first year, and are known to live up to 6 years in captivity.

Biological Conclusion: No Effect

Suitable habitat for Cape Fear shiner consisting of slow pools, riffles, and slow runs over a substrate of gravel, cobble, or boulder does not exist within the study area. A review of NCNHP records, updated April 2013 indicates no known Cape Fear shiner occurrence within 1.0 mile of the study area.

Rough-leaved loosestrife

USFWS Recommended Survey Window: May-June

Habitat Description: Rough-leaved loosestrife, endemic to the Coastal Plain and Sandhills of North and South Carolina, generally occurs in the ecotones or edges between longleaf pine uplands and pond pine pocosins in dense shrub and vine growth on moist to seasonally saturated sands and on shallow organic soils overlaying sand (spodosolic soils). Occurrences are found in such disturbed habitats as roadside depressions, maintained power and utility line rights-of-way, firebreaks, and trails. The species prefers full sunlight, is shade intolerant, and requires areas of disturbance (e.g., clearing, mowing, periodic burning) where the overstory is minimal. It can, however, persist vegetatively for many years in overgrown, fire-suppressed areas. Blaney, Gilead, Johnston, Kalmia, Leon, Mandarin, Murville, Torhunta, and Vaucluse are some of the soil series that the plant occurs on.

Biological Conclusion: No Effect

Suitable habitat for rough-leaved loosestrife consisting of ecotones or edges between longleaf pine uplands and pond pine pocosins, roadside depressions, maintained power and utility line rights-of-way, firebreaks, and trails is not present in the study area. A review of NCNHP records, updated April 2013 indicates no known rough-leaved loosestrife occurrence within 1.0 mile of the study area.

5.9 Bald Eagle and Golden Eagle Protection Act

Habitat for the bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large dominant trees are utilized for nesting sites, typically within 1.0 mile of open water.

A desktop-GIS assessment of the project study area, as well as the area within a 1.13-mile radius (1.0 mile plus 660 feet) of the project limits, was performed on April 16, 2013 using 2013 color aerials. No water bodies large enough or sufficiently open to be considered potential feeding sources were identified. Since there was no foraging habitat within the review area, a survey of the project study area and the area within 660 feet of the project limits was not conducted. Additionally, a review of NCNHP records, updated April 2013 revealed no known occurrences of this species within 1.0 mile of the project study area. Due to the lack of habitat, known occurrences, and minimal impact anticipated for this project, it has been determined that this project will not affect this species.

5.10 Endangered Species Act Candidate Species

As of September 22, 2010 the USFWS lists no Candidate species for Harnett County.

5.11 Essential Fish Habitat

The National Marine Fisheries Service (NMFS) has not identified any streams within the project study area as an Essential Fish Habitat.

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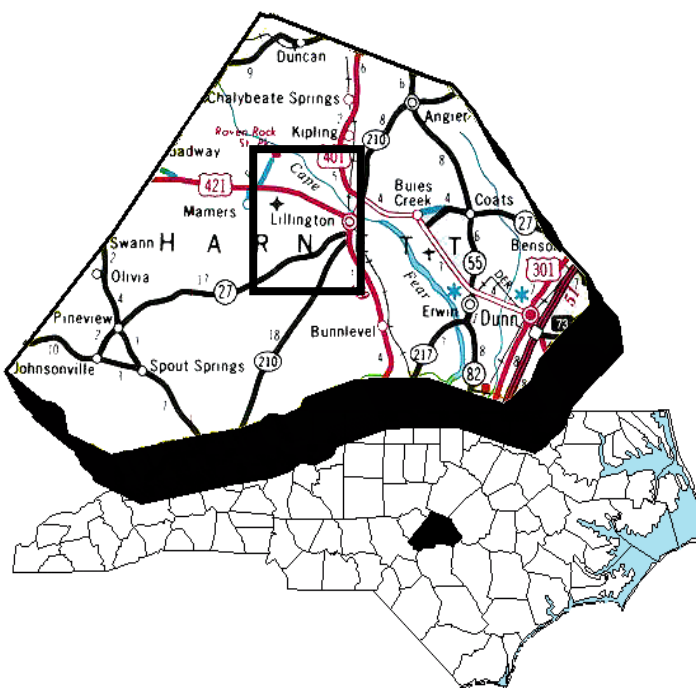
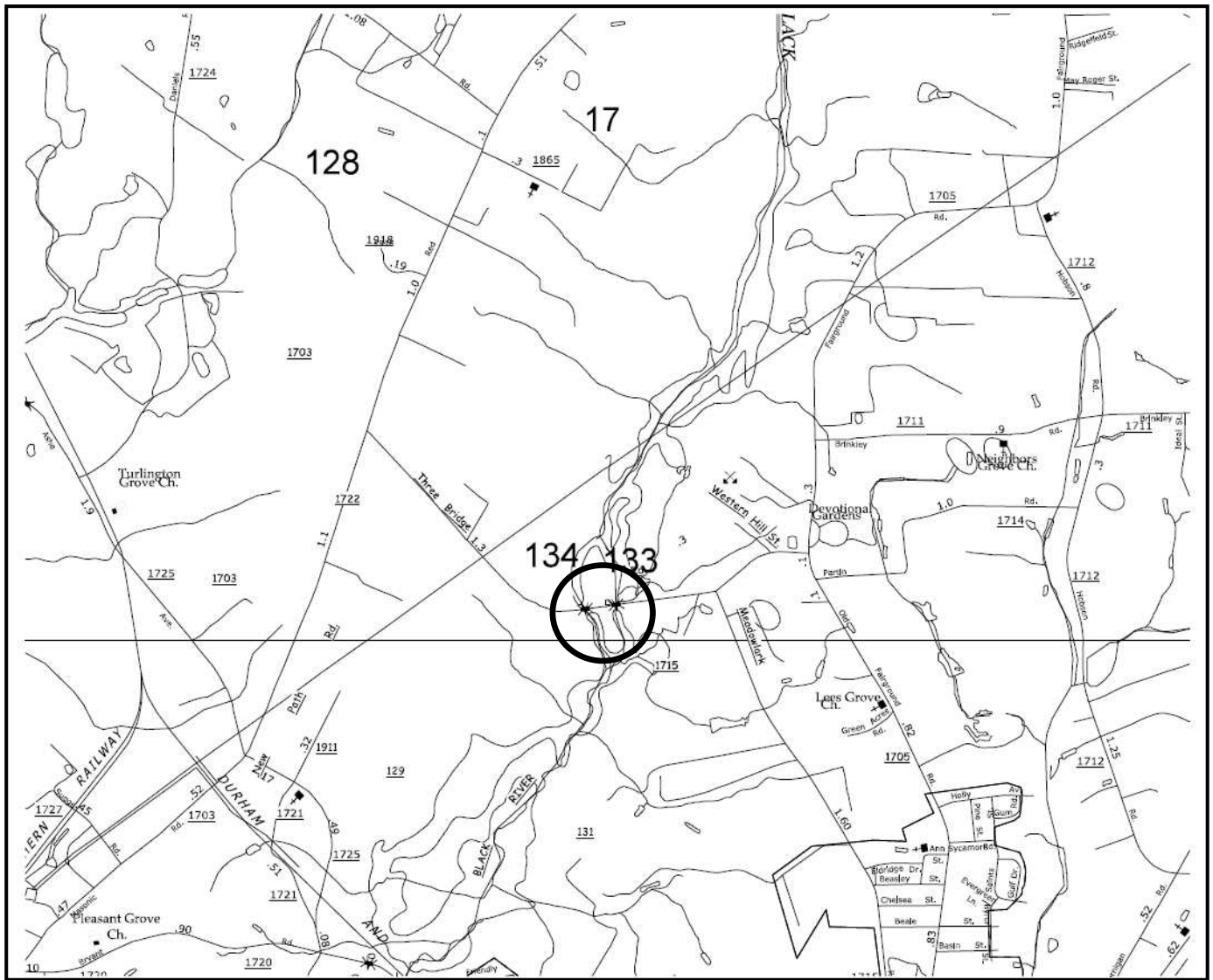
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Appendix A

Figures



	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS BRANCH
HARNETT COUNTY REPLACE BRIDGE NO.'S 133 & 134 ON SR 1722 OVER BLACK RIVER B-4544	

Figure 1



This Exhibit is for planning purposes only and information shown hereon does not meet NC 47-30 Requirements and therefore is not for design, construction, or recording or transfer of title. The Exhibit was compiled from available information obtained from the sources listed below. Streams and Wetlands: All features located in the field were recorded using a mapping grade Trimble GeoXT or GeoXH GPS receiver with supposed sub-meter accuracy.

Sources:
Study Limits: NCDOT Topo Maps: USGS



Legend



B-4544 Study Area



0 500 1,000
Feet

Figure 2

Project Study Area
B-4544 Bridge Replacement Project
Harnett County, North Carolina

Mapped location of Black River is approximated from aerial photography due to flooded/swamp conditions at the time of field investigations. Final extents of Black River will be determined by NCDOT Location Surveys at a future date.



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Sources:
Study Limits: NCDOT Imaginary: ESRI



- Legend**
- B-4544 Study Area
 - B-4544 Streams
 - B-4544 Wetlands
 - B-4544 Ponds
 - B-4544 Wetland Points
 - B-4544 Surface Points
 - + B-4544 Wetland Sample
 - + B-4544 Upland Sample

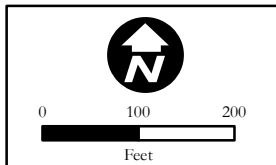
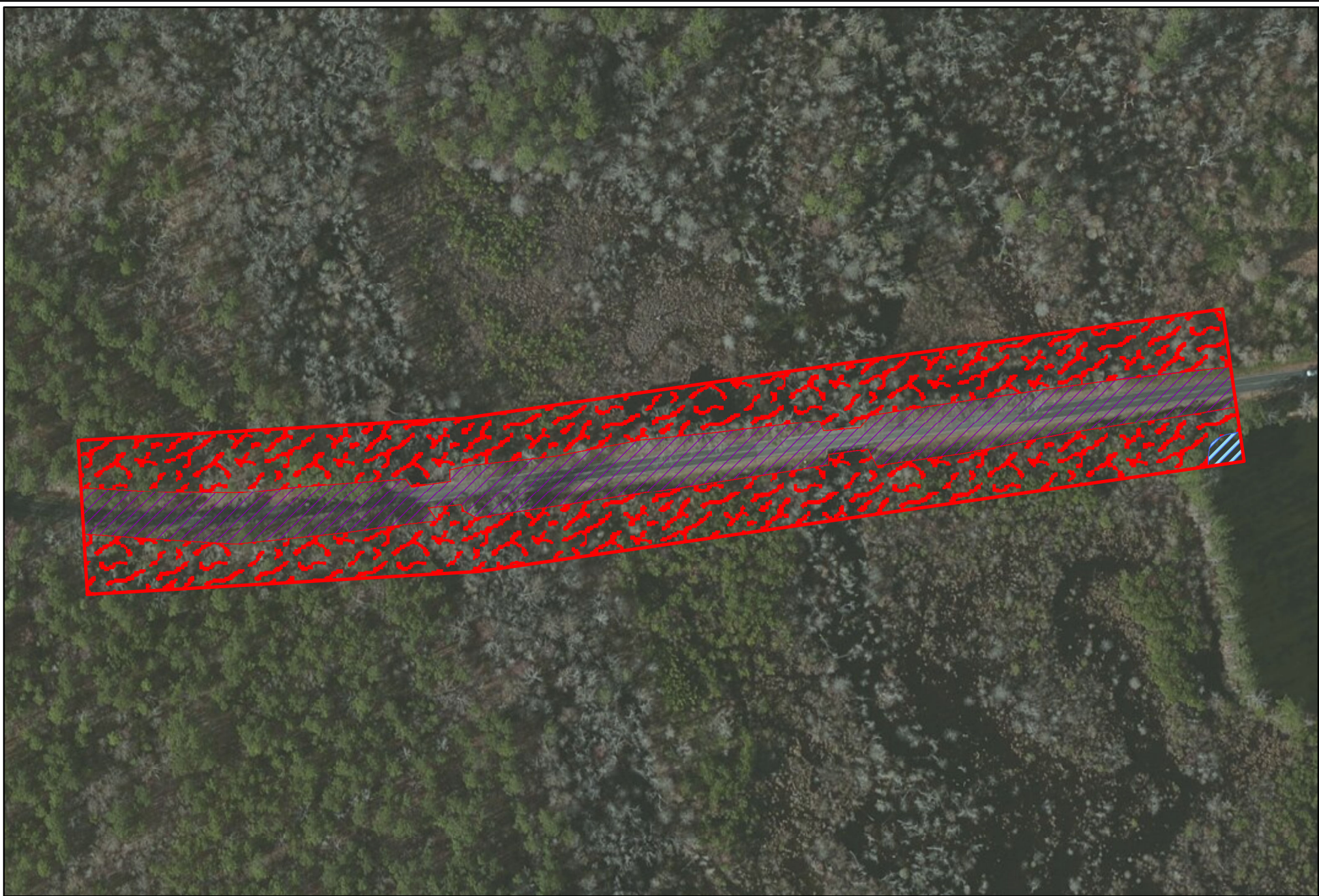


Figure 3
Jurisdictional Features
B-4544 Bridge Replacement Project
Harnett County, North Carolina



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Sources:
Study Limits: NCDOT Imaginary: ESRI



Legend

- | | | | |
|---|----------------------|---|------------------------------------|
|  | B-4544 Study Area |  | Coastal Plain Bottomland Hardwoods |
|  | Maintained/Disturbed |  | Open Water |



0 100 200
Feet

Figure 4
Terrestrial Communities
B-4544 Bridge Replacement Project
Harnett County, North Carolina

Appendix B

Scientific Names of Species Identified in Report

Plants

Common Name

American holly
Broomsedge
Chinese privet
Clover
Fescue
Greenbrier
Henbit
Japanese honeysuckle
Loblolly pine
Netted chain-fern
Red maple
Sedge
Spicebush
Sweet gum
Water willow
Wild onion
Yellow poplar

Scientific Name

Ilex opaca
Andropogon virginicus
Ligustrum sinense
Trifolium sp.
Festuca sp.
Smilax rotundifolia
Lamium amplexicaule
Lonicera japonica
Pinus taeda
Woodwardia areolata
Acer rubrum
Carex spp.
Lindera benzoin
Liquidambar styraciflua
Justicia americana
Allium canadense
Liriodendron tulipifera

Animals

<u>Common Name</u>	<u>Scientific Name</u>
American crow	<i>Corvus brachyrhynchos</i>
Banded watersnake	<i>Nerodia fasciata</i>
Bass	<i>Micropterus spp.</i>
Beaver	<i>Castor canadensis</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Black racer	<i>Coluber constrictor</i>
Bluegill	<i>Lepomis macrochirus</i>
Blue jay	<i>Cyanocitta cristata</i>
Bowfin	<i>Amia calva</i>
Brown watersnake	<i>Nerodia taxispilota</i>
Bullfrog	<i>Rana catesbeiana</i>
Canada goose	<i>Branta canadensis</i>
Carolina chickadee	<i>Poecile carolinensis</i>
Carp	<i>Cyprinus carpio</i>
Catfish	<i>Amelurus sp.</i>
Chain pickerel	<i>Esox niger</i>
Cottonmouth	<i>Agkistrodon piscivorous</i>
Crappie	<i>Pomoxis spp.</i>
Crayfish	<i>Cambaridae spp.</i>
Eastern box turtle	<i>Terrapene carolina</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Eastern fence lizard	<i>Sceloporus undulatus</i>
Five-lined skink	<i>Eumeces anthracinus</i>
Flathead catfish	<i>Pylodictis olivaris</i>
Great blue heron	<i>Ardea herodias</i>
Green tree-frog	<i>Hyla cinerea</i>
Raccoon	<i>Procyon lotor</i>
Redbelly watersnake	<i>Storeria occipitomaculata</i>
Snapping turtle	<i>Chelydra serpentina</i>
Tufted titmouse	<i>Parus bicolor</i>
Turkey vulture	<i>Cathartes aura</i>
Virginia opossum	<i>Didelphis virginiana</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Wood duck	<i>Aix sponsa</i>

Appendix C

Stream and Wetland Forms

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: B-4544 City/County: Harnett Sampling Date: 03/05/2013
 Applicant/Owner: NCDOT State: NC Sampling Point: WA 033_WET
 Investigator(s): Brian Dustin, Mulkey, Inc. Section, Township, Range: Dunn
 Landform (hillslope, terrace, etc.): drainage way Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): LRR P Lat: 35.347822 Long: -78.624353 Datum: NAD 83
 Soil Map Unit Name: Wehadkee loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐	
Wetland Hydrology Present? Yes ☒ No ☐	
Remarks: NCWAM: COASTAL BOTTOMLAND HARDWOOD FOREST HGM CODE: RIVERINE WATERS TYPE: RPWWO	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ Aquatic Fauna (B13) ☒ High Water Table (A2) ☐ Marl Deposits (B15) (LRR U) ☒ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1) ☐ Water Marks (B1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☒ Sediment Deposits (B2) ☐ Presence of Reduced Iron (C4) ☐ Drift Deposits (B3) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Algal Mat or Crust (B4) ☐ Thin Muck Surface (C7) ☐ Iron Deposits (B5) ☐ Other (Explain in Remarks) ☐ Inundation Visible on Aerial Imagery (B7) ☒ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☒ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>6+</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>0</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WA 033_WET

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Liquidambar styraciflua</u> FAC	<u>70</u>	<u>X</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = <u>0</u> FACW species _____ x 2 = <u>0</u> FAC species _____ x 3 = <u>0</u> FACU species _____ x 4 = <u>0</u> UPL species _____ x 5 = <u>0</u> Column Totals: _____ (A) <u>0</u> (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>70</u> = Total Cover 50% of total cover: <u>35</u> 20% of total cover: <u>14</u>				Hydrophytic Vegetation Indicators: <u> </u> 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u> </u> 3 - Prevalence Index is ≤3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)
Sapling/Shrub Stratum (Plot size: <u>15 ft.</u>)				
1. <u>Acer rubrum</u> FAC	<u>25</u>	<u>X</u>	<u>FAC</u>	
2. <u>Liquidambar styraciflua</u> FAC	<u>10</u>	<u>X</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>35</u> = Total Cover 50% of total cover: <u>18</u> 20% of total cover: <u>7</u>				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
Herb Stratum (Plot size: <u>5 ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Woody Vine Stratum (Plot size: <u>30 ft.</u>)
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8.				

SOIL

Sampling Point: WA 033_WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12+	10 YR 2/1	100					sl	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ Organic Bodies (A6) (LRR P, T, U)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)
☐ Muck Presence (A8) (LRR U)
☐ 1 cm Muck (A9) (LRR P, T)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Coast Prairie Redox (A16) (MLRA 150A) ☒
☐ Sandy Mucky Mineral (S1) (LRR O, S)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7) (LRR P, S, T, U)
- ☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Marl (F10) (LRR U)
☐ Depleted Ochric (F11) (MLRA 151)
☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Umbric Surface (F13) (LRR P, T, U)
☐ Delta Ochric (F17) (MLRA 151)
☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR O)
☐ 2 cm Muck (A10) (LRR S)
☐ Reduced Vertic (F18) (outside MLRA 150A,B)
☐ Piedmont Floodplain Soils (F19) (LRR P, S, T)
☐ Anomalous Bright Loamy Soils (F20)
 (MLRA 153B)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: B-4544 City/County: Harnett Sampling Date: 3-5-13
 Applicant/Owner: NCDOT State: NC Sampling Point: WA 033_UP
 Investigator(s): Brian Dustin, Mulkey, Inc. Section, Township, Range: Dunn
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%): 3
 Subregion (LRR or MLRA): LRR P Lat: 35.347877 Long: -78.624027 Datum: NAD 83
 Soil Map Unit Name: Wehadkee loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒	
Wetland Hydrology Present? Yes ☐ No ☒	
Remarks: UPLANDS	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☐ Surface Water (A1) ☐ Aquatic Fauna (B13) ☐ High Water Table (A2) ☐ Marl Deposits (B15) (LRR U) ☐ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1) ☐ Water Marks (B1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☐ Sediment Deposits (B2) ☐ Presence of Reduced Iron (C4) ☐ Drift Deposits (B3) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Algal Mat or Crust (B4) ☐ Thin Muck Surface (C7) ☐ Iron Deposits (B5) ☐ Other (Explain in Remarks) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WA 033_UP

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. Liquidambar styraciflua FAC	15	X	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: 2 (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = 0 FACW species _____ x 2 = 0 FAC species _____ x 3 = 0 FACU species _____ x 4 = 0 UPL species _____ x 5 = 0 Column Totals: _____ (A) 0 (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
15 = Total Cover 50% of total cover: 8 20% of total cover: 3				
Sapling/Shrub Stratum (Plot size: 15 ft.)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: 0 20% of total cover: 0				
Herb Stratum (Plot size: 5 ft.)				
1. _____	_____	_____	_____	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes X No _____
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	Woody Vine Stratum (Plot size: 30 ft.)
12. _____	_____	_____	_____	
_____ = Total Cover 50% of total cover: 0 20% of total cover: 0				
1. Lonicera japonica FAC	10	X	FAC	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes X No _____
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
10 = Total Cover 50% of total cover: 5 20% of total cover: 2				
Remarks: (If observed, list morphological adaptations below). Plot taken on toe slope of road.				

SOIL

Sampling Point: WA 033 UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12+	10 YR 4/6	70	2.5Y 5/6	30	RM	M	c	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ Organic Bodies (A6) (LRR P, T, U)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)
☐ Muck Presence (A8) (LRR U)
☐ 1 cm Muck (A9) (LRR P, T)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Coast Prairie Redox (A16) (MLRA 150A)
☐ Sandy Mucky Mineral (S1) (LRR O, S)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7) (LRR P, S, T, U)

- ☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Marl (F10) (LRR U)
☐ Depleted Ochric (F11) (MLRA 151)
☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Umbric Surface (F13) (LRR P, T, U)
☐ Delta Ochric (F17) (MLRA 151)
☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR O)
☐ 2 cm Muck (A10) (LRR S)
☐ Reduced Vertic (F18) (outside MLRA 150A,B)
☐ Piedmont Floodplain Soils (F19) (LRR P, S, T)
☐ Anomalous Bright Loamy Soils (F20)
 (MLRA 153B)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND RATING WORKSHEET (4th VERSION)

WA

Project Name: B-4544 County: Harnett
 Nearest Road: Three Bridges Rd. Date: 3/5/13
 Wetland Area (ac): 3.18 Wetland Width (ft): 1000-1500
 Name of Evaluator(s): Brian Dustin, Mulkey, Inc.

WETLAND LOCATION: WA

☐ on sound or estuary, pond or lake
☒ on perennial stream
☐ on intermittent stream
☐ within interstream divide
☐ other _____

SOILS:

Soil Series: Wehadkee loam
☐ predominantly organic (humus, muck or peat)
☒ predominantly mineral (non-sandy)
☐ predominantly sandy

HYDRAULIC FACTORS:

☒ freshwater
☐ brackish
☐ steep topography
☐ ditched or channelized
☒ total wetland width $\geq$ 100 feet

ADJACENT LAND USE:

(within 1/2 mile upstream, upslope or radius)
☒ forested/natural vegetation 70 %
☒ agricultural/ urbanized 20 %
☒ impervious surface 10 %
 Adjacent Special Natural Areas _____

DOMINANT VEGETATION:

1 Liquidambar styraciflua
 2 Acer rubrum
 3 _____
 4 _____

FLOODING AND WETNESS:

☒ semipermanently to permanently flooded or inundated
☐ seasonally flooded or inundated
☐ intermittently flooded or temporary surface water
☐ no evidence of flooding or surface water

WETLAND TYPE: (select one)*

☒ Bottomland Hardwood Forest	☐ Bog/Fen
☐ Swamp Forest	☐ Headwater Forest
☐ Carolina Bay	☐ Bog Forest
☐ Pocosin	☐ Ephemeral Wetland
☐ Pine Savannah	☐ Other: _____
☐ Freshwater Marsh	

* The rating system cannot be applied to salt and brackish marshes or stream channels.

DEM RATING

WATER STORAGE	<u>4</u>	X	4	=	<u>16</u>
BANK, SHORELINE STABILIZATION	<u>4</u>	X	4	=	<u>16</u>
POLLUTANT REMOVAL	<u>3</u> *	X	5	=	<u>15</u>
WILDLIFE HABITAT	<u>3</u>	X	2	=	<u>6</u>
AQUATIC LIFE HABITAT	<u>3</u>	X	4	=	<u>12</u>
RECREATION/EDUCATION	<u>2</u>	X	1	=	<u>2</u>
TOTAL WETLAND SCORE =					<u>67</u>

* Add one point if in sensitive watershed and >10% nonpoint disturbance within 1/2 mile upstream, upslope, or radius.

Appendix D

Qualifications of Contributors

Investigator: Mark Mickley
Education: B.S. Biology, 2003
Experience: Environmental Scientist, Mulkey, Inc., 2004-Present
Responsibilities: Document preparation.

Investigator: Christopher Dustin
Education: B.S. Environmental Science, 2009
Experience: Environmental Technician, Mulkey Inc., 2010-Present (Part-Time)
Responsibilities: Document preparation.