

Low/Minimal Impact Bridge Project Data Sheet

	TIP NO	
	WBS	17BP.6.R.43
	County	Columbus
	Bridge Number	230126
	Description	SR1005 over Gum Swamp
Stream	Basin	Lumber
	Classification	C;Sw
	SIN	15-17-1-12-3
	Type (Perennial/Intermittent)	Gum Swamp - Perennial SB - Man-made Tributary to Jurisdictional Water SC -Man-made Tributary to Jurisdictional Water
	Size (bankfull width)	Gum Swamp - 40' SB - 10' SC - 6'
	Existing Structure	Type
	Size	
	Suff. Rating	
Proposed Structure	Type	
	Size (width-out to out)	
Stream	USACE Impacts (Y/N)	Yes
	Non 404 Impacts (Y/N)	No
Wetlands	USACE Impacts (Y/N)	Yes
	Non 404 Impacts (Y/N)	No
	CAMA Impacts (Y/N)	
NC DWQ Buffers	Impacts (Y/N)	
Buffer Application Required (>40 ft) (Y/N)		
NC DWQ StormWater Permit Required (Y/N)		
T&E	Habitat (Y/N)	American alligator - Yes Wood stork - Yes Cooley's meadowrue - Yes Rough-leaved loosestrife - Yes
	Species Present	American alligator - Surveys not required due to T(S/A) designation Wood stork - No Cooley's meadowrue - Undetermined Rough-leaved loosestrife - Undetermined
	Bio Conclusion	American alligator - N/A Wood stork - No Effect Cooley's meadowrue - Unresolved Rough-leaved loosestrife - Unresolved
Moratorium	Type	
	Dates	
Trout Waters	Native/Hatchery	
	Trout Species Present	
	Trout Conditions (Y/N)	
	WRC Reviewer	
CAMA	AECs	
Essential Fish	Habitat (Y/N)	
Nav. Opening		
USCG	Permit	
Historic	Properties	
Archaeological	Resources	
Tribal	Lands	
4(f)	Resources	
6(f) [LWCF]	Resources	
Wild and	Scenic River	No
Forest Service	Lands	
TVA	Area	
FEMA	Buyout	
FEMA	Flood Study	
USTs	Haz Mats	
	Relocatees	
Location (decimal degrees)	LAT	34.203722
	LONG	-78.796537
Project Comments		Marginally suitable habitat for American alligator [T(S/A)] and wood stork (foraging) (T) exists within the study area within Gum Swamp, and wetlands WA, WB, and WC which are riverine swamp forests. No wading birds were observed during field observations, and the understory within the wetlands is dense. Suitable habitat for Cooley's meadowrue (E) and rough-leaved loosestrife (E) is present along the roadside ditches along SR1005. Field investigation was conducted outside of the USFWS survey windows for these plant species. Kimley-Horn staff will conduct surveys for these species during the appropriate survey window. According to NCNHP records (updated July 2014), there are no recorded element occurrences of any of the listed species within the project study area of within 1.0 mile of the study area.
Completed by:	Beth Reed, PWS	
	Consultant Biologist	
Reviewed by:	Kimley-Horn and Associates	
	Consulting Firm	

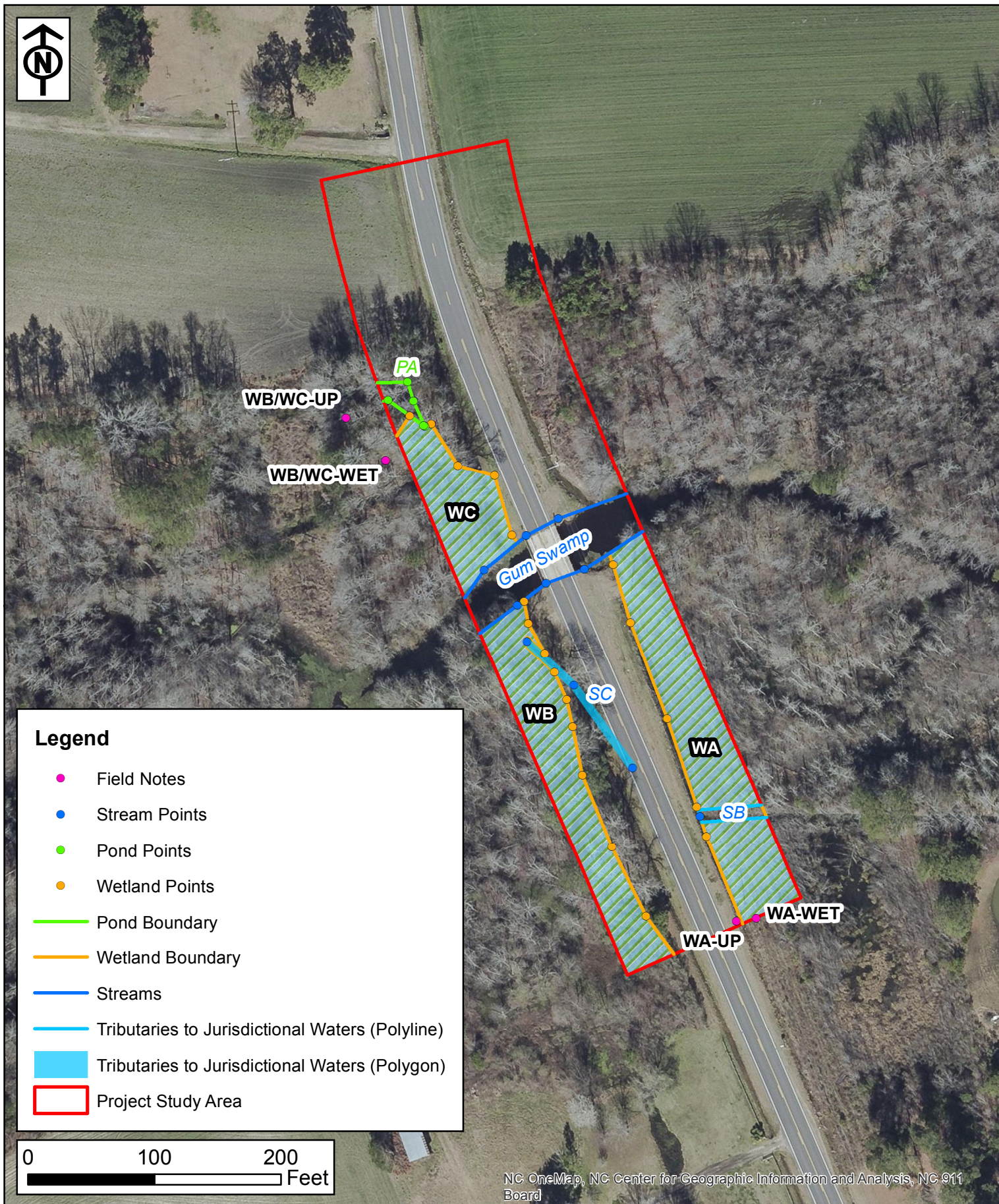


Figure 3: Aerial Image
 Division 6 Bridges - Structure #230126
 Columbus County, NC
 August 2014

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Structure # 230126 City/County: Columbus County Sampling Date: 8/21/2014
 Applicant/Owner: NCDOT State: NC Sampling Point: WA-UP
 Investigator(s): J. Hartshorn (KHA), R. Sullivan (KHA) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Fill slope Local relief (concave, convex, none): None Slope (%): 2%
 Subregion (LRR or MLRA): LRR P Lat: 34.202937 Long: -78.795987 Datum: NAD 1983
 Soil Map Unit Name: Meggett fine sandy loam NWI classification: N/A

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: Wetland WA is bounded on the east by a roadside fill slope and by an agricultural field to the south. The upland data point is approximately 15' east and 1' higher than wetland data point WA-WET. A roadside ditch separates the two data points. Columbus County Airport reported 0.7" of precipitation on 8/20/2014.			

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ 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)		Secondary Indicators (minimum of two required) ☐ 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>None</u> Water Table Present? Yes ☐ No ☒ Depth (inches): <u>>24"</u> Saturation Present? Yes ☐ No ☒ Depth (inches): <u>>24"</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: No indicators of wetland hydrology were observed at this location during the site visit.			

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

 Sampling Point: WA-UP

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>None</u>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>None</u>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Paspalum dilatatum</u>	90%	Y	FAC	
2. <u>Kyllinga odorata</u>	10%	N	FACW	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
_____ 100% = Total Cover				
50% of total cover: <u>50%</u> 20% of total cover: <u>20%</u>				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. <u>None</u>				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				

Domination Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across All Strata: 1 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
 ___ 1 - Rapid Test for Hydrophytic Vegetation
 ___ 2 - Dominance Test is >50%
 ___ 3 - Prevalence Index is ≤3.0¹
 ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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.

Hydrophytic Vegetation Present?
 Yes ☒ No ☐

Remarks: (If observed, list morphological adaptations below).

Data point collected on a roadside fill slope that was dominated by few weedy grass/sedge species.

SOIL

Sampling Point: WA-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		
0-4"	2.5Y 3/3	100%					Loam	
4-12"	2.5Y 5/4	90%					Sandy Loam	Split matrix
	10YR 6/6	10%					Sandy Loam	
12-24"	10YR 6/6	95%					Sandy Loam	Split matrix
	10YR 8/1	5%					Sandy Loam	

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:

No indicators observed at data point location during site visit. WA-UP is a roadside fill slope.

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 Applicant/Owner: NCDOT State: NC Sampling Point: WA-WET
 Investigator(s): J. Hartshorn (KHA), R. Sullivan (KHA) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Slight hillslope Local relief (concave, convex, none): None Slope (%): 1-2%
 Subregion (LRR or MLRA): LRR P Lat: 34.202944 Long: -78.795934 Datum: NAD 1983
 Soil Map Unit Name: Meggett fine sandy loam NWI classification: N/A

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 ☐
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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: Wetland WA is a low-lying wetland located adjacent to and within the floodplain of Gum Branch.			

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ High Water Table (A2) ☐ Saturation (A3) ☒ Water Marks (B1) ☒ Sediment Deposits (B2) ☒ Drift Deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☒ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) ☐ 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)
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Neither the water table nor soil saturation was observed at data point WA-WET. However, most of WA appears to be inundated for much of the year with some of the lowest areas having surface water to ~ 1' deep during the site visit. There were obvious signs of flooding from Gum Swamp. Hydrology for this wetland system is likely derived from overland flooding from Gum Swamp, precipitation, and groundwater. The data point was taken at wetland fringe near the road.		

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50% of total cover: <u>35%</u>		20% of total cover: <u>14%</u>																																																										
Woody Vine Stratum (Plot size: _____) <table style="width: 100%;"> <tr> <td>1. <u>Toxicodendron radicans</u></td> <td><u>10%</u></td> <td><u>Y</u></td> <td><u>FAC</u></td> </tr> <tr> <td>2. <u>Parthenocissus quinquefolia</u></td> <td><u>5%</u></td> <td><u>Y</u></td> <td><u>FACU</u></td> </tr> <tr> <td>3. <u>Campsis radicans</u></td> <td><u>5%</u></td> <td><u>Y</u></td> <td><u>FAC</u></td> </tr> <tr> <td>4. <u>Gelsemium sempervirens</u></td> <td><u>5%</u></td> <td><u>Y</u></td> <td><u>FAC</u></td> </tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr> <td colspan="4" style="text-align: right;">_____ = Total Cover</td> </tr> <tr> <td colspan="2">50% of total cover: <u>12.5%</u></td> <td colspan="2">20% of total cover: <u>5%</u></td> </tr> </table>					1. <u>Toxicodendron radicans</u>	<u>10%</u>	<u>Y</u>	<u>FAC</u>	2. <u>Parthenocissus quinquefolia</u>	<u>5%</u>	<u>Y</u>	<u>FACU</u>	3. <u>Campsis radicans</u>	<u>5%</u>	<u>Y</u>	<u>FAC</u>	4. <u>Gelsemium sempervirens</u>	<u>5%</u>	<u>Y</u>	<u>FAC</u>	5. _____				_____ = Total Cover				50% of total cover: <u>12.5%</u>		20% of total cover: <u>5%</u>																													
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Remarks: (If observed, list morphological adaptations below).

Location of the wetland data point was in a power line easement that had not been recently maintained. Many trees in WA displayed significant buttressing.

SOIL

Sampling Point: WA-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		
0-4"	2.5Y 3/2	95%	7.5YR 5/6	5%	C	PL	Sandy Loam
4-10"	2.5Y 4/2	80%	10YR 5/6	20%	C	M	Sandy Loam
10-16"	2.5Y 6/4	85%	10YR 6/6	15%	C	M	Loamy Sand
16-24"	10YR 3/1	95%	10YR 5/6	5%	C	M	Sandy Clay Loam

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:

Soils were indicative of past disturbance from ditch or powerline construction. No saturation or water table was observed at data point location during the site visit.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Structure # 230126 City/County: Columbus County Sampling Date: 8/21/2014
 Applicant/Owner: NCDOT State: NC Sampling Point: WB/WC-UP
 Investigator(s): J. Hartshorn (KHA), R. Sullivan (KHA) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): < 1%
 Subregion (LRR or MLRA): LRR P Lat: 34.204031 Long: -78.797004 Datum: NAD 1983
 Soil Map Unit Name: Meggett fine sandy loam NWI classification: N/A

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: The upland area is experiencing drainage effect from Pond PA. The upland data point is ~ 40' north of the wetland data point WB/WC-WET. Columbus County Airport reported 0.7" of precipitation on 8/20/2014.			

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
☐ Surface Water (A1) ☐ High Water Table (A2) ☐ Saturation (A3) ☐ Water Marks (B1) ☐ Sediment Deposits (B2) ☐ Drift Deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9)	☐ Aquatic Fauna (B13) ☐ Marl Deposits (B15) (LRR U) ☐ Hydrogen Sulfide Odor (C1) ☐ Oxidized Rhizospheres along Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Thin Muck Surface (C7) ☐ Other (Explain in Remarks)	☐ 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>None</u> Water Table Present? Yes ☐ No ☒ Depth (inches): <u>>24"</u> Saturation Present? Yes ☐ No ☒ Depth (inches): <u>>24"</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: No indicators of wetland hydrology were observed at this location during the site visit. Neither saturation nor the water table was observed within 24" of the soil profile.			

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

 Sampling Point: WB/WC-UP

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Liquidambar styraciflua</u>	<u>30%</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>11</u> (A) Total Number of Dominant Species Across All Strata: <u>13</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>84.6%</u> (A/B)																
2. <u>Acer rubrum</u>	<u>30%</u>	<u>Y</u>	<u>FAC</u>																	
3. <u>Prunus serotina</u>	<u>20%</u>	<u>Y</u>	<u>FACU</u>																	
4. <u>Quercus laurifolia</u>	<u>20%</u>	<u>Y</u>	<u>FACW</u>																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>100%</u> = Total Cover 50% of total cover: <u>50%</u> 20% of total cover: <u>20%</u>				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: _____</td> <td>(A) _____ (B) _____</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x 1 = _____	FACW species _____	x 2 = _____	FAC species _____	x 3 = _____	FACU species _____	x 4 = _____	UPL species _____	x 5 = _____	Column Totals: _____	(A) _____ (B) _____	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x 1 = _____																			
FACW species _____	x 2 = _____																			
FAC species _____	x 3 = _____																			
FACU species _____	x 4 = _____																			
UPL species _____	x 5 = _____																			
Column Totals: _____	(A) _____ (B) _____																			
Prevalence Index = B/A = _____																				
<u>50%</u> = Total Cover 50% of total cover: _____ 20% of total cover: _____																				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)																				
1. <u>Quercus nigra</u>	<u>10%</u>	<u>Y</u>	<u>FAC</u>																	
2. <u>Liquidambar styraciflua</u>	<u>10%</u>	<u>Y</u>	<u>FAC</u>																	
3. <u>Acer rubrum</u>	<u>10%</u>	<u>Y</u>	<u>FAC</u>																	
4. <u>Morella cerifera</u>	<u>10%</u>	<u>Y</u>	<u>FAC</u>																	
5. <u>Vaccinium fuscum</u>	<u>5%</u>	<u>N</u>	<u>FACW</u>																	
6. <u>Cyrilla racemiflora</u>	<u>5%</u>	<u>N</u>	<u>FACW</u>																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>50%</u> = Total Cover 50% of total cover: <u>25%</u> 20% of total cover: <u>10%</u>																				
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Woodwardia areolata</u>	<u>10%</u>	<u>Y</u>	<u>OBL</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)																
2. <u>Osmundastrum cinnamomeum</u>	<u>5%</u>	<u>Y</u>	<u>FACW</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
<u>15%</u> = Total Cover 50% of total cover: <u>7.5%</u> 20% of total cover: <u>3</u>																				
Woody Vine Stratum (Plot size: <u>30'</u>)																				
1. <u>Toxicodendron radicans</u>	<u>5%</u>	<u>Y</u>	<u>FAC</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.																
2. <u>Parthenocissus quinquefolia</u>	<u>5%</u>	<u>Y</u>	<u>FACU</u>																	
3. <u>Smilax rotundifolia</u>	<u>5%</u>	<u>Y</u>	<u>FAC</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
<u>15%</u> = Total Cover 50% of total cover: <u>7.5%</u> 20% of total cover: <u>3%</u>																				
Hydrophytic Vegetation Present? Yes ☒ No ☐																				

Remarks: (If observed, list morphological adaptations below).

No morphological adaptations observed during site visit.

SOIL

Sampling Point: WB/WC-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		
0-2"	2.5Y 6/2	100%					Loamy Sand	
2-14"	2.5Y 3/1	100%					Sandy Loam	30% UCS
14-24"	2.5Y 6/4	90%	2.5Y 6/8	10%	C	M	Loamy Sand	

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:

No indicators of hydric soil were observed during site visit. Neither saturation nor the water table was observed.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Structure # 230126 City/County: Columbus County Sampling Date: 8/21/2014
 Applicant/Owner: NCDOT State: NC Sampling Point: WB/WC-WET
 Investigator(s): J. Hartshorn (KHA), R. Sullivan (KHA) Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): None Slope (%): <1%
 Subregion (LRR or MLRA): LRR P Lat: 34.203940 Long: -78.796900 Datum: NAD 1983
 Soil Map Unit Name: Meggett fine sandy loam NWI classification: PFO1Cd

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: Wetlands WB and WC are both bottomland wetlands situated adjacent to Gum Swamp just west of Peacock Road. Historical human ditching/fill activities were observed in both wetlands. Both wetlands were similar in vegetation and soils. Columbus County Airport reported 0.7" of precipitation on 8/20/2014.			

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ 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)		Secondary Indicators (minimum of two required) ☐ 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>None</u> Water Table Present? Yes ☐ No ☒ Depth (inches): <u>>24"</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>18"</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Wetlands receives hydrology from precipitation events, overland flow, groundwater, and flood events from Gum Swamp. Soil saturation was observed at 18", but the water table was not observed within 24" of the soils surface.			

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

 Sampling Point: WB/WC-WET

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Quercus laurifolia</u>	<u>30%</u>	<u>Y</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>10</u> (A) Total Number of Dominant Species Across All Strata: <u>10</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																
2. <u>Liquidambar styraciflua</u>	<u>20%</u>	<u>Y</u>	<u>FAC</u>																	
3. <u>Acer rubrum</u>	<u>20%</u>	<u>Y</u>	<u>FAC</u>																	
4. <u>Pinus taeda</u>	<u>10%</u>	<u>N</u>	<u>FAC</u>																	
5. _____	_____	_____	_____	Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: _____</td> <td>(A) _____ (B) _____</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x 1 = _____	FACW species _____	x 2 = _____	FAC species _____	x 3 = _____	FACU species _____	x 4 = _____	UPL species _____	x 5 = _____	Column Totals: _____	(A) _____ (B) _____	Prevalence Index = B/A = _____	
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Column Totals: _____	(A) _____ (B) _____																			
Prevalence Index = B/A = _____																				
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
<u>80%</u> = Total Cover 50% of total cover: <u>40%</u> 20% of total cover: <u>16%</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'</u>)																				
1. <u>Morella cerifera</u>	<u>20%</u>	<u>Y</u>	<u>FAC</u>																	
2. <u>Quercus laurifolia</u>	<u>15%</u>	<u>Y</u>	<u>FACW</u>																	
3. <u>Viburnum dentatum</u>	<u>15%</u>	<u>Y</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____	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.																
8. _____	_____	_____	_____																	
<u>35%</u> = Total Cover 50% of total cover: <u>17.5%</u> 20% of total cover: <u>7%</u>																				
Herb Stratum (Plot size: <u>5'</u>)																				
1. <u>Arundinaria gigantea</u>	<u>40%</u>	<u>Y</u>	<u>FACW</u>	Hydrophytic Vegetation Present? Yes ☒ No ☐																
2. <u>Woodwardia areolata</u>	<u>10%</u>	<u>Y</u>	<u>OBL</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes ☒ No ☐																
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes ☒ No ☐																
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
<u>50%</u> = Total Cover 50% of total cover: <u>25%</u> 20% of total cover: <u>10%</u>				Hydrophytic Vegetation Present? Yes ☒ No ☐																
Woody Vine Stratum (Plot size: <u>30'</u>)																				
1. <u>Smilax rotundifolia</u>	<u>10%</u>	<u>Y</u>	<u>FAC</u>																	
2. <u>Vitis rotundifolia</u>	<u>10%</u>	<u>Y</u>	<u>FAC</u>																	
3. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes ☒ No ☐																
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
<u>20%</u> = Total Cover 50% of total cover: <u>10%</u> 20% of total cover: <u>4%</u>																				

Remarks: (If observed, list morphological adaptations below).

Morphological adaptations were not as distinct at the wetland data point, but became much more distinct towards Gum Swamp with buttressed trees.

SOIL

Sampling Point: WB/WC-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		
0-6"	2.5Y 2.5/1	100%					Loam	
6-18"	2.5Y 4/1	90%	10YR 4/6	10%	C	M	Clay Loam	
18-24"	2.5Y 6/4	80%	10YR 4/6	20%	C	M	Sandy Loam	

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:

The soil was saturated at 18". No water table observed within 24" of the soil's surface.

WETLAND RATING WORKSHEET Fourth version

STR #230126
WA

Project Name: Structure #230126 Nearest road: Peacock Rd
 County: Columbus Wetland area: 0.3 acres Wetland width: 400 feet
 Name of Evaluator: J. Hartshorn, R. Sullivan Date: 9/2/2014

Wetland Location

☐ on pond or lake
☒ on perennial stream
☐ on intermittent stream
☐ within interstream divide
☐ other: _____

Soil Series

☐ predominantly organic
 (humus, muck, or peat)
☒ predominantly mineral
 (non-sandy)
☐ predominantly sandy

Hydrolic factors

☐ steep topography
☐ ditched or channelized
☒ total riparian wetland width $\geq$ 100 ft

Adjacent land use (within ½ mile upstream, upslope, or radius)

☒ forested/natural vegetation 25 %
☒ agriculture, urban/suburban 70 %
☒ impervious service 5 %

Dominant vegetation

1) Liquidambar styraciflua
 2) Nyssa biflora
 3) Acer rubrum

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	☐ Pine savanna
☐ Headwater forest	☐ Freshwater marsh
☐ Swamp forest	☐ Bog/fen
☐ Wet flat	☐ Ephemeral wetland
☐ Pocosin	☐ Carolina Bay
☐ Bog forest	☐ Other _____

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

				weight			
R	Water Storage	<u>5</u>	x	<u>4.00</u>	=	<u>12</u>	
A	Bank/Shoreline stabilization	<u>3</u>	x	<u>4.00</u>	=	<u>12</u>	
T	Pollutant removal	<u>5</u>	x	<u>5.00</u>	=	<u>25</u>	
I	Wildlife habitat	<u>5</u>	x	<u>2.00</u>	=	<u>10</u>	
N	Aquatic life	<u>5</u>	x	<u>4.00</u>	=	<u>20</u>	
G	Recreation/Education	<u>1</u>	x	<u>1.00</u>	=	<u>1</u>	

Total Score¹ 80

¹Add 1 point if in sensitive watershed and >10% nonpoint disturbance within ½ mile radius.

WETLAND RATING WORKSHEET Fourth version

STR #230126
WB

Project Name: Structure #230126 Nearest road: Peacock Rd
 County: Columbus Wetland area: 0.24 acres Wetland width: 300 feet
 Name of Evaluator: J. Hartshorn, R. Sullivan Date: 9/2/2014

Wetland Location

☐ on pond or lake
☒ on perennial stream
☐ on intermittent stream
☐ within interstream divide
☐ other: _____

Soil Series

☐ predominantly organic
 (humus, muck, or peat)
☒ predominantly mineral
 (non-sandy)
☐ predominantly sandy

Hydrolic factors

☐ steep topography
☐ ditched or channelized
☒ total riparian wetland width $\geq$ 100 ft

Adjacent land use (within ½ mile upstream, upslope, or radius)

☒ forested/natural vegetation 30 %
☒ agriculture, urban/suburban 65 %
☒ impervious service 5 %

Dominant vegetation

1) Liquidambar styraciflua
 2) Nyssa biflora
 3) Acer rubrum

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	☐ Pine savanna
☐ Headwater forest	☐ Freshwater marsh
☐ Swamp forest	☐ Bog/fen
☐ Wet flat	☐ Ephemeral wetland
☐ Pocosin	☐ Carolina Bay
☐ Bog forest	☐ Other _____

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

				weight			
R	Water Storage	<u>5</u>	x	<u>4.00</u>	=	<u>12</u>	
A	Bank/Shoreline stabilization	<u>3</u>	x	<u>4.00</u>	=	<u>12</u>	
T	Pollutant removal	<u>5</u>	x	<u>5.00</u>	=	<u>25</u>	
I	Wildlife habitat	<u>5</u>	x	<u>2.00</u>	=	<u>10</u>	
N	Aquatic life	<u>4</u>	x	<u>4.00</u>	=	<u>16</u>	
G	Recreation/Education	<u>1</u>	x	<u>1.00</u>	=	<u>1</u>	

Total Score¹ 76

¹Add 1 point if in sensitive watershed and >10% nonpoint disturbance within ½ mile radius.

WETLAND RATING WORKSHEET Fourth version

STR #230126
WC

Project Name: Structure #230126 Nearest road: Peacock Rd
 County: Columbus Wetland area: 0.14 acres Wetland width: 200 feet
 Name of Evaluator: J. Hartshorn, R. Sullivan Date: 9/2/2014

Wetland Location

☐ on pond or lake
☒ on perennial stream
☐ on intermittent stream
☐ within interstream divide
☐ other: _____

Soil Series

☐ predominantly organic
 (humus, muck, or peat)
☒ predominantly mineral
 (non-sandy)
☐ predominantly sandy

Hydrolic factors

☐ steep topography
☐ ditched or channelized
☒ total riparian wetland width $\geq$ 100 ft

Adjacent land use (within ½ mile upstream, upslope, or radius)

☒ forested/natural vegetation 40 %
☒ agriculture, urban/suburban 55 %
☒ impervious service 5 %

Dominant vegetation

1) Liquidambar styraciflua
 2) Nyssa biflora
 3) Acer rubrum

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	☐ Pine savanna
☐ Headwater forest	☐ Freshwater marsh
☐ Swamp forest	☐ Bog/fen
☐ Wet flat	☐ Ephemeral wetland
☐ Pocosin	☐ Carolina Bay
☐ Bog forest	☐ Other _____

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

				weight			
R	Water Storage	<u>5</u>	x	<u>4.00</u>	=	<u>12</u>	
A	Bank/Shoreline stabilization	<u>3</u>	x	<u>4.00</u>	=	<u>12</u>	
T	Pollutant removal	<u>5</u>	x	<u>5.00</u>	=	<u>25</u>	
I	Wildlife habitat	<u>5</u>	x	<u>2.00</u>	=	<u>10</u>	
N	Aquatic life	<u>5</u>	x	<u>4.00</u>	=	<u>20</u>	
G	Recreation/Education	<u>1</u>	x	<u>1.00</u>	=	<u>1</u>	

Total Score¹ 80

¹Add 1 point if in sensitive watershed and >10% nonpoint disturbance within ½ mile radius.

North Carolina Division of Water Quality - Stream Identification Form, Version 4.11

Date: 8/21/2014	Project/Site: Structure 230126 Feature SB	Latitude: 34.20316
Evaluator: J. Hartshorn (KHA) R. Sullivan (KHA)	County: Columbus	Longitude: -78.795995
Total Points: 14.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology Subtotal = 6

	Absent	Weak	Moderate	Strong	Score
1 ^a . Continuity of channel bed and bank	0	1	2	3	3
2. Sinuosity of channel along thalweg	0	1	2	3	0
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	1
4. Particle size of stream substrate	0	1	2	3	1
5. Active/relic floodplain	0	1	2	3	0
6. Depositional bars or benches	0	1	2	3	0
7. Recent alluvial deposits	0	1	2	3	0
8. Headcuts	0	1	2	3	0
9. Grade control	0	0.5	1	1.5	1
10. Natural valley	0	0.5	1	1.5	0
11. Second or greater order channel	No = 0		Yes = 3		0

^a artificial ditches are not rated; see discussions in manual

B. Hydrology Subtotal = 5

12. Presence of Baseflow	0	1	2	3	1
13. Iron oxidizing bacteria	0	1	2	3	0
14. Leaf litter	1.5	1	0.5	0	1
15. Sediment on plants or debris	0	0.5	1	1.5	0
16. Organic debris lines or piles	0	0.5	1	1.5	0
17. Soil-based evidence of high water table?	No = 0		Yes = 3		3

C. Biology Subtotal = 3.5

18. Fibrous roots in streambed	3	2	1	0	1
19. Rooted upland plants in streambed	3	2	1	0	1
20. Macroinvertebrates (note diversity and abundance)	0	1	2	3	0
21. Aquatic Mollusks	0	1	2	3	0
22. Fish	0	0.5	1	1.5	0
23. Crayfish	0	0.5	1	1.5	0
24. Amphibians	0	0.5	1	1.5	0
25. Algae	0	0.5	1	1.5	0
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 ; Other = 0				1.5

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Feature SB is a linear ditch dug within a wetland, likely in an attempt to drain the wetland or convey surface water. The ditch has an ordinary high water mark and permanent surface water, however no flow was observed and the feature has clearly been dug out and historically channelized.



STREAM QUALITY ASSESSMENT WORKSHEET



Provide the following information for the stream reach under assessment:

1. Applicant's name: NCDOT
2. Evaluator's name: J. Hartshorn, R. Sullivan
3. Date of evaluation: 08/21/2014
4. Time of evaluation: 11:00 am
5. Name of stream: Structure 230126 - SB
6. River basin: Lumber
7. Approximate drainage area: <1 acre
8. Stream order: First Order
9. Length of reach evaluated: 100'
10. County: Columbus
11. Site coordinates (if known): prefer in decimal degrees.
12. Subdivision name (if any): n/a
- Latitude (ex. 34.872312): 34.203165 Longitude (ex. -77.556611): -78.795988
- Method location determined (circle): ☒ GPS ☐ Topo Sheet ☐ Ortho (Aerial) Photo/GIS ☐ Other GIS ☐ Other _____
13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location):
Feature SB is located east of Peacock Road, south of Gum Swamp, and begins at the roadside ditch.
14. Proposed channel work (if any): n/a
15. Recent weather conditions: Hot and humid, 0.7" of rainfall recorded within 48 hours (isolated showers)
16. Site conditions at time of visit: Hot, approximately 90 degrees and clear, no indication of recent rain.
17. Identify any special waterway classifications known: ☐ Section 10 ☐ Tidal Waters ☐ Essential Fisheries Habitat
☐ Trout Waters ☐ Outstanding Resource Waters ☐ Nutrient Sensitive Waters ☐ Water Supply Watershed (I-IV)
18. Is there a pond or lake located upstream of the evaluation point? NO If yes, estimate the water surface area: n/a
19. Does channel appear on USGS quad map? NO
20. Does channel appear on USDA Soil Survey? NO
21. Estimated watershed land use: _____% Residential _____% Commercial _____% Industrial _____% Agricultural
50% Forested _____% Cleared / Logged 50% Other (Roadway)
22. Bankfull width: 12'
23. Bank height (from bed to top of bank): 4'
24. Channel slope down center of stream: ☒ Flat (0 to 2%) ☐ Gentle (2 to 4%) ☐ Moderate (4 to 10%) ☐ Steep (>10%)
25. Channel sinuosity: ☒ Straight ☐ Occasional bends ☐ Frequent meander ☐ Very sinuous ☐ Braided channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 28 **Comments:** _____
Feature SB is a linear man-made ditch constructed through a wetland, likely to drain the system or convey surface water.

Evaluator's Signature Jason Hartshorn **Date** 08/21/2014

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	3
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	1
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	2
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	2
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	1
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	0
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	0
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	2
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	N/A
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	2
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	4
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture, livestock, or timber production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	3
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	1
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	0
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	N/A
BIOLOGY	20	Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	0
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						28

* These characteristics are not assessed in coastal streams.

North Carolina Division of Water Quality - Stream Identification Form, Version 4.11

Date: 8/21/2014	Project/Site: Structure 230126 Feature SC	Latitude: 34.203441
Evaluator: J. Hartshorn (KHA) R. Sullivan (KHA)	County: Columbus	Longitude: -78.796409
Total Points: 14.5 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology Subtotal = 6

	Absent	Weak	Moderate	Strong	Score
1 ^a . Continuity of channel bed and bank	0	1	2	3	3
2. Sinuosity of channel along thalweg	0	1	2	3	0
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3	1
4. Particle size of stream substrate	0	1	2	3	1
5. Active/relic floodplain	0	1	2	3	1
6. Depositional bars or benches	0	1	2	3	0
7. Recent alluvial deposits	0	1	2	3	0
8. Headcuts	0	1	2	3	0
9. Grade control	0	0.5	1	1.5	0
10. Natural valley	0	0.5	1	1.5	0
11. Second or greater order channel	No = 0		Yes = 3		0

^a artificial ditches are not rated; see discussions in manual

B. Hydrology Subtotal = 5

12. Presence of Baseflow	0	1	2	3	1
13. Iron oxidizing bacteria	0	1	2	3	0
14. Leaf litter	1.5	1	0.5	0	1
15. Sediment on plants or debris	0	0.5	1	1.5	0
16. Organic debris lines or piles	0	0.5	1	1.5	0
17. Soil-based evidence of high water table?	No = 0		Yes = 3		3

C. Biology Subtotal = 3.5

18. Fibrous roots in streambed	3	2	1	0	1
19. Rooted upland plants in streambed	3	2	1	0	1
20. Macrobenthos (note diversity and abundance)	0	1	2	3	0
21. Aquatic Mollusks	0	1	2	3	0
22. Fish	0	0.5	1	1.5	0
23. Crayfish	0	0.5	1	1.5	0
24. Amphibians	0	0.5	1	1.5	0
25. Algae	0	0.5	1	1.5	0
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 ; Other = 0				1.5

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Feature SC is a linear ditch that begins as a roadside drainage

ditch and turns and flows into a large wetland west of Peacock Road.

SC has an ordinary high water mark but low water levels were observed with light vegetation cover.



STREAM QUALITY ASSESSMENT WORKSHEET



Provide the following information for the stream reach under assessment:

1. Applicant's name: NCDOT
2. Evaluator's name: J. Hartshorn, R. Sullivan
3. Date of evaluation: 08/21/2014
4. Time of evaluation: 1:00 pm
5. Name of stream: Structure 230126 - SC
6. River basin: Lumber
7. Approximate drainage area: <1 acre
8. Stream order: First Order
9. Length of reach evaluated: 100'
10. County: Columbus
11. Site coordinates (if known): prefer in decimal degrees.
12. Subdivision name (if any): n/a
- Latitude (ex. 34.872312): 34.203418 Longitude (ex. -77.556611): -78.796374
- Method location determined (circle): ☒ GPS ☐ Topo Sheet ☐ Ortho (Aerial) Photo/GIS ☐ Other GIS ☐ Other _____
13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): _____
Feature SC is located west of Peacock Road, south of Gum Swamp, and is a roadside ditch that enters a wetland.
14. Proposed channel work (if any): n/a
15. Recent weather conditions: Hot and humid, 0.7" of rainfall recorded within 48 hours (isolated showers)
16. Site conditions at time of visit: Hot, approximately 90 degrees and clear, no indication of recent rain.
17. Identify any special waterway classifications known: ☐ Section 10 ☐ Tidal Waters ☐ Essential Fisheries Habitat
☐ Trout Waters ☐ Outstanding Resource Waters ☐ Nutrient Sensitive Waters ☐ Water Supply Watershed (I-IV)
18. Is there a pond or lake located upstream of the evaluation point? NO If yes, estimate the water surface area: n/a
19. Does channel appear on USGS quad map? NO
20. Does channel appear on USDA Soil Survey? NO
21. Estimated watershed land use: _____% Residential _____% Commercial _____% Industrial _____% Agricultural
50 % Forested _____% Cleared / Logged 50 % Other (Roadway)
22. Bankfull width: 6'
23. Bank height (from bed to top of bank): 3'
24. Channel slope down center of stream: ☒ Flat (0 to 2%) ☐ Gentle (2 to 4%) ☐ Moderate (4 to 10%) ☐ Steep (>10%)
25. Channel sinuosity: ☒ Straight ☐ Occasional bends ☐ Frequent meander ☐ Very sinuous ☐ Braided channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 30 **Comments:** _____
Feature SC is a roadside drainage ditch that runs along Peacock Road and turns to drain to wetland. SC did not have any flow at time of observation, however ordinary high water mark was observed.

Evaluator's Signature Jason Hartshorn **Date** 08/21/2014

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	2
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	1
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	1
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	2
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	1
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	0
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	4
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	0
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	2
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	N/A
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	2
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	4
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture, livestock, or timber production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	3
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	1
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	0
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	N/A
BIOLOGY	20	Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	0
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						30

* These characteristics are not assessed in coastal streams.