

WA, WB, WC wet

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Bridge 167 SR-1379 over Gwynn Swamp City/County: Columbus Sampling Date: 9/19/14
 Applicant/Owner: NCDOT State: NC Sampling Point: WA wet
 Investigator(s): B. Smith + J. Sullivan Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): P-133A Lat: 34.2706 Long: -79.0044 Datum: NAD83
 Soil Map Unit Name: Muckake sand/loam Frequently flooded NWI classification: PFO
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks:	

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 X No _____ Depth (inches): 1
 Water Table Present? Yes X No _____ Depth (inches): 0
 Saturation Present? Yes X No _____ Depth (inches): 0
 (includes capillary fringe)

Wetland Hydrology Present? Yes X 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: WAW1

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Nyssa biflora</u>	<u>40</u>	<u>X</u>	<u>OBL</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>5</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 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
50% of total cover: <u>20</u> 20% of total cover: <u>8</u> Sapling/Shrub Stratum (Plot size: <u>5</u>)				Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Ligustrum sinense</u>	<u>60</u>	<u>X</u>	<u>FAC</u>	
2. <u>Acer rubrum</u>	<u>20</u>	<u>X</u>	<u>FAC</u>	
3. <u>Persea palustris</u>	<u>10</u>	_____	<u>FACW</u>	
4. _____	_____	_____	_____	
50% of total cover: <u>45</u> 20% of total cover: <u>18</u> Herb Stratum (Plot size: <u>5</u>)				¹ Indicators 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.
1. <u>Ligustrum sinense</u>	<u>20</u>	<u>X</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
50% of total cover: <u>10</u> 20% of total cover: <u>4</u> Woody Vine Stratum (Plot size: <u>30</u>)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
1. <u>Vitis rotundifolia</u>	<u>40</u>	<u>X</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
50% of total cover: <u>20</u> 20% of total cover: <u>9</u>				
Remarks: (If observed, list morphological adaptations below).				

SOIL

Sampling Point: W1 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+	2.5Y 5/2	90	10YR 6/6	10	C	M	CL	

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 X No _____

Remarks:

WA, WB, WC UP

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Bridge 167 SR-1379 over Gapway Swamp City/County: Columbus Sampling Date: 9/19/14
 Applicant/Owner: NCDOT State: NC Sampling Point: WAUP
 Investigator(s): B. Smith & J. Sullivan Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR or MLRA): P-133A Lat: 34.8709 Long: -79.0042 Datum: NAD83
 Soil Map Unit Name: Muckalee sandy loam frequently flooded NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks:	

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 <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>	
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 up.

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Liquidambar styraciflua</u>	<u>30</u>	<u>X</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>88%</u> (A/B)
2. <u>Liriodendron tulipifera</u>	<u>20</u>	<u>X</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	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 = _____
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
50% of total cover: <u>25</u> 20% of total cover: <u>10</u> <u>50</u> = Total Cover				Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain)
Sapling/Shrub Stratum (Plot size: <u>15</u>)				
1. <u>Liquidambar styraciflua</u>	<u>20</u>	<u>X</u>	<u>FAC</u>	
2. <u>Quercus nigra</u>	<u>10</u>	<u>X</u>	<u>FAC</u>	
3. _____	_____	_____	_____	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. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
50% of total cover: <u>15</u> 20% of total cover: <u>6</u> <u>30</u> = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Herb Stratum (Plot size: <u>5</u>)				
1. <u>Vitis rotundifolia</u>	<u>10</u>	<u>X</u>	<u>FAC</u>	
2. <u>Osmunda cinnamomea</u>	<u>10</u>	<u>X</u>	<u>FACW</u>	
3. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
50% of total cover: <u>10</u> 20% of total cover: <u>4</u> <u>20</u> = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Woody Vine Stratum (Plot size: <u>30</u>)				
1. <u>Vitis rotundifolia</u>	<u>10</u>	<u>X</u>	<u>FAC</u>	
2. <u>Lonicera japonica</u>	<u>16</u>	<u>X</u>	<u>FAC</u>	
3. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
50% of total cover: <u>10</u> 20% of total cover: <u>4</u> <u>20</u> = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Remarks: (If observed, list morphological adaptations below).				

SOIL

Sampling Point: W 1 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		
0-10	10YR 3/2	100					SL	uncoated grains
10-16+	10YR 5/3	80	10YR 5/6	20	C	M	fine 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.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|--|--|
| ☐ 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) | ☐ 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 Fourth Version

Project Name Bridge 167 SR-1379 over Gapway Swamp Nearest Road Hinsons Crossroads
 County Columbus Wetland area ~1 acres Wetland width >100 feet
 Name of evaluator B. Smith & J. Sullivan Date 9/19/14

Wetland location

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

Adjacent land use

(within ½ mile upstream, upslope, or radius)

- ☒ forested/natural vegetation 70 %
☒ agriculture, urban/suburban 90 %
☐ impervious surface _____ %

Soil series:

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

Dominant vegetation

- (1) Swamp tupelo
 (2) Chinese privet
 (3) Black berry

Hydraulic factors

- ☐ steep topography
☒ ditched or channelized
☒ total wetland width ≥ 100 feet

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
☐ Headwater forest
☒ Swamp forest
☐ Wet flat
☐ Pocosin
☐ Bog forest

- ☐ Pine savanna
☐ Freshwater marsh
☐ Bog/fen
☐ Ephemeral wetland
☐ Carolina bay
☐ Other: _____

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

R	Water storage	<u>2</u>	x 4.00 =	<u>8</u>
A	Bank/Shoreline stabilization	<u>1</u>	x 4.00 =	<u>4</u>
T	Pollutant removal	<u>4</u>	** x 5.00 =	<u>20</u>
I	Wildlife habitat	<u>1</u>	x 2.00 =	<u>2</u>
N	Aquatic life value	<u>2</u>	x 4.00 =	<u>8</u>
G	Recreation/Education	<u>0</u>	x 1.00 =	<u>0</u>

**Wetland
rating**

42

** Add 1 point if in sensitive watershed and >10% nonpoint source disturbance within ½ mile upstream, upslope, or radius

WETLAND RATING WORKSHEET Fourth Version

Project Name Bridge 167 SR-1379 over Gapway Swamp Nearest Road Hinsons Crossroads
 County Columbus Wetland area ~1 acres Wetland width 7100 feet
 Name of evaluator B. Smith & J. Sullivan Date 9/19/14

Wetland location

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

Adjacent land use

- (within 1/2 mile upstream, upslope, or radius)
☒ forested/natural vegetation 70 %
☒ agriculture, urban/suburban 30 %
☐ impervious surface _____ %

Soil series:

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

Dominant vegetation

- (1) Swamp tupelo
 (2) Chinese privet
 (3) Bald cypress

Hydraulic factors

- _____ steep topography
 _____ ditched or channelized
☒ total wetland width $\geq$ 100 feet

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

R	Water storage	<u>3</u>	x 4.00 =	<u>12</u>
A	Bank/Shoreline stabilization	<u>2</u>	x 4.00 =	<u>8</u>
T	Pollutant removal	<u>4</u>	** x 5.00 =	<u>20</u>
I	Wildlife habitat	<u>1</u>	x 2.00 =	<u>2</u>
N	Aquatic life value	<u>2</u>	x 4.00 =	<u>8</u>
G	Recreation/Education	<u>1</u>	x 1.00 =	<u>1</u>
** Add 1 point if in sensitive watershed and >10% nonpoint source disturbance within 1/2 mile upstream, upslope, or radius				

Wetland rating

51

WDwet

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Bridge 167 SR-1379 over Gapway Swamp City/County: Columbus Sampling Date: 9/19/14
 Applicant/Owner: NCDOT State: NC Sampling Point: WDwet
 Investigator(s): B. Smith & J. Sullivan Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Crenulation Local relief (concave, convex, none): _____ Slope (%): —
 Subregion (LRR or MLRA): P-13A Lat: 34.2694 Long: -79.0653 Datum: NAD83
 Soil Map Unit Name: Muckalee sandy loam frequently flooded NWI classification: PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: _____ _____ _____	

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 <u>X</u> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> 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: WD wet

Tree Stratum (Plot size: <u>Entire</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Liquidambar styraciflua</u>	<u>10</u>	<u>X</u>	<u>FAC</u>
2.	<u>Acer rubrum</u>	<u>10</u>	<u>X</u>	<u>FAC</u>
3.				
4.				
5.				
6.				
7.				
8.				
		<u>80</u> = Total Cover		
50% of total cover: <u>10</u>		20% of total cover: <u>4</u>		
Sapling/Shrub Stratum (Plot size: <u>Entire</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Ligustrum sinense</u>	<u>50</u>	<u>X</u>	<u>FAC</u>
2.	<u>Fraxinus pennsylvanica</u>	<u>50</u>	<u>X</u>	<u>FACW</u>
3.				
4.				
5.				
6.				
7.				
8.				
		<u>100</u> = Total Cover		
50% of total cover: <u>50</u>		20% of total cover: <u>20</u>		
Herb Stratum (Plot size: <u>Entire</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Ligustrum sinense</u>	<u>30</u>	<u>X</u>	<u>FAC</u>
2.	<u>Arundinaria gigantea</u>	<u>20</u>	<u>X</u>	<u>FACW</u>
3.	<u>Saururus cernuus</u>	<u>20</u>	<u>X</u>	<u>OBL</u>
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
		<u>70</u> = Total Cover		
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>		
Woody Vine Stratum (Plot size: <u>Entire</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Vitis rotundifolia</u>	<u>10</u>	<u>X</u>	<u>FAC</u>
2.				
3.				
4.				
5.				
		<u>10</u> = Total Cover		
50% of total cover: <u>5</u>		20% of total cover: <u>2</u>		

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)
 Total Number of Dominant Species Across All Strata: 8 (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 X No _____

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

SOIL

Sampling Point: WDwet

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+	10YR 4/2	80	7.5YR 5/6	20	C	M	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 X No X

Remarks:

WD up

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Bridge 167 SR-1379 over Gapway Swamp City/County: Columbus Sampling Date: 9/19/14
 Applicant/Owner: NCDOT State: NC Sampling Point: WDUP
 Investigator(s): B. Smith & J. Sullivan Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): —
 Subregion (LRR or MLRA): P-133A Lat: 34.2696 Long: -79.0053 Datum: NAD83
 Soil Map Unit Name: Mucklake sandy loam frequently flooded NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: _____ _____ _____	

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 <u>X</u> Depth (inches): <u>—</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>—</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>—</u> (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: _____ _____ _____		
Remarks: _____ _____ _____		

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

Sampling Point: Wp 4

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>/</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. <u>/</u>				Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. <u>/</u>				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. <u>/</u>				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 = _____
5. <u>/</u>				
6. <u>/</u>				
7. <u>/</u>				
8. <u>/</u>				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling/Shrub Stratum (Plot size: <u>15</u>) 1. <u>Ligustrum sinense</u> <u>100</u> <u>X</u> <u>FAC</u>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				
50% of total cover: <u>50</u> 20% of total cover: <u>20</u>				
Herb Stratum (Plot size: <u>3</u>) 1. <u>/</u>				
2. <u>/</u>				
3. <u>/</u>				
4. <u>/</u>				
5. <u>/</u>				
6. <u>/</u>				
7. <u>/</u>				
8. <u>/</u>				
9. <u>/</u>				
10. <u>/</u>				
11. <u>/</u>				
12. <u>/</u>				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Woody Vine Stratum (Plot size: <u>30</u>) 1. <u>Vitis rotundifolia</u> <u>20</u> <u>X</u> <u>FAC</u>				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
50% of total cover: <u>10</u> 20% of total cover: <u>4</u>				
Hydrophytic Vegetation Present? Yes <u>X</u> No _____				
Remarks: (If observed, list morphological adaptations below). 				

SOIL

Sampling Point: WDup

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		
0-124	10 YR 4/3	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.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|--|---|
| ☐ 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) | ☐ 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:

WD WC

WETLAND RATING WORKSHEET Fourth Version

Project Name Bridge 167 SR-1379 over Gapway Swamp Nearest Road Hinsong Crossroad
 County Columbus Wetland area ~0.5 acres Wetland width ~50 feet
 Name of evaluator B. Smith & J. Sullivan Date 9/19/14

Wetland location

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

Adjacent land use

- (within 1/2 mile upstream, upslope, or radius)
☒ forested/natural vegetation 100 %
☒ agriculture, urban/suburban 40 %
☐ impervious surface %

Soil series:

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

Dominant vegetation

- (1) Chinese privet
 (2)
 (3)

Hydraulic factors

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

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: <u>Side Slope Seep</u> |

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

R	Water storage	<u>1</u>	x 4.00 =	<u>4</u>
A	Bank/Shoreline stabilization	<u>0</u>	x 4.00 =	<u>0</u>
T	Pollutant removal	<u>1</u>	** x 5.00 =	<u>5</u>
I	Wildlife habitat	<u>1</u>	x 2.00 =	<u>2</u>
N	Aquatic life value	<u>1</u>	x 4.00 =	<u>4</u>
G	Recreation/Education	<u>0</u>	x 1.00 =	<u>0</u>

Wetland
rating

15

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