

## PMBelCOL NPEmails

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**From:** Mallecia Hood  
**Sent:** Wednesday, February 04, 2009 10:38 AM  
**To:** PMBelCOL NPEmails  
**Subject:** FW: Wetlands delineation  
**Attachments:** Appendix\_A\_USACE\_Bellafonte NP\_Data Forms.pdf; Appendix\_B\_TVARAM Forms Bellafonte NP.pdf; Bellefonte NP Wetlands Preliminary Input\_D01.pdf

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**From:** Spink, Thomas E [mailto:[tespink@tva.gov](mailto:tespink@tva.gov)]  
**Sent:** Friday, January 30, 2009 2:18 PM  
**To:** Mallecia Hood  
**Cc:** Neil Haggerty  
**Subject:** Wetlands delineation

Mallecia,

Please find attached the detailed Wetlands delineation report. First 3 files, one more will follow.

*Thomas E. Spink*

Licensing Project Manager  
Nuclear Generation Development  
1101 Market Street, LP 5A  
Chattanooga, TN 37402  
423-751-7062; FAX (423) 751-6509

**Hearing Identifier:** Bellefonte\_COL\_NonPublic\_EX  
**Email Number:** 2926

**Mail Envelope Properties** (D841D501B2C4D244B75AB897F70C1494862BE599A7)

**Subject:** FW: Wetlands delineation  
**Sent Date:** 2/4/2009 10:38:07 AM  
**Received Date:** 2/4/2009 10:38:12 AM  
**From:** Mallecia Hood

**Created By:** Mallecia.Hood@nrc.gov

**Recipients:**  
"PMBeICOL NPEmails" <PMBeICOL.NPEmails@nrc.gov>  
Tracking Status: None

**Post Office:** HQCLSTR01.nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	481	2/4/2009 10:38:12 AM
Appendix_A_USACE_Bellafonte NP_Data Forms.pdf	712660	
Appendix_B_TVARAM Forms Bellafonte NP.pdf	258651	
Bellefonte NP Wetlands Preliminary Input_D01.pdf	1653951	

**Options**  
**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**

## TVA Natural Heritage Project Routine Wetland Determination Form

Project: Bellefonte NP REQ 10389	Investigator: J. Groton, H. Hart	Normal Circumstances: <input checked="" type="checkbox"/> y	Sample ID: W01
County: Jackson	Date: April 6, 2006	Atypical Situation: <input type="checkbox"/> n	Station or Structure Number(s):
State: AL		Problem Area: <input type="checkbox"/> n	Cowardin Code: PFO1E

### Vegetation

Plant Species		Stratum	Indicator	Plant Species		Stratum	Indicator
1.	<i>Quercus phellos</i>	Tr	Facw-	9.	<i>Toxicodendron radicans</i>	WV	Fac
2.	<i>Quercus nigra</i>	Tr	Fac	10.	<i>Carex tribuloides</i>	H	Facw
3.	<i>Quercus pagoda</i>	Tr	Fac+	11.	<i>Ulmus americana</i>	Tr	Facw
4.	<i>Pinus taeda</i>	Tr	Fac	12.	<i>Ulmus thomasii</i>	Tr, Sh	Fac
5.	<i>Acer rubrum</i>	Tr	Fac	13.	<i>Impatiens sp.</i>	H	Facw
6.	<i>Liquidambar styraciflua</i>	Tr, Sh	Fac+	14.			
7.	<i>Ilex decidua</i>	Sh	Facw-	15.			
8.	<i>Berchemia scandens</i>	WV	Facw	16.			

Percent of Dominant Species That are OBL, FACW, or FAC: 100%

### Hydrology

<b>Field Observations:</b>	<b>Wetland Hydrology Indicators:</b>
Depth of Surface Water: <u>0-6</u> (in.)	<b>Primary Indicators</b>
Depth to Free Water in Pit: <u>11</u> (in.)	<input checked="" type="checkbox"/> y Inundated
Depth to Saturated Soil: <u>8</u> (in.)	<input checked="" type="checkbox"/> y Saturated in Upper 12 in.
	<input type="checkbox"/> Sediment Deposits
	<input type="checkbox"/> Drift Lines
	<input type="checkbox"/> Water Marks
	<input checked="" type="checkbox"/> y Drainage Patterns
	<input type="checkbox"/> y Oxidized Root Channels
	<input type="checkbox"/> y Water Stained Leaves
Remarks: wet weather drainage to Town Creek embayment on Guntersville Reservoir	

### Soils

Soil Unit:	Drainage class:	Listed hydric soil?	Yes	No
<b>Profile Description:</b>				
Depth (Inches)	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance	Texture
0-2	10 YR 6/2	-	-	Loam
2-8	10 YR 6/4	-	-	Silt loam
8-12	10/YR 6/4	10 YR 6/2	Common	Silty clay loam
<b>Hydric Soil Indicators:</b>				
<input type="checkbox"/>	Gleyed or Low Chroma Colors	<input type="checkbox"/>	Histic Epipedon	<input type="checkbox"/>
<input type="checkbox"/>	Sulfidic Odor	<input type="checkbox"/>	High Organic Cont. Surf. Layer Sandy Soils	<input type="checkbox"/>
<input checked="" type="checkbox"/> y	Concretions	<input type="checkbox"/>	Organic Streaking in Sandy Soils	<input type="checkbox"/>
				Aquic Moisture Regime
				Reducing Conditions
				Other (Explain in Remarks)
Remarks: Soil color not quite hydric (chroma is too high); lots of evidence of extensive soil disturbance in past;				

### Wetland Determination

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> Y	No <input type="checkbox"/>	Is this Sampling Point Within a USACE Wetland?	Yes <input checked="" type="checkbox"/> Y	No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> Y	No <input type="checkbox"/>	Does area only meet USFWS wetland definition?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/> N
Hydric Soils Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/> N	Is wetland mapped on NWI?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/> N
Estimated size: 2.47 acres					

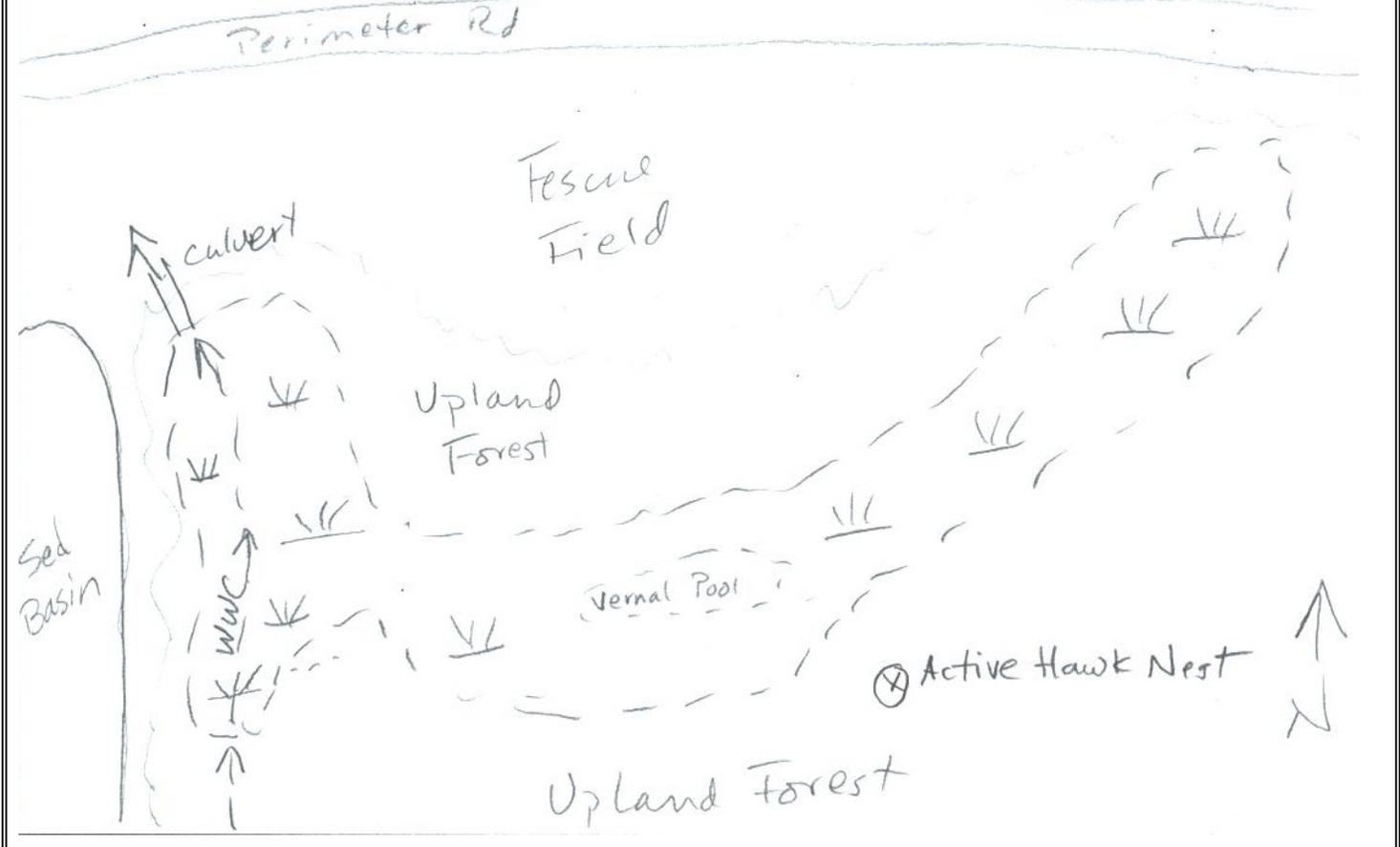
**Wetland Descriptors**

Sample ID: W01	Photo ID(s): W01-1W, W01-2W, W01-3W
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**Flagging Description:** 1-29 counterclockwise from NW corner near culvert around to east; 30-70 clockwise from #1 around north side back to #29

**Drawing**

**Please Include:** North Arrow, Project Centerline, Survey Corridor Boundaries, Length of Wetland Feature, Distances from Centerline, Photo Locations



<b>Obvious Connections to Waters of the US/State?</b>	y	Yes	No	Waterbody/Watershed: Unnamed drainage (WWC) to Town Creek (Tennessee River-Guntersville Reservoir)							
<b>Primary Water Source</b> (If other, note in comments)		Cap. Fringe	1	Overbanking	2	Sheet Flow	3	Groundwater	4	Precipitation	Other

<b>TVARAM SCORE:</b>	63.5	<b>TVARAM CATEGORY:</b>	Category 3
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**Description of Wetland and Other Comments:** (i.e. forest age class; habitat features; hydrologic regime; description of the wetland outside of or adjacent to ROW; erosion potential, existing disturbances, adjacent land use, wildlife observations, station numbers, lat-long, etc)

Flatwood forested wetland  
 Small perched wetland/vernal pool in center of eastern end; numerous scattered depressions with water-stained leaves  
 Wetland is outside (northwest) of AP1000 Footprint but wetland will receive stormwater runoff from construction area  
 Obvious signs of soil disturbance and earth-moving in past

Project: Bellefonte NP REQ 10389	Investigator: J. Groton, H. Hart	Normal Circumstances:	<input checked="" type="checkbox"/> y	Sample ID:	W02
County: Jackson		Atypical Situation:	<input type="checkbox"/> n	Station or Structure Number(s):	
State: AL	Date: April 6, 2006	Problem Area:	<input type="checkbox"/> n	Cowardin Code:	PFO1E

### Vegetation

Plant Species		Stratum	Indicator	Plant Species		Stratum	Indicator
1.	<i>Carpinus caroliniana</i>	Tr, Sh	Fac	9.	<i>Toxicodendron radicans</i>	WV	Fac
2.	<i>Quercus nigra</i>	Tr	Fac	10.	<i>Ulmus americana</i>	Tr	Facw
3.	<i>Quercus pagoda</i>	Tr	Fac	11.	<i>Ulmus thomasii</i>	Tr, Sh	Fac
4.	<i>Pinus taeda</i>	Tr	Fac	12.	<i>Impatiens sp.</i>	H	Facw
5.	<i>Acer rubrum</i>	Tr	Fac	13.			
6.	<i>Liquidambar styraciflua</i>	Tr, Sh	Fac+	14.			
7.	<i>Ilex decidua</i>	Sh	Fac	15.			
8.	<i>Berchemia scandens</i>	WV	Facw	16.			

Percent of Dominant Species That are OBL, FACW, or FAC: 100%

### Hydrology

<b>Field Observations:</b>		<b>Wetland Hydrology Indicators:</b>			
Depth of Surface Water:	<u>0-4</u> (in.)	<b>Primary Indicators</b>		<b>Secondary Indicators</b>	
Depth to Free Water in Pit:	<u>-</u> (in.)	<u>y</u> Inundated	<u>   </u> Drift Lines	<u>y</u> Oxidized Root Channels	
Depth to Saturated Soil:	<u>6</u> (in.)	<u>y</u> Saturated in Upper 12 in.	<u>   </u> Water Marks	<u>y</u> Water Stained Leaves	
		<u>   </u> Sediment Deposits	<u>y</u> Drainage Patterns		
Remarks: wet weather drainage to Town Creek embayment on Guntersville Reservoir					

### Soils

Soil Unit:		Drainage class:		Listed hydric soil?	Yes	No
<b>Profile Description:</b>						
Depth (Inches)	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance	Texture		
0-2	10 YR 4/2	-	-	Silt loam		
2-5	10 YR 5/2	-	-	Silt loam		
5-9	10 YR 7/3	10 YR 7/2	Common	Silty clay		
9-12	10 YR 7/3	10 YR 7/2	Common	Clay		
<b>Hydric Soil Indicators:</b>						
<u>y</u>	Gleyed or Low Chroma Colors	<u>   </u> Histic Epipedon	<u>   </u> Aquic Moisture Regime			
<u>y</u>	Sulfidic Odor	<u>   </u> High Organic Cont. Surf. Layer Sandy Soils	<u>y</u> Reducing Conditions			
<u>y</u>	Concretions	<u>   </u> Organic Streaking in Sandy Soils	<u>   </u> Other (Explain in Remarks)			
Remarks:						

### Wetland Determination

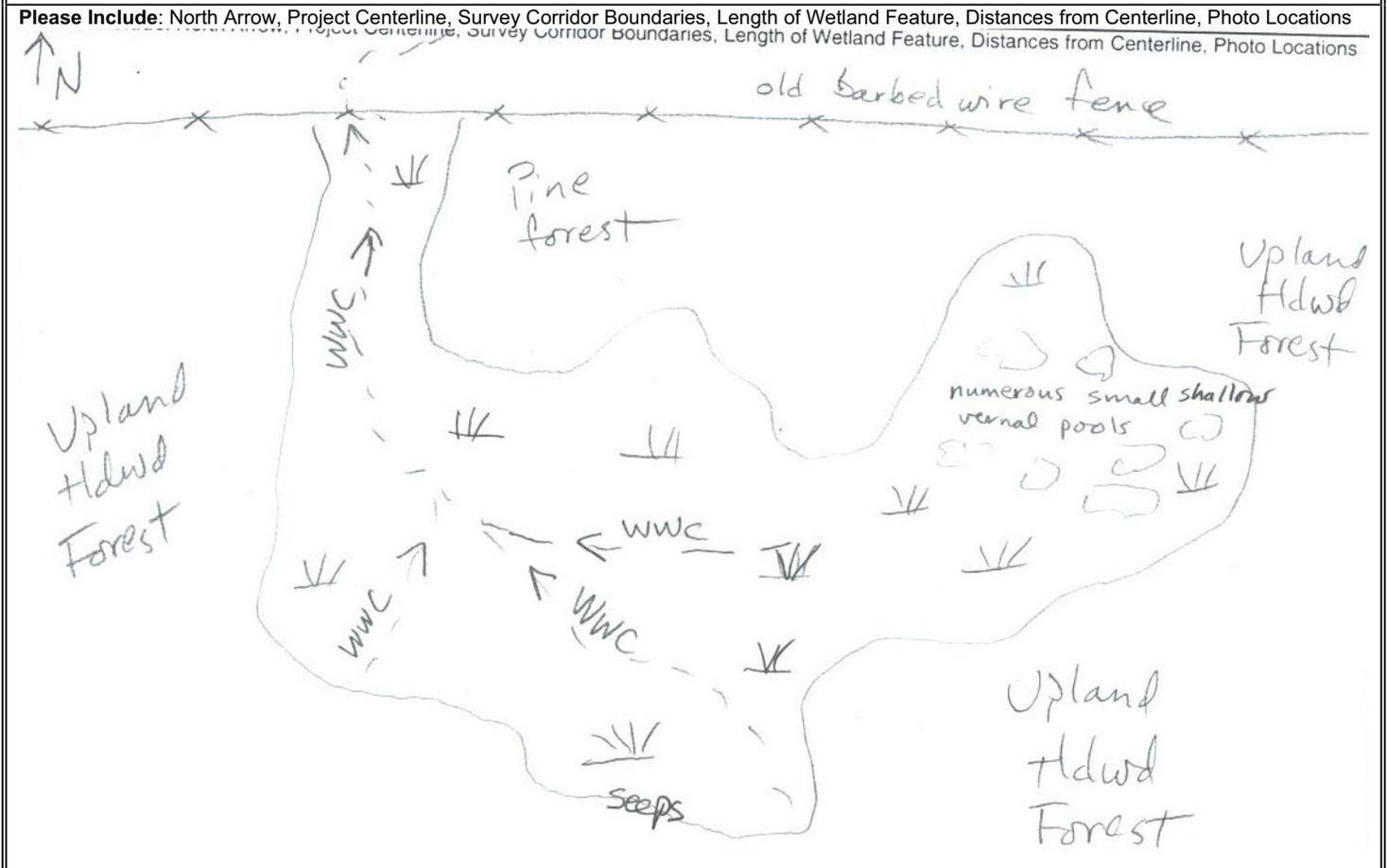
Hydrophytic Vegetation Present?	Yes <u>Y</u> No <u>   </u>	Is this Sampling Point Within a USACE Wetland?	Yes <u>Y</u> No <u>   </u>
Wetland Hydrology Present?	Yes <u>Y</u> No <u>   </u>	Does area only meet USFWS wetland definition?	Yes <u>   </u> No <u>N</u>
Hydric Soils Present?	Yes <u>Y</u> No <u>   </u>	Is wetland mapped on NWI?	Yes <u>   </u> No <u>N</u>
Estimated size: 4.05 acres			

# Wetland Descriptors

**Sample ID:** W02      **Photo ID(s):** W02-1W, W02-2W, W02-3W, W02-4W, W02-5W, W02-6W, W02-7W, W02-8W, W02-9W

**Flagging Description:** W2-1 to W2-16 clockwise from southern edge around to northwest corner, W2A-1 to W2A-43 clockwise from northeastern corner back to W2-1

## Drawing



<b>Obvious Connections to Waters of the US/State?</b>	y	Yes	No	Waterbody/Watershed: Unnamed drainage (WWC) to Town Creek (Tennessee River-Guntersville Reservoir)							
<b>Primary Water Source</b> (If other, note in comments)		Cap. Fringe	1	Overbanking	3	Sheet Flow	2	Groundwater	4	Precipitation	Other

<b>TVARAM SCORE:</b>	69	<b>TVARAM CATEGORY:</b>	Category 3
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**Description of Wetland and Other Comments:** (i.e. forest age class; habitat features; hydrologic regime; description of the wetland outside of or adjacent to ROW; erosion potential, existing disturbances, adjacent land use, wildlife observations, station numbers, lat-long, etc)

Flatwood forested wetland  
Wetland is outside (northwest) of AP1000 Footprint but wetland will be affected by proposed haul road, three containment vessel assembly areas, and another module assembly area.  
Wetland will receive stormwater runoff from construction area  
Obvious signs of soil disturbance and earth-moving in past  
Several perched wetlands/vernal pools scattered about northeastern lobe of wetland  
Numerous large trees (18-24+ inches DBH) throughout wetland but especially in northeastern lobe  
There is a ditch near the northeast corner that looks like someone attempted (unsuccessfully) to connect W02 to W06, about 100-150 feet to the north

Project: Bellefonte NP REQ 10389	Investigator: J. Groton, H. Hart	Normal Circumstances:	<input checked="" type="checkbox"/> y	Sample ID:	W03
County: Jackson		Atypical Situation:	<input checked="" type="checkbox"/> y	Station or Structure Number(s):	
State: AL	Date: April 6, 2006	Problem Area:	<input type="checkbox"/> n	Cowardin Code:	PFO1B

### Vegetation

Plant Species		Stratum	Indicator	Plant Species		Stratum	Indicator
1.	<i>Ligustrum sinense</i>	Sh	Fac	9.	<i>Glyceria striata</i>	H	Obl
2.	<i>Celtis laevigata</i>	Tr	Facw	10.	<i>Ulmus thomasii</i>	Tr, Sh	Fac
3.	<i>Fraxinus pennsylvanica</i>	Sh, Sap	Facw	11.	<i>Quercus michauxii</i>	Tr	Facw-
4.	<i>Berchemia scandens</i>	WV	Facw	12.			
5.	<i>Ulmus alata</i>	Tr	Facu+	13.			
6.	<i>Carex cherokeensis</i>	H	Facw-	14.			
7.	<i>Nothoscordum bivalve</i>	H	Fac	15.			
8.	<i>Sanicula sp.</i>	H	Fac-Facu	16.			

Percent of Dominant Species That are OBL, FACW, or FAC: 82%

### Hydrology

<b>Field Observations:</b>		<b>Wetland Hydrology Indicators:</b>			
Depth of Surface Water:	0-1 (in.)	<b>Primary Indicators</b>		<b>Secondary Indicators</b>	
Depth to Free Water in Pit:	- (in.)	<input checked="" type="checkbox"/> y	Inundated	<input type="checkbox"/> _____	Drift Lines
Depth to Saturated Soil:	7 (in.)	<input checked="" type="checkbox"/> y	Saturated in Upper 12 in.	<input type="checkbox"/> _____	Oxidized Root Channels
			Sediment Deposits	<input checked="" type="checkbox"/> y	Water Stained Leaves
				<input type="checkbox"/> _____	Water Marks
				<input type="checkbox"/> _____	Drainage Patterns

Remarks: Headwater of unnamed drainage (WWC) to Town Creek (Tennessee River-Guntersville Reservoir); connects by drainage channel to W02

### Soils

Soil Unit:		Drainage class:		Listed hydric soil?	Yes	No
<b>Profile Description:</b>						
Depth (Inches)	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance	Texture		
0-3	10 YR 3/2	-	-	Silt loam		
3-6	10 YR 5/3	10 YR 6/2	Common	Silt loam		
6-12	10 YR 6/2	10 YR 6/6	Common	Silty clay		
<b>Hydric Soil Indicators:</b>						
<input type="checkbox"/> _____	Gleyed or Low Chroma Colors	<input type="checkbox"/> _____	Histic Epipedon	<input type="checkbox"/> _____	Aquic Moisture Regime	
<input type="checkbox"/> _____	Sulfidic Odor	<input type="checkbox"/> _____	High Organic Cont. Surf. Layer Sandy Soils	<input type="checkbox"/> _____	Reducing Conditions	
<input checked="" type="checkbox"/> y	Concretions	<input type="checkbox"/> _____	Organic Streaking in Sandy Soils	<input type="checkbox"/> _____	Other (Explain in Remarks)	

Remarks: Soil color not quite hydric (chroma in second horizon too high); lots of evidence of extensive soil disturbance in past;

### Wetland Determination

Hydrophytic Vegetation Present?	Yes	<input checked="" type="checkbox"/> Y	No	<input type="checkbox"/> _____	Is this Sampling Point Within a USACE Wetland?	Yes	<input checked="" type="checkbox"/> Y	No	<input type="checkbox"/> _____
Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> Y	No	<input type="checkbox"/> _____	Does area only meet USFWS wetland definition?	Yes	<input type="checkbox"/> _____	No	<input checked="" type="checkbox"/> N
Hydric Soils Present?	Yes	<input type="checkbox"/> _____	No	<input checked="" type="checkbox"/> N	Is wetland mapped on NWI?	Yes	<input type="checkbox"/> _____	No	<input checked="" type="checkbox"/> N

Estimated size: 0.26 acre

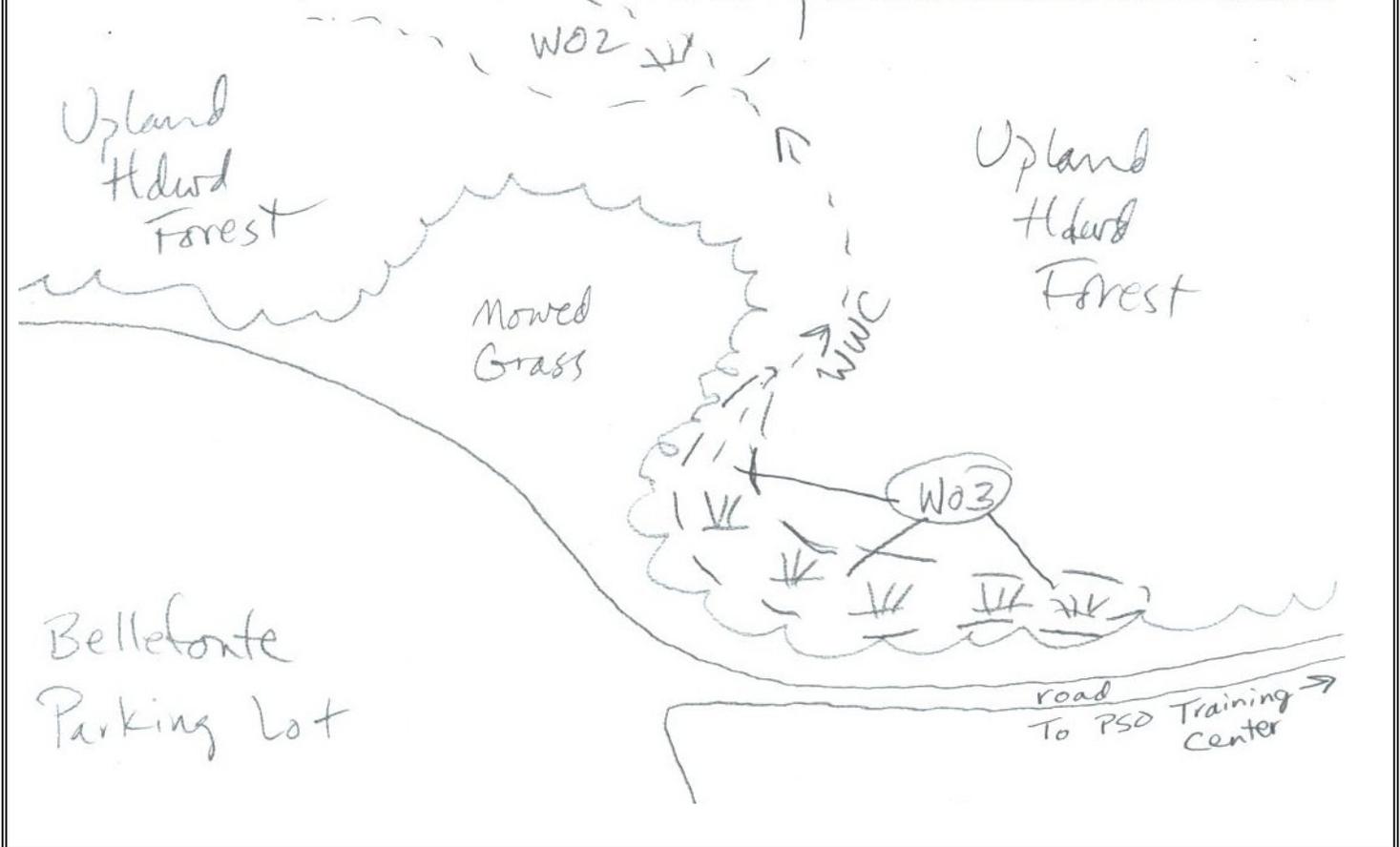
# Wetland Descriptors

Sample ID: W03	Photo ID(s): W03-1W, W03-2W
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Flagging Description: 1-19 counterclockwise from northwest

## Drawing

Please Include: North Arrow, Project Centerline, Survey Corridor Boundaries, Length of Wetland Feature, Distances from Centerline, Photo Locations



Obvious Connections to Waters of the US/State?	Yes	No	Waterbody/Watershed: Headwater of unnamed drainage (WWC) to Town Creek (Tennessee River-Guntersville Reservoir)						
Primary Water Source (If other, note in comments)	Cap. Fringe	Overbanking	2	Sheet Flow	1	Groundwater	3	Precipitation	Other

TVARAM SCORE:	35	TVARAM CATEGORY:	Category 2
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Description of Wetland and Other Comments: (i.e. forest age class; habitat features; hydrologic regime; description of the wetland outside of or adjacent to ROW; erosion potential, existing disturbances, adjacent land use, wildlife observations, station numbers, lat-long, etc)

Small area of forested wetland; partially intersects potential construction area (~0.25 acre inside construction footprint). It will also be affected by proposed haul road to site and module assembly areas  
 Wetland is connected to Wetland W02 by wet weather conveyance but higher in watershed  
 Possible small seep near southern edge

Project: Bellefonte NP REQ 10389	Investigator: J. Groton, B. Dimick	Normal Circumstances:	<input checked="" type="checkbox"/> y	Sample ID:	W04
County: Jackson		Atypical Situation:	<input type="checkbox"/> n	Station or Structure Number(s):	
State: AL	Date: April 26, 2006	Problem Area:	<input type="checkbox"/> n	Cowardin Code:	PFO1E

### Vegetation

Plant Species		Stratum	Indicator	Plant Species		Stratum	Indicator
1.	<i>Fraxinus pennsylvanica</i>	Tr, Sh, Sap	Facw	9.	<i>Nothoscordum bivalve</i>	H	Fac
2.	<i>Quercus phellos</i>	Tr, , Sap	Facw-	10.	<i>Galium aparine</i>	H	Facu
3.	<i>Ulmus americana</i>	Tr, Sh	Facw	11.	<i>Diospyros virginiana</i>	Sap	Fac
4.	<i>Campsis radicans</i>	Sap	Fac	12.	<i>Toxicodendron radicans</i>	WV, Sap	Fac
5.	<i>Berchemia scandens</i>	WV	Facw	13.	<i>Lycopus sp</i>	H	Obl
6.	<i>Ampelopsis arborea</i>	Sap	Fac+	14.	<i>Glyceria striata</i>	H	Obl
7.	<i>Ilex decidua</i>	Sh	Facw	15.	Several unidentified <i>Carex</i> species	H	
8.	<i>Pinus taeda</i>	Tr	Fac	16.	moss	H	

Percent of Dominant Species That are OBL, FACW, or FAC: 93%

### Hydrology

<b>Field Observations:</b>		<b>Wetland Hydrology Indicators:</b>	
Depth of Surface Water:	0-12 (in.)	<b>Primary Indicators</b>	<b>Secondary Indicators</b>
Depth to Free Water in Pit:	3 (in.)	<input checked="" type="checkbox"/> y Inundated	<input type="checkbox"/> Drift Lines
Depth to Saturated Soil:	0 (in.)	<input checked="" type="checkbox"/> y Saturated in Upper 12 in.	<input type="checkbox"/> Water Marks
		<input type="checkbox"/> Sediment Deposits	<input checked="" type="checkbox"/> x Drainage Patterns
Remarks: Unnamed drainage (WWC) to Town Creek (Tennessee River-Guntersville Reservoir)			

### Soils

<b>Soil Unit:</b>		<b>Drainage class:</b>		<b>Listed hydric soil?</b>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<b>Profile Description:</b>						
<b>Depth (Inches)</b>	<b>Matrix Color (Munsell Moist)</b>	<b>Mottle Colors (Munsell Moist)</b>	<b>Mottle Abundance</b>	<b>Texture</b>		
0-3	10 YR 5/3	10 YR 5/6	Common	Silty clay loam		
3-10	10 YR 6/2	10 YR 5/6	Common	Silty clay loam		
10-12+	10 YR 6/1	10 YR 5/6	Common	Silty clay loam		
<b>Hydric Soil Indicators:</b>						
<input checked="" type="checkbox"/> Y	Gleyed or Low Chroma Colors	<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> Aquic Moisture Regime			
<input type="checkbox"/>	Sulfidic Odor	<input type="checkbox"/> High Organic Cont. Surf. Layer Sandy Soils	<input checked="" type="checkbox"/> Y Reducing Conditions			
<input checked="" type="checkbox"/> Y	Concretions	<input type="checkbox"/> Organic Streaking in Sandy Soils	<input type="checkbox"/> Other (Explain in Remarks)			
Remarks:						

### Wetland Determination

Hydrophytic Vegetation Present?	Yes	<input checked="" type="checkbox"/> Y	No	<input type="checkbox"/>	Is this Sampling Point Within a USACE Wetland?	Yes	<input checked="" type="checkbox"/> Y	No	<input type="checkbox"/>
Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> Y	No	<input type="checkbox"/>	Does area only meet USFWS wetland definition?	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/> N
Hydric Soils Present?	Yes	<input checked="" type="checkbox"/> Y	No	<input type="checkbox"/>	Is wetland mapped on NWI?	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/> N
Estimated size: 1.81 acres									

# Wetland Descriptors

Sample ID: W04	Photo ID(s): W04-1W (northern end), W04-2W (center of wetland), W04-3W (southern end)
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Flagging Description: 1-48 clockwise from northeast corner

## Drawing

Please Include: North Arrow, Project Centerline, Survey Corridor Boundaries, Length of Wetland Feature, Distances from Centerline, Photo Locations



Obvious Connections to Waters of the US/State?	Y	Yes	No	Waterbody/Watershed: Unnamed drainage (WWC) to Town Creek (Tennessee River-Guntersville Reservoir)						
Primary Water Source (If other, note in comments)		Cap. Fringe	2	Overbanking	1	Sheet Flow	Groundwater	3	Precipitation	Other
TVARAM SCORE:	55		TVARAM CATEGORY:	Category 2						

**Description of Wetland and Other Comments:** (i.e. forest age class; habitat features; hydrologic regime; description of the wetland outside of or adjacent to ROW; erosion potential, existing disturbances, adjacent land use, wildlife observations, station numbers, lat-long, etc)

Young forested wetland formed in flooded drainageway  
 No evidence of beaver  
 Wetland drains into drainage ditch beside perimeter road  
 Drainage is impeded where wetland W04 intersects with the roadside drainage ditch – no evidence of plugged culvert  
 There are several shallow, linear ditches in the upper end of W04 (southern end) that run transverse to main axis of wetland. These appear to be the result of a past attempt to drain part of the wetland?  
 Gray Tree Frogs

Project: Bellefonte NP REQ 10389	Investigator: J. Groton, B. Dimick	Normal Circumstances:	y	Sample ID:	W05
County: Jackson		Atypical Situation:	n	Station or Structure Number(s):	
State: AL	Date: April 26, 2006	Problem Area:	n	Cowardin Code:	PFO1E

### Vegetation

Plant Species		Stratum	Indicator	Plant Species		Stratum	Indicator
1.	<i>Fraxinus pennsylvanica</i>	Tr, Sh, Sap	Facw	9.	<i>Ulmus alata</i>	Tr, Sh	Facu+
2.	<i>Microstegium vimineum</i>	H	Fac+	10.	<i>Rumex crispus</i>	H	Fac
3.	<i>Toxicodendron radicans</i>	WV, Sap	Fac	11.	<i>Ilex decidua</i>	Sh	Facw
4.	<i>Ulmus thomasii</i>	Tr, Sh	Fac	12.	<i>Populus deltoides</i>	Tr	Fac+
5.	<i>Carex cherokeensis</i>	H	Facw-	13.	<i>Berchemia scandens</i>	Sap	Facw
6.	<i>Senecio sp.</i>	H	-	14.			
7.	<i>Salix</i>	Tr, Sh	Obl	15.			
8.	<i>Lonicera japonica</i>	WV, Sap	Fac-	16.			

Percent of Dominant Species That are OBL, FACW, or FAC: 77%

### Hydrology

<b>Field Observations:</b>		<b>Wetland Hydrology Indicators:</b>	
Depth of Surface Water:	0-4 (in.)	<b>Primary Indicators</b>	<b>Secondary Indicators</b>
Depth to Free Water in Pit:	>12 (in.)	y Inundated	Drift Lines
Depth to Saturated Soil:	0 (in.)	y Saturated in Upper 12 in.	Water Marks
		Sediment Deposits	Drainage Patterns
Remarks: Isolated, perched wetland on terrace of WWC draining W02; ~25 feet from channel but no obvious connection to stream channel			

### Soils

Soil Unit:		Drainage class:		Listed hydric soil?	Yes	No
<b>Profile Description:</b>						
Depth (Inches)	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance	Texture		
0-12+	10 YR 4/2	7.5 YR 5/6	Common	Silty clay loam		
<b>Hydric Soil Indicators:</b>						
y	Gleyed or Low Chroma Colors	Histic Epipedon	Aquic Moisture Regime			
	Sulfidic Odor	High Organic Cont. Surf. Layer Sandy Soils	Reducing Conditions			
	Concretions	Organic Streaking in Sandy Soils	Other (Explain in Remarks)			
Remarks:						

### Wetland Determination

Hydrophytic Vegetation Present?	Yes	Y	No	Is this Sampling Point Within a USACE Wetland?	Yes	Y	No
Wetland Hydrology Present?	Yes	Y	No	Does area only meet USFWS wetland definition?	Yes		N
Hydric Soils Present?	Yes	Y	No	Is wetland mapped on NWI?	Yes	No	N
Estimated size: 0.24 acre							

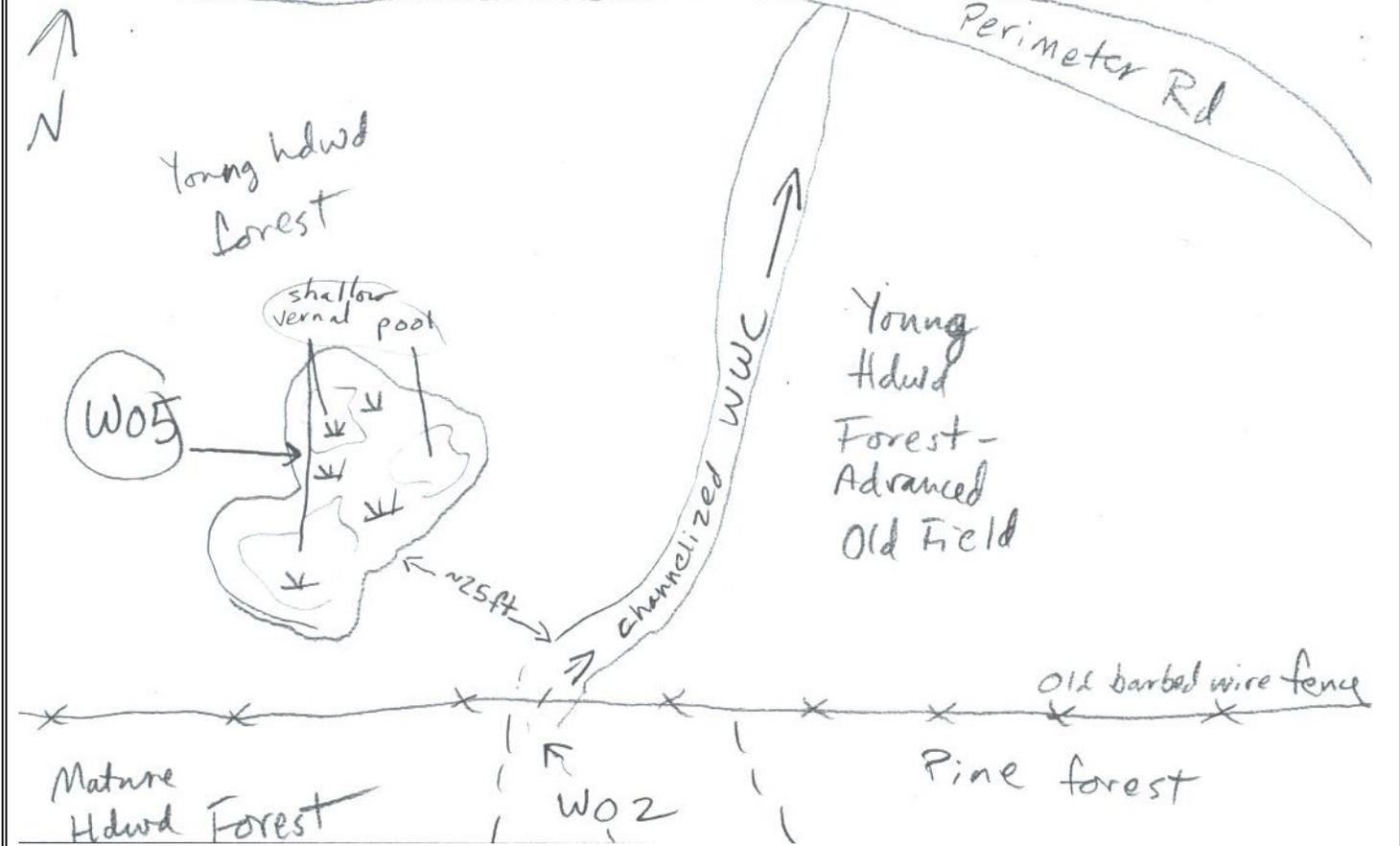
# Wetland Descriptors

Sample ID: W05      Photo ID(s): W05-1W, W05-2W, W05-3W, W05-4W

Flagging Description: 1-17 clockwise from southern tip of wetland

## Drawing

Please Include: North Arrow, Project Centerline, Survey Corridor Boundaries, Length of Wetland Feature, Distances from Centerline, Photo Locations



Obvious Connections to Waters of the US/State?	Yes	<input checked="" type="checkbox"/>	No	Waterbody/Watershed:					
Primary Water Source (If other, note in comments)	Cap. Fringe		Overbanking	2	Sheet Flow	Groundwater	1	Precipitation	Other
TVARAM SCORE:	60	TVARAM CATEGORY:	Category 3						

**Description of Wetland and Other Comments:** (i.e. forest age class; habitat features; hydrologic regime; description of the wetland outside of or adjacent to ROW; erosion potential, existing disturbances, adjacent land use, wildlife observations, station numbers, lat-long, etc)  
 Shallow, perched wetland or vernal pool on terrace of wet weather conveyance draining Wetland W02  
 Wetland W05 is about 25 feet from conveyance channel with no obvious signs of a direct hydrologic connection to the stream channel, even during high flows

Project: Bellefonte NP REQ 10389	Investigator: J. Groton, B. Dimick	Normal Circumstances:	<input checked="" type="checkbox"/> y	Sample ID:	W06
County: Jackson		Atypical Situation:	<input type="checkbox"/> n	Station or Structure Number(s):	
State: AL	Date: April 26, 2006	Problem Area:	<input type="checkbox"/> n	Cowardin Code:	PFO1E

### Vegetation

	Plant Species	Stratum	Indicator		Plant Species	Stratum	Indicator
1.	<i>Fraxinus pennsylvanica</i>	Tr	Facw	9.	<i>Glyceria striata</i>	H	Obl
2.	<i>Liquidambar styraciflua</i>	Tr	Fac+	10.	<i>Polygonum sp.</i>	H	-
3.	<i>Quercus phellos</i>	Tr	Facw-	11.	<i>Gratiola neglecta</i>	H	Obl
4.	<i>Ilex decidua</i>	Sh	Facw	12.	<i>Ligustrum sinense</i>	Sh	Fac
5.	<i>Berchemia scandens</i>	WV	Facw	13.	<i>Impatiens sp.</i>	H	Facw
6.	<i>Smilax glauca</i>	WV	Fac	14.	<i>Carpinus caroliniana</i>	Tr, Sh	Fac
7.	<i>Galium aparine</i>	H	Facu	15.	<i>Campsis radicans</i>	Sap	Fac
8.	<i>Celtis laevigata</i>	Tr	Facw	16.	Moss	H	-

Percent of Dominant Species That are OBL, FACW, or FAC: 88%

### Hydrology

<b>Field Observations:</b>		<b>Wetland Hydrology Indicators:</b>	
Depth of Surface Water:	<u>0-12</u> (in.)	<b>Primary Indicators</b>	<b>Secondary Indicators</b>
Depth to Free Water in Pit:	<u>3</u> (in.)	<input checked="" type="checkbox"/> y Inundated	<input type="checkbox"/> Drift Lines
Depth to Saturated Soil:	<u>0</u> (in.)	<input checked="" type="checkbox"/> y Saturated in Upper 12 in.	<input type="checkbox"/> Water Stained Leaves
		<input type="checkbox"/> Sediment Deposits	<input checked="" type="checkbox"/> y Drainage Patterns
Remarks:			

### Soils

Soil Unit:		Drainage class:		Listed hydric soil?	Yes	No
<b>Profile Description:</b>						
Depth (Inches)	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance	Texture		
0-4	10 YR 3/2	-	-	Silty clay loam		
4-12+	10 YR 5/2	10 YR 5.6	Common	Silty clay loam		
<b>Hydric Soil Indicators:</b>						
<input checked="" type="checkbox"/> y	Gleyed or Low Chroma Colors	<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> Aquic Moisture Regime			
<input type="checkbox"/>	Sulfidic Odor	<input type="checkbox"/> High Organic Cont. Surf. Layer Sandy Soils	<input checked="" type="checkbox"/> y Reducing Conditions			
<input type="checkbox"/>	Concretions	<input type="checkbox"/> Organic Streaking in Sandy Soils	Other (Explain in Remarks)			
Remarks:						

### Wetland Determination

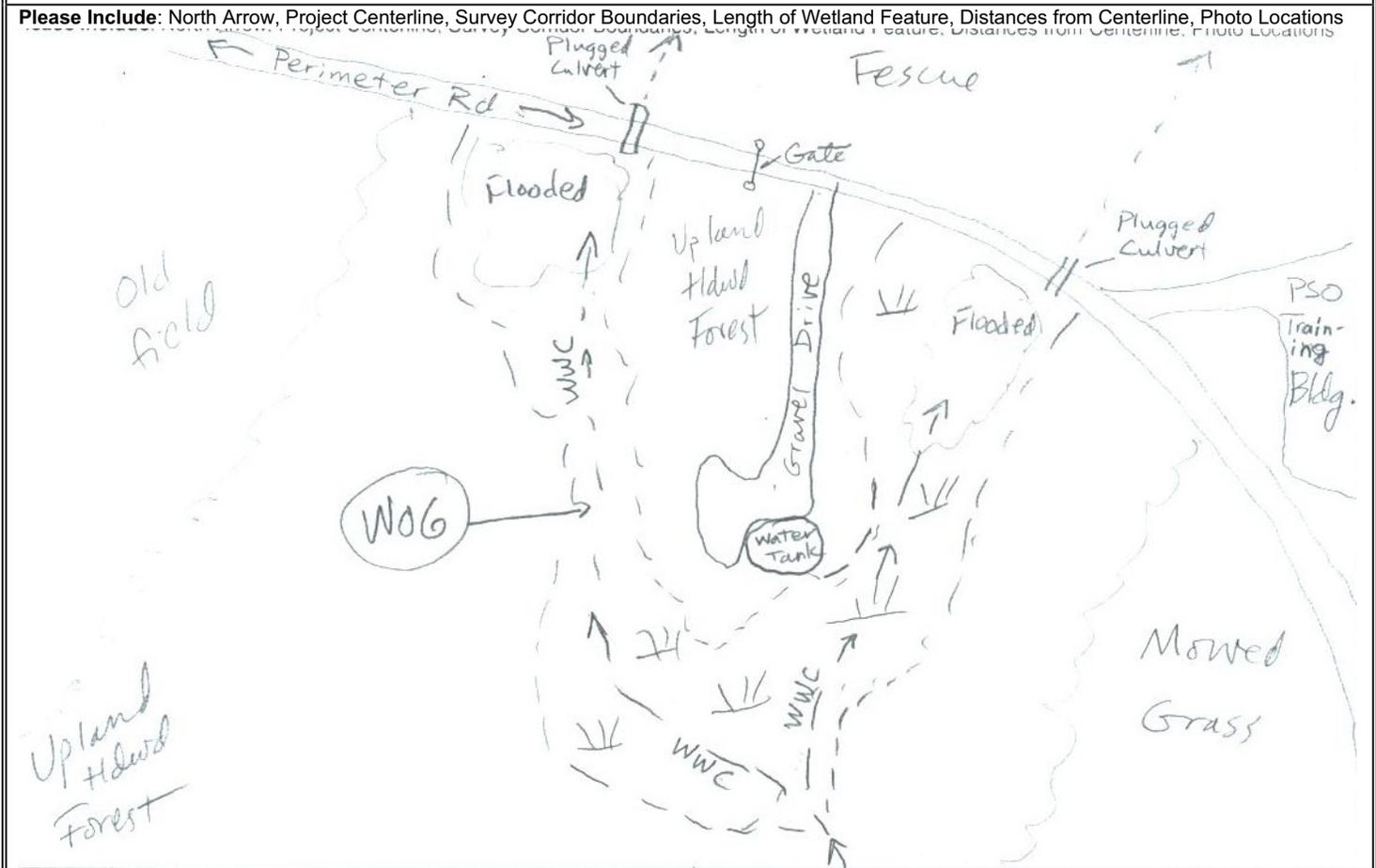
Hydrophytic Vegetation Present?	Yes	<input checked="" type="checkbox"/> Y	No	<input type="checkbox"/>	Is this Sampling Point Within a USACE Wetland?	Yes	<input checked="" type="checkbox"/> Y	No	<input type="checkbox"/>
Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/> Y	No	<input type="checkbox"/>	Does area only meet USFWS wetland definition?	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/> N
Hydric Soils Present?	Yes	<input checked="" type="checkbox"/> Y	No	<input type="checkbox"/>	Is wetland mapped on NWI?	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/> N
Estimated size: 2.35 acres									

# Wetland Descriptors

Sample ID: W06	Photo ID(s): W06-1W (northeastern end), W06-2W (center of wetland), W06-3W (northwestern end)
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Flagging Description: 1-75 clockwise from the northwest corner

## Drawing



Obvious Connections to Waters of the US/State?	x	Yes	No	Waterbody/Watershed: Two unnamed drainages (WWC) to Town Creek (Tennessee River-Guntersville Reservoir)						
Primary Water Source (If other, note in comments)		Cap. Fringe	1	Overbanking	Sheet Flow	2	Groundwater	3	Precipitation	Other

TVARAM SCORE:	TVARAM CATEGORY:
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**Description of Wetland and Other Comments:** (i.e. forest age class; habitat features; hydrologic regime; description of the wetland outside of or adjacent to ROW; erosion potential, existing disturbances, adjacent land use, wildlife observations, station numbers, lat-long, etc)

There is a ditch near the northeast corner that looks like someone attempted (unsuccessfully) to connect W06 to W02, about 100-150 feet to the south

Wetland W06 is fed by a wet weather conveyance that enters the wetland from the south and splits into two channels, one that flows northeast and a second that flows northwest. Both channels exit through culverts under the perimeter road. Both culverts are plugged with debris and water has ponded up at both culverts south of the perimeter road.

There appears to be some local groundwater influence (high water table) although no seeps or springs were observed

Grey tree frog, cricket frog, crayfish middens

Site: Bellefonte NP AP1000 W01

Rater(s): J. Groton, H. Hart

Date: April 6, 2006

**3** max 6 pts. **3** subtotal

**Metric 1. Wetland Area (size)**

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- >50 acres (>20.2 ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

- Aerial Photos
- Field Survey

**7** max 14 pts. **10** subtotal

**Metric 2. Upland Buffers and Surrounding Land Use**

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- High. Urban, industrial, open pasture, row cropping, mining, construction (1)

**21** max 30 pts. **31** subtotal

**Metric 3. Hydrology**

3a. Sources of water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3) [BR/CM (5)]
- Precipitation (1) [unless BR/CM primary source (5)]
- Seasonal/intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- 100-year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g., forest), complex (1)
- Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- >0.7 m (27.6 in.) (3)
- 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3) [BR/CM (4)]
- Seasonally inundated (2) [BR/CM (4)]
- Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

- |  |   |
|--|---|
| <input type="checkbox"/> ditch                               | <input type="checkbox"/> point source (nonstormwater) |
| <input checked="" type="checkbox"/> tile (including culvert) | <input checked="" type="checkbox"/> filling/grading   |
| <input checked="" type="checkbox"/> dike                     | <input type="checkbox"/> road bed/RR track            |
| <input type="checkbox"/> weir                                | <input type="checkbox"/> dredging                     |
| <input checked="" type="checkbox"/> stormwater input         | <input type="checkbox"/> other _____                  |

**13.5** max 20 pts. **44.5** subtotal

**Metric 4. Habitat Alteration and Development**

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

- |  |   |
|--|---|
| <input type="checkbox"/> mowing            | <input type="checkbox"/> shrub/sapling removal          |
| <input type="checkbox"/> grazing           | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input type="checkbox"/> clearcutting      | <input type="checkbox"/> woody debris removal           |
| <input type="checkbox"/> selective cutting | <input type="checkbox"/> sedimentation                  |
| <input type="checkbox"/> farming           | <input type="checkbox"/> dredging                       |
| <input type="checkbox"/> toxic pollutants  | <input type="checkbox"/> nutrient enrichment            |

**44.5**

subtotal this page

<b>Site: Bellefonte NP AP1000 W01</b>	<b>Rater(s): J. Groton, H. Hart</b>	<b>Date: April 6, 2006</b>
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<b>44.5</b>
subtotal previous page

<b>10</b>	<b>54.5</b>
max 10 pts.	subtotal

### Metric 5. Special Wetlands

<b>10</b>
raw score*

\*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- 5 Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- 5 Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- Ecological community with global rank (NatureServe): G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier]
- Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

<b>9</b>	<b>63.5</b>
max 20 pts.	subtotal

### Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities. Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- 2 Forest
- Mudflats
- Open water <20 acres (8 ha)
- Moss/lichen. Other \_\_\_\_\_

#### Vegetation Community Cover Scale

- 0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
- 2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
- 3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion. Select only one.

- High (5)
- Moderately high (4) [BR/CM (5)]
- Moderate (3) [BR/CM (5)]
- 2 Moderately low (2) [BR/CM (3)]
- Low (1) [BR/CM (2)]
- None (0)

#### Narrative Description of Vegetation Quality

- low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
- mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
- high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

6c. Coverage of invasive plants. Add or deduct points for coverage.

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- 1 Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

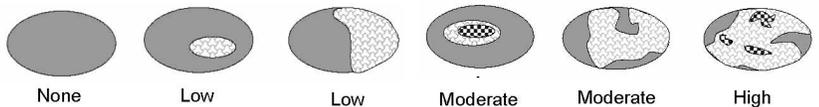
#### Mudflat and Open Water Class Quality

- 0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
- 2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]
- 3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography. Score all present using 0 to 3 scale.

- Vegetated hummocks/tussocks
- 2 Coarse woody debris >15 cm (6 in.)
- 2 Standing dead >25 cm (10 in.) dbh
- 2 Amphibian breeding pools

#### Hypothetical Wetland for Estimating Degree of Interspersion



#### Microtopography Cover Scale

- 0 = Absent
- 1 = Present in very small amounts or if more common of marginal quality
- 2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
- 3 = Present in moderate or greater amounts and of highest quality

<b>63.5 Category 3</b>	<b>GRAND TOTAL (max 100 pts)</b>
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Site: Bellefonte NP AP1000 W02

Rater(s): J. Groton, H. Hart

Date: April 6, 2006

**3**

max 6 pts.

**3**

subtotal

**Metric 1. Wetland Area (size)**

Select one size class and assign score.

- >50 acres (>20.2 ha) (6 pts)  
 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]  
 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]  
 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]  
 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]  
 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]  
 <0.1 acre (0.04 ha) (0)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Sources/assumptions for size estimate (list):

Aerial Photos  
Field Survey

**11**

max 14 pts.

**14**

subtotal

**Metric 2. Upland Buffers and Surrounding Land Use**

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)  
 MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)  
 NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)  
 VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)  
 LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)  
 MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)  
 High. Urban, industrial, open pasture, row cropping, mining, construction (1)

**23**

max 30 pts.

**37**

subtotal

**Metric 3. Hydrology**

3a. Sources of water. Score all that apply.

- High pH groundwater (5)  
 Other groundwater (3) [BR/CM (5)]  
 Precipitation (1) [unless BR/CM primary source (5)]  
 Seasonal/intermittent surface water (3)  
 Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 m (27.6 in.) (3)  
 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]  
 <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)  
 Recovered (7)  
 Recovering (3)  
 Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100-year floodplain (1)  
 Between stream/lake and other human use (1)  
 Part of wetland/upland (e.g., forest), complex (1)  
 Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl. check &amp; avg.

- Semi- to permanently inundated/saturated (4)  
 Regularly inundated/saturated (3) [BR/CM (4)]  
 Seasonally inundated (2) [BR/CM (4)]  
 Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

Check all disturbances observed

- |  |   |
|--|---|
| <input type="checkbox"/> ditch                       | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile (including culvert)    | <input checked="" type="checkbox"/> filling/grading   |
| <input type="checkbox"/> dike                        | <input checked="" type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir                        | <input type="checkbox"/> dredging                     |
| <input checked="" type="checkbox"/> stormwater input | <input type="checkbox"/> other _____                  |

**14**

max 20 pts.

**51**

subtotal

**Metric 4. Habitat Alteration and Development**

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)  
 Recovered (3)  
 Recovering (2)  
 Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)  
 Very good (6)  
 Good (5)  
 Moderately good (4)  
 Fair (3)  
 Poor to fair (2)  
 Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)  
 Recovered (6)  
 Recovering (3)  
 Recent or no recovery (1)

Check all disturbances observed

- |  |   |
|--|---|
| <input type="checkbox"/> mowing            | <input type="checkbox"/> shrub/sapling removal          |
| <input type="checkbox"/> grazing           | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input type="checkbox"/> clearcutting      | <input type="checkbox"/> woody debris removal           |
| <input type="checkbox"/> selective cutting | <input checked="" type="checkbox"/> sedimentation       |
| <input type="checkbox"/> farming           | <input type="checkbox"/> dredging                       |
| <input type="checkbox"/> toxic pollutants  | <input type="checkbox"/> nutrient enrichment            |

**51**

subtotal this page

<b>Site:</b> Bellefonte NP AP1000 W02	<b>Rater(s):</b> J. Groton, H. Hart	<b>Date:</b> April 6, 2006
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<b>51</b>
subtotal previous page

<b>10</b>	<b>61</b>
max 10 pts.	subtotal

## Metric 5. Special Wetlands

<b>20</b>
raw score*

\*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- 5 Bog, fen, wet prairie (10); acidophilic veg., **mossy substrate** >10 sq.m, sphagnum or **other moss** (5); muck, organic soil layer (3)
- 5 Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); **mature >18 in. (45 cm) dbh (5)** [exclude pine plantation]
- 5 Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- 5 **Vernal pool (5)**; isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- Ecological community with global rank (NatureServe): G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier]
- Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

<b>8</b>	<b>69</b>
max 20 pts.	Subtotal

## Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.  
Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- 2 Forest
- Mudflats
- Open water <20 acres (8 ha)
- Moss/lichen. Other \_\_\_\_\_

### Vegetation Community Cover Scale

- 0 = Absent or <0.1 ha (0.25 acre) contiguous acre  
[For BR/CM <0.04 ha (0.1 acre)]
- 1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
- 2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
- 3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.  
Select only one.

- High (5)
- Moderately high (4) [BR/CM (5)]
- 3 Moderate (3)[BR/CM (5)]
- Moderately low (2) [BR/CM (3)]
- Low (1) [BR/CM (2)]
- None (0)

### Narrative Description of Vegetation Quality

- Low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
- mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
- high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

6c. Coverage of invasive plants.  
Add or deduct points for coverage.

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- 1 Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

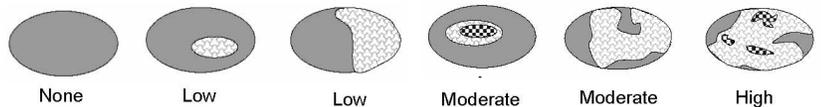
### Mudflat and Open Water Class Quality

- 0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
- 2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]
- 3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.  
Score all present using 0 to 3 scale.

- Vegetated hummocks/tussocks
- 1 Coarse woody debris >15 cm (6 in.)
- 1 Standing dead >25 cm (10 in.) dbh
- 2 Amphibian breeding pools

### Hypothetical Wetland for Estimating Degree of Interspersion



### Microtopography Cover Scale

- 0 = Absent
- 1 = Present in very small amounts or if more common of marginal quality
- 2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
- 3 = Present in moderate or greater amounts and of highest quality

<b>69 Category 3</b>
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**GRAND TOTAL (max 100 pts)**

Site: Bellefonte NP AP1000 W03

Rater(s): J. Groton, H. Hart

Date: April 6, 2006

**2**      **2**  
max 6 pts.      subtotal

### Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- >50 acres (>20.2 ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

- Aerial Photos
- Field Survey

**4**      **6**  
max 14 pts.      subtotal

### Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- High. Urban, industrial, open pasture, row cropping, mining, construction (1)

**14**      **20**  
max 30 pts.      subtotal

### Metric 3. Hydrology

3a. Sources of water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3) [BR/CM (5)]
- Precipitation (1) [unless BR/CM primary source (5)]
- Seasonal/intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- 100-year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g., forest), complex (1)
- Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- >0.7 m (27.6 in.) (3)
- 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3) [BR/CM (4)]
- Seasonally inundated (2) [BR/CM (4)]
- Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> ditch                    | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile (including culvert) | <input checked="" type="checkbox"/> filling/grading   |
| <input type="checkbox"/> dike                     | <input checked="" type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir                     | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input         | <input type="checkbox"/> other _____                  |

**9**      **29**  
max 20 pts.      subtotal

### Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

- |  |   |
|--|---|
| <input type="checkbox"/> mowing            | <input type="checkbox"/> shrub/sapling removal          |
| <input type="checkbox"/> grazing           | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input type="checkbox"/> clearcutting      | <input type="checkbox"/> woody debris removal           |
| <input type="checkbox"/> selective cutting | <input type="checkbox"/> sedimentation                  |
| <input type="checkbox"/> farming           | <input type="checkbox"/> dredging                       |
| <input type="checkbox"/> toxic pollutants  | <input type="checkbox"/> nutrient enrichment            |

**29**

subtotal this page

<b>Site:</b> Bellefonte NP AP1000 W03	<b>Rater(s):</b> J. Groton, H. Hart	<b>Date:</b> April 6, 2006
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<b>29</b>
subtotal previous page

<b>4</b>	<b>33</b>
max 10 pts.	subtotal

## Metric 5. Special Wetlands

<b>4</b>
raw score*

\*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- 4 Vernal pool (5); **isolated, perched, or slope wetland (4)**; headwater wetland [1st order perennial or above] (3)
- Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- Ecological community with global rank (NatureServe): G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier]
- Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

<b>2</b>	<b>35</b>
max 20 pts.	subtotal

## Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.  
Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- 2 Forest
- Mudflats
- Open water <20 acres (8 ha)
- Moss/lichen. Other \_\_\_\_\_

### Vegetation Community Cover Scale

- 0 = Absent or <0.1 ha (0.25 acre) contiguous acre  
[For BR/CM <0.04 ha (0.1 acre)]
- 1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
- 2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
- 3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.  
Select only one.

- High (5)
- Moderately high (4) [BR/CM (5)]
- Moderate (3) [BR/CM (5)]
- Moderately low (2) [BR/CM (3)]
- 1 Low (1) [BR/CM (2)]
- None (0)

### Narrative Description of Vegetation Quality

- low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
- mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
- high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

6c. Coverage of invasive plants.  
Add or deduct points for coverage.

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- 1 Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

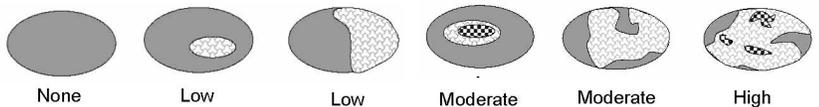
### Mudflat and Open Water Class Quality

- 0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
- 2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]
- 3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.  
Score all present using 0 to 3 scale.

- Vegetated hummocks/tussocks
- Coarse woody debris >15 cm (6 in.)
- Standing dead >25 cm (10 in.) dbh
- Amphibian breeding pools

### Hypothetical Wetland for Estimating Degree of Interspersion



### Microtopography Cover Scale

- 0 = Absent
- 1 = Present in very small amounts or if more common of marginal quality
- 2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
- 3 = Present in moderate or greater amounts and of highest quality

<b>35 Category 2</b>	<b>GRAND TOTAL (max 100 pts)</b>
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Site: Bellefonte NP AP1000 W04

Rater(s): J. Groton, B. Dimick

Date: April 26, 2006

**2** max 6 pts. **2** subtotal

### Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- >50 acres (>20.2 ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):  
Aerial Photos  
Field Survey

**5** max 14 pts. **8** subtotal

### Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- High. Urban, industrial, open pasture, row cropping, mining, construction (1)

**15** max 30 pts. **23** subtotal

### Metric 3. Hydrology

3a. Sources of water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3) [BR/CM (5)]
- Precipitation (1) [unless BR/CM primary source (5)]
- Seasonal/intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- 100-year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g., forest), complex (1)
- Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- >0.7 m (27.6 in.) (3)
- 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3) [BR/CM (4)]
- Seasonally inundated (2) [BR/CM (4)]
- Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

- |  |   |
|--|---|
| <input type="checkbox"/> ditch                               | <input type="checkbox"/> point source (nonstormwater) |
| <input checked="" type="checkbox"/> tile (including culvert) | <input checked="" type="checkbox"/> filling/grading   |
| <input checked="" type="checkbox"/> dike                     | <input type="checkbox"/> road bed/RR track            |
| <input type="checkbox"/> weir                                | <input type="checkbox"/> dredging                     |
| <input checked="" type="checkbox"/> stormwater input         | <input type="checkbox"/> other _____                  |

**11** max 20 pts. **34** subtotal

### Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

- |  |   |
|--|---|
| <input type="checkbox"/> mowing            | <input type="checkbox"/> shrub/sapling removal          |
| <input type="checkbox"/> grazing           | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input type="checkbox"/> clearcutting      | <input type="checkbox"/> woody debris removal           |
| <input type="checkbox"/> selective cutting | <input type="checkbox"/> sedimentation                  |
| <input type="checkbox"/> farming           | <input type="checkbox"/> dredging                       |
| <input type="checkbox"/> toxic pollutants  | <input type="checkbox"/> nutrient enrichment            |

**34**

subtotal this page

<b>Site: Bellefonte NP AP1000 W04</b>	<b>Rater(s): J. Groton, B. Dimick</b>	<b>Date: April 26, 2006</b>
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34
subtotal previous page

8	42
max 10 pts.	subtotal

## Metric 5. Special Wetlands

8
raw score*

\*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- 5 Bog, fen, wet prairie (10); acidophilic veg., mossy **substrate >10 sq.m.**, sphagnum or **other moss** (5); muck, organic soil layer (3)
- Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); **mature >18 in. (45 cm) dbh (5)** [exclude pine plantation]
- Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- Vernal pool (5)**; isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- 3 Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- Ecological community with global rank (NatureServe): G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier]
- Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

13	55
max 20 pts.	subtotal

## Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities. Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- 2 Shrub
- 2 Forest
- Mudflats
- 2 Open water <20 acres (8 ha)
- Moss/lichen. Other \_\_\_\_\_

**Vegetation Community Cover Scale**

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]

1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality

2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality

3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion. Select only one.

- High (5)
- Moderately high (4) [BR/CM (5)]
- 3 Moderate (3) [BR/CM (5)]
- Moderately low (2) [BR/CM (3)]
- Low (1) [BR/CM (2)]
- None (0)

**Narrative Description of Vegetation Quality**

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species

mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species

high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

6c. Coverage of invasive plants. Add or deduct points for coverage.

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- 1 Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

**Mudflat and Open Water Class Quality**

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]

1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]

2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]

3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography. Score all present using 0 to 3 scale.

- Vegetated hummocks/tussocks
- 2 Coarse woody debris >15 cm (6 in.)
- 1 Standing dead >25 cm (10 in.) dbh
- 2 Amphibian breeding pools

**Hypothetical Wetland for Estimating Degree of Interspersion**

None      Low      Low      Moderate      Moderate      High

**Microtopography Cover Scale**

0 = Absent

1 = Present in very small amounts or if more common of marginal quality

2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality

3 = Present in moderate or greater amounts and of highest quality

55 Category 2
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GRAND TOTAL (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: <http://www.epa.state.oh.us/dsw/401/401.html>

**2**      **2**  
max 6 pts.      subtotal

**Metric 1. Wetland Area (size)**

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- >50 acres (>20.2 ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):  
 Aerial Photos  
 Field Survey

**13**      **15**  
max 14 pts.      subtotal

**Metric 2. Upland Buffers and Surrounding Land Use**

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- High. Urban, industrial, open pasture, row cropping, mining, construction (1)

**19**      **34**  
max 30 pts.      subtotal

**Metric 3. Hydrology**

3a. Sources of water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3) [BR/CM (5)]
- Precipitation (1) [unless BR/CM primary source (5)]
- Seasonal/intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- 100-year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g., forest), complex (1)
- Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- >0.7 m (27.6 in.) (3)
- 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3) [BR/CM (4)]
- Seasonally inundated (2) [BR/CM (4)]
- Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

<input type="checkbox"/> ditch	<input type="checkbox"/> point source (nonstormwater)
<input type="checkbox"/> tile (including culvert)	<input type="checkbox"/> filling/grading
<input type="checkbox"/> dike	<input type="checkbox"/> road bed/RR track
<input type="checkbox"/> weir	<input type="checkbox"/> dredging
<input type="checkbox"/> stormwater input	<input type="checkbox"/> other _____

**14**      **48**  
max 20 pts.      subtotal

**Metric 4. Habitat Alteration and Development**

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

<input type="checkbox"/> mowing	<input type="checkbox"/> shrub/sapling removal
<input type="checkbox"/> grazing	<input type="checkbox"/> herbaceous/aquatic bed removal
<input type="checkbox"/> clearcutting	<input type="checkbox"/> woody debris removal
<input type="checkbox"/> selective cutting	<input checked="" type="checkbox"/> sedimentation
<input type="checkbox"/> farming	<input type="checkbox"/> dredging
<input type="checkbox"/> toxic pollutants	<input type="checkbox"/> nutrient enrichment

**48**  
subtotal this page

<b>Site: Bellefonte NP AP1000 W05</b>	<b>Rater(s): J. Groton, B. Dimick</b>	<b>Date: April 26, 2006</b>
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**48**

subtotal previous page

<b>4</b> <small>max 10 pts.</small>	<b>52</b> <small>subtotal</small>
--	--------------------------------------

## Metric 5. Special Wetlands

**4**

raw score\*

\*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- Bog, fen, wet prairie (10); acidophilic veg., **mossy substrate** >10 sq.m, sphagnum or **other moss** (5); muck, organic soil layer (3)
- Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- 4** **Vernal pool (5)**; isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- Ecological community with global rank (NatureServe): G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier]
- Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

<b>8</b> <small>max 20 pts.</small>	<b>60</b> <small>Subtotal</small>
--	--------------------------------------

## Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.  
Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- 2** Forest
- Mudflats
- 1** Open water <20 acres (8 ha)
- Moss/lichen. Other \_\_\_\_\_

**Vegetation Community Cover Scale**

---

0 = Absent or <0.1 ha (0.25 acre) contiguous acre  
[For BR/CM <0.04 ha (0.1 acre)]

---

1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality

---

2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality

---

3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.  
Select only one.

- High (5)
- Moderately high (4) [BR/CM (5)]
- 3** Moderate (3)[BR/CM (5)]
- Moderately low (2) [BR/CM (3)]
- Low (1) [BR/CM (2)]
- None (0)

**Narrative Description of Vegetation Quality**

---

Low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species

---

mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species

---

high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

6c. Coverage of invasive plants.  
Add or deduct points for coverage.

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- 1** Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

**Mudflat and Open Water Class Quality**

---

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]

---

1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]

---

2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]

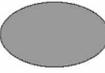
---

3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.  
Score all present using 0 to 3 scale.

- Vegetated hummocks/tussocks
- 1** Coarse woody debris >15 cm (6 in.)
- 1** Standing dead >25 cm (10 in.) dbh
- 1** Amphibian breeding pools

**Hypothetical Wetland for Estimating Degree of Interspersion**



None



Low



Low



Moderate



Moderate



High

**Microtopography Cover Scale**

---

0 = Absent

---

1 = Present in very small amounts or if more common of marginal quality

---

2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality

---

3 = Present in moderate or greater amounts and of highest quality

**60**

**Category 3 GRAND TOTAL (max 100 pts)**

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: <http://www.epa.state.oh.us/dsw/401/401.html>

Site: Bellefonte NP AP1000 W06

Rater(s): J. Groton, B. Dimick

Date: April 26, 2006

**2**

max 6 pts.

**2**

subtotal

**Metric 1. Wetland Area (size)**

Select one size class and assign score.

- >50 acres (>20.2 ha) (6 pts)  
 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]  
 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]  
 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]  
 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]  
 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]  
 <0.1 acre (0.04 ha) (0)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Sources/assumptions for size estimate (list):

Aerial Photos  
Field Survey

**9**

max 14 pts.

**11**

subtotal

**Metric 2. Upland Buffers and Surrounding Land Use**

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)  
 MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)  
 NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)  
 VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)  
 LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)  
 MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)  
 High. Urban, industrial, open pasture, row cropping, mining, construction (1)

**20**

max 30 pts.

**31**

subtotal

**Metric 3. Hydrology**

3a. Sources of water. Score all that apply.

- High pH groundwater (5)  
 Other groundwater (3) [BR/CM (5)]  
 Precipitation (1) [unless BR/CM primary source (5)]  
 Seasonal/intermittent surface water (3)  
 Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 m (27.6 in.) (3)  
 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]  
 <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)  
 Recovered (7)  
 Recovering (3)  
 Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100-year floodplain (1)  
 Between stream/lake and other human use (1)  
 Part of wetland/upland (e.g., forest), complex (1)  
 Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl. check &amp; avg.

- Semi- to permanently inundated/saturated (4)  
 Regularly inundated/saturated (3) [BR/CM (4)]  
 Seasonally inundated (2) [BR/CM (4)]  
 Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

Check all disturbances observed

- |  |   |
|--|---|
| <input type="checkbox"/> ditch                               | <input type="checkbox"/> point source (nonstormwater) |
| <input checked="" type="checkbox"/> tile (including culvert) | <input checked="" type="checkbox"/> filling/grading   |
| <input type="checkbox"/> dike                                | <input checked="" type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir                                | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input                    | <input type="checkbox"/> other _____                  |

**12.5**

max 20 pts.

**43.5**

subtotal

**Metric 4. Habitat Alteration and Development**

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)  
 Recovered (3)  
 Recovering (2)  
 Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)  
 Very good (6)  
 Good (5)  
 Moderately good (4)  
 Fair (3)  
 Poor to fair (2)  
 Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)  
 Recovered (6)  
 Recovering (3)  
 Recent or no recovery (1)

Check all disturbances observed

- |  |   |
|--|---|
| <input type="checkbox"/> mowing            | <input type="checkbox"/> shrub/sapling removal          |
| <input type="checkbox"/> grazing           | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input type="checkbox"/> clearcutting      | <input type="checkbox"/> woody debris removal           |
| <input type="checkbox"/> selective cutting | <input type="checkbox"/> sedimentation                  |
| <input type="checkbox"/> farming           | <input type="checkbox"/> dredging                       |
| <input type="checkbox"/> toxic pollutants  | <input type="checkbox"/> nutrient enrichment            |

**43.5**

subtotal this page

<b>Site: Bellefonte NP AP1000 W06</b>	<b>Rater(s): J. Groton, B. Dimick</b>	<b>Date: April 26, 2006</b>
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43.5

  
subtotal previous page

8

51.5

max 10 pts. subtotal

## Metric 5. Special Wetlands

8

  
raw score\*

\*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- 5 Bog, fen, wet prairie (10); acidophilic veg., **mossy substrate >10 sq.m**, sphagnum or **other moss** (5); muck, organic soil layer (3)
- Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- Vernal pool (5); **isolated, perched, or slope wetland (4)**; headwater wetland [1st order perennial or above] (3)
- Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- 3 Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- Ecological community with global rank (NatureServe): G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier]
- Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

12

63.5

max 20 pts. subtotal

## Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.  
Score all present using 0 to 3 scale.

- Aquatic bed
- 1 Emergent
- Shrub
- 2 Forest
- Mudflats
- 1 Open water <20 acres (8 ha)
- Moss/lichen. Other \_\_\_\_\_

**Vegetation Community Cover Scale**

---

0 = Absent or <0.1 ha (0.25 acre) contiguous acre  
[For BR/CM <0.04 ha (0.1 acre)]

---

1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality

---

2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality

---

3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.  
Select only one.

- High (5)
- Moderately high (4) [BR/CM (5)]
- 3 Moderate (3)[BR/CM (5)]
- Moderately low (2) [BR/CM (3)]
- Low (1) [BR/CM (2)]
- None (0)

**Narrative Description of Vegetation Quality**

---

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species

---

mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species

---

high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

6c. Coverage of invasive plants.  
Add or deduct points for coverage.

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- 1 Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

**Mudflat and Open Water Class Quality**

---

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]

---

1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]

---

2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]

---

3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.  
Score all present using 0 to 3 scale.

- 1 Vegetated hummocks/tussocks
- 2 Coarse woody debris >15 cm (6 in.)
- 1 Standing dead >25 cm (10 in.) dbh
- 2 Amphibian breeding pools

**Hypothetical Wetland for Estimating Degree of Interspersion**

None

Low

Low

Moderate

Moderate

High

**Microtopography Cover Scale**

---

0 = Absent

---

1 = Present in very small amounts or if more common of marginal quality

---

2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality

---

3 = Present in moderate or greater amounts and of highest quality

63.5 Category 3

GRAND TOTAL (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: <http://www.epa.state.oh.us/dsw/401/401.html>

05 May, 2006

**Request # 10389 – Bellefonte NP – Wetlands Site Visit: Wetland Input**

Combined office review and ground surveys were conducted for the project area between the Bellefonte parking lot and the perimeter road around the north side of the site. The office review included a review of TVA Natural Heritage data, National Wetlands Inventory data, aerial photographs supplied by TVA Nuclear, Natural Resources Conservation Service (Soil Conservation Service) soil survey data for Jackson County, Alabama (Swenson et al 1954), and the Alabama hydric soil list ([http://soils.usda.gov/soil\\_use/hydric/main.htm](http://soils.usda.gov/soil_use/hydric/main.htm)).

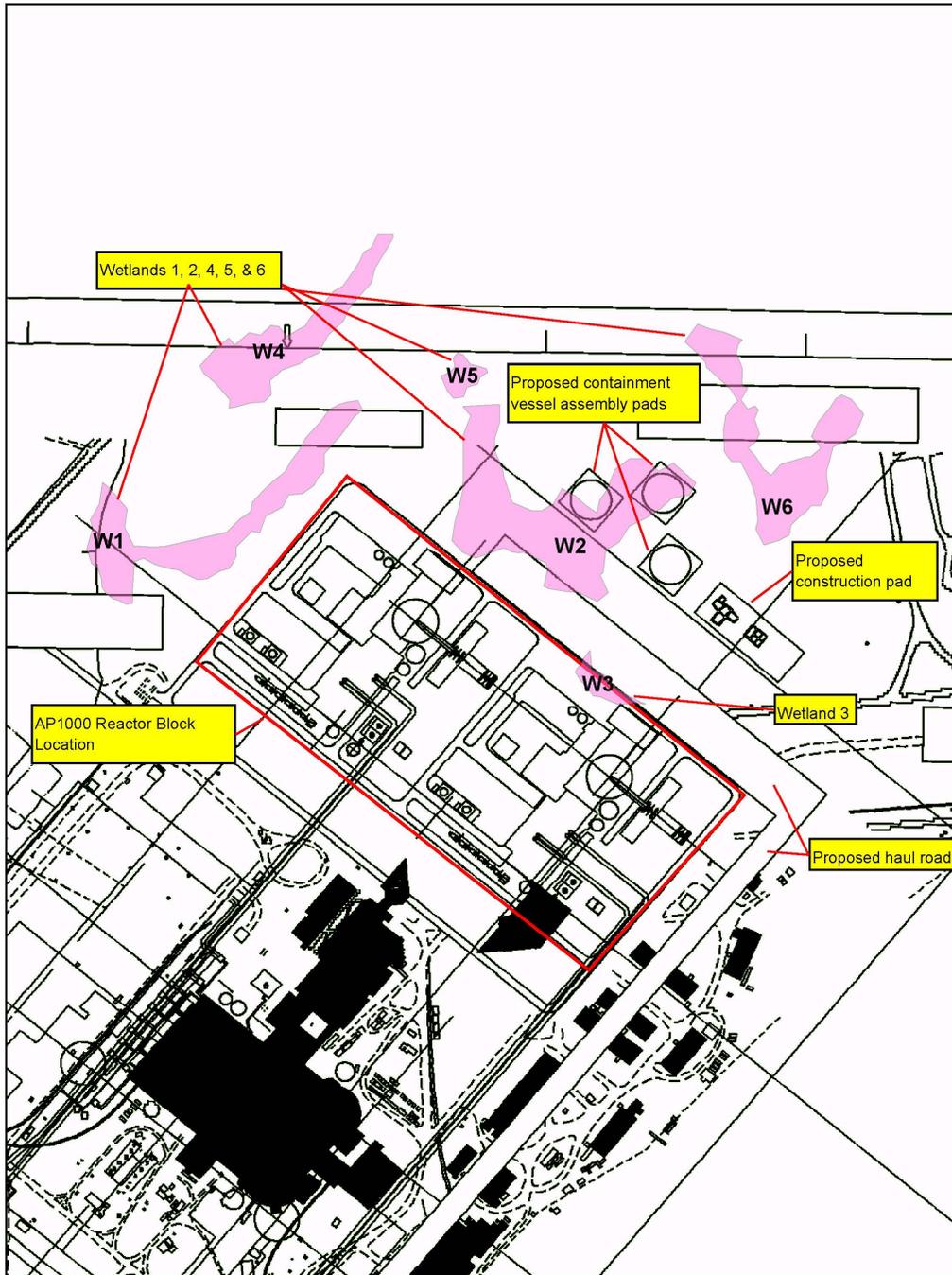
Field surveys were conducted April 6, 18, and 25-26, 2006 to determine the presence of wetlands between the Bellefonte Nuclear Plant parking lot and the perimeter road to the north of the site. Six forested wetlands were identified within the survey area (Figure 1) covering a total of 11.15 acres (Table 1). Individual wetlands ranged in size from 0.24 acre to 4.05 acres. Wetland boundaries were flagged in the field and mapped with a Trimble ProXRS geographic positioning system unit capable of submeter accuracy. Field data sheets (U. S. Army Corps of Engineers wetland delineation forms) and TVA Rapid Assessment forms are located in Appendix A and B respectively. Representative photographs of the six wetlands delineated in the vicinity of the AP1000 reactor block at Bellefonte are in located in Appendix C.

**Table 1. Wetlands near Proposed New Reactor Construction Area – Bellefonte Nuclear Plant, Alabama**

Wetland ID	Wetland Type	Acreage	TVARAM Score	TVARAM Category
Wetland 1	PFO1	2.46	63.5	3
Wetland 2	PFO1	4.05	69	3
Wetland 3	PFO1	0.25	35	2
Wetland 4	PFO1	1.80	55	2
Wetland 5	PFO1	0.24	60	3
Wetland 6	PFO1	2.35	63.5	3
Total		11.15		

Wetland 1 is a forested wetland (2.46 acres) about 100 feet northwest of the AP1000 reactor block (Figure 1). It is associated with two wet weather conveyances that ultimately discharge into Town Creek. Wetland 1 currently receives runoff from part of the proposed construction site. There is a small vernal pool in the center of Wetland 1 that provides important habitat for amphibians and other wildlife at the site. Wetland 1 is a Category 3 wetland indicating a high degree of functionality and ecological value (Table 1). Wetland 1 meets the criteria for a jurisdictional wetland.

Wetland 2 is a forested wetland (4.05 acres) immediately north of the proposed AP1000 reactor block. Wetland 2 is associated with several wet weather conveyances that ultimately discharge into Town Creek. There are at least two groundwater seeps along the southern boundary of the wetland. Wetland 2 currently receives runoff from part of



**Figure 1. Location of wetlands at Proposed Bellefonte Nuclear Plant AP1000 Reactor Block construction site.**

the proposed construction site; it could also be directly impacted by the haul road and the containment vessel assembly areas. The northern lobe of Wetland 2 contains several shallow, vernal pools that provide important habitat for amphibians and other wildlife at the site. Wetland 2 is a Category 3 wetland indicating a high degree of

functionality and ecological value (Table 1). Wetland 2 meets the criteria for a jurisdictional wetland.

Wetland 3 is a small forested wetland (0.25 acre) near the northeastern corner of the proposed AP1000 reactor block. It is fed by a groundwater seep. Wetland 2 ultimately receives drainage from Wetland 3 via a wet weather conveyance that exits Wetland 3. Wetland 3 lies directly within the footprint of the proposed construction and the haul road. Wetland 3 is a Category 2 wetland indicating a moderate degree of functionality and ecological value (Table 1). Wetland 3 may not meet the criteria for a jurisdictional wetland.

Wetland 4 is a forested wetland (1.80 acres) north of the proposed AP1000 reactor block along the south side of the northern perimeter road (Figure 1). Wetland 5 should not be affected by the proposed construction project. It is fed by water from a wet weather conveyance at the site. Wetland 4 drains to Town Creek via a roadside drainage ditch along the perimeter road. Wetland 4 is a Category 3 wetland indicating a high degree of functionality and ecological value (Table 1). Wetland 4 meets the criteria for a jurisdictional wetland.

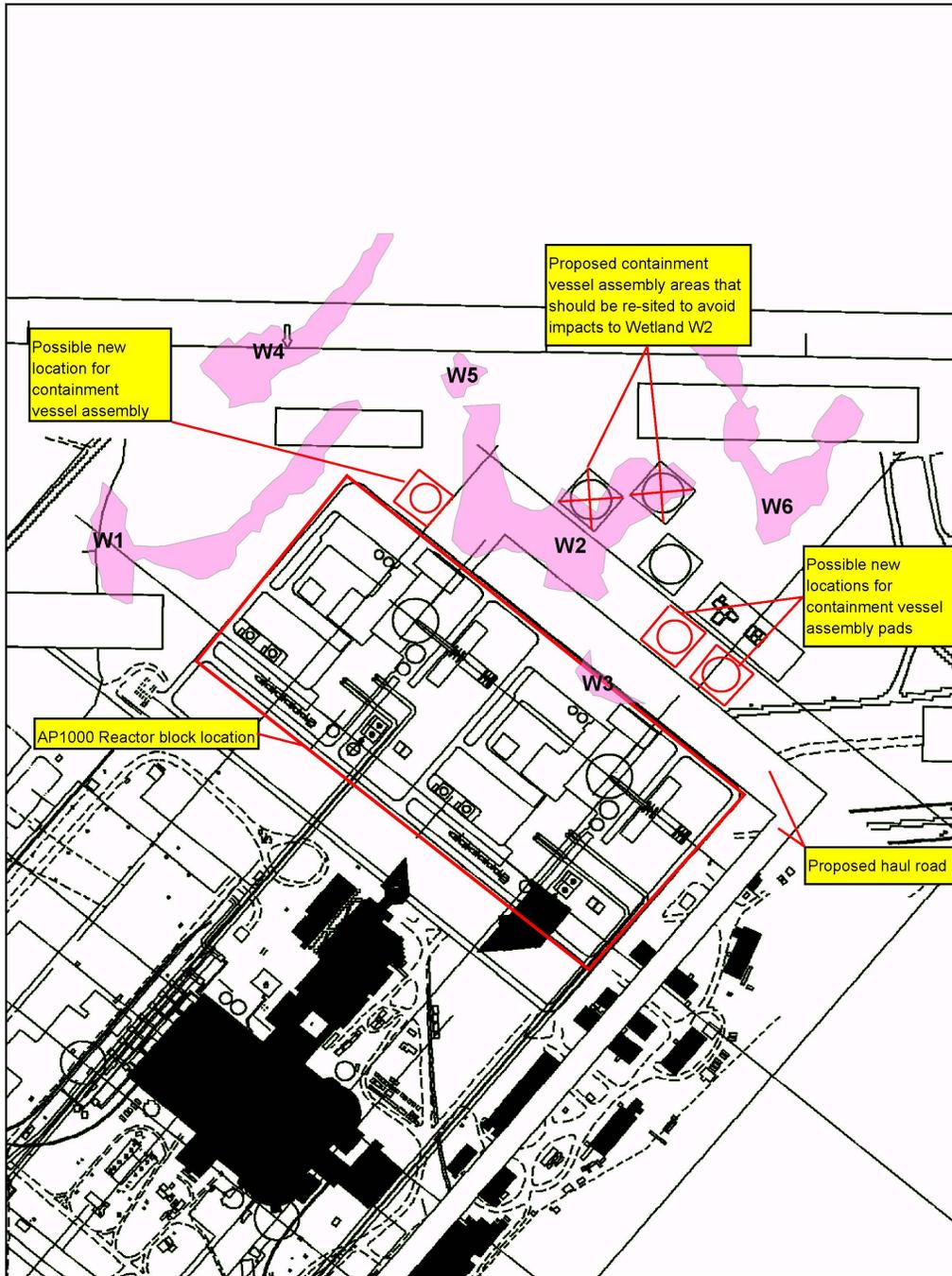
Wetland 5 is a small, forested wetland (0.24 acre) located about 25 feet north of Wetland 2 (Figure 1). Wetland 5 should not be affected by the proposed construction project. The wetland is perched on a stream terrace associated with the wet weather conveyance that drains Wetland 2. Wetland 5 is a Category 2 wetland indicating a moderate degree of functionality and ecological value (Table 1). Wetland 5 may not meet the criteria for a jurisdictional wetland.

Wetland 6 is a forested wetland (2.35 acres) northeast of the proposed AP1000 reactor block along the south side of the northern perimeter road (Figure 1). Wetland 4 should not be affected by the proposed construction project. It is fed by water from a wet weather conveyance at the site. Wetland 6 drains to Town Creek via a roadside drainage ditch along the perimeter road. Wetland 6 is a Category 3 wetland indicating a high degree of functionality and ecological value (Table 1). Wetland 6 meets the criteria for a jurisdictional wetland.

### **Potential Construction Impacts**

Preliminary construction plans indicate that the proposed construction of the new reactor units will directly impact at least two of the wetlands (Wetland 2 and Wetland 3) (Figure 2). Wetland 2 (W2) would be impacted by the proposed haul road to the construction site and at least two construction pads for containment vessel assembly. Wetland 3 (W3) would only be affected by the proposed haul road. Wetland 1 would receive stormwater runoff from the proposed construction site. Presumably an aggressive stormwater management plan would prevent or reduce any potential impacts to Wetland 1.

It may be possible to locate temporary construction areas (containment vessel assembly pads and haul roads) to avoid or minimize wetland impacts. Impacts to Wetland 2 could be reduced and minimized by moving two of the containment vessel assembly pads to alternate locations outside the wetland. The two northernmost assembly pads shown in Figure 1 are in the most pristine and ecologically sensitive part of Wetland 2. Figure 2 shows three possible alternate locations for the assembly pads that would reduce the



**Figure 2. Alternate containment vessel assembly pad locations to minimize impacts to Wetland 2, Bellefonte Nuclear Plant AP1000 construction site.**

impact to Wetland 2. With the construction plans shown in Figure 1 approximately 2.7 acres of Wetland 2 would be impacted by the proposed haul road and the two northernmost containment vessel assembly pads. If the two northernmost containment

vessel assembly pads could be located outside Wetland 2, the impact area could be reduced to about 0.6 acre. All of Wetland 3 (0.25 acre) would be affected by the proposed haul road. It appears that impacts to Wetland 3 are unavoidable due to the configuration of the AP1000 reactor block location and the haul road. Thus impacts to wetlands could range from about 2.95 acres with the construction plans depicted in Figure 1 to about 0.85 acre by relocating two of the containment vessel assembly pads.

## **Mitigation**

Ultimately detailed construction plans will be required to determine the exact extent of any impacts to the wetlands at the site. If it is not possible to avoid impacts to wetlands, additional compensatory mitigation would likely be required. Early discussions with U.S. Army Corps of Engineers and Alabama Department of Environmental Management will help streamline any issues related to Clean Water Act permits and wetland mitigation requirements. It is likely an Individual Permit will be required for this project.

Mitigation could be accomplished through local wetland mitigation banks if credits are available or through more traditional means (i.e., restoration or creation). Mitigation ratios are likely to be a minimum of 2:1 and may be much higher depending on the ecological functions of affected wetlands. "The type and amount of compensatory mitigation required will be commensurate with the nature and extent of the activity's adverse impact on aquatic functions and practicable in terms of cost, existing technology, and logistics, in light of the overall project purpose" (USACE 2004). TVA Natural Heritage Wetlands staff stands ready to assist with any discussions or meetings with USACE and development and implementation of wetland mitigation plans for the Bellefonte AP1000 project. Clean Water Act permits would be coordinated out of the USACE Western Regulatory Field Office in Decatur, Alabama:

U.S. Army Corps of Engineers  
2042 Beltline Road, SW  
Bldg. C, Suite 415  
Decatur, Alabama 35601  
Phone (256) 350-5620  
Fax (256) 350-5499

Wetlands are protected under Sections 404 and 401 of the Clean Water Act and by Executive Order (E.O.) 11990. In order to conduct specific activities in wetlands authorization under a Section 404 Permit from the U. S. Army Corps of Engineers is required. Section 401 gives states the authority to certify whether activities permitted by under Section 404 are in accordance with state water quality standards. Alabama Department of Environmental Management is responsible for Section 401 water quality certifications in Alabama. E.O. 11990 requires all federal agencies to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities.

Wetland determinations were performed according to US Army Corps of Engineers (USACE) standards (Environmental Laboratory, 1987), which require documentation of hydrophytic vegetation (USFWS 1996), hydric soil, and wetland hydrology. Broader definitions of wetlands, such as the definition provided in Executive Order 11990 (Protection of Wetlands), Alabama state regulatory definitions, the US Fish and Wildlife

Service definition (Cowardin et al. 1979), and the TVA Environmental Review Procedures definition, were also considered in this review.

## **References**

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